

V Zone Design and Construction Certification

Purpose: *To explain the certification requirements for structural design and methods of construction in V Zones.*

Structural Design and Methods of Construction Certification

As part of the agreement for making flood insurance available in a community, the National Flood Insurance Program (NFIP) requires the community to adopt a floodplain management ordinance that specifies minimum design and construction requirements. Those requirements include a **certification of the structural design and the proposed methods of construction** (a similar documentation requirement appears in the 2009 IRC, Section R322.3.6). It is recommended that the design professional use ASCE 24 and ASCE 7 as appropriate engineering standards.

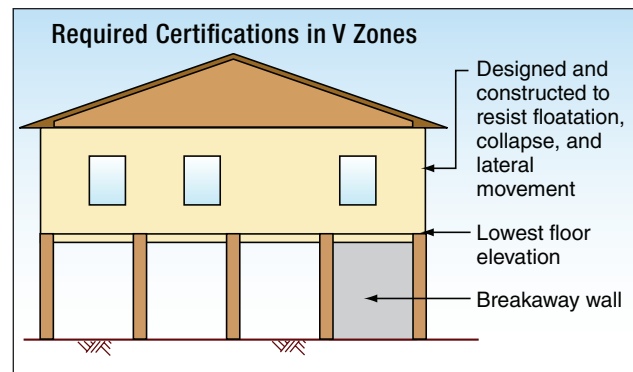
Specifically, NFIP regulations and local floodplain management ordinances require that:

1. A **registered professional engineer or architect shall develop or review the structural design, specifications, and plans** for the construction.
2. A **registered professional engineer or architect shall certify that the design and methods of construction** to be used are in accordance with accepted standards of practice in meeting these criteria:
 - The **bottom of the lowest horizontal structural member of the lowest floor** (excluding the pilings or columns) is elevated to, or above, the Base Flood Elevation (BFE).
 - The pile or column foundation and structure attached thereto is **anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously** on all building components. ASCE 7-10, *Minimum Design Loads for Buildings and Other Structures*, provides guidelines on different load combinations, which include flood and wind loads.

Completing the V Zone Design Certificate

There is no single V Zone certificate used on a nationwide basis. Instead, local communities and/or states have developed their own certification procedures and documents. Registered engineers and architects involved in V Zone construction projects should **check with the authority having jurisdiction regarding the exact nature and timing of required certifications**.

Page 2 shows a sample certification form. It is intended to show one way that a jurisdiction may require that the certification and supporting information be provided. In this example, the certification statement can address both design and proposed methods of construction and breakaway wall design.



Other Certifications Required in V Zone

- Breakaway Wall Design, by a registered professional engineer or architect (see Fact Sheet No. 8.1, *Enclosures and Breakaway Walls*)
- “As Built” Lowest Floor Elevation, by a surveyor, engineer, or architect (see Fact Sheet No. 1.4, *Lowest Floor Elevation*)

The V Zone Design certification should take into consideration the NFIP Free-of-Obstruction requirement for V Zones: the space below the lowest floor must be free of obstructions (e.g., building element, equipment, or other fixed objects that can transfer flood loads to the foundation, or that can cause floodwaters or waves to be deflected into the building), or must be constructed with non-supporting breakaway walls, open lattice, or insect screening. (See *NFIP Technical Bulletin 5 and Fact Sheet No. 8.1, Enclosures and Breakaway Walls.*)



V - ZONE DESIGN CERTIFICATE

Name _____ Policy Number (*Insurance Co. Use*) _____

Building Address or Other Description _____

City _____ State _____ Zip Code _____ Permit No. _____

SECTION I: Flood Insurance Rate Map (FIRM) Information

Community No. _____ Panel No. _____ Suffix _____ FIRM Date _____ FIRM Zone _____

SECTION II: Elevation Information Used for Design

NOTE: This section documents the elevations/depths used or specified in the design – it is not a substitute for an Elevation Certificate.

