Welcome

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- Please submit your technical questions via the Q&A box
- Please include the slide number when applicable to the question
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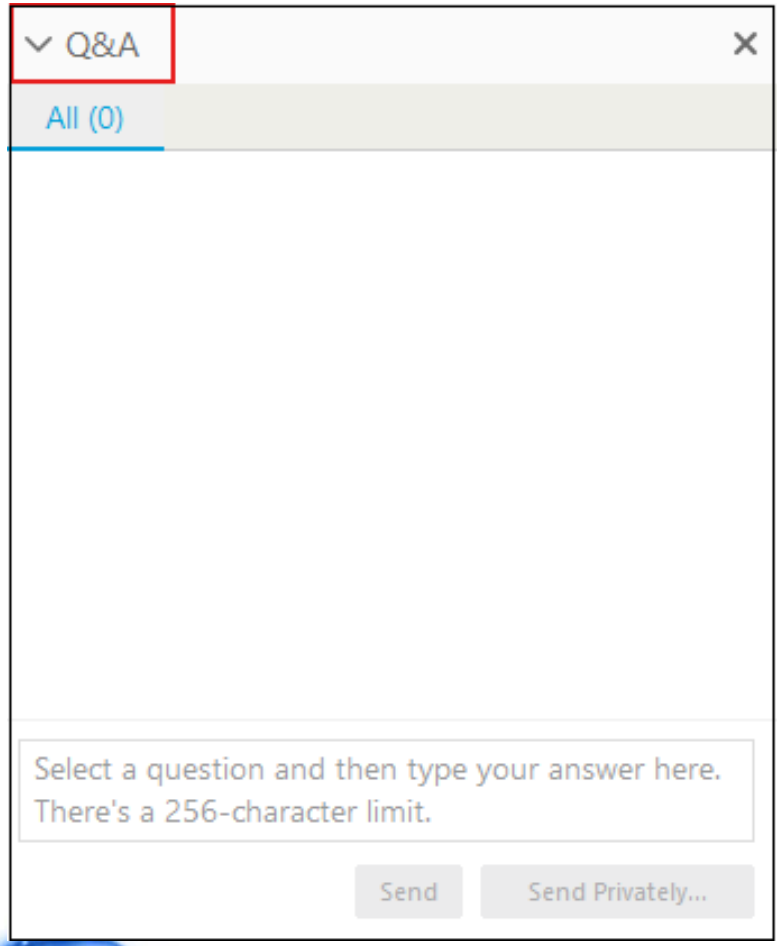






Using ASCE 24 for CDBG-MIT Projects

2020 CDBG-MIT Webinar Series

June 11, 2020

FEMA





Introduction and Agenda

FEMA

Introductions

- John Ingargiola, U.S. Department of Homeland Security, Federal Emergency Management Agency
- Adam J Reeder, PE, CFM , Principal, CDM Smith
- William Clay Lloyd, Department of Housing and Urban Development, CPD Specialist,
- Roosevelt Grant, U.S. Department of Homeland Security, Federal Emergency Management Agency

Agenda

- CDBG-MIT Program Overview (FRN language on use of ASCE 24)
- Overview of the Flood Requirements for a CDBG Mitigation Grant
- What is ASCE 24 and what does it cover?
- Complying with ASCE 24 for a CDBG Mitigation Grant?
- Overview of ASCE 24 use with Residential and Non-Residential Mitigation Projects
- Historic Buildings
- The Benefits of Using ASCE 24
- Getting Access to ASCE 24
- FEMA Resources when using ASCE 24





Background: CDBG-MIT

Clay Lloyd, HUD

FEMA

CDBG-MIT Purpose:

The CDBG Program provides Grantees funds to develop viable communities by providing **decent housing** and a **suitable living environment**, and by **expanding economic opportunities**, principally for low- and moderate-income persons.

HUD's Federal Register Notice requires:

- 1. Meet the definition of a mitigation activity;
- 2. Address current and future risks as identified in the grantee's mitigation needs assessment of most impacted and distressed (MID) areas;
- 3. Be CDBG-eligible activities or otherwise eligible pursuant to a waiver or alternative requirement; and
- 4. Meet a national objective, including additional criteria for mitigation activities and covered projects.

CDBG-MIT funds may be used to:

- Support infrastructure projects, housing activities, public services, economic development, disaster preparedness, and planning efforts.
- Increase resilience and reduce or eliminate risk, per HUD's definition of mitigation.
- 50% of CDBG-MIT funds must also be used to benefit low-to-moderate income (LMI) persons.

Maximizing CDBG-MIT

To maximize the impact of all available funds, grantees should coordinate and align these CDBG–MIT funds with other mitigation projects funded by FEMA, the U.S. Army Corps of Engineers (USACE), the U.S. Forest Service, and other agencies as appropriate.

According to the CDBG-MIT Notice, grantees must:

1. Advance long-term resilience to current and future hazards;
2. Align its CDBG–MIT programs or projects with other planned federal, state, regional, or local capital improvements; and
3. Promote community-level and regional planning for current and future disaster recovery efforts and additional mitigation investments.





Use of ASCE 24

Adam Reeder, CDM Smith

CDBG-MIT (FRN) ASCE-24

Long-term planning and risk mitigation considerations (45847)

The grantee must describe how it plans to: Promote local and regional long-term planning and implementation informed by its Mitigation Needs Assessment, including through the development and enforcement of building codes and standards (such as ASCE 24 and ASCE 7, as may be applicable), vertical flood elevation.

Building code and hazard mitigation planning (45848)

Grantees are encouraged to propose an allocation of CDBG–MIT funds for building code development and implementation, land use planning and/or hazard mitigation planning activities that may include but need not be limited to: (a) The development and implementation of modern and resilient building codes consistent with an identified model or standard, such as ASCE 24 and ASCE 7 as may be applicable, in order to mitigate against current and future hazards;

CDBG-MIT (FRN) ASCE-24

Elevation standards for new construction, repair of substantial damage, or substantial improvement (45864)

- All structures, defined at 44 CFR 59.1, designed principally for residential use and located in the 100-year (or 1 percent annual chance) floodplain that receive assistance for new construction, repair of substantial damage, or substantial improvement, as defined at 24 CFR 55.2(b)(10), must be elevated with the lowest floor, including the basement, at least two feet above the base flood elevation.
- Alternatively, grantees **may** choose to adopt the design flood elevation standards of ASCE 24 **if** it results in an elevation higher than two feet above base flood elevation. Mixed use structures with no dwelling units and no residents below two feet above base flood elevation must be elevated or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least two feet above base flood elevation.

Note about the handouts

- We will be using several terms and acronyms during the remaining presentation
- Please download the handout to aid in following along

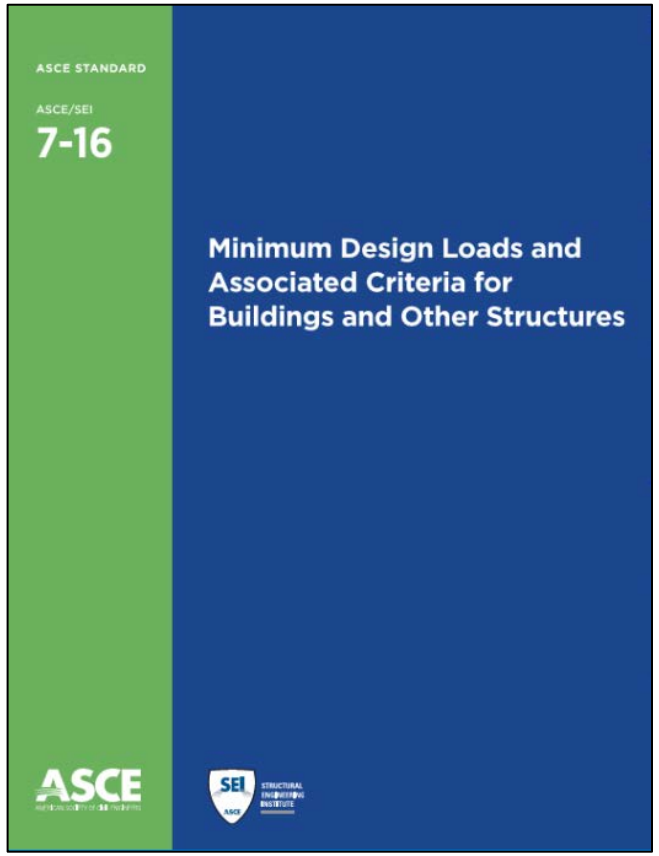
ASCE 7 - Calculating Flood Loads

ASCE 7: *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

- Methods to determine design loads and load combinations in flood hazard areas

Some key chapters for flood design

- Chapter 5 is Flood Loads
  - Commentary is located in Section C5
- Chapter 2 is Load Combinations
  - Commentary is located in Section C2
- Chapter 3 is Dead Loads, Soil Loads, and Hydrostatic Pressure
  - Commentary is located in Section C3



ASCE 24 - Overall Flood Standard

- Addresses:
  - Construction materials
  - Design and engineering requirements
  - Testing practices
- ASCE standards are developed by a consensus process that includes balloting by a committee and a public review
- Developed by industry organizations and professional associations
- Supplements the building code
- May be incorporated by reference into the building code

ASCE 24 Sections (1 of 2)

Each section builds on the previous section

1. General *(scope, definitions, basic requirements, and flood loading per ASCE 7)*
2. Basic Requirements for Flood Hazard Areas that are not identified as Coastal High Hazard Areas and Coastal A Zones *(buildings in most A zones)*
3. High Risk Flood Hazard Areas *(alluvial fans, flash flood areas, mudslide areas, erosion-prone areas, high-velocity flow areas, areas subject to wave action, and ice jams and debris areas)*
4. Coastal High Hazard Areas and Coastal A Zones (V Zones included)
5. Materials *(specific requirements for flood hazard areas, steel, concrete, masonry, wood, and finishes)*

Note: ASCE 24 and the International Building Codes utilize a modified flood zone designation that is more restrictive than the NFIP.

