



Fisheries and Oceans
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Canada

Small Craft Harbours Branch

F1571-198025

Technical Specifications

SQUIRREL COVE FLOAT AND WHARF REPAIRS CORTES ISLAND, B.C.

November 2019

TECHNICAL SPECIFICATIONS

SECTION	TITLE
00 00 01	Technical Specification Index
00 01 00	General Requirements
00 02 00	Summary of Work
00 20 60	Demolition of Structures
00 22 22	Health and Safety Requirements
00 51 00	Steel Hardware
00 66 00	Timber Repairs
00 70 62	Steel Pipe Pile Extensions
00 70 63	Wood Piles
00 70 64	Steel Piles

DRAWING NUMBER	TITLE
Sheet 001	Float Repairs and Typical Section
Sheet 002	Approach and Wharfhead Pile Replacement

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END OF SECTION

1 COMMENCEMENT AND COMPLETION

- .1 All work including clean-up and demobilization must be completed by **March 13, 2020**.

2 INSPECTION OF SITE

- .1 It is the responsibility of each bidder to obtain all necessary information pertaining to local site conditions and existing works, beyond the information provided in this Specification and accompanying drawing(s).

3 PERMITS, CERTIFICATES, LAWS AND ORDINANCES

- .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. He 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.
- .2 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.
- .3 All work to be done in accordance with Work Safe BC regulations.
- .4 The Contractor shall comply with Federal and Provincial laws, orders and regulations concerning the control and abatement of water and air pollution.
- .5 The Contractor shall comply with the requirements of any local or other Noise By-Laws.

4 MINIMUM STANDARDS

- .1 In the absence of other standards specified in the contract documents, all work is to conform to, or exceed, the minimum standards of the Canadian Government Specifications Boards, the Canadian Standards Association, the American Society for Testing of Materials, or the National Building Code of Canada, whichever is applicable.

5 INTERFERENCE WITH OPERATION

- .1 The Contractor shall obey all navigation regulations and conduct operations so as to interfere as little as possible with the use of berthing spaces, fairways and passages. Install and maintain any and all protection to navigation as may be required by any properly constituted authority or by the Owner. 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.

6 COMPLIANCE WITH STANDARD SPECIFICATIONS CODES AND REGULATIONS

- .1 Unless expressly stated to the contrary, all materials, equipment and articles furnished by the Contractor shall comply with the applicable provisions of the standards of the Canadian Standards Association (CSA) or the Canadian Government Specification Board (CGSB) with the applicable provisions of the American Society for Testing Materials (ASTM), National Dredging Association (NFPA), American Concrete Institute (ACI) and the American Water Works Association (AWWA).
- .2 The Contractor shall follow all regulations in accordance with the Fisheries Act. Care shall be taken not to release any deleterious materials to fish habitat, into the water.

7 CONTRACTOR'S PERSONNEL

- .1 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.

8 RESPONSIBILITY TO PERSONNEL

- .1 The Contractor shall have full responsibility for the board, lodging and transportation of his personnel and subcontractors. The cost for this shall be incorporated into his unit prices. He shall comply with all labor requirements, and Worker's Compensation regulations.

9 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.

10 SITE ACCESS

- .1 The Contractor shall provide access to the work for the Owner's inspectors and surveyors as required.
- .2 General site access shall be coordinated with the Owner.
- .3 The Contractor shall maintain routes of travel, with the Owner being the sole judge as to what may be deemed reasonable.
- .4 The Contractor shall erect and maintain barriers, fences, lights, warning devices, and other protective devices as may be required for prevention of theft or damage of goods and protection of the public and workmen, or if so ordered by the Owner.

11 CONSTRUCTION AREA

- .1 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.
- .2 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.

12 NIGHT WORK

- .1 The Contractor shall keep proper lights each night between the hours of sunset and sunrise upon all floating plants, false-work and other obstructions where necessary, and upon all buoys of such size and in such locations as required by a governing authority. When work is done at night, maintain from sunset to sunrise such lights on or about the work and plant as necessary for the proper observation of the work and the efficient prosecution thereof.

13 CLEAN-UP

- .1 At all times the Contractor shall keep the site free from accumulation of waste material and debris and leave the site clean and tidy on completion.

14 TEMPORARY SERVICES

- .1 On site the Contractor shall make his own arrangements for supply of water and electricity.
- .2 The Contractor shall supply for his own use; sanitary, first aid, and all other temporary services and facilities required for the work.

