



UNIT V: INVESTIGATING REGULATORY REQUIREMENTS



INVESTIGATING REGULATORY REQUIREMENTS

INTRODUCTION

States and communities throughout the United States enforce regulatory requirements that determine where and how buildings may be sited, designed, and constructed. These requirements include those associated with regulatory programs established by Federal and State statutes, building codes and standards, and locally adopted floodplain management and land use ordinances and laws.

Applicable regulatory programs include:

- The National Flood Insurance Program (NFIP), which is intended to reduce the loss of life and damage caused by natural hazards.
- Programs established to protect wetlands and other wildlife habitat, which seek to minimize degradation of the environment.
- State- and community-enforced requirements aimed specifically at the regulation of construction along the shorelines of oceans, bays, and lakes.

Federal, State, and local regulatory requirements can have a significant effect on the siting, design, construction, and cost of buildings. Therefore, designers, property owners, and builders engaged in residential construction projects in the coastal environment should conduct a thorough investigation to identify all regulations that may affect their properties and projects.

This unit will provide information about land use regulations, building codes and standards, NFIP minimum requirements and recommendations for exceeding those requirements, and other Federal legislation.

UNIT OBJECTIVES After completing this unit, you should be able to:

- 5.1 Identify ways in which the following regulatory measures help reduce damage to coastal residential structures:
 - Land use regulations.
 - Building codes and standards.
 - NFIP minimum requirements.
 - Coastal Barrier Resources Act regulations.
 - Coastal Zone Management regulations.
- 5.2 Identify minimum NFIP requirements for buildings in V and A zones and recommendations for exceeding those requirements.



LAND USE REGULATIONS

State and local governments establish regulations governing the development and use of land within their jurisdictions. The goal of these land use regulations is generally to promote sound physical, social, and economic development. The regulations take many forms, including:

- Zoning and floodplain management ordinances.
- Subdivision regulations.
- Utility codes.
- Impact fees.
- Historic preservations requirements.
- Environment regulations.

Land use regulations are often incorporated into and implemented under comprehensive or master plans developed by local jurisdictions in coordination with their State governments.

IMPACT OF LAND USE REGULATIONS

With land use regulations, communities can control development in a variety of ways. For example, they can:

- Prohibit or restrict development in specified areas.
- Establish requirements for:
 - Lot size.
 - Clearing and grading.
 - Drainage.
 - Siting of buildings.
 - Floodplain management.
 - Construction of access roads.
 - Installation of utility lines.
 - Planting of vegetative cover.
 - Other aspects of the land development and building construction processes.

The land use regulations enacted and enforced by State and local governments across the country vary in content and complexity according to the needs and concerns of individual jurisdictions. Therefore, it is beyond the scope of this course to list or describe specific regulations.

However, such regulations can have a significant impact on the construction and improvement of residential and other types of buildings in both coastal and non-coastal areas. Therefore, it is important that designers, builders, and property owners be aware of the regulations that apply to their projects.



SOURCES OF INFORMATION The best sources of information about land use regulations include the following:

- **State and local officials** in charge of planning, land management, economic development, building code, floodplain management, and community affairs.
- **Professional organizations** such as the American Planning Association (APA) and its State chapters.

Community officials may be interested in several recent APA projects and publications described below. More detailed information is available on the APA website: <http://www.planning.org>.

EXAMPLES OF APA PROJECTS AND PUBLICATIONS

- *Subdivision Design in Flood Hazard Areas* (Morris, 1997), APA Planning Advisory Service Report Number 473.

This report provides information and guidance on subdivision design appropriate for floodplain areas. It includes several examples of State and local subdivision requirements in coastal floodplains. The report was prepared under a cooperative agreement with FEMA.

- *Modernizing State Planning Statutes: The Growing SmartSM Working Papers* (APA 1996), American Planning Advisory Service Report Number 462/463, and *Growing SmartSM Legislative Guidebook* (APA, 1998).

Growing SmartSM is a major initiative launched by the APA in 1994. The project will result in a National planning statute clearinghouse and database of State legislative materials, and in model planning legislation and commentary. Chapter 7 of the document includes a model Natural Hazards Element for incorporation into local government comprehensive plans.

- *Planning for Post-Disaster Recovery and Redevelopment* (Schwab et al., 1998), APA Planning Advisory Service Report Number 483/484.

This report provides all-hazards guidance for local planners. It includes a model ordinance for regulating hazard areas and includes case studies for five hazard scenarios (flood, hurricane, wildfire, earthquake, and tornado). The report includes a model Natural Hazards Element (taken from the *Growing SmartSM Legislative Guidebook*) for incorporation into local comprehensive plans. The report was prepared under a cooperative agreement with FEMA.



WARNING

Hazard area identifications (including those on FIRMs) and associated development regulations can be rendered obsolete by a natural event. Take extreme care in siting and designing residential buildings in post-disaster situations.



BUILDING CODES AND STANDARDS

Many States and communities regulate the construction of buildings by adopting and enforcing building codes and standards that affect how buildings are designed and constructed.

BUILDING CODES The purpose of a building code is to establish the minimum acceptable requirements necessary for protecting the public, health, safety, and welfare in the built environment. Building codes set forth requirements for:

- Structural design.
- Materials.
- Fire safety.
- Exits.
- Natural hazard mitigation.
- Sanitary facilities.
- Light and ventilation.
- Environmental control.
- Fire protection.
- Energy conservation.

Building codes apply primarily to new construction, but they may also apply to existing buildings that are being rebuilt, rehabilitated, or modified. Codes may also apply when a building is undergoing a change of occupancy as defined by the code.

STANDARDS A standard, according to the Council of American Building Officials, is:

“a prescribed set of rules, conditions, or requirements concerned with the definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, design, or operations; descriptions of fit and measurement of size; or measurement of quality and quantity in describing materials, products, systems, services, or practices.”



The adoption and enforcement of building codes and standards is not consistent across the United States. Codes and standards in some States and communities may be more restrictive than in others. Some States and communities have not adopted any building codes or standards.

There are hundreds of standards related to design and construction practices, and thousands of standards related to construction materials.

When a standard is developed according to definitive rules of procedure and consensus, it may be incorporated into a building code **by reference** rather than by including all of the text of the standard in the code.

**MODEL BUILDING
CODES**

Most building codes in the United States are based on model building codes. Model building codes are the result of an effort begun early in the 20th century to produce a model law or guide document that could be adopted by a legislative body to reduce losses caused by fire and other hazards. Six model building codes are now used in the United States:

- *International Building Code (IBC)*, published by the International Code Council (ICC), 2000.
- *International Residential Code for One- and Two-Family Dwellings (IRC)*, published by the ICC, 2000.
- *Uniform Building Code (UBC)*, published by the International Conference of Building Officials (ICBO), 1997.
- *The BOCA National Building Code*, published by the Building Officials & Code Administrators International (BOCA), 1996.
- *Standard Building Code (SBC)*, published by the Southern Building Code Congress International (SBCCI), 1997.
- *International One- and Two-Family Dwelling Code*, published by the Council of American Building Officials (CABO), 1998.

**NOTE**

For more information about building codes and standards, refer to *An Introduction to Model Codes (CABO 1997)*, published by the Council of American Building Officials—now the International Code Council (ICC).

States and local jurisdictions may adopt a model code—unaltered or with amendments and revisions. They may also adopt and enforce other codes and standards to meet specific needs, such as providing additional resistance to damage in areas subject to flood, wind, and earthquake hazards. Examples of these State and local codes and standards include the South Florida Building Code, the Massachusetts State Building Code, and the Texas Department of Insurance Windstorm Resistant Construction Guide (1998).

Other codes and standards in use include:

- American Society of Civil Engineers (ASCE) *Minimum Design Loads for Buildings and Other Structures*, ASCE 7-98.
- SBCCI *Standard for Hurricane Resistant Residential Construction*, SSTD 10-99.

In addition, trade organizations publish design documents—for example, the High Wind Edition of the *Wood Frame Construction Manual for One- and Two-Family Dwellings* by the American Forest & Paper Association.

