POWELL RIVER SOUTHVIEW BEACH SHORELINE RESTORATION AND ENHANCEMENT

PARTICIPANTS

Owner: Private, Single Waterfront Lot
Engineering & Environmental: Jim Mitchell, PEng, MSc. Emerald Sea Engineering
Contractor: Sorenson and McDonald's construction

TOTAL COSTS

Total cost was $20,000. Design, authorization and supervision cost $5000 split evenly between design/permit and construction supervision. Construction costs were $15,000.

KEY WORDS

coastal erosion control, beach erosion

PROJECT OBJECTIVE

To create a solution to protect the shoreline from erosion in a green manner. Protection of shoreline from wave and ditch runoff erosion, maintain sandy beach and native plants, protect trees

PROJECT LOCATION

15 kms north of Powell River, Southview Beach, Sunshine Coast, British Columbia

PROJECT BACKGROUND

In the winter of 2007-2008, an extreme high tide combined with high wind and waves and high uplands runoff resulted in the drainage channels on either side of the property in joining together and running along the bank in front of the house. It is estimated that 15 to 20 cubic metres of sand was lost and the cottage and a large (4' diameter) fir and cedar (3' diameter) were threatened and could hit the cottage.

OVERALL DESIGN STRATEGY

Two truckloads of 60 cm rounded rock were buried under the sandy beach to act as a backup defense. The idea was to divert the creek runoff away from the bank, protect the roots of the large trees from erosion and to restore the sand beach that was washed away. A couple of loads of clean sand and one to two loads of clean bedding gravel and small rock were used under the large rock. It is expected that the rock would only be exposed during an extreme event and that the site will normally have a naturally accreted sand berm extending up to near the highest tide levels.

EROSION AND POLLUTION CONTROL

We will be working below the Natural Boundary in the 16 to 20 LNT tidal elevation ranges as per the plan and sections. We do not expect that the tides during July will wet the construction area and the existing berm will be maintained to isolate any potential construction runoff from tidal waters. Please note that the sections show the elevation of MHHW, HHWLT and HHXW in LNT datum. Two spill kits were on site.

PLANTING PLAN

Native plants disturbed by construction were set aside and replanted and native plantings enhanced. 150 clumps of beach grasses were replanted as well as some Nootka rose.

LESSONS LEARNED

One of the objectives of this project was to protect the trees, but they have been pounded by driftwood in big storms. Therefore, a few boulders will be placed around the base of the tree for protection. Neighbours on either side have placed wave reflecting large rock structures for their shore protection. The reflected wave action could endanger the soft shore protection in between, or it could create a sediment deposition zone or pocket beach. The Green Shores green example gallery will be a useful tool for convincing neighbouring property owners of the merits and effectiveness of a Green Shores approach. A collective neighbourhood design would increase the overall shore protection effectiveness while reducing the costs, as the design costs are a significant portion of the total costs for a very small project.

coastal strawberry, beach pea, silverwood, yarrow and shore lupine. Backshore plantings: 1 tree/3m^2 & 1 shrub/m^2: shore pine, Douglas fir, arbutus, big leaf maple, Garry Oak, Nootka rose, Saskatoon berry, tall Oregon grape, red flowering currant, snowberry, evergreen huckleberry and oceanspray.

KEY CHALLENGES

The key challenge was project timing. Due to delayed approval, the project had to be constructed in late fall in poor tide conditions and a short work window. Erosion and sedimentation control was therefore more challenging. The work schedule was affected and it was at times necessary to work at night with the available low tides.

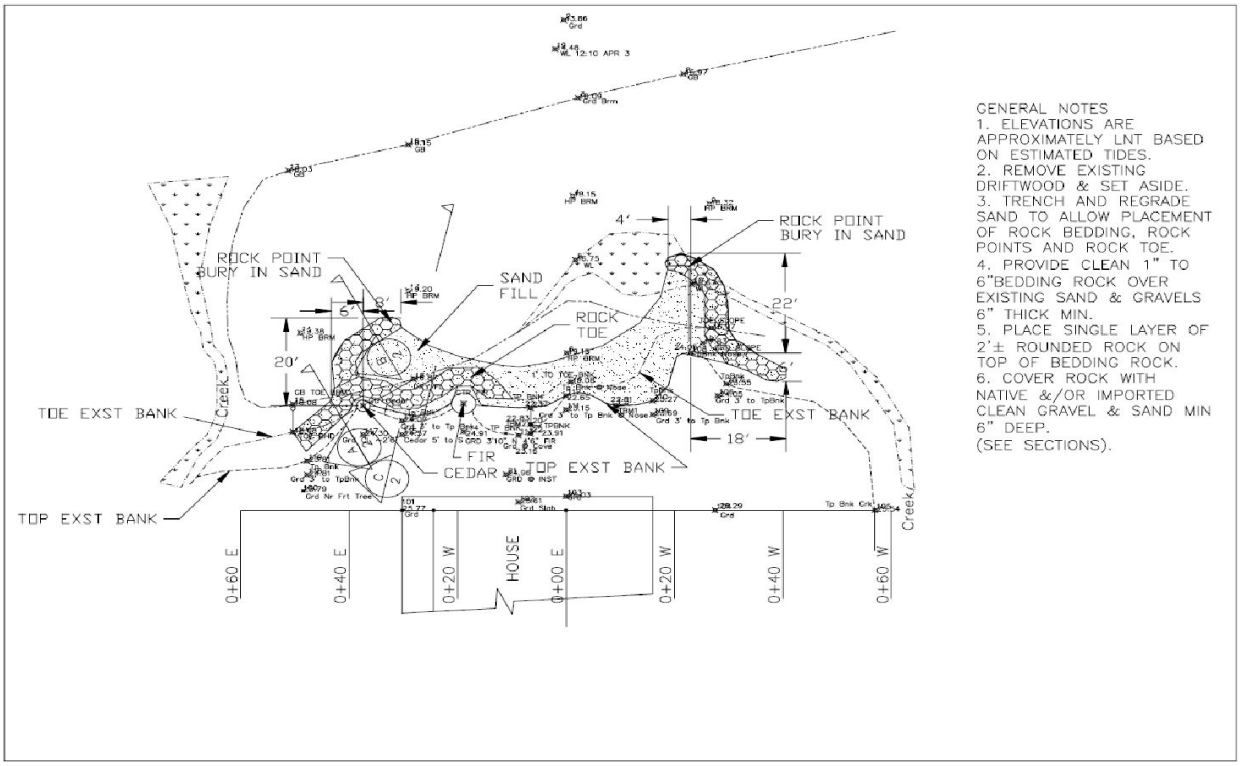
COST

Total cost was $20,000. Design, authorization and supervision was $5000 split evenly between design/permit and construction supervision. Construction costs were $15,000. The materials were ~25 cubic yards clean, larger rounded rock (60cm), 25 cubic yards clean medium to small rounded rock (~half 2" minus and ~half 3" to 12") and 45 cubic yards clean quarry sand. About 50% of the construction cost was material and 50% was equipment and labour.

OUTCOME

The final construction results blended in remarkably with the properties to the west (photos 8) and to the east (photo 9) and appears to be very close to a natural beach and is expected to improve with time. The project has successfully, withstood a few storms as of February 2010. In conclusion, this was a very succesful project. Many thanks to the owners, the Sliammon First Nations and Fisheries and Oceans for allowing this project to happen.

CONCEPTUAL DESIGN
GRAPHICS



GENERAL NOTES
1. ELEVATIONS ARE APPROXIMATELY LNT BASED ON ESTIMATED TIDES.
2. REMOVE EXISTING DRIFTWOOD & SET ASIDE.
3. TRENCH AND REGRADE SAND TO ALLOW PLACEMENT OF ROCK BEDDING, ROCK POINTS AND ROCK TOE.
4. PROVIDE CLEAN 1" TO 6"BEDDING ROCK OVER EXISTING SAND & GRAVELS 6" THICK MIN.
5. PLACE SINGLE LAYER OF 2'± ROUNDED ROCK ON TOP OF BEDDING ROCK.
6. COVER ROCK WITH NATIVE &/OR IMPORTED CLEAN GRAVEL & SAND MIN 6" DEEP.
(SEE SECTIONS).

