Higher Standards Reference Guide

For Local Floodplain Management Regulations

A Guide for Local Officials

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Introduction

The purpose of this Reference Guide is to provide a selection of higher development standards that can be adopted by a community to decrease the likelihood of serious injuries to people and damages to property that result from major flooding. Such injuries and damages have increased over time and continue to do so. Over the past years, many communities have found that the minimum floodplain management standards found in 44 CFR 60.3 were not sufficient to provide the level of safety against flooding they felt was necessary.

The Association of State Floodplain Managers (ASFPM) has established a philosophy and management principle it has entitled "No Adverse Impact (NAI)" to address this need.

> *"No Adverse Impact floodplain management is where the action of one property owner does not adversely impact the rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation."*

From the ASFPM website (www.floods.org), we read the following regarding NAI:

> *Current national floodplain management standards allow for: floodwater to be diverted onto others; channel and over bank conveyance areas to be reduced; essential valley storage to be filled; or velocities changed with little or no regard as to how these changes impact others in the floodplain and watershed. The net result is that through our actions we are intensifying damage potentials in the nation's floodplains. This current course is one that is not equitable to those whose property is impacted, and is a course that has shown to not be economically sustainable.*

To participate in the NFIP in good standing, a community must adopt and enforce at least the minimum standards mandated by Congress in 44 CFR 60.3. However, many communities develop, adopt, and enforce even higher development standards because they have found that new development, based on minimum standards, can still place people and property at risk to flooding. This is especially true in areas where there is a significant flooding history, a high growth rate, coastal areas, or areas with a relatively level topography.

The development, adoption, and enforcement of higher than minimum standards are voluntary, but the wisdom of doing so is becoming more evident with time. Our experience has shown that reasonable higher standards are legally enforceable and are successfully defendable in the courts. FEMA encourages communities to develop higher

flood damage protection policies and standards that a community needs to protect its citizens and property from the disastrous effects of flooding. However, with taking that extra step comes the obligation to enforce the additional standards the community has chosen to adopt. A primary requirement for a community to be eligible to enroll and successfully continue in the NFIP is that of adopting and enforcing the proper development standards. Whether they are the minimum standards mandated by Congress or selected higher standards, through adoption in the form of an ordinance, court order, or some other locally developed regulation (hereafter referred to by the term "ordinance"), they literally become that local community's own laws and should be treated as such.

This Guide was developed to help a community select and adopt those provisions that will provide it with the ability to meet its own unique flood protection needs. It is strongly suggested that before any of these provisions are adopted, the community should consult local legal authority to ensure their ordinance is legal and enforceable within its jurisdiction.

Comments for improving this document are welcome. Please contact Dale Hoff, FEMA Region VI, via email at dale.hoff@fema.dhs.gov.

TABLE OF CONTENTS

Higher Development Standards

Section 1: Elevation (Freeboard) and Floodproofing

Discussion: 44 CFR 60.3(c)(2) requires that the lowest floor of a residential structure be elevated to or above the BFE. 44 CFR 60.3(c)(3) also requires that a non-residential structure be elevated OR be dry-floodproofed to or above the BFE. Although any elevation of a structure decreases risk to flooding, the minimum standards may not be sufficient. Many communities have flood maps with only Approximate A Zones. Perhaps a detailed studied area may have been studied 20 years ago and, over time, may no longer be accurate. There is also the possibility of inaccuracies in determining elevations such as obtaining a BFE directly from the FIRM or the use of altered benchmarks and monuments by the surveyor. Those communities who elect to enforce only the minimum standards leave absolutely no room for error. This can cause problems that may be difficult to correct for both compliance and insurance premium determination purposes. The additional increase in elevation is often called "freeboard" – a term used to describe the safety margin provided above the BFE. Most communities choose a freeboard of 1 to 3 feet above BFE.

PROs:

The additional elevation and/or dry floodproofing of a structure will provide increased safety from flood damages. Freeboard also provides additional safety to compensate for inaccuracies in flood maps, construction, and survey work. Since elevating any structure, whether in or out of the Special Flood Hazard Area (SFHA), decreases its risk to flood damages, it should be one of the first considerations in its construction.

Increasing a structure's elevation also decreases the flood insurance premium.

CONs:

There will be an additional cost to elevate a structure on fill, piles, or columns. However, a reasonable amount of the cost of elevating can be significantly offset by the savings in flood insurance premiums over time. An owner should also consider the potential costs of repairing or replacing a flood damaged home and its contents.

