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Canada

TECHNICAL SPECIFICATIONS

Steveston Harbour, BC

Paramount Wharf 403 Reconstruction

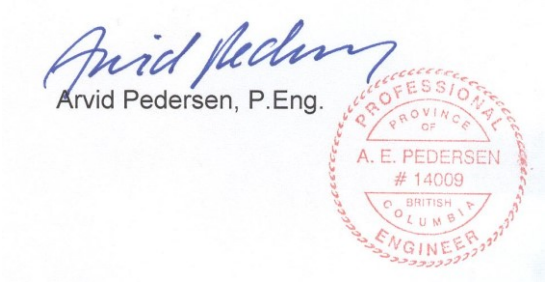
Fisheries and Oceans Canada

Small Craft Harbours – Pacific Region

October 2021

CONSULTANTS - SEAL & SIGNATURE

Discipline: Structural



END OF SECTION

DRAWINGS	TITLE
220118-000	Cover Page
220118-001	Existing Site Plan
220118-002	Wharf 403 Existing Conditions
220118-003	Proposed Wharf 403 General Arrangements
220118-004	Proposed Wharf 403 Wharf Sections
220118-010	Sheet Pile Wall Plan and Details
220118-011	Sheet Pile Wall Sections
220118-012	Sheet Pile Wall Sections and Details Sheet 1 of 2
220118-013	Sheet Pile Wall Sections and Details Sheet 2 of 2
220118-014	Travel Lift Pier Infill Grating Plan, Sections and Details

Appendices:

Appendix A: Wharf403historical_1996Dwg

Appendix B: Site Photo – Owner Supplied Material

Appendix C: Site photo – Low tide

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**: Real Property Contracting Acquisitions and Compensation Pacific Region, Public Works and Government Services Canada**.**

.3 **Contract Document:** Includes all Sections herein, as well as, attached drawings and appendices referenced in the Technical Specification Index.

.4 **Engineer/Departmental Representative**: Employee(s) that represents the Owner who act as the Engineer and Technical Authority for the project.

.5 **Owner:** Small Craft Harbours Program of the Department of Fisheries and Oceans, Vancouver, BC.

.6 **Site:** 12740 Trites Road, Richmond, British Columbia.

1.2 WORK INCLUDED

.1 The work under this contract shall include the supply of equipment, labour and materials for the performance of all work as required by the Contract Documents. All replaced items, cut-offs and waste material shall be disposed by the contractor in strict accordance with provincial, local, and municipal regulations and Part 8 of the National Building Code and with the Canadian Construction Safety Code.

.2 The work to be carried out under this contract includes demolition of the existing timber Wharf 403, supply and installation of an approximately 153.3 linear meter long anchored steel sheet pile wall, supply and place drain rock, compact rock fill and gravel fill, relocate an existing timber float and widen an existing walkway along the travel lift pier. The work generally consists of, but is not limited to the following items:

.1 Mobilization/Demobilization
.2 Demolish the existing timber Wharf 403 complete except for water and electrical services. These services will be dismantled by others. Demolition of the existing timber building will be by others.
.3 Supply and install approximately 153.3 linear meter of sheet pile wall complete with waling, anchor walls and anchor bars as shown on the drawings.
.4 Supply and place drain rock and compact rock fill and gravel fill as shown on the drawings. Asphalt paving by others.

.5 Relocate existing timber float complete with the existing gangway and timber dolphin piles as shown on the drawings.

.6 Supply and install galvanized steel grating and handrail along the existing travel lift pier as shown on the drawings.

1.3 SITE LOCATION

.1 Work of this Contract is located at 12740 Trites Road, Richmond, British Columbia.

1.4 COMMENCEMENT AND COMPLETION

.1 It is anticipated that any marine construction may begin in July 16th, 2022 onwards.

.2 Upland work may begin June 1st 2022 onwards.

.3 Entire work must be completed by end of December 31st 2022.

1.5 DESCRIPTION UNIT PRICE TABLE

.1 Mobilization and Demobilization

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

.2 Structure Demolition – Timber Wharf 403

.1 The lump sum cost for the complete demolition of wharf 403, concrete deck removal and partial demolition of existing concrete retaining wall as specified in Section 02 41 16.

.2 Building 25 demolition and disposal by others and will be completed prior to July 2022.

.3 Supply Sheet Pile

.1 The lump sum cost for a complete supply approximate 153.3 linear meter of sheet pile wall including waler system and weeping hole as specified in Section 31 62 17

.4 Install Sheet Pile Wall

.1 The lump sum cost for a complete installation approximate 153.3 linear meter of sheet pile wall including waler system and weeping hole as specified in Section 31 62 17

.5 Supply and Install Anchor Wall

.1 The lump sum cost for a complete anchor wall including waler system as specified in Section 31 62 17.

.6 Supply and Placement of Drain Rock

.1 The unit rate of supply and final placement of drain rock as specified in Section 31 22 20.

