

FANNY BAY CATAMARAN – CATAMARAN INSTALLATION

FISHERIES AND OCEANS CANADA
SMALL CRAFT HARBOURS – PACIFIC REGION
April 2016

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



Section 00 01 10 – Table of Contents

Section Number	Section Title	No. of Pages
01 11 00	SUMMARY OF WORK	8
01 35 29.06	HEALTH AND SAFETY REQUIREMENTS	5
01 35 43	ENVIRONMENTAL PROCEDURES	2
01 45 00	QUALITY CONTROL	2
02 41 19	STRUCTURE DEMOLITION	3
03 86 00	CATAMARAN INSTALLATION	1
05 50 00	STEEL FABRICATIONS	4
09 97 19	PAINTING	4
31 62 16.19	STEEL PILES	5

Drawing Number	Drawings Title	No. of Pages
DRAWINGS		
216105-001	SITE PLAN	1
216105-002	FLOAT LAYOUT – GENERAL ARRANGEMENT	1
216105-003	PILE WELL AND BOLLARD	1
216105-320	160FT DUAL FLOAT – PILE MOORING WELL C/W PILE WELL FRAME	1
FB-CM 001	ANODE INSTALLATION INSTRUCTIONS	1



Section 01 11 00 – Summary of Work

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
- .4 Section 01 45 00 - QUALITY CONTROL
- .5 Section 02 41 19 - STRUCTURE DEMOLITION
- .6 Section 03 86 00 – CATAMARAN INSTALLATION
- .7 Section 05 50 00 - STEEL FABRICATIONS
- .8 Section 09 97 19 - PAINTING
- .9 Section 31 62 16.19 - STEEL PILES

1.2 DEFINITIONS

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

- .1 Contracting Authority

- .2 Engineer/Departmental Representative

An employee of the Department (Departmental Representative) or a Consultant Engineer assigned by the Departmental Representative 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.

1.3 DRAWINGS

.1 CATAMARAN INSTALLATION DRAWINGS

216105-001	SITE PLAN
216105-002	FLOAT LAYOUT – GENERAL ARRANGEMENT
216105-003	PILE WELL AND BOLLARD
216105-320	160FT DUAL FLOAT – PILE MOORING WELL C/W PILE WELL FRAME
FB-CM 001	ANODE INSTALLATION INSTRUCTIONS



1.4 LOCATION

- .1 The Fanny Bay Small Craft Harbour is located on the east coast of Vancouver Island in British Columbia. The Fanny Bay Harbour is a Class "C" harbour located in Baynes Sound in the settlement of Fanny Bay, BC.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

- .1 The work under this contract shall include the supply of equipment, labour and materials for the performance of all work as required by the Contract Documents. All replaced items, cut-offs and waste material shall be disposed by the contractor in strict accordance with provincial, local, and municipal regulations and Part 8 of the National Building Code and with the Canadian Construction Safety Code.
- .2 The work to be carried out under this contract includes the demolition and disposal of the existing timber log breakwater in Fanny Bay, the supply of all material to install a new owner supplied floating catamaran breakwater and a new contractor supplied log breakwater as shown on the drawings. The work generally consists of, but is not limited to the following items:
 - .1 Mobilisation/Demobilisation
 - .2 Demolition.
 - .3 Delivery, Modification and Installation of the New Catamaran, Mooring Piles and associated hardware.
 - .4 Supply and Install of a new 18m log breakwater compete with mooring piles and associated hardware.
- .3 The work shall start upon award and be completed no later than November 30, 2016.
- .4 The following materials shall be supplied by the Owner and are available for retrieval by the Contractor from the **Fanny Bay Harbour** following award:
 - .1 Seven (7) anodes and cable to be installed on the steel piles.
 - .2 Sixteen (16) anodes and cable to be installed on the catamaran breakwater.

1.6 SCHEDULE OF QUANTITIES

- .1 The following are in reference to items as detailed in the Schedule of Quantities and Prices

LUMP SUM COSTS

1.0 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 all crew and equipment to Fanny Bay Harbour.
- .2 Any overhead costs not covered in other items.
- .3 Site clean-up and disposal of all materials not being salvaged.

