Sunshine Coast Regional District

Request for Proposal

Number: 2337006

for

Dam Safety Improvements & Upgrades to Chapman, Edwards and McNeil Lakes

Issue Date:

June 9, 2023

Closing Date of

July 11, 2023 at 3:00 PM local time

OPTIONAL SITE MEETING: An optional site meeting will be held on June 28, 2023 at 10:30 am local time starting at the 12222 McNeil Lake FSR, Madeira Park, which is accessible by vehicle. Immediately following the McNeil Lake Dam site meeting, interested Proponents will reconvene at Airspan Helicopters near the Sechelt Airport to visit the Chapman Lake and Edwards Lake dam sites by helicopter. Helicopter transportation will be limited to one (1) passenger per Proponent. Proponents needs to RSVP their intent to attend the optional site meeting at by June 22, 2023; if no RSVP's are received the site meeting will be cancelled.

CONTACT: All enquiries related to this Request for Proposal, including any requests for information and clarification, are to be submitted by June 28, 2023 and directed, in writing, to purchasing@scrd.ca, who will respond if time permits with a Q&A on BCBid by July 5, 2023 Information obtained from any other source is not official and should not be relied upon. Enquiries and any responses providing new information will be recorded and posted to BC Bid or otherwise distributed to prospective Proponents.

DELIVERY OF PROPOSALS: Proposals must be in English and must be submitted using one of the submission methods below, and must either **(1)** include a copy of this cover page that is signed by an authorized representative of the Proponent or **(2)** be submitted by using the e-bidding key on BC Bid (if applicable), in accordance with the requirements set out in the RFP.

BC Bid Electronic Submission: Proponents may submit an electronic proposal using BC Bid. Proposals must be submitted in accordance with the BC Bid requirements and e-bidding key requirements (found at https://www.bcbid.gov.bc.ca/). Only pre-authorized electronic bidders registered on the BC Bid system can submit an electronic proposal using the BC Bid system. Use of an e-bidding key is effective as a signature.

OR

Hard Copy Submission*:* Proponents must submit **ONE (1)** hard-copies and **ONE (1)** electronic copy on a USB Drive of the proposal. Proposals submitted by hard copy must be submitted by hand or courier to:

Sunshine Coast Regional District
1975 Field Road
Sechelt, BC V7Z 0A8

Regardless of submission method, proposals must be received before Closing Time to be considered.

A proposal is deemed to incorporate the Confirmation of Proponent's Intent to Be Bound below, without alteration.

CONFIRMATION OF PROPONENT'S INTENT TO BE BOUND:

The enclosed proposal is submitted in response to the referenced Request for Proposal, including any Addenda. By submitting a proposal the Proponent agrees to all of the terms and conditions of the RFP including the following:

a) The Proponent has carefully read and examined the entire Request for Proposal;
b) The Proponent has conducted such other investigations as were prudent and reasonable in preparing the proposal; and
c) The Proponent agrees to be bound by the statements and representations made in its proposal.

PROPONENT NAME (please print): _____

NAME OF AUTHORIZED REPRESENTATIVE (please print):_____

SIGNATURE OF AUTHORIZED REPRESENTATIVE: _____

DATE: _____

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1. GENERAL TERMS & CONDITIONS

1.1 DEFINITIONS

Throughout this Request for Proposal, the following definitions apply:

"**Addenda**" means all additional information regarding this RFP, including amendments to the RFP;
"**BC Bid**" means the BC Bid website located at https://www.bcbid.gov.bc.ca/ ;
"**Closing Location**" includes the location or email address for submissions indicated on the cover page of this RFP, or BC Bid, as applicable;
"**Closing Time**" means the closing time and date for this RFP as set out on the cover page of this RFP;
"**Contract**" means the written agreement resulting from the RFP executed by the Regional District and the successful Proponent;
"**Contractor**" means the successful Proponent to the RFP who enters into a Contract with the Regional District;
"**Must**", or "**mandatory**" means a requirement that must be met in order for a proposal to receive consideration;
"**Proponent**" means a person or entity (excluding its parent, subsidiaries or other affiliates) with the legal capacity to contract, that submits a proposal in response to the RFP;
"**Proposal**" means a written response to the RFP that is submitted by a Proponent;
"**Request for Proposals**" or "**RFP**" means the solicitation described in this document, including any attached or referenced appendices, schedules or exhibits and as may be modified in writing from time to time by the Regional District by Addenda; and
"**Should**", "**may**" or "**weighted**" means a requirement having a significant degree of importance to the objectives of the Request for Proposals.
"SCRD", "Regional District", "Organization", "we", "us", and**"our"** mean Sunshine Coast Regional District.

1.2 FORM OF PROPOSAL

This Proposal must be completed in its entirety. Failure to properly complete this Proposal form may cause your Proposal to be rejected. The signing officer must initial all corrections. The Sunshine Coast Regional District (Regional District) reserves the right to permit a correction, clarification or amendment to the Proposal or to correct minor errors and irregularities.

1.3 SUBMISSION OF PROPOSAL

a) Proposals must be submitted before Closing Time to the Closing Location using one of the submission methods set out on the cover page of this RFP. Proposals must not be sent by fax. The Proponent is solely responsible for ensuring that, regardless of submission method selected, the Regional District receives a complete Proposal, including all attachments or enclosures, before the Closing Time.

b) For electronic submissions (BC Bid or email), the following applies:

(i) The Proponent is solely responsible for ensuring that the complete electronic Proposal, including all attachments, is received before Closing Time;

(ii) The Regional District limits the maximum size of any single email message to 20MB or less.

(iii) Proponents should endeavour to submit emailed proposal submissions in a single message and avoid sending multiple email submissions for the same opportunity. If an electronic submission exceeds the applicable maximum single message size, the Proponent may make multiple submissions (BC Bid upload or multiple emails for the same opportunity). Proponents should identify the order and number of emails making up the email proposal submission (e.g. "email 1 of 3, email 2 of 3…");

(iv) For email proposal submissions sent through multiple emails, the Regional District reserves the right to seek clarification or reject the proposal if the Regional District is unable to determine what documents constitute the complete proposal;

(v) Attachments must not be compressed or encrypted, must not contain viruses or malware, must not be corrupted, and must be able to be opened using commonly available software (e.g. Adobe Acrobat). Proponents submitting by electronic submission are solely responsible for ensuring that any emails or attachments are not corrupted. The Regional District has no obligation to attempt to remedy any message or attachment that is received corrupted or cannot be viewed. The Regional District may reject proposals that are compressed encrypted, cannot be opened or that contain viruses or malware or corrupted attachments.

c) For BC Bid e-submissions only pre-authorized e-bidders registered on BC Bid can submit electronic bids on BC Bid. BC Bid is a subscription service ($150 per year) and the registration process may take two business days to complete. If using this submission method, Proponents should refer to the BC Bid website or contact BC Bid Helpdesk at 250-387-7301 for more information. An electronic proposal submitted on BC Bid must be submitted using the e-bidding key of an authorized representative of the Proponent. Using the e-bidding key of a subcontractor is not acceptable.

d) For email proposal submissions, including any notices of amendment or withdrawal referred to in Section 1.6, the subject line of the email and any attachment should be clearly marked with the name of the Proponent, the RFP number and the project or program title.

e) The Regional District strongly encourages Proponents using electronic submissions to submit proposals with sufficient time to complete the upload and transmission of the complete proposal and any attachments before Closing Time.

f) The Proponent bears all risk associated with delivering its Proposal by electronic submission, including but not limited to delays in transmission between the Proponent's computer and the Regional District Electronic Mail System or BC Bid.

g) While the Regional District may allow for email proposal submissions, the Proponent acknowledges that email transmissions are inherently unreliable. The Proponent is solely responsible for ensuring that its complete email proposal submission and all attachments have been received before Closing Time. If the Regional District Electronic Mail System rejects an email proposal submission for any reason, and the Proponent does not successfully resubmit its proposal by the same or other permitted submission method before Closing Time, the Proponent will not be permitted to resubmit its proposal after Closing Time. The Proponent is strongly advised to contact the Regional District Contact immediately to arrange for an alternative submission method if:

(i) the Proponent's email proposal submission is rejected by the Regional District Electronic Mail System; or

(ii) the Proponent does not receive an automated response email from the Regional District confirming receipt of each and every message transmitted, within a half hour of transmission by the Proponent.

An alternate submission method may be made available, at the Regional District's discretion, immediately to arrange for an alternative submission method, and it is the Proponent's sole responsibility for ensuring that a complete proposal (and all attachments) submitted using an approved alternate submission method is received by the Regional District before the Closing Time. The Regional District makes no guarantee that an alternative submission method will be available or that the method available will ensure that a Proponent's proposal is received before Closing Time.

1.4 SIGNATURE REQUIRED

Proposals must be properly signed by an officer, employee or agent having authority to bind the Proponent by that signature.

1.5 CLARIFICATIONS, ADDENDA & MINOR IRREGULARITIES

If any Proponent finds any inconsistencies, errors or omissions in the proposal documents or requires information, clarification of any provision contained therein, they shall submit their query in writing or email, addressed as follows:

Purchasing Division
Sunshine Coast Regional District
1975 Field Road, Sechelt, BC V7Z 0A8

purchasing@scrd.ca

Any interpretation of, addition to, deletions from or any corrections to the proposal documents will be issued as written addendum by the Regional District.

All Addenda will be posted on BC Bid. It is the sole responsibility of the Proponent to check for Addenda on BC Bid. Proponents are strongly encouraged to subscribe to BC Bid's email notification service to receive notices of Addenda.

1.6 WITHDRAWAL OR REVISIONS

Proposals or revisions may be withdrawn by written notice provided such a notice of withdrawal is received prior to the closing date and time. Proposals withdrawn will be returned to the Proponent unopened. Revisions to the proposals already received shall be submitted only by electronic mail, or signed letter. The revision must state only the amount by which a figure is to be increased or decreased, or specific directions as to the exclusions or inclusion of particular words.

1.7 CONDUCT OF THE CONTRACT

Unless otherwise specified within this document, any queries regarding this Request for Proposal are to be directed to purchasing@scrd.ca. No other verbal or written instruction or information shall be relied upon by the Bidder, nor will they be binding upon the Regional District.

1.8 CONFLICT OF INTEREST/NO LOBBYING

(a) A Proponent may be disqualified if the Proponent's current or past corporate or other interests, or those of a proposed subcontractor, may, in the Regional District's opinion, give rise to an actual or potential conflict of interest in connection with the services described in the RFP. This includes, but is not limited to, involvement by a Proponent in the preparation of the RFP or a relationship with any employee, contractor or representative of the Regional District involved in preparation of the RFP, participating on the evaluation committee or in the administration of the Contract. If a Proponent is in doubt as to whether there might be a conflict of interest, the Proponent should consult with the Regional District Contact prior to submitting a proposal. By submitting a proposal, the Proponent represents that it is not aware of any circumstances that would give rise to a conflict of interest that is actual or potential, in respect of the RFP.

(b) A Proponent must not attempt to influence the outcome of the RFP process by engaging in lobbying activities. Any attempt by the Proponent to communicate, for this purpose directly or indirectly with any employee, contractor or representative of the Regional District, including members of the evaluation committee and any elected officials of the Regional District, or with the media, may result in disqualification of the Proponent.

1.9 CONTRACT

By submitting a proposal, the Proponent agrees that should its proposal be successful the Proponent will enter into a Contract with the Regional District on substantially the same terms and Conditions set out in www.scrd.ca/bid and such other terms and conditions

to be finalized to the satisfaction of the Regional District, if applicable.

1.10 SUSTAINABLE PROCUREMENT

The Regional District adheres to its sustainable consideration factors. Proposals will be considered not only on the total cost of services, but Proposals that addresses the environment and social factors.

1.11 INVOICING AND PAYMENT

Unless otherwise agreed, the Regional District payment terms are Net 30 days following receipt of services or approved invoices, whichever is later. Original invoices are to be forwarded to the accounts payable department of the Regional District. The purchase order number assigned by the Regional District must be stated on the invoice otherwise payment may be delayed.

1.12 PRICING, CURRENCY AND TAXES

Offered prices are to be attached as a price schedule in Canadian dollars with taxes stated separately when applicable.

1.13 IRREVOCABLE OFFER

This Proposal must be irrevocable for 90 days from the Proposal closing date and time.

1.14 TIME IS OF THE ESSENCE

Time shall be of the essence in this contract.

1.15 ASSIGNMENT

The Proponent will not, without written consent of the Regional District, assign or transfer this contract or any part thereof.

1.16 OWNERSHIP OF DOCUMENTS & FREEDOM OF INFORMATION

All documents submitted in response to this Request for Proposal shall become the property of the Regional District and as such will be subject to the disclosure provisions of the *Freedom of Information and Protection of Privacy Act* and any requirement for disclosure of all or a part of a Proposal under that Act.

The requirement for confidentiality shall not apply to any Proposal that is incorporated into a Contract for the Work. Further, the Regional District may disclose the top scoring proponent's aggregate pricing to the Regional District Board at a public meeting, when making a recommendation for the award of the Contract.

For more information on the application of the Act, go to http://www.cio.gov.bc.ca/cio/priv_leg/index.page.

1.17 AWARD OF CONTRACT

The Purchasing Policy at the Regional District offers contracts to businesses through an open, fair and consistent competitive bidding process. This ensures that the Regional District will receive the best overall value for the goods and services it requires. The Regional District reserves the right to cancel, award all or part of the scope of work described in this document to a single Proponent or may split the award with multiple Proponents.

All awards are subject to Board approval that meets the needs as determined by the Board. The Regional District, in receipt of a submission from a Proponent, may in its sole discretion consider the Proponent to have accepted the terms and conditions herein, except those expressly excluded or changed by the Proponent in writing.

The RFP shall not be construed as an agreement to purchase goods or services. The lowest priced or any proposal will not necessarily be accepted. The RFP does not commit the Regional District in any way to award a contract and that no legal relationship or obligation regarding the procurement of any good or service will be created between Regional District and the proponent unless and until Regional District and the proponent execute a written agreement for the Deliverables

1.18 COST OF PROPOSAL

The Proponent acknowledges and agrees that the Regional District will not be responsible for any costs, expenses, losses, damage or liability incurred by the Proponent as a result of or arising out submitting a Proposal for the proposed contract or the Regional District's acceptance or non-acceptance of their proposal. Further, except as expressly and specifically permitted herein, no Proponent shall have any claim for any compensation of any kind whatsoever, as a result of participating in this RFP, and by submitting a proposal each Proponent shall be deemed to have agreed that it has no claim.

1.19 PROPONENT'S RESPONSIBILITY

It is the Proponent's responsibility to ensure that the terms of reference contained herein are fully understood and to obtain any further information required for this proposal call on its own initiative. The Regional District reserves the right to share, with all proponents, all questions and answers related to this bid call.

1.20 EVALUATIONS

Proposals will be evaluated in private, including proposals that were opened and read in public, if applicable. Proposals will be assessed in accordance with the evaluation criteria.

If only one Proposal is received, the Regional District reserves the right to open the Proposal in private or if the total bid price exceeds the estimated budget for the Contract, the Regional District may cancel and re-tender, accept, not accept and cancel or re-scope the Work seeking a better response, with or without any substantive changes being made to the solicitation documents. If more than one Proposal is received from the same Proponent, the last Proposal received, as determined by the Regional District, will be the only Proposal considered.

1.21 ACCEPTANCE OF TERMS

The submission of the Proposal constitutes the agreement of the Proponent that all of the terms and conditions of the RFP are accepted by the Proponent and incorporated in its Proposal, except those conditions and provisions which are expressly excluded and clearly stated as excluded by the Proponent's proposal.

1.22 MANDATORY REQUIREMENTS

Proposals not clearly demonstrating that they meet the mandatory requirements will receive no further consideration during the evaluation process.

1.23 INSURANCE & WCB

the term of the contract, insurance coverage with the Regional District Listed as “Additional Insured” the minimum limits of not less than those stated in the CCDC 18 Contract section 11.1 summarized below:

(a) Commercial General Liability – not less than $5,000,000 per occurrence
(b) Automobile Liability Insurance, including Bodily Injury and Property Damage in an amount no less than $2,000,000 per accident from the Insurance Corporation of British Columbia on any licensed motor vehicles of any kind used to carry out the Work.
(c) Aircraft and Watercraft Liability with respect to owned or non-owned aircraft and watercrafts if used directly or indirectly in the performance of the work, including use of additional premises, shall be subject to the limits of not less than $2,000,0000 inclusive per occurrence for bodily injury, death, and damage to property including loss of use thereof and limits of not less that $2,000,000 for aircraft passenger hazards.
(d) Property and Boiler Machinery Insurance.
(e) Contractor’s Equipment Insurance covering Construction Equipment used by the Proponent for the performance of the Work.
(f) A provision requiring the Insurer to give the Owners a minimum of 30 days' notice of cancellation or lapsing or any material change in the insurance policy;

The Proponent must comply with all applicable laws and bylaws within the jurisdiction of the work. The Proponent must further comply with all conditions and safety regulations of the Workers’ Compensation Act of British Columbia and must be in good standing during the tern of any contract entered into from this process.

1.24 COLLUSION

Except otherwise specified or as arising by reason of the provisions of these documents, no person, or corporation, other than the Proponent has or will have any interest or share in this proposal or in the proposal contract which may be completed in respect thereof. There is no collusion or arrangement between the Proponent and any other actual or prospective Proponent in connection with proposals submitted for this project and the Proponent has no knowledge of the context of other proposals and has no comparison of figures or agreement or arrangement, express or implied, with any other party in connection with the making of the proposal.

