





PROJECT NAME:
REGIONAL DISTRICT OF NANAIMO
SEWER INTERCEPTOR EAST OF OAR RD, LANTZVILLE, BC
EROSION PROTECTION CONSTRUCTION

INVITATION TO TENDER 22-051

CLOSING DATE: JUNE 30, 2022
CLOSING TIME: 15:00:00 (Pacific Time)

REGIONAL DISTRICT OF NANAIMO

#405 495 Dunsmuir St,
Nanaimo,
British Columbia, Canada,
V9R 6B9

Tel. (250) 754.6425

Date Issued: May 25, 2022

DISCLAIMER

This document has been prepared by **Northwest Hydraulic Consultants Ltd.** for the benefit of the Regional District of Nanaimo for specific application to the Sewer Interceptor East of Oar Rd, Lantzville BC: Erosion Protection Construction. The information and data contained herein represent **Northwest Hydraulic Consultants Ltd.** best professional judgment in light of the knowledge and information available to **Northwest Hydraulic Consultants Ltd.** at the time of preparation and was prepared in accordance with generally accepted engineering and geoscience practices.

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Regional District of Nanaimo
Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

INVITATION TO TENDER 22-051

INVITATION TO TENDER 22-051

The Regional District of Nanaimo (RDN) invites tenders for the construction of erosion protection works for an approximately 100 m section of exposed sewer pipeline. The work includes the installation of four rock headland structures consisting of Armour Rock and Filter Rock protecting Cobble Fill placed over the exposed pipeline.

All work shall be fully completed by September 1, 2022, in accordance with the Fisheries and Oceans Canada (DFO) Least Risk Timing Window. All prices shall be good for the completion of the work. Construction practice and scheduling must abide by the *Construction Environmental Monitoring Plan* (CEMP) prepared by Current Environmental on behalf of Northwest Hydraulic Consultants Ltd.

Tender documents may be obtained electronically through both the RDN and the BC Bid websites on or after May 25, 2022.

The award of the contract is subject to the availability of sufficient funds to complete the project and the receipt of pending regulatory and environmental approvals.

Sealed tenders prepared in accordance with the Instructions to Tenderers will be received at and until:

Tender Closing Time:	15:00:00 Pacific Daylight Savings Time
Tender Closing Date:	June 30, 2022
Tender Submittal Email:	gstpierre@rdn.bc.ca

Enquiries can be directed by email to Neville Berard, Project Manager, Northwest Hydraulic Consultants Ltd. – nberard@nhcweb.com.

Tenders will be in private by RDN after 15:01 Pacific Daylight Savings Time on June 30, 2022. The RDN will endeavor to post unverified tender results by 10:00 the next business day or sooner.

Regional District of Nanaimo
Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

INSTRUCTIONS TO TENDERS

PART 1

INSTRUCTIONS TO TENDERER – PART I

1.0 INTRODUCTION .....IT - 2

2.0 TENDER DOCUMENTS .....IT - 2

3.0 SUBMISSION OF TENDERS .....IT - 3

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1.0 Introduction

1.1 These Instructions apply to and govern the preparation of tenders for this *Contract*. The *Contract* is generally for the following work:

The construction of erosion protection works for an approximately 100 m section of exposed sewer pipeline. The work includes the installation of four rock headland structures consisting of Armour Rock and Filter Rock protecting Cobble Fill placed over the exposed pipeline.

1.2 Direct all enquiries regarding the *Contract*, to the *Contract Administrator*:

Neville Berard, P.Eng., Project Manager
Northwest Hydraulic Consultants Ltd.
Phone: 778-683-6442
Email: nberard@nhcweb.com

2.0 Tender Documents

2.1 The tender documents, which a tenderer should review to prepare a tender, consists of all of the *Contract Documents* listed in Schedule 1 entitled "Schedule of Contract Documents". Schedule 1 is attached to the Agreement which is included as part of the tender package. The *Contract Documents* also include the drawings listed in Schedule 2 to the Agreement, entitled "List of *Contract Drawings*".

2.2 A portion of the *Contract Documents* is included by reference. Copies of these documents have not been included with the tender package. These documents are the Instructions to Tenderers - Part II, General Conditions, Specifications and Standard Detail Drawings. They are those contained in the publication entitled "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings" from the year 2009. Refer to Schedule 1 to the Agreement. All sections of this publication are by reference included in the *Contract Documents*.

2.3 Any additional information made available to tenderers prior to the *Tender Closing Time* by the *Owner* or representative of the *Owner,* such as bathymetric data, which is not expressly included in Schedule 1 or Schedule 2 to the Agreement, is not included in the *Contract Documents*. Such additional information is made available only for the assistance of tenderers who must make their own judgment about its reliability, accuracy, completeness and relevance to the *Contract*, and neither the *Owner* nor any representative of the *Owner* gives any guarantee or representation that the additional information is reliable, accurate, complete or relevant.

3.0 Submission of Tenders

3.1 Tenders must be submitted via email, with the above *Contract* Title and Reference No. clearly labelled in the subject line, and must be received by:

Tender Closing Time: 15:00:00 Pacific Daylight Savings Time

Tender Closing Date: June 30, 2022

Tender Submittal Email: Gerald St. Pierre, P. Eng., PMP at gstpierre@rdn.bc.ca

3.2 Late tenders will not be accepted or considered.

4.0 Additional Instructions to Tenderers

Award of Contract

4.1 The award of this *Contract* is subject to approval by the *Owner* and to the availability of sufficient funds to complete the *Work*.

The award of this *Contract* is also subject to receipt of pending regulatory approvals required to implement the project.

4.2 The *Contractor's* attention is drawn to Clause 15.1 of the *Instructions to Tenderer's Part II* (not reproduced), regarding *Contract* award.

Mandatory Tenderer's Meeting

4.3 A mandatory Tenderer's site meeting will be held on June 16, 2022, at 10:00 Pacific Daylight Time at the project site starting from the northern terminus of Oar Road, Lantzville BC.

Clarification Requests

4.4 Requests for clarifications in accordance with Instructions to Tenderers Part II Section 9.1 must be brought to the attention of the *Contract Administrator* not less than five business days before the Tender Closing Date.

Copies of MMCD

4.5 Note that the Master Municipal Construction Document (this contract is based on the 2009 Platinum Edition) may be purchased separately from:

Support Services Unlimited
#102, 211 Columbia Street
Vancouver BC V6A 2R5

Web: https://www.mmcd.net/
Phone: 604- 681-0295
Email: admin@mmcd.net

Rejection of Tenders

4.6 The *Owner* may, in its absolute discretion, reject a Tender submitted by the Tenderer if the Tenderer, or any officer or director of a corporate Tenderer, is or has been engaged, either directly or indirectly through another corporation or legal entity, in a legal action against the *Owner*, it's elected and appointed officers and employees or any of them in relation to:

a) any other contract or services; or
b) any matter arising from the *Owner's* exercise of its powers, duties or functions under the *Local Government Act,* the *Community Charter* or any other enactments.

within the past five years of this Tender Offer.

For purposes of this section, the words "legal action" include, without limitation, a mediation, arbitration, hearing before an administrative tribunal or lawsuit filed in any court.

Without limiting the *Owner's* sole discretion, in determining whether or not to reject a Tender pursuant to this clause, the *Owner* will consider such factors as whether the legal action is likely to affect the Tenderer's ability to work with the *Owner* and its employees, agents, consultants and representatives or any of them and whether the *Owner*'s past experience with the Tenderer in the matter that resulted in the legal action indicates that the *Owner* is likely to incur increased staff and legal costs or either of them in the administration of this contract if it is awarded to the Tenderer.

Tender Evaluation

4.7 In addition to price and schedule, tender evaluation for this project may explicitly consider the *Contractor*'s past experience constructing in coastal environments areas as outlined in Appendices 3, 4 and 5 to the Form of Tender – specifically: 1: Superintendence, 2. Operator's Experience, and 3. Equipment Operations, Maintenance, and Repair.

Evaluation criteria, including but not necessarily limited to work experience in the coastal environment, may be objectively or subjectively weighted at the sole discretion of the *Owner*, and may include the removal from consideration of any tender failing to demonstrate a level of experience and expertise satisfactory to the *Owner*.

This advice on tender evaluation criteria is provided to prospective tenderers without any limitation of the discretionary rights afforded to the *Owner* in Instructions to Tenderers – Part II Sect. 15.1 as modified above.

Traffic Management

4.8 The area adjacent to the project area is residential and the beach site experiences recreational usage. The *Owner* does not intend to close any access points to project area to residents or recreational users for the duration of the construction.

Tenderers are advised that the *Contractor* will be responsible for management and safe interaction of pedestrian and vehicle traffic within the project area and along the haul route. The *Contractor* shall specify material access routes and must prepare a traffic management plan

summarizing the proposed measures to safely manage all forms of traffic interaction. The *Contractor*'s traffic control plan must be accepted by the *Owner* and the *Contract Administrator* prior to commencement of work.

Owner will accept tenders that include material and/or equipment delivery by water access (barge or similar); however, all additional permissions and permits for this methodology will need to be obtained by the *Contractor* and the project will need to meet construction timelines. Copies of all additional permits must be provided to the *Owner* and the *Contract Administrator* prior to the start of *Work*.

Survey

4.9 The *Contractor* will be expected to retain a qualified British Columbia land survey professional or firm, or other survey agency acceptable to the *Contract Administrator*, to conduct a survey of the pre-construction and the post-construction project area. The *Contractor* shall notify the *Contract Administrator* if the pre-construction survey varies significantly from what is shown on the *Contract Drawings.*

The survey professional or firm must be named as a sub-contractor in the tender. Although the original ground survey used for design can be provided by the *Contract Administrator*, the *Contractor* will be responsible for construction lay-out survey and daily quality control based on the drawings.

Consent of Surety

4.10 Every tender shall include a Consent of Surety for provision of Contract Performance (Performance Bond) as well as a Labour and Material Payment Bond.

4.11 The *Contractor's* attention is drawn to Clause 5.2 of the *Instructions to Tenderer's Part II* (not reproduced), requiring a bid bond (Bid Security) in an amount equal to 10% of the *Tender Price*.

4.12 Both the Bid Bond and the Consent of Surety will have to be digital and verifiable as defined by the Surety Association of Canada (https://www.suretycanada.com/SAC/Sure

INSTRUCTIONS TO TENDERERS

PART II

(Not Reproduced)

Regional District of Nanaimo
Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

FORM OF TENDER

FORM OF TENDER

Owner: Regional District of Nanaimo

Contract: ***22-051 Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction***

To *Owner*:
WE, THE UNDERSIGNED:

1.1 have received and carefully reviewed all of the *Contract Documents*, including the Instructions to Tenderers, the specified edition of the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings" and the following Addenda:

_____

_____

_____
(ADDENDA, IF ANY)

1.2 have full knowledge of the *Place of the Work*, and the *Work* required; and

1.3 have complied with the Instructions to Tenderers.

ACCORDINGLY WE HEREBY OFFER

2.1 to perform and complete all of the *Work* and to provide all the labour, equipment and material all as set out in the *Contract Documents*, in strict compliance with the *Contract Documents*; and

2.2 to have *Fully Completed* the Work on or before September 1, 2022, with *Substantial Completion* 1 week prior; and

2.3 to do the *Work* for the price, which is the sum of the products of the actual quantities incorporated into the *Work* and the appropriate unit prices set out in Appendix 1, the "*Schedule of Quantities and Prices*", plus any lump sums or specific prices and adjustment amounts as provided by the *Contract Documents*. For the purposes of tender comparison, our offer is to complete the *Work* for the "*Tender Price*" as set out on Appendix 1 of this Form of Tender. Our *Tender Price* is based on the estimated quantities listed in the *Schedule of Quantities and Prices* and excludes *GST*.

WE CONFIRM:

3.1 that we understand and agree that the quantities as listed in the *Schedule of Quantities and Prices* are estimated, and that the actual quantities will vary.

3.2 that we understand and agree that the regulatory approvals including environmental approvals are being sought by the *Owner* and that construction cannot begin until such approvals are in place.

WE CONFIRM:

4.1 that the following appendices are electronically attached to and form a part of this tender:

4.1.1 the appendices as required by paragraph 5.3 of the Instructions to Tenderers – Part II; and

4.1.2 the *Bid Security* as required by paragraph 5.2 of the Instructions to Tenderers – Part II.

4.1.3 the Consent of Surety as required by paragraph 4.11 of the instructions to Tenderers – Part I.

WE AGREE:

5.1 that this tender will be irrevocable and open for acceptance by the *Owner* for a period of 60 business days from the day following the *Tender Closing Date and Time*, even if the tender of another tenderer is accepted by the *Owner*. If within this period, the *Owner* delivers a written notice ("*Notice of Award*") by which the *Owner* accepts our tender we will:

5.1.1 within 7 *Business Days* of receipt of the written *Notice of Award* deliver to the *Contract Administrator*:

.1 a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Total Contract Price, covering the performance of the Work including the *Contractor*'s obligations during the Maintenance Period, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the *Owner*;

.2 a Baseline Construction Schedule, as provided by GC 4.6.1;

.3 a "clearance letter" indicating that the tenderer is in WorksafeBC compliance; and

.4 a copy of the insurance policies naming the *Owner* and *Contract Administrator* as additional insureds as specified in GC 24, indicating that all such insurance coverage is in place; and

.5 a copy of the insurance policy for Pollution/Environmental Impairment Liability Insurance in an amount not less than $1,000,000 per accident or occurrence and in the annual aggregate.

5.1.2 within 5 *Business Days* of receipt of written "*Notice to Proceed*", or such longer time as may be otherwise specified in the *Notice to Proceed*, commence the *Work*; and

5.1.3 sign the Contract Documents as required by GC 2.1.2.

WE AGREE:

6.1 that, if we receive written *Notice of Award* of this *Contract* and, contrary to paragraph 5 of this Form of Tender, we:

6.1.1 fail or refuse to deliver the documents as specified by paragraph 5.1.1 of this Form of Tender; or

6.1.2 fail or refuse to commence the *Work* as required by the *Notice to Proceed*, then such failure or refusal will be deemed to be a refusal by us to enter into the *Contract* and the *Owner* may, on written notice to us, award the *Contract* to another party. We further agree that, as full compensation on account of damages suffered by the *Owner* because of such failure or refusal, the *Bid Security* shall be forfeited to the *Owner*, in an amount equal to the lesser of:

6.1.2.1 the face value of the *Bid Security*; and
6.1.2.2 the amount by which our *Tender Price* is less than the amount for which the *Owner* contracts with another party to perform the Work.

OUR ADDRESS IS AS FOLLOWS:

_____

_____

_____

Phone: _____
Email: _____
Attention: _____

This Tender is executed this

_____ day of _____, 20 _____.

Contractor:

_____
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

Regional District of Nanaimo
Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

APPENDICES 1 - 7

Section	Para	Specification Title	Unit	Quantity	Unit Price	Amount
		General Requirements				
		Mobilization/Demobilization				
		Mobilization	LS	1	_____	_____
		Demobilization	LS	1	_____	_____
		Site Prep and Site Clean-Up				
01 03 00	1.7	Site prep (including large woody debris)	LS	1	_____	_____
01 03 00	1.9	Site clean-up	LS	1	_____	_____
		Rock Headland and Beach Placement				
31 05 17	2.13, 3.2	Supply and Install Cobble Fill	m^3	530	_____	_____
31 37 10	1.5, 2.1, 3.2	Supply and Install Armour Rock	m^3	245	_____	_____
31 37 10	2.2, 3.2	Supply and Install Filter Rock	m^3	140	_____	_____
		Provisional				
		Provisional				
01 03 00	1.11	Traffic and Pedestrian Control/Flagging	LS	1	_____	_____
		Tender Price			_____	_____
		GST			_____	_____
		Tender Price plus GST			_____	_____

Items required to complete the scope of work but not explicitly accounted for in the bid items, include the tidally influenced access windows to the Wok location, are to be considered in the rates for the listed bid items

Tenderer's Initials _____

Regional District of Nanaimo
22-051 Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

(TITLE OF CONTRACT)

See paragraph 5.3.2 of the Instructions to Tenderers – Part II.

Indicate Schedule with bar chart with major item descriptions and time.

MILESTONE DATES:_____

ACTIVITY	CONSTRUCTION WEEK SCHEDULE							
	1	2	3	4	5	6	7	8

Regional District of Nanaimo
22-051 Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

(TITLE OF CONTRACT)

See paragraph 5.3.3 of the Instructions to Tenderers – Part II.

