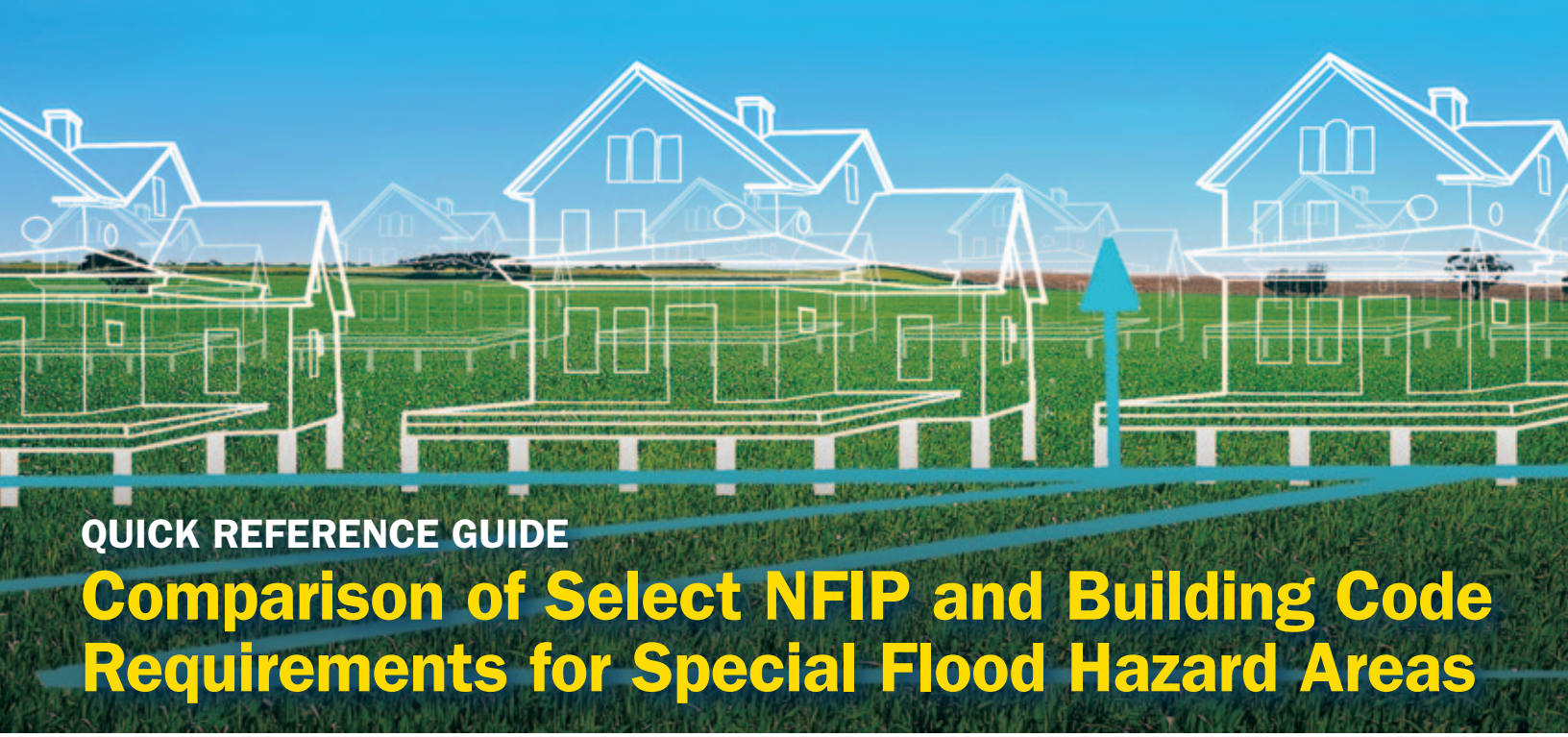


QUICK REFERENCE GUIDE

Comparison of Select NFIP and Building Code Requirements for Special Flood Hazard Areas

This guide illustrates the similarities and highlights the differences between the National Flood Insurance Program (NFIP) minimum requirements and the requirements of the International Code Series (I-Codes) and ASCE 24, *Flood Resistant Design and Construction* (ASCE 24), a standard referenced by the I-Codes.

Communities that participate in the NFIP adopt regulations and codes that govern development in special flood hazard areas, and enforce those requirements through the issuance of permits. The International Residential Code (IRC) and International Building Code (IBC), by reference to ASCE 24, include requirements that govern the design and construction of buildings and structures in flood hazard areas. FEMA has determined that the flood provisions of the I-Codes are consistent with the requirements of the NFIP (the I-Code requirements shown either meet or exceed NFIP requirements). ASCE 24, a design standard developed by the American Society of Civil Engineers, expands on the minimum NFIP requirements with more specificity, additional requirements, and some limitations.

The illustrations that follow highlight some of the key similarities and differences between foundation types, lowest floor elevations, enclosures below elevated buildings, and utilities requirements contained within the NFIP and I-Codes for most residential and commercial buildings (classified as "Category II" structures by the building codes).

FEMA

DID YOU KNOW?

Lowest floor elevation requirements in IBC/ASCE 24 vary with structure category, and may be higher for certain high occupancy buildings and critical and essential facilities.