1.25 CONFLICT OF INTEREST

Proponents shall disclose in its Proposal any actual or potential conflict of interest and existing business relationship it may have with the Regional District, its elected or appointed officials or employees.

1.26 LIABILITY FOR ERRORS

While the Regional District has used considerable efforts to ensure an acute representation of information in these bid documents, the information contained is supplied solely as a guideline for Proponents. The information is not guaranteed or warranted to be accurate by the Regional District nor is it necessarily comprehensive or exhaustive.

1.27 TRADE AGREEMENTS

This RFP is covered by trade agreements between the Regional District and other jurisdictions, including the following:

a) Canadian Free Trade Agreement; and
b) New West Partnership Trade Agreement.

1.28 LAW

This contract and any resultant award shall be governed by and construed in accordance with the laws of the Province of British Columbia, which shall be deemed the proper law thereof.

1.29 REPRISAL CLAUSE

Tenders will not be accepted by the Regional District from any person, corporation, or other legal entity (the “Party”) if the Party, or any officer or director of a corporate Party, is, or has been within a period of two years prior to the tender closing date, engaged either directly or indirectly through another corporation or legal entity in a legal proceeding initiated in any court against the Regional District in relation to any contract with, or works or services provided to, the Regional District; and any such Party is not eligible to submit a tender.

1.30 FORCE MAJEURE (ACT OF GOD)

Neither party shall be liable for any failure of or delay in the performance of this Agreement for the period that such failure or delay is due to causes beyond its reasonable control including but not limited to acts of God, war, strikes or labour disputes, embargoes, government orders or any other force majeure event. The Regional District may terminate the Contract by notice if the event lasts for longer than 30 days.

1.31 CONFIDENTIAL INFORMATION OF PROPONENT

A proponent should identify any information in its proposal or any accompanying documentation supplied in confidence for which confidentiality is to be maintained by Regional District. The confidentiality of such information will be maintained by Regional District, except the total proposed value, which must be publicly released for all proposals, or otherwise required by the Freedom of Information and Protection of Privacy Act (“FOIPPA”), law or by order of a court or tribunal. Proponents are advised that their proposals will, as necessary, be disclosed, on a confidential basis, to advisers retained by Regional District to advise or assist with the RFP process, including the evaluation of proposals. If a proponent has any questions about the collection and use of personal information pursuant to this RFP, questions are to be submitted to the RFP Contact.

1.32 DISPUTE RESOLUTION

All unresolved disputes arising out of or in connection with this Proposal or in respect of any contractual relationship associated therewith or derived therewith shall be referred to and finally resolved by arbitration as

prescribed by Mediate BC services pursuant to its rules, unless otherwise mutually agreed between the parties.

1.33 DEBRIEFING

At the conclusion of the RFP process, all Proponents will be notified. Proponents may request a debriefing meeting with the Regional District.

2. INTRODUCTION

2.1 Purpose

The Regional District is seeking proposals from a qualified Contractor to execute safety improvement works on three (3) existing dams on the Sunshine Coast: Edwards Lake Dam, Chapman Lake Dam and McNeil Lake Dam. The Regional District desires a project approach that will minimize impact on the environment surrounding the dams and access roads. Proponents are encouraged to look for creative solutions to deliver a cost-effective quality installation while minimizing work schedule and environmental impact.

3. SITUATION/OVERVIEW

3.1 Background

Dam Safety Reviews (DSRs) were completed in 2020 for three (3) concrete potable water supply dams on the Sunshine Coast at Chapman Lake, Edwards Lake and McNeil Lake. The dams are very important for the region as they impound lakes that supply drinking water.

Chapman Lake and Edwards Lake are located in Tetrahedron Provincial Park, near Sechelt in British Columbia. Chapman Lake Dam is a reinforced concrete dam structure constructed in 1978 that is about 35m long and up to 3.7m high and is founded on bedrock. Edwards Lake Dam is a reinforced concrete dam structure constructed in 1991 that is about 11m long and up to 5.5m high. Both those locations are not accessible by vehicle or water transportation and can only be accessed by helicopter (a helipad is located at both sites).

McNeil Lake is located in Pender Harbour near Sechelt, BC. The McNeil Lake Dam was built in 1965 and consists of a reinforced concrete gravity dam 18.3m long and 4.0m high. The Dam was raised by 0.9m in 1976 and four concrete buttresses were also put in place. A Saddle Dam is located on the southern part of the McNeil reservoir/lake, consisting of a 1.2m high eastern saddle dam. This location can be accessed by vehicle.

The 2020 DSRs noted some safety deficiencies and non-conformances that need to be addressed to ensure that the three (3) dams are up to National standards. These deficiencies and non-conformances define the scope of the upgrade works required as part of this project.

3.2 Ministry Approval

The Regional District has submitted the designs to the Ministry of Forest for approval under Section 11 of the Water Sustainability Act and has not yet received approval. No in-stream work will be permitted until Approval from the Ministry of Forest has been received. In the event approval from Ministry of Forest has not been received by August 1, 2023, the Regional District reserves the right to extend the contract completion date. No separate or additional payment will be made as a result of delays in obtaining approval from MOF.

3.3 Project Objectives

The following items are summarized objectives pertaining to all three (3) dams and their specific upgrade design drawings:

- Upgrade the existing platform over each dam, to be raised above the Inflow Design Flood (IDF) elevation with improved access.
- Upgrade the existing spillway system.
- Upgrade the existing Low-Level Outlet.
- Improve erosion protection.
- Install new systems such as debris boom, standard vertical staff gauge, and other safety/functional related upgrades as per the design drawings.
- Improve access safety.
- Strengthen the Chapman Lake Dam structure.
- Minimize project timeline and impact on the environment.

The works that are partially inside the watercourses (body of water) buffer zone (or riparian area) are only permitted to be constructed during the Least Risk Fisheries Window between August 1st and October 31st; 2023.

3.4 Scope

See Appendix D technical specifications and Appendix B design drawings. Summary of each dam's scope of work is the following.

For Chapman Lake Dam:

- Supply and installation of additional reinforcements/dowels from the dam's crest into the underlying bedrock.
- Supply and installation of erosion protection (riprap) at left and right abutments.
- Removal of all equipment located/attached to the existing platform, for their reuse and reinstallation.
- Removal of the existing platform (for its reuse).
- Removal of existing cross-braces and other miscellaneous metals.
- Supply and installation of structural steel members for raising the access platform.
- Re-installation of the existing platform, including all equipment that was previously attached/located on the existing platform prior to their removal (including any ancillary equipment required for a raised re-installation, for example cabling and supports).
- Assistance to the Regional District during verification of communication systems after re-installation.
- Supply and installation of security gate and fencing at the right bank for access restriction to the platform.
- Supply and installation of a standard vertical staff gauge on the dam.
- Installation of a debris boom: Contractor is required to conduct a site survey for the boom rock anchors to locate shallow bedrock and determine final anchor location (to be approved by the Engineer).
- Low Level Outlet upgrade: change the angle of the spindle by adding an adjustment spool between the embedded piping and the valve, position the spindle to plumb, install new spindle support brackets, reposition the valve actuator on the elevated platform.

- Site clean-up and environmental restoration.

For Edwards Lake Dam:

- Removal of all equipment located/attached to the existing platform, for their reuse and reinstallation.
- Removal of the existing platform (for its reuse) and existing miscellaneous metal.
- Supply and installation of structural steel members for raising the access platform.
- Reinstallation of the existing platform, including all equipment that was previously attached/located on the existing platform prior to their removal.
- Supply and installation of security gate and fencing at the left bank for access restriction to the platform.
- Supply and installation of a standard vertical staff gauge on the dam.
- Supply and installation of a debris boom: Contractor is required to verify the capacity of the two existing eyebolt anchors on site to determine if they can be reused for the debris boom. The location of any new anchors is to be approved by the Engineer.
- Supply and installation of a new spillway gate and hoisting system (with every removal required for this replacement. Existing stoplogs to be kept on site for future maintenance).
- Site clean-up and environmental restoration.

For McNeil Lake Dam:

- Supply and installation of new gravel access path on left bank of dam.
- Supply and install wooden box steps on left bank of dam.
- Investigation pits at right bank of dam (to bedrock).
- Existing platform and miscellaneous metal to be removed and disposed off-site.
- Installation of concrete columns (4 piers and 1 footing) with dowels into existing structure.
- Supply and installation of a new platform on the new concrete columns, with access ladder and access restriction fencing at right and left ends.
- Supply and installation of galvanized steel handrail on right wing wall.
- Remove and dispose existing Low Level Outlet valve and replace with new Contractor supplied Low Level Outlet gate, complete with beaver screen.
- Supply and installation of new stoplog hoist rack, c/w raiser, guides, hoists and handwheel with wooden stoplogs, including necessary removal of existing system prior to installation.
- Supply and installation of vertical staff gauge on the dam.
- Supply and installation of erosion protection (riprap) at left abutment.
- Site clean-up and environmental restoration.

Installation includes supply of material and every equipment/tool required to do so, unless specified differently in the bid documents. Removal includes removal off-site to appropriate disposal location, unless specified differently in the bid documents. Reuse of in situ granular material is encouraged, however it is the responsibility of the Contractor to verify their availability and for any permit potentially required.

4. CONTRACT

4.1 General Contract Terms and Conditions

Proponents should review carefully the terms and conditions set out in the CCDC 18 – 2001 Civil Works Contract including the Schedules and Supplemental Conditions. The Contract terms can be found in Appendix F.

4.2 Service Requirements

The Contractor's responsibilities will include the following:

1. Prior to signing the Contract, the Contractor will provide:
   a. Performance and Labour and Material Bond within 15 days of receipt of the written notice of award. The successful Contractor will deliver to the Regional District a performance bond and a labour and material bond, each in the amount of 50% of the contract price, covering the performance of the work including the successful Proponent's obligations during the maintenance period, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia and in a form acceptable to the Regional District; or
   A bank draft, in the amount of 20% of the total contract price. The bank draft less 5% of the total contract price will be returned 60 days after the completion of the contract which will be held until the end of the maintenance period: or
   A letter of credit, in the amount of 20% of the total contract price, without a termination date. The letter of credit will be returned 60 days after the completion of the contract and after the issuance of a letter of credit for the warrantee period, without a termination date in the amount of 5% of the total contract price which will be held until the end of the maintenance period.
2. The Contractor will be expected to work closely with the Regional District staff and representatives throughout the term of the contract. Weekly reports with photos are to be submitted by the Contractor to the Regional District.
3. The Contractor will provide all the deliverables as outlined above.
4. The Contractor will conform to all applicable codes, guidelines regulations and all laws as required by the authorities having jurisdiction.
5. The Contract will ensure all engineering work complies with applicable Permit to Practice requirements as articulated by Engineers and Geoscientists of BC.
6. The Contractor will employ skilled and qualified people to complete the work including subcontractors (helicopter, trade, etc).
7. The Contractor will be aware of and comply with all by-laws or regulations regarding noise for each respective jurisdiction.
8. The Contractor will notify the Regional District when the work has reached substantial performance and shall review all completed work with the Regional District for the purposes of final inspection, deficiencies, and commissioning. Any deficiencies identified the successful Proponent is required to provide the Regional District with a reasonable time period for the correction. The Regional District will provide acknowledgment of those corrections and time frame. The Regional District will conduct further inspections.
9. The Contractor will warrant that the work will be completed in a good and skilful manner and provide a minimum of one (1) year warranty on their work.

If within warranty period any part of the work is found by the Regional District to be defective or faulty due to imperfect or bad construction or material, the successful Contractor will replace such defective items without expense to the Regional District.

10. The Contractor will obtain all permits, licenses, approvals and certificate which are generally required for the performance of the work.
11. The Contractor will be responsible for temporary facilities and construction site maintenance.
12. The Contractor will submit a Quality Control Program prior to commencing the works (the program should include every item in the scope of work for each dam).
13. The Contractor will submit a Site-Specific Environmental Protection Plan (EPP), prepared by a Qualified Environmental Professional (QEP), prior to mobilization to Site. Mitigation measures and recommendations mentioned in the Construction Environmental Management Plans (Appendix E) should be applied to the three dams and are to be implemented by the Contractor, including environmental surveys (birds, vegetation).
14. The Contactor will provide two (2) hard copies and one (1) electronic copy in PDF format of as-built drawings, commissioning report, testing and verification reports and operation and maintenance manuals.

4.3 Related Documents

1. Appendix A – Schedule of Quantities and Prices
2. Appendix B – Drawings: Safety Dam Upgrades
3. Appendix C – Measurement and Payment of Work
4. Appendix D – Technical Specifications
5. Appendix E – Construction Environmental Management Plan
6. Appendix F – CCDC 18 Contract.

5. REQUIREMENTS

In order for a proposal to be considered, a Proponent must clearly demonstrate that they meet the mandatory requirements set out in Section 7.1 (Mandatory Criteria) of the RFP.

This section includes “Response Guidelines” which are intended to assist Proponents in the development of their proposals in respect of the weighted criteria set out in Section 7.2 of the RFP. The Response Guidelines are not intended to be comprehensive. Proponents should use their own judgement in determining what information to provide to demonstrate that the Proponent meets or exceeds the Regional District’s expectations.

Please address each of the following items in your proposal in the order presented. Proponents may find it helpful to use the individual Response Guidelines as headings for proposal responses.

5.1 Capabilities

5.1.1 Relevant Experience

The Proponent should have successful experience and should be able to demonstrate and verify managing at least three (3) Dam Improvement projects that meet the definition of similar in scope and complexity. To qualify, the projects should have achieved substantial completion within the last five (5) years.

"Similar in Scope and Complexity" shall mean projects having the following characteristics:

a) Initial construction contract value in excess of $1 million.

b) Seasonal construction schedule tied to Fisheries windows on a project with great public importance.

c) The project involved a water dam safety improvement including structural reinforcement installation at a dam reservoir site, construction at a site located within a remote location inaccessible by vehicle, construction at a site located in an environmentally sensitive location, underwater diver construction, and excavation dewatering. The Prime contractor should have been technically involved in that project and have a related technical background.

5.1.2 References

Proponents need to provide a minimum of 3 references (i.e. names and contact information) of individuals who can verify the quality of work provided specific to the relevant experience of the Proponent and of any subcontractors named in the proposal. References from the Proponent's own organization or from named subcontractors are not acceptable.

The Regional District reserves the right to seek additional references independent of those supplied by the Proponent, including internal references in relation to the Proponent's and any subcontractor's performance under any past or current contracts with the Regional District or other verifications as are deemed necessary by it to verify the information contained in the proposal and to confirm the suitability of the Proponent.

5.1.3 Environmental Requirements

The Contractor will comply with the Construction Environmental Management Plan and implement mitigation measures for work that applies to the Contractor.

All removed vegetation, existing system components, and waste installation materials should be disposed of in a manner that meets all regulatory and environmental requirements. Upcycling or recycling should be considered as the preferred method of disposal whenever possible. Proponents should provide details on how they will meet any environmental requirements.

5.2 Sustainable Social Procurement

A factor in the Regional District evaluation process is sustainable social procurement and the evaluation of proposals will take this into consideration.

As part of any submission the Proponent is encouraged to identify how they may contribute to the following key social, employment and economical goals, but not limited to the following:

a) Contribute to a stronger local economy by:
- promoting a Living Wage
- Using fair employment practices;

- Increase training and apprenticeship opportunities;

b) Local expertise knowledge by:
    a. Being locally owned;
    b. Utilization of local subcontractors;
c) Environmental Cost of Ownership;
d) Energy efficient products;
e) Minimal or environmental friendly use of packing materials; and
f) Reducing hazardous materials (toxics and ozone depleting substances).

5.3 Approach / Methodology and Objectives

5.3.1 Methodology and Objectives

Proponents should describe its methodology, approach and outline the process to complete the services. Proponents project approach should focus on ways to reduce overall project time and impact on the environment (Lakes and watercourses, surrounding vegetation and natural habitats, etc), and include methods of transportation to remote areas for equipment, material and labour. Consideration should also be given to minimize the impact on access roads and areas used by public (when applicable). Proponents should include features of their services that give them a competitive advantage and indicate what areas would be used for construction, storage and access.

5.3.2 Workplan

Proponents should provide a detailed work plan complete with safety plan, site access and personnel/equipment resourcing plan, and detailed schedule for each phase of the project including start date, key project milestones and phase completion date. Proponents should indicate if the project phases can be completed during and after the 2023 August 1st to October 31st least risk work window related to fish and fish habitat protection as per MOE and DFO requirements (note: mobilization and any pre-fabrication/pre-installation that can be done outside of the watercourse buffer zone can start prior to this window).

5.4 Added Value

Proponents should describe any additional goods or services in their proposal being offered at no additional cost to the Regional District.

5.5 Price

Proponents need to submit a fee proposal in accordance with Appendix A Schedule of Quantities and Prices for each dam described as well as an all-inclusive cost for all the project; the proposal should include a breakdown of the fix prices including time, travel, hourly billable rates and material costs.

Prices quoted will be deemed to be:

- in Canadian dollars ;
- inclusive of duty, FOB destination, and delivery charges where applicable; and
- exclusive of any applicable taxes.

5.6 Bid Bond

The proposal **must** be accompanied by a bid security in the form of a bid bond issued by a surety licensed to carry on the business of suretyship in British Columbia in a form reasonable satisfactory to the Regional District or a certified cheque or bank draft or letter of credit in a form acceptable to the Owner in the amount equal to 10% of the proposal price.

If the Proponent chooses to use the BC Bid e-submission method the Proponent will need to upload an electronic copy of the Bid Bond, Certified Check, Letter of Credit or Bank Draft with their BC Bid e-submission and the original will need to be received by the Regional District within 5 business days of the closing date. If the Proponent submit an e-bond the bond must be verifiable, containing a digital signature, digital corporate seal and a verification tag or a to check that the bond document has not been altered.

