

SPECIFICATIONS

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DRAWINGS - BOUND IN THE SPECIFICATIONS

NONE

DRAWINGS – BOUND IN THE SPECIFICATIONS, FOR REFERENCE

	Marker Buoy Installation 2020/21	
1 of 3	As-built drawings 2021/01/21 – Sounding Plan	
2 of 3	As-built drawings 2021/01/21 – Layout Plan and Groyne Cross Sections	
3 of 3	As-built drawings 2021/01/21 – Buoy Anchoring Details	
1 of 1	Hydrographic Survey 2020 Plan (sheet 1 of 5 only)	

1 GENERAL

1.1 RELATED REQUIREMENTS

1.1.1 Section 01 35 33

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 GENERAL CLARIFICATION

1.3.1 Public Services and Procurement Canada (PSPC) and Public Works and Government Services Canada (PWGSC) are the same entity. The Departmental Representative is an authorized representative of PSPC and PWGSC.

1.4 PRECEDENCE

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

1.5 SITE CONDITIONS

1.5.1 Visit site before submitting tender. Make inquiries or investigations necessary to become thoroughly acquainted with site, soil, climatic, water level and ice conditions along with the nature and extent of the work.

1.5.2 Submission of a tender will be deemed confirmation that the Contractor is familiar the site and is conversant with all relevant conditions.

1.5.3 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.

1.6 LOCATION OF SITE

1.6.1 The work is located at Lake Windermere Groyne, Lake Windermere near Invermere, B.C.

1.6.2 The work site includes the area of the groyne and extends 10 m either side of the

centreline shown on the drawings, 5 m east of Buoy B1, and 5 m west of Buoy B11, as shown on the drawings.

1.7 WORK COVERED BY CONTRACT DOCUMENTS

1.7.1 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:

1.7.1.1 Stage 1: Removal of the marker buoys but not the anchors or mooring lines during the period 15 to 31 October, to be complete by 31 October 2021.

1.7.1.2 Stage 2: Provision of the specified report of inspection of the marker buoys, to be complete by 15 November, 2021.

1.7.1.3 Stage 3: Storing the marker buoys during the period between their removal and their reinstallation.

1.7.1.4 Stage 4: Reinstalling the marker buoys during the period 14 to 25 March 2022, to be complete by 25 March 2022.

1.8 REFERENCES

1.8.1 National Research Council of Canada (NRC):

1.8.1.1 National Building Code of Canada (NBC) 2015.

1.8.2 The Canadian Aids to Navigation System, TP968, current edition.

1.8.3 See Section 01 35 33 for additional references.

1.9 CODES AND STANDARDS

1.9.1 Perform work in accordance with the National Building 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.

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

1.10 DOCUMENTS REQUIRED

1.10.1 Maintain at job site one copy of the following:

1.10.1.1 Contract drawings and approved shop drawings

1.10.1.2 Specifications

1.10.1.3 Addenda

- 1.10.1.4 Change orders
 - 1.10.1.5 Other modifications to contract
 - 1.10.1.6 Copy of approved work schedule
 - 1.10.1.7 Manufacturer's installation and application instructions
 - 1.10.1.8 Health and Safety Plan and Fire Safety Plan
 - 1.10.1.9 Environmental Emergency Response Plan (including Spill Response Plan)
- 1.10.2 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.

1.11 RECORD DRAWINGS

- 1.11.1 Not applicable.

1.12 GEOTECHNICAL REPORT

- 1.12.1 Not applicable.

1.13 DATUM

- 1.13.1 All elevations or soundings used in the drawings and specifications refer to Geodetic Survey Canada datum. The drawings identify local low water and high water levels obtained from records of a Canada Water Survey station nearby.

1.14 LAYOUT OF WORK

- 1.14.1 The drawings show locations for the work based on UTM coordinates. The drawings show reference coordinate points on shore with UTM coordinates.
- 1.14.2 Layout is not expected to be required.

1.15 ASSISTANCE BY THE CONTRACTOR

- 1.15.1 Place small work vessels at the Departmental Representative's disposal as required for transportation to and from the site, or for the Departmental Representative to perform their duties.

1.16 TIME OF COMPLETION

- 1.16.1 Complete work of each stage as indicated in Clause 1.7.1. Final completion is to be by 25 March 2022.

1.17 WORK SCHEDULE

1.17.1 Within 7 days of Contract award, provide a schedule of work. Observe the following requirements:

1.17.1.1 Whenever a variation from the schedule in excess of 5 working days occurs or is expected to occur, notify Departmental Representative of the change.

1.17.2 Provide information as indicated below:

<u>Construction Phase</u> <u>Activity on site</u>	<u>Start</u>	<u>Complete</u>
Buoy removal in fall		
Buoy reinstallation in March 2022		

1.17.3 Before start of each phase of work on site, confirm the schedule to the Departmental Representative.

1.17.4 Do not notify Department of Fisheries and Oceans or Front Counter BC of this work. The Departmental Representative has carried out the necessary contacts with these agencies.

1.17.5 If the contractor receives any notice or communication with respect to this work from Department of Fisheries and Oceans or the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD), the departmental Representative is to be advised immediately and is to be provided with a copy of the notice within 24 hours of receipt by the contractor.

1.18 USE OF SITE

1.18.1 There is no access to the site from land.

1.18.2 If the contractor proposes to access the site from land, a copy of the signed agreement for access between the contractor and the property owner is to be provided within 7 days of contract award. The agreement is to identify the date(s) for such access.

1.18.3 Any use proposed by the contractor of the nearby commercial launching ramp requires an agreement for such use between the ramp operator and the contractor. The agreement is to identify dates of use as well as agreement for temporary storage and parking for the contractor's plant, equipment, materials, vessels, and vehicles. Provide a copy of the agreement within 7 days of contract award.

1.18.4 Use of site is limited to construction areas for work and storage as follows:

1.18.4.1 No materials or equipment are to be stored on site when work is not in progress.

1.18.4.2 Keep closure of the work site to a minimum. Regulate construction activities to provide safe access to marine traffic at all times except in the areas of active work.

1.19 HOURS OF WORK

1.19.1 Perform work between normal hours of 07:00 to 18:00, Monday to Friday, except holidays and in accordance with local noise bylaws. Local noise bylaws include both District of Invermere and Regional District of East Kootenays. If in accordance with local noise bylaws, work may be performed after working hours, on weekends and holidays as approved by Departmental Representative.

1.20 PROJECT MEETINGS

1.20.1 The Departmental Representative will arrange project meetings and assume responsibility for setting times

1.20.2 Contractor will record and distribute minutes within two (2) working days.

1.21 LOCATION OF EQUIPMENT AND FIXTURES

1.21.1 Location of existing features indicated or specified is to be considered as approximate.

1.22 MATERIAL AND EQUIPMENT

1.22.1 Metric-Sized Products:

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

1.22.1.2 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.

1.22.1.3 Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric-sized products which are available on the Canadian market will not be considered sufficient reasons claiming that they cannot be provided.

1.22.1.4 Claims for additional costs due to provision of specified modular metric-sized products will not be considered.

1.22.2 Material and Equipment:

1.22.2.1 Use new material and equipment unless otherwise specified.

1.22.2.2 Within seven (7) days of written request by Departmental Representative or within the time identified in the specification, submit following information for any or all materials and products proposed for supply:

- 1.22.2.2.1 Name and address of manufacturer.
- 1.22.2.2.2 Trade name, model and catalogue number.
- 1.22.2.2.3 Performance, descriptive and test data.
- 1.22.2.2.4 Evidence of arrangements to procure.
- 1.22.2.3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- 1.22.2.4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- 1.22.3 Manufacturer's Instructions
 - 1.22.3.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
 - 1.22.3.2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions. Departmental Representative will designate which document is to be followed.
- 1.22.4 Delivery and Storage:
 - 1.22.4.1 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
 - 1.22.4.2 Store material and equipment in accordance with suppliers' instructions.
 - 1.22.4.3 Touch up damaged factory-finished surfaces to Departmental Representative's satisfaction. Use coatings to match original. Do not obscure name plates.
- 1.22.5 Construction Equipment and Plant:
 - 1.22.5.1 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.
 - 1.22.5.2 Maintain construction equipment and plant in good operating order.
- 1.23 **SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**
 - 1.23.1 Submit on request to the Departmental Representative, for review, shop drawings, and product data, and samples specified.

1.23.2 Submission Requirements:

- 1.23.2.1 Schedule submissions at least [7] days before dates reviewed submissions will be needed.
- 1.23.2.2 Submit as electronic PDF format. Ensure file size is less than 10 MB for each submission.
- 1.23.2.3 Accompany submissions with transmittal letter or e-mail.

1.23.3 Coordination of Submissions:

- 1.23.3.1 Review shop drawings, and product data prior to submission.
- 1.23.3.2 Responsibility for errors and omissions in submittals is not relieved by Departmental Representative's review of submittals.
- 1.23.3.3 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.
- 1.23.3.4 Notify Departmental Representative, in writing at time of submission, of deviations in submittals from requirements of Contract documents.
- 1.23.3.5 After Departmental Representative's review, distribute copies.

1.24 SHOP DRAWING REVIEW

- 1.24.1 The review of shop drawings by Public Works and Government Services Canada is for the sole purpose of ascertaining conformance with the general concept.
- 1.24.2 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.
- 1.24.3 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.

1.25 TESTING AND INSPECTION SERVICES

- 1.25.1 Particular requirements for inspection and testing to be carried out by testing service or in laboratory approved by Departmental Representative are specified under various sections.

1.25.2 Contractor will appoint and pay for services of testing laboratory including the following:

1.25.2.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

1.25.3 Where tests or inspections 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.

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

1.26 INTERPRETATION

1.26.1 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.

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

1.26.2.1 the Plans and Specifications, the Specifications govern;

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

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

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

2 PRODUCTS

Not applicable.

3 EXECUTION

Not applicable.

END OF SECTION

PWGSC

MARINE HEALTH AND SAFETY REQUIREMENTS

Marker Buoys Annual Removal and Re-installation

Lake Windermere Groyne

Project No. R.074582.003

1 GENERAL**PWGSC Update on Asbestos Use**

Effective April 1, 2016, all Public Works and Government Services of Canada (PWGSC) contracts for new construction and major rehabilitation will prohibit use of asbestos-containing materials.

COVID 19

All contractors shall follow Canadian Construction Association COVID-19 - Standardized Protocols for All Canadian Construction Sites.

1.1 REFERENCES

- .1 Government of Canada.
 - .1 Canada Labour Code - Part II (as amended)
 - .2 Canada Occupational Health and Safety Regulations (as amended).
- .2 National Building Code of Canada (NBC [2015]): (as amended)
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
- .3 The Canadian Electrical Code as amended.
- .4 Canadian Standards Association (CSA) as amended:
 - .1 CSA Z797-2018 Code of Practice for Access Scaffold.
 - .2 CSA Z462-18 Workplace Electrical Safety Standard
- .5 National Fire Code of Canada (as amended)
 - .1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
- .6 Province of British Columbia:
 - .1 Workers Compensation Act Part 3-Occupational Health and Safety. (as amended)
 - .2 Occupational Health and Safety Regulation (as amended)

1.2 RELATED SECTIONS

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- .1 Refer to the following sections as required:
 - .1 Section 01 11 05 - Marine General Instructions

1.3 WORKERS' COMPENSATION BOARD COVERAGE

- .1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.
- .2 Maintain Workers' Compensation Board coverage 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 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .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 Submit to Departmental Representative submittals listed for review in accordance with Section 01 11 05 Marine General Instructions.
- .2 Work affected by submittals shall not proceed until review is complete.
- .3 Submit the following:
 - .1 Organizations Health and Safety Plan.
 - .2 Site Specific Safety Plan or Health and Safety Plan (SSSP or HASP)
 - .2 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.
 - .3 Copies of incident and accident reports.
 - .4 Complete set of Material Safety Data Sheets (SDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .5 Emergency Response Procedures.

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- .6 Signed copy of the Preliminary Hazard Assessment Form.
- .4 The Departmental Representative will review the Contractor's Site Specific Safety Plan or Health and Safety Plan (SSSP/HASP) and emergency response procedures, and provide comments to the Contractor within 2 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.
- .5 Submission of the Site Specific Safety Plan or Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:
 - .1 Be construed to imply approval by the Departmental Representative.
 - .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
 - .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.6 RESPONSIBILITY

- .1 Assume responsibility as the Prime Contractor for work under this contract.
- .2 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.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract documents, applicable Federal, Provincial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.7 HEALTH AND SAFETY COORDINATOR

- .1 Assign a competent and qualified Health and Safety Coordinator who shall:
 - .1 Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.
 - .2 Be responsible for implementing, daily enforcing, and monitoring the Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP)
 - .3 Be on site during execution of work.
 - .4 Have minimum two (2) years' site-related working experience

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- .5 Have working knowledge of the applicable occupational safety and health regulations.