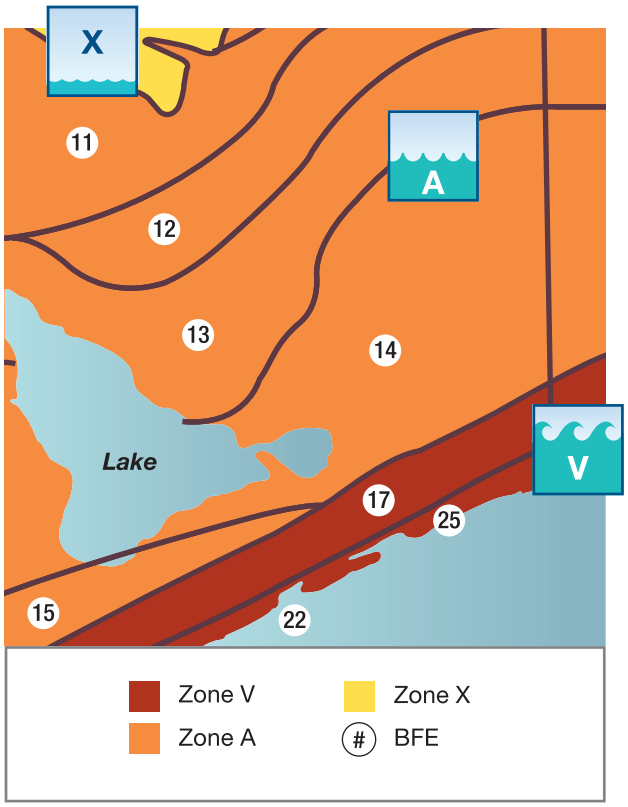
DID YOU KNOW?

The NFIP refers to the Base Flood Elevation (BFE) for lowest floor elevation requirements, while the I-Codes and ASCE 24 refer to the Design Flood Elevation (DFE). The DFE will always be the BFE or higher. Additional height above the BFE is known as freeboard.

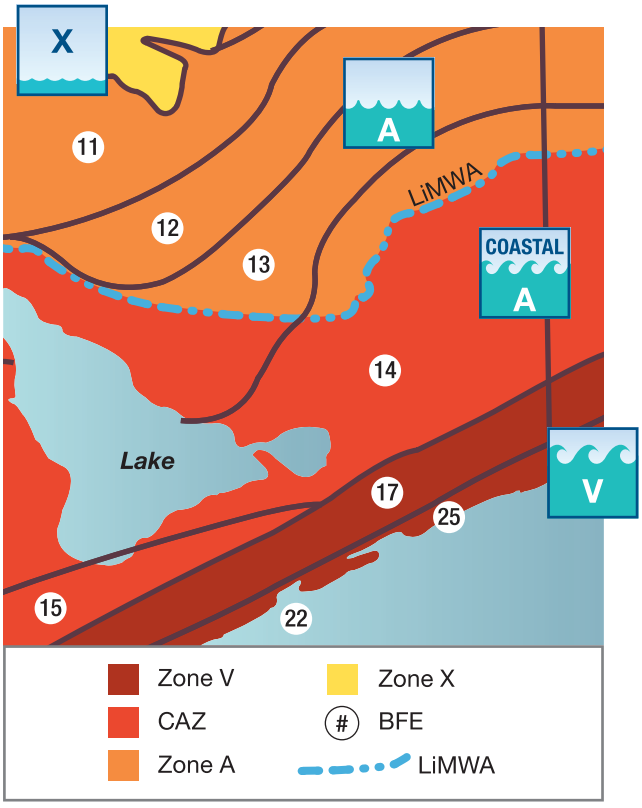
The NFIP, I-Codes, and ASCE 24 require the use of flood damage-resistant materials below the required lowest floor elevation (illustrated throughout this guide).

FLOOD ZONE MAPS

NFIP



I-Codes



DID YOU KNOW?

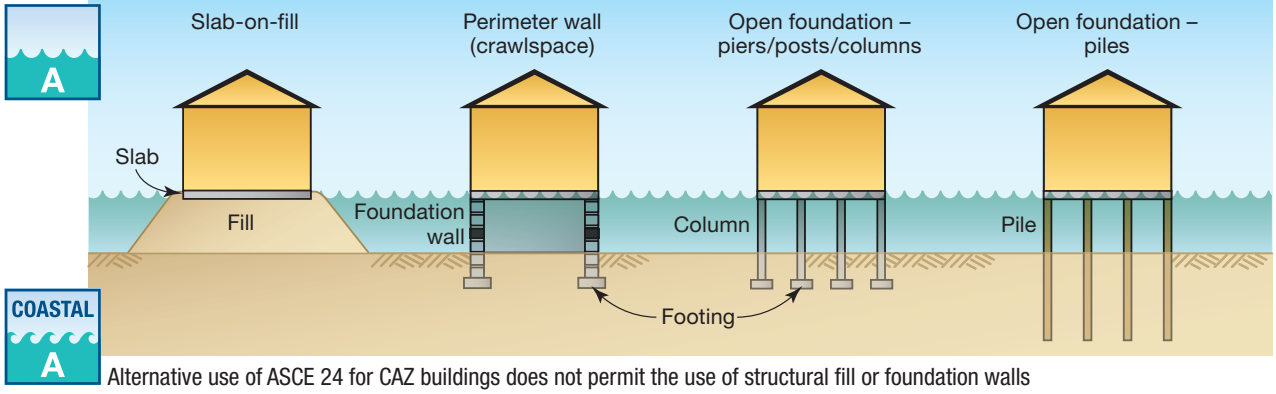
The NFIP regulations do not have provisions for Coastal A Zone (CAZ), but the I-Codes do (see map on right). The IBC, by reference to ASCE 24, requires CAZ buildings to be treated like Zone V buildings. The IRC permits the use of ASCE 24 in the CAZ as an alternative to its flood provisions, which allows CAZ buildings to be treated like Zone V buildings. Starting in 2008, revised and new coastal Digital Flood Insurance Rate Maps (FIRMs) show the Limit of Moderate Wave Action (LiMWA), which delineates the landward limit of the CAZ.