6. PROPOSAL FORMAT

Proponents should ensure that they fully respond to all requirements in the RFP in order to receive full consideration during evaluation.

The following format, sequence, and instructions should be followed in order to provide consistency in Proponent response and ensure each proposal receives full consideration. All pages should be consecutively numbered.

a) Signed cover page (see section 7.1 Mandatory Criteria).
b) Table of contents including page numbers.
c) A short (one or two page) summary of the key features of the proposal.
d) The body of the proposal, including pricing, i.e. the “Proponent Response”.
e) Appendices, appropriately tabbed and referenced.
f) Identification of Proponent (legal name)
g) Identification of Proponent contact (if different from the authorized representative) and contact information.

7. EVALUATION

Evaluation of proposals will be by a committee formed by the Regional District and may include other employees and contractors.

The Regional District’s intent is to enter into a Contract with the Proponent who has met all mandatory criteria and minimum scores (if any) and who has the highest overall ranking.

Proposals will be assessed in accordance with the entire requirement of the RFP, including mandatory and weighted criteria.

The Regional District reserves the right to be the sole judge of a qualified proponent.

The Evaluation Committee may, at its discretion, request clarifications or additional information from a Proponent with respect to any Proposal, and the Evaluation Committee may make such requests to only selected Proponents. The Evaluation Committee may consider such clarification or additional information in evaluating a Proposal.

7.1 Mandatory Criteria

Proposals not clearly demonstrating that they meet the following mandatory criteria will be excluded from further consideration during the evaluation process.

Mandatory Criteria
The proposal must be received at the Closing Location before the Closing Time.
The proposal must be in English.
The proposal must be submitted using one of the submission methods set out on the cover page of the RFP
Bid Bond
The proposal must either (1) include a copy of the cover page that is signed by an authorized representative of the Proponent, this is also required for email submissions or (2) be submitted by using the e-bidding key on BC Bid (if applicable), in accordance with the requirements set out in the RFP

7.2 Weighted Criteria

Proposals meeting all of the mandatory criteria will be further assessed against the following weighted criteria.

Weighted Criteria	**Weight (%)**
Capabilities	30
Project Approach and Work Plan	20
Environmental Requirements	5
Sustainable Social Procurement	5
Added Value	5
Price	35
TOTAL	**100**

7.3 Price Evaluation

The lowest priced Proposal will receive full points for pricing. All other prices will be scored using the following formula: lowest priced proposal/price of this proposal* total points available for price.

Appendix A Schedule of Quantities and Prices

The Price for the Work is comprised of the following components and the Contractor's overhead and profit are included in each component. All Proponents are to submit pricing on all items.

UPGRADES TO MCNEIL LAKE CONCRETE DAM

Items	Description	Unit	Quantity A	Unit Price B	Cost (A X B)
1.0	**General cost**				
1.1	Mobilization & Demobilization	L. Sum.	1.00		
1.2	Environmental protection	L. Sum.	1.00		
2.0	**Cutting, clearing & grubbing**				
2.1	Cutting, clearing & grubbing	sq. m	120.00		
3.0	**Structural Concrete**				
3.1	Reinforced concrete pier support, Type 1	Unit	4.00		
3.2	Reinforced concrete pier support, Type 2	Unit	1.00		
3.3	10-20M Dowels (1.5 m embedment, 1 m projection)	Unit	40.00		
4.0	**Structural Steel**				
4.1	Steel access platform, Module A	L. Sum.	1.00		
4.2	Steel access platform, Module B	L. Sum.	1.00		
4.3	Steel access platform, Module C	L. Sum.	1.00		
4.4	Removal of existing structural steel and miscellaneous metalwork	L. Sum.	1.00		
5.0	**Mechanical Items**				
5.1	Low level outlet gate, c/w spindle, handwheel and beaver screen (per section A drawing C-213)	L. Sum.	1.00		
5.2	Stoplog hoist rack, c/w raiser, guides, hoists and handwheel (per section B drawing C-213)	L. Sum.	1.00		
5.3	Wooden Stoplogs	L. Sum.	1.00		
6.0	**Miscellaneous Items**				
6.1	Gravel access path on left bank of dam	sq. m	20.00		
6.2	Wooden box steps on left bank of dam	sq. m	5.00		
6.3	Investigation pits at right bank of dam	cub. m	4.50		
6.4	Galvanized steel handrail on right wing wall	m	6.20		
6.5	Chain link metal security gate and fencing (per detail 2 drawing C-213)	Unit	2.00		
6.6	Access ladder, c/w extendable ladder	L. Sum.	1.00		
6.7	MOTI Class 100kg rip rap	cub. m	10.00		
6.8	Staff gauge	L. Sum.	1.00		

McNeil Lake Dam Subtotal (Subtotal A)	

UPGRADES TO CHAPMAN LAKE CONCRETE DAM

Items	Description	Unit	Quantity A	Unit Price B	Cost (A X B)
7.0	**General cost**				
7.1	Mobilization & Demobilization	L. Sum.	1.00		
7.2	Environmental protection	L. Sum.	1.00		
8.0	**Cutting, clearing & grubbing**				
8.1	Cutting, clearing & grubbing	sq. m	80.00		
9.0	**Structural Concrete**				
9.1	Reinforced concrete footing	Unit	2.00		
9.2	25M Dowels	Unit	60.00		
9.2	Mass concrete step	cub. m	0.50		
10.0	**Structural Steel**				
10.1	Revised platform supports - beams and columns	L. Sum.	1.00		
10.2	Removal of existing structural steel platform and reinstallation	L. Sum.	1.00		
11.0	**Mechanical Items**				
11.1	Low-Level Knife Valve and spool piece, c/w extension spindle (per detail 2 drawing C-011)	L. Sum.	1.00		
12.0	**Miscellaneous Items**				
12.1	Chain link metal security gate and fencing (per detail 3 drawing C-011)	Unit	1.00		
12.2	MOTI Class 25kg rip rap	cub. m	6.00		
12.3	Debris Boom	m	38.00		
12.4	Staff gauge	L. Sum.	1.00		
		Chapman Lake Dam Subtotal (Subtotal B)			

UPGRADES TO EDWARDS LAKE CONCRETE DAM

Items	Description	Unit	Quantity A	Unit Price B	Cost (A X B)
13.0	**General cost**				
13.1	Mobilization & Demobilization	L. Sum.	1.00		
13.2	Environmental protection	L. Sum.	1.00		
14.0	**Cutting, clearing & grubbing**				
14.1	Cutting, clearing & grubbing	sq. m	60.00		
15.0	**Structural Concrete**				
15.1	Mass concrete steps	cub. m	1.50		
16.0	**Structural Steel**				
16.1	Revised platform supports - beams and columns	L. Sum.	1.00		
16.2	Removal of existing structural steel platform and reinstallation	L. Sum.	1.00		
17.0	**Mechanical Items**				
17.1	Spillway gate (per detail 1, drawing C-111)	L. Sum.	1.00		
18.0	**Miscellaneous Items**				
18.1	Galvanized steel handrail on right wing wall	m	2.00		
18.2	Chain link metal security gate and fencing (per detail 3 drawing C-111)	Unit	1.00		
18.3	Debris Boom	m	14.00		
18.4	Staff gauge	L. Sum.	1.00		
18.5	Adjust actuator support frame	L. Sum.	1.00		
		Edwards Lake Dam Subtotal (Subtotal C)			

TOTAL ALL THREE DAMS

Upgrades to McNeil Lake Concrete Dam (Subtotal A)	
Upgrades to Chapman Lake Concrete Dam (Subtotal B)	
Upgrades to Edwards Lake Concrete Dam (Subtotal C)	
All three dams Subtotal	
GST	
Total	

Appendix B Drawings

ENGINEERING SERVICES FOR UPGRADES TO MCNEIL, EDWARDS AND CHAPMAN LAKE CONCRETE DAMS
SUNSHINE COAST REGIONAL DISTRICT

ISSUED FOR TENDER

SHEET INDEX

- C-000 COVER SHEET, LOCATION MAPS AND SHEET INDEX - REV 1
- C-001 GENERAL NOTES, LEGEND AND ABBREVIATIONS - REV 1

CHAPMAN LAKE DAM

- C-010 KEY PLAN OVERALL PLAN AND PLAN VIEW - REV 2
- C-011 PROFILE AND SECTIONS - REV 2

EDWARDS LAKE DAM

- C-110 KEY PLAN OVERALL PLAN AND PLAN VIEW - REV 3
- C-111 DAM SAFETY UPGRADES PROFILE AND SECTIONS - REV 3

MCNEIL LAKE DAM

- C-210 KEY PLAN OVERALL PLAN AND PLAN VIEW - REV 3
- C-211 CONCRETE PLANS AND SECTIONS - REV 3
- C-212 PLAN AND DOWNSTREAM ELEVATION - REV3
- C-213 UPSTREAM ELEVATION AND SECTION - REV 3
- C-214 STRUCTURAL STEEL MODULES A AND B - REV 3
- C-215 STRUCTURAL STEEL MODULES C - REV 3

CONTACT INFORMATION

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Codi Abbott
Sunshine Coast Regional District (SCRD)
Works Division
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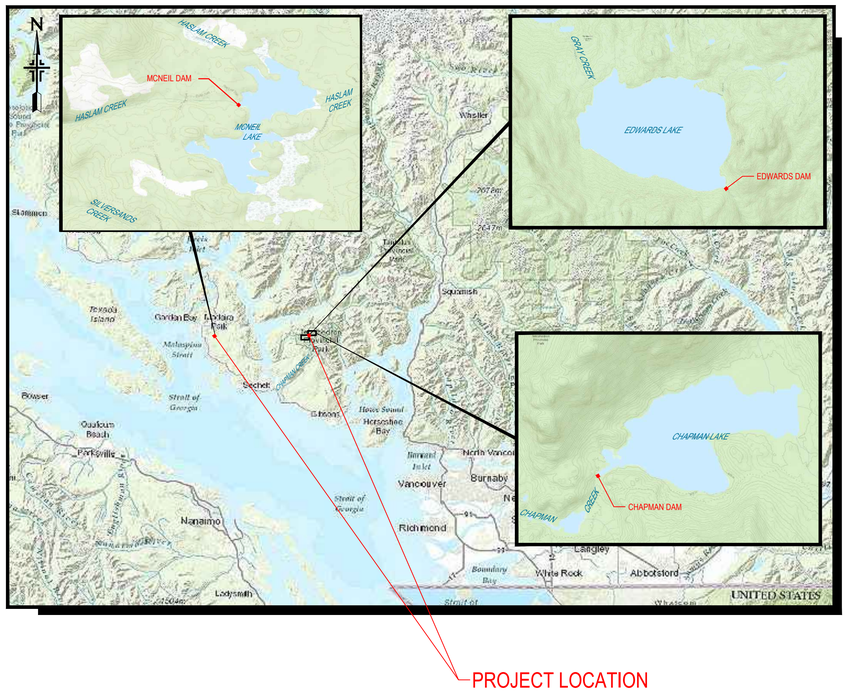
TEL: 604-885-6800 EXT.6311

NATURAL GAS
FortisBC Energy Inc.
16705 Fraser Highway
Surrey, BC V4N 0E8

POWER
BC Hydro
333 Dunsmuir St.
Vancouver, B.C. V6B 5R3

TELECOMMUNICATIONS
TELUS Communications
3777 Kingsway, Burnaby, BC V5H 3Z7



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840 HOWE STREET, SUITE 1000
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PERMIT TO PRACTICE NUMBER:

REVISIONS	
REVISION 1 : ISSUED FOR TENDER	2023-04-28
REVISION 0 : ISSUED FOR TENDER	2022-05-02

SUNSHINE COAST REGIONAL DISTRICT
INFRASTRUCTURE DEPARTMENT
1975 Field Road
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DESIGNED BY:		R.M.
DRAWN BY:		B.W.
CHECKED BY:		V.C.
APPROVED BY:		D.D.
SCALE	H AS SHOWN	V n/a
PLOT DATE:		2023-04-28

ENGINEERING SERVICES FOR UPGRADES TO MCNEIL, EDWARDS AND CHAPMAN CONCRETE DAMS

DRAWING :

COVER SHEET

SEAL :

2023-04-28

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-000
SHEET NO :	01 of 01

GENERAL NOTES:

1. ALL ELEVATIONS ARE MEASURED IN METRES. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES, UNLESS NOTED OTHERWISE.
2. COORDINATE SYSTEM :
   NORTH AMERICAN DATUM 1983 (NAD 83) IN UNIVERSAL TRANSVERSE MERCATOR (UTM) PROJECTION ZONE 10.
3. LIDAR FROM WEB MAP DOWNLOADED TO DATA-MYSCRD.OPENDATA.ARCGIS.COM.
4. SURVEY CARRIED OUT BY WSP ON SEPTEMBER 1ST, 2021.
5. DIMENSIONS AND ELEVATIONS ARE TAKEN FROM THE WSP SURVEY, SUPPLEMENTED WITH INFORMATION FROM RECORD DRAWINGS. ALL DIMENSIONS AND ELEVATIONS TO BE VERIFIED ON SITE.
6. EVERY EFFORT TO BE MADE TO SAVE EXISTING LANDSCAPING, VEGETATION AND TREES. CONTRACTOR TO RESTORE SURFACE FEATURES TO ITS ORIGINAL OR BETTER CONDITION AT COMPLETION. TREES REQUIRING TRIMMING OR REMOVAL SHALL BE CONFIRMED IN THE FIELD BY ENGINEER PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY AND SHALL BE THE "PRIME CONTRACTOR" AS DEFINED BY THE WORKERS COMPENSATION ACT AND REGULATIONS.
8. AS BUILT DRAWINGS: CONTRACTOR TO MAINTAIN AS BUILT RECORD OF DRAWINGS ON SITE AT ALL TIMES. UPON COMPLETION OF WORK, CONTRACTOR TO PROVIDE ONE CLEAN SET OF AS BUILT DRAWINGS MARKED CLEARLY "IN RED LINES".
9. FOR ANY CONFLICT ON THE DRAWING AND/OR SPECIFICATIONS AND/OR CODES, THE MORE STRINGENT REQUIREMENT SHALL APPLY. ANY SUCH CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
10. THE CONTRACTOR SHALL VERIFY ALL ON-SITE MEASUREMENTS OF EXISTING STRUCTURES AND VERIFY BOOM DIMENSIONS. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES FOUND THAT MAY AFFECT THE INTENDED WORK.
11. ALL WORK SHALL BE PERFORMED BY CONTRACTOR IN ACCORDANCE WITH APPLICABLE LOCAL, PROVINCIAL, AND NATIONAL CODES, LAWS, AND REGULATIONS. THE DRAWINGS SHALL NOT BE CONSTRUED TO IMPLY PERMITTING WORK NOT CONFORMING TO CODES, LAWS, OR REGULATIONS CONSIDER RULINGS OF THE ENFORCING AGENCIES AS PART OF THESE SPECIFICATIONS.
12. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL STIPULATIONS PRESENTED IN ENVIRONMENTAL PERMITS PERTAINING TO THIS PROJECT. COPIES OF PERMIT WORK STIPULATIONS SHALL BE MADE AVAILABLE TO THE CONTRACTOR.
13. COMPLIANCE WITH ALL REGULATIONS GOVERNING THE SAFETY OF ALL ON-SITE WORKERS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR THROUGHOUT MOBILIZATION, CONSTRUCTION AND DE-MOBILIZATION.
14. CONTRACTOR TO CONFORM TO ALL LAWS AND CODES GOVERNING SAFETY OF WORKERS IN AND AROUND WATER.

CIVIL NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING, INSTALLING AND MAINTAINING ALL NECESSARY MEASURES TO CONTROL EROSION IN ACCORDANCE WITH APPLICABLE REGULATIONS AS WELL AS ALL PERMITTING REQUIREMENTS INCLUDED IN THE CONTRACT DOCUMENTS.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF SHORING MEASURES, WHERE NECESSARY.