1.8 GENERAL CONDITIONS

- .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 site of the work. 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.
- .2 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian, marine, and vehicular traffic.
- .3 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - .1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.
 - .2 Secure site at night time or provide security guard as deemed necessary to protect site against entry.

1.9 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Federal employees and general public.
 - .2 Slippery and unstable surfaces.
 - .3 Hazards - PSPC Preliminary Hazard Assessment included as an Appendix to Specifications

1.10 UTILITY CLEARANCES

- .1 The Contractor is solely responsible for all utility detection and clearances prior to starting the work.

1.11 REGULATORY REQUIREMENTS

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

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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.

1.12 WORK PERMITS

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

1.13 FILING OF NOTICE

- .1 The General Contractor is to file Notice of Project with Provincial authorities prior to commencement of work. (All construction projects require a Notice of Work).
- .2 Provide copies of all notices to the Departmental Representative within two (2) days of submitting any notice.

1.14 SITE SPECIFIC HEALTH AND SAFETY PLAN

- .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.
- .2 Prepare and comply with the Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP) based on the required hazard assessment, including, but not limited to, the following:
 - .1 Primary requirements:
 - .1 Contractor's safety policy.
 - .2 Identification of applicable compliance obligations.
 - .3 Definition of responsibilities for project safety/organization chart for project.
 - .4 General safety rules for project.
 - .5 Job-specific safe work procedures.
 - .6 Inspection policy and procedures.
 - .7 Incident reporting and investigation policy and procedures.
 - .8 Occupational Health and Safety Committee/Representative procedures.

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- .9 Occupational Health and Safety meetings.
- .10 Occupational Health and Safety communications and record keeping procedures.
- .11 COVID 19 Protocols and Procedures
- .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.
- .3 List hazardous materials to be brought on site as required by work. SDS required for all products.
- .4 Indicate Engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
- .5 Identify personal protective equipment (PPE) to be used by workers.
- .6 Identify personnel and alternates responsible for site safety and health.
- .7 Identify personnel training requirements and training plan, including site orientation for new workers.
- .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.
- .4 Revise and update Site Specific Safety Plan (SSSP) and/or Health and Safety Plan (HASP) as required, and re-submit to the Departmental Representative.
- .5 Departmental Representative's review: the review of Site Specific Safety Plan and/or Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Site Specific Safety Plan and/or Health and Safety Plan of responsibility for meeting all requirements of construction and Contract documents and legislated requirements.

1.15 EMERGENCY PROCEDURES

- .1 List standard operating procedures and measures to be taken in emergency situations. Include an emergency response and emergency evacuation plan and emergency contacts (i.e.names/telephone numbers) of:
 - .1 Designated personnel from own company.
 - .2 Regulatory agencies applicable to work and as per legislated regulations.

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- .3 Local emergency resources.
- .4 Departmental Representative [and on-site staff of employer responsible for site].
- .5 A route map with written directions to the nearest hospital or medical clinic.
- .2 Include the following provisions in the emergency procedures:
 - .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
 - .2 Evacuate all workers safely.
 - .3 Check and confirm the safe evacuation of all workers.
 - .4 Notify the fire department or other emergency responders.
 - .5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - .6 Notify Departmental Representative.
- .3 Provide written rescue/evacuation procedures as required for, but not limited to:
 - .1 Work in confined spaces or where there is a risk of entrapment.
 - .2 Work on, over, under and adjacent to water.
- .4 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.
- .6 Contractors must not rely solely upon 911 for emergency rescue.

1.16 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Safety Data Sheets (SDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
- .2 Where use of hazardous and toxic products cannot be avoided:
 - 1.16.2.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable SDS and WHMIS 2015 documents as

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per Section 01 11 05.

1.16.2.2 The contractor shall ensure that only pre-approved products are bought onto the work site in an adequate quantity to complete the work.

1.17 ASBESTOS HAZARD

.1 Not applicable.

1.18 PCB REMOVALS

.1 Not applicable.

1.19 REMOVAL OF LEAD-CONTAINING PAINT

.1 Not applicable.

1.20 ELECTRICAL SAFETY REQUIREMENTS

(Reference: Worksafe BC OHS Regulation Part 19 – Electrical Safety)

.1 Maintain electrical safety procedures and take necessary precautions as necessary to ensure safety of all personnel working under this Contract, as well as safety of others on site.

1.21 ELECTRICAL LOCKOUT

.1 Not applicable.

1.22 OVERLOADING

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

1.23 FALSEWORK

.1 Not applicable.

1.24 SCAFFOLDING

.1 Not applicable.

1.25 CONFINED SPACES

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- .1 Carry out work in compliance with current Provincial / Territorial regulations.

1.26 POWDER-ACTUATED DEVICES

- .1 Use powder-actuated devices in accordance with ANSI A10.3 (as amended) only after receipt of written permission from the Departmental Representative.

1.27 FIRE SAFETY AND HOT WORK

- .1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.
- .2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.
- .3 Hot Work permits are a mandatory requirement for any hot work activities.

1.28 FIRE SAFETY REQUIREMENTS

- .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.
- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (as amended).
- .3 Portable gas and diesel fuel tanks are not permitted on most federal work sites. Approval from the Departmental Representative is required prior to any gas or diesel tank being brought onto the work site. Portable gas tanks to run outboard motors of vessels will be approved.

1.29 FIRE PROTECTION AND ALARM SYSTEM

- .1 Not applicable.

1.30 UNFORESEEN HAZARDS

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

1.31 POSTED DOCUMENTS

- .1 Post legible versions of the following documents on site:

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- .1 Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP)
- .2 Sequence of work.
- .3 Emergency procedures.
- .4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, location of the nearest emergency medical treatment centre, route to the centre from the site, and the emergency transportation provisions.
- .5 Notice of Project.
- .6 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.
- .7 Workplace Hazardous Materials Information System (WHMIS 2015) documents, if applicable.
- .8 Material Safety Data Sheets (SDS) if applicable.
- .10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
- .11 All Hazardous Material and Substance Reports including Lab Analysis
- .2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers.
- .3 Postings are to be protected from the weather, and visible as approved by the Departmental Representative.

1.32 MEETINGS

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

1.33 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

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Lake Windermere Groyne

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- .3 The Departmental Representative may issue a "stop work order" if noncompliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

2 PRODUCTS

- .1 Not used.

3 EXECUTION

- .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 Environmental Factors
- .1 Ensure that operations meet all applicable environmental regulations and standards.
 - .2 Comply with mitigation requirements as noted in the plans and specification, in the BC Water Sustainability Regulation Notification Terms and Conditions.
 - .3 Adhere to the mandatory invasive species provincial inspections for watercraft:
<https://www2.gov.bc.ca/gov/content?id=656F820C71D4449D84D4D751F97C3548>
 - .4 Clean and visually inspect all vessels, equipment, and materials prior to arriving on site to prevent the potential spread of invasive species and noxious weeds.
- 1.2 Vessels
- .1 All vessels are to be electrically powered.
 - .2 Vessels and floating equipment are not to come to rest on the bottom of the lake or river unless specified otherwise.
 - .3 Vessels, other equipment, and material are only to come to rest on the bottom at the nearby commercial launching ramp, unless specified or shown on the drawings otherwise.
- 1.3 Fires
- .1 Fires and burning of rubbish on site not permitted.
- 1.4 Disposal of Wastes
- .1 Do not bury rubbish and waste materials on site.
 - .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- 1.5 Drainage
- .1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
 - .2 Control water containing suspended materials from operations including placement of the anchors by use of silt curtains or other

measures as necessary.

- 1.6 Work Adjacent to and in Waterways
- .1 Do not operate land based construction equipment within waterways.
 - .2 Fuelling and servicing of vehicles, vessels, and equipment is to occur a minimum 30 m away from all streams, lakes, and waterways.
 - .3 Immediately report any spill of reportable quantities of a substance that is toxic, polluting, or deleterious to aquatic life to the Dangerous Goods Incident /report 24 hour phone line at 1-800-663-3456. Advise the Departmental Representative within 12 hours of such a spill.
 - .4 All machinery, vessels, and equipment operating within the waterbody including tributary watercourses and wetlands are to be clean and free of external grease, oil or fluid leaks.
 - .5 Do not use waterway beds for borrow material.
 - .6 Do not dump excavated fill, waste material or debris in waterways.
 - .7 Do not skid construction materials across or in waterways.
 - .8 Avoid indicated spawning beds.
- 1.8 Pollution Control
- .1 Maintain temporary erosion and pollution control features installed under this contract.
 - .2 Control emissions from equipment and plant to local authorities emission requirements.
 - .3 Spill kits and containment are to be maintained on site and ready for deployment in case of spills.
 - .1 Spill kits are to contain sufficient quantities of absorbent material on site in close proximity to working machinery.
 - .2 During the work there are to be trained and qualified personnel on site that are ready to deploy spill kits when necessary.
- 1.9 Protection of Wildlife
- .1 Make every effort to minimize disturbance to the benthic and upland wildlife communities.

- .2 Do not disturb, damage, or kill any mussels that may be present at the work site.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Not Used

END OF SECTION

1. PART 1 – GENERAL

1.1. References

- 1.1.1. American Society for Testing and Materials (ASTM).
- 1.1.2. Canadian Coast Guard (CCG).
- 1.1.3. Canadian Standards Association (CSA).
- 1.1.4. The Canadian Aids to Navigation System, TP968, current edition.

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 at any stage until the materials or products for that stage are satisfactorily installed 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. Method of Measurement

- 1.3.1. The overall method of measurement for the classes of labour, plant or material constituting the work will be a single Lump Sum. Payment will be made at the end of specified stages of the contract for the completed work as specified and shown on the drawings. Payment will be as follows:
 - 1.3.1.1. Stage 1
 - 1.3.1.1.1. Amount: 35% of the total contract amount.
 - 1.3.1.2. Stage 2
 - 1.3.1.2.1. Amount: 5% of the total contract amount.
 - 1.3.1.3. Stage 3 and Stage 4
 - 1.3.1.3.1. Amount: 60% of the total contract amount.

2. PART 2 – PRODUCTS

2.1. General

- 2.1.1. Use only new materials except where specified otherwise.
- 2.1.2. Information provided for reference only except for the securing wire or zip strips to secure shackle pins against rotation. Except for these, no new products are required for the work of this contract.

2.2. Masonry blocks

- 2.2.1. Conform to the Masonry Institute of British Columbia Technical Manual.
- 2.2.2. Blocks to be concrete masonry blocks
 - 2.2.2.1. Half high, nominal dimensions 100 x 200 x 400 mm.
 - 2.2.2.2. Faces to be standard finish.

- 2.2.2.3. Minimum concrete strength 15 MPa.
- 2.2.2.4. Oven dry density over 1800 kg/m³.

2.3. Marker Buoys

- 2.3.1. Caution buoys to be as identified in the Canadian Aids to Navigation System, colour yellow.
- 2.3.2. Starboard Hand navigation buoy to be as identified in the Canadian Aids to Navigation System, colour red, with a cone shape at the top of the buoy.
- 2.3.3. Buoys to all be from a single manufacturer.
- 2.3.4. Buoys to be manufactured by one of:
 - 2.3.4.1. Enviro Float, Model No. EFMITMB18
 - 2.3.4.2. Tidal Marine Buoy TDL-89-BE
 - 2.3.4.3. Or alternative approved by addendum during tendering.

2.4. Steel

- 2.4.1. Small fastenings: to CSA B111.
- 2.4.2. Bolts, washers and miscellaneous iron: to CSA G40.21, unless specified or indicated on the drawings to be stainless steel.
- 2.4.3. Items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties are not acceptable.
- 2.4.4. Bolts: to be of full dimension specified or shown on the drawings.
 - 2.4.4.1. Provide with steel plate washers under head and nut, nut to be nylock type.
- 2.4.5. Welding:
 - 2.4.5.1. Unless specified otherwise, welding is to be in accordance with [CSA W59] CAN/CSA-S16.
 - 2.4.5.2. Provide evidence that welding companies are certified to CSA W47.1.

2.5. Chain for mooring rode

- 2.5.1. Chain to be galvanized anchor chain, size as shown on the drawings.

2.6. Line for mooring rode

- 2.6.1. Line for the mooring rode to be double braided nylon, nominal diameter as shown on the drawings.
- 2.6.2. Eyes in the line to be fabricated in the shop. Eyes to have equivalent strength of the line. Submit shop drawings/ fabrication details indicating how the contractor proposes to fabricate the eyes, if requested by the Departmental Representative.

2.7. Ballast weight

- 2.7.1. Ballast weights to be lead, with a steel hoop to secure the weight to other components. Size as shown on the drawings.

2.8. Shackles and other small fittings

- 2.8.1. Shackles and swivels to be galvanized, size as shown on the drawings.
- 2.8.2. Screw pin type shackles and fittings unless specified otherwise.

