

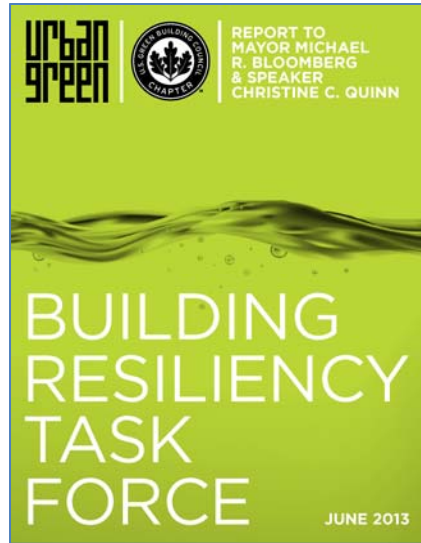
Amendments to Appendix G, Flood-Resistant Construction

Joseph Ackroyd, PE, CFM

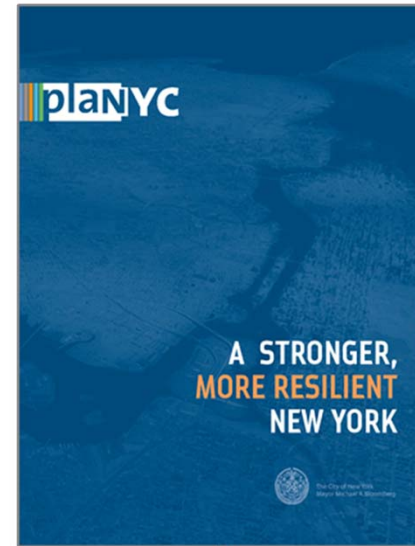
Director of Engineering & Floodplain Administrator

Technical Affairs Division





BRTF
(Building Resiliency Task Force)



SIRR
(Special Initiative for Rebuilding and Resiliency)

27 Total resiliency-related City Council bills

17 Local Laws have passed

Recent Local Laws Amending the 2008 and 2014 Building Code

- Local Law 82/13 – Flood Manual
- Local Law 83/13 – Backflow Prevention
- Local Law 95/13 – Healthcare Facilities
- Local Law 96/13 – Flood Maps
- Local Law 99/13 – Raising Building Systems
- **Local Law 100/13 – Relocating and Protecting Building Systems**
- **Local Law 108/13 – Connections for Secondary Building Systems**
- Local Law 109/13 – Flood Barriers
- Local Law 13/14 – Mold Resistant Gypsum and Cement Board

Amendments to Appendix G, Flood-Resistant Construction

- BRTF Bills (2014 Code effective date):
 - LL 100/2013: Relocating and protecting building systems in flood-prone areas
 - LL 108/2013: Secondary electrical power, heating and cooling systems for I-1 and I-2 occupancies and for adult homes, enrichment housing, community residences and Immediate care facilities

Alterations and 2014 Building Code (28-101.4.3)

Within areas of special flood hazard compliance with 2014 Building Code Appendix G required for:

- New Construction
- Alterations pursuant to 28-101.4.3

Amendments to Appendix G (BC G304.1.2)

- Dry Floodproofing revisions:
 - Delete restriction that in nonresidential buildings not more than one toilet, sink and a two compartment laundry tray be located within dry floodproofed enclosures

Amendments to Appendix G (BC G501)

**TABLE 5-1
MINIMUM ELEVATION, RELATIVE TO DESIGN FLOOD
ELEVATION (DFE), BELOW WHICH FLOOD-DAMAGE-RESISTANT
MATERIALS SHALL BE USED**