STRUCTURAL NOTES:

1. DESIGN CODES:
   a. CANADIAN HIGHWAY BRIDGE DESIGN CODE, CSA S6:19
   b. DESIGN OF STEEL STRUCTURES, CSA S16-19
   c. WELDED STEEL CONSTRUCTION (METAL ARC WELDING), CSA W59-18.
   d. CANADIAN DESIGN OF CONCRETE STRUCTURE, CSA A23.3:19
2. STRUCTURAL STEEL SHAPES, PIPES, AND FASTENERS. MISCELLANEOUS METALS SHALL COMPLY TO CSA G40.20-13/G40.21-13, GR 350W.
   a. CONNECTING HARDWARE NOTED AS "HDG" TO BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A123
3. CAST IN PLACE CONCRETE
   a. CONFORM TO CSA A23.1 / A23.2 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION."
   b. CAST IN PLACE CONCRETE TO BE NORMAL DENSITY (MIN. 2300 KG/M3) UNLESS NOTED OTHERWISE.
   c. CEMENT TO BE PORTLAND CEMENT TYPE GU, UNLESS NOTED OTHERWISE OR REQUIRED BY EXPOSURE CLASS.
   d. CEMENT TO CONFORM TO CSA A3000.AGGREGATE TO CONFORM TO CSA A23.1 / A23.2. DO NOT USE RECYCLED CONCRETE AS AGGREGATE.
   e. ADMIXTURES SHALL NOT CONTAIN CHLORIDES.
   f. ALL EXTERIOR APPLICATIONS:
      f.1. EXPOSURE CLASS: C1
      f.2. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 35 MPA
      f.3. NOMINAL SIZE OF COARSE AGGREGATE: 20 (3/4")
   g) TEMPERATURE CONSIDERATIONS
      g.1. PROTECT CONCRETE FROM EXCESSIVE HEAT AND DRYING DURING CURING. USE HOT WEATHER CONCRETING METHODS IN ACCORDANCE WITH CAN/CSA-A23.1 WHENEVER THE OUTDOOR TEMPERATURE IS GREATER THAN 27°C.
      g.2. PROTECT CONCRETE FROM FREEZING. USE COLD WEATHER CONCRETING METHODS IN ACCORDANCE WITH CAN/CSA-A23.1 WHENEVER THE OUTDOOR TEMPERATURE IS LESS THAN +5°C. ALL INSULATED COVERS, HEATERS AND OTHER MATERIALS NEEDED TO PROTECT CONCRETE TO BE ON HAND PRIOR TO POUR.
      g.3. DELIVER CONCRETE AT A TEMPERATURE BETWEEN +15°C AND +27°C. ENSURE A MINIMUM CONCRETE TEMPERATURE OF 10° IS MAINTAINED THROUGHOUT THE CURING PERIOD (MINIMUM 3 DAYS).
4. WELD:
   a. SHOP AND FIELD WELDING DONE BY OPERATORS WHO HAVE PREVIOUSLY QUALIFIED BY TESTS AS PRESCRIBED IN THE AMERICAN WELDING SOCIETY "STANDARD QUALIFICATION PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED. ALL STRUCTURAL WELDING SHALL CONFORM TO AWS STRUCTURAL WELDING D1.1.
5. REINFORCING STEEL:
   a. ALL NON-PRESTESSED REINFORCING STEEL SHALL COMPLY WITH CSA G30.18 (GRADE 400 MPa) AND TECHNICAL SPECIFICATIONS.
   b. REINFORCING WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH CSA A23.1 AND REINFORCING STEEL MANUAL OF STANDARD PRACTICE.
6. GROUT:
   a. FOR POST-INSTALLED CONCRETE ANCHOR, FOLLOW THE MANUFACTURER INSTALLATION PROCEDURE.
   b. FOR BASE PLATE GROUT, USE MASTERFLOW 640 EPOXY GROUT OR EQUIVALENT.
7. STRUCTURAL AND MISCELLANEOUS STEEL:
   a. ALL STRUCTURAL STEEL SHALL CONFORM TO CSA S16 AND CSA-G40.20/G40.21.
   b. MATERIALS SHALL CONFORM TO THE FOLLOWING UNO ON THE DRAWINGS AND TECHNICAL SPECIFICATION:
      b.1 W AND WWF SECTIONS: GRADE 350W.
      b.2 ANGLES, PLATES AND CHANNELS: GRADE 300W.
      b.3 HSS: GRADE 350W CLASS H.
      b.4 GRATING: GRADE 230W
      b.5 BOLTS: ASTM F3125, GRADE A325.
      b.6 NUTS: ASTM A563.
      b.7 WASHERS: ASTM F436.
   c. ALL STEEL SHALL BE HOT-DIP GALVANIZED AS PER ASTM A123M. ALL STEEL HARDWARE SHALL BE GALVANIZED AS PER ASTM A153M.
   d. ALL SHOP CONNECTIONS SHALL BE WELDED.
   e. ANCHOR BOLTS SHALL BE GALVANIZED AND CONFORM TO ASTM F1554 GRADE 55. BOLT
   f. ALL WELDING SHALL BE SEAL WELD TYPE AND CONFORM TO CSA W59 (E48XX), CSA S16 AND SHALL BE PERFORMED BY A WELDER QUALIFIED UNDER CSA W47.
   g. THE CONTRACTOR MUST SUBMIT, FOR REVIEW, SHOP DRAWINGS OF STRUCTURAL STEEL ELEMENTS, SIGNED AND SEALED BY AN ENGINEER.
8. METAL FINISHES AND COATINGS:
   a. HOT DIPPED GALVANIZING SHALL BE APPLIED WHERE DESIGNATED ON THE DRAWINGS IN CONFORMANCE WITH REQUIREMENTS OF CSA G194-M92 (r2003). PROVIDE A MINIMUM OF 2.3 OZ/SQ. FT GALVANIZING ON ALL SURFACES.
9. DEBRIS BOOM SHALL BE OF TYPE " TUFFBOOM STD" UNDER WORTHINGTON PRODUCTS.
10. ALL INTERCONNECTING HARDWARE CONNECTIONS SHALL BE WORTHINGTON BRAND, CROSBY BRAND, OR APPROVED EQUAL.
11. DEBRIS BOOM ANCHORS SHALL BE WILLIAMS MECHANICAL ANCHORS WITH ASSOCIATED MANUFACTURER SPECIFICATIONS OF BELOW TYPES:
    a. SPIN-LOCK MECHANICAL ANCHORS FOR INSTALLATION IN ROCK ANCHORS SHALL BE WILLIAMS SPIN-LOCK ANCHORS OR EQUIVALENT.
    b. MANTA-RAY MECHANICAL ANCHOR FOR INSTALLATION IN SOIL ANCHORS SHALL BE WILLIAMS MANTA-RAY ANCHORS OR EQUIVALENT.
12. FABRICATION:
    a. COMPLY WITH CSA SPECIFICATIONS FOR ALL STEEL FABRICATIONS.
    b. STEEL FABRICATOR TO HAVE A MINIMUM OF 3 YEARS EXPERIENCE IN FABRICATION OF STRUCTURAL STEEL AND CERTIFIED IN ACCORDANCE WITH W47.1-09(R2014) AND W178.2-14.
13. GUARD RAILS:
    a. STANDARD RAILING SHALL CONSIST OF TOP RAIL, INTERMEDIATE RAIL, AND POSTS, AND SHALL HAVE A VERTICAL HEIGHT OF 1140 mm NOMINAL FROM UPPER SURFACE OF TOP RAIL TO FLOOR, PLATFORM, RUNWAY, OR RAMP LEVEL.

MECHANICAL NOTES:

1. DESIGN CODES:
   a. AMERICAN WATER WORKS ASSOCIATION - AWWA
   b. AMERICAN SOCIETY OF MECHANICAL ENGINEERS - ASME
   c. PRESSURE VESSEL CODE SECTION VIII, DIV.I - ASME
2. STRUCTURAL STEEL SHAPES, AND FASTENERS. MISCELLANEOUS METALS SHALL COMPLY TO CSA G40.20-13/G40.21-13.
   a. HARDWARE SHALL BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A123, OR STAINLESS STEEL.
   b. GATES SHALL BE A VERTICAL LIFT, RISING STEM SLIDE TYPE SLUICE GATES.
   c. GATE GUIDE FRAME SHALL BE A ONE-PIECE FABRICATION COMPRISING OF THE SIDE GUIDES, SILL AND LINTEL. THE SEALING AND GUIDING ELEMENTS SHALL BE CONTAINED WITHIN THE GUIDES AROUND THE PERIPHERY OF THE OPENING AND SHALL BE OF LOW FRICTION MATERIAL.
   d. SEALS AND SEALING FACES SHALL BE DESIGNED AND CONSTRUCTED SO AS NOT TO EXCEED THE MAXIMUM PERMITTED LEAKAGE RATE STATED IN AWWA C 501.
   e. MATERIAL FOR GUIDES AND OPERATING STEMS OF GATES AND VALVES SHALL BE STAINLESS STEEL, OR AN APPROVED EQUIVALENT.
   f. NEOPRENE RUBBER SEAL SHALL BE PROVDED BETWEEN THE FRAME AND CONCRETE SURFACES.
   g. GATE SHALL BE OPERATED BY A MANUAL HAND WEEL AND WITH PROVISION FOR LOCKING IN BOTH THE OPEN AND CLOSED POSITION.

ABBREVIATIONS:

EL	ELEVATION
EX	EXISTING
HSS	HOLLOW STRUCTURAL STEEL
IL	INVERT LEVEL
LLO	LOW LEVEL OUTLET
M	METRES
MM	MILLIMETRES
MOTI	MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
REV	REVISION

LEGEND:

CONTOUR MINOR

CONTOUR MAJOR


TOP WATER LEVEL


ROCK


RIP RAP

TOP OF BANK

PROPOSED WORK SHOWN IN BOLD TEXT

EXISTING DAM FEATURES SHOWN IN PLAIN TEXT

wsp

840 HOWE STREET, SUITE 1000
VANCOUVER BRITISH COLUMBIA CANADA V6Z 2L2
TEL.: 604-685-0931 | FAX: 604-663-8655 | WWW.WSPGROUP.COM

PERMIT TO PRACTICE NUMBER:

REVISIONS	
REVISION 1 : ISSUED FOR TENDER	2023-04-28
REVISION 0 : ISSUED FOR TENDER	2022-05-02

SUNSHINE COAST REGIONAL DISTRICT
INFRASTRUCTURE DEPARTMENT

1975 Field Road
Sechelt, BC V0N 3A1
Ph: 604-885-6800 1-800-687-5753 Fax: 604-885-7909

DESIGNED BY:			R.M.
DRAWN BY:			B.W.
CHECKED BY:			V.C.
APPROVED BY:			D.D.
SCALE	H AS SHOWN	V n/a	
PLOT DATE:			2023-04-28

ENGINEERING SERVICES FOR UPGRADES TO MCNEIL, EDWARDS AND CHAPMAN CONCRETE DAMS

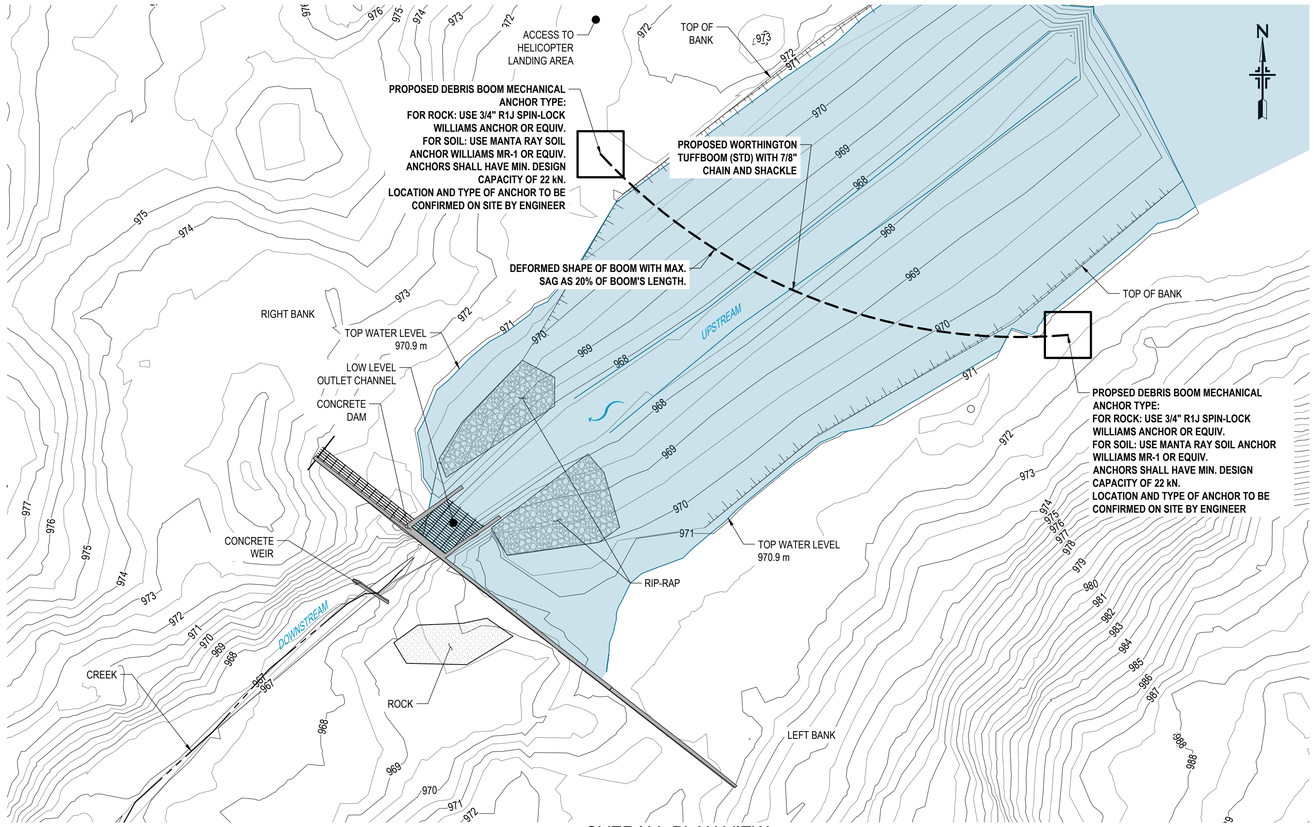
DRAWING :

GENERAL NOTES, LEGEND AND ABBREVIATIONS

SEAL :

2023-04-28

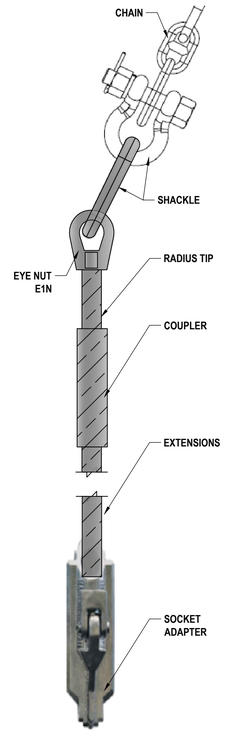
WORK ORDER NO:	211-09410-00
DRAWING NO:	C-001
SHEET NO :	01 of 01



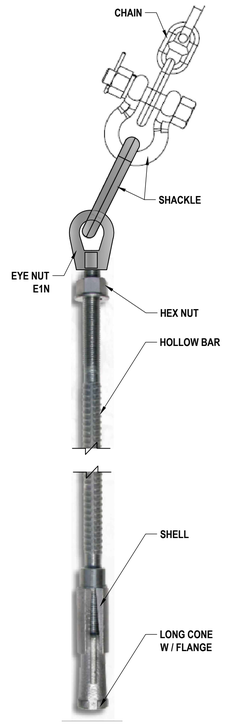
OVERALL PLAN VIEW
1:200

1 - TUFFBOOM STANDARD
NTS

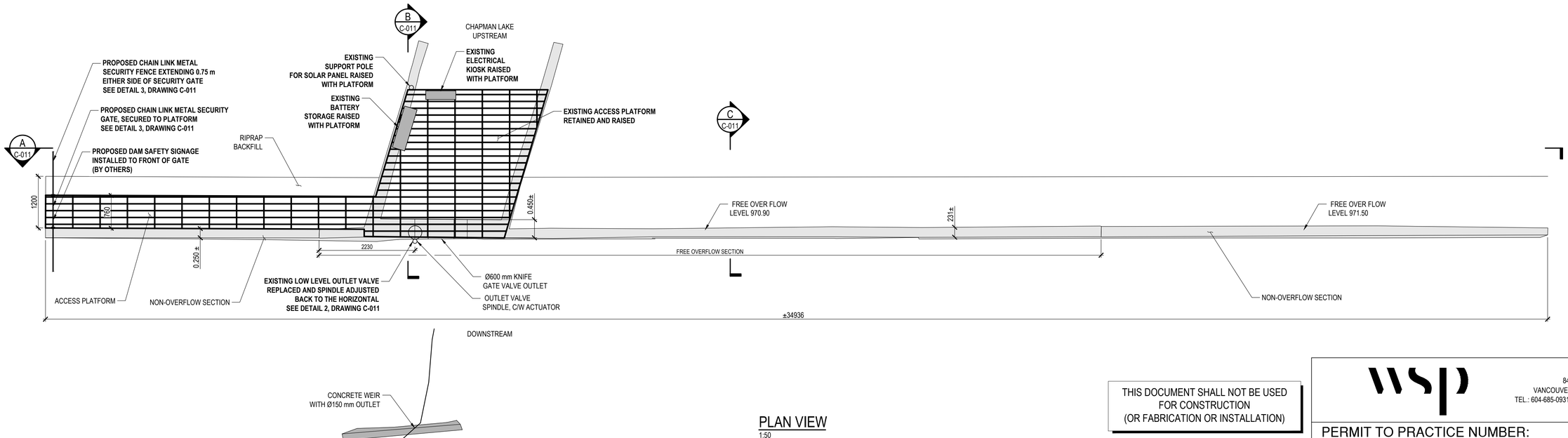
TUFFBOOM STANDARD TABLE	
DIAMETER	40.6 cm (16 in)
FLOAT LENGTH	305 cm (120 in)
CENTER TO CENTER LENGTH WHEN CONNECTED TO ADDITIONAL UNITS	340 cm (134 in)
WEIGHT (DRY)	64 kg (141 lbs)
BUOYANCY	317 kg (700 lbs)
FREEBOARD	30.5 cm (12 in)
DESIGN STRENGTH	130 kips
SPACING BETWEEN UNITS	39 cm (15,5 in)
INTERNAL CONSTRUCTION	C4 CHANNEL w/ EPS FOAM



2 - MANTA RAY SOIL ANCHORS
NTS



3 - R1J SPIN-LOCK ROCK BOLT
NTS



PLAN VIEW
1:50

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REVISIONS	
REVISION 3 : ISSUED FOR TENDER	2023-04-28
REVISION 2 : ISSUED FOR TENDER	2022-05-02
REVISION 1 : ISSUED FOR 90% DESIGN	2022-02-08
REVISION 0 : ISSUED FOR 60% DESIGN	2021-11-12

SUNSHINE COAST REGIONAL DISTRICT
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1975 Field Road
Sechelt, BC V0N 3A1
Ph: 604-885-6800 1-800-687-5753 Fax: 604-885-7909

