



BLUFFER'S PARK SOUTHWEST HEADLAND AND BEACH MAJOR MAINTENANCE

Community Liaison Committee Meeting
December 7th, 2017



OVERVIEW

Bluffer's Park southwest headland and adjacent beach are currently eroding and are in poor condition.

Toronto and Region Conservation Authority (TRCA) is undertaking a Class Environmental Assessment (Class EA) for Remedial Flood and Erosion Control Project at Bluffer's Park.

The objectives of this CLC meeting are:

- To present an overview of the Class EA process
- To present an overview of the project
- To present alternative solutions
- To obtain your input and comments

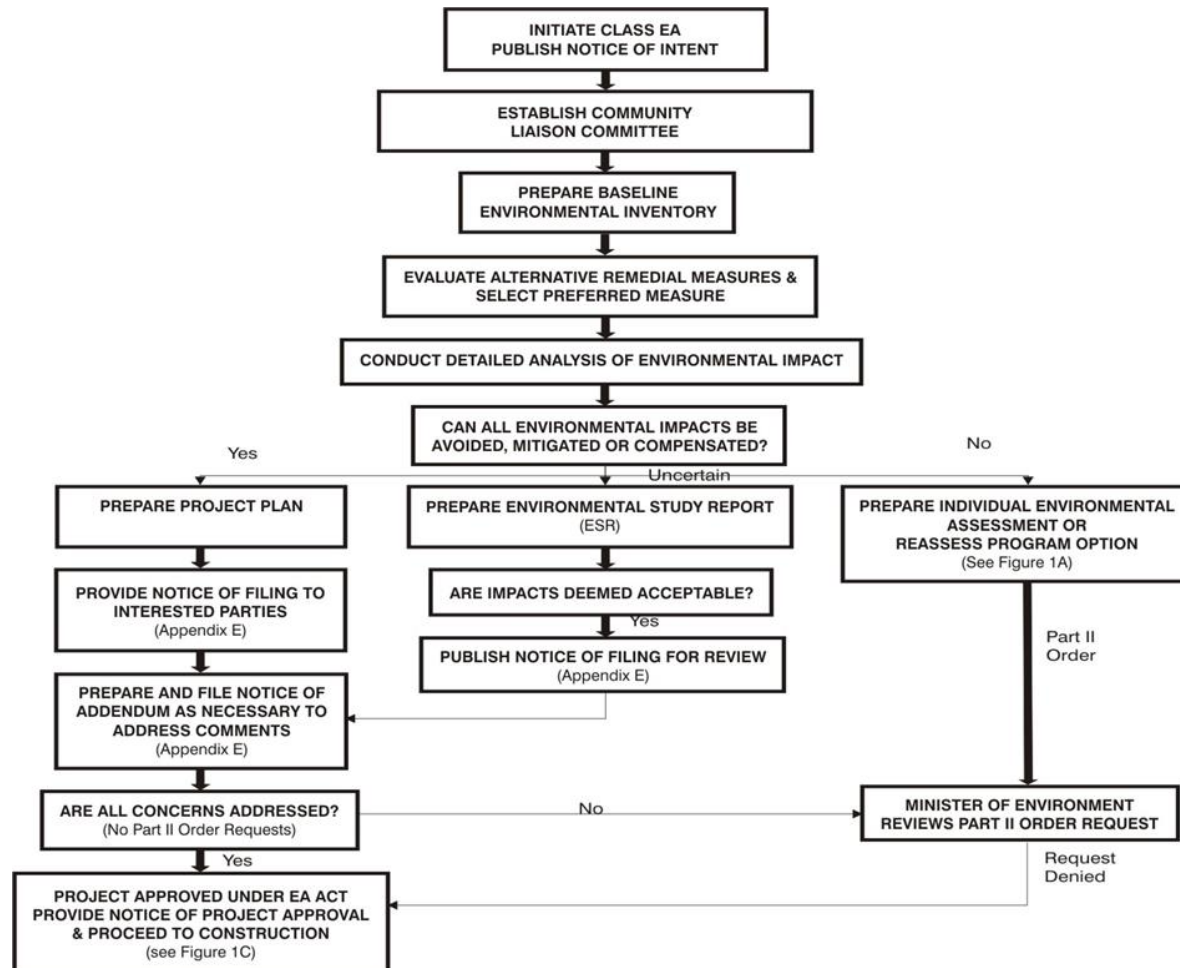


PROJECT OBJECTIVES

- Protect the shoreline fronting Bluffer's Park Marina and prevent/reduce further land loss
- Provide a long term, low maintenance and cost-effective solution with minimal disturbance to park users
- Protect and improve public safety



