Public Works and Government Services Canada

Requisition No: EZ899-200403/A

DRAWINGS & SPECIFICATIONS
for

Lake Windermere Groyne
Marker Pile Installation
Project # R.074582.003

APPROVED BY:

Regional Manager, AES — Date: 2018-12-03

Construction Safety Coordinator — Date: 2018-11-29

TENDER:

Project Manager — Date: Dec. 3/18

Real Property Services Branch, Professional and Technical Services, Pacific Region
Room 219 - 800 Burrard Street, Vancouver, B.C., V6Z 0B9

SPECIFICATIONS..... NUMBER OF PAGES

Division 1

Division 35

APPENDICES – BOUND WITH SPECIFICATIONS

DRAWINGS - BOUND SEPARATELY

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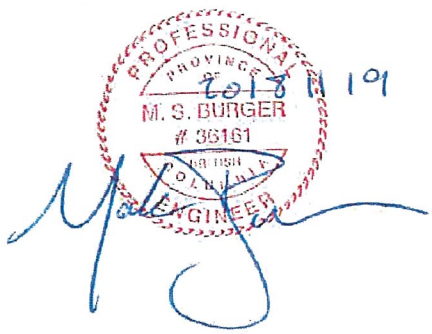

1 GENERAL

1.1 RELATED REQUIREMENTS

1.1.1 Not applicable.

1.2 SECTION INCLUDES

1.2.1 Location of site.

1.2.2 Site conditions.

1.2.3 Work covered by contract documents.

1.2.4 Time of completion.

1.2.5 Use of site.

1.3 PRECEDENCE

1.3.1 Division 1 Sections take precedence over technical specification sections in other Divisions of these Project Specifications.

1.4 SITE CONDITIONS

1.4.1 Contractors are encouraged to visit the site before submitting the tender. Make inquiries or investigations necessary to become thoroughly acquainted with site, soil and climatic conditions, as well as seasonal ice cover and water level variations, along with the nature and extent of the work.

1.4.2 All known discrepancies are to be brought to the attention of the Departmental Representative and are to be accounted for in the Contractor's Bid Price.

1.5 LOCATION AND DESCRIPTION OF SITE

1.5.1 The work is located at the north (downstream) end of Lake Windermere offshore from the town of Invermere, BC.

1.5.2 The work will take place along a rock groyne located in the lake. The groyne is 205 m long and consists of rocks (some of which are partially exposed above the lake bottom) with wood cribbing and a brush mattress (which are buried below the lake bottom). The work site includes the entire groyne.

1.5.3 No on-shore areas are included in the site of work. The Contractor is responsible to arrange with the upland owners for use of their property including for access. Provide a

copy of the agreement for use ten (10) working days before start of construction.

1.6 WORK COVERED BY CONTRACT DOCUMENTS

1.6.1 The principal works to be executed and for which all materials, plant and labour are to be supplied by the Contractor as shown on the drawings and in the specifications:

1.6.1.1 Install 13 pile markers along the groyne as shown on the drawings and as described in the specifications.

1.7 REFERENCES

1.7.1 National Research Council of Canada (NRC):

1.7.1.1 National Building Code of Canada (NBC) 2015.

1.7.2 See Section 01 35 33 for additional references.

1.8 CODES AND STANDARDS

1.8.1 Perform work in accordance with the National Building Code of Canada (2015), any other federal code, the Workers' Compensation Board of B.C., and any other code of provincial or local application provided that, in any case of conflict or discrepancy, the most stringent requirements shall apply.

1.8.2 Meet or exceed requirements of specified standards, codes and referenced documents.

1.9 DOCUMENTS REQUIRED

1.9.1 Maintain at job site one copy of the following:

1.9.1.1 Contract drawings and approved shop drawings

1.9.1.2 Specifications

1.9.1.3 Addenda

1.9.1.4 Change orders

1.9.1.5 Other modifications to contract

1.9.1.6 Copy of approved work schedule

1.9.1.7 Manufacturer's installation and application instructions

1.9.1.8 Health and Safety Plan and Fire Safety Plan

1.9.1.9 Environmental Emergency Response Plan (including Spill Response Plan)

1.9.2 Departmental Representative may furnish additional drawings to assist proper execution

of work. These documents will be issued for clarification only. Such documents will have the same meaning and intent as if they were included in the plans referred to in the Contract documents.

1.10 RECORD DRAWINGS

1.10.1 As work proceeds, maintain accurate records to show all deviations from the contract drawings. Note on as-built drawings as changes occur, and at completion supply one copy marked with all changes.

1.11 GEOTECHNICAL DATA

1.11.1 The existing groyne cross section was verified by limited test pitting. No other geotechnical data is available for this project.

1.12 DATUM

1.12.1 All elevations or soundings used in the drawings and specifications refer to Geodetic Survey of Canada (GSC) datum.

1.12.2 For the purposes of this Contract, local low water datum will be taken as 798.5 metres above Geodetic Datum.

1.13 LAYOUT OF WORK

1.13.1 Survey control points including elevation are shown on the drawings. The Contractor is to lay out the work from these control points.