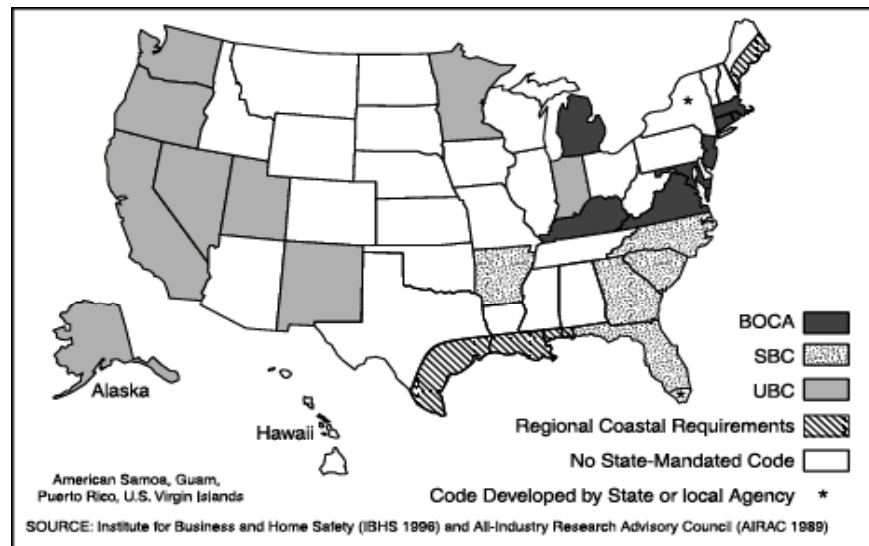


ADOPTION OF MODEL CODES

It is important to note that not every State has adopted a model building code, and some of those that have do not require that the code be applied to the construction of one- and two-family residential buildings.

The map in Figure 5-1 shows the States that have adopted a mandatory State building code, based on one of the model codes, that applies to some or all types of construction within the State. The figure also shows areas of the United States that have adopted regional requirements governing coastal construction.

Figure 5-1. States That Have a Mandatory Building Code Based on One of the Model Building Codes.



In areas where a model building code has not been adopted or where the existing code is not applied to one- and two-family residential buildings, those engaged in the design and construction of coastal residential buildings are encouraged to follow the requirements of a model building code and the recommendations presented in the *Coastal Construction Manual*.

In general, most coastal States have adopted a model building code and/or specific requirements concerning the construction of buildings in coastal flood and wind hazard areas.

In States where no mandated codes exist, it is common for relatively populous political jurisdictions, towns, and cities to have some form of regulatory control on the construction of housing. In the entire United States, about 4,400 political jurisdictions have adopted some type of building code.



INTERNATIONAL CODES The International Code Council was formed to bring together the three model code groups—ICBO, BOCA, and SBCCI—under a unifying code body in support of common code development.

Among the new codes developed by the ICC are:

- *International Building Code 2000* (IBC 2000).
- *International Residential Code for One- and Two-Family Dwellings 2000* (IRC 2000).
- Mechanical, plumbing, and private sewage disposal codes.

Compliance with NFIP and NEHRP

Both the IBC 2000 and the IRC 2000 meet the minimum building science requirements of the NFIP regulations. Together, the IBC 2000 (with its Appendix G) and the IRC 2000 meet the minimum requirements of the NFIP regulations. (Communities must adopt **both codes** to be compliant with the regulatory requirements of the NFIP.)

The mechanical, plumbing, and private sewage disposal codes are compliant with the applicable provisions of the NFIP regulations.

The IRC 2000 and the IBC 2000 are both substantially equivalent to the National Earthquake Hazards Reduction Program 1997 *NEHRP Recommended Provisions for Seismic Regulations for New Buildings* (FEMA 1997).

Adoption of the International Codes

At the time the *Coastal Construction Manual* went to print, many States and communities were considering adoption of the IBC 2000 and the IRC 2000. Thus many State and local building code requirements may change as a result.

Variations from one State or jurisdiction to the next, coupled with potential code revisions, make it imperative that the designer work with local officials to identify the current codes, standards, and other construction requirements that apply. Even in States and communities that have not adopted the IBC 2000 and IRC 2000, designers may elect to use the new codes.



***SELF-CHECK REVIEW:
LAND USE REGULATIONS, BUILDING CODES, AND STANDARDS***

Instructions: Answer the following questions. Then turn the page to check your answers. If you answered any items incorrectly, you should review the related material before continuing.

1. _____ may prohibit development in specified areas.
 - a. Land use regulations
 - b. Building codes
 - c. Standards
 - d. Model building codes

2. _____ set forth requirements for the overall design of a building.
 - a. Land use regulations
 - b. Building codes
 - c. Standards

3. A single residential building design may be subject to hundreds of _____.
 - a. Building codes
 - b. Standards

4. The International Building Code is an example of a _____.
 - a. Trade organization code
 - b. Land use regulation
 - c. Standard
 - d. Model building code



The Answer Key for the preceding Self-Check Review is located on the next page.



ANSWER KEY

1. **Land use regulations** may prohibit development in specified areas.
2. **Building codes** set forth requirements for the overall design of a building.
3. A single residential building design may be subject to hundreds of **standards**.
4. The International Building Code is an example of a **model building code**.



NATIONAL FLOOD INSURANCE PROGRAM—AN OVERVIEW

PURPOSE Congress created the NFIP in 1968 when it passed the National Flood Insurance Act. The NFIP, which is administered by FEMA, is a voluntary program whose goals are:

- To reduce the loss of life and the damage caused by flooding.
- To help victims recover from floods.
- To promote an equitable distribution of costs among those who are protected by flood insurance and the general public.

NFIP ACTIVITIES The NFIP achieves these goals through the following activities:

- Conducting **flood hazard studies** and providing each community with a Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report, which present flood hazard information. The provided information includes:
 - Boundaries of the Special Flood Hazard Area (SFHA)—the area subject to inundation by the flood that has a one percent probability of being equaled or exceeded in any given year.
 - Base flood elevations (BFEs).
 - Flood insurance zones.
- Providing State and local agencies with **technical assistance and funding** in support of flood hazard mitigation.
- Requiring participating communities to **control construction** so that new buildings, **substantially improved** buildings, and repaired **substantially damaged** buildings in the SFHA are in compliance with floodplain management ordinances and laws intended to eliminate or reduce flood damage.
- Providing residents in participating communities with **flood insurance** so that the need for disaster relief is reduced.
- Requiring the purchase of **flood insurance as a condition of receiving Federal or federally regulated financial assistance** for the acquisition and/or construction of buildings in SFHAs.



NOTE

An explanation of **substantial improvement** and **substantial damage** is provided on the next page.

The NFIP provides the means by which disaster assistance agencies and Federal lending regulatory agencies can fulfill their obligation to require that flood insurance be purchased for property in the SFHA that is securing a Federal or federally regulated loan or that has received Federal disaster assistance.



Substantial Damage and Substantial Improvement



Under the NFIP, substantially damaged and substantially improved buildings must meet the floodplain management requirements for new buildings.

- **Substantial damage:** Damage to a building (regardless of the cause) is considered substantial damage if the cost of restoring the building to its before-damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
- **Substantial improvement:** An improvement of a building (such as reconstruction, rehabilitation, or addition) is considered a substantial improvement if its cost equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement.

For more information, consult your local floodplain management officials or refer to *Answers to Questions About Substantially Damaged Buildings*, FEMA 213 (FEMA 1991).

HOW THE NFIP PROGRAM WORKS

The NFIP operates through a partnership between the Federal Government, the States, and individual communities (e.g., counties; parishes; and incorporated cities, towns, townships, boroughs, and villages). Participation in the NFIP is voluntary.

In participating communities, affordable federally backed flood insurance is made available to property owners and renters. In return, each community adopts and enforces a floodplain management ordinance or law, which it uses to define regulatory floodplains and to control floodplain development—including new construction, substantial improvement of existing buildings, and repairs of substantially damaged buildings.

A participating community's floodplain management ordinance or law must, at a minimum, meet the requirements of the NFIP regulations. However, FEMA encourages communities to establish additional or more stringent requirements as they see fit.



Community Rating System

In 1990, to provide incentives for communities to adopt more stringent requirements, FEMA established the NFIP Community Rating System (CRS). Through the CRS, FEMA encourages and recognizes community floodplain management activities that exceed the minimum NFIP requirements.

