

OTTAWA COUNTY FLOODPLAIN MANAGEMENT GUIDEBOOK



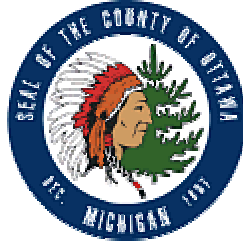



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INTRODUCTION

In Ottawa County, there are 32,413 acres of floodplain land. That floodplain land receives some measure of protection under state and federal regulations. Despite those existing regulations, local units of government still have a key role to play in maintaining the integrity of the floodplain and in preventing damage from future floods.

Communities have traditionally relied upon the Federal Emergency Management Agency's National Flood Insurance Program (NFIP) as a basis for floodplain management. However, it is important to realize the NFIP is limited in scope. Instead, it should be seen as a foundation for broader floodplain protection.

This Guidebook provides Ottawa County communities with the tools needed to build on the foundations of the NFIP and create a strong locally-based floodplain management program.

In order to institute a strong local floodplain management program, communities should follow these steps:

- Enroll in the National Flood Insurance Program.

- Adopt enhanced floodplain management standards.
- Implement a comprehensive "Best Management Practices" approach to deal with storm water management, prevent the loss of natural resources and preserve the integrity of the floodplain.

Also included in this Guidebook are six model floodplain ordinances. The Guidebook recommends adoption of one of the first two sample ordinances. Both sample ordinances prohibit all development in floodplain areas, save for low-impact uses such as park facilities.

The recommendation for prohibiting all development in the floodplain is based on the need to prevent the considerable negative impacts related to disrupting floodplains. Development in floodplain areas can lead to significant environmental and economic problems. Loss of floodplain land can cause diminished water quality and increased flooding downstream.

It is recognized that demand for use of waterfront land is high in Ottawa County. This Guidebook offers a number of innovative options to provide access to floodplain

land for landowners and the general public without directly developing the floodplain.

However, not all communities are willing to implement such restrictive ordinances, even with options which provide access to the floodplain. This Guidebook provides a number of other methods for lessening impacts on floodplain land and decreasing flood risks. It includes four additional sample ordinances which serve as a guide for meeting the requirements of the National Flood Insurance Program and allow for a wider range of uses in the floodplain.

BACKGROUND

Flooding is an essential aspect of the life-cycle of a waterway. In a healthy river or stream, floods annually replenish wetlands. This land cleanses the water while the flooding ensures the land's continued fertility. In Ottawa County, such land often serves as vital grazing ground for farmers' herds.

Natural and manmade factors play a role in frequency and seriousness of floods.

Flooding can occur at any time of the year and is mainly the result of excessive rainfall and/or the combination of rainfall and snowmelt. In the lower Grand River, ice jams have also led to significant flooding in winter and early spring.

The health of a waterway can become threatened with the development of the land surrounding the floodplain

and the surrounding watershed. This development of natural areas can eliminate floodwater storage areas, increase storm water runoff, and create problems downstream.

The following basic concepts are commonly used when dealing with floodplain management. These explanations also outline the relationships between floodplain, storm water, and watershed management.

Floodplain Management

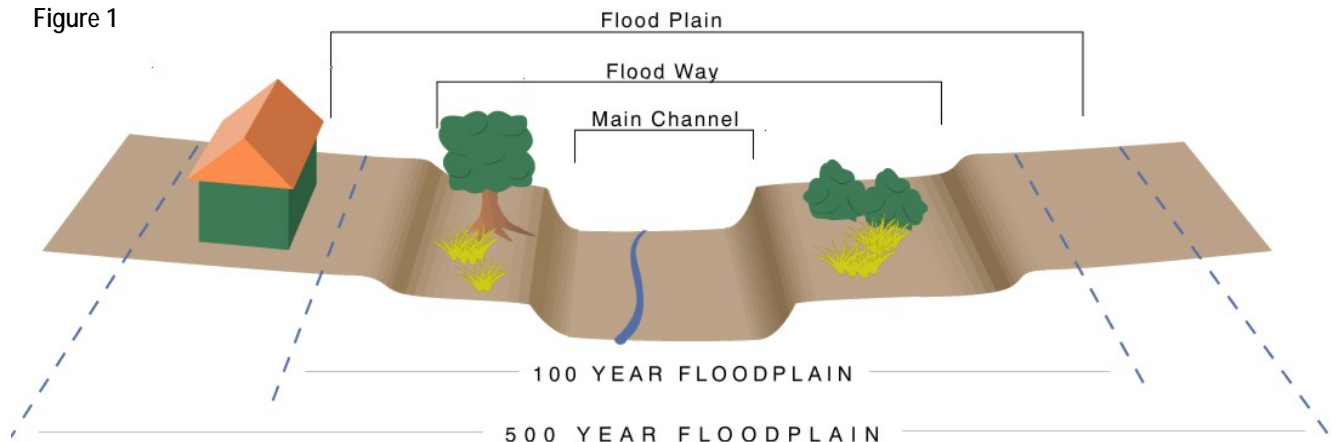
The floodplain is the land area adjacent to a river providing additional capacity for excess water flows when the normal river channel is exceeded. The floodplain itself is divided into two components commonly referred to as the flood fringe and the floodway. The floodway is the channel of river and the adjacent land

that actively discharges flood water downstream. The floodway usually carries deep and fast moving water. The flood fringe is that portion of the floodplain that extends between the edge of the floodway and the outer limit of the floodplain, and normally carries shallow, slow moving water. (see Figure 1)

According to the FEMA guidebook Subdivision Design in Flood Hazard Areas, "Floodplains serve as natural flood and erosion control systems by providing temporary storage of floodwaters, reducing the velocity of the water, and minimizing the amount of sediment that can accumulate downstream."

Floodplain management involves the designation of flood-prone areas and the limiting of their uses to those compatible with a given degree of risk. It also attempts to minimize modifications to streams, reduce flood hazards, and

Figure 1



protect the water quality of streams. As such, floodplain management can be seen as part of a larger process of surface water and storm water management within a local community.

The concept of floodplain management has evolved over time. Prior to the mid-1960's, flood control in Michigan and elsewhere was seen primarily as a structural control program where dams, levees and other flood control works were constructed to keep floodwaters away from developed areas. By the late 1980's, communities began to include the restoration and preservation of the natural floodplain areas into their floodplain management programs.

Floodplain Management Principles

The goal of floodplain management is to achieve a balance between competing demands for use of floodplain areas. Recommendations for local floodplain policy should be developed based upon the following principles:

- Floodplain management should balance economic development, environmental quality, and health and safety.

- Development that is located in flood prone areas, or that adversely affects floodplains, should be avoided unless it is considered necessary for the public interest.
- New developments adjacent to floodplains should not increase the risk of flooding for other properties.
- Capital and operating costs of floodplain management should be shared equitably by the public and specific beneficiaries instead of being borne by floodplain landowners.
- Consideration should be given to a combination of structural and non-structural tools to reduce flood damage.

- The floodplain should be considered in the context of the collective needs of the local community and as a part of a larger watershed plan.

The Association of State Flood Plain Managers' approach is shown in Figure 2, "No Adverse Impact Floodplain Management."

Storm Water Management

Traditionally, storm water management has involved protecting downstream areas from flooding by addressing increased drainage flows. It has been viewed as a field separate from floodplain management. However, new emphasis on water quality, nonstructural intervention and watershed management has resulted in the overlapping of storm water management and floodplain management.



Van Lopik subdivision in Robinson Township – Aerial View is looking upstream.

Watershed Management

Realizing that urban storm water quantity and quality management needs to be addressed on a larger scale, communities are increasingly turning to the development of comprehensive watershed and sub-watershed plans. These plans usually encompass broader management issues such as land use planning and zoning, recreational and aesthetic opportunities, water supply protection, and habitat management.

Because watershed boundaries do not coincide with political jurisdictions, multiple governmental units must often be involved in watershed planning efforts. Successful watershed management can only occur if all jurisdictions within a watershed boundary are involved at some level and committed to the same goals. The challenge is to develop effective inter-jurisdictional watershed plans that are proactive, well-defined, well-funded, and adequately staffed.

A number of watershed programs have already been undertaken in Ottawa County and demonstrate the benefits of cooperation between governmental units. These steps are key to successfully creating and implementing a watershed management plan:

- Develop a broad-based consensus for the need to protect and manage the specified watershed.
- Establish a written Memorandum of Understanding (MOU) or a memorandum of agreement between interested/concerned jurisdictions and agencies detailing management efforts to be undertaken.
- Obtain some level of funding commitment from all signatory parties.
- Establish a technical committee to develop and coordinate watershed management efforts.
- Consistently evaluate and update the watershed plan efforts.

The quality of the County's rivers, streams, lakes and wetlands and other water resources is directly linked to the quality of the environment surrounding these waters. However, floodplain management programs have historically focused on single goals or a small set of goals, such as mitigating damage to new structures and providing insurance coverage. Now, many communities are seeking ways to further reduce the impact of flooding through land use planning strategies. Approaches to dealing with these problems range from individual actions to comprehensive multi-objective management plans that integrate a wide range of community desires and goals with regard to floodplain areas. Floodplain protection programs are most effective when coordinated with other surface and groundwater protection programs and with other resource management programs, such as, water supply, restoration, control of storm water, and non-point source pollution.

No Adverse Impact Floodplain Management

"No Adverse Impact Floodplain Management" is the national policy of the Association of State Floodplain Managers. No Adverse Impact Floodplain Management is based on the principle that the action of one property owner must not adversely impact the rights of other property owners. Impact is measured through increased flood peaks, flood stage, flood velocity, and erosion and sedimentation. No impact floodplains would become the default management criteria if a community has not developed and adopted a comprehensive management plan that identifies acceptable levels of impact, appropriate measures to mitigate those adverse impacts, and a plan for implementation.

This policy is designed to dispel the myth that floodplain management standards are something imposed by FEMA, and promotes local accountability for developing and implementing a comprehensive strategy and plan for the floodplain. It gives communities the flexibility to adopt comprehensive, local management plans which would be recognized by FEMA and other federal and state programs as the acceptable standard in that community. Further information on "No Adverse Impact Floodplain Management" is available at <http://www.floods.org>.

No Adverse Impact Floodplain Management

3 Step Process

1. Undeveloped Land in the floodplain should be protected where feasible and regulated to mitigate impact on existing development.
2. Existing Development should have a permitting process in order to regulate future development or expansion of structures.
3. The River's Riparian Zone, including wetlands and forested areas, should be enhanced and protected as a buffer area.

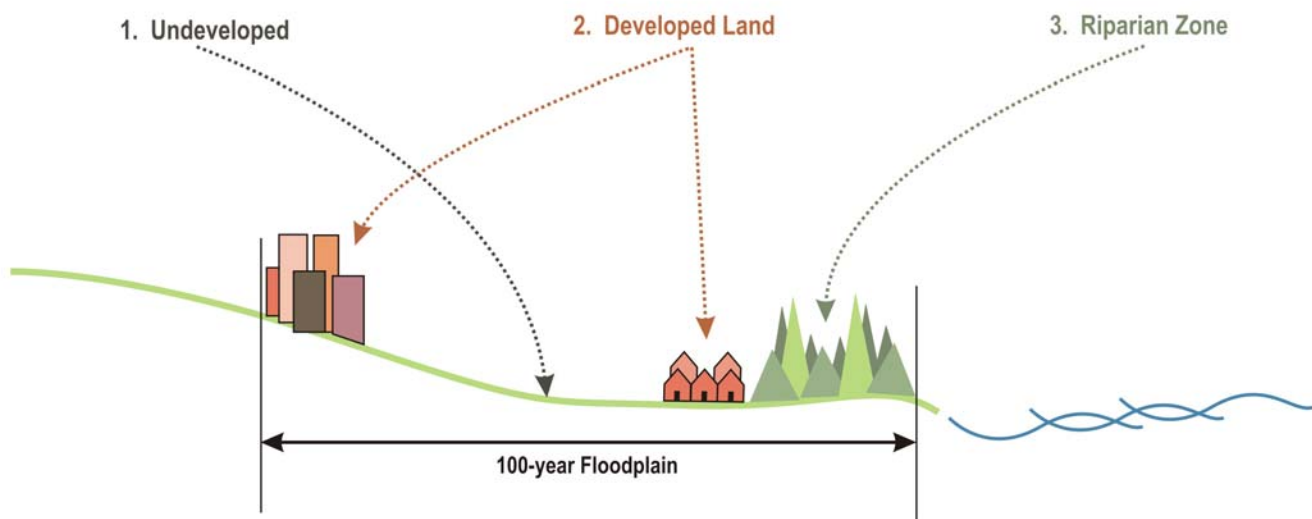


Figure 2

REGULATING FLOODPLAINS

Creation of a local floodplain management program requires awareness of the federal and state governments' current roles in regulating floodplains

The regulations at both the state and federal level are extensive. Participation in the federal government's flood insurance program requires the enactment of legislation at the local level. Most forms of development in a floodplain require a permit from the Michigan Department of Environmental Quality.

The state and federal regulations leave minimal room for local units of government to directly regulate floodplains in a way that exceeds their current standards. The recommended sample ordinances in this guidebook prohibit all development in the floodplain save for low-impact uses such as park facilities.

While there are few legislative options for local units of government with regard to floodplain management, there are a number of Smart Growth techniques that can be utilized to protect floodplains and reduce flood loss. Those tools and techniques are explored in-depth later in this section.

This section will introduce current federal and state regulations and discuss what form local floodplain protection might take.

Federal

The National Flood Insurance Program

The nation's floodplains fall under the authority of the Federal Emergency Management Agency (FEMA). FEMA administers the National Flood Insurance Program (NFIP), which provides insurance coverage for homes in floodplains while also requiring local units of government to enact basic regulations designed to reduce flood hazards.

"...NFIP is designed to reduce flood losses and provide for subsidized flood insurance..."

The federal government enacted a flood insurance program in 1968 (*the National Flood Insurance Act - NFIA*) after decades of mounting national losses due to continued development in floodplains. The National Flood Insurance Reform Act (NFIRA), signed into law in 1994, strengthened the NFIP by providing for mitigation insurance and establishing a grant program for state and community flood mitigation planning projects. The

NFIRA also codified the Community Rating System (CRS).

Is community participation mandatory?

Community participation in the NFIP is voluntary. Each identified floodprone community must assess its flood hazard and determine whether flood insurance and floodplain management would benefit the community's residents and economy. However, a community that chooses not to participate within 1 year after the flood hazard has been identified and an NFIP map has been provided is subject to the ramifications explained in the answer to below. A community's participation status can significantly affect current and future owners of property located in Special Flood Hazard Areas (SFHAs). The decision should be made with full awareness of the consequence of each action.

Source: FEMA's booklet *Answers to Questions about the National Flood Insurance Program*

Under the Community Rating System, insurance credits may be given to communities that implement measures to protect natural and beneficial floodplain functions and manage erosion hazards.

In Michigan only approximately 15 % of structures subject to flooding are actually insured against the risk. Currently there are approximately 769 Michigan communities participating in the National Flood Insurance Program (NFIP) and over 25,000 policies in force with coverage in excess of \$2.5 billion.

Minimum program requirements for communities under the NFIP include:

- Permitting for all proposed new development (including new buildings, improvements to buildings, filling, grading, or any other human-caused change to the land);
- Reviewing subdivision proposals to assure that they will minimize flood damage;
- Anchoring and floodproofing structures to be built in known flood prone areas;
- Safeguarding new water and sewer lines from flooding; and
- Enforcing risk zone, base flood elevation, and floodway requirements after the flood insurance map for the area becomes effective.

The NFIP also establishes local procedures relating to acceptable data on which to base management decisions, record keeping responsibilities, changes in the floodplain boundaries, planning considerations and development review. However, communities participating in the NFIP should become intimately familiar with the program regulations as printed in the

Flood Insurance Program Terminology

The National Flood Insurance Program (NFIP) utilizes terms and abbreviations which can be confusing in trying to understand the Program. A few of the terms and abbreviations are defined below. Definitions for other terms used in the Program can be found in the National Flood Insurance Program Regulations, Section 59.1

Base Flood – A base flood is a flood which has a one percent chance of being equaled or exceeded in any given year. This flood is also referred to as a 100-year flood.