DESIGNED BY:		B.R. / R.M.	
DRAWN BY:		B.W.	
CHECKED BY:		V.C.	
APPROVED BY:		D.D.	
SCALE	H AS SHOWN	V n/a	
PLOT DATE:		2023-04-28	

CHAPMAN LAKE DAM SAFETY UPGRADES

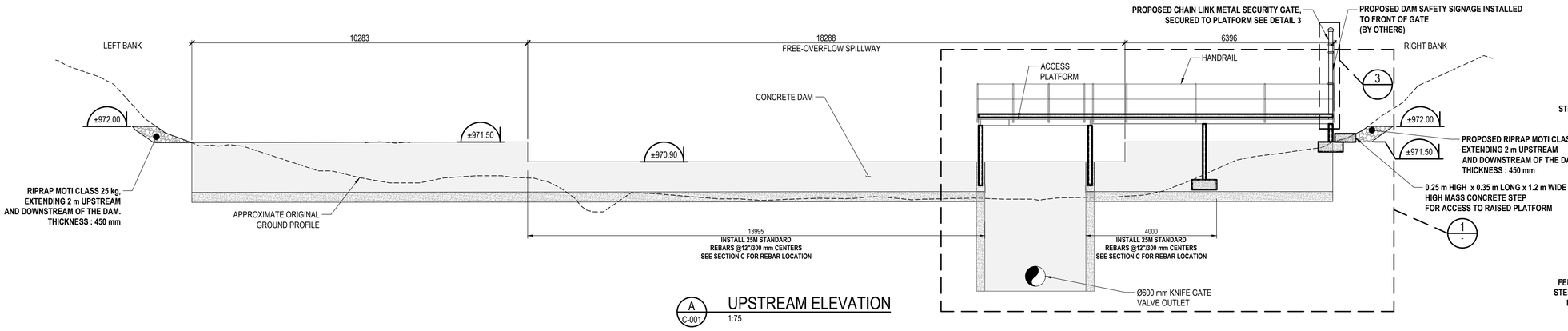
DRAWING :

KEY PLAN, OVERALL PLAN, AND PLAN VIEW

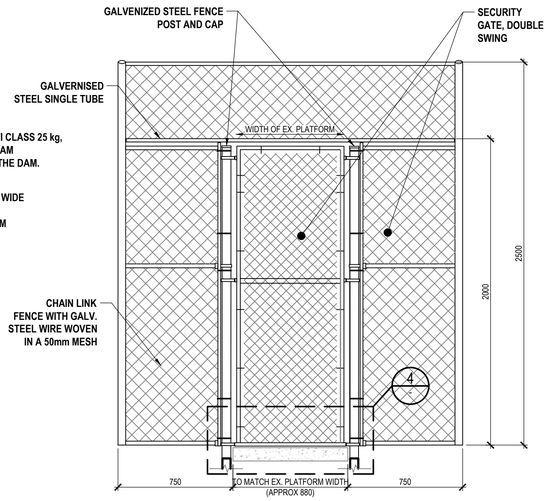
SEAL :

2023-04-28

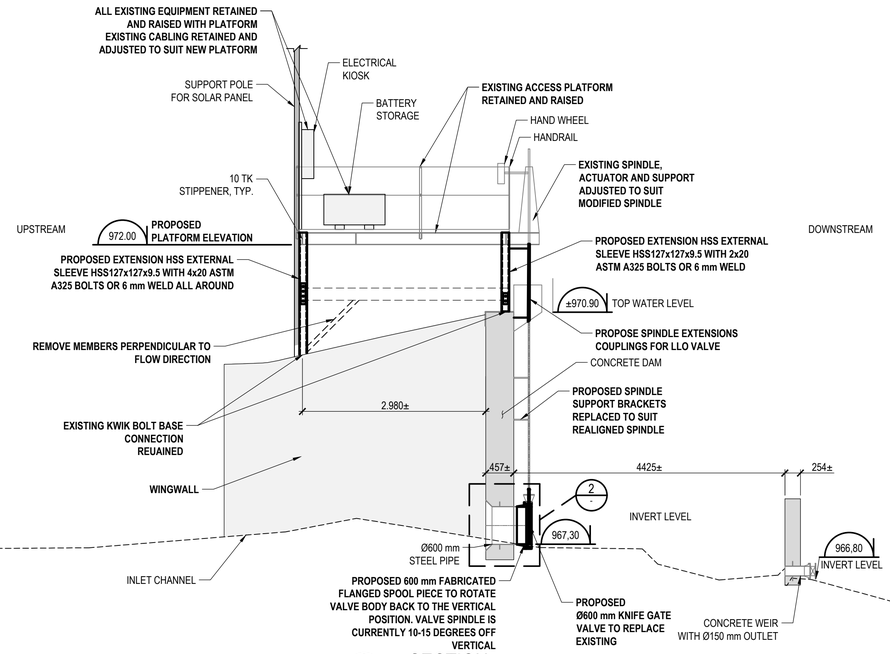
WORK ORDER NO:	211-09410-00
DRAWING NO:	C-010
SHEET NO :	01 of 01



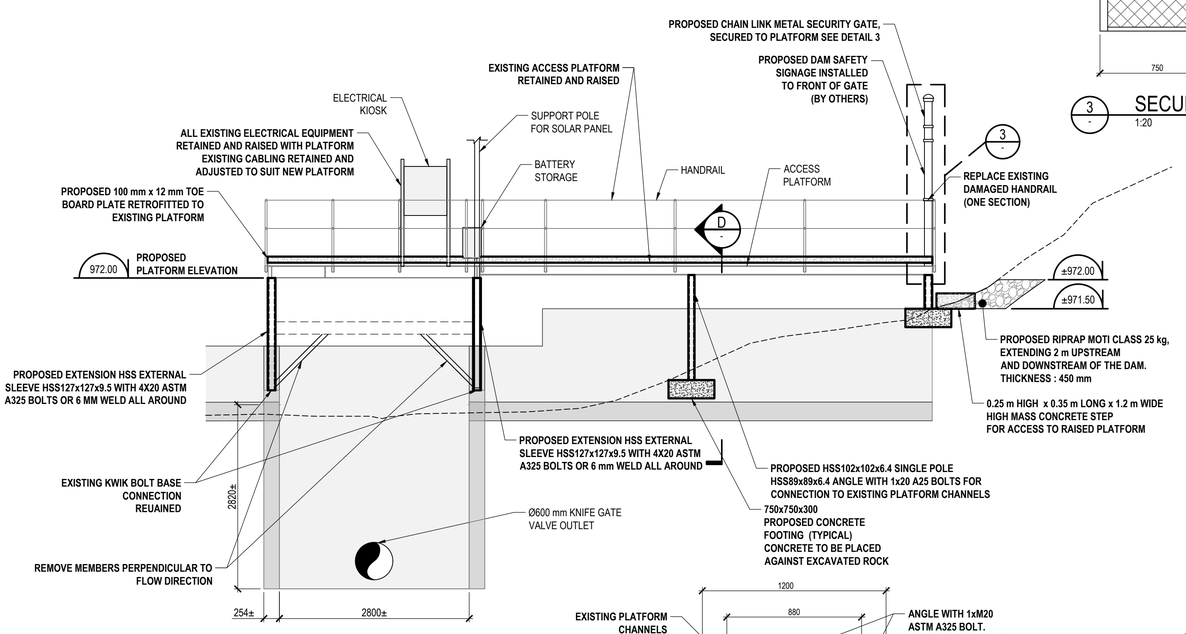
A C-001 UPSTREAM ELEVATION
1:75



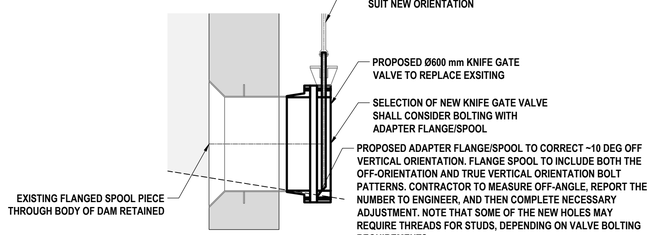
3 - SECURITY GATE AND FENCING DETAIL
1:20



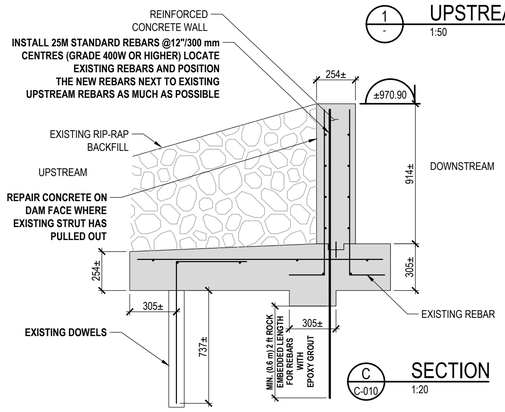
B C-010 SECTION
1:50



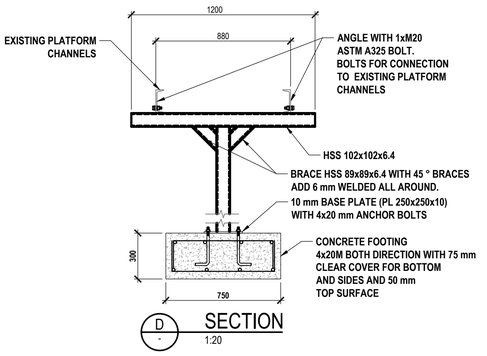
1 - UPSTREAM ELEVATION DETAIL
1:50



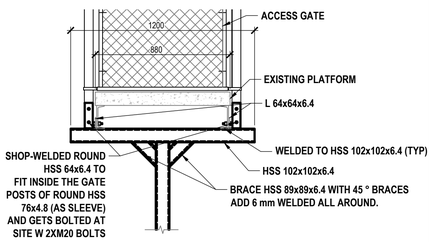
2 - KNIFE VALVE DETAIL
1:20



C C-010 SECTION
1:20



D - SECTION
1:20



4 - DETAIL
1:20

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PERMIT TO PRACTICE NUMBER:

REVISIONS	
REVISION 3 : ISSUED FOR TENDER	2023-04-28
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REVISION 1 : ISSUED FOR 90% DESIGN	2022-02-08
REVISION 0 : ISSUED FOR 60% DESIGN	2021-11-12

SUNSHINE COAST REGIONAL DISTRICT
INFRASTRUCTURE DEPARTMENT
1975 Field Road
Sechelt, BC V0N 3A1
Ph: 604-885-6800 1-800-687-5753 Fax: 604-885-7909

DESIGNED BY:		B.R.
DRAWN BY:		B.W.
CHECKED BY:		V.C. / R.M.
APPROVED BY:		D.D.
SCALE	H AS SHOWN	V n/a
PLOT DATE:		2023-04-28

CHAPMAN LAKE DAM SAFETY UPGRADES

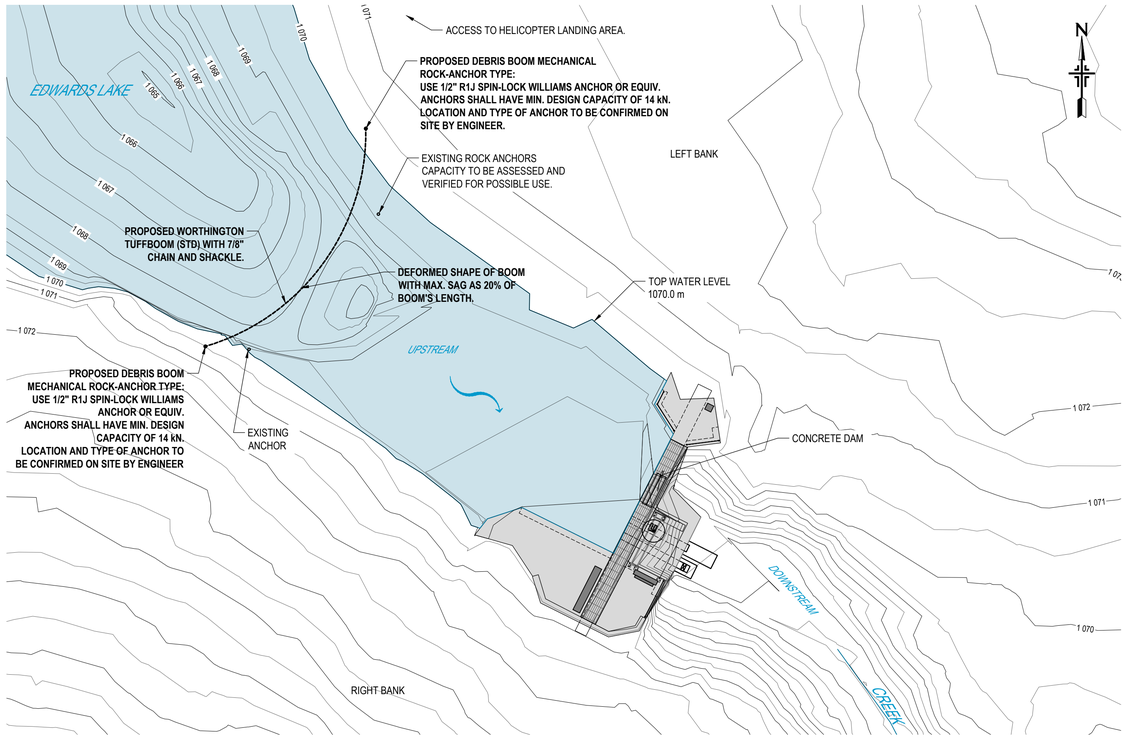
DRAWING :

PROFILE AND SECTIONS

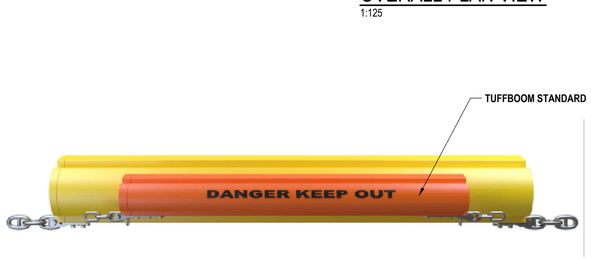
SEAL :

2023-04-28

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-011
SHEET NO :	01 of 01



OVERALL PLAN VIEW
1:125



1 TUFFBOOM STANDARD
NTS

TUFFBOOM STANDARD TABLE	
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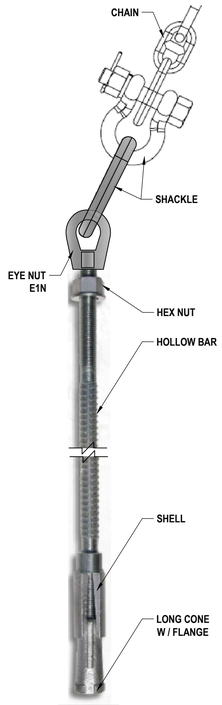
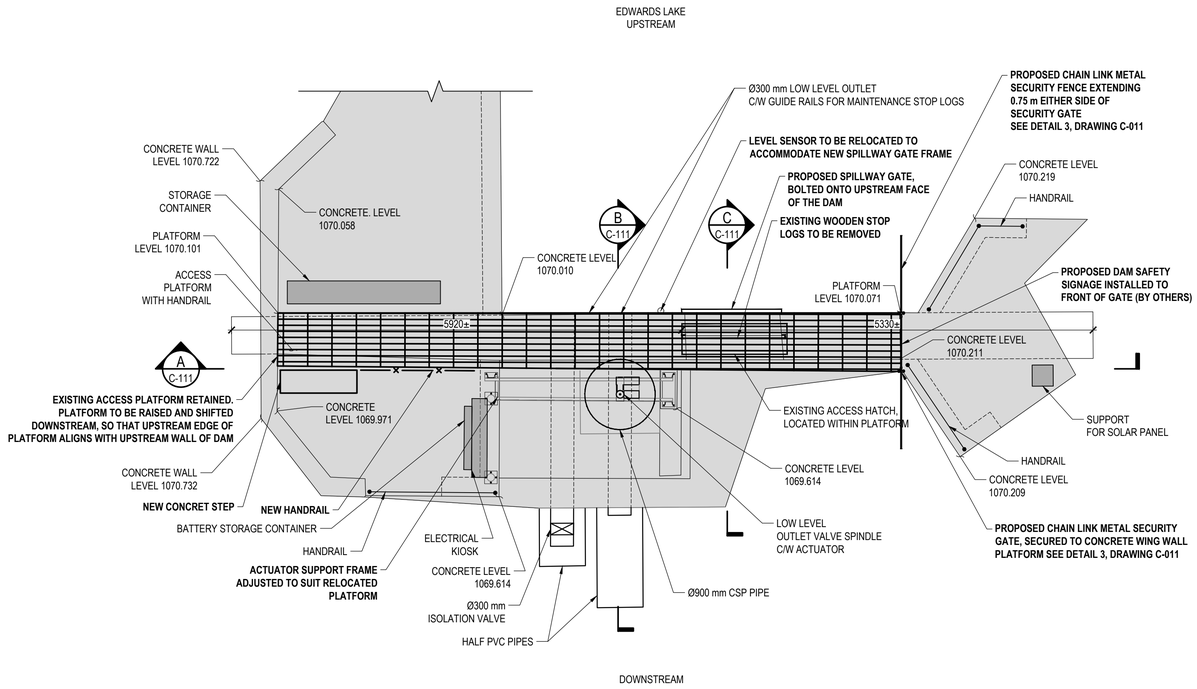


2 R1J SPIN-LOCK ROCK BOLT
NTS



PLAN VIEW
1:40

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SUNSHINE COAST REGIONAL DISTRICT
INFRASTRUCTURE DEPARTMENT
1975 Field Road
Sechelt, BC V0N 3A1
Ph: 604-885-6800 1-800-687-5753 Fax: 604-885-7909