Goals of the CRS. Under the CRS, flood insurance premium rates within participating communities are adjusted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS: reducing flood losses, facilitating accurate insurance rating, and promoting the awareness of flood insurance.

Class Determination. Through the CRS, communities are awarded credit points for carrying out floodplain management activities in the following areas:

- Public information.
- Mapping and regulations.
- Flood damage reduction.
- Flood preparedness.

The number of points awarded determines a community's CRS class, from 1 to 10. The class then determines the amount of reduction in the flood insurance premium rates for structures within and outside the SFHA.

Participation in the CRS is voluntary; any community compliant with the rules and regulations of the NFIP may apply for a CRS classification. In addition to helping communities obtain insurance premium discounts, the CRS promotes floodplain management activities that help save lives, reduce property damage, and promote sustainable, more livable communities.



NOTE

In 1999, nearly 900 communities throughout the United States were receiving flood insurance premium discounts through the CRS as a result of implementing local mitigation, outreach, and educational activities that go beyond minimum NFIP requirements.

For more information about the CRS, contact the NFIP Coordinating Agency for your State or the appropriate FEMA Regional Office.



FIRMs and FIS Reports

The regulatory requirements of the NFIP are based on the base flood—the flood that has a one percent probability of being equaled or exceeded in any given year.

To provide communities with the information they need to enact and enforce floodplain management ordinances or laws compliant with the NFIP requirements, FEMA conducts flood hazard studies for communities throughout the United States and publishes the results in the form of FIRMs and FIS reports.

Information Provided. FIS reports and FIRMs provide the following information:



NOTE

A FIRM consists of one or more numbered panels that cover the geographic area of a community such as a city, town, or county.

FIRMs that consist of two or more panels are accompanied by an index map that shows the layout of the panels.

For more information about FIRMs, refer to FEMA's *Guide to Flood Maps*, FEMA 258 (1995).

- Names and locations of flooding sources.
- Sizes and frequencies of past floods.
- Limits of the SFHA in areas subject to riverine, lacustrine, and coastal flooding.
- Flood insurance zone designations.
- BFEs throughout the SFHA.

With this information, communities can manage floodplain development and FEMA can establish insurance rates for houses and other buildings.

Of particular importance for a coastal construction project are the BFE and the flood insurance designation at the building site. The following sections explain how BFEs and zone designations are determined for coastal flood hazard areas and how they affect coastal construction.



***DETERMINATION
OF BFEs***

To determine BFEs for areas affected by coastal flooding, FEMA computes 100-year stillwater elevations and then determines the maximum 100-year wave heights (and, in some areas, the maximum 100-year wave runup) associated with those stillwater elevations.



- **Stillwater elevations** are the elevations of the water surface resulting solely from storm surge (i.e., the rise in the surface of the ocean as a result of the action of wind and the drop in atmospheric pressure associated with hurricanes and other storms).
 - **Wave heights** are the heights, above the wave trough, of the crests of wind-driven waves.
 - **Wave runup** is the rush of wave water up a slope or structure.
-

The BFEs for coastal flood hazard areas on FIRMs are established at the maximum elevation of either the wave crest or the wave runup—whichever is greater.

Whether the wave crest elevation or the wave runup elevation is greater depends primarily on upland topography. In general, wave crest elevations are greater where the upland topography is gentle, such as along most of the Gulf, southern Atlantic, and middle-Atlantic coasts. Wave runup elevations are greater where the topography is steeper, such as along portions of the Great Lakes, northern Atlantic, and Pacific coasts.



**FLOOD INSURANCE
ZONES**

The insurance zone designations shown on FIRMs indicate the magnitude and severity of flood hazards. The zone designations that apply to coastal flood hazard areas are listed below, in decreasing order of magnitude and severity.

Zones VE, V1–V30, and V

These zones, collectively referred to as V zones, identify the Coastal High Hazard Area—the portion of the SFHA that extends from offshore to the inland limit of a primary frontal dune along an open coast.



NOTE

Zones AE, VE, and X appear on FIRMs produced since the mid-1980s. On older FIRMs, the corresponding zones are A1–A30, V1–V30, and B or C, respectively.

V zones also include any other portion of the SFHA that is subject to high-velocity wave action from storms or seismic sources. V zones are generally based on wave heights (3 feet or greater) or wave runup depths (3 feet or greater).

Zones AE, A1–A30, AO, and A

These zones, collectively referred to as A zones, identify portions of the SFHA that are not within the Coastal High Hazard Area. Although both A zones and V zones designate areas at risk from a flood of the same magnitude, the hazard in V zones is greater because of the presence of breaking waves with heights equal to or greater than 3 feet.



NOTE

It is important to note that FIRMs use Zones AE, A1–A30 AO, and A to designate both coastal and non-coastal SFHAs, and that the regulatory requirements of the NFIP are the same for buildings in coastal and non-coastal A zones. However, buildings in coastal A zones may be subject to breaking waves with heights less than 3 feet and wave runup with depths less than 3 feet.

The Coastal A zone defined in the *Coastal Construction Manual* is not established by the NFIP regulations. However, this zone designation is useful because the hazards in coastal A zones are greater than those in non-coastal A zones but less severe than those in V zones.

Zones X, B, and C

These zones identify areas outside the SFHA. Zone B and shaded Zone X identify areas subject to inundation by the flood that has a 0.2 percent probability of being equaled or exceeded during any given year (the 500-year flood). Zone C and unshaded Zone X identify areas above the level of the 500-year flood.



SELF-CHECK REVIEW: NFIP OVERVIEW

Instructions: Answer the following questions. Then turn the page to check your answers. If you answered any items incorrectly, you should review the related material before continuing.

1. The NFIP conducts _____ to provide communities with information about flood hazards.

2. List three activities carried out by the NFIP.
 - (1) _____
 - (2) _____
 - (3) _____

3. The _____ provides incentives for communities to adopt more stringent requirements than the NFIP regulations.

4. _____ is the elevation of the water surface resulting solely from storm surge.

5. The BFEs on FIRMs are established at the maximum elevation of _____ or _____, whichever is greater.

6. Which of the following zones has the least risk of damage from high-velocity wave action?
 - a. V1–V30
 - b. AE
 - c. Coastal A
 - d. X



ANSWER KEY

NOTE: Some of your answers may be slightly different, but they should include the same main points.

1. The NFIP conducts **flood hazard studies** to provide communities with information about flood hazards.

2. List three activities carried out by the NFIP.

Any of the following:

- **Conducting flood hazard studies**
- **Providing technical assistance and funding**
- **Requiring participating communities to control construction in the SFHA**
- **Providing flood insurance**
- **Requiring the purchase of flood insurance as a conditions of receiving Federal or federally regulated loans**

3. The **Community Rating System** provides incentives for communities to adopt more stringent requirements than the NFIP regulations.

4. **Stillwater elevation** is the elevation of the water surface resulting solely from storm surge.

5. The BFEs on FIRMs are established at the maximum elevation of **wave crest** or **wave runup**, whichever is greater.

6. Which of the following zones has the least risk of damage from high-velocity wave action?

d. X



NFIP MINIMUM REGULATORY REQUIREMENTS

INTRODUCTION The floodplain management ordinances or laws adopted by communities that participate in the NFIP are based, in part, on the minimum NFIP regulatory requirements set forth at Title 44, Chapter 1, Section 60.3 of the U.S. Code of Federal Regulations (44 CFR 60.3).

Types of Buildings Affected

Community floodplain management ordinances and laws include requirements concerning the following types of buildings in the SFHA, including those in both A zones and V zones:

- Newly constructed buildings.
- Substantially damaged buildings.
- Substantially improved buildings.

Additional requirements apply to new subdivisions and other development in the SFHA.

Aspects of the Building Affected

The minimum NFIP regulatory requirements regarding newly constructed, substantially damaged, and substantially improved buildings affect primarily:

- Type of foundation allowed.
- Required height of the **lowest floor**.
- Installation of building utility systems.
- Use of flood-resistant materials.
- Use of the area below the lowest floor.



Under the NFIP, the **lowest floor** of a building includes the floor of a basement. The NFIP regulations define a basement as "...any area of a building having its floor subgrade (below ground level) on all sides."