2.0 DEMOLITION OF EXISTING BREAKWATER

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 Demolition and removal of existing timbers, dolphin piles, anchors and hardware including, and any other items identified for removal in the course of completing catamaran installation work.
 - .1 Protect surrounding harbour infrastructure, services and equipment against damage from demolition works as identified in Section 02 41 16 – STRUCTURE DEMIOLITION

3.0 NEW CATAMARAN 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 Take delivery of a new 8.5 m wide and 48.8 m long Owner supplied floating catamaran breakwater in Fanny Bay and align it into new location as outlined in the drawings and Section 03 86 00 – Catamaran Installation.

4.0 NEW LOG BREAKWATER 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 Supply an 18m long x 610mm min floating log breakwater and lash it to the new catamaran breakwater.

UNIT PRICE COSTS

3.0 NEW CATAMARAN INSTALLATION

This item includes the unit rate cost for the supply of materials, equipment, tools,



services, labour and all things necessary to complete the following:

- .2 Supply, fabricate and install four (4) painted pile well frames on the catamaran as shown on drawings 216105-003 – Pile Well & Bollard and 216105-320 – 160ft Dual Layer Pile Mooring Well C/W Pile Well Frame.
- .3 Supply and install four (4) 19.1mm x 762mm diameter unpainted straight seam steel pipe piles securing the catamaran as shown on drawing 216105-002 – General Arrangement and 216105-003 – Pole Well and Bollard
- .4 Install one (1) anode per pile as per Anode Installation Instructions shown on drawing FB-CI-001 - ANODE INSTALLTION INSTRUCTION.
- .5 Install sixteen (16) anodes on the designated areas of the catamaran breakwater as per Anode Installation Instructions shown on drawing FB-CI-001 - ANODE INSTALLTION INSTRUCTION and as directed by the Departmental Representative.

4.0 NEW LOG BREAKWATER INSTALLATION

This item includes the unit rate cost for the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

- .2 Supply, fabricate and install three (3) chain log pile well restrains on the log breakwater as shown on drawings 216105-003 – Pile Well & Bollard and 216105-002 – General Arrangement.
- .3 Supply three(3) 19.1mm x 762mm diameter unpainted steel straight seam steel pipe piles to secure the 18 m long floating log breakwater as shown on the drawing 216105-002 – General Arrangement.

5.0 ADDITIONAL PILE DRIVING

The additional pile driving item is to be used at the direction of the Departmental Representative. The items outlined below are reserved for unforeseen site conditions and are to be allotted at the discretion of the Departmental Representative.

This item includes the unit rate cost for the supply of materials, equipment, tools, services, labour and all things necessary to complete the following:

- .1 Supply and install 19.1mm x 762mm diameter unpainted straight seam steel pipe pile.
- .2 Additional Pile Driving into Bedrock



- .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 or direction of Engineer onsite.
- .3 Contractor must be capable of churning/drilling socket with pile already in place and driven through available overburden.
- .4 Contractor to include allowances for probable interruptions to driving for changing/modifying/maintaining churning equipment or other pile driving or barge equipment.
- .5 Contractor is to notify the Departmental Contact Immediately in writing upon encountering conditions that require churning/drilling/socketing
 - .1 Notice to include pile, location, and current depth reached at refusal
- .6 No churning/drilling/socketing or actions towards this item are to take place without acknowledgement of this notice, and written direction to proceed.
- .7 Quantities for this item reflect an estimate of bedrock conditions at the site, and no claim for additional quantities will be entertained without written direction from Departmental Contact.

1.7 WORK SEQUENCE AND OWNER OCCUPANCY

- .1 Owner to arrange for any moored vessels to be relocated prior to the start of construction.
- .2 Contractor to provide a minimum seven (7) day notice to the Owner and receive a written response from Owner that existing vessels have been relocated as per clause 1.7.1 prior to mobilization to site.
- .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.

1.8 CONTRACTOR USE OF PREMISES



- .1 Co-ordinate 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 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.

