FLOODPLAIN MANAGEMENT GUIDEBOOK

FOR

LOCAL OFFICIALS AND OTHERS

Addressing Federal and State Regulations

Including
National Flood Insurance Program Regulations
Michigan Environmental Regulations
2009 Michigan Residential Code
2009 Michigan Building Code

Revised 2013 Edition

Date Updates
Agency Name Updates
Website Address Updates
Form Updates

Michigan Department of Environmental Quality
Water Resources Division

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National Flood Insurance Program
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Michigan Department of Environmental Quality

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Michigan Department of Environmental Quality

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A LIST OF ACRONYMS USED THROUGHOUT THIS HANDBOOK

BFE	Base Flood Elevation (1% annual chance flood elevation)
CLOMA	Conditional Letter of Map Amendment
CLOMR-F	Conditional Letter of Map Revision based on fill
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
FIMA	Federal Insurance and Mitigation Administration
FIS	Flood Insurance Study
FIRM	Flood Insurance Rate Map
FHA	Federal Housing Authority
HUD	Housing and Urban Development
HVAC	Heating, Ventilating, and Air Conditioning
ISO	ISO (Insurance Services Office) Commercial Risk Services, Inc.
LAG	Lowest Adjacent Grade
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on fill
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
NFIP	National Flood Insurance Program
NREPA	Natural Resources and Environmental Protection Act
SBA	Small Business Administration
SFHA	Special Flood Hazard Area
VA	Veterans Administration

FLOODPLAIN MANAGEMENT DEFINITIONS

1% annual chance flood (often referred to as 1% chance flood, or base flood or the 100-year flood) – means a flood having a 1% chance of being equaled or exceeded in any given year; also known as the Base Flood Elevation (BFE) and is used as the regulatory flood event.

ALTERATION - means to place structures on or fill or grade the land for any purpose.

BASE FLOOD - means the flood having a 1% chance of being equaled or exceeded in any given year, commonly known as the 1% annual chance flood (100-year) flood.

BASE FLOOD ELEVATION (BFE) - is the elevation to which water would be expected to rise during the base flood (1% annual chance flood or 100-year flood).

BUILDABLE AREA - means that portion of a lot which is above the base flood elevation exclusive of the front, side and rear setbacks and easements

COMPENSATORY CUT - means providing a hydraulically equivalent excavation to replace the floodwater storage lost due to the placement of fill, structures, or buildings below the 1% annual chance flood elevation/BFE.

CONDITIONAL LETTER OF MAP AMENDMENT (CLOMA) - refers to a letter from the FEMA stating that a parcel of land or a proposed structure, that is not to be elevated by fill, would not be inundated by the base flood if built as proposed.

CONDITIONAL LETTER OF MAP REVISION - BASED ON FILL (CLOMR-F) - refers to a letter from FEMA stating that a parcel of land or proposed structure that is to be elevated by fill would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) - is the federal agency primarily responsible for disaster preparedness, mitigation, response and recovery and the administration of the National Flood Insurance Program (NFIP).

FLOOD or FLOODING - means a general and temporary condition of partial or complete inundation of normally dry land areas (for insurance policy purposes: inundation of two or more acres or two or more properties--one of which is your property) from:

a. the overflow of inland or tidal waters;
b. the unusual and rapid accumulation of runoff of surface waters from any source;
c. mudslides (i.e., mudflows); or
d. the collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge or by some similarly unusual and unforeseeable event which results in flooding.

FLOOD BOUNDARY AND FLOODWAY MAP (FBFM) - is a floodplain map issued by FEMA that depicts, based on detailed analyses, the boundaries of the 1% annual chance base flood area (100-year) floodplain, the .2% annual chance flood area (500-year) floodplain, and the base-flood floodway.

FLOOD HAZARD BOUNDARY MAP (FHBM) - is the initial insurance map issued by FEMA that identifies, based on approximate analyses, flood boundaries having special hazards designated as Zones A, M, and/or E hazards within a community.

FLOOD-HAZARD AREAS (A ZONES) – The greater of the following two areas:

1. The area within a floodplain subject to a 1% or greater chance of flooding in any year.
2. The area designated as a flood hazard area on a community's flood hazard map or otherwise legally designated.

FLOOD INSURANCE RATE MAP (FIRM) - is the insurance and floodplain-management map issued by FEMA that identifies, based on detailed or approximate analyses, areas of base flood hazards in a community. Also shown on the FIRM are the actuarial insurance-rate zones. In areas studied by detailed analyses, the FIRM will show the BFE elevations to the nearest whole number, and the boundaries for the 1% annual chance (100-year) floodplain and the .2% annual chance (500-year) floodplain boundaries (if determined) and, occasionally, the floodway boundaries.

FLOODPLAIN - means that area of land adjoining a lake or watercourse which will be inundated by a flood.

FLOODPLAIN MANAGEMENT - means an overall program of preventive and corrective measures within floodplain areas to enhance the quality of life and protect health, safety and welfare.

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

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

FLOODPLAIN STUDY - means a detailed hydrologic and hydraulic engineering study that delineates floodplains on a map based upon flood elevation information contained in the study.

FLOODWAY - means the channel of a riverine watercourse and those portions of the floodplain which are reasonably required to carry and discharge the base flood.

ELEVATION CERTIFICATE - is a document completed by a licensed professional engineer, surveyor or architect certifying the "as built" elevation of the lowest floor (including basement) of a structure built in the floodplain.

LETTER OF MAP AMENDMENT (LOMA) - is a letter from FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the base flood.

LOMR–F – A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA's determination concerning whether a structure or parcel has been elevated on fill above the BFE and is, therefore, excluded from the SFHA.

LOWEST ADJACENT GRADE (LAG) - means the elevation of the lowest ground next to a structure.

LOWEST OPENING - is the elevation of the bottom of a window opening in a fully enclosed basement or the elevation of the floor in a walkout basement.

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

LAKE - means a natural or artificial body of water with a surface area of five acres or greater, including the Great Lakes.

MINOR PROJECT - means an activity defined by the Administrative Rules for the Floodplain Regulatory Authority and other land/water interface regulations administered by the Water Resources Division of the MDEQ.

MITIGATION - means any activity which eliminates or reduces the long-term risk to human life, health and property from flooding (not to be confused with "wetlands mitigation").

NATIONAL GEODETIC VERTICAL DATUM (NGVD) - is the datum used as a reference in elevation surveys as recognized by the National Ocean Survey of the National Oceanic and Atmospheric Administration and formally called the National Geodetic Vertical Datum of 1929.

NORTH AMERICAN VERTICAL DATUM (NAVD) - is the new datum adopted by the National Geodetic Survey and will be used as a reference in all future flood-insurance studies. It is formally called the North American Vertical Datum of 1988 and is being used for all new studies.

NATURAL GRADE - means the elevation of the undisturbed ground surface prior to any and all development or construction activity.

STORMWATER RUNOFF - means water resulting from precipitation, snow melt, or ice melt that flows across the landscape and moves through a network of watercourses, wetlands, drains, and lakes that form the watershed.

STORMWATER STUDY - means a detailed hydrologic and hydraulic engineering study of a watershed that defines the impact of stormwater runoff on flood stages and discharge characteristics of the receiving waters.

SUBSTANTIAL DAMAGE - means damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

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 History Places.

WATERCOURSE - means an open conduit, either naturally or artificially created, which periodically or continually contains moving water.

WATERSHED - means the area of land that contributes runoff to a given point in a drainage system.

I. INTRODUCTION

Reducing future flood losses depends to a great extent on proper building construction in areas subject to flooding. This handbook is a tool for building inspectors, zoning administrators and other floodplain managers to help guide construction in floodprone areas and to meet the requirements of the National Flood Insurance Program (NFIP), state statutes and building codes, and local zoning ordinances.

The need to take flood hazards into account when permitting building construction can be demonstrated by the following statistical information.

A residential structure built in a flood-hazard area with its lowest floor (including basement) below the base flood 1% annual chance (100-year) flood elevation stands a 26 percent chance of being flooded before the average 30-year mortgage is paid off. That same building stands only a nine-percent chance of having a fire in 30 years. In other words, the building is almost 3 times more likely to be damaged by flood than by fire!

Topics covered in this handbook include floodplain construction and building code requirements, the duties and responsibilities of the enforcing agency/building inspector under the NFIP and the State Construction Code Act of 1972, PA 230, as amended, and flood-resistant building techniques and materials.

II. BUILDING CODES AND PERMIT COORDINATION

This section discusses the flood hazard construction provisions of building codes, mobile-home commission rules, subdivision and condominium acts, the state's Floodplain Regulatory Authority, and the NFIP. When all of these various authorities and requirements are considered, there can be no doubt that the enforcing agency/building inspector or local floodplain manager is expected to take flood hazards into account when issuing building permits or approving development projects in floodplain areas. Moreover, specific building standards for flood-resistant construction have been defined. The federal government, state government, and local units of government expect those standards to be met. The adverse impact that flood losses have had on federal, state, and local budgets in past, cannot be ignored. The data indicate these losses are likely to increase. For the ten-year period prior to 1989, expenditures from the Federal Emergency Management Agency's (FEMA) Disaster Relief Fund were four billion dollars; since 1989, FEMA has spent over 21 billion dollars in property losses. These losses must be addressed by all levels of government in a partnership.

PERMIT COORDINATION

In Michigan communities, consideration of flood hazards is required for building construction and mobile-home setup. Those governmental jurisdictions enforcing the 2009 Michigan Building Code and the 2009 Michigan Residential Code have the authority and responsibility to mandate flood resistant construction. In practical terms, the State Construction Code Act requires that every Michigan community be subject to the State Construction Code. Since the codes have requirements and standards for Flood-Resistant Construction, every Michigan community has floodplain construction regulations which are considered by FEMA to comply with the minimum NFIP regulatory construction criteria.

In many areas, townships, cities and villages rely upon the county or state government for building inspection services and regulation. This places the responsibility for mandatory flood-resistant construction upon the county or state on behalf of the individual community.

Manufactured home setup is restricted by the flood related provisions of the State Mobile Home Commission Act of 1987, PA 96, as amended, and the previously mentioned State Construction Code. Additional building restrictions may be mandated by restraints placed on subdivision developments, condominium developments, or by a community ordinance adopted to comply with NFIP requirements.

In addition, there are other environmental, health and safety regulations which must be considered. These areas of concern must be addressed by the respective regulatory agencies prior to the issuance of a building permit. It is the responsibility of the building code enforcing agency to know the permit requirements or approvals needed in the areas of zoning, fire, sanitary sewer, drainage, floodplain, air and water pollution, wetlands, Great Lakes, high-risk erosion, critical dunes, environmental areas, soil erosion and sedimentation control, and road access.

The Executive Director of the Bureau of Construction Codes and Fire Safety, Michigan Department of Labor and Economic Growth, has stated in a communication to this office that **". . . the Construction Code does prohibit the issuance of a building permit that violates any law."**

The basis for this statement can be found in R105.3.1 “Action on application” of the 2009 Michigan Residential Code and is quoted, in part, as follows:

"If the application or the construction documents do not conform to the requirements of pertinent laws, the building official shall reject such application in writing, stating the reasons therefor."

Similar language may be found in 105.3.1 “Action on application” of the 2009 Michigan Building Code.

In addition to a state floodplain permit, other specific areas of concern for the building official or plan reviewer would include a soil erosion and sedimentation control permit and, if the proposed project is not served by municipal sewer and water, a health department approval for an on-site septic tank and drain field should be presented. A city or county road commission or Michigan Department of Transportation (MDOT) approval for a driveway may be required as well.

A check list of allied permits or approvals required from other enforcing agencies should be developed by the local building official as a part of the application if not already in use.

Finally, there are a number of other state laws which address the construction of buildings adjacent to water bodies, wetlands, or other environmentally sensitive areas. In order to provide the local building official with a reasonable basis for approval or rejection of a building permit application based on the need for permits under other "pertinent laws," the remainder of this chapter will briefly discuss the pertinent laws administered by the Michigan Department of Environmental Quality (MDEQ). The following information is intended to acquaint the reader with the general concepts and/or requirements of the various statutes (see diagram on the next page). Detailed descriptions of the requirements of these other "pertinent laws" and/or copies of the laws and their administrative rules are available on our website or upon request by contacting:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
Water Resources Division
PO Box 30458
Lansing, MI 48909-7958
Phone: 517-373-1170

or by searching the internet site:
https://www.Michigan.gov/egle/about/organization/water-resources/joint-permit-application
for specific areas of interest related to land/water interface permitting that one may have.

•Floodplain Regulatory Authority found in Sections 3101-3105 and 3107-3108 of Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

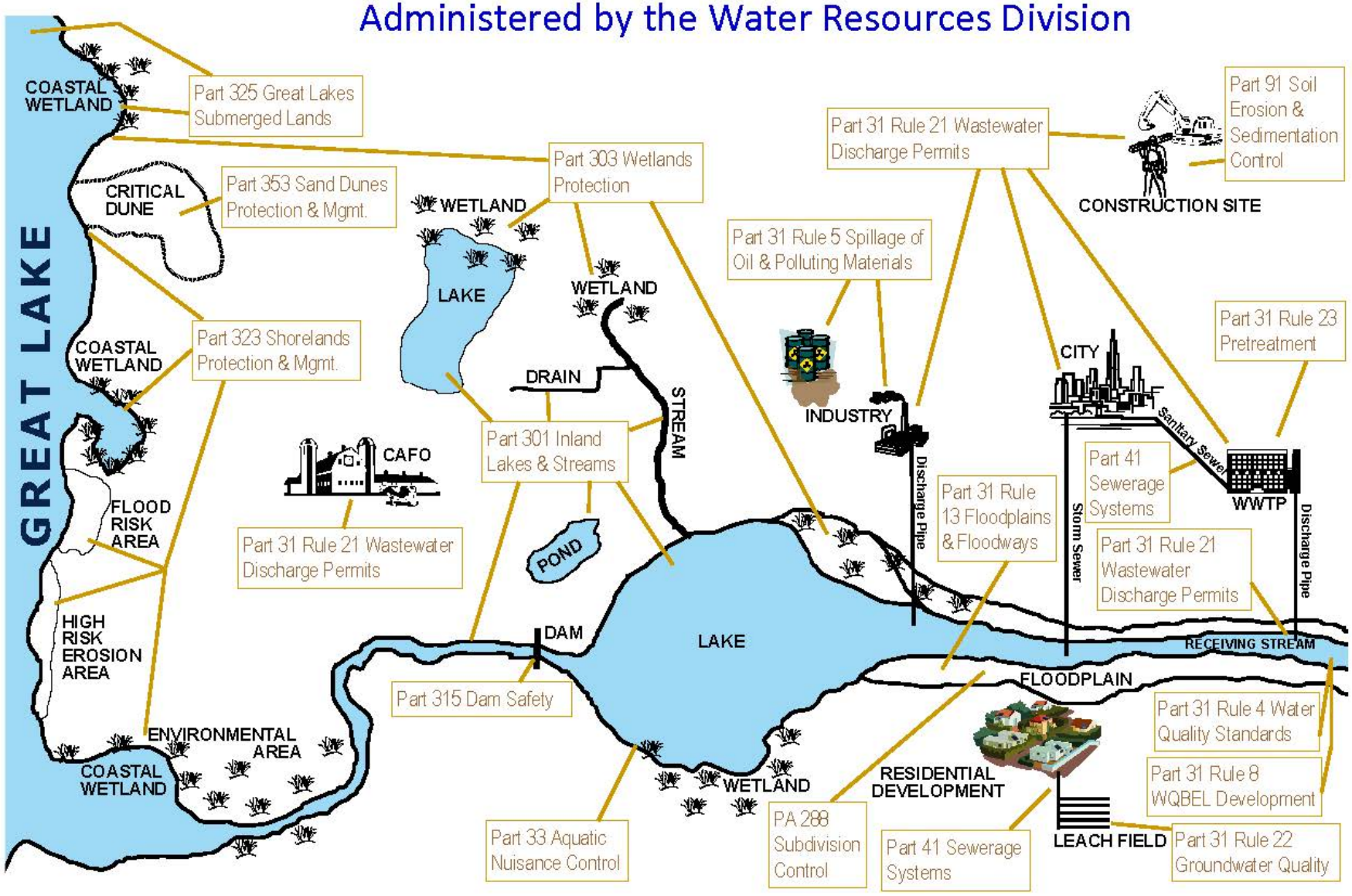
Purpose: To restrict residential occupation of high-risk flood-hazard areas and ensure that other occupations do not obstruct flood flows. To help assure that the structure will withstand all expected flood loads and resist damage from floods up to the 1% annual chance (100-year) flood.

Requirement: A permit is required for any occupation, construction, filling, or grade changes within the 1% annual chance (100-year) floodplain of a river, stream, or drain. Bridges and culverts are considered an occupation of the floodplain, as are activities that involve storage of materials in the floodplain.

Permits: MDEQ and local building/zoning regulations as applicable.

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Michigan Statutes and Rules of the Natural Resources and Environmental Protection Act, 1994 PA 451, as Amended Administered by the Water Resources Division



•**Land Division Act,** 1967 PA 288, as amended.

Purpose: To require that each lot in an approved subdivision has access and at a minimum 3,000 square feet of buildable area above the 1% annual chance/100-year floodplain elevation.

Requirement: The final plat must show the approved 1% annual chance/100-year floodplain and receive approvals from the MDEQ; Michigan Department of Transportation (MDOT); and Michigan Department of Licensing and Regulatory Affairs (LARA) and follow local regulations.

•**Part 315, Dam Safety**, of the NREPA.

Purpose: To ensure that dams are built and maintained with necessary engineering and inspections for safety of the public and environment.

Requirement: Retention or detention basin impounding more than five acres at design flood elevation and with a "height" of six feet or more where "height" is defined as "the difference in elevation measured vertically between the natural bed of a stream or watercourse at the downstream toe of the dam, or, if it is not across a stream channel or watercourse, from the lowest elevation of the downstream toe of the dam, to the design flood elevation or to the lowest point of the top of the dam, whichever is less." The MDEQ will provide hydrologic and hydraulic engineering assistance in determining height. A professional engineer must prepare and seal plans.

Permits: MDEQ, as required at design flood elevation.

•**Part 307, Inland Lake Levels**, of the NREPA.

Purpose: To legally establish and maintain lake levels that provide the most benefits to the public and private interests around a lake.

Requirement: Establishment of legal lake levels requires considerable planning. Initiation of an action to establish a legal lake level generally begins by a motion of the county board or by a petition to the county board of two thirds of the owners of land abutting a lake. More detailed information on “Establishing Legal Lake Levels” can be obtained on the Internet at: www.Michigan.gov/damsafety, look under “Information”. Printed copies are also available by calling the MDEQ at 517-373-1170.

Preliminary engineering studies may be required, special assessment districts may be created, and a circuit-court hearing is required before a legal lake level can be established.

Maintenance of the legal lake level is the responsibility of the county board or the delegated authority. Plans and specifications for construction of a dam which may be required to maintain a legal lake level require approval by the MDEQ. Inspection reports prepared by a licensed professional engineer are required every three years for structures that maintain legal lake levels.

Permits: Dam Safety Program, of MDEQ is responsible for the environmental and engineering reviews for structures proposed to maintain lake levels under this part. There are no permit requirements under Part 307; however, permits may be required under Part 31, Part 301, or Part 303 and legal procedure must be followed. Establishment of the legal lake level from a natural resource standpoint is the responsibility of the Michigan Department of Natural Resources (MDNR), Office of Legal Services, which can be reached at 517-335-4058.

•Part 325, Great Lakes Submerged Lands, of the NREPA.

Purpose: To authorize the public and private use of waters over the Great Lakes submerged lands through construction permits and bottomland conveyances.

Requirement: A permit is required for all filling, dredging, and placement of permanent structures (I.e., groins, docks, piers, pilings, etc.) below the ordinary high water mark and on all upland channels extending landward of the natural ordinary high-water mark of the Great Lakes.

Permits: MDEQ; U.S. Army Corps of Engineers, Detroit District Engineer's Office; and local/county regulations.

•Part 301, Inland Lakes and Streams, of the NREPA.

Purpose: To regulate all construction, excavation, and commercial marina operation on the state's inland waters. In reviewing an application, the MDEQ shall consider the possible effect of the proposed action upon public trust, riparian rights, the inland lake or stream and connecting waters and the uses and benefits of all such waters, including recreation, fish and wildlife, aesthetics, local government, agriculture, commerce and industry.

Requirement: A permit is required to:

a. Dredge or fill bottomlands.
b. Construct, enlarge, extend, remove, or place a structure on bottomland.
c. Erect, maintain, or operate a marina.
d. Create, enlarge, or diminish an inland lake or stream.
e. Structurally interfere with the natural flow of an inland lake or stream.
f. Construct, dredge, commence, extend, or enlarge an artificial canal, channel, ditch, lagoon, pond, lake, or similar waterway where the purpose is ultimate connection with an existing inland lake or stream, or where any part of the artificial waterway is located within 500 feet of the ordinary high-water mark of an existing inland lake or stream.
g. Connect any natural or artificially constructed waterway, canal, channel, ditch, lagoon, pond, lake, or wetland with an existing inland lake or stream for navigation or any other purpose.

Permits: MDEQ and Local Building and Zoning regulations as applicable and in some instances the U.S. Army Corps of Engineers, Detroit District Engineer's Office.

•Part 91, Soil Erosion and Sedimentation Control, of the NREPA.

Purpose: To control soil erosion and to protect the waters of the state from sedimentation.

Requirement: A permit is required for earth change activities (with some exceptions, as provided by the Part) which disturb one or more acres of land or if the earth change is within 500 feet of a lake or stream.

Permits: Issued locally by the county or approved municipal enforcing agencies (i.e. townships, cities, villages). If the earth change crosses the jurisdictional boundaries of Part 91 administering agencies, such as two counties, then the permitting responsibilities fall under the jurisdiction of the MDEQ.

•Part 303, Wetlands Protection, of the NREPA.

Purpose: To provide for the preservation, management, protection, and use of wetlands.