Common Options:

1.1 Require that structures be elevated higher than the minimum standards – also known as "freeboard"
1.2 Elevate structures based on fully developed watershed conditions
1.3 Require that non-residential structures be elevated or dry-floodproofed to a level higher than required
1.4 Require that the lowest floors of manufactured homes be elevated higher than required
1.5 Require the elevation of duct work, plumbing, and electrical components
1.6 Elevation of structures in an A Zone without available BFEs
1.7 Require detailed, engineered BFEs in an A Zone
1.8 Require elevation of a primary entry/exit road
1.9 Requires the elevation of a residential structure outside the SFHA above grade or the crown of a road
1.10 Requires the elevation of a structure outside the SFHA but is near a known flood prone area
1.11 Require residential structures to be elevated sufficiently to be removed from the SFHA
1.12 Require the elevation of all residential structures outside the SFHA

Suggested Ordinance Language:

1.1 New construction and substantial improvement of any residential structure shall have the lowest floor (including basement), elevated to a minimum of **[X feet or inches]** ***above the base flood elevation. A registered professional engineer, architect, or land surveyor shall submit a certification to the Floodplain Administrator***

NOTE for 1.1: most communities increase the required elevation 12, 18, or 24 inches above the BFE.

1.2 New construction and substantial improvement of any residential structure shall have the lowest floor (including basement), elevated to a minimum of **[X feet or inches]** ***above the base flood elevation based upon fully developed watershed conditions. A registered professional engineer, architect, or land surveyor shall submit a certification to the Floodplain Administrator***

NOTE for 1.2: This provision is becoming more common among urban communities. It assumes that all possible development in the SFHA has already occurred and that no additional adverse flooding effects are likely. The terms "fully developed watershed conditions", "ultimate conditions", and "built out" are generally synonymous.

NOTE for 1.2: most communities increase the required elevation 12, 18, or 24 inches above the BFE.

NOTE for 1.2: Some communities have used the term “design flood” in their ordinances to represent the concept of “fully developed” conditions. If so, they have included the definition in the definition section. Suggested wording could be, “Design Flood means the flood having a 1% chance of being equaled or exceeded in any given year based upon fully developed watershed conditions”.

NOTE for 1.2: FEMA will normally map ultimate conditions on the community’s FIRM if the community is willing to pay for the extra expense. It will appear as the Shaded X flood zone.

1.3 New construction and substantial improvements of any commercial, industrial or other nonresidential structure shall either have the lowest floor (including basement) elevated to a minimum of* [X feet or inches] *above the base flood level or together with attendant utility and sanitary facilities, be designed so that the structure is watertight to a minimum level of* [X inches or feet] *above the BFE with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall 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. A record of such certification which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained by the Floodplain Administrator

NOTE for 1.3 flood insurance premiums are rated by deducting 1 foot from the actual level of floodproofing to account for the wicking effect and possible wave action of flood waters. It is always wise to add 1 foot to whatever level to which the community determines a non-residential structure should be floodproofed.

NOTE for 1.3: most communities increase the required elevation 12, 18, or 24 inches above the BFE.

NOTE for 1.3: Your community may want to consider using “fully developed watershed conditions” for elevation purposes rather than the standard BFE. Doing so will decrease flood risk from future development. Reference Provision 1.2 and the associated NOTEs.

1.4 Require that manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM on sites (i) outside of a manufactured home park or subdivision, (ii) in a new manufactured home park or subdivision, (iii) in an expansion to an existing manufactured home park or subdivision, or (iv) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as a result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to a minimum of* [X inches or feet] *above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation,

collapse, and lateral movement.

NOTE for 1.4: most communities increase the required elevation 12, 18, or 24 inches above the BFE.

NOTE for 1.4: a large proportion of the value of a manufactured home is located at or below the floor level. Your community may consider elevating the unit so that the bottom of the lowest horizontal structural member of the chassis is a specified level above the BFE rather than using the floor as the reference point. This can decrease the flood risk significantly.

NOTE for 1.4: this provision is based on 44 CFR 60.3(c)(6)(iv). It allows that a manufactured home that meets the criteria of this paragraph would be considered substantially damaged ONLY if the damage is caused by flooding. In all other situations, substantial damage to any other type of structure may be caused by ANY means, i.e. fire, weather, etc. If a structure in the SFHA is substantially damaged by fire, tornado, etc., the community is required to ensure that it is brought into compliance based on its current floodplain management provisions. Your community may want to consider removing the phrase ". . . as a result of a flood". By doing so, you will place manufactured homes on the same regulatory level as all other structures.

NOTE for 1.4: Your community may want to consider using "fully developed watershed conditions" for elevation purposes rather than the standard BFE. Doing so could decrease flood risk from future development. Reference Provision 1.2 and the associated NOTEs.

1.5 All new and substantially improved residential structures shall have the ductwork, and exposed plumbing and electrical components elevated to or above the BFE.

NOTE for 1.5: This provision ensures that any service components for the structure are elevated to avoid flood risk. It is especially an important consideration for manufactured homes.

NOTE for 1.5: Additional elevation above the BFE should be considered.

NOTE for 1.5: Your community may want to consider using "fully developed watershed conditions" for elevation purposes rather than the standard BFE. Doing so could decrease flood risk from future development. Reference Provision 1.2 and the associated NOTEs.

1.6 If a structure is to be constructed in an Approximate A Zone, and a detailed BFE is unavailable, the lowest floor of the structure shall be elevated a minimum of* [X inches or feet] *above the highest adjacent grade.

NOTE for 1.6: the most common elevation for this provision is 12, 24, or 36 inches.