The NFIP requires that all buildings in Zone V resist the effects of wind and water loads acting simultaneously. The prescriptive wind design requirements in the IRC are applicable in regions where the basic wind speed is under 110 mph, or under 100 mph in hurricane-prone regions, which extend farther inland than Zone V in most areas. Where basic wind speeds exceed these minimum values, engineered design is required.

Comparison of Zone A Requirements: NFIP and IRC

FOUNDATION TYPE

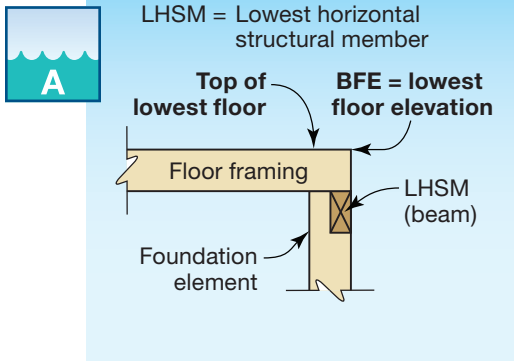
NFIP and IRC



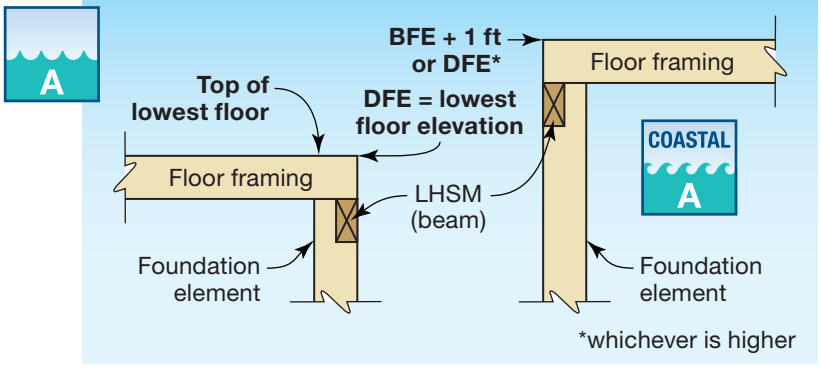
Alternative use of ASCE 24 for CAZ buildings does not permit the use of structural fill or foundation walls