Name: _____

Experience:

Dates: _____

Project Name: _____

Responsibility: _____

References: Name _____ Phone ( ) Email _____

Name _____ Phone ( ) Email _____

Dates: _____

Project Name: _____

Responsibility: _____

References: Name _____ Phone ( ) Email _____

Name _____ Phone ( ) Email _____

Dates: _____

Project Name: _____

Responsibility: _____

References: Name _____ Phone ( ) Email _____

Name _____ Phone ( ) Email _____

Regional District of Nanaimo
22-051 Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

(TITLE OF CONTRACT)

See paragraph 5.3.4 of the Instructions to Tenderers – Part II.

PROJECT	OWNER / CONTACT NAME PHONE and EMAIL	WORK DESCRIPTION	VALUE ($)
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		
	Owner / Contact _____ Phone ( ) _____ Email _____		

Regional District of Nanaimo
22-051 Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

(TITLE OF CONTRACT)

See paragraph 5.3.5 of the Instructions to Tenderers – Part II.

TENDER ITEM	TRADE	SUBCONTRACTOR NAME	PHONE NUMBER

Tenderer's Initials _____

Regional District of Nanaimo
22-051 Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

(TITLE OF CONTRACT)

LABOUR TYPE	HOURLY RATE ($/Hr)

Regional District of Nanaimo
Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

(TITLE OF CONTRACT)

MAJOR EQUIPMENT TYPE	HOURLY RATE ($/Hr)

FORM OF AGREEMENT

FORM OF AGREEMENT

BETWEEN OWNER AND CONTRACTOR

This agreement made in duplicate this

_____ day of _____, 20_____.

Contract Title: ***Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction***

BETWEEN:

The Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, BC V9T 6N2
(the "*Owner*")

AND:

_____

_____

_____
(NAME AND OFFICE ADDRESS OF CONTRACTOR)

(the "*Contractor*")

The *Owner* and the *Contractor* agree as follows:

Article 1 The Work Start / Completion Dates

1.1 The *Contractor* will perform all *Work* and provide all labour, equipment and material and do all things strictly as required by the *Contract Documents*.

1.2 The *Contractor* will commence the *Work* in accordance with the *Notice to Proceed*. The *Contractor* will proceed with the *Work* diligently, will perform the *Work* generally in accordance with the construction schedules as required by the *Contract Documents* and will have Fully Completed of the *Work* on or before September 1, 2022, with *Substantial Performance* 1 week prior subject to the provisions of the *Contract Documents* for adjustments to the *Contract Time.*

1.3 Time shall be of the essence of the *Contract.*

Article 2 Contract Documents

2.1 The "*Contract Documents*" consist of the documents listed or referred to in Schedule 1, entitled "Schedule of Contract Documents", which is attached and forms a part of this Agreement, and includes any and all additional and amending documents issued in accordance with the

provisions of the *Contract Documents*. All of the *Contract Documents* shall constitute the entire *Contract* between the *Owner* and the *Contractor*.

2.2 The *Contract* supersedes all prior negotiations, representations, or agreements, whether written or oral, and the *Contract* may be amended only in strict accordance with the provisions of the *Contract Documents.*

Article 3 Contract Price

3.1 The price for the *Work* ("*Contract Price*") shall be the sum in Canadian dollars of the following:

1.1.1 the product of the actual quantities of the items of *Work* listed in the *Schedule of Quantities and Prices* which are incorporated into or made necessary by the *Work* and the unit prices listed in the *Schedule of Quantities and Prices*; plus

1.1.2 all lump sums, if any, as listed in the *Schedule of Quantities and Prices*, for items relating to or Incorporated into the *Work*; plus

1.1.3 any adjustments, including any payments owing on account of *Changes* and agreed to *Extra Work*, approved in accordance with the provisions of the *Contract Documents.*

3.2 The *Contract Price* shall be the entire compensation owing to the *Contractor* for the *Work* and this compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing, and all other costs and expenses whatsoever incurred in performing the *Work*.

Article 4 Payment

4.1 Subject to applicable legislation and the provisions of the *Contract Documents*, the *Owner/Contract Administrator* shall make payments to the *Contractor*.

4.2 If the *Owner* fails to make payments to the *Contractor* as they become due in accordance with the terms of the *Contract Documents* then interest calculated at 2% per annum over the prime commercial lending rate of the Royal Bank of Canada on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

Article 5 Rights and Remedies

5.1 The duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

5.2 Except as specifically set out in the *Contract Documents*, no action or failure to act by the *Owner*, *Contract Administrator* or *Contractor* shall constitute a waiver of any of the parties' rights or duties afforded under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach under the *Contract*.

Article 6 Notices

6.1 Communications among the *Owner*, the *Contract Administrator,* and the *Contractor*, including all notices required by the *Contract Documents*, may be delivered by email to the recipients as set out below:

The *Owner*:

Gerald St. Pierre, P. Eng., PMP
Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, BC V9T 6N2
Phone: 250-390-4111

Email: gstpierre@rdn.bc.ca

The *Contract Administrator*:

Neville Berard, P. Eng.
Northwest Hydraulic Consultants Ltd.
495 Dunsmuir St #405
Nanaimo, BC V9R 6B9
Phone: 778-683-6442

Email: nberard@nhcweb.com

The *Contractor*:

_____

_____

_____

Phone:
Email:

6.2 A communication or notice that is addressed as above shall be considered to have been received immediately upon transmission.

6.3 The *Owner, Contract Administrator* or the *Contractor* may, at any time, change the email address(es) for Notices by providing the other parties with updated correspondence details and confirming receipt.

Article 7 General

7.1 This *Contract* shall be construed according to the laws of British Columbia.

7.2 The *Contractor* shall not, without the express written consent of the *Owner*, assign this *Contract*, or any portion of this *Contract*.

7.3 The headings included in the *Contract Documents* are for convenience only and do not form part of this *Contract* and will not be used to interpret, define, or limit the scope or intent of this *Contract* or any of the provisions of the *Contract Documents*.

7.4 A word in the *Contract Documents* in the singular includes the plural and, in each case, vice versa.

7.5 This agreement shall ensure to the benefit of and be binding upon the parties and their successors, executors, administrators, and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement the day and year first written above.

Owner:

Regional District of Nanaimo
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

(AUTHORIZED SIGNATORY)

(AUTHORIZED SIGNATORY)

Contractor:

(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

(AUTHORIZED SIGNATORY)

(AUTHORIZED SIGNATORY)

Schedule 1
Schedule of Contract Documents

The following is an exact and complete list of the *Contract Documents*, as referred to in Article 2.1 of the Agreement.

***NOTE*:** The documents noted with "*" are contained in the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings", Platinum edition dated 2009. All sections of this publication are included in the *Contract Documents.*

NOTE: In the case of a discrepancy or conflict between the NHC Design Drawings and any other *Contract Documents*, the NHC Design Drawings shall govern.

1. Instructions to Tenderers - Part I
2. Instructions to Tenderers - Part II*
3. Form of Tender and Appendices 1-7
4. Form of Agreement
5. General Conditions*
6. Supplementary General Conditions
7. Specifications*
8. Supplementary Specifications
9. Standard Detail Drawings*
10. NHC Design Drawings *(Contract Drawings* listed in Schedule 2 to the Agreement –" List of *Contract Drawings*")
11. Construction Environmental Monitoring Plan

12. The following Addenda:

_____

_____

_____

_____

_____
(Addenda, if any)

Schedule 2
List of Contract Drawings

TITLE	SHEET	REV NO.	ISSUED
RDN Interceptor East of Oar Road Beach Nourishment and Headland System Title Sheet and Notes	001	1	For Tender
RDN Interceptor East of Oar Road Beach Nourishment and Headland System Plan and Profile Views	002	1	For Tender
RDN Interceptor East of Oar Road Beach Nourishment and Headland System Section Views	003	1	For Tender

GENERAL CONDITIONS
(Not Reproduced)

SUPPLEMENTARY GENERAL CONDITIONS

Regional District of Nanaimo

Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

Supplementary Specification:	GC 1.1.1		
Affected Document(s):	Volume II	**Change Type:**	Append
Section:	GC 1.1.1	**Reference:**	General Conditions
Change Summary:	Add sentence to clause.		
Currently:			
Should Be:	Any shutdown of the work by a regulatory authority due to fire hazard is explicitly considered as *Abnormal Weather*.		

Supplementary Specification:	GC 4.1.3 Hours of Work		
Affected Document(s):	Volume II	**Change Type:**	Add Clause
Section:	GC 4.1	**Reference:**	4.1.3
Change Summary:	Add clause to restrict Hours of Work		
Currently:	<missing>		
Should Be:	Work shall not be undertaken between the hours of 8:00 p.m. and 7:00 a.m., or on Sundays or legal holidays except such *Work* as is necessary for the proper care and protection of completed *Work* or in the case of an emergency. The *Contractor* shall make a reasonable effort to obtain prior approval from the *Contract Administrator* for such emergency *Work*.		

Supplementary Specification:	GC 4.2.2 Emergency Contact Information		
Affected Document(s):	Volume II	**Change Type:**	Add Clause
Section:	GC 4.2	**Reference:**	4.2.2
Change Summary:	Add clause to provide list of authorized *Contractor* personnel		
Currently:	<missing>		
Should Be:	Before commencing any work at the *Place of the Work*, the *Contractor* shall provide the *Contract Administrator* with a list of at least three persons who have authority to act on behalf of the *Contractor* in an emergency. At least one of the persons shall be available outside normal working hours of the *Owner* (Monday to Friday, 8:30 a.m. to 4:30 p.m.).		

Regional District of Nanaimo

Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

Supplementary Specification:	GC 4.2.3 Safety Coordinator		
Affected Document(s):	Volume II	**Change Type:**	Add Clause
Section:	GC 4.2	**Reference:**	4.2.3
Change Summary:	Add clause to provide list of authorized *Contractor* safety coordinators		
Currently:	<missing>		
Should Be:	The *Contractor* shall designate, in writing, an authorized and qualified safety coordinator in charge of the *Contractor's* safety program, plus designate an alternate should this individual not be available.		

Supplementary Specification:	GC 10.1.1 Force Account Costs		
Affected Document(s):	Volume II	**Change Type:**	Replacement
Section:	GC 10.1.1	**Reference:**	GC 10.1.1
Change Summary:	Payment for Force Account Costs based on provided payment schedule		
Currently:			
Should Be:	Payment for Force Account Work shall be calculated as follows: 1. Labour at the hourly all-found rate, including small tools, overhead, profit, taxes, and assessments as outlined in Appendix 6 of the Form of Tender. 2. Major equipment at the hourly all-found rate, including overhead and profit, as outlined in Appendix 7 of the Form of Tender.		

Supplementary Specification:	GC 13.9.1 (1)		
Affected Document(s):	Volume II	**Change Type:**	Modification Clause
Section:	Liquidated Damages for Late Completion	**Reference:**	GC 13.9.1 (1)
Change Summary:	Rate change		
Currently:	As a genuine pre-estimate of the *Owner's* increased costs for the *Contract Administration* and the *Owner's* own staff caused by such delay an amount of $500.00 per day or pro rata portion for each Day the actual *Substantial Performance* is achieved after the *Substantial Performance Milestone Date*.		
Should Be:	As a genuine pre-estimate of the *Owner's* increased costs for the *Contract Administration* and the *Owner's* own staff caused by such delay an amount of $1500.00 per day or pro rata portion for each calendar day the work is fully completed after the September 1, 2022.		

Supplementary Specification:	GC 24.1.1 (2)		
Affected Document(s):	Volume II	**Change Type:**	Modification Clause
Section:	Required Insurance	**Reference:**	24.1.1 (2)
Change Summary:	Modification. Replace the first two lines of GC 24.1.1 (2) with the following:		
Currently:	(2) Comprehensive General Bodily Injury and Property Damage Liability Insurance Limits: Bodily Injury and Property Damage - inclusive $5,000,000		
Should Be:	(2) Comprehensive General Bodily Injury and Property Damage Liability Insurance Limits: Bodily Injury and Property Damage - inclusive each accident $5,000,000		

SPECIFICATIONS

(Not Reproduced)

SUPPLEMENTARY SPECIFICATIONS

Regional District of Nanaimo

Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

01 01 01 Summary of Work
01 03 00 Administrative Requirements
01 03 50 Special Procedures
31 05 17 Aggregates and Granular Materials
31 37 10 Rip Rap

Technical Specifications Submittal

NORTHWEST HYDRAULIC CONSULTANTS LTD.

Lucas Dunbar, EIT
Hydrotechnical Engineer

Reviewed by:

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
N. A. BERARD
47849

May 24, 2022

Neville Berard, P.Eng.
Coastal Engineer

Aaron Blezy, P.Eng.
Hydrotechnical Engineer

DISCLAIMER

This document has been prepared by **Northwest Hydraulic Consultants Ltd.** for the benefit of the Regional District of Nanaimo for specific application to the Sewer Interceptor East of Oar Rd, Lantzville BC: Erosion Protection Construction. The information and data contained herein represent **Northwest Hydraulic Consultants Ltd.** best professional judgment in light of the knowledge and information available to **Northwest Hydraulic Consultants Ltd.** at the time of preparation and was prepared in accordance with generally accepted engineering and geoscience practices.

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Tenderer's Initials _____

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1.2 Scope of Work 2
1.3 Site Access 2
1.4 Permits 2
1.5 Materials and Equipment....2
1.6 Payment 3

1.0 GENERAL

1.1 Background

.1 The work entails the construction of erosion protection works for an approximately 100 m section of exposed sewer pipeline. The work includes the installation of four rock headland structures consisting of Armour Rock and Filter Rock protecting Cobble Fill placed over the exposed pipeline.

.2 The work site is shown in RDN Interceptor East of Oar Road Beach Nourishment and Headland System (Drawing Sheet 1) and extends approximately 100 m, running parallel to the shoreline on the upper beach.

1.2 Scope of Work

.1 The work of this Contract consists of the supply and installation of materials, including all labour and equipment related to construction of the beach headland system.

.2 The primary work components can generally be described as follows:

(a) Site preparation
(b) Survey and placement of Rock Materials described in the drawing package
(c) Traffic and pedestrian control/flagging
(d) Site clean-up
(e) Environmental management

1.3 Site Access

.1 The *Contractor* shall submit a Site Access and Traffic Management Plan a minimum of 7 Business Days prior to commencement of the *Work* describing provisions proposed to minimize disruption to residents, provide adequate public safety, and minimize impact to the beach environment. This shall include:

(a) *Contractor*'s beach access plan, including how routes will connect to existing public roads, and modifications to be made to either.
(b) *Contractor's* method to protect the existing pipeline if crossing required.
(b) Arrangements for maintaining access for residents.

Note that tenders proposing site access via barge will be accepted provided the *Contractor* understands that all permits and costs related to the barge access will be the responsibility of the *Contractor.*

The Site Access and Traffic Management Plan is subject to approval by the *Owner* prior to start of construction. Any proposed additions or revisions shall be resubmitted for prior acceptance.

1.4 Permits

.1 The *Contractor* shall only be allowed to start work after the confirmation from the *Contract Administrator* that all applicable regulatory and environmental permits have been received.

1.5 Materials and Equipment

.1 The *Contractor* shall provide all materials required for completion of Site Access and Restoration. The *Contractor* shall remove all materials imported to the Site not used for the Work.

.2 For other materials incorporated in the work, the *Contractor* shall be required to procure, test, load, haul, unload, store and care for the construction materials, the cost of which shall be included in the tendered price.

1.6 Payment

.1 Clauses of the Master Municipal Construction Documents, Volume II, printed 2009 with the heading “Payment” or “Measurement and Payment” are to be replaced with the payment clauses included in Appendix 1 of the Form of Tender.

END OF SECTION

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1.7 Staging Area, Site Access & Construction Zone 3
1.8 Demobilization, Site Clean-Up 3
1.9 Access and Public Safety 3
1.10 Safety Procedures 4
1.11 Work Plan and Schedule 4
1.12 Permit Availability 4
1.13 Quality Assurance 5
1.14 Record Drawings 5

1.0 GENERAL

1.1 Co-operation

.1 The *Contractor* shall attend coordination and administrative meetings as required for the proper coordination and administration of the Work, and the *Contractor* shall maintain a cooperative approach towards the effective coordination of the Work with the work of Others during construction of the *Work*.

.2 If, in the opinion of *Contract Administrator*, the progress of the *Work* is insufficient to meet the *Contractor*'s accepted construction schedule, the *Contractor* shall attend meetings to explain the progress and to establish corrective action and shall maintain a cooperative approach in meeting its progress obligations under the Contract.

1.2 Contract Documents and Drawings

.1 The *Owner* shall issue three complete copies of the Contract Documents as soon as practicable after the award of the Contract.