For insurance rating purposes, this definition applies even when the subgrade floor is not enclosed by full-height walls, such as in a subgrade parking area under a building elevated on an open foundation.

In recognition of the greater hazard posed by breaking waves 3 feet high or higher, FEMA has established minimum NFIP regulatory requirements for V-zone buildings that are more stringent than the minimum requirements for A-zone buildings. Therefore, the location of a building in relation to the A-zone/V-zone boundary on a FIRM can affect the design of the building.

In that regard, it is important to note that **a building or other structure that has any portion of its foundation in a V zone must be built to comply with V-zone requirements.**

The following sections summarize the minimum NFIP regulatory requirements that apply throughout the SFHA and to A zones and V zones specifically.



**MINIMUM
REQUIREMENTS—
ALL BUILDINGS
IN ALL SFHAs**

The **minimum** floodplain management requirements applied in **all** SFHAs by communities participating in the NFIP affect:

- Buildings.
- Subdivisions and other new development.
- New and replacement water supply systems.
- New and replacement sanitary sewage systems.

These requirements, set forth at 44 CFR 60.3(a) and (b), are summarized below.

Newly Constructed, Substantially Damaged, and Substantially Improved Buildings in the SFHA

These buildings are subject to the following NFIP regulations:



Communities participating in the NFIP are encouraged to adopt and enforce floodplain management ordinances or laws that include requirements more stringent than the minimum NFIP requirements of the NFIP regulations.

For example, some States and communities require that buildings be elevated **above** rather than simply to the BFE (i.e., freeboard is required).

Check with local floodplain managers and building officials concerning such requirements.

- Building sites must be reasonably safe from flooding.
- Buildings must be:
 - Designed (or modified) and anchored to prevent flotation, collapse, and lateral movement of the building resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
 - Constructed with materials resistant to damage from immersion in flood waters.
 - Constructed with methods and practices that minimize flood damage.
 - Constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within their components during conditions of flooding.
- If FEMA has not provided BFE data on the FIRM, the community must obtain and reasonably use any BFE data available from other sources for the purpose of regulating construction in Zone A.



Subdivisions and Other New Development

This type of development must conform to the following NFIP regulations:

- All proposals for subdivisions and other new development in the SFHA must be consistent with the need to minimize flood damage within the floodprone area.
- All public utilities and facilities (such as sewer, gas, electrical, and water systems) for such subdivisions and other new developments must be located and constructed to minimize or eliminate flood damage.
- Adequate drainage must be provided for all such subdivisions and new developments to reduce exposure to flood hazards.
- All proposals for subdivisions and other new developments greater than 50 lots or 5 acres (whichever is less) in an SFHA for which no BFEs are shown on the effective FIRM must be accompanied by 100-year flood elevation data.

New and Replacement Water Supply Systems

Within the SFHA, these systems must be designed to minimize or eliminate infiltration of flood waters.

New and Replacement Sanitary Sewage Systems

Within the SFHA, these systems must be designed to minimize or eliminate infiltration of flood waters into the systems, and discharges from the systems into flood waters.

On-site waste disposal systems must be located to avoid impairment to them or contamination from them during flooding.



NOTE

The NFIP regulations also include requirements specific to **floodplains along rivers and streams**. For more information about these requirements, consult local floodplain management officials. Also refer to *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings*, FEMA 259 (1995).

For NFIP requirements concerning **manufactured housing**, refer to Section 60.3 of the NFIP regulations.



**ADDITIONAL
REQUIREMENTS—
BUILDINGS IN A
ZONES**

The additional **minimum** requirements specific to buildings in Zones AE, A1–A30, AO, and A pertain to:

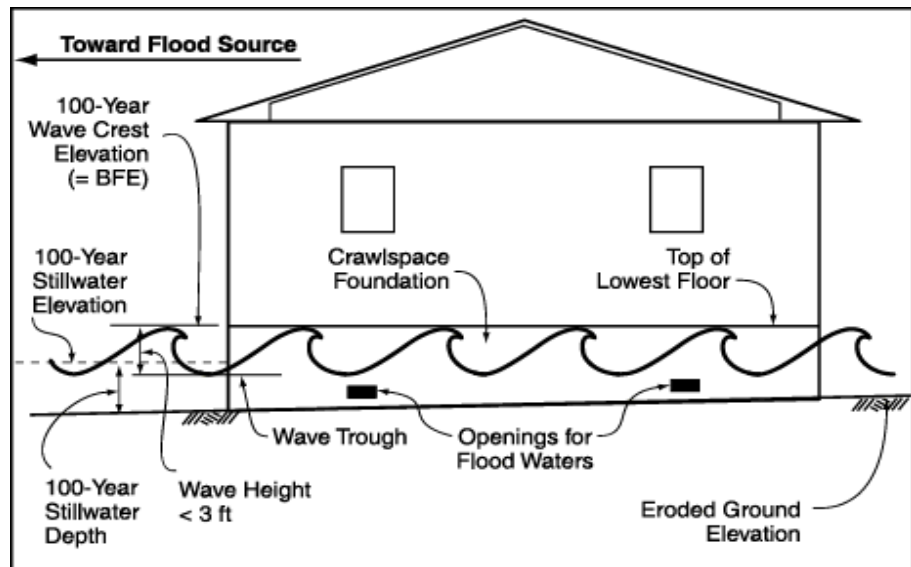
- Elevation of the lowest floor (including basement), in relation to BFE.
- Enclosed areas below the lowest floor.

These requirements, which are the same for coastal and non-coastal A zones, are summarized below

Building Elevation in Zones AE and A1–A30

The top of the lowest floor, including the basement floor, of all newly constructed, substantially damaged, and substantially improved buildings must be **at or above the BFE** (see Fig. 5-2).

Figure 5-2. Minimum NFIP A zone requirements. The lowest floors of buildings in Zones AE, A1–A10, and A must be at or above the BFE. Foundation walls below the BFE must be equipped with *openings* that allow the entry of flood waters so that interior and exterior hydrostatic pressures can equalize.



Building Elevation in Zone A

FIRMs do not present BFEs in SFHAs designated Zone A (i.e., unnumbered A zones). The lowest floors of buildings in Zone A must be elevated to or above the BFE whenever BFE data are available from other sources. If no BFE data are available, communities must ensure that the building is constructed with methods and practices that minimize flood damage.



WARNING

Even waves less than 3 feet high can impose large loads on foundation walls. The *Coastal Construction Manual* recommends that buildings in coastal A zones be designed and constructed to meet V zone requirements.

Building Elevation in Zone AO

Zone AO designates areas where flooding is characterized by shallow depths (averaging 1–3 feet) and/or unpredictable flow paths.

In Zone AO, the top of the lowest floor, including the basement floor, of all newly constructed, substantially damaged, and substantially improved buildings must be **above the highest grade adjacent to the building by at least the depth of flooding** in feet shown on the FIRM.

For example, if the flood depth shown on the FIRM is 3 feet, the top of the lowest floor must be at least 3 feet above the highest grade adjacent to the building.

If no depth is shown on the FIRM, the minimum required height above the highest adjacent grade is 2 feet.



NOTE

Areas adjacent to V zones—behind bulkheads or on the back sides of dunes—are sometimes designated Zone AO. For these areas, the *Coastal Construction Manual* encourages the use of open foundations, as required in V zones.



Enclosures Below the Lowest Floor in Zones AE, A1–A30, AO, A

Enclosed space below the lowest floors of newly constructed, substantially damaged, and substantially improved buildings may be used only for parking of vehicles, access to the building, or storage.

The walls of such areas must be equipped with openings designed to allow the automatic entry and exit of flood waters so that interior and exterior hydrostatic pressures will equalize during flooding. Designs for openings must either meet or exceed the following minimum criteria:



NOTE

For more information about **openings** requirements, refer to *Openings in Foundation Walls for Buildings Located in Special Flood Hazard Areas*, FEMA NFIP Technical Bulletin 1 (1993).

- **Net Area of Openings.** A minimum of two openings with a total net area of not less than 1 in² for every 1 ft² of enclosed area subject to flooding must be provided.

Alternatively, a certification may be provided by a registered engineer or architect stating that the openings are designed to automatically equalize hydrostatic forces on exterior walls by allowing the entry and exit of flood waters. Even if such a certification is provided, however, the openings must still meet the next two criteria.

