

**From:** Kevin Chamberlain [mailto:kevinc@dcstructural.com]  
**Sent:** Wednesday, September 14, 2016 4:26 PM  
**To:** Michelangelo, Joseph; Wendt, James  
**Subject:** Penfield - FEMA response - cut and paste from my Word doc

September 14, 2016

Mr. Joseph Michelangelo, P.E.  
Director of Public Works  
Town of Fairfield  
725 Old Post Road  
Fairfield, CT 06824

**Re:** Penfield Pavilion – Repair and Reconstruction  
323 Fairfield Beach Road, Fairfield, CT

**Dear Mr. Michelangelo,**

You and I met with Mr. James Wendt, Assistant Town Planner, on August 31, 2016. We discussed the letter authored by Robert Grimley and Richard Niklas from FEMA Region 1 office, dated August 9, 2016 and received August 18, 2016. It was in response to a letter submitted to them by Diane Ifkovic of CT DEEP and Dana Conover of CT DESPP on June 1, 2016. Both pieces of correspondence relate to the currently underway repair and reconstruction of the Penfield Pavilion facility, which began construction in March 2016.

Diane and Dana questioned if certain aspects of the project conform to the requirements of the National Flood Insurance Program (NFIP). The FEMA response, in general, is that these items may not conform to the NFIP, although it is not a final or conclusive document.

I will defer to you on the administrative issues raised related to the project worksheet process, and the decision to start construction. Two technical issues were raised which I will address as follows:

#### **Use of fill**

The project includes filling in the area under and around the building that eroded during Hurricanes Sandy and Irene, and raising the grade under the building to match the adjacent topography. There is a natural dune which runs parallel to the shore, approximate mid-way between mean high water and Fairfield Beach Road. The building has always, and will continue to, straddle the dune and sit above it. The fill which has been placed as part of this project meets existing grades along 3 edges (north, south, and east). On the 4<sup>th</sup> edge, facing the parking lot, a segmental retaining wall will be constructed to retain the fill. This segmental wall is a continuation of, and serves the same purpose as, an existing retaining wall to the south of the building. The segmental wall terminates into the dune to the north and into the end of the existing retaining wall to the south. At two locations, site stairs will provide access up and over the retaining wall. The site stairs are solid objects built as a projection of the retaining wall, and are not within the clear space below the building. They are remote from the building, and the fact that they are not open underneath is of no consequence and bears no impact on flooding of the site.

Technical Bulletin #5, "Free of Obstruction Requirements", contains the following caveats on the placement of fill:

1. "Fill must not prevent the free passage of floodwaters and waves beneath elevated buildings." Condition met. The fill is held to a level elevation of 10.7' or 11.0' NAVD beneath the building. There are no peaks or valleys in the fill. A clear space of at least 2 feet in height is maintained at all areas beneath the building.
2. "Fill must not divert floodwaters or deflect waves such that increased damage is sustained by adjacent or nearby buildings." Condition met. There is no speed up of channeling of flood waters, they will sheet flow under the building and into the parking lot as they always have.
3. "If additional fill height is proposed for a site, the proposed final grade should be compared to local topography. If the proposed final fill configuration is similar to grades and slopes in the immediate vicinity, a detailed analysis of the effects on flood flow and waves need not be required". Condition met. The fill meets existing grades and slopes, and the retaining wall is a continuation of the existing retaining wall.
4. "... there is no compelling reason to restrict the placement of site-compatible non-structural fill beneath those buildings if it will prevent ponding and / or saturated soil conditions." Without the fill a crater would remain beneath this building that would make it more susceptible to erosion, not less.
5. "For floodplain management purposes, site slopes shallower than one unit vertical to five units horizontal (regardless of fill height) are assumed not to cause or worsen wave runup, or reflection capable of damaging adjacent buildings". Condition met, grade under the building is dead level. Grades between the building and retaining wall are gently sloping.
6. "There are no established rules as to what constitutes acceptable vertical clearance but, for floodplain management purposes, a vertical clearance of 2 feet is considered adequate in most cases." Condition met, we have 2 feet clear.
7. "Dune construction, repair, and reconstruction under or around an elevated building may be assumed to be acceptable (without engineering analysis or certification) as long as: 1) the scale and location of the dune work is consistent with local beach-dune morphology, and (2) vertical clearance is maintained between the top of the dune and the building's floor system". Condition met, as stated previously.

### Grade beams

The lowest horizontal structural member on this project are the wood and steel beams which support the elevated floor system. Bottom of beam is set at or above the BFE 13.0' NAVD. A question has been raised as to whether the concrete grade beams that occur under the western half of the building constitute a horizontal structural member. From Technical Bulletin #5: "Grade beams that are placed with their upper surfaces flush with or below the natural grade are not considered obstructions and are allowed under the NFIP". The top of the grade beams are set flush with the fill under the building, and as discussed previously, the fill is set flush with adjacent grades. The fill continues the natural dune profile underneath the building. Therefore the logical conclusion is that the natural grade can be reasonably interpreted as the fill level underneath the building.

In conclusion, and in my opinion, FEMA's interpretation of the NFIP regulations in these two areas, although preliminary in nature, would be unsupported by FEMA's own technical bulletins. To consider the fill and grade beams as obstructions ignores the topography and conditions of this site and is unreasonable. A design without the fill under the building is less safe than the current design, which is

counter to the NFIP's mission to reduce risk. In my opinion as a professional engineer with extensive experience in the design of building structures in coastal high hazard areas, along Fairfield Beach in particular, this project conforms to the NFIP, Town of Fairfield Zoning Regulations, the State of Connecticut Building Code, and referenced standard ASCE 24 "Flood Resistant Design and Construction".

Please contact me with any questions.

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