

FISHERIES AND OCEANS CANADA

CANADIAN COAST GUARD

PACIFIC REGION

**Patricia Bay, B.C.
Institute of Oceans Science (IOS)
Steel Camel Repairs**

October 2014

SPECIFICATIONS

Division 01	General Requirements	No. of Pages
01 11 55	General Instructions	9
01 35 29 06	Health & Safety	4

DRAWINGS

Bound Separately

Sheet 1	Drawing No: 31-133-1, Overview, General Arrangement and Sections, Indications of Camel Repair Locations
Sheet 2	Camel Repair Details
Sheets 1 to 13	As-Built Drawings

END OF SECTION

Part 1 - General

1.1 SITE

- .1 The work is at the following site:
 - .1 The site of the work is at the Institute of Ocean Sciences located at 9860 West Saanich Road, Sidney, BC

1.2 GENERAL DESCRIPTION

- .1 Replace existing camel connections at twenty (20) locations.
- .2 Clean and remove all marine growth and barnacles on all surfaces of the floating camels
- .3 Salvage and repair leaks on seven (7) sinking steel camels

1.3 SITE CONDITIONS

- .1 Prospective bidders are expected to familiarize themselves with site and soil conditions prior to the submission of their tender.
- .2 Contractor will measure and verify the camels prior to ordering materials for the repairs.

1.4 SCHEDULE OF WORK

- .1 Provide a schedule of work within ten (10) days of award of contract and complete work within twelve (12) weeks from date of contract award.
- .2 Whenever variation from the schedule occurs or is expected to occur, notify the Engineer of the change.
- .3 Schedule the work so there is least amount of disruption to the operations at the IOS wharf. The Contractor will coordinate all operations with Mr. Rod Thompson at (250) 363 - 6320 to avoid interference with moorage of vessels.

1.5 DELAYS

- .1 Delays, other than those caused by changes requested by the Engineer, which occur will not affect the Tender Prices Per Unit. Claims for such delays will not be entertained by the Department.

1.6 ASSISTANCE BY CONTRACTOR

- .1 Co-operate with the Engineer and/or his representative on inspection of work and provide transportation and assistance requested for all shifts worked.
- .2 On request of the Engineer or his representative furnish for their use such boats, equipment, labour, and materials that would ordinarily form part of the plant as is necessary to inspect and supervise the work at all times.

1.7 CONTRACTOR'S USE OF SITE

- .1 As much as is practicable, regulate construction activities to provide safe access to traffic at all times.
- .1 Use of site: limited to immediate area of the work and areas assigned by the Engineer for temporary storage, equipment, sanitary facilities, etc.
- .2 As there will be **NO ACCESS** to any of the buildings, Contractor will provide sanitary facilities for the work force in accordance with governing regulations and ordinances
- .3 Vehicles entering and left in the designated work area must have Contractor's logo/name clearly marked on the vehicle
- .4 Pay parking is available and it will be the responsibility of the Contractor to arrange and pay for parking.
- .5 Confine work and operations of employee to areas defined by the Contract Documents unless directed otherwise in writing by the Department Representative. Do not unreasonably encumber premise with products

1.8 MOBILIZATION AND DEMOBILIZATION

- .1 Mobilization and demobilization will include all work required to supply materials, plant, and labour to the site of the work unless specified otherwise.

1.9 PLANT MOVES

- .1 Plant moves will include all work required to move material, plant, and labour from one site of the works to another during the duration of the Contract.

1.10 INTERFERENCE TO NAVIGATION

- .1 The Contractor shall be familiar with vessel movements and fishery activities in areas affected by the work. The Contractor shall plan and execute the work in a manner that will not impede navigation or interfere with fishing operations.

- .2 Claims for loss of production, delays or other expenses resulting from interference with moored or movement of vessels or fishing activities will not be entertained by the Department.
- .3 Comply with all Canadian Coast Guard regulations in conjunction with navigation aids which may be considered necessary during the course of the project.