1.3 Setting Out

.1 The *Contractor* shall, by accepted methods as specified by a BC Land Surveyor, set out the Work by reference to publicly available survey control points, drawings, and location of existing structures. All positional data shall have a minimum network horizontal and vertical accuracy of 0.05 metres. The *Contractor* shall provide, fix and be responsible for the protection of all monuments, stakes, templates, benchmarks and other reference marks and lines.

1.4 Sewage and Waste Fluid Disposal

1. The *Contractor* shall provide, operate, and maintain all facilities required for the disposal of sewage, and waste fluid resulting from its operations. The methods of disposal shall be subject to acceptance and shall meet Provincial agency requirements.

2. The *Contractor* shall not discharge or permit the discharge of raw sewage, polluted water, or waste fluid into any natural watercourses, lakes, ponds, or any area which has not been accepted.

3. The *Contractor* shall promptly report to the *Contract Administrator*, any leakage, spill or discharge from any sewage and waste fluid disposal installation.

1.5 Refuse Disposal

.1 The *Contractor* shall collect daily, and dispose of, on an accepted regular basis, refuse from all premises and work centres provided and/or staffed and operated for the Work. The *Contractor* shall collect the refuse in covered, fly proof and containers. If left unattended the containers must be bear proof.

.2 The *Contractor* shall make its own arrangement with the government authority having jurisdiction for refuse disposal and shall only use the methods of refuse disposal acceptable to the Provincial Health Inspector and the Pollution Control Branch and shall also meet local Municipal and Regional District requirements.

1.6 Site Preparation

.1 As much as possible, existing vegetation shall be protected. If vegetation is to be disturbed, it should be handled such that it can be replanted. All such vegetation handling shall be as directed by the *Environmental Monitor*.

.2 Salvage driftwood that is present in the work area prior to starting works.

1.7 Staging Area, Site Access & Construction Zone

.1 The staging area shall be located at the northern end of Oar Rd.

.2 Unless otherwise specified by the *Contract Administrator*, staging equipment and materials shall be in the designated area only.

.3 Identify and clearly mark access corridors below the high-water mark to minimize machinery disturbance in the riparian and intertidal zones.

.4 The *Contractor* shall protect the pipeline from heavy equipment as per methods outlined in the Traffic Management and Site Access Plan.

.5 Heavy equipment shall be restricted to an area 5 m away from the pipeline during construction, or areas approved by the *Contract Administrator* through review of the Traffic Management and Site Access Plan.

.6 The *Contractor* is responsible for confirming the location of the pipeline in all areas where the crossing will occur and where equipment will be within 10 m of the pipeline. *Contractor* shall notify *Contract Administrator* if the pipeline is more than 20 cm from location shown in the information supplied to the *Contractor*.

1.8 Demobilization, Site Clean-Up

.1 Demobilization shall be considered complete when the *Contractor* has finalized the Work to the satisfaction of the *Contract Administrator*, including:

(a) Removal of all *Contractor*'s equipment, waste, and excess materials
(b) Site cleanup and restoration
(c) Completion of the post-construction survey
(d) Delivery of as-built mark-up drawings and information

.2 Any disturbed access and staging areas shall be returned to the same condition as found.

.3 All excess materials and debris shall be removed from the area.

.4 Large woody debris will be replaced at the direction of the *Contract Administrator* or *Environmental Monitor*.

1.9 Access and Public Safety

.1 The *Contractor* is advised that traffic control will be required during the *Contractor*'s activities in the vicinity of Oar Road.

.2 The *Contractor* shall ensure that all public roads and pedestrian access corridors are kept free of rocky materials and construction debris at the end of each day's work and as much as practical during the workday.

.3 The *Contractor* is responsible for maintaining vehicle access at all times along Oar Road, and all residential areas adjacent to the construction site.

.4 To the extent possible, access to the beach via Seabold Rotary Park is also to be kept open to public access, or proper signage is to be posted with closures identified.

1.10 Safety Procedures

.1 The *Contractor* shall conform with all relevant safety procedures as outlined in the WorkSafeBC, Occupational Health and Safety Regulations.

.2 Public safety and convenience shall be preserved throughout the project.

.3 The project is in the foreshore area of a publicly accessible waterfront. It is anticipated that there will be a public presence around the construction site intermittently.

.4 The *Contractor* is required to delineate the active work area and take all measures to protect the public and park values. This may include signage, fencing and safety personnel on site as required by best management practices.

1.11 Work Plan and Schedule

.1 Within 10 business days of award of the Contract, the *Contractor* shall submit a detailed construction schedule and work plan detailing the *Contractor*'s proposed operations for the duration of the Work. The schedule shall clearly indicate the length of construction periods, any interim dates set out in the Contract, and sequences of operations in sufficient detail so that the *Contract Administrator* may determine its feasibility and monitor the progress of the Work. The schedule shall clearly identify the Contract milestones.

.2 Within 5 business days of receipt of the *Contractor*'s submissions, the *Contractor* shall be available to meet with *Contract Administrator* and participate in reviewing and revising the submissions as may be necessary to secure acceptance of the program.

.3 The *Contractor*'s submissions, when accepted, shall be used by the *Contractor* for planning, organizing, and directing the construction of the Work and for reporting progress.

.4 Acceptance of the *Contractor*'s detailed construction program and revisions thereto shall in no way be construed to relieve the *Contractor* of any of its duties or responsibilities under the Contract.

1.12 Permit Availability

.1 Copies of all regulatory permits must be available on site at all times throughout construction, including those from: Fisheries and Oceans Canada (Letter of Advice), and Ministry of Forests, Lands, Natural Resource Operations and Rural Development (Water Sustainability Act), and Canadian Navigable Waters Act (Navigation Protection Program).

1.13 Quality Assurance

.1 Within the work plan (see 1.11 Work Plan and Schedule above) the *Contractor* shall demonstrate a plan to ensure that the required material thicknesses, elevations, and slope grades are achieved. It is important that survey results are available in a timely manner to the personnel working on site and the *Contract Administrator* so that any deficiencies can be corrected quickly and avoid re-work.

.2 Survey transects to measure material placement shall be taken at intervals of no greater than 5 m spacing alongshore and 2 m spacing cross-shore. Surveys shall also define the toe, crest, and slope breaks of placed materials. Survey details to be included in the work plan submitted.

.3 Armour rock (in the rock headlands) to be surveyed using the highest point survey method.

.4 Tolerances:

Elevations: + 0.2 m, - 0.0 m
Horizontal: +/- 0.3 m

.5 Finished slope angles of rock materials of rock materials shall not be steeper than the design slopes shown on drawings.

1.14 Record Drawings

.1 The *Contractor* is responsible to perform a post-construction survey of all completed upgrades to the beach headland at sufficient density to produce accurate surfaces at 0.2 m contour interval and shall include all break lines, cross sections, and notable features. The *Contractor* shall also maintain a record of all changes incorporated into the Work. The post-construction survey data (in text or csv format) and drawings showing all as-constructed changes are to be submitted to the *Contract Administrator* within 5 business days of completion of construction work.

END OF SECTION

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2.0 PRODUCTS

<table>
<tr><td>Supplementary Specification:</td><td colspan="3">31 05 17 2.13</td></tr>
<tr><td>Affected Document(s):</td><td>Volume II</td><td>Change Type:</td><td>Add Clause</td></tr>
<tr><td>Section:</td><td>Aggregates and Granular Materials</td><td>Reference:</td><td>31 05 17 2.13</td></tr>
<tr><td>Change Summary:</td><td colspan="3">Add clause regarding cobble fill quality and gradation</td></tr>
<tr><td>Currently:</td><td colspan="3">Missing</td></tr>
<tr><td>Should Be:</td><td colspan="3">2.13 Cobble Fill
.1 Cobble Fill shall be rounded to sub-rounded stone of fluvial or glacial origin, similar to existing coarse intertidal beach material.

.2 Cobble Fill shall have a gradation within the limits below, based on the B-axis sediment diameter.
<table>
<tr><th>Percent Passing (% Finer by Mass)</th><th>Diameter (mm)</th></tr>
<tr><td>90 - 100</td><td>150</td></tr>
<tr><td>70 - 90</td><td>130</td></tr>
<tr><td>35 – 65</td><td>80</td></tr>
<tr><td>5 – 25</td><td>50</td></tr>
<tr><td>0 - 5</td><td>20</td></tr>
</table></td></tr>
</table>

3.0 EXECUTION

Supplementary Specification:	**31 05 17 3.2**		
Affected Document(s):	Volume II	**Change Type:**	Add Clauses
Section:	Riprap	**Reference:**	31 05 17 3.2
Change Summary:	Cobble Fill Placement		
Currently:	Missing		
Should Be:	**3.2 Cobble Fill Placement** .1 The placement of the Cobble Fill material shall be timed with the weather forecast such that it is not placed without the protection of the rock headlands, so that the material is not directly exposed to storm waves. .2 Cobble fill may be placed in bulk and trimmed to the elevations, thicknesses and slopes as indicated in the drawings.		

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1.0 GENERAL

<table>
<tr><td>Supplementary Specification:</td><td colspan="3">31 37 10 1.5</td></tr>
<tr><td>Affected Document(s):</td><td>Volume II</td><td>Change Type:</td><td>Replace Clause</td></tr>
<tr><td>Section:</td><td>Riprap</td><td>Reference:</td><td>31 37 10. 1.5</td></tr>
<tr><td>Change Summary:</td><td colspan="3">Rock Material Quality Assurance and Testing Requirements</td></tr>
<tr><td>Currently:</td><td colspan="3"></td></tr>
<tr><td>Should Be:</td><td colspan="3">.1 All rock materials (Armour Rock, Filter Rock, and Cobble Fill) shall be from sources approved by the Contract Administrator at least 10 business days prior to the first shipment to the project site. Approval may require a quarry visit by the Contract Administrator.

.2 During the course of the work, should the rock material from an approved quarry be different in any way from the quarry sample tested, test additional samples for conformance to the requirements of this section at no additional cost to the Owner. Test results shall be supplied as early as practically possible prior to delivery.

.3 The Contractor shall supply rock material which meets the specified gradation limits. If required by the Contract Administrator, the Contractor shall perform gradation test(s) on the rock material to prove the material meets the gradation specification. Tests will be in accordance with ASTM 5519 and sample size will be large enough such that the presence or absence of the largest piece of rock from the sample will affect the gradation by less than 10 percent. The Contract Administrator reserves the right to reject rock material based on visual inspection. The Contractor shall provide a stockpile of representative materials at the source quarry for this purpose. The Contractor is required to provide a weigh scale, accurate to 1 percent of the indicated mass at the source to measure rock mass in the event of a gradation discrepancy between rock mass and nominal rock diameter. The rock materials must meet the specified gradation limits or else the material is not to be shipped.

.4 Required tests for physical properties of rock materials shall include:
<table>
<tr><th>Property</th><th>Test</th><th>Requirement</th></tr>
<tr><td>Size Distribution</td><td>ASTM D5519</td><td></td></tr>
<tr><td>Specific Gravity</td><td>ASTM D6473</td><td>≥2.60</td></tr>
<tr><td>Absorption</td><td>ASTM D6473</td><td>≤1%</td></tr>
<tr><td>Soundness by use of Magnesium Sulphate</td><td>ASTM D5240</td><td>≤10% (following 5 cycles)</td></tr>
<tr><td>Micro-Deval Abrasion Loss Factor</td><td>ASTM D6928</td><td>≤20%</td></tr>
<tr><td>Acid Rock Drainage and Metal Leaching</td><td>MoE Technical Circular T10-04</td><td>No ARD or Metal Leaching</td></tr>
</table></td></tr>
</table>

2.0 PRODUCTS

Supplementary Specification:	**31 37 10 2.1 .1 .1 .1**		
Affected Document(s):	Volume II	**Change Type:**	Replace Clause
Section:	Riprap	**Reference:**	31 37 10. 2.1 2.1
Change Summary:	Specify Armour Rock Gradation		
Currently:			
Should Be:	.1 Armour Rock shall have a gradation within the limits below, based on the mass (kg).		

Percent Passing (% Finer by Mass)	B-axis Diameter (mm)	Weight (kg)
100	1000	2650
70 - 100	800	1360
50 – 85	700	910
15 – 40	550	440
0	500	330

Supplementary Specification:	**31 37 10 2.1 .2, .3, .4**		
Affected Document(s):	Volume II	**Change Type:**	Add Clause
Section:	Riprap	**Reference:**	31 37 10. 2.1 2.1
Change Summary:	Add Clause regarding Armour Rock dimensions and quality		
Currently:	Missing		
Should Be:	**2.1 Riprap** .1 All rock material shall be of dense, hard, durable character, free of organic material, in-filled joints, seams or other defects, resistant to breakdown by handling, frost action or weather, and not subject to deterioration in sea water. .2 The sizes of individual rocks are expressed by the dimensions of their three axes. The long axis, 'A', is the maximum length of the stone. The intermediate axis, 'B', is the maximum width, perpendicular to the long axis. The short axis, 'C', is the thickness perpendicular to axes 'A' and 'B'. The riprap size shall be measured based on 'B'-axis measurements. .3 Armour Rock shall be blocky in shape, predominantly angular, and roughly equidimensional with length not more than 2.5 times the width or thickness as measured at the middle of the stone. .4 Granite and quartzite are the preferred rock types. Basalt, limestone, and dolomite may be acceptable but may need an increased gradation size or placement thickness. Rhyolite, dacite, andesite, sandstone, and breccia are rarely acceptable.		

<table>
<tr><td>Supplementary Specification:</td><td colspan="3">31 37 10 2.2</td></tr>
<tr><td>Affected Document(s):</td><td>Volume II</td><td>Change Type:</td><td>Modification Clause</td></tr>
<tr><td>Section:</td><td>Riprap</td><td>Reference:</td><td>31 37 10 2.2</td></tr>
<tr><td>Change Summary:</td><td colspan="3">Specify Filter Rock Gradation</td></tr>
<tr><td>Currently:</td><td colspan="3">Hard durable graded stone or quarry tailings with specific gravity not less than 2.60 to meet the following size distribution:</td></tr>
<tr><td>Should Be:</td><td colspan="3">2.2 Filter Rock
.1 Filter Rock shall consist of angular quarried rock.

.2 Filter Rock shall be angular with a specific gravity not less than 2.60 and shall have a gradation within the limits below.
<table>
<tr><th>Percent Passing (% Finer by Mass)</th><th>Diameter (mm)</th><th>Weight (kg)</th></tr>
<tr><td>90 - 100</td><td>330</td><td>50</td></tr>
<tr><td>70 - 100</td><td>280</td><td>30</td></tr>
<tr><td>35 – 65</td><td>195</td><td>10</td></tr>
<tr><td>10 – 20</td><td>90</td><td>1</td></tr>
</table></td></tr>
</table>

3.0 EXECUTION

Supplementary Specification:	**31 37 10 3.2**		
Affected Document(s):	Volume II	**Change Type:**	Replace and Add Clauses
Section:	Riprap	**Reference:**	31 37 10 3.2
Change Summary:	Replace Clause and Add Clause regarding Armour Rock Placement		
Currently:	Missing		
Should Be:	**3.2 Riprap Placement** .1 Armour Rock shall be placed with an excavator equipped with a hydraulic thumb. The excavator operator and superintendent shall have experience placing interlocked shoreline protection. .2 Armour Rock shall be individually placed to ensure good inter-locking between adjacent rocks. .3 End-dumping is not an acceptable method of rock placement for the Armour Rock. Armour Rock must be placed and keyed into position. .4 Finished rock headlands (composed of Armour Rock) shall be well-keyed and stable, with uniform gradation of material size throughout the structures. Remove and replace any portion within which the materials are segregated in size or poorly interlocked.		

Supplementary Specification:	**31 37 10 3.4**		
Affected Document(s):	Volume II	**Change Type:**	Add Clauses
Section:	Riprap	**Reference:**	31 37 10 3.4
Change Summary:	Filter Rock Placement		
Currently:	Missing		
Should Be:	**3.4 Filter Rock Placement** .1 The placement of the Filter Rock material shall be timed with the weather forecast such that it is not directly exposed to large waves until Armour Rock is placed. .2 Filter Rock may be placed in bulk and trimmed to the elevations, thickness and slopes as indicated on the drawings.		

