



FEMA

Exhibit
13

November 28, 2018

Diane Ifkovic
National Flood Insurance Program Coordinator
Connecticut Department of Energy and
Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Michael C. Tetreau
First Selectman
Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

*Re: Town of Fairfield – Noncompliance with the Minimum Floodplain Management
Criteria at 44 C.F.R. § 60.3 – Penfield Pavilion*

Dear Mr. Tetreau and Ms. Ifkovic:

The purpose of this letter is to provide you with the Federal Emergency Management Agency's ("FEMA") final decision concerning whether the Penfield Pavilion complies with the National Flood Insurance Program ("NFIP") floodplain management regulations set forth in 44 C.F.R. pt. 60 and adopted by the Town of Fairfield ("Town"). In a letter dated October 17, 2017, FEMA informed both the Town and the State of Connecticut that the Penfield Pavilion did not appear to comply with the minimum floodplain management regulations and provided the Town with 60 days to provide any additional information. The Town, in turn, conducted a teleconference with FEMA staff and later provided FEMA with various documentation.

Upon review of the additional information and as detailed in the enclosed analysis, I have determined that the Town has not demonstrated that the Penfield Pavilion complies with the floodplain management regulations. Specifically, the Town placed horizontal grade beams for the Penfield Pavilion above the natural grade and below the base flood elevation in violation of 44 C.F.R. § 60.3(e)(5).

A community, to qualify for the sale of flood insurance under the NFIP, must adopt and adequately enforce floodplain management regulations that meet the requirements of 44 C.F.R. § 60.3. When FEMA identifies a failure of a community to enforce these minimum requirements, it communicates this violation to the community and expects the community to pursue actions to resolve or remedy violations to the maximum extent possible. The failure to take such corrective actions may result in the formal enforcement actions of probation, suspension, Community Rating System ("CRS") retrogrades, or other actions as deemed appropriate.

The corrective action to address the violation would be the movement of the horizontal grade beams below natural grade or above the base flood elevation, which would require structural modifications to the foundation of the Pavilion. As the Town has already completed construction, such a corrective action is likely not feasible. FEMA, notwithstanding, will be contacting Town of Fairfield officials to discuss potential remedial actions to address the violation and potential enforcement actions.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard Nicklas", with a stylized flourish at the end.

Richard Nicklas
Branch Chief
Floodplain Management and Insurance
FEMA Region I

**NATIONAL FLOOD INSURANCE PROGRAM
DETERMINATION ANALYSIS
Town of Fairfield, Connecticut
Restoration of the Penfield Pavilion
Compliance with the Requirements of 44 C.F.R. Part 60**

I. BACKGROUND

The Town of Fairfield ("Town") owns and operates the Penfield Pavilion, which is a single story, wood/steel frame structure located in the VE Zone¹ within the special flood hazard area ("SFHA")² at Penfield Beach in Fairfield, CT. The heavy storm surge during Hurricane Sandy from October 27 to November 8, 2012, damaged the Penfield Pavilion and the Town applied through the Connecticut Department of Emergency Services and Public Protection ("DESPP") under the Public Assistance Grant Program for major disaster declaration FEMA-4087-DR for financial assistance to restore this damage. After receiving the application, the Federal Emergency Management Agency ("FEMA") prepared Project Worksheet #680 to set forth the disaster damage, scope of work to restore this damage, and estimated costs for this work. FEMA awarded Project Worksheet ("PW") #680 on December 17, 2015, with total net estimated project cost of \$4,340,054.11.

The final approved scope of work in PW #680 was the replacement of the Penfield Pavilion. As detailed in the project description, the "new pavilion will be built in the existing footprint and elevated per Codes and Standards compliance. The new foundation system will be raised so the lowest horizontal member will be 2.5 feet above the Base Flood Elevation of 13 to an elevation of 15.5 feet."³ The project description made no provision for the placement of any horizontal members below the base flood elevation and also made clear that the "site will be returned to its original design, function, and capacity within the original footprint, meeting all appropriate codes and standards..."⁴ As it related to changing the scope, the project stated that if the applicant "wishes to alter the approved scope of work, they must first formally request approval for changes to the approved scope of work from FEMA, through the DESPP, prior to beginning construction."⁵

Following the award, DESPP later requested a change in the scope of work in April 2016 that involved repair instead of replacement, a scope of work already commenced by the Town without prior FEMA approval.⁶ DESPP later informed FEMA during a phone call on May 12, 2016, that there would be changes and additions to the scope change and asked for FEMA to put the scope change request on hold until it provided additional information. Before submitting the final scope change request, DESPP and the Connecticut Department of Energy and Environmental Protection ("DEEP") transmitted a joint letter to the Regional Office concerning Project Worksheet #680 on June 1, 2016, that requested technical assistance under the National

¹ A VE Zone is an area of special flood hazards, with water surface elevations determined and with velocity, that is inundated by tidal floods (coastal high hazard area). 44 C.F.R. § 64.3(a)(1).

² A special flood hazard area ("SFHA") is the land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year. 44 C.F.R. § 59.1.

³ PA-01-CT-4087-PW-00680(0) (Dec. 17, 2015) ("PW #680").

⁴ *Id.*

⁵ *Id.*

⁶ Letter from Dana Conover, Public Assistance Coordinator, State of Connecticut to Paul F. Ford, Acting Regional Administrator, FEMA Region I re: *Revision to Change in Scope of Work request: The Town of Fairfield DR-4087-CT PW-680 (Penfield Pavilion)* (Apr. 29, 2016).

Flood Insurance Program (“NFIP”).⁷

In the technical assistance request letter, DESPP and DEEP explained that the Town decided to repair the Penfield Pavilion instead of replacing it, commencing construction on February 29, 2016, without an official, approved change to the original scope of work. DESPP and DEEP expressed concern that the revised scope of work may not comply with the minimum requirements of the NFIP, although the Town asserted that the building construction plans complied with NFIP requirements. Because of the disagreement, DESPP and DEEP requested that FEMA review the design plans for NFIP compliance “in order that the PA SOW be re-written accurately so that there are no reimbursement issues upon project completion.”⁸ The stated goal of this review was to “assure all parties of the compliance with NFIP regulations and to avoid any potential eligibility and reimbursement concerns upon completion of the PA project.”⁹ The letter included the current design plans for the Penfield Pavilion.

