PORT SIMPSON LAX KW'ALAAMS – HARBOUR REVITALIZATION 2017

FISHERIES AND OCEANS CANADA
SMALL CRAFT HARBOURS – PACIFIC REGION

200 – 401 Burrard Street
Vancouver, British Columbia
V6C 3S4

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END OF SECTION

Section 01 11 00 – Summary of Work

Part 1 General

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1.2 DEFINITIONS

.1 Throughout contract documents, the words "Owner," "Contracting Authority," "Engineer/Departmental Representative," "Contractor," or "Department," shall be defined as follows:

.1 Owner
Small Craft Harbours Program of the Department of Fisheries and Oceans, 200-401 Burrard Street Vancouver B.C. V6C 3S4

.2 Engineer/Departmental Representative
An employee of the Owner or Engineer 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.

.3 Contractor
The party accepted by the Owner with whom a formal contract is entered to complete the work of this project.

.4 Department
The Department of Fisheries and Oceans, Canada.

.5 Contracting Authority
Public Works and Government Services Canada (PWGSC).

1.3 DRAWINGS

.1 FLOAT ASSEMBLY

FM12-ST-000 3.657m WIDE STANDARD FLOAT MODULE ASSEMBLY

FM12-ST-001	3.657m WIDE STANDARD FLOAT MODULE
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1.4 PROJECT SITE

.1 The Port Simpson Small Craft Harbour (The Project Site) is located 32 km north of Prince Rupert, British Columbia in the town of Port Simpson (also known as Lax Kw'alaams) on the northern coast of the Tsimpsean Peninsula.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work covered in this section comprises of the supply of steel pipe piles, assembly of timber float modules, removal of existing floats and piling, installation of new floats and piling, temporary relocation and installation of electrical services, and installation of fire protection.

1.6 COMMENCEMENT AND COMPLETION

.1 All work on-site is to commence no earlier than August 1, 2017 and is to be completed no later than December 15, 2017.

1.7 OWNER SUPPLIED MATERIALS

.1 The following Owner Supplied materials may be received by the Contractor at Port Edward Harbour, 200 Bayview Dr. Port Edward, BC V0V 1G0 following award:

.1 3660mm (12') wide standard SCH light float module kits including foam billets and hardware as per Drawings FM12-ST-000 and FM12-ST-001 – QTY: 14

.2 3660mm (12') wide standard SCH light end piece kit including hardware as per Drawings FM12-END-200 and FM12-END-201 – QTY: 2

.3 Zinc Pile Anodes as per Drawing "Anode Installation Instructions V.1" – QTY: 6

.4 38mm x 290mm ACZA fascia timber 6100mm long – QTY: 30

.5 Galvanized Steel Mooring Brackets as per Drawing 717891-30 – QTY: 6

1.8 SCHEDULE OF QUANTITIES

The following are in reference to items as detailed in the Unit Price Table

MANDATORY ITEMS

.1 MATERIAL SUPPLY

.1 762mm O.D. STEEL PILE SUPPLY

The unit cost per metre for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Supply of 762mm O.D. x 15.9mm wall straight seamed, coated steel pipe pile as per Section 31 62 16.19 STEEL PIPE PILES.

.2 Piles to be supplied in minimum 12.2m lengths.

.3 Piles are to be coated as per Section 01 98 00 PAINTING.

.4 Piles to be supplied to The Project Site.

.2 SUPPLY 80' GANGWAY

The unit cost per gangway for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Design and fabricate one (1) aluminum gangway to conform to the following requirements:

.1 Minimum clear passable width of eight (8) feet.
.2 Minimum clear passable height of eight (8) feet, along entire width.
.3 Length of eighty (80) feet, measure from top of hinge to landing feet.
.4 Minimum load capacity of one-hundred (100) pounds per square foot (psf).
.5 Minimum 400 pound point load capacity.

.2 Submit certified engineering drawings before construction for Owner's approval.

.3 Submit certified Engineering inspection report post fabrication.

.4 Surface to include 'rough top' conveyor material on diamond grip deck.

.2 FLOAT MODULE ASSEMBLY

.1 MODULE ASSEMBLY

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Assemble 12 standard 3.66m wide timber float modules (Float 804) complete with end modules into one floating unit (Float 804) as per drawings identified in Section 1.3 DRAWINGS.

.2 Contractor to supply all other material necessary for module assembly not included in materials identified in 1.7 Owner Supplied Materials.

.2 FLOAT DELIVERY

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Delivery of Float 804 to the Project Site.

.2 Contractor is responsible for successful delivery of assembled floats to the Project Site and shall ensure that no delays to the project or costs to the Owner are incurred in the process.

.3 FLOAT INSTALLATION

.1 MOBILIZATION/DEMOBILIZATION

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Mobilization/Demobilization of crew and equipment to Project Site.

.2 All crew living expenses and other associated costs.

.3 Receipt of Owner Supplied materials and supply to site. Contractor is responsible for confirming in writing that all Owner Supplied materials identified in 1.7 Owner Supplied Materials have been received.