15 PROGRESS REPORT

- .1 The Contractor shall keep a daily record of progress of the work available for inspection by the Engineer.
- .2 The daily record shall include particulars of weather conditions, number of men working, plant and equipment working and work performed.

16 ENGINEER'S ACCESS

- .1 The Contractor shall provide access to the work for the Engineer's inspectors and surveyors as required.

17 PERMITS AND ROYALTIES

- .1 Permits and licenses required for the Contractors work are the responsibility of the Contractor and shall be for the Contractor's account. The Contractor shall have the appropriate business license.

18 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. 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.

19 WEATHER

- .1 Time lost by the Contractor due to stoppage on account of adverse weather conditions may be allowed, at the discretion of the Engineer, as an extension of time for the completion of the work over and above the date of completion specified in the contract agreement.

20 SOIL DATA AND EXISTING TOPOGRAPHY

- .1 The Contractor shall notify the Engineer of any subsurface conditions at the place of the work that may differ materially from those indicated in the contract documents.

21 UTILITIES AND SERVICES

- .1 The Contractor shall be responsible for any damage to overhead, underwater and/or underground utilities and/or services caused by the Contractor's operations and shall repair and make good the repairs at the Contractor's own expense.
- .2 The Contractor shall be responsible, unless otherwise agreed to by the Engineer, for all temporary or construction services and utilities, and first aid facilities.

22 CARE OF FINISHED WORK

- .1 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.

23 DISPOSAL

- .1 All material designated to be replaced or removed will become the property of the Contractor and will be disposed of in an environmentally acceptable manner so that they neither become a menace to marine navigation nor a nuisance to the public on adjacent or any other property.
- .2 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.
- .3 Conduct clean-up and disposal operations to comply with local ordinances and antipollution laws.

24 MATERIAL HANDLING AND STORAGE

- .1 Any materials damaged by the Contractor during handling, transportation and storage shall be replaced at the Contractor's expense.
- .2 While the Contractor is mobilized on site, the Contractor is responsible for protecting all materials (including Owner supplied materials) from damage and theft. As a minimum, the Contractor shall provide fencing around any stored materials that are accessible to the general public.

25 CONSTRUCTION WORK SCHEDULE

- .1 The Contractor shall work whatever shifts 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 Within 7 days of award the Contractor shall supply a week by week schedule of proposed activities related to the contract.
- .4 The Contractor must notify the Owner immediately whenever a variation from the construction schedule is expected to occur or when the submission of the submittals will be delayed.

26 SETTING OUT OF WORK

- .1 The Contractor is expected to familiarize themselves with the site, facilities and amenities within.
- .2 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.

27 AS-BUILT 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.

28 SITE SECURITY

- .1 The Contractor is responsible for all materials and equipment either supplied by the Contractor, the Client Department, or the Owner. The Contractor is responsible for the repair and replacement of stolen or damaged items.

29 SITEWORK

- .1 All heavy construction equipment shall be free of leaks and cleaned prior to construction.
- .2 The Contractor shall have absorbent pads on site in case of any oil leaks or contaminants entering the water.
- .3 The Contractor shall develop a construction plan that minimizes disruption to harbour operations.
- .4 The site shall be left in a safe condition at the completion of each work day.

30 CO-OPERATION WITH HARBOUR AUTHORITY

- .1 The Contractor shall give the Harbour Authority **minimum 1 week notice** for start of construction.

- .2 The Contractor shall give the Harbour Authority **minimum 48 hours notice** for work that requires vessels to be moved.
- .3 The Contractor shall give the Harbour Authority **minimum 48 hours notice** for work that may interrupt harbour operations including access to floats.

31 CONDITION OF STRUCTURE

- .1 Existing structures, adjacent marine facilities, roads, and all other structures, services, piping or equipment within the work area shall be properly protected from any injury or damage, direct or indirect. Any damage that is caused as a result of the operations of the Contractor shall be repaired and made good at the Contractors expense to the satisfaction of the Owner.

32 INSPECTION OF STRUCTURE

- .1 The Owner or inspector, shall inspect the completed works. The Contractor shall be responsible for the costs of any re-inspections that may be required due to errors or omissions of the Contractor.

END OF SECTION

1 GENERAL

- .1 The Standard General Conditions of these specifications form an integral part of this section.

2 SITE LOCATION

- .1 Squirrel Cove Small Craft Harbour is located in Squirrel Cove on Cortes Island, BC, at the northern end of Squirrel Cove Road. Coordinates for the wharf approach are 50° 7'5.95"N, 124°54'41.47"W.