DESIGNED BY:		B.R. / R.M.
DRAWN BY:		B.W.
CHECKED BY:		V.C.
APPROVED BY:		D.D.
SCALE	H AS SHOWN	V n/a
PLOT DATE:		2023-04-28

EDWARDS LAKE DAM SAFETY UPGRADES

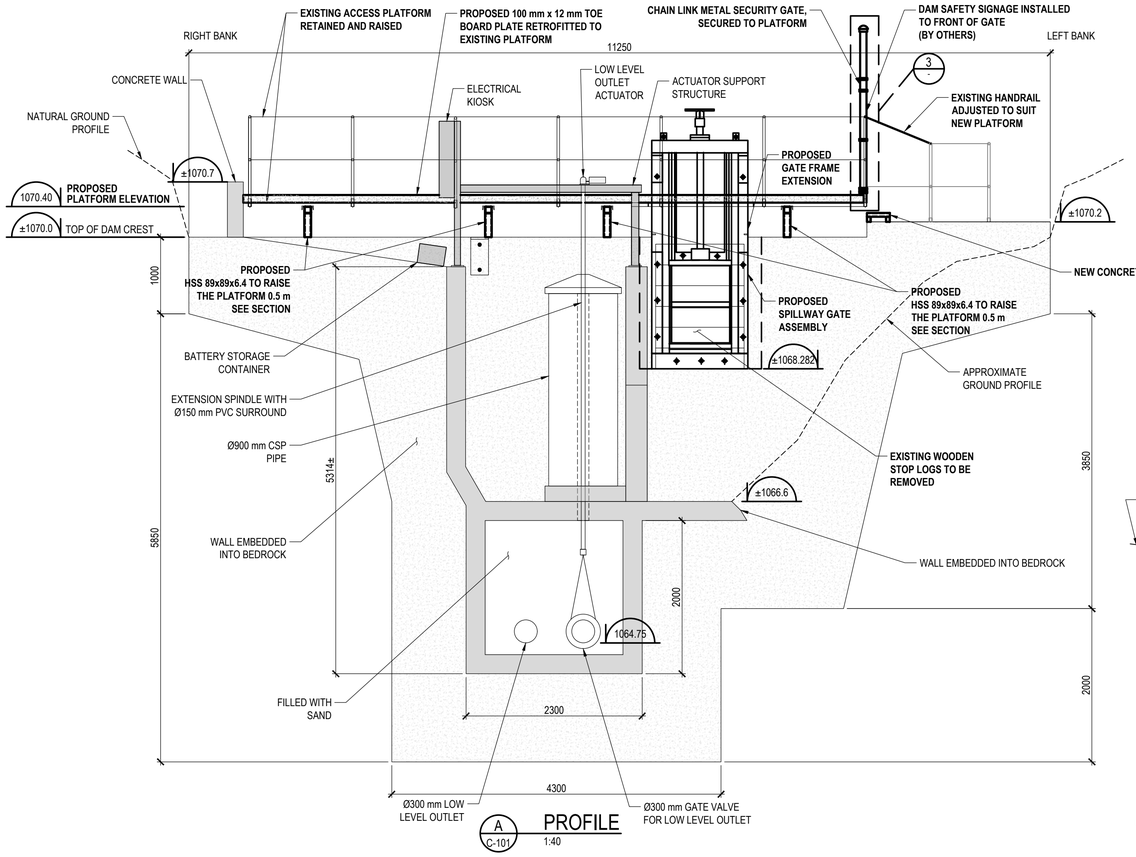
DRAWING :

KEY PLAN, OVERALL PLAN, AND PLAN VIEW

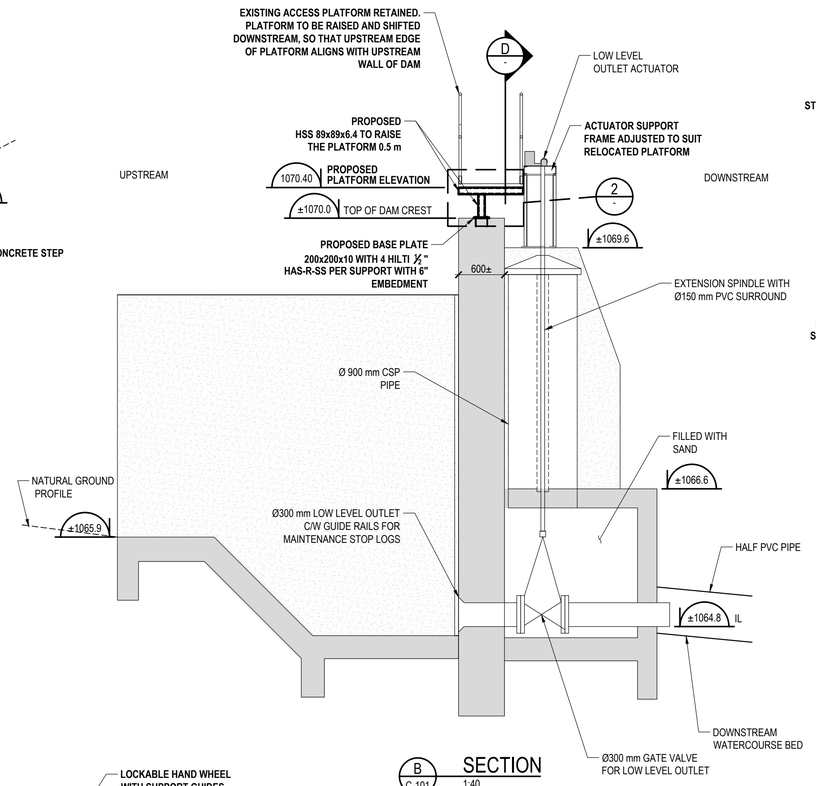
SEAL :

2023-04-28

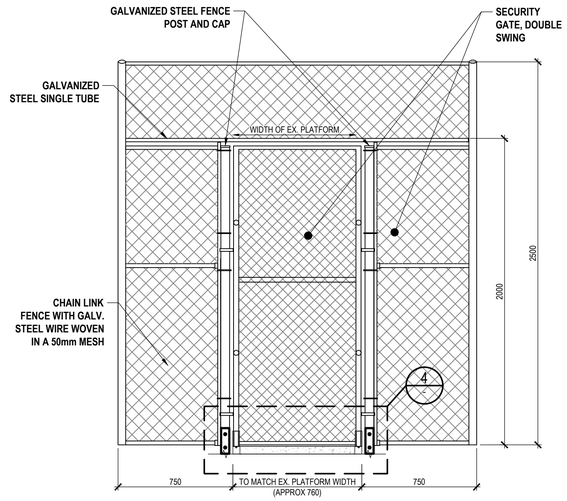
WORK ORDER NO:	211-09410-00
DRAWING NO:	C-110
SHEET NO :	01 of 01



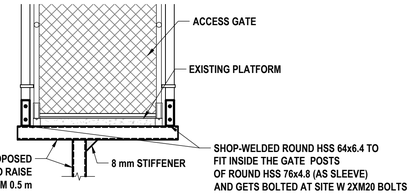
A C-101 PROFILE
1:40



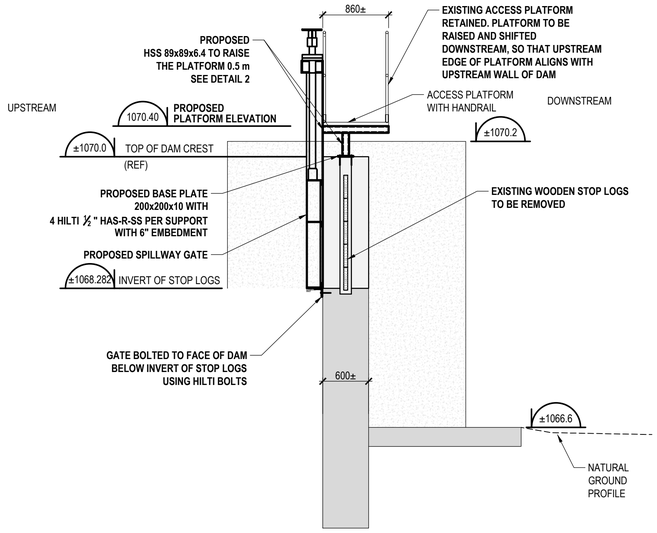
B C-101 SECTION
1:40



3 - SECURITY GATE AND FENCING DETAIL
1:20



4 - DETAIL
1:20



C C-101 SECTION
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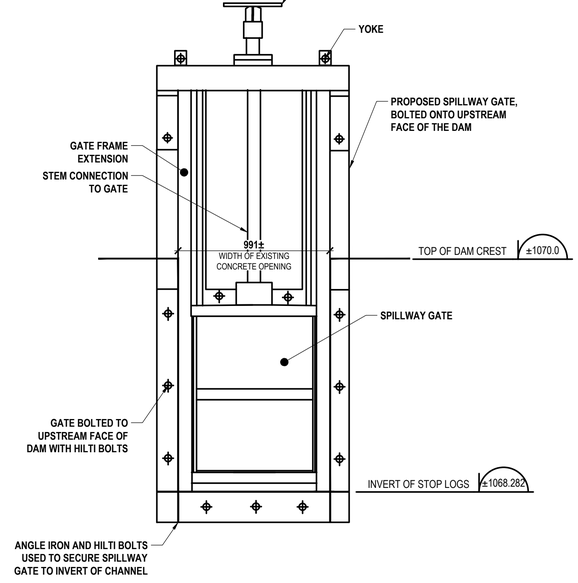
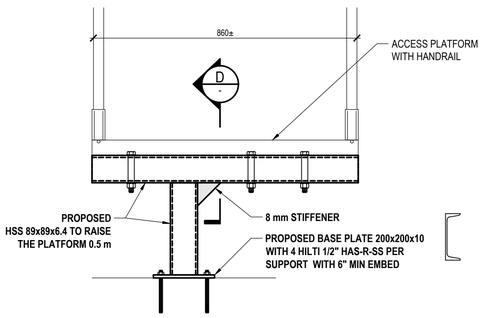
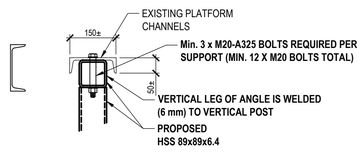


1 - DETAIL - SPILLWAY GATE UPSTREAM ELEVATION
1:20



2 - DETAIL
1:10



D - SECTION
1:10

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PERMIT TO PRACTICE NUMBER:

REVISIONS	
REVISION 3 : ISSUED FOR TENDER	2023-04-24
REVISION 2 : ISSUED FOR TENDER	2022-05-02
REVISION 1 : ISSUED FOR 90% DESIGN	2022-02-08
REVISION 0 : ISSUED FOR 60% DESIGN	2021-11-05

SUNSHINE COAST REGIONAL DISTRICT
INFRASTRUCTURE DEPARTMENT
1975 Field Road
Sechelt, BC V0N 3A1
Ph: 604-885-6800 1-800-687-5753 Fax: 604-885-7909

DESIGNED BY:		B.R./L.D.
DRAWN BY:		B.W.
CHECKED BY:		V.C. / R.M.
APPROVED BY:		D.D.
SCALE	H AS SHOWN	V n/a
PLOT DATE:		2023-04-28

EDWARDS LAKE DAM SAFETY UPGRADES

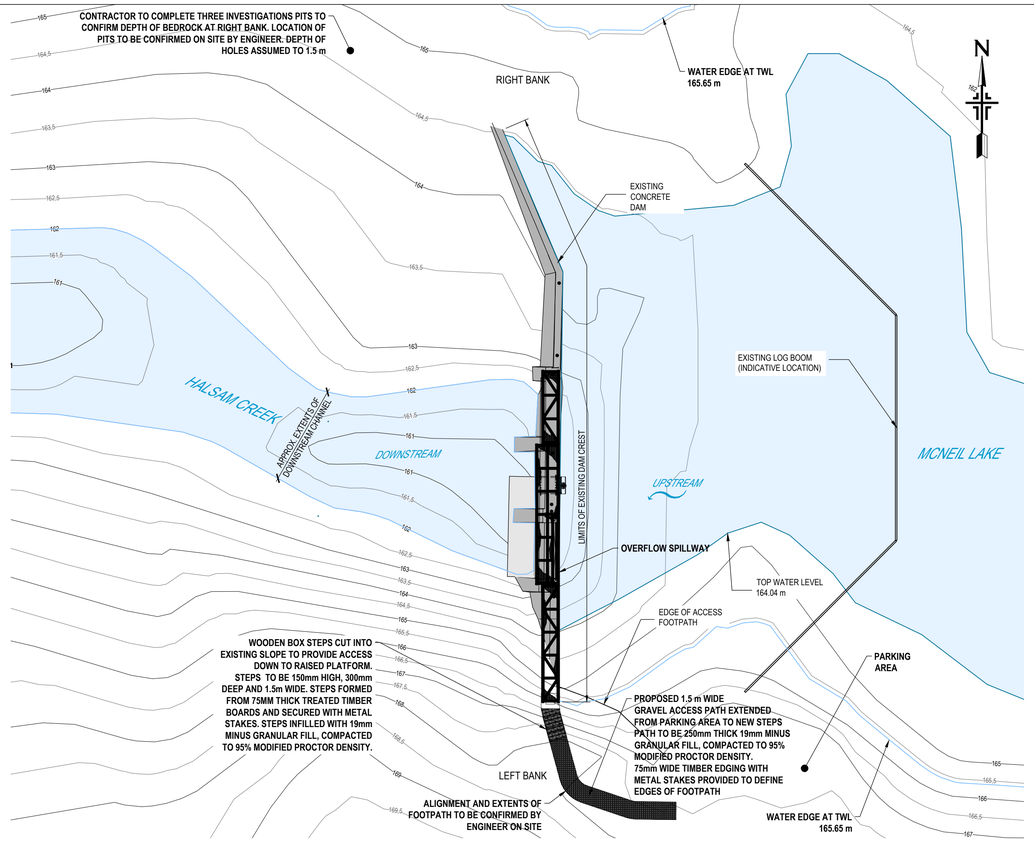
DRAWING :

DAM SAFETY UPGRADES PROFILE AND SECTIONS

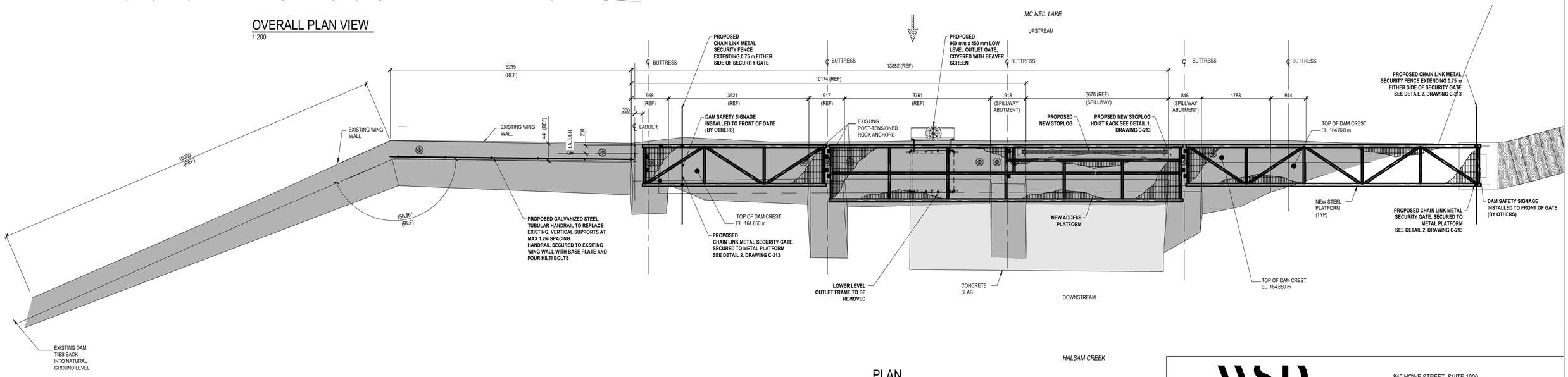
SEAL :

2024-03-24

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-111
SHEET NO :	01 of 01



OVERALL PLAN VIEW
1:200



PLAN
1:50

HALSAM CREEK

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DESIGNED BY:		R.M.
DRAWN BY:		B.W
CHECKED BY:		V.C.
APPROVED BY:		D.D.
SCALE	H as shown	V N/A
PLOT DATE:		2023-04-28

MCNEIL LAKE DAM SAFETY UPGRADES

DRAWING :

KEY PLAN, OVERALL PLAN, AND PLAN VIEW

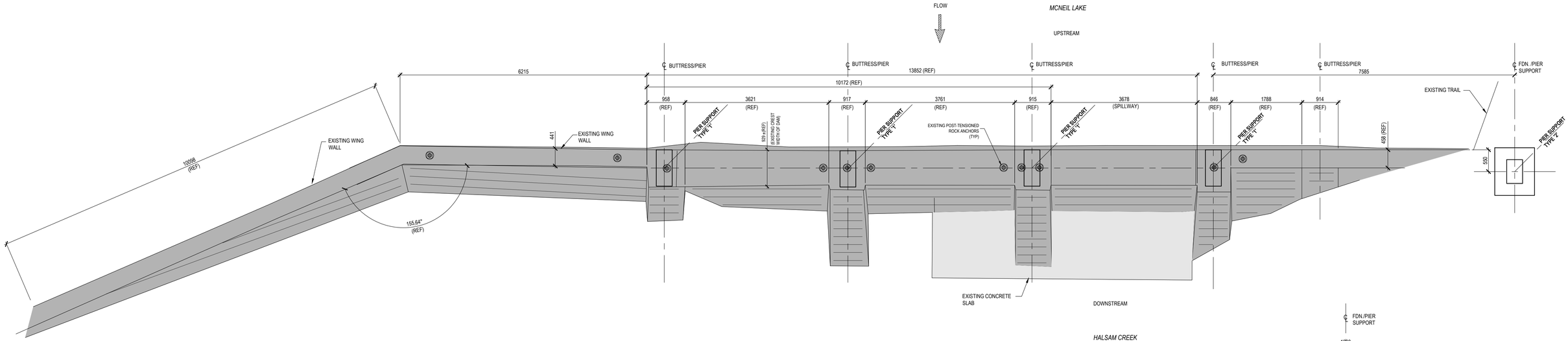
SEAL :

