Flood Control for the Westside Marsh in Port Darlington, ON

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Problem Description & Background

- High flood risk for Port Darlington shoreline community between Westside Marsh and Lake Ontario
- In Spring 2017 about 40 homes on Cedar Crest Beach Road experienced flooding, septic fouling, and well contamination
- Road currently overtops during 2-year storm event
- Existing overflow channel is non-functional
- Blue Circle Cement expanded quarry into 40% of the marsh
- Degradation of marsh and creek conditions have affected the wetland's ability to effectively store and convey floodwaters
- Marsh currently drains through barrier beach outlet and requires manual breakage during significant storm events

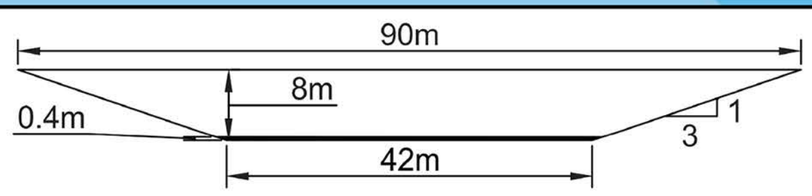
Objectives & Scope

- Design a flood control that prevents overtopping of Cedar Crest Beach Road for up to 100-year storm events
- Use HEC-RAS to evaluate the final design solution and provide CLOCA with accurate models for future site works

Final Design Solution

Overflow Channel
- Trapezoidal cross-section
- Short grass lining (n = 0.023)
- 263 m length

Weir:
- Broad-crested concrete weir
- Designed to release >5-year storm
- 1 m length



Conclusions & Recommendations

- Final design solution would effectively prevent overtopping of Cedar Crest Beach Road during a 10-year design storm
- Raising Cedar Crest Beach Road by 0.5 m at a few small sections would provide a free board of 1 ft during a 100-year storm event
- Implement restoration strategies for the Westside Creek and Marsh to further control flooding
- Model the Westside Marsh as a 2D area using HEC-RAS to improve model accuracy

Return Period	Water Surface Elevation at Road with Existing	Water Surface Elevation at Road with Final Design
2-year	75.91	75.73
5-year	76.06	75.85
10-year	76.14	75.91
25-year	76.23	75.99
50-year	76.29	76.05
100-year	76.37	76.10

Water surface elevation: fully under road | partially under road | fully overtopping road

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