Lehman Creek Breakwater Rehabilitation
Information Report
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August 2016

Introduction

The Lehman Creek Breakwater located at the outlet to Jackfish Lake from Murray Lake near North Battleford is intended to minimize siltation of the creek outlet and thereby support; efficient conveyance of water through the creek, fish and fish habitat, attenuate effects of flooding upstream of the breakwater, and enhance navigation characteristics between the two lakes. The breakwater is currently considered to be in poor condition, particularly the western portion of the structure and is in need of rehabilitation. The report describes, for information purposes only, the estimated cost of rehabilitating the breakwater and offers comment for the furthering of a project for its rehabilitation.

The report is developed in response to an informal request from Harvey Walker, Mayor, Resort Village of Cochin and is intended to provide information only to the Resort Village of Cochin Council.

Rehabilitation and Cost Estimate

For the purposes of this report it is assumed the breakwater would be rehabilitated to re-establish the original function of the structure. The breakwater in its current condition is illustrated in the photos within this report. As the photos show the original works have deteriorated and eroded. Rehabilitation includes constructing a cutoff wall using sheet steel piling, concrete anchors and re-establishing original lines and grades using a combination of granular fill, geo-textile filter fabric and rock rip rap.

A series of estimated measurements were used to develop a plan view and typical cross-sections of the structure in its existing condition. A typical rehabilitated cross-section was then overlaid on the existing cross-sections to allow the estimation of required material quantities. Unit costs for the required materials were applied to the resulting material volumes to develop the materials cost estimate. Engineering, environmental, and contingency values were then added to establish the estimated project cost.

The typical cross-sections, plan view and results of the cost estimation are described in the following pages of this report.

The total estimated cost of the project including engineering (design and construction supervision), environmental management, materials, and construction is $500,000.

Scheduling of this project would need to consider time lines impacted by the need for project management, funding, environmental assessment, engineering and environmental management, regulatory approvals, contracting for the work, and construction. Assuming funding is available projects of this type typically require a 2 to 3 year time window from planning to construction.

Comments

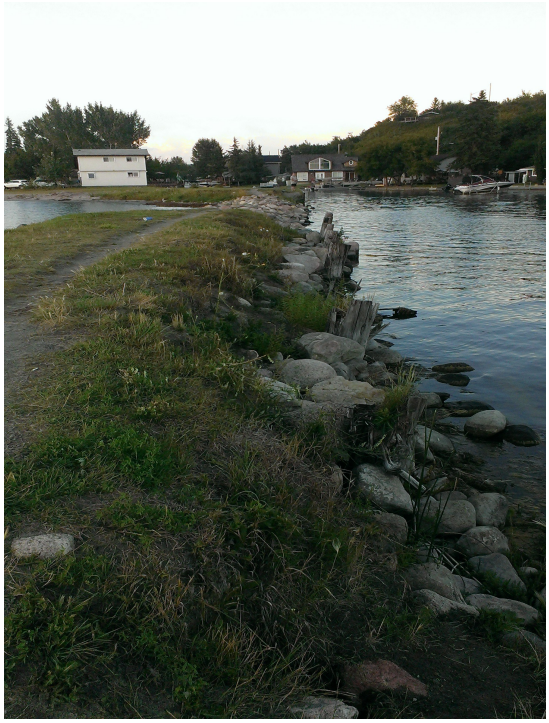
Were council to consider undertaking this project it would be beneficial to be better informed and to consider other back ground aspects including but not limited to the following:

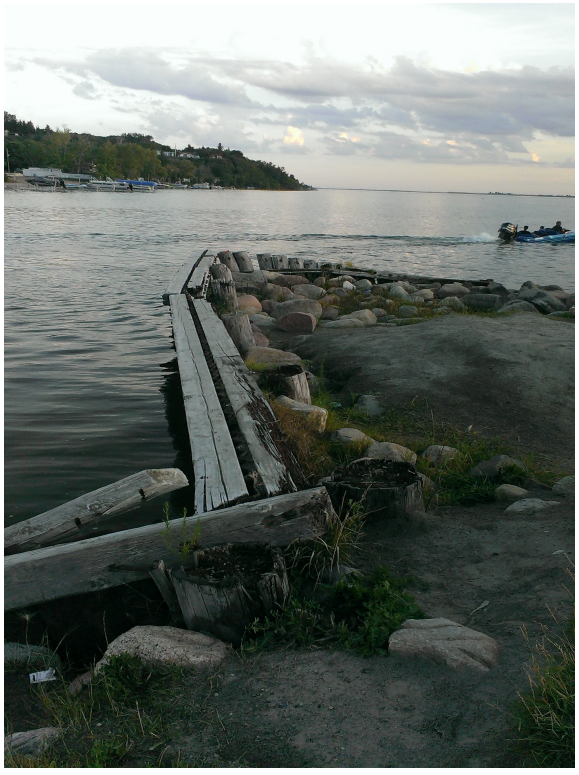
- Determine who owned the structure when it was constructed: province, Canada, partnership?
- Was there a transfer agreement?
- Determine who owns the structure now.
- Who is responsible for the structure's maintenance; the owner or through agreement?.
- Determine what entities may have an interest in the structure now?; RV of Cochin, RM s, Jackfish Lake Watershed Board, Federal or Provincial agencies, First Nations, etc.
- Determine who may (should or could) cost share in the project.
- Identify if any plans of the original structure are available.
- Establish what regulatory approvals exist for the structure.
- Determine what regulatory approvals, plans etc. are required for rehabilitation.
- Determine if there are agencies that may assist in the design, environmental management or construction, or cost sharing.
- Establish the scope of the project the RV is considering; Will the project be rehabilitation only, or will it incorporate other features; ie. Walkway, boat launch, marina, etc.
- Establish a Project Charter to define the scope, schedule and cost parameters of the project, who will champion the project (overall responsibility), who will sponsor (fund), who will do the work, how work will be assigned, etc