LOWEST FLOOR ELEVATION at top of lowest floor

NFIP

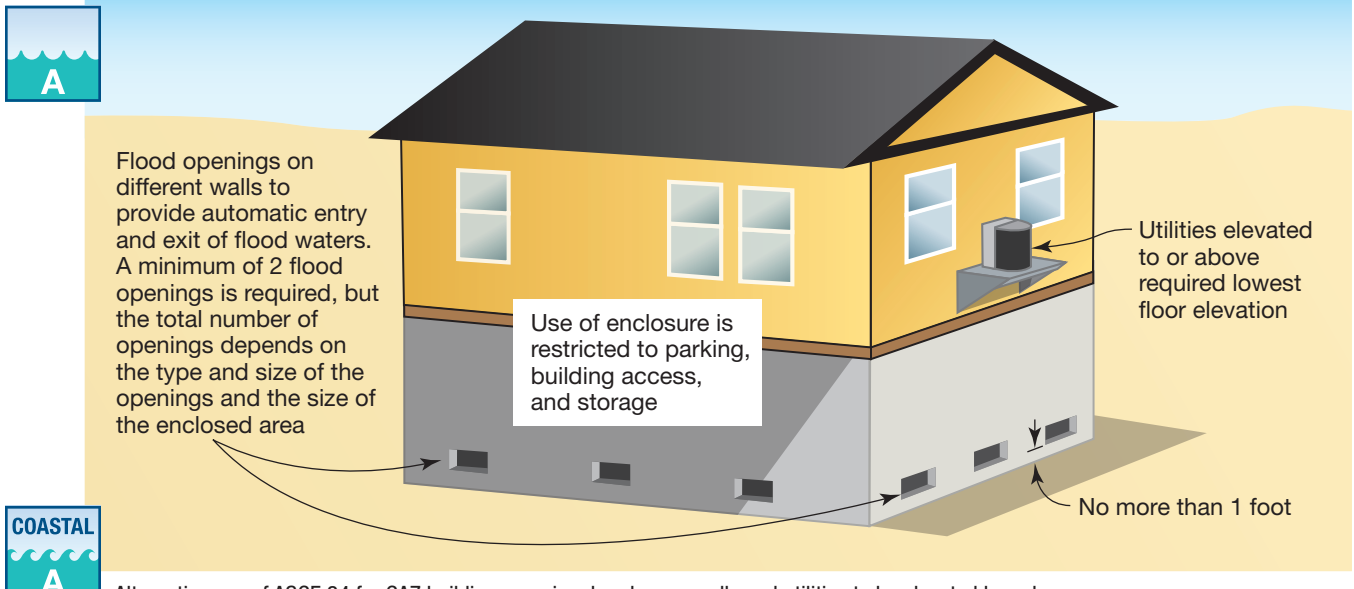


IRC



UTILITIES AND ENCLOSURES below elevated buildings

NFIP and IRC

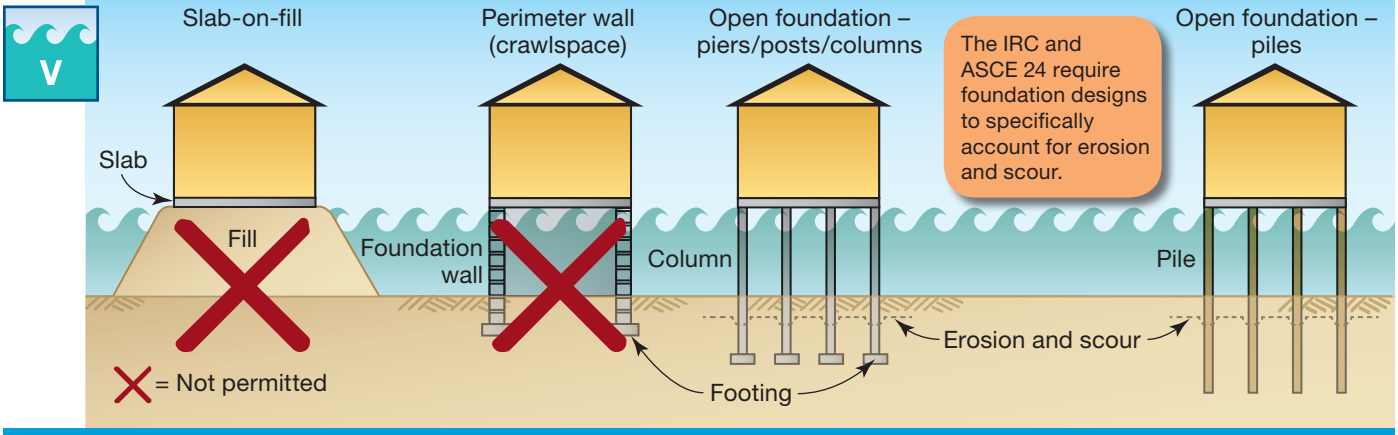


Alternative use of ASCE 24 for CAZ buildings requires breakaway walls and utilities to be elevated based on the orientation of lowest horizontal structural members (see page 6).

