

TOFINO FLOAT AND WHARF RECONSTRUCTION

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND TECHNICAL SUPPORT – PACIFIC REGION

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

Project Location

Tofino SAR Station
326-330 Main Street
Tofino, BC
Canada



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Section 01 11 00 – Summary of Work

Part 1 General

1.1 RELATED REQUIREMENTS

Section 02 41 16 – STRUCTURE DEMOLITION
Section 05 90 00 – STEEL HARDWARE
Section 31 62 19 – TIMBER PILES
Section 06 10 10 – TIMBER REPAIRS

1.2 DEFINITIONS

- .1 Throughout contract documents, the words “Owner,” “Contracting Authority,” “Contractor,” “Engineer,” or “Department,” shall be defined as follows:
- .1 Owner and Contracting Authority
Real Property and Technical Support of the Department of Fisheries and Oceans,
401 Burrard Street Vancouver B.C. V6C 3S4
 - .2 Engineer
An employee or contractor assigned by the Owner to lead project design and
approve contractor work for this project.
 - .3 Departmental Representative
An employee or contracted employee of the Owner designated to monitor and
report daily work details to the Owner and/or Engineer and, when necessary, to
act as a liaison between the Owner/Engineer and Contractor
 - .4 Department
The Department of Fisheries and Oceans, Canada.
 - .5 Contractor
The company and its employees and personnel contracted to perform the works
associated with this project described through Summary of Works Section 01 11
00 Sections 1.3 to 1.10.

1.3 DRAWINGS

- .1 TR-1717.1 – Facility Overview and Reconstruction Item
- .2 TR-1717.2 – Reconstruction Detail
- .3 TR-1717.3 – Approach, Helipad & Wharfhead Cross Section Detail
- .4 TR-1717.4 – Timber Float Cross Section Detail



1.4 LOCATION

- .1 The Tofino Canadian Coast Guard Search and Rescue Lifeboat Station is located on Vancouver Island in Tofino, BC, at 326-330 Main Street.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work covered in this project comprises the repair of the approach, wharfhead, Helipad and float. This includes the supply and installation of flotation units, diagonal brace timbers and timber bearing piles. All work includes the supply and installation of hardware.
- .2 The work shall commence after contract award and be completed no later than **March 31st, 2017.**
- .3 All materials to be supplied by the contractor.
- .4 Disposal of waste materials will be the responsibility of the contractor as per Section 02 41 61 Structure Demolition.

1.6 DESCRIPTION OF ITEMS

- .1 The following are in reference to items listed in the attached Schedule of Quantities and Prices table (TR-SQT-1717-01).

1.0 MOBILIZATION/DEMOBILIZATION

The lump sum cost for this item shall include the following:

- .1 Mobilization/demobilization of all crew, equipment and materials to and from the site in Tofino.
- .2 Supply of all materials required to complete the contract through Items 2.0 to 4.0 below.
- .3 Site clean-up and disposal of all materials not being salvaged as per Section 02 41 16 Structure Demolition after work is complete and deemed complete by Engineer/Departmental Representative.
- .4 Any overhead costs not covered in other items shall be included under this item.



2.0 Float Decking Repairs

The Contractor is responsible for the removal, supply and installation of 50% of float decking timber. Disposal is included in this item. Timber replacement priority will be within perimeter zones identified on drawing TR-1717.2 and all additional timber will be at locations approved by an onsite Departmental Representative to refresh decking timber which shows a moderate to heavy level of weathering and/or damage.

Once decking within the perimeter zones is removed, the Contractor will pause before installing new decking timber to complete Item 3.0, which requires the access granted to the interior of the float by removal of deck planks. Contractor is not to remove entire perimeter of the decking at the same time; safe access to the Coast Guard emergency response vessels to be maintained at all times.

