



TECHNICAL SPECIFICATIONS

Steveston, BC

Habitat Compensation Rock Berm Construction

Fisheries and Oceans Canada

Small Craft Harbours – Pacific Region

December 2022

SECTION NO.	SECTION TITLE	NO. OF PAGES
Division 01	General Requirements	
01 11 00	Summary of Work	2
01 13 00	General Instructions	4
01 33 00	Submittal Requirements	2
01 35 29.06	Health and Safety Requirements	4
01 35 43	Environmental Procedures	4
01 50 00	Mobilization and Demobilization	2
Division 31	Earthworks	
31 22 20	Fill and Rock Work	4

END OF SECTION

DRAWINGS

TITLE

22500-00-101	General notes and Design Criteria
22500-00-102	Existing Site Plan
22500-00-103	Habitat Bench General Arrangement
22500-00-104	Habitat Bench Section and Detail

**END OF
SECTION**



Part 1 General

1.1 DEFINITIONS

- .1 **Contractor:** The party accepted by the Owner with whom a formal contract is entered to complete the work of this project.
- .2 **Contracting Authority:** Procurement Services and Procurement Hub, Procurement Hub NCR, Department of Fisheries and Oceans Canada.
- .3 **Engineer/Departmental Representative:** Employee(s) that represents the Owner who act as the Engineer and Project Authority for the project.
- .4 **Owner:** Small Craft Harbours (SCH) Program of the Department of Fisheries and Oceans (DFO), Vancouver, BC.
- .5 **Site:** Area of work where the berm construction is to be (approximate northeastern edge of Steveston Island)

1.2 BACKGROUND

- .1 Small Craft Harbours requires to construct a marsh parcel on existing mudflat along the northeastern edge of Steveston Island (Shady Island). The new marsh leading edge will be protected by engineered rock berm to prevent scouring and erosion from tidal action.

1.3 WORK INCLUDED

- .1 The work under this contract includes the supply of equipment, labour and materials for the complete construction of the approximate 152 linear meter of rock berm complete with filter rock, riprap and filter cloth located on the northeastern edge of Steveston Island.
- .2 Site is marine access only.

1.4 WORK EXCLUSION (OUTSIDE SCOPE OF WORK)

- .1 Supply and placement of growing medium.

1.5 COMMENCEMENT AND COMPLETION

- .1 All in water work, undertakings and activities must be conducted during the least risk to fish work window unless otherwise specified by DFO: Fraser River Estuary (from mouth upstream to Oak Street Bridge and the George Massey Tunnel) between July 16 of any given year and February 28 of the following year.
- .2 Contract for this work must be completed by October 31st 2023.



1.6 DESCRIPTION UNIT PRICE TABLE

.1 Mobilization and Demobilization

.1 This lump sum item is specified in Section 01 50 00.

.2 Excavation for Toe Berm

.1 This unit rate is per unit volume of excavated material for the toe berm as specified in 31 22 00 and as per the drawings. Excavated material under this line item must be placed behind the newly constructed berm.

.3 Supply and Placement of Filter Rock

.1 The unit rate of supply and final placement of filter rock as specified in Section 31 22 20 and as per the drawings.

.4 Supply and Placement of Riprap

.1 The unit rate of supply and final placement of riprap as specified in Section 31 22 20 and as per the drawings.

.5 Supply and Install Filter Cloth

.1 The lump sum cost for the supply and install of filter cloth as specified in Section 31 22 20 and as per the drawings.

.6 Post Hydrographic Survey

.1 The lump sum price for a complete post hydrographic survey of the newly built rock berm as per section 01 33 00

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION



Part 1 General**1.1 MEASUREMENT AND PAYMENT**

- .1 Measurement and payment for work completed to Departmental Representative's satisfaction will be made as stipulated in the relevant technical Section of the Specification for that work item and the Unit Price Table.

1.2 NOTIFICATION

- .1 The Contractor must give the Departmental Representative minimum 2 weeks notice prior to mobilization to site.