DESPP later provided a revised scope change request on June 30, 2016, which superseded the previous request dated April 29, 2016.¹⁰ The scope change request called for repairing the pavilion rather than replacing it, citing cost savings as a motive for the change. DESPP provided a letter from the NFIP/CRS Coordinator from the Town that stated that the revised scope complied with the requirements of the NFIP and met the guidance provided in FEMA Technical Bulletin #5.¹¹ The NFIP/CRS Coordinator stated that the “lowest horizontal structural member will be at or above the base flood elevation with the required open pier foundation to allow the passage of flood waters” and there is a “breakaway wall design certified by a respected professional engineer with substantial experience in V-Zone construction.” This proposed scope was subject to a public hearing and “was approved by the Town Plan and Zoning Commission on June 9, 2015.”

FEMA responded to DESPP’s and DEEP’s request for technical assistance in a letter dated August 9, 2016.¹² In the letter, FEMA explained that there were concerns that the scope of work being pursued by the Town may not comply with the Fairfield Zoning Regulations, 44 C.F.R. §

⁷ Letter to Richard Nicklas, Floodplain Management and Insurance Branch Chief, FEMA Region I from Dana Conover, Public Assistance Coordinator, Connecticut Department of Emergency Services and Public Protection and Diane Ifkovic, State National Flood Insurance Program Coordinator, Connecticut Department of Energy and Environmental Protection *re: NFIP Technical Review Request – Penfield Pavilion, 323 Fairfield Beach Road, Fairfield, Connecticut* (June 1, 2016).

⁸ *Id.* at 2.

⁹ *Id.*

¹⁰ Letter from Dana Conover, Public Assistance Coordinator, State of Connecticut to Paul F. Ford, Acting Regional Administrator, FEMA Region I *re: Revision to Change In Scope of Work request: The Town of Fairfield DR-4087-CT pW-680 (Penfield Pavilion)* (June 30, 2016).

¹¹ Letter from James R. Wendt, AICP, Assistant Planning Director, NFIP/CRS Coordinator, Town of Fairfield, to Dana Conover, Public Assistance Coordinator, Connecticut Department of Emergency Services and Public Protection *re: Penfield Pavilion, 323 Fairfield Beach Road, Fairfield, CT* (June 28, 2016).

¹² Letter from Robert Grimley, Disaster Recovery Manager, FEMA Region I and Richard Nicklas, Branch Chief, Floodplain Management and Insurance, FEMA Region I to Diane Ifkovic, National Flood Insurance Program Coordinator, Connecticut Department of Energy & Environmental Protection and Dana Conover, Public Assistance Coordinator, Department of Emergency Services and Public Protection *re: FEMA-4087-DR – Town of Fairfield – PA-ID 001-26620-00 – Project Worksheet 680 – Restoration of Penfield Pavilion – Potential Violation of Minimum Requirements of the National Flood Insurance Program and Failure to Comply with the Terms and Conditions of the Public Assistance Project Award* (Aug. 9, 2016).

60.3, and 44 C.F.R. § 9.11(d). FEMA, in light of these and other issues, placed a financial hold on PW #680 and informed DESPP and the Town that it would be issuing a formal request for information ("RFI") to obtain more information before making any final determinations. FEMA made clear to the Town that continuing work on the Penfield Pavilion without waiting for FEMA approval might compromise the eligibility of the entire project.¹³ The Town, notwithstanding this warning, moved forward to complete construction.

FEMA sent a RFI to the Town and DESPP on or about September 30, 2016, that identified and requested information pertaining to various issues.¹⁴ One of these issues was whether the Town's proposed design complied with the minimum requirements of 44 C.F.R. § 60.3(e), the Fairfield Zoning Regulations, and 44 C.F.R. § 9.11(d). The RFI explained that there were three primary concerns, which were: (1) whether the horizontal grade beams were located above the natural grade and below the base flood elevation and, if so, whether they comprised a violation of 44 C.F.R. § 60.3(e)(4) or an impermissible obstruction in violation of 44 C.F.R. § 60.3(e)(5); (2) whether the large quantities of fill installed by the Town comprised an impermissible obstruction in violation of 44 C.F.R. § 60.3(e)(5) and whether that fill was used for structural support in violation of 44 C.F.R. § 60.3(e)(6); and (3) whether the placement of a retaining wall above the natural grade and below the base flood elevation comprised an impermissible obstruction in violation of 44 C.F.R. § 60.3(e)(5).

The Town responded to the RFI in a letter dated October 28, 2016,¹⁵ that DESPP forwarded to FEMA along with its own letter on that same date.¹⁶ The Town asserted that the Penfield Pavilion comported with the minimum floodplain management requirements of the NFIP and provided several documents supporting its position. This included the building plans for the Pavilion and a letter from a professional engineer which stated that the plans for the Pavilion project conformed to the NFIP, Town of Fairfield Zoning Regulations, the State of Connecticut Building Code, and the standard ASCE 24 Flood Resistant Design and Construction.¹⁷

After reviewing the information provided, FEMA issued a response to the request for technical assistance concerning whether the unapproved scope of work completed by the Town to restore Penfield Pavilion complied with the minimum floodplain management criteria set forth in 44 C.F.R. pt. 60.¹⁸ This letter, issued on October 17, 2017, explained that the Town did not

¹³ *Id.* at 6 ("The Grantee and Applicant should also carefully consider whether the Applicant should continue performing its construction of the pavilion, as such work could compromise future eligibility.").

¹⁴ Letter from G. Fred Vanderschmidt, Deputy Director Recovery Division, FEMA Region I to Dana Conover, Public Assistance Coordinator, Connecticut Division of Emergency Management & Homeland Security and Joseph Michelangelo, Director of Public Works, Town of Fairfield *re: Town of Fairfield DR-4087-CT PW-680 (Penfield Pavilion) – Change in Scope of Work – Request for Information* (Sep. 30, 2016).