.4 Any overhead costs not covered in other items.

.5 Supply one (1) additional gallon of paint as per Section 01 98 00 PAINTING. Inspect all existing and new piles at low tide and touch-up paint as necessary prior to demobilization.

.6 Site clean-up.

.2 EXISTING FLOAT REMOVAL

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Remove and dispose of all components of existing timber Floats N, O, P, and Q as shown on contract drawing 4209-D-10.5 with the exception of electrical system components identified.

.2 Electrical components identified on contract drawing 4209-D-10.5 to be temporarily removed for re-installation as part of Item 1.8.3.7. No interruption shall be made to existing electrical services on existing floats.

.3 Float ladders to be temporarily removed for re-installation as part of Item 1.8.3.7.

.4 Remove and dispose of seven (7) spread dolphins, each consisting of four (4) treated timber piles with associated timber blocking, gallow beam, fasteners and other components.

.5 Piles to be extracted with care to avoid breaking them and such that no amount of remaining pile extends above the mudline.

.6 Contractor is responsible for costs associated with ensuring that locations where existing piles have been extracted have no portion of timber protruding above the mudline.

.7 All removal of existing components as per Section 01 20 60 DEMOLITION OF STRUCTURES.

.3 FLOAT COMPLETION

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Position new Float 804 prior to driving of piles as shown on contract Drawing 4209-D-20.5.

.2 Modify/remove existing and new bullrails at interfaces between Float 802 and adjacent floats to provide a continuous float surface with continuous bullrail across such interfaces.

.3 Re-install one (1) Angle Float Connection and one (1) Straight Float Connection between Float 802 and Float 804 as per contract Drawing 4209-D-40.4 including all required hardware.

.7 Install Owner Supplied fascia timber around entire perimeter of Float 804 complete with all hardware.

.8 Contractor to ensure that existing electrical system components remain undamaged through the course of work.

.9 All field cuts and timber treatment as per Section 01 99 00 FLOAT REPAIRS.

.10 All hardware as per Section 01 51 00 STEEL HARDWARE.

.4 STEEL PILE INSTALLATION

The unit cost per pile for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Install one (1) 762mm O.D. x 15.9mm thick steel pipe pile as shown on contract drawings 4209-D-20.4 and 4209-D-30.4 and as per Section 31 62 16.19 STEEL PIPE PILES.

.2 Install one (1) steel mooring bracket as per contract drawing 717891-30 and 4209-D-30.4 complete with all required hardware as per Section 01 51 00 STEEL HARDWARE.

.3 Contractor to make allowance for adjustments in pile/mooring well position to accommodate actual location of float structural timbers.

.4 Contractor to ensure that piles come to bear evenly against all float mooring wells.

.5 Once specified penetration achieved and pile accepted by Engineer, cut pile top to final elevation, weld top plate and install bird spikes as shown on contract Drawing 4209-D-30.4.

.6 Install one (1) Owner supplied anode to completed pile as per Anode Installation Instructions V.1 including all necessary hardware.

.7 Notify Owner and Engineer in writing when conditions for pile driving change and bedrock is identified. Receive confirmation from Owner or Engineer before proceeding with Item 1.8.3.5 Pile Installation into Bedrock.

.5 PILE INSTALLATION INTO BEDROCK

The unit cost per metre for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Churn/drill socket into bedrock one (1) metre and drive piling into socket one (1) metre.

.2 Total socket depth to be determined as per Section 31 62 16.19 STEEL PIPE PILES and/or direction of Engineer.

.3 Any repositioning, extraction or re-driving involved in installing pile into bedrock is included.

.4 Contractor to include allowances for probable interruptions to driving for changing/modifying/maintaining churning equipment or other pile driving or barge equipment.

.5 Before proceeding with this item, submit written notice to Owner and do not proceed without approval.

.6 GANGWAY INSTALLATION

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Transport one (1) gangway to The Project Site. Transport one (1) gangway to Port Edward Harbour, 200 Bayview Dr. Port Edward, BC V0V 1G0.

.2 Remove old 65' gangway and access trestle and ship to Port Edward Harbour, 200 Bayview Dr. Port Edward, BC V0V 1G0.

.3 Ensure that access via open pedestrian traffic is not closed for more than six (6) hours per day and open hours are posted.

.4 Remove two (2) steel piles as indicated on Drawings 4209-D-10.5.

.5 Remove two (2) timber piles and spread pile dolphin at the end of landing float. Reconstruct mooring wells and decking to be flush with existing float deck.

.6 Supply and install one (1) new W12x12x79 beam on top of existing W12x12x79 beam.

.7 Mount gangway to beam.

.8 Supply and install upper and lower ramp transitions and roller guide track.

.7 SERVICES INSTALLATION

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Reinstall temporarily removed electrical cabling, transformers and cabinets in new Float 804 as shown on contract drawing 4209-D-10.5.

.2 See contract Drawings E001 and E002 for reference of electrical system layout and components.

.3 All electrical activation/deactivation and final connections to be performed by an electrician certified for practice in British Columbia.