- 2.8.3. Secure pin against rotation after fastening with No. 12 gauge (2.052 mm) insulated solid copper wire or zip strips

2.9. Decals

- 2.9.1. No work required, no new decals to be installed, provided for information only.
2.9.2. Self adhesive decals will be provided to the contractor. Each label is approximately 70 x 120 mm.
2.9.3. Fasten the decals on the tower of each buoy, 2 labels per buoy, in accordance with the decal supplier's instructions.

3. PART 3 - EXECUTION

3.1. General

- 3.1.1. The work under this contract is primarily the removal of the existing buoys to storage for the winter, inspection with reporting, storage over the winter, and re-installation in March.
3.1.2. Included in the work of this contract is inspection at the time of buoy removal, of each component (buoys, fittings, nylon line, chain, and anchor unit) of each buoy including the restraining line for buoy B1 from anchor A2, for wear, deterioration and damage. The results of the inspection are to be submitted in a report to be complete as specified in Section 01 11 05 for Stage 2. If wear has reduced the remaining thickness of a component to less than 80% of the original thickness, it is to be reported for that component as the minimum remaining thickness of the worn element measured to the nearest 3 mm and identifying the original thickness.
3.1.3. If the inspection identifies that corrective work may be required, that work is not to be carried out unless specifically authorized by the Departmental Representative in writing.

3.2. Buoy removal

- 3.2.1. During the period specified in Section 01 11 05, remove the buoys from the site and transport to storage.
3.2.2. Remove the buoys by disconnecting the shackle at the buoy. Leave the rode with all fittings attached to the anchor. Stretch the rode out full length to the north at right angles to the centreline of the groyne for easier retrieval when the buoys are re-installed.

3.3. Buoy storage

- 3.3.1. Store the buoys in a commercial storage facility within 15 km of the Lake Windermere Groyne. Storage is to be covered, dry, secure and the unit is to be separately locked, but storage may be unheated.
3.3.2. The buoys may be stacked to a maximum 2 high and except for the navigation buoy may be stored inverted. The navigation buoy is to be stored with its cone up and nothing contacting the cone.
3.3.3. The contract between the contractor and the storage facility is to identify that the Departmental Representative or their authorized representative is

to have access to the storage unit during regular business hours with minimum 2 business days notice.

3.3.4. Provide a copy of the contract for storage not later than 30 September, 2021.

3.3.5. Provide a copy of the key or combination lock code for the lock to the storage unit at the same time as the copy of the contract is provided. The key will be returned to the contractor after completion of all other work under the contract.

3.4. Buoy installation:

3.4.1. During the period specified in Section 01 11 05, remove the buoys from storage and reinstall them as specified and shown on the drawings.

3.4.2. Install or re-install the buoys as shown on the drawings by fastening them with the mooring rode to the anchor as shown on the drawings.

3.4.3. Debris removal and disposal:

3.4.3.1. Debris and waste materials from construction, and debris 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.

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

3.4.3.3. The Contractor shall submit proof of approval(s), copies of current permits and licences to the Departmental Representative 5 days before the initial disposal of debris.

3.4.4. Certificates of Disposal:

3.4.4.1. 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.

3.4.4.2. Provide certificates within 5 days of disposal.

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

3.5. Restoration

3.5.1. 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 at the Contractor's expense.

3.5.1.1. Any disturbance of rocks or cribbing of the groyne itself is to be restored by replacing the disturbed material.

3.5.1.2. Any damage to the existing cut-off piles or existing navigation buoys on or near the site of the work is to be restored by replacement.

END OF SECTION



PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	R.074582.003		
Location:	Lake Windermere Groyne, Invermere, B.C.		
Date:	2021/07/28		
Name of Departmental Representative:	Julian Ho		
Name of Client:	PSPC		
Name of Client Project Co-ordinator	NA	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
	PWGSC, OGD's, or tenants		General Public or other contractors		
Examples: Chemical, Biological, Natural, Physical, and Ergonomic					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.
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.	Yes	No	Yes	No	

Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)	Yes			No	
Slip Hazards or Unsound Footing	Yes			No	
Working at Heights		No		No	
Working Over or Around Water	Yes			No	
Heavy overhead lifting operations, mobile cranes etc.		No		No	
Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.	Yes		Yes		



Fire and Explosion Hazards		No		No	
High Noise Levels		No		No	
Excavations		No		No	
Blasting		No		No	
Construction Equipment	Yes			No	
Pedestrian Traffic (site personnel, tenants, visitors, public)	Yes			No	
Multiple Employer Worksite		No		No	Example : Contractor working in a occupied Federal Employee space.

Electrical Hazards					Comments
Contact With Overhead Wires		No		No	
Live Electrical Systems or Equipment		No		No	
Other:					
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions		No		No	
Earthquake	Yes		Yes		
Tsunami		No		No	
Avalanche		No		No	
Forest Fires	Yes		Yes		
Fire and Explosion Hazards		No		No	
Working in Isolation	Yes			No	
Working Alone	Yes			No	
Violence in the Workplace	Yes		Yes		
High Noise Levels		No		No	
Inclement weather	Yes		Yes		
High Pressure Systems		No		No	
Other: Marine traffic	Yes		Yes		
Hazardous Work Environments					
Confined Spaces / Restricted Spaces		No		No	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		No		No	
Other:					
Biological Hazards					
Mould Proliferations		No		No	
Accumulation of Bird or Bat Guano		No		No	
Bacteria / Legionella in Cooling Towers / Process Water	Yes			No	Contaminated lake water.
Rodent / Insect Infestation		No		No	
Poisonous Plants		No		No	
Sharp or Potentially Infectious Objects in Wastes	Yes			No	



Wildlife	Yes			No	
Chemical Hazards					
Asbestos Materials on Site		No		No	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		No		No	If "yes" a pre-project designated substance survey report is required.
Chemicals Used in work		No		No	
Lead in paint		No		No	If "yes" a pre-project lead survey report is required.
Mercury in Thermostats or Switches		No		No	If "yes" a pre-project mercury survey report is required.
Application of Chemicals or Pesticides		No		No	
PCB Liquids in Electrical Equipment		No		No	
Radioactive Materials in Equipment		No		No	
Other:					
Contaminated Sites Hazards					
Hazardous Waste		No		No	
Hydrocarbons		No		No	Subsurface, not expected to be disturbed
Metals		No		No	Subsurface not expected to be disturbed
Other:					

Security Hazards					Comments
Risk of Assault	Yes		Yes		
Other:					
Other Hazards					

Other Compliance and Permit Requirements¹	YES	NO	Notes / Comments²
Is a Building Permit required?		No	
Is a Electrical permit required?		No	
Is a Plumbing Permit required?		No	
Is a Sewage Permit required?		No	
Is a Dumping Permit required?		No	
Is a Hot Work Permit required?		No	
Is a Permit to Work required?		No	Mandatory for ALL AFD managed work sites.
Is a Confined Space Entry Permit required?		No	Mandatory
Is a Confined Space Entry Log required?		No	Mandatory for all Confined Spaces
Discharge Approval for treated water required?		No	



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			

Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association - November, 2003

The BC Marine and Pile Driving Contractors Association and Fisheries and Oceans Canada (DFO) 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
- Avoid contravention of the Fisheries Act
- 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 **prevent** damage to identified fish habitat (i.e. eelgrass). Where possible, alternative methods will be employed (i.e.: use of anchors instead of spuds). **In the event that, despite precautions, the contractor is aware that fish habitat has been**

inadvertently damaged, the incident must be reported and discussed with DFO to ensure that appropriate action (restoration) is taken.

- Prior to the commencement of any work, the contractor will complete and forward the attached “Notice of Project” to the Department of Fisheries and Oceans. Letters of advice or Habitat Authorizations may be required, depending on the scope of work proposed.
- If contractors are working and a herring (or other fish) spawning occurs, the work will be temporarily suspended and the appropriate DFO contact notified.
- There will be no restriction of work during closure periods (the only exception being when spawning is present, all work must cease and the local DFO habitat biologist must be contacted for further instructions), provided the contractors employ an exclusion device (protective netting or geotextile material suspended in the water column around pile driving area) around the work area to prevent fish access or when required, an effective method of mitigating shock waves (bubble curtain).
- Whenever shock wave monitoring (hydrophone) is performed at a marine construction site and the findings are available to the contractor, the data will be forwarded to the BC Marine and Pile Driving Contractors Association and Svein Vagle at the Institute of Ocean Sciences in Sidney, BC. It is hoped that a database can be built that will more precisely define work procedures and 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 prevent 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 and the DFO document “Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region”.
- Where the above is not possible, creosote piling will stand (weather) for a minimum of 45 days prior to installation.
- These requirements are for new piling only. Reused piling will not normally be subject to any additional treatments (timberfume is a provincially licensed preservative that is available for treatment of used piles), however, pilings with excessive creosote should be avoided. Reuse of suitable piling should be encouraged. In the case of mooring piles, exposed to significant wear, the contractor should encourage the owner to protect the piling with rub strips as per the “Guidelines for use of Treated Wood.
- 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 of sound pressure impacts to fish and their habitat when driving timber piles.

- Environmental monitoring of sound pressure impacts is not required.
- An attempt should be made to determine whether least impact means full extraction of the piling or if leaving a stub that would not interfere with navigation is acceptable. If complete 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. It may be appropriate to cut off the piling flush with the mud line. All demolition operations should be monitored in order to control and contain the construction debris and to determine whether there are any effects on fish or fish habitat.

3)-Concrete Piles

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

Concrete Piles 24 inch diameter and less

- The physical design of 24 inch concrete pile dictates that: 1/ the energy required must be controlled in order to prevent the pile from breaking and 2/ the concrete construction of the pile will absorb the energy. These two factors are expected to result in low level shock wave emission (less than 30 kPa.) and minimal or no effects to fish and their habitat should result.
- Environmental monitoring of sound pressure levels is generally not required.

Piles Greater than 24 inch diameter

- 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 and hydrophone monitoring of the impact on fish by the sound waves emitted will be required. If sound pressures over 30 kPa are measured or a fish kill occurs, 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 reduce the shock waves to an acceptable level.
- If, despite the introduction of preventative measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), the work will stop immediately, DFO will be contacted, and the methods will be reviewed and corrected

4)-Steel Pipe Piles

Piles less than 18 inch diameter

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

- Because of the small diameter of the pile it is assumed that the energy required to drive the pile to the final point of installation will not result in shock waves in excess of 30 kPa, therefore, protective measures to reduce shock waves are not expected to be required.
- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected (with consultation with DFO).

Piles Greater than 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 prevent impacts to fish habitat:

- Hydrophone and visual monitoring of the effects of the shock waves on fish will be required. If a fish kill occurs, the contractor will introduce effective means of reducing the level of the shockwave. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected (with consultation with DFO).

5)-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, mitigating measures are not expected to be required.
-
-

- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected (in consultation with DFO).

6)-Stone Column Construction

When installing stone column using a vibroflot, the following Best Management Practices will be employed to prevent impacts to 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 methods 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 prevented, thereby providing additional protection to fish habitat.
- An independent environmental consultant will be used to monitor turbidity levels.

7)-Underwater Drilling and Blasting

When performing underwater drilling and blasting the following Best Management Practices will be employed to prevent impacts to fish habitat:

Underwater Drilling

- Generally, drilling underwater is a process that has very little impact on fish or 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. Spill kits and containment booms must be maintained on-site in case of spills.
- Depending on soil conditions and the potential for turbidity, drill cuttings will be deposited adjacent to the operation, contained on the sea bed or pumped to the surface for deposit into containment skiffs or scows for land disposal 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 to prevent impacts to fish habitat:

- Because of the potential for harmful shock waves resulting from a blast, 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 preventing 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 may also provide protection for any fish swimming in the immediate area.
- Monitoring of fish movement and concentrations will be conducted using a sounder to determine if fish herding or scaring techniques (seal bombs) can be utilized to reduce the presence of fish in the blast area. If fish scaring techniques are deemed necessary, the DFO habitat biologist or technician responsible for the project must be consulted to determine the risk to fish.

8)-Cleaning out Pipe Piles:

When cleaning out pipe piles (i.e.: air lifting) the following Best Management Practices will be employed to prevent impacts to fish habitat:

- Generally, sediment contained in the pipe is will be pumped to the surface and processed through an approved containment system and disposed of at an approved landfill site.
- If the contractor knows that the sediment is toxic, the sediment must not be redistributed in the area. If the sediment is non-toxic, and if fish are not present in the area, and adjacent fish habitats are not a concern (contact DFO) it may be acceptable to:
 1. Pump the sediment through a discharge tube and allow it to settle in the immediate area with or without a silt curtain to contain the sediment.
 2. Pump the sediment through a discharge tube and additional flex hosing and redirect it back to the base of the pile.

