Section 1612 Flood Loads

ILLUSTRATION

1612.1 General

Within flood hazard areas as established in section 1612.3, all new construction of buildings, structures and portions of buildings and structures, including substantial improvement and restoration of substantial damage to buildings and structures, and substantial repair of a foundation shall be designed and constructed to resist the effects of flood hazards and flood loads. For buildings that are located in more than one flood hazard area the provisions associated with the most restrictive flood hazard area shall apply.

1612.2 Definitions

The following terms are defined in 780 CMR 2.00: *Definitions* and are in addition to those shown in the IBC:

BASE FLOOD.

BASE FLOOD ELEVATION.

BASEMENT.

COASTAL A ZONE.

COASTAL DUNE

COASTAL HIGH HAZARD AREA.

COASTAL WETLAND RESOURCE AREA

DESIGN FLOOD.

DESIGN FLOOD ELEVATION.

DRY FLOODPROOFING.

EXISTING STRUCTURE.

FLOOD or FLOODING.

FLOOD DAMAGE-RESISTANT MATERIALS.

FLOOD HAZARD AREA.

FLOOD INSURANCE RATE MAP (FIRM).

FLOOD INSURANCE STUDY.

FLOODWAY.

LOWEST FLOOR.

SPECIAL FLOOD HAZARD AREA.

START OF CONSTRUCTION.

SUBSTANTIAL DAMAGE.

SUBSTANTIAL IMPROVEMENT.

SUBSTANTIAL REPAIR OF A FOUNDATION

1612.3 Establishment of Flood Hazard Areas

See 780 CMR 2.00: *Definitions* for definition of flood hazard areas.

1612.3.1 Design Flood Elevations

Where design flood elevations are not included in the *flood hazard areas* established in Section 1612.3, or where floodways are not designated, the *building official* is authorized to require the applicant to:

1. Obtain and reasonably utilize any design flood elevation and floodway data available from a federal, state or other source; or

2. Determine the design flood elevation and/or floodway in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a *registered design professional* who shall document that the technical methods used reflect currently accepted engineering practice.

1612.3.2 Determination of Impacts

Reserved

1612.4 Design and Construction

The design and construction of buildings and structures located in flood hazard areas, including coastal high hazard areas shall be in accordance with Chapter 5 of ASCE 7 and ASCE 24. In using ASCE 24-14, delete a references to coastal A zone standards. For minimum elevation requirements for lowest floor, bottom of lowest horizontal structural member, utilities, flood-resistant materials and wet and dry flood-proofing refer to

tables in ASCE 24 which are to be amended as shown below. The design and construction of buildings and structures located in coastal dunes shall be in accordance with Appendix G.

ASCE 24 Tables for flood-resistant materials and wet and dry flood-proofing - Revised

		Flood Design Class 1	Flood Design Class 2	Flood Design Class 3	Flood Design Class 4
Minimum Elevation* of Lowest Floor (Zone A: ASCE 24-14 Table 2-1)	Zone A	BFE + 1 ft	BFE + 1 ft	BFE + 1 ft	BFE + 2 ft or 500-year flood elevation, whichever is higher
Minimum Elevation of Bottom of Lowest Horizontal Structural Member (Zone V: ASCE 24-14 Table 4-1)	Zone V	BFE + 2 ft	BFE + 2 ft	BFE + 2 ft	BFE + 2 ft or 500-year flood elevation, whichever is higher
Minimum Elevation Below Which Flood-Damage-Resistant Materials Shall Be Used (Table ASCE 24-14 5-1)	Zone A	BFE + 1 ft	BFE + 1 ft	BFE + 1 ft	BFE + 2 ft or 500-year flood elevation, whichever is higher
	Zone V	BFE + 2 ft	BFE + 2 ft	BFE + 2 ft	BFE + 2 ft or 500-year flood elevation, whichever is higher
Minimum Elevation** of Utilities and Equipment (ASCE 24-14 Table 7-1)	Zone A	BFE + 1 ft	BFE + 1 ft	BFE + 1 ft	BFE + 2 ft or 500-year flood elevation, whichever is higher
	Zone	BFE + 2	BFE + 2	BFE + 2	BFE + 2 ft

	V	ft	ft	ft	or 500-year flood elevation, whichever is higher
Minimum Elevation of Dry Floodproofing of non-residential structures and non-residential portions of mixed-use buildings (ASCE 24-14 Table 6-1)	Zone A	BFE + 1 ft	BFE + 1 ft	BFE + 1 ft	BFE + 2 ft or 500-year flood elevation, whichever is higher
	Zone V	Not Permitted	Not Permitted	Not Permitted	Not Permitted
Minimum Elevation of Wet Floodproofing*** (ASCE 24-14 Table 6-1)	Zone A	BFE + 1 ft	BFE + 1 ft	BFE + 1 ft	BFE + 2 ft or 500-year flood elevation, whichever is higher
	Zone V	Not Permitted	Not Permitted	Not Permitted	Not Permitted
*Flood Design Class 1 structures shall be allowed below the minimum elevation if the structure meets the wet floodproofing requirements of ASCE 24-14 Section 6.3. ** Unless otherwise permitted by ASCE 24-14 Chapter 7. *** Only if permitted by ASCE Section 6.3.1.					

Note: In V zones location of utilities and equipment to the indicated level is required. Protection of utilities and equipment below the indicated level is not accepted.

1612.5 Flood Hazard Documentation

ILLUSTRATION

The following documentation shall be prepared and sealed by a *registered design professional* and submitted to the *building official*:

1. For construction in *flood hazard areas* other than *coastal high hazard areas* or *coastal A zones*:

    1.1. The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Section 110.3.3 and for the final inspection in Section 110.3.10.1.

    1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in

Section 2.7.2.1 of ASCE 24, *construction documents* shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.7.2.2 of ASCE 24.

1.3. For dry floodproofed nonresidential buildings, *construction documents* shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.

2. For construction in *coastal high hazard areas* and *coastal A zones*:

2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3 and for the final inspection in Section 110.3.10.1.

2.2. *Construction documents* shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16.

2.3. For breakaway walls designed to have a resistance of more than 20 psf (0.96 kN/m^2) determined using allowable stress design, *construction documents* shall include a statement that the breakaway wall is designed in accordance with ASCE 24.