CLASS EA PROCESS





STUDY AREA





STUDY AREA



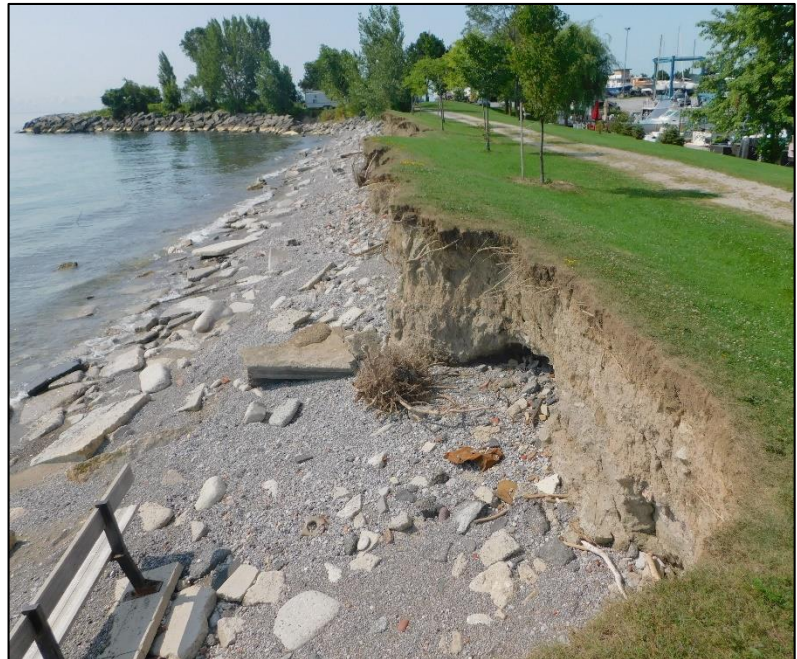


STUDY AREA



HEADLAND

BEACH





SITE BACKGROUND

Headland

- Armourstone protection - 165 m long, 31 m wide
- TRCA assessed as 'failing' or 'failed' since 2009
- Erosion visible along the east and west flanks of the headland
- Toe instability, lack of sufficient double-layer of armourstone, lack of sufficient filtering layer beneath armourstone
- Significant damage observed at the head of structure with washouts behind the crest
- Interim maintenance work was carried out in December 2016.





SITE BACKGROUND

Headland – Interim Maintenance (2016)

- Void area above headland was backfilled with armourstone
- The material used can be re-used during the final maintenance of the structure

BEFORE



AFTER





SITE BACKGROUND

Beach

- Cobble-sized material backed by access berm. 194 m long, 6 m wide (at construction)
- West end of beach is backed by rip rap slope
- Middle of beach has actively eroding sandy backshore
- East end beach is backed by stone curb
- TRCA assessed as 'failing' or 'failed' since 2009
- Lack of coarse material to provide stability
- Beach is too narrow to effectively dissipate waves





SITE BACKGROUND

Beach

- Between November 2016 and August 2017, there was enough erosion to cause a bench and at least 5 large trees to fall