¹⁵ Letter from Michael C. Tetreau, First Selectman, Town of Fairfield to G. Fred Vanderschmidt, FEMA Region I *re: Your Letter of September 30, 2016 re FEMA-4087-DR – Project Worksheet 680 – Restoration of Penfield Pavilion – Change in Scope of Work – Request for Information* (Oct. 28, 2016).

¹⁶ Letter from Dana Conover, Public Assistance Coordinator, Connecticut Department of Emergency Services and Public Protection to G. Fred Vanderschmidt, Deputy Director Recovery Division, FEMA Region I *re: Request for Information, The Town of Fairfield, DR-4087-CT PW 680 (Penfield Pavilion)* (Oct. 28, 2016).

¹⁷ Letter from Kevin H. Chamberlain, DeStefano & Chamberlain, Inc. to Joseph Michelangelo, Director of Public Works, Town of Fairfield *re: Restoration of Penfield Pavilion – 323 Fairfield Beach Road, CT FEMA-4087-DR-Town of Fairfield-PA-ID 001-26620-00 / PW 680* (Oct. 25, 2016).

¹⁸ Letter from Richard Nicklas, Branch Chief, Floodplain Management and Insurance, FEMA Region I to Dana Conover, Public Assistance Coordinator, Connecticut Department of Emergency Services & Public Protection and

demonstrate compliance with the minimum floodplain management criteria. FEMA—before moving forward to take an enforcement action under the NFIP—provided the Town with an opportunity to provide additional information.¹⁹ The Town provided additional information via a letter dated December 12, 2017,²⁰ that included a series of historical photographs of the buildings at the site over the past 100 years; U.S. Geological Survey (“USGS”) quadrangle maps from 1920-2012 to illustrate the general land formation; other historic mapping products; an engineering report prepared by DeStefano-Chamberlain; and an engineering report prepared by Race Coastal Engineering. Before the submission of this information, FEMA, DESPP, and the Town conducted a teleconference on November 20, 2017, to discuss the information that was to be submitted.

II. DISCUSSION

A. Overview of Applicable Regulations and Implementing Guidance

A community, to qualify for the sale of flood insurance under the NFIP, must adopt and adequately enforce floodplain management regulations that meet or exceed the requirements of 44 C.F.R. Part 60.²¹ The overriding purpose of the floodplain management regulations is to ensure that participating communities take into account flood hazards, to the extent that they are known, in all official actions relating to land management and use. When FEMA discovers an instance where a community has failed to adequately enforce the minimum requirements, it will identify the violation to the community and often provide an opportunity to remedy the violations to the maximum extent possible within established deadlines.²²

The NFIP regulation at 44 C.F.R. § 60.3 includes minimum building design criteria that apply to new construction, substantially damaged buildings, and substantial improvement of existing buildings in a SFHA. The requirements under this regulation are different depending on whether FEMA has provided base flood elevations for various types of flood zones in the community, designated the regulatory floodway on the Flood Insurance Rate Map (“FIRM”), and identified the coastal high hazard areas (V Zones) on the FIRM. The current FIRM for the Town of Fairfield designates a regulatory floodway and coastal high hazard areas, such that the requirements of 44 C.F.R. § 60.3(e) apply.

Diane Ifkovic, National Flood Insurance Program Coordinator, Connecticut Department of Energy & Environmental Protection re: *FEMA-4087-DR – Town of Fairfield – PA-ID 001-26620-00 – Project Worksheet 680 – Restoration of Penfield Pavilion – Violation of the Minimum Floodplain Management Criteria at 44 C.F.R. § 60.3 and Technical Bulletin 5* (Oct. 17, 2017).

¹⁹ 44 C.F.R. § 59.24.

²⁰ Letter from Michael C. Tetreau, First Selection, Town of Fairfield to Richard Nicklas, Branch Chief, Floodplain Management and Insurance, FEMA Region I re: *FEMA-4087-DR – Town of Fairfield – PA-ID 001-26620-00 – Project Worksheet 680* (Dec. 12, 2017).

²¹ National Flood Insurance Act of 1968, Pub. L. No. 90-448, § 1315 (1968) (codified as amended at 42 U.S.C. § 4022) (“National Flood Insurance Act”); 44 C.F.R. § 59.22.

²² See FEMA F-776, *Guidance for Conducting Community Assistance Contacts and Community Assistance Visits*, at 7-1 to 6 (Apr. 2011); 44 C.F.R. § 59.24.

The Town is a participating community in the NFIP and has adopted the Fairfield Zoning Regulations that meet the minimum requirements of 44 C.F.R. pt. 60.²³ The Fairfield Zoning Regulations, in turn, require that buildings and structures in flood prone areas as delineated on a FIRM "shall conform" to the standards set forth in Section 32 (entitled "Flood Protection"), which incorporate the requirements of 44 C.F.R. § 60.3 at Section 32.5.

One of the requirements in the regulation is 44 C.F.R. § 60.3(e)(5), which states that substantial improvements in the VE Zone must not have obstructions below the lowest floor:

[T]he community shall:...Provide that all new construction and substantial improvements within Zones...VE...on the community's FIRM have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system.²⁴

For the requirements of 44 C.F.R. § 60.3(e)(5) to apply, there must be a "substantial improvement" of a structure. The regulation at 44 C.F.R. § 59.1 defines "substantial improvement" as "any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the 'start of construction' of the improvement. ..."²⁵ This term includes a structure which has incurred "substantial damage," regardless of the actual repair work performed.²⁶ "Substantial damage" means "damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred."²⁷

FEMA has promulgated Technical Bulletin 5 to provide interpretive guidance concerning the structural fill and free-of-obstruction requirements in coastal high hazard areas (marked as V Zones on a FIRMs) under 44 C.F.R. § 60.3(e)(5) as well as the general requirement for construction that will minimize flood damage potential as it applies to V Zone construction.²⁸ Technical Bulletin 5 explains that 44 C.F.R. § 60.3(e) requires that all new and substantially improved structures in V Zones be elevated to or above the base flood elevation ("BFE") on open foundations (pilings, columns, or piers, and, sometimes, shear walls) that allow floodwaters and waves to pass beneath the elevated structures.²⁹ It also explains that the regulation requires that the area beneath these elevated structures remain free of any obstructions that would prevent the free flow of coastal floodwaters and waves during a base flood event.³⁰ FEMA has instituted these requirements under the NFIP to "minimize the transfer of flood forces to the building

²³ Town of Fairfield, *Zoning Regulations* (undated) (accessed at http://www.fairfieldct.org/filestorage/10726/11028/12429/12431/Zoning_Regulations.pdf)

²⁴ 44 C.F.R. § 60.3(e)(5).

