



# Floodplain Management Requirements for Agricultural Structures and Accessory Structures

FEMA Floodplain Management Bulletin P-2140

July 2020



FEMA

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## 1. Introduction

This floodplain management bulletin clarifies and refines the requirements that apply to certain agricultural structures and accessory structures proposed to be located in Special Flood Hazard Areas (SFHAs). These requirements are set forth by the Federal Emergency Management Agency (FEMA) in FEMA Policy #104-008-03: Floodplain Management Requirements for Agricultural Structures and Accessory Structures (referred to in this bulletin as “the Policy”). The Policy is included in Appendix A. This bulletin is a reference for floodplain managers and those involved in regulating, planning, designing, and constructing agricultural structures and accessory structures in SFHAs.

The regulations of the National Flood Insurance Program (NFIP) form the basis for floodplain management regulations adopted by communities that elect to participate in the program. Communities adopt floodplain management regulations to safeguard public health, safety, and general welfare and to minimize public and private losses caused by flooding.

The NFIP regulations specify requirements that apply to new construction, substantial improvement of structures, and repair of substantially damaged structures. The requirements for non-residential structures specify that those buildings must be properly elevated or dry floodproofed to or above the Base Flood Elevation (BFE). All residential structures must be elevated to or above the BFE.

The NFIP regulations do not provide explicit requirements for agricultural structures and accessory structures. Therefore, those structures are regulated as non-residential structures. However, FEMA recognizes that the inherent design and function of some agricultural structures and accessory structures may mean the structures have low damage potential and, as such, methods of flood protection other than elevation and dry floodproofing may be appropriate in some circumstances.

The NFIP regulations define **community** to include 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.

The terms **agricultural structure** and **accessory structure**, and some other terms used in the bulletin, are defined in Chapter 2.

This bulletin helps readers identify agricultural structures and accessory structures for floodplain management purposes, by:

- Describing the design and construction measures that are required when new construction and substantially improved structures are wet floodproofed rather than elevated or dry floodproofed.
- Laying out the limitations on use of wet floodproofing for agricultural structures and accessory structures.

- Defining the mechanisms available to communities that elect to allow wet floodproofed agricultural structures and accessory structures are defined.
- Providing information about NFIP flood insurance coverage for agricultural structures and accessory structures.

This bulletin primarily addresses floodplain management requirements of planning, designing, constructing, and regulating agricultural structures and accessory structures. To fully understand the impacts of the various design options, property owners and farm operators should consult with:

- Local floodplain managers and building code officials
- Local planning and zoning board or officials
- Professional engineers, architects, and land surveyors
- State, tribal, and territorial NFIP coordinators
- FEMA regional offices.

Table 1 provides a “big picture” snapshot of the contents of this bulletin.

**Table 1: Eligibility of Structures for Wet Floodproofing**

Structure Type	Method	Considerations	Examples
Other Structures, Non-Agricultural Structures, and Other Development	BY PERMIT	Communities must issue permits in accordance with floodplain management regulations and building codes and must require residential and non-residential structures to be elevated or dry floodproofed.	<ul style="list-style-type: none"><li>▪ Residential structures</li><li>▪ Non-residential structures</li><li>▪ Pole barns, hoop houses, gazebos, shade structures</li><li>▪ Manure-holding ponds and lagoons</li><li>▪ Ponds, aquaria, and raceways without walls and roofs</li></ul>

Structure Type	Method	Considerations	Examples
Agricultural Structures and Accessory Structures NOT ELIGIBLE for Wet Floodproofing	BY PERMIT	Communities must issue permits in accordance with floodplain management regulations and building codes and must require residential and non-residential structures to be elevated or dry floodproofed.	<ul style="list-style-type: none"> <li>▪ Not used exclusively for agricultural purposes</li> <li>▪ Places of employment or entertainment (workshop, wine tasting, farm store)</li> <li>▪ More than low damage potential (physical damage, contents damage, loss of function)</li> </ul>
Accessory Structures (Small, Low Damage Potential) ELIGIBLE for Wet Floodproofing	BY PERMIT	<p>Communities must issue permits and should adopt regulations that:</p> <ul style="list-style-type: none"> <li>▪ Include only small, low damage potential</li> <li>▪ Define accessory structures as incidental to a principal structure on the same property</li> <li>▪ Specify size consistent with FEMA's recommendations</li> <li>▪ Define wet floodproofing construction requirements</li> </ul>	<ul style="list-style-type: none"> <li>▪ Garden and storage sheds</li> <li>▪ One-story two-car garages (A zones)</li> <li>▪ 100 square feet (V zones)</li> </ul>

Structure Type	Method	Considerations	Examples
Agriculture Structures and Accessory Structures ELIGIBLE for Wet Floodproofing*	BY VARIANCE	<p>Communities must process requests for variances in accordance with floodplain management regulations and should adopt regulations to guide consideration of variances to specify:</p> <ul style="list-style-type: none"> <li>▪ Agricultural structures used exclusively for agricultural purposes</li> <li>▪ Low damage potential (physical damage, contents damage, loss of function)</li> <li>▪ Minimal or mitigated risks and dangers to public health, safety, and welfare</li> <li>▪ Wet floodproofing construction requirements</li> </ul>	<ul style="list-style-type: none"> <li>▪ Walled and roofed agricultural structures used exclusively for agricultural purposes</li> <li>▪ Accessory structures larger than recommended size limits</li> <li>▪ Agricultural and accessory structures that have low damage potential</li> <li>▪ Agricultural and accessory structures that do not pose risks to public health, safety, and welfare (no manure storage or any volatile, toxic, or water-reactive materials)</li> </ul>

\*Or by permit, if community applies for and FEMA approves Community-Wide Exception, in which case communities must adopt regulations

## 1.1. The National Flood Insurance Program

The National Flood Insurance Act (NFIA), as amended (42 United States Code [U.S.C.] §§ 4001 et seq.), and 44 Code of Federal Regulations (C.F.R.) Parts 59–60 establish general rules regarding community eligibility and participation in the NFIP, community management of development in floodplains, and the availability of Federal flood insurance. A fundamental requirement is that communities must “require permits for all proposed construction or other development” to determine whether the proposed activities are within floodprone areas (44 C.F.R. § 60.3(a)(1)). Those authorities also establish the minimum design and construction standards for all structures and development in SFHAs in communities that participate in the NFIP.

## 1.2. Statute, Regulations, and Published Guidance that are Clarified and Refined by the Policy and this Bulletin

FEMA guidance that was published before the release of the Policy and this bulletin did not fully account for the wide range of uses and types of agricultural structures and the specificities of the agricultural industry as it has changed over the past 25 years. The Policy and the guidance in this bulletin:

- Give greater clarity on how to identify agricultural structures and accessory structures that may be approved under specific conditions to be wet floodproofed instead of requiring those structures to be elevated or dry floodproofed.
- Provide guidance on construction methods and requirements when wet floodproofing is allowed.
- Describe options available to communities to authorize wet floodproofing of agricultural structures and accessory structures, including issuing permits (only small accessory structures); granting variances on a case by case basis; or by seeking FEMA approval of a community-wide exception that allows issuing permits rather than case-by-case variances.

Following the guidance in this bulletin and FEMA Policy #104-008-03 satisfies only the NFIP floodplain management requirements.

Credits or reductions in NFIP flood insurance premiums **may not be provided** when agricultural structures and accessory structures are wet floodproofed in accordance with this guidance.

Appendix B includes a table that briefly describes some of the FEMA guidance documents cited in this bulletin, the NFIP statute, and pertinent NFIP regulations as they relate to agricultural structures and accessory structures. The table describes clarifications and refinements embodied in the Policy and this bulletin. This reference will assist those who want to compare previous guidance to the guidance in this bulletin. Appendix D lists full titles and links to download referenced publications.

## **2. Definitions of Agricultural Structures and Accessory Structures**

This chapter provides key definitions and terms used in this bulletin and the Policy. Specific definitions for agricultural structures and accessory structures for floodplain management purposes are included, along with examples and decision charts to help floodplain managers and others apply the definitions. Differences and similarities between agricultural structures and accessory structures are illustrated.

### **2.1. Key Definitions and Terms**

The NFIP regulations (44 C.F.R. § 59.1) define many terms, while various FEMA guidance publications define and describe other terms. Key definitions and terms used in this bulletin are defined and described in this section; the definition for “agricultural structure” is in Section 2.1.9; and the definition for “accessory structure” is in Section 2.4.

#### **2.1.1. BASE FLOOD ELEVATION (BFE)**

The BFE is the computed elevation to which floodwater is anticipated to rise during the Base Flood. The Base Flood is the flood having a one percent chance of being equaled or exceeded in any given year.

- Where FEMA has performed detailed studies, flood insurance studies include detailed information and flood insurance rate maps (FIRMs) show BFEs.
- Where FEMA has not performed detailed studies, FIRMs do not show BFEs and communities must determine whether they can use information from other sources to regulate development in SFHAs.

#### **2.1.2. DEVELOPMENT**

For floodplain management purposes, development means any manmade 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. NFIP communities are required to regulate development in SFHAs. The term includes structures and buildings. Many construction projects associated with agriculture and aquaculture are development, even if they do not meet the definition of “structure” shown below; examples include livestock pens, open fish tanks and raceways, temporary tents or shade structures, and pole barns.

#### **2.1.3. DRY FLOODPROOFING**

Dry floodproofing is a combination of measures that results in structures, including attendant utilities and equipment, being watertight with all elements substantially impermeable to the entrance of floodwater and with structural components having the capacity to resist flood loads.

#### **2.1.4. LOW DAMAGE POTENTIAL**

FEMA does not establish a precise definition of the term “low damage potential.” Property owners, farm operators, and local officials should consider various elements that contribute to damage potential when evaluating whether wet floodproofing measures are acceptable for new agricultural structures and accessory structures, and substantial improvement or repair of substantial damage of those structures, instead of elevation and dry floodproofing. At least three elements of flood-related damage should be considered:

- **Physical Damage.** In general, the amount of physical damage incurred by a structure increases as the depth of floodwater increases. Similarly, the amount and type of damage incurred increases when floodwater is fast moving (high velocity) or has waves. Flooding also saturates building materials, which may mean materials have to be replaced. Inundated mechanical and electrical equipment may not be easily repaired. Another component of physical damage is caused by floodborne debris impacts, which also increase as velocity increases and when waves are breaking waves. A damaged wet-floodproofed building might contribute debris to floodwater, which could damage nearby buildings. In general, the greater the replacement cost of the portion of a structure that is exposed to flooding, the greater the cost to repair or replace damaged elements.
- **Contents Damage.** The value/type of content is another element to consider when evaluating damage potential. Structures permitted to be wet floodproofed are designed to flood, which means contents of those structures will get wet unless owners take action to relocate the contents before the onset of flooding.
- **Loss of Function.** Two additional elements to consider when evaluating damage potential is how a structure is used and how long it may be out of service if damaged by flooding.

#### **2.1.5. LOWEST FLOOR**

The lowest floor means the lowest floor of the lowest enclosed area of a structure, including a basement. Any NFIP-compliant unfinished or flood-resistant enclosure below an elevated building that is used solely for parking of vehicles, building access, or storage (in an area other than a basement) is not considered the lowest floor. The most obvious NFIP requirements for buildings in SFHAs are raising lowest floors to or above the BFE in flood zones identified as A zones (A, AE, A1-30, AH, AO, A99, and AR) and elevating the bottom of the lowest horizontal structural member of the lowest floor to or above the BFE in flood zones identified as V zones (V, VE, V1 30, and VO). In A zones, non-residential buildings may be dry floodproofed to or above the BFE. Flood zones are described in Section 3.1.

#### **2.1.6. SPECIAL FLOOD HAZARD AREA (SFHA)**

The SFHA is the land in the floodplain that is subject to a flood that has a one percent or greater chance of flooding in any given year, called the Base Flood. SFHAs shown on FIRMs are areas where NFIP floodplain management regulations must be enforced and the Federal requirement for federally

regulated and insured lenders to require purchase of flood insurance applies. “SFHA” and “floodplain” are used interchangeably in this bulletin. Examples of FIRMs and flood zone designations are shown in Section 3.1.

### **2.1.7. STRUCTURE**

For floodplain management purposes, a structure is a walled and roofed building that is principally above ground, where walled is considered “two or more outside rigid walls” and roofed is “a fully secured roof.” The term includes gas and liquid storage tanks and manufactured homes. The terms “structure” and “building” are used interchangeably in the NFIP regulations and this bulletin.

Floodplain managers must use professional judgement to determine which proposed development projects are “walled and roofed,” and thus regulated as structures, and which proposed projects are regulated as development. Examples of walled and roofed structures are shown in Section 2.3, and examples of development including structures that do not have walls and structure that do not have roofs are included in Section 2.5.

### **2.1.8. WET FLOODPROOFING**

Wet floodproofing is the use of flood damage resistant materials and construction techniques to minimize flood damage to structures by intentionally allowing floodwater to enter and exit automatically (without human intervention) to minimize unequal pressure of water on walls (called hydrostatic load or pressure). Wet floodproofing also requires structures to be anchored to resist flooding, have mechanical and utility equipment elevated or protected, and have flood openings installed in walls. Construction requirements for wet floodproofing are outlined in Section 3.2.

Use of **wet floodproofing measures** for flood protection is limited to:

- Enclosures used solely for parking, building access, or storage below elevated buildings
- Historic structures and functionally dependent uses (both defined by the NFIP), when authorized by variances
- Agricultural structures and accessory structures when communities authorize those structures in accordance with this bulletin.

### **2.1.9. FLOODWAY**

The floodway is the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation of the base flood by more than a designated height.

In general, floodwater is deeper and flows faster in floodways than in adjacent floodway fringe areas. When feasible, development and structures should be located outside of floodways.

### **2.1.10. VARIANCE**

The NFIP regulations define variance as a grant of relief by a community from the terms of a floodplain management regulation.

### **2.1.11. REPETITIVE LOSS STRUCTURES (RLS)**

Repetitive loss structure is a structure covered by an NFIP flood insurance policy that has incurred flood-related damage on two occasions during a 10-year period ending on the date of the event for which the second claim is made, in which the cost of repair, on average, equaled or exceeded 25 percent of the value of the structure at the time of each flood event.

### **2.1.12. SUBSTANTIAL DAMAGE (SD) AND SUBSTANTIAL IMPROVEMENT**

Substantial damage is damage of any origin 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. Structures that incur substantial damage must be brought into compliance with the requirements for new construction.

Substantial improvement is 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. Structures that are substantially improved must be brought into compliance with the requirements for new construction.

## **2.2. Definition of Agricultural Structure for Floodplain Management Purposes**

### **2.2.1. AGRICULTURAL STRUCTURES**

For floodplain management purposes, “agricultural structures” are structures that are used exclusively for agricultural purposes or uses in connection with the production, harvesting, storage, raising, or drying of agricultural commodities and livestock. Some structures used for aquaculture are considered agricultural structures (see Section 2.3.2). Structures used for human habitation and those that are places of employment or entertainment, and structures with multiple or mixed purposes, do not satisfy the “exclusive use” requirement described below and are not agricultural structures.

