City of Malibu

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November 6, 2017

Ed Curtis, P.E., CFM
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

SUBJECT: Appeal of the Federal Emergency Management Agency (FEMA) Preliminary Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS)

Dear Mr. Curtis:

This letter shall constitute the City of Malibu's appeal of the FEMA Preliminary FIRM panels and FIS.

FEMA distributed the Preliminary FIRM and FIS reports for the Los Angeles County and incorporated areas including the City of Malibu on October 28, 2016 as part of the Open Pacific Coast Study of the California Coastal Analysis and Mapping Project (CCAMP). The City and its consultant, Moffatt & Nichol, have reviewed the documents and have the following challenges:

1. The general transect layout is acceptable. However, it is recommended to add one transect between each of the following: Transects 10 and 11, 26 and 27, 27 and 28, 28 and 29, 32 and 33, 39 and 40, as well as 40 and 41. Also, if the difference in BFEs between neighboring transects is more than 10 feet, a transitional zone shall be provided as stated in the Pacific Guidelines (Section D.4.9.6). "Transition zones may be necessary between areas with high run-up elevations to avoid large differences in BFEs and smooth the changes in flood boundaries."
2. The Base Flood Elevation (BFE) is very sensitive to topography, especially to bluff/structure toe elevation. Toe elevation determines which of three wave run-up methods (Stockdon, DIM or TAW) shall be used. When the DWL2% (dynamic water level 2%) is below the toe of bluff/structure: 1) the Stockdon method is used if the foreshore slope is mild, and 2) the DIM method is used if the foreshore slope is steep. Physically, a steeper slope will result in a higher wave run-up than that in a milder slope. However, the Stockdon method for milder slopes results in higher wave run-up than that of the DIM method for steeper slopes. Hence, there is a clear sign that the Stockdon method is more conservative than DIM method for a similar shore type. When the DIM method is used, the BFE is often a few feet up to 10 feet lower than the neighboring transects. Different methods contributed to the alongshore BFE variations. Also, different methods were used for neighboring transects although they have similar shore/structure type. The City is currently conducting further review and analysis of several transects. Supporting and clarifying data will be submitted to FEMA within 30 days.

3. Wave analysis transects begin at a depth of 40-m. Using wave parameters at the 40-m depth from the nearshore wave model as input parameters for the wave run-up analysis is a poor choice for reaches with oblique wave approach angles and wave refraction patterns, which occur around the many headlands. Some of the two-dimensional (2-D) wave phenomena captured in a 2-D refraction model is not adequately represented in the one-dimensional transect based analysis, potentially leading to overestimates of the BFE. However, this may not be an issue if the depth-limited wave height is used in the wave run-up analyses. The City is currently conducting further review and analysis of wave input data. Supporting and clarifying data will be submitted to FEMA within 30 days.
4. The foreshore slope is not considered in determining the wave breaking criterion (ratio of wave height to water depth). A wave breaking factor of 0.78 for the flat beach was used for all transects, which may lead to an under-estimate of the depth-limited breaking wave height and resulting BFE.
5. Treatment of shore protection structures has a significant impact on BFEs. The revetment was assumed to be intact for Transects 11 and 42. Shore protection structures at other transects were assumed to be removed (failed) in the analyses. For failed condition analyses, rubble/ riprap were completely removed from the transect geometry and the roughness factor was replaced with that of sand (i.e., very smooth). The roughness treatment was not consistent with Section D.4.7.3.2 of the Pacific Guidelines, which states: "the Mapping Partner shall select an appropriate roughness factor when conducting run-up and overtopping analyses on the failed structure."
6. Errors were found in the following two transects:
    a. For Transect 11, the secondary VE elevation in Table 1 of IDS4 is 1 foot higher than the primary VE elevation; and
    b. b. For Transect 20, the BFE is 19 feet, while the total water level (TWL) of the event of the record is only 11.7 feet according to the supporting FIS documents.
7. A 35-foot minimum distance criterion was applied in mapping a secondary VE or AO zone for transects with overtopping. If the resulting landward overtopping distance was less than 35 feet, the overtopping run-up zones were integrated into the primary wave run-up Zone VE or, where the VE and AO overtopping zones together were at least 35 feet, combined to create a secondary overtopping zone VE with a different (often lower) BFE. At 13 transects there was overtopping calculated, but the distance was less than 35 feet; therefore, the primary run-up zone BFE was extended to cover this area. Since the primary run-up zone BFE is often a few feet higher than the calculated overtopping zone BFE, the resulting mapped BFE is higher than the calculated BFE at these transects. This practice is inconsistent with Pacific Guidelines (Section D.4.9.4) as the City of Malibu was not consulted about setting 35-foot as the minimum mappable distance criterion.

As stated, the City's consultant will be performing additional review and analysis of 22 transects (8, 9, 11, 20, 23-25, 27, 28, 31-43). This additional analysis will also include evaluating FEMA's topographic data located where houses are elevated on pile structures. Since FEMA utilized LIDAR data to obtain the topographic data, this method would not cover the area under the house and the assumptions made by FEMA may not represent actual site conditions. This additional review and analysis will be used to provide supporting data and documentation as part of this appeal. As stated in FEMA's Criteria

for Appeals of Flood Insurance Rate Maps dated November 11, 2011, the City of Malibu request an additional 30 days after the 90-day appeal period to submit the supporting and clarifying data for this appeal.

If you have any questions, please call me at (310) 456-2489, extension 339.

Sincerely,

Rob DuBoux, PE, Esq.
Assistant Public Works Director

cc: Mayor Peak and Honorable Members of the Malibu City Council
Robert Brager, PE, JD, Public Works Director
Reva Feldman, City Manager
Craig George, Environmental Sustainability Director
Juliette Hays, FEMA
Patrick Clancey, FEMA