

This Model Floodplain Management Ordinance has been developed as a tool to help communities meet the minimum requirements of the National Flood Insurance Program (NFIP). Communities choosing not to use this model ordinance must ensure their ordinance meets the minimum requirements of the NFIP. This model does not include any applicable State law requirements.

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INSTRUCTIONS FOR CREATING YOUR COMMUNITY FLOODPLAIN MANAGEMENT ORDINANCE

Before adopting your community floodplain management ordinance, it is advised that you discuss the ordinance with your community attorney.

Provide community specific information as requested in brackets:

- This model ordinance contains **{brackets}** that must be replaced with community specific information such as your community name, address, or job title.
- If you choose to re-number the sections in your ordinance differently than what is presented in this model, please check that the cross-referenced sections in your ordinance match.

Please note:

- This model ordinance contains language from the Code of Federal Regulations (CFR). Your community should review this language on an annual basis for any amendments to these provisions.
- Section 2.0 Definitions must be included. Definitions marked with an asterisk (*) are cited in 44 CFR 59.1 These are Program definitions and may vary from common understanding of the term. Therefore, these definitions must be included in your Ordinance.
- Definitions not marked with an asterisk are recommended as they are important to the meaning and understanding of this model ordinance. Additional definitions may be found in Appendix A and on the National Flood Insurance Program (NFIP) website <http://www.fema.gov/national-flood-insurance-program/definitions> and are optional. You may add any other definitions that apply to floodplain management in your community, provided those definitions do not contradict 44 CFR or applicable State law.
- Flood Boundary and Floodway Maps (FBFM) and Flood Hazard Boundary Maps (FHBM) have been superseded by Flood Insurance Rate Maps (FIRM). FBFM and FHBM are not referenced in this model ordinance. These definitions, if applicable for your community, have been included in Appendix A.
- NFIP Compliance:
This model ordinance meets the minimum standards required to participate in the National Flood Insurance Program (NFIP). Any community may exceed the minimum standards by adopting more comprehensive floodplain management regulations. Any community choosing to adopt higher regulatory standards will be held accountable for enforcing the higher standards.
- Additional floodplain management language can be found in Appendix B.

The following table of citations is provided as reference only. The citations from 44 CFR do not need to be included in your ordinance.

<i>Section</i>	<i>CFR citation</i>
1.1	59.22(a)(2)
1.2	59.22(a)(1)
1.3	59.2; 59.22(a)(1), (a)(8); 60.22
1.4	60.22
2.0	59.1
3.1	59.22(a)
3.2	59.22(a)(6); 60.2(h)
3.3	60.1(b)-(d)
3.4	60.1(b)-(d)
3.5	60.1(b)-(d)
3.6	59.2(b)
3.7	
3.8	
4.1	59.22(b)(1)
4.2.1-A	60.3(a)(1)
4.2.1-B	60.3(a)(2)
4.2.1-C	60.3(a)(3)
4.2.1-D	60.3(c)(10)
4.2.2	60.3(b)(4)
4.2.3	59.22(a)(9)(iii)
4.2.3-A	60.3(b)(5)(i),(5)(iii)
4.2.3-B	60.3(b)(5)(ii),(5)(iii),(c)(4)
4.2.3-C	60.3(b)(5)(iii)
4.2.3-D	60.3(b)(3)
4.2.3-E	60.3(d)(3)
4.2.3-F	60.6(a)(6)
4.2.3-G	
4.2.4-A	60.3(b)(6), (b)(7)
4.2.4-B	65.3
4.2.4-C	59.22(a)(9)(v)
4.2.5	
4.3	60.3(a)(1)
4.3-A	60.3(b)(5)(i), (c)(7), (c)(8), (e)(2)
4.3-B	60.3(b)(5)(ii)
4.3-C	60.3(c)(4)
4.3-D	60.3(b)(3)
4.3-E	60.3(b)(6)
5.1	60.3(a)(3)(i)
5.1.2-A	60.3(a)(3)(ii)
5.1.2-B	60.3(a)(3)(iii)
5.1.2-C	60.3(a)(3)(iv)
5.1.2-D	60.3(c)(11)
5.1.3.1	60.3(c)(2), (c)(7)
5.1.3.2	60.3(c)(3), (c)(4), (c)(8)
5.1.3.3	60.3(a)(3)(iv), (c)(5), Tech. Bulletin 7

5.1.3.4	60.3(c)(5)
5.2	
5.3-A	60.3(a)(5), (a)(6)(i)
5.3-B	60.3(a)(6)(ii)
5.4-A	60.3(a)(4)(i)
5.4-B	60.3(a)(4)(ii)
5.4-C	60.3(a)(4)(iii)
5.4-D	60.3(b)(3)
5.5	60.3(b)(8), (c)(6), (c)(12)
5.6	60.3(c)(14)
5.7	60.3(d)(3)
6.1	
6.2-A.1	60.6(a)(3)(iii)
6.2-A.2	60.6(a)
6.2-A.3	60.6(a)(4)
6.2-A.4	60.6(a)(3)(i)
6.2-A.5	60.6(a)(3)(ii)
6.2-A.6	60.6(a)(7)
6.2-B	60.6(a)(1)
6.2-C	60.6(a)(2)
6.3-A	
6.3-B	60.6(a)(5)
6.3-C	60.6(a)(6)

SECTION 1.0

STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE AND METHODS

1.1 STATUTORY AUTHORIZATION

In **{applicable State citation}**, the **{State Name}** State Legislature has delegated the responsibility to each community to adopt floodplain management regulations designed to promote the public health, safety and general welfare of its citizenry. Therefore, the **{Governing Body}** of the **{Community Name}** does ordain as follows:

1.2 FINDINGS OF FACT

- A. The flood hazard areas of **{Community Name}** are subject to periodic inundation which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.
- B. These flood losses may be caused by the cumulative effect of obstructions in flood hazard areas which increase flood heights and velocities and, when inadequately anchored, cause damage in other areas. Uses that are inadequately flood proofed, elevated or otherwise protected from flood damage, also contribute to flood loss.