.7 Supply and Placement of Rock Fill

.1 The unit rate of supply and final placement of rock fill as specified in Section 31 22 20.

.8 Supply and Placement of Gravel Fill

.1 The unit rate of supply and final placement of gravel fill as specified in Section 31 22 20.

.9 Supply and Install Travel Lift Infill Grating

.1 The lump sum cost for the supply and install of travel lift infill grating as specified in the IFT drawing sheet 014 with relevant section 05 12 33.

.10 Marine Crew and Equipment

.1 The hourly rate of marine crew and equipment for additional work task determined and directed by the Departmental Representative.

.2 Example of work tasks:

.1 Relocating timber floats which involves timber pile driving and extraction

.2 Timber float modification and general carpentry work

.3 Removal and reinstallation of pedestrian gangway

.4 Excavate area under timber float X if required by the Departmental Representative.

.3 Regular work hours – Monday to Friday.

.4 No additional mobilization and demobilization will be paid under this or any other item.

.5 Contractor must provide estimate duration of work task and get written approval by the Departmental representative prior to any work that will be claimed under this line item.

.11 Disposal – Tipping Fee

.1 The cost plus item for cost incurred for tipping fees resulted from Structure Demolition as specified in Section 02 41 16.

.2 Example for a tendered 10% markup, extended amount would be $80,000+10% = $88,000. $80,000 is an estimated amount and actual amount is reflected on actual cost incurred proven by documents as specified in Section 02 41 16.

1.6 WORK EXCLUSION (OUTSIDE SCOPE OF WORK)

.1 Refer to Section 01 12 00 for Owner supplied material.

.2 Building 25 Demolition.

.3 Utility relocation if required.

.4 Asphalt Paving

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 LOCATION OF OWNER SUPPLIED MATERIAL

.1 Owner supplied sheet piles is located in 3300 Chatham Richmond on a gravel parking lot. Photo attached in appendix B. Provide 7 calendar day notice prior to picking up the sheet piles.

Part 2 Product

2.1 OWNER SUPPLIED MATERIAL

.1 Sheet Pile EZ18-630 60ft long – 11 pairs.

.2 #18 DCP (57mm dia.) 14.5m long – 40 pcs.

Part 3 Execution

3.1 HANDLING AND USAGE

.1 The Contractor must be responsible for handling and transporting the materials around the Site.

.2 The Contractor must treat OWNER supplied material with care.

.3 Optimize usage and minimize wastage of OWNER supplied material. Additional material required to perform the work due to unnecessary wastage will be supplied by the Contractor.

.4 While the Contractor is mobilized on site, the Contractor is responsible for protecting materials (including Owner Supplied Materials) from damage and theft.

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 shall give the Departmental Representative **minimum 2 week 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. Submit written request to Departmental Representative to work outside of the normal work hours a minimum of forty (48) hours in advance.

1.4 CONSTRUCTION WORK SCHEDULE

.1 The Contractor shall work whatever shifts while abiding to the noise-bylaw required in order to ensure the work meets regulatory windows and is completed by the completion date of the contract.

.2 The Contractor shall 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 shall provide a schedule and sequence for all construction activities associated with this work prior to mobilization.

.5 Proposed schedule must be updated and submitted every two weeks.

.6 Contractor is responsible in procuring and securing materials in advance or as required and not an excuse to delay project timeline. Refer to Section 31 62 17 for Sheet Pile delivery schedule requirement.

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 The Contractor must, at his own expense, procure all permits, certificates and licenses required of him by law for the execution of his work under this contract.

.2 The Contractor shall 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.

.3 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.

.4 All work to be done in accordance with Work Safe BC regulations.

.5 The Contractor shall comply with Federal and Provincial laws, orders and regulations concerning the control and abatement of water and air pollution.

1.8 EXECUTION REQUIREMENTS

.1 The Contractor is expected to familiarize themselves with the site, facilities and amenities within.

.2 The Contractor's representative on site shall be completely familiar with the method of work to be employed. Such personnel shall remain on site for the duration of the work.

.3 The Contractor shall 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 shall be left in a safe condition at the completion of each work day.

1.9 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.

1.10 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 shall 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.

1.11 BARRIERS, LIGHTS AND WATCHING

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

1.12 SITE ACCESS

.1 General site access shall be coordinated with the Owner.

.2 The Contractor shall maintain routes of travel, with the Owner being the sole judge as to what may be deemed reasonable.

1.13 CONSTRUCTION AREA

.1 The Contractor shall 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 shall conduct his work so as not to impede unnecessarily any work being done by others nor adjacent to the site.

.2 The Contractor shall 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 shall 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 shall 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 shall be repaired and made good at the Contractor’s expense to the satisfaction of the Engineer.

1.15 EXISTING SERVICES

.1 Notify Departmental Representative if existing utilities and services are found within the Site and will be treated as extra.

1.16 TEMPORARY SERVICES

.1 The Contractor shall 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.