.4 Reinstall temporarily removed float safety ladders as per attached drawing Ladder Installation Instructions.

.8 WALKWAY TREAD INSTALLATION

The unit cost per metre for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Installation of 89m of walkway tread to Float 804 including hardware as per drawing 4900-D-01.4.

OPTION ITEMS

.4 FIRE PROTECTION

.1 FLOAT FIRE LINE INSTALLATION

The lump sum cost for this item shall include the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

.1 Install new float fire lines as per Drawings FP-1 to FP-4 and Section 21 05 05 Fire Protection.
.2 Install all associated piping, fittings, hangers, valves and auxiliary equipment.
.3 Install access panels and drains as required.
.4 Includes all cutting, coring, sleeving, reinforcing and making good.
.5 Obtain fire department acceptance.

1.9 WORK SEQUENCE AND OWNER OCCUPANCY

.1 Owner to move existing mooring vessels prior to start of construction.

.2 Contractor to provide a minimum 7-day notice to the Owner and receive a written response from Owner that existing vessels have been relocated prior to mobilization to site as per clause 1.6.1.

.3 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.

.4 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

.5 Contractor to provide detailed work plan and schedule within seven (7) days of Contract Award.

1.10 CONTRACTOR USE OF PREMISES

.1 Co-ordinate use of premises under direction of Owner.

.2 Protect existing structures from damage during the course of work.

.3 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Engineer.

.4 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.11 EXISTING SERVICES

.1 Notify Engineer and utility companies of intended interruption of services and obtain required permission.

.2 Establish location and extent of service lines in area of work before starting Work. Notify Engineer of findings which conflict with scope of work.

.3 Where unknown services are encountered, immediately advise Engineer and confirm findings in writing.

.4 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.5 Record locations of maintained, re-routed and abandoned service lines.

.6 Construct barriers around existing services as necessary.

1.12 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

.1 Contract Drawings, Specifications and any Addenda.

.2 Change Orders and other Modifications to Contract.

.3 Copy of Approved Work Schedule.

.4 Health and Safety Plan and Other Safety Related Documents.

.5 All regulatory permits required for the work.

.6 Associated Best Management Practices documentation.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Section 01 20 60 – Demolition of Structures

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 11 00	SUMMARY OF WORK
.2	Section 01 35 29.06	HEALTH AND SAFETY REQUIREMENTS
.3	Section 01 35 43	ENVIRONMENTAL PROCEDURES

1.2 SCOPE OF WORK

.1 This sections refers to all demolition and removal of existing structural timbers and hardware including timber piling, rubstrips and any other items identified for removal in the course of completing float reconstruction work.

Part 2 Products

2.1 EQUIPMENT

.1 Furnish all labour, materials, tools, plant and services required incidental to the completion to the full extent of the drawings and specifications for execution of all demolition salvage and protection work specified herein.

Part 3 Execution

3.1 REMOVAL OF DEMOLISHED MATERIAL

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

.2 If not specifically identified, the Engineer shall decide as to which material shall be salvaged for the Owner and which shall become the property of the Contractor.

.3 Timber piles shall be completely removed. If it is not possible to remove a pile, the pile shall broken off at or below seabed level such that no part of it protrudes above the elevation of the seabed.

3.2 SALVAGED MATERIAL

.1 Material to be salvaged for the Owner shall be stored as directed by the Engineer.

.2 Remove items to be reused, stockpile and re-install as directed by Engineer.

.3 Designate appropriate security resources/measures to prevent vandalism, damage and theft of salvaged items.

.4 Contractor is responsible for lost, stolen or damaged materials.

3.3 PROTECTION OF STRUCTURES TO REMAIN

.1 Protect remaining structural elements, services and equipment against damage from demolition works.

.2 Contractor is liable for any damage caused to structures not specified for removal as a result of completing work.

3.4 SERVICES

.1 All services that must be removed from existing structures in order to perform work must be removed so as not to damage them.

.2 All service materials including miscellaneous hangers, fasteners and supplies required to reinstall the services shall be supplied by the Contractor and will be of equivalent quality to the new conditions of such materials being replaced.

.3 All materials that are not reusable shall be disposed of by the Contractor.

.4 The Contractor shall be responsible for the handling and storage of services lines, lamps standards and other equipment during construction. All materials damaged by the Contractor shall be replaced at the Contractor's expense.

3.5 CLEANING AND RESTORATION

.1 Keep site clean and organized throughout demolition procedure.

.2 Upon completion of project or as appropriate, reinstate floats, walkways, light standards, electrical and water services and other items affected by Work to condition which existed prior to beginning of Work.

END OF SECTION

Section 01 35 29.06 – Health and Safety Requirements

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 11 00	SUMMARY OF WORK
.2	Section 01 20 60	DEMOLITION OF STRUCTURES
.3	Section 01 35 43	ENVIRONMENTAL PROCEDURES
.4	Section 01 99 00	TIMBER REPAIRS AND ASSEMBLY
.5	Section 31 62 16.19	STEEL PIPE PILES

1.2 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).