Section 2.3 includes a decision chart and examples to help floodplain managers and others determine whether proposed projects qualify as agricultural structures. Structures that are not agricultural structures (or accessory structures, see Section 2.4) must be designed and constructed to meet or exceed the NFIP requirements for structures in SFHAs. The differences and similarities between agricultural structures and accessory structures are illustrated in Section 2.6.

## **2.2.2. AGRICULTURAL COMMODITIES**

For the purposes of this bulletin, the term “agricultural commodities” means agricultural goods, products, commodities, and livestock. Examples of agricultural commodities include, but are not limited to, harvested crops, aquaculture products, livestock, and animal products. Floodplain managers should use professional judgment when deciding whether contents of agricultural structures are agricultural commodities.

## **2.2.3. AGRICULTURAL PURPOSES OR USES (“EXCLUSIVE USE”)**

For the purposes of this bulletin, the term “agricultural purposes or uses” refers to using agricultural structures exclusively in connection with the production, harvesting, storage, raising, or drying of agricultural commodities and livestock. Structures that house tools or equipment used in connection with these purposes or uses are also considered to have agricultural purposes or uses.

Because agriculture is an industry and therefore farms are places of work, it is understood that entry into agricultural structures is necessary. The “exclusive use” limitation is satisfied when the principal use of an agricultural structure does include occupation by people over extended periods of time (e.g., office or communal area for farm workers). Processing and production of agricultural commodities outside of harvesting, storage, raising, or drying are not considered agricultural purposes or uses. Examples of other processing and production activities include distilling, brewing or fermenting beverages, baking or cooking, leather tanning, packaging, and similar production processes. Structures used for those processes are places of employment and are not agricultural structures for the purposes of this bulletin.

Human habitation, such as a permanent or temporary residence or seasonal living quarters for workers, is not considered an agricultural purpose or use.

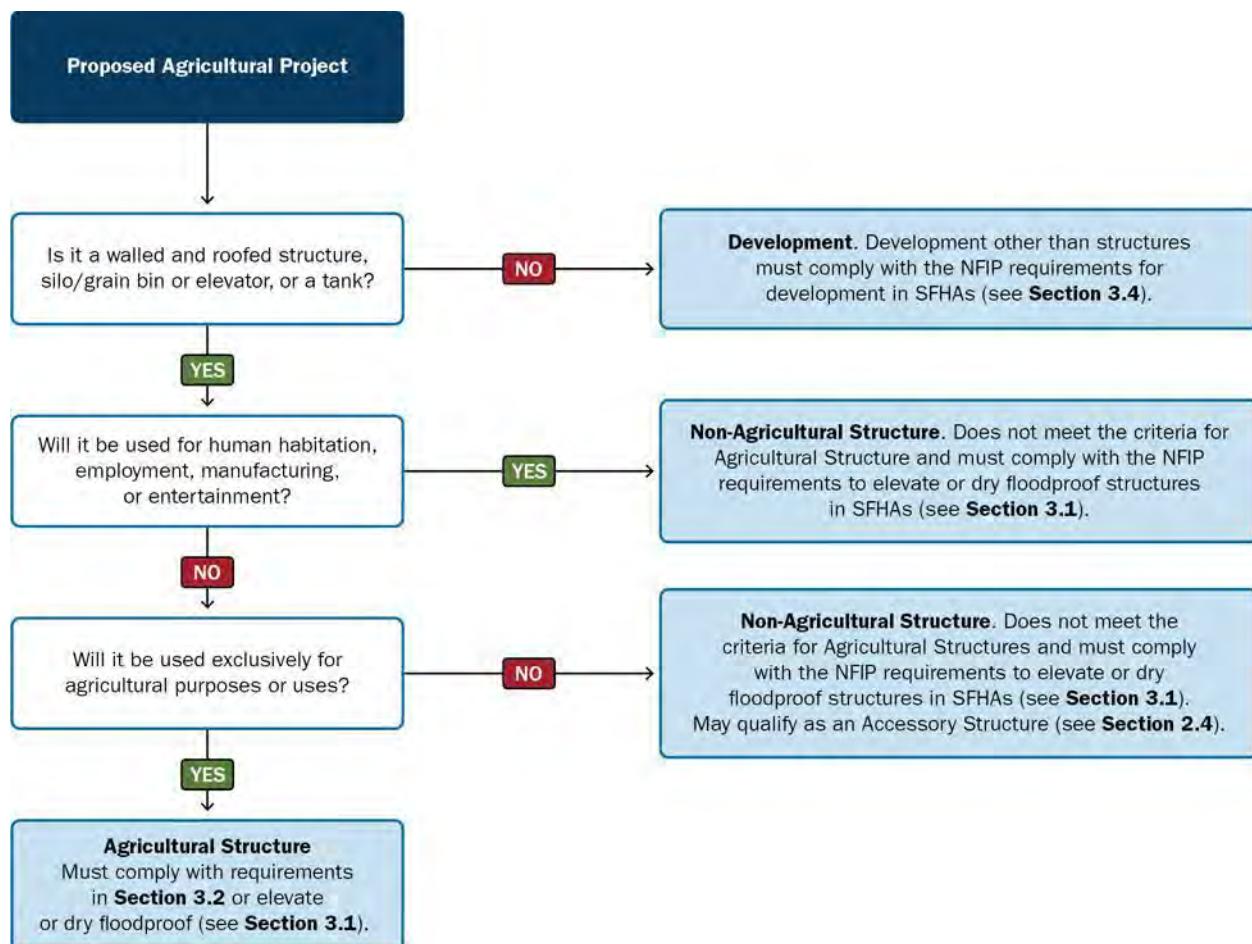
## **2.2.4. NON-AGRICULTURAL STRUCTURES**

Some buildings and structures are related to agricultural purposes and uses, but do not meet all the criteria to be considered agricultural structures for floodplain management purposes. This bulletin refers to structures that are not agricultural structures as “non-agricultural structures.” Section 2.3 includes a decision chart and examples to help floodplain managers and others determine whether proposed projects are non-agricultural structures or agricultural structures. Non-agricultural structures must be designed and constructed to meet the NFIP requirements for structures in the SFHA, briefly described in Section 3.1.

Structures with mixed uses, where one or more use is not exclusively agricultural, are not agricultural structures for floodplain management purposes.

## 2.3. Applying the Definition for Agricultural Structures

This section applies the definition for agricultural structure and related terms, described in Section 2.1.9, to illustrate examples of agricultural structures, non-agricultural structures, and agricultural development. Figure 1 is a decision chart to help floodplain managers and others determine whether proposed projects qualify as agricultural structures. Chapter 4 describes options communities have for considering and granting variances with specific conditions to allow wet floodproofed agricultural structures without requiring compliance with the elevation or dry floodproofing requirements.



**Figure 1: Determining When A Proposed Project Is an Agricultural Structure**

### 2.3.1. EXAMPLES OF AGRICULTURAL STRUCTURES

The structures shown in Figure 2 and Figure 3 are examples of agricultural structures that are within the scope of this bulletin, because they are walled and roofed and are used exclusively in connection with agricultural purposes. Whether these agricultural structures may be wet floodproofed depends on other factors, described in Section 4.3. Structures that are not agricultural structures are subject to the floodplain management requirements described in Section 3.1, and the requirements for development in SFHAs are described in Section 3.4.



**Figure 2: Agricultural Structure for Equipment and Storage, with Flood Openings (Source: Steve Samuelson, Kansas NFIP Coordinator)**



**Figure 3: Horse Barn with Storage**

### **Silos and Grain Elevators**

Silos are towers that store grain and silage, and grain elevators are towers with interior mechanisms to move grain. For floodplain management purposes, silos and grain elevators are agricultural structures with rigid walls and roofs (see Figure 4). A variety of materials and construction methods are used for these structures. Section 3.1 describes several factors to consider when determining how best to protect silos and grain elevators and their contents from flood damage.



**Figure 4: Welded-Seam Silo (Left) May Be Watertight; Bolted-Plate Silo (Right) Is Not Watertight**

### Fuel, Gas, and Liquid Storage Tanks

Aboveground and underground fuel, gas, and liquid storage tanks exposed to flooding may be dislodged if they are not installed to account for flood forces (see Figure 5). Options for installing tanks in SFHAs are described in Section 3.1.

Because of risks to public health, safety, and welfare, locate tanks used to store fuel, gas, and water-reactive or hazardous chemicals outside of SFHAs where feasible. Otherwise, design tanks with extra precautions to minimize risks, such as elevating higher than the BFE.

Gas and liquid storage tanks are not insurable structures under NFIP flood insurance policies.



**Figure 5: Buoyancy Forces Dislodged Two 10,000-Gallon Underground Fuel Tanks**

### 2.3.2. EXAMPLES OF AQUACULTURE STRUCTURES

Aquaculture involves the cultivation of aquatic organisms, such as fish, shellfish, plants, and algae, in all types of water under controlled or semi-controlled conditions. For floodplain management purposes, FEMA considers aquaculture to be farming that is conducted in water. Therefore, the definition for agricultural structures includes aquaculture structures.

Figure 6 shows aquaculture taking place on land, with tanks and related equipment in a walled and roofed structure. This type of structure meets the definition for agricultural structure and thus is subject to the same requirements applied to agricultural structures.

Processing facilities for aquaculture products are places of employment and are not agricultural structures for floodplain management purposes and this bulletin. Processing facilities must be elevated or dry floodproofed to meet the NFIP minimum requirements for non-residential structures based on flood zone (see Section 3.1).

Other structures and development associated with aquaculture, such as fabric tents, covers, and enclosures; ponds and open aquaculture tanks/pools, aquaria, and raceways; and other structures without walls and roofs, are development and subject to the floodplain management requirements described in Section 3.4.



**Figure 6: Agricultural Structure Housing Aquaculture Tanks and Equipment (Source: USDA Agricultural Research Service)**

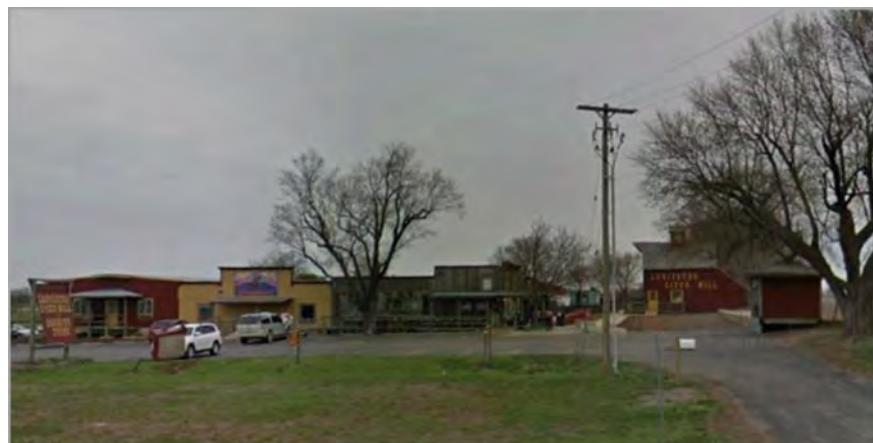
### 2.3.3. EXAMPLES OF NON-AGRICULTURAL STRUCTURES

Non-agricultural structures are structures that may be related to agriculture or located on farms but do not meet the definition of agricultural structure for the purposes of floodplain management and therefore are not eligible for wet floodproofing. The structures shown in Figure 7 through Figure 10 are examples of non-agricultural structures. When proposed to be located in SFHAs, these and similar non-agricultural structures must be elevated or dry floodproofed (see Section 3.1). Examples include:

- Structures that relate to agricultural purposes or uses but are not used exclusively for agricultural purposes
- Structures with mixed uses where one or more uses are not purely agricultural, such as a barrel storage room that is also used as a tasting room or a barn that has office space or is used for entertainment or private parties
- Structures that are places of employment
- Dwellings and other structures used for human habitation, including worker dormitories.



**Figure 7: Agricultural Equipment and Supply Store**



**Figure 8: Apple Farm, Cider Mill, and Farm Goods Store Open to the Public**



**Figure 9: Winery Building with Tasting Room Used for Entertainment Purposes**



**Figure 10: Structure Used for Processing Nuts**

#### **2.3.4. EXAMPLES OF AGRICULTURAL AND AQUACULTURE DEVELOPMENT**

Structures that are related to agricultural uses but are not agricultural structures for floodplain management purposes are regulated as development (defined in Section 2.1). Examples include livestock pens (may be walled but not roofed), pole barns and livestock shelters (roofed but not walled), and holding ponds or lagoons. Similarly, structures that are related to aquaculture uses but are not agricultural structures are regulated as development.

Figure 11 and Figure 12 show examples of agricultural development. The NFIP requirements for development other than buildings and structures are summarized in Section 3.4. Farmers and farm operators planning to pursue agricultural development in SFHAs, and owners and operators of aquaculture facilities planning to pursue aquaculture development in SFHAs, should consult with

local floodplain managers and appropriate state, tribal, or territorial authorities to discuss requirements.



**Figure 11: Round, Unroofed Manure Storage (Source: Tim McCabe, USDA National Agricultural Library – 2011)**



**Figure 12: Pole Barn Without Walls (Source: USDA Agricultural Research Service)**

### 2.3.5. GREENHOUSES

Greenhouses may be made with a variety of materials, including glass roofs and walls, light-transmitting rigid plastic or fiberglass roofs and walls, framing with transparent coverings, or combinations of those materials. When proposed to be located in SFHAs, greenhouses with flexible material forming the sides (see Figure 13) and those that are not walled and roofed are not

considered structures for floodplain management purposes related to wet floodproofing requirements. However, they are floodplain development and must meet NFIP development requirements (see Section 3.4).

Greenhouses with rigid walls should be elevated, dry floodproofed, or wet floodproofed in accordance with the requirements applicable to agricultural structures described in Section 3.2.



**Figure 13: Greenhouse with Flexible Sides and Removable “Roof”**

## **2.4. Definition of Accessory Structure for Floodplain Management Purposes**

### **2.4.1. ACCESSORY STRUCTURES**

For floodplain management purposes, accessory structures are structures that are on the same parcel of property as a principal structure, the use of which is incidental to the use of the principal structure. For floodplain management purposes, accessory structures must be used for parking or storage, be small and represent a minimal investment by owners, and have low damage potential (described in Section 2.1). FEMA considers size limits based on flood zone, where “small” means not larger than a one-story two-car garage in flood zones identified as A zones (A, AE, A1-30, AH, AO, A99, and AR) and not larger than 100 square feet in flood zones identified as V zones (V, VE, V1 30, and VO). Examples of small accessory structures include, but are not limited to, detached garages, storage and tool sheds, and small boathouses.

- **Structure Size.** The footprint of a typical two-car garage is about 600 square feet in area.
- **Limited Storage.** Contents stored in wet floodproofed structures will get wet during flooding. Some communities specify “limited storage.”