NOTE for 1.6: Use this provision ONLY if this development falls BELOW the threshold required by 44 CFR 60.3(b)(3), which states that any development that exceeds 5 acres or 50 lots must include BFE data. Minimum standards do not require the determining of BFEs if the development falls below this threshold. This provision is a better and safer option for communities who do not wish to require the development of BFEs (see 1.7 below). However, there is no substitute for a detailed BFE to ensure the safety of a structure. An accurate, detailed BFE should be sought whenever possible and reasonable. Also, avoid using this provision for high value structures or where the flood risk to people may be greater.

NOTE for 1.6: 44 CFR 60.3(b)(3) is interpreted to mean that detailed, engineered BFEs are required for development in an A Zone that exceeds the 5 acre/50 lot threshold where structures will be constructed. Reference FEMA - 265 "Managing Floodplain Development in Approximate A Zone Areas".

NOTE for 1.6: Development of BFEs in an Approximate A Zone can be confusing. Reference FEMA - 265 "Managing Floodplain Development in Approximate A Zone Areas" for clarification as to when to use simplified versus detailed methods to determine BFEs.

1.7 When a residential or non-residential structure is intended to be constructed in an Approximate A Zone, a BFE must be determined by using the same engineering standards and methods that are used to develop BFEs in a Flood Insurance Study (FIS).

NOTE for 1.7: this provision removes the 5 acre/50 lot threshold stated in 44 CFR 60.3(b)(3). It essentially directs that when ANY structure is constructed in the Approximate A Zone, BFEs must be determined by using detailed methods.

1.8 At least one primary entry road to a residential structure shall be elevated to or above the BFE to allow entry and exit of vehicles during a base flood event.

NOTE for 1.8: this provision is intended primarily for access to homes on rural or large lots that are a significant distance from the primary road. It may also be used for non-residential structures if desired. It is especially important for emergency vehicle access if the occupants are elderly or in ill health.

1.9 The lowest floor of a residential structure that is outside of the SFHA shall be elevated* (X inches) *above the natural grade or the crown of the road, whichever is higher.

NOTE for 1.9: most communities require an additional elevation of 12 or 24 inches.

NOTE for 1.9: it is common for structures located near elevated road beds to flood, whether or not they are in the SFHA. Your community should revise the elevation and distance noted in this provision to account for site unique conditions.

NOTE for 1.9: a requirement could also be added to require elevation above the crown of the road if the structure is a predetermined distance from the road. Suggest 75 to 200 feet.

1.10 If a new or substantially improved residential structure is constructed outside the SFHA but is within (X feet) of the centerline of a known but unmapped water course (including an intermittent water course) on the community's FIRM, then it shall be elevated so that the lowest floor (including basement) is a minimum of* [X inches or feet] *above the highest adjacent grade.

NOTE for 1.10: it is recommended that a community adopt a distance of 100 – 500 feet from the centerline of the stream

NOTE for 1.10: Most communities require an additional elevation of 12 or 24 inches.

NOTE for 1.10: this provision accounts for those areas on the community's FIRM that are known to be flood prone but are not designated as SFHA. It usually occurs on a stream or watercourse that has not been studied. The community should also consider the site conditions to determine if 100 feet is a sufficient distance from the water course.

NOTE for 1.10: this provision should also be considered for non-residential structures.

1.11: All new and substantially improved residential structures located in the SFHA shall be elevated to a level that will make them eligible to be removed from the SFHA. They shall be elevated so that the lowest adjacent grade is equal to or higher than the BFE. The BFE must be determined by using detailed study methods.

NOTE for 1.11: many home owners believe that if they follow the elevation requirements of the local community (who uses minimum standards), they are also removed from the SFHA. This is not the case. Where minimum standards require that the lowest floor be elevated to the BFE for compliance purposes, the structure must actually be elevated so that the lowest adjacent grade (LAG) is at or above the BFE to make it eligible to be removed from the SFHA. In many cases, only a few more inches of elevation may be required. The removal process is not complete until the proper Letter of Map Change (LOMC) is submitted to FEMA and the final document returned to the requestor. Mandatory purchase of flood insurance is normally no longer required once the structure has been removed. However, flood insurance should still be considered and the premium will be significantly lower.

Note for 1.11: Be careful to not adversely affect nearby structures when using fill to elevate new or substantially damaged structures.

NOTE for 1.11: this provision should also be considered for non-residential structures.

1.12: All residential structures that are constructed outside the SFHA shall be elevated* (X inches or feet) *above the highest adjacent grade.

NOTE for 1.12: most communities require an additional elevation of 12 to 24 inches.

NOTE for 1.12: this provision is especially valuable for areas with relatively level topography or in any area where flooding is known to occur or may be expected. The community should require an elevation that is suitable for the local conditions.

NOTE for 1.12: this provision should also be considered for non-residential structures.

Section 2: Regulatory Floodplains and Floodways

Discussion:

In addition to requiring additional elevation for structures to decrease the risk to flood damages, a community may choose to alter selected factors used to identify a regulatory floodplain or floodway. Another option is to increase the development requirements within and/or outside the SFHA. Your community may also elect to restrict or prohibit certain activities within these areas. The most common higher standards usually involve the use of fill to elevate structures or the community may choose to restrict or prohibit certain activities in the SFHA.