9) Containment of Concrete Residue and Water Run Off

When placing concrete in form work over or in water, the following Best Management Practices will be employed to prevent the impacts to fish habitat:

Pouring concrete

- Spills: When pouring concrete all spills of fresh concrete must be prevented. Concrete is toxic to fish due its high pH. If concrete is discharged from the transit mixer directly to the formwork 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 incompletely 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 may include introducing silt curtains to contain the solids and prevent fish from entering a contaminated area or constructing 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 entering the water.

Washing 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 water and excess concrete 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 contaminants entering water, 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

Project Location:

To: Fisheries and Oceans Canada Attention:

Telephone/Fax/email: _____

From: "Contractor"

Telephone/Fax/email: _____

Representative:

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

Project Name:

Project Location:

Project Manager/Superintendent:

Project Telephone/Fax/email: _____

Project commencement date:

Project Information:

Type: Bearing Fender Mooring

Number of Piles:

Pile Diameter (if steel)

Type of Driving: Vibro Drop Hammer _____

Special Conditions at the Bottom (use of pins, sockets, epoxy, concrete, other)

General Equipment On-Site (barge, truck, crane, etc.) _____

Signature of Contractor: _____

Date: _____



Kootenay-Boundary *Water Sustainability Regulation* Notification Terms and Conditions

The terms and conditions described within this document do not indicate compliance with other provincial, federal or municipal requirements. The proponent must be aware of, and comply with, obligations under the federal *Fisheries Act*, *Species at Risk Act*, *BC Wildlife Act*, *BC Riparian Areas Protection Act* (where applicable), *Local Government Act* or any other legislation related to the proposed works.

General Information

Only changes in and about a stream of the kind listed in Part 3 of the *Water Sustainability Regulation* (http://www.bclaws.ca/civix/document/id/complete/statreg/36_2016) can proceed as a Notification. Changes must occur in accordance with requirements of the regulation including any terms and conditions specified by a Habitat Officer (i.e., this document).

A proposed ‘change in and about a stream’ not listed in Part 3, Section 39 will require a separate Approval under the *Water Sustainability Act*.

Under the provisions of the regulation, a government Habitat Officer has 45 days following receipt of your application by the Ministry of this Notification:

- to request additional information from you; and
- to specify additional terms and conditions specific to your proposal.

A person making a change in and about a stream under this regulation, other than under section 39(1)(o) to (s) or 39(2) or 39(5), must then make that change in accordance with the regulation and any terms and conditions specified by the Habitat Officer. This includes the terms and conditions described below or as specified subsequently within 45 days of Habitat Officer receipt of this notification.

If you are not contacted by a Habitat Officer within 45 days of submitting your *Water Sustainability Act* application, you may proceed with your proposed changes in and about a stream.

It is recommended that copies of the following documents be kept or posted at the work site during implementation of the works so they may be shown to a Ministry official upon request:

1. A copy of your Notification letter, if received
2. A copy of your application
3. A copy of this document.
4. A copy of any impact mitigation plan(s) if developed by a Qualified Professional as described above.
5. A copy of any other documentation pertinent to the works.

Notification Terms and Conditions

44 (2) A habitat officer may provide to a person carrying out or proposing to carry out an authorized change in accordance with this Part, for the protection of an aquatic ecosystem, a written statement containing terms and conditions applicable to the person in relation to the following:

a) the timing window during which the change may be made;

- i. If works are proposed on a stream that contains fish (fish-bearing), all works must be completed during the applicable timing window to protect fish, wildlife or the aquatic ecosystem within that stream. Timing windows represent periods during which works can occur to ensure the lowest risk to environmental and wildlife values. For the Kootenay Boundary Region, timing windows are determined by the geographic location of the works and the species of fish found at the site (https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_window_kootenays.pdf)
- ii. Worksites located in the *Delayed Instream Work Window Zone* are typically at higher elevations. Colder temperatures associated with higher elevations often delay the lifecycles of resident fish species, which is why the timing windows in these areas occur later in the year.
- iii. If any one of the following conditions is met, the timing window is not applicable:
 - a. If the stream channel is naturally dry (no flow) or frozen to the bottom at the worksite and the instream activity will not adversely impact fish habitat (e.g. result in the introduction of sediment into fish habitat).
 - b. If construction of a winter crossing is proposed and such works does not adversely impact the stream channel (including stream banks), fish habitat or fish passage.
 - c. The structure does not encroach below the high water mark, no work is proposed below the high water mark of a fish stream, and measures will be taken to prevent the delivery of sediments or contaminants into fish habitat.
 - d. You retain a Qualified Professional (such as a Registered Professional Biologist) to prepare a prescription that provides specific measures to comply with to prevent impacts to fish or fish habitat. This document must be submitted to the Habitat Officer via Front Counter B.C. with reference to your Notification file number.
 - e. Work is in a non-fish stream and measures will be taken to prevent the delivery of sediments into downstream fish habitat or the stream is not fish-bearing and discontinuous with no connection to downstream fish habitat.
 - f. If you are uncertain if the stream on which works will occur is fish bearing, please consult the Fisheries Inventory Data Queries: <http://gov.bc.ca//fish-inventory-data-queries>. The lack of fish records for a particular area does not necessarily indicate fish absence.

b) the minimum instream flow or the minimum flow of water that must remain in the stream while the change is being made;

- i. The original rate of water flow in the stream (existing prior to commencing work) must be maintained upstream and downstream of the worksite during all phases of instream activity associated with the work.
- ii. Any post-application changes to the proposed works in and about a stream that includes the alteration or diversion of stream flows will require a formal *Water Sustainability Act* Approval.

c) the removal of material from the stream or stream channel in connection with the change;

- i. The stream channel width must not change as a result of the work.
- ii. The permanent removal of stable, naturally occurring material from the stream or stream channel must be minimized and completed only as necessary to make the change in accordance with Part 3 of the *Water Sustainability Regulation*.

d) the addition of a substance, sediment, debris or material to the stream or stream channel in connection with the change;

- i. The stream channel width must not change as a result of the work.
- ii. Any work associated with the proposed changes in and about a stream must not cause stream channel instability or increase the risk of sedimentation into the stream.
- iii. During works, erosion and sediment control materials must be available onsite at all times and must be installed if sedimentation is likely to occur into the stream (e.g. silt fences, straw bale dikes, settling basins, ditch blocks, or filter cloth). A contingency plan must be developed outlining the measures to be taken by workers when carrying out any work to control erosion and sediment. All erosion and sediment control devices must be regularly inspected and maintained to remain functional during works. These devices and any accumulated sediment must be removed from the site after the completion of works.
- iv. Soil disturbance must not occur in heavy rain conditions and any soil removed must be placed in a location that ensures that sediment or debris does not enter the stream.
- v. Work must be suspended if the sediment control measures are ineffective and result in the introduction of sediment into the stream. In the event of sediment release into a stream, proponents are directed to immediately stabilize and mitigate the release, and then notify the Habitat Officer.
- vi. There must be no deposition of concrete materials into the stream or any watercourse through spillage, hosing off, rain, cleaning of tools, etc. All cast-in-place concrete and grouting must be completely separated from any stream or watercourse for a minimum of 48 hours if ambient air temperature is greater than 0°C or 72 hours if ambient air temperature is less than 0°C.
- vii. The only preservative that will be accepted for use on materials that could come in contact with water is copper chromate arsenate (CCA; wood preservative). Application of CCA must be upland, well away from any stream or watercourse. Application of treatment solutions must never be carried out on or over water. The use of creosote is not permitted under any circumstances.
- viii. Bridge abutments or other structures and materials must not be placed within the stream channel width. Rip-rap must be keyed into the stream bank and must not constrict the natural stream channel width.
- ix. Road material and gravel on a bridge deck or culvert fill must be prevented from entering the stream.
- x. Machinery must operate from outside the wetted perimeter of the stream (e.g. from the top of the bank or from within a naturally dry stream channel).

- xi. Any equipment used in conducting work must be in good mechanical condition. When operating in close proximity to the wetted perimeter of a stream, the operator must prevent entry of any substance (i.e., fuel, hydraulic fluid), sediment or debris into the stream. Failure to comply may result in a remediation order.
- xii. Fueling and servicing of vehicles and equipment must occur away from the streams and any spills must be properly cleaned up and reported as required by the *Spill Reporting Regulation* (B.C. Reg. 263-90). Every effort must be made to contain the spill and prevent adverse impacts to the environment.
- xiii. Any materials, such as riprap or gabion rock, used for stream bank armouring must be clean and not contain substances that could be harmful to fish, wildlife or the aquatic ecosystem of the stream.

e) the salvage or protection of fish or wildlife while the change is being made or after the change has been made;

- i. All activities in and about streams must be conducted in a manner that does not cause harm to fish or fish habitat and species at risk or their habitat.
- ii. All water pumps used within fish-bearing streams are to be fitted with screens to prevent fish entrainment. Details of required mesh sizes can be found at www.dfo-mpo.gc.ca/Library/223669.pdf
- iii. Open bottom structures such as clear span bridges or open bottom culverts are preferred on all fish bearing streams. If proponents wish to install a closed bottom culvert (e.g. round or elliptical) on a fish bearing stream, they must ensure that upstream fish passage through the culvert is maintained. In addition, closed bottom culverts must be embedded in order to provide a natural substrate such that there is no net loss of fish habitat. To achieve this, proponents must comply with the requirements detailed in Section 3.2 of the 2012 *Fish-Stream Crossing Guidebook*. See weblink in Best Management Practices section (below).
- iv. Culvert flow capacity after embedment must be equivalent to the hydraulic capacity of the stream channel or it must be capable of passing the 1 in 200-year maximum daily flow (as per Section 39(1)(a) (vii) of the *WSA*).

f) the protection of natural materials and vegetation that contribute to the aquatic ecosystem or stream channel stability;

- i. The disturbance of natural materials (e.g. embedded logs) and stream bank vegetation must not occur or be minimized as much as possible. Any trees at the work site or within the clearing width area adjacent to streams that must be removed must be felled away from the stream to the fullest extent possible.

g) the restoration of the worksite after the change has been made.

- i. Any areas that are disturbed during the work (such as exposed soil) must be promptly restored to the pre-disturbance (or better) condition. All disturbed soils adjacent to the stream shall be re-vegetated with a suitable mix of grass, shrubs and/or trees immediately after the completion of

works, or as soon as site conditions are conducive to growth.

Additional Information

It is the responsibility of persons intending to carry out changes in and about a stream, as described under Part 3 of the *Water Sustainability Regulation* to:

- Ensure that all sections of the Notification form are properly completed;
- Comply with provincial, federal and municipal requirements; and
- Obtain the approval of the landowner for proposed changes and related works or activities intended to take place on private land or premises or to use any privately owner works, before proceeding.

In the event of non-compliance with the requirements of the regulation (including habitat officer terms and conditions), it is the responsibility of persons carrying out changes in and about a stream to:

- Report non-compliance with the regulation within 72 hours and then to take measures to remedy the non-compliance, as may be specified by a Water Sustainability Act Engineer, as well as to comply with any additional terms and conditions specified by the Habitat Officer; and
- Report damage to an aquatic ecosystem within 72 hours to a Habitat Officer and then to restore and repair the habitat to the state that existed before the damage was caused or as directed by the Habitat Officer.