STANDARD DETAIL DRAWINGS

(Not Reproduced)

Regional District of Nanaimo
Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

NHC DESIGN DRAWINGS

RDN INTERCEPTOR EAST OF OAR ROAD

BEACH NOURISHMENT AND HEADLAND SYSTEM

DRAWING INDEX		
SHEET NO.	**DESCRIPTION**	**REVISION**
001	TITLE SHEET AND NOTES	1
002	PLAN AND PROFILE VIEWS	1
003	SECTION VIEWS	1

1. GENERAL NOTES

1.1. GENERAL

1.1.1. ALL ELEVATIONS AND DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

1.1.2. COORDINATES ARE IN NAD83 (CSRS), UTM ZONE 10 NORTH.

1.1.3. ALL ELEVATIONS ARE TO CGVD2013 (GEOID GCC2013). CGVD2013 IS APPROXIMATELY 2.9m ABOVE CHART DATUM (CD).

1.1.4. ALL ELEVATIONS, DIMENSIONS, AND WORKPOINTS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

1.2. REFERENCES

1.2.1. ELEVATIONS BY NHC, SURVEY DATED 31 JULY 2020 AND 14 MAY 2021.

1.2.2. THIS DRAWING PACKAGE SHALL BE READ AND INTERPRETED SIMULTANEOUSLY WITH THE PROJECT TECHNICAL SPECIFICATIONS.

1.3. DESIGN CRITERIA

1.3.1. DESIGN LIFE: UP TO 10 YEARS

1.3.2. DESIGN EVENT: 1/100 AEP

1.3.3. DESIGN WATER LEVELS (BASED ON CHS DATUMS FROM WINCHELSEA ISLAND):

DESCRIPTION	ABBREVIATION	ELEVATION (m CGVD2013)	ELEVATION (m CD)
HIGHER HIGH WATER LARGE TIDE	HHWLT	2.2	5.1
HIGHER HIGH WATER MEAN TIDE	HHWMT	1.7	4.6
MEAN WATER LEVEL	MWL	0.3	3.2
LOWER LOW WATER MEAN TIDE	LLWMT	-1.7	1.2
LOWER LOW WATER LARGE TIDE	LLWLT	-2.8	0.1

1.4. DESIGN INTENT

1.4.1. THIS DESIGN IS A SOFT SHORE APPROACH TO MITIGATING SHORELINE EROSION OVERTOP OF THE PIPELINE. THE BEACH SHAPE AND ELEVATION ARE EXPECTED TO ADJUST FOLLOWING CONSTRUCTION. MONITORING AND ADAPTIVE MANAGEMENT ARE EXPECTED.



SITE PLAN
N.T.S.



KEY PLAN
1:10000

0 100 1:10,000 500m

PRELIMINARY

NOT FOR CONSTRUCTION

REGIONAL DISTRICT OF NANAIMO
6300 HAMMOND BAY ROAD
NANAIMO, BC
V9T 6N2

nhc northwest hydraulic consultants
405 - 495 Dunsmuir St.
Nanaimo, BC
Canada V9R 6B9
Office: 250.754.6425
Fax: 250.754.9264
www.nhcweb.com

REVISIONS		
0	2021-07-12	ISSUED FOR CLIENT REVIEW
1	2022-04-15	ISSUED FOR TENDER

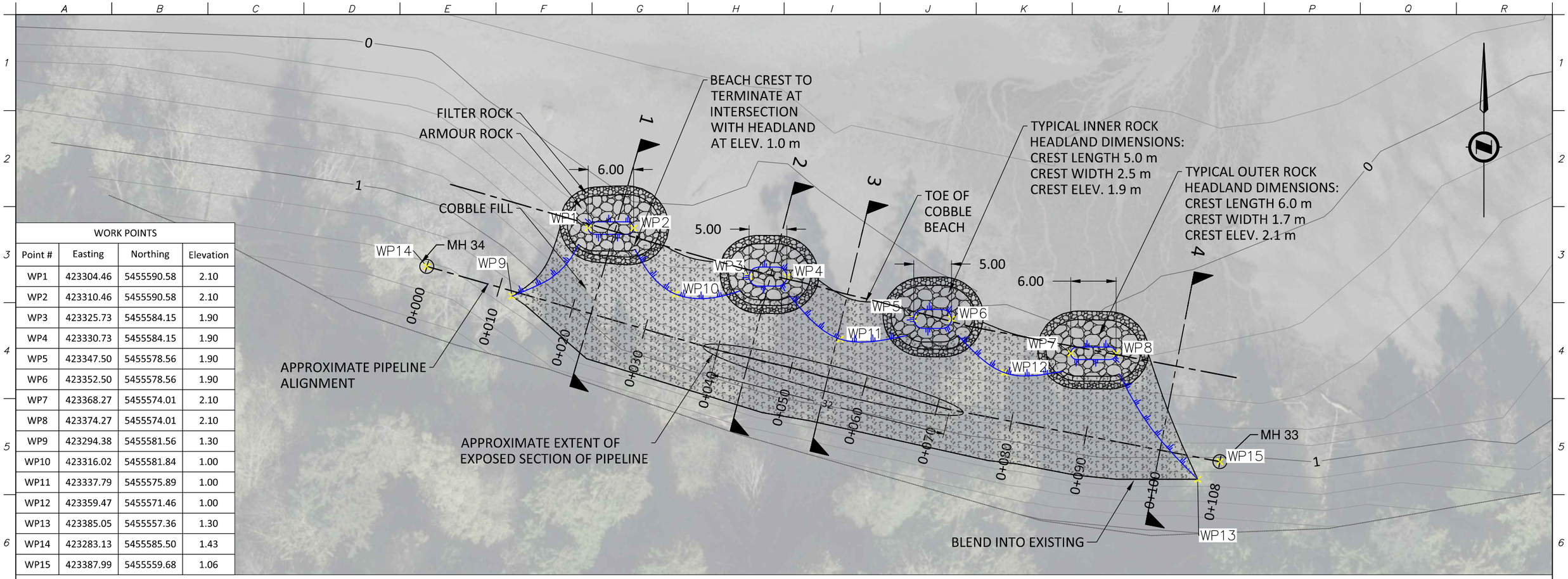
DRAWING INFORMATION	
DATE	29 Apr 2022
DESIGNED BY	NAB
DRAWN BY	CZZ
CHECKED BY	GFL
SHEET SIZE	B (11" x 17")

RDN INTERCEPTOR EAST OF OAR ROAD
BEACH NOURISHMENT AND HEADLAND SYSTEM
TITLE SHEET AND NOTES

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DRAWING NUMBER	3007038-2
SHEET NUMBER	001
REVISION	1

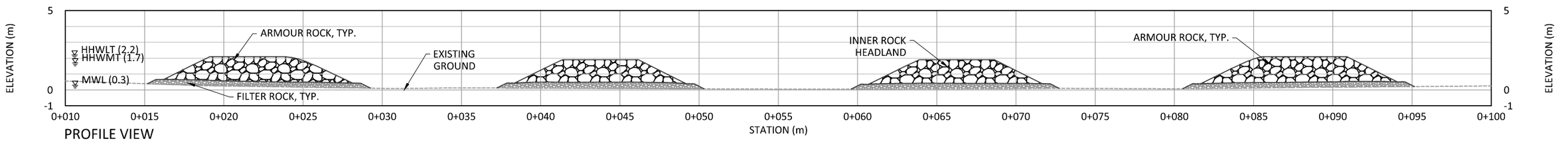
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WORK POINTS			
Point #	Easting	Northing	Elevation
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WP2	423310.46	5455590.58	2.10
WP3	423325.73	5455584.15	1.90
WP4	423330.73	5455584.15	1.90
WP5	423347.50	5455578.56	1.90
WP6	423352.50	5455578.56	1.90
WP7	423368.27	5455574.01	2.10
WP8	423374.27	5455574.01	2.10
WP9	423294.38	5455581.56	1.30
WP10	423316.02	5455581.84	1.00
WP11	423337.79	5455575.89	1.00
WP12	423359.47	5455571.46	1.00
WP13	423385.05	5455557.36	1.30
WP14	423283.13	5455585.50	1.43
WP15	423387.99	5455559.68	1.06



PLAN VIEW
1:500

0 5 1:500 25m



PROFILE VIEW
1:250

NOTES:
1. CONTOURS/ELEVATIONS ARE APPROXIMATE ONLY DUE TO INTERPOLATION BETWEEN SURVEYED POINTS.
2. CONTOUR INTERVAL = 0.2 m
3. PIPELINE ALIGNMENT IS APPROXIMATE ONLY. ACTUAL PIPELINE LOCATION MAY VARY.

NOT FOR CONSTRUCTION

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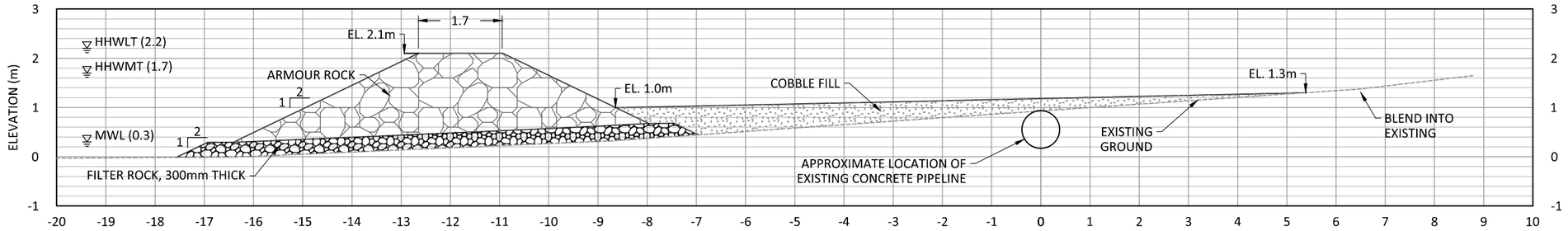
REVISIONS		
0	2021-07-12	ISSUED FOR CLIENT REVIEW
1	2022-04-15	ISSUED FOR TENDER

DRAWING INFORMATION	
DATE	29 Apr 2022
DESIGNED BY	NAB
DRAWN BY	CZZ
CHECKED BY	GFL
SHEET SIZE	B (11" x 17")

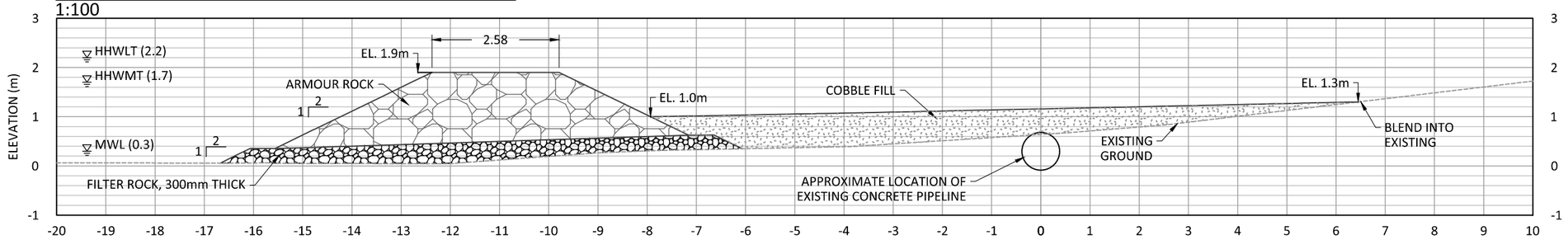
RDN INTERCEPTOR EAST OF OAR ROAD
BEACH NOURISHMENT AND HEADLAND SYSTEM
PLAN AND PROFILE VIEWS

PROJECT NUMBER	3007038
DRAWING NUMBER	3007038-2
SHEET NUMBER	002
REVISION	1

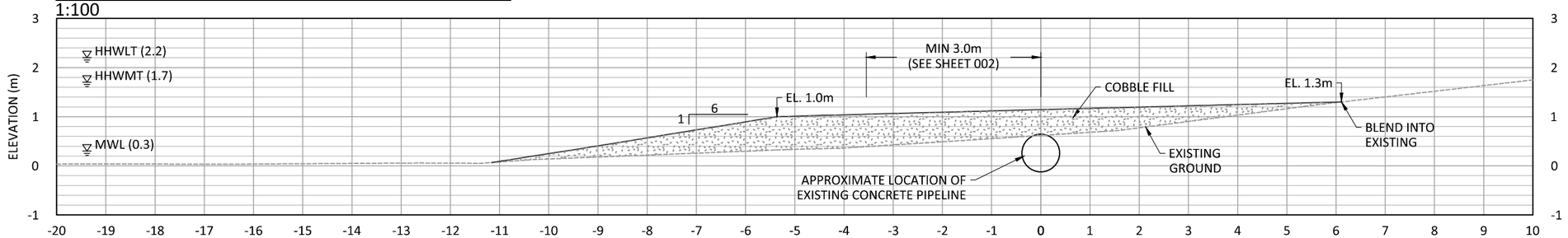
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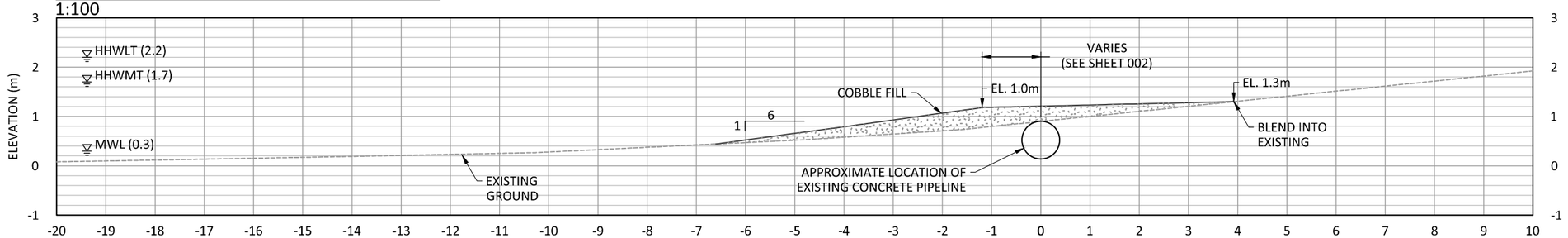
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1:100



SECTION 2: STA. 0+044 (TYPICAL INNER ROCK HEADLAND)
1:100



SECTION 3: STA. 0+055 (TYPICAL POCKET BEACH)
1:100



SECTION 4: STA. 0+100 (TYPICAL BEACH END / TRANSIITON)
1:100

NOTES:
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DRAWN BY	CZZ
CHECKED BY	GFL
SHEET SIZE	B (11" x 17")

RDN INTERCEPTOR EAST OF OAR ROAD
BEACH NOURISHMENT AND HEADLAND SYSTEM
SECTION VIEWS

PROJECT NUMBER	3007038
DRAWING NUMBER	3007038-2
SHEET NUMBER	003
REVISION	1

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Regional District of Nanaimo
Sewer Interceptor East of Oar Rd, Lantzville, BC – Erosion Protection Construction

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

BEACH NOURISHMENT & HEADLAND SYSTEM
RDN INTERCEPTOR AND EAST OF OAR ROAD
LANTZVILLE, BC



May 11, 2022

Prepared for:

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1 INTRODUCTION

This Construction Environmental Management Plan (CEMP) was prepared by Current Environmental Ltd. (CEL) on behalf of Northwest Hydraulic Consultants Ltd. (NHC). The purpose of this CEMP is to identify environmentally sensitive areas, address potential construction impacts and environmental concerns, and to outline specific environmental procedures and mitigation measures to be employed during proposed Beach Nourishment and Headland System Protection of the Regional District of Nanaimo's (RDN) upper intertidal Interceptor (the Project) located in Lantzville, BC.

This CEMP is provided to ensure that construction-related risks to the environment are minimized through appropriate management practices, communications, and operational protocols and to maintain compliance with federal and provincial regulations specific to environmental protection. The measures outlined in this document may be updated as required to adapt to prevailing conditions as the project proceeds to ensure effective protection of environmental resources.

The objectives of the CEMP are as follows:

1. Outline Environmentally Sensitive Areas (ESAs) associated with the site and project;
2. Outline potential risks or impacts to ESAs in the project footprint;
3. Summarize appropriate mitigation measures and Best Management Practices (BMPs) to minimize risk to ESAs;
4. Help ensure compliance with regulatory and project objectives; and
5. Outline the Environmental Monitoring program and communications plan for the proposed work.

General guidance for this plan has been taken from the *Land Development Guidelines for the Protection of Aquatic Habitat* (Chilibeck, 1993), *Standards and Best Practices for Instream Works* (MWLAP, 2004), *Environmental Best Management Practices for Urban and Rural Land Development in British Columbia* (MWLAP, 2004), and *Develop With Care - Environmental Guidelines for Urban and Rural Land Development in British Columbia* (Province of BC, 2014). As well, mitigation measures and BMPs will be based on the experience of CEL staff.