Many structures that may be considered accessory in nature under local zoning ordinances and other regulations are not accessory structures for floodplain management purposes because they are not used only for parking or storage. Development or structures that are not accessory structures for floodplain management purposes must be designed and constructed to meet or exceed the NFIP requirements for development or buildings in SFHAs (see Section 3.4 and Section 3.1, respectively). Examples of structures and development that are accessory in nature but are not accessory structures for floodplain management purposes include:

- Structures for which any part is used for human habitation
- Detached garages and carriage houses with a portion used as an apartment or a guest house (whether as a permanent residence or temporary living quarters)
- Structures used for employment and those accessible by the public
- Structures used for entertainment (such as workshops, recreational rooms, or game rooms)
- Gazebos, pergolas, and carports that are not walled and roofed.

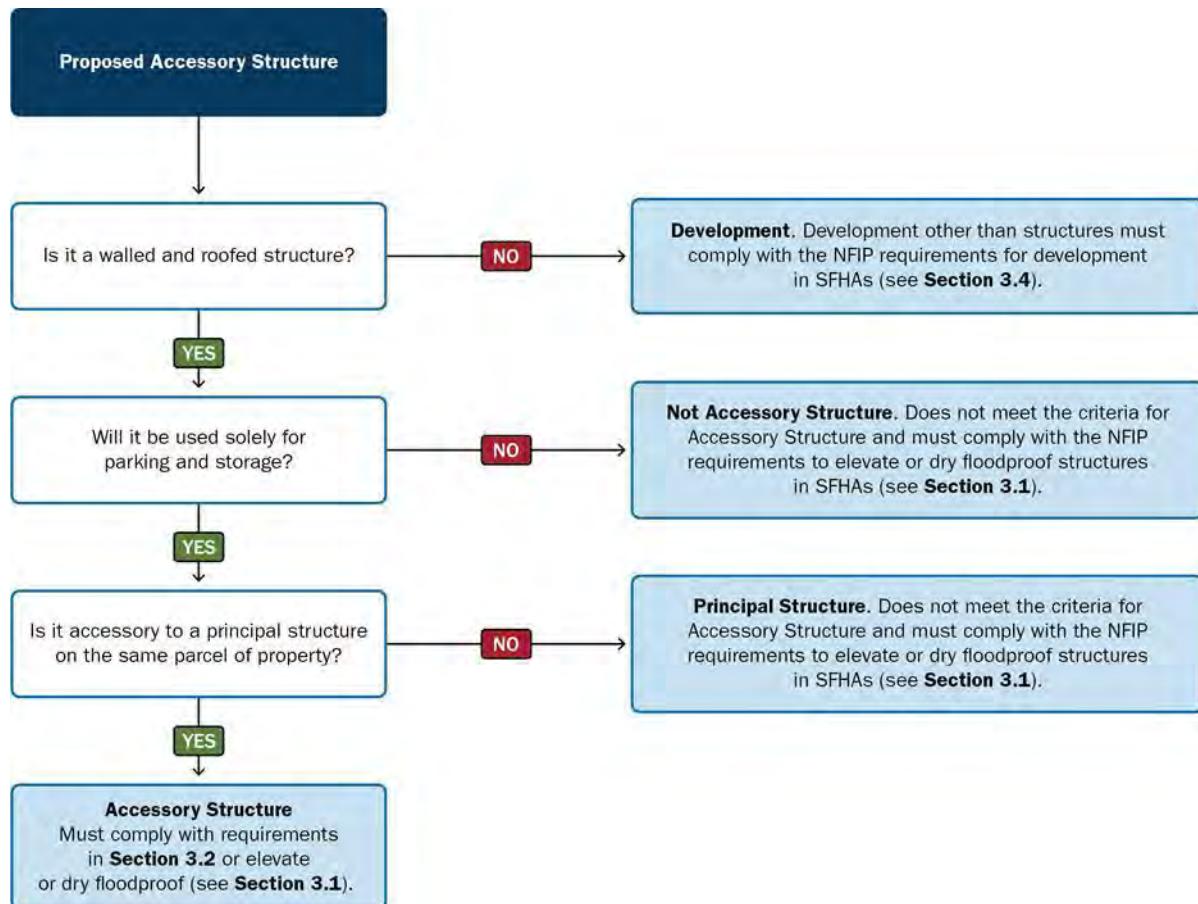
The differences and similarities between agricultural structures and accessory structures are illustrated in Section 2.6.

#### **2.4.2. STRUCTURES THAT ARE NOT ACCESSORY STRUCTURES**

Structures that are not accessory structures as defined in this section must be designed and constructed to meet the NFIP requirements for structures in SFHAs (briefly described in Section 3.1). When a parcel of land has only one structure, that structure is the principal structure, even if it would otherwise meet the definition for accessory structure based on size and use. In these cases, the structures must be elevated or dry floodproofed, unless owners apply for and are granted variances to allow the structures to be wet floodproofed.

### **2.5. Applying the Definition for Accessory Structure**

This section applies the definition for accessory structure and related terms to several examples to illustrate the difference between accessory structures, structures that are not accessory structures, and development. The decision chart in Figure 14 may help floodplain managers and others determine whether proposed projects qualify as accessory structures. Chapter 4 describes options communities have for issuing permits for small wet floodproofed accessory structures and for granting variances with specific conditions to allow larger wet floodproofed accessory structures, rather than requiring compliance with the elevation or dry floodproofing requirements.



**Figure 14: Determining When a Proposed Project Is an Accessory Structure**

### 2.5.1. EXAMPLES OF ACCESSORY STRUCTURES

The structure shown in Figure 15 is an accessory structure because it is walled and roofed; located on the same parcel of property as a principal structure and is incidental to the principal structure; small with low damage potential; and used for storage or parking.



**Figure 15: Storage Shed, with Flood Openings (Source: Kevin Wagner, Maryland Department of the Environment)**

### 2.5.2. EXAMPLES OF NON-ACCESSORY STRUCTURES AND DEVELOPMENT

Some structures are incidental or related to the primary structure on a parcel, but are not accessory structures for floodplain management purposes (defined in Section 2.4). These structures must be designed and constructed in accordance with floodplain management requirements based on whether the structure is residential, non-residential, or development (not walled and roofed).

The structure shown in Figure 16 is not an accessory structure as defined in this bulletin.



**Figure 16: Elevated Accessory Residential Structure, with Enclosure**

When an accessory dwelling is proposed, it must be regulated as a residential structure, and enclosures below the elevated dwelling must comply with the use limitations and construction requirements for enclosures. Figure 17 shows an example of development that is not walled and roofed.

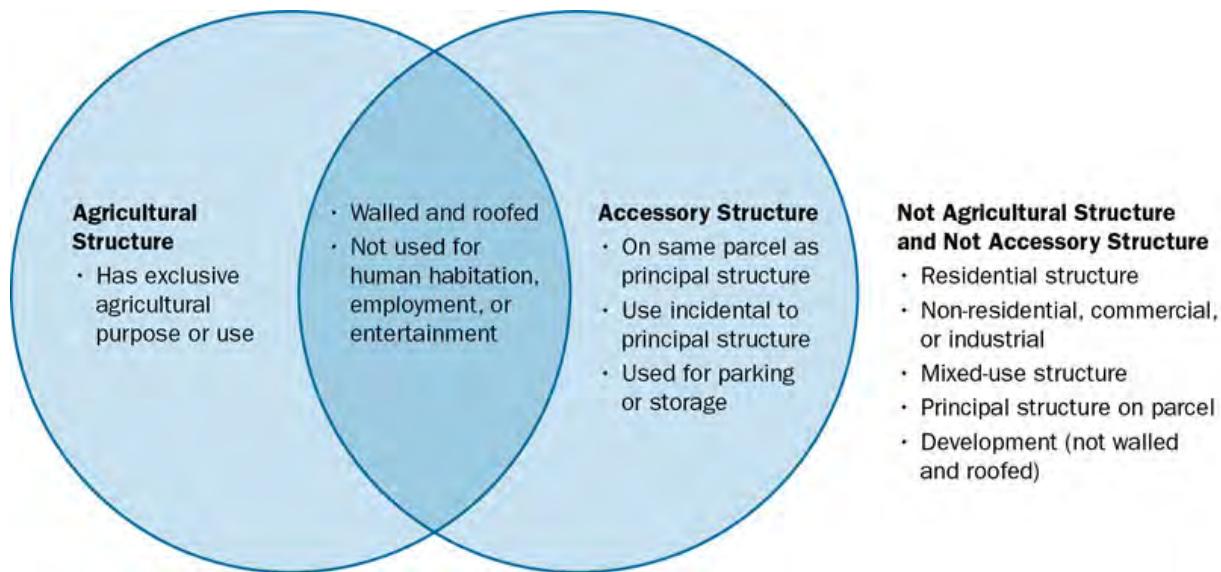


**Figure 17: Accessory Development; Gazebo with Roof but No Walls**

## **2.6. Differences and Similarities Between Agricultural Structures and Accessory Structures**

An agricultural structure may be an accessory structure, and an accessory structure may be an agricultural structure. The differences and similarities between agricultural structures and accessory structures are illustrated in Figure 18. Other than use, the most significant difference is that agricultural structures are not required to be located on the same parcel of land as a principal structure. Some agricultural structures may be the principal structure or only structure on the parcel. If a proposed project meets the definitions and use requirements of both agricultural structures and accessory structures, local officials may choose whether to regulate the structure as an agricultural structure or an accessory structure.

For floodplain management purposes, agricultural structures and accessory structures have separate definitions (see Section 2.1.9 and Section 2.4), but they are not mutually exclusive. A structure could be agricultural, accessory, or both.



**Figure 18: Differences and Similarities Between Agricultural Structures and Accessory Structures**

### 3. Floodplain Management Requirements for Agricultural Structures and Accessory Structures

Communities that participate in the NFIP agree to regulate development in SFHAs and require permits for that development. Those communities have adopted floodplain management regulations that meet or exceed the minimum requirements outlined in NFIP regulations (44 C.F.R. § 60.3). Specific requirements for structures depend on the flood zone and whether structures are residential or non-residential. Agricultural structures and accessory structures are regulated as non-residential structures.

Some states exempt agricultural structures or structures on farms from state and local building and zoning codes. This exemption does not exempt agricultural structures from floodplain management regulations administered by communities that participate in the NFIP.

FEMA recognizes that the types of construction and materials used to build many agricultural structures and accessory structures mean some of those structures inherently have low damage potential (described in Section 2.1). This differentiates these structures from other non-residential structures, such as factories, churches, retail and office buildings, and schools. Notably, post-flood recovery for most agricultural structures and accessory structures typically requires only cleaning, minor repairs, and repairs to put mechanical and electric equipment back in service.

State or local requirements that are more restrictive or stringent than the minimum requirements of the NFIP take precedence. This bulletin and other FEMA publications provide guidance on the minimum NFIP requirements and describe best practices.

Design professionals, builders, and property owners should contact local officials to determine whether more restrictive requirements apply to buildings or sites in question. All other applicable requirements of state or local building codes must also be met for buildings in SFHAs.

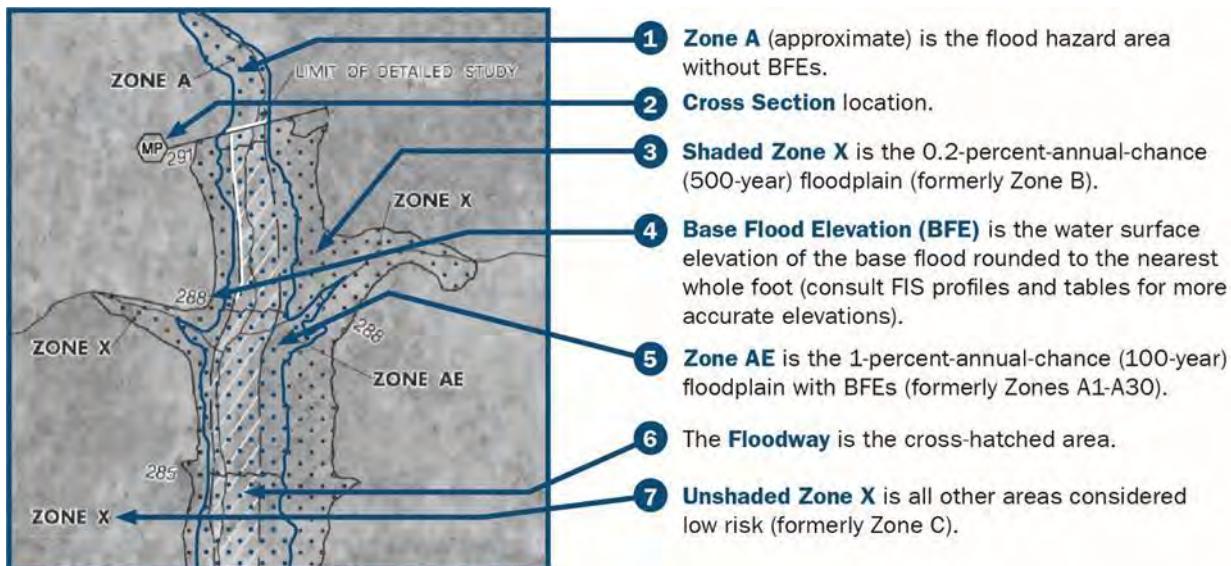
This chapter describes the requirements that apply to structures and development in SFHAs based on the minimum NFIP regulations and the Policy. Specifically:

- Section 3.1 summarizes the basic NFIP design and construction requirements for buildings and structures, based on flood zone, including elevation and dry floodproofing.
- Section 3.2 describes the construction requirements for wet floodproofing.
- Section 3.3 describes combining elevation with wet or dry floodproofing.
- Section 3.4 summarizes requirements for development other than buildings.