NOVEMBER
2016



AUGUST 2017

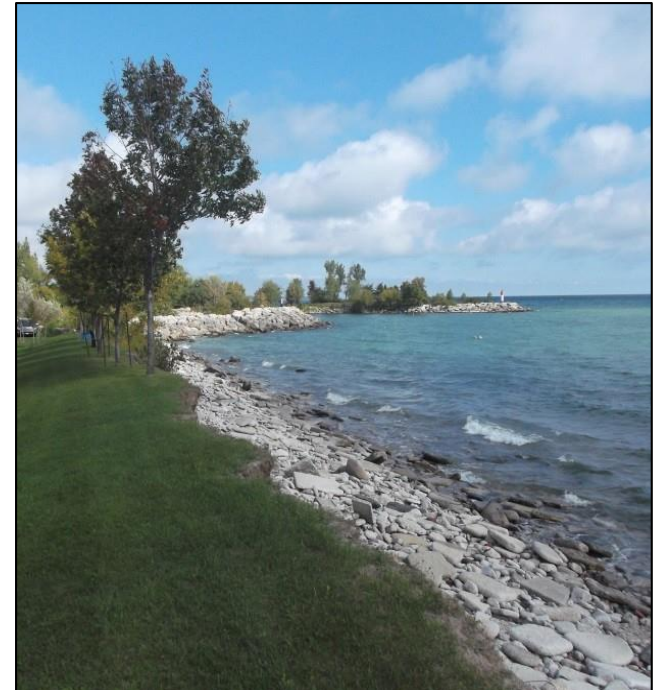




TERRESTRIAL AND AQUATIC HABITAT

Natural Heritage Features and Functions

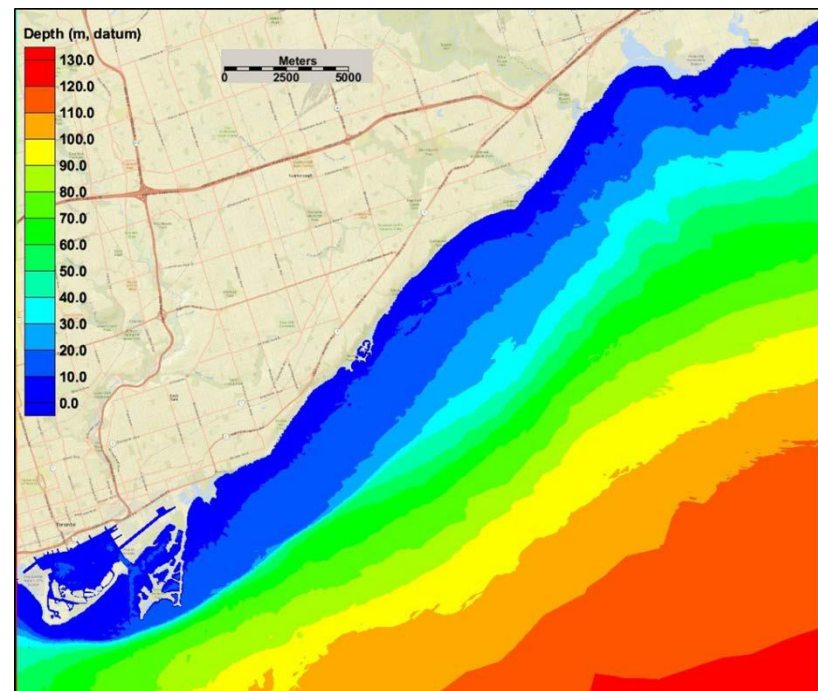
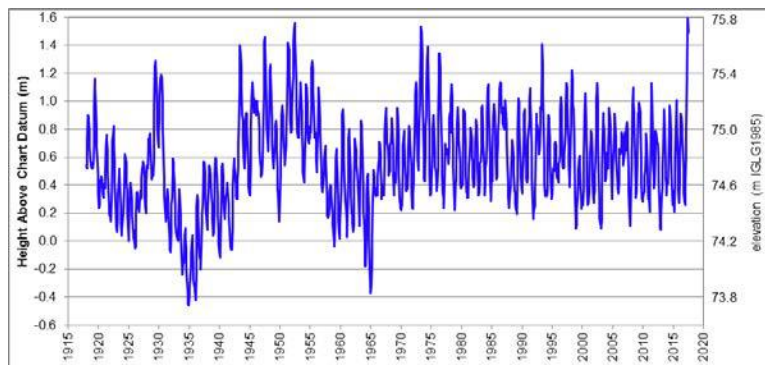
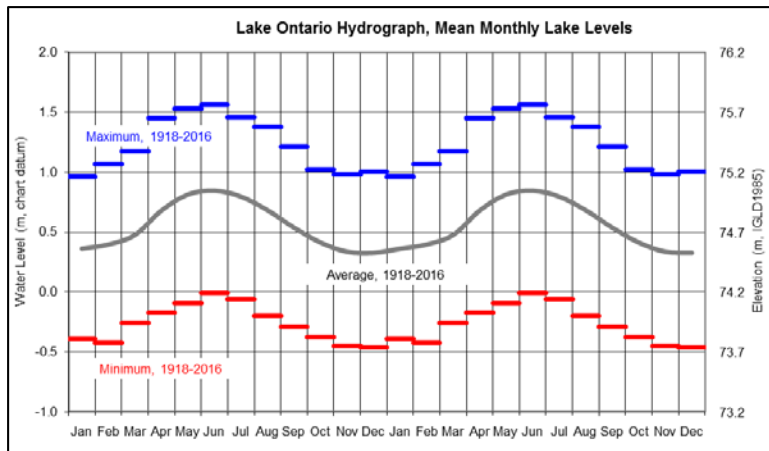
- Terrestrial vegetation is a mixture of manicured landscape plantings and vegetation which has colonized naturally.
- Trees provide nesting habitat for common birds.
- Nearshore aquatic habitat is dominated by sand, cobble/gravel substrates and scattered boulders.
- No aquatic macrophytes (vascular plants).
- Structural fish habitat (cover, niche spaces, etc) is sparse.
- Large fish, including sportfish, may forage in the study area.
- Some benthic fish species may spawn in the study area.





