

Sustainable
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February 19, 2019

Sean W. McNamara, Ph.D.
Project Manager / Engineer
Crede Associates, LLC
776 Main Street
Westbrook, ME 04092

Re: Gould Island Bunker Wall Structural Evaluations

Dear Mr. McNamara,

Per your request, our team visited the Gould Island site on February 12, 2019 to inspect and evaluate the existing east facing wall of bunkers (NED Sites 21 and 22) for structural stability. The existing bunker is constructed of two layers of horizontal timber planks backed by vertical timber uprights, similar to a soldier pile and lagging retaining wall (Refer to attached Photos #1 and #2). The two layers are separated and are filled with soil and tied together with threaded steel rods (Refer to attached Photo #3). The wall is approximately 18ft tall at its tallest point. The entire assembly is founded on a concrete foundation. The wall had two openings providing access through the wall.

Based on our visual assessment and sounding of the timber framing and concrete foundation, the wall appears to be in stable condition, albeit showing signs of deterioration. Some of the timber framing showed signs of deterioration but not significant enough to warrant concern. The east side of the wall faces a road and the water while the west side of the wall is filled with debris. The existing debris did not appear to be exerting a significant lateral pressure on the wall. Several trees and vegetation were observed growing near or through the wall but did not appear to be destabilizing the wall in any way (Refer to attached Photo #5).

It is our understanding that the debris is planned to be removed with an excavator that will be located atop a hill on the west side of the wall. Provided that the excavator will operate at least 10 feet from the wall, we do not see any concerns with this approach and do not foresee the excavator's operation destabilizing the wall in any way. In addition, since the existing debris did not appear to be imparting a lateral force onto the existing wall, pulling the debris away from the wall should not destabilize the wall in any way.

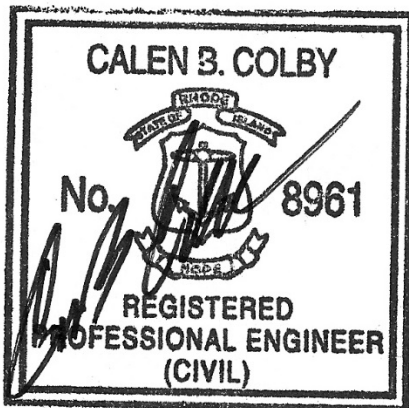
Although the wall was observed to be stable and safe to operate near, we suggest the following precautions be taken during the debris removal activities:

- At no point while the excavator is removing debris from the wall should a person be within 20 feet of the west face of the wall or within an 8ft radius of the west side of either of the two openings in the wall.

- The excavator should take care not to accidentally hit the wall with the bucket or claw potentially puncturing the existing planks. Although the wall is structurally redundant and is unlikely to progressively collapse from inadvertent damage, damage to the planks could cause the earth between the planks to spill out.
- When grabbing debris near the wall, the excavator should make sure not to accidentally grab one of the wall vertical uprights.
- If trees or vegetation needs to be removed near the wall, it should be fully sheared and not pulled in anyway to be removed. Under no circumstances may the excavator pull trees vegetation near the wall.

Thank you for contacting Colby Co for your engineering needs, please don't hesitate to call with any questions or clarifications.

Sincerely,



Calen B. Colby, PE

Cc: Brian Beaulieu, PE
Ben Townsend, PE



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Photo #1: View of West side of Wall



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Photo #2: View of East side of Wall



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Photo #3: View of Earthen Fill Within Wall



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Photo #4: Typical Wall Anchorage to Foundation



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Photo #5: Vegetation Growing within Wall



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