PROs:

The best possible use of the regulatory floodplain is always to avoid ANY development in the SFHA and maintain that area in as much of a natural state as possible. With decreasing availability of land to build on, and the ever increasing pressure of development in the SFHA, most communities find this unrealistic. The next best approach is to understand and utilize the appropriate management measures proposed by No Adverse Impact (NAI) practices. By wisely managing the development and use of the regulatory floodplains and floodways, risk of flood damages is significantly decreased.

CONs:

Developers and property owners may view these management methods as restrictions and prohibitions that result in local government's overregulation of their businesses. They may perceive that it is government that is delaying their projects and costing them money. Depending on how the community conducts its own floodplain management "business", most of these perceptions, true or not, can be alleviated. The community

must enforce its flood damage prevention provisions as directed in its ordinance, to ensure the relative safety of any new development within its jurisdiction. But it is also necessary to ensure that the developers and property owners understand the community's expectations up front so they can project those factors into their planning, design, and costs prior to the beginning of construction. The best way to ensure this occurs is for the community to develop and wisely use an effective floodplain development permitting system.

Common Options:

2.1 Prohibit development within a regulatory floodway
2.2 Prohibit structures in the regulatory floodway
2.3 Prohibit the drilling of water, gas, or oil wells in the floodway
2.4 Require that no fill may be placed in the floodway.
2.5 Require that hazardous materials not be stored in the regulatory floodway
2.6 Redefine the definition of a floodway by a number less than 1 foot. The result would be larger floodways.
2.7 Require that the entire SFHA be managed in the same manner as a floodway.
2.8 A certain percentage of the property in the SFHA must remain undeveloped
2.9 Allow fewer structures on larger lots in the SFHA
2.10 Requires open space in the SFHA
2.11 Require a study to be done for development in the floodway fringe
2.12 Requires compensatory storage for fill and other development in the SFHA
2.13 Requires certain actions (compaction, etc) when fill is placed in the SFHA
2.14 Prohibits all fill in a coastal zone
2.15 Requires a drainage study for development, in or out of the SFHA

Suggested Ordinance Language:

General NOTE for Development in the Regulatory Floodway: remember that no development is allowed in the floodway unless an engineering study is first conducted that confirms that it will not result in a rise in BFE. Reference: 44 CFR 60.3(d)(3).

2.1 All development, in any form, is prohibited within the boundaries of the regulatory floodway as delineated on the community's FIRM.

NOTE for 2.1: This is an admirable requirement if it can reasonably be enforced. But it may be unrealistic. The NFIP definition of development, as stated in 44 CFR 59.1, states, *"**Development** means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."* That essentially prohibits any man-made activity in the floodway, to include building a road, a fence, a structure – anything. Most communities will find that prohibitions in the floodway should be more selective rather than so universal.

2.2 Structures of any description are prohibited within the boundaries of the regulatory floodway as delineated on the community's FIRM.

NOTE for 2.2: Prohibiting the building of structures in the regulatory floodway can be a good method of reducing flood risk. The provision includes residential and non-residential structures. It also includes manufactured homes and gas or liquid storage tanks. See the definition of "structure" in 44 CFR 59.1. Your community may be selective in this requirement by prohibiting only certain types of structures and allowing others. For instance, the prohibition of construction of hospitals, fire stations, police stations – anything considered a critical facility in the floodway should be considered.

2.3 The drilling of water, gas, and/or oil wells is prohibited within the boundaries of the regulatory floodway as delineated on the community's FIRM.

NOTE for 2.3: the drilling of water, gas, and/or oil wells anywhere in the SFHA can cause serious problems if flood waters are allowed to enter the well's below ground area. This prohibition may also be considered for the entire SFHA.

2.4 Fill material of any kind is prohibited within the regulatory floodway as delineated on the community's FIRM.

NOTE for 2.4: prohibiting fill in the floodway would not only be for structural support, but also for landscaping or any other purposes. This prohibition may also include the entire SFHA.

NOTE for 2.4: your community should be sensitive to the effects of this provision. It would effectively eliminate the use of fill for elevating structures of any kind. Structures would have to be elevated on piles, columns, or piers if they are allowed at all.

2.5 The storage of hazardous materials, in any form, is prohibited within the boundaries of the regulatory floodway as delineated on the community's FIRM.

NOTE for 2.5: your community may want to consider this requirement for the entire SFHA.

NOTE for 2.5: it may be important for your community to define the term "hazardous materials" before adopting this provision.

2.6 A regulatory floodway shall be selected and adopted based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than* [X inches or X% of a foot] *at any point.

NOTE for 2.6: In defining the size of the floodway, the increase in BFE must not exceed 1 foot. However, by decreasing the measurement to something less than 1 foot, the size

of the floodway increases, thus making the overall SFHA more restrictive. Most communities that use this provision will use either .5 or .75 foot. In order to properly use this provision, the floodway must be restudied to determine the corrected floodway contours and then be remapped.