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

- .1 Remove and dispose of 65.25m² of float decking timber (representing 50% of float surface area) with priority given to perimeter zones. Decking bearing points are spaced 762mm. Minimum decking length is 3.10m and maximum length is 5.5m; random lengths exist on the float within these parameters.
- .2 With decking removed in the perimeter zones, pause to complete Item 3.0 prior to finishing the following point items.
- .3 Install new decking timbers once Item 3.0 is complete. The perimeter zones will receive new decking timber while the remainder of the new decking timber shall be dispersed throughout the float as directed by and onsite Departmental Representative. Decking timber will require onsite trimming and appropriate field treatment procedures as per timber standards summarized in Section 02 05 00, Timber Floats.
- .4 All timber shall be installed and treated appropriately as per Section 06 10 10 Timber Repairs and Section 02 50 00 Timber Floats. Where old hardware is removed, replace with new hardware as per Section 05 90 00 Steel Hardware.
- .5 Dispose of all waste materials according to Section 02 41 16 – Structure Demolition
- .6 Protect remaining structural elements, services and equipment against damage from demolition works as identified in Section 02 41 16 – Structure Demolition.



3.0 Flotation Repairs

The Contractor shall install a total number of ten (10) billets to replace previously damaged tire flotation units as directed by an onsite Departmental Representative. **The Contractor should be able to replace flotation in situ without lifting the float structure. The contractor's proposed method shall be discussed and approved by Owner prior to final executed contract.**

Flotation modules within this float consist primarily of tire-flotation units with some remedial flotation billets at the east and west ends (HDPE-wrapped Styrofoam billets and plastic modular pontoons, respectively). As float freeboard is lower at the northwest and northeast corners, and dislodged flotation exists at the northwest corner, priority will be given to float installation in these areas. Drawing TR-1717.2 shows float freeboard and perimeter locations where billet installation shall be focused. Flotation replacement will be accomplished by removing and disposing of inadequate tire flotation units and installing new HDPE-wrapped billets under direction of an onsite Departmental Representative.

Billets supplied by the Contractor shall be Enviro Float Manufacturing (2002) Ltd.™ HDPE wrapped encapsulated Styrofoam billets or equivalent as approved by the Owner. Billets shall have embedded longitudinal timber lag bolt strips. Flotation dimensions shall be 406mm height x 610mm width x 1200mm length with 38mm x 140mm lagging strips.

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

- .1 Once decking timber within the perimeter zones has been removed, under Item 2.0, new flotation billets will be installed as directed by an onsite Departmental Representative. A maximum of ten (10) billets will be installed before decking is re-installed under Item 2.0.
- .2 For each two (2) old tire flotation modules removed, 1 new flotation billet will be added as per orientations illustrated by drawing TR-1717.4.
- .3 The Contractor shall secure all newly installed flotation units to the lower crosstie with a minimum of eight (8) lag bolts directly placed into internal lagging strips of the billets. Lag bolts to be 19mm x 102mm.
- .3 This item will be deemed complete by the Owner once all required billets are installed and secured appropriately according to the Project Engineer or onsite Departmental Representative.



4.0 Timber Bearing Pile Installation

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

- .1 Installation of 4 piles at locations shown in drawing TR-1717.2. Pile lengths and details are shown on the drawing TR-1717.3. The contractor is responsible for supplying the new timber piles.
- .2 Pile removal and pile driving shall follow specifications contained in Section 31 62 19 - TIMBER PILES. Pile driving records shall be submitted to Departmental Representative. Minimum penetration shall be to a depth of 6.1m or refusal, as per the direction of the Engineer or Departmental Representative.
- .3 Pile tops to be cut neatly and so that part damaged during driving is cut off.
- .4 Dispose of all waste materials according to Section 02 41 16 – Structure Demolition.
- .5 Protect remaining structural elements, services and equipment against damage from demolition works as identified in Section 02 41 16 – Structure Demolition.

5.0 Cross Brace Repair

The cost for this item shall include the equipment, tools, services, labour, disposal and all things necessary to complete the following:

- .1 Removal and disposal of eleven (11) diagonal brace timbers as specified in Table 1 shown on drawing TR-1717.2. Cross-section details and specifications shown in drawing TR-1717.3.
- .2 Supply and install eleven (11) new diagonal brace timbers with new hardware at the locations shown in drawing TR-1717.2 as per Table 1.
- .3 Remove and replace existing cross-brace attachment (top and bottom locations) hardware located at Bents 3 through 6 of the Approach.
- .4 When possible, field cutting of timbers shall be prevented. Any necessary field cuts and timber treatment to be executed as per Section 06 10 10 Timber Repairs. If field cuts are necessary the cut ends shall be placed in the non-immersed (upper) location.
- .5 Dispose of all waste materials and salvage material identified by Departmental Representative as outlined in Section 02 41 16 – Structure Demolition.