ASCE 24 Sections (2 of 2)

6. Dry Floodproofing and Wet Floodproofing
7. Attendant Utilities and Equipment *(electrical, mechanical, plumbing, and elevators)*
8. Building Access
9. Miscellaneous Construction *(decks, porches, garages, carports, accessory structures, chimneys, pools, and tanks)*
10. References

Commentary *(covers all chapters)*

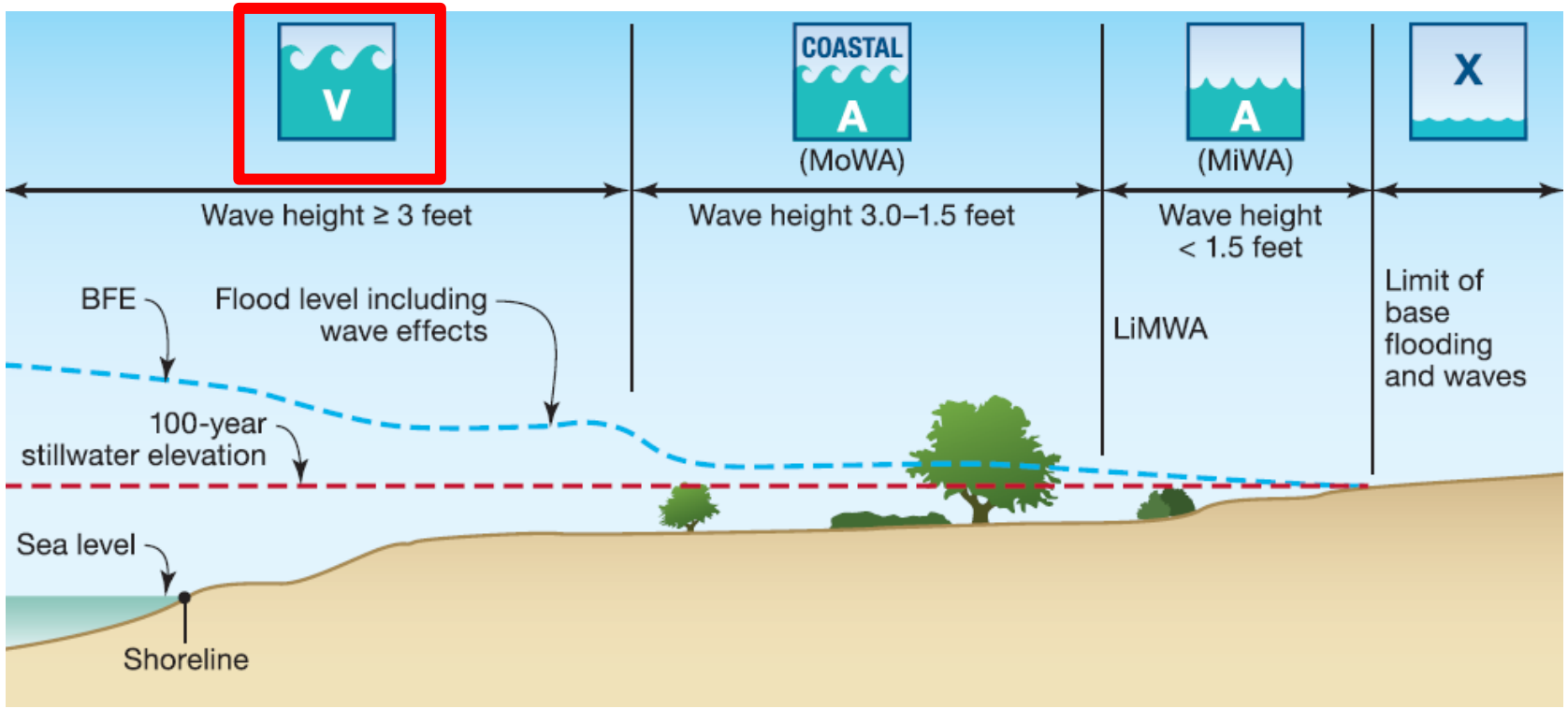
Note: Buildings are grouped by Flood Design Classes, which increase requirements based on the importance of the building to a community or life safety.

Key Concept: Structure Category

Nature of Occupancy	Flood Design Class
Low hazard to human life in the event of failure: • Agricultural facilities • Minor storage facilities	1
All buildings except those listed in Categories I, III, and IV.	2
Substantial hazard to human life in the event of failure: • Buildings where >300 people congregate • Day-care facilities with capacity of >150 • Elementary/secondary schools with capacity of >250	3
Essential facilities: • Hospitals • Fire, rescue, ambulance, police • Emergency operation centers	4

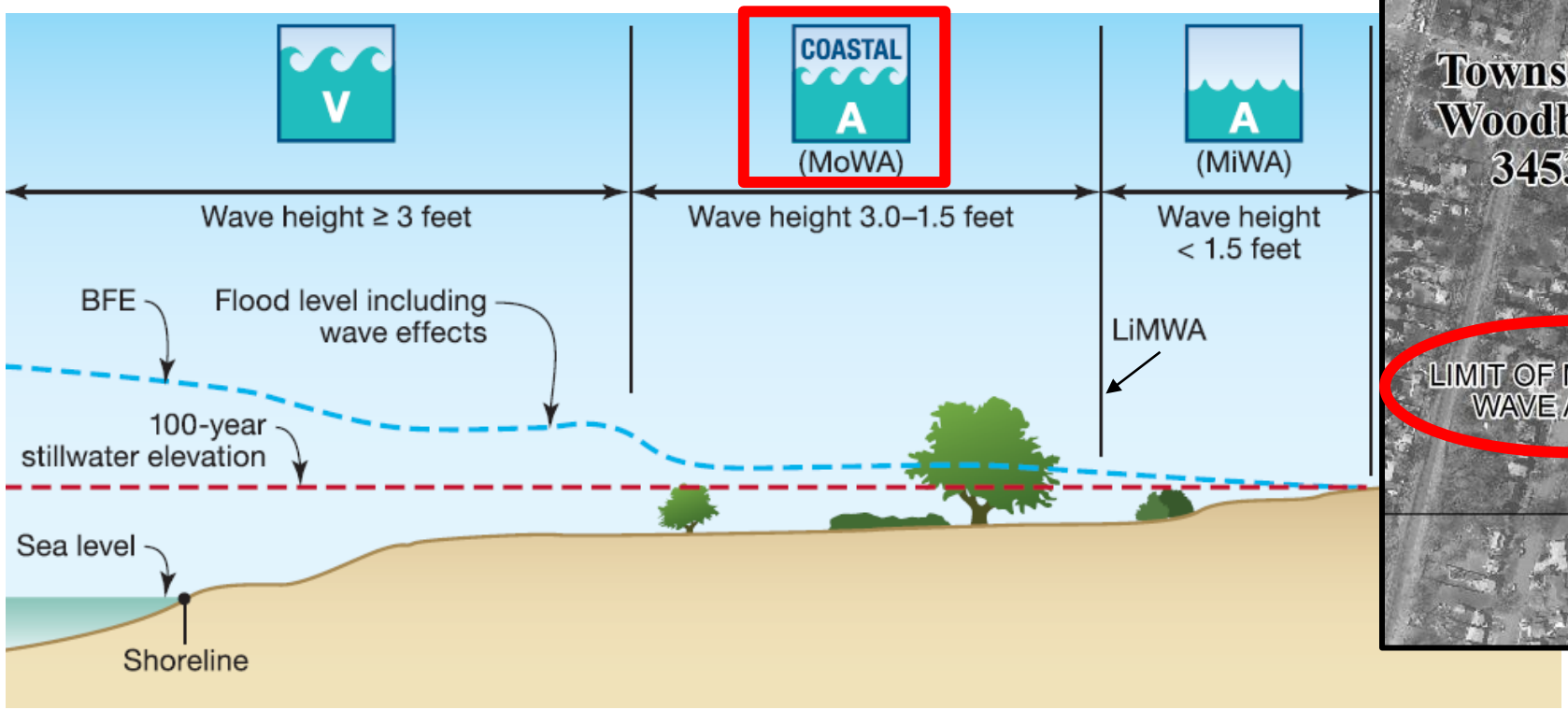
Source: ASCE 24, Table 1-1

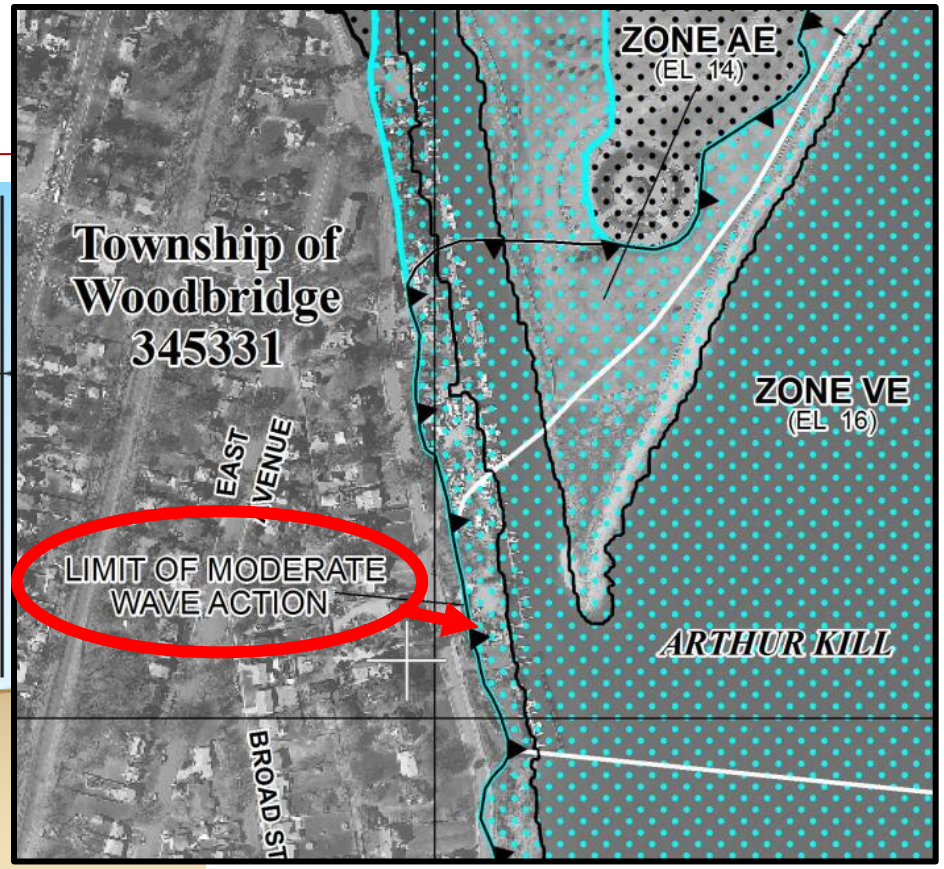
ASCE 24 Categories of Coastal Flood Zones