1.3 STATEMENT OF PURPOSE

It is the purpose of this ordinance to promote public health, safety, and general welfare, and to minimize public and private losses due to flooding in flood hazard areas by provisions designed to:

- A. Protect human life and health;
- B. Minimize expenditure of public money for costly flood control projects;
- C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- D. Minimize prolonged business interruptions;
- E. Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in flood hazard areas;
- F. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas so as to minimize blight areas caused by flooding;
- G. Notify potential buyers that the property is in a Special Flood Hazard Area
- H. Notify those who occupy flood hazard areas that they assume responsibility for their actions; and
- I. Participate in and maintain eligibility for flood insurance and disaster relief.

1.4 METHODS OF REDUCING FLOOD LOSSES

In order to accomplish its purposes, this ordinance includes methods and provisions to:

- A. Restrict or prohibit development which is dangerous to health, safety, and property due to water or

erosion hazards, or which result in damaging increases in erosion, flood heights or velocities;

- B. Require that development vulnerable to floods, including facilities, be protected against flood damage at the time of initial construction;
- C. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- D. Control filling, grading, dredging, and other development which may increase flood damage; and
- E. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters, or which may increase flood hazards in other areas.

SECTION 2.0

DEFINITIONS

Definitions marked with an asterisk () are cited 44 CFR 59.1.*

Appeal. A request for a review of the Floodplain Administrator's interpretation of any provision of this ordinance or a request for a variance.

***Area of shallow flooding.** A designated Zone AO, AH, AR/AO or AR/AH (or VO) on a community's Flood Insurance Rate Map (FIRM) with a one percent or greater annual chance of flooding to an average depth of one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

***Area of special flood hazard.** The land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year. It is shown on the Flood Insurance Rate Map (FIRM) as Zone A, AO, AH, A1-30, AE, A99, AR (V, VO, V1-30, VE). "Special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard".

***Base flood.** The flood having a one percent chance of being equaled or exceeded in any given year.

Base flood elevation (BFE). The elevation to which floodwater is anticipated to rise during the base flood.

***Basement.** Any area of the building having its floor sub-grade - i.e., below ground level - on all sides.

***Building.** See "Structure."

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

***Flood or Flooding.**

(a) A general and temporary condition of partial or complete inundation of normally dry land areas from:

- (1) The overflow of inland or tidal waters.
- (2) The unusual and rapid accumulation or runoff of surface waters from any source.
- (3) Mudslides (i.e., mudflows) which are proximately caused by flooding as defined in paragraph (a)(2) of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

(b) 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 flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (a)(1) of this definition.

***Flood elevation study.** An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

***Flood Insurance Rate Map (FIRM).** The official map of a community, on which the Federal Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map

(DFIRM).

***Flood Insurance Study (FIS).** See “Flood elevation study”.

***Floodplain or flood-prone area.** Any land area susceptible to being inundated by water from any source. See "Flood or flooding."

Floodplain administrator. The community official designated by title to administer and enforce the floodplain management regulations.

***Floodplain management.** The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

***Floodplain management regulations.** Zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain ordinance, grading ordinance and erosion control ordinance) and other application of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

***Flood proofing.** Any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate risk of flood damage to real estate or improved real property, water and sanitary facilities, structures, and their contents.

***Floodway.** 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. Also referred to as "Regulatory Floodway."

***Functionally dependent use.** A use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, and does not include long-term storage or related manufacturing facilities.

***Highest adjacent grade.** The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

***Historic structure.** Any structure that is:

1. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
2. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
3. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or
4. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
 - a. By an approved state program as determined by the Secretary of the Interior or

b. Directly by the Secretary of the Interior in states without approved programs.

***Lowest floor.** The lowest floor of the lowest enclosed area (including “Basement”). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building’s lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance.

***Manufactured home.** A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

***Manufactured Home Park or Subdivision.** A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

***Mean sea level.** For purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which Base Flood Elevations shown on a community's Flood Insurance Rate Map are referenced.

***New construction.** For the purposes of determining insurance rates, structures for which the “start of construction” commenced on or after the effective date of an initial Flood Insurance Rate Map or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, “new construction” means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

***One-hundred-year flood or 100-year flood.** See "Base flood."

***Recreational vehicle.** A vehicle which is:

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

***Regulatory floodway.** See “Floodway”.

***Sheet flow area.** See "Area of shallow flooding".

***Special Flood Hazard Area (SFHA).** See “Area of special flood hazard”.

***Start of construction.** Includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days from the date of the permit. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or

walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

***Structure.** For floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

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

***Substantial improvement.** Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include 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."* **

***Variance.** A grant of relief by a community from the terms of a flood plain management regulation.

***Violation.** The failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this ordinance is presumed to be in violation until such time as that documentation is provided.

***Water surface elevation.** The height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929, or other datum, of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

** Per FEMA P-467-2 (May 2008) *Floodplain Management Bulletin Historic Structures* and FEMA P-993 (July 2014) *Floodplain Management Bulletin Variances and the National Flood Insurance Program*, communities have the option of using either the Substantial Improvement Definition exclusion or the Variance criteria per 44CFR 60.6(a) to regulate Historic Structures.

SECTION 3.0

GENERAL PROVISIONS

3.1 LANDS TO WHICH THIS ORDINANCE APPLIES

This ordinance shall apply to all special flood hazard areas within the boundaries of **{community name}**.

3.2 BASIS FOR ESTABLISHING SPECIAL FLOOD HAZARD AREAS

The special flood hazard areas identified by the Federal Insurance Administrator in a scientific and engineering report titled “The Flood Insurance Study (FIS) for **{exact title of study}**” dated **{date}**, with accompanying Flood Insurance Rate Maps (FIRMs) dated **{date}**, are hereby adopted by reference and declared to be a part of this ordinance. The FIS and FIRM panels are on file at **{list the address or the building, i.e. County Administration Building, Department of Planning, Public Works etc.}**.

3.3 COMPLIANCE

All development within special flood hazard areas is subject to the terms of this ordinance and other applicable regulations.

3.4 ABROGATION AND GREATER RESTRICTIONS

This ordinance is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. However, where this ordinance and another ordinance, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

3.5 INTERPRETATION

In the interpretation and application of this ordinance, all provisions shall be:

- A. Considered as minimum requirements;
- B. Liberally construed in favor of the governing body; and
- C. Deemed neither to limit nor repeal any other powers granted under state statutes.