- .6 Protect remaining structural elements, services and equipment against damage from demolition works as identified in Section 02 41 16 – Structure Demolition.

1.7 WORK SEQUENCE AND OWNER OCCUPANCY

- .1 Site work may begin once contract is awarded and shall be completed no later than **March 31st, 2017**. Contractor will supply 10 days notice prior to commencement of work.
- .2 Contractor will co-ordinate and deliver a Work Schedule to the Owner 10 days prior to project commencement. During the project, the contractor will provide daily Progress Updates a Departmental Representative or directly to the Owner.
- .3 The Work Plan and anticipated work scheduling will need to be approved by the Owner to minimize facility usage conflict and to facilitate Owner occupancy and usage of the facility during the project.
- .4 The Contractor cannot interfere with the accessibility and functionality of the facility and the Owner's emergency response vessels moored at the float structure.

1.8 CONTRACTOR USE OF PREMISES

- .1 Co-ordinate the use of premises under direction of Owner.
- .2 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .3 At the completion of the operation, the condition of the facility shall be equal to or better than that which existed before work started.

1.9 EXISTING SERVICES

- .1 Notify Engineer and Departmental Representative of any intended interruption of services and obtain any required permission.
- .2 Determine 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 which may interfere with the planned work, immediately inform the Engineer and confirm the findings in writing.
- .4 Protect, relocate or maintain existing active services. When inactive services are encountered, cap-off in a manner approved by the Owner or other authorities having



jurisdiction.

- .5 Record locations of maintained, re-routed and abandoned services and report to the Owner.

1.10 DOCUMENTS REQUIRED

- .1 The Contractor shall maintain at the job site, one copy of 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.

END OF SECTION



Section 01 35 29.06 – Health and Safety Requirements

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 11 00 – SUMMARY OF WORK
- .2 Section 01 35 43 – ENVIRONMENTAL PROCEDURES
- .3 Section 02 41 16 – STRUCTURE DEMOLITION
- .4 Section 02 50 00 – TIMBER FLOATS
- .5 Section 05 90 00 – STEEL HARDWARE
- .6 Section 06 10 10 – TIMBER REPAIRS
- .7 Section 06 15 00 – DECKING
- .9 Section 31 62 19 –TIMBER 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 1 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 The Owner will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Contractor shall revise the plan as appropriate and resubmit to the Owner within five (5) days after receipt of comments from Owner.
- .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 three (3) weeks of contract award. Contractor to submit written acknowledgement to CSST along with Ouverture de Chantier Notice.
- .3 Work zone locations include:
 - .1 Tofino Search and Rescue Lifeboat Station

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 and Coast Guard staff prior to commencement of Work.

1.7 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Canadian Coast Guard



.2 Fisheries and Oceans Technical Support

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.

END OF SECTION



Section 01 35 43 – Environmental Procedures

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 62 19 – TIMBER 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 non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor shall, after receipt of such notice, inform 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, Departmental Representative or Owner 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.



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Part 2 Products

2.1 NOT USED

- .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 Any water-based equipment or machinery moored or used during the Project must not ground on the intertidal foreshore 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.
 - .4 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.
 - .5 Pile cut-offs, waste or any miscellaneous unused materials must be recovered for either disposal in a designated facility or placed in storage.
 - .6 Report any incidents of habitat damage to the Environmental Monitor or DFO to ensure that appropriate action (restoration) is taken.
 - .7 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 SECTIONS

- .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, Engineer and/or Departmental Representative 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.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals.
- .4 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.
- .5 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, the Contractor will correct such Work and pay cost of examination and correction.