V Zones: 3 foot or higher waves – Require Open Foundations and Compliance is measured to the Bottom of Lowest Horizontal Structural Member of the Lowest Floor Designated on Flood Insurance Rate Maps (FIRMs)

Categories of Coastal Flood Zones

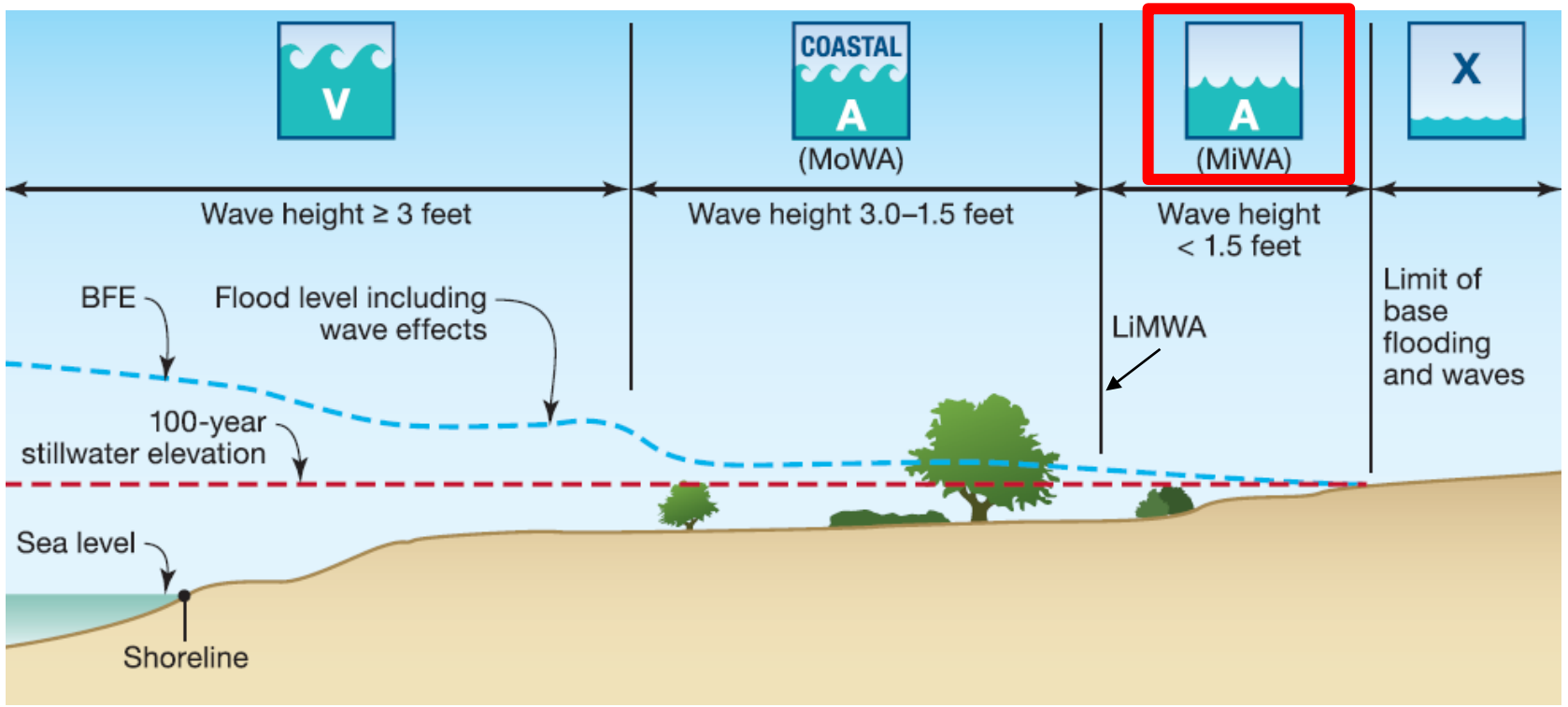




Example FIRM

Coastal A Zones: 1.5 foot to 3 foot waves – Require Open Foundations and Compliance is measured to the Bottom of Lowest Horizontal Structural Member of the Lowest Floor Only required if the Line of Moderate Wave Action (LiMWA) is shown on the FIRM

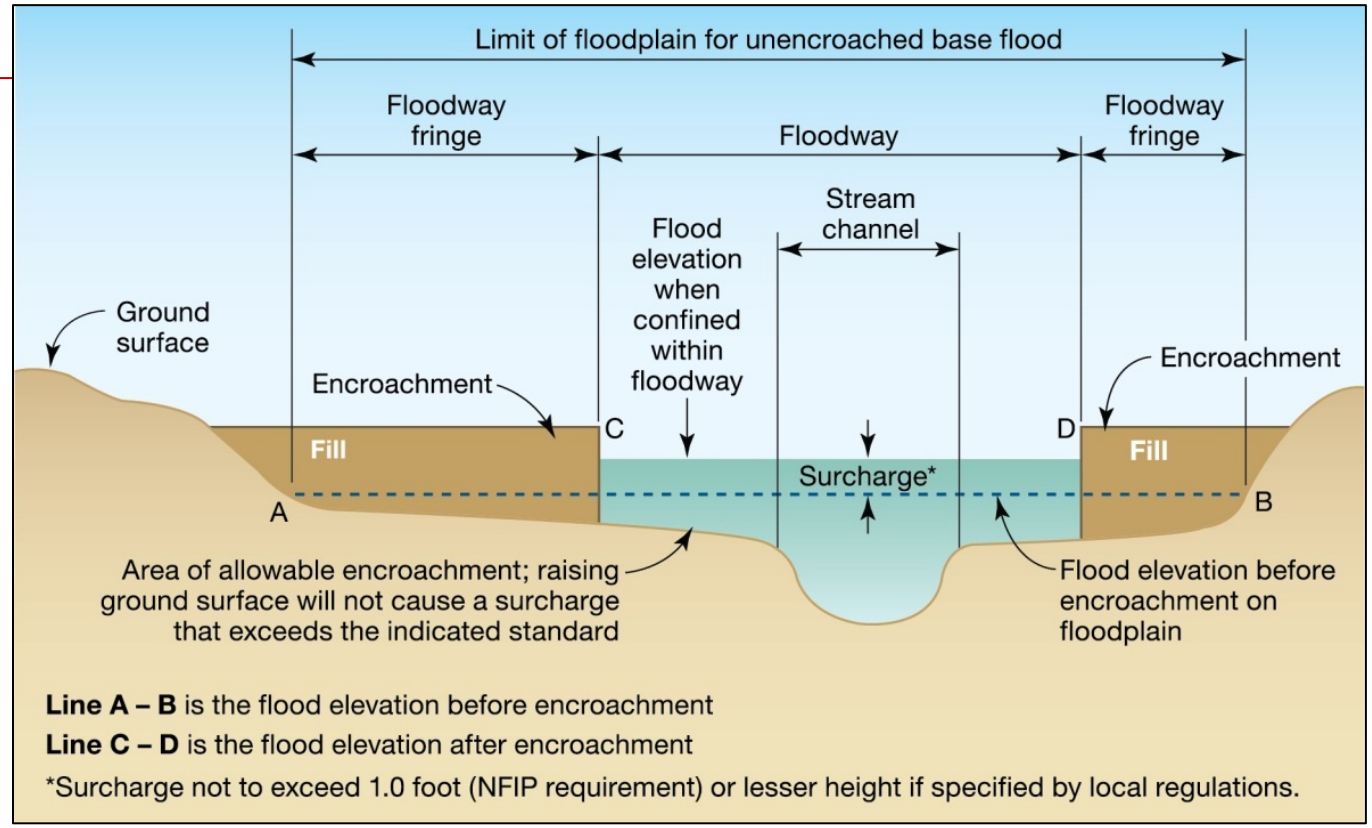
Categories of Coastal Flood Zones



A Zones: Less than 1.5 foot waves – Allows Closed Foundations (with openings) and Fill.
Compliance is measured to the Top of the Lowest Floor
Designated on Flood Insurance Rate Maps (FIRMs)

Riverine Flood Zones

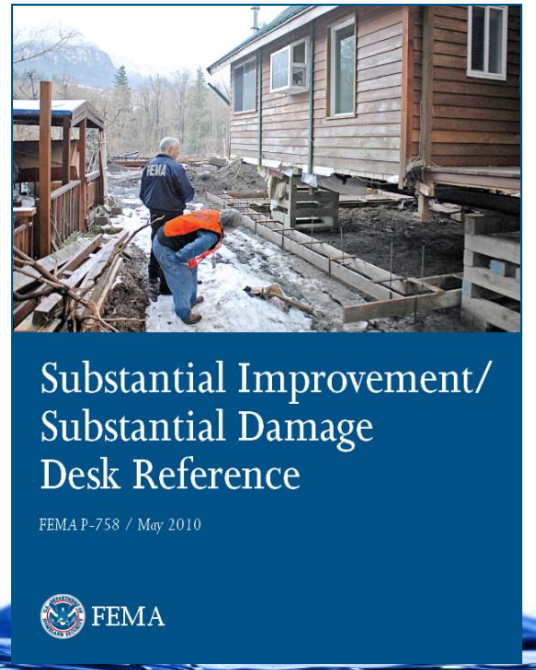
- A, AE, A1-A30 are all areas within the floodplain
- AO Zones = shallow flooding area
  - There may or may not be a depth of flooding, but no BFE.
- AH Zones = shallow flooding but there is a BFE
- A99 Zones = protected by a certified levee or flood control measure
- AR Zones = areas protected by a levee or flood control measure that is not certified.