.4 Province of British Columbia

.1 Workers Compensation Act, RSBC 1996 - Updated 2012.

1.3 ACTION AND INFORMATIONAL 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 operations.

.2 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.

.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.

.6 Departmental Representative will 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 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 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

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

.2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility within 3 weeks of contract award.

.3 Work zone locations include:

.1 Port Simpson Small Craft Harbour.

.4 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.5 SAFETY ASSESSMENT

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

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.7 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 Lax Kw'alaams First Nation.

1.8 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.

1.9 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.

1.10 COMPLIANCE REQUIREMENTS

.1 Comply with Workers Compensation Act, B.C. Reg.

.2 Comply with R.S.Q., c. S-2.1, an Act respecting Health and Safety, and c. S-2.1, r.4 Safety Code for the Construction Industry.

.3 Comply with Occupational Health and Safety Regulations, 1996.

.4 Comply with Occupational Health and Safety Act, General Safety Regulations, O.I.C.

.5 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 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 the Province having jurisdiction and advise Departmental Representative verbally and in writing.

.2 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise the Health and Safety co-ordinator and follow procedures in accordance with Acts and Regulations of the Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.12 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.

.2 Have working knowledge of 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.

1.13 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 the Province having jurisdiction, and in consultation with Departmental Representative.

1.14 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.

1.15 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.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Section 01 35 43 – Environmental Procedures

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 20 60	DEMOLITION OF STRUCTURES
.2	Section 01 35 29.06	HEALTH AND SAFETY REQUIREMENTS
.3	Section 01 45 00	QUALITY CONTROL
.4	Section 01 99 00	TIMBER REPAIRS AND ASSEMBLY
.5	Section 31 62 16.19	STEEL PIPE PILES

1.2 REFERENCES

.1 Definitions:

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.3 IN WATER WORKS

.1 Construction equipment to be operated on land or from floating barge equipment.

.2 Waterways to be kept free of excavated fill, waste material and debris.

.3 Do not skid logs or construction materials across waterways.

1.4 NOTIFICATION

.1 Engineer will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, Engineer of proposed corrective action and take such action for approval by Engineer.

.1 Take action only after receipt of written approval by Engineer.

.3 Engineer will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 PILE DRIVING

.1 Pile driving shall be conducted in accordance with the following Best Management Practices:

.1 Machinery is to arrive on site in a clean, washed condition and be free of fluid leaks.
.2 Complete works using appropriate timing windows related to species that may be affected by the works and or methods used.
.3 Underwater pressure waves not to exceed 30 kPa during driving.
.4 A vibratory hammer is to be used if driving conditions permit.
.5 Any water-based equipment or machinery moored or used during the Project must not ground on the intertidal foreshore or subtidal river or sea bed. The only exception to this condition is that use may be made of vertical spuds or other anchors to hold the water-based machinery or equipment in place.
.6 Wash, refuel and service machinery and store fuel and other materials for the machinery at least 30 metres away from the water in order to prevent any deleterious substance from entering the water.
.7 Pile cut-offs, waste or any miscellaneous unused materials must be recovered for either disposal in a designated facility or placed in storage.
.8 Report any incidents of habitat damage to the Environmental Monitor or DFO to ensure that appropriate action (restoration) is taken.
.9 If fish spawn in the area or on equipment all work should stop and the Environmental Monitor or DFO notified.

3.2 CLEANING

.1 Leave work area clean at end of each day.

.2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment to the approval of the Owner.

END OF SECTION

Section 01 45 00 – Quality Control

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Not Used.

1.2 REFERENCES

.1 Construction General Conditions

1.3 INSPECTION

.1 Refer to Construction General Conditions for stipulated interpretation.

.2 Allow Owner access to Work. If part of Work is in preparation at locations other than Place of Work; allow access to such Work whenever it is in progress.

.4 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals.

.5 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.6 Owner will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify appropriate agency in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

.1 Refer to Construction General Conditions for stipulated interpretation.

.2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.3 Make good other Contractor's work damaged by such removals or replacements promptly.

.4 If in opinion of Owner it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by The Engineer.

1.7 REPORTS

.1 Submit 4 copies of inspection and test reports to Owner.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Section 01 51 00 – Steel Hardware

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 99 00	TIMBER REPAIRS AND ASSEMBLY
.2	Section 01 45 00	QUALITY CONTROL
.3	Section 31 62 16.19	STEEL PIPE PILES

1.2 SCOPE OF WORK

.1 This section refers to the steel fastenings and hardware indicated in the Contract Drawings and related specifications.

Part 2 Products

2.1 STEEL

.1 Small fastenings will conform to the standard for Wire Nails, Spikes, and Staples CSA B111.

.2 Drift bolts, machine bolts, washers and miscellaneous iron will conform to the standard for General Purpose Structural Steel CAN3 G40.21-M81.

.3 Items manufactured or fabricated from scrap steel of unknown chemical or physical properties will not be accepted for use in the work.

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 ASTM A153. Galvanize to 610g/m2 (2oz/ft2).

.2 All bolts will be of the full dimension specified or shown on the plan.