1.11 NOTIFICATIONS

- .1 The Contractor will also notify the local Fisheries Officer not less than five (5) days prior to commencement and completion of operations.
- .2 Keep Vancouver Vessel Traffic Services, Canadian Coast Guard informed of operations in order that necessary notices to shipping will be issued. For notices to shipping, contact:

Canadian Coast Guard
Regional Marine Information Centre, Pacific
Suite 2380 - 555 West Hastings Street
PO Box 12107
Vancouver, B.C.
V6B 4N6
Tel: (604) 666 - 6011
E-mail : Offshore@rmic.gc.ca

1.12 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Ensure work meets all applicable environmental regulations and standards.
- .2 The Contractor shall comply with municipal, provincial, and national regulatory agency regulations relating to the project.
- .3 Claims for extra costs resulting from all regulatory agency requirements including those referenced in Clause 1.12.2 will not be entertained by the Department.
- .4 The Contractor shall mark floating equipment with lights in accordance with Notice to Mariners CCG regulations.
- .5 The Contractor will ensure that a fuel/oil spill emergency action plan is in place at all times.
- .6 The contractor shall comply with the "BC Marine and Pile Driving Contractors Association, Best Management Practices for Pile Driving and Related Operations"

1.13 DRAWINGS

- .1 Additional drawings: the Engineer may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only. Such drawings shall have the same meaning and intent as if they were included with the plans and referred to in the Contract documents.
- .2 Scale measurements taken from scaled drawings shall not apply for purposes of interpretation. The Contractor shall take his own measurements before presenting his tender.
- .3 Records:
 - .1 Two (2) complete sets of drawings and specifications shall be kept on the plant in the possession of the Contractor during the Contract period.
 - .2 As the work progresses, the Contractor shall keep an accurate list of all changes made in the work and show such changes clearly on two (2) sets of plans to be returned to the Engineer at the completion of the work.

1.14 HAZARDOUS MATERIALS

- .1 Comply with federal and provincial legislation pursuant to the storage, handling, and use of controlled products.

1.15 CODES AND STANDARDS

- .1 All work shall meet or exceed the requirements of the latest edition of the standards of the Canadian Government Specification Board (CGSB), Canadian Standards Association (CSA), National Building Code of Canada (NBCC), Worker's Compensation Board of B.C., Canada Labor Code, American Society of Testing and Materials (ASTM), and other standards referred to in the tender documents.
- .2 The requirements of the standards referenced to in the drawings and the specifications shall not be violated on the pretext that the provincial and local regulations are less stringent. Where conflict arises in the course of work, the strictest standards shall apply.

1.16 PERMITS, CERTIFICATES, AND FEES

- .1 The Contractor shall give all notices, obtain and pay all fees and permits, and all other services required or requested by the authorities having local jurisdiction.
- .2 The Contractor shall be responsible for all damages and costs which result from the Contractor's failure to pay the fees and procure the permits referred to herein.
- .3 The Contractor shall pay all accounts produced by the federal, provincial, and municipal authorities and relating to the present project.

1.17 INSPECTION AND TESTING OF MATERIALS

- .1 Inspection and testing will be arranged by Canadian Coast Guard unless otherwise specified. The cost of these services will be borne by Canadian Coast Guard, except as otherwise indicated.
- .2 If defects are revealed during inspection and/or testing, the Engineer will request additional inspection and/or testing to ascertain the full degree of defect. The Contractor shall pay the costs for re-testing and re-inspection.
- .3 Satisfactory inspection at any stage does not preclude future rejection if materials and workmanship subsequently are found to lack uniformity or fail to conform to the requirements specified. Acceptance will not be made until the materials are satisfactorily installed in the completed structure as specified.

1.18 ENVIRONMENTAL PROTECTION

- .1 Comply with Federal, Provincial and Municipal laws, orders, and regulations concerning the protection of the environment and the control and abatement of soil, water, and air pollution.
- .2 Do not dispose of waste or volatile materials such as oil, paint thinners, or mineral spirits into waterways, storm or sanitary sewers.
- .3 Fires and burning of rubbish on site not permitted.
- .4 The mitigation measures outlined in the Appendix will form part of the specification. The Contractor will keep a copy of the report on site.

1.19 RESTORATION

- .1 Any portion of the existing structure or other facilities at the site damaged due to construction activities will be restored to new condition at the Contractor's expense.