3.6 PENALTIES FOR NON-COMPLIANCE

Violation of the provisions of this ordinance by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall **{insert applicable penalty(ies) per State/local law}**. Nothing herein contained shall prevent the **{community name}** from taking such other lawful action as is necessary to prevent or remedy any violation.

3.7 DISCLAIMER OF LIABILITY

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the special flood hazard areas or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of the

{community name}, any officer or employee thereof, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

3.8 SEVERABILITY

This ordinance and the various parts thereof are hereby declared to be severable. Should any Section of this ordinance be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of the ordinance as a whole, or any portion thereof other than the Section so declared to be unconstitutional or invalid.

SECTION 4.0

ADMINISTRATION

4.1 DESIGNATION OF THE FLOODPLAIN ADMINISTRATOR

The **{job title}** is hereby appointed to administer, implement and enforce this ordinance by granting or denying development permits in accordance with its provisions. The Floodplain Administrator may delegate authority to implement these provisions.

4.2 DUTIES AND RESPONSIBILITIES OF THE FLOODPLAIN ADMINISTRATOR

Duties of the Floodplain Administrator shall include, but not be limited to:

4.2.1 PERMIT REVIEW

Review all development permits to determine that:

- A. The permit requirements of this ordinance have been satisfied;
- B. All other required state and federal permits have been obtained;
- C. The site is reasonably safe from flooding;
- D. In areas where a floodway has not been designated, require that no new construction, substantial improvements or other development (including fill) shall be permitted within Zones A1-30 and AE unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community. **{Do not include item D if not applicable to community}**

4.2.2 USE OF OTHER BASE FLOOD DATA

When Base Flood Elevation data has not been provided in accordance with Section **3.2 {or the numbering system used by the community}**, the Floodplain Administrator shall obtain, review and reasonably utilize any Base Flood Elevation data available from a federal, state or other source, in order to administer Section **5.0 {or the numbering system used by the community}**. Any such information shall be consistent with the requirements of the Federal Insurance Administrator.

4.2.3 OBTAIN AND MAINTAIN FOR PUBLIC INSPECTION

Obtain and maintain the following for public inspection and make available as needed:

- A. Certification required by Section **5.1.3.1** and Section **5.5 {or the numbering system used by the community}** (lowest floor elevations, bottom of the lowest horizontal structural member, and service facilities/mechanical equipment);
- B. Certification required by Section **5.1.3.2 {or the numbering system used by the community}** (lowest floor elevations or floodproofing of non-residential structures and service facilities/mechanical equipment);
- C. Certification required by Section **5.1.3.3 {or the numbering system used by the community}** (flood openings);

- D. Certification required by Section **5.7.A {or the numbering system used by the community}** (floodway encroachments);
- E. Records of all variance actions, including justification for their issuance;
- F. Improvement and damage calculations.

4.2.4 NOTIFICATION TO OTHER ENTITIES

- A. Whenever a watercourse is to be altered or relocated, notify adjacent communities and the State Coordinating Office prior to such alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administrator through appropriate notification means, and assure that the flood carrying capacity of the altered or relocated portion of said watercourse is maintained.
- B. Base Flood Elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the Floodplain Administrator shall notify the Federal Insurance Administrator of the changes by submitting technical or scientific data in accordance with Volume 44 Code of Federal Regulations Section 65.3. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.
- C. Notify the Federal Insurance Administrator in writing of acquisition by means of annexation, incorporation or otherwise, of additional areas of jurisdiction.

4.2.5 REMEDIAL ACTIONS

Take actions on violations of this ordinance as required in Section **3.6 {or the numbering system used by the community}** herein.

4.3 ESTABLISHMENT OF DEVELOPMENT PERMIT

A Development Permit shall be obtained before construction or development begins, including placement of manufactured homes, within any Special Flood Hazard Area established in Section **3.2 {or the numbering system used by the community}**. Application for a Development Permit may be made on forms furnished by the Floodplain Administrator and may include, but not be limited to, plans in duplicate drawn to scale showing the nature, location, dimensions and elevation of the area in question, existing or proposed structures, fill, storage of materials, drainage facilities and the location of the foregoing. Specifically, the following information is required:

For A Zones (A, A1-30, AE, AH, AO):

- A. Proposed elevation in relation to mean sea level of the lowest floor (including basement) of all structures. In Zone AO, elevation of existing highest adjacent grade and proposed elevation of lowest floor of all structures;
- B. Proposed elevation in relation to mean sea level to which any non-residential structure will be floodproofed;
- C. Certification by a registered professional engineer or architect that the floodproofing methods for any non-residential structure meet the floodproofing criteria in Section **5.1.3.2 {or the numbering system used by the community}**;

- D. Base Flood Elevation data for subdivision proposals or other development, including manufactured home parks or subdivisions, greater than 50 lots or 5 acres, whichever is the lesser; and
- E. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

For V Zones (VE, V1-30 and V):

- A. Proposed elevation in relation to mean sea level of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all structures, and whether such structures contain a basement;
- B. Base Flood Elevation data for subdivision proposals or other development, including manufactured home parks or subdivisions, greater than 50 lots or 5 acres, whichever is the lesser; and
- C. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

SECTION 5.0

PROVISIONS FOR FLOOD HAZARD REDUCTION

5.1 STANDARDS OF CONSTRUCTION

In all special flood hazard areas, the following standards are required:

5.1.1 Anchoring

- A. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy; and
- B. All manufactured homes shall meet the anchoring standards of Section **5.5 {or the numbering system used by the community}**.

5.1.2 Construction Materials and Methods

- A. All new construction and substantial improvements shall be constructed with materials resistant to flood damage;
- B. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage; and
- C. All new construction and substantial improvement shall 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.
- D. Within Zones AH or AO, adequate drainage paths shall be constructed around structures on slopes to guide floodwaters around and away from proposed structures.

5.1.3 Elevation and Floodproofing

5.1.3.1 Residential Construction

For A Zones (A, AE, A1-30, AH, AO):

Residential construction, new or substantial improvement, shall have the lowest floor, including basement, elevated to or above the Base Flood Elevation.

- A. In a Zone AO, the Base Flood Elevation is determined from the FIRM panel as the depth number specified. If no depth is specified, the required elevation is at minimum two (2) feet above highest adjacent grade.
- B. In a Zone A where the Base Flood Elevation has not been determined, the Base Flood Elevation is determined locally by the criteria set out in Section **4.2.2 {or the numbering system used by the community}**. A minimum of 2 feet above highest adjacent grade may result in a lower insurance premium.
- C. In Zones AE, A1-30, and AH, the Base Flood Elevation is determined from the FIS and/or FIRM.