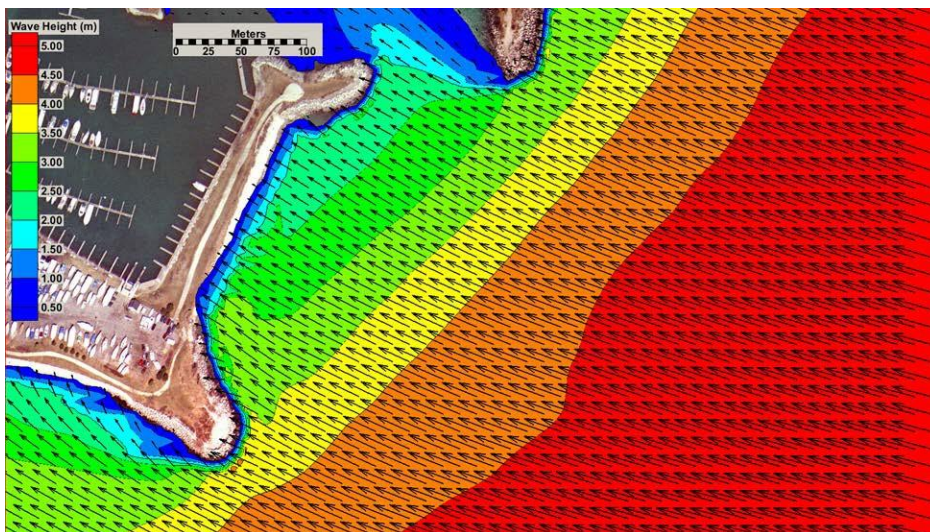
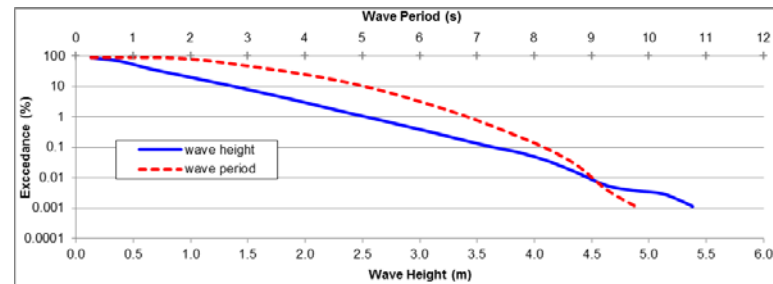
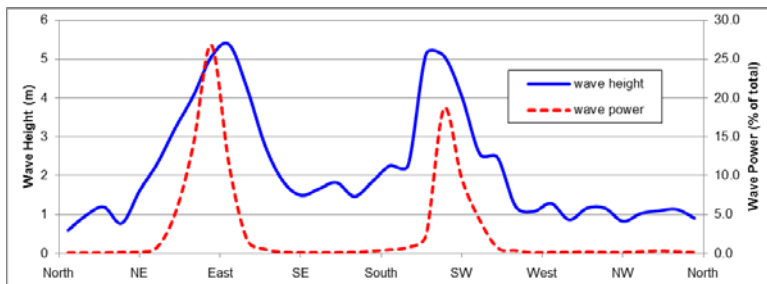
COASTAL CONDITIONS