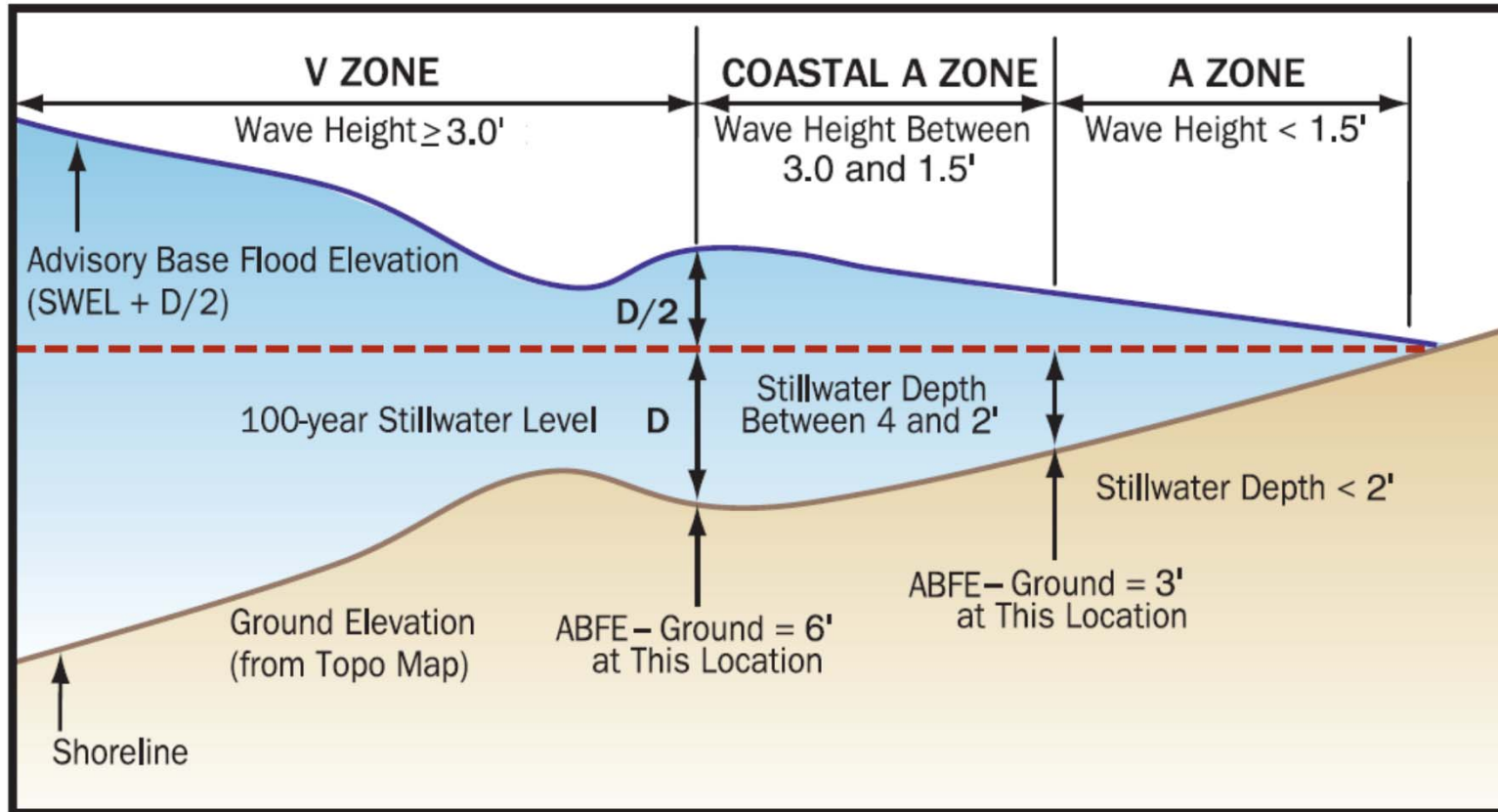
STRUCTURAL OCCUPANCY CATEGORY ^a	A-ZONE	[V-ZONES] Coastal High Hazard Areas and Coastal A-Zones	
		Orientation Parallel ^b	Orientation Perpendicular ^b
I	DFE=BFE	DFE=BFE	DFE=BFE
[11] II (1-and 2- family dwellings)	DFE=BFE+ 2 ft	DFE=BFE+ 2 ft	DFE=BFE+ 2 ft
II (all others)	DFE=BFE+ 1 ft	DFE=BFE+1 ft	DFE=BFE+ 2 ft
III	DFE=BFE+ 1 ft	DFE=BFE+ 2 ft	DFE=BFE+ 3 ft
IV	DFE=BFE+ 2 ft	DFE=BFE+ 2 ft	DFE=BFE+ 3 ft

- a. See Table 1-1, or Table 1604.5 of the *New York City Building Code*, for structural occupancy category descriptions.
- b. Orientation of lowest horizontal structural member relative to the general direction of wave approach; parallel shall mean less than or equal to +20 degrees from the direction of approach; perpendicular shall mean greater than +20 degrees from the direction of approach.