1.1 PROJECT SCOPE AND LOCATION

The project is located approximately 1 km to the east of the Oar Road beach access point, off Dickinson Road in Lantzville, BC (Figure 1). Currently an approximate 50 m length of interceptor pipe is exposed, sitting above surrounding intertidal substrates, that has subjected it to risk of damage from marine processes including storm surge causing driftwood impact and/or coarse substrate transport. The project intent is to import beach nourishment material to bury the exposed pipe to a safe depth and armour the seaside edge of the nourishment area with four rock headlands (Figures 2 & 3). The design is a "soft" erosion counter-measure over and around the pipeline. The shoreline morphology is expected to adjust following the beach nourishment.



Figure 1. Approximate location of the project (outlined in red), east of the Oar Rd. beach access point and temporary staging area (outlined in yellow) in Lantzville, BC. Machinery will traverse the upper intertidal zone along a designated travel corridor (delineated in purple) from the staging area to access the project site. Source: iMapBC.

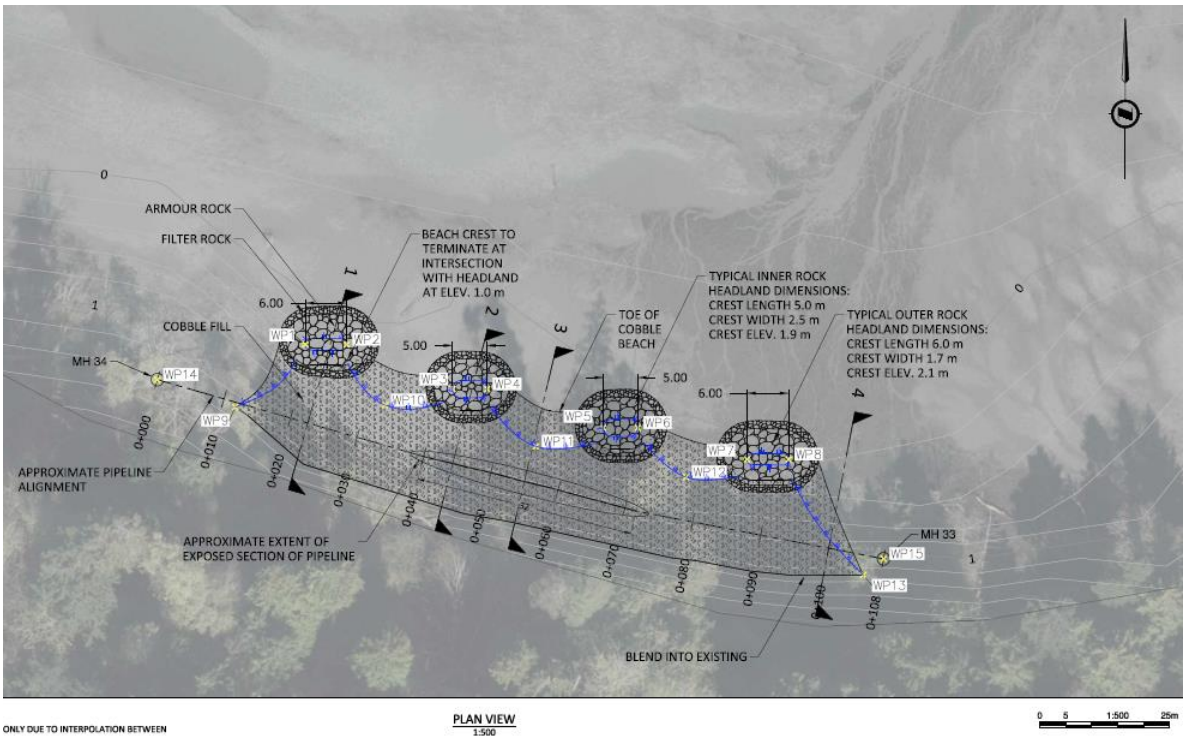


Figure 2. Project footprint showing rocky headland features and area of native beach nourishment over pipe (adapted from NHC, 2021).

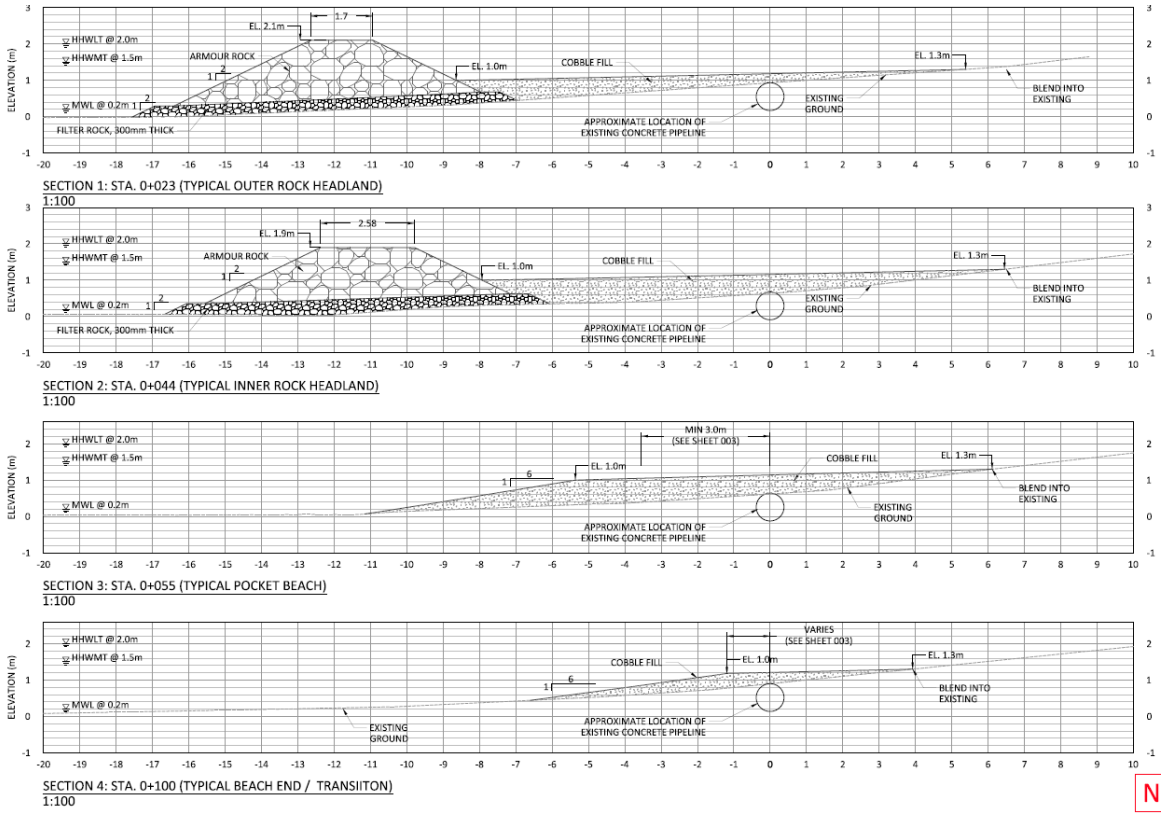


Figure 3. Typical beach profiles showing rocky headland features and extent of native beach nourishment over pipe (adapted from NHC, 2021).

1.1.1 Construction Methods

Work involved in completing the project will include importation of gravel/cobble beach nourishment fill and headland material using rock trucks accessing the shoreline from the Oar Road laydown area, and placement of this material using tracked excavators operating from the upper beach face. Import material quantities include 530 m^3 of cobble, 245 m^3 of armour material, and 140 m^3 of filter rock.

The area to be treated has approximate dimensions measuring 100 m long by 25 m wide. The treatment area will be nourished using a mix of gravel to cobble, within a 20 mm to 150 mm diameter range. Coarse sand is already present in high quantities on site and has therefore not been included in the materials list. Machine access to the beach from Oar Road will require temporarily displacing upper-intertidal driftwood but little to no vegetation is present that will be disturbed. Trucks will transport material loaded at the Oar Road staging area and deposit it in the interceptor treatment area where it will be spread by an excavator. A tracked excavator will traverse the intertidal along the approved path to the work area to install imported cobble fill and headland materials and return by the same path daily to be stationed overnight at the Oar Road staging area. Any machine maintenance or repair work will be done outside of the intertidal in the Oar Road staging area. All works will be completed in the dry during periods of low water during the fisheries least-risk timing window for marine/estuarine waters (Section 7.1).

Project preparation will include a forage fish survey prior to any machine access to the intertidal. This will be conducted by the Environmental Monitor (EM) before any works begin, and every seven days minimum following that until works are completed. It is expected that a staging area will be situated on the landward side of the beach access at Oar Road where materials will be loaded on to trucks for transport to the work area along the upper intertidal beach face. Following forage fish surveys, pre-clearing of intertidal organisms, pre-clearing nest surveys (if required), and any other salvage work by the EM based on the specific work occurring at the time, machinery will be driven immediately along an approved and clearly marked access route to the exposed interceptor work footprint. The access route will be established a minimum of 5 m from the existing pipe alignment unless safe crossing measures are implemented as directed by the Contract Administrator and machines will be restricted to the upper beach slope above the sandy tidal flats where possible.

2 REGULATORY SETTING

The following sections outlines relevant regulations that apply to the project works.

2.1 FISHERIES ACT (2019)

The federal *Fisheries Act* protects all marine fish and fish habitat in Canada and will apply to the project taking place in the marine environment. An updated version of the *Fisheries Act* was introduced on June 21, 2019, with additional provisions that came into force on August 28, 2019. The *Fisheries Act* is intended to ensure works are carried out in a manner that avoids resulting in the unlicensed death of fish, harmful alteration, disruption, or destruction (HADD) of fish habitat, and prevents pollution of water frequented by fish as described in the following notable sections:

1. A prohibition against causing death of fish (Section 34.4 (1)).
2. A prohibition against carrying “on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.” (Section 35(1)).

3. A prohibition against depositing or permitting the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water (Section 36(3)).
4. Duty to notify DFO should any works result in the death of fish or HADD of fish habitat (Section 38(4)) or introduction of a deleterious substance (Section 38(5)), and to take corrective measures to "prevent the occurrence or to counteract, mitigate or remedy any adverse effects that result from the occurrence" (Section 38(6)).

These provisions are intended to reduce threats to habitat (degradation or loss), flow alteration, aquatic invasive species, overexploitation of fish, and pollution of many kinds that may adversely affect water quality and fish health.

When conducting a project near water it is the responsibility of the person or proponent conducting the work to ensure they avoid causing a "*harmful alteration, disruption or destruction* (HADD) *of fish habitat"* in compliance with the *Fisheries Act*. The DFO document entitled "*Measures to Protect Fish and Fish Habitat*"[1] applies to all project types and is intended to assist compliance with fish and fish habitat protection provisions of the *Fisheries Act* by incorporating measures to avoid causing the death of fish and HADD of fish habitat.

2.1.1 Request for Review

The DFO Fish and Fish Habitat Protection Program offers a service ("Request for Review") which allows proponents to submit project plans in order to receive feedback on potential risks to conservation and protection of fish and fish habitat, as well as assistance in ensuring impacts are managed as best as possible. Ultimately, it is the responsibility of the proponent to ensure compliance with the *Fisheries Act*.

A Request for Review was submitted (November 25, 2021) for the proposed works (file number: 21-HPAC-01381). A Letter of Advice from DFO (April 25, 2022) indicated that works are anticipated to proceed without resulting in contravention of the *Fisheries Act* provided that the following mitigation measures are adhered to (as listed in the Letter of Advice):

1. All works, undertakings or activities located below the high water mark should be carried out in the dry (i.e., at low tide) and during the Fisheries and Oceans Canada Least Risk Timing Window of June 1 – September 1.
2. A Qualified Environmental Professional (QEP) should be present during all works, undertakings or activities with written authority to modify or stop any construction activity for the protection of fish and fish habitat.
3. Effective sediment and erosion control measures should be in place prior to the start of construction and should be upgraded and maintained throughout the duration of construction, such that a release of sediment into any water body is avoided.
4. Large motile invertebrates (e.g., crabs, sea star) located within the work area and access route should be salvaged and relocated prior to the start of construction activities and throughout the duration of construction activities (as needed). Salvage should be conducted by a QEP using appropriate gear, timing, and salvage techniques.

[1] Measures to Protect Fish and Fish Habitat. <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>.

5. Construction works, undertaking or activities should avoid creating pools of standing water that could strand or trap fish.
6. Placement of rocky materials should avoid overlap with eelgrass.
7. The access route should be clearly and visually marked (e.g., flagging tape) to minimize machinery disturbance in the riparian and intertidal zones.
8. If necessary, swamp pads (or similar) should be utilized along the access route to prevent rutting and/or compaction of materials within the intertidal zone by machinery.
9. The access route should avoid overlap with areas of suitable surf smelt / sand lance spawning habitat, to the extent feasible.
10. A QEP should conduct a forage fish egg survey prior to the start of construction activities and throughout the duration of construction activities (as needed) following appropriate survey methods. Surveys should be conducted in areas where works, undertakings or activities overlap suitable surf smelt spawning habitat. Any areas with eggs will be delineated and visually marked, and works within those areas will be temporarily suspended until a subsequent survey confirms that incubating embryos are no longer present.
11. Large woody debris located in the work area or access route should be salvaged (as needed to allow works to proceed) prior to the start of construction activities and reinstated to its initial state following completion of works, undertakings or activities.
12. All rocky materials should be non-acid generating, clean, and free of fine sediment and debris.
13. An appropriate spill prevention, containment and clean up contingency plan for hydrocarbons (e.g., fuel, oil, hydraulic fluid, etc.) should be put in place prior to work commencing, and appropriate spill containment and cleanup supplies should be kept available onsite. Onsite personnel should also be trained in spill prevention, containment and clean up procedures.
14. Machinery on site should be kept in a clean condition and free of fluid leaks.

Further detail on these recommended mitigation measures can be found in Section 7.

2.2 SPECIES AT RISK ACT (2002)

The *Species at Risk Act* (SARA) is a federal law with three main goals:

1. Prevent endangered or threatened species from becoming extinct or extirpated;
2. Help in the recovery of endangered, threatened and extirpated species; and
3. Manage species of special concern to help prevent them from becoming endangered or threatened.

For those species listed as extirpated, endangered or threatened under the Species at Risk Act (SARA), it is illegal to:

1. Kill, harm, harass, capture or take an individual;
2. Possess, collect, buy, sell or trade an individual or any part of an individual; and
3. Damage or destroy the residence of one or more individuals.

2.3 MIGRATORY BIRD CONVENTION ACT (1994)

The *Migratory Bird Convention Act* (MBCA) protects individuals and populations of migrating birds, including their eggs and nests. Among a number of prohibitions, this Act requires there be no disturbance to the nests or eggs of migratory birds without a permit from the Minister. The general timing window for migratory bird nesting in this region is 15 March to 15 August.

2.4 WILDIFE ACT (1996)

The provincial *Wildlife Act* has additional protections for breeding birds. Raptor nests covered under the *Act* are protected year-round whether they are active or not, while breeding birds' nests are only protected while inhabited by a bird or its egg. Section 34 of the *Wildlife Act* specifies that:

> A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys:
>
> (a) a bird or its egg,
> (b) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or
> (c) the nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.

If any wildlife salvage is required prior to or during construction, a General Wildlife Permit and Animal Care Application under the *Wildlife Act* may be required.

3 ENVIRONMENTALLY SENSITIVE AREAS

The following sections summarize the environmental sensitivities or ESAs associated with the project site that may be impacted by the proposed works. These ESAs are based on an environmental assessment conducted by CEL in May 2021, and the resulting *Environmental Assessment and Protection Plan* (CEL, 2021).

3.1 TERRESTRIAL HABITAT

The beach access point and staging area at the end of Oar Road is the only location where terrestrial activities will occur. Vegetation on the beach and within driftwood and rip rap is limited to sparse growth of beach dune grass. The location at the end of Oar Road is a popular beach access point and pedestrian traffic has limited vegetative growth in the area. Landward of existing rip rap protecting the end of Oar Road from erosive forces there is a small, paved parking area.

The terrestrial shoreline area immediately backing the beach nourishment site is characterized by a relatively steep vegetated bluff that has been subject to sloughing and toe erosion causing some trees to be deposited on the upper beach face (Photo 1). Vegetation on the bluff is a mixed deciduous/coniferous forest canopy dominated by western redcedar (*Thuja plicata*), bigleaf maple (*Acer macrophyllum*), and grand fir (*Abies grandis*). The understory is dominated by western sword fern (*Polystichum munitum*). The shoreline bluff appears unstable and sloughing is evident. Invasive species presence includes English ivy (*Hedera helix*) that is also affecting the health of backshore tree species.