2023-04-28

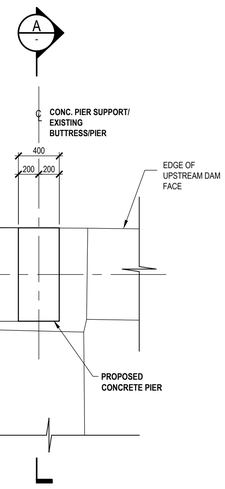
WORK ORDER NO: 211-09410-00

DRAWING NO: C-210

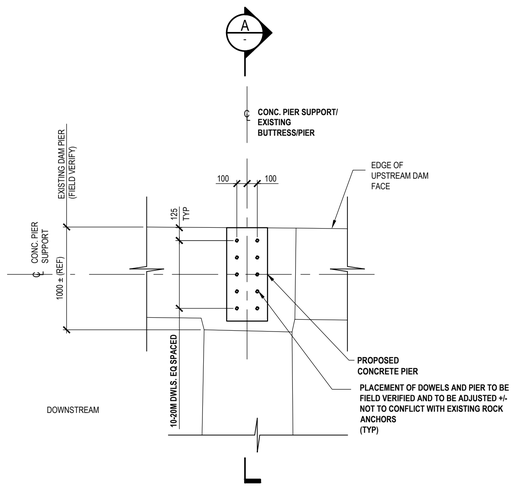
SHEET NO : 01 of 01



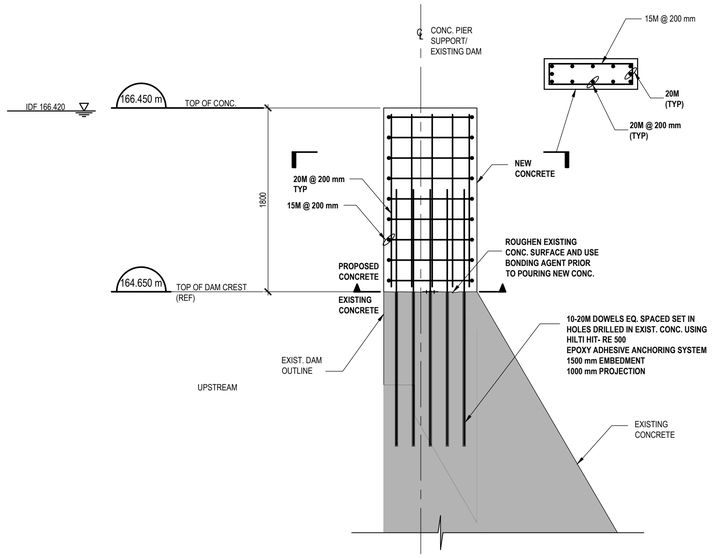
PLAN
1:50



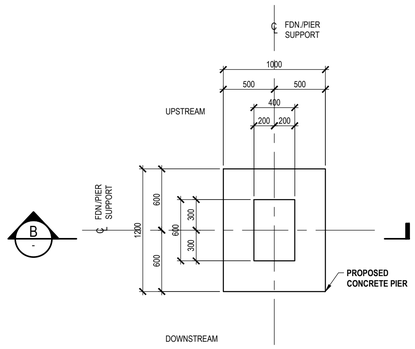
PIER TYPE '1' PLAN
1:30
4 LOCATIONS



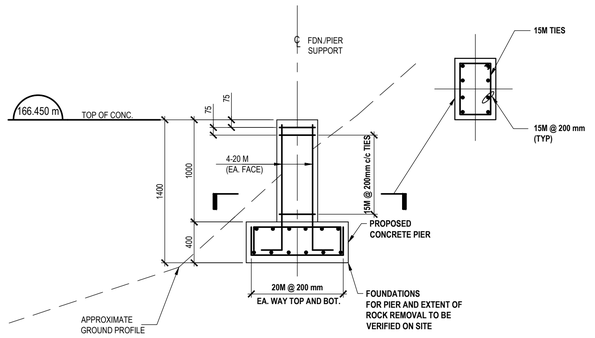
PIER TYPE '1' DOWEL LOCATION PLAN
1:30
4 LOCATIONS



A SECTION
SCALE: 1:30



PIER TYPE '2' PLAN
1:30
1 LOCATIONS



B SECTION
SCALE: 1:30

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VANCOUVER BRITISH COLUMBIA CANADA V6Z 2L2
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DESIGNED BY:		B.R.
DRAWN BY:		B.W.
CHECKED BY:		R.M. / V.C.
APPROVED BY:		D.D.
SCALE	H as shown	V as shown
PLOT DATE:		2023-04-28

MCNEIL LAKE DAM SAFETY UPGRADES

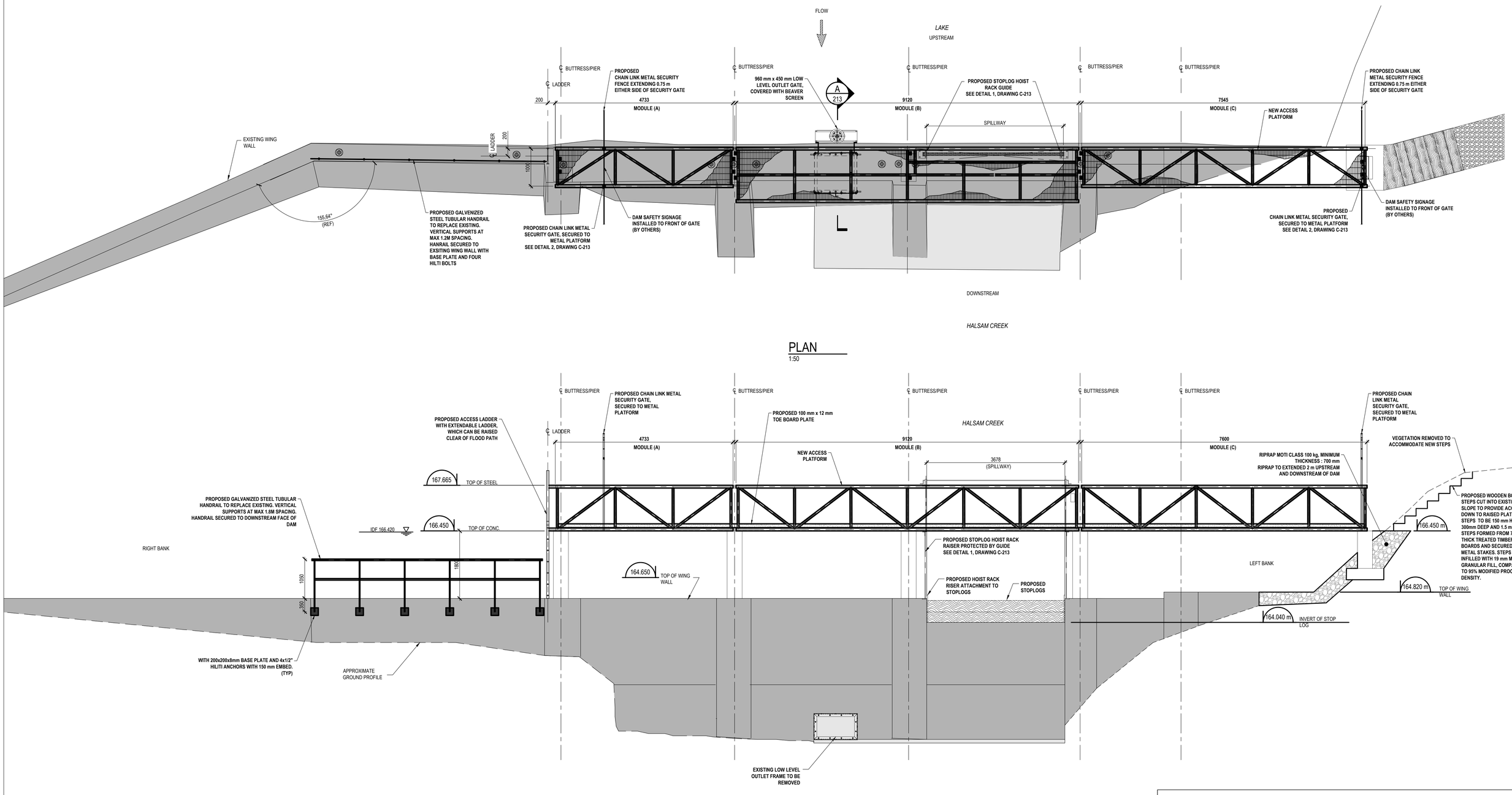
DRAWING :

CONCRETE PLANS AND SECTIONS

SEAL :

2023-04-28

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-211
SHEET NO :	01 of 01



PLAN
1:50

DOWNSTREAM ELEVATION
1:50

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VANCOUVER BRITISH COLUMBIA CANADA V6Z 2L2
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PERMIT TO PRACTICE NUMBER:

REVISIONS	
REVISION 3 : ISSUED FOR TENDER	2023-04-28
REVISION 2 : ISSUED FOR TENDER	2022-05-02
REVISION 1 : ISSUED FOR 90% DESIGN	2022-02-08
REVISION 0 : ISSUED FOR 60% DESIGN	2021-11-12

SUNSHINE COAST REGIONAL DISTRICT
INFRASTRUCTURE DEPARTMENT
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Sechelt, BC V0N 3A1
Ph: 604-885-6800 1-800-687-5753 Fax: 604-885-7909

DESIGNED BY:		B.R.
DRAWN BY:		B.W.
CHECKED BY:		R.M. / V.C.
APPROVED BY:		D.D.
SCALE	H as shown	V as shown
PLOT DATE:		2023-04-28

MCNEIL LAKE DAM SAFETY UPGRADES

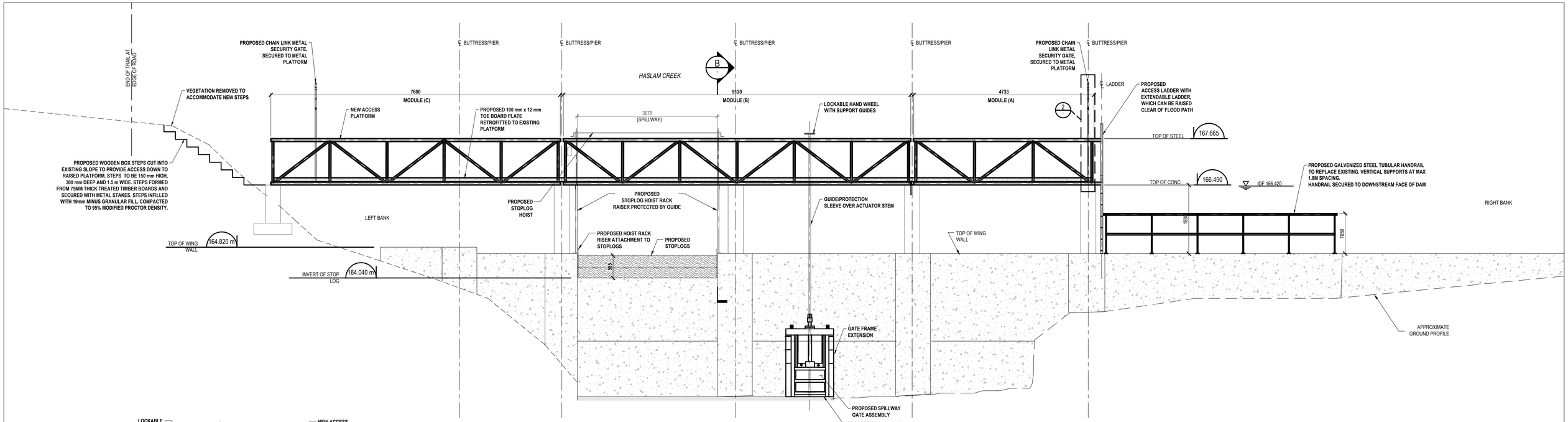
DRAWING :

PLAN AND DOWNSTREAM ELEVATION

SEAL :

2023-04-28

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-212
SHEET NO :	01 of 01



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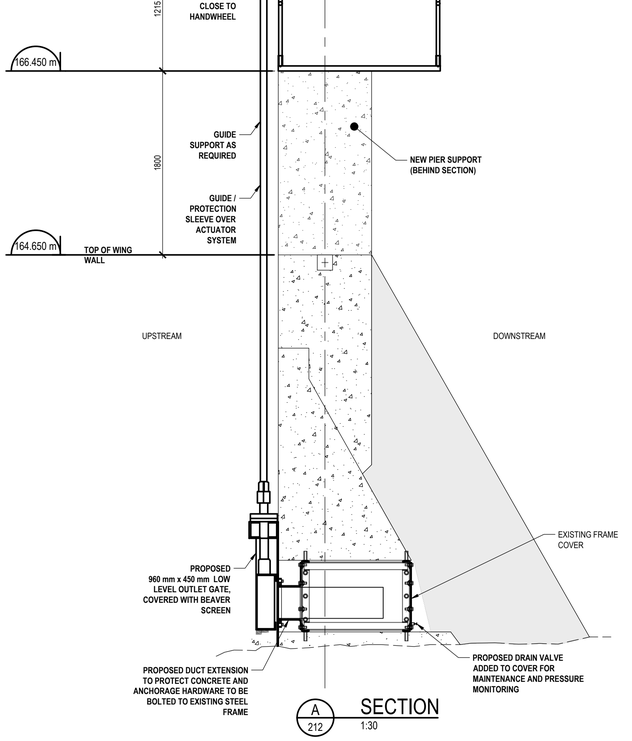

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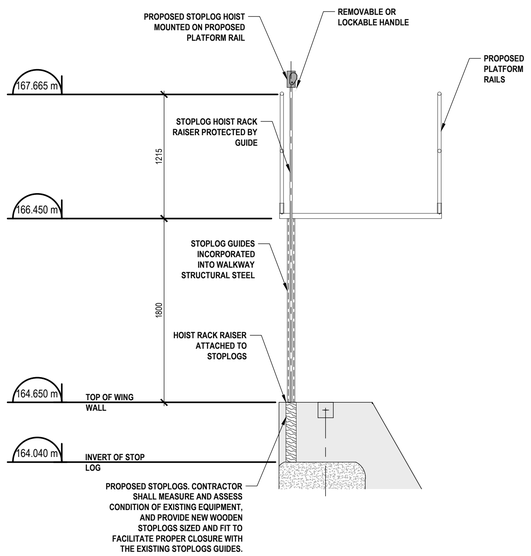

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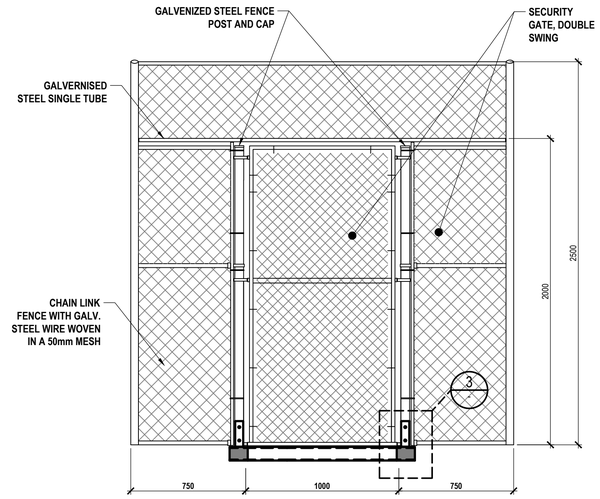

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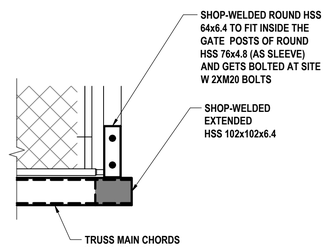

3
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DETAIL
1:20

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MCNEIL LAKE DAM SAFETY UPGRADES

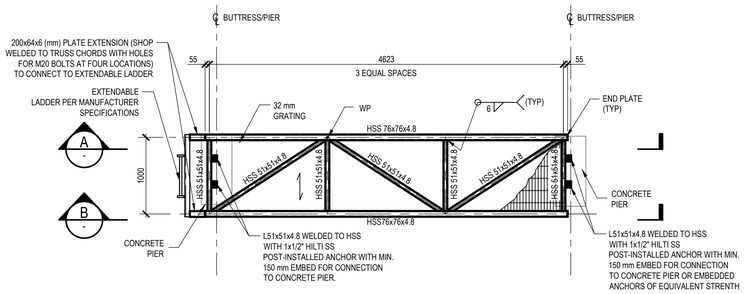
DRAWING :

UPSTREAM ELEVATION AND SECTION

SEAL :