- D. A garage attached to a residential structure, constructed with the garage floor slab below the Base Flood Elevation, must be designed to allow for the automatic entry and exit of flood waters. See Section **5.1.3.4 {or the numbering system used by the community}**.

Upon completion of the structure, certification by a registered professional engineer or surveyor that the elevation requirements of the lowest floor, including basement, of this section have been satisfied shall be provided to the Floodplain Administrator for verification.

For V Zones (VE, V1-30 and V):

Residential construction, new or substantial improvement, shall:

- A. Be located landward of the reach of mean high tide;
- B. Have the bottom of the lowest structural member of the lowest floor (excluding pilings and columns), elevated to or above the Base Flood Elevation;
- C. Have the pile or column foundation and structure attached thereto be anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards;
- D. Have the space below the lowest floor, usable solely for parking of vehicles, building access, or storage, either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purposes of this section, a breakaway wall shall have a design safe loading resistance of not less than 10 and no more than 20 pounds per square foot;
- E. Prohibit the use of fill for structural support of buildings; and
- F. Prohibit man-made alteration of sand dunes and mangrove stands.

A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of this Section.

Upon completion of construction, certification by a registered professional engineer or architect that these design standards have been satisfied, and certification by a registered professional engineer or surveyor that the elevation requirements of the bottom of the lowest structural member of the lowest floor, excluding pilings and columns, of this section have been satisfied shall be provided to the Floodplain Administrator for verification.

5.1.3.2 Non-residential Construction

For A Zones (A, AE, A1-30, AH, AO):

Non-residential construction, new or substantial improvement, shall have the lowest floor either elevated to conform with Section **5.1.3.1(A), (B), or (C) as appropriate {or the numbering**

system used by the community},

Or, together with attendant utility and sanitary facilities,

- A. Be floodproofed below the elevation recommended under Section **5.1.3.1(A), (B), or (C) as appropriate {or the numbering system used by the community}** so that the structure is watertight with walls substantially impermeable to the passage of water; and
- B. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice meeting the provisions listed above.

Upon completion of the structure, certification by a registered professional engineer or surveyor that the elevation requirements of the lowest floor, including basement, of this section have been satisfied shall be provided to the Floodplain Administrator for verification; **or** certification by a registered professional engineer or architect that the floodproofing design of this section is satisfied, including the specific elevation in relation to mean sea level to which such structures are floodproofed, shall be provided to the Floodplain Administrator for verification.

For V Zones (VE, V1-30, V):

Floodproofing of non-residential structures is prohibited. All structures must be elevated and constructed according to the requirements set forth in Section **5.1.3.1 {or the numbering system used by the community}**.

5.1.3.3 Appurtenant Structures (Detached Garages & Storage Structures)

For A Zones (A, AE, A1-30, AH, AO):

Appurtenant structures used solely for parking of vehicles or storage may be constructed such that the floor is below the Base Flood Elevation, provided the structure is designed and constructed in accordance with the following requirements:

- A. Use of the appurtenant structure must be limited to parking of vehicles or storage;
- B. The portions of the appurtenant structure located below the Base Flood Elevation must be built using flood resistant materials;
- C. The appurtenant structure must be adequately anchored to prevent flotation, collapse and lateral movement;
- D. Any machinery or equipment servicing the appurtenant structure must be elevated or floodproofed to or above the Base Flood Elevation;
- E. The appurtenant structure must comply with floodway encroachment provisions in Section 5.7 **{or the numbering system used by the community}**; and

- F. The appurtenant structure must be designed to allow for the automatic entry and exit of flood waters in accordance with Section **5.1.3.4 {or the numbering system used by the community}**.

Detached garages, storage structures and other appurtenant structures not meeting the above standards must be constructed in accordance with all applicable standards in Section **5.1.3.1(A), (B), or (C) as appropriate {or the numbering system used by the community}**.

Upon completion of the structure, certification that the requirements of this section have been satisfied shall be provided to the Floodplain Administrator for verification.

For V Zones (VE, V1-30 and V):

Floodproofing of non-residential structures is prohibited. All structures must be elevated and constructed according to the requirements set forth in Section **5.1.3.1 {or the numbering system used by the community}**.

5.1.3.4 Flood Openings

All new construction and substantial improvement with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwater. Designs for meeting this requirement must meet or exceed the following criteria:

For non-engineered openings:

- A. Have a minimum of two openings with a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
- B. The bottom of all openings shall be no higher than one foot above grade;
- C. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwater.

Alternatively, a registered engineer or architect may design and certify engineered openings.

5.2 STANDARDS FOR STORAGE OF MATERIALS AND EQUIPMENT

- A. The storage or processing of materials that could be injurious to human, animal or plant life if released due to damage from flooding is prohibited in special flood hazard areas.
- B. Storage of other material or equipment may be allowed if not subject to damage by floods and if firmly anchored to prevent flotation, or if readily removable from the area within the time available after flood warning

5.3 STANDARDS FOR WATER SUPPLY AND WASTE DISPOSAL SYSTEMS

- A. All new or replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from systems into flood waters.
- B. On-site waste disposal systems shall be located to avoid impairment to them or contamination

from them during flooding.

5.4 DEVELOPMENT PROPOSALS

All new development proposals, including subdivisions and manufactured home parks, shall:

- A. Be consistent with the need to minimize flood damage;
- B. Have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage; and
- C. Provide adequate drainage to reduce exposure to flood hazards.
- D. Include Base Flood Elevation data for all proposals of 50 lots or 5 acres, whichever is the lesser.

5.5 STANDARDS FOR MANUFACTURED HOMES

For A Zones (A, AE, A1-30, AH, AO):

All manufactured homes shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.

- A. Manufactured homes that are placed or substantially improved within Zone AO shall meet the residential construction standards in A Zones in Section **5.1.3.1 {or the numbering system used by the community}**.
- B. Manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM on sites:
 - a. Outside of a manufactured home park or subdivision,
 - b. In a new manufactured home park or subdivision,
 - c. In an expansion to an existing manufactured home park or subdivision, or
 - d. In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood,

Be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist floatation collapse and lateral movement.