FHBM – The letters FHBM refer to the Flood Hazard Boundary Map which is issued by the Federal Insurance Administration. The map delineates the boundaries of land areas subject to a flood hazard. This map represents the first technical flood information received by a community and is eventually superseded by the Flood Insurance Rate Map.

FIRM – The letters FIRM refer to a map known as the Flood Insurance Rate Map. This map comprises part of the flood insurance study which is completed by the Federal Insurance Administration. This map supersedes the Flood Hazard Boundary Map and together with flood elevation and floodway delineation information, forms the technical basis for the floodplain management regulations which must be adopted for participation in the regular phase of the program.

FBFWM – The letters FBFWM refer to a map known as a Flood Boundary Floodway Map which may be included with the Flood Insurance Rate Map when a flood insurance study is transmitted to a community.

Code of Federal Regulations 44. A few of the more noteworthy requirements are summarized as follows:

1. The floodplain management regulations must be legally enforceable, apply to both public and private land, and take precedence over less restrictive laws, ordinances or rules. (See Program Regulations, Section 60.1b.)

2. The management criteria set forth in the Federal Register are minimum standards. A community may adopt more stringent regulations. (See Program Regulations, Section 60.1d.)

<p>3. Communities must adopt appropriate management regulations within six months of receiving the floodplain data from the Federal Insurance Administration. (See Program Regulations, Section 60.2a.)</p>	<p>is encouraged; considerations to be included in such plans are specified. (See Program Regulations, Section 60.22.)</p>	<p>management regulations is encouraged. (See Program Regulations, Section 60.26.)</p>
<p>4. The floodplain management regulations must be based upon the most recent floodplain studies provided by the Federal Insurance Administration. In the absence of FIA studies, other available floodplain information may be used. (See Program Regulations, Section 60.2h and 60.3.)</p> <p>5. Upon receipt of floodplain data from the Federal Insurance Administration, the community must inform the appropriate state and area-wide clearinghouses that it must adopt management regulations within six months. The clearinghouses are encouraged to assist communities. (See Program Regulations, Section 60.2i.)</p>	<p>What happens if a community does not participate in the NFIP?</p> <p>Flood insurance under the NFIP is not available within that community. Furthermore, Section 202(a) of Public Law 93-234, as amended, prohibits Federal officers or agencies from approving any form of financial assistance for acquisition or construction purposes in a Special Flood Hazard Area (SFHA). For example, this would prohibit loans guaranteed by the Department of Veterans Affairs, insured by the Federal Housing Administration, or secured by the Rural Housing Services. Under Section 202(b) of Public Law 93-234, if a Presidential declared disaster occurs as a result of flooding in a nonparticipating community, no Federal financial assistance can be provided for the permanent repair or reconstruction of insurable buildings in SFHAs. Eligible applicants may receive those forms of disaster assistance that are not related to permanent repair and reconstruction of buildings. If the community applies and is accepted into the NFIP within 6 months of a Presidential disaster declaration, these limitations on Federal disaster assistance are lifted.</p> <p>Source: FEMA's booklet Answers to Questions about the National Flood Insurance Program</p>	<p>Shortcomings of the NFIP</p> <p>The FEMA flood hazard minimum regulations provide a national baseline –a code that works for many communities all over the country despite their varied circumstances and needs. Most communities in Michigan have adopted the FEMA minimum standard. However, FEMA recently recognized that the standard flood hazard ordinance and the FIRM maps are not the ideal for many communities. The official maps do not always delineate land that has experienced historic flooding. In addition, many communities prefer stricter development regulations in flood-prone areas. They have come to the realization that building homes and businesses in areas known to flood is a fundamental planning mistake that can be avoided with better subdivision and building designs.</p> <p>In Michigan and Ottawa County, floodplains are relatively small in area and alternatives can be found to allow reasonable development and still protect the floodplain. Therefore, many communities have adopted regulations that limit floodplain fill and restrict the placement of new structures.</p>
<p>6. The development of comprehensive management plans for flood-prone areas</p>	<p>7. Inter-jurisdictional cooperation in the adoption and implementation of floodplain</p>	

In addition to preventing property damage, restricting development in floodplains serves many other important functions. These include water recharge, protection of wildlife and riparian habitat and flood water storage.

While many communities in Michigan participate in the NFIP, the minimum requirements of the NFIP program are generally seen as having several inherent weaknesses including:

- Little or no action to reduce damages in existing flood prone areas.
- The tendency for the program to actually stimulate development in floodplain areas due to reduction of fear of substantial losses from flood damage.
- Little or no coverage for the smaller feeder and headwaters streams.
- The failure to take into account the tendency for flood boundaries to shift over time as increased runoff from new development increases the floodplain width. This results in structures thought to be beyond the area of flooding being endangered.
- Floodplain maps not available or updated.
- Communities failing to enforce NFIP regulations.

- Taking the position of doing only the minimum necessary to meet local, state or federal requirements, and not integrating the broader issues of community health and safety, watershed and water quality management, and quality of life into the process.
- Taking "piecemeal" approaches that may correct one problem area but create a more serious problem elsewhere.

It is important to remember that the NFIP is designed to simply reduce flood losses and provide for subsidized flood insurance. It is not designed to be a comprehensive floodplain management program. The NFIP should serve as the beginning of a broader floodplain management program. The "Local Units of Government" portion of this section provides guidance and approaches for developing a more comprehensive program.

The NFIP Process

FEMA works with state, county and local governments to identify their flood hazard areas and publishes a Flood Hazard Boundary Map (FHBM) of those areas. When the community chooses to join the NFIP, it then must require permits for all construction or other development in the areas

identified on the Flood Hazard Boundary Map. Each community must ensure that construction materials and methods used will minimize flood damage. In return, the federal government makes flood insurance available. Subsidized premium rate schedules are available for all insurable buildings and their contents regardless of flood risk if the start of construction has preceded the publication of an effective Flood Insurance Rate Map (FIRM). FEMA normally issues the community's FIRM, conducting after a Flood Insurance Study of risk zones and elevations.

The FIRM will indicate base flood elevations and flood hazard zones for insurance rating and floodplain management purposes. The community must adopt or amend its floodplain management ordinances to conform with or exceed the additional standards for the Special Flood Hazard Areas (SFHAs) identified on the FIRM. Once accomplished, the community becomes enrolled in the regular NFIP program, and increased amounts of flood insurance are made available, with insurance for new and substantially improved buildings being rated on an actuarial or actual risk basis.

The regulatory requirements set forth by FEMA are the minimum measures acceptable for NFIP participation. More stringent

requirements adopted by the local community or state would take precedence over the minimum regulatory requirements established for NFIP flood insurance availability.

The Michigan Department of Environmental Quality's Land and Water Management Division (LWMD) has been designated the State Coordinating Agency for the National Flood Insurance Program. The Division is available to answer questions related to Michigan's floodplain law and the National Flood Insurance Program and can provide limited technical assistance as well as review services.

State

Michigan Department of Environmental Quality

The State of Michigan's Floodplain Regulatory Authority, found in Part 31, Water Resources Protection of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended, requires that a permit be obtained prior to any alteration or occupation of the 100-year floodplain of a river, stream or drain.

The floodplain is divided into two parts: the floodway which carries most of the flow during a flood event and the floodway fringe which is an area of very slow moving water or "slack water."

Floodways are the channel of a river or stream and those portions of the floodplain adjoining the channel which are reasonably required to carry and discharge a 100-year flood. These are high hazard areas of rapidly moving water during times of flood. The purpose of Part 31 is to assure that the flow-carrying capacity of a watercourse is not harmfully obstructed, and that the floodway portion of the floodplain is not used for residential construction.

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, 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 considered to be floodway, provided local ordinance and building standards are met. New residential construction is specifically prohibited in the floodway. The minimum standard for residential construction within the 100-year floodplain requires that the lowest floor (including basement) be elevated one foot above the 100-year flood elevation. Non-residential structures must have the lowest floor either elevated one foot above the 100-year flood elevation or be designed to be flood-proof.

State Floodplain Review for Subdivisions

In an effort to provide consumer protection and minimize losses due to flooding, the Land Division Act (formerly the Subdivision Control Act), Act No. 288, Public Acts of 1967 as amended, Sections 116 and 117, requires that preliminary plats for subdivisions be submitted to the Department of Environmental Quality's Land and Water Management Division for review. (Other

parts of the act involving subdivisions are administered by Consumer and Industry Services). Section 116 requires the proprietor to submit the preliminary plat to the DEQ if the land proposed to be subdivided abuts a lake or stream, or abuts an existing or proposed channel or lagoon affording access to a lake or stream where public rights may be affected.

Section 117 requires the proprietor to submit the preliminary plat to the DEQ if any portion of the subdivision lies within the floodplain of a river, stream, creek, or lake. The 100-year floodplain must be shown on the final plat. All lots shown on the plat will be required to have 3,000 square feet of buildable area above the 100-year floodplain elevation. Permits will be needed from the LWMD if any filling, dredging, or performing construction within the floodplain, wetland, or below the established high water mark of any inland lake, stream, creek, or drainage course.

Local Units of Government

Local Floodplain Management Program

Objectives

The primary objective of a local floodplain management program is to ensure that flood levels are not increased, that public and private flood losses are minimized, and that the natural and beneficial value of floodplains is preserved. There are a number of ways a community may establish the necessary floodplain management regulations. Adoption strategies include:

1. Appropriate changes in local zoning, subdivision and building ordinances.
2. Development of comprehensive floodplain management ordinances that incorporate all of the National Flood Insurance Program regulatory requirements with an administrative mechanism.

The primary objective of local programs is to ensure the following:

- Flood levels are not increased
- Public & Private flood losses are minimized, and
- Natural & Beneficial values of floodplains are preserved.

3. Multi-jurisdictional floodplain management agreements.

Ultimately, a community should decide, on the basis of local circumstances, which regulatory method will be the most feasible. As local

floodplain situations and administrative capabilities are analyzed, the conclusion may be reached that additional floodplain management programs and regulations should be added which exceed the detail and scope required by the National Flood Insurance Program.

Outreach/Education

Achieving success when adopting and implementing a new floodplain management standard often depends on how it is received by those most affected. For a residential property having an occupied house, affected parties may include the property owner, rental tenants, the lending institution that holds the mortgage on the property, and the insurance company that insures it against flood damage. For a commercial or industrial property, the owner, board of directors, or group of shareholders may be most affected by a newly adopted floodplain management standard. For an undeveloped property, those impacted by floodplain management requirements may include a developer, builder and/or contractor, in addition to the property owner. All of these parties may react negatively or positively to the news that there is a new regulation that affects their particular piece of property. How and when that information is provided to them will also affect how it is received.

Adding Floodplain Protections to Codes and Regulations

Before a municipality implements new floodplain regulations, local officials should determine what form the regulations will take. For environmentally sensitive areas, regulations are typically one of two different types: text-based or map-based.

Text-based regulations are normally in ordinance format. These regulations contain definitions of sensitive land areas that are based on land characteristics, such as slope or distance from a river.

In a text-based system, the permit applicant must conduct a study of these environmentally sensitive characteristics and delineate the land area subject to regulation. Government officials then review the results of these private studies. In Michigan, development is regulated by the local or state building code which requires applicants to determine whether a property resides in a floodplain regardless of whether or not the community participates in the NFIP. Current building codes require that new residential units within the 100-year floodplain have the lowest floor, including basement, elevated above the 100-year flood elevation. Non-residential construction may either be elevated or flood-proofed to a level above the

100-year flood elevation. Properties within a floodplain must be reviewed by the Department of Environmental Quality before a building permit can be approved.

When crafting the text for floodplain regulations, local officials should consider what type of rules best suit their goals. Floodplain regulations are usually found in one of four types of forms: zoning ordinances, subdivision regulations, storm water, water and sewer regulations, or “stand alone” floodplain ordinances. Each is explained below.

Zoning Ordinance

A zoning ordinance regulates development by dividing the community into zones or districts and setting development criteria for each district. Two different approaches may be used to address development in flood-prone areas: separate districts or overlay zoning. With a separate zoning district, the floodplain can be designated as one or more separate zoning districts in which only development that is not susceptible to flood damage is allowed. Appropriate districts include public use, conservation, agriculture, and cluster or planned unit developments that limit building to areas outside the 100-year floodplain, wetlands or other sensitive areas.

Overlay zoning adds special requirements in areas subject

to flooding. Further discussion of overlay zoning is included later in this guidebook.

Subdivision Regulations

Subdivision regulations govern the method by which land will be divided into single lots. They set construction and location standards addressing roads, sidewalks, utility lines, storm sewers, drainageways and other infrastructure the developer will provide. They may also require that every lot have a buildable area above the Base Flood Elevation, include dry land access and meet other standards that provide more flood protection than a normal building code can provide.

Storm water, Water and Sewer Regulations

Depending on the situation, it may be most appropriate to include the National Flood Insurance Program’s requirements for water and sewer system protection within the regulatory section that sets the construction standards for these systems.

Floodplain Ordinance

The majority of communities in the NFIP have enacted separate ordinances that include all the NFIP regulatory requirements. These ordinances are usually based on a FEMA or state model. This permits all

floodplain development standards to be contained in one ordinance. Developers can easily see what is required of them, and FEMA and the state can easily see if the community has adopted the latest requirements. The disadvantage of a separate ordinance is that it may not be coordinated with other building, zoning or subdivision regulations. Some communities have found that by adopting a stand-alone floodplain ordinance, they adopt standards that are inconsistent or even contrary to the standards in the other regulations. For example, the building code may require crawlspace vents to be elevated, near the floor joists, while the floodplain ordinance requires them to be no more than one foot above grade. If you have a stand alone ordinance, you should review its provisions with all other offices and ordinances that regulate land development and building construction. Make sure that others know the floodplain regulations and that there are no internal inconsistencies. For example, a floodplain ordinance administered by the city engineer may not be coordinated with the permitting process conducted by the building department.

For map-based regulations, an official map is adopted and the regulation takes the form of an overlay zone. If an area is defined in the

map, it is subject to regulation. Typically, there is a provision to adjust the map based on better data that the applicant may supply. However, if an area is not on the map, it is not regulated – even if it meets the criteria for inclusion (thus the map must be drawn with great care). Floodplains are regulated this way through FEMA's recommended code.

We recommend that the map-based system be used in conjunction with text. This technique gives property owners specific information regarding regulatory impact. The maps can be adjusted to reflect minor floodplain deviations, developed areas, or where future development is more important than protection, such as in a downtown area. This system also allows the overall regulatory impact to be estimated by the affected jurisdictions. For example, a community can use the sensitive land map to help determine the community's development capacity.

Other Tools for Floodplain Protection

In many communities, identifying and managing areas that have environmental significance is one of the biggest concerns in planning for development. Historically, environmentally sensitive areas have been destroyed to make way for new development. Michigan was primarily wetland when it was first settled. Wetlands

have been filled, streams buried or turned into culverts and lakeshore areas filled and reclaimed. However, many communities have become more aware of the value of a healthy natural environment, and have enacted land-use codes providing a balance between the natural environment and urban areas.

The following are examples of practices that can be added to a community's comprehensive plan or adopted as an ordinance, improving the community's floodplain management program.

Fill Restrictions

Inadequate regulation of fill for developments can lead to catastrophic results. Adding soil to land in the floodplain and, in the process, altering the course of floodwaters, may expose a previously safe structure to flooding (see Figure 3).

Fill restrictions offer basic floodplain protection and can be adopted without undertaking more comprehensive restrictions. The following standards are often used to regulate fill during construction in a floodplain:

- Require cut and fill to be balanced so that the overall flood-storage capacity of the floodplain remains constant.

- Limit the total amount of permitted fill per site.

only be a forum to make suggestions that a developer can choose to implement or ignore.

with developers to integrate development with the natural features of a site, while developers are allowed more flexibility in designing a development. For example, most open space in a conventional zoning district is in the yard of each individual lot or in a park. A PUD offers the opportunity to provide the same mixture of land uses without the need for individual rezoning, resulting in a much more coordinated compatible plan. Some communities include a density bonus depending upon the extent of the public benefit.