Additional restrictions apply to buildings within a mapped floodway

Substantial Improvement/Substantial Damage impacts on the application of ASCE 24

- **Substantial Damage (SD):** Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
- **Substantial Improvement (SI):** Any repair, reconstruction rehabilitation, addition, or improvement of a building, the cost of which equals or exceeds 50 percent of the market value before the repair is started



The best resource for this is FEMA P-758, Substantial Improvement/Substantial Damage Desk Reference (2010)

ASCE 24 and the NFIP

- The provisions of ASCE 24 are consistent with NFIP performance requirements.
- ASCE 24 provisions meet or exceed NFIP regulations.
- Establishes new minimum requirements *(ASCE 24 is now the standard of practice)*
- ASCE 24 in comparison with NFIP requirements:
  1. Provides more specific requirements
  2. Incorporates the Coastal A Zone with foundation requirements
  3. Requires new construction and Substantial Improvement/Damage construction to incorporate freeboard
  4. Requires to dry floodproofing to consider human intervention requirements

CDBG-MIT Programmatic Compliance with ASCE 24

Projects that do not constitute *new construction* or Substantial Improvements:

- May not be required to comply with every provision of ASCE 24

CDBG-MIT Funded Retrofitting projects:

- Some requirements of ASCE 24 may be satisfied via a “deemed to comply” approach meeting the spirit of ASCE 24

Note:
City and/or state building codes may require compliance with ASCE 24. Adherence to ASCE 24 may also be required for compliance with other funding sources.

Design and Construction Documentation for CDBG-MIT

- Make sure that you can document that the project was both designed and constructed to comply with ASCE 7 and ASCE 24
- Make sure that you can document that the project complies with all applicable building codes and floodplain ordinances

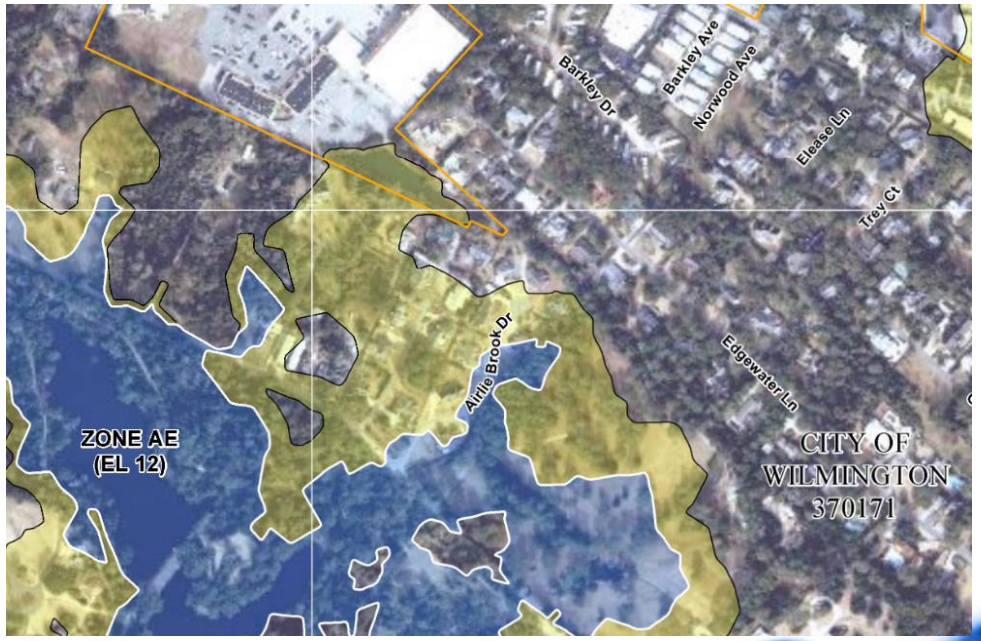
Examples might be:

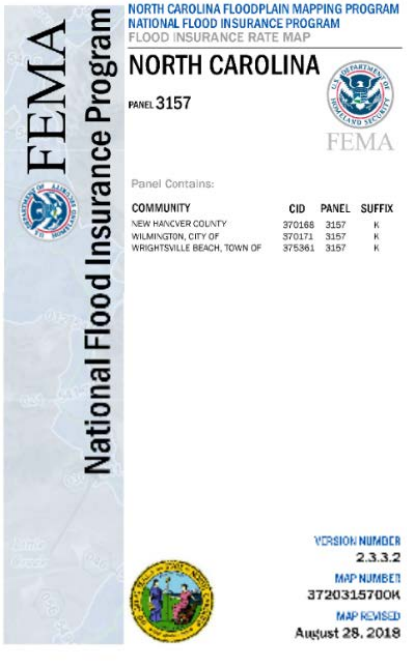
- A statement or affidavit from a design professional involved in evaluating the building and developing the design to meet ASCE 24 “deemed to comply” requirements
- A statement or affidavit from a local official with technical competency certifying that the design meets the spirit of ASCE 24

Design professionals should be familiar with ASCE 24 and incorporate it into their design and construction oversight estimate. Local building officials should verify that projects incorporated ASCE 24 into the design and should verify that the construction meets ASCE 24 requirements.

Recommendation to use the latest-issued flood data

- The relevant data source for this provision is the State, local, and tribal government land use regulations and hazard mitigation plans and the latest-issued FEMA data or guidance, which includes advisory data (such as Advisory Base Flood Elevations) or preliminary and final Flood Insurance Rate Maps.





Applying Codes, Standards, and Ordinances

CDBG-MIT projects must comply with:

- State and local laws/ordinances
- If no code exists, then the proposed project should meet a code consistent with an identified model or standard.
- Federal laws, regulations, and statutes, and requirements within NFIP

Even if a project is technically feasible and cost effective, if implementing the project violates a Federal, State, or local ordinance, code, or requirement, the project will be ineligible for Federal assistance.

Plan on doing a Code Compliance Check

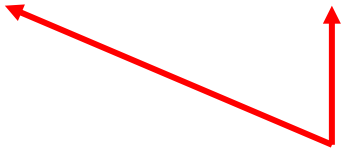
- Each project should undergo a code compliance check
- If improvements trigger Substantial Improvement/Damage requirements, provisions in the building code or flood ordinance must be met
- 2018 and 2015 IRC, IBC, and IEBC describe various categories to classify work on existing buildings

Code Adoption Vs. Standard Adoption

- States and communities regulate building construction by adopting and enforcing building codes
  - Building codes set minimum requirements for structural design, materials, natural hazard mitigation, etc.
  - Numerous standards are incorporated into building codes by reference

"1612.2 Design and construction. The design and construction of buildings and structures located in flood hazard areas, including coastal high hazard areas and coastal A zones, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24."

(Source: 2018 International Building Code, Section 1612 Flood Loads)