Comparison of Zone V Requirements: NFIP and IRC

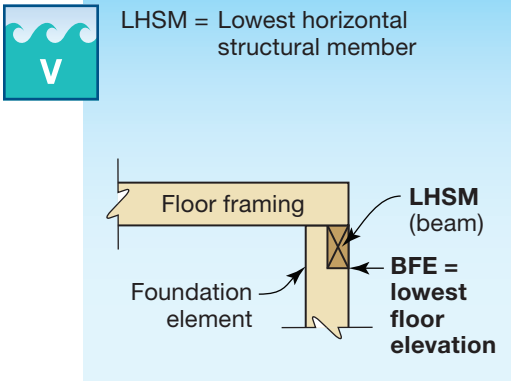
FOUNDATION TYPE

NFIP and IRC

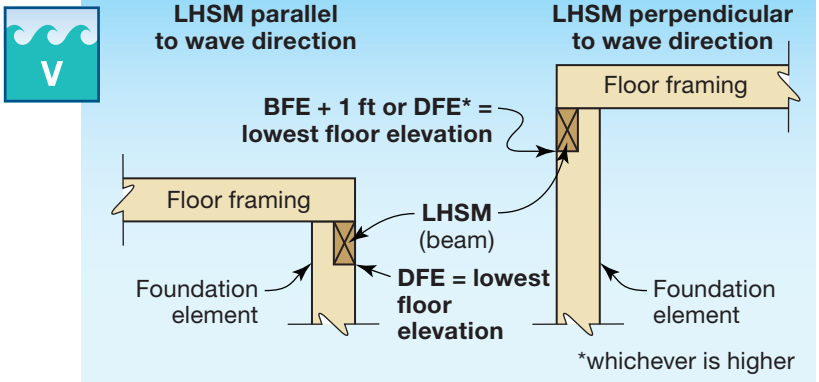


LOWEST FLOOR ELEVATION at bottom of LHSM

NFIP

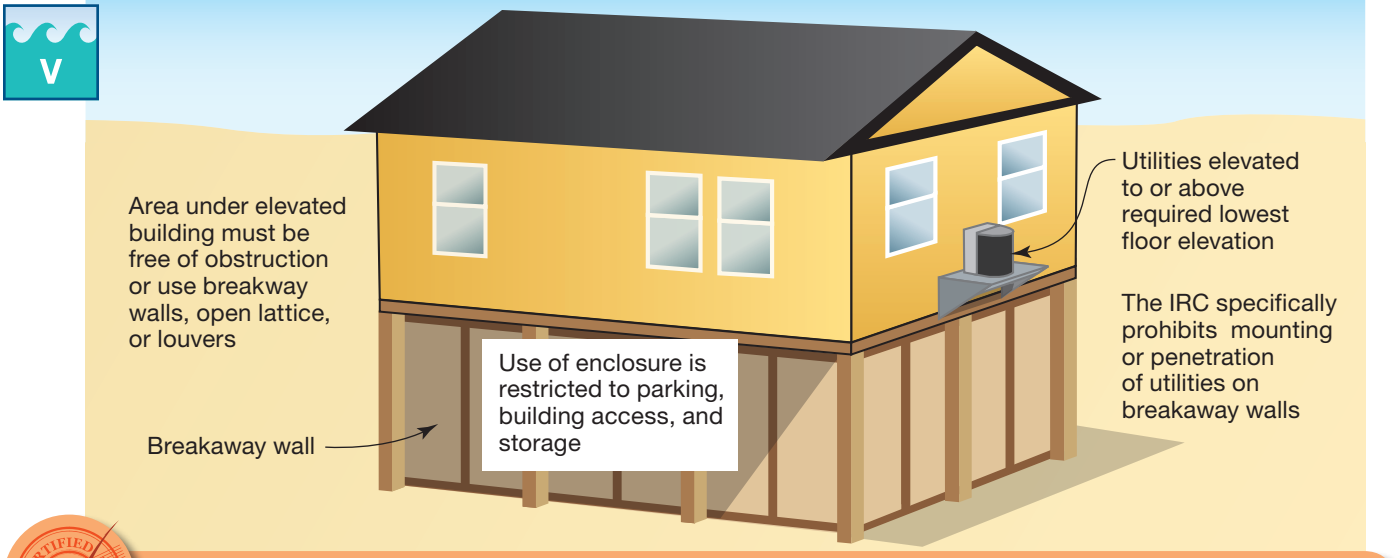


IRC



UTILITIES AND ENCLOSURES below elevated buildings

NFIP and IRC

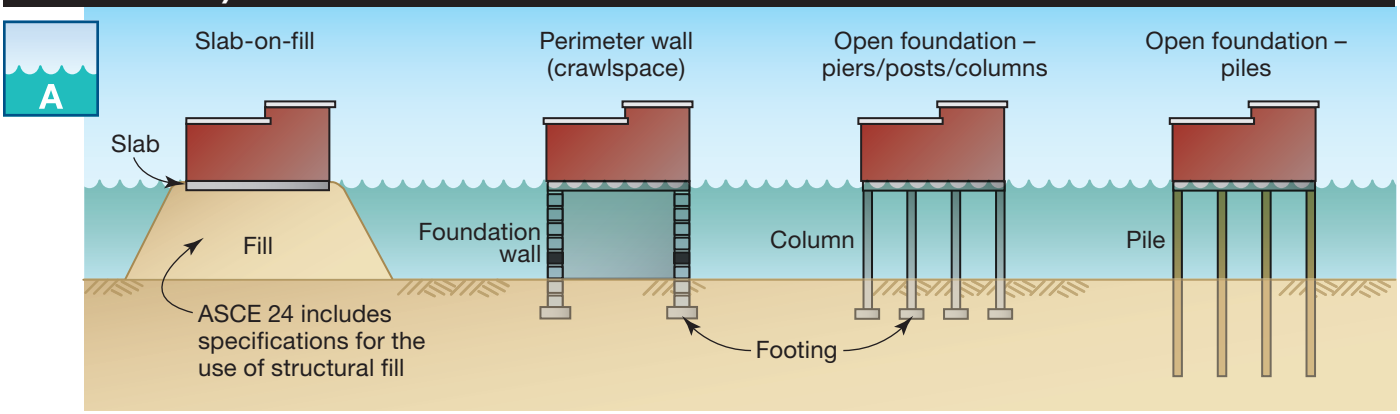


Both the NFIP and IRC require design certification in Zone V. Design certification is also required for breakaway walls that exceed a design safe loading resistance of 20 pounds per square foot.

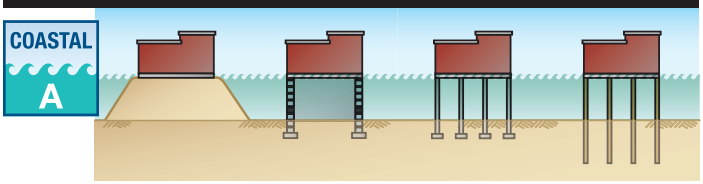
Comparison of Zone A Requirements: NFIP and IBC/ASCE 24

FOUNDATION TYPE

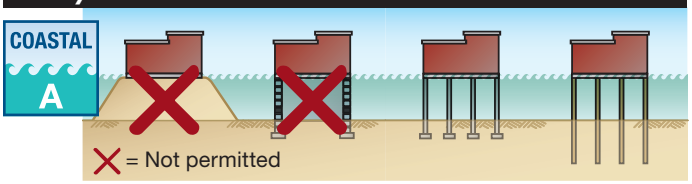
NFIP and IBC/ASCE 24



NFIP

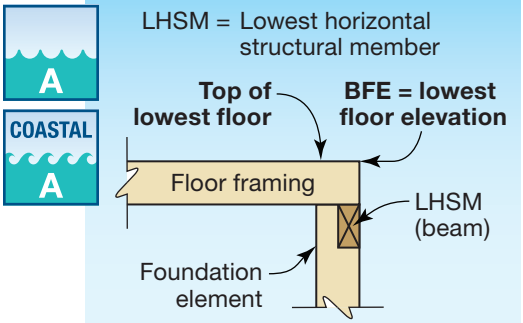


IBC/ASCE 24

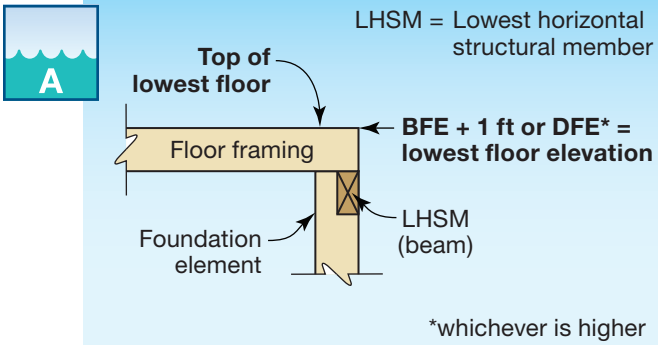


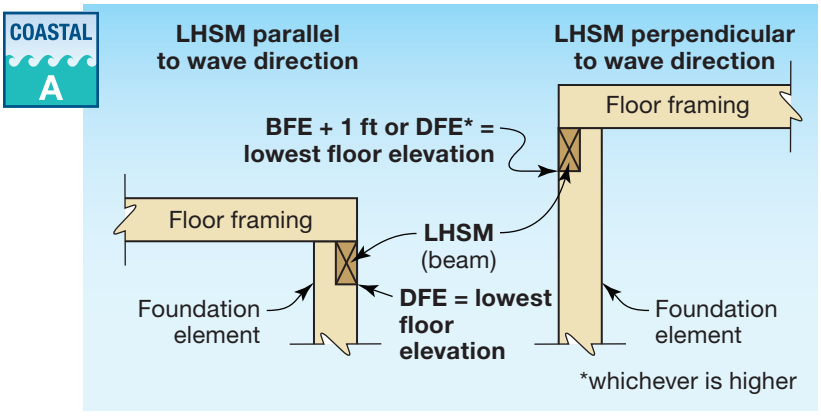
LOWEST FLOOR ELEVATION at top of lowest floor or bottom of LHSM