Although no standing tree removal is planned, it is likely that some of the recumbent trees that have fallen onto the beach as a result of shoreline bluff processes will need to be cut at their butts to remove the stems from the work area. The stems will be either be deposited elsewhere along the beach to add to the existing driftwood belt or be trimmed into smaller lengths and removed from the site. A bird nest scan will be completed prior to any vegetation removal or manipulation according to measures described in Section 7.2.2.



Photo 1. View west taken from the approximate mid-point of the treatment area showing bank sloughing and fallen trees from the backshore that will require removal to access the work area.

3.2 INTERTIDAL HABITAT

The intertidal zone, where the majority of the project footprint is sited, is predominantly sand with some limited cobble substrates in the upper intertidal within 15 m horizontal distance from highwater mark (Table 1). Also present in the upper intertidal where substrates are thin are limited patches of exposed hard clay layer suggesting that the sand/cobble mix in his zone may be a thin veneer overtopping a shallow bedrock bench or outcrops. Two intertidal transects were run perpendicular to the shoreline from the highwater mark seaward for 30 m to the outside edge of the proposed beach nourishment and armouring footprint with results shown in Table 1 below.

The intertidal assessment was timed for a period of low water coinciding with a 0.9 m low tide at 14:01h predicted for Nanoose Bay tidal station #7930. In general, upper intertidal beach slopes at a shallow 5% grade for approximately 15 m after which it is nearly flat from 15 m to the water's edge at > 60 m at the time of low tide assessment.

Intertidal biota in the mid-upper intertidal was limited to growth on cobbles including rock kelp (*Fucus distichus*), sea lettuce (*Ulva lactuca*), common acorn barnacle (*Balanus glandula*), and Pacific mussel (*Mytilus edulis*). The growth on cobble substrates was somewhat limited as these materials are mobilized during regular storm cycles causing them to roll along the seabed causing mechanical impacts to biota on their surfaces. Test digs in sandy substrates at 5 m intervals between 15-30 m along the transects showed the presence of burrowing ghost shrimp (*Callianassa californiensis*) and varnish clams (*Nuttallia oscurata*) in relatively high concentrations (Photo 2). A large number of burrowing/breathing holes were also observed at the surface of sandy substrates throughout the study area associated with these species. It is possible, although there was no forage fish sampling completed at the time of assessment, that sandy substrates in the work area have the potential to be used by shore spawning sand lance while Pacific herring are known to spawn subtidally in the area with the subject shoreline being categorized as "Vital" in the top 5% of herring spawn utilization areas (Figure 4).

Table 1. Intertidal beach composition measured from high-water mark to the water's edge during May 14, 2021 site survey. Note: measurements are from toe of shoreline bluff (0 m) towards water's edge (30 m) at time of survey.

0 - 10 m: cobble mixed with sand (20 cm minus ∅)		
10 – 15 m: sparse cobble mixed over sand w/ *Ulva*, and *Balanus*.		
15 – 30 m: sand w/ *Zostera japonica*		



Photo 2. Example of typical mid-intertidal burrowing invertebrates found in the sandy substrates of the treatment area including ghost shrimp and varnish clam.

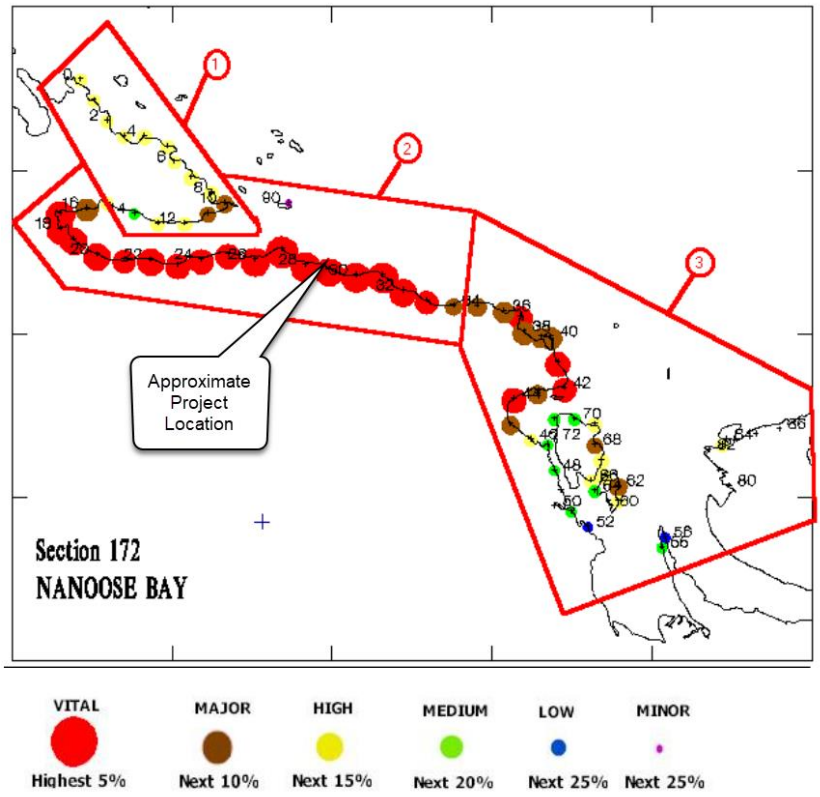


Figure 4. Cumulative herring spawn map for Section 172-Nanoose Bay showing the subject shoreline being located within a "Vital" area with the top 5% highest reoccurrence of herring spawn activity.

3.3 SUBTIDAL HABITAT

While no work should occur in the subtidal zone, the location of the project immediately adjacent necessitates the inclusion of this area in mitigation efforts. A large number of species are known to utilize the marine environment in the vicinity of the project works including salmonids, various species of seals and sea lions, whales, and porpoises. Although outside of the work area, the nearby Important Bird Area for "BC056: Little Qualicum Estuary and Nanoose Bay"[2] is located just west of Lantzville that provides important habitat for congregatory species and colonial seabirds.

3.4 SPECIES AT RISK

No marine species at risk were observed in the work area at the time of site assessment; however, according to the federal species at risk public registry[3] and DFO Aquatic Species at Risk list[4], it is possible that the following species could exist within proximity to the work area and care must be exercised to avoid any interactions should they be identified during the progress of work: Steller sea lion (*Eumetopias jubatus*), Chinook (*Oncorhynchus tshawytscha*) and sockeye (*O. nerka*) salmon, harbour porpoise (*Phocoena phocoena vomerina*), Northern abalone (*Haliotis kamtschatkana*), Bocaccio (*Sebastes paucispinis*), canary rockfish (*Sebastes pinniger*), quillback rockfish (*Sebastes maliger*), rougheye rockfish (*Sebastes aleutianus*), and yellow-eye rockfish (*Sebastes ruberrimus*). Notably, all of these species frequent deeper waters than what is immediately adjacent to the project footprint and it is unlikely there will be any interaction with project components.

Review of the provincial CDC iMap[5] database does not identify the presence of any recorded at-risk species within a concerning proximity to the project area. The nearest occurrence is red-legged frog (*Rana aurora*) located 1.7 km west of the Oar Road access point.

4 POTENTIAL ENVIRONMENTAL IMPACTS

Potential environmental impacts to identified ESAs are summarized in the sections below. The majority of activities scheduled for this project will be carried out using tracked excavators and wheeled or tracked rock trucks.

Activities with potential to impact the environment and ESAs include:

1. Introduction/spread of invasives. Where invasives are present, there is potential for work to further distribute the species. New species can also be introduced from machinery/materials coming in from off site;
2. Mechanical damage to native plants or animals during machine access to the intertidal;
3. Stockpiling activities increase the potential for erosion issues and runoff from the site as well as mechanical harm to plants and animals in the project area. Potential for erosion and runoff is low due to the nature of the material to be added (clean rounded cobble and gravel with pea gravel and coarse sand);

[2] https://www.ibacanada.ca/site.jsp?siteID=BC056
[3] https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html
[4] https://www.dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html?region=Pacific
[5] http://maps.gov.bc.ca/ess/hm/cdc/

4. Use and storage of fuels and hazardous materials. Fuels, hydraulic oils, and any other hazardous materials including concrete used on-site create the potential for spills, and input of hazardous materials into site soils and watercourses;
5. Fire. Use of fuels and personnel smoking on site increase fire hazard;
6. General waste. Potential sources of waste generated during the project will likely include:
    a. Dust;
    b. New construction debris;
    c. Fuel spill, leaks, drips;
    d. Construction waste from personnel.

5 DESIGN CONSIDERATIONS

According to BC Ministry of Environment & Climate Change *Procedures for Mitigating Impacts on Environmental Values*[6] a mitigation hierarchy for potential impacts resulting from project activities should be followed. The components of the mitigation hierarchy are as follows:

1. Avoid
2. Minimize
3. Restore on-site
4. Offset

For example, primary importance should be given to avoid making any impacts on wetted areas (below high-water mark) and riparian areas in and around the project footprint including access areas. This will be achieved through the following:

1. **Avoiding** unnecessary impacts to the intertidal that will be accomplished by implementing measures to clearly delineate environmentally sensitive areas to direct machine travel along cobbles in the upper intertidal and avoid mid-intertidal low-gradient sand bench habitat supporting bi-valves and arthropods.
2. If impacts are unavoidable, such as in the case of works below high-water in the treatment area, **minimizing** impacts must be considered. Minimizing impacts will involve reducing (where possible) impacts to commercial/recreational shellfish species by clearly marking the treatment area with a layout prior to the start of work to minimize any accidental encroachment outside of the work area boundaries.
3. Once options to minimize impacts have been exhausted, **restoring on-site** by reinstating course woody debris along the intertidal driftwood belt and nourishing sediments that support forage fish spawning may be considered.
4. If the restoration strategies are unable to result in an area of no-net-loss within the project footprint, additional measures may need to be considered where **offsets** could be applied to other nearby habitats. The potential for offsets is unlikely and will be assessed as needed as the project progresses.

6 ENVIRONMENTAL MANAGEMENT ROLES AND RESPONSIBILITIES

The following sections describe the roles and responsibilities of each of the various agencies and organizations involved with the proposed project during construction.

[6] MOE (2014). Procedures for Mitigating Impacts on Environmental Values (Environmental Mitigation Procedures). Working Document. Pp. 70.

6.1 CONTRACTOR – TBD

The Contractor is responsible for all activities related to the works and to ensure that, in consultation with the Contract Administrator, applicable permits, licenses, or related authorizations are in place for activities that will or could affect the environment. The Contractor assumes all reasonable and necessary measures to ensure that any activities undertaken in the performance of the work are conducted in such a way as to minimize any impacts to ESAs summarized in Section 3.

The Contractor will amend the construction schedule to allow time for the EM to conduct forage fish and breeding bird activity surveys prior to and during the construction period as necessary. The Contractor and EM will coordinate their schedules and make all efforts to ensure these requirements are met within a timely manner.

If any unanticipated impacts to the environment occur that do not have applicable regulatory approval, the Contractor will mitigate and restore the impacted areas as deemed appropriate by the Contract Administrator and applicable regulatory agencies. The Contractor will keep a copy of the CEMP and all related permits, licenses and approvals, on site at all times.

Throughout the execution of the work, the Contractor is responsible for:

1. Complying with the Contract documents and/or related work instructions;
2. Complying with all applicable regulatory requirements, including federal and provincial laws and any applicable local bylaws or related requirements;
3. Implementing the environmental measures outlined in this CEMP;
4. Supplying all materials needed to properly implement the mitigation measures outlined in this CEMP (i.e., silt fencing, spill kits, sorbent booms, poly sheeting, etc.);
5. Reviewing and signing off on a Project Environmental Orientation Record which will be provided by the EM prior to construction; and
6. Coordinating and discussing of the work plan with the EM on site to ensure that all mitigation measures are installed and working properly, and compliance with the EM should there be any shut down days during heavy rainfall events.

6.2 OWNER – REGIONAL DISTRICT OF NANAIMO

Regional District of Nanaimo is committed to ensuring that Project activities be undertaken in such a manner that the Project will not result in significant adverse environmental effects. RDN is responsible for ensuring all mitigation measures applicable to the Project are added to the terms and conditions of any permits or contracts issued for the Project. RDN may require or conduct surveillance of the Project throughout its implementation to confirm work is being carried out in accordance with the Project authorizations and permits.

The RDN, either through an RDN Departmental Representative or the Contract Administrator and Engineer, is responsible for:

1. Assigning, managing, and overseeing the EM, providing guidance and collaborating as needed to ensure environmental mitigation measures are being carried out appropriately;
2. Reviewing and approving the CEMP, including updates made as the Project progresses;
3. Preparing, reviewing and approving the DFO Request for Review and any other environmental permits and/or authorizations required for the Project;

4. Leading communications with regulatory agencies, First Nations, public stakeholders and Contractors working on the Project to ensure clear and effective communication;
5. Determining frequency and requirements of environmental monitoring reporting;
6. Tracking and updating contractual requirements and specifications;
7. Communicating the Project schedule to the project team;
8. Recording and communicating non-conformances with the CEMP and other contract obligations; and
9. Conducting all post-construction follow-up monitoring activities (as needed), unless otherwise stated in tender material.

6.3 ENVIRONMENTAL MONITOR – CURRENT ENVIRONMENTAL LTD.

Current Environmental Ltd. will act as the EM for the Project. The EM will oversee the work and ensure the Contractor's compliance to the CEMP and all applicable regulatory requirements. The EM has the authority to order the Contractor to modify and/or halt any work activity if deemed necessary for the protection of the environment and observance of statutory requirements. During construction, appropriate meetings involving the crew and the EM will be held as required to ensure that environmental risks are addressed and mitigated in a proactive manner. Instances of non-conformance and environmental incidents and near misses will be brought to the attention of the owner – Regional District of Nanaimo and the appropriate government agency.

The EM will be on-site during all works to fulfill environmental monitoring duties. Additionally, the EM will conduct forage fish surveys prior to and one week into construction. The Contract Administrator will provide additional engineering monitoring and intermittent on-site supervision.

Specifically, the EM is responsible for:

1. Updating the CEMP as necessary;
2. Reviewing the CEMP with the Contractor and recording the review on the Project Environmental Orientation Record at the project start up meeting (EM will supply this form during the review process);
3. Monitoring onsite works at all times during active construction, within 24 hours of a significant rain event (e.g. 25 mm of rain in 24 hours), and in response to emergency spill incidents;
4. Completing forage fish surveys prior to and one week into construction,
5. Completing monitoring reports for every 2-week work period, incident reports as needed, and a final compliance report if requested by RDN (see below) to be distributed to all Project proponents;
6. Identifying the requirement for specialty services (i.e., nesting bird surveys, amphibian salvage, fish salvage, wildlife tree assessments, etc.);
7. Directing the Contractor on the implementation of various mitigation measures required throughout construction and ensuring the proper implementation of these mitigation measures;
8. Halting work if a major non-conformance occurs or an unforeseen environmental sensitivity is discovered;
9. Communicating on a frequent basis with the construction supervisor to ensure ongoing implementation of mitigation requirements, to discuss any environmental management issues, and to address upcoming issues that could cause project delays;
10. Liaising with relevant parties regarding environmental aspects of the project, as necessary; and
11. Contacting appropriate environmental agency personnel in the event of any non-conformance with this CEMP, and/or applicable legislation and permits.

6.4 ENVIRONMENTAL COMMUNICATIONS

Environmental communication involves a number of documents and activities, including the following:

1. **Construction Environmental Management Plan (CEMP):** The CEMP, this document, details the roles, responsibilities and expectations regarding the activities associated with the works. The CEMP should be printed and kept on site at all times during construction.

2. **Project Environmental Orientation Record (PEOR):** All Contractors must complete an environmental orientation provided by the EM at project startup. All Supervisors and crew members will sign the Project Environmental Orientation Record (PEOR) provided by the EM to acknowledge that they have reviewed and understood the environmental requirements of the project.

3. **Environmental Monitoring Reports:** The EM will be responsible for completing and submitting environmental monitoring reports to the Contractor and Project Proponents. During active construction, reports will be submitted for a 2-week period, and should be submitted no later than 7 days after a given work period.

   The EM may be responsible for producing a final Environmental Compliance Monitoring Report on construction activities at the request of RDN, which will include:

   a. Project details and reporting period;
   b. Construction activities;
   c. Reporting period conditions;
   d. Environmental monitoring undertaken;
   e. Environmental incidents or non-compliance issues;
   f. Mitigation measures employed;
   g. Recommended actions or outstanding issues; and
   h. Photographs.

