

## **Superstorm Sandy: Pile foundation design issues for single-family homes.**

As the rebuilding of the New Jersey shore begins, there have been numerous questions, rumors and misinformation about foundation designs. The intent of this Bulletin is to answer the question, dispel the rumors and correct the misinformation.

As with all construction activity, construction documents submitted by anyone other than the owner of a detached single-family dwelling who has prepared his or her plans for their private family residence must be signed and sealed by a New Jersey licensed design professional. However, the Federal requirements at 44 CFR 60.3(e)(4) state in part: “***A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice.***” Therefore, a licensed design professional is required in a V-Zone. This does not apply to homes in an A-zone.

In V-zones, the International Residential Code (IRC) requires the building to be constructed on pilings or columns and to be adequately anchored to them. The pilings must have adequate soil penetration to resist combined wave action and wind load. The embedment must include consideration for decreased resistance capacity caused by scour of the soil strata surrounding the pile. The Department is recommending the use of American Society of Civil Engineers (ASCE) 24, Flood Resistant Design and Construction, for the design and construction of the pile and column foundations. This document will provide the designer and the code official a means of determining compliance. ASCE 24 is a referenced standard in the building and residential codes and R322.1.1 permits its use as an alternative.

Questions have arisen regarding the types of piles that may be used in a V-zone. Typical pile types include wood, steel, concrete and helical, all of which are permissible.

Questions have arisen regarding the use of grade beams. Grade beams that are placed with the upper surface flush with or below the natural grade are not considered obstructions or the lowest horizontal structural member and are allowed by the code. The grade beam must be designed and constructed taking into consideration the effects of storm erosion and local scour. The grade beam must also resist flood, wave and debris loads and remain in place and functional when undermined. There have been several inquiries into the need for the piles to line up with any columns constructed above the grade beam; provided the grade beam is designed to support this type of loading, this practice is not prohibited.