REVISIONS	BY

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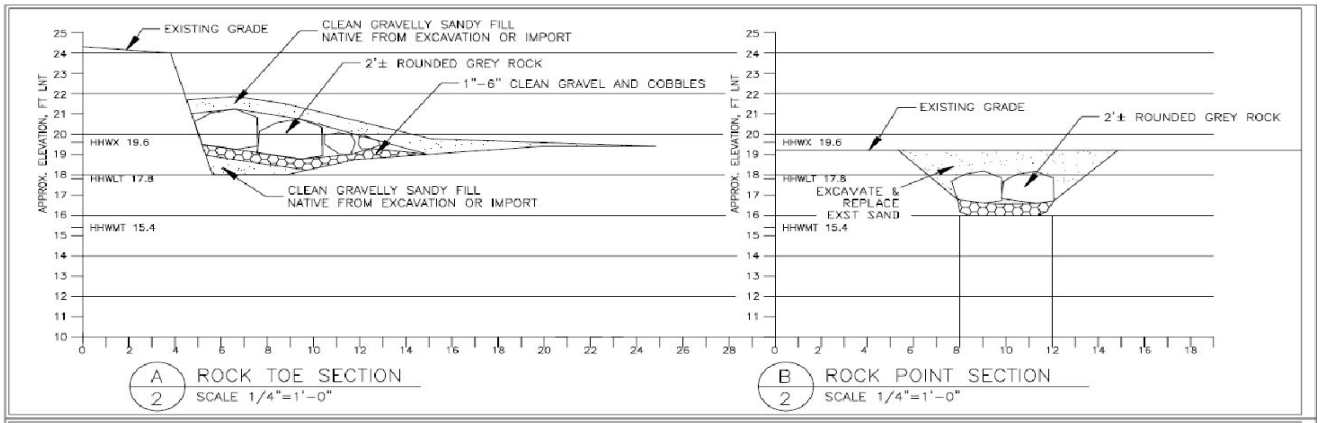
Southview Cottage
Shoreline Restoration & Enhancement – Plan

DATE: 10 Jun 09
Scale: 1/16"=1'
Drawn: JAM
Job: Southview
Sheet 1 of 2 Sheets



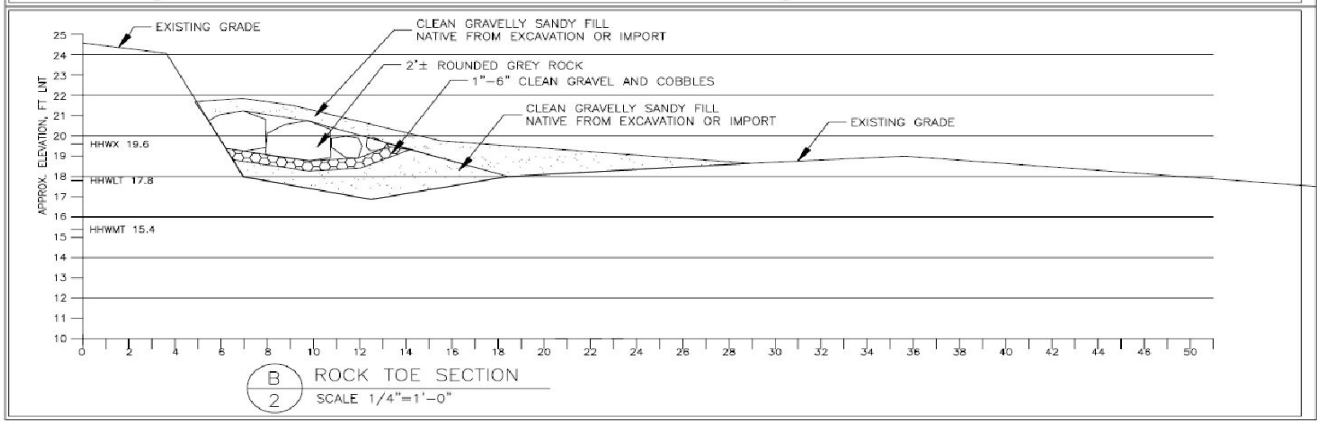


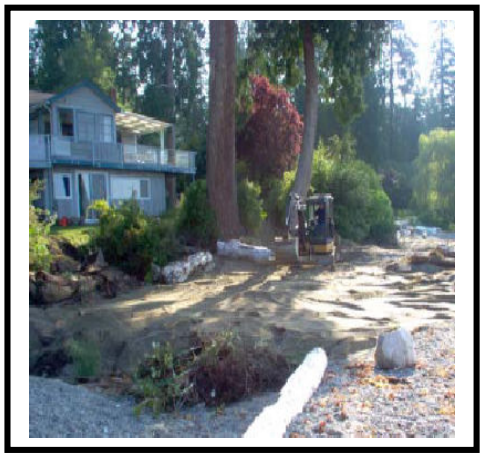
PHOTO DOCUMENTATION:

Pre-Construction



Construction Phase





Post-Construction

July 2009

October 2009 (first storm)

January 2010

Contact for More Information:

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Green Sites, Green Buildings