.3 Unless otherwise specified, all machine bolts will be provided with round steel plate washers under head and nut.

.4 All bolts shall be 19mm (3/4") National course thread, unless shown otherwise.

.5 All 19mm washers shall be 6mm thick and 75mm diameter galvanized steel.

.6 All 25mm washers shall be a minimum of 8mm thick and 100mm diameter galvanized steel.

.7 All bolts to have 100mm (4") of thread unless shown otherwise.

Part 3 Execution

3.1 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 the Contractor's expense as per Section 01 99 00 TIMBER REPAIRS AND ASSEMBLY.

.3 Pre-drilling:

.1 All ends of timbers not fastened by bolts shall be predrilled prior to installation to prevent splitting.

.4 Holes for machine bolts will be bored to provide a driving fit.

3.2 DECKING

.1 Lay boards heart side down, spaced 6 mm apart.

.2 Secure each contact point with 2 – 100mm galvanized ARDOX nails.

.3 Pre-drill deck boards for spikes nearest to both board ends.

3.3 FASCIA

.1 Secure each contact point with 2 – 100mm galvanized ARDOX nails.

.2 Contact points every 500mm maximum.

END OF SECTION

Section 01 98 00 - Painting

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 45 00	QUALITY CONTROL
.3	Section 31 62 16.19	STEEL PIPE PILES

1.2 REFERENCES

.1	CGSB	Standards of the Canadian General Standards Board
.2	SSPC-SP1	Solvent Cleaning (degreasing)
.3	SSPC-SP2	Hand Tool Cleaning
.4	SSPC-SP7	Brush-off Blast Cleaning
.5	SSPC-SP10	Near White Blast Cleaning
.6	SSPC-SP11	Power Tool Cleaning to Bare Metal
.7	SSPC-GUIDE 6	Debris Containment
.8	ASTM-03276	Recommended Practice Guide for Paint Inspection
.9	ASTM-D3359	Method for Measuring Adhesion by Tape Test
.10	Work Safe BC	Occupational Health and Safety Regulations BC Waste Management Act (SWEP)
.11	SSPC-PA2	Procedure for Determining Conformance to Dry Coating Thickness Requirement

1.3 SCOPE OF WORK

.1 All steel piles are to be painted.

1.4 SURFACE PREPARATION

.1 All steel surfaces to be painted shall be prepared in accordance with the SSPC Manual Volume II and the paint manufacturer's specifications.

.2 Degrease according to SSPC-SP1 Solvent Cleaning. Remove all weld splatter and grind all welds and sharp edges. Blast clean to SSPC-SP10, Near White Metal Standard.

.3 Minimum allowable motor anchor pattern is 50 microns (2 mils). Shape of surface profile shall be jagged and irregular, as opposed to peened.

.4 If chloride substrates measurements are required by Engineer, the chloride concentration shall be less than 3µg/cm2 measure by Chlor-Rid test.

.5 The surface finish shall be approved by a representative of the Owner or the paint manufacturer before application of any coatings.

1.5 PAINT APPLICATION

.1 Coatings shall be applied in accordance with the manufacturer's specifications. All blast cleaning and shop painting shall be carried out under cover in an area protected from weather and other detrimental effects.

.2 Paint application should commence prior to any presence of rust bloom and within 8 hrs following abrasive blasting.

.3 Paint manufacturers recommendation for application parameters shall be consulted to identify minimum and maximum temperatures, relative humidity and dewpoint restrictions and pot life. Consult paint manufacturer for further information.

1.6 PAINT SYSTEM

.1 All dry film thickness (DFT) shall be stated in Mils (thousands of an inch). The equivalent measurement and conversions are as follows:

One thousandth of an inch (1 mil) = 25 microns

The detailed requirements of the paint schedule are given below.

.2 Stripe coats shall be applied to all welds, lap joints, plate edges, corners, sharp edges and any other areas where spray application of the overall coating system may result in low dry film thickness.

.3 The following paint systems shall be used for painting of steel pipe support piles and for all structural and miscellaneous steel except galvanized components:

.1 Steel pipe piles:

Coat No.	Type	Binder	Product Name	Dry Film Thickness
1	Primer	Modified Epoxy	Interzone 954	12 mils
2	Stripe Coat	Modified Epoxy	Interzone 954	5 mils
3	Topcoat	Modified Epoxy	Interzone 954	12 mils
-	-	-	-	24 mils minimum

Note: Finished coating system Dry Film Thickness shall be a minimum of 24 Mils (600 microns) at each spot measurement. Strip coat not included.

.4 Topcoat to be a light grey colour (colour code RAL 7035).

.5 All bolts, washers and nuts shall be hot dip galvanised in accordance with ASTM Specifications A-153 or A-123, or CSA Specification G 164-M (minimum zinc coating 610 g/m2).

1.7 WORKMANSHIP

.1 The Contractor shall complete a daily reporting account for Shop/Field Quality Assurance.

.2 An Engineer's Representative may request on site monitoring during paint preparation.

.3 Each coat, including stripe coat shall be of contrasting colors and mixed in full proportions.