3 WORK SCHEDULE

- .1 All work including site clean-up and demobilization must be completed by **March 13, 2020** (refer to Section 00 01 00 - General Requirements).

4 DEFINITIONS

- .1 Throughout contract documents, the words "Owner," "Harbour Authority," "Engineer," or "Department," shall be defined as follows:
- .1 Owner
Small Craft Harbours Program of the Department of Fisheries and Oceans Canada, 200-401 Burrard Street Vancouver BC V6C 3S4
- .2 Harbour Authority (HA)
For the most part, Harbour Authorities are incorporated, not-for-profit organizations. They have a board of directors and members, who are representative of local interest groups and harbour users. Each Harbour Authority is a unique and independent business responsible for managing, operating and maintaining one or more public fishing harbours, through a lease agreement with Small Craft Harbours.
- .3 Engineer
An employee of the Owner or Consultant assigned by the Owner as the Engineer for this project, or the Engineer's representative assigned by the Engineer as his representative for the project.
- .4 Contractor
The party accepted by the Owner with whom a formal contract is entered to complete the work of this project.
- .5 Department
The Department of Fisheries and Oceans Canada.

5 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 consists of but is not limited to the following items:

Mandatory Works**.1 Mobilisation/Demobilisation**

The supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

- .1 Move all crew, equipment/tools and materials on and off site.
- .2 All crew living expenses and other associated costs.
- .3 Any overhead costs not covered in other items.
- .4 Site clean-up and disposal of all demolished materials, including but not limited to: hardware, treated timber, and general waste.

.2 Replace Bearing Piles Along Approach and at Wharf Head

Includes the supply of materials, equipment, tools, services, labour, and all things necessary to complete the following:

- .1 Remove and dispose of existing bearing piles, and install new owner-supplied bearing piles, at the 14 locations identified on Drawing Sheet 002.
- .2 Timber bearing piles shall be driven to refusal or to a minimum penetration of 6 metres.
- .3 For treated wood requirements refer to section 00 66 00.

.3 Replace Fender and Batter Piles at Wharf Head

The supply of materials, equipment, tools, services, labour, and all things necessary to complete the following:

- .1 Remove and dispose of existing fender or batter piles, and replace with new owner-supplied batter or fender piles, at the 6 locations identified, along bent 22, on Drawing 002.
- .2 Timber fender piles shall be driven to refusal or to a minimum penetration of 2.5 metres, and capped with a new annealed 0.8mm thick (22gauge) aluminum pile hat.
- .3 Timber batter piles shall be driven to refusal or to a minimum penetration of 3 metres, and capped with a new annealed 0.8mm thick (22gauge) aluminum pile hat.
- .4 For treated wood requirements refer to section 00 66 00.

.4 Existing steel piles – weld extension

The supply of materials, equipment, tools, services, labour, and all things necessary to complete the following:

- .1 Weld a 1.5m extension to the top of four existing steel float mooring piles to the piles specified in drawing 001.
- .2 Supply of four (4) 1.5m long, 406mm diameter with a 12.7mm wall thickness pile sections, and capped with a 12mm x 394mm OD steel plate welded to seal the top of each steel pile.
- .3 Transporting pile from laydown area to the pile installation locations, removing the bird spikes on top of the existing piles, lifting the pile sections on top of the existing piles, welding the pile sections to the top of the existing piles and re-installing the bird spikes on top of the pile extensions.
- .4 This item also includes working with tidal fluctuations.
- .5 All material and work must conform to section 00 70 62, Steel Pipe Pile Extensions.
- .6 Provide a 3rd party certified inspection of all welds and provide inspection results to the Owner.
- .7 Should a weld indicate poor alignment of the pile sections, insufficient penetration of the weld, lack of fusion, slag inclusions, porosity or any such defects, the Contractor shall take the necessary corrective measure to provide a full strength weld to the satisfaction of the Owner/Engineer. The cost of correcting defective welds shall be borne by the Contractor.

.5 Replace existing timber dolphins and mooring piles with steel piles (except for Float D)

The supply of materials, equipment, tools, services, labour, and all things necessary to complete the following:

- .1 Remove a total of eight (8) existing timber piles at the three pile locations indicated on drawing 001.
- .2 For each mooring pile location, install a new 406 mm diameter x 15.9 mm thick, straight seam, steel mooring pile.
- .3 Steel piles to be driven to refusal, or to a penetration depth of 7 metres. Following driving, steel mooring piles are to be cut off at an elevation of 9.0m chart datum, and capped with a 12mm x 394mm OD steel plate welded to seal the top of each steel pile.
- .4 Drop hammer is preferred method of pile driving; vibro-hammer will also be accepted.
- .5 Refer to specifications 00 70 64, Steel Piles and the Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association.