Location Restrictions

Where the hazard is so severe that certain types of development should be prohibited, a location restriction provision may be appropriate. Some communities prohibit some or all development in all or part of the floodplains. A common approach is to prohibit particular structures in the floodway or areas exceeding certain flood depths.

Because this is the most restrictive regulatory provision, location restriction language has to be drafted carefully to avoid "property taking" litigation. Sometimes a community can tie transfers of development rights, density bonuses or other benefits to a development that avoids the flood hazard area. These types of "win – win"

Construction in the Floodplain

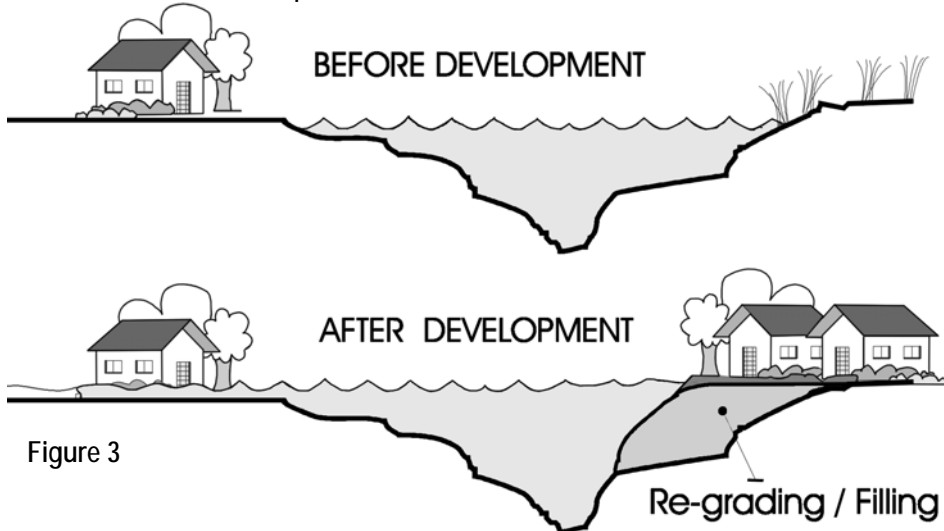


Figure 3

- Specify permitted locations for fill on a site. For example, designate fill for the portion of the lot furthest from the floodplain.

Site Plan Review Standards

The site plan review process is key to the implementation of any new standard or regulation. During the review process, floodplain concerns can be raised and requests to modify a proposed development can be made. Local officials and developers can negotiate solutions to problems with regard to the floodplain. However, without the incorporation of the appropriate standards in a community's zoning ordinance, the effectiveness of the site plan review process can be limited. For many communities, it may

Planned Unit Development

The Planned Unit Development (PUD) process can compensate for some of the drawbacks of the conventional site plan review process.

If the floodplain is allowed to have a natural, open space land use, it will then be able to do its job. Other low damage uses of the floodplain include playgrounds, reforestation, parking, gardens, pasture, created wetlands, and other open space uses.

The planned unit development is a common regulatory tool that enables preservation of sensitive areas and open space. Local municipalities have more leverage to negotiate

situations benefit everyone and reduce the potential for challenging the ordinance.

Conservation Subdivision Design

Open space preservation is central to floodplain management. Once land is developed, it can increase storm water runoff to a stream or lead to more sediment or erosion. This, in turn, can negatively impact the floodplain. One innovative method of open space preservation is "Conservation Subdivision Design." Conservation Subdivision Design can also address some of the issues surrounding location restrictions.

When a development is proposed, communities have many tools to arrange the development so that buildings are kept out of the floodplain. This has two advantages over simply requiring the buildings to be protected from flooding:

- It limits the potential for buildings to become isolated by rising waters during a flood, lessening the burden on local emergency services which are responsible for evacuation/rescue operations
- The neighborhood will have waterfront open space and recreation areas – a valuable

amenity in most communities.

A housing development can be clustered, as shown in Figure 4, so the developer can sell the same number of home sites as a conventional subdivision.

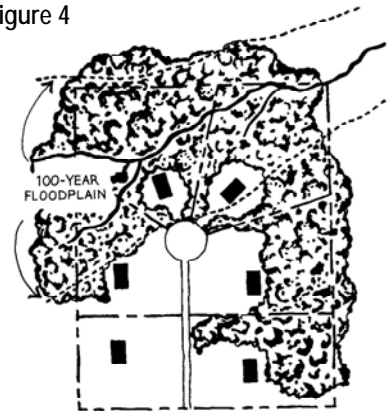
Subdivision and planning regulations can also mandate that a certain portion of a development be set aside as open space for recreation or storm water management purposes. Developers find that it is cheaper to set floodplain land as open space than to construct buildings that have to incorporate the more expensive floodplain requirements. Linear parks and greenways that connect the open space areas throughout a community are becoming increasingly popular and help sell new developments.

When a community utilizes Conservation Subdivision Design, a number of tools can be employed to ensure the practice is successful. Density bonuses, Transfer of Development Rights (TDRs) and conservation easements serve as incentives for developers to consider using conservation design instead of relying on conventional subdivision design.

Safe Uses of the Floodplain

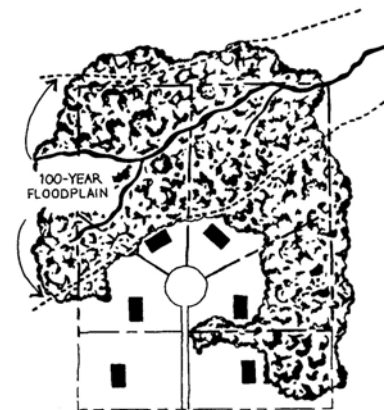
Conventional Plan A Not Recommended

Figure 4



All land is subdivided into lots, some homesites and lots partially or entirely in the floodplain.

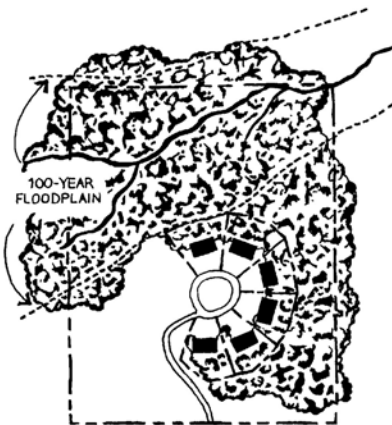
Conventional Plan B Recommended



All land is subdivided into lots, some lots partially in the floodplain, setbacks modified to keep the homesites on high ground.

Cluster Plan

Preferred



Floodplain land is placed into public/common open space, net density remains, lot sizes reduced and setbacks modified to keep homesites on high ground.

Source: American Planning Association,
Subdivision Design in Flood Hazard Areas

Density Bonuses

In order to encourage open space preservation, developers are allowed to increase the number of lots per acre in a development in exchange for larger open space protection. For example, if 60 percent of a site were preserved as common open space, the allowable density for the development would be increased by 40 percent.

Transfer of Development Rights (TDR)

A TDR program is designed to transfer the development potential from certain types of land, such as valuable

resource lands, environmental areas, and historic sites (designated sending zone), to areas designated for growth (designated receiving zone). The program revolves around the concept that ownership of land includes owning a "bundle of rights" (i.e., the right to access, to mine mineral deposits, etc.). The TDR establishes a market driven, incentive-based mechanism making the selling of development rights possible without actually buying or selling the land. Therefore, this tool does not require public funds, as the developer pays for the development rights. This type of program creates an opportunity to achieve community growth and development goals, promotes more efficient and less costly patterns of growth, compensates landowners in preservation areas for lost development potential, and provides the private sector with incentives to pursue development in designated growth areas.

Open Space/Conservation Easements

The conservation easement method is the most commonly used preservation tool in the United States and can be defined as a restriction on private property that is legally binding on present and future homeowners. Initiation of easements by the landowner is voluntary; however, when an owner

places a conservation easement on land, certain rights are transferred to another person or organization. Easements are often donated, but they can also be purchased. Easements are most commonly received by land trusts that enforce and monitor their terms.

A conservation easement allows for certain limited uses and activities such as farming, grazing, or recreational uses. The purpose of such easements is to maintain open space for human use and to prevent future development. The intent of the conservation easement is to protect land that is environmentally sensitive or unique.

Under Michigan law, conservation easements may range from 10 years to an indefinite amount of time. However, to receive federal income and estate tax reduction benefits, a permanent easement must be recorded. Additionally, the easement must be designated as a charitable donation as determined by the IRS, and must be used for the following public benefits: outdoor recreation, maintaining natural habitat/ecosystem, scenic enjoyment, or historical significance. The Michigan Farmland and Open Space Preservation Act P.A. 116 of 1974 also offers financial incentives for creating conservation easements. This act provides up to 10

years of tax relief through the enactment of a development rights easement.

Traditional Neighborhood Development

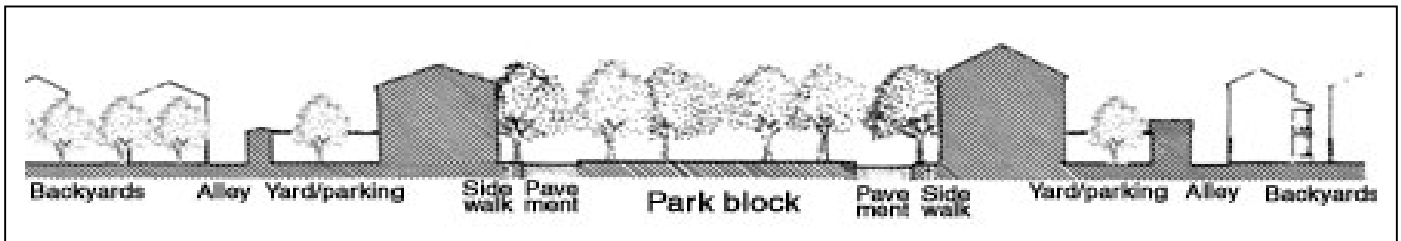
This type of development is modeled after neighborhoods typically built during the late 19th and early 20th centuries. Common elements of this type of development include: a strong pedestrian orientation, grid street pattern, mixed land uses, central and intensively used open spaces such as a town square, narrow, tree-lined streets, and architectural character

and continuity including shallow setbacks, front porches, alleys, and rear garages. Traditional neighborhood development uses land more efficiently than standard subdivisions. Encouraging Traditional Neighborhood Development may not directly aid floodplain areas. However, when used in connection with conservation subdivision design for rural areas of a township, a municipality has a comprehensive method of preserving land throughout a township. This land preservation strategy can help preserve the integrity of the floodplain over the long term.

Traditional Neighborhood Developments allow people to walk to school, work or businesses, foster a sense of community, and allow people of various ages and incomes to live in the same neighborhood. Traditional Neighborhood Development design principles can be used for new development, large redevelopment areas, or small infill projects.

The Overlay Zoning District

An overlay zone is a designated area in which special zoning rules are applied in addition to the



Benefits of Applying the Model Development Principles

The model land development principles can benefit both the natural environment and the community. Benefits can include the following:

- Protection of local rivers, streams, and lakes
- Generate smaller loads of storm water pollutants
- Help to reduce soil erosion during construction
- Reduce development costs
- Increase property values
- Provide open space for recreation
- Protect sensitive forests, wetlands, and habitats from clearing
- Result in a more attractive landscape
- Allow for more sensible locations for storm water facilities
- Facilitate compliance with wetland and other regulations
- Promote neighborhood designs that provide a sense of community
- Preserve urban wildlife habitat

What's the Difference?

Here's a quick comparison of the major differences between conventional suburban developments and traditional neighborhood developments:

Traditional Neighborhood Design:

- Streets designed for the pedestrian
- Parks and squares are planned to serve as focal points of the neighborhood
- Walkable linkages
- Housing types and price ranges are integrated – even on the same street

Conventional Suburban Development:

- Streets are designed for the automobile. They are wider with more impervious surfaces.
- Parks and other public spaces are usually "leftover spaces" created after the homes have been built.
- Different housing types and price ranges are separated.

requirements of underlying zoning districts. The advantage of using the overlay zone is that the additional rules can be tailored to protect land in the floodplain that is defined in a zoning map (See Figure 5).

increases significantly as undeveloped and rural local drainage areas become urbanized. The accumulation of developed building lots with impervious surfaces increases storm drainage from higher to lower areas within the drainage area.

development. Combining narrower streets with narrower right of ways would also alleviate the need to clear-cut large swaths of land for the roadway.

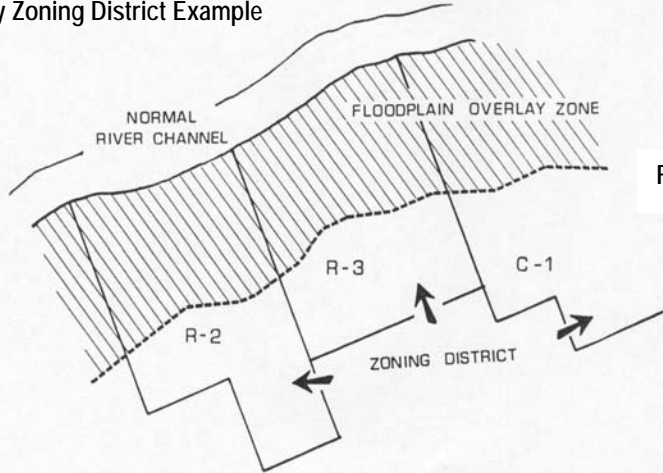
Land preserved due to narrow streets and right of ways could be converted into open space, preserving natural drainage areas.

Local units of government can also protect floodplains through storm water and soil erosion regulations. A storm water management ordinance should require the review of site plans for proper drainage and storm water management, which is essential to water quality and the health of riparian corridors. Although the Ottawa County Drain Commissioner's office reviews drainage and storm water runoff plans for developments, the Drain Commissioner is limited in his authority to require best management practices for storm water control. Local storm water regulations can fill the gaps in the Drain Commissioner's authority. The Drain Commissioner's office has produced a model Storm Water Ordinance for local units of government.

Master Plan updates

Communities can help relieve development pressures in floodplain areas by revising their master land use plans. Communities can recommend that floodplain areas be zoned for lower density uses

Overlay Zoning District Example



An additional benefit of an overlay zone is that it can be implemented without disturbing land-use goals for the rest of the community as outlined in the master land use plan and the zoning ordinance. Reasonable use of land can be accommodated as long as the floodplain management requirements of the overlay zone are met. The drawback of using an overlay zone is that sensitive areas outside the zone that may impact the floodplain receive no special consideration.

Storm Water Management/ Impervious Surface Regulations

The percentage of impervious surfaces

This increases the possibility of flooding downstream while also increasing the risks of the flooding of yards, streets, basements, and houses within the urbanizing drainage area. In addition, the water temperature heats up as it runs over these impervious surfaces and picks up oil, car fluids, and debris. These contaminated, warmer waters can have a significant negative impact on water quality, wetlands, and other sensitive natural areas.

Reducing the width of streets and road right of ways will help combat this problem. Narrower streets in developments would decrease the amount of impervious surfaces in a

or Planned Unit Developments. They can also recommend that infrastructure improvements such as new roads be placed away from the floodplain. The master land use plan can be updated during the process of creating an overlay zone.

Resource protection

Woodlands and wetlands both play a key role in maintaining floodplains and storing floodwaters during significant rain events. Replacing these resources once they are lost can be costly.

Communities can protect these resources through specific ordinances. Implementation of such ordinances offers the advantage of local protection for local resources.

However, use of such ordinances should be approached cautiously. Resource-specific ordinances can be costly to create and enforce. They must be carefully written so that they do not conflict with state regulations and do not expose a local unit to possible property takings litigation.

Another way to foster resource protection is through the creation of area special purpose plans. These plans identify geographic areas in the master plan requiring special attention, such as commercial corridors, highway interchange areas, historic districts, or areas requiring resource protection.

An example of an area or special purpose plan would be a greenway plan. Greenway plans focus on corridors of land recognized for their ability to connect people and places. These plans identify ribbons of open space within linear corridors that are either natural, such as rivers and streams, or manmade, such as abandoned railroad beds and utility corridors. Greenways identified in greenway plans

act as vegetative buffers that serve to protect natural habitats, improve water quality, and reduce the impacts of flooding in floodplain areas. Most provide routes for alternative transportation and improve the overall quality of life in an area.