1.17 RECORD DRAWINGS

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

1.18 CLOSEOUT SUBMITTALS

.1 Submit final mark up record drawings.

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 is to 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 shall be considered as incidental to the work.

1.3 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 by Departmental Representative.

.4 Make changes or revisions to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

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 It is Contractor's responsibility to 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 al 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 shall be responsible for adhering 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 shall 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 shall 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 In water refueling of marine and land equipment
.5 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 shall 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 shall immediately advise Departmental Representative and shall 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 shall 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 at the commencement of sheet pile driving works, during demolition of the existing wharf and at the commencement of infilling works.
.6 Measurement of underwater noise via hydrophone at the commencement of sheet pile driving works to ensure sound pressure levels remain within the established threshold.
.7 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 is responsible to 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 WATER AND SEDIMENT QUALITY

.1 No excavation of sediment behind the sheet pile wall and below the High Water Mark (HWM) will occur.

.2 Rock placed below the HWM will not contain any fines and shall be inspected by the EM prior to use on Site.

.3 During pile removal by vibratory hammer in situ water turbidity will be monitored against water quality standard of 5 NTU when background is 8 to 50 NTU or 10% when background >50NTU (MOE, 2001b).

1.8 FIRES

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

1.9 SPILL OR RELEASE OF DELETERIOUS SUBSTANCES

.1 Contractor shall 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 All workers shall be fully aware of the spill prevention and response procedures including notification of Departmental Representative.

.3 Departmental Representative shall be immediately informed of all spills that occur at the Work Site.

.4 Spill kits will be kept at the Work Site at all times.

1.10 EQUIPMENT MAINTENANCE

.1 All heavy construction equipment shall be free of leaks and cleaned prior to construction. The Contractor shall have absorbent pads on site in case of any oil leaks or contaminants entering the water.

.2 Hydraulic machinery shall use environmentally friendly hydraulic fluids (i.e. non toxic to aquatic life and biodegradable).

.3 Equipment washing, refueling and servicing shall be conducted away from the water (i.e. no closer than 30m from the river).

.4 Grounding of equipment must be avoided to prevent sediment mobilization.

.5 Do not refuel any type of equipment within 100m of a waterbody

1.11 WASTE MANAGEMENT

.1 Accomplish maximum control of solid construction waste.

.2 Preserve environment and prevent pollution and environment damage.

.3 Store materials to be reused, recycled and salvaged in locations as directed by Owner. Unless specified otherwise, materials for removal become Contractor's property.

.4 Transport and deliver non-salvageable items to licensed disposal facility.

.5 Remove co-mingled materials to off-site processing facility for separation.

.6 Do not bury rubbish or waste materials.

.7 Do not dispose of waste into waterways, storm, or sanitary sewers.

.8 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

1.12 DRAINAGE

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

1.13 NOISE AND LIGHT CONTROL

.1 Ensure that noise control devices (i.e. mufflers and silencers) on construction equipment are properly maintained.

.2 Contractor shall implement use of lighting shrouds for work to be completed during night-time hours to minimize lighting disruptions to local residents.

1.14 HISTORICAL/ARCHAELOGICAL CONTROL

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

1.15 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 shall 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.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 SHEET PILE AND BACKFILL INSTALLATION

.1 Sheet pile wall system must be completed prior to any backfill activity.

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 shall 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 shall be deemed to be incidental to the work.

.3 Progress claim upon complete mobilization shall 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.

.2 All pre-construction submittals

.3 Close-out submittals

1.4 MOBILIZATION AND DEMOBILIZATION

.1 Mobilization shall include the following activities:

.1 All pre-construction submittals;
.2 Establishment of necessary site offices if required by the Contractor;
.3 Workshops and other temporary facilities;
.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, pile-driving derricks and equipment to be used for the above mentioned work tasks;
.6 Include pile driving equipment for general timber pile removal and installation.
.7 Move all crew and tools to site;
.8 Making ready for work; and,
.9 The cost of maintaining bonds and insurance as required.

.2 Demobilization shall include the following activities:

.1 Project closeout and required closeout submittals;
.2 Removal of all construction equipment, plant and 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 provides project closeout requirements for post-construction submittals that Contractor is required to submit to Departmental Representative following completion of the work.

.2 This Section also presents process and requirements for inspection and declaration that the work has been completed as required by the Contract documents. Upon formal review and acceptance of the work by Departmental Representative, the work will be determined to be complete and Contractor shall then demobilize from the Work Site.

1.2 MEASUREMENT AND PAYMENT

.1 Closeout Procedures are considered incidental to the work and will not be measured separately. Include all cost for close out submittals in the tendered price for “Mobilization and Demobilization” as described in Section 01 50 00.

1.3 INSPECTION AND DECLARATION

.1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.2 Notify Owner in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.3 Request inspection by Departmental Representative.

.4 Inspection by Departmental Representative: Departmental Representative, accompanied by Contractor, will inspect the work to identify defects or deficiencies in the work and then compile a deficiency list describing all noted defects and deficiencies.