4. **Environmental Incident Reports:** An environmental incident is one that has caused an impact to the environment and an environmental near miss is an incident that had the potential to cause an impact to the environment. The Contractor must report environmental incidents to the EM immediately so they may assist with the necessary clean up or action items. The EM is responsible for completing environmental incident reports for incidents or near misses within 24 hours of an incident occurring. Environmental incident reports will be signed by the Contractor and distributed to Project Proponents. For contraventions under the Fisheries Act, Environmental Management Act, and any other relevant Acts, the EM must report to Environmental Agencies (e.g. Fisheries and Oceans Canada, Ministry of Environment, Ministry of Forest, Lands, Natural Resource Operations and Rural Development (FLNRORD), etc.) as applicable, as well as the Ministry Representative. The reporting criteria for deleterious substance spills to the marine environment (water) and to land (soil) are different, and explained further in Section 7.6.

6.4.1 Project Contact List

The following table provides the contact information for project team members and regulatory agency staff.

Table 2. List of project contacts.

Name	Role	Affiliation	Contact Information
Gerald St.Pierre	Owner – Representative	Regional District of Nanaimo	O: 250-390-6751 M: E: gstpierre@rdn.bc.ca
Neville Berard	Contract Administrator - Project Manager/ Engineer of Record	Northwest Hydraulic Consultants Ltd.	O: 604-980-6011 ext. 3278 M: 778-683-6442 E: nberard@nhcweb.com
Lucas Dunbar	Contract Administrator – Site Engineer	Northwest Hydraulic Consultants Ltd.	O: 250-754-6425 ext. 3309 M: E: ldunbar@nhcweb.com
TBD	Contractor – Site Supervisor	TBD	O: M: E:
Rupert Wong	Project Biologist	Current Environmental Ltd.	O: 250.871.1944 M: 250.703.1196 E: rwong@currentenv.ca
TBD	Environmental Monitor	Current Environmental Ltd.	O: 250.871.1944 M: E:
Clint Carl	DFO Representative	Fisheries and Oceans Canada	O: 236-335-6803 M: E: clint.carl@dfo-mpo.gc.ca

7 MITIGATION MEASURES

The following sections outline mitigation measures that are to be implemented to ensure risks to environmental attributes are minimized. See additional mitigation measures outlined by the DFO Letter of Advice in section 2.1.1.

7.1 PROJECT TIMING

According to DFO marine/estuarine timing windows for the protection of fish and fish habitat, marine foreshore construction may generally occur during the period July 1 – Sept. 1 in Summer and Dec. 1 – Feb. 15 in winter of any calendar year for Area 17 – Nanaimo (inc. Lantzville)[7]. These timing constraints are specific to work below the highwater mark. Intertidal work must take place during periods of low tides and no materials will be placed "in the wet."

Construction works for the Project are scheduled to occur during the 2022 summer work window, between July 1 and September 1, 2022, and will take approximately two to three weeks to complete.

7.2 SITE DELINEATION AND PROTECTION OF ENVIRONMENTALLY SENSITIVE AREAS

Unnecessary expansion of the project footprint should be avoided to minimize destruction of the adjacent vegetation, wildlife, and habitats. The following mitigation measures will reduce risk to these ESAs:

1. Prior to construction, the EM and Contractor are to clearly mark the limits of project activities, including all ESAs, maintaining a footprint as close as possible to the existing infrastructure (interceptor pipe) and selected upper intertidal machine access path;
2. Land-based staging and storage areas are to be clearly delineated;

[7] www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/bc-s-eng.html#area-17

3. No machinery access or spoil material storage of any kind is to occur outside the delineated project areas without the consent of the EM;
4. Vegetation identified for protection, (e.g., outside designated work areas) will be left intact and root systems undisturbed where applicable; and
5. No clearing work is anticipated for the proposed works; however, if some vegetation trimming/removal is required it will be limited to what is necessary to complete work.

7.2.1 Aquatic Habitats

Works near waterbodies will require additional mitigation measures, which are as follows:

1. Perform frequent visual checks of waterbodies near construction activities. If sediment is observed in a waterbody, the contractor must stop work and notify the EM who will be on-site during all works;
2. Keep equipment in good and clean order and do not complete any machinery maintenance within 30 m of any waterbody;
3. Implement sediment and erosion control measures as appropriate, including keeping water away from exposed soils, using silt fences and placing mulch over exposed soils or otherwise treating permanently or temporarily until revegetation (see Erosion and Sediment Control below);
4. Stockpile excavated materials for reuse in site remediation when such topsoil does not contain invasive species. No excavation of materials is anticipated unless it is required near the access point to facilitate machine access onto the beach;
5. Ensure that work during each low tide cycle can be completed and machines can exit the site before tide level reaches the work area;
6. Ensure that the state of the work area is such that no fish are entrapped following the low tide work period;
7. Do not start work before the EM has confirmed access approval to the intertidal;
    a. The EM must survey the work area and determine if substrates remain suitable for forage fish (such as sand lance) spawning;
    b. If the substrates appear suitable for forage fish spawning, the EM must conduct a forage fish survey to ensure no eggs are present in the work area; and
    c. The EM must be allowed sufficient time to ensure all organisms (within reason) in the project footprint have been relocated prior to each access to the work area in the intertidal. Sub-surface bivalves and arthropods will be left *in-situ* as the treatment area will require only materials being added to the surface and no excavation should be required.

7.2.2 Wildlife

Where wildlife is encountered (excluding small invertebrates beyond the scope of reasonable salvage efforts), the following mitigation measured can be applied to reduce risk of impact:

1. Alert the EM immediately and stop work in the area;
2. Do not handle wildlife without a permit under the *Wildlife Act*;
3. If required, erect exclusion barriers as directed by the EM and salvage wildlife from within work areas as required. Move the salvaged species to suitable habitat at a safe distance. The EM will be responsible for any salvage required.

In the unlikely event that vegetation clearing becomes necessary for site access/work, the following measures ensure impacts to breeding birds are minimized during construction:

1. Minimize the amount of vegetation clearing and other works that disturb nesting inside the increased risk migratory and passerine nesting window (1 April – 15 August) and/or raptor nesting window (31 January – 31 August);
2. The EM must be given three business days notice in advance of clearing within this increased risk window in order to complete a pre-clearing nest survey;
    a. Each nest survey will be valid for a maximum of 7 days, and additional surveys are required if clearing exceeds the 7 day period;
    b. If a nest is found with a bird/egg, a vegetated buffer will be maintained around the nest tree at a species-specific minimum width determined by a QEP in accordance with avian BMPs; and
    c. A species-specific Construction Environmental Management Plan (CMP) must be developed to regulate construction activities near an active nest.

7.2.3 Species at Risk

Heightened mitigation measures are outlined below for any potentially occurring species at risk (SAR):

1. Do not handle wildlife without a permit under the *Wildlife Act*;
2. Monitor nearby subtidal for presence of SAR immediately adjacent to the project footprint;
3. Remove woody debris and other potential cover from the area to be used for beach access several days prior to clearing (e.g. during the EM's site delineation);
4. Ensure there are no previously unidentified at-risk plants, animals, or habitat in the immediate area to be used for beach access, materials transport, or within the treatment area. If any at-risk plants are found near the beach access point, they should be clearly marked by the EM with a suitable buffer so that accidental damage does not occur;
5. Minimize disturbance of natural vegetation;
6. Increase efforts to locate others in the area or move work to another part of the site for the remainder of the day should any SAR be detected; and
7. Identify any potentially occurring endangered species with assistance from the EM.

7.3 ARCHEOLOGICAL AND HERITAGE RESOURCES

This project is situated within the traditional territories of the Snuneymuxw First Nation and Snaw-naw-as (Nanoose) First Nation. First Nations cultural and other heritage resources will be responsibly and sensitively managed for the duration of the project pursuant to the Heritage Conservation Act (HCA). Archeological sites in BC are protected by the HCA, whether they are located on Provincial Crown or private land, and whether they are previously known or newly discovered sites. The HCA prohibits the alteration, damage, removal, excavation or desecration of archeological and cultural remains without a permit issued under section 12 of the Act.

The project does not require excavation or other means of disturbing soils, and therefore carries low risk of potentially impacting archeological and heritage resources; however, should the discovery of such a resource occur during the course of construction works, the following Chance Find Protocol should be adhered to:

1. Stop all work in the vicinity immediately.
2. Record the location, delineate the area, and leave all remains in place.

3. Notify the onsite EM immediately, who will then contact the Contract Administrator. The Contract Administrator will be responsible for contacting the BC Archeology Branch and the appropriate First Nations to receive further guidance.
4. Resume construction works only if and when permission is granted by the responsible authorities.

7.4 RESTORATION OF THE SITE AND SENSITIVE HABITAT

Plans must be made to restore the site and disturbed sensitive habitats within the project area after construction is complete. Measures to restore the site are as follows:

1. Retain and replace any large woody displaced for beach access;
2. Replace any salvaged animals or plants following work where possible; and
3. Revegetate disturbed areas (e.g. vehicle turning radii, soil stockpiles) with a suitable assemblage of native species as needed.

7.4.1 Invasive Species Management

In the event that any invasive plants are identified at the project site, the following mitigation measures must be in place to ensure no further spread of these plants occurs:

1. Identify all areas with invasive species prior to any clearing or machine access. Invasive species that may be disturbed should be removed prior to the work;
2. Pay special attention to contain the brush if removal of any invasive plants is to occur to prevent the spread of these invasive plants;
3. Wash all equipment used to remove invasive species (including hand tools) following each removal effort to avoid further migration;
4. Wash all equipment before entering/after leaving the site;
5. Ensure all materials entering the project site are free from invasive species;
6. Transport invasive species to an appropriate waste facility to be composted, deep-buried, or burned in a controlled setting as directed by the EM;
7. Revegetate the site with native vegetation where necessary as determined by the EM; and
8. Be alert for new invasive plants growing along access routes and remove them promptly before they become established and spread.

7.5 GENERAL SITE ACTIVITIES

7.5.1 Waste Management

The following mitigation measures minimize the impact of general site waste produced during construction:

1. Project materials with the potential to generate “flyaway” waste will be transported by covered truck or otherwise suitably contained during transport;
2. Lunch debris and any waste generated by construction crew will be collected in plastic garbage bags and discarded at appropriate facilities daily;
3. Paper, wood and plastic debris will be recycled;

4. Any amount of vegetation that needs to be removed from the site will be stored at a designated debris storage area. No cut vegetation will be left at the work site unless directed otherwise by the EM. No clearing work is anticipated;
5. The EM will conduct visual inspections for contamination of soils around waste disposal areas throughout construction. Identified soils will be dealt with according to protocols outlined in Section 7.6.1.
6. Upon completion of the work, all materials and equipment surplus to the work will be removed from the site by the contractor. The site will be left in a condition that is acceptable to the EM;
7. Any vehicle and equipment maintenance will be conducted in a designated location approved by the EM. This maintenance will be conducted on an impermeable surface (e.g. over asphalt or lined surface). All waste materials (filters, rags, fluids, etc.) must be disposed of to an appropriate facility.

7.5.2 Noise and Air Quality Management

High levels of noise and degradation of air quality related to the project can lead to the disturbance of wildlife and can become a factor for worker safety. The following mitigation measures will reduce risk to ESAs from noise and air pollution:

1. Keep equipment in good working order and minimize machinery idling time;
2. Plan works efficiently to minimize the duration and extent of noise and air disturbance to avoid wildlife disturbance or displacement;
3. Use hearing protection (i.e. ear plugs) in areas where personnel will be exposed to noise levels of 85 dB or higher. Protection will be required and will be readily available on site;
4. Avoid the use of prohibited chemical dust suppressants such as calcium lignosulphate, sodium lignosulphate, or magnesium chloride; and
5. Manage dust emissions as necessary by the application of water, which will be the responsibility of the Contractor.

7.5.3 Access Routes

Access and egress routes to the site must be minimized as much as possible to reduce impact to ESAs. Routes should be as direct as possible and will be sited away from more sensitive intertidal biota by delineating a travel corridor along upper intertidal cobbles immediately below the driftwood belt. Swamp mats or similar will be used where compaction, rutting or vegetation damage is an issue.

7.6 EROSION AND SEDIMENT CONTROL

Site preparation, earth moving, and excavation may create sediment-laden run-off that can impact aquatic habitats, soils, groundwater, and/or surface water. The implementation and maintenance of sediment control measures and related equipment and supplies are the responsibility of the construction contractor, and will be designed, constructed, and maintained as required in consultation with the EM. Except for potential site access locations, there is no excavation or earth moving other than placement of clean cobbles, gravels, and sand anticipated. The majority of mitigation measures below apply only where excavation or movement of large materials (e.g. large woody debris) that may expose soil is required for beach access or access to the treatment area.

Activity-specific mitigation measures to be employed:

1. Coordinate construction activities within the intertidal zone with suitable tide levels to avoid working "in the wet;"
2. Commence construction activities only after proper sediment control measures are in place, and extra materials are on-site and available for deployment if required;
3. Inspect sediment control measures regularly during construction and ensure these are functioning and maintained as required;
4. Use Erosion and Sediment Control (ESC) products recommended by the EM based on the nature and duration of work. Substitutes can be used as approved by the EM provided they provide the same function as the recommended product. Having a product on hand does not make it a suitable substitute if it does not function as well as the recommended product;
5. Use biodegradable products where possible and ensure products are free of invasive species materials and will not attract wildlife;
6. Halt construction during intense rainfall events or whenever surface erosion occurs affecting the watercourse near the site. This will be at the discretion of the EM;
7. Minimize vehicle activity on disturbed surfaces during or after rainfall events;
8. Limit access paths used for the construction to be as narrow and direct as possible;
9. Avoid traversing watercourses with machinery at any time and machine access to the intertidal is to be monitored by the EM;
10. Control sediment sources by immediately endhauling or securely stockpiling any excavated material, localizing machine access, sweeping contaminated paved surfaces using a Bobcat® Sweeper (or equivalent) as needed to prevent off-site release of sediment;
11. Store any soils or materials not to be used for beach nourishment securely above high-water mark and endhaul them as soon as possible;
12. Conduct clearing immediately prior to beach access being required to minimize the area and duration of exposed soils when possible;
13. Avoid disturbance to existing vegetated areas and limit clearing or material movement to what is needed to gain access for the proposed works;
14. Stabilize, revegetate or otherwise treat any exposed soil areas and erosion-prone slopes that may potentially erode into watercourses as soon as practical following completion of work in that area; and
15. Ensure all ESC measures and products have been removed and disposed of appropriately following completion of work and site stabilization.

7.7 FUELS AND HAZARDOUS MATERIALS

The accidental release of petroleum, oils, hydraulic fluids, lubricants, concrete additives, anti-freeze or other hazardous materials onto land surfaces or into waterbodies may result in degradation of habitat quality and could be a threat to human health. General mitigation measures are provided below, and Section 7.6.2 and the Emergency Spill Response (Appendix A) provide detail on spill response.

1. Outfit machinery with an environmentally friendly, biodegradable hydraulic fluids package;

2. Keep a large spill kit of suitable capacity to contain the largest possible spill on hand at all times during construction;
3. Maintain smaller spill kits on all machinery;
4. Clean up all identified spills immediately, and remove contaminated soils and vegetation for appropriate disposal at an approved facility;
5. Refuel equipment only at designated fueling stations and located at least 15 m from all waterbodies in suitable containment (impermeable surface or drip pan);
6. Mark all fuel, chemicals, and hazardous materials clearly;
7. Remove waste products to an approved disposal/recycling facility should accidental mixing of fuels, chemicals, and hazardous materials occur;
8. Locate fuel tanks within containment areas off the ground;
9. Place spill containment trays of suitable size under parked vehicles when not in use;
10. Place pumps and jerry cans on manufactured spill containment trays or "cribs" constructed of poly sheeting and small logs with sorbent pads to contain spills or similar;
11. Complete all equipment maintenance with the potential for accidental spills (e.g., oil changes, lubrications) on a designated area at least 15 m from any waterbodies. Tarps should be laid down prior commencement of work to facilitate clean up. This maintenance will be conducted on an impermeable surface (e.g. over concrete or a lined surface);
12. Collect used oil, filters, and grease cartridge lubrication containers and other products of equipment maintenance and store in a secure receptacle for later disposal at an appropriate facility;
13. Follow the guidelines below in the event of a spill:
    a) As soon as spill is noticed, immediately STOP work;
    b) Immediately deploy on-site personnel to build containment dykes, deploy booms and pads as needed, or pump spilled contaminant into storage drums;
    c) Dispose of all contaminated soils, debris, cleaning materials, and absorbent material by placing in an approved disposal site. Contaminated soils must be removed from the site;
    d) The construction supervisor and EM will be responsible for coordinating clean-up and collecting all pertinent information;
    e) Spills need to be immediately reported to the EM and the construction supervisor. Spills to soil are to be reported to the Emergency Management BC (EMBC) line (1-800-663-3456) if they exceed the reportable limits (e.g. 100 litres of fuel or oil). Deleterious substance spills of any volume into water are to be reported to the Fisheries and Oceans Canada (DFO) line (1-800-465-4336) as well as the Canadian Coast Guard (CCG) line (1-800-889-8852) if the spill occurs in the marine environment;
    f) Debrief all site personnel on the incident and implement additional precautions or measures to ensure that similar accidents will not recur;
14. Complete no less than weekly, documented inspections of environmental mitigation measures, fire prevention and spill recovery supplies; and
15. Complete daily, documented inspections of all vehicles and equipment for leaks and worn hydraulic hoses and fittings.