1.20 MATERIAL DISPOSAL

- .1 Material designated to be removed will become the property of the Contractor and is to be disposed of in an environmentally acceptable manner so that it becomes neither a menace to marine navigation nor a nuisance to the public on any property.
- .2 Unless otherwise specified, all existing material to be replaced or renewed will be disposed of in accordance with Clause 1.20.1 above.

1.21 TAXES

- .1 The Contractor shall pay all provincial and municipal taxes levied by law. Do not include any amounts for the federal Goods and Services Tax in the

tender price. Any amounts to be levied in respect of the GST will be billed as a separate item on the request for progress payment submitted by the Contractor. The appropriate GST levy will be paid to the Contractor in addition to the amount approved by the Engineer for the work performed under the Contract and will not affect any of the individual amounts or the total amount of the Contract. The Contractor will be required to remit the appropriate amount to Revenue Canada in accordance with the applicable legislation.

1.22 MEASUREMENT FOR PAYMENT

.1 General:

- .1 Payment for work will be made at the Prices Per Unit as tendered for the various classifications of the work appearing in the "Unit Price Table" of the Form of Tender.
- .2 Any work called for in the specifications or shown on the plans, or which is necessary for the completion of the work called for in the specifications and is not specifically listed as a separate item in the "Unit Price Table", shall be deemed incidental to the general purpose of the Contract and no separate payment will be made on account of any such work, but the cost of any such incidental work shall be included in the Price Per Unit values as tendered for the various items appearing in the "Unit Price Table".

.2 Mobilization, Demobilization, Site Preparation, Disposal, and General Conditions - Pay Item #1:

- .1 The unit of measurement will be a single fixed item. This item will include all costs associated with mobilizations and demobilizations, removal of debris, the General Conditions, requirements and instructions of the Contract, and preparing the site for the work and cleaning up after completion.
- .2 Mobilization and demobilization required to move the plant, material, and labour within each work area is not a pay item.
- .3 The demolition and removal of the existing logs, mooring chains, and concrete anchors will be included in this pay item

.3 Supplying and Install New Camel Connections - Pay Item #2:

- .1 The unit of measurement will be each camel connection supplied and remaining an integral part of the completed work as specified and accepted by the Engineer.
- .2 The supply and installation of the new steel plates and pipe sleeves will be included in this pay item.
- .3 The supply and installation of new hardware to secure the connections be included in this pay item.

- .4 The removal and disposal of the existing camel connections will be included in this pay item.

.4 Steel Camel Repair - Pay Item #3:

- .1 The unit of measurement will be a lump sum item for the repairs to the leaks for the seven (7) steel camels as specified and accepted by the Engineer.
- .2 The supply and installation of the steel plates (if any) and all necessary hardware will be included in this pay item.

.5 Marine Growth Removal on Steel Camels - Pay Item #4:

- .1 The unit of measurement will be a lump sum item for the cleaning and removal of marine growth on the steel camels. This will include removing the marine growth on all surfaces including above and below the water line.

Part 2 - Products

2.1 GENERAL

- .1 Except as otherwise noted, only new materials will be used in and remain an integral part of this structure.
- .2 The Engineer may inspect materials and products (excluding Owner-supplied materials) at his discretion at all stages of their manufacture, transportation and assembly. Satisfactory inspection at any stage does not preclude future rejection if the materials or products are subsequently found to lack uniformity or fail to conform to the requirements specified. Acceptance will not be made until the materials or products are satisfactorily installed in the completed structure as specified.

2.2 METAL FABRICATION

- .1 Materials:**
 - .1 Steel sections and plates: to CAN3-G40.21, Grade 300W.
 - .2 Welding materials: to CSA W59.
 - .3 Welding electrodes: to CSA W48, electrode to match steel grade and metallurgy
 - .4 Steel pipe: to ASTM A53/A53M, Grade B, Type E, Schedule XXS

2.4 STEEL

- .1 Small fastenings will conform to the standard for Wire Nails, Spikes, and Staples, Canadian Standards Association (CSA) B111.
- .2 Drift bolts, washers and miscellaneous iron will conform to the standard for General Purpose Structural Steel of the CAN3-G40.21.
- .3 All bolts will be machine bolts conforming to ASTM A307 unless otherwise specified.
- .4 Items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties are not acceptable.