.4 The preparation of surfaces to be painted and the application of the paints shall be as specified above.

.5 Coating shall take place as soon as practicable after inspection of cleaning, but, in any event, within eight hours and before any visible or detrimental rusting or contamination occurs.

.6 All coating material shall be applied by airless spray unless otherwise allowed or specified by the manufacturer. Spray painting equipment shall be of ample capacity and suitable for the work and shall at all times be kept clean and in good working order. Air lines shall be equipped with water traps to positively remove condensed moisture.

.7 No thinner shall be added to any paint in excess of the paint manufacturer's recommendations.

.8 Prior to spray application of primer, all crevices, appurtenances, and re-entrant surfaces which would otherwise be difficult to coat by spraying, together with all weld areas shall be brushed (stripe) in order to ensure a continuous film on all surfaces, and then painted as specified.

.9 Newly coated surfaces will be inspected when the coating has thoroughly dried and immediately before the coated member is to be removed from the paint shop for shipment. The coated surfaces may be rejected if any of the following defects are apparent, and the Engineer or his representative, in his judgement, believes the coating performance and life will be impaired by these conditions:

.1 Inadequate dry film thickness (DFT).
.2 Runs, sags, holidays or shadowing caused by inefficient application methods.
.3 Evidence of poor coverage at plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
.4 Damage to shop coat due to handling before the coating is sufficiently cured or any other contributory cause.

.10 Coated surfaces rejected by the Engineer shall be made good by the Contractor at his own expense. The Contractor shall submit to the Engineer his proposed method of repair to the damaged surfaces.

.11 Damage to adjacent property, vehicles, pedestrians and other portions of the structure due to the painting operations shall be made good without additional expenses to the Owner. No paint, equipment, scaffolding, et cetera shall obstruct traffic or pedestrians, except by written permission of the Owner's Representative, in which case proper warning signs, barricades, et cetera shall be placed, maintained and removed without additional expense to the Owner.

.12 Field touch up painting shall be carried out in accordance with the paint manufacturer's specifications.

.13 The Contractor shall provide sufficient paint for field touch-up of any damaged paint surface.

.14 Only nylon ropes or rubber covered slings may be used for handling steel in either the Contractors shop during loading or shipment or during unloading and erection at the site. Where coatings are damaged during handling/erection, these areas shall be marked and recorded for remedial actions.

Part 2 Products

NOT USED

Part 3 Execution

NOT USED

END OF SECTION

Section 01 99 00 – Timber Repairs and Assembly

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 51 00	STEEL HARDWARE
.2	Section 01 35 29.06	HEALTH AND SAFETY REQUIREMENTS
.3	Section 01 35 43	ENVIRONMENTAL PROCEDURES
.4	Section 01 45 00	QUALITY CONTROL

1.2 SCOPE OF WORK

.1 This section refers to the supply, modification and field treatment of all timbers indicated in the Contract drawings and related specifications.

Part 2 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 all stages of manufacture and transportation to the Project 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.

.3 Acceptance will not be made until the materials or products are satisfactorily installed in the completed structures specified.

.4 The Contractor shall be responsible to repair all materials damaged through their handling, storage and/or installation.

.5 Except as otherwise noted, salvaged materials deemed to be reusable by the Owner shall remain property of the Owner.

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.

.2 Refer to drawings and specifications for timber dimensions and treatment.

.3 All timber shall be Coast Douglas Fir. No 1 Structural Grade or better, unless specified otherwise.

.4 All decking shall be S1S2E (rough cut), heart side down.

.5 All joists, cross-ties, stringers, blocking, bullrail, risers and fascia boards shall be S2E (rough cut).

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".

.2 All creosote treated materials will have a minimum retention of 225kg per cubic metre (14lb. Per cubic foot).

.2 Salt-treated Materials:

.1 All salt-treated timber to 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 outlines in "Best Management Practices for the use of Treated Wood in Aquatic Environments".

.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.

2.4 FIELD TREATING

.1 Creosote-treated timber members that have fresh cut surfaces exposed in the structure shall be treated as specified:

.1 All cuts or breaks in the surfaces shall be treated with two (2) separate coats of creosote oil.

.2 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 bolts are placed.

.3 Alternative field wood treatment to be approved by the Engineer before application.

.4 Ensure preservatives are properly stored and protected in case of spillage.

.5 Install copper cap on all cut surfaces. Cut square sheet to 150mm larger than the cut end, turn edges down and secure to the end with a minimum of ten (10) copper nails.

.2 Salt-treated timber members that have fresh cut surfaces exposed in the structure shall be treated as specified:

.1 All field cut surfaces to be treated with two (2) coats of Copper Naphthenate.

.2 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.

.3 Ensure preservatives are properly stored and protected in case of spillage.

Part 3 Execution

3.1 HANDLING OF MATERIALS

.1 Treated material will not be accepted if damaged in any manner in handling, including damage from strapping or slings.

.2 The Contractor shall be responsible to repair or replace all materials damaged by handling, storage and/or installation of materials.