7.7.1 Contaminated Soils

It is the contractor's responsibility to minimize potential risk of contaminated soils and material on site by following the procedures outline below:

1. Conduct visual inspection for contamination periodically throughout construction;
2. Stop work in the area and contact the EM if suspected contaminated soils are encountered;
3. Determine if soil testing is required (EM) or whether work can continue;
4. Avoid use of contaminated material as backfill;
5. Ensure all soils brought in for beach nourishment are clean.

7.7.2 Emergency Spill Response Plan

Accidental spillage of fuels, lubricants or hydraulic fluid will be immediately contained, removed and disposed of in accordance with the Spill Response Plan (Appendix A), as well as guidelines stipulated by the Environmental Protection Branch of the Federal Department of the Environment (DOE/EP) and the provincial Ministry of Environment (MoE). Significant spills to soil (exceeding 100 L) must be promptly reported to the Emergency Management BC (EMBC) line at 1-800-663-3456. In accordance with Section 36(3) and Sections 38 (4 thru 7) of the Federal Fisheries Act, the proponent and contractor will also have a duty to mitigate, notify and report any deleterious substance spill (any volume) to water to the Fisheries and Oceans Canada (DFO) line at 1-800-465-4336, as well as the Canadian Coast Guard (CCG) line (1-800-889-8852) if the spill occurs in the marine environment. An Environmental Incident Report (EIR) form is provided in Appendix B, which should be filled out in the event of a spill in addition to contacting the required agencies summarized in Table 3 (See Appendix A for further details).

Table 3. Spill reporting matrix.

Substance	Quantity[1]	External Reporting	Internal Reporting
Marine Water			
Any Spill	Any amount in aquatic habitat	CCG 1-800-889-8852 EMBC 1-800-663-3456	EIR
Fresh Water			
Any Spill	Any amount in aquatic habitat	EMBC 1-800-663-3456	EIR
Terrestrial			
Oil and waste oil	> 100 L	EMBC 1-800-663-3456	EIR

[1]Amounts are based on Spill Reporting Regulation (BC Reg 263/90) of the Environmental Management Act and Section 35 and 37 of the Federal Fisheries Act

7.8 FIRE PREVENTION AND RESPONSE PLAN

The following procedures and protocols will be implemented during construction to minimize the potential for a fire on-site:

1. Smoking will be prohibited near dry fuel, explosives, fuel and hazardous materials;
2. Fire equipment will be located on-site including fire extinguishers, and shovels;
3. Construction personnel will be aware of firefighting techniques, as appropriate;
4. All vehicles will be equipped with fire extinguishers, as appropriate;
5. No open fires or burning of brush is permitted on site;
6. Vegetation around the perimeter of the work site will be irrigated or wet down during high fire risk season, as necessitated by the type of activity that could create sparks or open flames; and
7. Fuels will be contained in safe storage areas/sheds out of direct sunlight.

8 RECOMMENDED EQUIPMENT

The following is a list of equipment recommended for this project, as described in the mitigation measures section:

1. Large, centrally located spill kit in a waterproof container with the capacity to handle 110% of the largest possible spill;
2. Smaller spill kits on all machinery;
3. Sufficient length of sorbent booms to contain work area for spills near water;
4. Suitable flagging or marking material that can demarcate the access route in the intertidal zone that can either be removed prior to high tide (e.g. stakes with flagging tape) or remain in place without risk to public walking on beach at low tide.

9 CLOSURE

We trust that the RDN interceptor beach nourishment and protection works can be completed in a way that avoids causing harm to environmentally sensitive areas provided that the measures described in this CEMP are adhered to and best management practices for works in the marine environment are followed closely.

10 DISCLAIMER

This report was prepared exclusively for Northwest Hydraulic Consultants Ltd. and the Regional District of Nanaimo by Current Environmental Ltd. The quality of information, conclusions and estimates contained herein is consistent with the level of effort expended and is based on: i) information available at the time of preparation; ii) data collected by the authors and/or supplied by outside sources; and iii) the assumptions, conditions and qualifications set forth in this report. This report is intended to be used by Northwest Hydraulic Consultants Ltd. and the Regional District of Nanaimo only, subject to the terms and conditions of its contract or understanding with Current Environmental Ltd. Other use or reliance on this report by any third party is at that party's sole risk.

Appendix 1. Spill Response Plan (Four pages)

Follow these procedures if a spill of fuels, chemicals, or other hazardous materials occurs

Contacts

Report major spills (>100 L) of Class 3 Flammable liquids to EMBC (1-800-663-3456)
For deleterious substance spills of any volume to water call DFO (1-800-465-4336) and CCG (1-800-889-8852) if the spill occurs in the marine environment

9-1-1 FOR EMERGENCY SERVICES

Response

For spills of *any* volume follow these steps:

1) ENSURE HUMAN SAFETY
2) STOP THE FLOW (when possible)
3) SECURE THE AREA
4) CONTAIN THE SPILL
5) NOTIFY
6) CLEAN-UP
7) REPORT
8) DE-BRIEF

1) ENSURE HUMAN SAFETY

- Assess the situation. Never rush in.
- Warn other people in the immediate vicinity.
- Determine what product has been spilled.
- If the spilled product is flammable ensure there are no ignition sources nearby.
- Wear appropriate personal protective equipment.

2) STOP THE FLOW

- Act quickly.
- Stop the flow or spill at its source.
- Close valves, shut off pumps, or plug holes/leaks.

3) SECURE THE AREA

- Inform the Environmental Monitor and Construction Supervisor of the spill.
- Limit worker access to spill area.
- Prevent public entry to the site.

Continued next page…

4) CONTAIN THE SPILL

- Prevent spillage from entering drainages (watercourses, ditches, culverts, drains).
- Use ample spill sorbent material to contain the spill.
- As necessary, use a dyke, pumping into containment structures, or other method to prevent discharge from the site.
- Make every effort to minimize contamination.

5) NOTIFY

- When necessary (spills of flammable materials >100L) the first external call should be made to: Emergency Management BC (EMBC) 1-800-663-3456 (24 hour)
- For deleterious substance spills of any volume to water call DFO 1-800-465-4336, and CCG 1-800-889-8852 if the spill occurs in the marine environment.
- Provide necessary spill details to other external agencies.
- See Spill Reporting Notification Chart and Table of Reportable Levels of Certain Substances provided below.

6) CLEAN-UP

- The Environmental Monitor will be responsible to ensure that clean-up methods comply with Ministry of Environment requirements including the *Environmental Management Act* and Regulations, or relevant regulation.
- All material and equipment used in clean-up (e.g. used spill containment material, and sorbent pads) are to be disposed of appropriately.
- Soils or other materials contaminated by the spill will be treated as special wastes and be disposed of as required on a site-specific basis. Residue sampling may be required in association with soil contamination to ensure complete removal and/or treatment.

7) REPORT

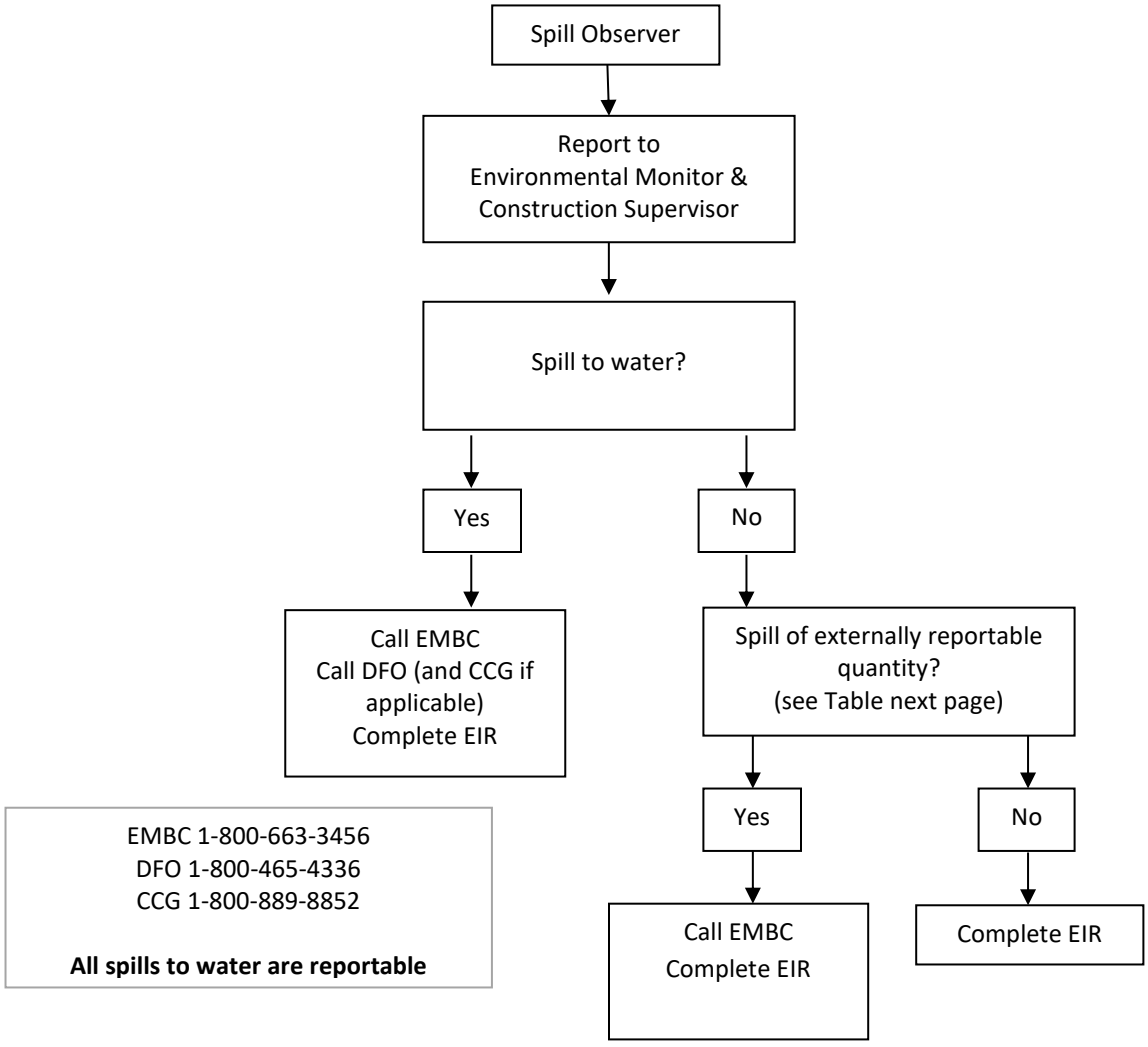
- Complete an Environmental Incident Report (EIR).
- The EIR will be submitted to MoT/MoE/DFO as required (or any other pertinent regulatory agencies), and copies will be retained by the EM and Construction Supervisor.

8) DE-BRIEF

- Following the clean-up of a spill the Construction Supervisor will call a meeting with all personnel to discuss the following as a means to inform future prevention and spill management techniques:
  - Identify the source of the spill and whether it could have been avoided.
  - Review the sequence of events used to handle the spill, including what was done right/wrong.
  - Determine whether the equipment used to handle the spill was available when needed and in sufficient quantity.
  - Discuss how the spill response procedure could be improved.

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Spill Reporting Notification Chart



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Table of Reportable Levels of Certain Substances

(Adapted from *Environmental Management Act* – Spill Reporting Regulation)

Item	Column 1 Substance spilled	Column 2 Specified amount
1	Explosives of Class 1 as defined in section 3.9 of the Federal Regulations	any
2	Flammable gases, other than natural gas, of Division 1 of Class 2 as defined in section 3.11 (a) of the Federal Regulations	10 kg, if the spill results from equipment failure, error or deliberate action or inaction
3	Non-flammable gases of Division 2 of Class 2 as defined in section 3.11 (d) of the Federal Regulations	10 kg, where spill results from equipment failure, error or deliberate action or inaction
4	Poisonous gases of Division 3 of Class 2 as defined in section 3.11 (b) of the Federal Regulations	5 kg, where spill results from equipment failure, error or deliberate action or inaction
5	Corrosive gases of Division 4 of Class 2 as defined in section 3.11 (c) of the Federal Regulations	5 kg, where spill results from equipment failure, error or deliberate action or inaction
6	Flammable liquids of Class 3 as defined in section 3.12 of the Federal Regulations	100 L
7	Flammable solids of Class 4 as defined in section 3.15 of the Federal Regulations	25 kg
8	Products or substances that are oxidizing substances of Division 1 of Class 5 as defined in section 3.17 (a) and 3.18 (a) of the Federal Regulations	50 kg
9	Products or substances that are organic compounds that contain the bivalent "-0-0-" structure of Division 2 of Class 5 as defined in sections 3.17 (b) and 3.18 (b) of the Federal Regulations	1 kg
10	Products or substances that are poisons of Division 1 of Class 6 as defined in section 3.19 (a) to (e) and 3.20 (a) of the Federal Regulations	5 kg
11	Organisms that are infectious or that are reasonably believed to be infectious and the toxins of these organisms as defined in sections 3.19 (f) and 3.20 (b) of the Federal Regulations	any
12	Radioactive materials of Class 7 as defined by section 3.24 of the Federal Regulations	All discharges or a radiation level exceeding 10 mSv/h at the package surface and 200 µSv/h at 1 m from the package surface
13	Products or substances of Class 8 as defined by section 3.25 of the Federal Regulations	5 kg
14	Miscellaneous products or substances of Division 1 of Class 9 as defined by section 3.27 (1) and (2) (a) of the Federal Regulations	50 kg
15	Miscellaneous products or substances of Division 2 of Class 9 as defined in section 3.27 (1) and (2) (b) of the Federal Regulations	1 kg
16	Miscellaneous products or substances of Division 3 of Class 9 as defined in section 3.27 (1) and (2) (c) of the Federal Regulations	5 kg
17	Waste asbestos as defined in section 1 of the Hazardous Waste Regulation	50 kg
18	Waste oil as defined in section 1 of the Hazardous Waste Regulation	100 l
19	Waste containing a pest control product as defined in section 1 of the Hazardous Waste Regulation	5 kg
20	A substance not covered by items 1 to 19 that can cause pollution	200 kg
21	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas
*Refer to *Transportation of Dangerous Goods Regulation under the Transportation of Dangerous Goods Act* for substance definitions. ** If there is any doubt regarding the substance spilled, specified amount, or whether it is reportable, take a cautious approach and report it.		

END – Spill Response Plan

Appendix 2. Environmental Incident Report (EIR) (Three pages)

Any work causing an environmental incident must be reported by the contractor to the EM as soon as possible; the EM will fill out the following form within 24 hours.

DESCRIPTION OF INCIDENT

<table>
<tr><td>Date of incident (YYYY-MM-DD):</td><td>Date reported (YYYY-MM-DD):</td></tr>
<tr><td>Time of incident:</td><td>Time of report:</td></tr>
<tr><td colspan="2">Description of the incident, including sequence of events and works being completed:</td></tr>
<tr><td colspan="2">Weather/site conditions at time of incident:</td></tr>
<tr><td>Equipment type:

Serial number:</td><td>Material released:

Amount:</td></tr>
<tr><td>Environment impacted:
□ Air
□ Asphalt/concrete
□ Surface water/ditch
□ Soil
□ Drainage system
□ Watercourse
□ Inside building/ engineered containment</td><td>Was this reported to any external agency?
□ Yes
□ No</td></tr>
</table>

	If yes, indicate agency:

ACTIONS TAKEN

Immediate actions taken:
Corrective actions taken (e.g. measures to prevent recurrence of incident):

CONTRACTOR INFORMATION

Company name	
Contractor's representative	
Address	
Phone number	

ADDITIONAL INFORMATION

(additional notes, sketches, photos, etc.)

SIGN OFF

Contractor representative signature	**Date**

Appendix 3. Northwest Hydraulic Consultants *RDN Interceptor East of Oar* Road Project design sheets (issued for permitting)