- .5 All bolts will be of the full dimension specified or shown on the plan. Unless otherwise specified, all machine bolts will be provided with steel plate washers under head and nut. The steel plate washers shall be round unless specified square and, unless otherwise specified, shall be selected for size from the table below:

WASHER DIMENSIONS

Bolt Size	Thickness	Round Plate Outside Diameter.	Square Plate Side Size
13 mm	5 mm	62 mm	62 mm
16 mm	6 mm	69 mm	69 mm
19 mm	6 mm	75 mm	75 mm
22 mm	8 mm	81 mm	81 mm
25 mm	9 mm	87 mm	87 mm
32 mm	11 mm	100 mm	100 mm
38 mm	11 mm	112 mm	112 mm

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

2.5 HARDWARE

- .1 All bolts (including drift bolts, machine bolts, carriage bolts, lag bolts, eyebolts, etc.), nuts and washers will be hot dip galvanized in accordance with CAN/CSA - G164. Unless otherwise specified, staples, cable clamps, pipe sleeves, spikes and nails will also be hot dip galvanized in accordance with ASTM A153. All other hardware specified to be galvanized will be hot dip galvanized in accordance with CAN/CSA - G164.

Part 3 - Execution

3.1 Cleaning

- .1 Scrape and brush off all foreign substance and marine growth at all surfaces of the steel camels (above and below waterline).

3.2 Installation

- .1 Contractor to be certified to the Canadian Welding Bureau (CWB) to CAN/CSA Standards 47.1, Division 2.
- .2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush
- .4 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .5 Do welding work in accordance with CSA W59 unless specified otherwise.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of British Columbia
 - .1 Workers Compensation Act, RSBC 1996 - Updated 2006.
 - .2 Occupational Health and Safety Regulation.
- .4 National Building Code of Canada (NBC)
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.

1.2 WORKERS COMPENSATION BOARD COVERAGE

- .1 Comply fully with Workers' Compensation Act, regulations, and orders made pursuant thereto and any amendments up to the completion of work
- .2 Maintain Workers' Compensation Board coverage during term of Contract, until and including date that Certificate of Final Completion is issued.

1.3 COMPLIANCE WITH REGULATIONS

- .1 DFO may terminate Contract without liability to Canada where Contractor, in the opinion of DFO, refuses to comply with a requirement of Workers' Compensation Act or Occupational Health and Safety Regulations.
- .2 Contractor is responsible to ensure that all workers are qualified, competent and certified to perform work as required by Workers' Compensation Act or Occupational Health and Safety Regulations.

1.4 SUBMITTALS

- .1 Submit to Department Representative submittals listed for review.
- .2 Work effected by submittal will not proceed until review is completed.
- .3 Submit the following:
 - .1 Health and Safety Plan.
 - .2 Copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
 - .3 Copies of incident and accident reports.
 - .4 Copies of Material Safety Data Sheets and all other documents required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .5 Emergency procedures

- .4 Submission of Health and Safety Plan and any revised version to the Departmental Representative is for information and reference purpose only. It will not:
 - .1 Be construed to imply as approval by Department Representative
 - .2 Be interpreted as warranty of being complete, accurate, and compliant.
 - .3 Relieve the Contractor of his legal obligations for provision of health and safety for the project.
- .5 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

1.5 WORK PERMITS

- .1 Obtain speciality permit(s) related to the project before start of work

1.6 FILING OF NOTICE

- .1 Complete and submit Notice of Project as required by Provincial authorities.
- .2 Provide copies of all notices to Department Representative.

1.7 SAFETY ASSESSMENT

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

1.8 MEETINGS

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

1.9 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.

1.10 GENERAL CONDITIONS

- .1 Provide safety barricades and lights at work site as required to provide safe working environment for workers
- .2 Ensure that non-authorized persons are not allowed in designated construction areas and work site.
 - .1 Provide appropriate means by use of barricades, fences, and warning signs.

1.11 REGULATORY REQUIREMENTS

- .1 Comply with specified codes, acts, bylaws, standards, and regulations to ensure safe operations at site.
- .2 In the event of conflict between any provision of above authorities, the most stringent provision will apply.