1.9 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 MINIMUM STANDARDS

- .1 In the absence of other standards specified in the Contract Documents, all work is to conform to, or exceed, the minimum standards of the Canadian Government Specifications Boards, the Canadian Standards Association, the American Society for Testing of Materials, or the National Building Code of Canada, whichever is applicable.
- .2 All work to be done in accordance with Work Safe BC regulations.

3.2 INTERFERENCE WITH OPERATION

- .1 The Contractor shall obey all navigation regulations and conduct operations so as to interfere as little as possible with the use of berthing spaces, fairways and passages. Install and maintain any and all protection to navigation as may be required by any properly constituted authority or by the Engineer. During the course of construction and cleanup, do not dispose of surplus, waste or demolished materials in navigable waters.



- .2 The Contractor shall upon instruction of the Owner or Engineer, promptly remove any of the Contractor's equipment located outside the specified work area and obstructing any harbour operation.

3.3 BARRIERS, LIGHTS AND WATCHING

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

3.4 SITE ACCESS

- .1 The Contractor shall make his own arrangements subject to the approval of the Engineer, for access to the site. Site access shall be coordinated with the local Harbour Authority.
- .2 The Contractor shall maintain routes of travel, the Engineer being the sole judge as to what may be deemed reasonable:
- .3 The Contractor shall erect and maintain barriers, fences, lights, warning devices, and other protective devices as may be required for prevention of theft or damage of goods and protection of the public and workers, or if so ordered by the Engineer.

3.5 CONSTRUCTION AREA

- .1 The Contractor shall regulate construction traffic on public areas and comply with all local ordinances in connection therewith, including load limitation and removal of debris.
- .2 The Contractor shall confine his operations on the site to those areas actually required for the work including routes and regulations approved by the Owner for haulage of materials.

3.6 TEMPORARY SERVICES

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

3.7 ACCESS



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

3.8 WEATHER

- .1 No work shall be undertaken by the Contractor when, in the opinion of the Engineer, the weather is unsuitable or unfavourable for a particular class of work. Time lost by the Contractor due to stoppage on account of adverse weather conditions may be allowed the Contractor, at the discretion of the Engineer, as an extension of time for the completion of the work over and above the date of completion specified in the contract agreement.

3.9 SOIL DATA AND EXISTING TOPOGRAPHY

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

3.10 UTILITIES AND SERVICES

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

3.11 CARE OF FINISHED WORK

- .1 The Contractor shall protect all finished work from injury, defacement, unauthorized entry, or trespass until such time as the work described in the Contract Documents is substantially complete.

3.12 NOISE BY-LAWS

- .1 The Contractor shall comply with the requirements of any local or other Noise By Laws.

END OF SECTION



2016

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

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 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 five (5) days after receipt of comments from Departmental Representative.



2016

- .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 with 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 Fanny Bay 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 Fanny Bay Harbour Authority
 - .2 Small Craft Harbours



2016

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

- .1 Not used.



2016

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION



Section 01 35 43 – Environmental Procedures

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 62 16.19 - STEEL 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

- .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 sub tidal 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 SECTIONS

- .1 Not Used.

1.2 INSPECTION

- .1 Allow Owner access to Work. If part of Work is in preparation at locations other than
- .2 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, correct such Work and pay cost of examination and correction.

1.3 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.

1.4 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.



1.5 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.

1.6 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 02 41 16 – Structure Demolition

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 35 43 – ENVIRONMENTAL PROCEDURES
- .2 Section 31 62 16.19 – STEEL PILES

1.2 SCOPE OF WORK

- .1 This section refers to all demolition and removal of existing timber piles, log breakwater, anchors and hardware including timber piling, rubstrips and any other items identified for removal in the course of completing catamaran installation work.