1.13.2 Lay out work on the ground and execute the work to the Departmental Representative's satisfaction.

1.14 ASSISTANCE BY THE CONTRACTOR

1.14.1 Place tugs or other small work vessels at the Departmental Representative's disposal as required for transportation to and from the working equipment, or for the Departmental Representative to perform his duties.

1.15 TIME OF COMPLETION

1.15.1 Complete work within 6 weeks of Contract award.

1.16 WORK SCHEDULE

1.16.1 The work on site is to be carried out and completed within the applicable environmental window of **July 15 to August 31, 2019**.

1.16.2 Within 5 working days of Contract award, provide a schedule of work. Observe the

following requirements:

1.16.2.1 Submit shop drawings and proposed installation procedures for pile markers with the schedule of work. Allow 5 working days for PWGSC review.

1.16.2.2 Whenever a variation from the schedule in excess of 10 working days occurs or is expected to occur, notify Departmental Representative of the change.

1.16.3 Provide information as indicated below:

Materials Assembly Phase:

Materials	Supplier and/or fabricator	Date of Delivery
Piling		

Construction Phase

Activity on site	Start	Complete
Pile Driving		

1.16.4 Notify the local Fisheries Officer no less than 5 days before start and completion of operations at site.

1.17 USE OF SITE

1.17.1 Hours of work

1.17.1.1 Perform work between normal hours of 07:00 to 18:00, Monday to Friday, except holidays and in accordance with local noise bylaws.

1.17.1.2 Work may be performed after working hours, on weekends and holidays as approved by Departmental Representative.

1.18 ENVIRONMENTAL FACTORS

1.18.1 Ensure that operations meet all applicable environmental regulations and standards.

1.18.2 Prepare a Spill Prevention Plan [and an Environmental Emergency Response Plan] for the work.

1.18.2.1 Provide 1 copy to the Departmental Representative 14 days before start of construction.

1.18.2.2 Provide materials, equipment and personnel required to carry out the plan.

1.19 PROJECT MEETINGS

1.19.1 The Contractor will arrange project meetings and assume responsibility for setting times

and recording and distributing minutes.

1.20 LOCATION OF EQUIPMENT AND FIXTURES

1.20.1 Location of existing equipment and fixtures indicated or specified is to be considered as approximate.

1.21 MATERIAL AND EQUIPMENT

1.21.1 Metric-Sized Products:

1.21.1.1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.

1.21.1.2 The Contractor is required to provide metric products where specified in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.

1.21.2 Material and Equipment:

1.21.2.1 Use new material and equipment unless otherwise specified.

1.21.3 Delivery and Storage:

1.21.3.1 labels intact.

1.21.3.2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

1.21.3.3 over name plates.

1.21.4 Construction Equipment and Plant:

1.21.4.1 On request, prove to the satisfaction of Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.

1.22 SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND OTHER SUBMISSIONS

1.22.1 Submit as specified and on request to the Departmental Representative, for review, shop drawings, product data, samples, and other submissions, all submissions will be referred to as Shop Drawings.

1.22.2 Product Data:

1.22.2.1 Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations

and other standard descriptive data will be accepted in lieu of shop drawings, provided that the product concerned is clearly identified. Submit in sets, not as individual submissions.

1.22.3 Submission Requirements:

1.22.3.1 Schedule submissions at least 14 days before dates reviewed submissions will be needed.

1.22.3.2 Submit number of copies of product data, shop drawings which Contractor requires for distribution plus one (1) electronic copy which will be retained by Departmental Representative.

1.22.4 Coordination of Submissions:

1.22.4.1 Review shop drawings, product data and samples prior to submission.

1.22.4.2 Responsibility for errors and omissions in submittals is not relieved by Departmental Representative's review of submittals.

1.22.4.3 Responsibility for deviations in submittals from requirements of Contract documents is not relieved by Departmental Representative's review of submittals, unless Departmental Representative gives written acceptance of specified deviations.

1.22.4.4 After Departmental Representative's review, distribute copies.

1.23 SHOP DRAWING REVIEW

1.23.1 The review of shop drawings by Public Works and Government Services Canada is for the sole purpose of ascertaining conformance with the general concept.

1.23.2 This review shall not mean that Public Works and Government Services Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents.

1.23.3 Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

1.24 TESTING AND INSPECTION SERVICES

1.24.1 Where tests or inspections performed by the testing service or Departmental Representative reveal work is not in accordance with the contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental

Representative may require to verify acceptability of corrected work.

1.24.2 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Departmental Representative.

1.25 INTERPRETATION

1.25.1 In interpreting the Contract, in the event of discrepancies or conflicts between anything in the Plans and Specifications and the General Conditions, the General Conditions govern.

1.25.2 In interpreting the Plans and Specifications, in the event of discrepancies or conflicts between:

1.25.2.1 the Plans and Specifications, the Specifications govern;

1.25.2.2 the Plans, the Plans drawn with the largest scale govern;

1.25.2.3 figured dimensions and scaled dimensions, the figured dimensions govern; and

1.25.2.4 the appendices and the Plans or Specifications, the Plans or Specification govern.

2 PRODUCTS

Not applicable.

3 EXECUTION

Not applicable.