.5 Contractor shall correct work accordingly, as advised by Departmental Representative, at no cost to the Owner.

.6 Final Inspection: When items noted above are completed, request Final Inspection of work by Departmental Representative, accompanied by Contractor. If work is still deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection. Repeat this process until the work is complete to Departmental Representative’s satisfaction.

1.4 SUBMITTAL REQUIREMENT

.1 Submit a written certificate that the following actions have been performed:

.1 Work has been completed and inspected for compliance with the Contract documents.
.2 Defects have been corrected and deficiencies have been completed.
.3 Work is complete and ready for final inspection.

.2 Mark up red line record drawings to reflect as built and all changes made during the course of the project as described in Section 01 13 00 (General Instructions).

.3 Summary table for all the drain rock, rock fill and gravel fill delivered to Site, listing the net tonnage, rock/fill material, the source and date of delivery that would be claimed under the unit rate line item “Supply and Placement of Drain Rock”, “Supply and Placement of Rock Fill” and “Supply and Placement of Gravel Fill”.

.4 Summary table for all disposal fee listing net tonnage, material type, disposal facility and date of delivery that would be claimed under the cost plus line item “Disposal – Tipping Fee”.

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 demolition and disposal of approximate 2800 square meter of timber wharf.

.2 Where existing works are to be removed, they shall be removed and salvaged or disposed of to the satisfaction of the Departmental Representative.

.3 The Contractor shall furnish all labour, materials, tools, plant and services required incidental to the completion to the full extent of the drawings and specifications for the execution of all demolition salvage and protection work specified herein.

.4 Demolition and disposal shall be carried out in strict accordance with provincial, local, and municipal regulations and Part 8 of the National Building Code and with the Canadian Construction Safety Code.

1.2 DEFINITION

.1 Removal: Dismantling, demolition, handling, sorting, and hauling material away from Site.

.2 Substructure: Portion of the construction of a pier or wharf below, and including, the deck.

1.3 MEASUREMENT AND PAYMENT

.1 Lump Sum price tendered for "Structure Demolition" shall include the following:

.1 Removal of wharf 403 timber substructure, fender piles included.
.2 Removal of existing concrete deck as specified in the drawings. Concrete deck is approximate 3 – 4 inches thick on Q Deck.
.3 Removal portion of existing concrete retaining wall to accommodate anchor wall as specified in the Drawing. Assume 6" thick reinforced concrete retaining wall.

.2 Tipping fee will be paid as a cost plus. Invoice, receipt, truck weigh slip and any other document showing proof that material comes from this project, the total amount claimed and is disposed or recycled at approved facility. Payment will be calculated based on cost incurred on tipping fee plus mark up established in the tender unit price table.

1.4 SUBMITTALS

.1 Contractor must seek approval for propose disposal and/or recycling facility for each material type.

1.5 AS BUILT

.1 PWGSC's historical drawing of the Wharf is for reference only. Please note that the first 8.7m south face of the timber wharf has been removed.

Part 2 Product

2.1 NOT USED

Part 3 Execution

3.1 DEMOLITION

.1 Demolition shall be carried out in accordance with the construction schedule as approved by the Owner.

3.2 REMOVAL OF DEMOLISHED MATERIAL

.1 All material, which are not to be salvaged for the Owner, shall become the Contractor's property and the Contractor must remove it from the site.

.2 It shall be the Engineer's decision as to which material shall be salvaged and which materials shall be disposed of.

.3 Timber piles shall be left in place. The top shall be cut or broken off at about elevation +1.3 m or 1.5 m below finished grade. All cross bracing, pile caps and deck structure shall be completely removed.

3.3 SALVAGE

.1 Material to be salvaged for the Owner shall be stored as directed by the Engineer. No material is currently identified for salvage.

3.4 PROTECTION

.1 The Contractor shall protect the remaining structural elements and adjacent structures against damage from falling debris or other causes.

.2 The Contractor shall take precautions to guard against movement or settlement of adjacent structures and remaining structural elements, provide and place shoring or bracing as required, and be responsible for the safety and support of such structures, be liable for any damage or injury caused thereby or resulting therefore. If at any time safety of any adjacent structure appears to be endangered; the Contractor shall cease operations and notify the Engineer.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

.1 All cost in connection with anchor bolts, brackets, railing, gratings and other miscellaneous steel fabrications shall be included in the price tendered for the associated items of work.

1.2 WORKMANSHIP

.1 All fabrication and erection of structural steel shall comply with CSA Standard CAN3-S16.1, latest revision.

1.3 SHOP DRAWINGS

.1 The Contractor shall prepare and submit shop drawings.

.2 The Contractor shall submit three prints or an electronic copy in PDF of the shop drawings for the Engineer's review prior to commencing fabrication. If shop drawings are not to the Engineer's satisfaction, they will be returned with the notation "Resubmit". Drawings that have been returned with the notation "Reviewed" would allow fabrication to commence.