1.3 GENERAL

- .1 Fisheries and Oceans General Conditions and related contract documents form an integral part of this section.
- .2 Where existing works are to be removed, they shall be removed and salvaged or disposed of to the satisfaction of the Engineer.
- .3 The Contractor shall furnish all labour, materials, tools, plant and services required incidental to the completion to the full extent of the drawings and specifications for the execution of all demolition salvage and protection work specified herein.
- .4 Demolition and disposal shall be carried out in strict accordance with provincial, local, and municipal regulations and Part 8 of the National Building Code and with the Canadian Construction Safety Code.
- .5 Demolition shall be carried out in accordance with the construction schedule as approved by the Engineer.

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

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

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.

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 03 86 00 – Catamaran Installation

Part 1 General

1.1 SCOPE OF WORK

- .1 This section refers to the placement of the catamaran.

Part 2 Products

2.1 GENERAL

- .1 The Contractor shall be responsible for the supply of small item materials and any materials required to complete the installation.

Part 3 Execution

3.1 GENERAL

- .1 All work shall be inspected by the Engineer.
- .2 Contractor to co-operate with Engineer in providing access for inspection of materials, assembly, pile placement location and tensioning during performance of work.

3.2 CONNECTIONS

- .1 All connections and hardware to be performed to the satisfaction of the Engineer prior to placement of piles and final alignment of catamaran.
- .2 All anodes shall be installed on piles and on catamaran breakwater as directed by the departmental representative.

3.4 PILE INSTALLATION

- .1 The Contractor to have equipment capable of lifting, placing and repositioning Specified mooring piles and pile wells an attaching it to the catamaran.
- .2 The contractor will take direction from the Engineer for on-site adjustments to the catamaran alignment.
- .3 Floating equipment to be capable of passing safely between new catamaran and adjacent old log boom(s) or structure(s).
- .5 Before final approval of catamaran the bearing and location of the mooring line shall be approved by the Engineer.

END OF SECTION



Section 05 50 00 – Metal Fabrications

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 62 16.19 – STEEL PILES

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A53/A53M-[07], Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A325, Standard Specification for Structural Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .1 CSA International
 - .1 CSA G40.20/G40.21-[04(R2009)], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel Class C, Grade 350W.
 - .2 CAN/CSA G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16.1, Steel Structures.
 - .4 CSA W47-[09], Welding of Structural Metals
 - .4 CSA W48-[06], Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-[M03(R2008)], Welded Steel Construction (Metal Arc Welding) [Metric].

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for piling and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Shop Drawings
 - .1 The Contractor shall prepare and submit shop drawings with metric dimensions.
 - .2 The Contractor shall submit three prints or an electronic copy in PDF of the shop drawings for the Engineer's review prior to commencing fabrication. If shop drawings are not to the Engineer's satisfaction, they will be returned with the notation "Resubmit". Drawings that have been returned with the notation "Reviewed" would allow fabrication to commence.



- .3 The review of shop drawings will be for size and arrangement of members and strength of connections. Any errors in dimensions shown on the shop drawings shall be the responsibility of the Contractor.
- .4 Upon completion of the project, all reviewed shop drawings shall be submitted to the owner along with the As-Built marked drawings. In addition, diskettes containing all shop drawings in AutoCAD format shall be submitted.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Steel hollow sections: to CSA G40.20/G40.21, Grade 350W unless otherwise noted.
- .2 All other rolled sections and plates: to CSA G40.20/G40.21, Grade 300W unless otherwise noted.
- .3 Steel pipe: to ASTM A53/A53M standard weight galvanized finish.
- .4 Welding materials: to [CSA W59].
- .5 Welding electrodes: to CSA W48 Series
- .6 Welding of Structural Metals to CSA W47-[09]
- .7 Bolts and anchor bolts: to ASTM A325.
- .8 All structural steel members shall be made of the size and weight shown on the drawings unless written approval is obtained by the Departmental Representative

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Where possible, fit and shop assemble work, ready for erection.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.



- .4 Unless noted otherwise, all welds shall develop the full strength of the connected members, and shall be continuous seal welds with a minimum 6mm leg length.
- .5 Where on the drawings it is called for double sided welding; the welding details called for on the near side shall be duplicated on the far side if not called up otherwise.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating [610] g/m² to CAN/CSA-G164.
- .2 Except as noted below, all structural and miscellaneous steel for pile wells and bollards shall be painted in accordance with the requirements of Section 00 98 00 – Painting.
- .3 Pipe piles shall not be painted.
- .4 Bolts, washers and nuts shall be hot dip galvanized in accordance with ASTM Specifications A-153 or A-123 or CSA G 164-M (minimum zinc coating 610 g/m²).