- C. Manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A1-30, AH, and AE on the community's FIRM that have **not** incurred substantial damage as the result of a flood are to be elevated so that either:
 - a. The lowest floor of the manufactured home is at or above the base flood elevation, or
 - b. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement.

Upon completion of installation of the manufactured home, certification by a registered professional engineer or surveyor that the elevation requirements of this section have been satisfied shall be provided to the Floodplain Administrator for verification.

For V Zones (VE, V1-30 and V):

- A. Manufactured homes placed or substantially improved within Zones V1-30, V, and VE on the community's FIRM on sites:
 - a. Outside of a manufactured home park or subdivision,
 - b. In a new manufactured home park or subdivision,
 - c. In an expansion to an existing manufactured home park or subdivision, or
 - d. In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood,

Meet the standards of residential construction in V Zones in Section **5.1.3.1 {or the numbering system used by the community}**.

- B. Manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones V1-30, V, and VE on the community's FIRM that have **not** incurred substantial damage as the result of a flood are to:
 - a. Meet the standards of residential construction in V Zones in Section **5.1.3.1 {or the numbering system used by the community}**; **AND**
 - b. Be elevated so that either:
 - i. The lowest floor of the manufactured home is at or above the base flood elevation, or
 - ii. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement.

Upon completion of installation of the manufactured home, certification by a registered professional engineer or surveyor that the elevation requirements of this section have been satisfied shall be provided to the Floodplain Administrator for verification.

5.6 STANDARDS FOR RECREATIONAL VEHICLES

All recreational vehicles placed on site shall:

- A. Be on site for fewer than 180 consecutive days,
- B. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or
- C. Meet the permit requirements of Section **4.0 {or the numbering system used by the community}** of this ordinance and the applicable elevation and anchoring requirements for manufactured homes in Section **5.5 {or the numbering system used by the community}**.

5.7 FLOODWAYS

Located within the special flood hazard areas established in Section **3.2 {or the numbering system used by the community}** are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:

- A. 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;
- B. If Section **5.7 (A) {or the numbering system used by the community}** is satisfied, all new construction and substantial improvements shall comply with all other applicable flood hazard reduction provisions of Section **5.0 {or the numbering system used by the community}**.
- C. Encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations may be permitted, provided that **{community name}** first applies for and fulfills the requirements for a Conditional Letter of Map Revision (CLOMR), and receives approval from the Federal Insurance Administrator to revise the FIRM and FIS in accordance with Section **4.2.4.B {or the numbering system used by the community}**.

SECTION 6.0 **VARIANCE PROCEDURE**

6.1 NATURE OF VARIANCES

The variance criteria set forth in this section of the ordinance are based on the general principle of zoning law that variances pertain to a piece of property and are not personal in nature. A variance may be granted for a parcel of property with physical characteristics so unusual that complying with the requirements of this ordinance would create an exceptional hardship to the applicant or the surrounding property owners. The characteristics must be unique to the 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.

It is the duty of the **{governing body}** to help protect its citizens from flooding. This need is so compelling and the implications of the cost of insuring a structure built below the Base Flood Elevation are so serious that variances from the flood elevation or from other requirements in the flood ordinance are quite rare. The long-term goal of preventing and reducing flood loss and damage can only be met if variances are strictly limited. Therefore, the variance guidelines provided in this ordinance are more detailed and contain multiple provisions that must be met before a variance can be properly granted. The criteria are designed to screen out those situations in which alternatives other than a variance are more appropriate.

6.2 CONDITIONS FOR VARIANCES

A. Variances shall only be issued:

1. Upon a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances;
2. *For the repair, rehabilitation or restoration 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; ***
3. Upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief;
4. Upon a showing of good and sufficient cause;
5. Upon a determination that failure to grant the variance would result in exceptional hardship to the applicant;
6. Upon a showing that the use cannot perform its intended purpose unless it is located or carried out in close proximity to water. This includes only facilities defined in Section **2.0 {or the numbering system used by the community}** of this ordinance in the definition of "Functionally Dependent Use."

** Per FEMA P-467-2 (May 2008) *Floodplain Management Bulletin Historic Structures* and FEMA P-993 (July 2014) *Floodplain Management Bulletin Variances and the National Flood Insurance Program*, communities have the option of using either the Substantial Improvement Definition exclusion or the Variance criteria per 44CFR 60.6(a) to regulate Historic Structures.

- B. Variances shall not be issued within any floodway if any increase in flood levels during the base flood discharge would result.
- C. Generally, variances may be issued 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 Elevation, provided the procedures of Sections **4.0** and **5.0 {or the numbering system used by the community}** of this ordinance have been fully considered. As the lot size increases beyond one-half acre, the technical justification required for issuing the variance increases.

6.3 VARIANCE CRITERIA

- A. In considering variance applications, the **{Governing Body}** shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and:
 - 1. The danger that materials may be swept onto other lands to the injury of others;
 - 2. The danger of life and property due to flooding or erosion damage;
 - 3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
 - 4. The importance of the services provided by the proposed facility to the community;
 - 5. The necessity to the facility of a waterfront location, where applicable;
 - 6. The availability of alternative locations for the proposed use, which are not subject to flooding or erosion damage;
 - 7. The compatibility of the proposed use with existing and anticipated development;
 - 8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
 - 9. The safety of access to the property in time of flood for ordinary and emergency vehicles;
 - 10. The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site; and,
 - 11. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, water system and streets and bridges.
- B. Any applicant to whom a variance is granted shall be given written notice over the signature of a community official that:
 - 1. The issuance of a variance to construct a structure below the Base Flood Elevation will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage, and
 - 2. Such construction below the base flood elevation increases risks to life and property; and
- C. The Floodplain Administrator shall maintain a record of all variance actions, including justification

for their issuance.

APPENDIX A

ADDITIONAL DEFINITIONS

Definitions marked with an asterisk () are cited 44 CFR 59.1.*

Appurtenant structure: A structure that is on the same parcel of property as a principal structure, the use of which is incidental to the use of the principal structure.

Alluvial fan. A geomorphologic feature characterized by a cone or fan-shaped deposit of boulders, gravel, and fine sediments that have been eroded from mountain slopes, transported by flood flows, and then deposited on the valley floors, and which is subject to flash flooding, high velocity flows, debris flows, erosion, sediment movement and deposition, and channel migration.