.6 Remove existing Float D and timber mooring piles, and install owner-supplied float

The supply of materials, equipment, tools, services, labour, and all things necessary to complete the following:

- .1 Remove and dispose one (1) existing steel mooring pile and twelve (12) existing timber mooring piles.
- .2 Remove existing gangway sliders and related hardware from the existing float to be re-installed on the new float.
- .3 Safely place and secure the existing gangway onto the new float. Contractor to include methodology of securing gangway to the new float to the Engineer prior to Construction.
- .4 Unsecure and transport new float from the laydown area on on-site to the replacement location.
- .5 Drive three (3) steel mooring piles as specified in drawing 001. All material and work must conform to section 00 70 64, Steel Piles, and to the Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association.
- .6 Steel piles to be driven to refusal, or to a penetration depth of 7 metres. Following driving, steel mooring piles are to be cut off at an elevation of 9.0m chart datum, and capped with a 12mm x 394mm OD steel plate welded to seal the top of each steel pile.
- .7 New float to be provided by the Owner and to be accessible on-site for the Contractor.

END OF SECTION

1 GENERAL

- .1 The Standard General Conditions and Supplementary General Conditions of these specifications form an integral part of this section.
- .2 Where existing works are to be removed, they shall be removed and salvaged or disposed of to the satisfaction of the Engineer.
- .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.
- .5 Demolition shall be carried out in accordance with the construction schedule as approved by the Engineer.

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 completely removed. If it is not possible to remove a pile, the pile shall be broken off below seabed level.

3 SALVAGE

- .1 Material to be salvaged for the Owner shall be stored as directed by the Engineer.
- .2 No material is expected to be salvaged for the Owner.

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

1 GENERAL

- .1 Health and safety considerations required to ensure that PWGSC shows due diligence towards health and safety on construction sites, and meets the requirements laid out in PWGSC/RPB Departmental Policy DP 073 -Occupational Health and Safety - Construction.

2 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of British Columbia
 - .1 Workers Compensation Act, RSBC 1996 - Updated 2006.
 - .2 Occupational Health and Safety Act, S.N.S. [1996].

3 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.
- .2 Submit one copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.
- .3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .4 Submit copies of incident and accident reports.
- .5 Submit WHMIS MSDS - Material Safety Data Sheets if requested.
- .6 Departmental Representative may review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .7 Departmental Representative's 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.

- .8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

4 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.

5 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

6 MEETINGS

- .1 Schedule and administer Health and Safety meeting prior to commencement of Work.

7 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Harbour Manager.
 - .2 Departmental Representative.

8 GENERAL REQUIREMENTS

- .1 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. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns

9 RESPONSIBILITY

- .1 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.
- .2 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.

10 COMPLIANCE REQUIREMENTS

- .1 Comply with Workers Compensation Act, B.C.
- .2 Comply with B.C. Occupational Health and Safety Regulations.
- .3 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

11 UNFORESEEN 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 Departmental Representative verbally and in writing.

12 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with steel and timber pile driving.
 - .2 Have working knowledge of B.C. occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work.

13 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 Departmental Representative.

14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

15 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

END OF SECTION

1 GENERAL

1.1 General

- .1 This section refers to the steel fastenings and hardware indicated on the Contract Drawings.

1.2 Related Work

- .1 Section 009900 –Timber Repairs

2 PRODUCTS

2.1 Steel

- .1 Small fastenings will conform to the standard for Wire Nails, Spikes, and Staples, Canadian Standards Association (CSA) B-111-1974.
- .2 Drift bolts, machine bolts, washers, and miscellaneous iron will conform to the standard for General Purpose Structural Steel of the CAN3-G40.21-M81.
- .3 Items manufactured or fabricated from scrap steel of unknown chemical or physical properties are not acceptable.
- .4 All bolts will be of the full dimension specified or shown on the plan. Unless otherwise specified, all machine bolts will be provided with steel plate washers under head and nut. The steel plate washers shall be round unless specified otherwise.
- .5 All bolts shall be 19mm (3/4") National course thread, unless shown otherwise.
- .6 All 19mm washers shall be 6mm thick and 75 mm diameter galvanized steel.
- .7 All mooring pile rings shall be round HSS with 101.6 mm outside diameter x 7.95 mm wall.
- .8 All mounting plates and hardware on the mooring pile rings shall be of the full dimension specified or shown on the plan.