2.4 SHOP PAINTING

- .1 All structural and miscellaneous steel for pile wells and bollards shall be painted in accordance with the requirements of Section 09 97 19 – Painting

Part 3 Execution

3.1 EXAMINATION AND INSPECTION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
- .2 The Contractor shall furnish all facilities for inspecting and testing the weight, dimensions and quality of workmanship at the shop where the material is fabricated.
- .3 The Departmental Representative shall be notified well in advance of the start of work, in order to allow sufficient time for inspection of material and workmanship.
- .4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

3.2 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
 - .1 Primer: maximum VOC limit [250] g/L [to GS-11].



- .4 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
 - .1 Primer: maximum VOC limit [250] g/L [to GS-11].

3.3 CLEANING

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION



Section 09 97 19 – Painting

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 90 00 – STEEL HARDWARE
- .2 Section 31 62 16.19 – STEEL PILES

1.2 SCOPE OF WORK

- .1 All ferrous surfaces except galvanised components are to be painted. This includes:
 - .1 Steel pipe piles from top of pile to 6 m below seabed or ground elevation.
 - .2 All structural and miscellaneous steel.

1.3 CODES

- .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
- .11 SSBC-PA2 Procedure for Determining Conformance to Dry Coating Thickness Requirement

Part 2 Products

2.1 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:

Coat No.	Type	Binder	Product Name	Dry Film Thickness
1	Primer	Zinc-Rich Epoxy	Interzinc 52	2.5 mils
2	Mid Coat	Polyamide Epoxy	Interseal 670HS	7 mils
2	Stripe Coat	Polyamide Epoxy	Interseal 670HS	5 mils
3	Topcoat	Polyamide Epoxy	Interseal 670HS	7 mils
-	-	-	-	16.5 mils minimum

Note: Finished coating system Dry Film Thickness shall be a minimum of 16.5 Mils (412 microns) at each spot measurement. Stripe coat not included.

- .5 Topcoat to be a light green colour as directed by the owner.
- .6 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).

Part 3 Execution

3.1 SURFACE PREPARATION

- .1 All steel surfaces to be painted shall be prepared in accordance with 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 measured 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.

3.2 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.

3.3 WORKMANSHIP

- .1 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:
 - a. Inadequate dry film thickness (DFT).
 - b. Runs, sags, holidays or shadowing caused by inefficient application methods.
 - c. Evidence of poor coverage at plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
 - d. 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.

END OF SECTION



Section 31 62 16.19 – Steel Piles

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 35 43 – ENVIRONMENTAL PROCEDURES
- .2 Section 05 90 00 – STEEL HARDWARE
- .4 Section 09 97 19 – PAINTING

1.2 MEASUREMENT PROCEDURES

- .1 Method 1:
 - .1 Measure supply of steel pipe piles in metres delivered to site, in lengths indicated on Drawings and approved by Departmental Representative.
 - .2 Measure installations of piles in number of piles and lengths acceptably driven,
- .2 Method 2:
 - .1 Measure supply and installation of piles in metres of pile acceptably incorporated into work.
- .3 Mobilization of equipment: paid as lump sum item.
- .4 Actual number and lengths of piles installed: established by Departmental Representative from piling records.
- .5 Unit of measurement for piles: per metre measured from tip elevation (lowest point of pile) to cut off elevation at pile cap.

1.3 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 Consultant. The Contractor shall co-operate with the Consultant 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 Soil penetration.
 - .5 Length of pile driven.
 - .6 Tip elevation.
 - .7 Type of pile driving hammer.
 - .8 Final set and hammer energy.

Part 2 Products

2.1 MATERIALS

- .1 Steel pipe piles shall be 762mm O.D. x 19.1mm thick, painted straight seam steel pipe pile



as shown on contract drawings 216105-003 – Pile Well & Bollard and 216105-320 – 160ft Dual Layer Pile Mooring Well C/W Pile Well Frame.