Requirement: A permit is required to:

a. Deposit or permit the placing of fill material in a wetland.
b. Dredge, remove, or permit the removal of soil or minerals from a wetland.
c. Construct, operate, or maintain any use or development in a wetland.
d. Drain surface water from a wetland."

The MDEQ regulates wetlands which are contiguous to a water body and noncontiguous wetlands that are five acres or greater in size. Part 303 also provides regulatory information about adoption of wetland ordinances by local units of government. The MDEQ provides a Wetland Identification Program for property owners interested in site-specific information about the presence or absence of wetlands on their property. For specific projects, MDEQ offers a pre-application meeting option to allow landowners, project planners and developers to meet with MDEQ staff prior to discuss project options.

Permits: MDEQ; U.S. Army Corps of Engineers, Detroit District Engineer's Office; and local regulations.

•**Part 323, Shorelands Protection and Management**, Part 323, of the NREPA.

Purpose: To protect designated environmental areas, flood-risk areas, and high-risk erosion areas that may be damaged by various land use activities along the Great Lakes shoreline.

Requirement: A permit is required for any activities as defined within the following designated areas:

Designated Environmental Areas (See Rule 281.23): A permit is required for:
a. Dredging, filling, grading, or other alterations of the soil.
b. Alteration of natural drainage, but not including the reasonable care and maintenance of established drainage.
c. Alteration of vegetation utilized for the preservation and maintenance of fish or wildlife, including identified colonial bird nesting areas.
d. Placement of permanent structures.
e. Farming of land is allowed without a permit if the person is engaged in the business of farming and the land is used for the production and harvesting of agricultural products using normal farming implements and generally accepted agricultural practices and if artificial draining, diking, dredging, or filling are not used and the natural contour of the land is not altered.

The following counties have designated environmental areas:

Alcona	Arenac	Charlevoix	Delta	Huron	Monroe
Alger	Baraga	Cheboygan	Emmet	Mackinac	Tuscola
Alpena	Bay	Chippewa	Houghton	Marquette	Wayne

Designated Flood Risk Area (See Rule 281.24 for list of communities): Any new permanent structure or expansion of an existing structure on a parcel of land located in the floodplain of a Great Lake located in a designated community.

Designated High Risk Erosion Areas (See Rule 281.22): A permit is required for the erection, installation, or moving of a permanent structure on a parcel of land where any portion is a designated high risk erosion area. Examples include homes, porches, septic systems, additions, substantial improvements of existing structures, and out buildings. The current counties with high risk erosion areas include:

Alger	Bay	Emmet	Keweenaw	Mason	Presque Isle

Allegan	Benzie	Gogebic	Leelanau	Menominee	St. Clair
Alpena	Berrien	Grand Traverse	Luce	Muskegon	Sanilac
Antrim	Cheboygan	Houghton	Mackinac	Oceana	Schoolcraft
Arenac	Chippewa	Huron	Manistee	Ontonagon	Van Buren
Baraga	Delta	Iosco	Marquette	Ottawa	

Permits: MDEQ; possible local administration of state statutes.

•Part 305, Natural Rivers, of the NREPA.

Purpose: To establish a system of outstanding rivers in Michigan, and to preserve, protect, and enhance their values for water conservation, free-flowing condition and the river's fish, wildlife, boating, scenic, aesthetic, floodplain, ecologic, historic, and recreational values and uses.

Requirement: Most activities within a designated Natural River District (all lands within 400 feet of the river's edge on both sides of the river) require compliance with state administrative rules or locally administered Natural River Zoning Ordinances. These include:

a. Building construction.
b. Platting of lots.
c. Cutting vegetation within an established natural vegetation strip.
d. Land alteration.
e. Bridge construction.

Permit/Approval: Township/County zoning administrator within areas with approved local Natural River zoning, or state zoning administrator within state-zoned areas of designated Natural Rivers. The Natural Rivers Program is administered by Fisheries Division, DNR.

•Part 353, Sand Dune Protection and Management, of the NREPA.

Purpose: To protect certain critical dune areas from damage and destruction as a result of developmental, recreational, and silvicultural activities.

Requirement: A permit is required for all proposed new uses including recreational, silvicultural, and significant contour alteration activities in designated critical dune areas mapped in the "Atlas of Critical Dune Areas" prepared by the MDEQ. The following counties have designated critical dune areas:

Alger	Berrien	Emmet	Luce	Mason	Ottawa
Allegan	Charlevoix	Keweenaw	Mackinac	Muskegon	Schoolcraft
Antrim	Chippewa	Leelanau	Manistee	Oceana	Van Buren
Benzie					

Islands that have designated critical dune areas include Beaver Island, North Fox Island, South Fox Island, High Island, North Manitou Island, and South Manitou Island.

Permits: MDEQ; possible local administration of state statutes. The MDEQ district staff should be contacted for more specific information.

JOINT PERMIT APPLICATION FEES

Many of the laws administered by the MDEQ that regulate activities near the land/water interface were amended, with regard to permit application fees, by the State Legislature in 1994. The amendments authorize permit application fees for construction in or adjacent to lakes, streams, rivers, floodplains, and designated sand dune and high-risk erosion areas. Some of the fees were maintained at previous rates, while others were newly created or increased. In 1998, the legislature passed amendatory language for Part 303, Wetlands Protection, of the NREPA. This action increased application fees and provided for a wetland identification process. In subsequent years, legislative actions have caused changes in land/water interface permitting processes. Many have been oriented towards facilitation of quicker review times which resulted in additional funding by those benefitting in the process changes.

The additional funds collected from these fees provide funding for staff in MDEQ field offices in an effort to shorten processing time for the nearly 9,000 annual permit applications.

There has been greater effort made by the department and its staff to answer questions and provide information to potential permit applicants while their projects are still in the planning stage. This should help curb violations, minimize potential damage to our natural resources, reduce flood and other building damage due to poor construction practices, and aid important economic development projects. This will also reduce the reliance on general taxpayer funds and shift the burden to those impacting the natural resources.

The land/water interface permitting process requires the submittal of the applicable statutorily required permit processing fees as part of the application submittal for department review and final action determination. The application fees vary with the applicable regulatory statutes and can range from $50. to $4,000. depending on the type and scope of the proposed project activity. Activities that fall under multiple regulatory parts are subject to the highest required fee. Fees are not cumulative, with the exception of dam and critical dune projects. Current application fees are listed, under “fees” at www.Michigan.gov/JointPermit. The “jointpermit” website also offers information and guidance on the application process.

Additional fees may be charged for certain services associated with some proposed activities. An additional fee of $1500 is required under Part 31, for hydraulic reviews needed to assess the impact of proposed floodplain alteration on the flood stage or discharge characteristics. A fee of $500 is assessed for preliminary plat reviews under the Land Division Act (formerly the Subdivision Control Act), 1967 PA 288, as amended, Sections 116 and 117. An additional fee of $1,500 is also assessed when the department determines that engineering computations are required to establish the limits of the floodplain.

Projects that do not meet the Critical Dune requirements and are reviewed by a Special Exception panel are assessed a fee of $2000. A $250 fee is required under Part 303 and 353 for minor permit modifications or to transfer a permit.

Fees, starting at $100 are also assessed under Part 301, 303 or 353 for optional pre-application meetings on site and for in-house meetings for non-single family projects or projects that may impact over 1 acre. Fees are not charged for in-house pre-application meetings regarding single-family lots less than one acre.

The Wetland Identification Program is available to assist the public in identifying wetland and non-wetland (i.e., upland) areas on their property. Fees for on-site review start at $500.

Permit application fees for construction of dams range from $100 to $3,000, based on the size of the structure and are in addition to fees from other state statutes. These fees are authorized by Part 315, Dam Safety, of the NREPA.

Proposed subdivisions within or affected by floodplain areas or projects impacting floodplains, inland lakes and streams, wetlands, and designated High-Risk Erosion Areas, or Great Lakes bottomlands are subject to the single highest fee required under the Land Division Act, 1967 PA 288, as amended, and the following Parts of NREPA:

- Floodplain Regulatory Authority found in Part 31, Water Resources Protection
- Part 301, Inland Lakes and Streams
- Part 303, Wetlands Protection
- Part 323, Shorelands Protection and Management
- Part 325, Great Lakes Submerged Lands

Permit application fees for construction in designated Critical Dune Areas range from $100 to $2500 with an additional fee of $500 for a "special exception" request. These fees are in addition to the fees from other state statutes. These fees are authorized by Part 353, Sand Dunes Protection and Management, of the NREPA.

For additional permit processing or fee information, one may contact the specific MDEQ district office covering the county where a project is located. For a district county assignment map go to https://www.Michigan.gov/egle/about/organization/water-resources/staff.

Current application fees are listed, under "fees" at www.Michigan.gov/JointPermit. The "jointpermit" website also offers information and guidance on the application process.

LAND/WATER INTERFACE STATUTORY PROJECT PROCESSING CATEGORIES

The state's various land/water interface statutes have developed rules for the administration of the statutes and one area commonly addressed by the rules are the type of projects with high or low potential impacts to natural resources and public trust. Certain sizes and types of projects would involve public noticing and others would not and would be processed under minor project/general permit category criteria. **The most current minor project/general permit categories for the various land/water interface statutes can be found at the internet address of:** https://www.michigan.gov/egle/about/organization/water-resources/joint-permit-application. Click on "minor project categories" or "general permit categories" for whatever your interest is.

For the specific minor project listing under **Floodplain Regulatory Authority found in Sections 3101-3105 and 3107-3108 of Part 31**, **Water Resources Protection**, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).Part 31, please find the following R323.1316 Minor project categories:

MINOR PROJECT CATEGORIES FOR PART 31

Rule 316. Upon receipt of an application for a permit for any of the following minor projects, the department may act upon the application, if accompanied by a fee of $100.00, as provided for in section 3103 of Act. No. 451 of the Public Acts of 1994, as amended, being S324.3103 of the Michigan Compiled Laws:

(a) Construction, filling, or grading that is landward of the floodway limit identified in floodplain delineation studies listed in R 323.1314(1).

(b) Construction, filling, or grading that is landward of the bed and banks of the St. Marys, St. Clair, and Detroit Rivers.
(c) Construction, filling, or grading that is landward of the floodway limits as determined by the department on stream reaches or in areas where floodways have not been defined by R 323.1314(1).
(d) Any construction or filling which is located within the following critical floodwater storage areas and which is done on an individually owned subdivision lot where the construction and fill is confined to less than 5,000 square feet:
    (i) Clinton river forks, as follows: Land areas within the 100-year floodplain of the Clinton river and branches within Clinton township and Macomb township, Macomb county.
    (ii) Saginaw river storage area, as follows: Land areas within the 100-year floodplain of the Saginaw river and tributaries, including Cheboyganing and Dutch creeks, between the cities of Saginaw and Bay City, Saginaw and Bay counties.
    (iii) Shiawassee flats, as follows: Land areas within the 100-year floodplain of the lower reaches of the Shiawassee, Cass, Flint, Tittabawassee, and Bad rivers within Saginaw county.
    (iv) Snake creek, as follows: Land areas within the 100-year floodplain of Snake creek in the city of Midland, Midland county.
    (v) Rush creek, as follows: Land areas within the 100-year floodplain of Rush creek in Georgetown township and the city of Hudsonville, Ottawa county.
    (vi) Frank and Poet drain, as follows: Land areas within the 100-year floodplain of the Frank and Poet drain in the city of Trenton, Wayne county.
(e) A clear span bridge that has the lowest bottom of beam elevation at or above the natural ground elevations on either bank and the approach fill sloping to natural ground elevations within 10 feet on either end of the bridge.
(f) A culvert which has an effective waterway opening that equals or exceeds the cross-sectional area of the channel, which has the fill over the culvert that is not more than 1.5 feet, and which has approach fill that slopes to natural ground elevations within 10 feet on either side of the culvert.
(g) A boardwalk which is of open pile construction and which is landward of or along the existing shoreline.
(h) A pond where excavated materials are placed landward of the floodway, as defined in R 323.1311(g)
(i) A parking lot constructed at grade or resurfacing that is not more than 4 inches above the existing surface.
(j) A deck placed on a residential structure which is of open pile design, which is anchored to prevent flotation, and which does not extend over the bed and bank of a river or stream.
(k) A stormwater outfall which conforms to the side slope of the river, stream, or waterway and which does not project beyond the shoreline.

ADMINISTRATIVE PROCEDURES

In order to help reduce or defuse confrontations with irate citizens, it is strongly recommended that the building official publish the requirements for a building permit in the local newspaper. This public notice should include the amount of time consumed from application to the issuance of a permit. It should be clear that certain building permits may take longer, such as those where state or other permits are necessary. An administrative procedure should be adopted by the governing body of the jurisdiction. In many cases, where the administrative procedure has been published in a local newspaper or is readily available at the community offices, there are far fewer unhappy citizens demanding a building permit immediately or alleging discriminatory

practices. Such notice may also be permanently displayed at the building department, township hall or city hall.

A sample administrative procedure for buildings proposed in floodplain areas follows. It can be used as is or amended to fit your community's specific needs, but it will help assure compliance with the State Construction Code, other state laws, and the NFIP and reduce misunderstandings between citizens and the building department.

BUILDING PERMIT ISSUANCE PROCEDURE FOR CONSTRUCTION WITHIN THE 1% ANNUAL CHANCE (100-YEAR) FLOODPLAIN

Purpose: To assist and assure that construction guidelines and requirements within regulated special flood hazard areas of (insert community name) are addressed and accomplished. This procedure is in addition to the "Standard Building Permit Issuance" procedure.

Who:	**Action:**
Applicant	Makes application for a building permit.
Building Inspector	Reviews the FIRM or other floodplain information (not all floodplains are mapped by FEMA floodplain maps, but all rivers and streams have floodplains) and determines if the parcel might be within the !% annual chance (100-year) floodplain. If the parcel IS NOT in the regulated areas, then revert to Standard Building Permit Issuance procedure. If the parcel is near or within the regulated floodplain boundaries then notify the applicant and proceed with the following procedures for permit issuance within the 1% annual chance (100-year) floodplain.
Applicant	When notified by the building inspector that the parcel is within or near the regulated floodplain areas, the applicant shall submit a site plan showing: 1. property lines 2. proposed construction 3. existing ground elevations 4. the 1% annual chance (100-year) flood elevation This plan shall be prepared by, and bear the original signature and seal of a land surveyor, engineer, or architect authorized by law to certify elevation information.
Building Inspector	If the submitted plan details that the parcel IS NOT WITHIN the regulated areas by virtue of elevation, then revert to Standard Building Permit Issuance procedures. **NOTE**: If the community is in the NFIP, the applicant should be advised to obtain a LOMA if the property is shown as being located in the floodplain but actual survey elevations show it to be above or out of the floodplain. See **Chapter IX - Making Changes in Flood Hazard Maps**. If the plan details show that the parcel IS WITHIN a regulated floodplain area, then notify the applicant and proceed as follows:
Applicant	When notified by the building inspector that the parcel is within a riverine floodplain area, the applicant shall:

- Obtain a permit from the MDEQ to build in a riverine floodplain.
- Have a Registered Professional establish an on-site bench mark.
- Stake the property lines and the boundaries of the proposed structure.
- Give the building inspector 24-hours notice that the site is ready for inspection.

Building Inspector Visit the site and determine whether the structure is located according to the submitted plan and if the bench mark has been set.

If everything is in compliance, revert to the Standard Building Permit Issuance procedure. Note on the building permit the required elevation of the lowest floor, including basement.

Applicant Upon placement of the lowest floor, including basement, and prior to further vertical construction submit a certificate of as-built elevation from a registered design professional (2009 Michigan Residential Code, R109.1.3 “Floodplain inspections.”

Give the building department 24-hours notice that the project is ready for final inspections.

Building Inspector If the building meets the elevation requirements and other code provisions, issue a Certificate of Occupancy to the applicant.

Place all related certificates and documents in the community’s permanent file for the subject building.

This procedure, with slight revisions, can be applied to other MDEQ regulatory requirements such as Wetlands Protection or Inland Lakes and Streams.

III. PLAN REVIEW FOR FLOOD HAZARD REDUCTION

While reviewing a proposed development, there are several specific sections of the State Construction Code that must be considered when the building is located in or near the floodplain. The development of a checklist for use during plan review will help assure the resulting structure meets the requirements of the State Construction Code. These requirements are discussed in this chapter.

STATE CONSTRUCTION CODE

The State Construction Code Commission has adopted the 2009 edition of the International Building Code and the 2009 edition of the International Residential Code, with amendments, as the official Michigan State Construction Code to be enforced statewide. The flood-resistant construction provisions of the amendments require a higher elevation standard than the International Codes.

The provisions of the 2009 Michigan Residential Code – The flood resistant construction standards are found primarily in R322.0. "Detached one- and two-family dwellings and multiple single-family dwelling (townhouses) not more than three stories in height with a separate means of egress and their accessory structures,…" These provisions establish the design flood elevation (R322.1.4) as being at a minimum, the base flood elevation (BFE) at the depth of peak elevation of flooding (including wave height) which has a 1-percent or greater chance of being equaled or exceeded in any given year [1% annual chance (100-year) flood].

The provisions of the 2009 Michigan Building Code apply to all other structures and requires similar elevation standards or, as an option, structures must be water tight flood-proofed. Non residential buildings choosing the water tight flood-proofing option must be designed and certified by a registered architect or professional engineer.

ELEVATION

The Michigan Codes include two consensus standards published by the American Society of Civil Engineers (ASCE) that deal specifically with flood loads and floodplain construction. They are ASCE-7-10 Minimum Design Loads for Buildings and Other Structures and ASCE 24-05 Flood Resistant Design and Construction. These standards classify all structures as to their hazards to human life and are used to establish the elevation requirements. ASCE 24-05 defines four categories as outlined in Table 1.5-1.

TABLE 1.5-1. Risk Category of Buildings and Other Structures for Flood, Wind, Snow, Earthquake, and Ice Loads

Nature of Use or Occupancy of Buildings and Structures	Risk Category
Buildings and other Structures that represent a low hazard to human life in the event of failure including, but not limited to: 1. Agricultural facilities 2. Certain temporary facilities 3. Minor storage facilities	**I**
All buildings and other structures <u>except</u> those listed in Risk Categories I, III and IV	**II**
Buildings and other structures the failure of which could pose a substantial risk to human life including, but not limited to: 1. Buildings and other structures, not included in Risk Category IV, with potential to cause a substantial economic impact and/or mass disruption of day–to-day civilian life in the event of failure. 2. Buildings and other structures not included in Risk Category IV (including, but not limited to, facilities that manufacture, process, handle store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, hazardous waste, or explosives) containing toxic or explosive substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction and is sufficient to pose a threat to the public if released.	**III**
Buildings and other structures designated as essential facilities 1. Buildings and other structures, the failure of which could pose a substantial hazard to the community. 2. Buildings and other structures (including, but not limited to, facilities that manufacture, process, handle, store, use or dispose of such substances as hazardous fuels, hazardous chemicals, or hazardous waste) containing sufficient quantities of highly toxic substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction and is sufficient to pose a threat to the public if released. 3. Buildings and other structures required to maintain the functionality of other Risk Category IV Structures	**IV**

(Source: ASCE Standard 7-10, page 2)

R322.2.1 of the 2009 Michigan Residential Code establishes the minimum elevation requirement as follows:

"(1) Buildings and structures shall have the lowest floor including basements elevated so the lowest point of the floor's concrete or subfloor surface is 1 foot or more above the design flood elevation.

(2) Crawl space interior floor grade elevation shall comply with R408.6 of the code.

(3) Basement floors that are below grade on all sides shall be considered lowest floors and shall be elevated so that the lowest point of the floor surface is 1 foot or more above the design flood elevation.

Exception: Enclosed areas below the design flood elevation, including basements that have floors which are not below grade on all sides, shall meet the requirements of section R322.2.2 of the code."

Section 1612.4 Design and construction. of the 2009 Michigan Building Code establishes the elevation requirements as follows:

1612.4.1 "Buildings and structures, located in flood hazard areas subject to high velocity wave action shall be designed and constructed in accordance with flood hazard areas subject to high velocity wave action of ASCE 24 listed in Chapter 35.

1612.4.2 Type II buildings located in flood hazard areas not subject to high velocity wave action shall be designed and constructed in accordance with section 2.0 basic requirements for flood hazard areas and shall have the lowest floors elevated 1 foot above the 1% annual chance (100 year) flood elevation.

1612.4.3 Type III and IV buildings located in flood hazard areas not subject to high velocity wave action shall be designed and constructed in accordance with section 2.0 basic requirements for flood hazard areas and shall have the lowest floors elevated 1 foot above the 500-year flood level.

1612.4.4 If the lowest floor of nonresidential buildings and structures as defined in ASCE 24 listed in chapter 35 are located in flood hazard areas and are not elevated as required in accordance with sections 1612.4.2 and 1612.4.3, Type II buildings shall be flood proofed to 1 foot above the design flood elevations and Type III IV buildings shall be flood proofed to 1 foot above the 500-year flood level in accordance with the flood proofing requirements contained in ASCE 24 listed in chapter 35.

1612.4.5 Crawl space interior floor grade elevations shall comply with section 1807.1.2.1 of the code.

As an alternative to elevation, structures may be designed and constructed in accordance with ASCE 24-05. Section C7.2—Dry Floodproofing, category III and IV buildings shall use the higher elevation requirement of one foot above the .2 % annual chance (500-year) flood elevation.

The codes grant latitude to the code official to require additional elevation through the common use of the phrase “at or above.” In addition, the flood elevations shown on the FEMA Flood Insurance Rate Maps are still water elevations and do not account for wind and wave action or higher flood levels due to ice jams. With this in mind, it is wise to require elevation to at least the State Construction Code standard. If a higher elevation standard is imposed, it should be through a formal policy established by the governing body having jurisdiction to avoid allegations of differential treatment against the Building Official. This added protection has another benefit in NFIP communities--lower flood insurance premiums through the Community Rating System.

It must be pointed out at this juncture that these elevation requirements apply to all floodplain areas, including those adjacent to the Great Lakes, inland lakes, rivers, and county drains. Similarly, these flood resistant standards apply to all communities in Michigan, not just NFIP communities.

HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

HVAC is an important system to keep in mind when establishing the lowest floor elevation to be maintained by the owner/developer. Under R322.1.6 “Protection of mechanical and electrical systems,” of the 2009 Michigan Residential Code or Section 7.0 Utilities of ASCE 24-05, all new and replacement electrical, heating, ventilating, air conditioning or other service equipment must be placed above the base flood elevation or protected so as to prevent water from entering the system components.

In crawl space construction, the elevation of the lowest floor is critical if heat runs and plenums are below the floor joists, and floodwaters must be kept out of these components. Hence, once again, the use of the phrase "at or above" in the elevation requirement. This allows the building official to meet specific code requirements for HVAC in different types of construction, such as crawl space versus slab on grade. R322.1.6 of the 2009 Michigan Residential Code states in part, "… heating, ventilating, air conditioning and plumbing appliances, plumbing fixtures, duct systems, and other service equipment shall be located at or above the design flood elevation."

CRAWL SPACES

Crawl space construction demands some specific discussion because of the confusion between NFIP standards, code requirements, and building practices which have been utilized by some owners and builders.

This discussion will be offered in the light of the rules and regulations of the NFIP and the provisions of the State Construction Code.

The State Construction Code defines basement, however it does not specifically define crawl space and, unfortunately, we are seeing more and more of such enclosed spaces that are 6 or more feet in height between the bottom of the floor joists and the interior grade. Technically, under the State Construction Code, this is a basement since there is usually less than 6 feet between exterior grade and the floor above. Furthermore, under the NFIP, if the interior space is subgrade on four sides it is also considered a basement. In this instance, it becomes the floor upon which flood insurance is rated--resulting in a substantially higher premium and a violation of NFIP regulations.

The FEMA has a technical bulletin on crawl spaces (see Technical Bulletin 11-01 in Appendix G). This bulletin introduces a second set of standards for crawl spaces. Previously, the only acceptable standard required the interior grade to equal the exterior grade on at least one side of the building with openings to equalize hydrostatic pressure. The bottom of the openings could be no higher than one foot above exterior grade and the net openings had to aggregate one square inch of opening for every square foot enclosed.

The new acceptable alternative has the same opening requirements but will allow the interior grade to be as much as two feet below exterior grade. This NFIP standard is not in conflict with the Michigan Codes. The relevant sections are found at R322.1.5 “Lowest floor” and R322.2.3 “Foundation design and construction” of the 2009 Michigan Residential Code.

"R322.1.5 Lowest floor. The lowest floor shall be the floor of the lowest enclosed area, including basement, but excluding any unfinished flood-resistant enclosure that is useable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the building or structure in violation of this section."

"R322.2.3 Foundation design and construction. Foundation walls for all buildings and structures erected in flood hazard areas shall meet the requirements of Chapter 4.

Exception: Unless designed in accordance with Section 404:

1. The unsupported height of 6 inches plain masonry walls shall be no greater than 3 feet.
2. The unsupported height of 8 inches plain masonry walls shall be no greater than 4 feet.

3. The unsupported height of 8 inches reinforced masonry walls shall be no greater than 8 feet.

   For the purpose of this exception, unsupported height is the distance from the finished grade of the under-floor space and the top of the wall."

Note the language of R322.1.5 excludes any unfinished flood-resistant enclosure that is useable solely for vehicle parking, building access, or limited storage. This can fit the description of a crawl space. The section still requires complete compliance with the other requirements, such as the opening requirement and the use of flood-resistant materials below the BFE (1% annual chance (100-year) elevation). R322.2.3 establishes the construction and design standards for foundation walls. These standards do not conflict with the NFIP Technical Bulletin 11-01.

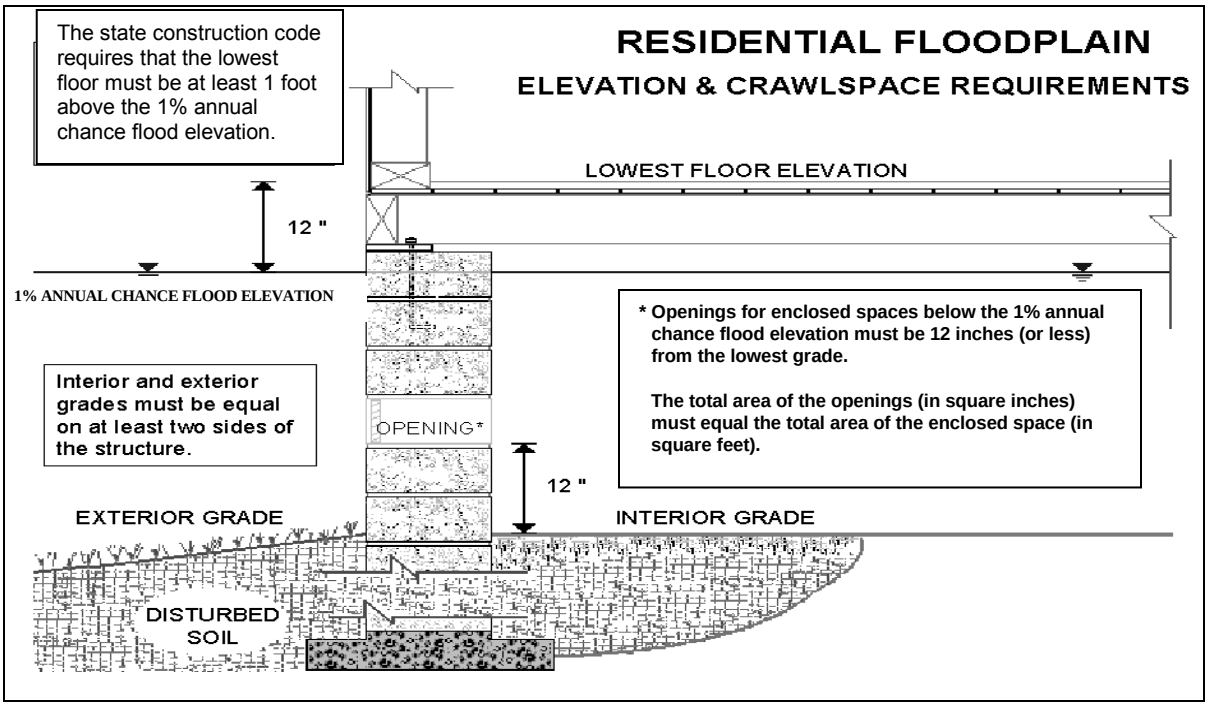
Therefore, under the State Construction Code and the Technical Bulletin, it is permissible to construct a crawl space that is sub-grade four sides by up to two feet provided it meets R322.2.3 and is equipped with openings to equalize hydrostatic pressure. Furthermore, the crawl space must be provided with a positive means of draining the interior space.

However, use of this construction technique will result in higher flood insurance premiums since the floor of the crawl space will be considered the lowest floor.

This brings us to the next consideration for crawl space plan review, site grading.

"R401.3 Drainage. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches within the first 10 feet.

Exception: Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be constructed to ensure drainage away from the structure."



The elevation of backfill adjacent to the foundation must be taken into consideration when determining the final interior grade since it cannot be more than two feet below final exterior grade. In addition, the vertical location of the required openings to equalize hydrostatic pressure must be given careful consideration since the bottom of the openings must be no more than one foot above the finished exterior grade. R322.2.2 is quoted, as follows:

"Enclosed area below design flood elevation. Enclosed areas, below the design flood elevation shall:

1. Be used solely for parking of vehicles, building access or storage.
2. Be provided with flood openings which shall meet the following criteria:

    2.1 There shall be a minimum of two openings on different sides of each enclosed area; if a building has more than one enclosed area below the design flood elevation, each area shall have openings on exterior walls.
    2.2 The total net area of all openings shall be at least 1 square inch for each square foot of enclosed area or …etc.
    2.3 The bottom of each opening shall be 1 foot or less above the adjacent ground level.
    2.4 Openings shall not be less than 3 inches in any direction in the plane of the wall.
    2.5 Any louvers, screens or other opening covers shall allow the automatic flow of floodwaters into and out of the enclosed area.
    2.6 Openings installed in doors and windows, that meet requirements 2.1 through 2.5, are acceptable; however, doors and windows without installed openings do not meet the requirements of this section."

It can be seen from the State Construction Code requirements and the FEMA NFIP Technical Bulletin 11-01 that proposed crawl space construction in floodplains must be carefully reviewed with a very critical eye towards proposed interior and exterior grades. Also, if the interior grade is below exterior grade, a positive means of drainage of the crawl space is mandatory.

A good rule to remember the next time you review a crawl space proposed in a floodplain is, **"If you don't have to crawl, it isn't a crawl space!"**

This is particularly important for any NFIP communities since such interior space with four sides sub-grade, more than two feet, is considered a basement and, as such, becomes the lowest floor for insurance rating purposes. A list of current participating NFIP communities is available on the FEMA website called the “Community Status Book”. If a loan was used to build the structure and it is federally insured or regulated, flood insurance will be required. This is true for all subsequent owners using similar loans. The resultant annual premium for flood insurance can become prohibitive where the lowest floor, including basement, is below the 1% annual chance (100-year) flood elevation or the crawl space interior grade is below exterior grade on four sides. See the sample rates in Appendix D.

Additional guidance on proper construction techniques is found in the U. S. Army Corps of Engineers "Floodproofing Regulations," #1165-2-314*, 12/15/1995, a technical reference volume. Sections 401.2-4 and 612.1-3***** of this reference relate to floodproofing classifications and construction above flood elevations.

----------Document #EP 1165 2 314 is available at no cost from the U.S. Army Corps of Engineers, Publications Department, 890 South Pickett, Alexandria, VA 22304; or the MDEQ - NFIP Coordinator, P.O. Box 30458, Lansing, MI 48909, or telephone 517-373-1170.

In addition, FEMA technical bulletins regarding various floodplain construction aspects have been prepared by the FEMA. See Appendix G for the current list and the FEMA internet link for accessing them.

MOBILE HOMES

Mobile home setup is governed in part by the administrative rules of the Mobile Home Commission Act, PA 96 of 1987, as amended. These rules prohibit placement of mobile homes in floodway portions of floodplains and require anchoring of any mobile homes placed in floodplains. R125.1602, Rule 602, deals with manufactured home installation and states:

"(4) Mobile homes shall not be placed in a designated floodway as determined by the Michigan Department of Environmental Quality. (5) Mobile homes which are sited within a floodplain shall have installed an anchoring system in compliance with R125.1605, Rule 605 through R125.1608, Rule 608 of these rules."

R125.1605, Rule 605 deals with anchoring systems and states:

"A mobile home anchoring system sold and installed in this state shall be in compliance with all of the following provisions: (a) Be designed and constructed in compliance with the United States Department of Housing and Urban Development regulations entitled Mobile Home Construction and Safety Standards . . ., (b) Be installed in compliance with the manufacturer's specification, (c) Be approved for sale and use within this state by the Michigan Construction Code Commission."

The 2009 Michigan Residential Code regulates the installation of mobile homes and address them in Section R322.1.9 “Manufactured homes.” as follows:

"New or replacement manufactured homes shall be elevated in accordance with Section R322.2 or Section R322.3 in Coastal high-hazard areas (V Zones). The anchor and tie-down requirements of Sections AE604 and AE605 of Appendix E shall apply. The foundation and anchorage of manufactured homes to be located in identified floodways shall be designed and constructed in accordance with ASCE 24.

This Section may appear to allow the placement of manufactured homes within a floodway. However, the Floodplain Regulatory Authority found in Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, prohibits human habitation of a floodway. Manufactured structures, however, could be utilized for purposes other than housing and could be permitted under Part 31 if they also met the other review standards.

Other provisions of the Mobile Home Commission Act regulate development of new or expanded mobile home parks. Administrative rules require that when a new or expanded mobile home park lies within or abuts a 1% annual chance (100-year) floodplain, the 1% annual chance (100-year) flood contour line be shown and a mobile home pad not be placed at an elevation below the 1% annual chance (100-year) floodplain contour line.

New or replacement manufactured homes placed in existing older mobile home parks or individual sites, must meet the elevation requirements of the 2009 Michigan Residential Code and local Flood Damage Prevention Ordinance if the manufactured home site is in the 1% annual chance (100-year) floodplain. This requirement mirrors the standard for a site

built home, where, if the original structure was destroyed by fire, tornado or any reason, the replacement structure must meet the current code standards.

SUBDIVISION DEVELOPMENTS

The Land Division Act, 1967 PA 288, as amended, regulates the subdivision of land in Michigan. Provisions of the Act and its administrative rules require that the floodplain limits be defined and prescribe minimum standards for new developments for residential purposes and occupancy, within or affected by a floodplain. Restrictive deed covenants are filed with the final plat and stipulate that any building used or, capable of being used, for residential purposes and occupancy within or affected by the floodplain shall meet the following conditions quoted from the PA 288 Administrative Rules:

"R560.304 Building in areas affected by floodplains.

Rule 304.

1. The purpose of this rule is to prescribe minimum standards for a new development for residential purposes and occupancy within or affected by a floodplain.
2. A proprietor shall file and record with the final plat restrictive deed covenants that state, in perpetuity, that no filling or occupation of the floodplain area will be allowed without approval of the department of environmental quality and that any building used or capable of being used for residential purposes and occupancy within or affected by the floodplain shall comply with all of the following requirements:
   a. Be located on a lot having a minimum buildable site of 3,000 square feet of its area at its natural grade above the elevation of the line defining the floodplain limits. The buildable site shall exclude all setbacks and easements.
   b. Be served by streets within the proposed subdivision having surfaces not lower than 1 foot below the elevation defining the floodplain limits.
   c. Have lower floors, excluding basements, not lower than the elevation defining the floodplain limits.
   d. Have openings into the basement not lower than the elevation defining the floodplain limits.
   e. Have basement walls and floors, if below the elevation defining the floodplain limits, that are watertight and designed to withstand hydrostatic pressures from a water level equal to the elevation of the contour defining the floodplain limits following methods and procedures outlined in chapter 5 for type A construction and chapter 6 for class 1 loads found in the publication entitled "Flood Proofing Regulations," EP 1165 2 314, prepared by the office of the chief of engineers, United States Army, Washington DC, March 1992. Figure 6 on page 14-5 of the regulations shows typical foundation drainage and waterproofing details. This document is adopted by reference in these rules and is available, at no cost, from the Michigan Department of Environmental Quality, Water Resources Division, P.O. Box 30458, Lansing, MI 48909-7958, or the Department of the Army, Corps of Engineers, Publications Depot, 890 S. Pickett, Alexandria, Virginia 22304.
   f. Be equipped with a positive means of preventing sewer backup from sewer lines and drains which serve the building.
   g. Be properly anchored or weighted to prevent flotation.
3. The requirement that the building site have its natural grade above the floodplain limit in subrule (2) (a) of this rule may be waived if the building site is to be filled…"

The key to the subdivision rules is in Rule 304 (2)(a), where we find the requirement that 3,000 square feet of a lot's area at natural grade must be above the 1% annual chance (100-year) flood elevation. The operative word is natural. This means the building area must be above the

1% annual chance (100-year) flood elevation naturally, without the addition of fill or manipulation of existing ground elevations through grading. In a situation such as this, there are no restrictions on the use of basements except for having the lowest opening into a basement above the floodplain level and being capable of withstanding expected hydrostatic loads. These standards are found in Chapter 4 of the 2009 Michigan Residential Code.

However, effective October 28, 1998, according to Rule 304 (3) promulgated under the Land Division Act, 1967 PA 288, as amended, a lot that does not have 3,000 square feet above the 1 % annual chance (100-year) flood elevation can still be platted and offered for sale if the building site is filled and the lowest floor of the building including the basement is constructed above the 1% annual chance (100-year) flood elevation. This relates back to use of the term "natural grade." If fill is used to elevate the site, the resulting lot is not at its natural grade. Such a lot may have been filled with highly permeable material, if a basement were constructed in such a situation; it would be subject to collapse due to hydrostatic pressure exerted through the pervious soils.

Because there was no control over the type of fill material or construction practices the state would not authorize basement construction in filled portions of the floodplain. **However**, in 1996, Section 324.3108 of the State Floodplain Regulatory Authority found in Part 31 was amended to allow the construction of basements in the filled portion of a floodplain. There are some very critical conditions which must be met and procedures which must be explicitly followed in order to prevent building collapse or inordinate cost increases for flood insurance. The basement provisions of the amended law are found on pages III-13 and III-14.

If the proposed structure is in a community participating in the NFIP and it has been mapped by the FEMA, it is vitally important that the map be revised through the established procedure **prior to building construction**.

While the state law allows construction of basements in the floodplain, the MDEQ discourages such construction due to the increased risk of damage and possible increased cost for flood insurance during the life of the mortgage. Failure to follow the established procedure will result in exorbitant costs for flood insurance as a mortgage condition. The rates for flood insurance are based on the relationship between the lowest floor (including basement) and the 1% annual chance (100-year) flood elevation. As the lowest floor elevation goes below the 1% annual chance (100-year) flood elevation, the premium cost rises exponentially. This cost will be attached to the house during the period of the mortgage and all succeeding mortgages. Hence, the vital importance of revising the map to remove the filled land from the floodplain prior to construction is critical.

The FEMA recently revised the procedures for removing a filled portion of land from the floodplain. This process is known as a Letter of Map Revision based on fill or LOMR-F. The new provisions require the community to provide the FEMA with assurances that the filled land and any existing or future structures located or to be located on the filled parcel will be “reasonably safe from flooding.”

The FEMA‘s Technical Bulletin 10-01, found in Appendix G, defines “reasonably safe from flooding.” In two instances, the standard includes structures with basement floors below the 1% annual chance (100-year) flood elevation. The requirements involve certain soil conditions and building design standards. In essence, the FEMA is requiring the community to certify that any existing building or future building will meet these standards.

The community may be uncertain whether it can certify an existing building as "reasonably safe from flooding" and can require the building owner to provide such a certification from an

architect or professional engineer. They may also require such a certification on any future buildings constructed on the land subject to the LOMR-F. As stated earlier, the premium for flood insurance may be prohibitive if the procedures are not followed and certifications provided.

If the community refuses to provide the assurances of "reasonably safe from flooding," the LOMR-F will be denied by the FEMA. In this event, any existing buildings with a basement below the 1% annual chance (100-year) flood elevation will be considered to be in the floodplain and the flood insurance purchase requirement will apply as a condition of any federally regulated, supervised, or insured mortgage.

Remember, when permitting a building in a platted subdivision, check the plat for restrictive deed covenants. This is particularly true in subdivisions platted in the last 25 years. There may be recorded restrictions regarding basements, particularly on lots which were filled years ago and now support a healthy growth of trees, disguising the fact that they were filled.

These rules regarding the subdivision of land and subsequent sale of the individual lots are meant to prevent flood damage, but also to stop property fraud and victimization of the public. The sale of floodprone or "swamp land" during August to unsuspecting buyers is a dishonest practice which is slow in dying. Every year this office hears from individuals that found out too late that the lake-front property they bought was really lake-bottom property for several months each year.

SELLER DISCLOSURE ACT 1993 PA 92

The Legislature approved a disclosure act in 1993. This law dictates the format and content of the disclosure form to be used for residential property transactions. The content is to include an indication of whether there is any evidence of water having been in the basement or crawl space and if yes provide an explanation. It further requires the indication of any awareness of

settling, flooding, drainage, structural, or grading problems and if yes provide an explanation. Also required is an indication of whether the owner/seller has flood insurance on the property.

This law took effect on July 13, 1993. It is hoped that this change in regulation regarding the sale of residential structures will reduce the number of dissatisfied home buyers. This law, however, only applies to existing 1-4 family structures, not vacant land.

CONDOMINIUMS

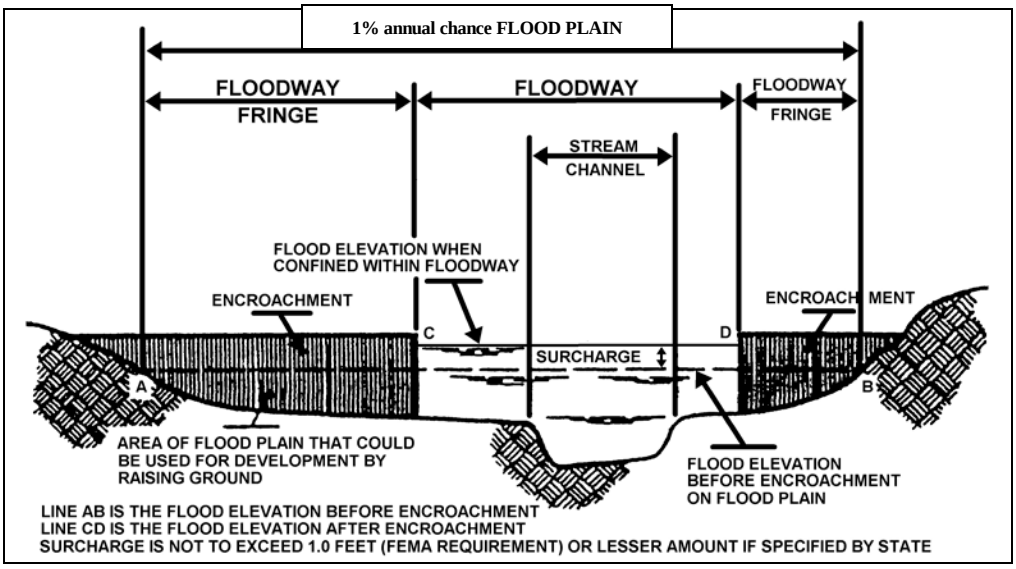
The Condominium Act, 1979 PA 59, as amended, similar to the Mobile Home Commission Act, 1986 PA 96, as amended, and Land Division Act, 1967 PA 288, as amended, requires identification of floodplain limits and places certain restrictions on structures in floodplain areas. Administrative Rule 559.402 (c) (v) states:

"The floodplain area shall be clearly labeled . . . A common element or a condominium unit, other than a campsite or a marina unit, shall not be constructed where it may be reasonably anticipated that the structures will be damaged by flooding . . . ".