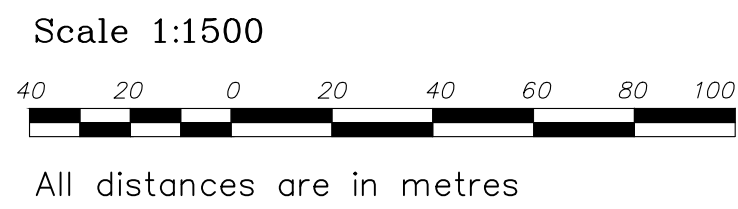
Best Management Practices

Additional guidance when proposing works in and about a stream can be found at:

- *Standards and Best Practices for Instream Works*
<http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>
- *Fish Stream Crossing Guidebook*
https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/resource-roads/fish-stream_crossing_web.pdf
- *BC Guidelines and Best Management Practices*
<https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resource-standards-and-guidance/best-management-practices>

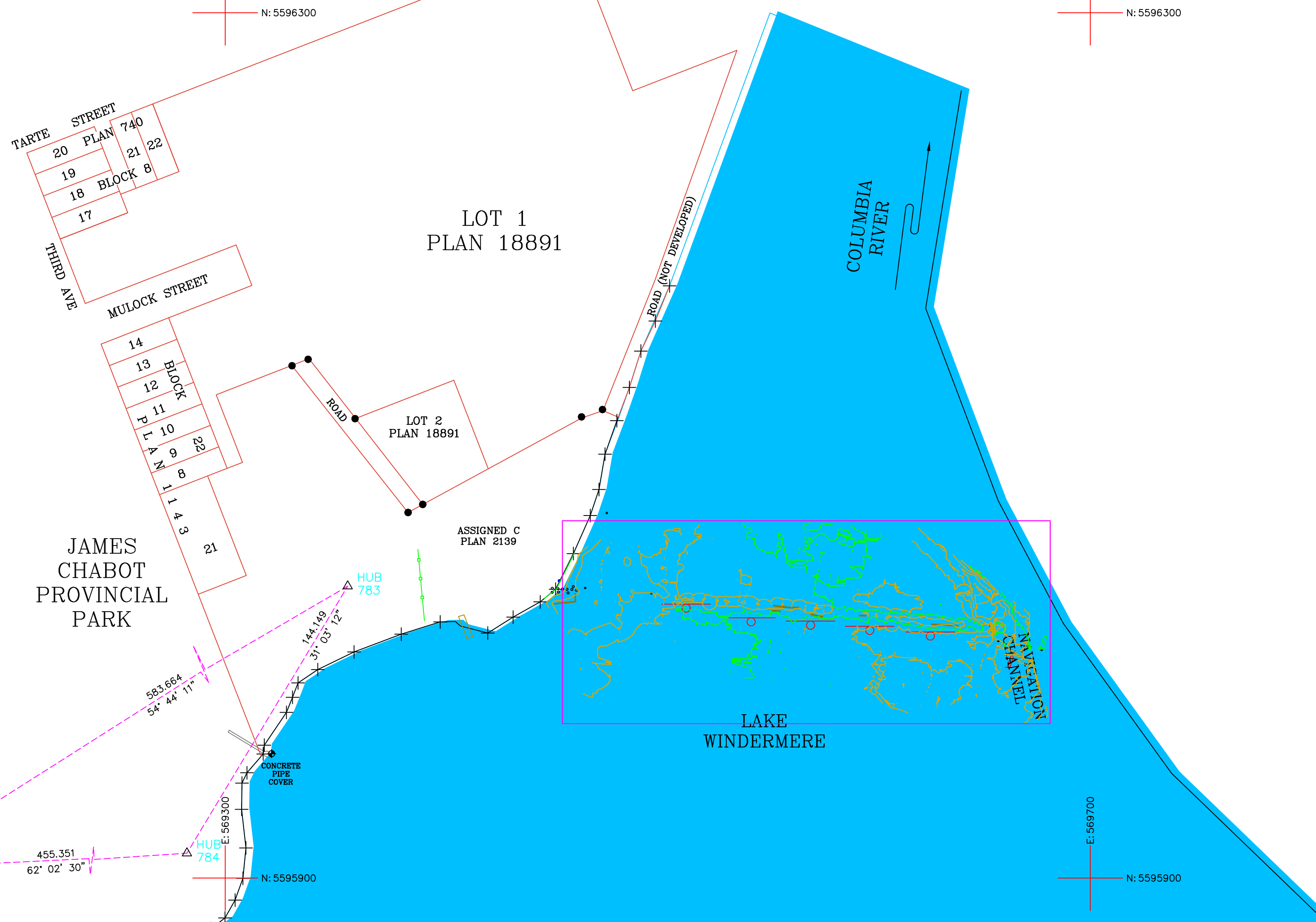
Topographic Plan of the Lake Windermere Groyne

Invermere, British Columbia.
B.C.G.S. 82K.060



- Legend:**
- STANDARD IRON POST FOUND
 - △ CONTROL POINT SET
 - ⊙ ACTIVE CONTROL POINT
 - ⊙ BM SET
 - ⊙ UNMARKED MEASURED POINT
 - PROPERTY LINES
 - MAJOR CONTOUR
 - MINOR CONTOUR
 - SIGN
 - SPAR BUOY

Control Points NAD83 (CSRS) UTM 11 ELEVATIONS ARE ORTHOMETRIC (CGVD28)				
Point #	Northing	Easting	Elevation	Description
783	5596034.92	569356.65	800.38	HUB
784	5595911.48	569282.32	800.89	HUB



Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Location Map BCGS 82K.060

Bearings are Grid, and Derived from Dual Frequency Differential GPS Observations Between Hub (753) and Hub (754) and Invermere Active Control Point (GCM 164418) and Referenced to the 117th Meridian.

Elevations are derived from GPS observations and are Orthometric and are Referenced to Canadian Geodetic Vertical Datum 1928 (HT.0). All Distances are Ground Unless Otherwise Noted. To Calculate Grid distance, Multiply by the Combined Scale Factor 0.99953610

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Date of Survey Sept 21-22, 2010 By I.R. Robertson, BCIS
SF#3249.00, FB#21, Pg 63-71

The Intended Plot Size of this Plan is 594MM by 841 mm

Revision/Revision	Description/Description	Date/Date
0	AS BUILT	2021.01.29

Client/client project
Public Services and Procurement Canada

Project title/Titre du projet
Lake Windermere Groyne Marker Buoy Installation

Consultant Signature Only

Designed by/Concept par
GOUIN BARFORD P.ENG 2020-JUL-06

Drawn by/Dessine par
KEVIN LOUKES 2020-JUL-06

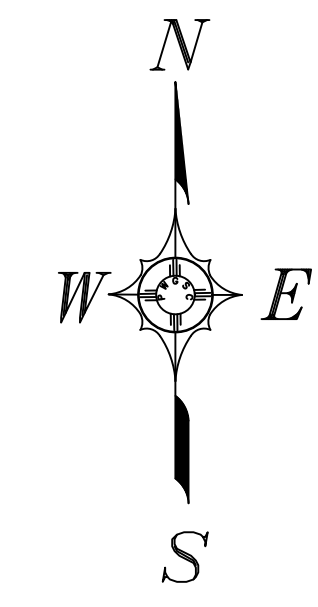
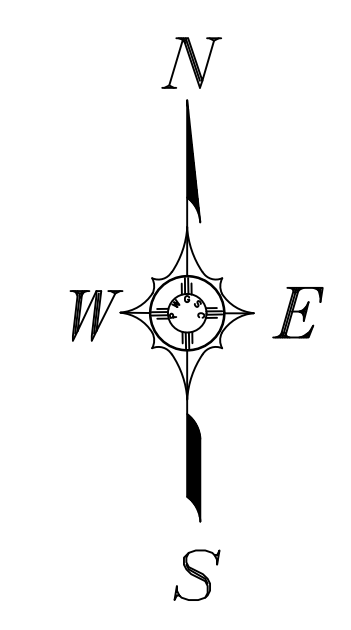
PWGSC Project Manager/Administrateur de Projets TPSGC
NEDA NADERI

Regional Manager, Architectural and Engineering Services
Gestionnaire régionale, Services d'architectural et de génie, TPSGC
PREETIPAL PAUL, PENG

Drawing title/Titre du dessin

Sounding Plan

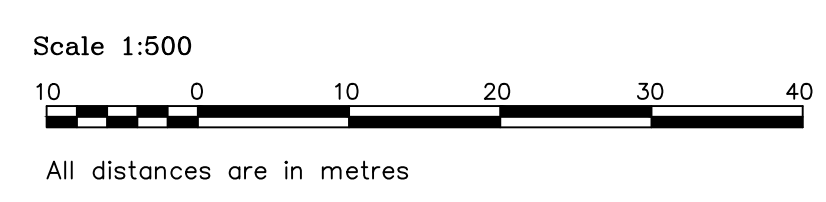
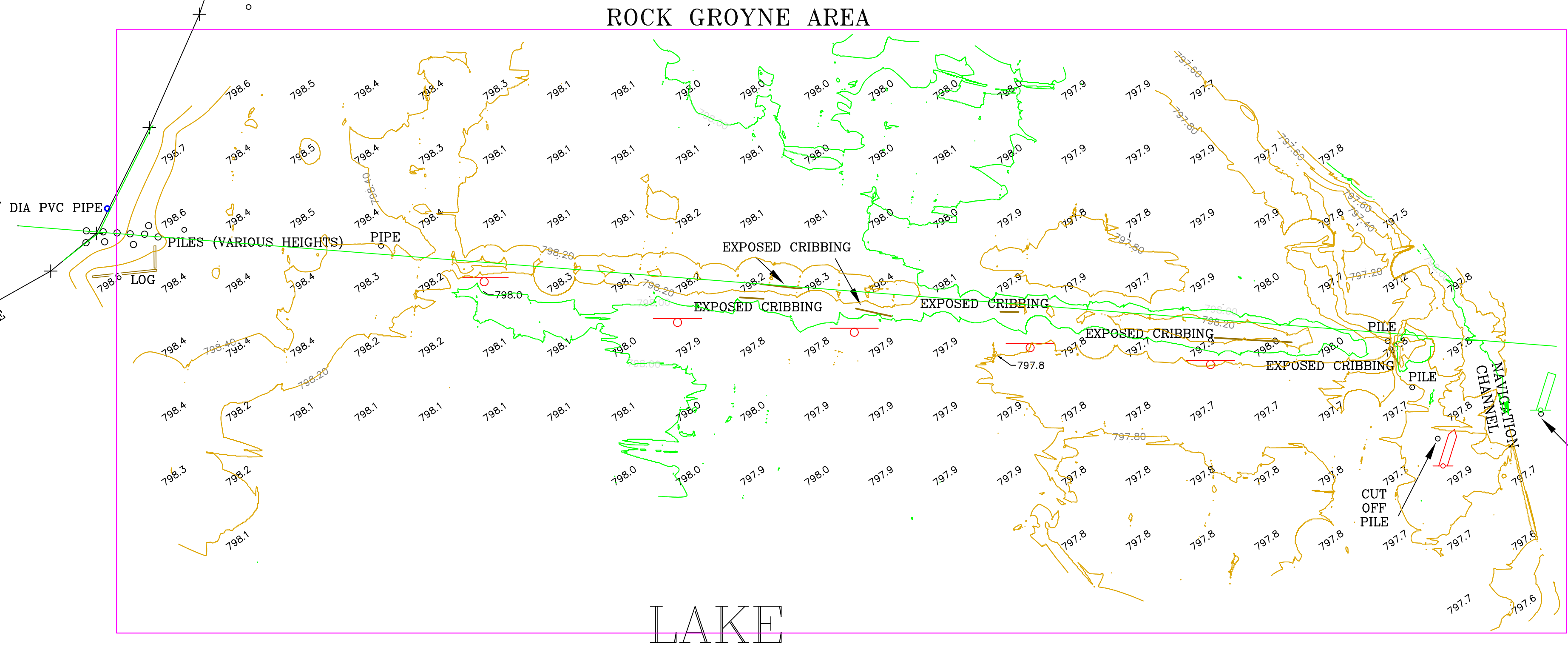
Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
R.074582.003	1 of 3	0



NOTE: This Revision updates the elevations used in Sheet 4 Only, for the Cross Profiles 1 thru 7 Only. Dated April 11, 2012

This sheet is a copy of Sheet 1 of 7, from PSPC GCDOCS file #79361423.

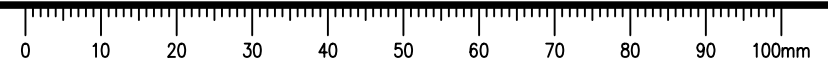
This Plan lies within the East Kootenay Regional District



Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Geomatics Services

#2-100 Annacis Parkway
New Westminster, B.C.
V3M 6A2
604-666-9994



DESIGN MARKER BUOY LOCATIONS AND TYPES

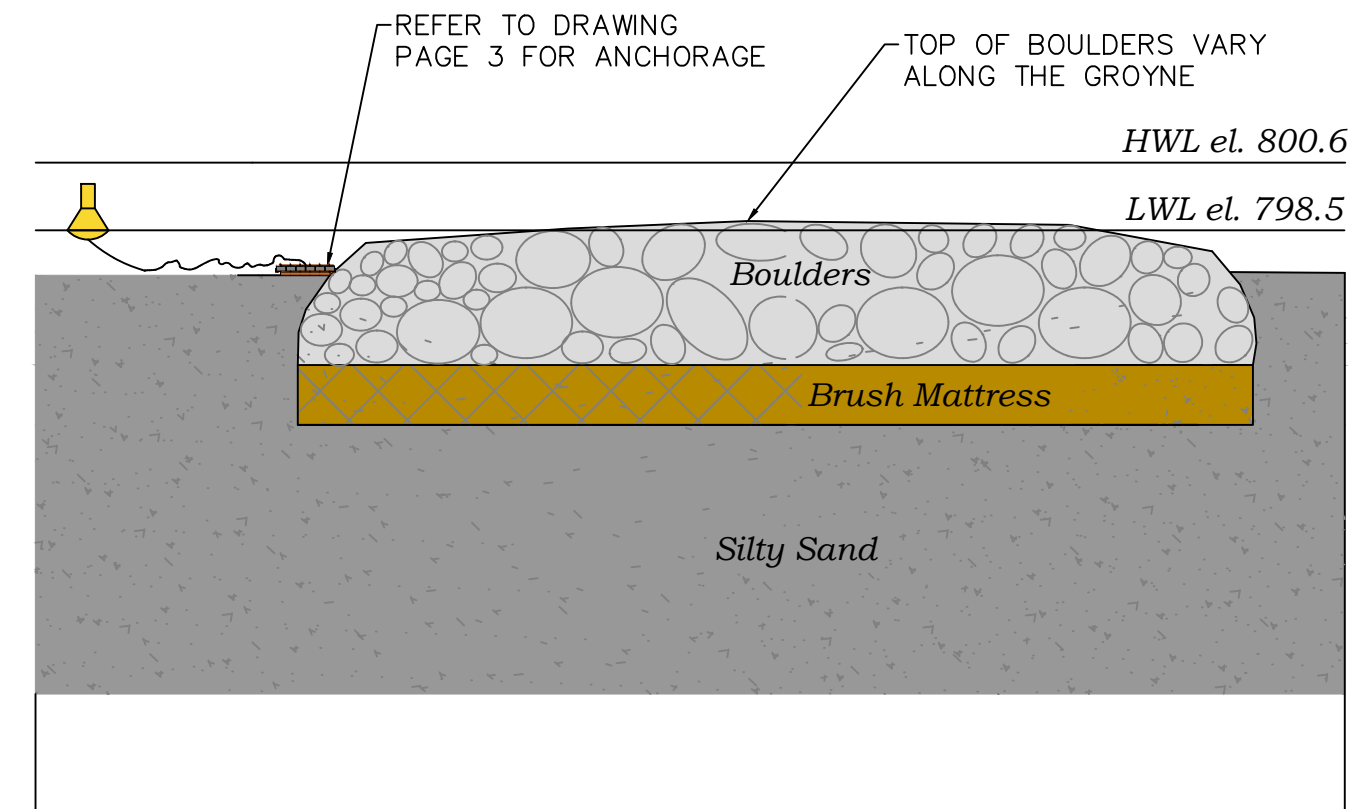
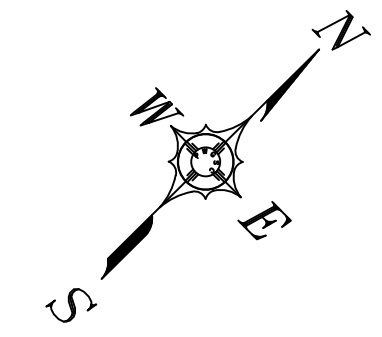
BUOY #	NORTHING	EASTING	TYPE
B1	5596018.001*	569653.840*	STARBOARD HAND
B2	5596018.781	569643.871	CAUTION
B3	5596019.562	569633.901	CAUTION
B4	5596021.123	569613.962	CAUTION
B5	5596022.683	569594.023	CAUTION
B6	5596024.244	569574.084	CAUTION
B7	5596025.805	569554.145	CAUTION
B8	5596027.365	569534.206	CAUTION
B9	5596028.926	569514.267	CAUTION
B10	5596030.487	569494.328	CAUTION
B11	5596032.047	569474.389	CAUTION

*B1 DESIGN ANCHOR LOCATION CHANGED TO THE END OF THE GROUYNE AS LOCATED IN THE FIELD (REFER TO AS-BUILT LOCATIONS)

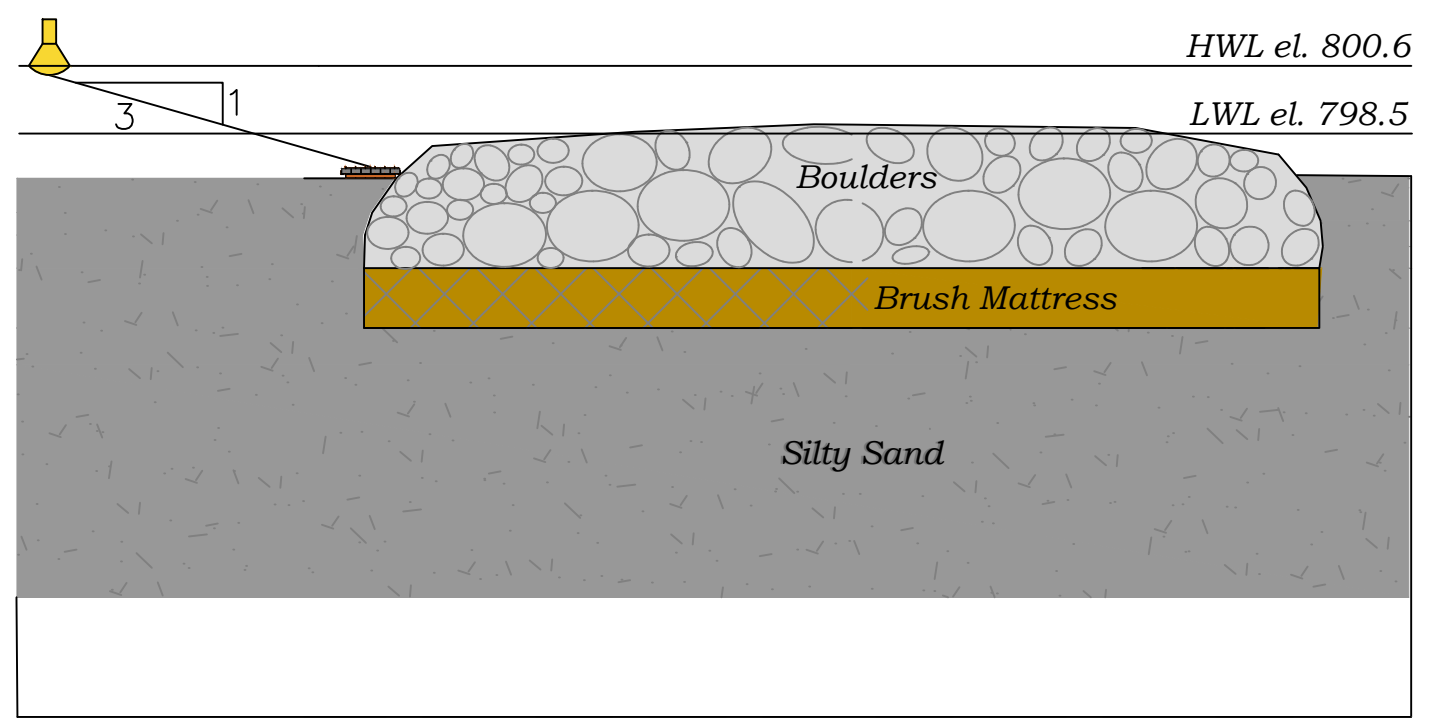
AS-BUILT MARKER BUOY LOCATIONS AND TYPES

BUOY #	NORTHING	EASTING	TYPE
B1	5596014.522	569653.202	STARBOARD HAND
B2	5596018.651	569643.8154	CAUTION
B3	5596019.427	569633.917	CAUTION
B4	5596021.125	569613.9638	CAUTION
B5	5596022.69	569593.9457	CAUTION
B6	5596024.371	569574.0612	CAUTION
B7	5596025.852	569554.1826	CAUTION
B8	5596027.488	569534.1838	CAUTION
B9	5596029.062	569514.3616	CAUTION
B10	5596030.496	569494.3812	CAUTION
B11	5596031.935	569474.3701	CAUTION

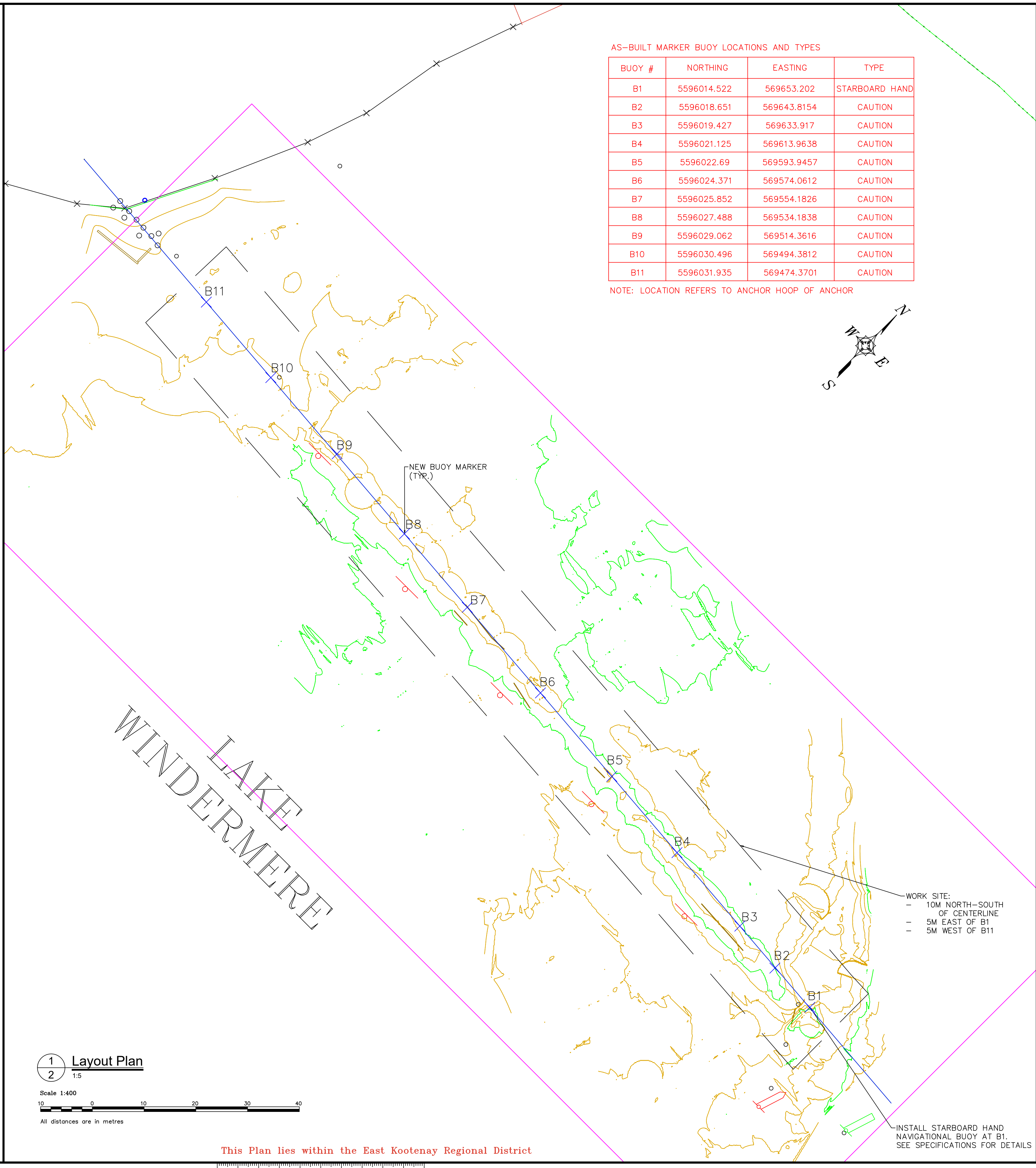
NOTE: LOCATION REFERS TO ANCHOR HOOP OF ANCHOR



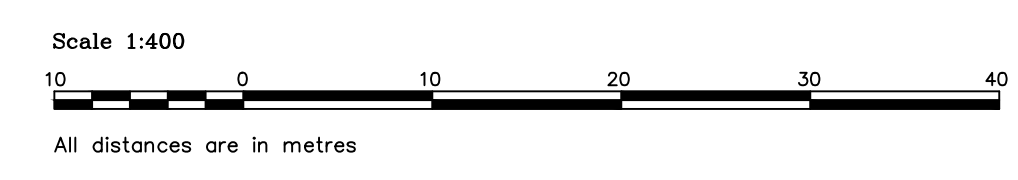
TYPICAL GROUYNE CROSS SECTION WITH BUOY AT LOW WATER LEVEL NTS



TYPICAL GROUYNE CROSS SECTION WITH BUOY AT HIGH WATER LEVEL NTS



1 Layout Plan
2 1:5



This Plan lies within the East Kootenay Regional District

The Intended Plot Size of this Plan is 594MM by 841 mm

Revision/Revision	Description/Description	Date/Date
0	AS BUILT	2021.01.29

Public Services and Procurement Canada

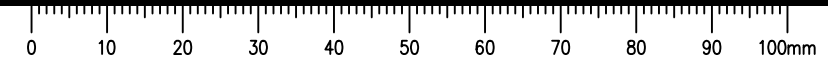
Lake Windermere Groyne Marker Buoy Installation

