Balls Beach Shoreline Protection Presentation

Brett Ruck Environmental Services Supervisor Irrigation & Drainage Superintendent

COTW - General Monday, August 23, 2021



Agenda

- Shoreplan Engineering Presentation
 - Jane Graham, P.Eng.
- GEI Consultants Presentation
 - Peter Ventin, P.Eng.
- Daniel & Partners LLP Questions & Answers
 - Callum Shedden









Dock Area Parkette Shoreline Protection Presentation to Council August 2021

Background

In 2005, Baird reviewed the shoreline conditions at the Dock Area Parkette and prepared conceptual designs for the shoreline protection, including this figure from their report



Figure 4.1 Preliminary Preferred Concepts

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Later, a variation of the preferred alternative including two smaller offshore armour stone breakwaters was constructed to protect the shoreline.

High water levels on the Lake in 2017 caused erosion of the existing shore and threatened the historical culvert.



Dock Area Parkette Shoreline Protection Presentation to Council August 2021

Detailed design was completed between 2017 and 2019.

In August 2020, construction of the breakwater was completed.

On March 15, 2021, we were notified that the breakwater was damaged.



Dock Area Parkette Shoreline Protection Presentation to Council August 2021

March 23, 2021

A sounding survey was carried out to determine the river bottom elevation and compare to the contours from the original survey.

Significant scour was observed offshore of park.



3 to 7m below surface 1 to 3m below surface 0 to 1m below surface 0 to 2m above surface

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Niagara River Average flow is 5700m³/s. Maximum flow is 9800 m³/s.

In November 2020 and February 2021, record high flows were recorded at Fort Erie gauge.

No data is available from the end of February to April.

Real-Time Hydrometric Data Graph for NIAGARA RIVER AT FORT ERIE (02HA013) [ON]



COVID-19: We continue to ensure the delivery of critical services. Operating within Public Health Restrictions may result in impacts to the real-time or annual published record.

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.





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November 15 to 16, 2020, a storm surge (+3.0m) event happened on Lake Erie which coincides with the record high flows recorded at Fort Erie gauge.





March 12 to 13, 2021, a storm surge event happened over a number of hours on Lake Erie which coincides with the missing data at the Fort Erie gauge.

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Recommended realignment of breakwater



Ball's Beach Headland Assessment – June 2021

August 23, 2021

Assessment

- Assessment Team
 - Ron Bourne, P. Eng 30 years
 - Darren Dhiems, P. E. 27 years
 - Peter Ventin, P. Eng 25 years
 - Liela Pike, P.E. 8 years
- Representative Active Projects
 - Toronto Port lands Flood Protection Don River
 - City of Detroit Detroit River Coastal Protection
 - Sault St Marie US Corp of Engineers St Marys River



Assessment

- Complex hydraulic zone with riverine and coastal interaction.
- Flow volumes average 5,700 m³/s
- Historical maximum flow rate of 9,800 m³/s (100-year event).
- Extreme flow rates of 12,700 m³/s (Nov. 2020)
- Near record high lake levels.
- Transition of Zone of interaction.



- 1. Ensure public safety.
- 2. Implement monitoring of existing headland (this recommendation was superseded by the retrieval of the stone blocks and relocation closer to shoreline).
- 3. Conduct modelling to investigate cause and effect of rapid erosion under changed circumstances.
- 4. Prepare a design which provides details on the most efficient way to either repair, replace or move the headland feature to prevent future scour and erosion from occurring.