NOTE for 2.6: In addition to redefining the size of the floodway, the community may also want to consider combining one or more of provisions 2.1 through 2.5 noted above.

2.7 Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the SFHA 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.

NOTE for 2.7: This provision requires that before ANY development occurs within ANY SFHA in the community, an engineering study must be conducted to demonstrate that the effects of that development will not create any rise in BFE, anywhere within the community. The resulting certification is often referred to as the "Zero or No Rise Certificate", although no specified certificate format exists. This provision essentially requires the same standards in any SFHA that are normally reserved only for the regulatory floodway by minimum standards.

2.8 A minimum of* (X%) *of the area within any given SFHA in the community must remain in its undeveloped condition and free of impermeable surfaces.

NOTE for 2.8: this provision would allow fewer obstructions to the flow of floodwaters and more open space for property owners.

NOTE for 2.8: 30% to 60% is recommended.

NOTE for 2.8: Your community may wish to consider a combination of provisions 2.8, 2.9, and 2.10.

NOTE for 2.8: this provision is similar to 2.10 with the exception that 2.8 requires no development of any kind where there may be some allowable uses in 2.10.

2.9 New and substantially improved residential structures and subdivision designs in the SFHA shall consist of one structure on lots no smaller than* (X) *acre(s).

NOTE for 2.9: creates low-density development and leaves space for the flow of flood waters.

NOTE for 2.9: lots are generally 1 acre or more. It is important to determine a lot size that is reasonable and compliments the general use of the surrounding lands.

NOTE for 2.9: Your community may wish to consider a combination of provisions 2.8, 2.9, and 2.10.

2.10 Subdivision proposals shall reserve a minimum of (X%) ***of open space in the community's SFHA***.

NOTE for 2.10: this provision allows for open space to be reserved for selected improvements that will have minimal effect, if any, on the flow of flood waters. Your community may also want to specifically designate what uses will be allowed for the space reserved, ie., parks, ball fields, hiking trails – or totally open space with no development at all.

NOTE for 2.10: it is recommended that 10% to 30% of open space be reserved.

NOTE for 2.10: Your community may wish to consider a combination of provisions 2.8, 2.9, and 2.10.

NOTE for 2.10: this provision is similar to 2.8 with the exception that 2.8 requires no development of any kind where there may be some allowable uses in 2.10.

2.11 Before development may occur within the floodway fringe area, a hydrologic and hydraulic study must be accomplished to determine the effects of such development. Those effects shall not exceed any of the provisions of this ordinance.

NOTE for 2.11: Minimum standards require that a "no rise" engineering study be accomplished for any type of development that occurs in the regulatory floodway. However, no study is required when development occurs within the fringe areas of the floodway (the area of the SFHA that remains, excluding the floodway). When large amounts of fill are introduced into the fringe area, the flow characteristics of the watercourse, as shown on the FIRM, are usually altered. These effects should become known to ensure that flood risk is not increased of transferred to other locations.

2.12 When fill or any other development are placed in the SFHA that have the effect of reducing the storage volume of flood waters in the SFHA, then an equal amount of storage volume must be created in another location of the same SFHA to compensate for the storage capacity lost.

NOTE: 2.12: This provision is used by many communities. When development occurs in the SFHA, it is usually in the form of introducing fill to elevate structures or some other type of development that essentially removes flood water storage capacity in the SFHA. Since this storage capacity is one of the most important factors in effectively controlling the effects of flooding, it must be replaced. This provision ensures that flood water storage capacity is maintained in the as-mapped condition. It is commonly referred to as "compensatory storage".

2.13 If fill material is to be used to elevate any structure in Zones A, A1-30, AE, AO, AH, AR, or A99, the following will apply:

- ***a. Fill material must be compacted to at least 95% of Standard Laboratory Maximum Density (Standard Proctor) according to ASTM Standard D-698;***
- ***b. Fill soils must be fine grained soils of low permeability, such as those classified as CH, CL, SC, or ML according to ASTM Standard D-2487, "Classification of Soils for Engineering Purposes". See Table 1804.2 in the "2000 International Building Code (IBC)" for descriptions of these soils types.***
- ***c. The fill material must be homogeneous and isotropic; that is, the soil must be all of one material, and the engineering properties must be the same in all directions.***

NOTE for 2.13: The provision above is taken verbatim from Technical Bulletin #10, "Ensuring that Structures Built on Fill In or Near Special Flood Hazard Areas are Reasonably Safe from Flooding". Some community officials consider FEMA Technical Bulletins to be "guidance" documents, and in that light, the guidance in them is deemed to be optional, not mandatory. In other words, a community official may choose to accept or reject the guidance found in any Technical Bulletin and it is not considered mandatory for compliance purposes. This wording was located in 44 CFR 65.5, making it a regulatory requirement, but was removed in 2002 and placed in the newly developed Technical Bulletin #10. The fill requirements noted above should be considered to be mandatory. Including this language in a local ordinance will remove any doubt as to whether it is guidance or mandatory to meet compliance requirements.