- .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 X46
 - .3 CSA Z245.1-M with the following provisions:
 - i) Chemical analysis of material shall show a minimum copper content of 0.20%.
 - 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 6.0 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

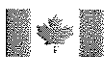
3.1 FABRICATION



- .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 have a deviation of more than 1.0 - 1.6 mm from a plane perpendicular to the axis of the pile.
- .7 Maximum deviation of the line of the pile at the splices shall be 3 mm when measured with a 3.0 m straight edge.
- .8 All pile splices shall be 100 percent inspected and tested. This inspection shall be conducted at the Contractor's expense.
- .9 Inspections of pile splices shall be by non-destructive ultrasonic tests in accordance with the requirements of AWS D1.1; static. The test results shall be made available to the Engineer. If the inspection of a weld should indicate poor alignment of the pile sections, insufficient penetration of the weld, lack of fusion, slag inclusions, porosity or any such defects, the Contractor shall take the necessary corrective measures to provide a full strength weld to the satisfaction of the Engineer. The cost of correcting defective welds and re-testing shall be borne by the Contractor.

3.2 INSTALLATION

- .1 Piles shall be installed in accordance with Best Management Practice for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association – November; 2003.
- .2 All piles shall be installed to the pile tip elevation shown on the drawings. All piles may be installed to final tip elevation with a standard air, diesel, hydraulic, drop or vibratory hammer. The ground conditions may not allow the contractor to install the piles to final pile tip elevation with a vibratory hammer. The contractor shall be prepared to drive the piles with a standard air, diesel, hydraulic, drop hammer or socket the pile into hard layers encountered before the specified tip elevation is reached as shown on the drawings.



- .3 All pile driving equipment shall be in good mechanical condition and shall be capable of delivering the manufacturer's rated energy output and shall be operated in accordance with the manufacturer's instructions.
- .4 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.
- .5 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.
- .6 The driving cap shall fit continuously over the top of the pile and shall project about 150 mm down over/into the pile and shall be such that the pile is held properly in line with the leads. A cushion of hardwood, fibre, plywood or other suitable material shall be placed between the driving cap and the hammer. The cushion shall be replaced if so directed by the Engineer.
- .7 Piles shall be driven in the positions shown on the drawings. Piles shall be driven and installed within a tolerance of +/- 50 mm in location and within 0.5% from the specified axial alignment. The Engineer may reject piles driven out of alignment or damaged in any way after inspection. Cost of remedial measures decided by the Engineer shall be borne by the Contractor.

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 19.1 Pipe Piles

Penetration Obtained in Overburden	Required Additional Penetration into Bedrock
9m or more	Not Required
8m	1.5m
6m	2.0m
4m	2.5m
3m or less	3.0m

- .2 Additional penetration is in addition to the overburden depth.
- .3 Rock socket diameter must be approximately the same diameter as the outside diameter of the pile. The pile must be a tight fit with the hole diameter being no larger than $\frac{1}{4}''$ + pile diameter.



- .4 Additional rock penetration depth to start once tight hole diameter requirement achieved not at contact with rock.

3.4 STEEL PILE CUTTING SHOES

- .1 Pile cutting shoes will not be required.

3.5 MOORING WELLS

- .1 Mooring wells to be installed as outlined on drawing 2016105-003 – Pile Well and Bollard.

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 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.

3.8 CORROSION PROTECTION

- .1 Piles are to be protected by the installation of sacrificial anodes. Piles shall not be painted.

END OF SECTION



Section 00 10 00 – Schedule of Quantities and Prices

Bidders are to complete the following schedule indicating costs to deliver works as specified in this contract.