Coastal A-Zone

- Coastal A-Zone revisions:
 - Section G104.5.2: Coastal A-zone certifications
 - Section G201.2:
 - Revised definition of SFHA
 - Coastal A-zone definition and applicability
 - Section G 304.3: Coastal construction standards
 - Section G501: Amendments to ASCE 24 tables

Coastal A-Zone

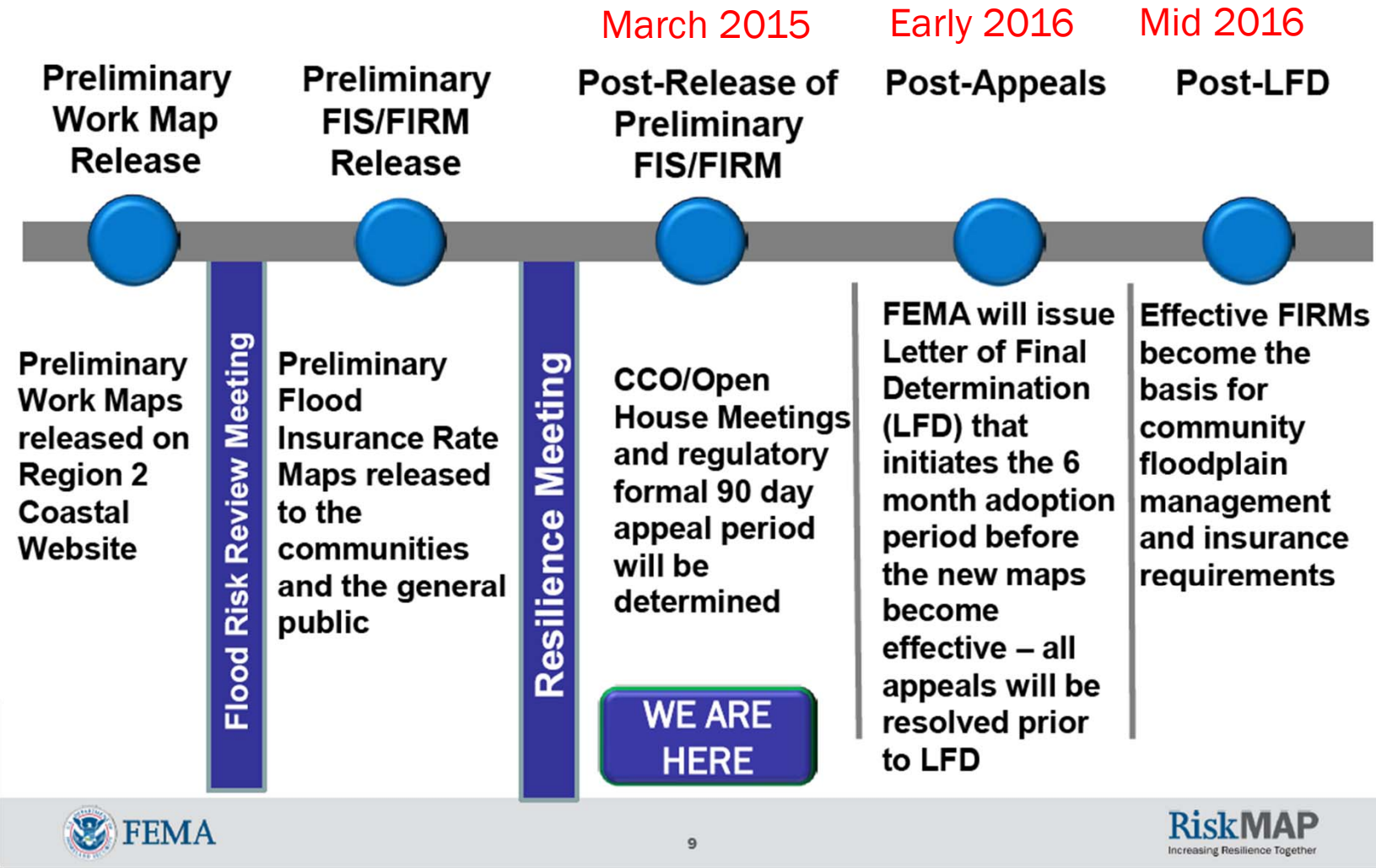


Design and Construction in Coastal A-Zones, Hurricane Ike Recovery Advisory, January, 2009