Greenway plans can be regional in scope and, therefore, may be multi-jurisdictional. They provide communities with a regional vision and help identify what lands must be acquired to make the greenway complete in a local and regional context.

Ottawa County currently has three greenway plans in place covering the Grand, Pigeon and Macatawa rivers.



Grand River overflowing into Limberlost subdivision in Robinson Township.

Ottawa County Model Floodplain Management Ordinances

Introduction

The sample zoning provisions which follow are designed as new articles to be added to a zoning ordinance. Six sample articles are presented. Following each article are supplementary amendments for the municipality's general zoning ordinance which should be adopted at the same time the floodplain regulations in that particular article are adopted.

Since situations differ from community to community, additional provisions tailored to local needs may be warranted. For example, it may be appropriate in some floodplain situations to limit floodplain use beyond that required by the National Flood Insurance Program, except in situations where there is hardship or practical difficulty. (See the first sample provision.) In such situations, development meeting the standards of the National Flood Insurance Program would be permitted.

The first article is a general floodplain ordinance adapted from the Department of Environmental Quality Model Ordinance presented in Article II. The first two articles exceed the requirements of the National Flood Insurance Program by prohibiting all flood hazard area development. The remaining four articles correspond with a level in the National Flood Insurance Program and present the regulatory language necessary for participation at that level. These levels are explained in Code of Federal Regulations 44 Section 60.3. The level of participation for Ottawa County communities will depend on the amount of available Floodplain data for each that community. Some sections in these following ordinances have been reserved. Each successive ordinance includes additional language to replace these reserved sections.

- **Please note that the words in italics represent instructions and observations, and are not a part of the suggested ordinance language.**

I. General Model Floodplain Ordinance: Exceeds NFIP requirements of Section 60.3

The following zoning ordinance surpasses the requirements of Section 60.3 by prohibiting all floodplain development.

ARTICLE _____

FLOOD HAZARD AREAS

- (a.) **Intent.** It is the intent of the (community) in adopting this article to significantly reduce hazards to persons and damage to property as a result of flood conditions in the (community); to comply with the provisions and requirements of the National Flood Insurance Program; to protect human life, health and property from dangerous and damaging effects of flood conditions; to minimize public expenditures for flood control projects, rescue and relief efforts in the aftermath of flooding, repair of flood-damaged public facilities and utilities, and the redevelopment of flood damaged homes, neighborhoods, commercial and industrial areas; to maintain stable development patterns not subject to the blighting influence of flood damage; to designate floodplains and institute floodplain development regulations and general development standards; to establish regulations concerning the same; and to provide for the administration of this article and to provide penalties for violation.
- (b.) **Delineation of the flood hazard area overlay zone.**
- (1) The flood hazard area zone shall overlay existing zoning districts delineated on the official (community) Zoning Map. The boundaries of the flood hazard area zone shall coincide with the boundaries of the areas indicated as within the limits of the 100-year flood on the Flood Insurance Road Map for (community) dated _____. The Flood Insurance Rate Map is adopted by reference, appended, and declared to be a part of this ordinance. The term flood hazard area, or used in this ordinance, shall mean the flood hazard area zone.
 - (2) Disputes as to the location of a flood hazard area zone boundary shall be resolved by the Zoning Board of Appeals.
 - (3) In addition to other requirements of this ordinance applicable to development in the underlying zoning districts, compliance with the requirements of this Section shall be necessary for all development occurring within the flood hazard area zone. Conflicts between the requirements of this Section and other requirements of this ordinance or any other ordinance shall be resolved in favor of this Section, except where the conflicting requirement is more stringent and would further the objectives of this Section to a greater extent than the requirements of this Section. In such cases, the more stringent requirement shall be applied.

(c.) Principal and Accessory Uses Permitted.

- (1) Within the flood hazard area overlay zone, no land shall be used except in one or more of the following cases/instances/situations:
 - a. Agriculture and pasture land.
 - b. Parks and recreation facilities, provided no permanent structures are constructed.
 - c. Swimming beaches, fishing, and boating docks in accordance with the provisions of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451.
 - d. Required open space or lot area for structural uses that are landward of the overlay zone.
- (2) The following accessory structures and uses are permitted, provided they are also permitted in the underlying zoning district.
 - a. Off-street parking, streets, roads, bridges, outdoor play equipment, sheds and garages, boathouses, boat hoists, utility lines, pump houses, bleachers, bank protection structures, signs, fences, gazebos and similar outdoor equipment and appurtenances, provided each of the following requirements are met:
 1. The structure would not cause an increase in water surface elevation, obstruct flow, or reduce the impoundment capacity of the floodplain.
 2. All equipment and structures shall be anchored to prevent flotation and lateral movement.
 3. Compliance with these requirements is certified by an engineering finding by a registered engineer.

(d.) Filling and Dumping. Dredging and filling and/or dumping or backfilling with any material in any manner is prohibited unless through compensating excavation and shaping of the floodplain, the flow and impoundment capacity of the floodplain will be maintained or improved, and unless all applicable state regulations are met.

(e.) General Standards for Flood Hazard Reduction.

- (1) No building or structure shall be erected, converted, or substantially improved or placed, and no land filled or structure used in a flood hazard area unless permission is obtained from the (community). Approval shall not be granted until a permit is obtained from the Michigan Department of Environmental Quality under authority Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451
- (2) All public utilities and facilities shall be designed, constructed, and located to minimize or eliminate flood damage.
- (3) Land shall not be divided in a manner creating parcels or lots which cannot be used in compliance with the requirements of this Section.

- (4) Available flood hazard data from federal or state governments or other sources shall be reasonably utilized in meeting the standards of this section.

(f.) Disclaimer of Liability. The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based upon engineering and scientific methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes. Thus, approval of the use of land under this article shall not be considered a guarantee or warranty of safety from flood damage. This article does not imply that areas outside the flood hazard area will be free from flood damage. This article does not create liability on the part of the (community) or any officer or employee thereof for any flood damage that results from reliance on this article, or any administrative decision lawfully made.

(g.) Flood Hazard Area Variances.

- (1) Variances from the provisions of Section _____ Floodplain Management shall only be granted by the Zoning Board of Appeals upon a determination of compliance with the general standards for variances contained in this ordinance and each of the following specific standards.
 - a. A variance shall be granted only upon:
 1. a showing of good and sufficient cause;
 2. a determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 3. a determination that the granting of a variance will not result in a harmful increase in flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances;
 4. a determination that the granting of a variance will not result in any violations of applicable state or federal laws.
 - b. The variance granted shall be the minimum necessary, considering the flood hazards, to afford relief to the applicant.
- (2) The Zoning Board of Appeals may attach conditions to the granting of a variance to ensure compliance with the standards contained in this ordinance.
- (3) Variances may be granted for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the Michigan Historic Markers listing of historic sites or any other state register of historic places without regard to the requirements of this section governing variances in flood hazard areas.

(h.) Mapping disputes.

- (1) Where disputes arise as to the location of the flood hazard area boundary or the limits of the floodway, the Zoning Board of Appeals shall resolve the dispute and establish the boundary location. In all cases, the decision of the Zoning Board of Appeals shall be based upon the most current floodplain studies issued by the Federal Insurance Administration. Where Federal Insurance Administration information is not available, the best available floodplain information shall be utilized.
- (2) Where a dispute involves an allegation that the boundary is incorrect as mapped and the Federal Insurance Administration floodplain studies are being questioned, the Zoning Board of Appeals shall modify the boundary of the flood hazard area or the floodway only upon receipt of an official letter of map amendment issued by the Federal Insurance Administration.
- (3) All parties to a map dispute may submit technical evidence to the Zoning Board of Appeals.

II. MDEQ Model Floodplain Ordinance: EXCEEDS NFIP REQUIREMENTS OF SECTION 60.3

The following zoning ordinance surpasses the requirements of Section 60.3 by prohibiting all floodplain development. Additional supplementary amendment provisions are also presented. This kind of ordinance offers the greatest advantage to communities whose flood hazard areas are not highly developed or have low development potential and to communities which have a history of flooding.

ARTICLE _____

FLOOD HAZARD AREAS

Section _____.1 Intent

- (1) It is the purpose of this Article to significantly reduce hazards to persons and damage to property as a result of flood conditions in (name of governmental unit), and to comply with the provisions and requirements of the National Flood Insurance Program, as constituted in accord with the National Flood Insurance Act of 1968, and subsequent enactments and the rules and regulations promulgated in furtherance of this program by the Federal Emergency Management Agency, as published in the Federal Register, Vol. 41, No.207, Tuesday, October 26, 1976, and redesignated at 44 FR 31177, May 31, 1979.
- (2) Further, the objectives of this Article include:
 - a. the protection of human life, health and property from the dangerous and damaging effects of flood conditions;
 - b. the minimization of public expenditures for flood control projects, rescue and relief efforts in the aftermath of flooding, repair of flood damaged public facilities and utilities, and the redevelopment of flood damaged homes, neighborhoods, commercial and industrial areas;
 - c. the prevention of private and public economic loss and social disruption as a result of flood conditions;
 - d. the maintenance of stable development patterns not subject to the blighting influence of flood damage;
 - e. to insure that the public has access to information indicating the location of land areas subject to periodic flooding; and
 - f. to preserve the ability of floodplains to carry and discharge a base flood.

Section _____.2 Delineation of the flood hazard area overlay zone.

- (1) The flood hazard area zone shall overlay existing zoning districts delineated on the official (name of governmental unit) Zoning Map. The boundaries of the flood hazard area zone shall coincide with the boundaries of the areas indicated as within the limits of the 100-year flood (*on the Flood Hazard Boundary map, or in the report entitled "The Flood Insurance Study (name of governmental unit)", dated _____ with accompanying Flood Insurance Rate Maps. The Study and accompanying maps are adopted by reference, appended and declared to be a part of this ordinance*). The term flood hazard area, as used in this ordinance, shall mean the flood hazard area zone.
- (2) Where there are disputes as to the location of a flood hazard area zone boundary, the Zoning Board of Appeals shall resolve the dispute in accord with section_____.
- (3) In addition to other requirements of this ordinance applicable to development in the underlying zoning districts, compliance with the requirements of this Article shall be necessary for all development occurring within the flood hazard area zone. Conflicts between the requirements of this Article and other requirements of this ordinance or any other ordinance shall be resolved in favor of this Article, except where the conflicting requirement is more stringent and would further the objectives of this Article to a greater extent than the requirements of this Article. In such cases, the more stringent requirement shall be applied.

Section _____.3 Use and Principal Structure Regulations

- (1) Within the flood hazard area overlay zone, no land shall be used except for one or more of the following uses:
 - a. grading and agriculture, pastureland and animal grazing
 - b. harvesting of a native or wild crop permitted by law such as wild rice, marsh hay, berries and seeds
 - c. harvesting of trees
 - d. parks, picnic areas, playgrounds, playfields, athletic fields, golf courses, bridle paths, nature paths and trails
 - e. wildlife preserves
 - f. fishing, trapping and hunting in compliance with current laws and regulations
 - g. hunting and conservation clubs, noncommercial archery, rifle and shooting ranges
 - h. historic sites and structures
 - i. swimming beaches, fishing and boating docks in accord with the provisions of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451 Part 301 Inland Lakes and Streams

- j. sand and gravel extraction
- k. required open space or lot area for structural uses that are landward of the overlay zone

Section _____.4 Accessory Structures and Uses

Within the flood hazard area overlay zone, no structure shall be used except for one or more of the following and only in a manner consistent with the requirements of permitted uses and accessory structures in the underlying district, and with those that follow. These accessory structures and uses are permitted: off-street parking, streets, roads, bridges, outdoor play equipment, sheds and garages, boathouses, boat hoists, utility lines, pump houses, bleachers, bank protection structures, signs, fences, gazebos and similar outdoor equipment and appurtenances; provided each of the following requirements are met:

- a. The structure would not cause an increase in water surface elevation, obstruct flow or reduce the impoundment capacity of the floodplain.
- b. All equipment and structures shall be anchored to prevent flotation and lateral movement.
- c. Compliance with these requirements is certified by an engineering finding by a registered engineer.

Section _____.5 Filling and Dumping

Dredging and filling and/or dumping or backfilling with any material in any manner is prohibited unless through compensated excavation and shaping of the floodplain, maintaining or improving the flow and impoundment capacity of the floodplain, and meeting all applicable state regulations including, but not limited to, approvals pursuant to Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451.

Section _____.6 General Standards for Flood Hazard Reduction

- (1) No building or structure shall be erected, converted or substantially improved or placed, and no land filled or structure used in a floodplain district unless a zoning compliance permit, or variance from the zoning board of appeals, is obtained. Approval shall not be granted until a permit from the Michigan Department of Environmental Quality under authority Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451 is obtained.
- (2) Where a development permit cannot be obtained prior to the issuance of a zoning compliance permit, a letter from the issuing agency indicating intent to issue contingent only upon proof of zoning compliance shall be acceptable.
- (3) All public utilities and facilities shall be designed, constructed and located to minimize or eliminate flood damage.

- (4) The (designated local official) or his representative shall review development proposals to determine compliance with the standards in this section, and shall transmit his determination to the zoning administrator.
- (5) Land shall not be divided in a manner creating parcels or lots which cannot be used in compliance with the requirements of this Article.
- (6) The flood-carrying capacity of any altered or relocated watercourse not subject to federal or state regulations designed to insure flood carrying capacity shall be maintained.
- (7) Available flood hazard data from federal or state governments or other sources shall be reasonably utilized in meeting the standards of this section. Data furnished by the Federal Insurance Administration shall take precedence over data from other sources.

Section _____.7 Disclaimer of Liability

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based upon engineering and scientific methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. Approval of the use of land under this Article shall not be considered a guarantee or warranty of safety from flood damage.

This ordinance does not imply that areas outside the flood hazard area will be free from flood damage. This ordinance does not create liability on the part of (name of government unit) or any officer or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made thereunder.

SUPPLEMENTARY AMENDMENTS TO A ZONING ORDINANCE

I. Supplementary Definitions

The following definitions of words and phrases used in the flood hazard area zone provisions should be added to the definitions section of the zoning ordinance:

1. "Base Flood" means the flood having a one-percent chance of being equaled or exceeded in any given year.
2. "Development" means any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.
3. "Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:
 - (1) the overflow of inland or tidal waters
 - (2) the unusual and rapid accumulation or runoff of surface waters from any source

4. "Flood Hazard Boundary Map" (FHBM) *(insert if your community has this map)* means an official map of a community, issued by the Federal Insurance Administration, where the boundaries of the areas of special flood hazards have been designated as Zone A.
5. "Flood Hazard Area" means land which on the basis of available flood plain information is subject to a one-percent or greater chance of flooding in any given year.
6. "Flood Insurance Rate Map" (FIRM) *(insert if a FIRM has been prepared for your community)* means an official map of a community, on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.
7. "Flood Insurance Study" *(insert if a flood insurance study has been prepared for your community)* is the official report provided by the Federal Insurance Administration. The report contains flood profiles, the water surface elevation of the base flood, and may include a Flood Hazard Boundary - Floodway Map.
8. "Flood Plain" means any land area susceptible to being inundated by water from any source (see definition of flood).
9. "Floodway" means the channel of a river or other watercourse and the adjacent land areas which must be reserved in order to discharge the base flood.
10. "Harmful Increase" means an unnaturally high stage on a river, stream or lake which causes, or may cause damage to property, threat to life, personal injury, or damage to land or water resources.
11. "Structure" means a walled and roofed building that is principally above ground, gas or liquid storage facility, or a mobile home.
12. "Substantial Improvement" means any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either, (1) before the improvement or repair is started, or (2) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floors, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to insure safe living conditions, or (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

(NOTE: When adapting these suggested definitions to a zoning ordinance, care should be exercised to insure that these words have not already been defined in the ordinance in a manner conflicting with these definitions. Where a conflict occurs, the definition ultimately chosen should comply with the FEMA Rules and Regulations.)