1.12 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.

1.13 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations having jurisdiction and advise Departmental Representative verbally and in writing.

1.14 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 the work outlined in the Contract.
 - .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.
 - .5 Be on site during execution of work.

1.15 HAZARDOUS PRODUCTS

- .1 Comply with the requirements of Workplace hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Departmental Representative and in accordance with Canada Labour Code.

1.16 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations having jurisdiction, and in consultation with Departmental Representative.

1.17 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. The Contractor will be responsible for costs arising from such "stop work order".

1.18 CONFINED SPACES

- .1 Carry out work in confined spaces in compliance with Provincial regulations.

1.19 OVERLOADING

- .1 Ensure no part of the work is subject to a load which will endanger its safety or will cause permanent deformation

1.20 FIRE SAFETY REQUIREMENTS

- .1 Store oily/paint soaked rags, waste products, and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis
- .2 Handle, store, use and dispose of inflammable and combustible materials in accordance with the National Fire Code of Canada.

1.21 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

APPENDICES

Standard Mitigation Organized by Project Activity

PROJECT ACTIVITY	MITIGATION
<p>GENERAL (to be incorporated into all activities below)</p>	<ol style="list-style-type: none"> 1. Ensure all personnel involved with activities are adequately trained and utilize appropriate personal protective equipment. 2. Storage of fuels and petroleum products will comply with safe operating procedures, including containment facilities in case of a spill. 3. Waste or any miscellaneous unused materials will be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown into the marine or terrestrial environment. 4. Onsite crews will have emergency spill equipment available. 5. All activities should be completed in such a way as to minimize stress and disturbance to resident flora and fauna. 6. Operations should only operate where entirely necessary to complete the works to reduce effects to nearby soils, vegetation, and resident species. Respect should be given to the natural environment to minimize the footprint of the project. 7. Aesthetic effects created by activities will be short-term and localized. Sites should be kept in a tidy manner during activities and left in a good condition at the end of the project. 8. Archaeological sites in remote locations are not likely to have been previously identified. Care should be taken to observe archaeological deposits while work is being completed. Work must be stopped if evidence shows a potential archaeological artifact or deposit.
<p>MACHINERY OPERATION</p>	<ol style="list-style-type: none"> 1. All equipment will be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products. 2. Vehicles should not be operated below the line of Highest High Water in the intertidal zone. 3. Operations should only operate where entirely necessary to complete the works to reduce effects to nearby soils, vegetation, and resident species. Respect should be given to the natural environment to minimise the footprint of the project. 4. Machinery must be operated efficiently, to ensure that noise and air quality issues are short-term and local.
<p>POWER-WASHING</p>	<ol style="list-style-type: none"> 1. Activities should be completed in such a way as to minimise the amount of fines and organic debris that may enter nearby aquatic environments.
<p>EXCAVATION/ROCK DRILLING</p>	<ol style="list-style-type: none"> 1. Rock drilling and excavation activities must be conducted conservatively so that physical changes to rock remain small and localized. 2. Dust and fines entering the water must be avoided. 3. Archeological sites in remote locations are not likely to have been previously identified. Care should be taken to observe archaeological deposits while work is being completed. Work must be stopped if