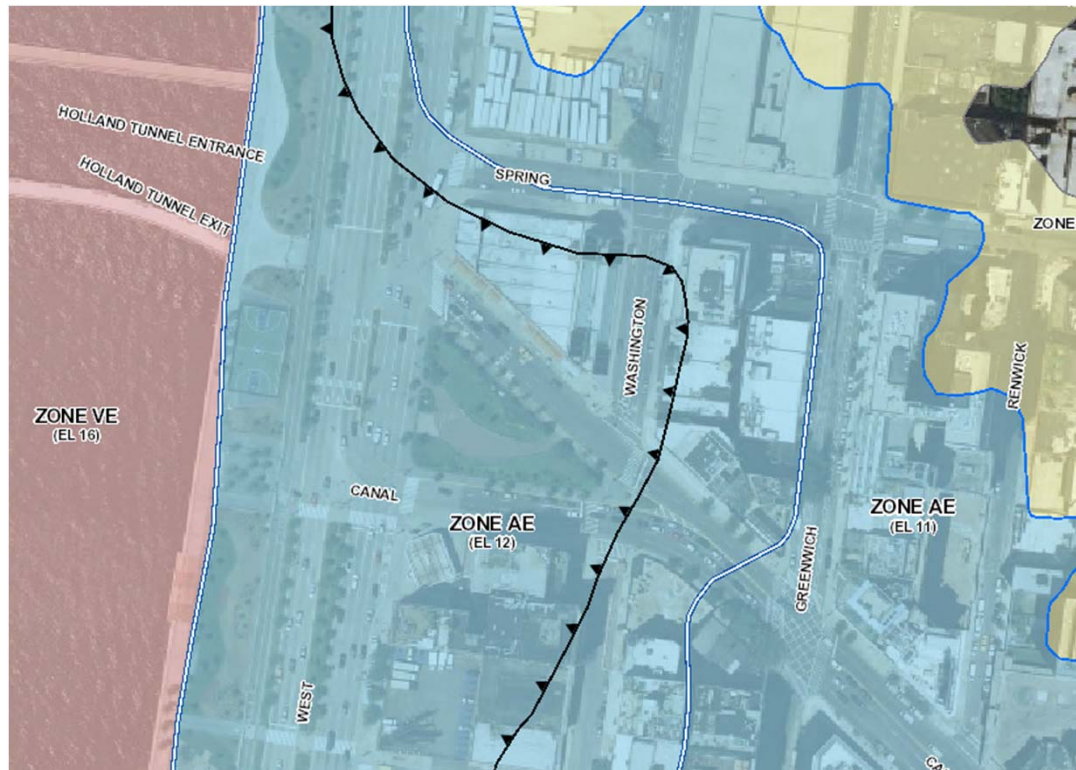
Coastal A-Zone Definition (BC G201.2)

COASTAL A-ZONE: An area within a special flood hazard area, shown on FEMA FIRMs 360497 as an area bounded by a “Limit of Moderate Wave Action,” landward of a V-Zone or landward of an open coast without mapped V-Zones. In a Coastal A-Zone, the principal source of flooding must be astronomical tides, storm surges, seiches, or tsunamis, and not riverine flooding. During the base flood conditions, the potential for breaking wave heights must be greater than or equal to 1 foot, 6 inches (457 mm). **In no case shall an area of special flood hazard be deemed a coastal A-Zone unless and until it has been identified as such on the adopted FEMA FIRMs 360497.**

FIRM ADOPTION TIMELINE



Coastal A-Zones and PFIRM



FEMA New York City

Details Legend Layers

Preliminary_FIRM_NYC
Flood Hazard Boundaries

- 1 Pct Annual Chance Flood
- - Floodway
- 0.2 Pct Annual Chance Flood
- Zone Break
- Limit of Floodway
- Limit of Study

Limit of Moderate Wave Action
▲

Base Flood Elevations
—

Coastal Transects
- -

Political Jurisdiction Boundaries

Coastal A-Zone Construction Standards (BC G 304.3)

New buildings and substantial improvements in a Coastal A-Zone shall comply with the V-Zone construction standards.

Exceptions:

- Wave-resisting stem wall foundation
- Wave-resisting dry floodproofing wall and foundation system

Coastal A-Zone Construction Standards (BC G 304.3)

Coastal A-Zone shall comply with the V-Zone construction standards.