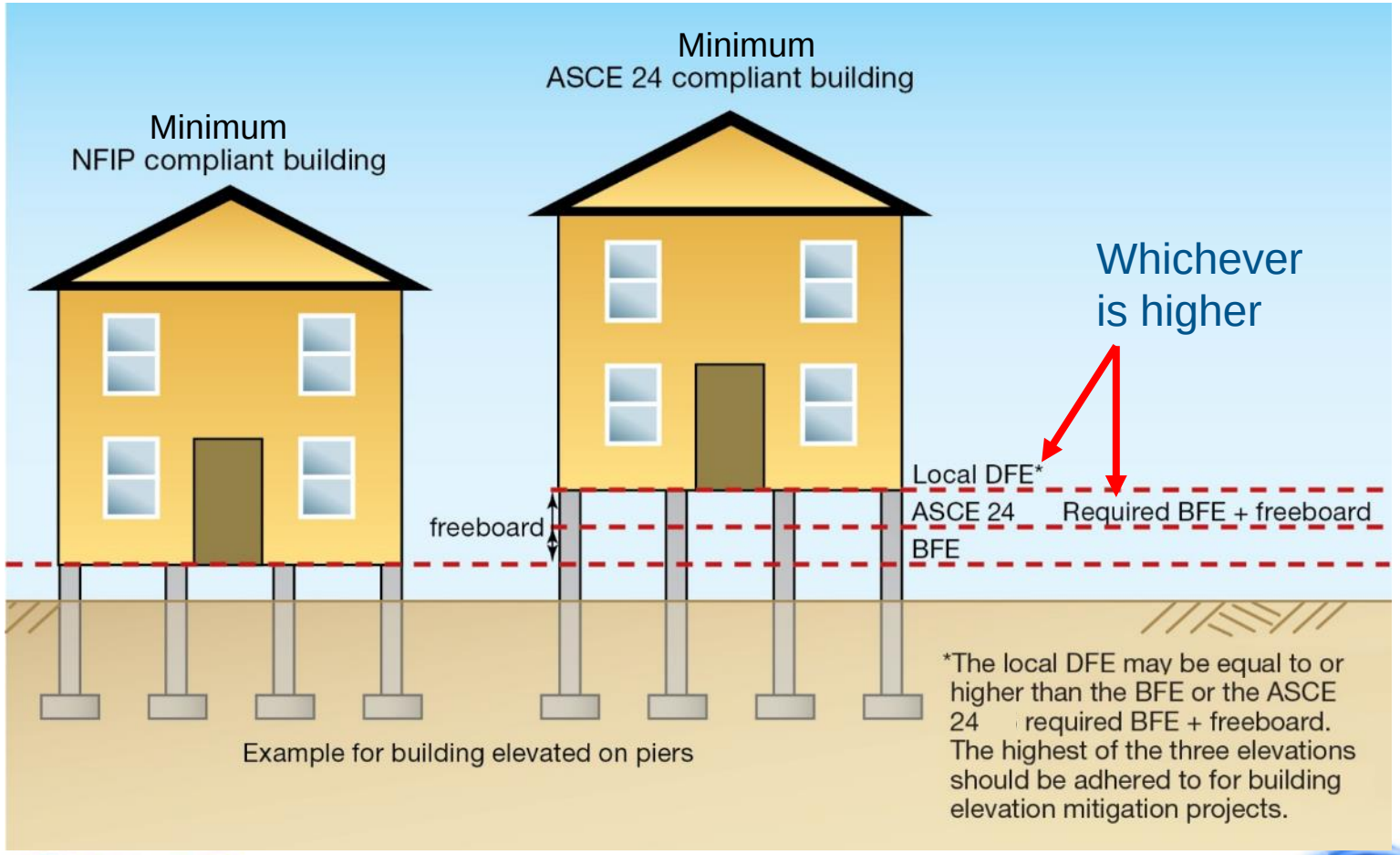
Design Standards

Note: Communities that do not currently have a building code will need to plan for how they will make sure the requirements have been met during design and construction of the building.

Using ASCE 24 with Residential Mitigation Projects

- Applies to single family, multi-family, and residential portions of mixed-use buildings
- Mitigation options discussed:
  - Retrofit Elevation
  - Reconstruction of a new building (Mitigation Reconstruction)
- Dry Floodproofing is NOT an allowable mitigation measure
- Wet Floodproofing is only allowable for parking, building access, and storage areas
- Prior to design determine whether the provisions in ASCE 24, State/Local Building Codes, or Local Floodplain Management Ordinances are more restrictive – this standard should be applied to each facet of the design (e.g. elevation, materials, foundation types).

Minimum Elevation Requirements



Example of A Zone requirements

Flood Design Class	Minimum Elevation
1	DFE
2	BFE+2 or DFE*
3	BFE+2 or DFE*
4	BFE+3 or DFE or 500-year flood elevation*

* Whichever elevation is higher

Note: The CDBG-MIT requirements add an additional foot of freeboard above the ASCE 24 minimum elevation requirements.

Minimum Elevation Requirements

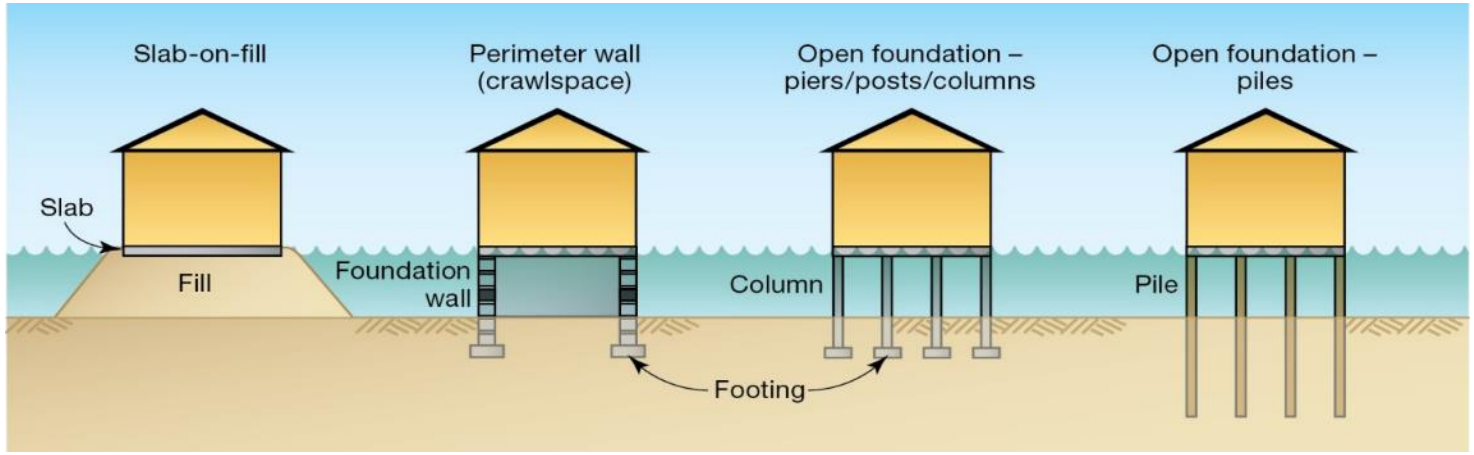
V Zone and Coastal A Zone

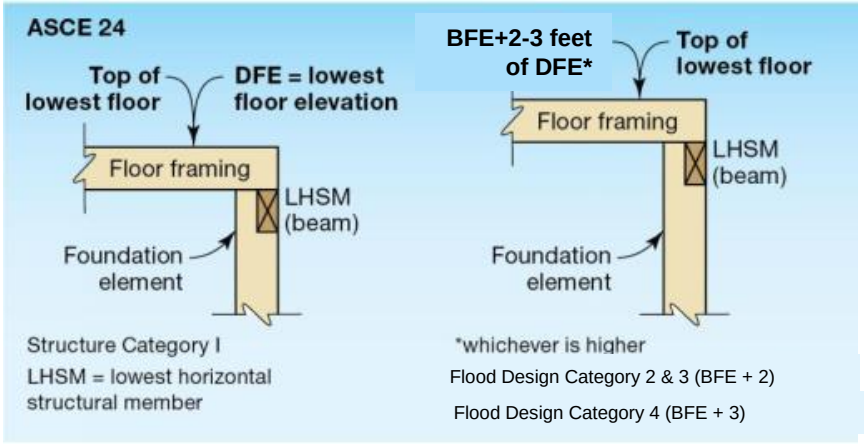
Flood Design Class	Minimum Elevation of Bottom of Lowest Horizontal Structural Member of the Lowest Floor
1	DFE
2	BFE + 2 foot or DFE, whichever is higher
3	BFE + 2 foot or DFE, whichever is higher
4	BFE + 3 feet, 500 yr., or DFE, whichever is higher

Adapted from CDBG-MIT Guidance

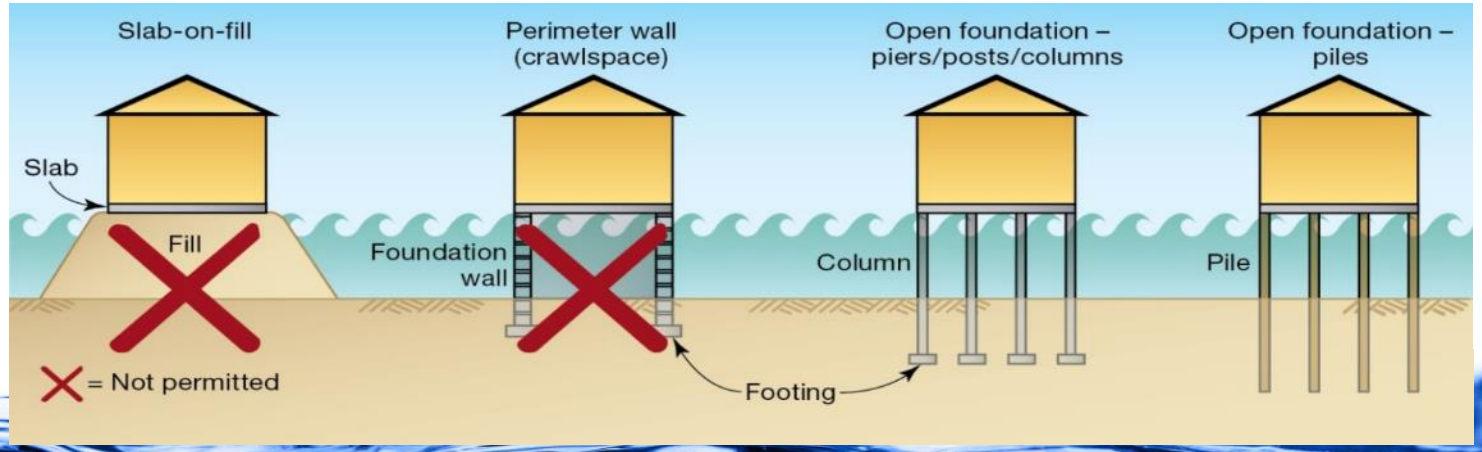
Allowable Foundation Types for Elevation

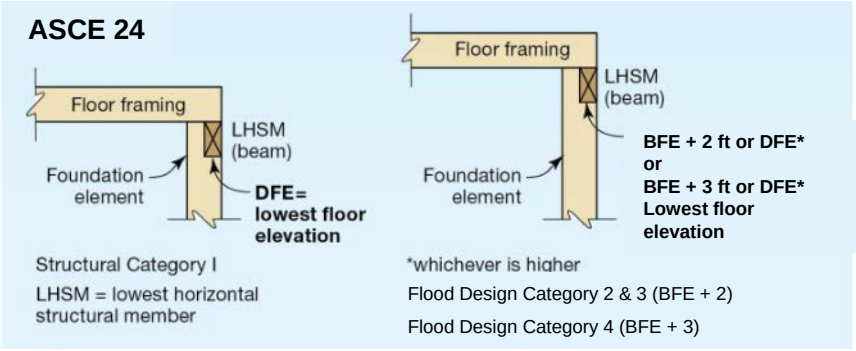
A Zones





V Zones and Coastal A Zones





Foundation Design: A Zones

- Foundations should be designed to:
  - Resist flotation, collapse, or permanent lateral movement under design loads
  - Have adequate connections between foundation and superstructure
  - Meet building code or ASCE 24, whichever is more restrictive