.3 The review of shop drawings will be for size and arrangement of members and strength of connections. Any errors in dimensions shown on the shop drawings shall be the responsibility of the Contractor.

.4 Upon completion of the project, all reviewed shop drawings shall be submitted to the owner along with the As-Built marked drawings. In addition, diskettes containing all shop drawings in AutoCAD format shall be submitted.

Part 2 Product

2.1 MATERIALS

.1 Hollow structural steel sections shall conform to CSA Standard G40.20/G40.21-M, Class "C", Grade 350W.

.2 All other rolled sections and miscellaneous plate shall be grade 300W, unless noted otherwise on the drawings, in conformance with CSA Standard G40.20/G40.21-M.

.3 All structural steel members shall be made of the size and weight shown on the drawings unless written approval for any change is first obtained from the Engineer.

.4 Bolts, washers and nuts shall conform to ASTM specification A325.

2.2 COATINGS

.1 Railing, grating, bolts, inserts, washers and nuts shall be hot dip galvanized in accordance with ASTM Specifications A-153 or A-123 or CSA G 164-M (minimum zinc coating 610 g/m^2).

.2 Anchor bars shall have standard double corrosion protection.

.3 Waling, support beams for grating and miscellaneous plates and gussets shall not be painted.

.4 Damaged galvanized surfaces shall be coated with Galvacon immediately after the damage has occurred.

Part 3 Execution

3.1 WELDING

.1 Welding practice and qualifications of welders and erectors of welded construction shall conform to the requirements of CSA Standards W47, W48, and W59 latest editions. The metallurgy of weld metal shall be similar to the parent material.

.2 Unless noted otherwise, all welds shall develop the full strength of the connected members, and shall be continuous seal welds with a minimum 6 mm leg length.

.3 Where on the drawings it is called for double sided welding; the welding details called for on the near side shall be duplicated on the far side if not called up otherwise.

3.2 INSPECTION

.1 The Contractor shall furnish all facilities for inspecting and testing the weight, dimensions and quality of workmanship at the shop where the material is fabricated.

.2 The Engineer shall be notified well in advance of the start of work, in order to allow sufficient time for inspection of material and workmanship.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section covers:

.1 Any timber float modification and general carpentry work.

1.2 MEASUREMENT AND PAYMENT

.1 Any float modification work instructed or approved by the Departmental Representative will be paid for at the unit rate tendered for "Marine Crew and Equipment"

.2 Any materials required to modify floats will be extra.

.3 Work Tasks under this Section will be directed by Departmental Representative.

1.3 WORKMANSHIP

.1 All work shall be carried out in accordance with Specification CAN/CSA 086.1-M, latest revision and in accordance with Best Management Practices (BMP) for the use of treated wood in aquatic environments.

.2 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

Part 2 Product

2.1 LUMBER MATERIAL

.1 Lumber grades shall conform to the requirements of the N.L.G.A. Standard Grading Rules for Canadian Lumber, latest revision.

.2 All lumber except deck planks and guard rails shall be D.Fir-L(N), No. 1 Structural grade or better as called for on the drawings. Deck planks and guard rails shall be D.Fir-L(N), No. 2 Structural grade or better.

.3 All lumber, unless specified otherwise, shall be properly air dried and seasoned, containing not more than 19% moisture.

2.2 FASTERNERS

.1 All bolts, nuts and washers shall be hot dip galvanised in accordance with Specification CAN/CSA G164-M.

.2 Bolt holes in timber shall be bored to provide driving fit. Holes for drift bolts shall be 2 mm undersize and longer than the drift bolts.

.3 All bolts to meet the requirements of Standard ASTM - A325

.4 Deck planks shall be fastened with two galvanized nails at each contact with one nail at each side of the plank. Nails shall be 100 mm long.

2.3 WOOD PRESERVATIVE

.1 All preservative treatment, inspection and re-treatment shall be in accordance with Specification CAN/CSA 080-M, latest edition.

.2 All lumber except joists, cross ties and pile well timber shall be given a CCA or ACZA preservative treatment in accordance with the Best Management Practices.

.3 Joists, cross ties and pile well timber shall be given a full-cell creosote treatment in accordance with the Best Management Practices for Creosote, to a net retention of 224 kg per m^3 (14 lb/c.f.) and to a minimum penetration of 22 mm (7/8 inch).

.4 All treated timbers shall be incised before treatment.

Part 3 Execution

3.1 ROUGH CARPENTRY

.1 All timber, which has been given a preservative treatment, shall be carefully handled to avoid breaking through the treated surfaces. Cant hooks and rafting dogs shall not be used on timbers. No spikes shall be driven into timbers except to tack the timbers in their final position. If spikes are used, they shall be fully driven and left in.

.2 Bolt holes and countersunk holes shall be filled with CCA or ACZA preservative and the bolts shall be dipped in CCA or ACZA preservative concentrate before the bolts are placed. Bolt holes with a final position at an elevation below water level shall be filled with approved mastic before the bolts are placed.