In practice, flood prone condominium projects are identified during the Floodplain Permit Application Review by the MDEQ Floodplain Engineer. To avoid damage by flooding, the elevation of the lowest floor is stipulated in the state floodplain permit issued under authority of the state Floodplain Regulatory Authority found in Part 31. Copies of these permits are sent to the local unit of government. Be certain to review these permits and note the restrictions. All of the standards apply to condominiums located within the 1% annual chance (100-year) floodplain. The 2009 Michigan Residential Code, Section R322. “Flood Resistant Construction,” applies to condominiums not more than three stories in height with separate means of egress. All other condominiums are subject to the 2009 Michigan Building Code, Section 1612 “Flood Loads.”

FLOODPLAIN OCCUPATION

While required state permits were discussed earlier in Chapter II, the State's Floodplain Regulatory Authority, found in Part 31, deserves particular attention in connection with the construction of buildings. Part 31 requires that a permit be obtained from the MDEQ before filling or otherwise occupying a riverine floodplain or altering the channel of any watercourse. The purpose of this law is to insure that the floodplains are maintained clear of obstructions which would interfere with the flood carrying capacities of rivers or cause damage to adjacent property owners and to reduce flood damage to structures. This law also prohibits the construction of a human habitation in the floodway. The floodway is that portion of the floodplain which must be reserved to carry off floodwaters from a 1% annual chance (100-year) flood. It is an area of rapidly moving water which can carry debris and ice flows and is an extremely hazardous location (see the following diagram).



The diagram shows a typical floodplain cross-section. The definitions of terms associated with a floodplain follow.

Floodplain: means that area of land adjoining a river or stream which will be inundated by a 1% annual chance (100-year) flood.

Flood Fringe: means that portion of the floodplain that is not floodway.

Floodway: means 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 1 % chance/100-year flood.

Encroachment: means any structure, filling, grading, or deposition of materials in, upon, across, or projecting into a floodplain, channel, or floodway.

The normal process of permit issuance under Part 31 requires that a copy of the permit, including specific conditions, be sent to the local unit of government.

As a local official involved with the use and development of land, you should be aware of the stipulations placed in a Part 31 floodplain permit issued by the MDEQ. A specific effort is made to not issue a permit that would violate any local law or ordinance. If you do not currently see copies of state Part 31 floodplain permits, check with your clerk and ask that they be routed to you. A copy of the permit should be kept in the individual file for the building.

Even though the MDEQ has issued a permit for construction in a floodplain, the proposed development must meet all local requirements as well. The issuance of a state Part 31 floodplain permit does not eliminate local building or zoning requirements. Local floodplain regulations may be more restrictive than the state statute, but may not be contradictory. The following is from a 1976 opinion issued by Frank J. Kelley, Attorney General:

> **"My examination of 1929 PA 245; supra, leads me to conclude that no attempt has been made to preclude a home rule city, city of the fifth class, special charter city, organized township, charter township, village, or county from adopting and enforcing zoning ordinances reasonable and uniform in their content and application regulating or prohibiting construction or placement of structures**

within the floodplain, streambed, or channel of a watercourse, whether natural or artificial, so long as the ordinance or any permit issued thereunder does not permit construction activity prohibited by the Water Resources Commission."

Remember that Michigan law requires a Part 31 floodplain permit from the MDEQ for the occupation of riverine floodplains. If such an occupation is being proposed in your jurisdiction, DO NOT issue a building permit until a MDEQ Part 31 floodplain permit or letter of no authority is in hand.

Further advantages of requiring this permit are that the proposed project will, at the same time, be reviewed for compliance with the following state and federal laws:

- Natural Resources and Environmental Protection Act, 1994 PA 451
  - 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 Dunes Protection and Management

- Section 10 of the Federal Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- Section 404 of the Federal Clean Water Act of 1972 (33 U.S.C. 1344)

As stated earlier, the State Floodplain Regulatory Authority was amended. It now allows the construction of buildings with basements in floodplain areas, but only under very specific standards. Those standards are quoted as follows:

"324.3108 Unlawful occupation, filling, or grading of floodplain, stream bed, or channel of stream; exceptions; construction of building with basement.

Sec. 3108. (1) A person shall not occupy or permit the occupation of land for residential, commercial, or industrial purposes or fill or grade or permit the filling or grading for a purpose other than agricultural of land in a floodplain, stream bed, or channel of a stream, as ascertained and determined for the record by the department, or undertake or engage in an activity on or with respect to land that is determined by the department to interfere harmfully with the discharge or stage characteristics of a stream, unless the occupation, filling, grading, or other activity is permitted under this part.

(2) A person may construct or cause the construction of a building that includes a basement in a floodplain that has been properly filled above the 1% annual chance (100-year) flood elevation under permit if one or more of the following apply:

(a) The lowest floor, including the basement, will be constructed above the 1% annual chance (100-year) flood elevation.

(b) A licensed professional engineer schooled in the science of soil mechanics certifies that the building site has been filled with soil of a type and in a manner that hydrostatic pressures are not exerted upon the basement walls or floor while the watercourse is at or below the 100-year flood elevation, that the placement of the fill will prevent settling of the building or buckling of floors or walls, and that the building is equipped with a positive means of preventing sewer backup from sewer lines and drains that serve the building.

(c) A licensed professional engineer or architect certifies that the basement walls and floors are designed to be watertight and to withstand hydrostatic pressure from a water level equal to the 1% annual chance 100-year flood elevation and that the building is properly anchored or

weighted to prevent flotation and is equipped with a positive means of preventing sewer backup from sewer lines and drains that serve the building.

(3) If the community within which a building described in subsection (2) is located is a participant in the national flood insurance program authorized under the national flood insurance act of 1968, title XIII of the housing and urban development act of 1968, Public Law 90-448, 82 Stat. 572, .42 U.S.C. 4001, 4011 to 4012, 4013 to 4020, 4022 to 4102, 4104 to 4104d, 4121 to 4127, and 4129, **then the developer shall apply for and obtain a letter of map revision, based on fill, from the FEMA prior to the issuance of a local building permit or the construction of the building** if one or both of the following apply:

(a) The floodplain will be altered through the placement of fill.

(b) The watercourse is relocated or enclosed."

Copies of the MDEQ/USACE Joint Permit Application form may be acquired by contacting any MDEQ District Office, or by downloading the form from the Internet at website: www.Michigan.gov/JointPermit. MDEQ district office location information can be found at https://www.Michigan.gov/egle/contact/district-office-locations

Insurance Implications

In NFIP communities, it is VITALLY IMPORTANT that the Letter of Map Revision from the FEMA be issued. This will require the community assurances that the land and any existing or future buildings are reasonably safe from flooding. For example, rates for a post FIRM two story home without basement in Zones A1-30, with the lowest floor one foot below 1% annual chance levels, are $4.40 per $100 of coverage, with lowest floor at 1% annual chance level $1.78 per $100 of coverage, and with lowest floor one foot above the 1% annual chance level $0.71 per $100 of coverage for the first $50,000 of coverage and correspondingly, $0.97, $0.13, and $0.10 per $100 of coverage above $50,000. See the Insurance Rate Table 3B in Appendix C.

Floodplain Service Program

The MDEQ Floodplain Service Program associated with the Floodplain Regulatory Authority, found in Part 31, Water Resources Protection, of the NREPA, can also be very useful in local permitting as it provides a source of floodplain information where no map or base flood elevations are available. Estimates of flood elevations, floodplain determinations, and state and local permit requirements are provided. The form found in Appendix H of this document can be utilized by community officials and private citizens to find out what floodplain restrictions apply to a specific land parcel. And, where flood elevations are not provided on NFIP floodplain maps, the MDEQ will provide an estimated 1% annual chance (100-year flood) elevation or depth of flow.

NATIONAL FLOOD INSURANCE PROGRAM

Voluntary community participation in the NFIP has had a significant positive impact on floodplain construction in the state. Most Michigan communities with any significant flood hazard area participate in the program. The program makes flood insurance available in those communities agreeing to regulate future floodplain construction. Associated with the program are community floodplain mapping, building standards, federal lending restrictions, and flood insurance rates supportive of local floodplain regulations. In order for a community to participate in the NFIP, local regulations must be in force to:

1. Require that new construction and substantial improvements in flood prone areas be designed and adequately anchored to prevent flotation, collapse or lateral movement, be

constructed with materials and utility equipment resistant to flood damage, and be constructed by methods and practices that minimize flood damages.

2. Require, where flood elevation data are available, that

    a. All new construction and substantial improvements/damage of residential structures located in mapped floodplain areas have the lowest floor (including basement) elevated one foot above the 1% annual chance (100-year) flood level.

    b. All new construction and substantial improvements/damage of nonresidential structures in flood hazard areas have the lowest floor (including basement) elevated or floodproofed to or above the 1% annual chance (100-year) flood level or the .2% annual chance (500year flood) depending on the building category type as defined by the Michigan Buildng Code. Floodproofing must be certified by a registered professional engineer or architect.

3. Require anchoring of mobile homes in flood prone areas.
4. Maintain a record of all lowest floor elevations or the elevations to which buildings have been floodproofed when the building is located in a mapped flood hazard area.

These requirements are met or exceeded by a combination of existing state laws, building codes and some local zoning ordinances. Remember, while these state and local regulations meet or exceed the federal requirements, they are of no value in reducing flood losses if you, the local floodplain manager or the building inspector, representing the community, do not enforce them. Failure by a community to enforce these standards can result in the loss of all flood insurance, federal grants and loans in flood prone areas and federal disaster assistance. **Suspension for failure to enforce the provisions can also result in the loss of all federally insured, regulated, or supervised mortgages in the community.**

While NFIP regulations deal with other issues not listed, the heart of the program is the requirement for flood resistant building construction in flood prone areas. The common technique used is to require that the lowest floor, including basement, be elevated as required by the Michigan Residential or Michigan Building Codes. In practical terms, this requirement precludes basement construction in floodplain areas unless a Letter of Map Revision is obtained.

IV. BUILDING INSPECTOR'S DUTIES

The requirements for the licensing of building officials and inspectors bring with it not only the need for continuing education, but also implied is a higher standard of practice. Invariably, when doing a community assessment for the NFIP, the most often found administrative shortcoming is in record keeping. This is particularly true with regard to the requirement to obtain and maintain an elevation certificate or proof of the as-built elevation of the lowest floor, including basement, for buildings constructed in floodplain areas (See R109.1.3 “Floodplain inspections”). The following list of duties is provided as a reminder of the additional specific requirements called for by the State Construction Code and the NFIP when permitting construction in a floodplain.

NFIP REQUIREMENTS

Additional information and record keeping requirements may be necessary to properly administer the building provisions of local zoning regulations or building codes and to obtain information necessary for community participation in the NFIP. Specific duties of the building inspector include:

1. **Determine if the project is in a flood hazard area using flood hazard maps specified by a community ordinance or the State Construction Code (usually the current effective FEMA Flood Insurance Rate Maps (FIRMs).**

2. Obtain the 1% annual chance (100-year) flood elevation from the Flood-Insurance Rate Map (FIRM) or from other available information to determine the elevation to which the project must be elevated or floodproofed as required by the current effective state construction codes.

3. Obtain or require information on the ground elevation at the building site. If the land was recently filled, a MDEQ Part 31 floodplain permit should be available on site or in the owner's possession.

4. Make any necessary interpretations to determine the boundaries of the special flood hazard areas (for example, where there appears to be a conflict between a mapped boundary and actual field conditions).

5. Check to see if the project needs a permit from another agency (federal, state, or local) including, but not limited to, a permit under the state's Floodplain Regulatory Authority found in Part 31.

6. Review permit applications to ensure that the structure meets local floodplain requirements and all necessary precautions are being taken to minimize flood damages.

7. After issuing a permit, make an inspection: (1) before any filling or placement of obstruction is done, (2) upon placement of the lowest floor (See R 109.1.3 of the 2003 Michigan Residential Code), and (3) a final inspection when the project is completed.

8. Verify that the new or substantially improved structure permitted in the flood hazard area has been elevated or floodproofed to comply with the current effective state construction codes.

9. When floodproofing for non-residential buildings is used, obtain through the owner, a certification from a registered professional engineer or architect that the floodproofing method is designed to meet state construction code or community ordinance standards before issuing the building permit.

10. Record the actual elevation, in relation to mean sea level (National Geodetic Vertical Datum), of the lowest floor (including basement) or the elevation to which the structure was floodproofed.

11. Maintain a record of all variances granted.

12. Notify applicants for variances, in writing, that issuance of a variance to construct a structure below the base flood elevation ***will result in a dramatic increase in insurance rates and added threat to life***. A copy of this notification should be retained in the official records. (This is required to alleviate possible future liability claims against the community.)

These duties are reflected in the administrative procedure presented earlier.

STATE CONSTRUCTION CODE REQUIREMENTS

The 2009 Michigan Residential Code and 2009 Michigan Building Code require certain record keeping standards. The record-keeping requirements of the codes follow:

"R 322.1.10 As-built elevation documentation. A registered design professional shall prepare and seal documentation of the elevations specified in Section R322.2 or R322.3."

"1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a registered design professional and submitted to the building official:

1. For construction in flood hazard areas not subject to high-velocity wave action:

    1.1 The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection As part of the lowest floor elevation inspection in Section 110.3.3.
    1.2 For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1, ASCE 24, construction documents shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2, ASCE 24.
    1.3 For dry floodproofing nonresidential buildings, construction documents shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.
    1.4
2. For construction in flood hazard areas subject to high-velocity wave action:

    2.1 The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3.
    2.2 Construction documents shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting

simultaneously on all building components, and other load requirements of Chapter 16.

2.3 For breakaway walls designed to resist a nominal load of less than 10 pounds per square foot (0.48 kN/m²) or more than 20 pounds per square foot (0.96 kN/m²), construction documents shall include a statement that the breakaway wall is designed in accordance with ASCE 24.

2.4

While high hazard zones (V-zones) have not been designated in Michigan by the FEMA, there are areas along the Great Lakes shoreline where the elevation standards equivalent to V-zones apply. These standards are included in both the 2009 Michigan Residential Code and 2009 Michigan Building Code.

V. FLOOD-HAZARD CONSTRUCTION TECHNIQUES

Various construction techniques are used to insure that structures are resistant to flood damage. This section discusses NFIP and State Construction Code issues related to elevating and floodproofing structures. Particular emphasis is given to flood insurance provisions, which through the insurance rate structure, encourage conformance to NFIP building standards. Also included is a section on waterproofing which provides a helpful checklist to insure watertight construction.

ELEVATION OF STRUCTURES

Elevation of structures on fill, raised foundations, or piers is a common technique used to protect buildings from flood damages. The NFIP requires the lowest floor (including basements) of residential structures located in the 1% annual chance (100-year) floodplain to be elevated to or above the 1% annual chance (100-year) flood level. Nonresidential structures are also required to be elevated or floodproofed to or above the 1% annual chance (100-year) flood level. The State Construction Code is more restrictive in that for residential structures it requires the surface of the lowest floor to be 1 foot above the 1% annual chance (100-year flood) level at a minimum. For nonresidential structures they have to be elevated one foot above the 1%annual chance (100 year) flood or the .2 % annual chance (500 year) flood depending on the type of structure or otherwise floodproofed.

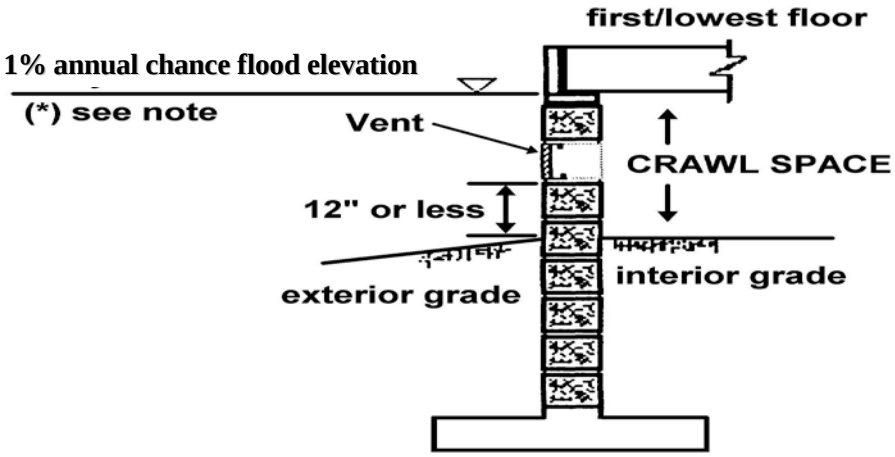
Elevation of Structures – On Fill

Elevation on fill is the most common flood damage prevention technique used in Michigan. While generally providing effective flood protection, filling may not be appropriate if the building site is in the floodway (moving water) portion of the floodplain. [Remember, state laws prohibit **residences** in floodways]. If the "footprint" of the proposed structure falls (even partially) within the floodplain then elevation is required. The method of elevation is not specified but fill is most often utilized. While the lowest floor is elevated above the base flood elevation, the foundation elements may still be subject to flood damages, therefore, the flood insurance purchase requirements could still apply, unless a Letter of Map Revision or Letter of Map Amendment has been granted by the FEMA. See Chapter IX - Making Changes in Flood Hazard Maps. Flood insurance rates recognize the flood damage prevention benefits of elevation and vary with the relationship of the lowest floor elevation to 1% annual chance (100-year) flood levels.

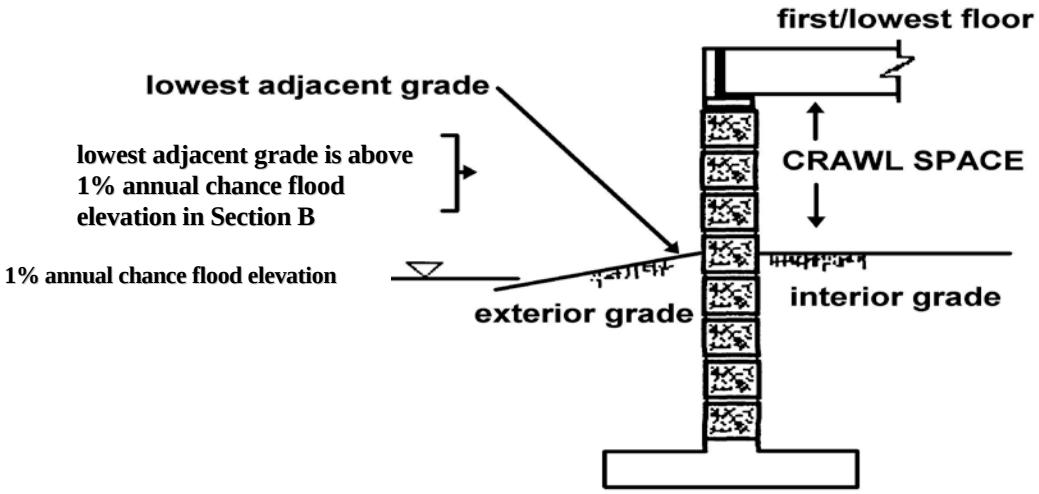
Elevation of Structures – On Raised Foundation or Piers

Elevation on a raised foundation or piers has the advantage of providing space under the structure for building access, parking or storage. However, caution should be exercised in allowing enclosure of this area or placement of equipment attached to the building. The lowest floor for NFIP insurance rating takes into consideration enclosed areas. To avoid being considered the lowest floor, enclosed area walls should either be constructed as break away walls or be constructed with openings (such as with parallel sheer walls, open lattice walls, discontinuous foundation walls, or combinations thereof) to facilitate the unimpeded movement of floodwaters. The floor of an enclosure with solid, load-bearing foundation walls, such as a crawl space, is not considered the lowest floor if designed with permanent openings to equalize hydrostatic pressure, the interior grade is equal to the exterior grade or complies with the FEMA Technical Bulletin 11-01 - Preferred Method, contains no machinery or equipment located below the 1% annual chance (100-year) flood elevation and is usable only for access for building maintenance, parking of vehicles or incidental storage. See the FEMA Technical Bulletins in Appendix G.

CAUTION: This drawing is only intended to illustrate some of the features of lowest floor requirements under the National Flood Insurance Program. It should only be used in conjunction with NFIP Technical Bulletins.



CROSS SECTION A



CROSS SECTION B

(*) NOTE: Under the NFIP, the lowest floor, including basement, of any new or substantially improved residential structure must be at or above the 1% annual chance (100-year) flood elevation. This is a minimum requirement. Under the state construction code, the surface of the lowest floor must be one foot above the 1% annual chance (100-year) flood elevation. Enclosed space such as the crawl space that is below the flood elevation as in Section A must have openings/vents to equalize the hydrostatic forces on the foundation wall. The size and placement of openings must be per the NFIP specifications. Please note in Cross Section B that the lowest adjacent grade and the lowest floor are both above the BFE. This structure would qualify for a LOMR-F if the community certifies "the land or structures are reasonably safe from flooding."

STRUCTURAL FLOODPROOFING

Under the NFIP and the 2009 Michigan Building Code, structural floodproofing is acceptable only in non-residential structures. The code provisions are found in the consensus standard from the American Society of Civil Engineers, ASCE 24-05:

"C7.2 Dry Floodproofing

Whenever dry floodproofing is proposed for the lowest story of a new structure, whether it be above grade, below grade, or a combination of the two, assurance must be provided that reliable flood protection will be achieved, and that the structure will be substantially impermeable to the passage of floodwater, against all floods up to and including the design flood. This requires strict adherence to materials and construction requirements for dry floodproofing.

C7.2.1 DRY FLOODPROOFING RESTRICTIONS

Dry floodproofing in residential structures is not permitted because it frequently requires human action such as installing flood shields, maintaining the protective features, having an operational plan, and being able to take actions within a reasonable warning time. The possible failure of the home owner to take such an action either because of absence from home, lack of maintenance, change in ownership of the home, is regarded as an unacceptable risk.

The 5.0 ft/s velocity restriction for floodproofing is not a FEMA requirement but is used in the U.S. Army Corps of Engineers regulations [C26] in design of structures exposed to water loads from stagnant or flowing waters. Although effective dry floodproofing can be designed for higher velocities, this is a reasonable existing limit that addresses safety of dry floodproofed structures during a flood."