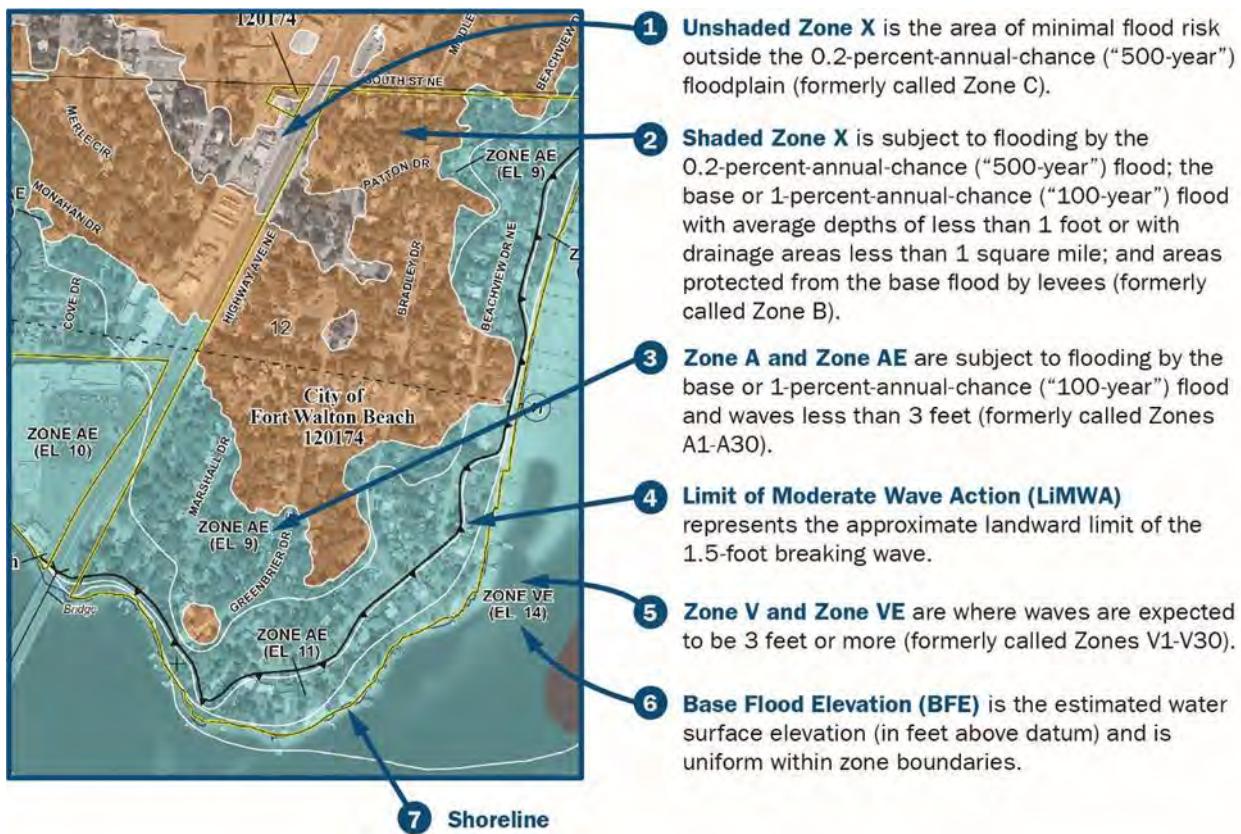
### 3.1. Basic Design and Construction Requirements Based on Flood Zone

FIRMs produced by FEMA depict SFHAs and insurance risk premium zones. Figure 19 and Figure 20 show examples of FIRMs with flood zone terminology:

- Areas identified as Zones A, AE, A1 30, AH, AO, A99, and AR are collectively called Zone A or A zones.
- Areas identified as Zones V, VE, V1 30, and VO are coastal high-hazard areas that collectively are called Zone V or V zones.
- Areas identified as Zone X (shaded and unshaded, formerly identified as Zones B and C) are outside of SFHAs and not subject to floodplain management regulations.
- A Flood Insurance Study (FIS) or Flood Elevation Study (FES) is an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations.



**Figure 19: Example FIRM Showing Riverine Flood Zone Terminology**



**Figure 20: Example FIRM Showing Coastal Flood Zone Terminology**

- **Substantial damage** is damage of any origin 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** is 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.

Substantially damaged and substantially improved structures must be brought into compliance with the requirements for new construction.

The basic requirements for new construction in SFHAs for substantially improved structures and when structures incur substantial damage by any cause include:

- Foundations must resist flood forces.
- Flood-damage-resistant materials must be used below the BFE.
- Equipment and machinery, including electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities, must be elevated, dry floodproofed, or

specifically designed to prevent water from entering or accumulating within the components during flooding.

- Lowest floors must be elevated to or above the BFE or flood depth in all A zones (A, AE, A1-30, AH, AO, A99, and AR) (see Figure 21 and Figure 22). In all V zones (V, VE, V1 30, and VO), the bottom of lowest horizontal structural members of lowest floors must be elevated to or above the BFE.
- In all A zones, non-residential structures may be designed to be watertight (dry floodproofed) if properly designed and certified by registered professional engineers or architects. FEMA P-936, Floodproofing Non-Residential Buildings, provides guidance and design specifications for dry floodproofing.

Two standards produced by the American Society of Civil Engineers and referenced by building codes are useful:

- ASCE 24, Flood Resistant Design and Construction, a standard of practice accepted by FEMA
- ASCE 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures, the standard of practice for determining loads, including flood loads

- In all V zones, foundation design and elevation requirements are more stringent because of the added forces of wave action, and designs must be certified by registered professional engineers or architects.
- Enclosures below elevated structures must be used only for parking, storage, and building access and must have flood openings (in all A zones) or breakaway walls (in all V zones).
- If located in floodways, documentation must be provided to show the floodway encroachment provisions of the NFIP and local floodplain management regulations are satisfied.

The **floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation of the base flood by more than a designated height.

In general, floodwater is deeper and flows faster in floodways than in adjacent floodway fringe areas. When feasible, development and structures should be located outside of floodways.



**Figure 21: Three-Car Garage Elevated on Fill**



**Figure 22: Hog Farm Houses Elevated on Fill (Source: Waterkeeper Alliance)**

### 3.1.1. SILOS AND GRAIN ELEVATORS

For floodplain management purposes, silos and grain elevators are agricultural structures with rigid walls and roofs. Several factors should be considered when determining how best to protect silos and grain elevators, and their contents, from flood damage:

- Silos that are designed to contain silage without leaking may also be watertight under flood conditions. Communities should require applications for dry floodproofed silos to include documentation prepared by registered professional engineers or architects certifying the silos will be watertight during conditions of flooding.

- Silos and grain elevators for storing grain typically are not designed to be watertight. To protect both the towers and contents, the structures must either be elevated or modified to be watertight (dry floodproofed), or a combination of those methods.
- Another option, sometimes called “component protection,” is to install silos and grain elevators inside areas designed to be substantially impermeable to flooding. This technique is described in FEMA P-348, Protecting Building Utility Systems from Flood Damage, where it is suggested as a method to protect equipment or groups of equipment that serve non-residential buildings.
- Silos and grain elevators that are not watertight may be wet floodproofed to minimize structure damage (see Section 3.2). In general, this option is not viable because of the nature and value of the stored materials.
- Controls for electrified equipment should be elevated and electric service should be supplied by branch circuits that have ground fault circuit interrupter (GFCI) protection or are otherwise protected from flooding.

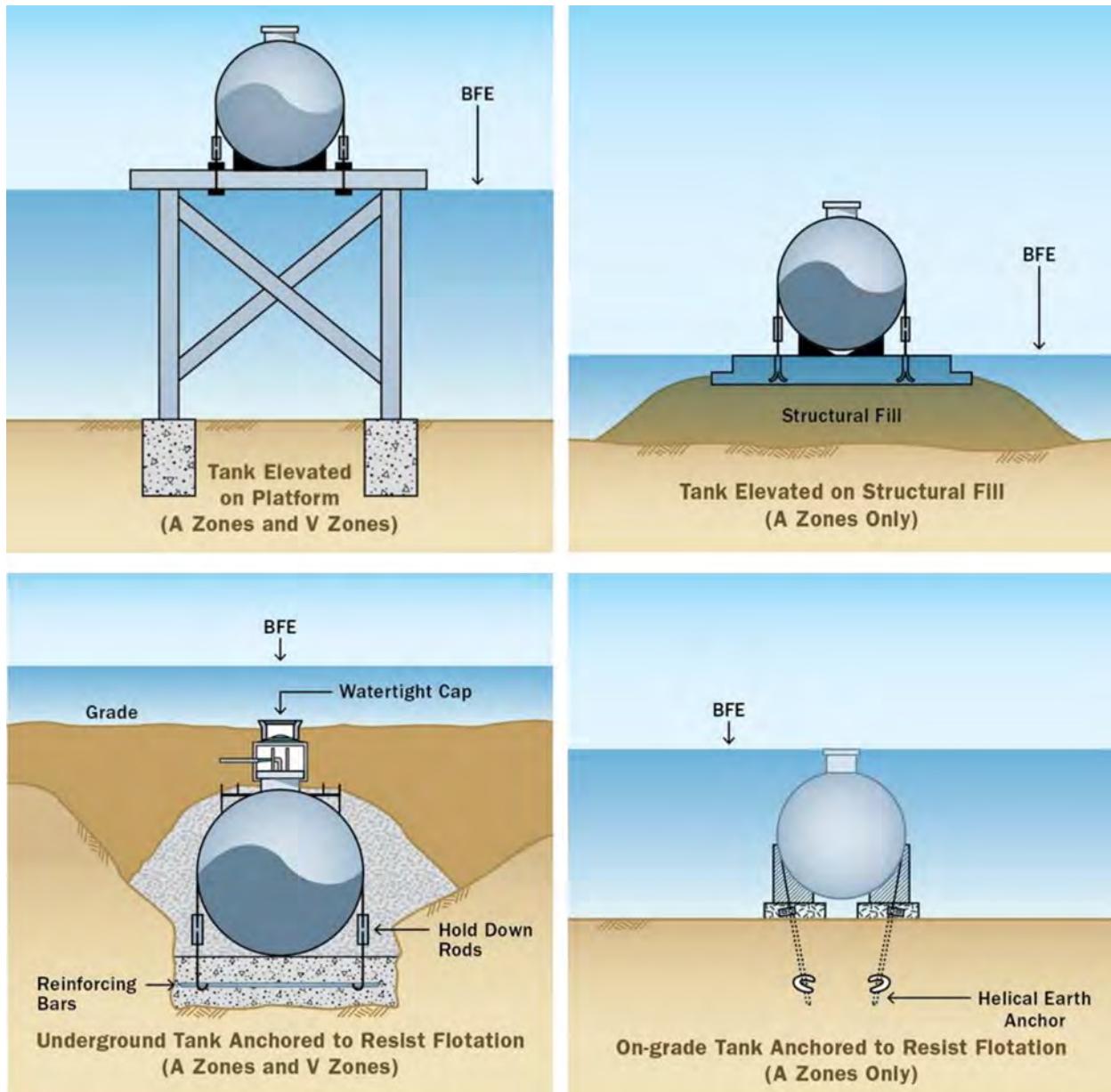
### **3.1.2. FUEL, GAS, AND LIQUID STORAGE TANKS**

Figure 23 illustrates options for installing tanks in SFHAs, which vary by flood zone. Where allowed above ground, tanks can be installed on grade or elevated on platforms or fill. Underground tanks must be installed and anchored to account for saturation of surrounding soils and scour and erosion during flooding. Tanks that are above ground but not fully elevated are allowed only in A zones (A, AE, A1-30, AH, AO, A99, and AR), in which case they must be anchored to resist flood forces. Another option allowed only in A zones, sometimes called “component protection,” is to install tanks inside enclosures or vaults that are designed to be substantially impermeable to flooding. This technique is described in FEMA P-348, Protecting Building Utility Systems from Flood Damage, where it is suggested as a method to protect equipment or groups of equipment that serve non-residential buildings.

Protecting other elements of tanks must also be considered:

- Fill openings, outlets, vents, and cleanouts must either be elevated above the BFE or designed to prevent the entry of floodwater and the loss of contents during flooding.
- Controls for electrified equipment should be elevated above the BFE and electric service must be supplied by branch circuits that have GFCI protection.

Tank design and options for tanks associated with non-residential uses are described in more detail in FEMA P-348, Protecting Building Utilities from Flood Damage.



**Figure 23: Options to Install Tanks Above and Below Grade**

### 3.2. Construction Requirements for Wet Floodproofing

Wet floodproofing involves use of materials and construction techniques that allow structures or portions of structures to intentionally flood. The same wet floodproofing requirements apply to enclosures below elevated structures where the use of the enclosures is limited solely to vehicle parking, storage, and building access. Allowing floodwater to enter these areas counteracts hydrostatic pressure on walls and buoyancy from hydrostatic uplift forces. Although enclosure interiors and contents get wet, the risk of structural damage is reduced.

The NFIP minimum requirements for wet floodproofing structures are similar to the NFIP requirements for enclosures below elevated buildings:

- Wet floodproofed structures must be anchored to resist flotation, collapse, and lateral movement. During flooding, structures can be dislodged and cause damage to other buildings or block downstream culverts and bridges.
- Portions of structures below the BFE must be constructed of flood-damage-resistant materials. FEMA Technical Bulletin 2, Flood Damage Resistant Materials, includes guidance and tables that classify typical construction materials as acceptable or unacceptable for use below the BFE.

**Flood-damage-resistant materials** are any construction materials capable of withstanding direct and prolonged contact with floodwater without sustaining damage that requires more than cosmetic repair. Cosmetic repair includes cleaning, sanitizing, and resurfacing of the material.

- Enclosed areas must have measures that equalize hydrostatic forces on exterior walls by allowing the automatic entry and exit of floodwaters. This is accomplished by installing at least two flood openings in the walls of each enclosed area. FEMA Technical Bulletin 1, Requirements for Flood Openings in Foundation Walls and Walls of Enclosures, includes detailed guidance, examples and illustrations of flood opening installations, non-engineered openings, engineered openings, and measures that are not acceptable as flood openings.

Installing doors, panels, or covers that must be opened before the onset of flooding does not satisfy the automatic entry and exit of floodwaters criterion because human intervention is necessary.

- Basements, which are areas below grade on all sides, are not permitted. To avoid being basements, the interior floor of wet floodproofed enclosed areas must be at or above the exterior grade across an entire side and there must be positive surface drainage away from the structure.
- Mechanical and utility equipment, including electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities, must be elevated (example shown in Figure 24), dry floodproofed, or specifically designed to prevent water from entering or accumulating within the components during flooding. For additional guidance, see FEMA P-348, Protecting Building Utilities from Flood Damage.

Communities should consider implementing two best practices when approving wet floodproofing of agricultural structures and accessory structures in accordance with this bulletin:

- **Limit what is stored** in wet floodproofed areas and structures. Because contents will get wet during flooding, contents should be low-value items. Some communities specify the types of

contents that can be stored, and some prohibit the storage of hazardous materials or pollutants.

- **Require nonconversion agreements** as part of approving wet floodproofed areas and structures. These agreements, signed by applicants and property owners, affirm that owners agree not to convert or modify in any manner that is inconsistent with the approved permit (and variance conditions, when applicable). Specifically, owners agree not to convert the space to uses other than approved uses. Communities typically require nonconversion agreements to be recorded on property deeds to notify future owners.