.3 All cut ends of lumber shall be treated with two separate coats of CCA or ACZA preservative. Cut ends of lumber with a final position at an elevation below water level shall in addition be treated with one coat of approved mastic at least 5 mm thick.

.4 All structural timber used in the work shall be carefully and accurately placed in accordance with the drawings.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section covers the backfilling requirement behind the installed sheet pile wall. It includes the supply and placement of drain rock, rock fill and gravel fill as shown on the drawings.

1.2 MEASUREMENT AND PAYMENT

.1 Measured per net tonnage of drain rock, rock fill and gravel fill supplied, delivered and final placement including grading and compaction to specifications. No measurement will be made for material which is placed on a temporary basis or materials which are subsequently removed.

.2 Drain rock, rock fill and gravel fill will be paid for at the unit price tendered for "Supply and Placement of Drain Rock", "Supply and Placement of Rock Fill" and "Supply and Placement of Gravel Fill".

1.3 SUBMITTALS

.1 Material source(s), qualification test results confirming gradation curve meets or exceed the requirements of this specification.

.2 Copies of all manifest, truck weigh bills and other documentation to demonstrate and track rock and gravel product from source(s) to Site.

Part 2 Product

2.1 MATERIAL

.1 Rock Fill: Gravel or quarry tailing comprising well graded granular material with continuous gradation, free of any deleterious material, and conforming to the following grading requirements:

U.S. Standard Sieve Size	Percent Passing by Weight
150 mm Screen	100
75 mm Screen	40 - 70
37.5 mm Screen	30 - 50

19	mm Screen	20 - 35
4.75	mm Screen	10 - 20
1.18	mm Screen	0 - 10

.2 Drain Rock: Well graded quarry rock with continuous gradation, free of any deleterious material, having a maximum diameter of 75 mm (3") and gradation conforming to the following requirements:

U.S. Standard Sieve Size		Percent Passing by Weight
75	mm Screen	100
37.5	mm Screen	70 - 100
19	mm Screen	40 - 90
4.75	mm Screen	5 - 25
2.0	mm Screen	0

.3 Gravel Fill: Well graded crushed rock, gravel, sand and fines with continuous gradation, free of any deleterious material, having a maximum diameter of 25 mm (1") and gradation conforming to the following requirements:

U.S. Standard Sieve Size		Percent Passing by Weight
25	mm Screen	100
19	mm Screen	70 - 100
9.5	mm Screen	40 - 75
4.75	mm Screen	30 - 55
2.36	mm Screen	20 - 40

1.18	mm Screen	15 - 30
0.300	mm Screen	5 - 15
0.75	mm Screen	0 - 5

.4 The Contractor shall when and as directed by the Engineer break down into fractions a sample of a representative volume compared to the material. The Contractor shall carry out the necessary weighing of the fractions.

.5 Material, which does not meet the Specifications and hence is rejected by the Engineer shall be promptly removed from the site and satisfactorily substituted by the Contractor.

Part 3 Execution

3.1 BACKFILLING

.1 Sheet pile wall system must be completed prior to any backfill activity.

.2 Remove all debris, logs etc. from areas that will be covered by the new fill.

.3 Placement of Rock Fill: Place fill material in uniform layers not exceeding 500 mm loose thickness. Fill above mean water level (+ 0.2 m) shall be compacted to a minimum of 97% density Standard Proctor up to grade indicated. Compact each layer before placing succeeding layer.

.4 Placement of Drain Rock: The Contractor shall place the drain rock in a uniform layer to the lines and grades shown on the drawings.

.5 Placement of Gravel Fill: Place the gravel fill in a uniform layer and compacted to a minimum of 99% density Standard Proctor up to grade indicated.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This Section describes the requirements for supply and installation of sheet pile wall and anchor bars.

1.2 MEASUREMENT AND PAYMENT

.1 The supply, fabrication and installation of complete sheet pile wall system including sheet piles, walers, weeping holes, fixing bolts and miscellaneous hardware will be paid for at the Lump Sum price tendered for “Supply Sheet Pile” and “Install Sheet Pile Wall”

.2 The supply, fabrication and installation of complete anchor sheet pile wall including walers, anchor bars and miscellaneous hardware will be paid for at the Lump Sum price tendered for “Supply and Install Anchor Wall”.

.3 All cost associated with quality control and quality control testing will be considered as incidental to the Work.

1.3 SHEET PILE DELIVERY SCHEDULE

.1 Sheet piles must be delivered to Contractor’s yard by March 1st 2022. Departmental Representative to confirm receipt of sheets at Contractor’s yard. Upon payment for the tendered item “supply of sheet pile”, the sheet piles becomes the property of the Government of Canada and must not be sold, destroyed, damaged or delivered to any other site other than the Site (12740 Trites Road, Richmond).

1.4 SUBMITTAL

.1 Mill certificates for sheet pile signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.2 Anchor bars as indicated in clause 2.2.3 in this Section.