1.4 ACCESS TO WORK

- .1 Allow inspection personnel and/or testing agencies access to Work Site, off-site manufacturing and/or fabrication plants related to items or material of this project.
- .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.

END OF SECTION



Section 02 41 16 – Structure Demolition

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 35 43 – ENVIRONMENTAL PROCEDURES
- .2 Section 31 62 19 – TIMBER PILES

1.2 SCOPE OF WORK

- .1 This section refers to all demolition and removal of existing structural timbers and hardware including timber piling, cross braces, float units, hardware and any other items identified for removal in the course of completing float and wharf reconstruction work and pile installation.

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 it from the site.
- .2 If not specifically identified, the Engineer shall decide as to which material shall be salvaged and which materials shall be disposed of.
- .3 Timber piles shall be completely removed.

3.2 SALVAGED MATERIAL

- .1 Material to be salvaged for the Owner shall be stored as directed by the Departmental Representative.



- .2 Remove items to be reused, stockpile and re-install as directed by the Departmental Representative.
- .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 items affected by Work to condition which existed prior to beginning of Work.

END OF SECTION



Section 02 50 00 – Timber Floats

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 90 00 – STEEL HARDWARE
- .2 Section 06 10 10 – TIMBER REPAIRS

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 to complete the work shall be supplied by the contractor conform to what is outlined in this section.
- .2 All timber for the purpose intended shall conform to the requirements of the N.L.G.A. Standard Grading Rules for Canadian Lumber.
- .3 Refer to drawings and specifications for timber dimensions and treatment.
- .4 All timber shall be Coast Douglas Fir. No 1 Structural Grade or better, unless specified otherwise.



- .5 All decking shall be S1S2E installed heart side down.
- .6 All joists, cross-ties, stringers, blocking, bullrails, risers and fascia boards shall be S2E (rough cut)
- .7 Timber will be graded in the following classes:
 - .1 Joists and Planks
 - .2 Beams and Stringers
 - .3 Posts and Timbers
- .8 All timber shall be free of heart centre with no sap.
- .9 All treated timber shall be S4S precut, to specified dimensions, before treating.
- .10 Rubboards, decking and lower cross-ties shall be treated with ACZA.
- .11 All decking lumber shall be surfaced lumber meeting grading S1S2E, Surfaced on the heart side and two edges, heart side down.

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 290 kg per cubic metre.
- .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.
- .3 Testing:
 - .1 The Engineer may carry out testing of materials including core sampling at the treatment plant. Data will be made available to the Contractor for information only.
 - .2 Notwithstanding the Engineer's testing program, the Contractor will ensure the materials meet the specified requirements in all respects. The Engineer reserves the right to reject materials on site.

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 or approved alternative.
 - .2 Where bolt holes must be bored through creosote treated piles, the holes shall be treated with creosote oil (or approved alternative) and the bolts shall be dipped in mastic 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.
- .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.

2.5 STEEL HARDWARE

- .1 Contractor will supply all hardware necessary to complete contract items.

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 the works shall be repairs and made good at the Contractor's expense to the satisfaction of the Engineer.

3.3 SHIPPING AND PACKAGING

- .1 As stated in the Summary of Work, the contractor is to supply all material necessary for completion of this project.

3.4 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



Section 05 90 00 – Steel Hardware

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 50 00 – TIMBER FLOATS
- .2 Section 31 62 19 – TIMBER PILES

Part 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 DPW washers under head and nut. The steel DPW washers shall be round unless specified square.
- .5 All bolts shall be 25mm (1") National course thread, unless shown otherwise.
- .6 Holes for machine bolts will be bored to provide a driving fit.
- .7 Holes for drift pins to be drilled 1.5mm smaller than pin diameter and 19mm deeper than pin length.

2.2 HARDWARE

- .1 All hardware supplied by the contractor must meet the standards below, any **additional hardware required** to complete the work shall be supplied by the contractor and conform to what is outlined in this section.
- .2 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).