***Apex.** A point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.

***Area of special flood-related erosion hazard.** The land within a community which is most likely to be subject to severe flood-related erosion losses. The area may be designated as Zone E on the Flood Hazard Boundary Map (FHBM). After the detailed evaluation of the special flood-related erosion hazard area in preparation for publication of the FIRM, Zone E may be further refined.

***Area of special mudslide (i.e., mudflow) hazard.** The land within a community most likely to be subject to severe mudslides (i.e., mudflows). The area may be designated as Zone M on the FHBM. After the detailed evaluation of the special mudslide (i.e., mudflow) hazard area in preparation for publication of the FIRM, Zone M may be further refined.

***Breakaway wall.** A wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

***Coastal high hazard area.** An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources.

***Community.** Any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or Alaska Native village or authorized native organization, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

***Elevated Building.** For insurance purposes, a non-basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.

Elevation Certificate. An administrative tool of the National Flood Insurance Program (NFIP) that can be used to provide elevation information, 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).

***Erosion.** The process of the gradual wearing away of landmasses. This peril is not, per se, covered under the National Flood Insurance Program.

***Existing manufactured home park or subdivision.** A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain

management regulations adopted by a community.

***Expansion to an existing manufactured home park or subdivision.** The preparation of additional sites by the construction of facilities for servicing the lots on which the manufacturing homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

***Flood Hazard Boundary Map.** An official map of a community, issued by the Federal Insurance Administrator, where the boundaries of the flood, mudslide (i.e., mudflow) related erosion areas having special hazards have been designated as Zones A., M, and/or E.

***Flood-related erosion.** The collapse or subsidence of land along the shore of a lake or other body of water as a result of 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-related erosion area or flood-related erosion prone area.** A land area adjoining the shore of a lake or other body of water, which due to the composition of the shoreline or bank and high water levels or wind-driven currents, is likely to suffer flood-related erosion damage.

Floodway fringe. The special flood hazard area outside the "Regulatory Floodway".

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

Hardship. As related to **Section 6.0 {or the numbering system used by the community}** of this ordinance, meaning the exceptional hardship that would result from a failure to grant the requested variance. The **{community governing body}** requires that the variance be exceptional, unusual, and peculiar to the property involved. Mere economic or financial hardship alone is not exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.

***Levee.** A man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.

***Levee system.** A flood protection system which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.

***Mudslide (i.e., mudflow).** Describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. A mudslide (i.e., mudflow) may occur as a distinct phenomenon while a landslide is in progress and will be recognized as such by the Administrator only if the mudflow, and not the landslide, is the proximate cause of damage that occurs.

***New manufactured home park or subdivision.** A manufactured home park or subdivision for which

the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of floodplain management regulations adopted by the community.

***Person.** Any individual or group of individuals, corporation, partnership, association, or any other entity, including State and local governments and agencies.

***Primary Frontal Dune.** A continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

***Program.** The National Flood Insurance Program authorized by 42 U.S.C. 4001 through 4128.

***Program deficiency.** A defect in a community's floodplain management regulations or administrative procedures that impairs effective implementation of those floodplain management regulations.

Reasonably safe from flooding. Base flood waters will not inundate the land or damage and that any subsurface waters related to the base flood will not damage existing or proposed buildings.

***Remedy a violation.** To bring the structure or other development into compliance with Federal, State or local floodplain management regulations, or if this is not possible, to reduce the impacts of its noncompliance. Ways that impacts may be reduced include protecting the structure or other affected development from flood damages, implementing the enforcement provisions of the ordinance or otherwise deterring future similar violations, or reducing Federal financial exposure with regard to the structure or other development.

***Riverine.** Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

***Structure.** For insurance purposes:

- (1) A building with two or more outside rigid walls and a fully secured roof, that is affixed to a permanent site;
- (2) A manufactured home ("a manufactured home," also known as a mobile home, is a structure: built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation);
or
- (3) A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws.

For insurance purposes, "structure" does not mean a recreational vehicle or a park trailer or other similar vehicle, except as described in paragraph (3) of this definition, or a gas or liquid storage tank.

APPENDIX B

ADDITIONAL REGULATORY STANDARDS

Floodplain management criteria for areas of flood protection restoration (AR) (44 CFR 60.3(f)):

For Zones designated AR, AR/A1-30, AR/AE, AR/AH, AR/AO and AR/A, the community shall:

- A. Meet all the applicable requirements listed in Section **5.0 {or the numbering system used by the community}**;
- B. Adopt the official map or legal description in those areas that are designated developed areas in accordance with the eligibility procedures under 44CFR 65.14
- C. For all new construction of structures in areas within Zone AR that are designated as developed areas and in other areas within Zone AR where the AR flood depth is 5 feet or less:
 - a. Determine the lower of either the AR base flood elevation or the elevation that is 3 feet above highest adjacent grade; and
 - b. Using this elevation, require the standards of **5.0 {or the numbering system used by the community}**.
- D. For all new construction of structures in those areas within Zone AR that are not designated as developed areas where the AR flood depth is greater than 5 feet:
 - a. Determine the AR base flood elevation; and
 - b. Using that elevation require the standards of Section **5.0 {or the numbering system used by the community}**.
- E. For all new construction of structures in areas within Zone AR/A1-30, AR/AE, AR/AH, AR/AO, and AR/A:
 - a. Determine the applicable elevation for Zone AR from items **C or D (above) { or the numbering system used by the community}**;
 - b. Determine the base flood elevation or flood depth for the underlying A1-30, AE, AH, AO and A Zone; and
 - c. Using the higher elevation from **E(a) or (b) {or the numbering system used by the community}**, require the standards of **5.0 {or the numbering system used by the community}**.
- F. For all substantial improvements to existing construction within Zones AR/A1-30, AR/AE, AR/AH, AR/AO, and AR/A:
 - a. Determine the A1-30 or AE, AH, AO, or A Zone base flood elevation; and
 - b. Using this elevation apply the requirements of **5.0 {or the numbering system used by the community}**.
- G. Notify the permit applicant that the area has been designated as an AR, AR/A1-30, AR/AE, AR/AH, AR/AO, or AR/A Zone and whether the structure will be elevated or protected to or above the AR base flood elevation.