END OF SECTION

PWGSC Update on Asbestos Use

Effective April 1, 2016, all Public Service and Procurement Canada (PSPC) contracts for new construction and major rehabilitation will prohibit the use of asbestos-containing materials. Further information can be found at:

http://www.tpsgc-pwgsc.gc.ca/comm/vedette-features/2016-04-19-00-eng.html

General

1.1. References

1.1.1. Government of Canada

1.1.1.1. Canada Labour Code – Part II

1.1.1.2. Canada Occupational Health and Safety Regulations

1.1.2. National Building Code of Canada 2015 (NBC 2015):

1.1.2.1. Part 8, Safety Measures at Construction and Demolition Sites.

1.1.3. Canadian Standards Association (CSA): as amended:

1.1.3.1. CSA S269 Falsework for Construction Purposes.

1.1.3.2. CSA Z797-2009 Code of Practice for Access Scaffold

1.1.3.3. CSA-S350-M, Code of Practice for Safety in Demolition of Structures.

1.1.4. National Fire Code of Canada (as amended):

1.1.4.1. Part 5 – Hazardous Processes and Operations and Division B as applicable and required.

1.1.5. American National Standards Institute (ANSI):

1.1.5.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.

1.1.6. Province of British Columbia:

1.1.6.1. Workers Compensation Act Part 3 Occupational Health and Safety.

1.1.6.2. Occupational Health and Safety Regulation.

1.2. Related Sections

1.2.1. Section 01 11 05 Marine General Instructions

1.2.2. Section 35 05 51 Marine General Sitework

1.3. Workers Compensation Board Coverage

1.3.1. Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.

1.3.2. Maintain Workers' Compensation Board coverage through WorkSafe BC during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.4. Compliance with Regulations

1.4.1. PSPC may terminate the Contract without liability to PSPC where the Contractor, in the opinion of PSPC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.4.2. It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.5. Submittals

1.5.1. Submit to Departmental Representative submittals listed for review in accordance with Section 01 11 05 Marine General Instructions.

1.5.2. Work affected by submittals shall not proceed until review is complete.

1.5.3. Submit the following:

1.5.3.1. Health and Safety Plan

1.5.3.2. Copies of reports or directions issued by Federal and Provincial Health and Safety inspectors.

1.5.3.3. Copies of incident and accident reports.

1.5.3.4. Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.

1.5.3.5. Emergency Procedures.

1.5.4. The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 working days after receipt of the plan. Revise the plan as appropriate and re-submit to Departmental Representative.

1.5.5. Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:

1.5.5.1. Be construed to imply approval by the Departmental Representative.

1.5.5.2. Be interpreted as a warranty of being complete, accurate and legislatively compliant.

1.5.5.3. Relieve the Contractor of his legal obligations for the provision of Health and Safety on the project.

1.5.6. 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.

1.6. Responsibility

1.6.1. Assume responsibility as the Prime Contractor for all the work under this contract.

1.6.2. Be responsible for health and safety of persons on the work 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 the Work.

1.6.3. 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.

1.7. General Conditions

1.7.1. Health and Safety plan is to indicate how the contractor proposes to isolate the site of this work from the activities of other employers and the public on the property. Separation may be achieved by physical barriers or by time. Include as appropriate a plan of the site showing the outline of the work site including storage and work areas which the contractor proposes to use.

1.7.2. Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian, vehicular, vessel, and seaplane traffic. This includes winter use of the groyne on top of the ice.

1.7.3. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

1.7.3.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel and temporary lighting as required.

1.7.3.2. Secure site at night time or provide security guard as deemed necessary to protect site against entry.

1.8. Project/Site Conditions

1.8.1. Work at site will involve:

1.8.1.1. Pile driving near and under the lake surface.

1.8.1.2. Slippery and unstable surfaces.

1.8.1.3. Possible use of the lake by the public near the site of work.

1.9. Regulatory Requirements

1.9.1. Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

1.9.2. In event of conflict between any provisions of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

1.10. Filing of Notice

1.10.1. The Prime Contractor is to complete and submit a Notice of Project to WorkSafe BC.

1.10.2. Provide copies of all notices to the Departmental Representative within two (2) days of submitting to WorkSafe BC.

1.11. Health and Safety Plan

1.11.1. Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

1.11.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

1.11.2.1. Primary requirements:

1.11.2.1.1. Contractor's safety policy

1.11.2.1.2. Identification of applicable compliance obligations

1.11.2.1.3. Definition of responsibilities for project safety/organization chart for project.

1.11.2.1.4. General safety rules for project

1.11.2.1.5. Job-specific safe work procedures

1.11.2.1.6. Inspection policy and procedures

1.11.2.1.7. Incident reporting and investigation policy and procedures.

1.11.2.1.8. Occupational Health and Safety Committee/ Representative procedures.

1.11.2.1.9. Occupational health and safety meetings.

1.11.2.1.10. Occupational Health and Safety communications and record keeping procedures.

1.11.2.2. Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.

1.11.2.3. List of hazardous materials to be brought on site as required by work.

1.11.2.4. Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.

1.11.2.5. Identify personnel protective equipment (PPE) to be used by workers.

1.11.2.6. Identify personnel and alternate responsible for site safety and health.

1.11.2.7. Identify personnel training requirements and training plan, including site orientation for new workers and visitors.