Design and Construction
in Coastal A Zones



HURRICANE IKE RECOVERY ADVISORY



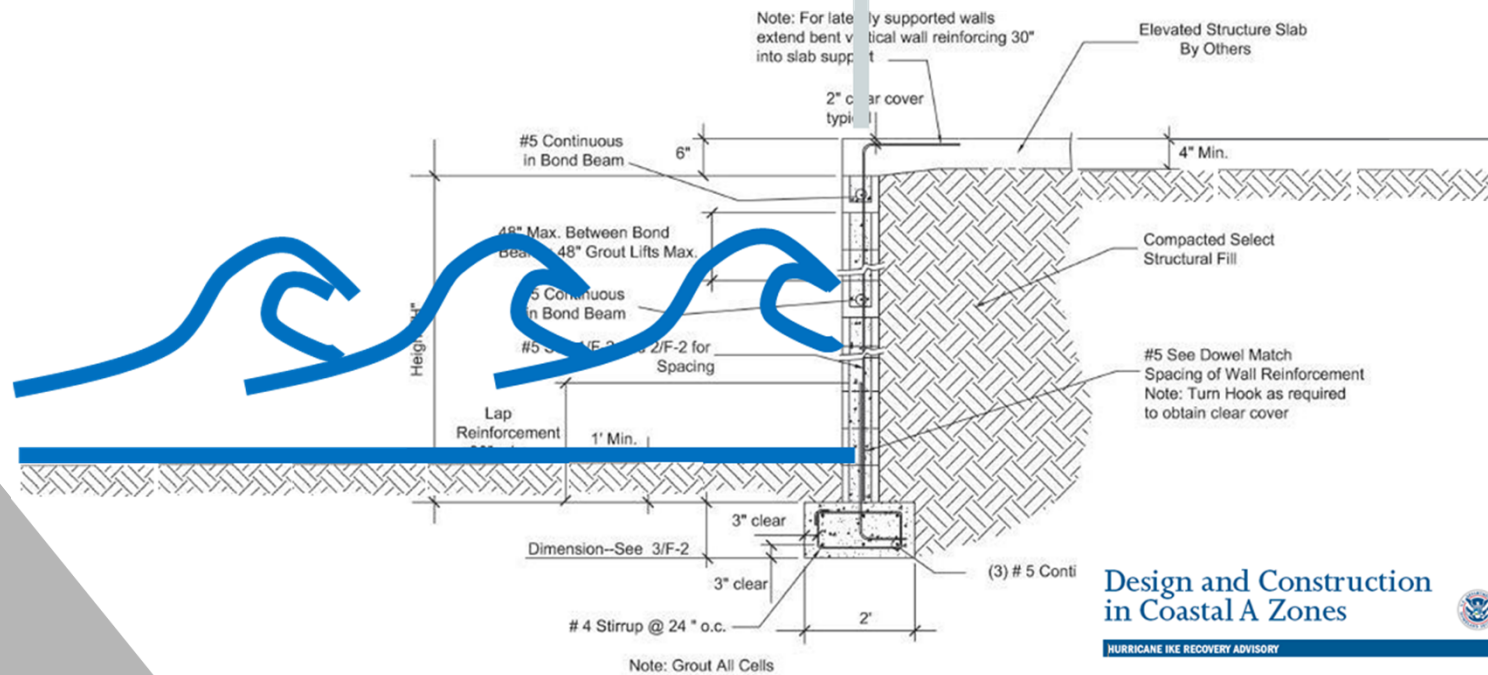
Coastal A-Zone Construction Standards (BC G 304.3)

Wave-resisting stem wall foundation:

- The underside of such floor system shall be located at or above the design flood elevation specified in ASCE 24, Table 4-1
- Stem walls enclosing areas below the design flood elevation prohibited
- Flood openings shall not be required in stem walls

Coastal A-Zone Construction Standards

ASCE 24-13 (IBC 2015):
Wave-resisting stem wall foundation



Design and Construction
in Coastal A Zones



HURRICANE IKE RECOVERY ADVISORY

FEMA P 550

Coastal A-Zone Construction Standards (BC G 304.3)

Wave-resisting stem wall foundation design considerations:

- Wave action, debris impact, erosion, local scour
- Soil pressure behind walls
- Hydrostatic loads
- Live and dead surcharge loads from the slab above
- Sliding, uplift, or overturning