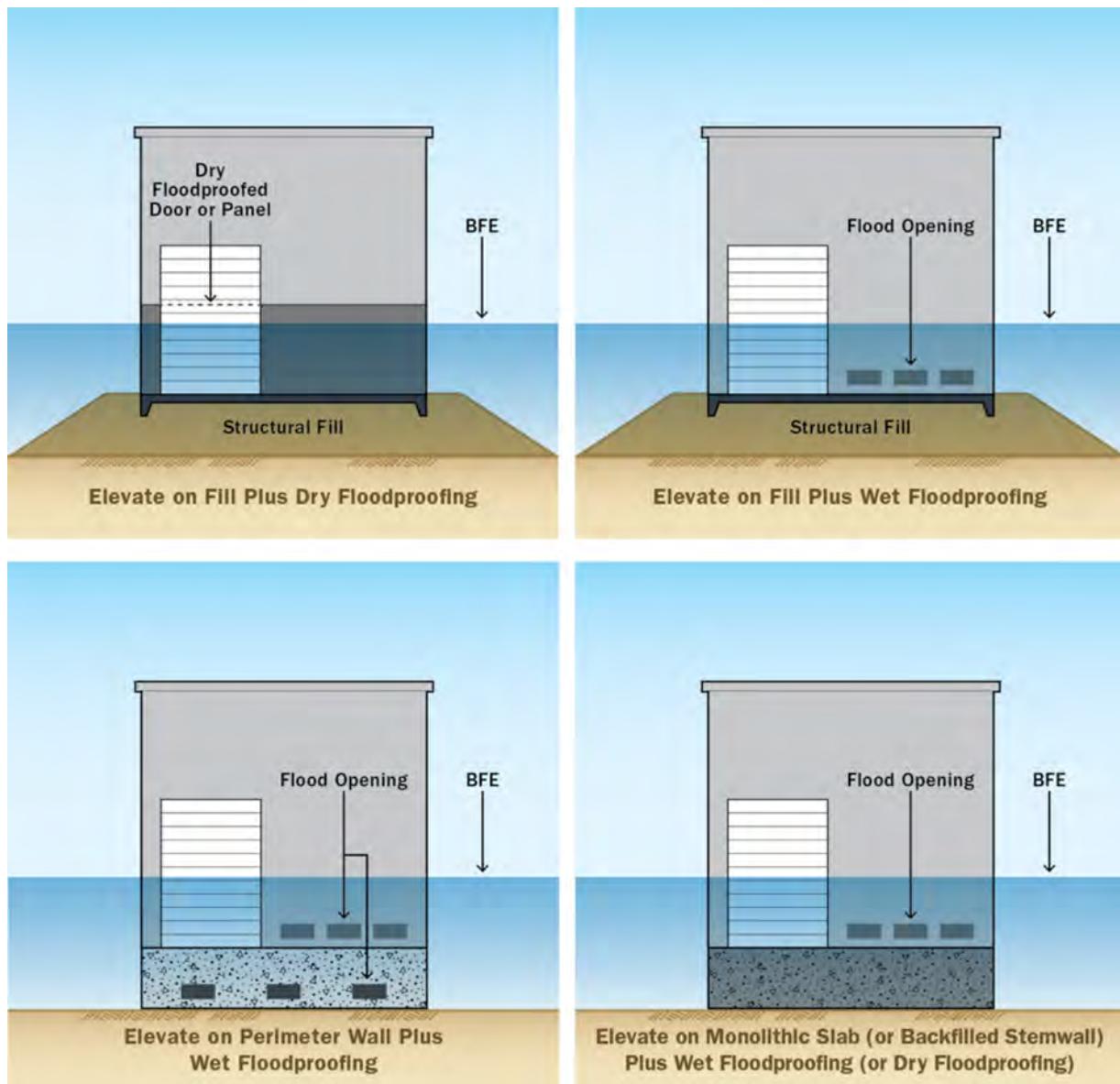
Many communities apply these practices to enclosures below elevated buildings, which are allowed if used solely for parking, storage, and building access and if constructed in accordance with specific requirements (outlined in Section 3.1).



**Figure 24: Elevated Electric Service and Equipment**

### 3.3. Combining Elevation with Wet or Dry Floodproofing

Local floodplain management regulations for considering variances include a specific provision that variances must only be issued after the community's variance review board determines a variance is the minimum necessary to afford relief, considering the flood hazard (44 C.F.R. § 60.6(a)(4)). For example, requests to vary the elevation requirements to allow wet floodproofing should be examined to determine whether a combination of measures is feasible (sometimes called "mixed mitigation"). Elevating a structure to the maximum extent feasible and then wet floodproofing or dry floodproofing up to the BFE would provide some degree of protection while minimizing the negative impacts of the variance. Figure 25 illustrates some examples of using partial elevation achieved by combining elevation with wet or dry floodproofing, which protects structures and contents during frequent, low-level flood events.



**Figure 25: Combining Elevation with Wet Or Dry Floodproofing (Access Ramps Not Shown)**

### 3.4. Requirements for Development Other than Structures

Communities must evaluate development in SFHAs in accordance with their floodplain management regulations. The general requirements that apply to development other than buildings include:

- Meet encroachment limitations if located in regulated floodways
- Be anchored to prevent flotation, collapse, or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of flooding
- Be constructed of flood-damage-resistant materials

- Have mechanical, plumbing, and electrical systems elevated or designed to prevent water from entering or accumulating within the components during flooding.

Development activities that change the land in ways that may increase flood risk include mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment and materials, and roads. Agricultural practices such as tilling, discing, planting, spraying, fertilizing, and harvesting are not considered development for floodplain management purposes. However, installing irrigation ditches and wells, fences and berms, pond embankments, and other activities that alter the land or could obstruct flood flows are regulated as development.

Another important consideration when evaluating development proposals is whether the activity will encroach into floodways. Communities must require engineering analyses to examine the effect of floodway encroachments to determine whether flood depths would be increased if the development is allowed. In riverine floodplains where no floodway has been designated, communities must consider the cumulative effect of the proposed development, combined with all other existing and anticipated development, to ensure flood levels will not increase more than a foot at any point in the community. If a community determines it is in the public interest to allow development that increases flood heights more than the allowable amount, the community or applicant must apply to FEMA for conditional approval of such action and FEMA must issue a conditional approval before a permit can be issued. Then, after the project is completed, documentation must be submitted to FEMA so the flood maps can be updated to reflect the change in flood hazard.

Communities may determine that some projects in floodways are too small to warrant engineering analyses. For example, barbed wire and electrified wire fences do not block the flow of water, but board, woven wire, and other more solid fencing can obstruct flow and cause water to back up and rise higher than if the fences were not present.

## 4. Options to Authorize Wet Floodproofing of Agricultural Structures and Accessory Structures

Communities should consider the acceptable options described in this chapter for authorizing wet floodproofing of agricultural structures and accessory structures, as those structures are defined in the bulletin (see Table 2). Each community should determine which option works best, given community-specific needs. In all cases when those structures are not elevated or dry floodproofed, they must be wet floodproofed in compliance with the requirements described in Section 3.2. Model ordinance language for most options is included in Appendix C.

**Table 2: Local Regulation Changes**

Action Taken	Update Ordinance Language?
PERMITS for small accessory structures, wet floodproofed	SHOULD
VARIANCES for agricultural structures and accessory structures, wet floodproofed	SHOULD
COMMUNITY-WIDE exception for agricultural and accessory structures (only with FEMA approval)	MUST
PERMITS for repair or restoration of certain flood-damaged agricultural structures to pre-damage condition	MUST

For wet floodproofed **accessory structures**, communities must choose from the following options for administration of the requirements:

- Issue **permits** for small accessory structures (described in Section 4.2). FEMA considers accessory structures to be small if less than or equal to a one story two car garage (all A zones) and less than or equal to 100 square feet (all V zones).
- Grant **variances** on a case-by-case basis for accessory structures that are larger than the sizes allowed to be approved permit (described in Section 4.3).
- Issue **permits** for accessory structures, but only after obtaining FEMA approval of a community-wide exception (described in Section 0).

For wet floodproofed **agricultural structures**, communities must choose from one of the following options for administration of the requirements:

- Grant **variances** on a case-by-case basis (described in Section 4.3).
- Issue **permits** for agricultural structures, but only after obtaining FEMA approval of a community-wide exception (described in Section 0).

- Issue **permits** for repair and restoration of certain previously flooded agricultural structures, but only after adopting regulations approved by FEMA (described in Section 4.5).

## 4.1. Ensuring Compliance and Maintaining Records

While FEMA regional offices, state, tribal, and territorial NFIP coordinators, and communities all have roles in ensuring local floodplain management regulations are properly administered and enforced, the ultimate responsibility for maintaining NFIP compliance lies with communities. Communities must maintain adequate records of permits issued and variances granted, including the supporting documentation and justification for variances.

Refer to FEMA Floodplain Management Bulletin P-993, Variances and the National Insurance Program, for guidance on variances and record keeping.

Communities must enforce the requirements of local floodplain management regulations and the conditions of permits and variances. FEMA regional offices and state, tribal, and territorial NFIP coordinators monitor and evaluate community compliance and provide technical assistance to help communities remain in good standing with the NFIP.

Communities that follow FEMA's policy and guidance for granting variances will not jeopardize their standing with the NFIP. And, specific to agricultural structures and accessory structures, communities that follow the guidance in this bulletin will remain in good standing. If FEMA determines that a community is granting variances and permitting exceptions inconsistent with policies and guidance, the community will be expected to correct all violations and deficiencies to the maximum extent practicable or risk probation or suspension from the NFIP.

Communities that participate in the NFIP must have adequate procedures for reviewing applications, processing requests for variances, inspecting structures and development approved by permits or variances, and maintaining records. Communities that are approved by FEMA for community-wide exceptions for agricultural structures and accessory structures (see Section 0) must be especially careful to maintain detailed records, including copies of notices given to owners stating the increased risks to life and property and the potential for increased flood insurance rates. FEMA recommends that the findings, conditions, and authorizations for variances be recorded in deed records to permanently notify prospective buyers and future owners of the terms of the variances.

The NFIP regulations for variances provide that FEMA may review a community's findings that justify granting variances and may place a community on probation if the review indicates a pattern inconsistent with the objectives of sound floodplain management (44 CFR § 60.6(a)).

Variances issued in accordance with this bulletin are consistent with the objectives of sound floodplain management.

## 4.2. Issuing Permits for Certain Accessory Structures

Communities must follow standard procedures to review applications and issue permits for accessory structures that will be elevated or dry floodproofed in accordance with the NFIP requirements in local floodplain management regulations. Section 3.1 briefly summarizes those requirements.

Communities must follow standard procedures to review applications and issue permits for wet floodproofed accessory structures that are smaller than the size limits suggested by FEMA.

Communities should adopt explicit provisions in local regulations (see model ordinance language in Appendix C, Section C.2). Before adopting changes to local regulations, proposed changes should be reviewed by state NFIP coordinators or FEMA regional offices.

Documentation of lowest-floor elevations and dry floodproofing designs must be submitted by applicants and permit holders when structures are elevated or dry floodproofed. Communities should document compliance with wet floodproofing requirements when agricultural structures and accessory structures are approved to be wet floodproofed.

Before issuing permits for small accessory structures, communities must verify:

- Use is limited to parking of vehicles or storage
- Size is less than or equal to the suggested limits based on flood zone (for example, one-story two-car garage in A zones, 100 square feet in V zones, or other size limit approved by FEMA)
- The structures have low damage potential
- The structures comply with the wet floodproofing requirements outlined in Section 3.2.

## 4.3. Considering Variances and Granting Variances

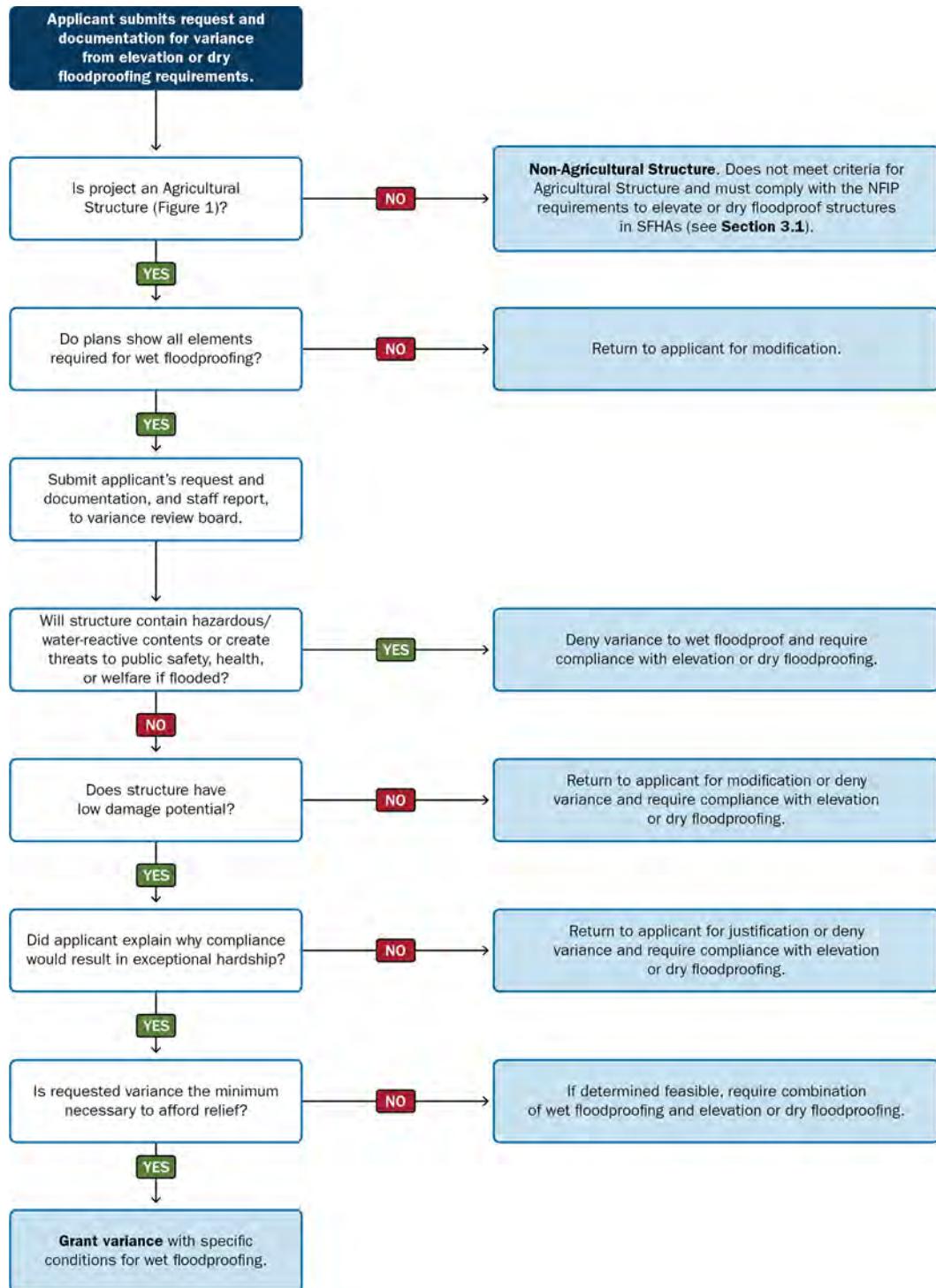
Every community that participates in the NFIP adopts regulations that include the general requirements for consideration of variance requests in the NFIP regulations at 44 C.F.R. § 60.6(a). When a request is received, floodplain management staff should review the request against the regulations, determine completeness of the submitted documentation, and make recommendations for consideration by the community's variance review board. Documenting the staff review in a staff report is a good practice and provides a record of the community's action.

The NFIP regulations define **variance** as a grant of relief by a community from the terms of a floodplain management regulation.

In addition to the typical standard provisions for variances (summarized in Appendix C, Section C.3), when communities receive requests to allow agricultural structures or accessory structures to be constructed in ways that vary from the strict floodplain management requirements for elevation and

dry floodproofing, additional factors must be considered. Communities should adopt explicit provisions in local regulations (see model ordinance language in Appendix C, Section C.4).