2.14 Fill material is prohibited in Zones V, V1-30, VE, or VO

Note for 2.14: Fill material is prohibited in coastal SFHAs for structural support by minimum standards. This provision increases that prohibition to include fill for any purpose.

2.15 A drainage study shall be conducted for all subdivisions of any size or development covering* (X) *or more acres within or outside of the SFHA. Flood waters originating within these areas shall not be allowed to drain from the area described in higher quantities or flow rates than existed under pre-development conditions. This shall be accomplished by the proper design and construction of detention, retention, and/or drainage systems.

NOTE for 2.15: the community should adopt whatever area is desired here. 5 acres is recommended.

NOTE for 2.15: a problem caused by adopting only minimum standards occurs when large developments (residential subdivisions, malls, etc) are constructed outside the SFHA without any consideration for the potentially massive amounts of additional runoff created by the introduction of impervious surfaces and re-grading during the development of the project. The result can be more floodwaters, flowing faster, and in higher

quantities, into the local watercourses. BFEs are elevated. The maps are no longer accurate. Structures downstream that are shown to be outside the SFHA are flooding with increasing frequency and severity. In short, damaging floods are occurring downstream when not expected, by development occurring upstream and outside the SFHA. This provision is one way of alleviating this concern.

NOTE for 2.15: The proper design and use of these systems is intended to ensure that flood waters remain onsite (detention) or remain for a specified period of time and then are released in a measured or time-phased manner (retention). It is important for communities, especially neighboring communities, to coordinate the design and construction of retention systems. If the timing of floodwater releases is not coordinated or designed properly, it can possibly cause even more serious flooding problems downstream when artificially created surges arrive at the same time. Detention and retention methods are not the cure-all for all flooding problems, but they can be effective if designed and constructed properly.

NOTE for 2.15: The physical sizes of these projects should be adjusted to meet the unique requirements of the community and its neighboring jurisdictions.

Section 3: Miscellaneous Program Standards

Discussion:

In addition to increasing the provisions that affect the physical, on-the-ground aspects of the SFHA, the community may also increase existing or add programmatic regulatory provisions in the ordinance. They are normally procedural in nature but, when combined with the provisions in Sections 1 and 2, may significantly decrease the risk of flood damages.

Additional definitions are also recommended to help clarify some of the issues that may be unclear in the NFIP Regulation.

PROs:

Adding the suggested definitions will help clarify some of the issues and program elements that may not be clearly defined in the regulations. They will also assist local officials understand more clearly some of the expectations required by various NFIP regulations and guidance documents.

The suggested provisions are intended to (1) allow communities to require mitigating actions to damaged properties earlier than required by minimum standards,
(2) administratively simplify the management of floodplains and make it more effective,

and (3) allow policy holders access to additional insurance funds under certain circumstances.

CONs:

Some developers and property owners (and also a few community officials) feel that the minimum standards are good enough, and anything above that is unnecessary and possibly even overkill. Also, additional development requirements usually translate into increased costs – thus lower profits. They seldom understand the often unseen savings gained by requiring additional protective provisions that result in lower damage and replacement costs.

Common Options:

3.1 Add a definition for "Base Flood Elevation (BFE)"
3.2 Add a definition for "Reasonably Safe From Flooding"
3.3 Add a definition for "Residential Structure"
3.4 Add a definition for "Non-residential Structure"
3.5 Add a definition for "Enclosure"
3.6 Establish a cumulative process for following substantial improvements and damages
3.7 Require a more restrictive (lower) threshold for determining substantial improvement and damage
3.8 Require structures constructed in the Shaded X Zone be elevated
3.9 Require the use of the Elevation Certificate
3.10 Exempt small, accessory structures from elevation and floodproofing requirements
3.11 Include special ordinance language to allow ICC funds to be available for repetitive loss structures

Suggested Ordinance Language:

3.1 Add a definition for "Base Flood Elevation (BFE)": ***Base Flood Elevation (BFE) means the elevation shown on the Flood Insurance Rate Map (FIRM) and found in the accompanying Flood Insurance Study (FIS) for Zones A, AE, AH, A1-A30, AR, V1-V30, or VE that indicates the water surface elevation resulting from the flood that has a 1% chance of equaling or exceeding that level in any given year – also called the Base Flood.***

3.2 Add a definition for "Reasonably Safe From Flooding": ***``Reasonably safe from flooding'' means base flood waters will not inundate the land or damage structures to be removed from the SFHA and that any subsurface waters related to the base flood will not damage existing or proposed buildings.***

NOTE for 3.2: This definition is taken verbatim from 44 CFR 65.2(c).

NOTE for 3.2: Although the term "reasonably safe from flooding" has been found in 44 CFR 60.3(a)(3) since the NFIP's earliest days, a definition was first placed in 44 CFR 65.2(c) in 2002 in conjunction with the issuing of Technical Bulletin #10, "Ensuring that Structures Built on Fill In or Near Special Flood Hazard Areas are Reasonably Safe from Flooding". The term, and what it represents, have received much more emphasis since 2002. For instance, certain Letters of Map Change (LOMCs) require a local official to sign and certify that a specific project is "reasonably safe from flooding" on the application or it will not be issued. Placing this definition in a local ordinance clarifies the concept significantly.