II. Supplements to Administrative Duties of the Zoning Administrator

In the portion of the zoning ordinance where the duties of the zoning administrator are defined, the following language detailing additional duties relating to the National Flood Insurance Program should be added:

Section _____. Floodplain Management Administrative Duties

- (1) With regard to the National Flood Insurance Program, and the regulation of development within the flood hazard area zone as prescribed in Article _____, the duties of the zoning administrator shall include, but are not limited to:
 - a. notification to adjacent communities and the Department of Environmental Quality of the proposed alteration or relocation of any watercourse, and the submission of such notifications to the Federal Insurance Administration;
 - b. recording of written notification to all applicants to whom variances are granted in a flood hazard area indicating the terms of the variance, the increased danger to life and property, and the increased cost of flood insurance commensurate with the increased flood risk which may reach amounts in excess of \$25.00 for \$100.00 of insurance coverage per year. A record of all variance notifications and variance actions shall be maintained together with the justification for each variance.
- (2) All records and maps pertaining to the National Flood Insurance Program shall be maintained in the office of the (zoning administrator) and shall be open for public inspection.
- (3) It shall be the responsibility of the zoning administrator to obtain and utilize the best available flood hazard data for purposes of administering this ordinance in the absence of data from the Federal Insurance Administration.

III. Supplementary Permit Application Information

In that portion of the zoning ordinance where information which must be submitted with an application for a zoning compliance permit is specified, the following information necessary for administration of the flood hazard area zone requirements should be added:

Section _____. Flood Hazard Area Application Information

- (1) In addition to the information required with an application for a zoning compliance permit, special use permit, variance, or any other type of development permission required under this ordinance, the following information shall be submitted as a part of an application for permission to commence any type of development within a flood hazard area zone:
 - a. the elevation in relation to mean sea level of the floor, including basement, of all structures;

- b. a description of the extent to which any watercourse will be altered or relocated as a result of proposed development;
- c. proof of development permission from the appropriate federal, state, and local agencies as required by section _____.6 (1), including a floodplain permit, approval, or letter of no authority from the Michigan Department of Environmental Quality under the authority of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451
- d. base flood elevation data where the proposed development is subject to Public Act 451 of 1994, the Subdivision Control Act, or is greater than five acres in size; and
- e. additional information which may be reasonably necessary to determine compliance with the provisions of this ordinance.

IV. Supplementary Variance Requirements

In the portion of the ordinance where standards for the granting of variances from the provisions of the ordinance are specified, the following language relating to variances in flood hazard areas should be added:

Section _____. Flood Hazard Area Variances

- (1) Variances from the provisions of Article _____ Flood Hazard Areas shall only be granted by the Zoning Board of Appeals upon a determination of compliance with the general standards for variances contained in this ordinance and each of the following specific standards.
 - a. A variance shall be granted only upon:
 - 1. a showing of good and sufficient cause;
 - 2. a determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 - 3. a determination that the granting of a variance will not result in a harmful increase in flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
 - b. The variance granted shall be the minimum necessary, considering the flood hazard, to afford relief to the applicant.
- (2) The (name of governmental unit) Zoning Board of Appeals may attach conditions to the granting of a variance to insure compliance with the standards contained in this ordinance.
- (3) Variances may be granted for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the Michigan Historic

Markers listing of historic sites, or any other state register of historic places without regard to the requirements of this section governing variances in flood hazard areas.

V. Mapping Disputes

In the portion of the ordinance giving the zoning board of appeals authority to interpret the zoning maps, the following language governing mapping disputes should be added:

Section _____. Mapping disputes

- (1) Where disputes arise as to the location of the flood hazard area boundary or the limits of the floodway, the Zoning Board of Appeals shall resolve the dispute and establish the boundary location. In all cases, the decision of the Zoning Board of Appeals shall be based upon the most current floodplain studies issued by the Federal Insurance Administration. Where Federal Insurance Administration information is not available, the best available floodplain information shall be utilized.
- (2) Where a dispute involves an allegation that the boundary is incorrect as mapped and Federal Insurance Administration floodplain studies are being questioned, the Zoning Board of Appeals shall modify the boundary of the flood hazard area or the floodway only upon receipt of an official letter of map amendment issued by the Federal Insurance Administration.
- (3) All parties to a map dispute may submit technical evidence to the Zoning Board of Appeals.

III. Model Ordinance for Code of Federal Regulations 44 Sec. 60.3(a)

Upon entering the National Flood Insurance Program, a community must adopt a basic set of floodplain management regulations and use available floodplain information for administration until the Flood Hazard Boundary Map is provided by the Federal Insurance Administration. The following provisions establish the basic floodplain management regulations needed.

ARTICLE _____

FLOOD HAZARD AREAS

Section _____.1 Intent

- (1) It is the purpose of this Article to significantly reduce hazards to persons and damage to property as a result of flood conditions in (name of governmental unit), and to comply with the provisions and requirements of the National Flood Insurance Program in accordance with the National Flood Insurance Act of 1968, and subsequent enactments and the rules and regulations promulgated in furtherance of this program by the Federal Emergency Management Agency, as published in the Federal Register, Vol. 41, No.207, Tuesday, October 26, 1976, and redesignated at 44 FR 31177, May 31, 1979.
- (2) Further, the objectives of this Article include:
 - a. the protection of human life, health and property from the dangerous and damaging effects of flood conditions;
 - b. the minimization of public expenditures for flood control projects, rescue and relief efforts in the aftermath of flooding, repair of flood damaged public facilities and utilities, and the redevelopment of flood damaged homes, neighborhoods, commercial and industrial areas;
 - c. the prevention of private and public economic loss and social disruption as a result of flood conditions;
 - d. the maintenance of stable development patterns not subject to the blighting influence of flood damage;
 - e. to insure that the public has access to information indicating the location of land areas subject to periodic flooding; and
 - f. to preserve the ability of floodplains to carry and discharge a base flood.

Section _____.2 RESERVED

Section _____.3 Development Permit

- (1) The zoning administrator shall utilize available floodplain information and determine whether proposed development will be reasonably safe from flooding prior to issuance of a zoning compliance permit. If it is determined by the zoning administrator that the proposed development lies within an area prone to flooding (flood hazard area), all new construction and substantial improvements shall comply with the requirements of this Article.
- (2) Development, including the erection of structures and placement of mobile homes, within a flood hazard area shall not occur except upon issuance of a zoning compliance permit in accord with the requirements of (citation for sections dealing with zoning compliance permit issuance) and the following standards:
 - a. the requirements of this Article shall be met;
 - b. the requirements of the underlying zoning district and applicable general provisions of this ordinance must be met; and
 - c. all necessary development permits shall have been issued by the appropriate federal, state, and local authorities including a floodplain permit, approval, or letter of no authority from the Michigan Department of Environmental Quality under the authority of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451. Where a development permit cannot be obtained prior to the issuance of a zoning compliance permit, a letter from the issuing agency indicating intent to issue contingent only upon proof of zoning compliance shall be acceptable.

(NOTE: Communities may wish to designate in the ordinance the floodplain information which will be used by the zoning administrator to determine if a flood hazard exists.)

Section _____.4 General Standards for Flood Hazard Reduction

- (1) All new construction and substantial improvements within a flood hazard area, including the placement of prefabricated buildings and mobile homes, shall:
 - a. be designed and anchored to prevent flotation, collapse, or lateral movement of the structure;
 - b. be constructed with materials and utility equipment resistant to flood damage; and
 - c. be constructed by methods and practices that minimize flood damage.
- (2) All new and replacement water supply systems shall minimize or eliminate infiltration of flood waters into the systems.

- (3) All new and replacement sanitary sewage systems shall minimize or eliminate infiltration of flood waters into the systems and discharges from systems into flood waters. On-site waste disposal systems shall be located to avoid impairment to the system or contamination from the system during flooding.
- (4) All public utilities and facilities shall be designed, constructed, and located to minimize or eliminate flood damage.
- (5) Adequate drainage shall be provided to reduce exposure to flood hazards.
- (6) The (designated local official) or his representative shall review development proposals to determine compliance with the standards in this section, and shall transmit his determination to the zoning administrator.
- (7) Land shall not be divided in a manner creating parcels or lots which cannot be used in conformance with the requirements of this Article.
- (8) Available flood hazard data from federal or state governments or other sources shall be reasonably utilized in meeting the standards of this section.

*(NOTE: Where a building code or other local code contains standards relating to the flood-proofing concerns in this section, the ordinance language should indicate compliance with that code. As an optional language, a community may desire to replace subsection (6) with:
"Compliance with the standards of this section shall be certified
by a registered professional engineer or architect.")*

Section _____.5 RESERVED

Section _____.6 RESERVED

Section _____.7 RESERVED

Section _____.8 RESERVED

Section _____.9 Disclaimer of Liability

- (1) The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes such as ice jams and bridge openings restricted by debris. Approval of the use of land under this Article shall not be considered a guarantee or warranty of safety from flood damage.
- (2) This ordinance does not imply that areas outside the flood hazard area will be free from flood damage. This ordinance does not create liability on the part of (name of governmental unit) or any officer or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made thereunder.

SUPPLEMENTARY AMENDMENTS TO A ZONING ORDINANCE**I. Supplementary Definitions.**

The following definitions of words and phrases used in the flood hazard area provisions should be added to the definition section of the zoning ordinance:

1. "Development" means any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.
2. "Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from: the overflow of inland or tidal waters or the unusual and rapid accumulation or runoff of surface waters from any source
3. "Flood Hazard Area" means land which on the basis of available floodplain information is subject to a one-percent or greater chance of flooding in any given year.
4. "Flood Plain" means any land area susceptible to being inundated by water from any source (see definition of flood).
5. "Harmful Increase" means an unnaturally high stage on a river, stream, or lake which causes, or may cause damage to property, threat to life, personal injury, or damage to land or water resources.
6. "Mobile Home" means a structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. It does not include recreational vehicles or travel trailers.
7. "New Construction" means structures for which the start of construction commenced on or after the effective date of this ordinance.
8. "Structure" means a walled and roofed building that is principally above ground, gas or liquid storage facility, or a mobile home.
9. "Substantial Improvement" means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either, (1) before the improvement or repair is started, or (2) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceilings floors or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions, or (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

(NOTE: When adapting these suggested definitions to a zoning ordinance, care should be exercised to insure that these words have not already been defined in the ordinance in a manner conflicting with these definitions. Where a conflict occurs, the definition ultimately chosen should comply with the provisions of the program regulations.)

II. Supplementary Administrative Duties of the Zoning Administrator

In the portion of the zoning ordinance where the duties of the zoning administrator are defined, the following language detailing additional duties relating to the National Flood Insurance Program should be added:

Section _____. Floodplain Management Administrative Duties

- (1) All records and maps pertaining to the National Flood Insurance Program shall be maintained in the office of the zoning administrator and shall be open for public inspection.
- (2) It shall be the responsibility of the zoning administrator to obtain and utilize the best available flood hazard data for purposes of administering this ordinance in the absence of data from the Federal Insurance Administration.
- (3) Written notification shall be given to all applicants to whom variances are granted in a flood hazard area indicating the terms of the variance, the increased danger to life and property, and the increased cost of flood insurance commensurate with the increased flood risk which may reach amounts in excess of \$25.00 for \$100.00 of insurance coverage per year. A record of all variance notifications and variance actions shall be maintained together with the justification for each variance.

III. Supplementary Permit Application Information

In the portion of the zoning ordinance where information which must be submitted with an application for a zoning compliance permit is specified, the following information necessary for administration of the flood hazard area requirements should be added:

Section _____. Flood Hazard Area Application Information

- (1) In addition to the information required with an application for a zoning compliance permit, special use permit or any other type of development permission required under this ordinance, the following information shall be submitted as a part of an application for permission to commence any type of development within a flood hazard area:
 - a. proof of development permission from the appropriate local, state, and federal agencies as required by section _____.3(1)c, including a floodplain permit, approval, or letter of no authority from the Michigan Department of Environmental Quality under the authority of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451.
 - b. Any additional information which may be reasonably necessary to determine compliance with the provisions of this ordinance.

IV. Supplementary Variance Requirements

In the portion of the ordinance where standards for the granting of variances from the provisions of the ordinance are specified, the following language relating to variances in flood hazard areas should be added:

Section _____. Flood Hazard Area Variances

- (1) Variances from the provisions of Article ____ Flood Hazard Areas shall only be granted by the zoning Board of Appeals upon a determination of compliance with the general standards for variances contained in this ordinance and each of the following specific standards.
 - a. A variance shall be granted only upon:
 1. a showing of good and sufficient cause;
 2. a determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 3. a determination that the granting of a variance will not result in a harmful increase in flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
 - b. the variance granted shall be the minimum necessary, considering the flood hazard, to afford relief to the applicant.
- (2) The (name of governmental unit) Zoning Board of Appeals may attach conditions to the granting of a variance to insure compliance with the standards contained in this ordinance.
- (3) Variances may be granted for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the Michigan Historic Markers listing of historic sites, or any other state register of historic places without regard to the requirements of this section governing variances in flood hazard areas.

V. Mapping Disputes

In the portion of the ordinance giving the zoning board of appeals authority to interpret the zoning maps, the following language governing mapping disputes should be added:

Section _____. Mapping Disputes

- (1) Where disputes arise as to the location of the flood hazard area boundary the Zoning Board of Appeals shall resolve the dispute and establish the boundary location. In all cases, the decision of the Zoning Board of Appeals shall be based upon the most current floodplain studies issued by the Federal Insurance Administration. Where Federal Insurance Administration information is not available, the best available floodplain information shall be utilized.
- (2) All parties to a map dispute may submit technical evidence to the Zoning Board of Appeals.

IV. Model Ordinance for Code of Federal Regulations 44 Sec. 60.3(b)

Upon receipt of the Flood Hazard Boundary Map (FHBM), the following article should be added to the zoning ordinance. If the previous sample article is in the zoning ordinance, Sections 2, 5 and 6 of this sample should be added to those provisions, and subsection (1) of Section 3 should be deleted. Additional supplementary amendment provisions are also presented.

ARTICLE _____

FLOOD HAZARD AREAS

Section _____.1 Intent

- (1) It is the purpose of this Article to significantly reduce hazards to persons and damage to property as a result of flood conditions in (name of governmental unit), and to comply with the provisions and requirements of the National Flood Insurance Program in accordance with the National Flood Insurance Act of 1968, and subsequent enactments and the rules and regulations promulgated in furtherance of this program by the Federal Emergency Management Agency, as published in the Federal Register, Vol. 41, No. 207, Tuesday, October 26, 1976, and redesignated at 44 FR 31177, May 31, 1979.
- (2) The objectives of this Article also include:
 - a. the protection of human life, health, and property from the dangerous and damaging effects of flood conditions;
 - b. the minimization of public expenditures for flood control projects, rescue and relief efforts in the aftermath of flooding, repair of flood damaged public facilities and utilities, and the redevelopment of flood damaged homes, neighborhoods, commercial and industrial areas;
 - c. the prevention of private and public economic loss and social disruption as a result of flood conditions;
 - d. the maintenance of stable development patterns not subject to the blighting influence of flood damage;
 - e. insuring that the public has access to information indicating the location of land areas subject to periodic flooding; and
 - f. preserving the ability of floodplains to carry and discharge a base flood.

Section _____.2 Delineation of the Flood Hazard Area Overlay Zone

- (1) The flood hazard area zone shall overlay existing zoning districts delineated on the official (name of governmental unit) Zoning Map. The boundaries of the flood hazard area zone shall coincide with the boundaries of the areas of special flood hazards (A zones) designated by the Federal Insurance Administration in the Flood Hazard

Boundary Map (FHB) No. _____, dated _____, and amendments thereto, which are adopted by reference, appended, and declared to be a part of this ordinance. The term flood hazard area, as used in this ordinance, shall mean the flood hazard area zone.

- (2) Where there are disputes as to the location of a flood hazard area zone boundary, the Zoning Board of Appeals shall resolve the dispute in accord with section _____.
- (3) In addition to other requirements of this ordinance applicable to development in the underlying zoning district, compliance with the requirements of this Article shall be necessary for all development occurring within the flood hazard area zone. Conflicts between the requirements of this Article and other requirements of this ordinance or any other ordinance shall be resolved in favor of this Article, except where the conflicting requirement is more stringent and would further the objectives of this Article to a greater extent than the requirements of this Article. In such cases the more stringent requirement shall be applied.

