Rankin Coastal Engineering
20 Corporate Park Drive
Suite 100-101
St. Catharines, ON, L2S 3W2
905-321-7524

Coastal Engineering Assessment
Firelane 13B, NOTL

May 10, 2024

Attention: Dylan Earl

Based on historical mapping and our site visit earlier this month we are able to offer the following assessment of the property at Firelane 13B.

Historical Erosion:

We looked at satellite imaging between 2000 and 2020 to determine how the current shoreline protection has performed over a 20-year period. As seen below the property in question has two areas fronting Lake Ontario with a separate property in between.

Based on the historical mapping from 2000-2020 we have calculated the west section has eroded 1.8-meters over the 20-year period while the east section has eroded 0-meters. To be noted the neighbouring property on the east with no shoreline protection in place has eroded 9.15-meters over this same period. Based on this information the following erosion rates are calculated:

Armoured Section of Property: 0.09 m/yr.

No Shoreline Protection: 0.475 m/yr.

Current Shoreline Protection Assessment:

During our site visit we looked at the current shoreline protection at the east and west side of the property. We observed dumped armour stone and concrete ranging from 1-3 MT.

East Section

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West Section

Based on the images above and the historical erosion mapping the current shoreline protection is successfully reducing the erosion rate. The current shoreline protection was likely constructed 30-40-years ago and does not appear to be engineered. The shoreline protection on the west section extends higher into the bank than the east section. Based on this we believe the east section is more likely to experience bank erosion from overtopping waves in the future. The current shoreline protection is successfully reducing erosion at the toe of the bank.

Recommendations:

Based on our inspection we believe the current shoreline protection has a remaining serviceable life of 15-years with proper maintenance. We recommend constructing a new breakwall in the next 15-years. The site has good access for maintenance and future construction, if any work to the property is being completed, we recommend leaving a 6-meters wide access lane from the

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road. Completing a site inspection every 5-years is recommended if replacement is not completed. See below the current erosion hazard limit and the erosion hazard limit if a new breakwall is installed:

Current Erosion Hazard Limit:

Stable Slope Allowance = 12-meters at ½ (6m x 2 = 12m)

Erosion Allowance = (0.09m/yr. * 15yr) + (0.30m/yr. * 85yr.) = 26.85-meters

*0.30m/yr. is a conservative assumption based on the NPCA Management plan (Baird, 2009)

Erosion Hazard Limit = 38.85-meters

Erosion Hazard Limit with New Breakwall Installed (75-year Design Life):

Erosion Allowance with New Breakwall = (0m/yr * 75yr) + (0.30m/yr * 25yr) = 7.5m

Erosion Hazard Limit with New Breakwall = (12m+ 7.5m) = 19.5-meters

Sincerely,

Rankin Coastal Engineering

Thomas Robertson, P.Eng.