2.2 Hardware

- .1 All hardware including bolts, drift bolts, carriage bolts, lag bolts, pipe sleeves, nuts and washers etc., will be hot dipped galvanized in accordance with the American Society for testing Materials (ASTM) Standard A153. Galvanize to 610gm/m³ (2oz/ft²).
- .2 All bolts to have 75mm (3") of thread unless shown otherwise.

3 EXECUTION

3.2 Assembly

- .1 All bolts shall be tightened to 100 Newton Meters (80 ft/lbs.)
- .2 Care shall be taken not to damage the treated wood finish. All treatment damaged by the contractor shall be repaired at his own expense.
- .3 Pre-drilling:
All pile well guard timbers and ends of decking shall be predrilled prior to installation to prevent splitting.
- .4 Holes for machine bolts will be bored to provide a driving fit.
- .5 All holes drilled for pile braces shall be treated with preservative as specified prior to bolting.

END OF SECTION

1 GENERAL

The contractor is to supply all required materials (timber, planking, etc.) The contractor is to supply all required equipment, labour, misc. materials to refurbish, remove, disassemble, salvage and reassemble the existing works as specified.

1.1 RELATED WORK

Section 00 23 64 – Wood Piling

2.0 PRODUCTS

2.1 GENERAL

- .1 Except as otherwise noted, only new materials will be used in, and remain an integral part of the structures.
- .2 The Engineer may inspect materials and products at his discretion at all stages of their manufacture, and transportation to the site. Satisfactory inspection at any stage does not preclude future rejection if the materials or products are subsequently found to lack uniformity or fail to conform to the requirements specified. Acceptance will not be made until the materials or products are satisfactorily installed in the completed structures as specified.
- .3 The contractor shall be responsible to repair all materials damaged by his handling, storage and installation of materials.
4. Salvaged materials deemed to be reusable shall remain property of the Department.

2.2 TIMBER

- .1 All timber for the purpose intended shall conform to the requirements of the N.L.G.A. Standard Grading Rules for Canadian Lumber, latest revision.
- .2 All timber shall be Coast Douglas Fir. No.1 Structural Grade or better; or specified otherwise
- .3 All decking shall be S4S, heart side down.
- .4 All ballast boards shall be S4S.
- .5 All pile caps shall be S4S.

2.3 TREATMENT OF MATERIAL

- .1 Creosote-treated Materials:
 - .1 All creosote treated timber will be treated in accordance with CSA 080 and will follow the Best Management Practices for Creosote as outlined in “Best Management Practices for the use of Treated Wood in Aquatic Environments”, Canadian Version January 1997.
 - .2 All creosote treated materials will have a minimum retention of 225kg per cubic meter (14lb. per cubic foot).

- .3 All timber currently used for the bearing piles, fender piles, batter piles, pile caps, cross braces, and stringers on the approach and wharfhead are creosote-treated timber.
- .2 Salt-treated Materials:
 - .1 All timber specified to be treated with water-home salts will be treated in accordance with CSA 080-1989, "Wood Preservation", and its current amendments CSA 080.14, for materials in contact with ground or water. (Only non-leachable ACA salts will be accepted).
 - .2 All salt treatment will follow the Best Management Practices for ACA and ACZA as outlined in "Best Management Practices for the use of Treated Wood in Aquatic Environments", Canadian Version January 1997.
 - .3 All salt-treated timber will have a minimum retention of 6.4 kg/m³ (0.40 lb. per cubic foot) and a depth of penetration of 10mm as specified in CSA 080.14.
 - .4 All timber currently used on the floats and all timber currently used for decking, curbing, and handrails on the approach and wharfhead are salt-treated timber.

2.4 FIELD TREATING

- .1 Creosote treated timber members that have fresh cut surfaces exposed in the structure shall be treated as specified. All cuts or breaks in the surfaces of creosote treated timber shall be treated with two separate coats of creosote oil. Where bolt holes must be bored through creosote treated piles, the holes shall be filled with creosote oil and the bolts shall be dipped in hot creosote oil before the bolts are placed. Other alternative field wood treatment should be approved by the engineer before application. Ensure the creosote or other preservatives are properly stored and protected in case of spillage. (i.e. place in tray)
- .2 All salt treated members that are modified (cut or drilled) shall be field treated with two coats of Copper Naphthenate or pentachlorophenol. When field treating by brushing, spraying, dipping or soaking do so in such a manner that the preservative does not drip into the water or onto the ground. Ensure the creosote or other preservatives are properly stored and protected in case of spillage. (i.e. place in tray)

3 EXECUTION

3.1 HANDLING OF MATERIALS

- .1 Treated material will not be accepted if damaged in any manner in handling. This includes damage from strapping and slings.
- .2 The contractor shall be responsible to repair or replace all materials damaged by his handling, storage and installation of materials.