1.11.3. Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

1.11.4. Revise and update the Health and Safety Plan as required, and re-submit to the Departmental Representative.

1.11.5. Departmental Representative's review of Health and Safety Plan shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

1.12. Emergency Procedures

1.12.1. List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:

1.12.1.1. Designated personnel from own company

1.12.1.2. Regulatory agencies applicable to work and as per legislated regulations.

1.12.1.3. Local emergency resources

1.12.1.4. Departmental Representative

1.12.2. Include the following provisions in the emergency procedures:

1.12.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency.

1.12.2.2. Evacuate all workers safely.

1.12.2.3. Check and confirm the safe evacuation of all workers.

1.12.2.4. Notify the fire department or other emergency responders.

1.12.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.

1.12.2.6. Notify Departmental Representative.

1.12.3. Provide written rescue/evacuation procedures as required for, but not limited to:

1.12.3.1. Work on, over, under and adjacent to water.

1.12.4. Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.13. Hazardous Products

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

1.13.2. Where use of hazardous and toxic products cannot be avoided:

1.13.2.1. Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents.

1.13.2.2. In conjunction with Departmental Representative, schedule to carry out work during "off hours" when the public is least likely to be impacted.

1.14. Fire Safety and Hot Work

1.14.1. Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.

1.14.2. Hot work includes cutting/melting with use of torch, flame heating roofing kettles, other open flame devices, and grinding with equipment which produces sparks.

1.15. Fire Safety Requirements

1.15.1. Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

1.15.2. Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.16. Unforeseen Hazards

1.16.1. Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

1.17. Posted Documents

1.17.1. Post legible versions of the following documents on site:

1.17.1.1. Health and Safety Plan.

1.17.1.2. Emergency procedures.

1.17.1.3. Notice of Project.

1.17.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

1.17.1.5. Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.

1.17.1.6. Workplace Hazardous Materials Information System (WHMIS) documents.

1.17.1.7. Material Safety Data Sheets (MSDS).

1.17.2. Post all Material Safety Data Sheets (MSDS) on site, in a common area, protected from inclement weather, visible to all workers.

1.18. Meetings

1.18.1. Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

1.19. Correction of Non-Compliance

1.19.1. Immediately address health and safety non-compliance issues identified by the Departmental Representative.

1.19.2. Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

1.19.3. The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected

immediately or within posted time. The Prime Contractor will be responsible for any costs arising from such a "stop work order".

2. Products

Not Applicable

3. Execution

Not applicable

END OF SECTION

1 GENERAL

1.1 REFERENCES

1.1.1 American Society for Testing and Materials (ASTM):

1.1.1.1 ASTM A123/A123M-02, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

1.1.1.2 ASTM A307 04, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

1.1.2 Canadian Standards Association (CSA):

1.1.2.1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

1.1.2.2 CAN3-O56-M79 (R2001), Round Wood Piles.

1.1.2.3 CSA O121 M1978 (R2003), Douglas Fir Plywood.

1.2 INSPECTION AND ACCEPTANCE

1.2.1 At their discretion, the Departmental Representative may inspect materials and products at any stage of 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 specified requirements.

1.2.2 The Contract work will not be accepted until the materials or products are satisfactorily installed in the completed structure as specified.

1.2.3 Additional costs incurred by Canada that result from unsatisfactory materials or workmanship will be charged to the Contractor.

1.3 MOBILIZATION AND DEMOBILIZATION

1.3.1 Mobilization and demobilization will include all work required to supply the material, plant and labour to the various sites of the work, unless specified otherwise.

1.4 METHOD OF MEASUREMENT

1.4.1 The method of measurement for the classes of labour, plant or material constituting the

work will be as follows:

1.4.1.1 Item No. 1, Mobilization and Demobilization (Including Health and Safety)

1.4.1.1.1 Unit: a single lump sum for all mobilization and demobilization work.

1.4.1.2 Item No. 2, Supplying and Driving Untreated Piling

1.4.1.2.1 Unit: each lineal metre of new untreated piling supplied, placed and remaining an integral part of the completed work as specified, measured from cut-off to ground line plus actual penetration into the ground.

1.4.1.2.2 If ground conditions are such that specified penetration cannot be obtained without damaging the pile, measurement will include the portion of cutoff representing the difference between specified and actual penetration.

1.4.1.2.3 Penetration in excess of specified penetration will not be measured for payment unless the Departmental Representative is satisfied that such penetration is necessary and has so notified the Contractor in writing.

1.4.1.2.4 Make allowance in pile lengths to obtain specified penetration and to allow pile to be cut off at a sound section below any damage from driving. No portion of cut off will be measured for payment.

1.4.1.2.5 One aluminum pile cap is to be provided for each installed pile. The cost of supply and installation of the cap shall be included under this item.

1.4.1.2.6 Supply and installation of navigation markers on Pile P1 shall be included under this item.

2 PRODUCTS

2.1 GENERAL

2.1.1 Use only new materials except where specified otherwise.

2.2 PILING

2.2.1 Wood piling (round):

2.2.1.1 Douglas Fir to CSA O56, untreated.

2.2.1.2 Piles to be size 36, peeled, unless otherwise specified.

2.2.2 Aluminum caps shall be provided for installation on each pile.

2.3 HARDWARE

2.3.1 Bolts (drift, machine, carriage, lag, etc.), nuts and washers: hot dip galvanized to

CAN/CSA-G164.