1.3 HOURS OF WORK

- .1 Normal work hours are between 0700 hrs to 1700 hrs Monday through Friday not including statutory holidays.
- .2 Contractor may request to work outside the above-mentioned normal work hours by submitting a written request to Departmental Representative minimum of forty eight (48) hours in advance.

1.4 CONSTRUCTION WORK SCHEDULE

- .1 The Contractor must work whatever shifts while abiding to the noise-by-law required in order to ensure the work meets regulatory windows and is completed by the completion date of the contract.
- .2 The Contractor must normally perform all work within daylight hours, except in instances where the Contractor has requested and received approval for shift changes from the Owner.
- .3 Time lost by the Contractor due to stoppage on account of adverse weather conditions may be allowed, at the discretion of the Departmental Representative, as an extension of time for the completion of the work over and above the date of completion specified in the contract agreement.
- .4 Contractor must provide a schedule and sequence for all construction activities associated with this work within two (2) weeks from award date.

1.5 HEALTH AND SAFETY

- .1 Specified in Section 01 35 29.06

1.6 ENVIRONMENTAL PROCEDURES

- .1 Specified in Section 01 35 43



1.7 REGULATORY REQUIREMENT

- .1 Owner has obtained Fisheries Act Authorization (Path no: 21-HPAC-01159) for this Work.
- .2 Owner has obtained Navigation Protection Program (NPP) (file number 2001-500780, registry number 3580) for this Work.
- .3 The Contractor must comply with all Federal, Provincial or Municipal laws, ordinances or rules and regulations relating to the performance of his work and in force during the duration of this contract.
- .4 The Contractor is required to give all required notices, comply with all local, municipal, provincial, and federal laws, ordinances, codes, by-laws, rules and regulations relating to the work.
- .5 All work to be done in accordance with Work Safe BC regulations.
- .6 The Contractor must comply with Federal and Provincial laws, orders and regulations concerning the control and abatement of water and air pollution.

1.8 NAVIGATION PROTECTION REQUIREMENT

- .1 Navigational Warning action must be taken by contacting the Canadian Coast Guard a minimum of two (2) days in advance of Contractor's intended date of commencement. Submission can be made via email to NavWarn.MCTSPRinceRupert@innav.gc.ca, or by phone at 250-627-3070
- .2 Construction equipment used in conjunction with this project must be stored in such a manner that it does not obstruct charted Aids to Navigation and does not obstruct navigation.
- .3 Equipment used in construction must not prevent vessels from navigating past the work site.

1.9 EXECUTION REQUIREMENTS

- .1 The Contractor is expected to familiarize themselves with the site, facilities and amenities within.
- .2 The Contractor's representative on site must be completely familiar with the method of work to be employed. Such personnel must remain on site for the duration of the work.
- .3 The Contractor must protect all finished work from injury, defacement, unauthorized entry, or trespass until such time as the work described in the contract documents is substantially complete.
- .4 The site must be left in a safe condition at the completion of each work day.



1.10 INSPECTION

- .1 Allow Departmental Representative access to the Work. If part of the Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

1.11 INTERFERENCE WITH OPERATION

- .1 During the course of construction and clean-up, do not dispose of surplus, waste or demolished materials in navigable waters.
- .2 The Contractor must upon instruction of the Owner or Engineer, promptly remove any of the Contractor's equipment located outside the specified work area and obstructing any harbour operation.

1.12 BARRIERS, LIGHTS AND WATCHING

- .1 The Contractor must provide all requisite barriers, fences, warning signs, lights and watching for the protection of persons and property on or adjacent to the site if applicable.