While floodproofing of nonresidential structures is permissible, floodproofing design and construction are complex and should only be permitted if plans and construction are certified by a professional engineer or architect. (Remember, you are required to keep a record of this certification.) Important design considerations for floodproofing include:

1. Type of soil - soil pressure on basement walls.
2. Height of water expected - hydrostatic pressures on walls and floor.
3. Water impact loads - hydrodynamic loading of walls.
4. Duration of exposure to floodwaters.
5. Flash flood potential.
6. Type of basement construction - drained or undrained: concrete block, poured concrete, thickness of wall, thickness of slab, amount and spacing of steel reinforcement.
7. If basement is to be drained:
   a. Adequate sump pump capacity.
   b. Sump located outside the structure to maintain watertight effectiveness.
   c. Adequate footing and under drainage.
8. Sewer back-up valve.
9. Waterproof membrane and seal.
10. Properly designed against flotation (buoyancy).
11. Utility openings.
12. Window and door openings.
13. Anchoring.
14. Landscaping and roof drainage to reduce soil saturation.

The NFIP flood insurance rates recognize floodproofing of nonresidential structures as an acceptable flood damage prevention technique. However, the floodproofed elevation must be at least one foot above the 1% annual chance (100-year) flood elevation (or 1 foot above the .2% annual chance (500-year) flood elevation if the structure is a critical facility, see Table III-1) and the structure must be certified by a professional engineer or architect as being designed and built in accordance with the standards. Insurance premiums are determined by subtracting one foot from the difference between the floodproofed elevation and the 100-year flood elevation (i.e., a structure floodproofed to +2 feet above the 100-year elevation would be rated as a structure with lowest floor at +1 foot). This allows consideration of the uncertainties of flood conditions. Also, it reflects the fact that flood elevations shown on FIRMs are still water elevations and do not account for wind or waves.

Neither Part 31 nor the 2009 Michigan Residential Code allows floodproofing of new or substantially improved residential structures as an alternative means of achieving flood protection.

Further guidance on floodproofing and waterproofing can be found in "Floodproofing Regulations," U. S. Army Corps of Engineers, EP1165-2-314, December 1995, and in the Technical Bulletins available from FEMA. Copies of these documents are available from the MDEQ NFIP State Coordinator, PO Box 30458, Lansing, Michigan 48909-7958.

DAMPPROOFING

The 2009 Michigan Building Code specifies dampproofing or waterproofing of foundation walls that retain earth and enclose interior spaces and floors below grade. Approved methods are specified in Section 1805 “Dampproofing and Waterproofing” as follows:

1805.1 General. Walls or portions thereof that retain earth and enclose interior spaces and floors below grade shall be waterproofed and dampproofed in accordance with this section, with the exception of those spaces containing groups other than residential and institutional, where such omission is not detrimental to the building or occupancy.

Ventilation for crawl spaces shall comply with Section 1203.4.

1805.1.1 Story above grade. Where a basement is considered a story above grade and the finished ground level adjacent to the basement wall is below the basement floor elevation for 25 percent or more of the perimeter, the floor and walls shall be dampproofed in accordance with Section 1805.2 and a foundation drain shall be installed in accordance with Section 1805.4.2. The foundation drain shall be installed around the portion of the perimeter where the basement floor is below ground level. The provisions of Sections 1803.5.4, 1805.3, and 1805.4.1 shall not apply in this case.

1805.1.2 Underfloor space. The finished ground level of an underfloor space such as a crawl space shall not be located below the bottom of the footings. Where there is evidence that the ground water table rises to within 6 inches of the ground level at the outside building perimeter, or that the surface water does not readily drain from the building site, the ground level of the underfloor space shall be as high as the outside finished ground level, unless an approved drainage system is provided. The provisions of Sections 1803.5.4, 1805.2, 1805.3, and 1805.4 shall not apply in this case.

1805.1.2.1 Flood hazard areas. For buildings and structures in flood hazard areas as established in Section 1612.3, the finished ground level of an underfloor space such as a crawl space shall be equal to or higher than the outside finished ground level on at least one side.

Exception: Under-floor spaces of Group R-3 buildings that meet the requirements of FEMA/FIA-TB-11.

1805.1.3 Ground-water control. Where the ground-water table is lowered and maintained at an elevation not less than 6 inches below the bottom of the lowest floor, the floor and walls shall be dampproofed in accordance with Section 1805.2. The design of the system to lower the ground-water table shall be based on accepted principles of engineering that shall consider, but not necessarily be limited to, permeability of the soil, rate at which water enters the drainage system, rated capacity of pumps, head against which pumps are to pump, and the rated capacity of the disposal area of the system.

1805.2 Dampproofing: Where hydrostatic pressure will not occur as determined by Section 1803.5.4, floors and walls for other than wood foundation systems shall be dampproofed in accordance with this section. Wood foundation systems shall be constructed in accordance with AF&PA PWF.

1805.2.1 Floors. Dampproofing materials for floors shall be installed between the floor and the base course required by Section 1805.4.1, except where a separate floor is provided above a concrete slab.

Where installed beneath the slab, dampproofing shall consist of not less than 6-mil (0.006 inch; 0.152 mm) polyethylene with joints lapped not less than 6 inches, or other approved methods or materials. Where permitted to be installed on top of the slab, dampproofing shall consist of mopped-on bitumen, not less than 4-mil (0.004 inch; 0.102 mm) polyethylene, or other approved methods or materials. Joints in the membrane shall be lapped and sealed in accordance with the manufacturer's installation instructions.

1805.2.2 Walls. Dampproofing materials for walls shall be installed on the exterior surface of the wall, and shall extend from the top of the footing to above ground level.

Dampproofing shall consist of a bituminous material, 3 pounds per square yard of acrylic modified cement, 1/8-inch (3.2 mm) coat of surface-bonding mortar complying with ASTM C 887, any of the materials permitted for waterproofing by Section 1805.3.2, or other approved methods or materials.

1805.2.2.1 Surface preparation of walls. Prior to application of dampproofing materials on concrete walls, holes and recesses resulting from the removal of form ties shall be sealed with a bituminous material or other approved methods or materials. Unit masonry walls shall be parged on the exterior surface below ground level with not less than 3/8 inch (9.5 mm) of portland cement mortar. The parging shall be coved at the footing.

Exception: Parging of unit masonry walls is not required where a material is approved for direct application to the masonry.

1805.3 Waterproofing. Where the ground-water investigation required by Section 1803.5.4 indicates that a hydrostatic pressure condition exists, and the design does not include a ground-water control system as described in Section 1805.1.3, walls and floors shall be waterproofed in accordance with this section.

1805.3.1 Floors. Floors required to be waterproofed shall be of concrete, designed and constructed to withstand the hydrostatic pressures to which the floors will be subjected.

Waterproofing shall be accompanied by placing a membrane of rubberized asphalt, butyl rubber, fully adhered/fully bonded HDPE or polyolefin composite membrane or not less than 6-mil (0.006 inch; 0.152 mm) polyvinyl chloride with joints lapped not less than 6 inches or other approved materials under the slab. Joints in the membrane shall be lapped and sealed in accordance with the manufacturer's installation instructions.

1805.3.2 Walls. Walls required to be waterproofed shall be of concrete or masonry and shall be designed and constructed to withstand the hydrostatic pressures and other lateral loads to which the walls will be subjected.

Waterproofing shall be applied from the bottom of the wall to not less than 12 inches above the maximum elevation of the ground water table. The remainder of the wall shall be dampproofed in accordance with Section 1805.2.2. Waterproofing shall consist of two-ply hot-mopped felts, not less than 6-mil (0.006 inch; 0.152 mm) polyvinyl chloride, 40-mil (0.040 inch; 1.02 mm) polymer modified asphalt, 6-mil (0.006 inch; 0.152 mm) polyethylene or other approved methods or materials capable of bridging nonstructural cracks. Joints in the membrane shall be lapped and sealed in accordance with the manufacturer's installation instructions.

1805.3.2.1 Surface preparation of walls. Prior to the application of waterproofing materials on concrete or masonry walls, the walls shall be prepared in accordance with Section 1805.2.2.1.

1805.3.3 Joints and penetrations. Joints in walls and floors, joints between the wall and floor, and penetrations of the wall and floor shall be made watertight utilizing approved methods and materials.

1805.4 Subsoil drainage system. Where a hydrostatic pressure condition does not exist, dampproofing shall be provided and a base shall be installed under the floor and a drain installed around the foundation perimeter. A subsoil drainage system designed and constructed in accordance with Section 1807.1.3 shall be deemed adequate for lowering the ground-water table.

1805.4.1 Floor base course. Floors of basements, except as provided for in Section 1805.1.1, shall be placed over a floor base course not less than 4 inches in thickness that consists of gravel or crushed stone containing not more than 10 percent of material that passes through a No. 4 (4.75 mm) sieve.

Exception: Where a site is located in well-drained gravel or sand/gravel mixture soils, a floor base course is not required.

1805.4.2 Foundation drain. A drain shall be placed around the perimeter of a foundation that consists of gravel or crushed stone containing not more than 10 percent material that passes through a No. 4 (4.75 mm) sieve. The drain shall extend a minimum of 12 inches beyond the outside edge of the footing. The thickness shall be such that the bottom of the drain is not higher than the bottom of the base under the floor, and that the top of the drain is not less than 6 inches above the top of the footing. The top of the drain shall be covered with an approved filter membrane material. Where a drain tile or perforated pipe is used, the invert of the pipe or tile shall not be higher than the floor elevation. The top of joints or the top of perforations shall be protected with an approved filter membrane material. The pipe or tile shall be placed on not less than 2 inches (51 mm) of gravel or crushed stone complying with Section 1805.4.1, and shall be covered with not less than 6 inches of the same material.

1805.4.3 Drainage discharge. The floor base and foundation perimeter drain shall discharge by gravity or mechanical means into an approved drainage system that complies with the *International Plumbing Code*.

Exception: Where a site is located in well-drained gravel or sand/gravel mixture soils, a dedicated drainage system is not required."

VI. DEVELOPMENTS REQUIRING SPECIAL ATTENTION

Numerous questions have been raised, regarding construction in identified flood prone areas of communities participating in the NFIP. This section provides special emphasis on construction subject to frequent misinterpretations, FEMA policy decisions and the flood insurance policy. While insurance issues are not normally within the purview of building inspectors or the MDEQ, building decisions have a direct relationship with the cost of flood insurance and may affect the insurability or salability of a structure. In this section, special attention is directed to residential basements, accessory structures, substantial improvements including additions, and mobile homes.

RESIDENTIAL BASEMENTS

For purposes of the NFIP, the lowest floor of a structure includes the basement floor if a basement is proposed. And, if flood elevation data are available from any source, basement construction is effectively prohibited within the floodplain unless the basement floor is elevated one foot above 1% annual chance (100-year) flood elevation, except as noted in Chapter III. THE PLACEMENT OF FILL, AS APPROVED BY A STATE PART 31 FLOODPLAIN PERMIT, DOES NOT REMOVE THE PROPERTY FROM THE FLOODPLAIN. EVEN AFTER FILL IS PLACED, THE REQUIREMENT IN THE STATE CONSTRUCTION CODE AND UNDER THE NFIP IS THAT THE LOWEST FLOOR INCLUDING THE BASEMENT MUST BE AT OR ABOVE THE 100-YEAR FLOOD ELEVATION, unless the specific requirements and procedures outlined in Chapter III are followed precisely!

Applicable floodplain management criteria for flood prone areas are stated in Section 60.3(b)(4) and (c)(2) of the NFIP Regulations. These regulations **"require that all new construction and substantial improvement of residential structures have the lowest floor (including basement) elevated to or above the base (1% annual chance/100 year) flood level."** As stated earlier, the method of elevation is not prescribed. It can include piers, pilings, parallel shear walls or fill!

Although dry floodproofing is allowed for nonresidential structures in lieu of elevating, floodproofing is not permitted for residential construction.

Residential Basements - Options

The above stated regulations generally apply and prohibit basement construction within flood prone areas of communities participating in the NFIP. However, prior to imposing the basement prohibition, the relationship of the elevation of the building site at its natural grade to the 1% annual chance (100-year) flood elevation should be considered. Due to mapping limitations, there are instances where building sites have been incorrectly mapped as floodprone. If an owner can demonstrate that the site is naturally above regulatory flood elevations, basement construction may be permitted, if a Letter of Map Amendment (LOMA) is obtained from the FEMA. The proof needed to secure a LOMA from the FEMA consists of a legal description of the property, an elevation survey by a registered land surveyor or engineer, and a statement from a community official that the property was not filled since the date of the original community floodplain map. This process has the effect of amending the map without reprinting it. The resulting LOMA can be recorded with the deed for the benefit of current and future owners. Such a LOMA also waives the federal flood insurance purchase requirement. Standard application forms and instructions for letters of map amendment/revision are found in Chapter IX - Making Changes in Flood Hazard Maps.

Where building sites are flood prone, basements are permitted only in the following three situations:

1. If floodplain mapping is not available, a community official may use his/her discretion to approve appropriate construction materials and practices to minimize flood damage. Basement construction can be permitted, but floodproofing considerations are recommended. However, the local official has a legal obligation to obtain and utilize flood elevation data from federal, state, or other sources. Such flood elevation data are provided in conjunction with a MDEQ Part 31 floodplain permit or in response to a floodplain service elevation request, or are known locally from historic flooding. Specifically, the 2009 Michigan Residential Code addresses the topic of identifying floodprone lands as follows:

   "R301.2.4 Floodplain construction. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1) shall be designed and constructed in accordance with Section R322.

   Exception: All buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24."

   "R322.1.3 Flood-resistant construction. All buildings and structures erected in areas prone to flooding shall be constructed by methods and practices that minimize flood damage."

   "R322.1.4 Establishing the design flood elevation. The design flood elevation shall be used to define areas prone to flooding. At a minimum, the base flood elevation is the higher of:

   1. The base flood elevation at the depth of peak elevation of flooding (including wave height) which has a 1 percent (100-year flood) or greater chance of being equaled or exceeded in any given year, or

   2. The elevation of the design flood associated with the area designated on a flood hazard map adopted by the community, or otherwise legally designated.

The 2009 Michigan Building Code addresses identifying floodprone lands as follows:

"1612.3 Establishment of flood hazard areas. To establish flood hazard areas, the governing body shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled "The Flood Insurance Study for [INSERT NAME OF JURISDICTION]," dated [INSERT DATE OF ISSUANCE], as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section."

Both Codes place the responsibility of identifying floodprone lands upon the local jurisdiction by using the language in R301.2.4 "Floodplain construction". Additional criteria shall be established by the local jurisdiction and set forth in Table R301.2(1) "Climatic and Geographic Design Criteria" of the 2009 Michigan Residential Code or 1612.3 "Establishment of flood hazard areas" of the 2009 Michigan Building Code.

2. Variances of community regulations may be given to allow individual basement construction in cases of exceptional hardship. Caution should be exercised in issuing variances, as actuarial insurance rates apply and issuing variances inconsistent with NFIP objectives may jeopardize community participation in the program. The issuance of variances should be

guided by conditions in community regulatory variance procedures and the State Construction Code requirements; Section 60.6 Variances and exceptions (a) of the NFIP Regulations; and a December 20, 1978 Federal Insurance Administration (now the Flood Insurance and Mitigation Administrations) policy letter on floodproofing residential basements. Summarizing NFIP criteria, a community should only issue variances for basement construction when community regulatory variance criteria are followed, when written notice is provided to the applicant that a variance will result in increased threat to life and much higher flood insurance rates, and when unfinished dry floodproofed residential basements are proposed. See Chapter VII for a full discussion of variances.

Caution: While the building official is authorized to grant modifications in R104.10 **"**Modifications", that authorization is modified for areas prone to flooding as follows:

"R104.10.1 Areas Prone to Flooding. The building official **shall not grant** modifications to any provision related to areas prone to flooding as established by Table R301.2(1) without the granting of a variance to such provisions by the board of appeals. "

3. The FEMA can grant a community exception for basement construction. However, less than 20 communities in the nation have been granted this exception, and none of these are in Michigan. Approximately 18 months are required for the FEMA to process a community application, and extensive scientific evidence is required to support the request.

Residential Basements – Flood Insurance Ramifications

Flood insurance rates support floodplain management standards. If mortgage monies are Federal Housing Administration (FHA), Veterans Administration (VA), Farm Home Administration (FMHA), etc., or federally supervised or regulated (almost all lenders) and the structure securing the loan is in an identified special flood hazard area (shown on a FEMA floodplain map), flood insurance purchase is a condition of receiving the loan. Insurance rates for new construction in an area where the FEMA has provided flood elevations are based on the relationship of lowest floor elevation to base flood elevation. Therefore, communities with a FIRM (most urban areas) should exercise extreme caution in allowing construction below base flood levels. See Appendix C for sample rates.

ACCESSORY STRUCTURES

An accessory structure is one that is on the same lot and is incidental to the principal structure. For example, a detached garage or storage shed is an accessory structure to a home. Due to the cost of elevating or floodproofing these structures FEMA has waived the elevation requirement. However, the following conditions must be met:

1. The building must be equipped with permanent openings to automatically allow the entry and exit of floodwaters in order to equalize hydrostatic pressure.

2. The building must not be intended for human habitation.

3. The building must be designed to have a low flood damage potential.

4. The structure must offer minimum resistance to the flow of floodwater by location and design.

5. The structure must be anchored.

6. Any electrical or mechanical services must be elevated above the base flood elevation or be floodproofed.

7. The building should represent a minimal investment. No dollar value has been identified by the FEMA because of the differences in building costs around the nation. Generally, in Michigan, the value should be less than $5,000.

If your community has a flood damage prevention ordinance or zoning ordinance governing floodplain construction it applies to all buildings. The ordinance may need to be amended to allow non-elevated accessory structures. The amendatory language should include the conditions noted.

The 2009 Michigan Residential Code specifically states that accessory structures under 200 square feet do not need a building permit. However, the structure must conform to the appropriate Code provisions.

> "R105.2 Work exempt from permit. Exemption from the permit requirements of the code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of the code or any other laws or ordinances of this jurisdiction…"

The 2009 Michigan Building Code also has such a provision in 105.2:

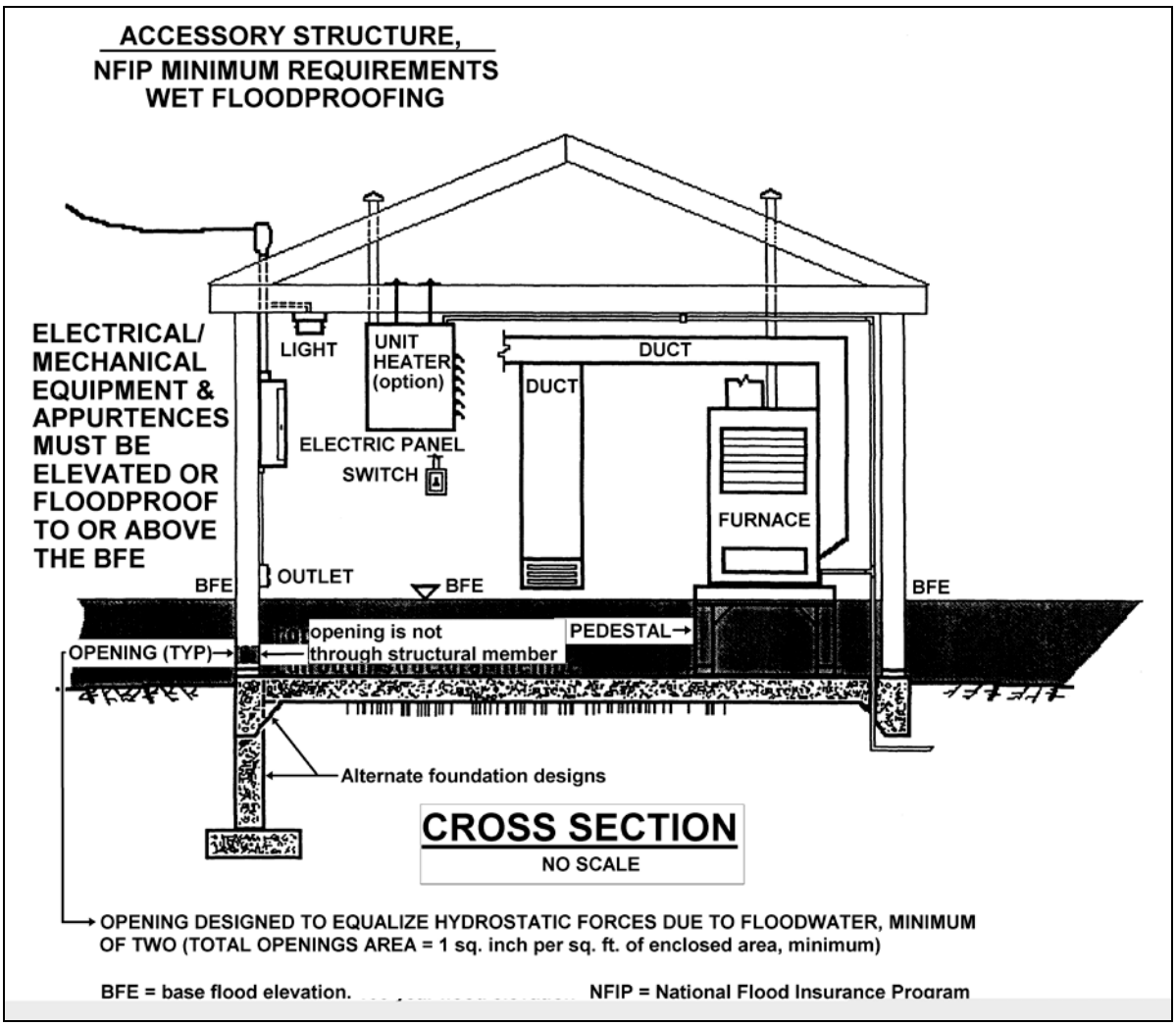
> "105.2 Work exempt from permit. Exemptions from permit requirements of the code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of the code or any other laws or ordinances of this jurisdiction…"

While the FEMA allows an alternative to elevation for accessory structures, your building codes do not. Review and approval by the Construction Code Board of Appeals may be necessary.