Per 44 CFR 60.22: Planning considerations for flood-prone areas (these are not mandatory):

- A. The flood plain management regulations adopted by a community for **flood-prone areas** should:
 - a. Permit only that development of flood-prone areas which (i) is appropriate in light of the probability of flood damage and the need to reduce flood losses, (ii) is an acceptable social and economic use of the land in relation to the hazards involved, and (iii) does not increase the danger to human life;
 - b. Prohibit nonessential or improper installation of public utilities and public facilities in flood-prone areas.

- B. In formulating community development goals after the occurrence of a flood disaster, each community shall consider—
 - a. Preservation of the flood-prone areas for open space purposes;
 - b. Relocation of occupants away from flood-prone areas;
 - c. Acquisition of land or land development rights for public purposes consistent with a policy of minimization of future property losses;
 - d. Acquisition of frequently flood-damaged structures;

- C. In formulating community development goals and in adopting flood plain management regulations, each community shall consider at least the following factors—
 - a. Human safety;
 - b. Diversion of development to areas safe from flooding in light of the need to reduce flood damages and in light of the need to prevent environmentally incompatible flood plain use;
 - c. Full disclosure to all prospective and interested parties (including but not limited to purchasers and renters) that (i) certain structures are located within flood-prone areas, (ii) variances have been granted for certain structures located within flood-prone areas, and (iii) premium rates applied to new structures built at elevations below the base flood substantially increase as the elevation decreases;
 - d. Adverse effects of flood plain development on existing development;
 - e. Encouragement of floodproofing to reduce flood damage;
 - f. Flood warning and emergency preparedness plans;
 - g. Provision for alternative vehicular access and escape routes when normal routes are blocked or destroyed by flooding;
 - h. Establishment of minimum floodproofing and access requirements for schools, hospitals, nursing homes, orphanages, penal institutions, fire stations, police stations, communications centers, water and sewage pumping stations, and other public or quasi-public facilities already located in the flood-prone area, to enable them to withstand flood damage, and to facilitate emergency operations;
 - i. Improvement of local drainage to control increased runoff that might increase the danger of flooding to other properties;
 - j. Coordination of plans with neighboring community's flood plain management programs;
 - k. The requirement that all new construction and substantial improvements in areas subject to subsidence be elevated above the base flood level equal to expected subsidence for at least a ten-year period;
 - l. For riverine areas, requiring subdividers to furnish delineations for floodways before approving a subdivision;
 - m. Prohibition of any alteration or relocation of a watercourse, except as part of an overall drainage basin plan. In the event of an overall drainage basin plan, provide that the flood carrying capacity within the altered or relocated portion of the watercourse is maintained;
 - n. Requirement of setbacks for new construction within Zones V1-30, VE, and V on a

- community's FIRM;
- o. Requirement of additional elevation above the base flood level for all new construction and substantial improvements within Zones A1-30, AE, V1-30, and VE on the community's FIRM to protect against such occurrences as wave wash and floating debris, to provide an added margin of safety against floods having a magnitude greater than the base flood, or to compensate for future urban development;
 - p. Requirement of consistency between state, regional and local comprehensive plans and flood plain management programs;
 - q. Requirement of pilings or columns rather than fill, for the elevation of structures within flood-prone areas, in order to maintain the storage capacity of the flood plain and to minimize the potential for negative impacts to sensitive ecological areas;
 - r. Prohibition, within any floodway or coastal high hazard area, of plants or facilities in which hazardous substances are manufactured;
 - s. Requirement that a plan for evacuating residents of all manufactured home parks or subdivisions located within flood prone areas be developed and filed with and approved by appropriate community emergency management authorities.

Floodplain management criteria for mudslide (i.e., mudflow)-prone areas (44 CFR 60.4):

The Federal Insurance Administrator will provide the data upon which flood plain management regulations shall be based. If the Federal Insurance Administrator has not provided sufficient data to furnish a basis for these regulations in a particular community, the community shall obtain, review, and reasonably utilize data available from other Federal, State or other sources pending receipt of data from the Federal Insurance Administrator. However, when special mudslide (i.e., mudflow) hazard area designations have been furnished by the Federal Insurance Administrator, they shall apply. The symbols defining such special mudslide (i.e., mudflow) hazard designations are set forth in 44 CFR 64.3. In all cases, the minimum requirements for mudslide (i.e., mudflow)-prone areas adopted by a particular community depend on the amount of technical data provided to the community by the Federal Insurance Administrator. Minimum standards for communities are as follows:

When the Federal Insurance Administrator has not yet identified any area within the community as an area having special mudslide (i.e., mudflow) hazards, but the community has indicated the presence of such hazards by submitting an application to participate in the Program, the community shall:

- A. Require permits for all proposed construction or other development in the community so that it may determine whether development is proposed within mudslide (i.e., mudflow)-prone areas;
- B. Require review of each permit application to determine whether the proposed site and improvements will be reasonably safe from mudslides (i.e., mudflows). Factors to be considered in making such a determination should include but not be limited to (i) the type and quality of soils, (ii) any evidence of ground water or surface water problems, (iii) the depth and quality of any fill, (iv) the overall slope of the site, and (v) the weight that any proposed structure will impose on the slope;
- C. Require, if a proposed site and improvements are in a location that may have mudslide (i.e., mudflow) hazards, that (i) a site investigation and further review be made by persons qualified in geology and soils engineering, (ii) the proposed grading, excavations, new construction, and substantial improvements are adequately designed and protected against mudslide (i.e., mudflow) damages, (iii) the proposed grading, excavations, new construction and substantial improvements do not aggravate the existing hazard by creating either on-site or off-site disturbances, and (iv) drainage, planting, watering, and maintenance be such as not to endanger slope stability.

When the Federal Insurance Administrator has delineated Zone M on the community's FIRM, the community shall:

- A. Meet the requirements listed above; and;
- B. Adopt and enforce a grading ordinance or regulation in accordance with data supplied by the Federal Insurance Administrator which (i) regulates the location of foundation systems and utility systems of new construction and substantial improvements, (ii) regulates the location, drainage and maintenance of all excavations, cuts and fills and planted slopes, (iii) provides special requirements for protective measures including but not necessarily limited to retaining walls, buttress fills, sub-drains, diverter terraces, benchings, etc., and (iv) requires engineering drawings and specifications to be submitted for all corrective measures, accompanied by supporting soils engineering and geology reports.