Water Levels and Bathymetry

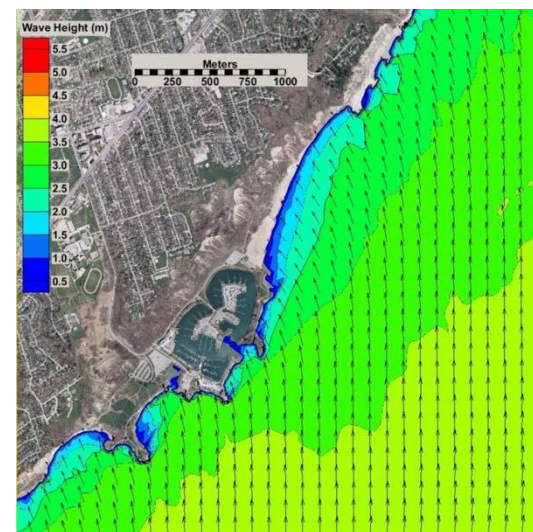




COASTAL CONDITIONS



100-year Easterly Wave Condition



100-year Southerly Wave Condition



ALTERNATIVE SOLUTIONS

Headland

1. Do nothing
2. Reconstruct headland
3. Repair headland

Beach

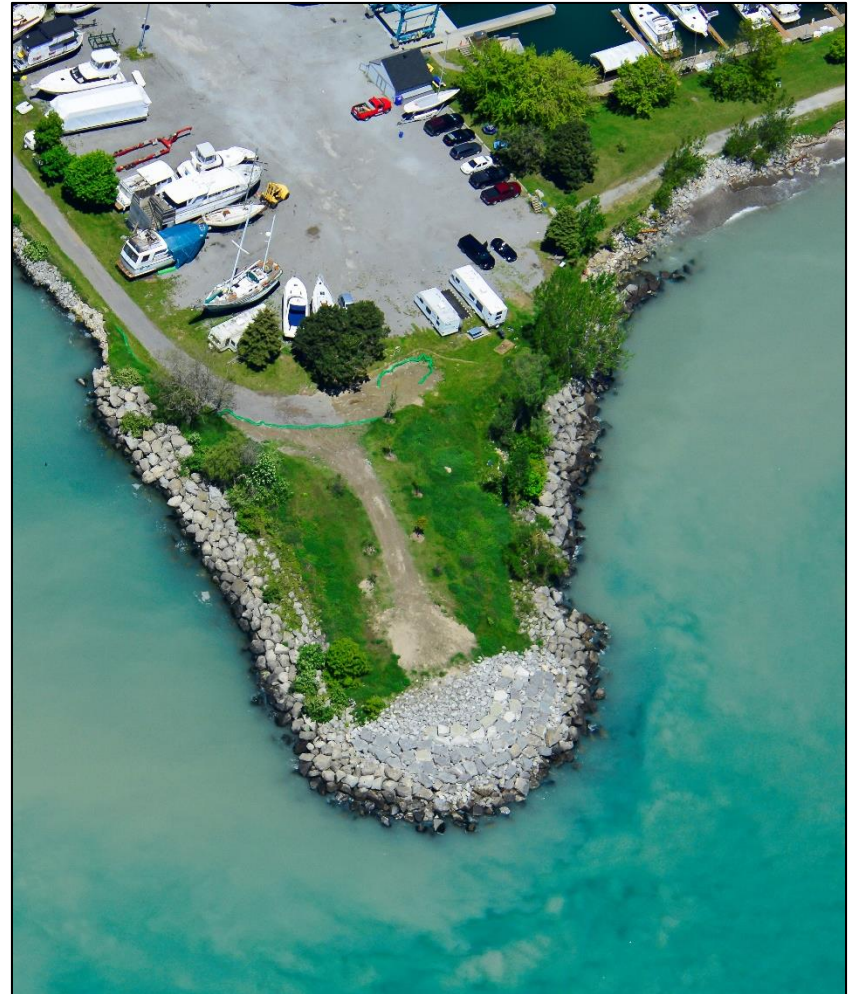
1. Do nothing
2. Armourstone revetment
3. Cobble beach with optional shoal



ALTERNATIVE SOLUTIONS - HEADLAND

1) Do Nothing

- Existing appearance and views will be unchanged
- Continued flooding of backshore and damage to headland during normal storm events
- Requires restricted access to headland
- No capital cost
- High maintenance costs repairing damage to backshore

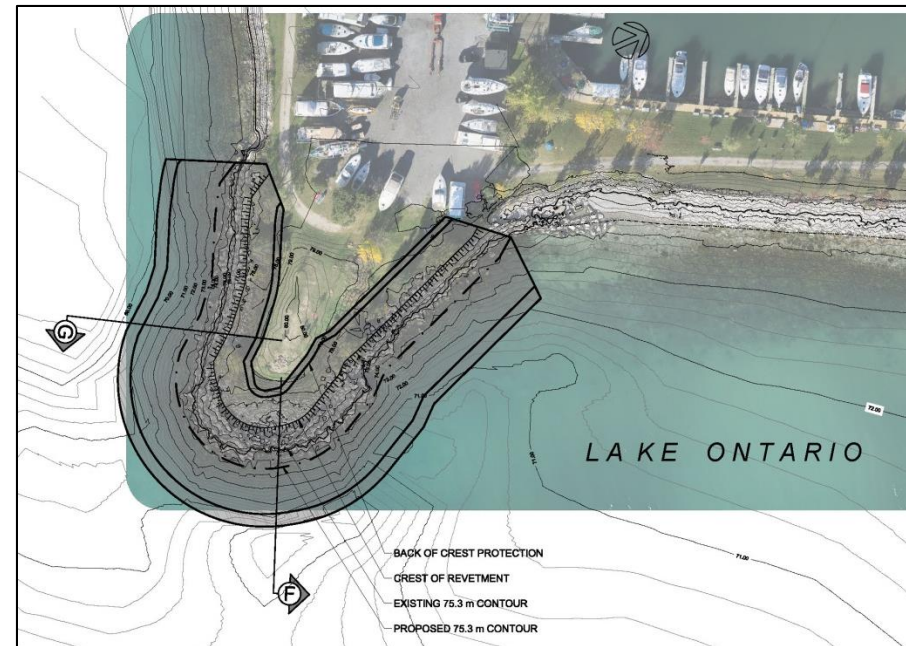
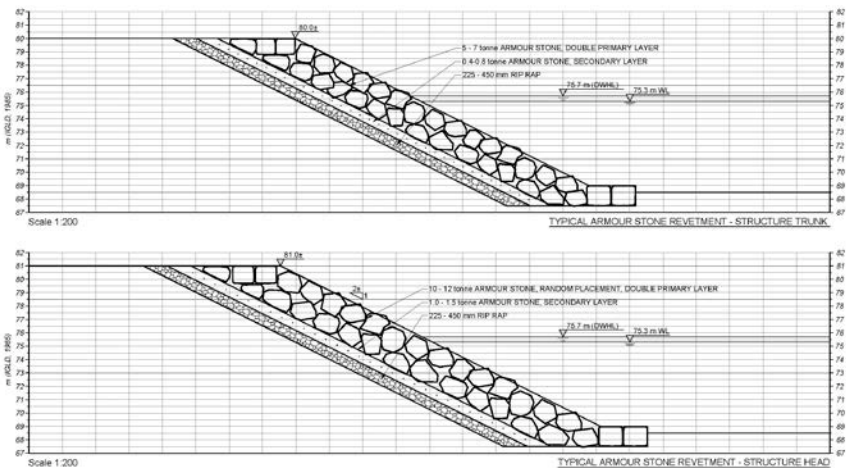