1.13 CONSTRUCTION AREA

- .1 The Contractor must not enter on nor occupy with men, tools, equipment or material, any ground outside the property of the Harbour Authority without the written consent of the party owning such ground. Other Contractors or employees or representatives of the Department may, for all necessary purposes, enter upon the work and premises used by the Contractor, and the Contractor must conduct his work so as not to impede unnecessarily any work being done by others nor adjacent to the site.
- .2 The Contractor must regulate construction traffic on public areas and comply with all local ordinances in connection therewith, including load limitation and removal of debris.
- .3 The Contractor must confine his operations on the site to those areas actually required for the work including routes and regulations approved by the Owner for haulage of materials.

1.14 PROTECTION OF EXISTING STRUCTURES

- .1 Existing structures, adjacent marine facilities, roads, services, piping or equipment within the work area which are not to be replaced must be properly protected from any injury or damage, direct or indirect.



- .2 Any damage that is caused as a result of the operations of the Contractor must be repaired and made good at the Contractor's expense to the satisfaction of the Engineer.
- .3 No existing structures or utilities are expected on the proposed work site.
- .4 Notify Departmental Representative if existing utilities and services are found within the Site and will be treated as extra.

1.15 TEMPORARY SERVICES

- .1 The Contractor must supply for own use; sanitary, first aid, and all other temporary services such as water and electricity and any other facilities or amenities required for the work.

1.16 RECORD DRAWINGS

- .1 The Contractor must mark up one set of plans with any changes or amendments implemented during the Contract. These plans must be submitted to the engineer before the Final Certificate of completion is issued.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION



Part 1 General

1.1 DESCRIPTION

- .1 This section covers the general requirements and procedures for Contractor's submission of all required submittals following award of the Contract.
- .2 Contractor must provide submittals to Departmental Representative in advance of and throughout the duration of the work.

1.2 MEASUREMENT AND PAYMENT

- .1 Construction submittals and re-submittals must be considered as incidental to the work.

1.3 PROJECT PRECONSTRUCTION SUBMITTALS

- .1 Health and Safety Requirements as per Section 01 35 29.06.
- .2 Environmental Procedures as per Section 01 35 43.
- .3 Work Methodology and Sequencing
 - .1 General size, type and quantity of major equipment
- .4 Construction Schedule
 - .1 Must contain at least the start date and duration of the following activities:
 - .1 Mobilization
 - .2 Berm Toe Construction
 - .3 Berm Construction
 - .4 Demobilization
 - .2 Contractor to revise construction schedule for any changes.
- .5 Rock submittals requirements as per Section 31 22 20.
- .6 Certified Scow/Barge Scow Displacement Table/Chart as per Section 31 22 20.
- .7 Notice to Mariners as per Section 01 13 00.

1.4 PROJECT POST CONSTRUCTION SUBMITTALS

- .1 Red line mark up drawings for any changes made to the design or construction
- .2 Post hydrographic survey
 - .1 All surveys must be conducted in accordance with the "Canadian Hydrographic Survey Standards".
 - .2 Chart Datums Reference System
 - .3 A spot elevation plan - Elevations marked on a 5m spacing grid



- .4 XYZ cloud point file in a global or local coordinate system. (Density of points typically from 30cm – 1m depending on the area of site.)
- .5 PDF plan view of the bathymetry area, with colour coded elevations map, and a CAD format
- .6 Specified contours in meters.
- .3 Summary table for all the filter rock and riprap delivered to Site, listing the net tonnage, rock material, the source and date of delivery that would be claimed under the unit rate line item “Supply and Placement of Filter Rock”, and “Supply and Placement of Riprap”.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 SUBMITTALS GENERAL REQUIREMENT

- .1 Submit to Departmental Representative for review submittals listed, including shop drawings, samples, certificates and other data, as specified in other sections of the Specifications.
- .2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative’s review and not cause delay in work.
- .3 Do not proceed with work until relevant submissions are reviewed and approved by Departmental Representative.
- .4 Revise submittal for any change in plan including health and safety, work methodology and scheduling.
- .5 Make changes or revisions to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative.
- .6 All project related preconstruction submittals must be submitted and approved by the Departmental Representative prior to any site work.
- .7 All project related close out submittal must be submitted and approved prior to 100% completion.