In addition, while the Codes waive the requirement for a building permit in these instances, they still require a MDEQ Part 31floodplain permit.

Accessory Structures – Insurance Ramifications

Communities should be aware of the flood insurance ramifications of exempting accessory structures from the elevation or floodproofing requirements. Ten percent of a residential flood insurance policy can be applied to an accessory structure regardless of the flood protection level of the accessory structure. However, if more than 10 percent of the principal policy coverage is desired, or if the principal structure is nonresidential, a separate policy must be written. In this instance, flood insurance rates would be potentially prohibitive if the accessory structure is neither elevated nor dry floodproofed.



- Wet Floodproofing is for accessory structure with the floor below BFE.
- Construction materials shall be flood resistant.
- Utilities entering or running below the BFE shall be floodproofed to prevent entry of floodwater.
- This drawing illustrates NFIP minimum requirements only and is not intended for structural, mechanical, or electrical purposes, nor does it reflect any code requirements except the basic floodprone construction guidelines.

SUBSTANTIAL IMPROVEMENTS

Communities participating in the NFIP must regulate all new development and substantial improvements located in flood hazard areas. Section 59.1 Definitions of the NFIP Regulations state:

"Substantial improvement means any repair, reconstruction, rehabilitation, addition, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. The term includes structures which have incurred “substantial damage”, regardless of the actual repair work performed. The term does not however include either: (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are

the minimum necessary to assure safe living conditions or (2) Any alteration of a “historic structure, provided that the alteration will not preclude the structure’s continued designation as a “historic structure”.”

Local administrators often have questions on how to interpret and how to implement this part of the NFIP Regulations. This section addresses some of these questions and recommends a way to administer the substantial improvement requirements of your floodplain regulations.

The 2009 Michigan Residential Code also requires floodproofing of substantially improved structures.

> "R105.3.1.1 Determination of substantially improved or substantially damaged existing buildings in flood hazard areas. For applications for reconstruction, rehabilitation, addition, or other improvement of existing buildings or structures located in an area prone to flooding as established by Table R301.2(1), the building official shall examine or cause to be examined the construction documents and shall prepare a finding with regard to the value of the proposed work. For buildings that have sustained damage of any origin, the value of the proposed work shall include the cost to repair the building or structure to its pre-damage condition. If the building official finds that the value of proposed work equals or exceeds 50 percent of the market value of the building or structure before the damage has occurred or the improvement is started, the finding shall be provided to the board of appeals for a determination of substantial improvement or substantial damage. Applications determined by the board of appeals to constitute substantial improvement or substantial damage shall require all existing portions of the entire building or structure to meet the requirements of Section R322.”

Section 1612 FLOOD LOADS of the 2009 Michigan Building Code provides the following definitions:

> "SUBSTANTIAL DAMAGE. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
>
> SUBSTANTIAL IMPROVEMENT. Any repair reconstruction, rehabilitation, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either:
>
> 1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions.
>
> 2. Any alteration of a historic structure provided that the alteration will not preclude the structure’s continued designation as a historic structure."

Substantial Improvements - Administration

In administering the substantial improvement NFIP Regulations and the State Construction Code, the local official has several items to consider: (1) non-conforming use; (2) market value; (3) additions versus renovations; and (4) exceptions.

1. **Nonconforming Use:** As with all provisions of the NFIP, the local administrator should consider whether other provisions of local regulations are more stringent than the NFIP. Non conforming use provisions of local regulations should be considered in light of floodplain management regulations. If an existing building does not conform to standards for new construction, nonconforming use provisions of local regulations may stipulate standards for permitable improvements and methods for making associated administrative decisions. If so, these standards and methods must be followed for administrative consistency if they are more stringent than the floodplain management requirements or the State Construction Code. With nonconforming use questions evaluated, other issues dealing with improvements may be addressed.

2. **Market Value:** The NFIP substantial damage and substantial improvement definitions are straight forward - it is any improvement which equals or exceeds 50 percent of the market value of a structure. This means if a home can sell for $100,000 and the land value is estimated at $30,000 the resulting structure value would be $70,000 and a $35,000 or greater improvement is proposed, the "substantial improvement" definition is met and floodplain regulations apply. An easy and consistent method to determine market value is to work closely with the community's tax assessor. Property taxes for residential and commercial structures are assessed on a percentage of their market value. A community's tax assessor can provide the building inspector with this information. The standard referenced in the State Construction Code is also market value of the structure, excluding the land value.

3. **Exceptions:** Two types of improvements are excluded from the substantial improvement requirement. The first is improvements required to bring a structure into compliance with health or safety codes. This exception is intended to prevent the type of blight that results from unchecked deterioration. The second type is improvements to historical structures which are excluded so that their historical significance will not be diminished. Such structures must be listed on the National or State Inventory of Historic Places. To determine whether or not a structure is listed, a local administrator can contact the:

   State History Preservation Office
   Michigan State Housing Development Authority (MSHDA)
   Central Office: 735 E. Michigan Ave., PO Box 30044, Lansing, Michigan 48909
   Phone: 517-373-8370; Fax: 517-335-4797

MOBILE HOMES

The NFIP Regulations impose special restrictions on mobile homes because of their buoyancy. In addition to elevation requirements for residential structures, mobile homes are prohibited from floodway portions of floodplains and must be anchored. Floodway and elevation requirements are carried out through provisions of The Mobile Home Commission Act, Act 96 of 1987, for newly established mobile home subdivisions. However, the building inspector must insure that mobile homes are properly anchored in or out of a mobile home subdivision and mandate elevation, tie down and floodway requirements for mobile homes placed on individual parcels. Recall that the state Floodplain Regulatory Authority found in Part 31 and the Mobile Homes Administrative Rules **prohibit human habitation of a floodway.**

Mobile-Home Requirements

For mobile homes designed and constructed in compliance with the Housing and Urban Development (HUD) "Mobile Home Construction and Safety Standards," proper anchoring can be achieved by affixing the integral mobile home anchoring system to ground anchors. For those homes not constructed in compliance with HUD standards, over-the-top and frame ties to ground anchors are required. Specific requirements are:

1. Over-the-top ties be provided at each of the four corners of the mobile home, with two additional ties per side at intermediate locations, except that on mobile homes less than 50 feet in length one tie per side is required.
2. Frame ties be provided at each corner of the home with five additional ties per side at intermediate points, except that on mobile homes less than 50 feet in length four ties per side are required.
3. All components of the anchoring system be capable of carrying a force of 4,800 pounds.
4. All additions to a mobile home be similarly anchored.

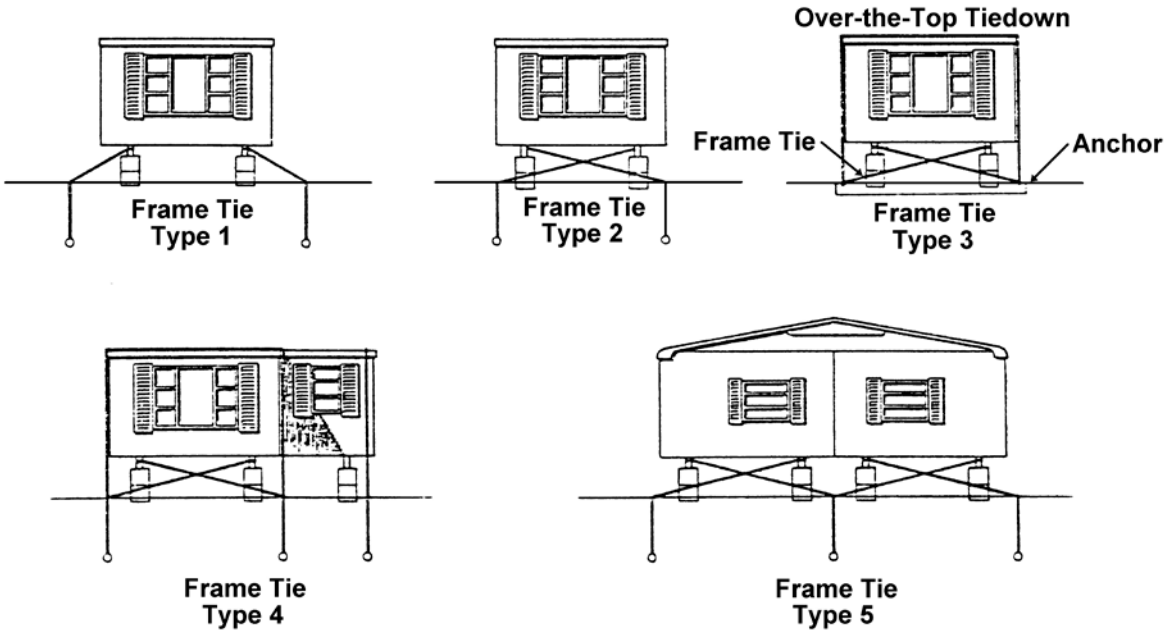
Mobile-Home Flood-Insurance Ramifications

To be insurable under the NFIP, a mobile home:

1. Must be on a permanent foundation, and
2. Must be anchored if located in an identified floodprone area.

Mobile-Home Anchoring Systems

These sketches illustrate various methods of connecting frame ties to the mobile home frame. A Type 2 system can resist greater horizontal forces than a Type 1. A Type 3 system involves placement of the mobile home on a concrete slab. Anchors embedded in the concrete slab are connected to ties.



Additions or canopies also need to be secured with over-the-top tiedowns.

Doublewides do not require over-the-top tiedowns, but are subject to the same frame tie requirements

VII. NFIP VARIANCE CRITERIA

The provision of a variance procedure or construction board of appeals is mandated constitutionally in order to provide due process. However, in many communities the variance procedure is utilized to such a degree that it merely becomes a way to get around a regulation or ordinance. The following discussion sheds light on the proper granting of a variance.

GENERAL STANDARDS

Community participation in the NFIP is based upon a mutual agreement between the federal government (FEMA) and the identified floodprone communities. In return for the local adoption and enforcement of floodplain management regulations that meet the minimum criteria of the NFIP, the FEMA provides the availability of flood insurance coverage within that community. Participating communities in which the local floodplain management regulations meet the minimum criteria of the NFIP are responsible for administering and enforcing their local floodplain management requirements pursuant to their own authority and through their own procedures. However, the FEMA periodically evaluates the administration and enforcement of local floodplain management programs in relation to the NFIP Regulations and has the authority to impose sanctions against those communities whose overall floodplain management programs are found to be inadequately administered or enforced.

DESCRIPTION AND INTENT OF VARIANCE REGULATIONS

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

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

Once the character of the owner changes (i.e., the property is sold, leased, etc.) the justification for a variance based on personal considerations no longer exists. Because the structure remains, future owner/occupants are exposed to the nonconforming nature of the property and whatever hazards and public safety problems are associated with it. This exposure to flood risk is unnecessary because the sole reason for granting the variance was the personal condition of the previous owner.

The variance criteria in Section 60.6(a) of the NFIP Regulations must be read as a whole and not piecemeal. Variances can be granted for new construction and substantial improvements only if all criteria in Section 60.6(a) and the local ordinance are met. If any one of the criteria is not met, the variance should not be granted.

Floodways

Section 59.1 Definitions of the NFIP Regulations state:

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

It is important to reserve the floodway as a water conveyance area because any encroachments or obstructions placed in the floodway will increase flood heights and consequently flood damages. **Thus, Section 60.6(a)(1) of the NFIP Regulations must be followed:**

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

The intent of this variance criterion is to prohibit non-conforming development that may increase flood levels which in turn would increase potential flood damages to other property owners. In most cases, there will be alternative locations for the proposed development outside the floodway, or other actions can be taken to compensate for increased flood stages or the floodway can be modified through flood control measures. If there is no feasible or practical alternative site to locate the development and it must meet all criteria under Section 60.6(a) and, in accord with Section 60.3(d)(3), demonstrate that no increase in flood stages will result. Section 60.3(d)(3) requires the community to:

“Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge."

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

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

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

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

endanger other citizens. Also, local emergency service personnel may be endangered attempting to rescue the occupants before the manufactured home is carried downstream.

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

Lots of One-Half Acre or Less

Section 60.6(a) Variances and Exceptions states:

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

Subsection 60.6(a)(2) states:

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

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

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

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

Many design and construction alternatives exist that will ease a hardship caused by potential drainage problems, while still allowing a structure in this situation to be built in full compliance with NFIP Regulations. There are several acceptable elevation techniques that cause no more, and usually less, disruption of drainage patterns than building a structure at ground level through a variance. Examples include: 1) elevation of the structure on pilings, columns, or extended foundation walls; 2) grading or landscaping the elevated fill pad to drain away from the adjoining properties; and 3) creation of natural or artificial infiltration fields or systems located at the intersection of the fill slope and the natural ground. Many of these types of alternatives can be cost-effective, as well as visually appealing in the community, while still not creating drainage problems for adjacent structures.

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

Good and Sufficient Cause

Subsection 60.6(a)(3)(i) states:

"Variances shall only be issued by a community upon a showing of good and sufficient cause,"

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

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

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

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

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

Exceptional Hardship

Subsection 60.6(a)(3)(ii) states:

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

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

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

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

For example, a situation in which it would cost a property owner several thousand dollars more to elevate a house to comply with the ordinance and an additional several thousand to build a wheelchair ramp or an elevator to provide access to that house for a handicapped member of the family might at first glance seem like the sort of problem that could be relieved by a

variance. However, while financial considerations are always important to property owners and the needs of the handicapped person certainly must be accommodated, these difficulties do not put this situation in the category of "exceptional hardships", as they relate to variances. This is because the characteristics that result in the hardship are personal (the physical condition and financial situation of the people who propose to live on the property) rather than pertaining to the property itself. Also, the problem of the day-to-day access to the building can be alleviated in any one of a number of ways (going to the additional expenses of building a ramp or elevator) without granting a variance. In fact, one method which facilitates the use of a structure for handicapped persons (especially those in wheelchairs) is to elevate the structure by means of earthen fill.

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

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

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

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

1. The hardship would be based on personal preference, not the property per se;
2. Most structures can be elevated such that they are aesthetically pleasing and architecturally consistent, despite the height difference;
3. Elevated structures are much less prone to flood damage and, therefore, actually increase in value relative to adjacent unprotected structures, especially after they are damaged in a flood;
4. The health and safety risks placed on occupants of the unprotected structure are unnecessary and unavoidable.

Increased Flood Heights

Subsection 60.6(a)(3)(iii) states:

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

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

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

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

Public Safety and Nuisances

Subsection 60.6(a)(3)(iii) also states:

A variance will not cause **". . . additional threats to public safety, . . . create nuisances"**

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

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

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

rise. Therefore, it is difficult to imagine a case where a variance would be appropriate for structures when there is to be handicapped and/or elderly occupancy.

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

Public Expense

Subsection 60.6(a)(3)(iii) also states:

Variances shall only be issued by a community upon a determination that the granting of a variance will not result in **"extraordinary public expense."** The public expense is usually monetary (government funds), but can also be non-monetary. An example of extraordinary public expense is the repair or replacement of public facilities and infrastructure damaged by a flood because of a variance issuance. Another example is the construction of flood control projects or other public works to protect structures prone to flooding because of the issuance of variances. There are also public costs associated with emergency floodproofing measures such as sandbags and temporary floodwalls built (with public funds) to protect structures flooded because they were issued a variance from elevation requirement.

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

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

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

Fraud and Victimization

Subsection 60.6(a)(3)(iii) also states:

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

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

One of the biggest potential problems involving variances is the change of ownership of a structure for which a variance has been granted. Future owners that purchase the property may be unaware that it is subject to potential flood damages and can be insured only at very high flood insurance rates. Frequently, resale happens after the structure has been flooded. The original owner repairs the structure and removes all evidence of previous flooding. The structure is then put up for sale in an attempt to "unload" it on prospective buyers that are new to the area or who are otherwise unfamiliar with extent and nature of the local flood hazard.

An example of public victimization is the case of a variance request to waive elevation requirements for a mini-warehouse. The units or "bays" of the warehouse are rented to the public for various personal uses such as the storage of excess furniture. Granting a variance in this case would create the potential for victimization of citizens who, unknowing of the flood hazard and the risk to their property, rent units to store their possessions.

When the warehouse is flooded and its contents (which are not covered for flood damage by a homeowner's policy) are damaged, the owners may have no recourse for financial compensation. In addition, many stored possessions that are damaged may be family heirlooms, have sentimental or historic value, or otherwise be irreplaceable. Variances that have the potential to cause this type of victimization or fraud on the public should never be granted.

Existing Local Laws or Ordinances

Subsection 60.6(a)(3)(iii) also states:

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

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

Minimum Necessary to Afford Relief

Subsection 60.6(a)(4) states:

"Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief."

The variance that is granted should be for the minimum deviation from the local requirements that will still alleviate the hardship. In the case of variances to an elevation requirement, this means the community need not grant permission for the applicant to build at grade or even to

whatever elevation the applicant proposes, but only to that level that will both provide relief and preserve the integrity of the local ordinance.

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

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

"(i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy,

(ii) be constructed with material resistant to flood damage,

(iii) be constructed by methods and practices that minimize flood damages, and

(iv) be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding."

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

Disclosure

Community officials must notify the applicant that the issuance of a variance to construct a structure below BFE will result in increased premium rates for flood insurance and that such construction below BFE increased risks to life and property. Specifically, it is stated in Section 60.6(a)(5) that:

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

In addition, under Section 60.22 Planning considerations for flood-prone areas, in Subsection (c)(3)(ii), it is recommended that a community consider implementing:

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

Such a disclosure is important and necessary to inform subsequent buyers of structures for which a variance was granted to build below BFE. From a public safety standpoint, the prospective buyer has a right to know that the structure will be susceptible to flooding and its occupants subject to risk. From a financial standpoint, the prospective buyer has the right to know that the structure and its contents will be susceptible to damage. All prospective owners of these structures who desire flood insurance should be made aware, before closing, that the premium rates applied to these structures can be extreme, and possibly prohibitively high.

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

Functionally Dependent Uses

Subsection 60.6(a)(7) states:

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

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

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

In accordance with Section 60.6(a)(7), " Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of functionally dependent use provided that (i) the criteria of (a)(1) through (a)(4) of this section are met, and (ii) the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety."

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

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

Therefore, to address the unique problems of functionally dependent uses and in accordance with Subsection 60.6(a)(4), “Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.”

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

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

Historic Structures

Section 60.6(a) provides for issuance of variances for historic structures: "Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure."

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

The granting of a variance should be based on a structure-by-structure review to determine whether elevation (or floodproofing if a non-residential structure is involved) to or above the

BFE would destroy the historic character or design of the structure. If so, a variance for that structure may be granted. Variances should never be granted for portions of, or entire historic districts, but only for individual historic structures.

For example, if elevation of a historic structure would destroy its character and cause a loss of its Department of Interior (DOI) designation, a variance for the elevation requirement may be considered. However, the owner of the structure should still be required, in accordance with Subsection 60.6(a)(4), to do the following where feasible: 1) elevate all utilities and finished interior and exterior improvements wherever possible; and/or 2) raise the interior floors to or above the BFE or to the maximum extent possible (this is often technically feasible in older structures with high ceilings).

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

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

VIII. COMMUNITY RATING SYSTEM

The NFIP has provided federally backed flood insurance which encourages communities to enact and enforce floodplain regulations. Nationwide, there are over 5.6 million policies in force and over $48.6 billion has been paid out for flood losses. As of April 2013 Michigan has had more than 9,900 claims which have resulted in damage payments of over $48.4 million in damages.

To be covered by a flood insurance policy, a property must be in a community that participates in the NFIP. To quality for the program, a community adopts and enforces a floodplain management ordinance to regulate development in flood hazard areas. The basic objective of the ordinance is to ensure that such development will not aggravate existing flooding conditions and new buildings will be protected from flood damage.

The NFIP has been successful in requiring new buildings to be protected from damages from 1% annual chance (100-year) flood events. Under the Community Rating System (CRS), there is an incentive for communities to do more than just regulate construction of new buildings to comply with minimum national standards. Under the CRS, flood insurance premiums are lowered to reflect community activities that reduce flood damage to existing buildings, manage development in areas not mapped by the NFIP, and protect new buildings beyond the minimum NFIP protection level.

OBJECTIVE

The objective of the CRS is to reward those communities which are doing more than the minimum NFIP requirements to help their residents prevent or reduce flood losses. The CRS also provides an incentive for communities to initiate new flood protection activities.

The goals of the CRS are threefold:

"[To] encourage, by the use of flood insurance premium adjustments, community and state activities beyond those required by the NFIP to:

1. Reduce flood losses,
2. Facilitate accurate insurance rating, and
3. Promote the awareness of flood insurance."

OPERATION

To recognize community floodplain management activities in the insurance rating system, they must be described, measured, and evaluated. The basic tool for this is the CRS Schedule, which lays out the application procedures, creditable activities, and the credit points these activities are worth. A community receives a CRS classification based upon the total score for its activities. The Commentary explains the Schedule and gives examples. The Schedule and Commentary are included within the CRS Coordinator's Manual, the primary document which details the program.

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

Community participation in the CRS is voluntary. Any community which is in full compliance with the rules and regulations of the NFIP may apply for a CRS classification better than Class 10.

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

A community applies for a CRS classification by completing Application Worksheets with appropriate documentation. Applications are due by December 15 of each year. The FEMA and the state NFIP Coordinator, with the assistance of a representative of the Insurance Services Office (ISO) Commercial Risk Services, Inc., review and comment on the community's CRS application.

ISO is a not-for-profit corporation subscribed to by more than 1,300 insurance companies. Among their services, ISO develops and provides advisory fire insurance classifications for community fire protection programs. ISO has been asked by write-your-own insurance companies to conduct CRS application review, verification, and program improvement tasks.

The CRS Schedule identifies 18 creditable activities, organized under four categories in Sections 300 through 600: Public information, mapping and regulations, flood damage reduction, and flood preparedness. The Schedule assigns credit points based upon how well an activity affects the three goals of the CRS. Communities are invited to propose alternative approvals to these activities in their applications.