Foundation Type	ASCE 24 Requirement
Slab-on-grade	• Placed on structural fill or soil with adequate bearing capacity
Piers, posts, columns, piles	• Properly designed enclosures below the DFE
Perimeter wall (crawlspace)	• Properly designed flood openings

Foundation Design: V Zones, Coastal A Zones

- Foundations should be designed to:
  - Minimize flood forces acting on the foundation
  - Be free of obstructions
  - Meet building codes or ASCE 24, whichever is more restrictive

Foundation Type	ASCE 24 Requirement
Piles	• Foundations on erodible soils must be constructed on piles or the provisions in ASCE 24, Section 4.5.1 must be met • ASCE 24, Sections 4.5.5 and 4.5.6
Piers, posts, columns	• ASCE 24, Section 4.5.7 • If elevating on existing spread, mat, or raft foundation, the requirements differ

Foundation Design: A Zones, V Zones, and Coastal A Zones

- Where portions of existing foundation will be used:
  - Verify that existing foundation elements are able to resist design loads and conditions
  - Apply design loads to existing and new portions of foundation
- Where existing foundation will be removed and replaced with new foundation:
  - ASCE 24 applies to entire foundation as well as to connection of existing structure to new foundation
- When structure is being (retrofit) elevated, ASCE 24 load provisions do not apply to the superstructure

Enclosures Below the DFE

A Zones

- Space used for parking, access, storage
- Will affect the insurance premium
- Requirements for number, size, location, and spacing of openings in walls
- Breakaway walls must have openings

V Zones and Coastal A Zone

- Space used for parking, access, storage
- No size restrictions, but size may affect insurance premium
- Breakaway walls must fail in base flood or lesser conditions
  - Breakaway walls in Coastal A Zone that form an enclosure must have openings (*in ASCE 24 this also applies to V Zones*)

Enclosures Below the DFE

A Zones

V Zones

Source: FEMA 765

FEMA Technical Bulletin Guidance on Enclosures

Requirements for Flood Openings in Foundation Walls and Walls of Enclosures

Below Elevated Buildings in Special Flood Hazard Areas In Accordance with the National Flood Insurance Program

NFIP Technical Bulletin 1 / March 2020

FEMA

Free-of-Obstruction Requirements

For Buildings Located in Coastal High Hazard Areas in Accordance with the National Flood Insurance Program

NFIP Technical Bulletin 5 / *March* 2020

FEMA

Design and Construction Guidance for Breakaway Walls

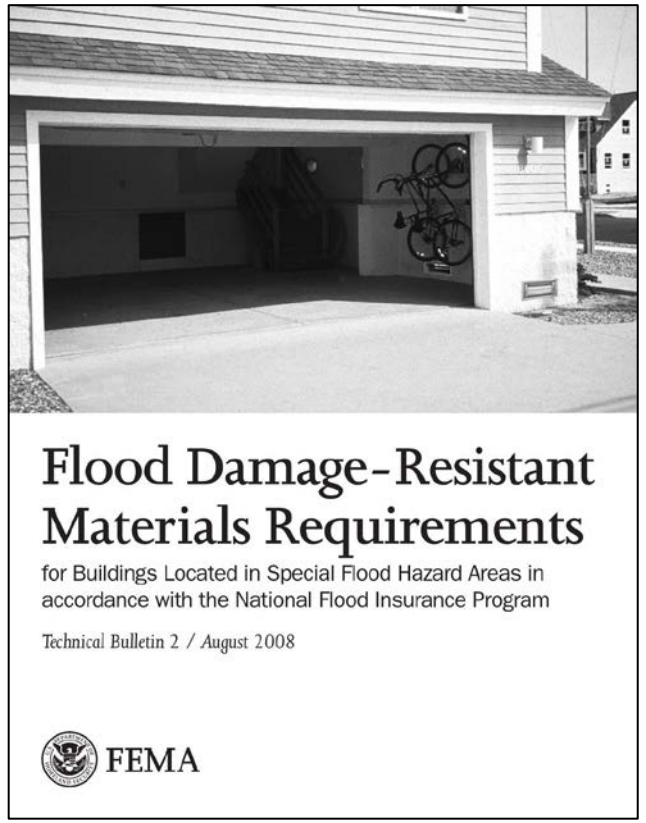
Below Elevated Buildings Located in Coastal High Hazard Areas in accordance with the National Flood Insurance Program

Technical Bulletin 9 / August 2008

FEMA

Building Materials: A Zones

- Portions of the building below the minimum elevation specified by ASCE 24 must be constructed of flood-damage-resistant materials
- Materials must resist:
  - Damage
  - Corrosion
  - Deterioration
  - Decay
  - Flood-related and other loads (except breakaway walls)
- ASCE 24 has additional requirements beyond those in FEMA TB 2
- Key difference between A Zone and V Zone / Coastal A Zone requirements for building materials is **minimum elevation**



Utilities: A Zones, V Zones, Coastal A Zones

- Must be:
  - Elevated above minimum elevations specified in ASCE 24
  - Anchored to resist damage from wind and flood loads
- Utility systems include (but are not limited to):
  - Electrical service, plumbing, mechanical systems
  - Heating, ventilation, and air-conditioning (HVAC) systems
  - Elevators
- **Key difference** between A Zone and V Zone / Coastal A Zone:
  - Minimum elevation
  - V Zone / Coastal A Zone requirement that utilities resist wave loads, erosion, and scour

Elevation Requirements: Materials and Utilities

A Zone

Flood Design Class	Minimum Elevation of Lowest Floor
1	DFE
2	BFE + 2 foot or DFE, whichever is higher
3	BFE + 2 foot or DFE, whichever is higher
4	BFE + 3 feet, 500 yr., or DFE, whichever is higher

Adapted from CDBG-MIT Guidance

Elevation Requirements: Materials and Utilities

V Zone and Coastal A Zone

Flood Design Class	Minimum Elevation of Bottom of Lowest Horizontal Structural Member of the Lowest Floor
1	DFE
2	BFE + 2 foot or DFE, whichever is higher
3	BFE + 2 foot or DFE, whichever is higher
4	BFE + 3 feet, 500 yr., or DFE, whichever is higher

Adapted from CDBG-MIT Guidance

Elevation Example: Zone A

Elevation: The raising of an existing structure on fill or foundation elements, such as solid perimeter walls, piers, posts, columns, or pilings.

Note: Allowable solid foundation walls

Elevation Example: Zone V

Before

After

Note: Open foundation – piles or columns

Applying ASCE 24 Requirements to Elevation Projects

- Allowable foundation types and requirements will be dictated by the applicable flood zone
- Foundation designed/constructed to resist floatation, collapse, or lateral movement under design loads (applies only to foundation)
- If existing foundation is used then the design needs to verify that the used portions of the foundation will meet ASCE 24 requirements – this could be impacted based on flood zones
- Foundation walls must include flood openings
- All materials below the required elevation will need to meet NFIP Technical Bulletin 2
- All utilities below the required elevation will need to be elevated or protected

Applying ASCE 24 Requirements to Mitigation Reconstruction

- **Definition:** Constructing a compliant building on the same site where an existing building has been partially or completely demolished or destroyed
  - Must meet NFIP and CDBG-MIT general policy requirements
  - Must be designed to meet all building code requirements applicable to the grant
  - Eligible for assistance under the CDBG-MIT programs
- If a CDBG-MIT grantee chooses to apply ASCE 7 and ASCE 24, the requirements **should be met in their entirety** as mitigation reconstruction qualifies as **new construction**

Using ASCE 24 with Non-Residential Mitigation Projects

- Applies to any non-residential buildings (e.g., commercial, government, critical actions) and non-residential portions of mixed-use buildings
- Mitigation options:
  - Dry Floodproofing
  - Retrofit Elevation
  - Reconstruction of a new building (Mitigation Reconstruction)

Similar to Residential requirements

- Minimum elevation requirements are based on the building's ASCE 24 Flood Design Class
- Prior to design determine whether the provisions in ASCE 24, State/Local Building Codes, or Local Floodplain Management Ordinances are more restrictive – this standard should be applied to each facet of the design (e.g. elevation, materials, foundation types).

How CDBG-MIT applies to Critical Actions

All Critical Actions, as defined at 24 CFR 55.2(b)(3), within the 500-year (0.2 percent annual chance) floodplain must be elevated or floodproofed (in accordance with the FEMA standards) to:

- The higher of the 500-year floodplain elevation or
- 3 feet above the 100-year floodplain elevation.
- If the 500-year floodplain is unavailable, and the Critical Action is in the 100-year floodplain, then the structure must be elevated or floodproofed at least 3 feet above the 100-year floodplain elevation.

Critical Actions are defined as an ‘‘activity for which even a slight chance of flooding would be too great, because such flooding might result in loss of life, injury to persons or damage to property.’’ For example, Critical Actions include hospitals, nursing homes, police stations, fire stations and principal utility lines.

How CDBG-MIT applies to Mixed Use

Mixed-use building: A building that has both residential and commercial uses.

- Nonresidential portions of mixed-use structures (no dwelling units and no residential uses) currently below the minimum elevation requirement (2 feet above Base Flood Elevation) must be elevated or floodproofed, in accordance with FEMA floodproofing standards at 44 CFR 60.3(c)(3)(ii) or successor standard, up to at least 2 feet above Base Flood Elevation.
- Residential sections of mixed-use structures below 2 feet above Base Flood Elevation must be elevated to at least + 2BFE.

What is Dry Floodproofing?