(NOTE: Sample ordinance provisions dealing with resolution of mapping disputes are presented in the supplementary amendments.)

Section _____.3 Development Permit

- (1) Development, including the erection of structures and placement of mobile homes. within a flood hazard area shall not occur except upon issuance of a zoning compliance permit in accord with the requirements of (citation for sections dealing with zoning compliance permit issuance) and the following standards:
 - a. the requirements of this Article shall be met;
 - b. the requirements of the underlying zoning district and applicable general provisions of this ordinance must be met; and
 - c. all necessary development permits shall have been issued by the appropriate local, state, and federal authorities including a floodplain permit, approval, or letter of no authority from the Michigan Department of Environmental Quality under the authority of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451. Where a development permit cannot be obtained prior to the issuance of a zoning compliance permit, a letter from the issuing agency indicating intent to issue contingent only upon proof of zoning compliance shall be acceptable.

Section _____.4 General Standards for Flood Hazard Reduction

- (1) All new construction and substantial improvements within a flood hazard area, including the placement of prefabricated buildings and mobile homes, shall:
 - a. be designed and anchored to prevent flotation, collapse, or lateral movement of the structure;

- b. be constructed with materials and utility equipment resistant to flood damage; and
 - c. be constructed by methods and practices that minimize flood damage.
- (2) All new and replacement water supply systems shall minimize or eliminate infiltration of flood waters into the systems.
- (3) All new and replacement sanitary sewage systems shall minimize or eliminate infiltration of flood waters into the systems and discharges from systems into flood waters. On-site waste disposal systems shall be located to avoid impairment to the system or contamination from the system during flooding.
- (4) All public utilities and facilities shall be designed, constructed and located to minimize or eliminate flood damage.
- (5) Adequate drainage shall be provided to reduce exposure to flood hazards.
- (6) The (designated local official) or his representative shall review development proposals to determine compliance with the standards in this section, and shall transmit his determination to the zoning administrator.
- (7) Land shall not be divided in a manner creating parcels or lots which cannot be used in conformance with the requirements of this Article.
- (8) The flood carrying capacity of any altered or relocated watercourse not subject to federal or state regulations designed to insure flood carrying capacity shall be maintained.
- (9) Available flood hazard data from federal or state governments or other sources shall be reasonably utilized in meeting the standards of this section. Data furnished by the Federal Insurance Administration shall take precedence over data from other sources.

(NOTE: Where a building code or other local code contains standards relating to the flood-proofing concerns in this section, the ordinance language should indicate compliance with that code. As optional language, a community may desire to replace subsection (6) with: "Compliance with the standards of this section shall be certified by a registered professional engineer or architect.")

Section _____.5 Specific Base Flood Elevation Standards

- (1) On the basis of the most recent available base flood elevation data, the following standards shall apply in the flood hazard area zone:
 - a. all new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated to or above the base flood level.

(NOTE: It is often recommended that elevation and flood-proofing be required to one (1) foot above base flood level to allow for flooding variations caused by such

unpredictable occurrences as ice jams or the cumulative effect of future minor floodplain encroachments.)

- b. all new construction and substantial improvements of non-residential structures shall have either:
 - 1. the lowest floor, including basement, elevated to or above the base flood level; or
 - 2. be constructed such that below base flood level, together with attendant utility and sanitary facilities, the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subparagraph are satisfied, and that the flood-proofing methods employed are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with a base flood in the location of the structure. Such certification shall be submitted as provided in section (citation) and shall indicate the elevation to which the structure is flood-proofed.

(NOTE: The Federal Regulations permit a community to adopt local flood-proofing regulations to be used in lieu of the certification procedures. Such regulations must be approved by the Federal Insurance Administration prior to implementation.)

- (2) The most recent base flood elevation data received from the Federal Insurance Administration shall take precedence over data from other sources.

Section _____.6 Mobile Home Standards

- (1) All mobile homes shall be anchored to resist flotation, collapse, or lateral movement by providing over-the-top and frame ties in accord with the following specifications:
 - a. over-the-top ties shall be provided at each of the four corners of the mobile home, with two additional ties per side at intermediate locations, except on mobile homes less than 50 feet in length, one tie per side shall be required;
 - b. frame ties shall be provided at each corner of the home with five additional ties per side at intermediate points, except on mobile homes less than 50 feet in length, four ties per side shall be required;
 - c. all components of the anchoring system shall be capable of carrying a force of 4,800 pounds; and
 - d. all additions to a mobile home shall be similarly anchored.
- (2) An evacuation plan indicating alternate vehicular access and escape routes shall be filed with (indicate appropriate disaster preparedness authority) for mobile home parks and mobile home subdivisions.

Section _____.7 RESERVED

Section _____.8 RESERVED

Section _____.9 Disclaimer of Liability

- (1) The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based upon engineering and scientific methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. Approval of the use of land under this article shall not be considered a guarantee or warranty of safety from flood damage.
- (2) This ordinance does not imply that areas outside the flood hazard area will be free from flood damage. This ordinance does not create liability on the part of (name of governmental unit) or any officer or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made thereunder.

SUPPLEMENTARY AMENDMENTS TO A ZONING ORDINANCE

I. Supplementary Definitions

The following definitions of words and phrases used in the flood hazard area zone provisions should be added to the definitions section of the zoning ordinance:

1. "Area of Special Flood Hazard" is the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year.
2. "Base Flood" means the flood having a one percent chance of being equaled or exceeded in any given year.
3. "Development" means any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.
4. "Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters or the unusual and rapid accumulation of runoff of surface waters from any source.
5. "Flood Hazard Boundary Map" (FHBM) means an official map of a community, issued by the Federal Insurance Administration, where the boundaries of the areas of special flood hazards have been designated as Zone A.
6. "Flood Plain" means any land area susceptible to being inundated by water from any source. (See definition of flood.)
7. "Harmful Increase" means an unnaturally high stage on a river, stream, or lake which causes, or may cause damage to property, threat to life, personal injury, or damage to land or water resources.

8. "Mobile Home" means a structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. It does not include recreational vehicles or travel trailers.
9. "New Construction" means structures for which the "start of construction" commenced on or after the effective date of this ordinance.
10. "Structure" means a walled and roofed building that is principally above ground, gas or liquid storage facility, or a mobile home.
11. "Substantial Improvement" means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either, (1) before the improvement or repair is started, or (2) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceilings floors or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions, or (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

(NOTE: When adapting these suggested definitions to a zoning ordinance, care should be exercised to insure that these words have not already been defined in the ordinance in a manner conflicting with these definitions. Where a conflict occurs, the definition ultimately chosen should comply with the provisions of the program regulations.)

II. Supplementary Administrative Duties of the Zoning Administrator

In that portion of the zoning ordinance where the duties of the zoning administrator are defined, the following language detailing additional duties relating to the National Flood Insurance Program should be added:

Section _____. Floodplain Management Administrative Duties

- (1) With regard to the National Flood Insurance Program and the regulation of development within the flood hazard area zone as prescribed in Article _____, the duties of the zoning administrator shall include, but are not limited to:
 - a. notification to adjacent communities and the Department of Natural Resources of the proposed alteration or relocation of any watercourse, and the submission of such notifications to the Federal Insurance Administration;
 - b. verification and recording of the actual elevation in relation to mean sea level of the lowest floor, including basement, of all new or substantially improved structures constructed within the flood hazard area, and in the case of flood-proofed structures, the elevation to which the structure was flood-proofed; and

- c. recording of all certificates of flood-proofing, and written notification to all applicants to whom variances are granted in a flood hazard area zone indicating the terms of the variance, the increased danger to life and property, and the increased cost of flood insurance commensurate with the increased flood risk which may reach amounts in excess of \$25.00 for \$100.00 of insurance coverage per year. A record of all variance notifications and variance actions shall be maintained together with the justification for each variance.
- (2) All records and maps pertaining to the National Flood Insurance Program shall be maintained in the office of the zoning administrator and shall be open for public inspection.
- (3) It shall be the responsibility of the zoning administrator to obtain and utilize the best available flood hazard data for purposes of administering this ordinance in the absence of data from the Federal Insurance Administration.

III. Supplementary Permit Application Information

In the portion of the zoning ordinance where information which must be submitted with an application for a zoning compliance permit is specified, the following information necessary for administration of the flood hazard area zone requirements should be added:

Section _____. Flood Hazard Area Application Information

- (1) In addition to the information required with an application for a zoning compliance permit, special use permit or any other type of development permission required under this ordinance, the following information shall be submitted as a part of an application for permission to commence any type of development within a flood hazard area zone:
 - a. the elevation in relation to mean sea level of the floor, including basement, of all structures;
 - b. where flood-proofing will be employed and the elevation in relation to mean sea level to which a structure will be flood-proofed;
 - c. where flood-proofing will be employed, a certificate from a registered professional engineer or architect that the flood-proofing criteria of this ordinance will be met;
 - d. a description of the extent to which any watercourse will be altered or relocated as a result of proposed development;
 - e. proof of development permission from the appropriate federal, state, and local agencies as required by section _____.3 (1)c, including a floodplain permit, approval, or letter of no authority from the Michigan Department of Environmental Quality under the authority of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451;

- f. base flood elevation data where the proposed development is subject to Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451 or greater than five acres in size; and
- g. additional information which may be reasonably necessary to determine compliance with the provisions of this ordinance.

IV. Supplementary Variance Requirements

In the portion of the ordinance where standards for the granting of variances from the provisions of the ordinance are specified, the following language relating to variances in flood hazard areas should be added:

Section _____. Flood Hazard Area Variances

- (1) Variances from the provisions of Article _____ Flood Hazard Areas shall only be granted by the Zoning Board of Appeals upon a determination of compliance with the general standards for variances contained in this ordinance and each of the following specific standards.
 - a. A variance shall be granted only upon:
 - 1. a showing of good and sufficient cause;
 - 2. a determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 - 3. a determination that the granting of a variance will not result in a harmful increase in flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
 - b. The variance granted shall be the minimum necessary, considering the flood hazard, to afford relief to the applicant.
- (2) The (name of governmental unit) Zoning Board of Appeals may attach conditions to the granting of a variance to insure compliance with the standards contained in this ordinance.
- (3) Variances may be granted for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the Michigan Historic Markers listing of historic sites, or any other state register of historic places without regard to the requirements of this section governing variances in flood hazard areas.

V. Mapping Disputes

In the portion of the ordinance giving the zoning board of appeals authority to interpret the zoning maps, the following language governing mapping disputes should be added:

Section _____. Mapping Disputes

- (1) Where disputes arise as to the location of the flood hazard area boundary, the Zoning Board of Appeals shall resolve the dispute and establish the boundary location. In all cases, the decision of the Zoning Board of Appeals shall be based upon the most current floodplain studies issued by the Federal Insurance Administration. Where Federal Insurance Administration information is not available, the best available floodplain information shall be utilized.
- (2) Where a dispute involves an allegation that the boundary is incorrect as mapped and Federal Insurance Administration floodplain studies are being questioned, the Zoning Board of Appeals shall modify the boundary of the flood hazard area only upon receipt of an official letter of map amendment issued by the Federal Insurance Administration.
- (3) All parties to a map dispute may submit technical evidence to the Zoning Board of Appeals.

V. Model Ordinance for Code of Federal Regulations 44 Sec. 60.3(c)

Upon receipt of the Flood Insurance Rate Map, the following article should be added to the zoning ordinance. This article is based on the situation where a community has not designated a regulatory floodway, but has both numbered and unnumbered A zones on the Flood Insurance Rate Map. If the previous sample article is currently a part of a community's zoning ordinance, the following article changes sections 2 and 6 and adds sections 7 and 8. Additional supplementary amendment provisions are also present.

ARTICLE _____

FLOOD HAZARD AREAS

Section _____.1 Intent

- (1) It is the purpose of this Article to significantly reduce hazards to persons and damage to property as a result of flood conditions in (name of governmental unit), and to comply with the provisions and requirements of the National Flood Insurance Program, in accordance with the National Flood Insurance Act of 1968, and subsequent enactments and the rules and regulations promulgated in furtherance of this program by the Federal Emergency Management Agency, as published in the Federal Register, Vol. 41, No. 207, Tuesday, October 26, 1976, and redesignated at 44 FR 31177, May 31, 1979.
- (2) Further, the objectives of this Article include:
 - a. the protection of human life, health and property from the dangerous and damaging effects of flood conditions;
 - b. the minimization of public expenditures for flood control projects, rescue and relief efforts in the aftermath of flooding, repair of flood damaged public facilities and utilities, and the redevelopment of flood damaged homes, neighborhoods, commercial and industrial areas;
 - c. the prevention of private and public economic loss and social disruption as a result of flood conditions;
 - d. the maintenance of stable development patterns not subject to the blighting influence of flood damage;
 - e. insuring that the public has access to information indicating the location of land areas subject to periodic flooding; and
 - f. preserving the ability of floodplains to carry and discharge a base flood.

Section _____.2 Delineation of the Flood Hazard Overlay Zone

- (1) The flood hazard area zone shall overlay existing zoning districts delineated on the official (name of governmental unit) Zoning Map. The boundaries of the flood hazard area zone shall coincide with the boundaries of the areas indicated as within the limits of the 100-year flood in the report entitled "The Flood Insurance Study (name of governmental unit)", dated _____ with accompanying Flood Insurance Rate Maps. The Study and accompanying maps are adopted by reference, appended and declared to be a part of this ordinance. The term flood hazard area as used in this ordinance shall mean the flood hazard area zone.
- (2) Where there are disputes as to the location of a flood hazard area zone boundary, the Zoning Board of Appeals shall resolve the dispute in accord with section _____.
- (3) In addition to other requirements of this ordinance applicable to development in the underlying zoning district, compliance with the requirements of this Article shall be necessary for all development occurring within the flood hazard area zone. Conflicts between the requirements of this Article and other requirements of this ordinance or any other ordinance shall be resolved in favor of this Article, except where the conflicting requirement is more stringent and would further the objectives of this Article to a greater extent than the requirements of this Article. In such cases, the more stringent requirement shall be applied.

Section _____.3 Development Permit

- (1) Development, including the erection of structures and placement of mobile homes, within a flood hazard area shall not occur except upon issuance of a zoning compliance permit in accord with the requirements of *(citation for sections dealing with zoning compliance permit issuance)* and the following standards:
 - a. the requirements of this Article shall be met;
 - b. the requirements of the underlying zoning district and applicable general provisions of this ordinance must be met; and
 - c. all necessary development permits shall have been issued by appropriate federal, state and local authorities including a floodplain permit, approval, or letter of no authority from the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451. Where a development permit cannot be obtained prior to the issuance of a zoning compliance permit, a letter from the issuing agency indicating intent to issue contingent only upon proof of zoning compliance shall be acceptable.

(NOTE: Sample provisions relating to map disputes are presented in the supplementary amendments.)

Section _____.4 General Standards for Flood Hazard Reduction

- (1) All new construction and substantial improvements within a flood hazard area, including the placement of prefabricated buildings and mobile homes, shall:

- a. be designed and anchored to prevent flotation, collapse, or lateral movement of the structure;
 - b. be constructed with materials and utility equipment resistant to flood damage; and
 - c. be constructed by methods and practices that minimize flood damage.
- (2) All new and replacement water supply systems shall minimize or eliminate infiltration of flood waters into the systems.
- (3) All new and replacement sanitary sewage systems shall minimize or eliminate infiltration of flood waters into the systems and discharges from systems into flood waters. On-site waste disposal systems shall be located to avoid impairment to the system or contamination from the system during flooding.
- (4) All public utilities and facilities shall be designed, constructed, and located to minimize or eliminate flood damage.
- (5) Adequate drainage shall be provided to reduce exposure to flood hazards.
- (6) The (designated local official) or his representative shall review development proposals to determine compliance with the standards in this section, and shall transmit his determination to the zoning administrator.
- (7) Land shall not be divided in a manner creating parcels or lots which cannot be used in conformance with the requirements of this Article.
- (8) The flood carrying capacity of any altered or relocated watercourse not subject to federal or state regulations designed to insure flood carrying capacity shall be maintained.
- (9) Available flood hazard data from federal or state governments or other sources shall be reasonably utilized in meeting the standards of this section. Data furnished by the Federal Insurance Administration shall take precedence over data from other sources.