²⁵ *Id.* § 59.1.

²⁶ *Id.*

²⁷ *Id.*

²⁸ FEMA Technical Bulletin 5, *Free-of-Obstruction Requirements for Buildings Located in Coastal High Hazard Areas in Accordance with the National Flood Insurance Program* (Aug. 2008).

²⁹ *Id.* at 1.

³⁰ FEMA Technical Bulletin 5, *supra* note 28, p. 1; see also 44 C.F.R. § 60.3(e)(5).

foundation and to preclude the deflection or redirection of flood forces that could damage the elevated building or neighboring buildings.”³¹

Technical Bulletin 5 provides various guidance regarding common building elements that may significantly affect the free passage of flood flow and waves under elevated buildings, one of which are horizontal grade beams that are not part of the lowest floor. First, the Technical Bulletin makes no allowance for the placement of horizontal grade beams above the natural grade and below the BFE. This is because such a horizontal grade beam would constitute an impermissible obstruction under 44 C.F.R. § 60.3(e)(5).³² Second, the Technical Bulletin states that horizontal 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.³³ But Technical Bulletin 5 does not provide any exceptions that would allow the placement of a horizontal grade beam above the natural grade and below the BFE.

The “natural grade” of a location means the grade unaffected by construction techniques such as fill, landscaping, or berming.³⁴ A FIRM promulgated by FEMA will delineate the SFHA and the BFEs for a community, but will not identify the natural grade of any particular location. As the FIRM does not identify the elevation of the natural grade, determining the natural grade for a specific location (such as the site of the Penfield Pavilion) requires the analysis of site specific topographical data, any available contour maps, light detection and ranging (“LIDAR”) data, field observations of surrounding topography, photographs, and other available data.

B. The Placement of the Horizontal Grade Beams Above the Natural Grade and Below the Base Flood Elevation Violated 44 C.F.R. § 60.3(e)(5)

The restoration of the Penfield Pavilion was a substantial improvement, as the repair cost exceeded 50% of the market value.³⁵ Because it was a substantial improvement, the regulation at 44 C.F.R. § 60.3(e)(5) prohibits the creation of any obstruction below the BFE in the VE Zone. In this case, the Town placed horizontal grade beams (with their top elevation) at 10.7’ NAVD 1988 when constructing the foundation of the Penfield Pavilion. The three issues, accordingly, are: (1) determining whether the project site is in the VE Zone; (2) if in the VE Zone, determining the elevation of the site’s natural grade in order to evaluate whether the horizontal grade beams’ elevation of 10.7’ NAVD 1988 is below the natural grade; and (3) determining

³¹ *Id.*

³² See FEMA Technical Bulletin 10, *Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe from Flooding*, at 3 (May 2001) (“Buildings constructed in a V zone must be constructed on an open foundation consisting of piles, piers, or posts and must be elevated so that the bottom of the lowest structural members is at or above BFE.”) (emphasis added).

³³ *Id.* at 13 (“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.”).

³⁴ Federal Emergency Management Agency, *National Flood Insurance Program Definitions* (available at <https://www.fema.gov/national-flood-insurance-program/definitions#N>).

³⁵ FEMA’s original estimate to repair the pavilion as detailed in Part A of the Cost Estimating Format for the Public Assistance project was \$2,090,442.85 (which excluded costs of contingencies and other factors) and the appraised value of the Penfield Pavilion in 2015 was \$1,781,900. See Cost Estimating Format, Town of Fairfield, CT – Penfield Pavilion (July 14, 2015); Vision Government Solutions, Appraisal of 323 Fairfield Beach Road (Oct. 5, 2018). This means that the original FEMA estimate of the cost to repair the pavilion exceeded 50% of the market value of the structure, making this structure substantially damaged. A substantial improvement includes any substantially damaged structure.

whether the horizontal grade beams comprise an impermissible obstruction under 44 C.F.R. § 60.3(e)(5).

Natural Grade and Base Flood Elevation

FEMA has concluded, based on the most recent FIRM, that the BFE at the project site is 13.0' NAVD 1988 and that the project site is in the VE Zone.³⁶ FEMA has also examined the LiDAR data from 2006 and the photographs, engineering reports, and mapping products provided by the Town and concluded that the pre-existing natural grade of the project site ranged from 8.0' to 9.0' NAVD 1988 as depicted in Enclosure 2.³⁷ Because the elevation of the top of the horizontal grade beams are 10.7' NAVD 1988, this means that the horizontal grade beams are above the natural grade and below the BFE and in violation of 44 C.F.R. § 60.3(e)(5).

The Town has made a number of statements and provided various documentation to attempt to demonstrate that the average natural grade of the Penfield Pavilion site is 11.0' NAVD 1988 and under the building is 10.8' NAVD 1988, such that the grade beam at 10.7' NAVD would be below natural grade. When originally asked to explain its basis/source of the natural grade assertion, the Town stated in its October 28, 2016, letter that the "natural grade is the dune topography that once existed between Long Island Sound and Fairfield Beach Road before the site was first built on in the early 1900s, then disturbed by demolition and new construction in the 2000s, and finally scoured by Hurricanes Irene and Sandy in 2011 and 2012."³⁸ The Town, to reestablish the natural topography under and around the building, then "took site transects taken to the east and west of the subject building."³⁹ During a November 2017 teleconference with FEMA, the Town explained that it believed the knolls to the right and to the left of the Pavilion were, at one point, a continuous land formation before being disturbed by development and that connecting corresponding elevation points of the two transects created an elevation model representative of the natural grade.