NFIP



IBC/ASCE 24





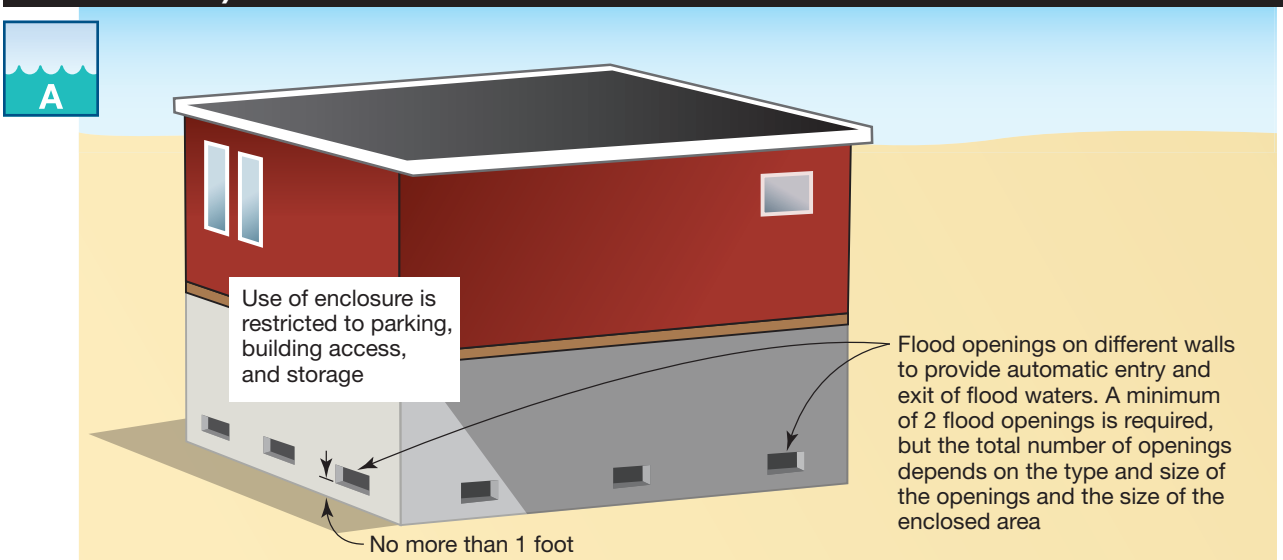
DID YOU KNOW?

The NFIP and IBC/ASCE 24 allow *non-residential* buildings in Zone A to be dry floodproofed. Residential buildings are not permitted to be dry floodproofed in any flood hazard zone. ASCE 24 includes limitations on the use of dry floodproofing and on measures that require human intervention.

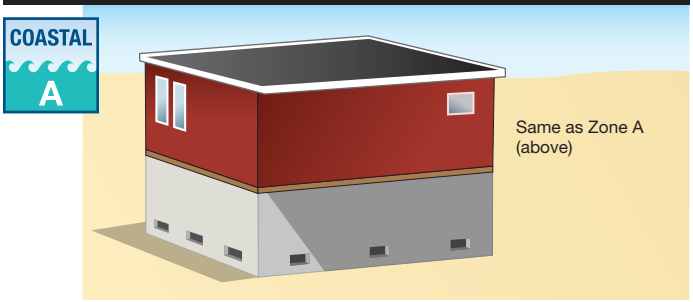
Comparison of Zone A Requirements: NFIP and IBC/ASCE 24