END OF SECTION



Part 1 General**1.1 DESCRIPTION**

- .1 Health and safety considerations are required to ensure that the Contractor shows due diligence towards health and safety on construction sites.

1.2 MEASUREMENT AND PAYMENT

- .1 Health and Safety Requirements are considered incidental to the work and will not be measured separately. No separate payment will be made under this Section.

1.3 REFERENCES

- .1 Government of Canada:
 - .1 Canada Labour Code – Part II
 - .2 Canada Occupational Health and Safety Regulations.
- .2 National Building Code of Canada (NBC):
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
- .3 The Canadian Electric Code
- .4 Canada Standards Association (CSA):
 - .1 CSA S269, Falsework for Construction Purposes.
 - .2 CSA S269.2, Access Scaffolding for Construction Purposes.
 - .3 CSA-S350, Code of Practice for Safety in Demolition of Structures.
 - .4 CSA Z462 – Workplace Electrical Safety Standard.
- .5 American National Standards Institute (ANSI):
 - .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- .6 Province of British Columbia:
 - .1 Workers Compensation Act. Part 3 Occupational Health and Safety.
 - .2 Occupational Health and Safety Regulation
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

1.4 WORKERS COMPENSATION BOARD COVERAGE

- .1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.



- .2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.5 COMPLIANCE WITH REGULATIONS

- .1 The Owner may terminate the Contract without liability to the Owner where Contractor, in the opinion of the Owner, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .2 The Contractor must ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.6 SUBMITTALS

- .1 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .3 Risk Management and Safety Procedure for possible events including but not limited to storm, fire, and fall.
 - .4 WHMIS MSDS - Material Safety Data Sheets if requested.
 - .5 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations
- .2 The Engineer review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .3 Submit copies of incident and accident reports to Department Representative whenever an unforeseen incident and/or accident occurred.

1.7 RESPONSIBILITY

- .1 Assume responsibility as the Prime Contractor under this Contract.
- .2 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .3 Comply with and enforce compliance by employees with safety requirements of contract documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.



- .4 Report all safety and environmental incident to the Department Representative as soon as it happened.

1.8 BARRICATION

- .1 Provide safety barricades around work site as required to provide a safe working environment for workers and protection for pedestrian traffic.
- .2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - .1 Provide appropriate means by use of barricades, fences, and warning signs as required.
 - .2 Secure site at night time as deemed necessary to protect site against entry.

1.9 REGULATORY REQUIREMENTS

- .1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at the Contractor's Work Site.
- .2 In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representatives will advise on the course of action to be followed.

1.10 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Provide copies of all notices to Departmental Representative.

1.11 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.
- .2 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site.
- .3 Schedule and administer Health and Safety meeting prior to commencement of Work.

1.12 FIRE SAFETY REQUIREMENTS

- .1 Store oily / paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.



- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- .3 Do not use fire hydrants, standpipes and hose systems for purposes other than fire fighting.

1.13 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Engineer verbally and in writing.

1.14 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Engineer.

1.15 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by the Engineer.
- .2 Provide the Engineer with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 The Engineer may stop Work if non-compliance of health and safety regulations is not corrected.
- .4 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule consideration for Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION



Part 1 General**1.1 DESCRIPTION**

- .1 This Section describes environmental procedures that are required for the Contract. Contractor must adhere to these special procedures while completing all work under this Contract.
- .2 Contractor is responsible for environmental protection during all construction activities at all locations it performs work.

1.2 MEASUREMENT AND PAYMENT

- .1 Environmental Procedures are considered incidental to the work and will not be measured separately. No separate payment will be made under this Section.