The Town also provided an engineering report prepared by DeStefano & Chamberlain in December 2017 that "disagreed [with FEMA] on the site grades" and stated that they could demonstrate the "as-constructed project grades are consistent with surrounding topography."⁴⁰ In making such demonstration, the report first stated that it was including a 0.5 interval contour map plotted by the Town of Fairfield Engineering Department in NAVD datum using the same 2006 LIDAR data used by FEMA, as the 2' contour interval map created by FEMA was not "detailed enough." This Town-generated map, however, shows most of the Pavilion at between

³⁶ National Flood Insurance Program, Flood Insurance Rate Map, Fairfield County, Connecticut, Panel 438 of 626, Map No. 09001C0438G (July 8, 2013) (Enclosure 3).

³⁷ Federal Emergency Management Agency, *Penfield Pavilion – Fairfield CT* (Enclosure 2) (depicting what FEMA has determined are the contour lines of the elevations in and around the site).

³⁸ Letter from Michael C. Tetreau, *supra* note 15, at Appendix A; *see also* Letter from Kevin H. Chamberlain, P.E., DeStefano & Chamberlain Inc. to Joseph Michelangelo, P.E., Director of Public Works, Town of Fairfield *re: Restoration of Penfield Pavilion – 323 Fairfield Beach Road, Fairfield, CT FEMA-4087-DR-Town of Fairfield-PA-ID 001-26620-00 / PW 680*, at 1 (Oct. 25, 2016) (which is included as Exhibit 2 to the Letter from Michael C. Tetreau).

³⁹ *Id.*

⁴⁰ Letter from Kevin H. Chamberlain, P.E., DeStefano & Chamberlain, Inc. to Joseph Michelangelo, P.E., Director of Public Works, Town of Fairfield *re: Penfield Pavilion – Repair and Reconstruction, 323 Fairfield Beach Road, Fairfield, CT* (Dec. 1, 2017).

8' and 9' NAVD 1988, which is the elevation being asserted by FEMA.

The report then stated that it had included historical photographs of the site that:

[S]how a continuous dune along the length of the site with the former building at the crest. From both the 2006 LiDAR data and the 2017 as-built survey, the dune crest elevation at the two ends of the building can be seen as 10.0' and 11.0' NAVD. Based on the photographs, the LiDAR data and the as-built survey, it is our opinion that it is reasonable and logical to infer that this crest elevation would have continued across the entire length of the site in the property's "natural" state.⁴¹

FEMA finds these arguments and documentation unpersuasive. Several of the maps and photographs provided by the Town identify two knolls—one to the left and one to the right back (landward side) of the Pavilion—with elevations higher than those within the footprint of the Pavilion. None of this documentation, however, shows these two knolls ever being connected as a continuous dune. Even assuming, *arguendo*, that they did show that the two knolls were once connected as a continuous dune, that elevation would not cover the front (seaward) side of the pavilion, such that the elevation of the front of the Pavilion would still be between 8' and 9' NAVD 1988 before the restorative work took place.

In addition to the engineering report prepared by DeStefano & Chamberlain, the Town also provided historical photographs, USGS quadrangle maps, and other mapping products in order attempt to demonstrate that the elevation of the site of the Penfield Pavilion is 11.0' NAVD 1988 and under the building is 10.8' NAVD 1988. FEMA has reviewed these individual items and concluded that none of them demonstrate a natural grade higher than the 8' to 9' NAVD 1988 as established by the 2006 LIDAR information. In fact, most of the mapping products provided by the Town depict an elevation of between 8' and 9' NAVD 1988 over the past 83 years. The following provide a brief summary of FEMA's analysis concerning this information that is further detailed in **Enclosure 1**:

- **Historical Photographs.** The historical photographs provided do not demonstrate a natural grade higher than 8-9 feet NAVD 1988. In all cases but one, the photographs contain no elevation markings in order to enable FEMA to determine the natural grade of the site. There was one photograph that appeared to contain an elevation marking on the original Penfield Pavilion of 11.0' NGVD 1929. The sand built-up at the location appears to be approximately 0.75 foot below this marking, placing the sand at an elevation of 10.25' NGVD 1929. When converting this to NAVD 1988, the elevation of the sand would be 9.16' NAVD 1988. This means that the only photograph with an elevation marking—if FEMA accepted the elevation marking as being accurate and the location of the sand in that photograph as representative of natural grade—actually supports FEMA's conclusion that the elevation of the horizontal grade beam (10.7' NAVD 1988) is above the natural grade.
- **USGS Quadrangle Maps.** First, the Town provided a USGS quadrangle map from 1920 that only had 20' contour lines (based on mean sea level datum) that showed no contour

⁴¹ *Id.* at 2.

lines in the area of the Penfield Pavilion, such that it provides no useful data. Second, the Town provided USGS quadrangle maps from 1951, 1960, 1970, and 1984 that had 10' contour lines and generally showed the Pavilion on a 10' contour line. That being said, the datum for these maps was NGVD 1929 or mean seal level and—when converted to NAVD 1988 datum—means the natural grade at the site of the pavilion would be 8.91' NAVD 1988. Third, the Town also provided a USGS quadrangle map from 2012 that used the NAVD 1988 datum and showed the Pavilion to be at an elevation of 10'. However, the USGS did not change the contour lines for this 2012 map from the previous 1984 map based on the update to the new datum. This means the elevation of the site in 2012 remained 8.91' NAVD 1988. As such, the USGS quadrangle maps from 1951, 1960, 1970, 1984, and 2012 all support FEMA's conclusion that the elevation of the horizontal grade beam (10.7' NAVD 1988) is above the natural grade.