Some of these activities may be implemented by the state or a regional agency rather than at the community level. For example, some states have disclosure laws which are creditable under Activity 340 (Flood Hazard Disclosure). Any community in those states will receive those credit points if they apply for the credit and demonstrate that the law is effectively implemented within the community.

The results of the ISO review of the community's application are sent to the Federal Insurance and Mitigation Administration (FIMA). The FIMA sets the credit to be granted and notifies the community, the state, insurance companies, and other appropriate parties. The flood insurance premium rate reduction takes effect on October 1. The amount of premium credit for each class is published annually by the FIMA. Beginning October 1, 1991, property owners in Class 9 communities received a 5 percent rate reduction.

The community's activities and performance are reviewed periodically. If a community is not properly or fully implementing the credited activities, its credit points, and possibly its CRS classification, will be revised. A community may add credited activities each year in order to change its CRS classification.

Credit criteria will change over time as experience is gained in implementing, observing and measuring the activities. Also over time, entirely new concepts in floodplain management may come into common practice. Since about 1970, for example, computer modeling has enabled many communities to undertake stormwater management and flood warning programs. As such innovations arise, they will be considered for recognition by the CRS.

Because the State of Michigan’s regulations dealing with floodplains, building codes, and other laws are more restrictive than the NFIP minimum standards, they are creditable activities under the CRS. These more restrictive state standards will result in a community receiving a five percent reduction in the cost of flood insurance for its citizens. However, the community must apply for CRS participation and must be found to be compliant with the NFIP regulations through the successful completion of a Community Assistance Visit. Any further CRS activities implemented by the community can result in further reductions in premium rates.

COSTS AND BENEFITS

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

1. Costs: No fee is charged for a community to apply for participation in the CRS. Costs to the community are:
   a. The costs of implementing creditable floodplain management activities; and
   b. The costs of staff time in preparing the CRS application.

2. Benefits: It is important to note that reduction in flood insurance rates is only one of the rewards a community receives from undertaking the floodplain management activities described here. Others include increased public safety, reduction of damages to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering, and protection of the environment.

PUBLICATIONS

The basis for CRS credit and community classification is the CRS Schedule, which is contained within the CRS Coordinator's Manual. The Commentary explains and amplifies the Schedule and provides examples. The Coordinator's Manual is the document a community needs if it wishes to apply for CRS classification.

There are a variety of additional publications available, including application worksheets, example plans and publications on credit for mapping and management of special flood related hazards. These publications are described in the CRS Coordinator's Manual. These documents were produced for the FIMA by ISO, and they are available AT NO COST from:

Flood Publications
NFIP/CRS
P.O. Box 501016
Indianapolis, IN 46250-1016
(Telephone) 317-848-2898
(FAX) 317-848-3578
nfipcrs@iso.com

COMMUNITY RATING SYSTEM ACTIVITIES

The CRS Schedule describes the 18 floodplain management activities which are credited by the CRS and includes the documentation required for obtaining credit for each activity. The credits and formulas used to calculate credit are also included. These activities are divided into four categories.

1. The 300 series activities credit public information programs which advise people about the flood hazard, flood insurance and ways to reduce flood damages. They also provide data needed by insurance agents for accurate flood insurance rating. They generally serve all members of the community and work toward all three goals of the CRS.

2. The 400 series activities credit mapping and regulatory programs which provide increased protection to new development. These activities include mapping areas not shown on the FIRM, preservation of open space, higher regulatory standards and stormwater management. This credit is increased for growing communities. These activities work toward the first and second goals of the CRS, damage reduction and accurate insurance rating.

3. The 500 series activities credit damage reduction programs where existing development is at risk. Credit is provided for addressing repetitive loss problems, acquisition and retrofitting of floodprone structures and drainage system maintenance. These activities work toward the first goal of the CRS, damage reduction.

4. The 600 series activities credit flood preparedness programs. Credit is provided for flood warning, levee safety and dam safety programs. These activities work toward the first and third goals of the CRS, damage reduction and hazard awareness.

5. The CRS Commentary discusses some methods of reaching the objectives of each activity. Applicants are encouraged to propose alternative approaches to these objectives. All activities except 510 (Repetitive Loss Projects) receive credit if they are included in a comprehensive floodplain management plan.

COMMUNITY RATING SYSTEM ELEMENTS

Within each of the 18 CRS activities, there are one or more elements of floodplain management. For example, Activity 430 (Higher Regulatory Standards) includes such elements as freeboard and preservation of floodplain storage capacity.

IX. MAKING CHANGES IN FLOOD HAZARD MAPS

A community may determine that their map does not accurately reflect the floodplain. This may be a result of a mapping error, structural flood protection measures, or the use of more detailed topography.

The following section outlines procedures for a community to follow in order to correct their flood hazard maps and describes how an individual can have the flood prone designation removed from a particular property.

METHODS OF APPEALING FLOOD HAZARD BOUNDARY MAPS OR FLOOD INSURANCE RATE MAPS

1. Formal Appeal – Community No Longer Flood Prone - Section 201(b) of the Flood Disaster Protection Act sets up a formal appeals procedure whereby a community can declare that it no longer has any flooding, based on sufficient technical data. This would apply, for example, where a new dam or levee has been constructed subsequent to issuance of the FEMA map, or where the study did not consider such a project in the initial delineation. In any case, the project would need to be of sufficient magnitude to assure that the community would no longer be flooded by the 1% annual chance (100-year) flood.

   Time: approximately four months.

   APPEAL MADE BY THE COMMUNITY.

2. Partial Appeal to Consider New Floodworks - Flood control projects will be constructed in communities from time to time. Where such projects are constructed subsequent to issuance of the flood hazard map and make a portion of the previously flooded area no longer flood prone, an appeal on the basis of the technical data can be made. If the data is accurate, FEMA will revise its map accordingly.

   Time: approximately four months.

   APPEAL MADE BY THE COMMUNITY.

3. Partial Appeal to More Accurately Reflect Boundaries - FEMA seeks to provide the best information available in preparing its maps. When better technical data is available (such as more detailed mapping based on 2 foot elevation contours), it can be submitted, and if valid, the boundaries will be altered to either include or exclude new areas.

   Time: approximately four months.

   APPEAL MADE BY THE COMMUNITY.

   Send Appeals to:

   Chief, Hazards Study Branch
   Federal Insurance and Mitigation Administration
   Federal Emergency Management Agency
   500 'C' Street, S.W.
   Washington, D.C. 20472

CONDITIONS AND CRITERIA FOR LETTERS OF MAP AMENDMENT (LOMA)

This explains the policy of the FEMA for determinations of whether or not a structure or proposed structure is in a SFHA shown on a FIRM. In order for the FEMA to issue a LOMA, a property owner should submit documentation as described below. Issuance of a LOMA will result in removal of the property from the SFHA, thus removing the Federal mandatory flood insurance purchase requirement. Be advised that a LENDER may still require flood insurance purchase as a condition of the loan.

1. Requirement to Submit Technical Data:

   All requests for a LOMA must be supported by technical or scientific data to demonstrate that the property is not subject to inundation by the base flood. The lowest grade adjacent to the structure must be at or above the base flood elevation. The following documentation should be submitted to aid FEMA in processing each LOMA request.

   a. A copy of the recorded deed or recorded plat, showing the legal description of the property, official record information (deed or plat book volume and page number) and the seal of the Recorder of Deeds. If the property is not recorded on a plat map, actual copies of the deed or tax map are required.

   b. A topographical map, certified by a licensed professional engineer or land surveyor, indicating structure locations, ground elevations, and the elevation of the lowest finished grade adjacent to the structure.

      For new construction, a clear distinction must be made between existing and proposed elevations, and after completion all finished grades and elevations must be certified as-built.

      Data to substantiate the base flood elevation (BFE) [1% annual chance (100-year) flood elevation] should be provided from a FEMA FIS, the U.S. Army Corps of Engineers, U.S. Geological Survey, Soil Conservation Service, or other federal agency, state or local agencies, or from technical data prepared by a licensed engineer.

      A signed copy of the statement asserting the accuracy of the information submitted (form entitled Request for LOMA).

   c. Additional data may be required for FEMA to make a determination. This may consist of certifications by licensed engineers or land surveyors as to the type of structure, how it is elevated, hydraulic calculations on the flooding conditions, and development plans indicating the dates and extent of fill placement.

2. Criteria for Removing Floodplain Designation and Waiving Flood Insurance Purchase Requirement:

   Structures located on natural (non-fill) high ground can be removed from the SFHA if the lowest adjacent grade elevation is above the BFE and, therefore, should not have been included in the SFHA. Structures that have been elevated out of the floodplain by the placement of fill, after the first map was issued, however, must have both lowest floor (including basement) and lowest adjacent grade elevations at or above the BFE to be removed.

a. Floodways

A LOMA will not be issued if a structure is located within an officially designated or anticipated regulatory floodway.

b. Elevated Structures

Buildings which have the lowest floor elevated on posts, piers or pilings above the BFE in the SFHA will not be removed from the SFHA if any portion of the structure (i.e., posts or piers) is still in the SFHA.

c. Sheet Flow Areas

In areas of sheet flow flooding where the water depth ranges from 1 foot to 3 feet, LOMAs can be issued only if it can be shown that the structure has been elevated with the lowest adjacent grade and lowest floor (including basement) above the sheet flow level.

d. Levees

LOMAs will only be issued for structures protected by levees if the levee meets FEMA criteria for providing adequate protection against a 1% annual chance (100-year) flood. FEMA follows the guidelines established by the U.S. Army Corps of Engineers in their manual entitled "Design and Construction of Levees" dated March 31, 1978 (EM 1110-2-1913).

3. FEMA Evaluation and Response:

Upon receipt and evaluation of the required data by FEMA, the applicant will be notified of their findings. If the evidence indicates a change in FEMA maps is needed, a LOMA will be issued. The time required for FEMA to review requests for a LOMA depends upon the quality and completeness of the data submitted. Requests are usually evaluated within four to eight weeks of the receipt of the required data.

4. Refund of Insurance Premium After Issuance of LOMA:

Property owners are required to purchase flood insurance if they seek federal or federally-related financial assistance on a structure located in a designated SFHA. Persons seeking a LOMA should check with the lending institution which imposed the flood insurance requirement to assure that they will honor a LOMA. Even though FEMA may issue a LOMA removing a property from the SFHA, it is the lending institution's prerogative to still require flood insurance if they deem such action appropriate. If, however, the lending institution accepts the LOMA and agrees to waive the flood insurance purchase requirement, the property owner is eligible for a full refund of the premium paid for the current policy year provided that no claim is pending or has been paid on the policy in question during the same policy year. For processing of the refund, the property owner need only provide the LOMA and evidence of the waiver of the flood insurance requirement from the lending institution to the agent or broker who sold the policy. The property owner may also wish to have the LOMA recorded with the deed.

REQUEST FOR LETTER OF MAP AMENDMENT/REVISION

The following FEMA forms are used for the specific map amendment/revision situations as described:

"**MT-EZ Form**" is used when seeking a LOMA for a single lot or structure. (See Appendix H.)

"**MT-1 Form**" is used for amendments and revisions to NFIP maps for multiple lots or structures and proposed projects on large acreage parcels.

"**MT-2 Form**" is used when seeking Conditional Letters of Map Revisions, Letters of Map Revision, and Physical Map Revisions.

All of these forms are available from the MDEQ District Floodplain Engineers, The MDEQ NFIP Coordinator, and the FEMA Regional Office in Chicago, as well as the FEMA homepage at https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms#mt-1.

APPENDIX A

For Assistance

Points of contact, addresses, and phone #s of those who can provide assistance with NFIP issues, floodplain management, floodplain management grant programs, and permitting questions:

For local floodplain management and state permit related assistance:

- Michigan Department of Environmental Quality
  District Floodplain Engineers (see page III-14),

For NFIP related assistance (primary initial contact):

- Michigan Department of Environmental Quality
  Water Resources Division
  National Flood Insurance Program (NFIP) Coordinator
  Les Thomas
  Lansing, MI
  517-335-3448 or 517-373-1170; fax: 517-241-9003

For Federal flood mitigation grant assistance:

- Michigan State Police (primary initial contact)
  Emergency Management and Homeland Security Division
  Mitigation Grants Program
  Matt Schnepp
  Lansing, MI
  517-336-2040
  (The link provided was broken and has been removed)

- Federal Emergency Management Agency - Region V (secondary contact):
  National Flood Insurance Program and Flood Mitigation Assistance
  536 South Clark Street, 6th Floor
  Chicago, IL 60605
  312-408-5500
  NFIP: https://www.fema.gov/flood-insurance
  Mitigation: *(The link provided was broken and has been removed)*

For NFIP publications and general information:
1-800-638-6620 or https://www.fema.gov/flood-insurance

For copies of Flood Insurance Rate Maps: 1-800-358-9616

APPENDIX B

MDEQ / US ARMY CORPS OF ENGINEERS (USACE)
JOINT PERMIT APPLICATION

The Joint Permit Application form is not being provided here due to its extensive content and potential for future updating and revision. A complete and current hard copy can be acquired from any of the MDEQ district offices. **You may also access a current electronic downloadable copy by going to the MDEQ web site of** www.Michigan.gov/JointPermit

APPENDIX C

NATIONAL FLOOD INSURANCE PROGRAM
GENERAL INFORMATION

Although flood insurance is sold by insurance agents directly to homeowners, community officials often receive inquiries regarding flood insurance.

The following information on flood insurance purchase requirements and insurance rates will provide answers to frequently asked questions.

In addition, a sample press release informing citizens of the availability of flood insurance is included here. It is helpful to occasionally remind citizens that flood insurance can be purchased so they can be protected before a flood occurs.

FLOOD INSURANCE COVERAGE

A flood insurance policy covers all direct losses by a flood. As used in flood insurance policies a flood is defined as:

1. A "general and temporary condition of partial or complete inundation of normally dry land area or of two or more properties (one of which is yours) from:

    a. overflow of a lake, river, stream, ditch, etc.

    b. unusual or rapid accumulation of surface water runoff from any source.

    c. mudflow

2. Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

NFIP policies will normally not cover damages caused by sewer backups unless the cause for the backup is a direct result of flooding

Structural and contents insurance coverage can be purchased for any walled and roofed building, including a mobile home on a permanent site. **Any building and its contents can be insured whether or not it is in a floodplain.** Flood insurance does not cover: personal injury or loss of life, cars, boats, animals, crops in the field, outdoor swimming pools, driveways, or personal contents in basements except washers, dryers, freezers and the food in the freezers which are covered as contents when located in a basement. Furnaces, water heaters, pumps, etc. are covered as structural items regardless of location.

3. Insurance purchase is required for all construction, improvement or purchase of structures in A zones (special flood hazard areas) which use federal assistance or commercial loans insured by the federal government.

4. Full replacement cost coverage is only available for a primary residence single-family home which is insured for 80 percent of the building's replacement cost at the time of loss, or the maximum amount of coverage available, whichever is less.

5. Insurance policies are sold through any agent who deals in property insurance. The "expense constant", which is the cost of processing and issuing policies, is $50. In addition, there is a $30 federal policy fee mandated by Congress to cover administrative expenses such as flood studies and federal floodplain management expenses.

6. The standard deductible for damages to a structure or contents is $500 for post-FIRM building and $1,000 for pre-FIRM buildings and emergency phase policies. Structures subject to subsidized rates have a $750 deductible.

7. For additional information on flood insurance and rates, see your local insurance agent, or call toll free: 1-800-638-6620.

NOTES ON INSURANCE RATES FOR NEW CONSTRUCTION IN REGULAR PHASE COMMUNITIES

When a regular phase community permits a structure to be built below the 1% annual chance (100-year) flood elevation (either through a variance or negligence), the insurance rates for that structure will be significantly higher. In addition, those rates will apply to all future purchasers of that building if they are borrowing from a federally regulated supervised or insured lender.

The following chart prepared from the FEMA October 1, 2012 Rate 4 Table 3B (Flood Insurance Manual) on the following page demonstrates the building insurance rate increase as the elevation of the lowest floor (including basement) decreases from one foot above the BFE to one foot below the BFE.

Structural Insurance for a post-firm residence on a crawl space in an AE zone.

(rates per $100 of coverage)

		State Building Code
One-Foot Above 1% annual chance flood elevation		
First $50,000	$.71 x 500 =	$355.00
Second $20,000	$.10 x 200 =	20.00
Expense Constant		50.00
Federal Policy Fee		30.00
		$455.00
Zero-Feet Above 1% annual chance flood elevation		
First $50,000	$1.78 x 500 =	$890.00
Second $20,000	$.13 x 200 =	26.00
Expense Constant		50.00
Federal Policy Fee		30.00
		$996.00
One-Foot Below 1% annual chance flood elevation		
First $50,000	$4.40 x 500 =	$2,200.00
Second $20,000	$.97 x 200 =	194.00
Expense Constant		50.00
Federal Policy Fee		30.00
		$2,474.00

TABLE 3B. REGULAR PROGRAM – POST-FIRM CONSTRUCTION RATES

ANNUAL RATES PER $100 OF COVERAGE

(Basic/Additional)

FIRM ZONES AE, A1–A30 – BUILDING RATES

ELEVATION OF LOWEST FLOOR ABOVE OR BELOW THE BFE[1,2]	1 FLOOR No Basement/Enclosure/ Crawlspace[3,4]		MORE THAN 1 FLOOR No Basement/Enclosure/ Crawlspace[3,4]		MORE THAN 1 FLOOR With Basement/Enclosure/ Crawlspace[3,4]		MANUFACTURED (MOBILE) HOME[5]	
	1–4 Family	Other Residential & Non-Residential	1–4 Family	Other Residential & Non-Residential	1–4 Family	Other Residential & Non-Residential	Single Family	Non-Residential
+4	.24 / .08	.20 / .08	.24 / .08	.20 / .08	.24/ .08	.20 / .08	.28 / .12	.26 / .12
+3	.30 / .08	.26 / .10	.25 / .08	.22 / .08	.27 / .08	.23 / .09	.34 / .12	.30 / .12
+2	.42 / .08	.35 / .11	.32 / .08	.28 / .08	.32 / .08	.27 / .09	.50 / .12	.47 / .13
+1	.71 / .10	.61 / .15	.57 / .09	.40 / .10	.43 / .09	.33 / .11	.89 / .16	.87 / .18
0	1.78 / .13	1.60 / .25	1.34 / .12	1.09 / .17	.98 / .10	.86 / .17	2.30 / .22	2.25 / .28
-1	4.40 / .97	4.85 / 1.03	3.33 / .72	3.42 / .45	2.24 / .45	1.94 / .52	***	***
-2	***	***	***	***	***	***	***	***

FIRM ZONES AE, A1–A30 – CONTENTS RATES

ELEVATION OF LOWEST FLOOR ABOVE OR BELOW THE BFE[1,2]	LOWEST FLOOR ONLY – ABOVE GROUND LEVEL No Basement/Enclosure/ Crawlspace[3]		LOWEST FLOOR ABOVE GROUND LEVEL & HIGHER FLOORS No Basement/Enclosure/ Crawlspace[3]		MORE THAN 1 FLOOR With Basement/Enclosure/ Crawlspace[3]		MANUFACTURED (MOBILE) HOME[5]	
	Residential	Non-Residential	Residential	Non-Residential	Residential	Non-Residential	Single Family	Non-Residential
+4	.38 / .12	.22 / .12	.38 / .12	.22 / .12	.38 / .12	.22 / .12	.38 / .12	.22 / .13
+3	.38 / .12	.22 / .12	.38 / .12	.22 / .12	.38 / .12	.22 / .12	.38 / .14	.29 / .15
+2	.38 / .12	.24 / .12	.38 / .12	.22 / .12	.38 / .12	.22 / .12	.38 / .16	.34 / .19
+1	.53 / .12	.41 / .14	.38 / .12	.31 / .12	.38 / .12	.22 / .12	.58 / .23	.58 / .27
0	1.10 / .12	.83 / .24	.68 / .12	.60 / .16	.45 / .12	.35 / .13	1.20 / .30	1.12 / .41
-1	2.74 / .57	2.29 / .70	1.80 / .37	1.53 / .45	.72 / .15	1.15 / .15	***	***
-2	***	***	***	***	***	***	***	***

FIRM ZONES AE, A1–A30 – CONTENTS RATES

ELEVATION OF LOWEST FLOOR ABOVE OR BELOW THE BFE[1]	ABOVE GROUND LEVEL MORE THAN 1 FULL FLOOR			
	Single Family	2–4 Family	Other Residential	Non-Residential
+4		.35 / .12	.35 / .12	.22 / .12
+3		.35 / .12	.35 / .12	.22 / .12
+2		.35 / .12	.35 / .12	.22 / .12
+1		.35 / .12	.35 / .12	.22 / .12
0		.35 / .12	.35 / .12	.22 / .12
-1		.35 / .12	.35 / .12	.22 / .12
-2		.35 / .12	.35 / .12	.22 / .12

1 If the Lowest Floor is -1 because of an attached garage and the building is described and rated as a single-family dwelling, see the Lowest Floor Determination subsection in the Lowest Floor Guide section of this manual or contact the insurer for rating guidance; rate may be lower.

2 Use Submit-for-Rate procedures if either the enclosure below the lowest elevated floor of an elevated building or the crawlspace (under-floor space) that has its interior floor within 2 feet below grade on all sides, which is used for rating, is 1 or more feet below the BFE.

3 Includes subgrade crawlspace.

4 Use Submit-for-Rate procedures if there is an elevator below the BFE regardless of whether there is an enclosure or not.

5 The definition of Manufactured (Mobile) Home includes travel trailers; see the Definitions section of this manual.

***SUBMIT FOR RATING**

The rates do go higher as the flood risks increase. The application for insurance for any building with its lowest floor more than 1 foot below the 1% annual chance (100-year) flood elevation must be sent to the FIMA for special rating.

REMEMBER: Allowing a structure to be built in the floodplain with the lowest floor (including basement) below the 1% annual chance (100-year) flood elevation will end up costing the first and all future owners money. In addition, the community is saddled with a property whose net worth steadily decreases, adversely impacting the tax base.