- **Placement.** The bottoms of all openings must be no higher than 1 foot above grade.
- **Coverings.** The openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of flood waters.



ADDITIONAL REQUIREMENTS— BUILDINGS IN V ZONES The additional **minimum** requirements specific to buildings in Zones VE, V1–V30, and V pertain to:

- Siting of the building.
- Alterations of sand dunes and mangrove stands.
- Elevation of the lowest floor in relation to the BFE.
- Foundation design.
- Enclosures below the BFE.

These requirements, set forth at 44 CFR 60.3(d), are summarized below.

Siting

All newly constructed buildings must be **located landward of the reach of mean high tide** (i.e., the mean high water line).

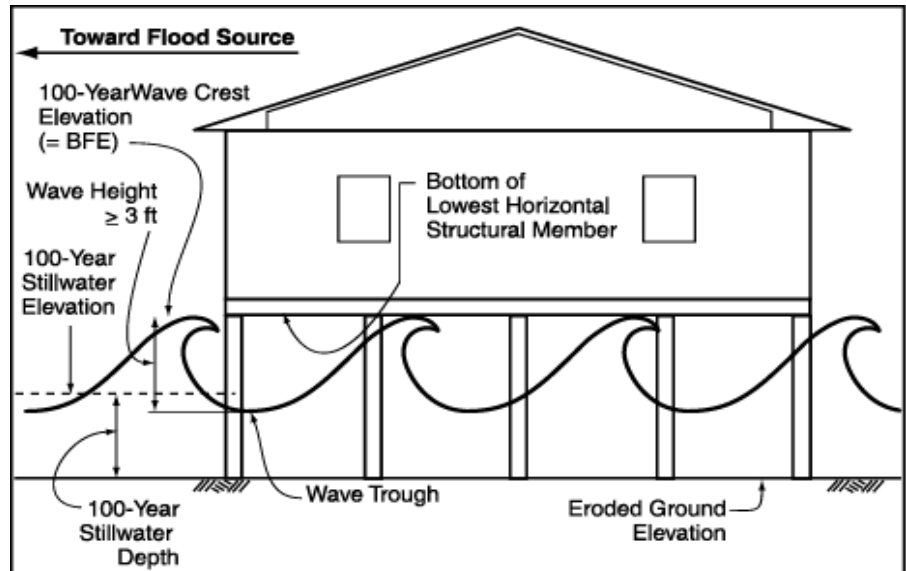
Manmade **alterations of sand dunes or mangrove stands** are prohibited if those alterations would increase potential flood damage. Removing sand or vegetation from, or otherwise altering, a sand dune or removing mangroves may increase potential flood damage. Therefore, such actions must not be carried out without the prior approval of a local official.



Building Elevation

All newly constructed, substantially damaged, and substantially improved buildings must be elevated on pilings, posts, piers, or columns so that the bottom of the lowest horizontal structural member of the lowest floor (excluding the vertical foundation members) is **at or above the BFE** (see Fig. 5-3).

Figure 5-3.
Minimum NFIP V zone requirements. Buildings must be elevated on an open foundation so that the bottom of the lowest horizontal structural member is at or above the BFE.





Foundation Design

The piling or column foundations for all newly constructed, substantially damaged, and substantially improved buildings, as well as the buildings attached to the foundations, must be **anchored** to resist flotation, collapse, and lateral movement from the effects of wind and water loads acting simultaneously on all components of the building.

A **registered engineer or architect must develop or review** the structural design, construction specifications, and plans for construction and must **certify** that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the building elevation and foundation design standards described above.

Erosion control structures and other structures such as bulkheads, seawalls, and retaining walls may not be attached to the building or its foundation.

Use of Fill

Fill may not be used for the structural support of any building within Zones VE, V1–V30, and V. Fill may be used in V zones for minor landscaping and site drainage purposes.



NOTE

For more information about the use of fill in V zones, refer to *Free of Obstructions Requirements for Buildings Located in Coastal High Hazard Areas*, FEMA NFIP Technical Bulletin 5 (1993). Consult local officials for specific guidance or requirements.



Space Below the BFE

The space below all newly constructed, substantially damaged, and substantially improved buildings must meet the following requirements:



WARNING

These requirements have been developed over the years, based on damage to thousands of structures during many flood events. They should not be ignored by the designer, contractor, or owner. Failure to comply with these requirements not only violates the local floodplain management ordinance and NFIP regulations but can also lead to large, uninsured losses.

- **Freedom from Obstructions.** The space below the BFE must either be (1) free of obstructions or (2) enclosed only by non-supporting breakaway walls, open wood latticework, or insect screening intended to collapse under water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or the supporting foundation system.

The current NFIP regulatory requirements regarding **breakaway walls** are set forth in 44 CFR 60.3(e)(5). The regulations specify a design safe loading resistance for breakaway walls of not less than 10 lb/ft² and not more than 20 lb/ft².

However, the regulations also provide for the use of **alternative designs** that do not meet the specified loading requirements. In general, breakaway walls built according to such designs are permitted if a registered professional engineer or architect certifies that (1) the walls will collapse under a water load less than that which would occur during the base flood and (2) the elevated portion of the building and supporting foundation system will not be subject to collapse, displacement, or other structural damage from the effects of wind and water loads acting simultaneously on all components of the building.

- **Permitted Uses.** Additional requirements apply to the use of an enclosed area below the BFE. It may be used only for parking, building access, or storage.
- **Materials.** An enclosed area below the BFE must be constructed of flood-resistant materials.
- **Mechanical/Utility Equipment.** There are specific requirements regarding the placement of mechanical/utility equipment below the BFE.



Although the NFIP regulations permit below-BFE enclosures that meet the criteria presented here, many communities may have adopted ordinances that prohibit all such enclosures or that establish more stringent criteria, such as an enclosure size limitation. Check with local officials about such requirements.

**NOTE**

Additional Information

Alternative Breakaway Wall Designs. The current NFIP regulations do not provide specifications or other detailed guidance for the design and construction of alternative types of breakaway walls. However, the results of recent research conducted for FEMA and the National Science Foundation by North Carolina State University (NCSU) and Oregon State University (OSU), including full-scale tests of breakaway wall panels, provide the basis for prescriptive criteria for the design and construction of breakaway wall panels that do not meet the requirement for a loading resistance of 10-20 lb/ft².

These criteria are presented in *Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings*, FEMA NFIP Technical Bulletin 9 (1999). The criteria address:

- Breakaway wall construction materials, including wood framing, light-gauge steel framing, and masonry.
- Attachment of the walls to floors and foundation members.
- Utility lines.
- Wall coverings such as interior and exterior sheathing, siding, and stucco.
- Other design and construction issues.

The bulletin also describes the results of the NCSU-OSU tests.

Other Sources of Information. For more information about enclosures, the use of space below elevated buildings, and breakaway walls, refer to:

- *Flood-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas*, FEMA NFIP Technical Bulletin 2 (1993).
 - *Free-of-Obstruction Requirements for Buildings Located in Coastal High Hazard Areas*, FEMA NFIP Technical Bulletin 5 (1993).
-



SELF-CHECK REVIEW: NFIP MINIMUM REQUIREMENTS

Instructions: Answer the following questions. Then turn the page to check your answers. If you answered any items incorrectly, you should review the related material before continuing.

1. If the foundation of a coastal building is 1/3 within the V zone and 2/3 within the A zone, the building must comply with _____ requirements.
 - a. A zone
 - b. V zone

2. According to NFIP minimum requirements, newly constructed buildings in a V zone must have the bottom of the lowest structural member at what elevation?

3. One NFIP requirement is that the building site must be reasonably safe from flooding. This requirement applies to buildings _____.
 - a. Only in A zones
 - b. Only in V zones
 - c. In all SFHAs
 - d. Only in subdivisions and other new developments

4. Enclosed space below the lowest floors in A and V zones may be used for:

_____, _____, and _____.

5. Newly constructed buildings in _____ zones must be elevated on pilings, posts, piers, or columns.



The Answer Key for the preceding Self-Check Review is located on the next page.



ANSWER KEY

NOTE: Some of your answers may be slightly different, but they should include the same main points.