NOTE for 3.2: notice that proper floodplain management must also consider the effects of "subsurface waters" if they are related to the base flood. Reference Technical Bulletin #10.

3.3 Add a definition for "Residential Structure": ***A Residential Structure is one that is considered to be a domicile or is used for residential purposes for 6 months or more. Residential structures include a single family home, multiple unit apartment buildings, a residential condominium, or a manufactured or modular home.***

3.4 Add a definition for "Non-Residential Structure": ***A Non-Residential Structure includes, but is not limited to: small business concerns, churches, schools, farm buildings (including grain bins and silos), poolhouses, clubhouses, recreational buildings, mercantile structures, agricultural and industrial structures, warehouses, hotels and motels with normal room rentals for less than 6 months' duration, and nursing homes.***

3.5 Add a definition for "Enclosure": ***An enclosure is a fully enclosed area below the lowest floor that is usable solely for parking of vehicles, building access or storage in an area other than a basement. To qualify as an enclosure, the area must meet the non-elevation design requirements of 44 CFR 60.3. See also the definition of "lowest floor".***

3.6 A structure shall be deemed to be substantially improved or substantially damaged when the cumulative costs of the improvements or damage repairs, when combined incrementally over a 10-year period of time, equal or exceed 50% of the market value of the structure.

NOTE for 3.6: The community's determination that a structure is substantially improved or damaged will require that the structure be mitigated and brought into compliance with the community's current floodplain standards. Under minimum standards, each improvement or damage event may fall just below the 50% level, thus allowing it to remain at high risk to flood damages through multiple events. This provision allows the

costs to build over a specific period of time and require the structure to be mitigated much sooner. Also, some builders and property owners who are familiar with the minimum standard, purposely allow incremental improvements to be made that fall just below the 50% threshold. By doing so, they can thwart the intent of the law. This provision will eliminate that maneuver. The primary difficulty with enforcing this provision is that the community must maintain records for each structure to track the costs.

NOTE for 3.6: the inclusion of a period of time (10 years) is optional but advised.

NOTE for 3.6: A community may want to combine the provisions for 3.6 and 3.7

3.7 A structure shall be deemed to be substantially improved or substantially damaged when the costs of the improvements or damage repairs equal or exceed* [X% - something less than the standard 50%] *of the market value of the structure.

NOTE for 3.7: The community should select a reasonable percentage that is less than 50%. The results would be that the structure would need to be mitigated and brought to compliance with the community's current ordinance with less damage than normally required. Most communities choose a percentage within the range of 25% to 40%.

NOTE for 3.7: A community may want to combine the provisions for 3.6 and 3.7

3.8 Residential structures constructed within the shaded X Zone shall be elevated so the lowest floor is* (X feet) *or more above the natural grade.

NOTE for 3.8: The most common elevation is 1 foot above grade. Elevation to 18 inches or 2 feet should also be considered based on the unique characteristics of the location.

NOTE for 3.8: this provision may also be applied to non-residential structures.

NOTE for 3.8: The shaded X Zone has the same meaning as Zone B on earlier flood maps.

3.9 All elevation requirements noted in this ordinance shall be documented using the Elevation Certificate, FEMA 81-31, and shall be certified by a registered professional engineer, surveyor, or architect, and shall be submitted to the Floodplain Administrator.

NOTE for 3.9: consult your state laws to determine who is qualified to certify an Elevation Certificate in your State.

3.10 Small, detached accessory structures of 400 sq feet or less and valued at $3,000 or less are exempt from the requirements to elevate or dry flood proof non-residential structures. They may be used only for limited parking of light vehicles and storage of low cost items.

NOTE for 3.10: If your community chooses to adopt this provision, you should reference the section concerning accessory structures in Technical Bulletin 7-93, "Wet Floodproofing Requirements". Accessory structures of any size or value, are considered non-residential structures and, by regulation, must be elevated or floodproofed. According to Technical Bulletin 7-93, these structures may be exempted from the elevation and floodproofing rules but it must be done, on an individual basis, by variance. By placing this provision in your local ordinance, you may avoid the variance process for individual structures.

NOTE for 3.10: Technical Bulletin 7-93 states that the community must establish the meaning of "low cost" and "small" accessory structures. The suggested ordinance language noted above should be altered to reflect the community's definition of these terms, if required.

NOTE for 3.10: to be eligible to exempt a structure from the non-residential rules, the following must occur:

1. It must be anchored to resist flotation, collapse, and lateral movement.
2. The portions of these structures located below the BFE must be constructed of flood-resistant materials
3. It must b designed to allow for the automatic entry and exit of flood waters.
4. Mechanical and utility equipment must be floodproofed to or above the BFE.
5. Its use must be limited to parking and/or limited storage.