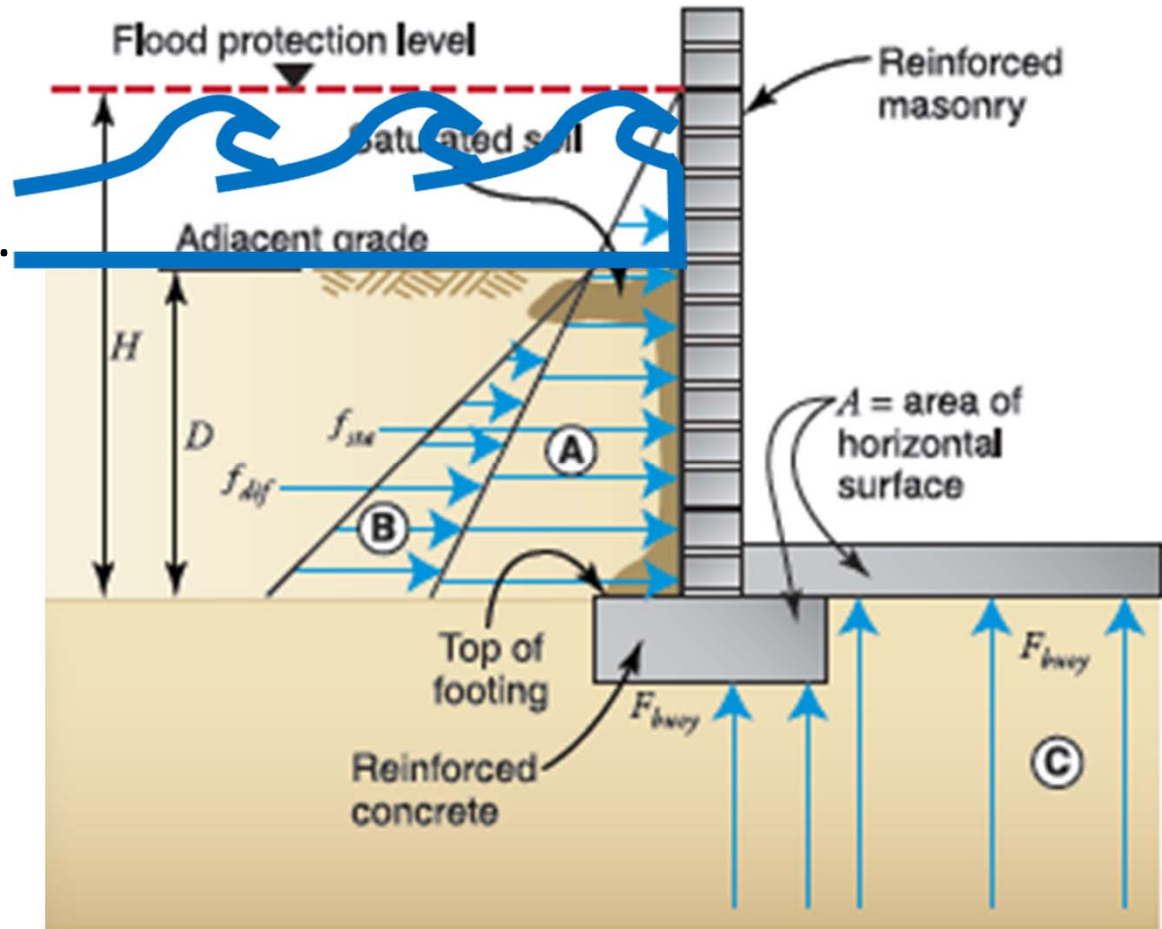
Coastal A-Zone Construction Standards (BC G 304.3)

Wave-resisting dry floodproofing wall and foundation system :

- Non-residential buildings dry floodproofed in accordance with Section G304.1.2:
 - Design flood elevation specified in ASCE 24, Table 6-1
 - Calculations demonstrating foundation, building and flood shields will resist wave action

Coastal A-Zone Construction Standards (BC G 304.3)

Wave-resisting dry floodproofing for commercial buildings.



FEMA P 936

Coastal A-Zone Construction Standards (BC G 304.3)

Wave-resisting dry floodproofing



Coastal A-Zones Certifications (BC G 104.5.2)

V-Zones and coastal A-Zones. Permit application shall include the following certifications, as applicable:

- Structural design certification
- Breakaway wall certification
- Utility certification