1. If the foundation of a coastal building is 1/3 within the V zone and 2/3 within the A zone, the building must comply with **V zone** requirements.

2. According to NFIP minimum requirements, newly constructed buildings in a V zone must have the bottom of the lowest structural member at what elevation?

At or above the BFE

3. One NFIP requirement is that the building site must be reasonably safe from flooding. This requirement applies to buildings _____.

c. In all SFHAs

4. Enclosed space below the lowest floors in A and V zones may be used for:

Parking, building access, and storage.

5. Newly constructed buildings in **V** zones must be elevated on pilings, posts, piers, or columns.



RECOMMENDATIONS FOR EXCEEDING MINIMUM NFIP REQUIREMENTS

The *Coastal Construction Manual* presents recommendations for exceeding NFIP minimum requirements. These recommendations address the significant hazards present in coastal A zones and V zones and are aimed at increasing the ability of coastal residential buildings to withstand natural hazard events.

Table 5.1, presented at the end of this section, summarizes the NFIP requirements and the recommendations for exceeding those requirements.

**NON-COASTAL
A ZONES** Recommendations for the design and construction of buildings in non-coastal A zones are not within the scope of this course. Designers seeking guidance regarding good practice for the design and construction of such buildings should consult local floodplain management, building, or code officials.

Additional guidance can be found in:

- *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings*, FEMA 259 (1995).
- The IBC 2000 and IRC 2000.
- FEMA's NFIP Technical Bulletin Series.

**COASTAL A ZONES
AND V ZONES** NFIP regulations do not differentiate between coastal and non-coastal A zones. Because coastal A zones may be subject to the types of hazards present in V zones—wave effects, velocity flows, erosion, scour, and high winds—the *Coastal Construction Manual* recommends that **buildings in coastal A zones should meet the NFIP regulatory requirements for V-zone buildings**, including the performance requirements concerning:

- Resistance to flotation, collapse, and lateral movement.
- Prescriptive requirements concerning:
 - Elevation.
 - Foundation type.
 - Engineering certification of design and construction.
 - Enclosures below the BFE.
 - Use of structural fill.



Recommended Good Practices: Coastal A and V Zones

To provide a greater level of protection against the hazards in coastal A zones and V zones, the following are recommended as good practice for the siting, design, and construction of buildings in those zones:

- **Siting.** The building should be located landward of both the long-term erosion setback and the limit of 100-year storm erosion (rather than simply landward of the reach of mean high tide).
- **Elevation.** The bottom of the lowest horizontal structural member should be elevated **above** (rather than to) the BFE. That is, **freeboard** should be provided (see Fig. 5-4).
- **Space Below the BFE.** Open latticework or screening should be used in lieu of breakaway walls in the space below the elevated building, or—at a minimum—the use of solid breakaway wall construction should be minimized.
- **Orientation.** In V zones, the lowest horizontal structural members should be oriented perpendicular to the expected wave crest.

Recommendation for exceeding NFIP minimum elevation. The bottom of the lowest horizontal structural member should be **above** the BFE. In V zones, the lowest horizontal structural members should be **perpendicular** to the expected wave crest.

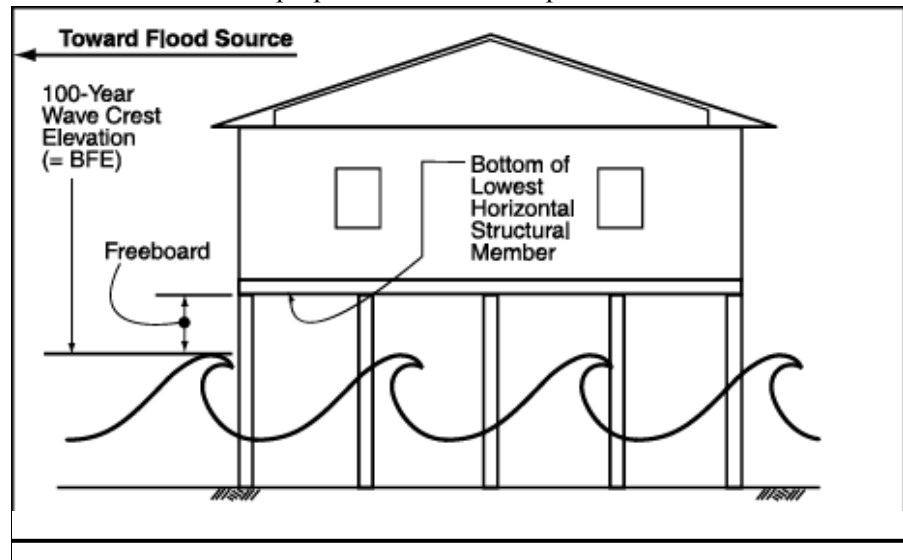







Table 5.1. Summary of NFIP Regulatory Requirements and Recommendations for Exceeding the Requirements

				Guidance ^a		
				 V Zone	 Coastal A Zone	 A Zone
General Requirements						
Design	Requirement: Building and its foundation must be designed, constructed, and anchored to prevent flotation, collapse, and lateral movement from simultaneous wind and water loads .	Requirement: Building must be designed, constructed, and anchored to prevent flotation, collapse, and lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Recommendation: Same as a V zone.	Requirement: Building must be designed, constructed, and anchored to prevent flotation, collapse, and lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.			
Materials	Requirement: Structural and nonstructural building materials at or below the BFE must be flood-resistant.	Requirement: Structural and nonstructural building materials at or below the BFE must be flood-resistant.	Requirement: Structural and nonstructural building materials at or below the BFE must be flood-resistant.			
Construction	Requirement: Building must be constructed with methods and practices that minimize flood damage.	Requirement: Building must be constructed with methods and practices that minimize flood damage.	Requirement: Building must be constructed with methods and practices that minimize flood damage.			
Siting	Requirement: All new construction shall be landward of mean high tide; alteration of sand dunes and mangrove stands that increases potential flood damage is prohibited. Recommendation: Site new construction landward of the long-term erosion setback and landward of the area subject to erosion during the 100-year coastal flood event.	Requirement: Encroachments into the SFHA are permitted as long as they do not increase the BFE by more than 1 foot. ^b Encroachments into the floodway are prohibited. Recommendation: Same as V zone.	Requirement: Encroachments into the SFHA are permitted as long as they do not increase the BFE by more than 1 foot. ^b Encroachments into the floodway are prohibited.			

Notes:




^a “Prohibited” and “Allowed” refer to the minimum NFIP regulatory requirements; individual States and communities may enforce more stringent requirements that supersede those summarized here. **Exceeding minimum NFIP requirements will provide increased flood protection and may result in lower flood insurance premiums.**

^b Some communities may allow encroachments to cause a 1-foot rise in the flood elevation, while others may allow no rise.



UNIT V: INVESTIGATING REGULATORY REQUIREMENTS

Table 5.1 (Continued)




	Guidance		
	 V Zone	 Coastal A Zone	 A Zone
Foundation			
Structural Fill	Prohibited	Allowed, but not recommended Compaction required where used; protect against scour and erosion. ^c	Allowed Compaction required where used; protect against scour and erosion. ^c
Solid Foundation	Prohibited	Allowed, but not recommended^c	Allowed^c
Open Foundation	Required	Not required, but recommended^c	Allowed^c
Lowest Floor Elevation	Not applicable^d	Requirement: Top of floor must be at or above BFE. ^e Recommendation: Elevate bottom of lowest horizontal structural member to or above BFE ^e (see next category below); orient member perpendicular to wave crest.	Requirement: Top of floor must be at or above BFE. ^e
Bottom of Lowest Horizontal Structural Member	Requirement: Bottom must be at or above BFE. ^e	Allowed below BFE^e, but not recommended. Recommendation: Same as V zone.	Allowed below BFE^e, but not recommended Recommendation: Same as V zone.
Orientation of Lowest Horizontal Structural Member	No requirement Recommendation: Orient perpendicular to wave crest.	No requirement	No requirement
Freeboard	Not required,^e but recommended	Not required,^e but recommended	Not required,^e but recommended

Notes:

- ^c Some coastal communities require open foundations in A zones.
- ^d Bottom of lowest horizontal structural member must be at or above the BFE.
- ^e State or community may regulate to a higher elevation (DFE).