Standard Mitigation Organized by Project Activity

PROJECT ACTIVITY	MITIGATION
EXCAVATION/ROCK DRILLING continued	<p>evidence shows a potential archaeological artifact or deposit.</p> <ol style="list-style-type: none"> 4. Loose material at excavation sites should be managed to avoid excessive migration of silt and debris to nearby waters, especially during heavy rainfall events. 5. All excavation below Highest High Water should be completed by hand, as no vehicles should be operated in the intertidal zone. 6. Any blasting will follow the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters.
PILE INSTALLATION	<ol style="list-style-type: none"> 1. All equipment will be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products. 2. Contractors where possible will position their water borne equipment in a manner that will minimize damage to identified fish habitat (e.g. eel grass). Where possible, alternative methods will be employed (e.g. use of anchors instead of spuds). 3. Proper notice should be given to transportation authorities to warn of potential disruptions to navigability during works. 4. Whenever Contractors are working in areas where spawning is present, appropriate monitoring by a qualified person will be undertaken and activities ceased if spawn disruption is apparent. 5. Where possible, new timber piles will comply with the BMP for the use of treated wood in aquatic environments as developed by the Canadian Institute of Treated Wood and the Western Wood Preservers Institute. 6. Where the BMP pilings are not available, creosote piling will stand for a minimum of 45 days prior to installation. These requirements are for new pilings only and will not restrict the use of re-used timber pilings. Reused pilings will not be subject to any additional treatments. 7. If pile installation activities are causing fish kill, work must cease immediately and contractors will be responsible for introducing effective means of reducing the level of shock waves or introduce measures that will protect fish from entering the potentially harmful shock wave area. For example, appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile that would defuse the shock waves to an acceptable level. 8. If, after preventive measures are introduced, visual monitoring reveals unacceptable conditions (fish kill), then work will stop immediately and the system reviewed and corrected. 9. Any instances of fish kill must be reported to the appropriate agencies (DFO). 10. When cleaning out pipe piles (i.e. air lifting), if the material that is to be removed inside the pipe is non-toxic, then it shall be redistributed in a manner that will minimize damage to the surrounding aquatic fish habitat.

Standard Mitigation Organized by Project Activity

PROJECT ACTIVITY	MITIGATION
CONCRETE WORKS	<ol style="list-style-type: none"> 1. When pouring concrete all spills of fresh concrete must be prevented. If concrete is discharged from the transit mixer directly to the form work or placed by wheelbarrow, proper sealed chutes must be constructed to avoid spillage. If the concrete is being placed with a concrete pump, all hose and pipe connections must be sealed and locked properly to ensure the lines will not leak or uncouple. Crews will ensure that concrete forms are not filled to overflowing. 2. All concrete forms will be constructed and sealed in a manner which will prevent fresh concrete or cement laden water from leaking into the surrounding water. 3. All tools, pumps, pipes, hoses and trucks used for finishing, placing or transporting fresh concrete must be washed off in such a way as to prevent the wash off water from entering the marine environment. The wash water will be contained and disposed of upland in an environmentally acceptable manner.
SITE ACCESS	<ol style="list-style-type: none"> 1. Site access practices must be undertaken with regard to resident flora and fauna, especially during times of the year when they are most sensitive.
AID MAINTENANCE	<ol style="list-style-type: none"> 1. Equipment maintenance activities must be completed in a manner that prevents the deposit of foreign materials to the environment. 2. Power washing activities must follow mitigation provided under “POWER-WASHING” 3. An approach of “contain and recover” should be adopted. Drop sheets or other means should be used to prevent paint chips and other debris from entering the surrounding environment. Refuse should be disposed of properly. 4. Painting activities should be completed in such a way as to minimise the amount of fumes that may enter the environment. The amount of paint used should be minimized and unused containers must be covered.
PILE REMOVAL	<ol style="list-style-type: none"> 1. Contractors will position their water borne equipment in a manner that will minimize damage to identified fish habitat (e.g. eel grass). Where possible, alternative methods will be employed (e.g. use of anchors instead of spuds). 2. When demolition is required on timber pile structures, the contractor will remove the piling by mechanical means and avoid breaking the piling at the mud line or below. All demolition operations should be monitored in order to control and contain the construction debris.
CONCRETE BASE REMOVAL	<ol style="list-style-type: none"> 1. Contractors where possible will position their water borne equipment in a manner that will minimize damage to identified fish habitat (e.g. eel grass). Where possible, alternative methods will be employed (e.g. use of anchors instead of spuds). 2. All debris deposited throughout the life of the aid should be removed from the site.
CONCRETE BASE ABANDONMENT	<ol style="list-style-type: none"> 1. Care should be taken to remove all components of the Fixed Aid that are not incorporated into the concrete base.

Standard Mitigation Organized by Project Activity

PROJECT ACTIVITY	MITIGATION
CONCRETE BASE ABANDONMENT continued	<ol style="list-style-type: none">2. All debris deposited throughout the life of the aid should be removed from the site.3. Areas near the base should be protected from excessive disturbance.4. Concrete base abandonment will be conducted only in remote sites, where aesthetic effects are not a concern.