1.3 SUBMITTALS

- .1 Contractor must submit a Environmental Protection Plan (EPP) and Spill Response Emergency Plan for review and acceptance by Departmental Representative at least one (1) week prior to site mobilization.
- .2 At a minimum, EPP must contain the following information:
 - .1 Organization chart and names of person responsible for EPP compliance.
 - .2 In water and on land works: describe method, procedures and best management practices to comply with water quality performance criteria objectives.
 - .3 Pollution control plan
 - .4 Identification of potentially hazardous substances and how it is being managed.
- .3 Contractor must submit spill incident report if occurred at minimum detailing the timing, the root cause, the spill substance and quantity, the clean up and the implemented preventive action.

1.4 ENVIRONMENTAL RESPONSIBILITY

- .1 Contractor must demonstrate in the performance of the work that it is environmentally responsible by complying with environmental legislation, regulations, and authorizations.
- .2 Follow all Departmental Representative instructions and policies, practices, and procedures established by Departmental Representative with respect to the environment that are communicated by Departmental Representative to Contractor from time to time.



- .3 Take all reasonable and necessary measures in the performance of the work to avoid causing negative impacts to the environment. Where negative impacts occur, Contractor must immediately advise Departmental Representative and must be solely liable to undertake all reasonable and necessary measures to minimize the effect of such negative impacts and restoring the site to pre-impact conditions.
- .4 Maintain key pollution control systems in working condition throughout the project and undertake all works such that there are no unauthorized discharges of liquids or solids to the marine environment, or of gas to the atmosphere.
- .5 Maintain a neat work area free of unnecessary debris, tools, equipment, or materials; dispose of sewage, refuse, and chemical wastes in compliance with the Best Management Practices and applicable federal, provincial, and municipal or local legislation, regulations, or laws; and remove all tools, equipment, supplies, and wastes from the site upon completion of the work.
- .6 Ensure that workers and supervisory staff are knowledgeable with the provisions of the proposed Spill Emergency Response Plan and are adequately trained to implement the measures contained therein.

1.5 ENVIRONMENT MONITORING

- .1 The Owner will provide an Environment Monitor (EM). The role of the environmental monitor is to ensure compliance with environmental mitigation procedures.
- .2 The EM must be granted the authority to stop work.
- .3 Monitoring measures will include, but not limited to:
 - .1 Initial full time monitoring of in-water works.
 - .2 Visual inspections of equipment and site cleanliness.
 - .3 Assessment of onsite fuel storage and transfer procedures.
 - .4 Assessment of onsite spill response equipment and training provided to the construction crew.
 - .5 Collection of in situ turbidity measurements during the excavation and placement of the filter rock and riprap.
 - .6 Observation for the presence of fish, birds and marine mammals.
- .4 The EM will rely on the construction detailed schedule provided by the Contractor. Contractor must provide updated schedule as necessary and keep the EM in the loop of important construction activity timelines such as sheet pile driving, demolition and infilling works.

1.6 SILT CURTAIN

- .1 Provision of silt curtain is not expected and will be extra if required.



1.7 FIRES

- .1 Fires and burning of rubbish on Site is not permitted.

1.8 SPILL OR RELEASE OF DELETERIOUS SUBSTANCES

- .1 Contractor must immediately contain and assess the spill, provide appropriate notifications, and take the necessary steps to prevent further discharge. Contractor is responsible for immediate cleanup of the spill and restoration of the area to the satisfaction of Departmental Representative and other regulatory agencies, where involved.
- .2 Departmental Representative must be immediately informed of all spills that occur at the Work Site.
- .3 Spill kits will be kept at the Work Site at all times.

1.9 OPERATION OF MACHINERY

- .1 All equipment and machinery on site must be in good working order, maintained free of fluid leaks, invasive species and noxious weeds
- .2 The Contractor must have absorbent pads on site in case of any oil leaks or contaminants entering the water.
- .3 Biodegradable hydraulic fluids must be used in all equipment working above or near water.
- .4 Equipment washing, refueling and servicing must be conducted away from the water (i.e. no closer than 30m from the river).
- .5 Grounding of equipment must be avoided to prevent sediment mobilization.