2.3.2 Spikes and nails: hot dip galvanized to CAN/CSA-G164 unless otherwise specified.

2.3.3 Navigation markers shall be aluminum Starboard Hand daybeacons, minimum 300 mm tall. Two (2) markers shall be provided.

2.3.4 All other hardware specified to be galvanized: hot dip galvanized to CAN/CSA-G164 unless specified otherwise.

3 EXECUTION

3.1 PILE REMOVAL

3.1.1 Piles to be removed: fully extract from the ground.

3.1.1.1 Expected level of effort for full extraction is the use of a vibratory hammer and straight-line pull along the axis of the pile.

3.1.1.2 Minimum characteristics of vibratory hammer are to include the following:

3.1.1.2.1 Line pull 450 kN minimum.

3.1.1.2.2 Bare hammer weight 2,000 kg.

3.1.1.2.3 Adjustable frequency between 0 – 2,300 vibrations per minute.

3.1.1.2.4 Equipped with end suitable for removal of wood piles.

3.1.1.3 Contractor may chose alternate extraction methods. If full extraction is not achieved, provide alternate equipment to achieve the requirements within the specifications. Provision of this alternate equipment will be at no additional cost to Canada.

3.1.1.4 A claim for change in soil conditions will only be considered if the piles are not capable of extraction using the specified minimum equipment.

3.1.1.5 Schedule of pile removal to be confirmed with the Departmental Representative 3 business days before removal.

3.1.2 Measure, record and report the length of extracted pile which was below the mud line. The Contractor is to assist and coordinate with the Departmental Representative to verify lengths.

3.1.3 Remove large invertebrates from the piles and return them to the environment near where the piles were extracted.

3.2 **PILE DRIVING**

3.2.1 Equipment: To be capable of driving piles at each of the locations required by the drawings and the specifications.

3.2.1.1 Impact Hammer:

3.2.1.1.1 Capable of developing a blow at operating speed with an energy of not less than 20,000 joules per blow.

3.2.1.1.2 When required penetration is not obtained by use of hammers complying with the minimum requirements, use a larger hammer or take other measures approved by the Departmental Representative.

3.2.1.2 Vibratory Hammer:

3.2.1.2.1 If the contractor proposes the use of a vibratory hammer for driving piles, submit the specifications of the equipment to be used in writing to the Departmental Representative for review not less than 2 weeks before first proposed use.

3.2.1.3 Leads:

3.2.1.3.1 Pile driver leads to provide free movement of the hammer. Hold leads in position at top and bottom with guys, stiff braces, or other means approved by the Departmental Representative, to ensure support to the pile while being driven.

3.2.1.3.2 Provide length of leeds so that use of a follower is unnecessary.

3.2.2 Drive piles so as to avoid splitting, brooming, or other damage to piles. Make sufficient allowance in lengths provided to site so that, when driven to final position, pile may be cut off at a sound section.

3.2.3 Piles damaged in driving to be removed from site and replaced with new piles.

3.2.4 Replacement piles are to be driven at least 0.3 m further below mudline than the extracted piles.

3.2.5 Drive new piles at the angles specified to the penetrations shown on the drawings.

3.2.6 Drive piles to the penetration specified unless solid bearing is reached at a lesser depth and approved by the Departmental Representative in writing.

3.2.7 Cut off piles as shown on the drawings.

3.2.8 Pile tolerances are as follows:

3.2.8.1 Pile centreline to be within 0.5% of the design centreline, measured as the difference perpendicular to the centreline between the point of entering the bottom and the cut-off divided by the length between those two points.

3.2.8.2 No pile to be more than 50 mm in any direction from its design location at the cut-off elevation or the bottom elevation.

3.3 PILE TOP TREATMENT

3.3.1 Bearing piles and posts:

3.3.1.1 Cut off to provide full bearing for the cap.

3.4 **Provide further protection by covering each pile top with a sheet of 0.8 mm annealed corrosion-resistant aluminum, cut 150 mm larger than pile top diameter, edges turned down and secured to the pile with 8 aluminum roofing nails. Do not cut or otherwise puncture aluminum sheet.**

3.5 NAVIGATION MARKERS

3.5.1 Install navigation markers on Pile P1, with one marker facing north and one marker facing south to maximize visibility to boaters navigating through the navigation channel.

3.5.2 Mount navigation markers within 1.0 m from the top of pile.

3.5.3 Fasten each navigation marker to pile using minimum 2 galvanized lag bolts, minimum 12.7 mm diameter by 150 mm long, each with a washer under the head.

3.6 MATERIAL DISPOSAL

3.6.1 General:

3.6.1.1 Debris including all waste and surplus material from construction specified to be removed and disposed of becomes the property of the Contractor. Disposal of the debris shall be performed in an environmentally sensitive manner at upland site(s) approved by the Ministry of Water, Land and Air Protection under the B.C. Waste Management Act, and by other agencies having jurisdiction, including municipal authorities.

3.6.1.2 All disposal sites must be operating with up-to-date permits and licences.

3.6.1.3 The Contractor shall submit proof of approval(s), copies of current permits and licences to the Departmental Representative 10 days before the initial disposal of debris.