Key steps for evaluating requests for variances for agricultural structures are illustrated in Figure 26. Similar steps apply to requests for variances for accessory structures.



**Figure 26: Key Steps for Evaluating Variance Requests for Wet Floodproofed Agricultural Structures**

Additional factors to consider and determine include:

- Variances must be for individual agricultural structures or accessory structures.

- Justification must be on a case-by-case basis.
- The communities must:
  - Document the floodway encroachment provisions in local floodplain management regulations are satisfied when structures are proposed to be located in floodways.
  - Confirm that proposed:
    - Accessory structures are small, represent minimal investment, and have low damage potential
    - Agricultural structures have low damage potential, meet the exclusive use requirement, and will be restricted to such exclusive uses.
  - Verify the proposed structures will meet the following wet floodproofing design and construction requirements (see Section 3.2), including:
    - Anchored to resist flotation, collapse, and lateral movement
    - Flood-damage-resistant materials below the BFE
    - Mechanical and utility equipment elevated or dry floodproofed to or above the BFE
    - Measures to protect structures from hydrostatic pressure in accordance with the NFIP standards for flood openings to allow the automatic entry and exit of floodwaters without manual operation or the presence of a person or persons.
  - Verify that applicants include descriptions of the exceptional hardships they would experience if variances are denied.
  - Document that variances provide the minimum relief necessary, and if feasible, require consideration of combining elevation with wet floodproofing or dry floodproofing (see Section 3.3).
- Increased risks to the public. FEMA does not recommend variances for wet floodproofing instead of elevation or dry floodproofing when:
  - Agricultural structures would be located in V zones (V, VE, V1 30, and VO)
  - Agricultural structures and accessory structures that, if flooded, would create threats to public health, safety, and welfare, including but not limited to release of concentrated animal waste or highly volatile, toxic, and water-reactive materials (described in Section 4.3.2).
- Communities that participate in the NFIP Community Rating System and receive credits for freeboard (elevation or protection to a higher level than the minimum NFIP requirement)

should be aware that granting variances that allow lowest floors to be below the BFE may result in reduction of credits for freeboard.

- Floodplain management regulations adopted by many communities give variance review boards the authority to attach additional conditions to variances when deemed necessary to further safeguard public health, safety, and general welfare and to minimize public and private losses caused by flooding.

#### **4.3.1. ADMINISTRATIVE RESPONSIBILITIES FOR VARIANCES**

As part of fulfilling their responsibilities to the NFIP, communities must have mechanisms to ensure compliance with their floodplain management regulations. Permits are required for agricultural structures and accessory structures, even those authorized by variance. Communities that anticipate a large number of variance requests should include the additional factors listed above in their floodplain management regulations. Typical model ordinance language is included in Appendix C, C.4. Before adopting changes to local regulations, proposed changes should be reviewed by state NFIP coordinators or FEMA regional offices.

FEMA recommends that communities develop written procedures for evaluating requests for variances to satisfy all general requirements and the specific additional factors listed in the introduction to Section 4.3. Having written procedures also leads to uniform treatment of all variance requests. Communities that grant variances for agricultural structures and accessory structures will preserve their standing with the NFIP by following written procedures that are consistent with 44 C.F.R. § 60.6(a) and FEMA Floodplain Management Bulletin P-993, Variances and the National Flood Insurance Program, and this bulletin. Communities can request additional guidance for variance procedures from state, tribal, and territorial NFIP coordinators and FEMA regional offices.

FEMA also recommends that communities develop a formal variance application or checklist to help applicants understand the variance process, provide the necessary technical justifications, and demonstrate that they meet the requirements for variances.

Modification of local regulations to add specific requirements is **required** when:

- FEMA approves requests for community-wide exceptions, described in Section 4.4
- Communities intend to issue permits for repair and restoration to pre-damaged condition when agricultural structures are substantially damaged by flood or are designated by the NFIP as repetitive loss structures, described in Section 4.5

#### **4.3.2. AGRICULTURAL STRUCTURES THAT POSE A DANGER TO PUBLIC HEALTH, SAFETY, AND WELFARE**

Communities should carefully examine requests for variances to determine whether granting the requests would increase risks and pose a danger to public health, safety, and welfare. Variances to allow wet floodproofing should not be granted when flooding of an agricultural structure and its

contents would increase those risks. Structures that could increase risks and dangers during flooding include those used for manure storage, livestock confinement operations, liquefied natural gas terminals, and production and storage of highly volatile, toxic, or water-reactive materials. Where feasible, such structures and uses should be located outside of SFHAs. If they must be located in SFHAs, these structures should be elevated or dry floodproofed to minimize risks and dangers during flooding.

#### 4.4. Community-Wide Exceptions

All communities that participate in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed minimum NFIP regulations. FEMA recognizes that in some instances, due to extraordinary circumstances or local conditions, applying the NFIP requirements for elevation or dry floodproofing to agricultural structures or accessory structures could cause hardship or inequity. In these cases, and in accordance with 44 C.F.R. § 60.6(b) and the Policy, FEMA may approve requests submitted by communities for an exception to specific requirements. The “community-wide exception” mechanism described in this section only applies to agricultural structures or accessory structures, as both terms are defined in this bulletin (see Chapter 2) and in the Policy. If approved, community-wide exceptions allow communities to deviate from minimum standards under specific conditions without having to process individual variance requests.

As part of considering whether to seek FEMA approval for community-wide exceptions for accessory structures, communities should evaluate whether the size limits described in Section 4.2 are reasonable, in which case permits may be issued without variances. Requests for larger accessory structures and for agricultural structures can be handled as individual variance requests, described in Section 4.3.

It is very important for communities with approved community wide exceptions to realize the same care and attention given to requests for variances must be directed to the review of applications for agricultural structures and accessory structures in accordance with the FEMA approval. FEMA recommends that communities develop written procedures for evaluating requests to ensure all general requirements and specific requirements are satisfied. When FEMA approves a community's request for a community-wide exception, FEMA regional offices will monitor the community's compliance with the specific provisions of the approval.

Communities must submit requests for community-wide exceptions in writing to the appropriate FEMA regional office. Consistent with the Policy, requests must include the following:

1. **A description of the nature, extent of, and reasons for the exception request.** The “nature” of the exception request refers to the specific minimum NFIP requirement(s) from which an exception is requested and the community’s proposed alternative to the minimum requirements. The “extent” of the exception describes any limitations or specific characteristics that will be used to apply and administer the exception. Descriptions of the “reasons” must state the reasons the

community is requesting the exception. Communities must specify which types of structures are within the scope of the request and must detail criteria proposed for evaluating requests.

When communities include accessory structures in requests for community-wide exceptions, they must determine the appropriate size limits that are consistent with the Policy and this bulletin and specify the size limits in their requests.

2. **A description of the extraordinary circumstances and local conditions that would cause hardship or inequity if the minimum elevation and dry floodproofing requirements are enforced.** Descriptions should address factors that contribute to hardship or inequity if the minimum elevation and dry floodproofing requirements are enforced. The goal of floodplain management regulations is to reduce future damage, which may not be achieved when agricultural structures or accessory structures are allowed without requiring full compliance.
3. **Supporting justification.** Justifications should include factors relevant to the community, including community-wide economic impacts; environmental, topographic, and hydrologic and hydraulic conditions and data; other scientific and technical data; and information demonstrating the impact on public health, safety, and welfare and the environment. Communities could propose limitations based on flood conditions, for example, when base flood depths are greater than five feet and velocities are higher than five feet per second. The objective is to demonstrate that a community-wide exception to allow wet floodproofing of certain agricultural structures or accessory structures will not have adverse impacts.
4. **Supporting information regarding other planning considerations and factors that justify wet floodproofing as an appropriate alternative mitigation design.** The request should include supporting information to demonstrate that communities have considered other planning and engineering factors in determining that the requested exception to allow wet floodproofing is a practicable alternative that provides the minimum relief necessary. Factors might include proximity to land outside of mapped SFHAs; available warning time before the onset of flooding; frequency of flooding; depth of water, velocity and duration under base flood conditions; safety and access; emergency operations plans; protection of contents and equipment; and any other conditions, requirements, or restrictions proposed by the community.
5. **Proposed ordinance language to allow certain agricultural structures or accessory structures to be wet floodproofed and to effectively administer and enforce the conditions of the community-wide exception.** Communities should consult with their FEMA regional office to develop proposed ordinance language that is consistent with the Policy and this bulletin. The ordinance language must outline the specific criteria and requirements for determining whether to issue permits for wet floodproofed agricultural structures or accessory structures. Communities should provide evidence that their existing variance provisions are consistent with the minimum NFIP variance requirements and conditions and evidence that implementing a community-wide exception does not conflict with other state, tribal, or territorial laws and regulations. The proposed ordinance language must, at a minimum, include the additional factors to consider and determine that are listed in Section 4.3.

Communities requesting community-wide exceptions **must not** modify floodplain management regulations or make regulations effective until **after** FEMA approves the requests.

#### **4.4.1. FEMA REVIEW OF COMMUNITY-WIDE EXCEPTION REQUESTS**

FEMA considers and approves requests for community-wide exceptions on a community-by-community basis. The general process for FEMA's review and approval of requests for community-wide exceptions is outlined below:

- The community submits an exception request, including all supporting documents and technical data, to the appropriate FEMA regional office.
- The FEMA regional office will complete an initial review and evaluation of the request and work with the community to ensure sufficient documentation and justification is included. The regional office will confirm with the state, tribal, or territorial NFIP coordinator that the community's proposed ordinance language is consistent with applicable laws and regulations. After confirming the request has sufficient documentation and justification, the regional office will forward the request to FEMA Headquarters for final review and action.
- FEMA Headquarters will review the request package and prepare a special environmental clearance to determine whether the proposed community-wide exception will have a significant impact on the human environment. The decision to prepare an environmental impact statement or other environmental documentation will be made in accordance with the NFIP regulations (44 C.F.R. § 60.6(b)(2)) and FEMA Directive 108-1 and Instruction 108-1-1. This will be part of FEMA's assessment of how applicable environmental and historic preservation laws, regulations, Executive Orders, and agency policy apply to proposed Federal actions.
- Upon completion of the final review by FEMA Headquarters and completion of the environmental impact evaluation, the regional office will notify the community of the outcome. If the request is denied, an explanation for the denial will be provided. If the request is approved, the regional office will provide technical assistance, if necessary, to ensure the community's proposed ordinance language is sufficient and consistent with the requirements of the approved community-wide exception.

#### **4.5. Repair and Restoration of Substantially Flood Damaged and Repetitive Loss Agricultural Structures**

Communities that participate in the NFIP must adopt and enforce regulations that apply when structures in SFHAs incur substantial damage by any cause and when owners propose to substantially improve structures in SFHAs. When structures are substantially damaged or will be substantially improved, communities must require that the structures be brought into compliance with all requirements for new construction.

Because the NFIP **repetitive loss structure** designation is based on insurance claims paid over a 10-year period, the list of designated structures changes over time. When communities adopt the necessary regulations to allow repair and restoration of repetitive loss agricultural structures to pre-damage condition, after each flood event, local officials should contact the FEMA regional office to determine whether specific flood-damaged agricultural structures have been designated.

The NFIP statute provides that communities may adopt regulations to allow agricultural structures that are substantially damaged by flooding, and agricultural structures that are designated by the NFIP as repetitive loss structures, to be repaired or restored to pre damaged conditions [42 U.S.C. § 4022(a)(2), enacted by NFIA Section 1315(a)(2)]. The statute also establishes that agricultural structures repaired or restored in accordance with this provision:

- Will not be eligible for disaster relief under any program administered by FEMA or any other Federal agency
- Will have NFIP flood insurance premiums rated based on a structure's risk, although the NFIP is not required to provide flood insurance coverage unless repairs include wet floodproofing measures.

- **Repetitive loss structure** is a structure covered by an NFIP flood insurance policy that has incurred flood-related damage on two occasions during a 10-year period ending on the date of the event for which the second claim is made, in which the cost of repair, on average, equaled or exceeded 25 percent of the value of the structure at the time of each flood event.
- **Substantial damage** is damage of any origin 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. Structures that incur substantial damage must be brought into compliance with the requirements for new construction.
- **Substantial improvement** is 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. Structures that are substantially improved must be brought into compliance with the requirements for new construction.

When communities adopt the appropriate regulations, permits may be issued to authorize repair and restoration of agricultural structures substantially damaged by flooding, and those that are repetitive loss structures, without requiring the structures to be brought into full compliance with the elevation or dry floodproofing requirements that would otherwise apply (see Section 3.1). Changes to local floodplain management regulations must be adopted to implement this approach, and the draft changes **must be reviewed and approved** by FEMA before adoption.

Communities considering this option should review the model ordinance language in Appendix C, Section C.5. Because FEMA must review and approve proposed ordinance language, communities should request assistance from FEMA regional offices to finalize the draft changes well in advance of scheduling adoption.

Local floodplain management regulations to allow certain flood-damaged agricultural structures to be repaired or restored to pre-damage condition must specify:

- Only the cost to repair damage caused by flooding to pre-damage condition must be used to make the substantial damage determination for the purpose of deciding whether an agricultural structure can be repaired or restored without being brought into full compliance.
  - If damage was caused by a combination of flooding and another cause, then the cost to repair damage by that other cause must not be used to make the substantial damage determination.
  - If the flood damage alone is determined to not be substantial damage, but if damage by all causes is determined substantial damage, then the agricultural structure must be brought into compliance with the requirements for new construction. However, owners may request variances to allow wet floodproofing instead of elevation or dry floodproofing, which communities must consider in accordance with variance provisions described in Section 4.3.
- The work authorized by permits must be limited to only the work necessary to repair and restore agricultural structures to pre-damaged conditions. If any additional work or improvements are proposed at the same time, the combined repair and improvements constitute substantial improvement and communities must require the structures to be brought into compliance. However, owners may request variances to allow wet floodproofing instead of elevation or dry floodproofing, which communities must consider in accordance with variance provisions described in Section 4.3.

Owners seeking relief to allow certain flood-damaged agricultural structures to be repaired or restored to pre-damaged condition should be aware of these restrictions set forth in the NFIP statute:

- The structures will not qualify for Federal disaster assistance
- The structures may be denied NFIP flood insurance policies unless repairs include wet floodproofing measures.

FEMA recommends that communities considering adopting regulations to implement this option for flood-damaged agricultural structures also consider requiring the structures to be retrofitted with wet floodproofing measures as part of repair and restoration. Wet floodproofing measures, described in Section 3.2, reduce the potential for future flood damage. In addition, the NFIP may deny NFIP flood insurance policies unless wet floodproofing measures are included. When communities decide to

require retrofitted wet floodproofing, the costs of those measures should not be counted in the initial determination as to whether the damage by flooding is substantial damage.