1. FIRM Base Flood Elevation (BFE)..... _____ feet* (NGVD)
2. Community's Design Flood Elevation (BFE + 1.5' FREBOARD = DFE) _____ feet* (NGVD)
3. Elevation of the Bottom of Lowest Horizontal Structural Member _____ feet* (NGVD)
4. Elevation of Lowest Adjacent Grade..... _____ feet* (NGVD)
5. Depth of Anticipated Scour/Erosion used for Foundation Design..... _____ feet* (NGVD)
6. Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade _____ feet* (NGVD)

* Indicate elevation datum used in 1-4: NGVD29 NAVD88 Other _____

SECTION III: V Zone Design Certification Statement

NOTE. sections III-VI must be certified by a registered engineer

I certify that I have developed or reviewed the structural design, plans, and specifications for construction of the above-referenced building and that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the following provisions:

- The bottom of the lowest horizontal structural member of the lowest floor (excluding piles and columns) is elevated to or above the DFE.
- The pile and column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of the wind and water loads acting simultaneously on all building components. Water loading values used are those associated with the base flood. Wind loading values used are those required by the applicable State or local building code. The potential for scour and erosion at the foundation has been anticipated for conditions associated with the base flood, including wave action.

(Certified construction plan and specifications on file with the Community Official)

Sections I-V (Page 1 and 2) are due at permit submittal.

Provide Section VI (Page 3) to the Building Department prior to final inspection.

SECTION IV: Breakaway Wall Design Certification Statement

I certify that I have developed or reviewed the plans and specifications for breakaway walls to be constructed under the above referenced building and that the design and methods of construction specified are in conformance with NFPA Technical Bulletin 9 (specified or performance based) and ASCE 24-14. Accepted standards of practice meet the following provisions:

- Breakaway wall collapse shall result from a water load less than that which would occur during the base flood.
- The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components.
- All materials are flood damage resistant and permanent flood opening in conformance with NFIP regulations have been planned and specified in the design documents.

(Certified construction plan and specifications on file with the Community Official)

SECTION V: Design Certification

I certify the V Zone Design Certification Statement (Section III) and _____ the Breakaway Wall Design Certification Statement (Section IV, if checked).

Certifier's Name _____

License Number _____ Firm No. _____

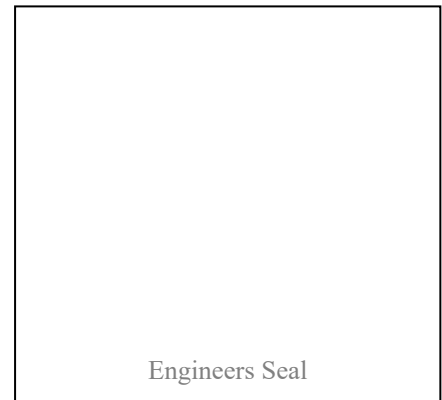
Title _____ Company Name _____

Address _____

City _____ State _____ Zip Code _____

Telephone _____ E-Mail _____

Signature _____ Date _____



(This certification is to be signed and sealed by a registered professional engineer authorized by law to certify structural designs.)

Sections I-V (Page 1 and 2) are due at permit submittal.

Provide Section VI (Page 3) to the Building Department prior to final inspection.

V - ZONE CONSTRUCTION CERTIFICATE

Name _____ Policy Number (*Insurance Co. Use*) _____

Building Address or Other Description _____

City _____ State _____ Zip Code _____ Permit No. _____

SECTION I: Flood Insurance Rate Map (FIRM) Information

Community No. _____ Panel No. _____ Suffix _____ FIRM Date _____ FIRM Zone _____

SECTION VI: Final Construction Certification

I certify that I have inspected the installation of the pilings (Sec III) and ___ construction of the breakaway walls (Sec IV, if checked), and they are constructed in accordance with the certified design documents and Section.

Certifier's Name _____

License Number _____ Firm No. _____

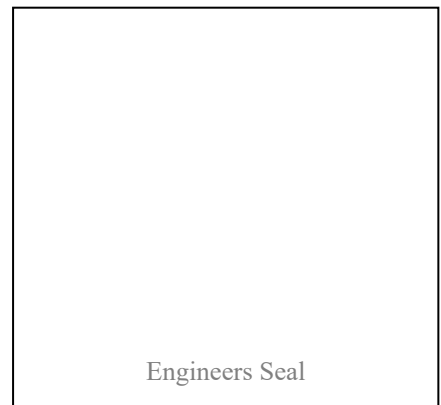
Title _____ Company Name _____

Address _____

City _____ State _____ Zip Code _____

Telephone _____ E-Mail _____

Signature _____ Date _____



(This certification is to be signed and sealed by a registered professional engineer authorized by law to certify structural designs.)

Provide Section VI (Page 3) to the Building Department prior to final inspection.