3.6.2 Certificates of Disposal:

3.6.2.1 Provide the Departmental Representative with certificates of disposal from the disposal site, noting the dates, quantities, weights and general description of the

debris received and proof of payment of all disposal fees.

3.6.2.2 Provide certificates within 5 days of disposal.

3.6.2.3 The Contract work will not be accepted until all certificates have been received by the Departmental Representative.

3.7 RESTORATION

3.7.1 Any portion of the existing structure or other facilities at the site that are damaged due to construction activities are to be restored to condition at the time of contract award or better at the Contractor's expense.

END OF SECTION

Best Management Practices for Pile Driving and Related Operations

BC Marine and Pile Driving Contractors Association

March 2003

The B.C. Marine and Pile Driving Contractors Association and Fisheries and Oceans Canada have developed a Best Management Practices Policy for pile driving operations and related activities when working on the water within the province of British Columbia.

The Pile Driving Industry utilizes many different construction methods, equipment and materials in order to complete the contractual obligations for its client. Hammers; including drop, diesel, air, vibratory and hydraulic, vibroflot, and rotary, air and churn drills are the primary instruments in a pile driving operation. These hammers and drills are supported by a wide variety of heavy equipment, including a range of conventional cranes (truck mounted, crawler and pedestal mounted), spud scows, support barges and other water borne equipment. The piling types include treated timber (primarily creosote), concrete and steel (pipe, h-beam and sheet). Construction projects have the potential to utilize a number of different combinations of equipment and materials. It is the purpose of this document to examine the characteristics of each potential combination and develop a Best Management Practices Policy that will meet the following criteria:

-Maximize environmental protection
-Adhere to the Fisheries and Oceans regulations
-Provide construction services economically

1)- Basic Rules of Operation

When in an aquatic environment, contractors will employ the following BASIC Best Management Practices:

- All equipment will be maintained in good proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products.
- Storage of fuels and petroleum products will comply with safe operating procedures, including containment facilities in case of a spill.
- Pile cut offs, 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 overboard.
- Contractors will have emergency spill equipment available whenever working near or on the water.
- 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). In the event that circumstances will not allow an alternative, contractors will minimize the damage and where required restore habitat to its original state at the completion of the project.

- Prior to the commencement any work that is longer than 5 working days in duration and falls under this agreement, the contractor will complete and forward the attached "Notice of Project" to the Department of Fisheries.
- Whenever Contractors are working in areas where spawning is present, the work will be temporarily suspended and the appropriate fisheries officer contacted.
- There will be no restriction of work during closure periods (with the only exception when spawning is present) provided the contractors employ an exclusion device around the work area to restrict fish access or when required an effective method of mitigating shock waves (bubble curtain).
- Whenever shock wave monitoring (hydro phone) is performed at a marine construction site and the findings are available to the contractor, the data will be forwarded to the B.C. Marine and Pile Driving Contractors Association. It is intended to build a data base of information so that work procedures will reflect the safest and most economical approach to protecting the fish and their habitat.

2)-Timber Piling (creosote):

When driving timber piling, the following Best Management Practices will be employed to ensure minimum impact to marine fish and their habitat:

- Where possible, new timber piles will comply with the best Management Practices for the use of treated wood in aquatic environments as developed by the Canadian Institute of Treated Wood and the Western Wood Preservers Institute.
- Where the above is not possible creosote piling will stand for a minimum of 45 days prior to installation.
- These requirements are for new piling only and will not restrict the use of re-used timber piling. Reused piling will not be subject to any additional treatments.
- Timber piling is normally driven using a drop hammer, a diesel/air impact hammer or a small vibratory hammer. Because of the relative small diameter of the timber pile, and its excellent energy absorbing quality, there is little threat to fish and their habitat when driving timber piles.
- No environmental monitoring is required.
- 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.

3)-Concrete Piles

When driving concrete piles regardless of which hammer is being used, the following Best Management Practices will be employed to minimize the impact on fish habitat:

<u>Up to 24 inch diameter concrete piling</u>

- The physical design of 24 inch concrete pile dictates that one, the energy required must be controlled in order to prevent the pile from breaking and second the concrete construction of the pile will absorb the energy. These two factors result in low level shock waves (less than 30 kPa.) being emitted and are of no danger to fish and their habitat.
- No environmental monitoring is required.

Over 24 inch diameter concrete piling

- When driving concrete piles with a diameter greater than 24 inches using an impact or hydraulic hammer, the following Best Management Practice will be employed to minimize the impact on fish habitat:
- Visual monitoring of the impact on fish by the shock waves emitted will be required. If fish kill is evident then the contractor will introduce effective means of reducing the level of the shock waves. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile. This should defuse the shock waves to an acceptable level.
- If after the preventive measure is introduced, and further visual monitoring reveals unacceptable conditions (excessive fish kill), then the work will stop immediately and the system reviewed and corrected.