## 5. NFIP Flood Insurance Considerations

Property owners and farm operators should carefully consider the economic consequences of implementing wet floodproofing in accordance with this bulletin. Although wet floodproofing measures will reduce physical damage to structures, contents are exposed to flooding. Also, owners and operators should consult with their insurance agents to learn how NFIP flood insurance premiums differ when agricultural structures and accessory structures are wet floodproofed rather than elevated or dry floodproofed.

The NFIP takes into consideration several factors when determining premiums for buildings and contents covered by NFIP flood insurance policies:

- When buildings are **elevated**, the elevation of the lowest floor compared to the BFE or flood depth is a significant factor (provided that enclosures, if any, are compliant).

Elevating or protecting buildings to one foot or higher above the BFE reduces the exposure of buildings and contents to future flooding and results in lower NFIP flood insurance premiums.

- When non-residential buildings are **dry floodproofed**, the height of the dry floodproofing measures compared to the BFE or flood depth is a significant factor in how insurance policies are rated. Dry floodproofing must extend at least one foot above the BFE to be rated equivalent to a building elevated to the BFE. The measures must be designed and certified by registered professional engineers or architects and approved by FEMA as part of writing insurance coverage.
- When agricultural structures and accessory structures are approved to be **wet floodproofed**, whether by permit, variance, or if the community has a FEMA-approved community-wide exception, that approval does not influence how the NFIP determines insurance premiums. Structures with lowest floors below the BFE will be more costly to insure than those that are elevated or dry floodproofed.

Property owners and farm operators should consult with their insurance agents to discuss possible impacts of using wet floodproofing measures instead of elevation or dry floodproofing.

- The NFIP only insures **contents** that are located in buildings that are eligible for building coverage. Some self-propelled vehicles and machines not licensed for use on public roads are insurable, as are contents in silos and grain storage buildings.

The NFIP uses a definition of **building or structure for flood insurance purposes** that is distinct from the definition used for floodplain management purposes. Property owners and farm operators should be aware that structures that meet the definition for floodplain management purposes may not fit the insurance definition and vice versa.

For insurance purposes, the NFIP considers a building as:

- A structure with two or more outside rigid walls and a fully secured roof, that is affixed to a permanent site; or
- 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
- 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.

“Building” does not mean a gas or liquid storage tank or a recreational vehicle, park trailer, or other similar vehicle.

Property owners and farm operators should consider the following implications for NFIP flood insurance when planning and constructing agricultural structures and accessory structures in SFHAs:

- The NFIP is authorized to deny individual property owners flood insurance coverage if structures and development in SFHAs are in violation of local floodplain management regulations and the owners refuse to bring the structures into compliance (NFIA Section 1316).
- Insurance agents may be required to use the NFIP’s specific rating guidelines when a structure’s lowest floor is below the BFE. In some cases, agents may submit documentation to the NFIP specifically to rate individual structures, including documentation of variances granted to allow the structures below the BFE.
- The contents of some agricultural structures may be more valuable than the structures. When agricultural structures are insurable, owners may consider contents-only flood insurance policies, although coverage is limited (consult with insurance agents to learn which contents are insurable). Lenders may still require flood insurance coverage for structures.
- Lenders making or servicing federally backed loans will usually require owners to purchase flood insurance coverage for insurable structures, regardless of the structure’s value, nature or value of contents, and how the buildings are constructed.
- When detached garages are located on the same lots as single-family and two- to four-family dwellings that are covered by NFIP flood insurance policies, the garages are included in the policies, but coverage is limited to no more than 10 percent of the limit of liability on the dwellings. Accessory structures used for storage are not included in the coverage, but may be insured by separate policies.
- Accessory structures on the same lots as non-residential structures and residential structures other than single-family and two- to four-family dwellings may be insured by separate policies.

Section 4.5 describes an option for communities to adopt regulations to allow agricultural structures that are substantially damaged by flooding, and those that are designated by the NFIP as repetitive

loss structures, to be repaired or restored to pre-damaged conditions. The NFIP is authorized to rate flood insurance policies on those agricultural structures based on the lowest floor elevation. However, the NFIP is not required to provide flood insurance policies unless repaired or restored agricultural structures are wet floodproofed (NFIA Section 1315(a)(2)).

Learn more about NFIP flood insurance online at <https://www.FloodSmart.gov/> or by calling 1-888-379-9531.

## Appendix A: FEMA Policy #104-008-03: Floodplain Management Requirements for Agricultural Structures and Accessory Structures

The Floodplain Management policy (FEMA Policy #104-008-03, effective February 2020), *Floodplain Management Requirements for Agriculture Structures and Accessory Structures*, can be found on FEMA.gov at the following link: [https://www.fema.gov/sites/default/files/2020-08/fema\\_floodplain-management\\_agriculture-accessory-structures\\_2020.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_floodplain-management_agriculture-accessory-structures_2020.pdf)

You can also access the document through the main [Glossary](#) or [NFIP Terminology Index](#) by searching for “Accessory Structures” or “Agricultural Structures.”

## Appendix B: FEMA Guidance, Statute, and NFIP Regulations Clarified and Refined by this Bulletin

This table briefly describes some of the FEMA guidance documents cited in this bulletin, the statute, and pertinent NFIP regulations as they relate to agricultural structures and accessory structures. Readers should be aware that some guidance documents predate FEMA Policy #104-008-03.

The table describes clarifications and refinements embodied in the Policy and this bulletin. This reference will assist those who want to compare previous guidance to the guidance in this bulletin. Appendix D lists full titles and links to download referenced publications.

**Table 3: Clarifications and Refinements in the Policy and this Bulletin**

Guidance, Regulation, Statute	Brief Description	How the Policy and this Bulletin Clarify and Refine Guidance, Regulations, and Statute
NFIP Technical Bulletin 1 (2008 and 2020 editions)	<p>Provides guidance for meeting the NFIP requirements for flood openings in foundation walls and walls of enclosures. Detached garages and detached accessory structures used only for parking and storage may be permitted in Zone A without requiring them to be elevated when the structures comply with measures described as wet floodproofing, including flood openings.</p> <p>Technical Bulletin 1 does not explicitly address agricultural structures.</p>	<ul style="list-style-type: none"> <li>Explain when it is appropriate to allow accessory structures in A Zones to be wet floodproofed. Indicates the size FEMA considers to be “small” accessory structures in Zone A (e.g., one-story two-car garage) for approval by permit (larger sizes may be authorized by variance).</li> <li>Establish parameters by which communities may seek FEMA approval for community-wide exceptions to allow issuance of permits for agricultural structures and accessory structures, rather than by granting variances on a case-by-case basis.</li> </ul>
NFIP Technical Bulletin 5 (2008 and 2020 editions)	<p>Provides guidance for meeting the NFIP free of obstruction requirements for development in Zone V. Accessory storage structures in Zone V should be limited to low-cost and small structures that are “disposable.” Small means less than or equal to 100 square feet in size. Detached garages are “too large” to allow below the BFE. The 2008 edition states that “low cost” means \$1,000 or less, while the 2020 edition does not identify a dollar amount.</p> <p>Technical Bulletin 5 does not explicitly address agricultural structures.</p>	<ul style="list-style-type: none"> <li>Explain when it is appropriate to allow accessory structures in A Zones to be wet floodproofed. Indicates the size FEMA considers to be “small” accessory structures in Zone V (100 square feet) for approval by permit (larger sizes may be authorized by variance). Does not recommend variances for wet floodproofing of agricultural structures in V Zones because of increased risks to public safety.</li> </ul>

Guidance, Regulation, Statute	Brief Description	How the Policy and this Bulletin Clarify and Refine Guidance, Regulations, and Statute
NFIP Technical Bulletin 7 (1993 edition)	<p>Provides guidance for planning and engineering (construction) considerations for the use of wet floodproofing measures, including:</p> <ul style="list-style-type: none"> <li>▪ Accessory structures used for parking (two-car detached garage or smaller) or storage (small, low-cost sheds) may be approved by variance.</li> <li>▪ Certain agricultural structures (farm storage structures, grain bins, corn cribs, and general-purpose barns) located in “wide, expansive floodplains” and used “exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock” may be approved by variance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Refine and expand definitions for “agricultural structure” and “accessory structure” for floodplain management purposes.</li> <li>▪ Explain the requirements for wet floodproofing and establish limits for when agricultural structures can be wet floodproofed (low damage potential) and when accessory structures can be wet floodproofed.</li> <li>▪ Establish specific criteria for authorizing certain agricultural structures and accessory structures by variance.</li> <li>▪ Establish parameters by which communities may seek FEMA approval for community-wide exceptions to allow issuance of issue permits for agricultural structures and accessory structures, rather than by granting variances on a case-by-case basis.</li> </ul>
FEMA Floodplain Management Bulletin P-993: Variances and the National Flood Insurance Program	<p>Provides guidance on variance procedures in accordance with the NFIP regulations at 44 C.F.R. § 60.6.</p> <p>Describes conditions that may be placed on accessory structures and detached garages authorized by variance. A limit on size of accessory structures in Zone A is not specified. Accessory structures in Zone V should be prohibited or allowed only if “very low value, ‘disposable’ storage sheds.”</p> <p>FEMA P-993 does not explicitly address agricultural structures.</p>	<ul style="list-style-type: none"> <li>▪ Describe conditions that allow communities to approve: <ul style="list-style-type: none"> <li>○ Accessory structures by permit if “low damage potential” and small, rather than requiring all accessory structures to be handled by variance. Communities must use variances to approve accessory structures that are larger than approved size limits.</li> <li>○ Agricultural structures by variance, if “low damage potential.”</li> <li>○ Agricultural structures and accessory structures by permit, when FEMA has approved “community-wide exceptions” in those communities that</li> </ul> </li> </ul>

Guidance, Regulation, Statute	Brief Description	How the Policy and this Bulletin Clarify and Refine Guidance, Regulations, and Statute
NFIA Section 1315(a)(2) (42 U.S.C. § 4022(a)(2))	<p>Provides that communities may adopt regulations to allow the repair and restoration to pre-damage condition of agricultural structures that are “repetitive loss structures” (defined in statute) or are substantially damaged by flood related damage.</p> <p>Specifies flood insurance provided for such structures must be based on “chargeable premium rates” and that the NFIP is not required to provide insurance coverage unless such structures are “wet floodproofed through permanent or contingent measures applied to the structure or its contents that prevent or provide resistance to damage from flooding by allowing flood waters to pass through the structure.”</p> <p>Specifies that such structures are not eligible for disaster relief assistance under any program administered by FEMA or any other Federal agency.</p>	<p>submit requests and documentation for such exceptions.</p> <ul style="list-style-type: none"> <li>▪ Describe requirements communities may adopt, with FEMA concurrence, to allow repair and restoration to pre-damage condition when agricultural structures are substantially damaged by flooding and when agricultural structures are designated by the NFIP as “repetitive loss structures.”</li> <li>▪ Encourages communities considering allowing repair and restoration of those agricultural structures to consider requiring owners to incorporate wet floodproofing as part of repairs, to reduce future flood damage and maintain eligibility for NFIP flood insurance coverage.</li> </ul>
44 C.F.R. § 60.6(a) – Variances and Exceptions	<p>Sets forth procedures for granting variances and factors that communities must consider. Communities must grant variances only upon specific findings (listed in the regulation), and only if they determine variances are the minimum necessary to afford relief.</p> <p>Provides that FEMA may review a community’s findings justifying granting variances and may take action to place a community on probation if the review indicates a pattern inconsistent with the objectives of sound floodplain management.</p>	<ul style="list-style-type: none"> <li>▪ Explain specifically how the variance process can be used by communities to approve wet floodproofing of agricultural structures and accessory structures.</li> </ul>

Guidance, Regulation, Statute	Brief Description	How the Policy and this Bulletin Clarify and Refine Guidance, Regulations, and Statute
44 C.F.R. § 60.6(b) – Variances and Exceptions	Acknowledges that “certain exceptions” from the minimum floodplain management standards in 44 C.F.R. § 60.3 may be permitted by FEMA	<ul style="list-style-type: none"><li>Explain how community wide exceptions, if approved by FEMA, can be used by communities to approve wet floodproofing to mitigate agricultural structures and accessory structures.</li></ul>

## Appendix C: Model Ordinance Language to Allow Wet Floodproofed Agricultural Structures and Accessory Structures

This appendix offers model ordinance language that can be used by NFIP communities, with guidance and assistance from state, tribal, and territorial NFIP coordinators and FEMA regional offices.

The model ordinance language addresses wet floodproofing of agricultural structures and accessory structures in conformance with the Policy and this bulletin.

Before making changes to the model language in this appendix, other than to adjust to fit within local floodplain management regulations, check with the FEMA regional office or the state, tribal, or territorial NFIP coordinator.

Unless approved, changes to this model language could make the provisions no longer consistent with the Policy and the bulletin.

This appendix includes the following sections:

- Section C.1 includes definitions for accessory structure, agricultural structure, and repetitive loss agricultural structure.
- Section C.2 includes sample ordinance language to allow communities to issue permits (instead of granting variances) for small accessory structures based on specific size limits and if compliant with specific construction requirements. Refer to Section 4.2 of this bulletin.
- Section C.3 includes an example of typical standard variance provisions that include the NFIP minimum procedures, including specific determinations and actions that must be taken by communities and community variance boards when considering requests for variances (see 44 C.F.R. § 60.6(a)). Similar provisions are adopted by every community that participates in the NFIP.
- Section C.4 includes sample ordinance language that can be incorporated into standard variance provisions to specifically outline criteria that communities must evaluate when considering and granting variances with specific conditions to allow agricultural structures and accessory structures to be wet floodproofed. These criteria are in addition to the standard variance provisions shown in Section C.3. Refer to Section 4.3 of this bulletin.
- Section C.5 includes sample ordinance language that can be incorporated into local floodplain management regulations to allow certain flood-damaged agricultural structures to be repaired or restored to pre-damage condition without bringing the structures into compliance. FEMA must review and approve a community's proposed draft regulations before adoption. Refer to Section 4.5 of this bulletin.

## General instructions for amending local regulations

- The model ordinance language shown in this appendix is consistent with the Policy and this bulletin.
- Communities may be more restrictive than the model provisions shown in this appendix.
- Communities must ensure the model ordinance language is formatted to be compatible with existing regulations and numbered to fit into the appropriate sections. Where italicized notes appear [*in brackets*], each community must insert the appropriate cross-referenced section number where the referenced provisions are specified in that community's existing regulations.
- Before adoption, proposed changes to local regulations should be reviewed by state, tribal, and territorial NFIP coordinators or FEMA regional offices.

### C.1 Model Definitions

Communities should select the appropriate definition(s) to pair with the provision(s) they will adopt. For example, if a community decides to amend local regulations to only address accessory structures, there would be no need to adopt definitions for agricultural structure and repetitive loss agricultural structure. Communities should include the definition for repetitive loss agricultural structure only when they adopt specific provisions applicable to those structures (see Section 4.5 and Section C.5). Communities in states that define agricultural structures or farm structures should contact the state NFIP coordinators for guidance before amending the definition for agricultural structure shown below.

The definitions shown below are consistent with the Policy.