3.11 Specific language is required in a community's local ordinance for policy holders to be eligible to obtain Increased Cost of Compliance (ICC) flood insurance funds to mitigate a structure designated to be a repetitive loss. Your community must select 1 of the following 2 options:

Option 1:

Adopt the Following Definition:

> ***"Repetitive Loss" means flood related damage sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25% of the market value of the structure before the damage occurred."***

AND

Modify the "Substantial Improvement" Definition as Follows:

> ***"Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals***

or exceeds 50% of the market value of the structure before the "start of construction" of the improvement. The term includes structures which have incurred "repetitive loss" or substantial damage, regardless of the actual repair work performed."

Option 2:

Modify the "Substantial Damage" Definition as Follows:

"Substantial Damage" means 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% of the market value of the structure before the damage occurred. "Substantial Damage" also means flood related damage sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each flood event, on the average, equals or exceeds 25% of the market value of the structure before the damage occurred.

NOTE for 3.11: communities need to make sure that these definitions are tied to the floodplain management requirements for new construction and substantial improvements and to any other requirements of the ordinance, such as the permit requirements, in order to enforce this provision.

NOTE for 3.11: an ICC Claim Payment is ONLY made for flood related damage. The Substantial Damage part of the definition must still include "damage of any origin" to be compliant with the minimum NFIP Floodplain Management Regulations.

NOTE for 3.11: this provision is only required to trigger an ICC payment for repetitive loss. No ordinance changes are needed for the ICC coverage for substantial damage.

NOTE for 3.11: the primary source for the information noted above is "Increased Cost of Compliance Coverage: Guidance for State and Local Officials", FEMA-301, September 2003

Section 4: Administrative Standards

Discussion:

This section includes selected administrative policies and procedures that may not fit comfortably in a local ordinance. Therefore, ordinance language is not provided. Many communities find that they can avoid problems by administering these policies and procedures as part of their flood damage protection program.

These procedures should be promulgated in written form so they can be considered official policies, should they ever be questioned. Consult with your community's State NFIP Coordinator or local FEMA Region Mitigation Directorate for suggested wording if needed.

PROs:

These policies and activities can substantially improve the effective management of the community's flood damage prevention program if used properly and conscientiously. Greater flood protection can be realized. They may also provide the community, as well as property owners, with increased legal protection.

CONs:

These requirements will translate into added effort and record keeping. However, the benefits should completely outweigh the extra work.

Common Options:

4.1 Require that 1316 actions (flood insurance prohibitions) be entered into the county records.

It is an unfortunate, yet a common experience, for an unsuspecting buyer to purchase a home that has had 1316 action placed on it by the community. They discover, after the fact that flood insurance cannot be purchased through the NFIP. Even though they may have paid cash for the structure, a future prospective buyer may not be able to, or desire to. It is very possible, if not likely, for a buyer to go through the entire purchase process and never be aware that the home had been flooded or constructed in a non-compliant manner. One of the most effective ways for a community to ensure that potential buyers are informed of distressed properties is to attach such action to the title or place a formal notice in the county records so the negative information on the structure will be discovered during the title search.

4.2 Require the use of the Elevation Certificate

a. Require that the Elevation Certificate be used whenever such information is required for compliance purposes. This is requirement is already in place for CRS communities
b. Require that ECs that are obtained for insurance purposes are shared with the community
c. Require photos for all uses, not just insurance

4.3 Require real estate agents to disclose flood risk of properties listed

a. Is the property in the SFHA

b. Is the property in the Floodway
c. What Zone is the property in and what that means
d. Previous or current flood insurance policies on the structure

4.4 Require surveys and plats to reflect SFHA delineations

4.5 Enclosure limits: prohibit *all* enclosures or limit the enclosure area

NOTE: enclosures can provide functionality to the structure or even be invaluable to the owner while still meeting all compliant standards. However, they can possibly place the structure above at more risk to flood damages if not designed or constructed properly. A few owners also illegally alter the enclosure and/or use it for non-compliant purposes. Probably the most significant factor in determining the desired size of an enclosure is the way flood insurance premiums are rated for structures in coastal areas. For an enclosure of 299 square feet or less in a coastal area, the rate is relatively high because coastal premiums are high anyway. However, the rate for 300 or more square feet increases radically, to an amount considered to be excessive by many owners. It is important for coastal owners to be aware of this fact.

4.6 Arrange for utility providers (electric, gas, etc) or septic inspectors to notify community floodplain administrators when they notice new development beginning in the areas they serve. Sometimes, this is the quickest way to discover that unpermitted development is occurring in an SFHA

4.7 Prohibit, or require higher standards for the construction of "critical facilities" in the 500-year floodplain (shaded X or B zones). These structures include but are not limited to police and fire departments, EOCs, hospitals, schools, nursing homes, etc.

4.8 Require property owners to routinely mow and remove debris from properties in SFHAs to minimize drainage and flooding problems.

4.9 Place in the community's statutes an allowance for community officials or employees to enter private property to survey the conditions of the regulatory floodplains and to provide maintenance as required.

NOTE: this can be a highly sensitive issue. States and communities have differing laws that affect private property rights. On the other hand, if the community owns or has an easement for its watercourses, the officials still need to access those areas to manage their floodplains properly.