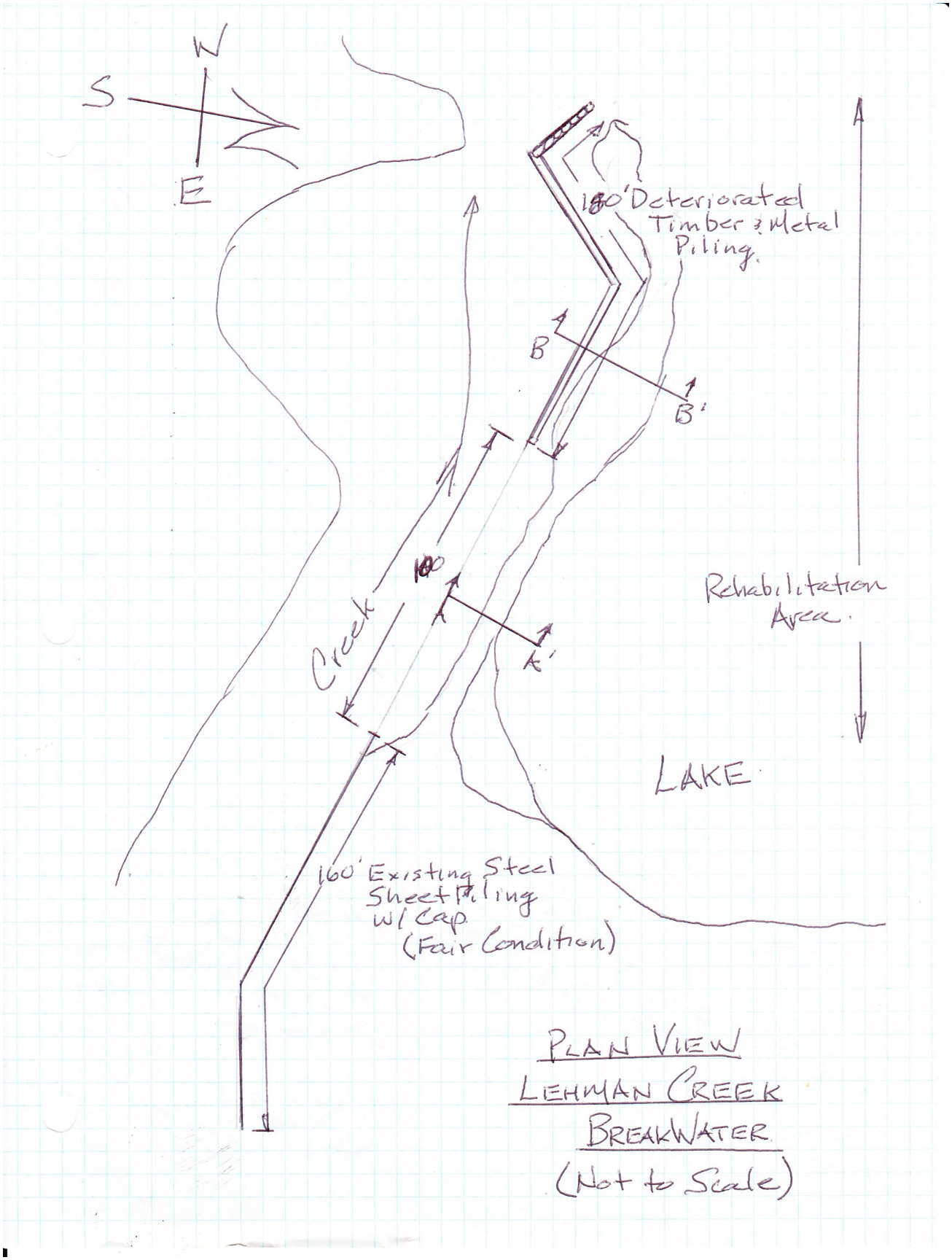
Summary

Projects such as this type of rehabilitation work can be complex, expensive, and subject to a considerable time line. Complex because of the many and varied interests of stakeholders that often take a personal interest in water related issues. Expensive because of the need for work in and around water which requires specialized design, construction knowledge and equipment, and is sensitive to environmental management issues that often carry additional and unforeseen costs. And long time lines over several years (3 years minimum) due to regulatory demands, associated public consultation, determining and acquiring funding and partners, and also to accommodate contracting, construction, and related environmental construction windows.