3.2 PILE CAP AND SHIM REPLACEMENT

- .1 Treated Materials:
Field cuts in treated material comprising the wharf will be treated as specified.

- .2 All blocking and shims shall be creosote treated and supplied by contractor.

3.3 EXISTING STRUCTURES

- .1 Any structures damaged by the Contractor during the works shall be repaired and made good at the Contractor's expense to the satisfaction of the Engineer.”

3.4 SERVICES

- .1 Removal
All services shall be removed from the wharf as not to damage them. All service materials misc. hangers, fasteners and supplies required to reinstall the services shall be supplied by the contractor. All materials that are not reusable shall be disposed of by the contractor.
- .2 Handling and Storage
The contractor shall be responsible for the handling and storage of the service lines, lamp standards and other equipment during construction. All materials damaged by the contractor shall be replaced at his expense.

3.5 PATCHING AND REPAIRS

- .1 All unused bolt holes or damaged areas of creosote treatment shall be patched with creosote treated dowels, mastic, ships felt and copper patches as specified.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

.1 Not used.

1.2 SCOPE OF WORK

.1 This section refers to the extension of steel piling as defined by the Contractor Drawings and Specifications.

Part 2 Products**2.1 MATERIALS**

.1 Steel Pipe Piles.

.2 Steel pipe pile extensions shall have minimum yield strength of 310 MPa meeting the requirements of the last edition of at least one of the following specifications:

- .1 ASTM A252 Grade 3
- .2 API 5L Grade B
- .3 ASTM A53 Grade B
- .4 CSA Z245.1-M

with the following provisions:

- i) Chemical analysis of material shall show an equivalent carbon content of less than 0.30%.
 - ii) All welds shall be full strength and shall satisfy the requirements of either ASTM A53 or CSA Z245.1-M.
 - iii) Flattening tests for ductility shall be conducted in accordance with the procedure and frequency stipulated in CSA Standard Z245.1-M or ASTM Standard A53.
 - iv) Unless longitudinal welds are certified as conforming to the requirements of ASTM A53, CSA Z245.1-M or API 5L to the satisfaction of the Engineer, welds shall be 100 percent inspected by ultrasonic or electromagnetic inspection according to the requirements of ASTM A53. This inspection shall be conducted at the Contractor's expense.
 - v) The Contractor shall bear the expense of repairing and re-inspecting all rejected welds.
 - vi) Allowable tolerance on dimensions shall meet the requirements of CSA Z245.1-M.
- .3 The minimum length of a pile extension section shall be 1.5 m.
- .4 Welded steel pile extensions shall have full strength welds.

2.2 HANDLING

- .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 Engineer, shall be made good to his satisfaction or replaced.

Part 3 Execution**3.1 WELDING**

- .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 The splice shall be complete joint penetration welds and shall develop the full strength of the pile section. Splices shall be made in a manner that will ensure good alignment of the spliced parts. The number of splices shall be held to a minimum.
- .3 The longitudinal welds of pipe pile lengths to be joined shall be staggered 90 degrees.
- .4 The end profile of a pile section to be butt welded shall not deviate more than 1.0 - 1.6 mm from a plane perpendicular to the axis of the pile.
- .5 Maximum deviation of the line of the pile at the splices shall be 3 mm when measured with a 3.0 m straight edge.
- .6 All pile splices shall be 100 percent inspected and tested. This inspection shall be conducted at the Contractor's expense.
- .7 Inspection of pile splices shall be by non-destructive ultrasonic tests in accordance with the requirements of AWS D1.1-75. If the inspection of a weld should indicate poor alignment of the pile sections, insufficient penetration of the weld, lack of fusion, slag inclusions, porosity or any such defects, the Contractor shall take the necessary corrective measures to provide a full strength weld to the satisfaction of the Engineer. The cost of correcting defective welds and re-testing shall be borne by the Contractor.