ALTERNATIVE SOLUTIONS - HEADLAND

2) Reconstruct Headland

- Replaces the shoreline protection along headland shorelines
- Raises crest height of structure
- Opportunity to enhance terrestrial and aquatic habitat
- High capital cost, low maintenance costs

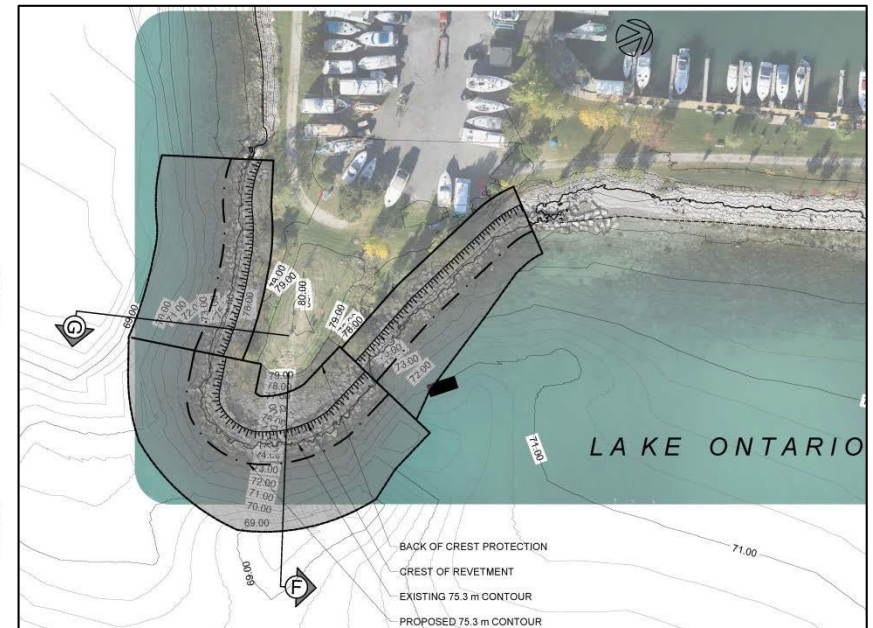
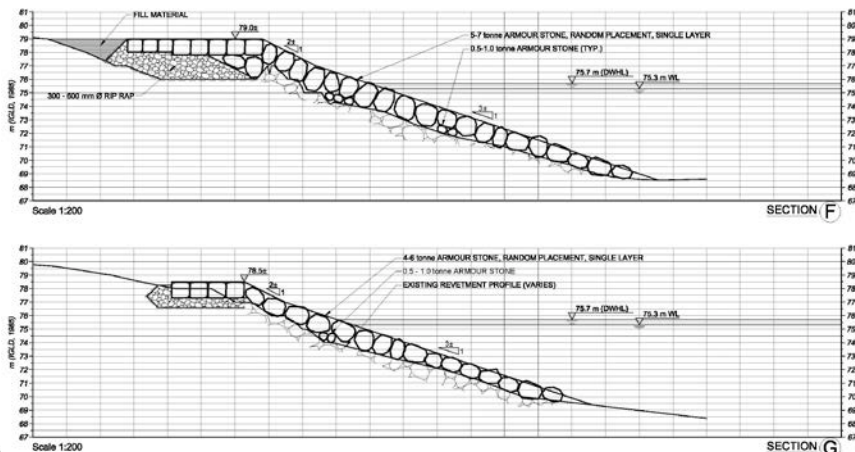




ALTERNATIVE SOLUTIONS - HEADLAND

3) Repair Headland

- Repairs existing shoreline protection along headland shorelines by placing a second layer of armourstone over existing structure
- Armourstone crest extends further into land to reduce damage due to wave overtopping
- Maintains existing structure slopes and crest height
- Potential for minor damage to headland after extreme storm events
- Moderate capital cost, moderate maintenance cost





ALTERNATIVE SOLUTIONS - BEACH

1) Do Nothing

- Existing appearance will be unchanged
- Continued erosion of bank behind beach with possibility of breaching
- No access to the water along beach area because of high bank
- Existing path will need to be relocated and trees will be lost
- No capital cost
- High maintenance costs repairing damage to backshore





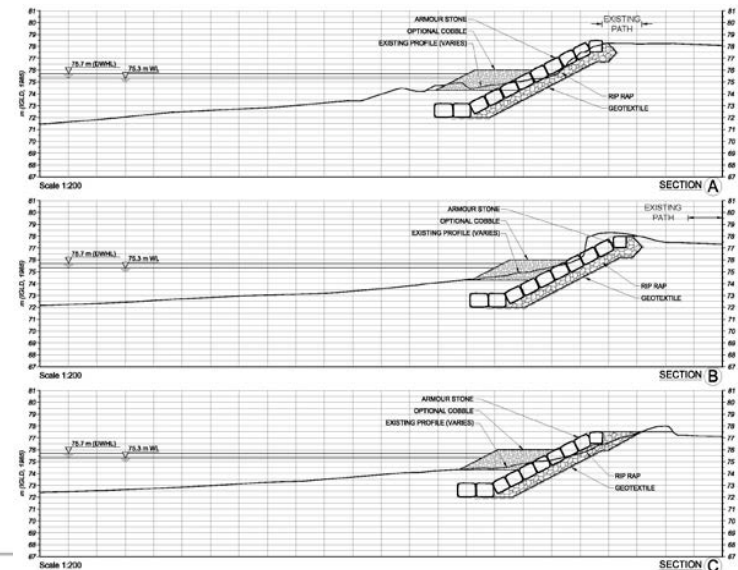
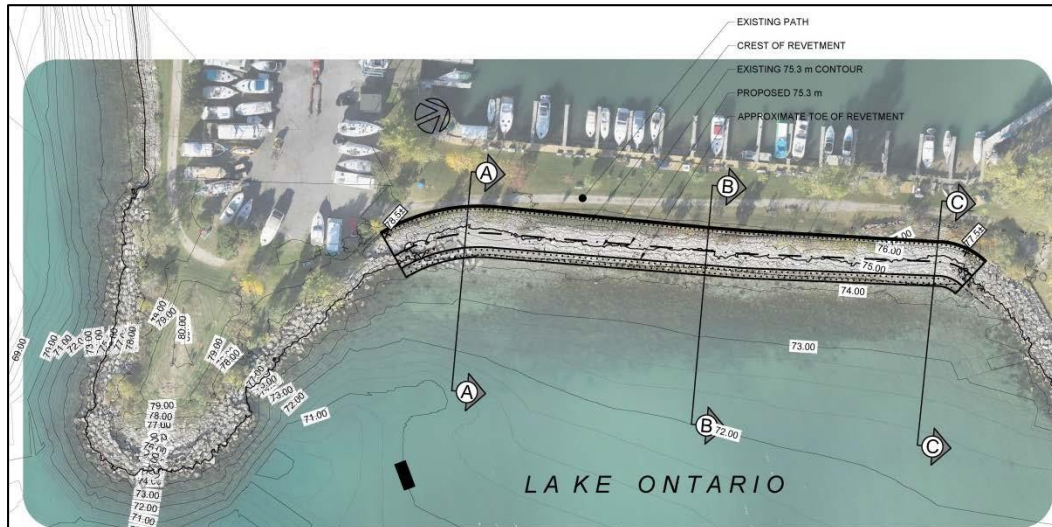
ALTERNATIVE SOLUTIONS - HEADLAND

2) Armourstone Revetment

- Armourstone structure with crest at or somewhat higher than the existing bank
- Optional cobble berm covers toe of the revetment
- Protects eroding bank
- Current location of path and vegetation is maintained
- No access to the water over the revetment
- Moderate to high capital cost, low maintenance costs