Table 5.1 (Continued)

Guidance			
 V Zone	 Coastal A Zone	 A Zone	
Enclosures Below the BFE			
(Also see Certification)	Prohibited , except for breakaway walls, open lattice, and screening. ^f Recommendation: If constructed, use open lattice or screening instead of breakaway walls.	Allowed, but not recommended If an area is fully enclosed, the enclosure walls must be equipped with openings to equalize hydrostatic pressure. Size, location, and covering of openings governed by regulatory requirements. Recommendation: If enclosure is constructed, use breakaway walls, open lattice, or screening (as required in V zone). ^{f,g}	Allowed If an area is fully enclosed, the enclosure walls must be equipped with openings to equalize hydrostatic pressure. Size, location, and coverings of openings governed by regulatory requirements. ^{f,g}
Nonstructural Fill			
	Allowed for minor landscaping and site drainage as long as the fill does not interfere with the free passage of flood waters and debris beneath the building or cause changes in flow direction during coastal storms that could result in damage to buildings.	Allowed ^h Recommendation: Same as V zone.	Allowed
Use of Space Below the BFE^l			
	Allowed only for parking, building access, and storage.	Allowed only for parking, building access, and storage.	Allowed only for parking, building access, and storage.
Utilitiesⁱ			
	Requirement: Must be designed, located, and elevated to prevent flood waters from entering and accumulating in components during flooding.	Requirement: Must be designed, located, and elevated to prevent flood waters from entering and accumulating in components during flooding.	Requirement: Must be designed, located, and elevated to prevent flood waters from entering and accumulating in components during flooding.




Notes:

- ^f Some coastal communities prohibit breakaway walls and allow only open lattice or screening.
- ^g If an area below the BFE in an A-zone building is fully enclosed by breakaway walls, the walls must meet the requirement for openings that allow equalization of hydrostatic pressure.
- ^h Placement of nonstructural fill adjacent to buildings in coastal AO zones is not recommended.
- ^l There are some differences between what is permitted under floodplain management regulations and what is covered by NFIP flood insurance. Building designers should be guided by floodplain management requirements, not by flood insurance policy provisions.



UNIT V: INVESTIGATING REGULATORY REQUIREMENTS

Table 5.1 (Continued)

		Guidance		
		 V Zone	 Coastal A Zone	 A Zone
Certification				
Structure	Required: Registered engineer or architect must certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the design requirements described under General Requirements .		Recommendation: Same as V zone.	Recommendation: Same as V zone.
Breakaway Walls (Also see Enclosures Below the BFE)	Required: Either of the following: (1) Walls must be designed to provide a safe loading resistance of between 10 lb/ft ² and 20 lb/ft ² OR (2) a registered engineer or architect must certify that the walls will collapse under a water load associated with the base flood and that the elevated portion of building and its foundation will not be subject to collapse, displacement, or lateral movement under simultaneous wind and water loads. ^{f,g}		Not required, but recommended^{f,g}	Not required^{f,g}
Openings in Below-BFE Walls (Also see Enclosures Below the BFE)	Not applicableⁱ		Required: Unless number and size of openings meets regulatory requirements, registered engineer or architect must certify that openings are designed to automatically equalize hydrostatic forces on walls by allowing the automatic entry and exit of flood waters.	Required: Unless number and size of openings meets regulatory requirements, registered engineer or architect must certify that openings are designed to automatically equalize hydrostatic forces on walls by allowing the automatic entry and exit of flood waters.

Notes:

^f Some coastal communities prohibit breakaway walls and allow only open lattice or screening.

^g If an area below the BFE in an A-zone building is fully enclosed by breakaway walls, the walls must meet the requirement for openings that allow equalization of hydrostatic pressure.

^j Walls below BFE must be designed and constructed as breakaway walls that meet the minimum requirements of the NFIP regulations.



***SELF-CHECK REVIEW:
RECOMMENDATIONS FOR EXCEEDING NFIP MINIMUM REQUIREMENTS***

Instructions: Answer the following questions. Then turn the page to check your answers. If you answered any items incorrectly, you should review the related material before continuing.

1. The *Coastal Construction Manual* recommends that. . .
 - A. In coastal A and V zones, the building should be located landward of:
 - a. The reach of the mean high tide
 - b. The long-term erosion setback
 - c. The limit of 100-year storm erosion
 - d. The long-term erosion setback and the limit of 100-year storm erosion
 - B. In coastal A and V zones, the bottom of the lowest horizontal structural member should be elevated:
 - a. At the BFE
 - b. At the stillwater elevation
 - c. Above the BFE
 - d. At the wave crest elevation
 - C. In V zones, the lowest horizontal structural members should be oriented _____ to the expected wave crest.
2. According to *Coastal Construction Manual* recommendations for A and V zone construction, which of the following would be most desirable in the space below the BFE?
 - a. Space enclosed by solid, weight-bearing walls
 - b. Enclosed space with openings
 - c. Breakaway walls
 - d. Open latticework or screening



ANSWER KEY

1. The *Coastal Construction Manual* recommends that . . .
 - A. In coastal A and V zones, the building should be located landward of:
 - d. The long-term erosion setback and the limit of 100-year storm erosion**
 - B. In coastal A and V zones, the bottom of the lowest horizontal structural member should be elevated:
 - c. Above the BFE**
 - C. In V zones, the lowest horizontal structural members should be oriented **perpendicular** to the expected wave crest.
2. According to *Coastal Construction Manual* recommendations for A and V zone construction, which of the following would be most desirable in the space below the BFE?
 - d. Open latticework or screening**



COASTAL BARRIER RESOURCES ACT OF 1982

PURPOSE The Coastal Barrier Resources Act (CBRA) of 1982 was enacted to:

- Protect vulnerable coastal barriers from development.
- Minimize the loss of life.
- Reduce expenditures of Federal revenues.
- Protect fish, wildlife, and other natural resources.

This law established the Coastal Barrier Resources System (CBRS), which is managed by the U.S. Department of the Interior, Fish and Wildlife Service.

HOW THE LAW WORKS The law restricts Federal expenditures and financial assistance that could encourage development of coastal barriers. The CBRA does not prohibit privately financed development. However, it does prohibit most new Federal financial assistance, **including federally offered flood insurance**, in areas within the CBRS (also referred to as CBRA areas).

Flood insurance may not be sold for buildings in the CBRS that were constructed or substantially improved after October 1, 1983. The financial risk of building in these areas is transferred from Federal taxpayers directly to those who choose to live in or invest in these areas.

“Otherwise Protected Areas”



NOTE

Additional information about CBRS regulations and areas included in the CBRS is available at the U.S. Fish and Wildlife Service website at <http://www.fws.gov/cep/cbrtable.html>

The Coastal Barrier Improvement Act (CBIA), passed in 1991, tripled the size of the CBRS to over 1.1 million acres. The CBIA also designated “otherwise protected areas” that include lands that are under some form of public ownership. The CBIA prohibits the issuance of flood insurance on buildings constructed or substantially improved after November 16, 1991, for the areas added to the CBRS, including these “otherwise protected areas.”

An exception is made to allow insurance for buildings located in “otherwise protected areas” that are used in a manner consistent with the purpose for which the area is protected. Examples include research buildings, buildings that support the operation of a wildlife refuge, and similar buildings.



UNIT V: INVESTIGATING REGULATORY REQUIREMENTS

CBRS BOUNDARIES CBRS boundaries are shown on a series of maps produced by the Department of the Interior (DOI). In addition, FEMA has transferred CBRS boundaries to FIRMs so that insurance agents and underwriters may determine eligibility for flood insurance coverage.

Before constructing a new building, substantially improving an existing building, or repairing a substantially damaged building, the designer or property owner should review the FIRM to determine whether the property is within the CBRS. In situations where the FIRM does not allow for a definitive determination, the designer or property owner should consult local officials. In some situations, it may be necessary to request a determination from the U.S. Fish and Wildlife Service based on the DOI maps.



NOTE

Remember: Any building within a CBRS area that is constructed or substantially improved after October 1, 1983, or the date of designation for areas added to the system in 1991, is not eligible for Federal flood insurance or other Federal financial assistance. The same restriction applies to substantially damaged buildings in a CBRS area that are repaired or renovated after those dates.