- **Other Historical Mapping.** The Town provided a number of other maps dating from 1935 until 2017. As a general matter, most of these maps support a conclusion that the elevation of the natural grade is between 8' and 9' NAVD 1988. The other maps not supporting such a conclusion used a scale not useful for analysis or otherwise depicted the as-built conditions of the restored pavilion that are not useful for analysis because of the large volumes of fill used during the restorative work.

Impermissible Obstruction – Violation of 44 C.F.R. § 60.3(e)(5)

The regulation at 44 C.F.R. § 60.3(e)(5) prohibits the creation of any obstruction below the BFE for a substantial improvement in the VE Zone. Technical Bulletin 5, in clarifying the application of these prohibitions, states that horizontal grade beams placed with their upper surfaces flush with or below the natural grade are permissible. As detailed above, FEMA has concluded that there was a substantial improvement of the Pavilion, the elevation of the natural grade of the site is 8.0' to 9.0' NAVD 1988, the BFE of the site is 13.0' NAVD, and the site is in the VE Zone. The issue presented, accordingly, is whether the horizontal grade beams are above the natural grade and below the BFE. As set forth in the design plans and confirmed by the Town, the horizontal grade beams are at an elevation of 10.7' NAVD 1988. This means that the horizontal grade beams are above the natural grade and below the BFE, such that they comprise an impermissible obstruction under 44 C.F.R. § 60.3(e)(5).

The Town has provided two engineering reports to attempt to refute this conclusion, neither of which is persuasive. The first engineering report—prepared by DeStefano & Chamberlain and discussed earlier in this analysis—asserted that Technical Bulletin #5 can be read to allow a horizontal grade beam regardless of its elevation to be a permissible obstruction based on the theory that such a grade beam would eventually be exposed by scour whether embedded in fill above the natural grade or in existing soils below the natural grade. The report pointed to language in Technical Bulletin #5 recognizing that, even where horizontal grade beams are permissibly placed with their upper surfaces flush with or below the natural grade, storm erosion and local scour will often expose and undermine such grade beams, leaving them suspended above the post-storm ground profile.⁴² Technical Bulletin #5, in light of this potential scour or erosion, stated that “Designers must anticipate this circumstance and design grade beams to resist

⁴² Technical Bulletin 5, *supra* note 28, at 13.

flood, wave, and debris loads and to remain in place and functional when undermined.”⁴³ This language, according to DeStefano & Chamberlain, can be read to allow a grade beam above the natural grade so long as it can withstand these loads and stated that they conducted structural calculations to verify that the horizontal grade beams can resist the horizontal and vertical loads presented during a 100-year flood in combination with hydrostatic pressure, wind, and gravity loads.⁴⁴

Technical Bulletin #5 does recognize that storm erosion and local scour can expose and undermine grade beams placed below the natural grade, leaving them suspended above the post-storm ground profile.⁴⁵ But even though designers must anticipate this circumstance and design grade beams to handle loads when exposed, this language in no way authorizes the placement of a grade beam above the natural grade and below the BFE in the first place. Simply put—there is no exception in 44 C.F.R. § 60.3(e)(5) or Technical Bulletin #5 to have a horizontal grade beam above the natural grade and below the BFE, irrespective of any engineering analysis showing that the impermissible grade beam could handle the loads from a 100-year flood. Therefore, because all substantial improvements in the coastal high hazard area must have an open foundation below the BFE, the horizontal grade beams are impermissible obstructions.

The second engineering report, prepared by RACE Coastal Engineering, asserted that the horizontal grade beams do not comprise a “significant” obstruction and, as a result, do not violate 44 C.F.R. § 60.3(e)(5).⁴⁶ In reaching this conclusion, it noted language in Technical Bulletin #5 that “it is not always clear whether a particular building element or site development practice will be a significant obstruction that prevents the free passage of floodwaters and waves. The term ‘significant’ is used here because any construction or development practice below the flood level will cause a localized disruption of flow and waves during the base flood.”⁴⁷ RACE Coastal Engineering then conducted its own wave crest, runup, erosion, load, and reflection analysis; identified loads and scour depths for the pavilion based on this analysis; and concluded that the horizontal grade beams would not divert water to adjacent properties or cause damage to the underside of the Pavilion during flood events if it had been designed to be stable accounting for the loads and scour depths. As such, the grade beams “should not be considered [a] ‘significant obstruction[]’ and...consistent with the floodplain management criteria of 44 C.F.R. § 60.3(e)(5).”⁴⁸

FEMA disagrees. The regulation at 44 C.F.R. § 60.3(e)(5) prevents an obstruction below the BFE for a structure in the VE zone and a horizontal grade beam that is part of a building’s foundation comprises just such an obstruction. The language in Technical Bulletin #5 noted by RACE Coastal Engineering about an obstruction needing to be “significant” is clarifying that FEMA does not consider every building element—just because it happens to be below the BFE—to create the type of obstruction prohibited by the regulation. Technical Bulletin #5

⁴³ *Id.*

⁴⁴ *Id.* at 4.

⁴⁵ *Id.* at 13.

⁴⁶ Letter from Azure Dee Sleicher, PE, RACE Coastal Engineering to Joseph Michelangelo, PE, Director Public Works, Town of Fairfield re: *Penfield Pavilion, Repair and Reconstruction, 323 Fairfield Beach Road, Fairfield, CT* (Dec. 1, 2017).

⁴⁷ Technical Bulletin 5, *supra* note 28, at 5.

⁴⁸ Letter from Azure Dee Sleicher, *supra* note 46, at 3.

describes how some types of building elements (such as stairs, ramps, decks, patios, elevators, and foundation bracing) can be constructed below the BFE without comprising an obstruction if designed in a certain way. For example, a building elevated above the BFE may need access stairs below the BFE and such stairs can be constructed so as not to comprise a significant obstruction.

But as it relates to horizontal grade beams, Technical Bulletin #5 states that only grade beams placed with their upper surfaces flush with or below the natural grade are not considered obstructions and allowed. It makes no provision for potential ways to construct grade beams below the BFE and above natural grade so as to not comprise an obstruction. If FEMA had wanted to create such a possibility, then Technical Bulletin 5 would have been worded very differently, such as "Grade beams are allowed below the BFE and above natural grade if they are designed to resist flood, wave, and debris loads." Technical Bulletin 5 makes no such allowance.