4)-Steel Pipe Piles (less than 24 inch in diameter):

When driving steel piles of less than 24 inches in diameter regardless of the type of hammer being used, the following Best Management Practices will be employed to minimize the impact on the fish habitat:

- Because of the small diameter of the pile it is an accepted principle that the energy required to drive the pile to final point of installation would not result in shock wave in excess of 30 kPa. , and therefore would not require protective measures from the possibility of shock waves.
- If due to the ground conditions, the pile installation is causing excessive fish kill work will cease 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. Appropriate mitigating measures would be the deployment a bubble curtain over the full length of the wetted pile that would defuse the shock waves to an acceptable level.
- If after preventive measures are introduced, and visual monitoring reveals unacceptable conditions (excessive fish kill), then the work will stop immediately and the system reviewed and corrected.

5)-Steel Pipe Piles (over 24 inches in diameter)

When driving steel pipe piles with a diameter greater than 24 inches using impact or hydraulic hammers, the following Best Management Practices will be employed to minimize the impact on fish habitat:

- Visual monitoring of the effects of the shock waves on fish habitat will be required. If fish kill is evident then the contractor will introduce effective means of reducing the level of the shock wave. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile. If after preventive measures are introduced, and further visual monitoring reveals unacceptable conditions (excessive fish kill), then the work will stop immediately and the system reviewed and corrected.

6)-Steel Sheet Piles and H-piles

When driving steel sheet piles and H-piles with a drop hammer, an impact hammer or a vibratory hammer the following Best Management Practices will be employed to minimize the impact on fish habitat:

- It is anticipated that the driving of these types of piles will not generate shock waves in excess of 30kPa., therefore the need for mitigating measures is not required.
- If due to ground conditions, the pile installation is causing excessive fish kill, work will cease and the contractor will be responsible for introducing an effective means of reducing the level of shock wave or introduce measures that will protect fish from entering the harmful shock wave area. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile that would defuse the shock waves to an acceptable level.
- If after preventive measures are introduced, and visual monitoring reveals unacceptable conditions (excessive fish kill), then the work will stop immediately and the system reviewed and corrected.

7)-Stone Column Construction

When installing stone column using a vibroflot the following Best Management practices will be employed to minimize the impact on fish habitat:

- The vibrating action and air flush associated with the operation of the probe results in a high degree of turbidity. When this level exceeds the criteria as outlined in the British Columbia Approved Water Quality Guidelines, the contractor will introduce containment method that are designed to isolate the contaminated area and to prevent
  fish from entering the contaminated area. Silt curtains and netting are two methods that can provide the necessary protection.
- When supplying the aggregate to the probe, the contractor will ensure that spillage is controlled thereby providing additional protection to the fish habitat.
- An independent environmental agency will be used to monitor the levels of turbidity.

8)-Underwater Drilling and Blasting

When performing underwater drilling and blasting the following Best Management Practices will be employed to minimize the impact on fish habitat:

<u>Underwater Drilling</u>

- Drilling underwater is a process that has very little impact on the fish habitat. The procedure does not generate shock waves.
- Contractors will ensure that all attachments (hydraulic connections and couplings) are in good operating order and inspected prior to the start of every day.
- Depending on soil conditions and the potential for turbidity, drill cuttings will be deposited adjacent to the operation, contained on the sea bed or deposited into containment skiffs or scows when it is determined that the drill cuttings are unsuitable for return to the environment.

Underwater Blasting
Contractors required to perform blasting underwater will provide the following protection:

- Because of the potential for a blasted shock wave, a protection shield will surround the immediate blast area. This would be in the form of an air-induced bubble curtain, which has the primary purpose of absorbing the shock wave and a secondary purpose of keeping fish from entering the blast area.
- In order to protect against flying rock, mats (rubber) will be placed over the blasting area. The placement of the mats will also provide protection for any fish caught in the immediate area.
- Monitoring of fish movement and concentrations will be performed to determine if fish herding or scaring techniques (seal bombs) can be utilized to reduce the presence of fish in the blast area.

9)-Cleaning out Pipe Piles:

When cleaning out pipe piles (i.e. air lifting) the following Best Management Practice will be employed to minimize the impact on fish habitat:

- 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 fish habitat. This can be achieved by the following systems:
- The excavated material is pumped through a discharge tube and allowed to settle in the immediate area.
- The excavated material is pumped through a discharge tube and contained within an enclosure (silt curtain) in order to control the sediment.
- The excavated material is pumped through a discharge tube and additional flex hosing and redirected back to the base of the pile.
- If the material to be removed from the pipe is determined to be toxic, then it will be processed through an approved containment system and the unwanted material removed and disposed of accordingly.

10) Containment of Concrete Residue and Water Run Off

When placing concrete in form work over or in water, the following Best Management Practice will be employed to minimize the impact on fish habitat:

Pouring concrete

- Spills: 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.
- Sealing forms: All concrete forms will be constructed in a manner which will prevent fresh concrete or cement laden water from leaking into the surrounding water.

Curing concrete

- When fresh water is used to cure concrete, the run off must be monitored for acceptable pH levels. If the pH levels are outside the allowable limits then the run off water must be contained and neutralized.

Grinding concrete

- When grinding cured concrete the dust and fines entering the water must not exceed the allowable limits for suspended solids. When grinding green or not completely cured concrete and the dust or fines are entering the water, pH monitoring will be conducted to ensure allowable ranges are maintained. In the event that the levels are outside the acceptable ranges preventative measures will be introduced. This could include introducing silt curtains to contain the solids and prevent fish from entering a contaminated area or constructing a catch basins to recover the run off and neutralizing it prior to disposal.