- .3 All bolts will be of the full dimension specified or shown on the plan.
- .4 Unless otherwise specified, all machine bolts will be provided with round steel plate washers under head and nut.
- .5 All bolts shall be 25mm (1") National course thread, unless shown otherwise.
- .6 All 19mm washers shall be 6mm thick and 75mm diameter galvanized steel.
- .7 All 25mm washers shall be a minimum of 8mm thick and 100mm diameter galvanized steel.
- .8 All bolts to have 152mm (6") of thread unless shown otherwise.
- .9 Pile drift pins to be galvanized steel of 25mm diameter and provide a minimum of 200mm penetration into pile top.

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 00 99 00 Timber Repairs.
- .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 Secure each contact point with 2 – 125mm galvanized RDOX nails.

3.3 FASCIA

- .1 Secure each contact point with 2 – 125mm galvanized RDOX nails.
- .2 Contact points every 500mm maximum.

END OF SECTION



Section 06 10 10 – Timber Repairs

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 50 00 – TIMBER FLOATS
- .2 Section 05 90 00 – STEEL HARDWARE

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 290kg per cubic metre.
- .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 (or approved alternative).
 - .2 Where bolt holes must be bored through creosote treated timber, the holes shall be filled with creosote oil (or approved alternative) and the bolts shall be dipped in mastic 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 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

- .1 Field treated timber ends will be placed above water when and where possible.

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 the works shall be repairs and made good at the Contractor's expense to the satisfaction of the Engineer.

3.3 SERVICES

- .1 Removal
- .1 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
- .1 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.

3.4 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



Section 31 62 19 – Timber Piles

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 35 43 – ENVIRONMENTAL PROCEDURES
- .2 Section 05 90 00 – STEEL HARDWARE

1.2 MEASUREMENT PROCEDURES

- .1 Consider shoes, cap plates, straps and preservative treatment incidental to supply of piles.
- .2 Method 1:
 - .1 Measure supply of piles in metres delivered to site, in lengths indicated on Drawings and approved by Engineer.
 - .2 Measure installation of piles in number of piles and lengths acceptably driven, and approved by Departmental Representative.
- .3 Method 2:
 - .1 Measure supply and installation of piles in metres of pile approved by Engineer and acceptably incorporated into Work.
- .4 Mobilization of equipment paid as lump sum item
- .5 Number of lengths of piles installed: established in report and by project Engineer
- .6 Unit of Measurement for piles: in metres measured from tip (lowest point of pile) elevation to cut-off elevation at pile cap.

Part 2 Products

2.1 MATERIALS

- .1 Round wood piles: to CAN3-056 with minimum size of 36 tip diameter of 200mm.
- .2 Order length of piles at minimum 11.0 metres.
- .3 Type of peeling: Clean Peeled
- .4 Pile species: Douglas Fir to CSA 056.



- .5 Pile caps and brace timbers: pressure treated in accordance with CSA-O80-M 'Wood Preservation', its applicable subsections and amendments. The use category to which timber elements will be exposed is UC5A (Marine (salt water) applications). For timber specified to be preservative treated by the water-borne ACZA process minimum net retention shall be 30.0 kg/m³. For timber specified to be preservative treated by the Creosote process minimum net retention shall be 290.0 kg/m³. The Contractor shall provide certification that the specified treatment retention has been achieved. Preservative treatment of timber shall be undertaken in compliance with the latest revision of the 'Best Management Practices (BMP's) for the Use of Treated Wood in Aquatic Environments', as published by The Canadian Institute of Treated Wood and the Western Wood Preservers Institute. The Contractor shall provide assurance to the Engineer that preservative treatment has been undertaken in accordance with these BMP's.
- .6 Piles one piece, splices not permitted.
- .7 The Owner will be sole judge of quality and dimension of piles.

2.2 EQUIPMENT

- .1 Pile hammer: select and use pile hammer of sufficient weight and energy to suitably install specified pile without damage into soils. Hammers to be capable of developing a blow at operating speed with an energy of 47,425 Joules per blow. When required penetration is not achieved by use of hammers complying with minimum requirements, use larger hammer approved by the Engineer. For air/steam and double-acting hammers, provide independent calibrated pressure gauges on hammer side of all valves. Provide calibration certificate dated within six months of calibration.
- .2 Weight of hammer to be a minimum of 1000kg and maximum of 3000kg.