#### Model definitions

- **Accessory Structure** – a structure on the same parcel of property as a principal structure and the use of which is incidental to the use of the principal structure. For floodplain management purposes, the term includes only accessory structures used for parking and storage.
- **Agricultural Structure** – for floodplain management purposes, a walled and roofed structure used exclusively for agricultural purposes or uses in connection with the production, harvesting, storage, raising, or drying of agricultural commodities and livestock, including aquatic organisms. Structures that house tools or equipment used in connection with these purposes or uses are also considered to have agricultural purposes or uses.
- **Repetitive Loss Agricultural Structure** – an agricultural structure covered by a National Flood Insurance Program contract for flood insurance that has incurred flood-related damage on two (2) separate occasions in which the cost of repair, on the average, equaled or exceeded 25 percent of the value of the structure at the time of each such flood event. The floodplain administrator should contact the FEMA regional office

to determine whether specific flood-damaged agricultural structures have been designated repetitive loss structures.

## C.2 Model Ordinance Language for Small Accessory Structures by Permit (Instead of by Variance)

The following model ordinance language establishes clear limits and requirements for communities to issue permits for certain small accessory structures to allow wet floodproofing instead of requiring compliance with the minimum elevation or dry floodproofing requirements for non-residential buildings. To qualify for approval by permit instead of by variance, wet floodproofed accessory structures must be small, represent minimal investment, and have low damage potential (refer to Section 4.2 of this bulletin). Larger accessory structures may be wet floodproofed, but must be considered under the variance provisions. Communities may decide to require variances for all accessory structures, regardless of size (see Section C.3).

### **Model ordinance language for detached accessory structures**

#### SECTION [community-specific number] DETACHED ACCESSORY STRUCTURES.

Detached accessory structures used only for parking of vehicles and storage are permitted at grade if:

- (1) In special flood hazard areas other than coastal high hazard areas (Zones A, AE, AH, AO, and A1-30), not larger than a one-story two-car garage and walls have flood openings in compliance with the requirements of [insert section number where flood opening requirements are specified].
- (2) In coastal high hazard areas (Zones V, VE, V1 30, and VO), not larger than 100 sq. ft. in area.
- (3) Anchored to resist flotation, collapse, and lateral movement.
- (4) Flood damage-resistant materials used below the base flood elevation comply with the requirements of [insert section number where flood damage-resistant material requirements are specified].
- (5) Mechanical, electrical, and utility equipment comply with the requirements of [insert section number where requirements for equipment and utilities are specified].

## C.3 Typical Standard Variance Provisions

The NFIP regulations for variances state that FEMA does not set forth absolute criteria for communities to use when considering granting variances from the minimum requirements for development in SFHAs (44 C.F.R. § 60.6). However, the regulations do establish minimum procedures that require communities to make specific determinations and take specific actions. Communities must approve or deny requests for variances, after examining documentation submitted by applicants.

The example of typical standard variance provisions shown below is included because review and evaluation of requests for variances for agricultural structures and accessory structures must be processed in the context of these standard provisions. Most communities adopt local regulations based on model ordinances developed by each state and territory. Having minor differences between provisions in existing local regulations and the sample provisions shown here does not mean communities must modify their regulations to match. Communities should contact the FEMA regional office or the state, tribal, or territorial NFIP coordinator for guidance on the standard variance provisions and how best to incorporate desired changes to be able to consider variances for agricultural structures and accessory structures.

### **Model ordinance language for standard variance provisions**

#### SECTION [community-specific number] VARIANCES.

**A. General.** The [community-specific entity designated as the community's variance review board] shall hear and decide requests for variances. The [variance review board] has the right to attach such conditions to variances as it deems necessary to further the purposes and objectives of these regulations. The [variance review board] shall base its determinations on:

- (1) Technical justifications submitted by the applicant.
- (2) The staff report, comments, and recommendations submitted by the floodplain administrator.
- (3) The limitations, considerations, and conditions set forth in this section.

**B. Records.** The floodplain administrator shall maintain a permanent record of all variance actions, including justification for issuance.

**C. Historic structures.** A variance is authorized to be issued for the repair or rehabilitation of a historic structure 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.

Exception: Within flood hazard areas, historic structures that are not:

- (1) Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or
- (2) Determined by the Secretary of the U.S. Department of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
- (3) Designated as historic under a state or local historic preservation program that is approved by the Department of the Interior.

**D. Functionally dependent uses.** A variance is authorized to be issued for the construction or substantial improvement of a functionally dependent use provided the variance is the minimum necessary to allow the construction or substantial improvement, and that all due

consideration has been given to methods and materials that minimize flood damage during the base flood and create no additional threats to public safety.

**E. Restrictions in floodways.** A variance shall not be issued for any proposed development in a floodway if any increase in flood levels would result during the base flood discharge.

**F. Considerations for review.** In reviewing applications for variances, all technical evaluations, all relevant factors, all other portions of these regulations, and the following shall be considered:

- (1) The danger that materials and debris may be swept onto other lands resulting in further injury or damage.
- (2) The danger to life and property due to flooding or erosion damage.
- (3) The susceptibility of the proposed development, including contents, to flood damage and the effect of such damage on current and future owners.
- (4) The importance of the services provided by the proposed development to the community.
- (5) The availability of alternate locations for the proposed development that are not subject to flooding or erosion.
- (6) The compatibility of the proposed development with existing and anticipated development.
- (7) The relationship of the proposed development to the comprehensive plan and floodplain management program for that area.
- (8) The safety of access to the property in times of flood for ordinary and emergency vehicles.
- (9) The expected heights, velocity, duration, rate of rise and debris and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site.
- (10) 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 and water systems, streets, and bridges.

**G. Conditions for issuance.** Variances shall only be issued upon:

- (1) A showing of good and sufficient cause that the unique characteristics of the size, configuration, or topography of the site renders the elevation standards inappropriate.
- (2) A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
- (3) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, nor create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances.

- (4) A determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
- (5) Notification to the applicant in writing over the signature of the floodplain administrator that the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage, and that such construction below the base flood level increases risks to life and property.

## C.4 Model Ordinance Language for Variances for Individual Agricultural Structures and Accessory Structures

The following model ordinance language establishes clear limits and requirements that must be considered before granting variances with specific conditions for individual agricultural structures and accessory structures to allow wet floodproofing instead of requiring compliance with the minimum elevation or dry floodproofing requirements for non-residential buildings (see Section 4.3 of this bulletin).

### INSTRUCTIONS FOR TAILORING MODEL ORDINANCE LANGUAGE FOR INDIVIDUAL COMMUNITIES.

- Where italicized notes appear [*in brackets*], insert the appropriate cross-referenced section number where the described provisions are specified in the community's existing regulations.
- The model ordinance language may be modified to include only accessory structures or only agricultural structures
- Communities may decide to require all wet floodproofed accessory structures to be approved under the variance provisions, rather than distinguish based on size. In this case, remove the size limit in paragraph H(1) b.

#### Model ordinance language for standard variance provisions

**H. Accessory structures and agricultural structures.** A variance is authorized to be issued for the construction or substantial improvement of accessory structures and agricultural structures provided the requirements of this section and the following are satisfied:

- (1) **Accessory structures.** A determination that the proposed accessory structure:
  - a. Represents minimal investment and has low damage potential (amount of physical damage, contents damage, and loss of function).
  - b. Is larger than the size limits specified in [*insert section number where requirements for accessory structures, including size limits, are specified*].
  - c. Complies with the wet floodproofing construction requirements of paragraph H(3) below.

(2) **Agricultural structures.** A determination that the proposed agricultural structure:

- a. Is used exclusively in connection with the production, harvesting, storage, raising, or drying of agricultural commodities and livestock, or storage of tools or equipment used in connection with these purposes or uses, and will be restricted to such exclusive uses.
- b. Has low damage potential (amount of physical damage, contents damage, and loss of function).
- c. Does not increase risks and pose a danger to public health, safety, and welfare if flooded and contents are released, including but not limited to the effects of flooding on manure storage, livestock confinement operations, liquified natural gas terminals, and production and storage of highly volatile, toxic, or water-reactive materials.
- d. Is an aquaculture structure that is dependent on proximity to water if located in a coastal high-hazard area (Zones V, VE, V1 30, and VO).
- e. Complies with the wet floodproofing construction requirements of paragraph H(3) below.

(3) **Wet floodproofing construction requirements.** Wet floodproofed structures shall:

- a. Be anchored to resist flotation, collapse, and lateral movement.
- b. Have flood damage-resistant materials below the base flood elevation in compliance with the requirements of *[insert section number where flood damage-resistant material requirements are specified]*.
- c. Have mechanical, electrical, and utility equipment in compliance with the requirements of *[insert section number where requirements for equipment and utilities are specified]*.
- d. In special flood hazard areas other than coastal high hazard areas, have flood openings in compliance with the requirements of *[insert section number where flood opening requirements are specified]*.

## C.5 Model Ordinance Language for Permits for Certain Flood-Damaged Agricultural Structures

The following model ordinance language establishes clear limits and requirements for communities to consider before issuing permits to allow certain flood-damaged agricultural structures to be repaired or restored to pre-damage condition without bringing the structures into compliance. To be eligible, the agricultural structures must be determined to have been substantially damaged by flooding only (even if damage was caused by flooding and another cause), or have been designated repetitive loss agricultural structures by the NFIP (refer to Section 4.4 of this bulletin).

## INSTRUCTIONS FOR TAILORING MODEL ORDINANCE LANGUAGE FOR INDIVIDUAL COMMUNITIES.

Where italicized notes appear [*in brackets*], insert the appropriate new section number and the cross-referenced section number where the described provisions are specified in the community's existing regulations.

### **Model ordinance language to a new section where requirements for buildings are included**

#### SECTION [*community-specific number*] AGRICULTURAL STRUCTURES DAMAGED BY FLOODING.

Agricultural structures that are substantially damaged by flooding and agricultural structures that are repetitive loss structures are permitted to be repaired or restored to pre-damage condition, provided the following are satisfied:

- (1) If substantially damaged, the substantial damage determination is based only on the cost to repair damage caused by flooding to pre-damage conditions.
- (2) The proposed repair or restoration does not change the size of the structure and does not significantly alter the nature of the building. With the exception of costs associated with wet floodproofing in accordance with paragraph (5) below, proposals that include work beyond or in addition to that necessary to repair or restore the structure to pre-damage condition must be regulated as substantial improvements.
- (3) The repaired or restored structure will continue to be an agricultural structure, as defined in these regulations.
- (4) Owners are notified, in writing, that agricultural structures approved under this section:
  - a. Will not be eligible for disaster relief under any program administered by the Federal Emergency Management Agency or any other Federal agency.
  - b. Will have National Flood Insurance Program flood insurance policies rated based on the structure's risk.
  - c. May be denied National Flood Insurance Program flood insurance policies if repairs do not include the wet floodproofing construction requirements of paragraph (5) below.
- (5) Wet floodproofing construction requirements. When owners elect to wet floodproof flood-damaged agricultural structures as part of repair or restoration to pre-damage condition, the structure shall:
  - a. Be anchored to resist flotation, collapse, and lateral movement.
  - b. Have flood damage-resistant materials below the base flood elevation in compliance with the requirements of [*insert section number where flood damage-resistant material requirements are specified*].

- c. Have mechanical, electrical, and utility equipment in compliance with the requirements of [*insert section number where requirements for equipment and utilities are specified*].
- d. In special flood hazard areas other than coastal high hazard areas, have flood openings in compliance with the requirements of [*insert section number where flood opening requirements are specified*].

## Appendix D: References and Photograph Sources

### References

- 42 U.S.C. Chapter 50 National Flood Insurance [National Flood Insurance Act, as amended), §§ 4001 et seq. Available at <https://uscode.house.gov/browse/prelim@title42/chapter50&edition=prelim>.
- 44 C.F.R. Part 59 General Provisions and Part 60 Criteria for Land Management and Use). Available at <https://www.govinfo.gov/app/details/CFR-2011-title44-vol1/CFR-2011-title44-vol1-part59> and <https://www.govinfo.gov/app/details/CFR-2011-title44-vol1/CFR-2011-title44-vol1-part60>.
  - 44 C.F.R. § 59.1 Definitions
  - 44 C.F.R. § 60.3 Flood Plain Management Criteria for Flood Prone Areas
  - 44 C.F.R. § 60.6 Variances and Exceptions
- ASCE. 2017. ASCE 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures. Available for purchase from ASCE at <https://www.asce.org/>.
- ASCE. 2015. ASCE 24-14, Flood Resistant Design and Construction. Available for purchase from ASCE at <https://www.asce.org/>.
- FEMA. Various dates. NFIP Technical Bulletins. Current editions available at <https://www.fema.gov/nfip-technical-bulletins>:
  - Technical Bulletin 0, User's Guide to Technical Bulletins
  - Technical Bulletin 1, Requirements for Flood Openings in Foundation Walls and Walls of Enclosures
  - Technical Bulletin 2, Flood-Damage-Resistant Materials Requirements
  - Technical Bulletin 3, Non-Residential Floodproofing – Requirements and Certification
  - Technical Bulletin 4, Elevator Installation
  - Technical Bulletin 5, Free-of-Obstruction Requirements for Buildings Located in Coastal High-Hazard Areas
  - Technical Bulletin 6, Below-Grade Parking Requirements
  - Technical Bulletin 7, Wet Floodproofing Requirements

- Technical Bulletin 8, Corrosion Protection for Metal Connectors and Fasteners in Coastal Areas
- Technical Bulletin 9, Design and Construction Guidance for Breakaway Walls Below Elevated Buildings Located in Coastal High Hazard Areas
- Technical Bulletin 10, Ensuring that Structures Built on Fill in or near Special Flood Hazard Areas Are Reasonably Safe from Flooding
- Technical Bulletin 11, Crawlspace Construction for Buildings Located in Special Flood Hazard Areas (Interim Guidance)
- FEMA. 2010. FEMA P-758. Substantial Damage/Substantial Improvement Desk Reference. Available at <https://www.fema.gov/media-library/assets/documents/18562>
- FEMA. 2013. FEMA P-936. Floodproofing Non-Residential Buildings. Available at <http://www.fema.gov/media-library/assets/documents/34270>.
- FEMA. 2014. FEMA P-993. Floodplain Management Bulletin: Variances and the National Flood Insurance Program. Available at <https://www.fema.gov/media-library/assets/documents/99703>.
- FEMA. 2016. FEMA Environmental Planning and Historic Preservation Responsibilities and Requirements (FEMA Directive 108-1 and Instruction 108-1-1). Available at <https://www.fema.gov/media-library/assets/documents/118323>.
- FEMA. 2017. FEMA P-348, Protecting Building Utility Systems from Flood Damage. Available at <https://www.fema.gov/media-library/assets/documents/3729>.

## Appendix E: Acronym List

ARS	Agricultural Research Service
ASCE	American Society of Civil Engineers
BFE	Base Flood Elevation
C.F.R.	Code of Federal Regulations
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GFCI	Ground Fault Circuit Interrupter
LiMWA	Limit of Moderate Wave Action
NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
SFHA	Special Flood Hazard Area
U.S.C.	United States Code
USDA	United States Department of Agriculture