(NOTE: Where a building code contains standards relating to the flood-proofing concerns in this section, the ordinance language should indicate compliance with the code. As optional language, a community may desire to replace subsection (6) with: "Compliance with the standards of this section shall be certified by a registered professional engineer or architect".)

Section _____.5 Specific Base Flood Elevation Standards

- (1) On the basis of the most recent available base flood elevation data the following standards shall apply in the flood hazard area zone:
 - a. all new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated to or above the base flood level.

- b. all new construction and substantial improvements of non-residential structures shall have either:
 1. the lowest floor, including basement, elevated to or above the base flood level; or
 2. be constructed such that below base flood level, together with attendant utility and sanitary facilities, the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subparagraph are satisfied, and that the flood-proofing methods employed are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with a base flood in the location of the structure. Such certification shall be submitted as provided in section (citation) and shall indicate the elevation to which the structure is flood-proofed.

(NOTE: The Federal Regulations permit a community to adopt local flood-proofing regulations to be used in lieu of the certification procedure. Such regulations must be approved by the Federal Insurance Administration prior to implementation.)

- (2) The most recent base flood elevation data received from the Federal Insurance Administration shall take precedence over data from other sources.

Section _____.6 Mobile Home Standards

- (1) All mobile homes shall be anchored to resist flotation, collapse or lateral movement by providing over-the-top and frame ties in accord with the following specifications:
 - a. over-the-top ties shall be provided at each of the four corners of the mobile homes, with two additional ties per side at intermediate locations, except on mobile homes less than 50 feet in length, one tie per side shall be required;
 - b. frame ties shall be provided at each corner of the home with five additional ties per side at intermediate points, except on mobile homes less than 50 feet in length, four ties per side shall be required;
 - c. all components of the anchoring system shall be capable of carrying a force of 4,800 pounds; and
 - d. all additions to a mobile home shall be similarly anchored.
- (2) An evacuation plan indicating alternative vehicular access and escape routes shall be filed with (indicate appropriate disaster preparedness authority), for mobile home parks and mobile home subdivisions.
- (3) Mobile homes within zones A1-A30 on the Flood Insurance Rate Map shall be located in accord with the following standards:

- a. all mobile homes shall be placed on stands or lots which are elevated on compacted fill or on pilings so that the lowest floor of the mobile home will be at or above the base flood level;
- b. adequate surface drainage away from all structures and access for a mobile home hauler shall be provided;
- c. in the instance of elevation on pilings, lots shall be large enough to permit steps; piling foundations shall be placed in stable soil no more than 10 feet apart; and reinforcement shall be provided for piers more than six feet above ground level; and
- d. in mobile home parks and mobile home subdivisions which exist at the time this subsection is adopted, where repair, reconstruction or improvement of streets, utilities, and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, the standards in subparagraphs a, b, and c of this subsection shall be complied with.

Section _____.7 Standards for Areas of Shallow Flooding

- (1) The following standards shall apply in areas of shallow flooding denoted as AO zones on the FIRM:
 - a. all new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated above the crown of the nearest street to or above the depth number specified on the FIRM;
 - b. all new construction and substantial improvements of non-residential structures shall either:
 1. have the lowest floor, including basement, elevated above the crown of the nearest street to or above the depth number specified on the FIRM; or
 2. be flood-proofed together with attendant utility and sanitary facilities to the level specified in subparagraph b1 in accord with the standards in section _____.5(1)b2.

(NOTE: Communities which do not have AO zones need not include this section in their ordinance.)

Section _____.8 Floodway Protection Standards

- (1) New construction, substantial improvements and all other development, including fill, shall be prohibited within zones numbered A1-A3O on the FIRM, except where it is demonstrated to the zoning administrator that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not harmfully increase the water surface elevation of a base flood. In determining whether a harmful increase will occur, compliance with Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, shall be required, provided that the

allowable increase shall not exceed one foot. Zones A1-A3O on the FIRM shall be considered to be the floodway.

- (2) The uses of land permitted in an underlying zoning district shall not be construed as being permitted within the floodway, except upon compliance with the provisions in this section.

(NOTE: Communities may wish to require certification by a registered professional engineer and approval by the Department of Environmental Quality to insure that development will not cause a harmful increase in flood levels.)

Section _____.9 Disclaimer of Liability

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based upon engineering and scientific methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. Approval of the use of land under this article shall not be considered a guarantee or warranty of safety from flood damage. This ordinance does not imply that areas outside the flood hazard area will be free from flood damage. This ordinance does not create liability on the part of (name of governmental unit) or any officer or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made thereunder.

SUPPLEMENTARY AMENDMENTS TO A ZONING ORDINANCE

I. Supplementary Definitions

The following definitions of words and phrases used in the flood hazard area zone provisions should be added to the definitions section of the zoning ordinance:

1. "Area of Shallow Flooding" means a designated AO zone on a community's Flood Insurance Rate Map (FIRM) with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident.
2. "Area of Special Flood Hazard" is the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year.
3. "Base Flood" means the flood having a one percent chance of being equaled or exceeded in any given year.
4. "Development" means any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.
5. "Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters or the unusual and rapid accumulation or runoff of surface waters from any source

6. "Flood Hazard Boundary Map" (FHBM) means an official map of a community issued by the Federal Insurance Administration, where the boundaries of the areas of special flood hazards have been designated as Zone A.
7. "Flood Insurance Rate Map" (FIRM) means an official map of a community on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.
8. "Flood Insurance Study" is the official report provided by the Federal Insurance Administration. The report contains flood profiles, flood boundaries, flood insurance rate zones, and the water surface elevation of the base flood.
9. "Flood Hazard Area" means land, which on the basis of available floodplain information, is subject to a one-percent or greater chance of flooding in any given year.
10. "Flood Plain" means any land area susceptible to being inundated by water from any source (see definition of flood).
11. "Floodway" means the channel of a river or other watercourse and the adjacent land areas which must be reserved in order to discharge the base flood.
12. "Harmful Increase" means an unnaturally high stage on a river, stream or lake which causes, or may cause damage to property, threat to life, personal injury, or damage to land or water resources.
13. "Mobile Home" means a structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. It does not include recreational vehicles or travel trailers.
14. "New Construction" means structures for which the "start of construction" commenced on or after the effective date of this ordinance.
15. "Structure" means a walled and roofed building that is principally above ground, gas or liquid storage facility, or a mobile home.
16. "Substantial Improvement" means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either, (1) before the improvement or repair is started, or (2) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions, or (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

(NOTE: When adapting these suggested definitions to a zoning ordinance, care should be exercised to insure that these words have not already been defined in the ordinance)

in a manner conflicting with these definitions. Where a conflict occurs, the definition ultimately chosen should comply with the provisions of the program regulations.)

II. Supplementary Administrative Duties of the Zoning Administrator

In the portion of the zoning ordinance where the duties of the zoning administrator are defined, the following language detailing additional duties relating to the National Flood Insurance Program should be added:

Section _____. Floodplain Management Administrative Duties

- (1) With regard to the National Flood Insurance Program and the regulation of development within the flood hazard area zone as prescribed in Article _____, the duties of the zoning administrator shall include, but are not limited to:
 - a. notification to adjacent communities and the Department of Natural Resources of the proposed alteration or relocation of any watercourse, and the submission of such notifications to the Federal Insurance Administration;
 - b. verification and recording of the actual elevation in relation to mean sea level of the lowest floor, including basement, of all new or substantially improved structures constructed within the flood hazard area, and in the case of flood-proofed structures, the elevation to which the structure was flood-proofed; and
 - c. recording of all certificates of flood-proofing and written notification to all applicants to whom variances are granted in a flood hazard area zone indicating the terms of the variance, the increased danger to life and property, and the increased cost of flood insurance commensurate with the increased flood risk which may reach amounts in excess of \$25.00 for \$100.00 of insurance coverage per year. A record of all variance notifications and variance actions shall be maintained together with the justification for each variance.
- (2) All records and maps pertaining to the National Flood Insurance Program shall be maintained in the office of the zoning administrator and shall be open for public inspection.
- (3) It shall be the responsibility of the zoning administrator to obtain and utilize the best available flood hazard data for purposes of administering this ordinance in the absence of data from the Federal Insurance Administration.

III. Supplementary Permit Application Information

In the portion of the zoning ordinance where information which must be submitted with an application for a zoning compliance permit is specified, the following information necessary for administration of the flood hazard area zone requirements should be added:

Section _____. Flood Hazard Area Application Information

- (1) In addition to the information required with an application for a zoning compliance permit, special use permit or any other type of development permission required under

this ordinance, the following information shall be submitted as a part of an application for permission to commence any type of development within a flood hazard area zone:

- a. the elevation in relation to mean sea level of the floor, including basement, of all structures;
- b. where flood-proofing will be employed, the elevation in relation to mean sea level to which a structure will be flood-proofed;
- c. where flood-proofing will be employed, a certificate from a registered professional engineer or architect that the flood-proofing criteria of this ordinance will be met;
- d. where it can be determined that development is proposed within zones A1-A30 on the FIRM a certification as required by this ordinance;
- e. a description of the extent to which any watercourse will be altered or relocated as a result of proposed development;
- f. proof of development permission from the appropriate federal, state and local agencies as required by section _____.3(1)c, including a floodplain permit, approval, or letter of no authority from the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451;
- g. base flood elevation data where the proposed development is subject to Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451 or is greater than five acres in size; and
- h. additional information which may be reasonably necessary to determine compliance with the provisions of this ordinance.

IV. Supplementary Variance Requirements

In the portion of the ordinance where standards for the granting of variances from the provisions of the ordinance are specified, the following language relating to variances in flood hazard areas should be added:

Section _____. Flood Hazard Area Variances

- (1) Variances from the provisions of Article____, Flood Hazard Areas shall only be granted by the Zoning Board of Appeals upon a determination of compliance with the general standards for variances contained in this ordinance and each of the following specific standards.
 - a. A variance shall be granted only upon:
 1. a showing of good and sufficient cause;
 2. a determination that failure to grant the variance would result in exceptional hardship to the applicant; and

3. a determination that the granting of a variance will not result in flood heights in excess of that permitted by Section _____.8(1), additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
- b. The variance granted shall be the minimum necessary, considering the flood hazard, to afford relief to the applicant.
- (2) The (name of governmental unit) Zoning Board of Appeals may attach conditions to the granting of a variance to insure compliance with the standards maintained in this ordinance.
- (3) Variances may be granted for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the Michigan Historic Markers listing of historic sites, or any other state register of historic places without regard to the requirements of this section.

V. Mapping Disputes

In the portion of the ordinance giving the zoning board of appeals authority to interpret the zoning maps, the following language governing mapping disputes should be added.

Section _____. Mapping Disputes

- (1) Where disputes arise as to the location of the flood hazard area boundary or the limits of flood risk zones A1-A30, the Zoning Board of Appeals shall resolve the dispute and establish the boundary location. In all cases, the decision of the Zoning Board of Appeals shall be based upon the most current floodplain studies issued by the Federal Insurance Administration. Where Federal Insurance Administration information is not available, the best available floodplain information shall be utilized.
- (2) Where a dispute involves an allegation that the boundary is incorrect as mapped and Federal Insurance Administration floodplain studies are being questioned, the Zoning Board of Appeals shall modify the boundary of the flood hazard area or the zones defining the floodway only upon receipt of an official letter of map amendment issued by the Federal Insurance Administration.
- (3) All parties to a map dispute may submit technical evidence to the Zoning Board of Appeals.

VI. Model Ordinance for Code of Federal Regulations 44 Sec. 60.3(d)

In cooperation with the community and the Department of Environmental Quality, the Federal Insurance Administration will designate and map a regulatory floodway. This information may be transmitted with the Flood Insurance Rate Map or at a later date. In either case, the following article should be added to the zoning ordinance upon receipt of the floodway designation information. The construction of this sample article is based upon a community which has received a Flood Insurance Rate Map with both numbered and unnumbered A zones, as well as maps delineating the regulatory floodway. If the previous article appears in the zoning ordinance, the following article changes Sections 2 and 8. Additions to the Supplementary Amendments have also been made.

ARTICLE _____

FLOOD HAZARD AREAS

Section _____.1 Intent

- (1) It is the purpose of this Article to significantly reduce hazards to persons and damage to property as a result of flood conditions in (name of governmental unit) and to comply with the provisions and requirements of the National Flood Insurance Program, in accordance with the National Flood Insurance Act of 1968, and subsequent enactments and rules and regulations promulgated in furtherance of this program by the Federal Emergency Management Agency, as published in the Federal Register, Vol. 41, No. 207, Tuesday, October 26, 1976, and redesignated at 44 FR 31177, May 31, 1979.
- (2) The objectives of this Article include:
 - a. the protection of human life, health and property from the dangerous and damaging effects of flood conditions;
 - b. the minimization of public expenditures for flood control projects, rescue and relief efforts in the aftermath of flooding, repair of flood damaged public facilities and utilities, and the redevelopment of flood damaged homes, neighborhoods, commercial and industrial areas;
 - c. the prevention of private and public economic loss and social disruption as a result of flood conditions;
 - d. the maintenance of stable development patterns not subject to the blighting influence of flood damage;
 - e. insuring that the public has access to information indicating the location of land areas subject to periodic flooding; and
 - f. preserving the ability of floodplains to carry and discharge a base flood.

Section _____.2

Delineation of the Flood Hazard Overlay Zone

- (1) The flood hazard area zone shall overlay existing zoning districts delineated on the official (name of governmental unit) Zoning Map. The boundaries of the flood hazard area zone shall coincide with the boundaries of the areas indicated as within the limits of the 100-year flood in the report entitled "The Flood Insurance Study (name of governmental unit)," dated _____ with accompanying Flood Insurance Rate Maps and Flood Boundary and Floodway Maps. Within the flood hazard area zone a regulatory floodway shall be designated. The boundaries of the regulatory floodway shall coincide with the floodway boundaries indicated on the Flood Boundary and Floodway Map. The Study and accompanying maps are adopted by reference, appended, and declared to be a part of this ordinance. The term flood hazard area as used in this ordinance, shall mean the flood hazard area zone, and the term floodway shall mean the designated regulatory floodway.
- (2) Where there are disputes as to the location of a flood hazard area zone boundary, the Zoning Board of Appeals shall resolve the dispute in accord with section _____.
- (3) In addition to other requirements of this ordinance applicable to development in the underlying zoning district, compliance with the requirements of this Article shall be necessary for all development occurring within the flood hazard area zone. Conflicts between the requirements of this Article and other requirements of this ordinance or any other ordinance shall be resolved in favor of this Article, except where the conflicting requirement is more stringent and would further the objectives of this Article. In such cases the more stringent requirement shall be applied.

Section _____.3 Development Permit

- (1) Development, including the erection of structures and placement of mobile homes, within a flood hazard area shall not occur except upon issuance of a zoning compliance permit in accord with the requirements of (citation for sections dealing with zoning compliance permit issuance) and the following standards:
 - a. the requirements of this Article shall be met;
 - b. the requirements of the underlying zoning districts and applicable general provisions of this ordinance shall be met;
 - c. all necessary development permits shall have been issued by the appropriate federal, state, and local authorities, including a floodplain permit, approval, or letter of no authority from the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451. Where a development permit cannot be issued prior to the issuance of a zoning compliance permit, a letter from the issuing agency indicating intent to issue contingent only upon proof of zoning compliance shall be acceptable.