ENCLOSURES below elevated buildings

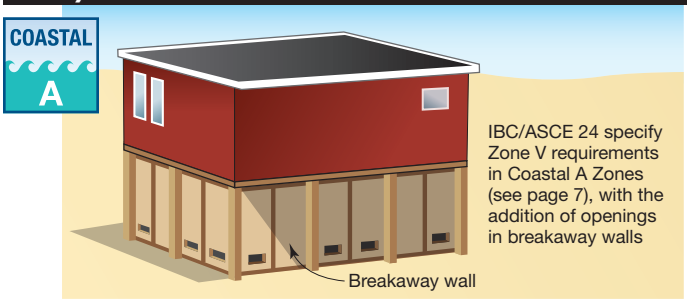
NFIP and IBC/ASCE 24



NFIP

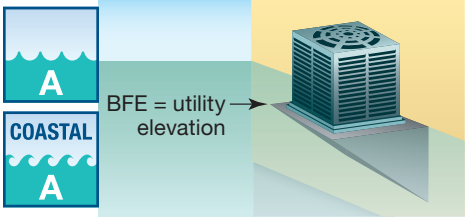


IBC/ASCE 24

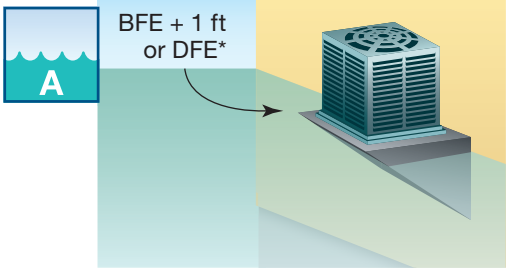


UTILITIES

NFIP

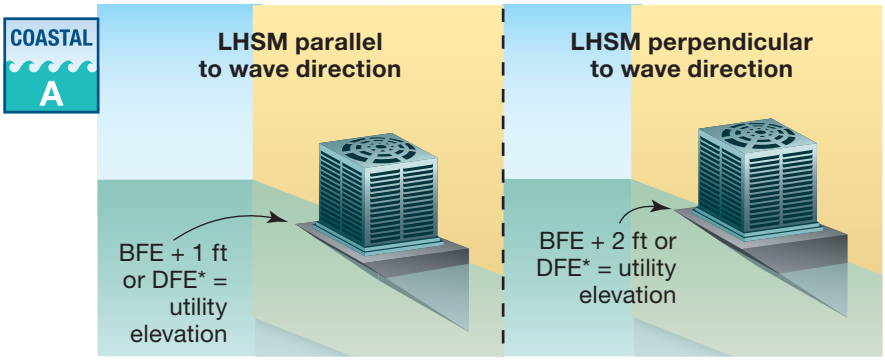


IBC/ASCE 24



*whichever is higher

LHSM = lowest horizontal structural member



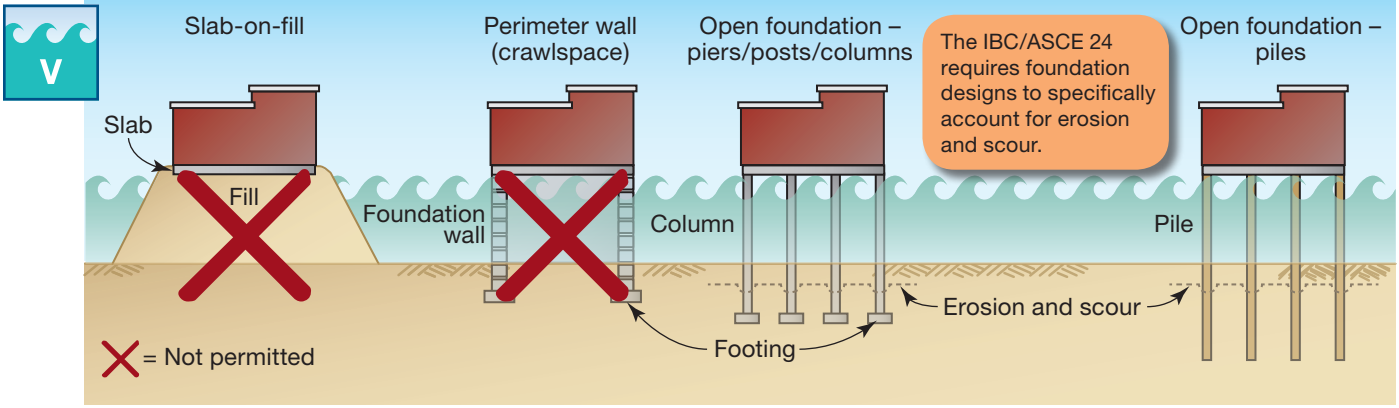
DID YOU KNOW?

Elevation requirements for utilities in IBC/ASCE 24 vary with structure category, and may be higher for certain high occupancy buildings and critical and essential facilities.