Part 2 Product

2.1 SHEET PILES

.1 Sheet piles shall be hot rolled steel sheet piles having a minimum yield strength of 350 MPa meeting the requirements of the latest edition of at least one of the following specifications:

.1 CSA G40.21 Grade 350 W

.2 ASTM A572 Grade 50

.3 EN 10248 Grade S355 GP With the following provisions:

.1 The minimum copper content shall be 0.2%.

.2 The Contractor shall bear the expense of repairing and re-inspecting all rejected welds.

.3 Allowable tolerance on dimensions shall meet the requirements of CSA G40.20.

.2 Sheet pile anchor wall may be used good condition sheets, subjective to Departmental Representative inspection and approval.

.3 No splicing of sheet piles are allowed.

2.2 ANCHOR BARS

.1 Anchor bars shall be Dywidag Threadbars with double corrosion protection as supplied by Dywidag-Systems International or approved equal in accordance with the drawings and specifications.

.2 Anchor bars shall conform to the requirements of Standard CSA G30.18 or ASTM A615 with steel grade 517/690 MPa.

.3 The Contractor shall provide necessary certification from a certifier acceptable to the Engineer to demonstrate that the material meets the above standards.

2.3 HANDLING PILES

.1 Piling shall be handled and stored so as to avoid over stressing or injury, and any piles bent or damaged, or in any way made defective in the opinion of the Owner or Engineer, shall be made good to his satisfaction or replaced.

.2 Use slings for lifting piling so that mass is evenly distributed and piling is not subjected to excessive bending stresses.

.3 Store sheet piling on level ground or provide supports so that sheet piling is level when stored. Provide blocking at spacing not exceeding 5 m so that there is no excessive sagging in piling. Overhang at ends not to exceed 1 m. Block between lifts directly above blocking in lower lift.

2.4 FABRICATION

.1 Welding practice and qualifications of fabricators and erectors of welded construction shall conform to the requirements of CSA Standards W47, W48, and W59, latest editions.

.2 Use full length piles unless splicing is indicated or approved on site by Engineer.

2.5 CORROSION PROTECTION

.1 Steel sheet piles shall not be painted.

.2 Anchor bars shall have standard double corrosion protection.

Part 3 Execution

3.1 INSTALLATION OF STEEL SHEET PILES

.1 Sheet pile wall system must be completed prior to any backfill activity.

.2 Piles shall be installed in accordance with Best Management Practice for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association – November; 2003.

.3 All piles shall be driven to the pile tip elevation shown on the drawings.

.4 All pile driving equipment shall be in good mechanical condition and shall be capable of delivering the manufacturer's rated energy output and shall be operated in accordance with the manufacturer's instructions.

.5 Submit full details of method and sequence of installation of piling to the Engineer for review prior to start of pile installation work. Details must include guide frames, bracing, setting and driving sequence and number of piles in panels for driving.

.6 Provide temporary guide frames or bracing to hold piles in alignment during setting and driving.

.7 Piles to be driven in pairs where possible. Drive first pair sufficiently deep into ground to ensure that it will remain plumb, then place panel of a number of pairs of sheet piles in guide frames and secure last pair in location to prevent spreading of piles in panel.

.8 After one panel has been driven, place and drive succeeding panels in similar manner.

.9 Piles shall be driven and installed within a tolerance of +/- 50 mm in location and within 0.5% from the specified axial alignment.

.10 If obstruction encountered during driving, leave obstructed pile and proceed to drive remaining piles. Return and attempt to complete driving of obstructed pile later.

.11 Advise Engineer immediately if impossible to drive pile to full penetration, and obtain direction from Engineer on further steps required to complete work.

.12 After driving, sheet piles shall be cut off at the elevations shown on the plans within +/- 2 mm. In driving, sufficient length above cut off shall be allowed so that no damaged or deformed part of the sheets remains in the work. A suitable

guide shall be used to aid in cutting the sheet piles so that the cut off plane is within specified tolerances.

3.2 INSTALLATION OF ANCHORS

.1 Do not place backfill behind anchored sheet pile wall or remove material from in front of the wall until the piles have been completely driven, adjusted and secured in final position by the anchorage system.

.2 Support tie rods at intervals along their length as required to avoid overstressing.

.3 Fit and adjust anchor systems so that the anchor rods are tight before backfilling.

.4 Backfill in accordance with Section 31 22 20 – Fill and Rock Work and as indicated on the drawings.

.5 Protect the anchor systems from damage or displacement during backfilling operations.

3.3 PILE DRIVING RECORDS

.1 The Contractor shall maintain an accurate record of pile driving. The Contractor shall submit a copy of the record to the Engineer. The Contractor shall co-operate with the Engineer in maintaining these records. The Contractor shall record for each pile:

- Date and time driven
- Cut off elevation
- Length of pile driven
- Tip elevation
- Type of pile driving hammer

3.4 TEMPORARY RESTRAINT OF DRIVEN PILES

.1 The Contractor shall furnish sufficient labour and materials to adequately secure the piles during the installation.