COASTAL ZONE MANAGEMENT REGULATIONS

PURPOSE The Coastal Zone Management (CZM) Act of 1972 encourages adoption of coastal zone policies by U.S. coastal States in partnership with the Federal government.

CZM regulations have been adopted by 27 coastal states and 5 island territories. Two of the three remaining coastal States—Indiana and Minnesota—are preparing CZM regulations for the Great Lakes for Federal approval.

For current information concerning the status of State and National CZM programs, refer to the website of the National Oceanic and Atmospheric Administration, National Ocean Service, Office of Coastal Resource Management, at <http://wave.nos.oaa.gov/ocrm/czm>

PROVISIONS Each State’s CZM program contains provisions to:

- Protect natural resources.
- Manage development in high hazard areas.
- Manage development to achieve quality coastal waters.
- Give development priority to coastal-dependent uses.
- Have orderly processes for the siting of major facilities.
- Locate new commercial and industrial development in or adjacent to existing developed areas.
- Provide public access for recreation.
- Redevelop urban waterfronts and ports, and preserve and restore historic, cultural, and aesthetic coastal features.
- Simplify and expedite governmental decisionmaking actions.
- Coordinate State and Federal actions.
- Give adequate consideration to the views of Federal agencies.
- Ensure that the public and local government have a say in coastal decisionmaking.
- Plan for and manage living marine resources.



VARIATIONS Coastal zone regulations vary greatly. The following are examples of these variations.

- Many States, such as Washington, Oregon, and Hawaii, provide guidelines for development but **leave the enactment of specific regulatory requirements up to county and local governments.**
- Most State coastal zone regulations **control construction seaward of a defined boundary line**, such as a dune or road.
- Many States—though not all—**regulate or prohibit construction seaward of a second line based on erosion.** Some of these lines are updated when new erosion mapping becomes available. (Lines that follow physical features such as dune lines are not fixed; they “float” as the physical feature shifts over time.)
- Some States have requirements concerning the placement or prohibition of **shore protection structures** and the **protection of dunes.**
- Some States not only control new construction, but also **regulate renovations and repairs of substantially damaged buildings** to a greater degree than required by the NFIP. These regulations help limit future damage in coastal areas by requiring that older buildings be brought up to current standards when they are renovated or repaired.
- In addition to regulating the construction of buildings near the coast, many jurisdictions **regulate the construction of accessory structures, roads and infrastructure**, and other development-related activities.



NOTE

To determine whether State coastal zone management regulations apply to a specific property, consult community officials or the appropriate State coastal zone management agency.



SELF-CHECK REVIEW: CBRA AND CZM

Instructions: Answer the following questions. Then turn the page to check your answers. If you answered any items incorrectly, you should review the related material before continuing.

1. The CBRA restricts Federal expenditures and financial assistance that could encourage
_____.

2. The CBRA prohibits privately financed development.

True False

3. The Coastal Barrier Improvement Act designated _____,
which include lands under some form of public ownership.

4. CBRS boundaries are / are not shown on FIRMs. (Circle one.)

5. Give an example of the kinds of issues addressed by State Coastal Zone Management regulations.



ANSWER KEY

NOTE: Some of your answers may be slightly different, but they should include the same main points.

1. The CBRA restricts Federal expenditures and financial assistance that could encourage **development of coastal barriers.**
2. The CBRA prohibits privately financed development.
False.
It restricts Federal expenditures and financial assistance, including federally offered flood insurance.
3. The Coastal Barrier Improvement Act designated **“otherwise protected areas”**, which include lands under some form of public ownership.
4. CBRS boundaries **are** shown on FIRMs.
5. Give an example of the kinds of issues addressed by State Coastal Zone Management regulations.

Any of the following:

- **Protection of natural resources**
- **Management of development in high hazard areas**
- **Maintenance of coastal water quality**
- **Development priorities (i.e., for coastal-dependent uses)**
- **Siting of major facilities**
- **Location of new commercial and industrial development**
- **Public access for recreation**
- **Redevelopment of urban waterfronts and ports**
- **Preservation of historic, cultural, and aesthetic coastal features**
- **Simplification of governmental decisionmaking**
- **Coordination of State and Federal actions**
- **Shared coastal decisionmaking (Federal, local, public)**
- **Management of living marine resources**



UNIT V EXERCISE

Instructions: Use this Unit Exercise to test how well you learned the material presented in Unit V. When you complete the exercise, check your answers against those in the Answer Key that follows. If you answered any questions incorrectly, be sure to review the corresponding section of the unit before proceeding to Unit VI.

1. Land use regulations can be rendered obsolete by a natural hazard event.
True False

2. Building codes may apply both to new construction and to existing buildings that are being rebuilt, rehabilitated, or modified.
True False

3. When a local jurisdiction adopts a model building code, it must adopt the entire code, as is.
True False

4. Few coastal States have adopted a model building code and/or specific requirements concerning the construction of buildings in coastal flood and wind hazard areas.
True False

5. A community that adopts the IBC 2000 and the IRC 2000 will be compliant with the regulatory building requirements of the NFIP and the recommended provisions of the NEHRP.
True False

6. The NFIP requires the purchase of flood insurance as a condition of receiving Federal financial assistance for the construction of buildings in SFHAs.
True False



7. Hazards in coastal A zones are:
 - a. The same as those in non-coastal A zones.
 - b. More severe than those in V zones.
 - c. The same as those in V zones.
 - d. Greater than those in non-coastal A zones.

8. The NFIP operates through a partnership between (1) _____,
(2) _____, and (3) _____.

9. NFIP minimum requirements cover the type of foundation allowed. List two other aspects of coastal construction that are covered by NFIP requirements.
 - (1) _____.
 - (2) _____.

10. If the foundation of a coastal residence lies half in the A zone and half in the V zone, the building must comply with _____ requirements.
 - a. A zone
 - b. V zone
 - c. Coastal A zone
 - d. Either A or V zone (builder's choice)

11. The NFIP regulations require that buildings be designed and anchored to prevent flotation, collapse, and lateral movement of the building resulting from hydrodynamic and hydrostatic loads. This requirement applies to buildings in:
 - a. A zones only.
 - b. V zones only.
 - c. The SFHA.
 - d. The CBRS.

12. The *Coastal Construction Manual* recommends that buildings in coastal A zones be designed and constructed to _____ requirements.



The Answer Key for the preceding Unit Exercise is located on the next page.



UNIT V EXERCISE — ANSWER KEY

NOTE: Some of your answers may be slightly different, but they should include the same main points.

1. Land use regulations can be rendered obsolete by a natural hazard event.

True

2. Building codes may apply both to new construction and to existing buildings that are being rebuilt, rehabilitated, or modified.

True

3. When a local jurisdiction adopts a model building code, it must adopt the entire code, as is.

False. A model code may be adopted unaltered or with amendments and revisions.

4. Few coastal States have adopted a model building code and/or specific requirements concerning the construction of buildings in coastal flood and wind hazard areas.

False. Most coastal States have done so.

5. A community that adopts the IBC 2000 and the IRC 2000 will be compliant with the regulatory building requirements of the NFIP and the recommended provisions of the NEHRP.

True

6. The NFIP requires the purchase of flood insurance as a condition of receiving Federal financial assistance for the construction of buildings in SFHAs.

True



7. Hazards in coastal A zones are:

d. Greater than those in non-coastal A zones

8. The NFIP operates through a partnership between (1) **the Federal Government**, (2) **the States**, and (3) **individual communities**.

9. NFIP minimum requirements cover the type of foundation allowed. List two other aspects of coastal construction that are covered by NFIP requirements.

Any of the following:

- **Required height of the lowest floor**
- **Installation of building utility systems**
- **Use of flood-resistant materials**
- **Use of the area below the lowest floor**

10. If the foundation of a coastal residence lies half in the A zone and half in the V zone, the building must comply with _____ requirements.

b. V zone

11. The NFIP regulations require that buildings be designed and anchored to prevent flotation, collapse, and lateral movement of the building resulting from hydrodynamic and hydrostatic loads. This requirement applies to buildings in:

c. The SFHA

12. The *Coastal Construction Manual* recommends that buildings in coastal A zones be designed and constructed to **V zone** requirements.