Per 44 CFR 60.23: Planning considerations for mudslide (i.e., mudflow)-prone areas (these are not mandatory):

The planning process for communities identified under part 65 of this subchapter as containing Zone M, or which indicate in their applications for flood insurance pursuant to §59.22 of this subchapter that they have mudslide (i.e., mudflow) areas, should include—

- A. The existence and extent of the hazard;
- B. The potential effects of inappropriate hillside development, including:
 - a. Loss of life and personal injuries, and
 - b. Public and private property losses, costs, liabilities, and exposures resulting from potential mudslide (i.e., mudflow) hazards;
- C. The means of avoiding the hazard including the (i) availability of land which is not mudslide (i.e., mudflow)-prone and the feasibility of developing such land instead of further encroaching upon mudslide (i.e., mudflow) areas, (ii) possibility of public acquisition of land, easements, and development rights to assure the proper development of hillsides, and (iii) advisability of preserving mudslide (i.e., mudflow) areas as open space;
- D. The means of adjusting to the hazard, including the (i) establishment by ordinance of site exploration, investigation, design, grading, construction, filing, compacting, foundation, sewerage, drainage, sub-drainage, planting, inspection and maintenance standards and requirements that promote proper land use, and (ii) provision for proper drainage and sub-drainage on public property and the location of public utilities and service facilities, such as sewer, water, gas and electrical systems and streets in a manner designed to minimize exposure to mudslide (i.e., mudflow) hazards and prevent their aggravation;
- E. Coordination of land use, sewer, and drainage regulations and ordinances with fire prevention, flood plain, mudslide (i.e., mudflow), soil, land, and water regulation in neighboring communities;
- F. Planning subdivisions and other developments in such a manner as to avoid exposure to mudslide (i.e., mudflow) hazards and the control of public facility and utility extension to discourage inappropriate development;
- G. Public facility location and design requirements with higher site stability and access standards for schools, hospitals, nursing homes, orphanages, correctional and other residential institutions, fire and police stations, communication centers, electric power transformers and substations, water and sewer pumping stations and any other public or quasi-public institutions located in the mudslide (i.e., mudflow) area to enable them to withstand mudslide (i.e., mudflow) damage and to facilitate emergency operations; and
- H. Provision for emergencies, including:
 - a. Warning, evacuation, abatement, and access procedures in the event of mudslide (i.e., mudflow),
 - b. Enactment of public measures and initiation of private procedures to limit danger and damage from continued or future mudslides (i.e., mudflow),
 - c. Fire prevention procedures in the event of the rupture of gas or electrical distribution systems by mudslides,
 - d. Provisions to avoid contamination of water conduits or deterioration of slope stability by the rupture of such systems,
 - e. Similar provisions for sewers which in the event of rupture pose both health and site stability hazards, and
 - f. Provisions for alternative vehicular access and escape routes when normal routes are blocked or destroyed by mudslides (i.e., mudflow);
- I. The means for assuring consistency between state, areawide, and local comprehensive plans with the plans developed for mudslide (i.e., mudflow)-prone areas;
- J. Deterring the nonessential installation of public utilities and public facilities in mudslide (i.e., mudflow)-prone areas.

Flood plain management criteria for flood-related erosion-prone areas (44 CFR 60.5):

The Federal Insurance Administrator will provide the data upon which flood plain management regulations for flood-related erosion-prone areas shall be based. If the Federal Insurance Administrator has not provided sufficient data to furnish a basis for these regulations in a particular community, the community shall obtain, review, and reasonably utilize data available from other Federal, State or other sources, pending receipt of data from the Federal Insurance Administrator. However, when special flood-related erosion hazard area designations have been furnished by the Federal Insurance Administrator they shall apply. The symbols defining such special flood-related erosion hazard designations are set forth in §64.3 of this subchapter. In all cases the minimum requirements governing the adequacy of the flood plain management regulations for flood-related erosion-prone areas adopted by a particular community depend on the amount of technical data provided to the community by the Federal Insurance Administrator. Minimum standards for communities are as follows:

When the Federal Insurance Administrator has not yet identified any area within the community as having special flood-related erosion hazards, but the community has indicated the presence of such hazards by submitting an application to participate in the Program, the community shall:

- A. Require the issuance of a permit for all proposed construction, or other development in the area of flood-related erosion hazard, as it is known to the community;
- B. Require review of each permit application to determine whether the proposed site alterations and improvements will be reasonably safe from flood-related erosion and will not cause flood-related erosion hazards or otherwise aggravate the existing flood-related erosion hazard; and
- C. If a proposed improvement is found to be in the path of flood-related erosion or to increase the erosion hazard, require the improvement to be relocated or adequate protective measures to be taken which will not aggravate the existing erosion hazard.

When the Federal Insurance Administrator has delineated Zone E on the community's FIRM, the community shall:

- A. Meet the requirements listed above; and;
- B. Require a setback for all new development from the ocean, lake, bay, riverfront or other body of water, to create a safety buffer consisting of a natural vegetative or contour strip. This buffer will be designated by the Federal Insurance Administrator according to the flood-related erosion hazard and erosion rate, in conjunction with the anticipated "useful life" of structures, and depending upon the geologic, hydrologic, topographic and climatic characteristics of the community's land. The buffer may be used for suitable open space purposes, such as for agricultural, forestry, outdoor recreation and wildlife habitat areas, and for other activities using temporary and portable structures only.

Per 44 CFR 60.24: Planning considerations for flood-related erosion-prone areas (these are not mandatory):

The planning process for communities identified under part 65 of this subchapter as containing Zone E or which indicate in their applications for flood insurance coverage pursuant to §59.22 of this subchapter that they have flood-related erosion areas should include;

- A. The importance of directing future developments to areas not exposed to flood-related erosion;
- B. The possibility of reserving flood-related erosion-prone areas for open space purposes;
- C. The coordination of all planning for the flood-related erosion-prone areas with planning at the State and Regional levels, and with planning at the level of neighboring communities;
- D. Preventive action in E zones, including setbacks, shore protection works, relocating structures in the path of flood-related erosion, and community acquisition of flood-related erosion-prone properties for public purposes;
- E. Consistency of plans for flood-related erosion-prone areas with comprehensive plans at the state, regional and local levels.