1.10 WASTE MANAGMENT

- .1 Accomplish maximum control of solid construction waste.
- .2 Store materials to be reused, recycled and salvaged in locations as directed by Owner. Unless specified otherwise, materials for removal become Contractor's property.
- .3 Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Do not bury rubbish or waste materials. Do not dispose of waste into waterways, storm, or sanitary sewers.
- .5 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

1.11 DRAINAGE

- .1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

1.12 NOISE AND LIGHT CONTROL

- .1 Ensure that noise control devices (i.e. mufflers and silencers) on construction equipment are properly maintained.
- .2 Contractor must implement use of lighting shrouds for work to be completed during night-time hours to minimize lighting disruptions to local residents.

1.13 HISTORICAL/ARCHAEOLOGICAL CONTROL

- .1 Contractor must notify the Owner immediately if potential historical archaeological, cultural resources and biological resources are discovered during construction.

1.14 NOTIFICATION

- .1 The Departmental Representative will notify Contractor of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 The Contractor must inform the Engineer of proposed corrective action after receipt of such notice, and take such action for approval by the Engineer.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

1.15 TRAPPING OF MARINE LIFE

- .1 At all times, the work must not trap any marine life including fish and left in the dry.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION



Part 1 General**1.1 DESCRIPTION**

- .1 This Section covers mobilization and demobilization for the work at Steveston Work Site.

1.2 MEASUREMENT AND PAYMENT

- .1 Mobilization and demobilization will be paid for at the Lump Sum price tendered for “Mobilization and Demobilization”. Payment must include for all costs in connection with mobilization and demobilization as described in Clause 1.4 of this Section.
- .2 Supply and set up of plant and equipment not specifically noted in Clause 1.4 of this Section must be deemed to be incidental to the work.
- .3 Progress claim upon complete mobilization must not be more than 60% of this lump sum item. Progress claim for the balance of this lump sum item will be upon complete demobilization.

1.3 SUBMITTALS

- .1 Submit heavy equipment or plant specifications and/or drawings required for the work upon request.

1.4 MOBILIZATION AND DEMOBILIZATION

- .1 Mobilization must include the following activities:
 - .1 All pre-construction submittals;
 - .2 Establishment of necessary site offices;
 - .3 Workshops and other temporary facilities, including utility connections;
 - .4 Development and implementation of all environmental protection measures;
 - .5 All work required to prepare and move to the Work Site the Contractor’s plant and equipment, to be used for the above mentioned work tasks;
 - .6 Move all crew and tools to site;
 - .7 Making ready for work; and,
 - .8 The cost of maintaining bonds and insurance as required.
- .2 Demobilization must include the following activities:
 - .1 Project closeout and required closeout submittals;
 - .2 Removal of all construction equipment, plant and any excess materials from the Steveston Work Site;



- .3 Clean up of the Steveston Work Site to a condition satisfactory to Departmental Representative at completion of the work.
- .4 Items which are not to be included in mobilization / demobilization are any portion of the work covered by a specific Tender item or other incidental work which is specified as being included in a Tender item.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION



Part 1 General

1.1 DESCRIPTION

- .1 This section covers the rock berm supply and install specification. It includes the excavation for toe berm, supply and placement of filter rock, riprap and filter cloth as shown on the drawings.

1.2 MEASUREMENT AND PAYMENT

- .1 Measured per net tonnage of filter rock and riprap supplied in metric tonnes (t), delivered and final placement to specifications. No measurement will be made for material which is placed on a temporary basis or materials which are subsequently removed.
- .2 Weight measurement will be based on differential freeboard with reference to certified marine scow/barge displacement table/chart. Scow/Barge Displacement Table/Chart must be certified by a member of International Institute of Marine Surveying (IIMS).
- .3 Convert volume of materials in cubic meters (m³) as shown on the drawings to tonnes (t) by multiplying the value in m³ by 2.0 t/m³.

1.3 SUBMITTALS

- .1 Material source(s), qualification test results confirming gradation curve meets or exceed the requirements of this specification.
- .2 Proposed marine equipment used for the work.
- .3 Certified Scow/Barge Displacement Table/Chart .
- .4 Rock test result as per clause 1.4.