2.3 PRESERVATIVE TREATMENT

- .1 Full cell creosote treatment with net retention of 290 kg per cubic metre in accordance with CSA 080.

2.6 ACCESSORIES

- .1 Wire nails, spikes, staples: to CSA B111.
- .2 Bolts, nuts and washers: to ASTM A307.
- .3 Hot dip galvanize bolts, nuts and washers and unless otherwise specified, staples, cable clamps, pipe sleeves, spikes and nails: to [CAN/CSA-G164] [and] [ASTM A153/A153M].
- .1 Other hardware to be galvanized to ASTM A123/A123M.



Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 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.
- .4 Treat cuts, breaks or abrasions on surfaces of treated piles, bolt holes and field cuts in accordance with CSA-O80 Series. Bolts shall be dipped in mastic prior to installation.

3.5 INSTALLATION

- .2 Restrain lateral movement of piling, during driving at intervals not exceeding 6m, or depth instructed by engineer, over length between ground surface and driving head.
- .3 Treat exposed ends of cut off piles with two (2) liberally brushed coats of creosote (or approved alternative) followed by application of coal tar pitch, allowing sufficient interval between applications to permit total absorption.
- .4 Install metal pile coverings, where indicated, on tops of piles immediately after treatment; bend edges down over sides of pile, neatly trim and fasten with 8 large headed roofing nails.
- .5 Protection: treat end cut-offs and bolt holes with appropriate preservative.
- .6 The Contractor will be responsible for the temporary removal and reinstallation of all existing bracing members, batter pile connections, walers, etc., in order to facilitate the removal of damaged piles and the installation of new piles.
- .7 All damaged piles will be removed in their entirety. Pile stubs broken off at the mudline are not acceptable.
- .8 All piles driven to the penetration depth as specified or to practical refusal if approved by Engineer.
- .9 Piles not to be more than 1° out of plumb.
- .10 Assist the Engineer to maintain accurate records of driving for each pile, including:
 - .1 Type and make of hammer, stroke, weight or related energy.



- .2 Other driving equipment including water jet, driving cap, cushion.
- .3 Pile size and length, location of pile in pile group, location or designation of pile group.
- .4 Sequence of driving piles in group.
- .5 Number of blows per meter for entire length of pile and number of blows per 25 mm for the last 300 mm.
- .6 Final tip and cut-off elevations.
- .7 Other pertinent information such as interruption of continuous driving, pile damage.
- .8 Record elevation taken on adjacent piles during driving of each pile.
- .9 Measure rate of penetration if vibratory methods are used for pile installation.

3.6 BRACING

- .1 Install bracing as indicated.

3.7 APPLICATION / DRIVING

- .1 Place driving helmet or cap and cushion block combination capable of protecting pile head between top of pile and ram to prevent impact damage to pile.
- .2 Replace block if it is damaged, split, highly compressed, charred or burned or has become spongy or deteriorated, with a new block.
- .3 Block helmet: uniformly transmit energy to pile and minimum loss of energy.

3.9 PRE-AUGERING OR SPUDDING

- .1 Pre-auguring or spudding of piles may be used if necessary with the approval of Engineer.
- .2 Discontinue pre-auguring or spudding at distance above pile tip elevation as directed by Engineer.
- .3 Drive pile final 6m of penetration or as directed by Engineer.

3.10 TOLERANCES IN DRIVING

- .1 Variation of not more than 2% of length off vertical alignment.
- .2 Center of butts: within 75mm of location indicated.
- .3 Manipulation of piles: not be permitted.
- .4 In addition to complying with stated tolerances, clear distance between pile heads and pile cap edges minimum of 125 mm.



- .6 Redesign of pile caps or additional work required due to improper location of piles is responsibility of Contractor as reviewed by Departmental Representative.
- .7 Re-drive heaved piles to required tip elevation.
- .8 Remove and replace damage piles, mis-located piles, driven out of alignment piles and provide additional piles, driven as directed.

3.11 CLEANING

- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

