CAPE & ISLANDS ENGINEERING

February 4, 2022

Chairman Robert Gray
Bourne Conservation Commission
24 Perry Avenue – Room 201
Buzzards Bay, MA 02532-3441

RE: Project NOI SE#007-2171 - 96 Megansett Road, Cataumet, (Bourne), MA
Proposed Single Family Dwelling

Dear Mr. Gray:

Cape and Islands Engineering, Inc (CIE) hereby submits the following update to the proposed single family dwelling project at 96 Megansett Road. The following plan revisions have been made based on comments received from the Commission, Public and Peer review:

1. Revised grading associated with the house, pool/patio area and surrounding grades. Grading has been revised to provide a 10:1 slope in areas of existing development (lawn and pavement) that provides a gradual rise to a 4' retaining wall which then supports the patio and pool area. The patio and pool are now at elevation 15.1 which is above the A/E based flood elevation of 15. This grade changes protects the proposed development as well as does not allow flood waters to move landward.
2. Removed the driveway down to a garage at the southerly end of the dwelling. This change provides a significant reduction of pavement within the RFA and reduces work on the coastal bank. Pavement proposed in the entire River Front Area (0 – 200') is now reduced from 6,112 square feet to 146 square feet (98% reduction). Mitigation is provided as required for other work within the RFA. Significant vegetative buffers are created between the remaining lawn area and the Salt Marsh resource area by the implementation of the required mitigation.
3. Performed geotechnical borings and provided a Geotechnical Report signed by a Geotechnical Engineer to document soil suitability for work on and near the coastal bank and the ability for the soils to provide for the proposed development and create a stable coastal bank within the standards of the WPA.

The following is an updated summary of the proposed work associated with the Coastal Bank and how that work meets the performance standards for Coastal Banks.

PER WPA - Section 10.30: Coastal Banks

The proposed project includes redevelopment on a previously legally disturbed Coastal Bank.

Under the DEP Wetland Regulations 310 CMR 10.0 Coastal Banks are significant under the following conditions:

"(1) Preamble. Coastal banks are likely to be significant to storm damage prevention and flood control. Coastal banks that supply sediment to coastal beaches, coastal dunes and barrier beaches are per se significant to storm damage prevention and flood control. Coastal banks that, because of their height, provide a buffer to upland areas from storm waters are significant to storm damage prevention and flood control."

"Per the WPA 10.30: WHEN A COASTAL BANK IS DETERMINED TO BE SIGNIFICANT TO STORM DAMAGE PREVENTION OR FLOOD CONTROL BECAUSE IT SUPPLIES SEDIMENT TO COASTAL BEACHES, COASTAL DUNES OR BARRIER BEACHES, 310 CMR 10.30(3) THROUGH (5) SHALL APPLY:"

The existing coastal bank is a non-eroding coastal bank. The existing coastal bank where work is to be performed does not supply sediment to Coastal Beaches, Coastal Dunes or Barrier Beaches therefore sections 10.30(3) through (5) do not apply.

"WHEN A COASTAL BANK IS DETERMINED TO BE SIGNIFICANT TO STORM DAMAGE PREVENTION OR FLOOD CONTROL BECAUSE IT IS A VERTICAL BUFFER TO STORM WATERS, 310 CMR 10.30(6) THROUGH (8) SHALL APPLY:"

The existing coastal bank where work is being performed will not be subject to vigorous wave action and thus has no significant potential for erosion due to wave action. Based on the Flood Insurance Rate Map the Limit of Moderate Wave Action (LIMWA) area is shown seaward of the existing building/house closest to the water and generally follows the mapped salt marsh line at approximately elevation 3.0. Wave height upgradient of the LIMWA is so limited that it is not likely to ever even reach the toe of the coastal bank at elevation 6.0, therefore this bank is not subject to vigorous wave action. Furthermore, per the Summary of Coastal Transect Mapping Considerations for the area, this entire site and cove and the related Zone VE is determined based on and protected by the primary frontal dune which is the nearly continuous landform between Squeteaque Harbor and Megansett Harbor. The bank serves only as a vertical buffer to storm waters or storm surge and therefore the followings sections apply:

"(6) Any project on such a coastal bank or within 100 feet landward of the top of such coastal bank shall have no adverse effects on the stability of the coastal bank."

Per revision #4, the proposed project now has a 10:1 grassed slope within the existing developed lawn and pavement areas. This slope will provide a gradual and stable grade change to elevation 11 which will be well above normal wave action and lesser storm elevations. At elevation 11 an engineered retaining wall is proposed on suitable soils to achieve a finished grade for the pool and patio area of elevation 15.1 which is above the FEMA flood elevation. The slope and retaining wall will be of sufficient design to not adversely affect the stability of the bank.

Picture 1 – A view of the bank facing north – showing existing pavement, pitch pines and un-stabilized surfaces.

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Picture 2 – Existing condition of one of the trees on the bank – significant portions of the bank have peastone, pavement and moss areas – no presence of stabilizing vegetation.

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Picture 3 – view of the bank to the right of the yellow flag stakes, with pine needles removed by hand to expose existing peastone and pavement bank stabilization – no vegetation aside from one tree in this view.

Most of the existing bank in the area of the work has NO vegetation. With exception of the 10 existing trees and the existing asphalt pavement there is no stabilization. The bank is also not eroding under these conditions. The proposed work as designed and conditioned will not negatively affect the stability and functionality of the existing bank.

> *"(7) Bulkheads, revetments, seawalls, groins or other coastal engineering structures may be permitted on such a coastal bank except when such bank is significant to storm damage prevention or flood control because it supplies sediment to coastal beaches, coastal dunes, and barrier beaches."*

As previously documented the coastal bank is a non-eroding bank which does not supply sediment to a coastal beach, coastal dune or barrier beach. Furthermore, although the proposed 4' high retaining wall is not a coastal engineering structure since it designed to raise the grade around the patio, it is permissible and would also be permissible if it were a Coastal Engineering Structure. The proposed 4' retaining wall has been documented to be proposed on suitable soils and therefore will not have any adverse effect on the stability of the bank.

> *"(8) Notwithstanding the provisions of 310 CMR 10.30(3) through (7), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37."*

The site is not a located in a habitat site as identified in 10.37.

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It is my professional opinion that the proposed project as designed meets the performance standards for Coastal Banks and Riverfront areas within the Wetlands Protection Act and the Town of Bourne wetlands bylaws and is therefore worthy of an Order of Conditions.

Please let us know if you have any questions or need any additional information.

Sincerely,

Mark Dibb, PE
Senior Project Engineer

Encl.: Revised site plan
Cc: Matt Creighton