Patching concrete

- Spills: When patching concrete all spills must be contained and prevented from falling into the water.

Washing down hand tools, pumps and transit mixer

- 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.

Whenever there is the possibility of contaminates entering habitat waters, the contractor will monitor pH levels to ensure acceptable levels.

APPENDIX

Fisheries and Oceans Canada

Contact List

Name	Telephone No.	Fax. No.

NOTICE OF PROJECT

To: Fisheries and Oceans Canada

Attention:

Fax. No.:

From: "Contractor"

Telephone No.:

Fax. No.:

Representative:

Please be advised of the following marine/pile driving project:

Project Name:

Project Location:

Project Manager/Superintendent:

Project Telephone No.:

Project Fax. No.:

Project commencement date:

PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	**R.074582.003**
Location:	**Lake Windermere near Invermere, BC**
Date:	2018-11-19
Name of Departmental Representative:	
Name of Client:	PSPC APM-RES
Name of Client Project Co-ordinator	PH: ( )- -

Site Specific Orientation Provided at Project Location **Yes** ☐ **No** ■

Notice of Project Required **Yes** ■ **No** ☐

NOTE:
PWGSC requires "**A Notice of Project"** for all construction work related activities.

NOTE:
OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

Important Notice: This hazard assessment has been prepared by PWGSC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PWGSC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	PWGSC, OGD's, or tenants		General Public or other contractors		Note: When thinking about this pre-construction hazard assessment, remember a **hazard** is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the **risk** is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.
	Yes	**No**	**Yes**	**No**	
Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)		X		X	
Slip Hazards or Unsound Footing		X	X		
Working at Heights		X		X	
Working Over or Around Water	X		X		
Heavy overhead lifting operations, mobile cranes etc.		X	X		
Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.		X	X		

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Fire and Explosion Hazards		X		X	
High Noise Levels		X	X		
Excavations		X		X	
Blasting		X		X	
Construction Equipment	X		X		
Pedestrian Traffic (site personnel, tenants, visitors, public)	X		X		
Multiple Employer Worksite		X		X	Example : Contractor working in a occupied Federal Employee space.

Electrical Hazards					**Comments**
Contact With Overhead Wires		X		X	
Live Electrical Systems or Equipment		X		X	
Other:					
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions		X	X		
Earthquake		X		X	
Tsunami		X		X	
Avalanche		X		X	
Forest Fires		X		X	
Fire and Explosion Hazards		X		X	
Working in Isolation		X		X	
Working Alone		X		X	
Violence in the Workplace	X		X		
High Noise Levels		X		X	
Inclement weather	X		X		
High Pressure Systems		X		X	
Other:					
Hazardous Work Environments					
Confined Spaces / Restricted Spaces		X		X	Review and provide confined space assessment(s) from PWGSC or client confined space inventories. Refer to PWGSC Standard on Entry into Confined Spaces. Contact the Regional Construction Safety Coordinator.
Suspended / Mobile Work Platforms		X	X		
Other:					
Biological Hazards					
Mould Proliferations		X		X	
Accumulation of Bird or Bat Guano		X		X	
Bacteria / Legionella in Cooling Towers / Process Water		X		X	
Rodent / Insect Infestation		X		X	
Poisonous Plants		X		X	
Sharp or Potentially Infectious Objects in Wastes		X		X	

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Wildlife	X		X		
Chemical Hazards					
Asbestos Materials on Site		X		X	If "yes" a pre-project asbestos survey report is required. Provide Contractor with DP – 057 ELF Form 16 "Contractor Notification and Acknowledgement"
Designated Substance Present		X		X	If "yes" a pre-project designated substance survey report is required.
Chemicals Used in work		X		X	
Lead in paint		X		X	If "yes" a pre-project lead survey report is required.
Mercury in Thermostats or Switches		X		X	If "yes" a pre-project mercury survey report is required.
Application of Chemicals or Pesticides		X		X	
PCB Liquids in Electrical Equipment		X		X	
Radioactive Materials in Equipment		X		X	
Other:					
Contaminated Sites Hazards					
Hazardous Waste		X		X	
Hydrocarbons		X		X	
Metals		X	X		Unlikely, but possible
Other:		X	X		Creosote – low levels expected

Security Hazards					**Comments**
Risk of Assault		X		X	
Other:					
Other Hazards					

Other Compliance and Permit Requirements[1]	**YES**	**NO**	**Notes / Comments[2]**
Is a Building Permit required?		X	
Is a Electrical permit required?		X	
Is a Plumbing Permit required?		X	
Is a Sewage Permit required?		X	
Is a Dumping Permit required?		X	
Is a Hot Work Permit required?		X	
Is a Permit to Work required?		X	Mandatory for ALL AFD managed work sites.
Is a Confined Space Entry Permit required?		X	Mandatory
Is a Confined Space Entry Log required?		X	Mandatory for all Confined Spaces
Discharge Approval for treated water required?			N/A

Notes:

(1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.

(2) TBD means To Be Determined by Service Provider.

Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.			
Service Provider Name			
Signatory for Service Provider		**Date Signed**	
RETURN EXECUTED DOCUMENT TO PWGSC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING			