NANOOSE SHORELINE PROTECTION PROJECT

PARTICIPANTS

Owner: Snaw'naw' as First Nation
Engineering & Environmental: Chatwin Engineering Ltd
Wave Modelling:
Hay & Company Consultants
Contractor: Hazelwood Construction Services Inc.
Sign Design: Schramm Designs
Totem Carving:
Brian Bob, Nanoose First Nation
Funding by: Indian and Northern Affairs Canada

TOTAL COSTS

$610,000 including design, approvals, environmental assessment and construction. $95,000 for five years of monitoring and re-nourishment or replanting if necessary.

KEY WORDS

Storm berms, riparian zone restoration, erosion control, beach rehabilitation, habitat restoration

PROJECT OBJECTIVE

To create a long-term solution to protect the shoreline, especially the sanitary line, from erosion. To restore naturally functioning habitat.

PROJECT LOCATION

Nanoose Bay, east coast of Vancouver Island, British Columbia

PROJECT BACKGROUND

Since 1878 approximately 13 m of the shoreline fronting the Nanoose campground eroded due to high tides and large storm events, threatening a sanitary outfall pipe running across the shoreline in front of the campground and out to Nanoose Bay. The pre-existing beach was gravel in the upper intertidal area with extensive (600m) sand flats below. Upland soils were compacted and the riparian vegetation had been destroyed due to the campers being allowed to park right up to the shoreline. There is a 600m breakwater at the western end of the project area. Intertidal clam beds are located 400-600m from shore.

OVERALL DESIGN STRATEGY

The project rebuilt 300m of foreshore to the 1878 high tide line fronted by a low slope gravel beach and coastal berm to absorb waves and protect the shoreline erosion. The berm was stabilized using logs and natural vegetation. A 5m buffer upland of the berm was planted with natural shoreline vegetation to restore habitat and provide soil stability. Methods also included beach nourishment of 100m of intertidal area at a 10:1 slope, a 300m coastal berm with embedded beach logs, fencing, interpretive signage and access paths. A small, low profile groyne was required at the eastern end to retain the placed beach material.

EROSION AND SEDIMENTATION CONTROL

A 300m floating silt curtain was constructed to enclose the work site to control sediment dispersion during construction of the new upland and beach gravel area. Silt fencing was also installed at the toe of the berm; however, this fencing was destroyed by wave action and a small amount of beach gravel was build up at the toe of the berm to contain fines. This alternative method worked well.

PLANTING PLAN

A total of 4,000 plants were installed and approximately 12'' of top soil was spread as a planting medium over the backshore area. Berm plantings: 2 plants/m^2: dune grass, ambrosia, 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.

LESSONS LEARNED

Two groynes were designed to retain beach nourishment. The groyne planned for the midpoint of the beach, as well as use of embedded lock block (originally planned as final protection of the sanitary outfall) were later deemed unnecessary following further site examination and wave modeling.

OUTCOME

Project construction was completed in 2008. Initial performance has exceeded expectations, and will be monitored for 5 years. A natural crest began to form through the first winter season. A small amount of sand is accreting eastward of the groyne that may contribute to the formation of a small pocket beach fronting the adjacent property.

CONCEPTUAL DESIGN GRAPHIC

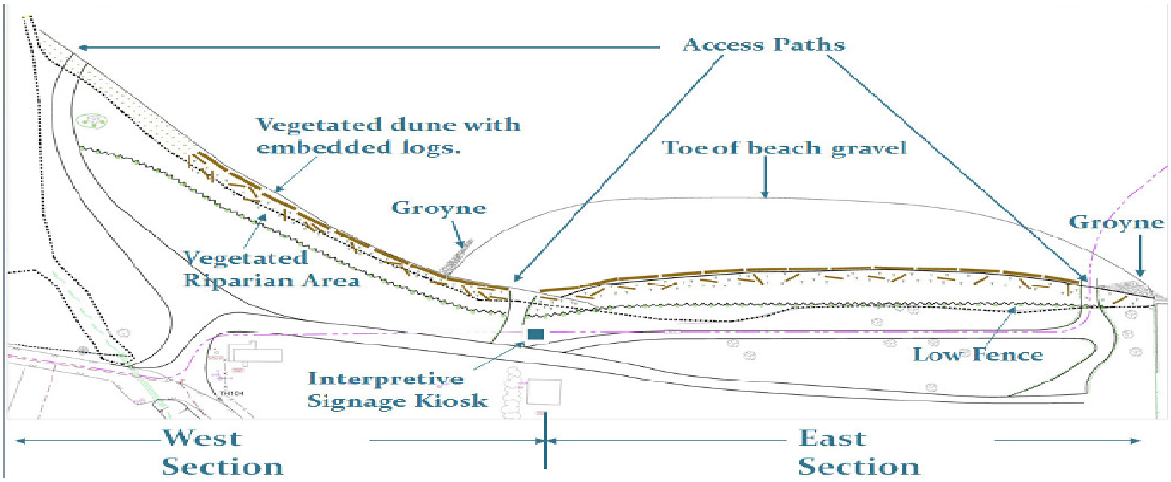

PHOTO DOCUMENTATION:

Pre-Construction



Construction Phase



Post-Construction



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