III. CONCLUSION

FEMA has determined that the Town has violated the minimum floodplain management criteria under 44 C.F.R. § 60.3(e)(5) by creating an impermissible obstruction through the construction of the foundation of the Pavilion with horizontal grade beams above the natural grade and below the BFE.

Enclosure 1
Analysis of Documentation Provided by the Town of Fairfield

No.	Document	Description	Analysis
1	Photograph 1	Original Penfield Pavilion sitting on peak of the barrier beach, looking from the southeast, from the first half of the 20 th century	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
2	Photograph 2	Original Penfield Pavilion in the late 1970s after the Town of Fairfield acquired the property, looking west to east	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
3	Photograph 3	The original Penfield Pavilion circa 1970s	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
4	Photograph 4	The original Penfield Pavilion in the 1980s from the landward side	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
5	Photograph 5	The original Penfield Pavilion in the 1980s from the landward side (closer angle than Photograph 4)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
6	Photograph 6	The construction of the Durrell Pavilion in the 1980s that shows the Penfield Pavilion in the background	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
7	Photograph 7	The Penfield Pavilion in the 2000s from the landward side	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
8	Photograph 8	The Penfield Pavilion in the 2000s from the landward side (showing an area to the right of the structure that includes a knoll)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site. Further, the wooded knoll was identified on the 2006 LIDAR and considered as part of FEMA

No.	Document	Description	Analysis
			making its determination that 8' to 9' NAVD 1988 is the elevation of the natural grade of the pavilion site.
9	Photograph 9	Original Penfield Pavilion in 2008 from the seaward side	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
10	Photograph 10	View of the new Penfield Pavilion locker room constructed in 2007-2008	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
11	Photograph 11	Original Penfield Pavilion after a storm event circa 2008	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site; further, if there were, the height of the sand adjacent to the original pavilion is most likely not representative of the sites natural grade, but rather an accumulation/build-up over some period of time and likely facilitated by the presence of the structure. The natural grade is more likely below the elevation of sand shown in this photograph.
12	Photograph 12	Original Penfield Pavilion after a storm event circa 2008 that shows a 11.0' NGVD 1929 Datum marking by the Town Engineer Department	This photograph shows what appears to be an elevation marking on the original Penfield Pavilion representing an elevation of 11.0' NGVD 1929. The sand built-up at the location appears to be approximately 0.75 feet below this marking, placing the sand at an elevation of 10.25' NGVD 1929. When converting this to NAVD 1988, the elevation of the sand would be 2.16' NAVD 1988. This means that—if FEMA accepted the elevation marking as being accurate

No.	Document	Description	Analysis
			and the location of the sand in that photograph as representative of natural grade—the elevation of the horizontal grade beam (10.7' NAVD 1988) is above the natural grade in violation of 44 C.F.R. § 60.3(e)(5).
13	Photograph 13	Seaward side of Penfield Pavilion after a storm event circa 2008	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site; further, if there were, the height of the sand adjacent to the original pavilion is most likely not representative of the sites natural grade, but rather an accumulation/build-up over some period of time and likely facilitated by the presence of the structure. The natural grade is more likely below the elevation of sand shown in this photograph.
14	Photograph 14	Original Penfield Pavilion circa 2007 view towards the east side of the structure	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
15	Photograph 15	Original Penfield Pavilion circa 2007 showing the cross section from the east	The caption in the photograph states that the height of sand below the building is at an elevation of 9.75' NAVD 1988. <u>First</u> , even if this information were accurate, it would demonstrate that the horizontal grade beam (at 10.7' NAVD) is above the natural grade in violation of the 44 C.F.R. § 60.3(e)(5). <u>Second</u> , the elevation of sand underneath the pavilion is most likely not representative of the site's natural grade, but rather an accumulation/build-

No.	Document	Description	Analysis
			up over some period of time and likely facilitated by the presence of the structure.
16	Photograph 16	Original Penfield Pavilion circa 2007 after demolition of the east wing	The photograph contains no elevation markings in order to enable FEMA to determine the natural grade elevation of the site; further, if there were, the height of the sand underneath the pavilion is most likely not representative of the site's natural grade, but rather an accumulation/build-up over some period of time and likely facilitated by the presence of the structure.
17	Photograph 17	Original Penfield Pavilion circa 2007 after demolition of the east wing	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site; further, if there were, the height of the sand underneath the pavilion is most likely not representative of the site's natural grade, but rather an accumulation/build-up over some period of time and likely facilitated by the presence of the structure.
18	Photograph 18	Demolition of east wing of Penfield Pavilion circa 2007 (looking toward Long Island Sound)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
19	Photograph 19	Demolition of east wing of Penfield Pavilion circa 2007 (looking from southwest)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.

No.	Document	Description	Analysis
20	Photograph 20	Penfield Pavilion circa 2007 showing town workers preparing formwork for the footing/foundation system	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
21	Photograph 21	Penfield Pavilion circa 2007 showing completed formwork for the footing/foundation system	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
22	Photograph 22	Penfield Pavilion circa 2009 showing completed east wing (looking from southeast)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
23	Photograph 23	Penfield Pavilion circa 2009 showing completed east wing (looking from southeast)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
24	Photograph 24	Penfield Pavilion in 2016 showing new top of grade beams (looking from east)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
25	Photograph 25	Penfield Pavilion in 2016 showing new top of grade beams (looking from southwest)	The photograph contains no elevation markings or other data in order to enable FEMA to determine the natural grade elevation of the site.
26	USGS Quadrangle Map – 1920	This map has 20' contour intervals, with no contours shown in the location of the pavilion. The accuracy of this map is considered to +/- 1/2 contour 95% of the time and the datum used was mean sea level.	The map has no contour lines below 20' and none in the location of the pavilion; as such, the map provides no data in order to determine an elevation at the pavilion site.
27	USGS Quadrangle Map – 1951	This map has 10' contour intervals and the pavilion appears to be located on the 10'	The elevation in this map must be converted to the NAVD 1988 datum used in the 2006 LiDAR

