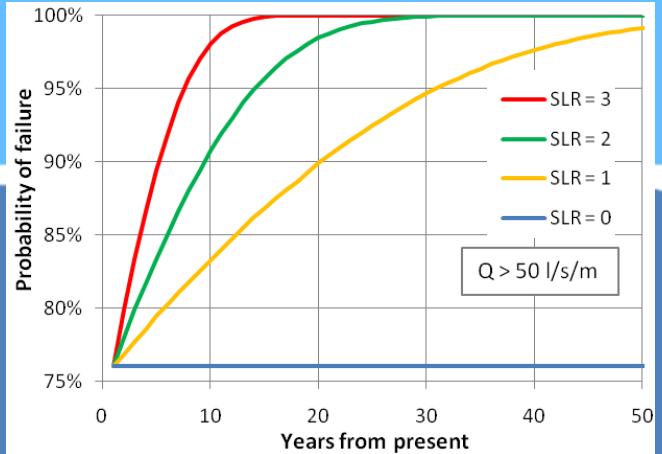




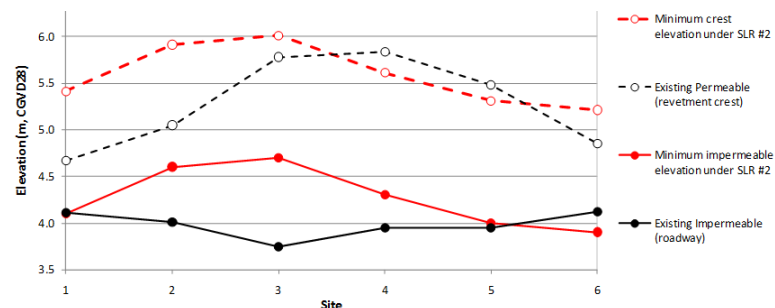
PROJECT DESCRIPTION

Storm damage to the causeway and roadbed at Cow Bay, NS is an ongoing maintenance issue for the Halifax Regional Municipality (HRM). The exceptional severity of recent storms, including Hurricane Juan, post-tropical storm Noel, and the storm of January 2nd, 2010, have prompted an examination of the strategy for long-term maintenance of the causeway. In response to this, Coldwater Consulting Ltd., was contracted by HRM to assess existing and future conditions along the causeway and to provide recommendations for future protection and/or maintenance works.

DESIGN APPROACH

The design of the repair strategies required assessment of the wave climate at the site, including expected storm conditions that may affect the stability of the revetment as well as less severe, but more frequent wave conditions that affect the operational performance of the roadway. Coldwater undertook field surveys of the structure and nearshore bathymetry surveys. After detailed analysis of the offshore wave conditions and surge conditions, numerical modeling was used to determine design conditions at the shore. The revetment characteristics and modelled design conditions were then used in Coldwater's CIAPS (Coastal Infrastructure Adaptation Planning System). CIAPS optimises a design by minimizing total coast (capital cost + long-term repairs) under various sea level rise scenarios using a probabilistic approach.

The analysis produced a design that involved re-building the armour stone causeway to provide a consistent 3-stone wide crest and construction of an impermeable barrier landward of the crest. Cost savings were achieved by optimizing the structure elevation along its length.



Results of a CIAPS analysis to optimize crest elevations for the entire structure's length under IPCC sea level rise scenario AR4

CLIENT

Halifax Regional Municipality
Halifax, NS

LOCATION

Cow Bay, NS

DATE

2009-2011