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

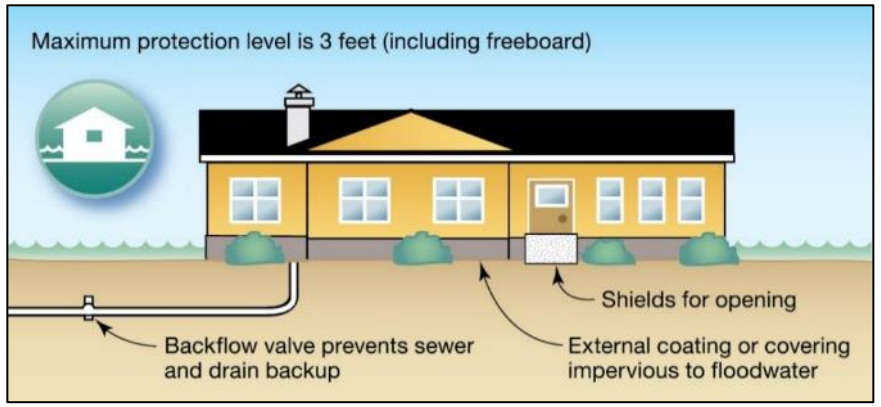


Figure 1-9, FEMA P-259

Note: Dry floodproofing is <u>not</u> an allowable project type in High Risk Flood Hazard Areas, Coastal High Hazard Zones, and Coastal A Zones

Dry Floodproofing Minimum Elevation Requirements

A Zone

Flood Design Class	Minimum Elevation of Lowest Floor
1	DFE
2	BFE + 2 foot or DFE, whichever is higher
3	BFE + 2 foot or DFE, whichever is higher
4	BFE + 3 feet, 500 yr., or DFE, whichever is higher

Adapted from CDBG-MIT Guidance

Applying ASCE 24 Requirements to Dry Floodproofing

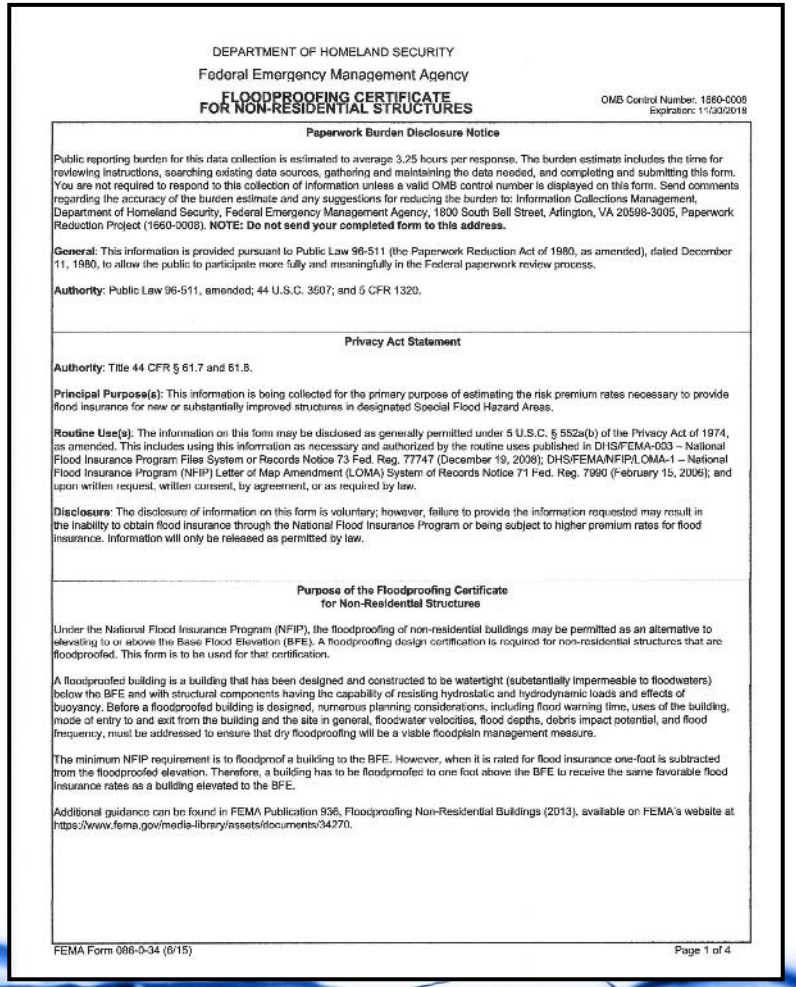
- Must meet elevation requirements, flood zone restrictions, and flood velocity restrictions
- ASCE 24 materials requirements apply to all aspects of the protection
- A system that can render the floodproofed area "substantially impermeable" to floodwaters without the assistance of sump pumps
- Sump pumps shall provide a means to remove accumulated water
- Meet egress requirements of one exit door, window, or opening above the minimum elevation
- Meet flood warning time of 12 hours unless the community has a system with time for notification, travel time to site, installation time, and evacuation time.
- All removable covers and shields must meet flood load requirements
- Where shields and covers are used, have a flood emergency plan and approved by AHJ

Applying ASCE 24 Requirements to Dry Floodproofing

- Strict compliance with ASCE 24 can be difficult with existing structures. Dry floodproofing provisions should be applied as follows:
  - **Primarily Intended for:**
    - Nonresidential Buildings and nonresidential portions of mixed-use buildings
  - **Protection of Building Utility Systems:**
    - Utility lines/systems within the floodproofed area will be protected.
    - Utility lines/sanitary systems **outside** dry floodproofed area must be protected.
  - **Historic Residential Buildings** (currently occupied in a nonresidential capacity):
    - Adhere to ASCE 24 provisions as closely as possible without compromising historic designation of building.

ASCE 24 Applies to the Floodproofing Certificate

- Required by the NFIP and building codes for dry floodproofing projects
- Required for NFIP flood insurance
- It is **now** an "as-built" certification
- Required in Zone A for:
  - Non-residential structures
  - Portions of mixed-use buildings with all residential uses above the required level of protection
- Important for building owners to understand
- Requires compliance with ASCE 24



DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency

FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

OMB Control Number: 1660-0008
Expiration: 11/30/2019

Paperwork Burden Disclosure Notice

Public reporting burden for this data collection is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

General: This information is provided pursuant to Public Law 96-511 (the Paperwork Reduction Act of 1980, as amended), dated December 11, 1980, to allow the public to participate more fully and meaningfully in the Federal paperwork review process.

Authority: Public Law 96-511, amended; 44 U.S.C. 3507; and 5 CFR 1320.

Privacy Act Statement

Authority: Title 44 CFR § 61.7 and 61.8.

Principal Purpose(s): This information is being collected for the primary purpose of estimating the risk premium rates necessary to provide flood insurance for new or substantially improved structures in designated Special Flood Hazard Areas.

Routine Use(s): The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA-003 – National Flood Insurance Program Files System or Records Notice 73 Fed. Reg. 77747 (December 19, 2008); DHS/FEMA/NFIP/LOMA-1 – National Flood Insurance Program (NFIP) Letter of Map Amendment (LOMA) System of Records Notice 71 Fed. Reg. 7990 (February 15, 2006); and upon written request, written consent, by agreement, or as required by law.

Disclosure: The disclosure of information on this form is voluntary; however, failure to provide the information requested may result in the inability to obtain flood insurance through the National Flood Insurance Program or being subject to higher premium rates for flood insurance. Information will only be released as permitted by law.

Purpose of the Floodproofing Certificate for Non-Residential Structures

Under the National Flood Insurance Program (NFIP), the floodproofing of non-residential buildings may be permitted as an alternative to elevating to or above the Base Flood Elevation (BFE). A floodproofing design certification is required for non-residential structures that are floodproofed. This form is to be used for that certification.

A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. Before a floodproofed building is designed, numerous planning considerations, including flood warning time, uses of the building, mode of entry to and exit from the building and the site in general, floodwater velocities, flood depths, debris impact potential, and flood frequency, must be addressed to ensure that dry floodproofing will be a viable floodplain management measure.

The minimum NFIP requirement is to floodproof a building to the BFE. However, when it is rated for flood insurance one-foot is subtracted from the floodproofed elevation. Therefore, a building has to be floodproofed to one foot above the BFE to receive the same favorable flood insurance rates as a building elevated to the BFE.

Additional guidance can be found in FEMA Publication 936, Floodproofing Non-Residential Buildings (2013), available on FEMA's website at https://www.fema.gov/media-library/assets/documents/34270.

FEMA Form 086-0-34 (6/15) Page 1 of 4

Considerations for Historic Structures

What Makes a Building Historic?

A. Consult the National Register of Historic Places and State Inventories of Historic Places
B. Meets one or more of National Register Criteria for Evaluation
C. Significance in American history, architecture, archaeology, engineering and culture
D. Maintains integrity of location, design, setting, materials, workmanship, feeling and association
   - Criteria (36 CFR Part 60) makes property eligible for NRHP listing: http://www.nps.gov/nr/publications/bulletins/nrb15/nrb15_7.htm

Historic Structure Considerations

Effects on structures can be direct or indirect

- HUD encourages retention of historic integrity
- In some cases, the benefits of providing a higher level of protection outweigh some loss of historic integrity
- If historic integrity cannot be maintained, contact the grant administrator to understand possible restrictions and how to apply ASCE 24 as outlined in previously

Mitigation Considerations for Historic Properties

Consider these things when evaluating effects:

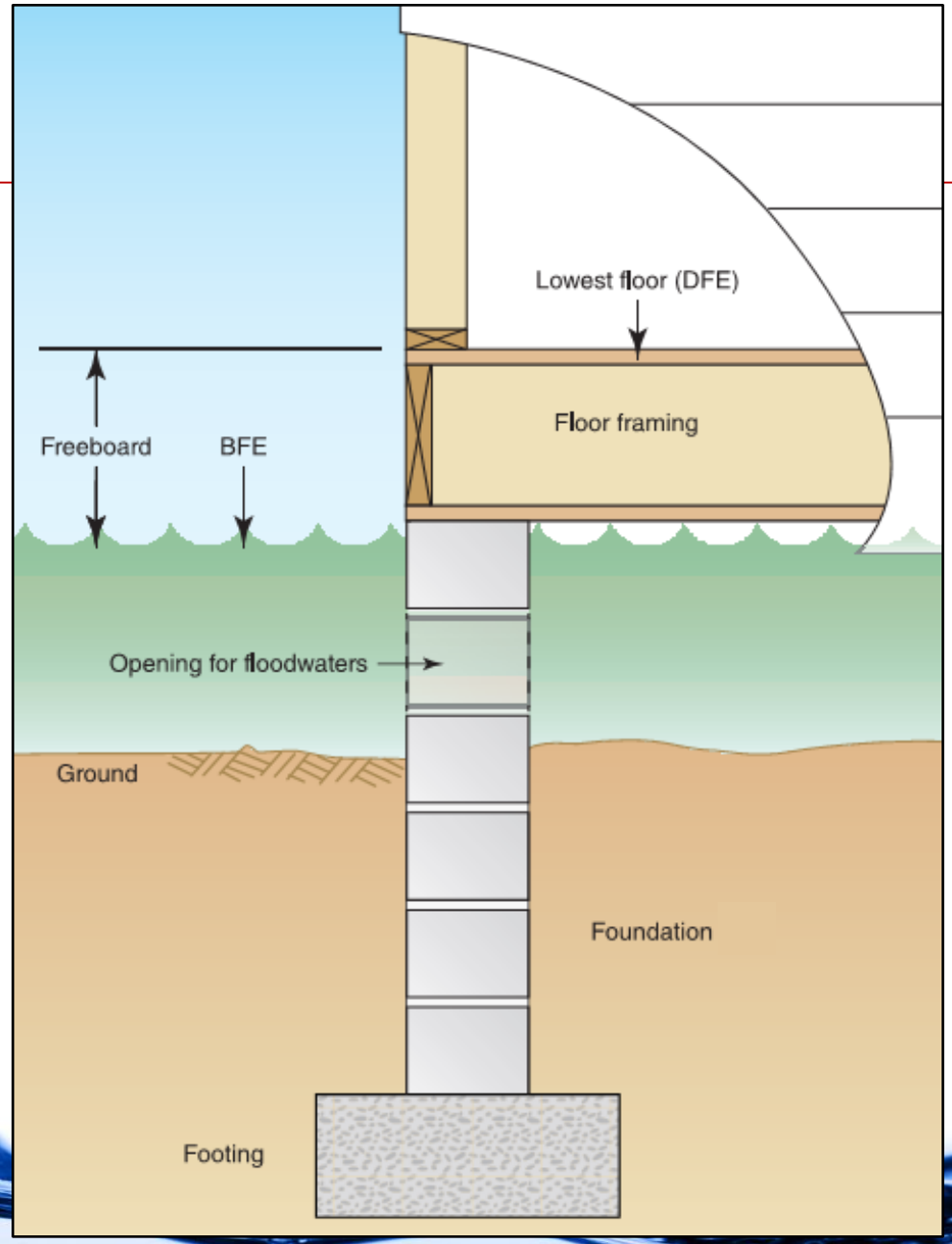
- Building height, scale, mass, and proportions
- Architectural character (design elements, features, materials)
- Building footprint, orientation, and location
- Landscape features
- Archaeology
- Site elevation and topography
- Adjoining historic properties/historic district

Guidelines on Flood Adaptation for Rehabilitating Historic Buildings
https://www.nps.gov/tps/standards/rehabilitation/flood-adaptation-guidelines.pdf

Benefits of using ASCE 24

- Reduced building and building contents damage during a base flood event
- A factor of safety if changes in the floodplain increase flood heights
- Reduced time out of the house
- Potential for reduced flood insurance premiums

- Communities who adopt and enforce ASCE 24 can be eligible for Community Rating System (CRS) Credits



Getting Access to ASCE 24

- Web Address - https://sp360.asce.org/PersonifyEbusiness/Merchandise/Product-Details/productId/233129242
- Purchased through the American Society of Civil Engineers

FEMA Resources

- Guidance for Applying ASCE 24 Engineering Standards to HMA Flood Retrofitting and Reconstruction Projects (2013)
- Highlights of ASCE 24-14 Flood Resistant Design and Construction (2015)
- Highlights of ASCE 24-05 Flood Resistant Design and Construction (2010)
- FEMA P-259, *Engineering Principles and Practices of Retrofitting Floodprone Residential Structures,* 3rd Edition (2012)
- FEMA P-348, *Protecting Building Utility Systems From Flood Damage* (2017)
- FEMA P-55, *Coastal Construction Manual*, 4th Edition (2011)
- FEMA P-936, *Floodproofing Non-Residential Buildings* (2013)
- FEMA NFIP Technical Bulletins

Find FEMA Building Science publications at http://www.fema.gov/buildingscience-publications.

Flood Code Resources

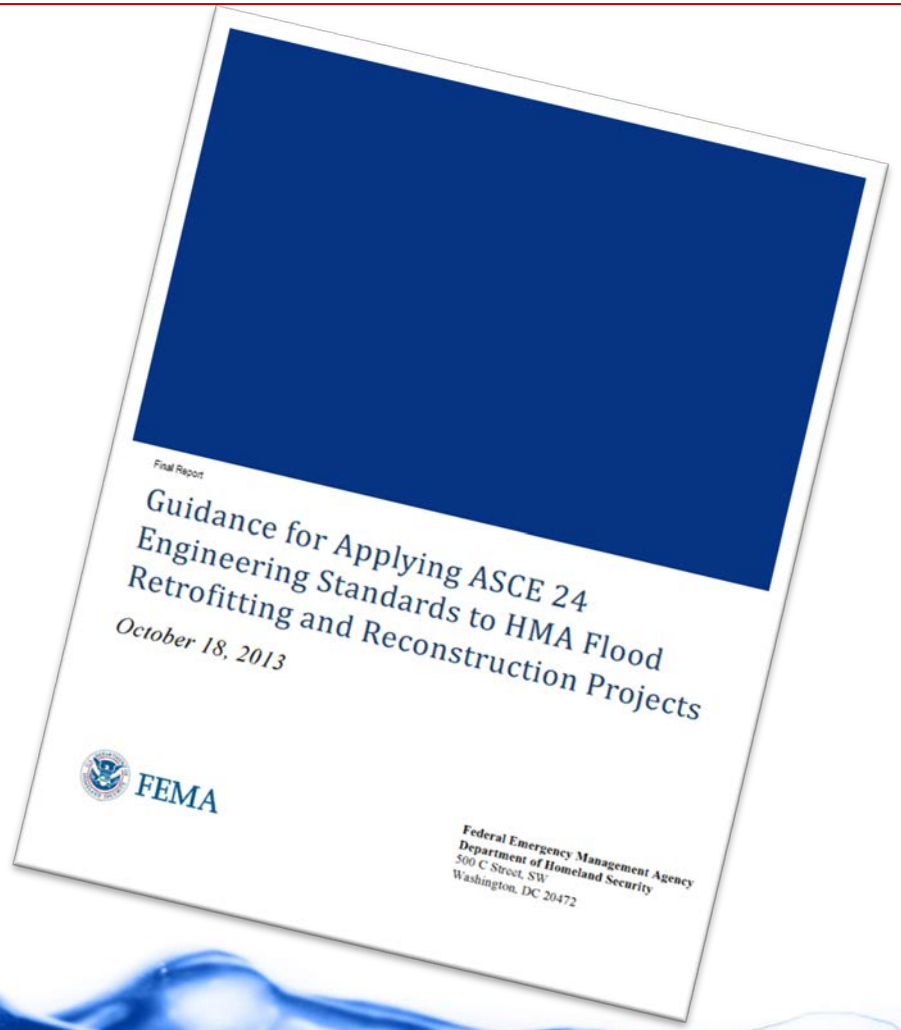
- *CodeMaster for Flood Resistant Design*
  - 12-step procedure for determining loads for design
  - Based on IBC, IRC, ASCE 7 and ASCE 24
  - Includes illustrations
  - Steps through an example
  - ICC with FEMA support

CodeMasters can be purchased through the ICC Website https://shop.iccsafe.org/

FEMA's Guidance for Applying ASCE 24

- Different from the actual ASCE 24 Standard (You should have both for project oversight)
- Ensures that each project meets FEMA's HMA requirements which includes adhering to project-related design standards
- Supports integration of ASCE 24 as the minimum standard for flood-related HMA projects

For CDBG-MIT projects, note that the elevation requirements are potentially more restrictive







Summary and Resources

Roosevelt Grant, FEMA

FEMA

Value of ASCE 24: Meeting CDBG-MIT's Goals

- **HUD Goal 1:** Support data-informed investments, focusing on repetitive loss of property and critical infrastructure

✓ ASCE-24 a consensus standard for flood construction for new construction, repair of substantial damage, or substantial improvement

- **HUD Goal 2:** Build capacity to comprehensively analyze disaster risks and update hazard mitigation plans

✓ Grantees are encouraged to use the best available data (e.g. ABFE's) to assess their flood risk

- **HUD Goal 3:** Support the adoption of policies that reflect local and regional priorities that will have long-lasting effects on community risk reduction, including risk reduction to community lifelines and decreasing future disaster costs

✓ Use of ASCE 24 can help reduce future disaster costs, reduce building occupant displacement, and protect community lifelines (e.g. critical actions)

- **HUD Goal 4:** Maximize the impact of funds by encouraging leverage, private/ public partnerships, and coordination w/other federal dollars

✓ ASCE 24 as a "standard of practice" provides partners confidence in the long-term resiliency for their investment

HUD CDBG-MIT Resources

- Community Development Block Grant Mitigation Program: https://www.hudexchange.info/programs/cdbg-mit/
- HUD CDBG-Mitigation Notice: https://files.hudexchange.info/resources/documents/FR-6109-N-02-CDBG-Mitigation-Notice.pdf
- HUD CDBG-Mitigation 2019 Webinar series: https://www.hudexchange.info/news/cdbg-mit-webinar-series/

Questions?

HUD CDBG-MIT Guidance Questions

HUD Policy Unit
DRSIPolicyUnit@hud.gov

FEMA Flood/Wind Building Science Helpline

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