Part 4 CUT OFFS AND COMPLETION

- .1 Piles shall be cut off at an elevation 2 metres above the original top elevation of the pile.
- .2 Piles tops shall be cut in a flat horizontal plane. A suitable guide shall be used to aid in cutting piles so that the cut off plane is within specified butt weld splice tolerances. If a satisfactory hand-held cut cannot be obtained, the Contractor shall cut the pile with an automatic cutter.
- .3 Pile tops shall be capped with a 12mm (1/2-inch) thick steel plate welded to the top.

END OF SECTION

1 GENERAL

- .1 PWGSC's General Conditions and related contract documents form an integral part of this section.
- .2 All work to be in accordance with Best Management Practices (BMP) for the use of treated wood in aquatic environments.

2 MATERIAL

- .1 Pile Material
 - .1.1 All timber piles, which shall be supplied by the Owner, 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.
- .2 Fasteners
 - .2.1 All bolts, nuts, washers, drift pins, spikes and nails shall be hot dip galvanised in accordance with Specification CAN/CSA G164-M.
 - .2.2 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.
 - .2.3 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.
 - .2.4 Plate washers shall be used under the heads and nuts of all bolts against timber piles.
 - .2.5 All bolts to meet the requirements of Standard ASTM - A325.
 - .2.6 Nails, spikes and staples to meet the requirements of Standard CAN/CSA B111-M.
- .3 Wood Preservative
 - .3.1 All timber piles shall be carefully peeled to avoid removing sapwood, so that all piles have a 25 mm minimum thickness of sapwood.
 - .3.2 All piles shall be given a full-cell creosote treatment in accordance with Standard CAN/CSA 080-M and BMP, to a net retention of 224 kg per m³ (14 lb/c.f.) and to a minimum penetration of 22 mm (7/8 inch). Inspection and re-treatment of piles shall be in accordance with Standard CAN/CSA 080-M.

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.

4 EXECUTION

.1 Preparation

- .1.1 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.
- .1.2 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.
- .1.3 Where bolt holes must be bored through creosote treated piles, the holes shall be filled with creosote oil and the bolts shall be dipped in hot creosote oil before the bolts are placed. Other alternative field wood treatment should be approved by the engineer before application. Ensure the creosote or other preservatives are properly stored and protected in case of spillage. (i.e. place in tray)
- .1.4 All unused bolt holes or damaged areas of creosote treatment shall be patched with creosote treated dowels, mastic, ships felt and copper patches as specified.
- .1.5 Where timber piles have to be cut for plate washers, the cut surface shall be treated with two coats of CCA preservative and a further coat of mastic before washers are placed.

.2 Installation

- .2.1 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.
- .2.2 Piles shall be driven with standard equipment; vibrator, air, steam, diesel or drop hammer approved by the Engineer. Piles shall be driven tip down.
- .2.3 Prior to any pile driving, the Contractor shall inform the Engineer about the equipment he intends to use. Based on the type and size of hammer, the Engineer will determine the final set requirements.
- .2.4 Fender piles shall be driven to refusal or to a minimum penetration of 2.5 metres.
- .2.5 Bearing piles shall be driven to refusal or to a minimum penetration of 6 metres.
- .2.6 Batter piles shall be driven to refusal or to a minimum penetration of 3 metres.
- .2.7 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.
- .2.8 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.

- .2.9 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 Treatment of Pile Tops
- .3.1 The tops of all timber piles shall be treated with two separate coats of creosote oil. Other alternative field wood treatment should be approved by the engineer before application. Ensure the creosote or other preservatives are properly stored and protected in case of spillage. (i.e. place in tray)
- .3.2 All field cut creosote members shall also be protected by covering the ends with caps consisting of 12mm (1/2") of Roof Patch mastic and two thicknesses of tar-saturated fabric and a cap consisting of 1 mm annealed corrosion-resistant aluminium. The cap shall extend 100mm from the end of the timber. Attach with minimum ten copper nails (copper deters marine borers). All field drilled holes in creosote timbers shall be protected by installing a bolt fully covered in Roof Patch mastic.

END OF SECTION

1 GENERAL

- .1 PWGSC's General Conditions and related contract documents form an integral part of this section.

2 MATERIALS

- .1 Steel pipe piles shall have minimum yield strength of 310 MPa meeting the requirements of the latest edition of at least one of the following specifications:

- a) ASTM A252
Grade 3 b) API 5L
Grade X46
- c) CSA Z245.1-M with the following provisions:

- i) Chemical analysis of material shall show the copper content.