Comparison of Zone V Requirements: NFIP and IBC/ASCE 24

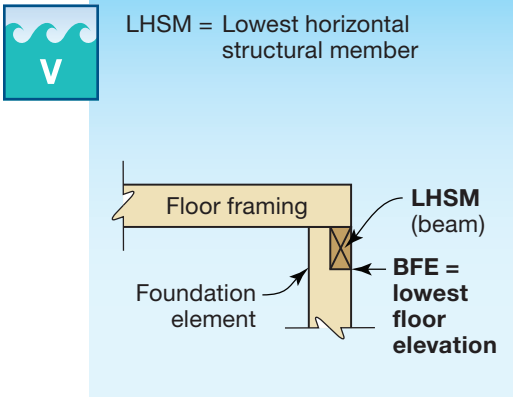
FOUNDATION TYPE

NFIP and IBC/ASCE 24

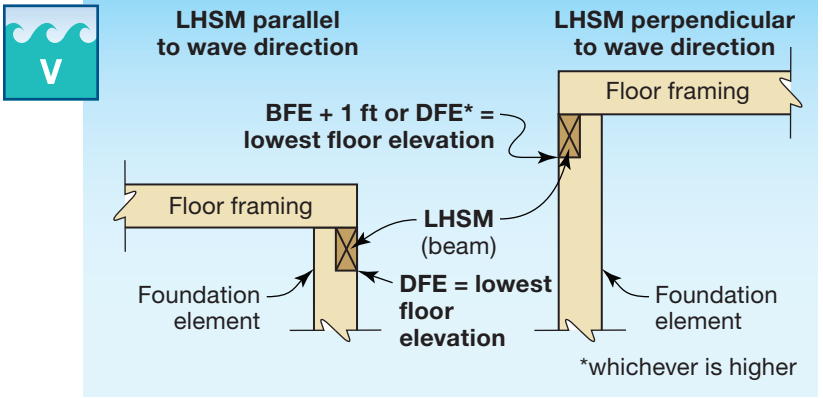


LOWEST FLOOR ELEVATION at bottom of LHSM

NFIP

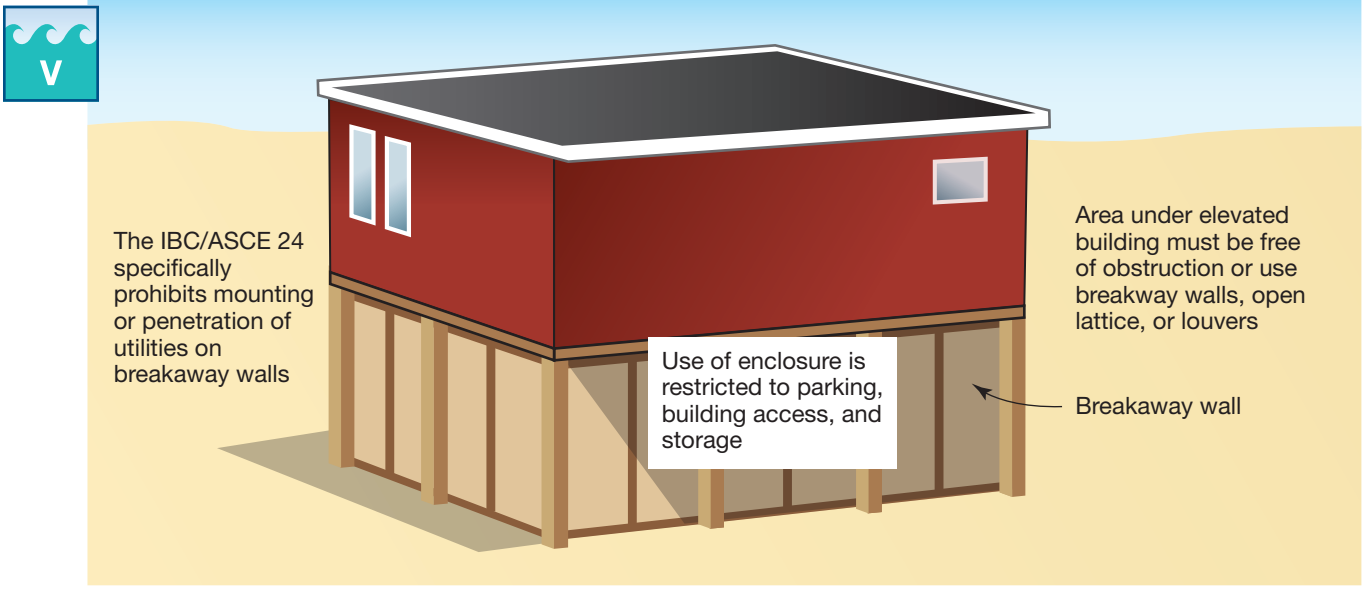


IBC/ASCE 24



ENCLOSURES below elevated buildings

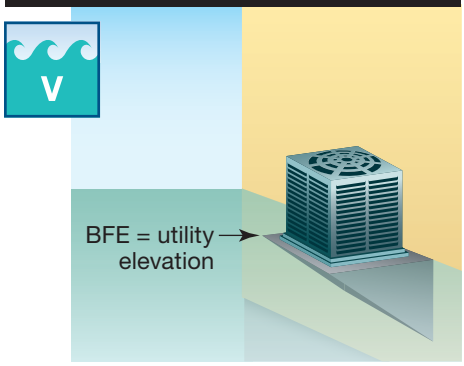
NFIP and IBC/ASCE 24



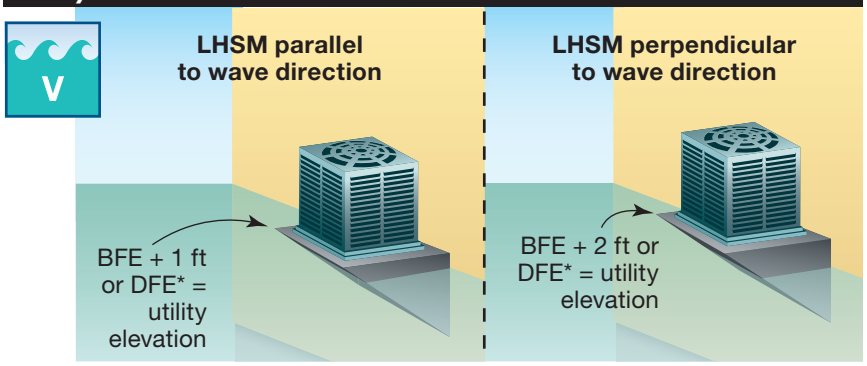
Comparison of Zone V Requirements: NFIP and IBC/ASCE 24

UTILITIES

NFIP



IBC/ASCE 24



*whichever is higher

LHSM = lowest horizontal structural member

DID YOU KNOW?

The IBC/ASCE 24 places constraints on construction in high risk flood hazard areas, including alluvial fan, flash flood, mudslide, erosion-prone, high velocity flow, and ice jam and debris areas.

For More Information

For a more detailed and comprehensive summary, see *Flood Resistant Provisions of the 2009 I-Codes, Flood Resistant Provisions of the 2012 I-Codes, Highlights of ASCE 24-05 Flood Resistant Design and Construction,* and *Provisions of the 2009 I-Codes and ASCE 24 Compared to the NFIP* at www.fema.gov/rebuild/buildingscience/coderesources.shtm

See also *CodeMaster: Flood Resistant Design*, an 8-page guide to designing a structure for flood loads in accordance with the IBC, IRC, ASCE 7 and ASCE 24. It can be purchased by going to www.iccsafe.org/store and searching for "CodeMaster."

If you need additional information, contact the FEMA Building Science Helpline at (866) 927-2104 or email FEMA-Buildingsciencehelp@fema.dhs.gov.

FEMA