No.	Document	Description	Analysis
		contour. The map uses mean sea level (MSL) datum. The accuracy is this map is considered to +/- 1/2 contour 95% of the time.	data. [NAVD 1988 - MSL = -1.093'. Note: MSL was renamed NGVD 1929 in 1973]. Converting the 10' MSL elevation to NAVD 1988, the elevation of the site would be 8.91'. Assuming the map is accurate, this supports FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
28	USGS Quadrangle Map - 1960	This map has 10' contour intervals and the pavilion appears to be located on the 10' contour. The map uses mean sea level (MSL) datum. The accuracy is this map is considered to +/- 1/2 contour 95% of the time.	The elevation in this map must be converted to the NAVD 1988 datum used in the 2006 LiDAR data. Converting the 10' MSL elevation to NAVD 1988, the elevation of the site would be 8.91'. Assuming the map is accurate, this supports FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
29	USGS Quadrangle Map - 1970	This map has 10' contour intervals and the pavilion appears to be located on the 10' contour. The map uses MSL datum. The accuracy is this map is considered to +/- 1/2 contour 95% of the time.	The elevation in this map must be converted to the NAVD 1988 datum used in the 2006 LiDAR data. Converting the 10' MSL elevation to NAVD 1988, the elevation of the site would be 8.91'. Assuming the map is accurate, this supports FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
30	USGS Quadrangle Map - 1984	This map has 10' contour intervals and the pavilion appears to be located on the 10' contour. The map uses NGVD 1929 datum. The accuracy is this map is considered to +/- 1/2 contour 95% of the time.	The elevation in this map must be converted to the NAVD 1988 datum used in the 2006 LiDAR data. [NAVD 1988 - NAVD 1929 = -1.093'] Converting the 10' NAVD 1929 elevation to NAVD 1988, the elevation of the site would be 8.91'. Assuming the map is accurate, this

No.	Document	Description	Analysis
			supports FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
31	USGS Quadrangle Map – 2012	This map has 10' contour intervals and the pavilion appears to be located on the 10' contour. This map uses NGVD 1988 datum. The accuracy of this map is considered to +/- 1/2 contour 95% of the time.	This map shows the pavilion to be at an elevation of 10'. However, the USGS did not change the contour lines for this 2012 map from the previous 1984 map based on the update to the new datum from NAVD 1929 to NAVD 1988. This means the elevation of the site depicted on the 2012 USGS Quadrangle Map remained 8.91' NAVD 1988.
32	Topographic Maps of Town of Fairfield, CT, Sheet No. 1-29 – 1935	This map has 4' contour intervals and the pavilion appears to be located on the 20' contour line. This map uses 13.45' below MSL datum.	The elevation in this map must be converted to the NAVD 1988 datum: $20' \text{ elevation} - 13.45' = 6.55' \text{ NGVD 1929}$ $6.55' \text{ NGVD 1929} - 1.093' = 5.46' \text{ NAVD 1988}$ This means that the elevation of the site is 5.46' NAVD 1988, which is <u>below</u> FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
33	Fairfield, Connecticut, Town Plan and Zoning Commission, Drawing C-18 of 180 – 4/12/1968	This map has contour intervals of 2' and appears to show the Penfield Pavilion between 8' contours. The map uses NAVD 1929 datum.	The elevation in this map must be converted to the NAVD 1988 datum: $8' \text{ NGVD 1929} - 1.093' = 6.91' \text{ NAVD 1988}$. This means that the elevation of the site is 6.91' NAVD 1988, which is <u>below</u> FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.

No.	Document	Description	Analysis
34	Town of Fairfield, dept. of Public works, Existing conditions survey, Penfield Pavilion – April 2015	This map has contour intervals of 1' and, although hard to read, appears to show the Penfield Pavilion at an elevation of between 8' and 9'. This map uses NAVD 1988 datum.	This map shows as-built, existing conditions and is difficult to interpret. Furthermore, the 8' to 9' elevation of the site in this map directly supports FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
35	Town of Fairfield, CT, Sanitary Sewer System – October 30, 2017	This map has contour intervals of ½ foot and appears to show multiple contour intervals at the location of the Penfield Pavilion, ranging from 7.5' to 12'. The majority of the structure appears to be located over 8' to 9' contours. The map uses NAVD 1988 datum.	This map shows as-built, existing conditions and is therefore of limited utility to show the elevation of the natural grade, as the Town had already installed significant amounts of fill during construction. That being said, the majority of the structure appears to be located over 8' to 9' contours, which supports FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
36	LIDAR Data from April 2004	The map has contour intervals of ½' and appears to show multiple contour intervals at the location of the Penfield Pavilion, ranging from 8.5' to 10.5'. The map uses NGVD 1929 datum.	The elevation in this map must be converted to the NAVD 1988 datum: $8.5' \text{ NGVD } 1929 - 1.093' = 7.41' \text{ NAVD } 1988$ $10.5' \text{ NGVD } 1929 - 1.093' = 9.41' \text{ NAVD } 1988$ This means that the average elevation is 8.41' NAVD 1988, which supports FEMA's conclusion that the natural grade elevation of the site is between 8' and 9' NAVD 1988.
37	As-Built, Improvement Location survey of Penfield Beach – December 21, 2016	The elevation of the pavilion appears to be located between the 11' contour line on the seaward side and the 7' contour line located in the parking lot of the landward side. The map uses NAVD 1988 datum.	This map depicts as-built conditions and is not considered to be beneficial in determining natural grade of the site due to the volume of fill used in the most recent site work.

No.	Document	Description	Analysis
38	Penfield Pavilion, Grade Comparison - Included with DeStefano and Chamberlain Report	The map uses 2017 as-built survey data with 1' contour intervals as well as 2008 LIDAR data with 0.5' contour intervals. Both data sets use NAVD 1988 datum.	This map was not useful due to scale limitations and unreadability.