Section _____.4 General Standards for Flood Hazard Reduction

- (1) All new construction and substantial improvements within a flood hazard area, including the placement of prefabricated buildings and mobile homes, shall:

- a. be designed and anchored to prevent flotation, collapse, or lateral movement of the structure;
 - b. be constructed with materials and utility equipment resistant to flood damage; and
 - c. be constructed by methods and practices that minimize flood damage.
- (2) All new and replacement water supply systems shall minimize or eliminate infiltration of flood waters into the systems.
- (3) All new and replacement sanitary sewage systems shall minimize or eliminate infiltration of flood waters into the systems and discharges from systems into flood waters. On-site waste disposal systems shall be located to avoid impairment to the system or contamination from the system during flooding.
- (4) All public utilities and facilities shall be designed, constructed and located to minimize or eliminate flood damage.
- (5) Adequate drainage shall be provided to reduce exposure to flood hazards.
- (6) The (designated local official) or his representative shall review development proposals to determine compliance with the standards in this section, and shall transmit his determination to the zoning administrator.
- (7) Land shall not be divided in a manner creating parcels or lots which cannot be used in conformance with the requirements of this Article.
- (8) The flood carrying capacity of any altered or relocated watercourse not subject to federal or state regulations designed to insure flood carrying capacity shall be maintained.
- (9) Available flood hazard data from federal or state governments or other sources shall be reasonably utilized in meeting the standards of this section. Data furnished by the Federal Insurance Administration shall take precedence over data from other sources.

(NOTE: Where a building code or other local code contains standards relating to the flood-proofing concerns in this section, the ordinance language should indicate compliance with that code. As optional language, a community may desire to replace subsection (6) with: "Compliance with the standards of this section shall be certified by a registered professional engineer or architect".)

Section _____.5 Specific Base Flood Elevation Standards

- (1) On the basis of the most recent available base flood elevation data the following standards shall apply in the flood hazard area zone:
 - a. all new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated to or above the base flood level.

(NOTE: It is often recommended that elevation and flood-proofing be required to 1 foot above base flood level to allow for flooding variations caused by such unpredictable occurrences as ice jams or the cumulative effect of future minor floodplain encroachments.)

- b. all new construction and substantial improvements of non-residential structures shall have either:
 - 1. the lowest floor, including basement, elevated to or above the base flood level; or
 - 2. be constructed such that below base flood level, together with attendant utility and sanitary facilities, the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subparagraph are satisfied, and that the flood-proofing methods employed are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with a base flood in the location of the structure. Such certification shall be submitted as provided in section (citation) and shall indicate the elevation to which the structure is flood-proofed.
- (2) The most recent base flood elevation data received from the Federal Insurance Administration shall take precedence over data from other sources.

(NOTE: The federal regulations permit a community to adopt local flood-proofing regulations to be used in lieu of the certification procedure. Such regulations must be approved by the Federal Insurance Administration prior to implementation.)

Section _____.6 Mobile Home Standards

- (1) All mobile homes shall be anchored to resist flotation, collapse, or lateral movement by providing over-the-top and frame ties in accord with the following specifications:
 - a. over-the-top ties shall be provided at each of the four corners of the mobile home, with two additional ties per side at intermediate locations, except on mobile homes less than 50 feet in length, one tie per side shall be required;
 - b. frame ties shall be provided at each corner of the home with five additional ties per side at intermediate points, except on mobile homes less than 50 feet in length, four ties per side shall be required;
 - c. all components of the anchoring system shall be capable of carrying a force of 4,800 pounds; and
 - d. all additions to a mobile home shall be similarly anchored.

- (2) An evacuation plan indicating alternate vehicular access and escape routes shall be filed with (indicate appropriate disaster preparedness authority) for mobile home parks and mobile home subdivisions.
- (3) Mobile homes within zones A1-A30 on the Flood Insurance Rate Map shall be located in accord with the following standards;
 - a. all mobile homes shall be placed on stands or lots which are elevated on compacted fill or on pilings so that the lowest floor of the mobile home will be at or above the base flood level;
 - b. adequate surface drainage away from all structures and access for a mobile home hauler shall be provided;
 - c. in the instance of elevation on pilings, lots shall be large enough to permit steps, piling foundations shall be placed in stable soil no more than 10 feet apart; and reinforcement shall be provided for piers more than six feet above ground level; and
 - d. in mobile home parks and mobile home subdivisions which exist at the time this subsection is adopted, where repair, reconstruction or improvement of streets, utilities and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, the standards in subparagraphs a, b, and c of this subsection shall be complied with.

Section _____.7 Standards For Areas of Shallow Flooding

- (1) The following standards shall apply in areas of shallow flooding denoted as AO zones on the FIRM:
 - a. all new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated above the crown of the nearest street to or above the depth number specified on the FIRM;
 - b. all new construction and substantial improvements of nonresidential structures shall either:
 1. have the lowest floor, including basement, elevated above the crown of the nearest street to or above the depth number specified on the FIRM; or
 2. be flood-proofed together with attendant utility and sanitary facilities to the level specified in sub paragraph b1 in accord with the standards in section .5(1)b2.

(NOTE: Communities which do not have AO zones need not include this section in their ordinance.)

Section _____.8 Floodway Protection Standards

- (1) New construction, substantial improvements and all other development, including fill, shall be prohibited within zones numbered A1-A30 on the FIRM, except where it is demonstrated to the zoning administrator that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not harmfully increase the water surface elevation of a base flood. In determining whether a harmful increase will occur, compliance with Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, shall be required, provided that the allowable increase shall not exceed one foot. The provisions of this section shall not apply within the regulatory floodway. The provisions of subsection (2) shall be applied to land situated within the regulatory floodway.
- (2) All development occurring within the regulatory floodway shall comply with the following standards:
 - a. encroachments, including fill, new construction, substantial improvements and other development shall be prohibited. Exception to this prohibition shall only be made upon certification by a registered professional engineer or the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451;
 - b. the placement of mobile homes shall be prohibited except in mobile home parks and subdivisions which exist at the time this Article is adopted; and
 - c. development which is permitted in the regulatory floodway shall meet the requirements of sections _____.3 to _____.6.
- (3) The uses of land permitted in an underlying zoning district shall not be construed as being permitted within the regulatory floodway, except upon compliance with the provisions on this section.

(NOTE: Certification by a registered professional engineer is not required, however, it is recommended and will be necessary in many instances for a state floodplain permit. This floodway provision does not permit development which would cause any increase in flood levels. Variance language permitting increases up to one foot is included in the Supplementary Amendments for use in concert with this requirement under certain circumstances. It should also be noted that on page 55, immediately following the supplementary amendments, alternative ordinance standards for regulating development in the floodway are presented.)

Section _____.9 Disclaimer of Liability

- (1) The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based upon engineering and scientific methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. Approval of the use of land under this article shall not be considered a guarantee or warranty of safety from flood damage. This ordinance does not imply that areas outside the flood hazard area will be free from flood damage. This ordinance does not create liability on the part of (name of governmental unit) or any officer or employees thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made thereunder.

SUPPLEMENTARY AMENDMENTS TO A ZONING ORDINANCE**I. Supplementary Definitions**

The following definitions of words and phrases used in the flood hazard area zone provisions should be added to the definitions section of the zoning ordinance:

1. "Area of Shallow Flooding" means a designated A0 zone on a community's Flood Insurance Rate Map (FIRM) with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident.
2. "Area of Special Flood Hazard" is the land in the floodplain within a community subject to a one-percent or greater chance of flooding in any given year.
3. "Base Flood" means the flood having a one-percent chance of being equaled or exceeded in any given year.
4. "Development" means any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.
5. "Flood or Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters or the unusual and rapid accumulation or runoff of surface waters from any source
6. "Flood Hazard Boundary Map" (FHBM) means an official map of a community, issued by the Federal Insurance Administration, where the boundaries of the areas of special flood hazards have been designated as Zone A.
7. "Flood Insurance Rate Map" (FIRM) means an official map of a community on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.
8. "Flood Insurance Study" is the official report provided by the Federal Insurance Administration. The report contains flood profiles as well as the Flood Hazard Boundary-Floodway Map and the water surface elevation of the base flood.
9. "Flood Hazard Area" means land, which on the basis of available floodplain information, is subject to a one percent or greater chance of flooding in any given area.
10. "Flood Plain" means any land area susceptible to being inundated by water from any source (see definition of flood).
11. "Floodway" means the channel of a river or other watercourse and the adjacent land areas designated in the Flood Insurance Study which must be reserved in order to discharge the base flood.

12. "Harmful Increase" means an unnaturally high stage on a river, stream or lake which causes, or may cause damage to property, threat to life, personal injury, or damage to land or water resources.
13. "Mobile Home" means a structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. It does not include recreational vehicles or travel trailers.
14. "New Construction" means structures for which the "start of construction" commenced on or after the effective date of this ordinance.
15. "Structure" means a walled and roofed building that is principally above ground, gas or liquid storage facility, or a mobile home.
16. "Substantial Improvement" means any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either, (1) before the improvement or repair is started, or (2) if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural participation of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions, or (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

(NOTE: When adapting these suggested definitions to a zoning ordinance, care should be exercised to insure that these words have not already been defined in the ordinance in a manner conflicting with these definitions. Where a conflict occurs, the definition ultimately chosen should comply with the provisions of the program regulations.)

II. Supplementary Administrative Duties of the Zoning Administrator

In the portion of the zoning ordinance where the duties of the zoning administrator are defined, the following language detailing additional duties relating to the National Flood Insurance Program Should be added:

Section _____. Floodplain Management Administrative Duties

- (1) With regard to the National Flood Insurance Program, and the regulation of development within the flood hazard area zone as prescribed in Article____, the duties of the zoning administrator shall include, but are not limited to:
 - a. notification to adjacent communities and the Department of Environmental Quality of the proposed alteration or relocation of any watercourse, and the submission of such notifications to the Federal Insurance Administration;
 - b. verification and recording of the actual elevation in relation to mean sea level of the lowest floor, including basement, of all new or substantially improved

structures constructed within the flood hazard area, and in the case of flood-proofed structures, the elevation to which the structure was flood-proofed; and

- c. recording of all certificates of flood-proofing, and written notification to all applicants to whom variances are granted in a flood hazard area zone indicating the terms of the variance, the increased danger to life and property, and the increased cost of flood insurance commensurate with the increased flood risk which may reach amounts in excess of \$25.00 for \$100.00 of insurance coverage per year. A record of all variance notifications and variance actions shall be maintained together with the justification for each variance.
- (2) All records and maps pertaining to the National Flood Insurance Program shall be maintained in the office of the zoning administrator and shall be open for public inspection.
 - (3) It shall be the responsibility of the zoning administrator to obtain and utilize the best available flood hazard data for purposes of administering this ordinance in the absence of data from the Flood Insurance Administration.

III. Supplementary Permit Application Information

In the portion of the zoning ordinance where information which must be submitted with an application for a zoning compliance permit is specified, the following information necessary for administration of the flood hazard area zone requirements should be added:

Section _____. Flood Hazard Area Application Information

- (1) In addition to the information required with an application for a zoning compliance permit, special use permit or any other type of development permission required under this ordinance the following information shall be submitted as a part of an application for permission to commence any type of development within a flood hazard area zone:
 - a. the elevation in relation to mean sea level of the floor, including basement, of all structures;
 - b. where flood-proofing will be employed, the elevation in relation to mean sea level to which a structure will be flood-proofed;
 - c. where flood-proofing will be employed, a certificate from a registered professional engineer or architect that the flood-proofing criteria of this ordinance will be met;
 - d. where it can be determined that development is proposed within zones A1-A30 on the FIRM or the regulatory floodway, a certification as required by this ordinance;
 - e. a description of the extent to which any watercourse will be altered or relocated as a result of proposed development;

- f. proof of development permission from appropriate federal, state and local agencies as required by section _____.3(1)c, including a floodplain permit approval, or letter of no authority from the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451;
- g. base flood elevation data where the proposed development is subject to Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451 or is greater than five acres in size; and
- h. additional information which may be reasonably necessary to determine compliance with the provisions of this ordinance.

IV. Supplementary Variance Requirements

In the portion of the ordinance where standards for the granting of variances from the provisions of the ordinance are specified, the following language relating to variances in flood hazard area zones should be added:

Section _____. Flood Hazard Area Zone Variances

- (1) Variances from the provisions of Article _____, Flood Hazard Areas shall only be granted by the Zoning Board or Appeals upon a determination of compliance with the general standards for variances contained in this ordinance and each of the following specific standards.
 - a. A variance shall not be granted within a regulatory floodway where the result would be any increase in flood levels during a base flood discharge, except upon certification by a registered professional engineer or the Department of Environmental Quality that the cumulative effect of the proposed development will not harmfully increase the water surface elevation of a base flood. In determining whether a harmful increase will occur, compliance with Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451 shall be required, provided that the allowable increase, including the increase used as the design standard for delineating the floodway, shall not exceed one foot.
 - b. A variance shall be granted only upon:
 - 1. a showing of good and sufficient cause;
 - 2. a determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 - 3. a determination that the granting of a variance will not result in flood heights in excess of those permitted by this ordinance, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
 - c. The variance granted shall be the minimum necessary, considering the flood hazard, to afford relief to the applicant.

(NOTE: Alternative variance language governing development within the regulatory floodway is presented on page 58.)

- (2) The (name of governmental unit) Zoning Board of Appeals may attach conditions to the granting of a variance to insure compliance with the standards contained in this ordinance.
- (3) Variances may be granted for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the Michigan Historic Markers listing of historic sites, or any other state register of historic places without regard to the requirements of this section governing variances in flood hazard areas.

V. Mapping Disputes

In the portion of the ordinance giving the zoning board of appeals authority to interpret the zoning maps, the following language governing mapping disputes should be added:

Section _____. Mapping Disputes

- (1) Where disputes arise as to the location of the flood hazard area boundary or the limits of the floodway, the Zoning Board of Appeals shall resolve the dispute and establish the boundary location. In all cases, the decision of the Zoning Board of Appeals shall be based upon the most current floodplain studies issued by the Federal Insurance Administration. Where Federal Insurance Administration information is not available, the best available floodplain information shall be utilized.
- (2) Where a dispute involves an allegation that the boundary is incorrect as mapped and Federal Insurance Administration floodplain studies are being questioned, the Zoning Board of Appeals shall modify the boundary of the flood hazard area or the floodway only upon receipt of an official letter of map amendment issued by the Federal Insurance Administration.
- (3) All parties to a map dispute may submit technical evidence to the Zoning Board of Appeals.

Alternative Floodway Standards

(NOTE: Regulatory floodways are being mapped in Michigan on the basis of a design standard which is more restrictive than that required by the Federal Insurance Administration. As a result, the Federal Insurance Administration has authorized communities in Michigan to relax the floodway encroachment requirement in Section 60.3 (d) 3 of the program regulations under certain conditions. The floodway standards which appear in the sample ordinance article as Section _____.8(2a) and as subsection (1a) of the supplementary variance requirements are designed to provide maximum protection against floodway encroachment while permitting variances from these standards in certain situations. These floodway standards can be altered in either of the two ways presented below. The first alternative would provide a maximum level of protection against floodway encroachment, without provisions for the granting of variances from the floodway requirements. The second option would simply relax the floodway encroachment standard to a level equal to the federal requirements. Only one alternative can be used in the ordinance.)

1. Variance for Floodway Development Prohibited

a. Amend subsections (1)(a) and (1)(a)(3) under Supplementary Variance Requirements on pages 49 as follows:

- (1)(a) A variance shall not be granted within a regulatory floodway where the result would be any increase in flood levels during a base flood discharge.
- (1)(a)(3). A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, nuisances, cause fraud or victimization of the public, or conflict with existing laws or ordinances.

2. Alter Floodway Standards

a. Replace subsection (2a) of Section _____.8 with the following language:

- (2a). Encroachments, including fill, new construction, substantial improvements and other development shall be prohibited. Exception to this prohibition shall only be made upon certification by a registered professional engineer or the Department of Natural Resources that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not harmfully increase the water surface elevation of a base flood. In determining whether a harmful increase will occur, compliance with the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, shall be required, providing that the allowable increase, including that increase used as the design standard for delineating the floodway, shall not exceed one foot.

b. *Amend subsections (1)(a) and (1)(a)(3) under Supplementary Variance Requirements on pages 49 as follows:*

(1)(a). A variance shall not be granted within a regulatory floodway where the result would be any increase in flood levels during a base flood discharge in excess of that permitted by this ordinance.

(1)(a)(3). A determination that the granting of a variance will not result in flood heights in excess of those permitted by this ordinance, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.

If the above method is used to relax floodway standards, development will be permitted in floodways upon proof of compliance with the Michigan floodplain encroachment statute Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451) and one foot maximum allowable increase standard.