SCHEDULE OF QUANTITIES AND PRICES

LUMP SUM ITEMS

****Includes all items listed in the Schedule of Quantities not identified in the unit price table.****

Lump Sum items to include:

- 1.0 Mobilization/Demobilization
- 2.0 Demolition of Existing Breakwater
- 3.0 New Catamaran Installation - .1 Catamaran Delivery and Alignment
- 4.0 New Log Breakwater Installation - .1 Supply of Log Breakwater

ITEM	CLASS OF LABOUR PLANT OR MATERIAL	UNIT OF MEASURE	QTY	PRICE/UNIT	TOTAL
1.0 Fanny Bay Catamaran Installation					
.1	Catamaran Installation	L.S.	1		
				SUBTOTAL	
				GST	
				TOTAL	

UNIT PRICE TABLE

ITEM	CLASS OF LABOUR PLANT OR MATERIAL	UNIT OF MEASURE	QTY	PRICE/UNIT	TOTAL
3.0 New Catamaran Installation					
.2	Pile Well Frames, Supply, Fabrication and Installation	Per Frame	4		
.3	Steel Pile Supply and Installation	Per Pile	4		
4.0 New Log Breakwater Installation					
.2	Pile Chain Restraints, Supply, Fabrication and Installation	Per Chain	3		
.3	Steel Pile Supply	Per Pile	3		
5.0 Additional Pile Driving					
.1	Supply of Additional Piles	Per Pile	1		
.2	Installation Of Piles into Bedrock	Per M	5		
				SUBTOTAL	
				GST	
				TOTAL	



END OF SECTION



PRELIMINARY
NOT FOR CONSTRUCTION

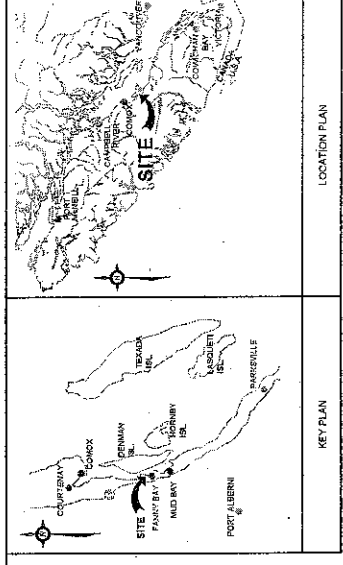
WILLHOFF, JENSEN & ASSOC. LTD.
CONSULTING ENGINEERS
VANCOUVER, B.C.

215105
A

Fisheries & Oceans Canada
Small Craft Harbours Branch
Pacific Division
280-401 Burrard Street
Vancouver, Canada, V6C 3S4

FANNY BAY HARBOUR
BREAKWATER

DO NOT SCALE DRAWINGS



DESIGN CRITERIA:

1. TIDE: HIGHER HIGH WATER LEVEL (HHWL), MEAN WATER LEVEL (MWL), LOWER LOW WATER LEVEL (LLWL)
2. WIND: DESIGN WIND VELOCITY (IN 20 YRS)
3. SNOW: DESIGN SNOW LOAD (SPECIFIED ASSOCIATED RAIN LOAD)
4. SEISMIC
5. ROLLING LOAD

GENERAL NOTES:

GENERAL

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS ARE IN METRES AND ARE TO HYDROGRAPHIC DATUM.
3. FACILITY PLAN, BATHYMETRY AND TOPOGRAPHY BASED ON SURVEY PLAN BY CHICAGO SURVEILLANCE SURVEYING, DATED MAY 2004.

STRUCTURAL AND MISCELLANEOUS STEEL

1. ALL ROLLED SECTIONS & MISCELLANEOUS PLATES TO BE GRADE 500W CONFORMING TO CAN CSA STD. S400/04/04.2 UNLESS NOTED OTHERWISE.
2. ALL BOLTS TO CONFORM TO ASTM A325 UNLESS NOTED OTHERWISE.
3. ALL WELDING TO CONFORM TO CAN CSA STD. W47, W54 & W58. THE MINIMUM WELD SIZE TO BE 8mm.
4. ALL PIPE SECTION SHALL BE SPRAYED ZINCO PRIME CONFORMING TO ASTM GRADE 1 ON APPROVED EQUIVALENT.
5. WALL THICKNESS OF DUPLEX STEEL PILES INCREASED BY 2mm AS CORROSION PROTECTION.