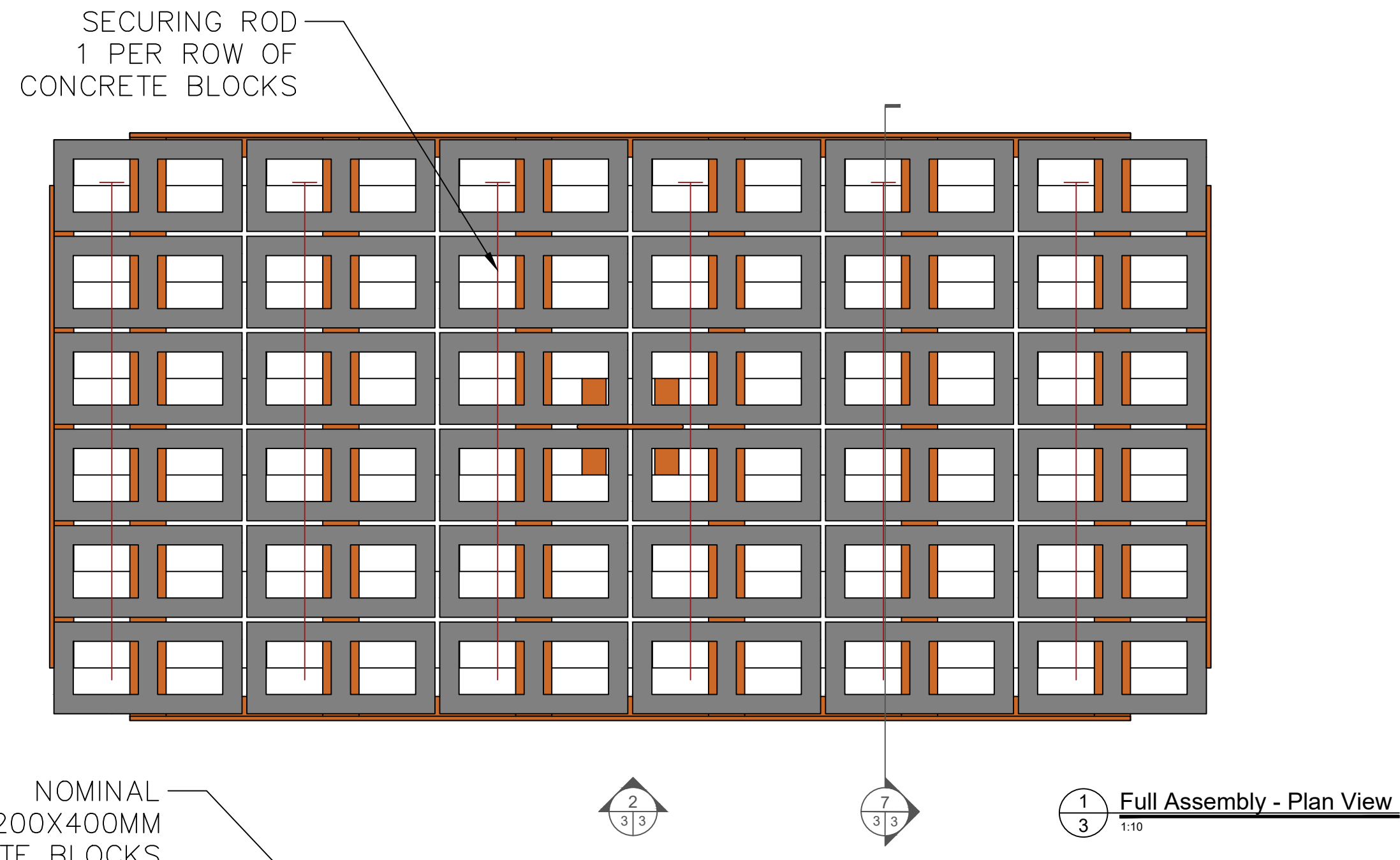
Designed by/Concept par: GOUIN BARFORD P.ENG 2020-JUL-06
 Drawn by/Dessine par: KEVIN LOUKES 2020-JUL-06
 PWGSC Project Manager/Administrateur de Projets TPSGC: JULIAN HO, P.ENG
 Regional Manager, Architectural and Engineering Services / Gestionnaire régionale, Services d'architecture et de génie, TPSGC: PREETIPAL PAUL, P.ENG

Layout Plan and Groyne Cross Sections

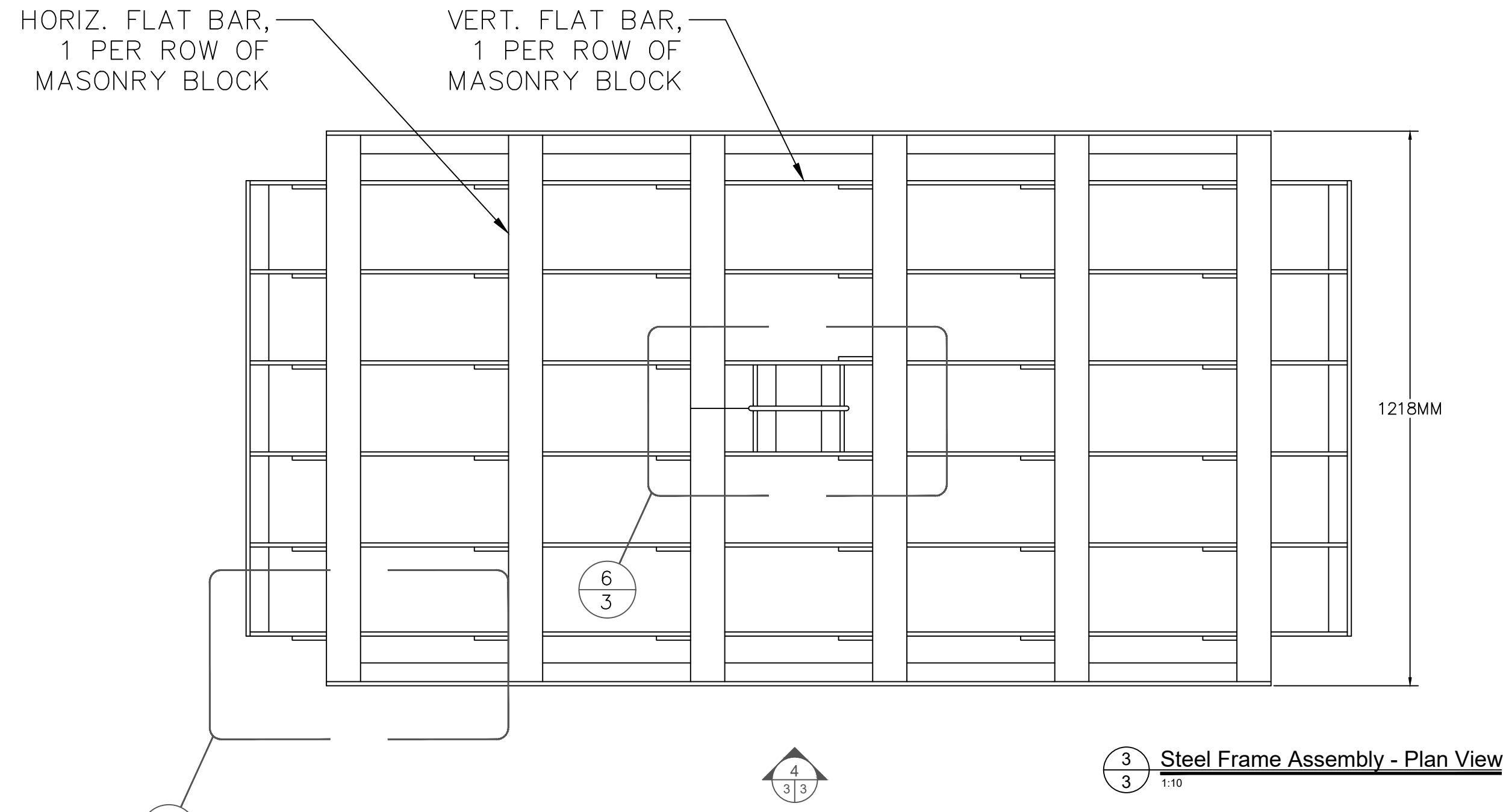
Project No./No. du projet	Sheet/Fauille	Revision no./La Révision no.
R.074582.003	2 of 3	0