3.2 EXISTING STRUCTURES

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

END OF SECTION

Section 21 05 05 – Fire Protection

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 20 60	DEMOLITION OF STRUCTURES
.2	Section 01 35 43	ENVIRONMENTAL PROCEDURES
.3	Section 01 45 00	QUALITY CONTROL

1.2 SCOPE OF WORK

.1 This section refers to the furnish of all permits, materials, labour and miscellaneous equipment necessary for the installation of the new fire line system as specified in Section 01 11 00 SUMMARY OF WORK and as shown on Drawings FP-1 to FP-4.

1.3 QUALITY ASSURANCE

.1 QUALIFICATION OF THE CONTRACTOR

.1 The Contractor shall be a qualified installation company whose employees are familiar with the installation of materials as specified. The Contractor to have the capabilities to thread and 'cut-groove' SCH 40 steel piping up to and including 4 inch to fusion 3 inch Sclair piping. List of past installation to be submitted with tender.

.2 AUTHORITIES AND AGENCIES

All work is to be installed to the approval or acceptance of the following:

a) Small Craft Harbours
b) Local Authorities
c) Fire Department

1.4 SUBMITTALS

.1 AS-BUILT DRAWINGS

.1 Record in red pencil daily as the work proceeds, on one (1) set of white prints, all deviations from the original contract drawings. Record items of importance to future operations and maintenance, and to future alterations and additions, including all access panel and drain locations.

Keep "As-Build drawings" neat and legible and on site available for review at any time. At completion of all work and after verifications by the Contractor of the "as-built" conditions, submit the "As-Built drawings" to the Owner.

.2 PRESSURE TEST CERTIFICATES

.1 Upon completion of all pressure tests and before the substantial completion inspection, submit four (4) completed copies of the "Contractor's Material and Test Certificate" to the Consultant. (Copy of the form included in Appendix 'A')

Part 2 Products

2.1 MATERIALS

.1 For reference an estimated Bill of Materials is included in Appendix 'B'. Final Bill of Materials will change with Contractors installation practises.

.2 All materials, equipment, valves and devices installed and/or furnished under this section shall be new and be listed and/or approved – with the exception of the Sclair piping installed within the float structure – for use in fire protection installations by the following authorities:

a) Underwriters' Laboratories of Canada (ULC);
Or, if not available
b) Underwriters' Laboratories Inc. (UL);
c) Factory Mutual Engineering Association.

.3 CONTROL VALVES

.1 Valves for the same application shall be of one manufacture and bearing ULC label, manufacturer's name, valve size and pressure rating. Unless otherwise specified, design for 175 psi working pressure.

.2 Valves 3" and smaller shall be bronze construction with screwed connections, either O.S. & Y. valves or ball valves.

.4 PIPING AND FITTINGS

.1 Galvanized SCH 40 steel piping and galvanized fittings shall meet the requirements of ASTM A 795 and ANSI B 16 or as indicated. Sclair pipe to be Type D-9.

.5 FIRE DEPARTMENT CONNECTION & HOSE VALVES

.1 Fire department connection shall be 4" x 2 ½" x 2 ½" complete with caps and plate marked "Standpipe" in 2" letters.

Hose valves shall be angle type 2 ½" complete with caps.

All threads to be compatible with the local standard.

The fire department connection and hose valves shall be plain bronze finish.

.6 HANGERS, SEISMIC SWAY-BRACING & PIPING RESTAINTS

.1 Hangers and seismic sway bracing and piping restraints shall conform to current NFPA No. 13.

.7 ACCESS PANELS

.1 Install access panels as required at control and drain valve locations. Manufactured type and style to suite structural conditions. Size to be as required for intended use (i.e. hand only or full access). Access panels to be painted fire red.

Part 3 Execution

3.1 GENERAL

.1 WELDING

.1 Welding of steel pipe and fittings on the wharf and floats prohibited.

.2 PIPE INSTALLATION

.1 Obtain Engineer's approval for method and type of pipe hangers to be used for each construction type prior to commencing the Work. *Victaulic piping connections to be cut-grooved.*

.3 CUTTING, CORING & PATCHING

.1 Cut or core openings in floats as required for installation of the work. Coordinate, schedule and obtain Owner's approval prior to commencement of cutting or coring.

In addition to obtaining approval or coring locations, the Contractor shall take precautions during coring to avoid damaging existing services located in floats.

Structures to be reinforced where weakened by cutting or coring.

Contractor to make good where existing equipment removed and new one installed.

Contractor to keep an accurate record of horizontal and vertical locations of all cores and submit a marked up structural set of prints for as-built purposes.

.4 IDENTIFICATION

.1 Provide control valves and drains with factory produced lamicoid identification tags. All standpipe risers and equipment to be painted fire red.

.5 DRAINS

.1 System and auxiliary drains shall be piped to drainage systems and/or to a point where they are easily accessible and equipped with valve, nipple and cap. Access panels are to be provided where necessary.

A copy of the location and size of all drains and low points on all systems must be submitted with the as-built drawings.