The FEMA updates its Flood Insurance Manual from time to time. **For the most current version, please refer to the FEMA internet link of** https://www.fema.gov/flood-insurance/work-with-nfip/manuals.

SAMPLE NEWS RELEASE

Flood Insurance Now Available for Property in this Community

WASHINGTON -- The Mitigation Directorate announced that the community of __(community name)__, Michigan is now participating in the NFIP, making flood insurance available to its residents. The community became eligible by adopting floodplain management regulations intended to prevent future losses due to flooding.

Effective __ (date) __, the community joined the more than 21,000 communities in the United States currently participating in the program. The FIMA, a part of the FEMA, administers the NFIP, a self-supporting government program that makes previously unobtainable insurance available to property owners in flood-prone communities at a reasonable price.

Through the NFIP, residents can insure their homes, businesses and property. The insurance limit, under the regular program, is $250,000 for single-family homes and $100,000 for contents. Renters, while they do not own the properties they live in, can protect their belongings. Businesses can be covered for up to $500,000. The insurance can be bought through insurance agents either directly from the NFIP or, more commonly, through licensed private insurance companies.

Residents do not have to live within designated flood areas to purchase the insurance. However, residents within these areas are required by the Flood Disaster Protection Act of 1973 to purchase the insurance as a precondition to receiving a mortgage from any federally backed lender or loan program, such as the FHA. Lenders are required to notify prospective buyers if the property they plan to buy is located within a designated flood hazard area.

Under the strain of mounting disaster relief costs, the program was authorized by Congress in 1968 to find an alternative mechanism for responding to flooding, the most prevalent and costly natural disaster. Since implementation, the program has grown to include nearly 5.6 million policyholders and provides more than $48.6 billion worth of coverage. All losses are paid for by the program's reserve fund, not taxpayers or the treasury.

APPENDIX D

MICHIGAN NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY PARTICIPATION AND COMMUNITY STATUS BOOK

Absolutely no one in any particular community can purchase flood insurance under the National Flood Insurance Program (NFIP) unless that particular community has applied to the Federal Emergency Management Agency (FEMA) for enrollment into the program. The FEMA maintains a community participation list called the "Community Status Book" which lists all current NFIP participating communities nationwide.

Community enrollment into the NFIP originates by contacting the respective state NFIP Coordinator to obtain the proper enrollment documentation and guidance for completing the necessary documents for forwarding onto the applicable FEMA Regional office. For Michigan communities the point of contact would currently be:

Les Thomas, NFIP State Coordinator
MDEQ, Water Resources Division
PO Box 30458
Lansing, Michigan 48909
email removed, no longer valid
phone 517-335-3448 or 517-373-1170.

Community Status Book

The Community Status Book listing of participating communities is updated on a regular basis by the FEMA and is available on the internet through the FEMA website address of https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book or by conducting an internet search for "FEMA Community Status Book". If any possible errors are identified in the content of the Community Status Book please feel free to report them by contacting the FEMA Region V Chicago office at 312-408-5500.

The following is an excerpt from the FEMA Federal Insurance Administration (FIA), Washington, D.C. 20472 about the NFIP Community Status Book.

Purpose

This book provides information about:

- communities participating in the NFIP (42 U.S.C. 40014128) - Section I.
- communities which are not participating in the NFIP but have had special flood hazards identified by the Flood Insurance and Mitigation Administration (FIMA) - Section II.

Its purpose is to:

- assist lenders in determining whether or not flood insurance must be required as a condition of Federal or federally related financial assistance.
- assist property owners and insurance agents in determining whether or not flood insurance is available in a particular community, and whether a map showing flood zones is available.

- assist Federal agencies in meeting their responsibilities under Executive Order 11988, floodplain management, to evaluate whether a proposed action will occur in a flood hazard area.
- assist State and local agencies by providing information for floodplain management.
- assist any other members of the general public who may be interested in the information contained within this book.

Section I

Section I of this book lists communities PARTICIPATING in the National Flood Insurance Program. Flood insurance policies for residential and commercial properties and their contents located in the communities listed may be purchased from any insurance agent or broker licensed to sell property or casualty insurance and in good standing in all the states in which the agent is licensed. Agents may obtain information about coverage, rates, etc., by calling the National Flood Insurance Program toll free at 1-800-638-6620, by calling the Telecommunication Device for the Deaf (TDD) toll free at 1-800-447-9487, or from any private sector property insurance company participating in the Write Your Own (WYO) Program.

The following columns of information are provided for the communities listed on the Community Status Book:

Column 1 - (COMMUNITY NUMBERS). These six digit numbers are either the same number or the same first six digits of the community number (or COMMUNITY PANEL NUMBER) appearing on the FIA flood map for the community. The alphabetic suffix at the end of the number indicates whether the currently effective map is a revision of an earlier map (e.g., "A" normally indicates a first edition, "B" a first revision, etc.). This number and the suffix, if any, must be written on all flood insurance policies.

Column 2 - (COMMUNITY NAME). This indicates the name of the community, followed by the name of the county in which it is located. When the community is a county, only its unincorporated areas are referred to; incorporated areas are listed individually as township, city, village, etc.

Column 3 - This indicates TNE DATE OF THE COMMUNITY'S ENTRY INTO THE REGULAR OR EMERGENCY PROGRAM of the National Flood Insurance Program. The symbol (R) following the date indicates Regular Program; if no parenthetical symbol appears after the date, the community is participating in the Emergency Program.

Column 4 - This indicates THE EFFECTIVE DATE OF THE CURRENTLY EFFECTIVE FLOOD MAP OF THE COMMUNITY. This date also appears on the flood map of the community. If there is no date in this column, a flood map for the community has not yet been published, but the community is still participating in the National Flood Insurance Program.

NOTE: If a date appears in both columns, then the purchase of flood insurance is required as a condition of Federal or federally related financial assistance for construction or acquisition of buildings located within the special flood hazard areas as shown on the FIA flood maps. (including FHA and VA mortgage guarantees, mortgage loans [from federally regulated

lending institutions, Federal disaster assistance, etc.)

Section II

Section II of this book lists communities which are NOT PARTICIPATING in the NFIP, but which have an FIA flood map delineating the special flood hazard areas in the community.

Column 1 - same as Column 1 described above.

Column 2 - same as Column 2 described above.

Column 3 - HAZARD AREA IDENTIFIED. This is the effective date of the first FIA flood map of that community. There may be other, more recent maps for the community.

Column 4 - DATE ON WHICH SANCTIONS APPLY. Effective on this date, no direct Federal assistance (including FHA or VA mortgage guarantees) can legally be provided for the acquisition or construction of buildings in the special flood hazard areas shown on the FIA map of this community. To obtain up-to-date information on whether the sanction on Federal assistance still applies to their community, call the Federal Emergency Management Agency (202) 646-3444.

Symbols

L- The community has no special flood hazard areas and a flood map for the community has not been published. Although it may not be subject to the 1% annual chance (100-year) flood, floods of a greater magnitude could occur there. In addition, certain structures may be damaged by local drainage problems. The community is ALL ZONE C for flood insurance rating purposes.

L- Minimally Flood Prone, with Flood Hazard Boundary Map converted to Flood Insurance Rate Map by letter, no change in flooding shown on map, no elevation on map.

M - Minimally Flood Prone, no elevation on map.

R - Entry date into Regular Program.

S - Suspended from the National Flood Insurance Program.

F - Effective Map is a Flood Insurance Rate Map. Note, however, that the "Hazard Area Identified" date denotes the date of original identification of the special flood hazard area and is not necessarily the date of the most recent Flood Insurance Rate Map.

W - The community has withdrawn from the National Flood Insurance Program. No flood insurance available. Other sanctions apply. For up-to-date information after suspension date, call the above number.

* - Unincorporated areas only.

> - Date of current effective map is after the date of this report.

- This community has a map with a 10-digit ID number. Each map with such a number will be published as one or more Z-fold panels (like road maps). Each map having more than one panel also has an index showing which panels apply to the various sections of a community. Since the 10-digit system permits the revision of individual panels rather than the entire map, the index also shows the correct suffix of the most current panel for a particular location in the community.

Each time a panel is revised and published, the map index is also revised and republished with a new effective date to reflect the panel revision. For community maps with 10-digit ID numbers, the Status Book gives data relating to the index only. The index must be consulted for information on individual panels.

State-Owned Property

Flood insurance is not required for State-owned property in the following states because these states have submitted to FIA satisfactory self-insurance plans against flood loss:

Florida	Georgia	Iowa
Kentucky	Maine	New Jersey
New York	North Carolina	Oregon
Pennsylvania	South Carolina	Tennessee
Vermont		

Ordering Flood Maps

Various FEMA mapping products can be ordered from the FEMA website of: https://msc.fema.gov/portal/home or

Federal Emergency Management Agency
Map Service Center
PO Box 3617
Oakton, Virginia 22124-9617
Phone (877)-336-2627
Adobe Acrobat Reader required to view certain documents

APPENDIX E

FEMA ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the NFIP. It is to be used to provide the elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision Based on Fill (LOMR-F).

An elevation certificate must accompany a flood insurance application for structures built in your community after the effective date of your FIRM. Building inspectors can expect to be contacted by insurance agents for elevation information necessary to complete the certificate.

This should not be a problem if you are requiring the builder (owner) to supply you with the certified as-built elevation of the lowest floor (including basement). In nonresidential construction, the building may be elevated or flood-proofed.

These record-keeping requirements are included in the 2009 Michigan Residential Code and the 2009 Michigan Building Code. And, failure to keep these records could jeopardize the availability of flood insurance throughout your community.

The current version of the FEMA flood insurance elevation certificate is available at https://www.fema.gov/sites/default/files/documents/fema_form-ff-206-fy-22-152.pdf or also be ordered from the FEMA Distribution Center by calling 1-800-480-2520; select option 4 and ask for FEMA Form 81-31.

These elevation certificates are a good way to maintain the elevation record keeping requirements of the single state construction codes and the NFIP in one document. The certificates should be signed or certified by a licensed surveyor or where flood-proofing is employed by a licensed engineer or architect.

The elevation certificate is also part of the MT-EZ & MT-1 form submittal requirements for Letter of Map Change options (LOMAs, LOMR-Fs) provided by FEMA.

APPENDIX F

"**MT-EZ Form**" is a form used when seeking a specific type of Letter of Map Change (LOMC) called the Letter of Map Amendment (LOMA). Such a LOMC is for a single lot or structure and represents a large portion of the LOMCs which are processed by FEMA annually. More detailed LOMC information and access to the MT-EZ form and its instructions are readily available on the FEMA website of: *(The link provided was broken and has been removed)* and the forms link on that site.

APPENDIX G

TECHNICAL BULLETINS

These bulletins are revised and others or issued from time to time by FEMA. Please refer to the listed Internet sites for the most recent versions. These documents are stored in Adobe's Acrobat Reader™ format. Adobe's Acrobat Reader™ can be downloaded for free from:

www.adobe.com/prodindex/acrobat/readstep.html

User's Guide to Technical Bulletins
(The link provided was broken and has been removed)

1- 93 Openings in Foundation Walls
(The link provided was broken and has been removed)

2- 93 Flood Damage-Resistant Materials Requirements
(The link provided was broken and has been removed)

3- 93 Non-Residential Floodproofing - Requirements and Certification
(The link provided was broken and has been removed)

4- 93 Elevator Installation
(The link provided was broken and has been removed)

5- 93 Free-Of-Obstruction Requirements
(The link provided was broken and has been removed)

6- 93 Below-Grade Parking Requirements
(The link provided was broken and has been removed)

7- 93 Wet Floodproofing Requirements
(The link provided was broken and has been removed)

8- 96 Corrosion Protection for Metal Connectors in Coastal Areas
(The link provided was broken and has been removed)

9- 99 Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings
(The link provided was broken and has been removed)

10- 01 Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding
(The link provided was broken and has been removed)

11- 01 Crawlspace Construction for Buildings Located in Special Flood Hazard Areas
(The link provided was broken and has been removed)

APPENDIX H

FLOOD HAZARD DETERMINATIONS

Many floodplain areas of the state have not been mapped; some areas have been mapped, but, no 1% annual chance (100-year) flood elevations were provided. Through the MDEQ Floodplain Services Program, determinations of flood elevations or depths of flow, and state and local floodplain related permit requirements are provided.

Building officials and individual citizens are invited to take advantage of this free service. District Floodplain Engineers will need basic information to respond to a request, such as *requestor/property owner information, property/site/waterbody information, site location map, site plan, and existing and proposed cross-sections*. **Specific needed information and sample drawings follow**. Specific questions and the service request should be directed to the appropriate District Floodplain Engineer. See the Floodplain Engineering Staff Map on Page III-15.

Note: Due to other floodplain management work priorities and workloads that the flood hazard determination process can represent, the processing of such determination requests may take up to 150 plus days to complete.

When such a time frame does note accommodate a development's scheduling needs, then consideration may be given to hiring the services of a professional engineer or licensed surveyor to compute the needed AE Zone BFE from the effective FIRMS or compute the approximate A Zone BFE's by using the guidelines contained in the FEMA 265/July1995 publication. Such computed BFEs with background calculations must then be provided with any eventual floodplain permit application for the issuance of the Part 31 floodplain regulatory permit. The MDEQ permit application review will then consider the BFEs as submitted with the application and compare them to what the MDEQ calculated BFEs would be.

Anyone interested in using the MDEQ Flood Hazard Determination Services may use the following "MDEQ Flood Hazard Determination Request Form". Upon completing this form and including a location map, site plan, and cross sections similar to and providing the type of information shown on the following sample drawings you may mail the completed request packet to the respective district office for which the project is located. **The district addresses are available at the following website address:**

https://www.Michigan.gov/egle/contact/district-office-locations

If you wish to submit your request information electronically you may do so at the following website address:

https://mienviro.Michigan.gov/ncore/external/home

Michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/MiEnviro/floodplain-service.pdf

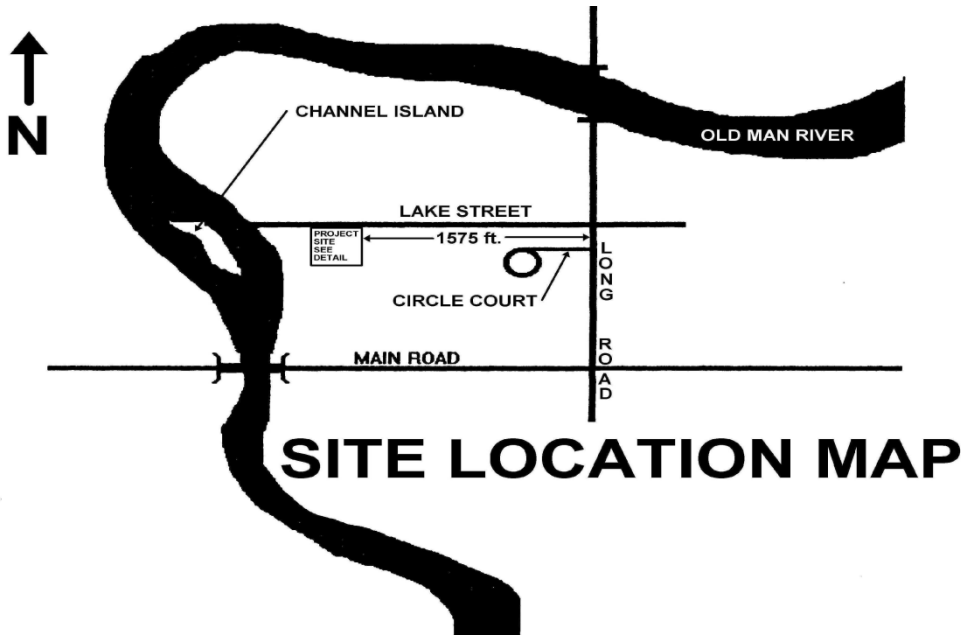


Figure 1. Sample Location Map

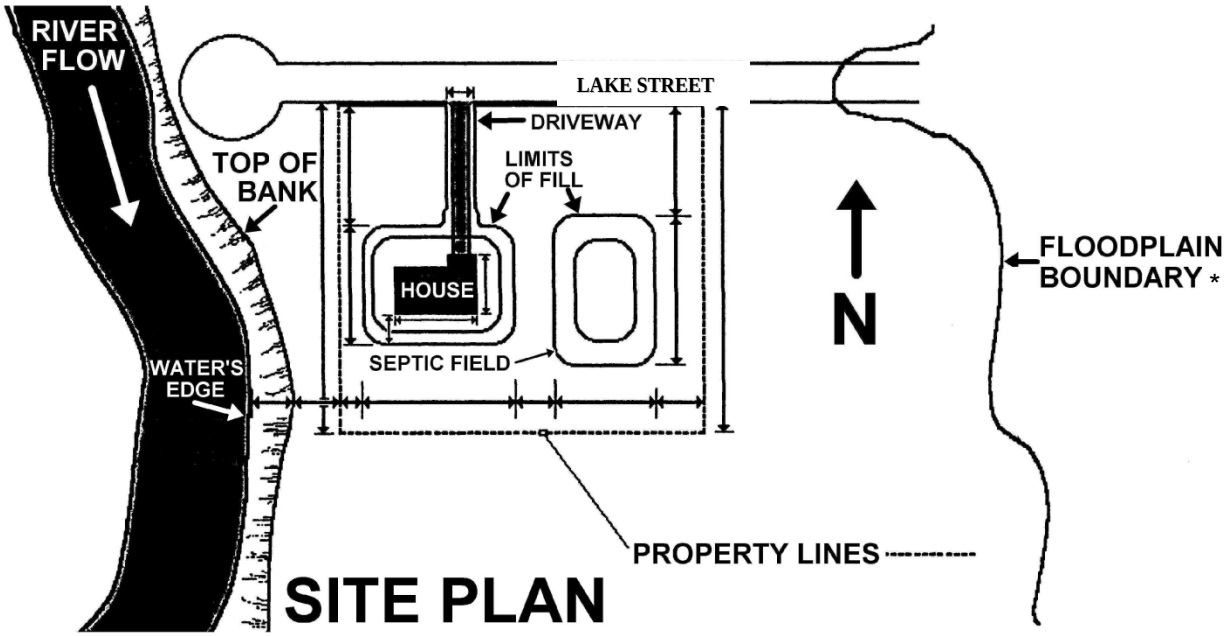


Figure 2. Sample Site Plan

Please provide measurements for all noted dimension lines.

*Please show the floodplain boundary only if known or provide a copy of an effective FEMA flood map showing the boundary with your project site location identified.

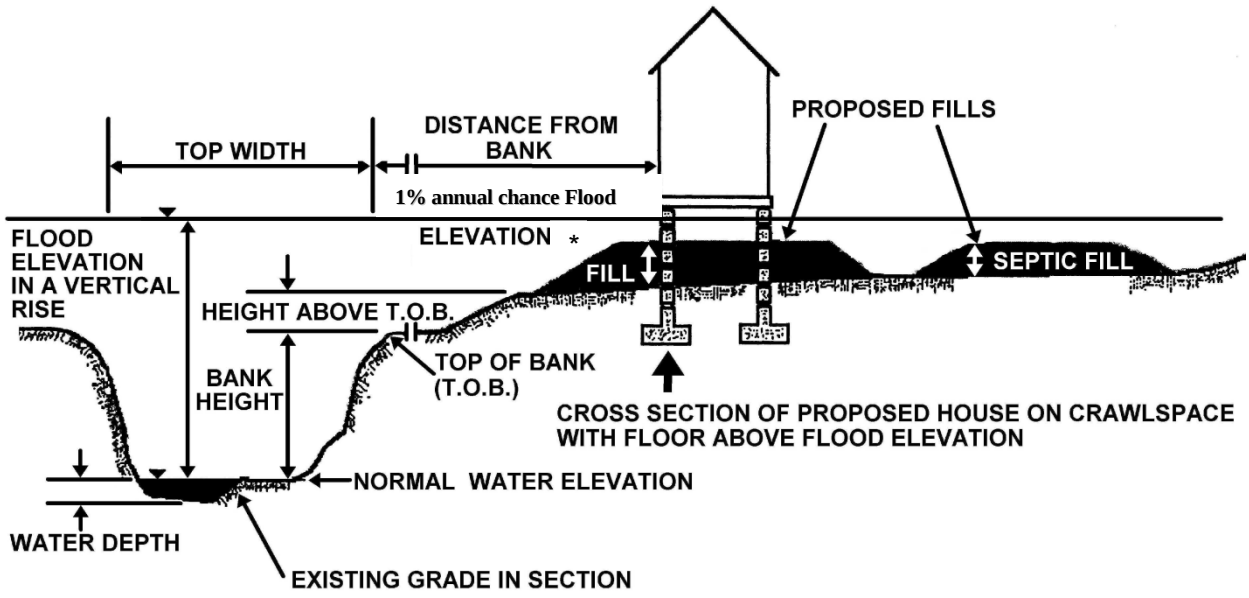


Figure 3. Sample Cross Section(s)

Please provide measurements for all noted dimension lines.
*Please show the 1% annual chance flood elevation only if known.

The "Flood Hazard Determination Request Form" follows and may be duplicated for use and submittal to the appropriate MDEQ, WRD district office by using this website source for district office addresses:

https://www.Michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/About-Us/Staff-Floodplain.pdf

MDEQ Flood Hazard Determination Request Form

To be filled out by applicant or applicant's agent.

APPLICANT'S MAILING ADDRESS:
Name: _____ Date: _____
Street/Road Address: _____
City: _____ State: _____ ZIP Code: _____
Home Phone #: _____ Work Phone #: _____

Project Property Location:
Street/Road address: _____
City, Village, or Township: _____

Subdivision (if applicable): Name-_____

Lot No.(s)-_____ Town: _____ Range: _____ Section: _____
[Note: Town, Range, and Section information can usually be found in the legal property description on a tax bill. An example is T12N, R5E, NW ¼, section 5.]

Legal Property Description: _____
_____
_____
_____
_____

Describe project/type of construction:
_____
_____
_____
_____
_____

Nearest Watercourse: Name-_____

Map and Plan Attachment Check List:
___ LOCATION MAP
___ SITE PLAN
___ CROSS SECTIONS

(submittal of these will facilitate a more accurate review and flood determination finding)