Plot Scale: VARIES

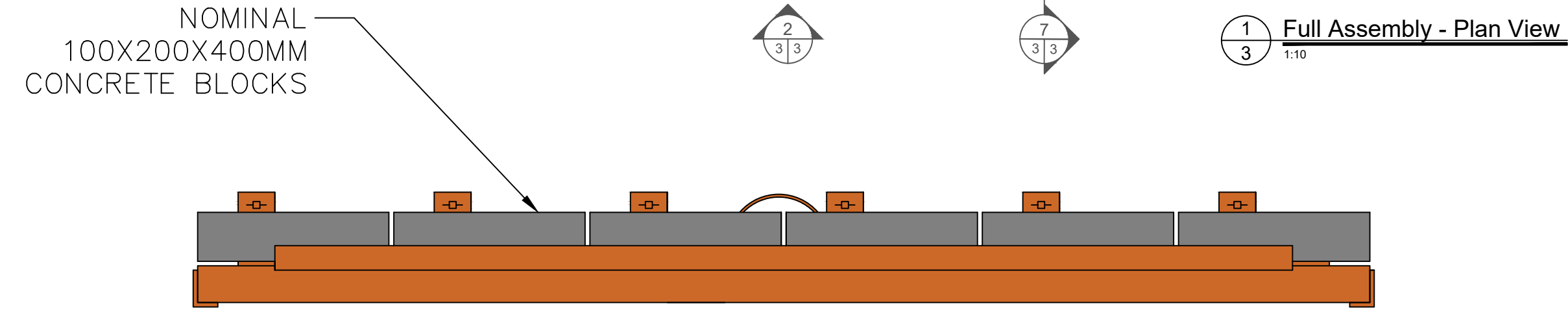




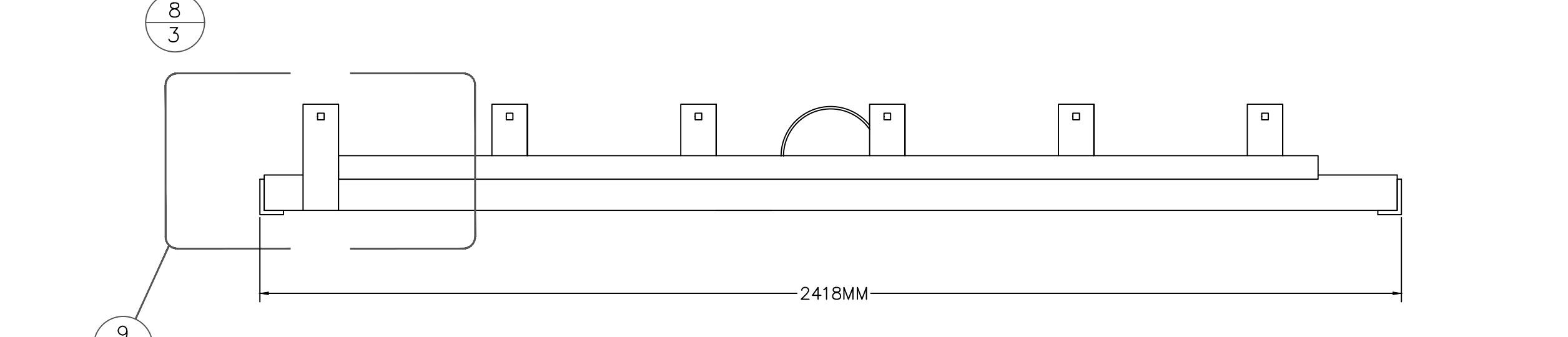
1 Full Assembly - Plan View
3 1:10



3 Steel Frame Assembly - Plan View
3 1:10



2 Full Assembly - Side View
3 1:10



4 Steel Frame Assembly - Side View
3 1:10

NOTES:
 - ANCHOR FOR B1 IS 1218x2818MM WITH 42 BLOCKS
 - ANCHOR FOR OTHER BUOYS ARE 1218x2418MM WITH 36 BLOCKS



The Intended Plot Size of this Plan is 594MM by 841 mm

Revision/Revision	Description/Description	Date/Date
0	AS BUILT	2021.01.29

Client/client
Project

Project title/Titre du projet

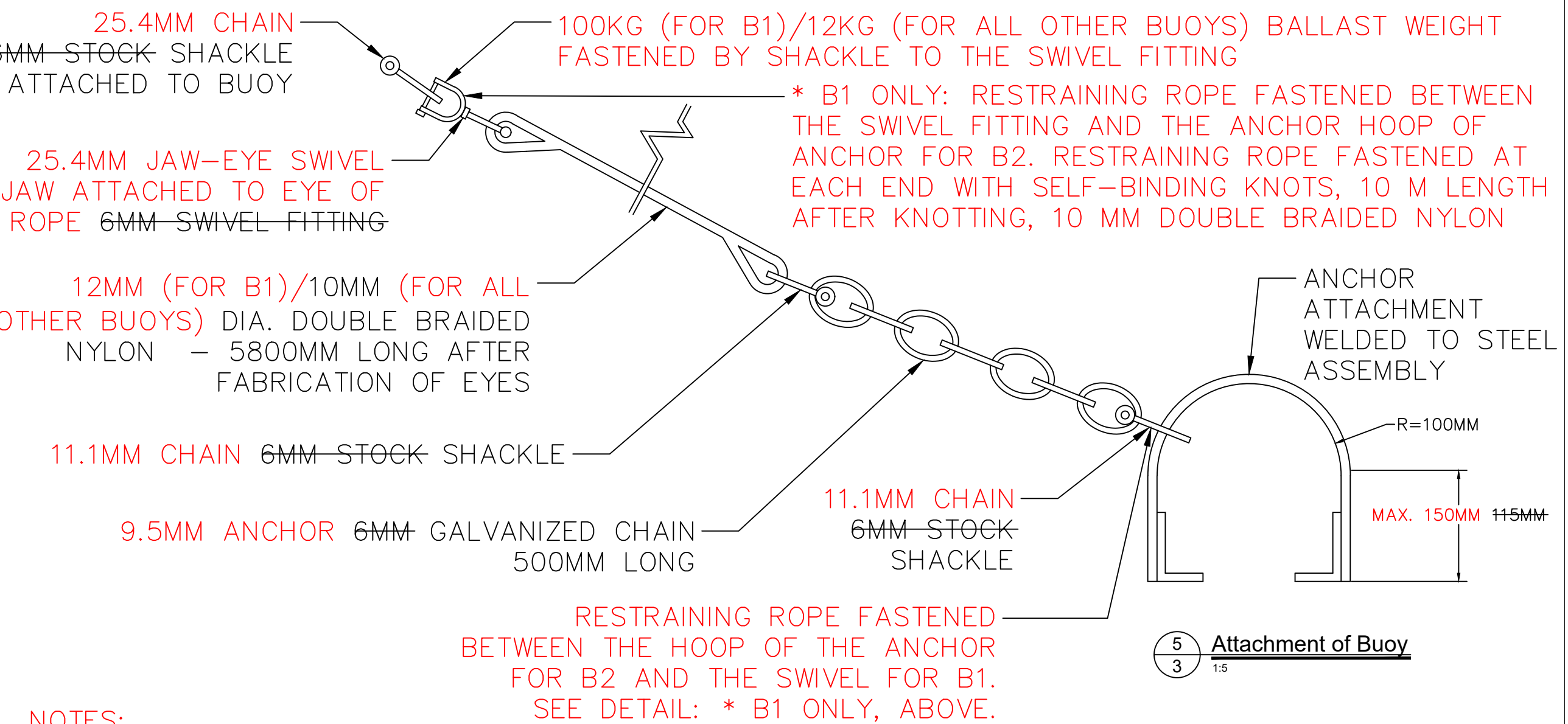
Lake Windermere Groyne Marker Buoy Installation

Consultant Signature Only

Designed by/Concept par
GOUIN BARFORD P.ENG 2020-JUL-06
 Drawn by/Dessiné par
KEVIN LOUKES 2020-JUL-06
 PWGSC Project Manager/Administrateur de Projets TPSPC
JULIAN HO, P.ENG
 Regional Manager, Architectural and Engineering Services
Gestionnaire régionale, Services d'architectural et de génie, TPSPC
PREETIPAL PAUL, P.ENG
 Drawing title/Titre du dessin

Buoy Anchoring Details

Project No./No. du projet	Sheet/Fauille	Revision no./La Révision no.
R.074582.003	3 of 3	0

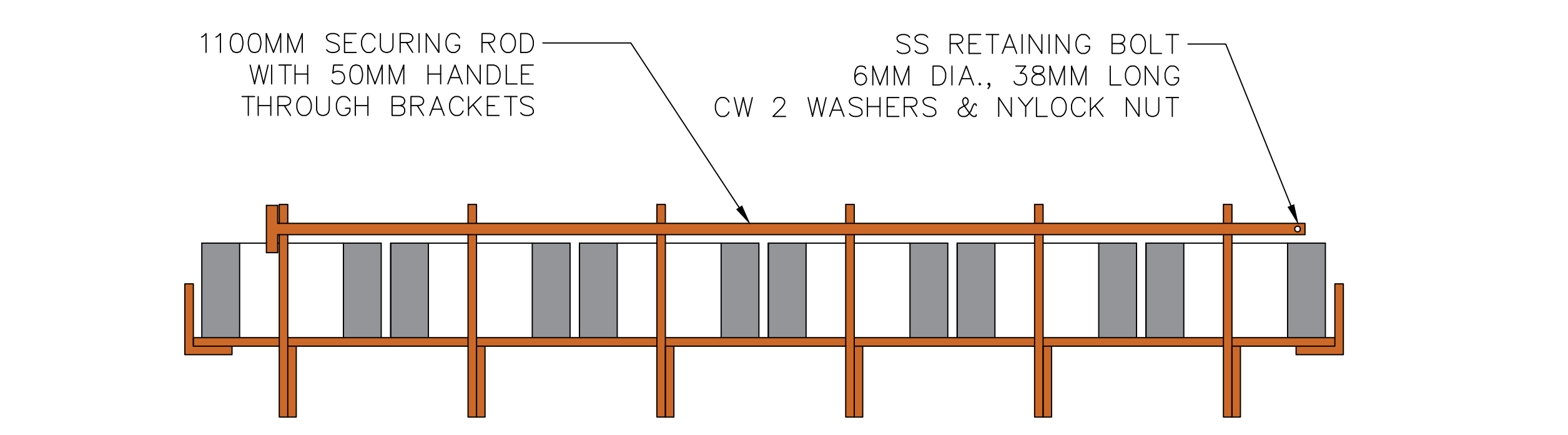


5 Attachment of Buoy
3 1:5

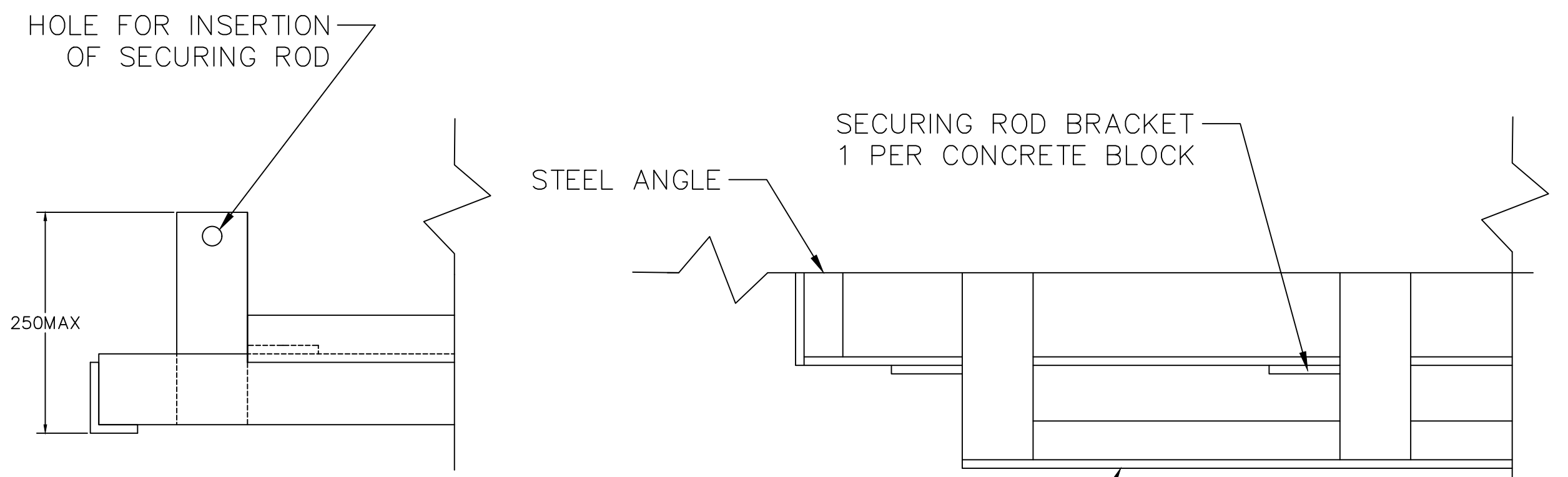
NOTES:
 - ALL SHACKLES ARE 'SCREW PIN CHAIN' SHACKLES
 - ALL HARDWARE IS GALVANIZED



6 Attachment of Buoy to Steel Frame
3 1:5



7 Securing Rod for Concrete Blocks
3 1:5



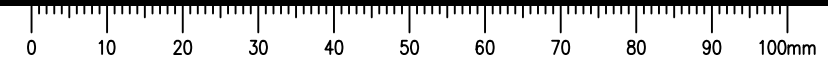
8 Detail - Securing Rod Bracket
3 1:5

9 Detail - Steel Frame
3 1:5



Notes:
- SEAL WELD ALL ROUND AT ALL CONTACTS

Plot Scale: VARIES



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	795.00	795.50	Red
2	795.50	796.00	Orange
3	796.00	796.50	Yellow
4	796.50	797.00	Light Green
5	797.00	797.50	Green
6	797.50	798.00	Dark Green
7	798.00	798.50	Teal
8	798.50	799.00	Light Blue
9	799.00	799.50	Blue
10	799.50	800.00	Dark Blue
11	800.00	800.50	Purple

Water Level Information for period between 1915 - 1984 at Athabasca gauge (08NA004) location:
 Maximum water level: 800.6m
 Minimum water level: 798.5m
 (Water level referenced to "Geodetic Survey of Canada Datum")

Control Hub (4179) Coordinates
 Datum: NAD83 (CSRS) (Epoch 2002.0)
 UTM ZONE 11
 UTM Northing: 5596222.687
 UTM Easting: 569520.407
 Elevation (CGVD28): 799.631

Control Hub (4180) Coordinates
 Datum: NAD83 (CSRS) (Epoch 2002.0)
 UTM ZONE 11
 UTM Northing: 5596140.383
 UTM Easting: 569375.770
 Elevation (CGVD28): 804.216

DISTRICT LOT 267

DISTRICT LOT 4347

DISTRICT LOT 4596

Legend:

- Priv DENOTES PRIVATE MARKER BUOY
- Priv DENOTES PRIVATE MOORING BUOY
- OU DENOTES STARBOARD (WHEN TRANSITING UPSTREAM)
- OU DENOTES PORT (WHEN TRANSITING UPSTREAM)
- OU DENOTES NAVIGATIONAL BUOY (OWNERSHIP UNKNOWN)
- OU DENOTES NAVIGATIONAL BUOY (OWNERSHIP UNKNOWN)
- Denotes FLOAT (DOCK)
- Denotes CONTROL HUB
- Denotes SPOT ELEVATION (TYPICAL)
- Denotes PILE
- Denotes LOCATION OF TOP OF BULKHEAD TIE
- DL Denotes DISTRICT LOT
- Denotes TIE LINE
- Denotes MAJOR CONTOUR (INTERVAL = 0.5M)
- Denotes MINOR CONTOUR (INTERVAL = 0.1M)
- Denotes VISIBLE CRIBBING OR WOOD
- Denotes PROPERTY BOUNDARIES (LOCATION APPROXIMATE)

Public Services and Procurement Canada
 Services publics et Approvisionnement Canada
 Geomatics Services
 #2-100 Annacis Parkway
 Delta, BC, V3M-6A2
 604-666-7765

LOCATION MAP
 (Not to Scale)
 Source: NRCan Toporama

HYDROGRAPHIC AND SITE SURVEY OF LAKE WINDERMERE GROYPE

Scale 1:600

The intended plot size of this plan is 864mm in width by 560mm in height (D size) when plotted at a scale of 1:600

Distances are in metres and decimals thereof.

Date of Survey: August 18-19, and September 9-10 2020.

SF # 3643.00
 SK # 5782.00
 Project #: R.074582.003
 Drawn: CMB - 2020-09-29

Notes:

HYDROGRAPHIC DATA COLLECTION:
 Vessel: PINGSON "Stanley"
 Sounder: Knudsen Mini 200 kHz - 10° Beam
 Positioning: Trimble R10 GNSS

UPLAND DATA COLLECTION:
 Trimble R10 GNSS

Grid bearings are derived from dual frequency, differential carrier phase GNSS observations, and are referred to the central meridian of UTM zone 11 (117° West longitude)

The UTM coordinates are derived dual frequency, static GNSS observations, processed using Natural Resources Canada Precise Point Positioning Service (PPP).

This plan shows horizontal ground-level distances unless otherwise specified. To compute grid distances, multiply ground-level distances by the average combined factor of 0.9995359. The average combined factor has been determined based on an ellipsoidal elevation of 786.17 metres.

Elevations are Orthometric (CGVD28), and derived from dual frequency static GNSS observations processed using Natural Resources Canada Precise Point Positioning Service (PPP).

This plan was prepared for planning and discussion purposes only and is for the exclusive use of our client. It shall not be used to define property boundaries. It shall not be relied upon as definitive proof of encroachments or fill in relation to any property boundary. Any questions to the above should be followed up with an additional in-depth legal survey.

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This plan lies within the East Kootenay Regional District
 Certified Correct this 1st day of October, 2020.

Christopher Bryenton, BCLS