1.4 ROCK MATERIAL

- .1 Test at least one sample of rock from each quarry proposed for use as a source of rock for the work for conformance to the requirements of this section. Each sample must not weigh less than 100 kg and must be accompanied by a statement with a copy to the engineer indicating the exact location of the quarry.
- .2 All rock materials must be rough angular quarried stone of dense, hard, durable character, free of organic material, infilled joints, steams or other defects, resistant to breakdown by handling, frost action or weathering and not subject to deterioration in water. As a minimum rock must meet the following:



Test #	Test	Requirement
1	Absorption (ASTM c127)	Not more than 2%
2	Abrasion, 500 revolutions (ASTM C353)	Not more than 20% loss
3	Magnesium sulfate soundness (ASTM C88)	Not more than 15% loss
4	Petrographic examination	Absence of weakness of material that could result in significant stone alteration and reduction in durability
5	Degradation (ASTM D3744)	No index less than 35

- .3 The rock must have a unit mass not less than 2650 kg/m^3 ; i.e. Specific gravity not less than 2.65 (SSD).
- .4 If water absorption from test no. 1 is less than 0.5% and specific gravity is greater than 2.65, then test no's 2, 3 and 5 may be eliminated, and the rock will be deemed acceptable if test no. 4 meets the requirement.
- .5 The rock should be graded within the limits specified, with the longest dimension of any piece not greater than 2.5 times its least dimension.
- .6 Mass governs for riprap and the gradation and the normal size is defined as:
 - .1 $D = 1000 \times (W/2650)^{1/3}$
 - .2 Where mass (W) is in kg and D is the normal size in mm.
- .7 Riprap (D50=375 mm, layer thickness=750 mm):

Percentage less than		Stone size, W (kg)	Stone size, D (mm)
Min %	Max %		
100	-	560	600
60	100	279	475
50	75	210	425
30	50	140	375
15	35	105	340



0	20	61	285
0	10	43	250

.8 Filter rock (150 mm minus with fines for filtering the soft substrate)

Percentage less than		Particle size, D (mm)
Min %	Max %	
100	-	150
70	100	75
50	75	50
35	50	20
15	25	5
10	20	3
0	5	1

1.5 FILTER CLOTH

- .1 Filter cloth must be Nilex nonwoven 4510 or approved equal with a minimum overlap of 1.0m.

Part 2 Execution

2.1 PLACEMENT OF MATERIALS

- .1 Place rock in the location and to the elevations, thickness, slopes and lines shown on the drawings and as directed by the engineer.
- .2 Begin placement of the riprap at the toe of the area and continue placement working up the slope. Place the rock in such a way as to create firm bedding and interlocking of individual pieces of rock to provide a tightly packed structure. Prepare the surface so it is densely placed, well keyed and uniform. Rework rocks not properly embedded and remove protuberances to the satisfaction of the engineer.
- .3 Use methods to ensure that the finer one-third of the gradation is uniformly distributed over the surface being covered. Remove and replace that portion of



any layer in which the material becomes segregated during handling or placement.

- .4 Contractor must provide a drainage channel for fish migration at all water levels and at all stages of placing growing medium.

2.2 TOLERANCES

- .1 The maximum permissible variations in the finished thickness of rock layers, when measured as the perpendicular dimension between the top and bottom surface planes, must be 15% of the layer thickness indicated. The surface planes must be considered to pass through the average location of the crests of the individual rocks on the surface.

2.3 FIELD QUALITY CONTROL

- .1 Maintain a complete, accurate log of controls and surveys as the work progresses.
- .2 Soundings and topographical surveys must be carried out with the engineer in attendance.

2.4 EXCAVATION

- .1 Excavate to the lines shown on the drawings using methods specified by the environmental consultant.
- .2 Excavation will be performed with the environmental consultant in attendance.

END OF SECTION

