

Technical Memorandum North Willapa Shoreline Erosion Protection Demonstration Project Engineering Design and Permitting Services Scope of Work and Budget

1. Introduction

The following outlines the scope of engineering services to develop a preferred erosion protection concept, assemble the corresponding engineering design documents, and obtain environmental permits for construction of a small-scale North Willapa Shoreline Erosion Protection Demonstration Project.

A significant section of the shoreline at North Willapa Bay (approximately 6 miles) has been subjected to severe long-term coastal erosion. Figure 1 shows the approximate location of the coastline subjected to erosion.



Figure 1. North Willapa Bay shoreline subjected to long-term coastal erosion

A prior study of this area was initiated by Pacific County and identified major coastal processes controlling shoreline erosion along the North Willapa Bay shoreline (See

Attachment 1 - Presentation at the Willapa Erosion Community Action Now, November 16, 2016). The study delineated the three regions along the coastline with a different complexity of controlling coastal processes and feasibility for shoreline erosion protection measures. The approximate boundaries and brief descriptions for these three regions are depicted in Figure 2.



Figure 2. Preliminary boundaries of three regions at North Willapa Bay shoreline

The study conducted by Pacific County also developed conceptual-level engineering alternative measures for shoreline erosion protection along each of the three regions and provided preliminary cost estimates. It was found that the construction cost of shoreline erosion protection strongly depends on the specific location and scope of design requirements (i.e., durability, frequency of maintenance, environmental benefits, level of risk for flood protection, and other factors), and may be in a range from \$500 to \$3,500 per linear foot of shoreline.

It was also found that due to the complexity of the physical conditions (waves, tidal flow circulation, sediment transport, coastal geology and geomorphology, etc.), limited data on geologic/geotechnical settings, uncertainties with environmental consequences, and a wide-range of predicted construction costs, implementation of a shoreline erosion protection project for the entire coastline (all of Regions 1, 2, and 3) is not feasible at the present time. Instead, a smaller-scale shoreline erosion protection project for design, permitting, construction, and monitoring of a particularly-vulnerable section of Region 2 is proposed as a demonstration project and feasibility step towards a broader solution to the regional North Willapa Bay shoreline erosion problem.

The objectives of this demonstration project are identified as follows:

- Ensure long-term (30 years and longer) shoreline erosion protection for the critical part of the North Willapa Bay shoreline at Region 2 to guard an endangered stretch of SR105 (approximately 1,500 - 3,000 ft) and provide protection for a normal functioning tidal gate that controls water discharge from the cranberry bogs.
- Develop expertise in construction technique and materials requirements and validate the previous Pacific County conceptual-level engineering study for future use in implementation of a regional-scale North Willapa Bay shoreline erosion protection project.
- Develop and implement maintenance and repair requirements for the existing SR105 dike and groin structure to ensure long-term viability and continued function for protecting the highway.
- Develop protocol (masterplan and guidance) for implementation of the next phases (for all three regions) of shoreline erosion protection that minimizes or eliminates adverse environmental impacts and meets state and federal regulatory requirements.

The current document outlines the scope and budget for consulting engineering services to complete preliminary and final design and to obtain all required environmental permits for construction of the small-scale shoreline erosion protection demonstration project at Region 2 of the North Willapa Bay shoreline. The outcome of the proposed consulting services will include final design documents (plans, technical specifications, and engineering cost estimate) and permits that are required for the construction. The engineering work under the current scope of work will determine the specific location of the demonstration project, identify the type and all dimensions of the shoreline erosion protection measure, cross-sectional configuration, type of material, etc. to provide Pacific County with a package that is ready to go to bid for construction.

2. Tasks and Budgets

TASK 100 – Data Collection and Filed Investigations, including required geotechnical data collection and investigation, topographic and bathymetric surveys, sediment sampling and characterization, etc.	\$108,000
TASK 200 – Engineering Analysis, including numerical modeling to determine location, length, type, cross-sectional dimensions, and material and to develop sufficient technical information for the permitting process.	\$96,000
TASK 300 – Preliminary Design (including Basis of Design Report)	\$80,000
TASK 400 – Permitting	\$105,000
TASK 500 - Final Design and Preparation of Bid Documents	\$96,000
TASK 600 – Develop Masterplan and Guidance for implementation of large-scale shoreline erosion protection project.....	\$47,000
TASK 500 – Project Coordination, Meetings, and Reporting	\$39,000
TOTAL ESTIMATED COST	\$571,000