.6 PROTECTION

.1 All exposed steel pipe, fittings and equipment located in the float structure to be completely wrapped in Denso tape.

.7 CLEANING

.1 Maintain the work in a tidy condition and free from the accumulation of waste products and debris. Material accumulated by cutting and opening up shall be removed as work is performed.

Unless otherwise noted, all equipment demolished or removed and not to be handed over to the Owner shall become the property of the Contractor and removed from the site.

.8 TESTING OF PIPING

.1 Contractor shall hydrostatic pressure test the piping system as required by the Contractors Material & Test Certificate. Prior to pressure test, flush all piping in accordance with NFPA No. 13 to ensure removal of all foreign material and debris within the system. These tests shall involve the local Fire Department and be witnessed by the Owner or his representative.

Any leaks found as a result of this testing shall be repaired by the Contractor.

.9 INSPECTIONS AND TESTS

.1 The Contractor shall provide field labour and equipment to facilitate all inspections, examinations and tests required by the authorities and/or agencies specified under Section 1.3.2 of the specifications, as necessary, to obtain complete interim and final acceptance of the fire protection system.

The tests required shall be in the presence of representatives of the agencies having jurisdiction.

.10 PLACING IN SERVICE

.1 When the entire fire protection system has been completed to the satisfaction of the Owner, the Contractor shall demonstrate the complete operation and maintenance required to the Fire Department designated personnel and obtain their acceptance.

END OF SECTION

Section 31 62 16.19 – Steel Pipe Piles

Part 1 General

1.1 RELATED REQUIREMENTS

.1	Section 01 35 29.06	HEALTH AND SAFETY REQUIREMENTS
.2	Section 01 35 43	ENVIRONMENTAL PROCEDURES
.3	Section 01 45 00	QUALITY CONTROL
.4	Section 01 51 00	STEEL HARDWARE
.5	Section 01 99 00	TIMBER REPAIRS AND ASSEMBLY

1.2 SCOPE OF WORK

.1 This sections refers to the supply and installation of steel pipe piles.

Part 2 Products

2.1 MATERIALS

.1 Steel Pipe Piles.

.2 Steel pipe piles 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 section used in the fabrication of piles shall be 3.0 m.

.4 Welded steel piles shall have full strength welds.

.5 The Contractor shall provide necessary certification to demonstrate that the material meets the above standards.

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 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 deviate more than 1.0 - 1.6mm 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 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.

3.2 INSTALLATION

.1 All piles shall be driven to the pile tip elevation shown on the drawing. All piles may be installed to final tip elevation with a standard air, diesel, hydraulic, drop or vibratory hammer.

.2 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.

.3 Pile driver leads shall be constructed in a manner which affords freedom of movement of the hammer and they shall be held in position by guys, stiff braces or by attaching to cranes or derricks so as to ensure proper support for the pile during driving. Hammer blows at all times shall be in direct line with the axis of the pile.

.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 150mm 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 +/- 100 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.

3.3 PILE SOCKETING INTO BEDROCK

.1 If available overburden is less than 9m, pile will have to be socketed into bedrock as outlined in Table 1 below.

TABLE 1: Rock Penetration for 762 x 15.9 Pipe Piles

Penetration Obtained in Overburden	Required Additional Penetration into Bedrock
9m or more	Not Required.
8m	0.4m
7m	0.8m
6m	1.2m
5m	1.6m
4m	2.0m
3m or less	2.4m

3.4 STEEL PILE CUTTING SHOES

.1 Pile cutting shoes will not be required.

3.5 MOORING WELLS

.1 Pile well to consist of Owner supplied galvanized steel pipe ring.

.2 Pipe ring to have an inside rub-strip of 25mm thick UHMW material.

.3 Rub-strip to include 25mm gap to allow clearance for 19mm anode cable.

.4 See Drawing 717891-30 for mooring well details.

3.6 CUT OFFS

.1 After driving, piles shall be cut off at the elevations shown on the plans. 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 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.

3.7 PILE DRIVING RECORDS.

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

.2 The Contractor shall record for each pile:

.1 Pile number and location.

.2 Cut off elevation.

.3 Date and time driven.

.4 Overburden penetration.

.5 Socket penetration.

.5 Length of pile driven.

.6 Tip elevation relative to Local Chart Datum.

.7 Type of pile driving hammer.

.8 Final set and hammer energy.

3.8 TEMPORARY RESTRAINT OF DRIVEN PILES.

.1 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.

3.9 CORROSION PROTECTION

.1 Each pile is to have one (1) Owner supplied anode installed as per Anode Installation Instructions V.1.

END OF SECTION

Appendix A: Gangway Requirements

Bidders are to complete the following table to demonstrate how their design meets the gangway design requirements as per Section 01 11 00 SUMMARY OF WORK 1.8.1.2.

No	ITEM	REQUIREMENT	DESIGN
1	Width	8 feet	
2	Length	80 feet	
3	Load Capacity	100 psf	
4	Point Load Capacity	400 lb	
5	Deck	Diamond grip with 'rough-top' conveyor material	

END OF SECTION