.2 Temporary restraints once erected and approved shall be maintained in good order until completion of the structure.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section covers:

.1 Any timber pile driving and extraction that may be required for relocating existing floats. All work to be in accordance with Best Management Practices (BMP) for the use of treated wood in aquatic environments.

1.2 MEASUREMENT AND PAYMENT

.1 Any timber pile driving and extraction work, instructed or approved by the Departmental Representative will be paid for at the unit rate tendered for "Marine Crew and Equipment"

.2 Any additional materials required for such task will be considered as extra.

.3 Work Tasks under this Section will be directed by Departmental Representative.

Part 2 Product

2.1 PILE MATERIAL

.1 All timber piles shall be round Douglas Fir with a minimum butt diameter of 305 mm (12") and shall comply in quality with the requirements of Canadian Standard CAN/CSA 056, latest revision. It is expected that the existing timber dolphin piles can be reused for the relocation of the mooring float.

2.2 FASTENERS

.1 All bolts, nuts, washers, drift pins, spikes and nails shall be hot dip galvanised in accordance with Specification CAN/CSA G164-M.

.2 Bolt holes in timber piles shall be bored to provide driving fit. Holes for drift pins shall be 2 mm undersize and longer than the drift pins. Hole sizes of lag screws are to be as specified in Standard CAN/CSA 086.1-M, latest edition.

.3 Unless otherwise specified, connection bolts, lag screws or drift bolts shall be placed through the centre of the timber piles and shall not be less than seven times the bolt diameter from the end of the timber pile.

.4 Plate washers shall be used under the heads and nuts of all bolts against timber piles.

.5 All bolts to meet the requirements of Standard ASTM - A307.

.6 Nails, spikes and staples to meet the requirements of Standard CAN/CSA B111-M.

2.3 PROTECTION

.1 Avoid dropping, bruising or breaking of wood fibres.

.2 Avoid breaking surfaces of treated piles.

.3 Do not damage surfaces of treated piles below cut-off elevation by boring holes or driving nails or spikes into them to support temporary material or staging. Support staging in rope slings carried over tops of piles or by attaching to pile clamps of approved design.

.4 Treat cuts, breaks or abrasions on surfaces of treated piles, bolt holes and field cuts in accordance with Standard CAN/CSA 080-M.

Part 3 Execution

3.1 PREPARATION

.1 Protect pile heads during driving and closely fit driving heads to top of pile. Where necessary protect pile heads by means of heavy steel straps or wrought iron rings.

.2 Protect treated piles to avoid breaking through the treated surface. Cant hooks and rafting dogs may be used only in the end of piles. No spikes shall be driven into the piles below high-water level. All cuts or breaks in the surfaces of creosote treated piles shall be treated with one coat of approved mastic.

.3 Bolt holes with a final position at an elevation above high water level shall be filled with CCA or ACZA preservative and the bolts shall be dipped in CCA or ACZA preservative concentrate before the bolts are placed. Bolt holes with a final position at an elevation below high water level shall be filled with approved mastic before the bolts are placed.

.4 Where timber piles have to be cut for plate washers, the cut surface shall be treated with two coats of CCA or ACZA preservative and a further coat of mastic before washers are placed.

3.2 INSTALLATION

.1 Piles shall be installed in accordance with Best Management Practice for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association – November; 2003.

.2 Piles shall be driven with standard equipment; vibrator, air, steam, diesel or drop hammer approved by the Engineer. Piles shall be driven tip down.

.3 Prior to any pile driving, the Contractor shall inform the Engineer about the equipment he intends to use.

.4 Piles shall be driven to a minimum penetration of 5 m.

.5 Piles shall be installed with a maximum deviation of 100 mm at the seabed from the given location and not more than 0.5% off alignment.

.6 Timber piles shall be driven in such a way that they are not broken or split. The heads of piles shall be sniped and the tips shall be fresh if the driving is hard in the opinion of the Engineer. A ring or wire mesh shall be used to prevent the head from splitting during hard driving. If the rings or wire mesh do not prevent splitting, steel tension bands 30 mm by 1 mm shall be used. These materials are to be supplied by the Contractor. After driving, the piles shall be cut off at the elevation shown on the drawings.

.7 Any pile which is split or otherwise damaged below the cut-off elevation or is driven out of position or location, so that in the opinion of the Engineer it is unfit for the use for which it is intended, shall be removed and replaced with a sound pile, at the Contractor's expense.

3.3 TREATMENT OF PILE TOPS

.1 The tops of all piles shall be treated with two separate coats of CCA or ACZA preservative and one coat of approved mastic at least 5 mm thick.

.2 In addition, the tops of all piles shall be covered with a sheet of 1 mm annealed corrosion-resistant aluminium cut 150 mm larger than the diameter of the pile top. The overhanging edges shall be crimped and turned down and secured to the piles with eight aluminium roofing nails and shall not be cut to facilitate fitting.

END OF SECTION