Example of an armourstone revetment





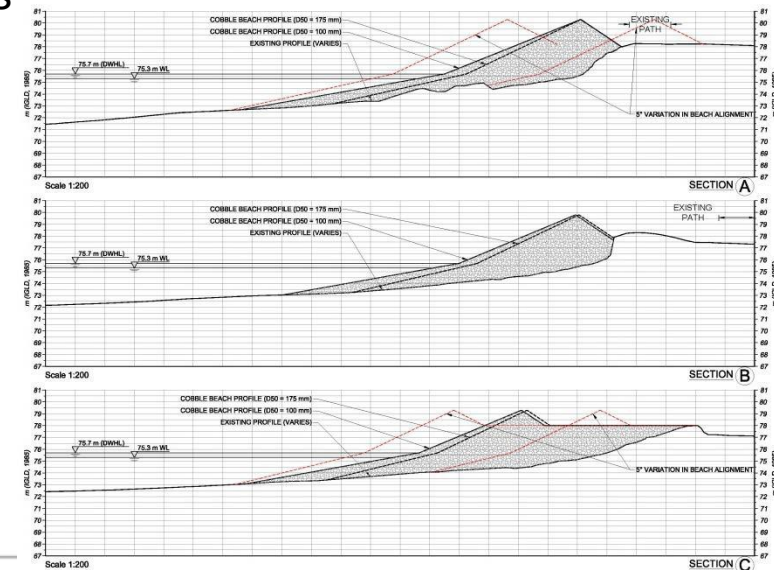
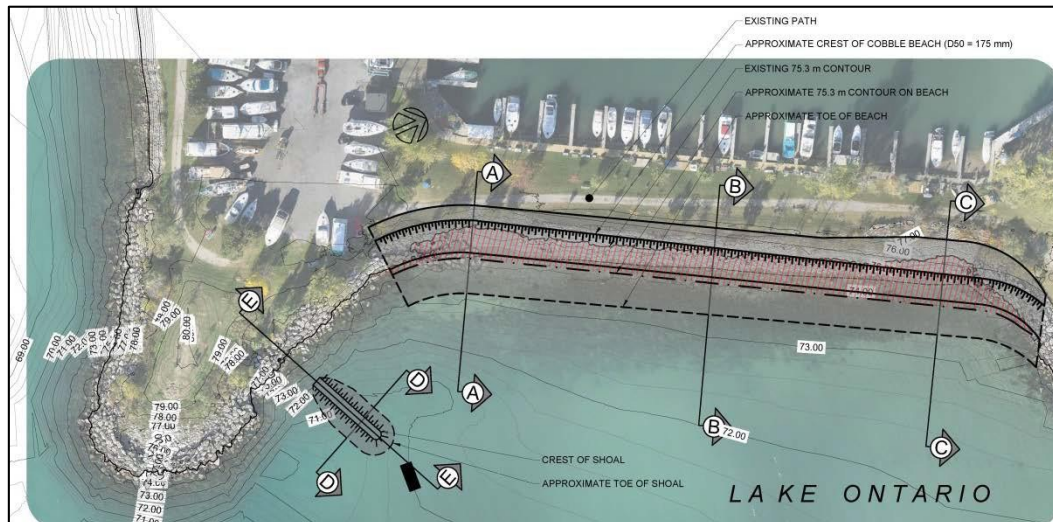
ALTERNATIVE SOLUTIONS - HEADLAND

3) Cobble Beach with Optional Shoal

- Large berm of cobble placed along the shoreline reshapes with wave action
- Beach will shift based on storm direction
- Cobble material may cover crest of bank after storm events at high water level
- Access to the water over cobble beach material
- Moderate capital cost, moderate maintenance costs



Example of a cobble beach





EVALUATION CRITERIA

Criteria	Rationale
Natural Environment	
Aquatic Habitat	Alternatives that improve the quantity and quality of aquatic habitat are preferred.
Terrestrial Habitat	Alternatives that improve the quantity and quality of terrestrial habitat are preferred.
Vegetation	Alternatives that minimize tree and vegetation removal or preserve vegetation are preferred.
Socio-cultural Environment	
Pedestrian Access to the Waterfront	Alternatives that provide opportunities for pedestrian access to the waterfront and improve accessibility are preferred.
Aesthetics	Alternatives that provide a positive change to appearance are preferred.
Disturbance to Public	Alternatives that that limit disturbance to public park usage are preferred.
Economic Environment	
Capital and Maintenance Costs	Alternatives with the least relative capital and maintenance costs are preferred.
Life Cycle	Alternatives with long life cycles are preferred.
Technical and Engineering	
Erosion Protection	Alternatives that provide stable slopes and reduce erosion are preferred.
Flood Protection	Alternatives that reduce flooding are preferred
Land and Lake Bottom Requirements	Alternatives that can meet project objectives with minimal land and lake bottom occupation are preferred.
Agency Acceptance	Alternatives that have the potential to be approved under regulating Acts and permits from local, regional and/or federal government are required.
Design	Alternatives that are standard designs are preferred.
Constructability	Alternatives that meet the objectives of the project with the least difficulty are preferred.



PRELIMINARY PREFERRED ALTERNATIVE - HEADLAND

Repair Headland

- Implementation cost is significantly lower than the 'reconstruction' option while providing a comparable maintenance and design life
- Constructability significantly greater. Reconstruction would require marine based equipment for much more of the work and would involve a crane rather than simply an excavator



PRELIMINARY PREFERRED ALTERNATIVE - BEACH

Revetment

- Moderate to high implementation cost with low maintenance cost
- Less aquatic habitat loss below the high water level
- This level of habitat loss will likely negate the need for DFO Authorization
- Provides erosion protection with no access to shore

Cobble Beach

- Moderate implementation cost with moderate maintenance cost
- More aquatic habitat loss below the high water level
- This level of habitat loss will likely require DFO Authorization
- Provides erosion protection with access to the shore
- Cobble material may need to be removed from path following storm events



NEXT STEPS

- Comment sheets due - December 21, 2017
- Bring alternatives to Aquatic Habitat Toronto for comment – January 2018
- Confirm preferred alternative – February 2018
- Complete ESR/PP – March 2018
- Circulate report for review – March/April 2018
- Finalize designs – May 2018