- ii) All welds shall be full strength and shall satisfy the requirements of either ASTM A53 or CSA Z245.1-M.

- iii) Flattening tests for ductility shall be conducted in accordance with the procedure and frequency stipulated in CSA Standard Z245.1-M or ASTM Standard A53.

- iv) Unless longitudinal welds are certified as conforming to the requirements of ASTM A252, CSA Z245.1-M or API 5L to the satisfaction of the Engineer, welds shall be 100 percent inspected by ultrasonic or electromagnetic inspection according to the requirements of ASTM A53. This inspection shall be conducted at the Contractor's expense.

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

- vi) Allowable tolerance on dimensions shall meet the requirements of CSA Z245.1- M.

- .2 The minimum length of a pile section used in the fabrication of piles shall be 3.0 m.

- .3 Welded pipe splices shall have full strength welds.

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

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.

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 Piles shall be spliced to the required lengths in a workshop or similar suitable place that will ensure good quality splices.
- .3 Lengths to be joined shall be manipulated in jigs so that only down-hand welding is employed.
- .4 The splice shall be complete joint penetration welds and shall develop the full strength of the pile section. Splices shall be made in a manner that will ensure good alignment of the spliced parts. The number of splices shall be held to a minimum.
- .5 The longitudinal welds of pipe pile lengths to be joined shall be staggered 90 degrees.
- .6 The end profile of a pile section to be butt welded shall not have a deviation of more than 1.0 - 1.6 mm from a plane perpendicular to the axis of the pile.
- .7 Maximum deviation of the line of the pile at the splices shall be 3 mm when measured with a 3.0 m straight edge.
- .8 All pile splices shall be 100 percent inspected and tested. This inspection shall be conducted at the Contractor's expense.
- .9 Inspections of pile splices shall be by non-destructive ultrasonic tests in accordance with the requirements of AWS D1.1; dynamic. The test results shall be made available to the Engineer. If the inspection of a weld should indicate poor alignment of the pile sections, insufficient penetration of the weld, lack of fusion, slag inclusions, porosity or any such defects, the Contractor shall take the necessary corrective measures to provide a full strength weld to the satisfaction of the Engineer. The cost of correcting defective welds and re-testing shall be borne by the Contractor.

5 INSTALLATION OF STEEL PILES

- .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 All piles shall be driven to refusal, or to a penetration depth of 7m, with a standard air, diesel, hydraulic or drop hammer.
- .3 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.
- .4 Steel piles shall be driven without excessive deformation of the head of the pile. The head of the pile shall be cut square and a driving cap shall be provided to hold the axis of the pile in line with the axis of the hammer.
- .5 The driving cap shall fit continuously over the top of the pile and shall project about 150 mm down over/into the pile and shall be such that the pile is held properly in line with the leads. A cushion of hardwood, fibre, plywood or other suitable material shall be placed between the driving cap and the hammer. The cushion shall be replaced if so directed by the Engineer.
- .6 Piles shall be driven in the positions shown on the drawings. Piles shall be driven and installed within a tolerance of +/- 50 mm in location and within 0.5% from the specified axial alignment. The Engineer may reject piles driven out of alignment or damaged in any way

after inspection. Cost of remedial measures decided by the Engineer shall be borne by the Contractor.

6 STEEL PILE CUTTING SHOES

- .1 The requirements for cutting shoes shall be determined by the contractor.

7 CUT OFFS

- .1 After driving, piles shall be cut off at an elevation of 9.0 m Chart Datum. In driving, sufficient length above cut off shall be allowed so that no part of the head of the pile damaged or deformed during driving remains in the work.
- .2 Piles shall be cut in a flat plane. A suitable guide shall be used to aid in cutting piles so that the cut off plane is within specified butt weld splice tolerances. If a satisfactory hand-held cut cannot be obtained, the Contractor shall cut the pile with an automatic cutter.

8 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:
- Pile number and location
 - Date and time driven
 - Length of pile driven
 - Type of pile driving hammer
 - Cut off elevation
 - Penetration in overburden and in bedrock
 - Tip elevation
 - Final set and hammer energy

9 TEMPORARY RESTRAINT OF DRIVEN PILES

- .1 The Contractor shall furnish sufficient labour and materials to adequately secure the piles of any given group against motion relative to others in the group.
- .2 Temporary restraints once erected and approved shall be maintained in good order until completion of the structure.

10 CORROSION PROTECTION

- .1 Painting is not required. Piles have added wall thickness for corrosion protection.

END OF SECTION