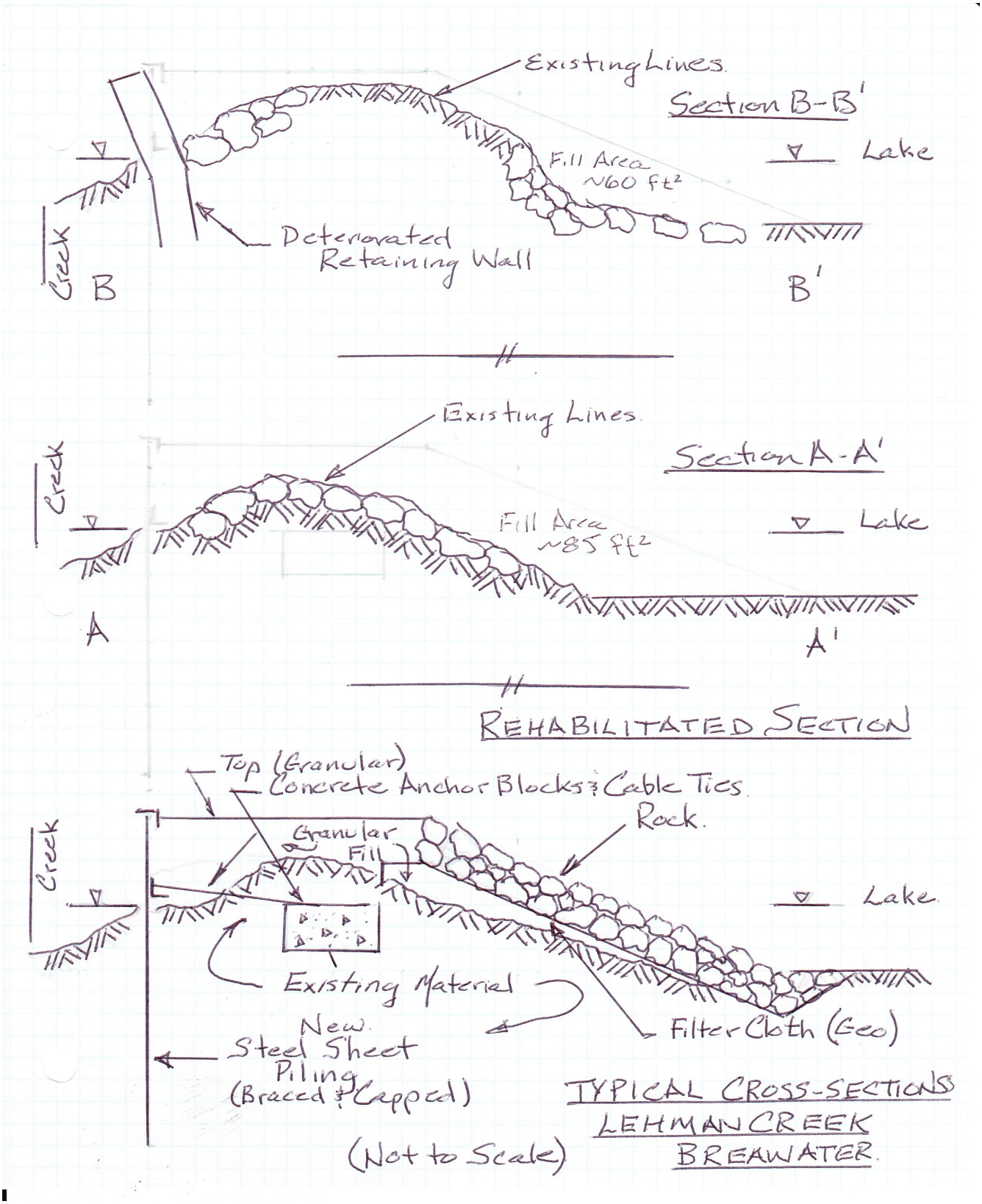
This project is not likely one which the RV of Cochin should or could undertake independently. It will be important to allow adequate time to determine the intricacies, allow for plannig, consultation, design regulatory approvals, and partner and funding development before entering into construction aspects.







PLAN VIEW
LEHMAN CREEK
BREAKWATER
(Not to Scale)



Lehman Creek Breakwater Rehabilitation Cost Estimate

Cost Item	Unit	Unit Cost	Quantity	Extension	Notes
Care of Water (Suspended curtain wall)	sq m	30	200	$6,000.00	1
Granular – Pit Run (Procure and Place)	Cu m	40	110	$4,400.00	1,2
Remove and Dispose Deteriorated Material	m	130	55	$7,150.00	1
Anchor Blocks and Rods (Procure and Place)	cu m	900	10	$9,000.00	3
Rock Salvage?	cu m	0	0	$0.00	
Sheet Steel Piling (Procure and Place)	sq m	600	370	$222,000.00	2
Top Cap and Anchor Rail (Procure and Place)					
Top Cap	m	70	85	$5,950.00	3
Anchor Rail	m	115	85	$9,775.00	3
Bedding Gravel – Granular (Procure and Place)	cu m	50	150	$7,500.00	1
Filter Cloth (Procure and Place)	sq m	3	520	$1,560.00	2
Rock (Procure and Place)	cu m	190	250	$47,500.00	2
Trim & Clean and Remove Sediment Control	m	65	77	$5,005.00	3
Sub-Total				$325,840.00	
Environmental Assessment and Monitoring		5.00%		$16,292.00	
Engineering Design		7.00%		$22,808.80	
Contract and Construction Supervision		8.00%		$26,067.20	
Sub-Total				$65,168.00	
Pre-Contingency-Total				$391,008.00	
Contingencies 30%				$117,302.40	
Grand Total				$508,310.40	

1. Alberta Highways Cost Averaging 2015
2. Recent Contracts (PFRA, WSA)
3. Sourced estimate (phone)