

restrictive than a community's requirements where that community has elected to exceed minimum NFIP requirements. In instances where a community has adopted the NFIP minimum requirements, the design flood described in this standard will default to the base flood.

Second, this standard also uses the terms "flood hazard area" and "flood hazard map" to correspond to and show the areas affected by the design flood. Again, in instances where a community has adopted the minimum requirements of the NFIP, the flood hazard area defaults to the NFIP's SFHA and the flood hazard map defaults to the FIRM.

Third, the concept of a Coastal A Zone is used to facilitate application of load combinations contained in Chapter 2 of this Standard. Coastal A zones lie landward of V zones, or landward of an open coast shoreline where V zones have not been mapped (e.g., the shorelines of the Great Lakes). Coastal A Zones are subject to the effects of waves, high-velocity flows, and erosion, although not to the extent that V Zones are. Like V zones, flood forces in Coastal A Zones will be highly correlated with coastal winds or coastal seismic activity.

Coastal A Zones are not delineated on flood hazard maps prepared by FEMA, but are zones where wave forces and erosion potential should be taken into consideration by designers. The following guidance is offered to designers as help in determining whether or not an A zone in a coastal area can be considered a Coastal A Zone.

In order for a Coastal A Zone to be present, two conditions are required: (1) a stillwater flood depth greater than or equal to 2.0 ft (0.61 m); and (2) breaking wave heights greater than or equal to 1.5 ft (0.46 m). Note that the stillwater depth requirement is necessary, but is not sufficient by itself, to render an area a Coastal A Zone. Many A Zones will have stillwater flood depths in excess of 2.0 ft (0.61 m), but will not experience breaking wave heights greater than or equal to 1.5 ft (0.46 m), and therefore should not be considered Coastal A Zones. Wave heights at a given site can be determined using procedures outlined in (U.S. Army Corps of Engineers 2002) or similar references.

The 1.5 ft (0.46 m) breaking wave height criterion was developed from post-flood damage inspections, which show that wave damage and erosion often occur in mapped A zones in coastal areas, and from laboratory tests on breakaway walls that show that breaking waves 1.5 ft (0.46 m) in height are capable of causing structural failures in wood-frame walls (FEMA 2000).

C5.3 DESIGN REQUIREMENTS

Sections 5.3.4 (dealing with A-Zone design and construction) and 5.3.5 (dealing with V-zone design and construction) of ASCE 7-98 were deleted in preparation of the 2002 edition of this standard. These sections summarized basic principles of flood-resistant design and construction (building elevation, anchorage, foundation, below Design Flood Elevation (DFE) enclosures, breakaway walls, etc.). Some of the information contained in these deleted sections was included in Section 5.3, beginning with ASCE 7-02, and the design professional is also referred to ASCE/SEI Standard 24 (*Flood Resistant Design and Construction*) for specific guidance.

C5.3.1 Design Loads

Wind loads and flood loads may act simultaneously at coastlines, particularly during hurricanes and coastal storms. This may also be true during severe storms at the shorelines of large lakes and during riverine flooding of long duration.

C5.3.2 Erosion and Scour

The term "erosion" indicates a lowering of the ground surface in response to a flood event, or in response to the gradual recession of a shoreline. The term "scour" indicates a localized lowering of the ground surface during a flood, due to the interaction of currents and/or waves with a structural element. Erosion and scour can affect the stability of foundations and can increase the local flood depth and flood loads acting on buildings and other structures. For these reasons, erosion and scour should be considered during load calculations and the design process. Design professionals often increase the depth of foundation embedment to mitigate the effects of erosion and scour and often site buildings away from receding shorelines (building setbacks).

C5.3.3 Loads on Breakaway Walls

Floodplain management regulations require buildings in coastal high hazard areas to be elevated to or above the design flood elevation by a pile or column foundation. Space below the DFE must be free of obstructions in order to allow the free passage of waves and high velocity waters beneath the building (FEMA 1993). Floodplain management regulations typically allow space below the DFE to be enclosed by insect screening, open lattice, or breakaway walls. Local exceptions are made in certain instances for shearwalls, firewalls, elevator shafts, and stairwells. Check with the authority having