2023-04-28

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-213
SHEET NO :	01 of 01



PLAN
BOTTOM CORD
MODULE (A)
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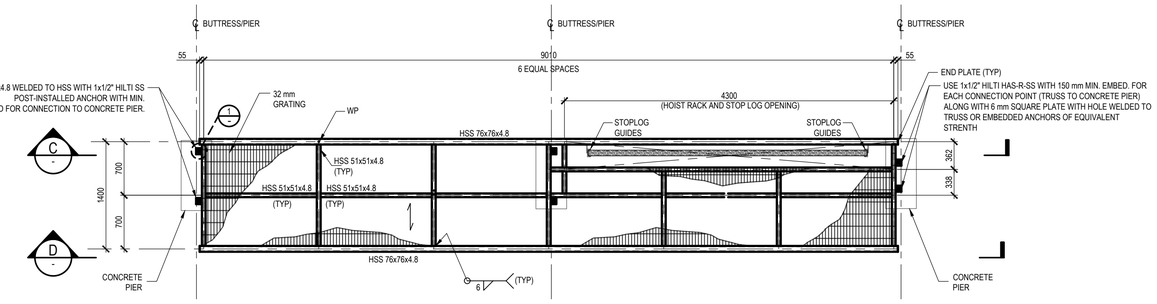

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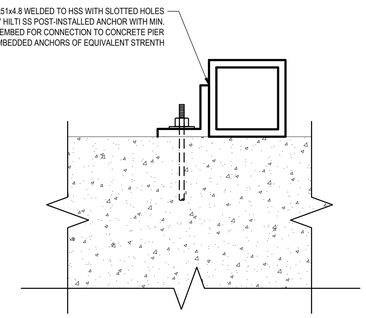
MODULE (B)
1:40



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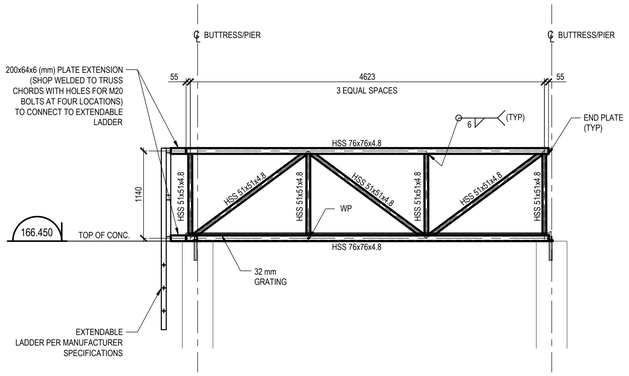
SCALE: 1:2



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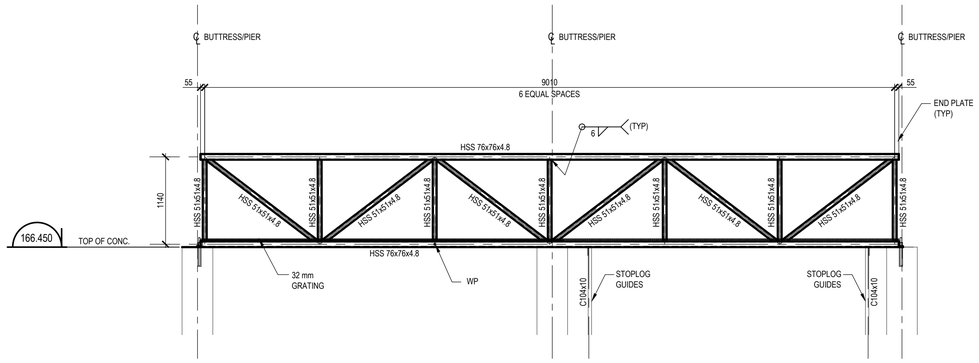
SCALE: 1:40



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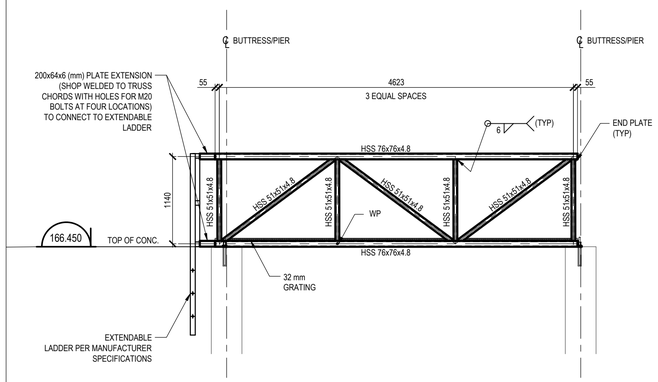

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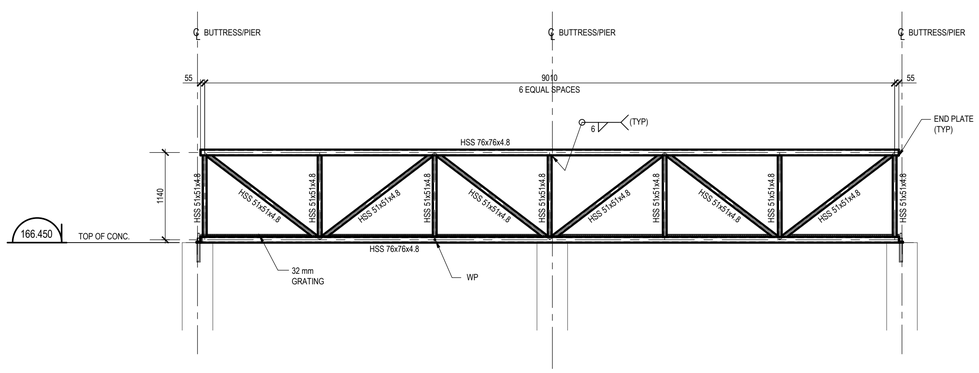

D - SECTION
SCALE: 1:40

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MCNEIL LAKE DAM SAFETY UPGRADES

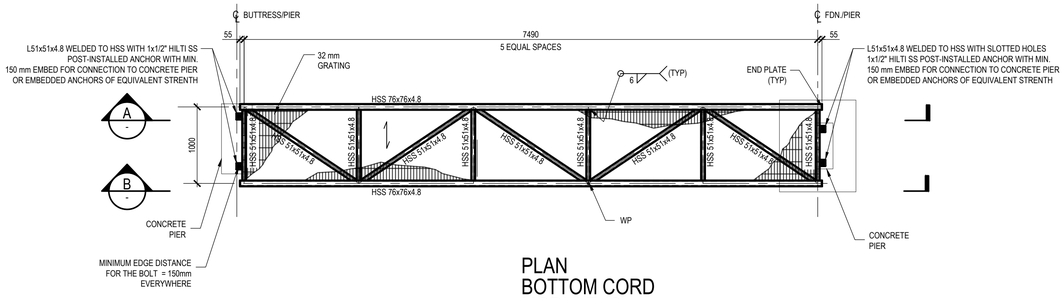
DRAWING :

STRUCTURAL STEEL MODULES A AND B

SEAL :

2023-04-28

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-214
SHEET NO :	01 of 01



PLAN
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MODULE (C)
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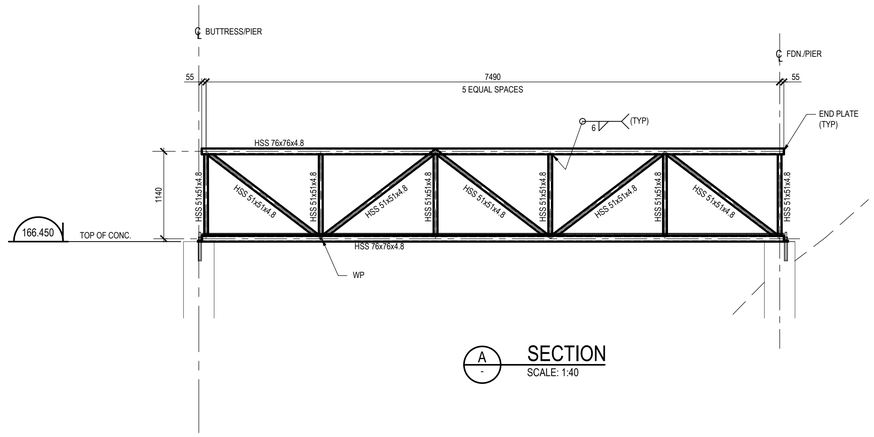

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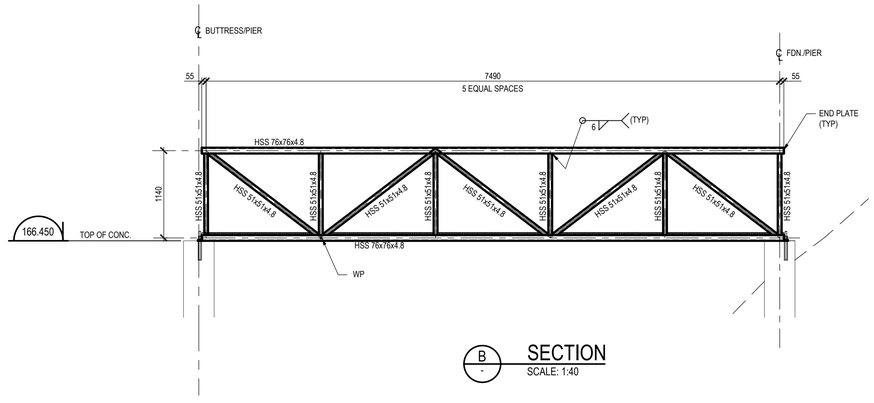

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MCNEIL LAKE DAM SAFETY UPGRADES

DRAWING :

STRUCTURAL STEEL MODULE C

SEAL :

2022-02-08

WORK ORDER NO:	211-09410-00
DRAWING NO:	C-215
SHEET NO :	01 of 01

Appendix C Measurements and Payment of Work

MEASUREMENT AND PAYMENT OF WORK

FOR

SUNSHINE COAST REGIONAL DISTRICT

UPGRADES TO MCNEIL, CHAPMAN AND EDWARDS CONCRETE DAMS

28th April 2023

Prepared by WSP Canada Inc.

1. GENERAL

Measurement of and Payment for the Works shall be made in accordance with this Section. The item reference for each sub-heading refers to the Item bearing the same number in the Schedule of Quantities and Prices.

Any work called for in the Specifications or shown or implied on the drawings or necessary for the completion of the work called for in the Specifications, which is not specifically listed as a separate item in the Schedule, will be deemed incidental to the general purpose of the Contract and no separate payment will be made on account of any such work, but the cost of any such work will be included in the tendered unit prices or lump sum prices for the various items of work appearing in the Schedule.

No payment will be made for work beyond the lines and grades shown on the Drawings without approval in writing by the Consultant.

The List of Itemized Prices, as either Lump Sum Prices or Unit Prices extended against Contract Quantities or Provisional Quantities (as appropriate), aggregate to the Total Stipulated Proposal Price which will, upon the selection of the Proponent, become the Contract Price (less the value of items identified in the List of Itemized Prices as Provisional Items), subject only to the finalization of open terms and conditions of the draft Definitive Agreement, if any, between the Parties.

1.1 LUMP SUM PRICE WORK

Lump Sum Price Work includes all work items necessary for the complete and unfettered delivery of the Work other than those work items specifically designated in Schedule of Quantities and Prices as being measured and paid as a Unit Price.

The Contractor shall include the costs of lump sum price work in the Lump Sum Prices identified in the List of Itemized Prices and as described herein.

1.2 UNIT PRICE WORK

Unit Price Work includes all work items within Schedule of Quantities and Prices where the Consultant will periodically measure the quantities of work completed by the Contractor in accordance with the Consultant Documents. The Consultant shall establish the quantity of Unit Price Work (the Eligible Quantity) and determine payment due the Contractor by extending the Eligible Quantity against the applicable Contract Unit Price

1.3 NO SEPARATE PAYMENT

No separate payment will be made by SCRD to the Contractor for any of the following items:

a. Insurance as per the Contract Documents

b. Acceptance of the SCRD's Environmental Protection Plan (EPP) as the minimum requirements for the Contractors Site Specific Environmental Protection Plan (SSEMPP)

c. Development and implementation of the Contractor's Sight Specific Occupational Health and Safety Program (SSOHSP)

d. Development and implementation of the SCRD accepted Contractor's Quality Control Plan (CQCP) in accordance with Construction Documents and specifically SCRD's QMP as described in the Scope of Work, including the production and management of all quality related documents

e. Provision of independent third parties (including but not limited to professional engineers, construction monitoring specialist(s) and environmental testing entities) as required (explicitly or by inference) by the Contract Documents

f. Approvals, permits and fees, including those associated with private landowners, municipalities and other authorities including lease payments (if any)

g. Removal and disposal of hazardous wastes generated by the Contractor

h. Access to Edwards Lake Dam and Chapman Lake Dam via helicopter, as outlined in the technical specification.

i. Contractor corporate overhead recovery and profit

j. Other common element type items required or reasonably inferred in the Contract Documents

Contractors are to include the costs for these work items in the most applicable line item of the Stipulated Proposal Price Form.

MCNEIL LAKE DAM

1. GENERAL COST

ITEM 1.1 MOBILIZATION & DEMOBILIZATION

This Item shall includes all costs with mobilization and demobilization associated with all the Contractor's equipment, safety equipment, site facilities, regulatory agency compliance and services and shall also include the cost of licenses, permits and security necessary to complete the work and all close-out submittals, except as listed elsewhere.

The total amount of this Item shall not exceed 10% of the total tendered price. Mobilization will be processed under the first progress payment certificate and demobilization will be processed after the work has been completed and there is no Contractor's equipment or facilities remaining on the site.

Payment for this Item will be made at the lump sum price tendered for mobilization and demobilization, on the following basis:

- 50% upon mobilization.
- 50% upon demobilization.

ITEM 1.2 ENVIRONMENTAL PROTECTION

This Item shall include labour, materials and equipment necessary to carry out environmental requirements, including installation and maintenance of silt fencing, construction of temporary drainage ditches, protection of watercourses, other siltation and erosion control measures, and all other items to meet the environmental requirements outlined in the Construction Environmental Management Plan.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 75% paid over the course of construction based on the percentage of the total work completed.
- 25% upon demobilization.

2. CUTTING, CLEARING & GRUBBING

ITEM 2.1 CUTTING, CLEARING & GRUBBING

This Item shall be for all cutting, clearing and grubbing required in accordance with the Contract Documents.

This Item shall be measured in square meters (m^2),

A completely cleared and grubbed area comprises all standing timber felled, all brush and timber on the ground moved to an offsite location. This item also includes the disposal of all unneeded trees. This Item includes removal of topsoil. This Item shall also include removal of trees within the project area, including any roots larger than 50 mm in diameter. The Contractor shall observe all requirements in the Construction Environmental Management Plan.

Measurements shall be made by the Contractor and may be independently verified by the Consultant. The Consultant may adjust the limits of clearing and grubbing as necessary to allow for completion of the Work.

No interim payment will be considered for clearing and grubbing of partial areas since the Work occurs early in the schedule and should be completed in its entirety all at once. No payment shall be made for partial completion of cleared area if the condition does not meet the description for a completely cleared area defined above.

Final payment for this Item shall be made based on total survey measured complete area that conforms with the definition above which allows a subsequent phase of Work in the area to commence.

3. STRUCTURAL CONCRETE

ITEM 3.1 REINFORCED CONCRETE PIER SUPPORT, TYPE 1

This Item shall include all work necessary to complete the concrete works required for the Type 1 reinforced concrete support piers, in accordance with the Contract Documents.

This Item shall be measured by unit, for each pier constructed.

The work includes, but is not limited to, the supply and installation of reinforcing steel, formwork, falsework, block outs, concrete supply and placement, bond and bond breaker activities and materials, cure and finish (wet and dry) activities and supplies, concrete surface preparation, concrete accessories such as water stop and sealants, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each Type 1 reinforced concrete support pier constructed.

ITEM 3.2 REINFORCED CONCRETE PIER SUPPORT, TYPE 2

This Item shall include all work necessary to complete the concrete works required for the Type 2 reinforced concrete support piers, in accordance with the Contract Documents.

This Item shall be measured by unit, for each pier constructed.

The work includes, but is not limited to, the supply and installation of reinforcing steel, formwork, falsework, block outs, concrete supply and placement, bond and bond breaker activities and materials, cure and finish (wet and dry) activities and supplies, excavation to establish suitable subgrade, subgrade preparation, concrete accessories such as water stop and sealants, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each Type 2 reinforced concrete support pier constructed.

ITEM 3.3 10-20M DOWELS

This Item shall include all work necessary to complete the installation of 10-20M anchor dowels into the existing concrete piers, in accordance with the Contract Documents.

This Item shall be measured by unit, for each dowel installed.

The dowels shall be 2.5 m long, extending 1.5 m into the existing concrete pier.

The work includes, but is not limited to, the supply and installation of 10-20M dowels, drilling of holes in existing concrete piers, supply and installation of epoxy, locating of existing rock anchors and reinforcement and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each dowel installed.

4. STRUCTURAL STEEL

ITEM 4.1 STEEL ACCESS PLATFORM, MODULE A

This Item shall include all work necessary to complete the installation of the steel access platform Module A, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 25% upon delivery of the Module to site.
- 60% following complete installation of the Module.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of HSS structural members, anchor bolts, 32mm floor grating, toe board plate, end plates, finishes, welding, temporary works and equipment required for platform installation and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

ITEM 4.2 STEEL ACCESS PLATFORM, MODULE B

This Item shall include all work necessary to complete the installation of the steel access platform Module B, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 25% upon delivery of the Module to site.
- 60% following complete installation of the Module.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of HSS structural members, anchor bolts, 32mm floor grating, toe board plate, end plates, finishes, welding, temporary works and equipment required for platform installation and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

ITEM 4.3 STEEL ACCESS PLATFORM, MODULE C

This Item shall include all work necessary to complete the installation of the steel access platform Module C, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 25% upon delivery of the Module to site.
- 60% following complete installation of the Module.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of HSS structural members, anchor bolts, 32mm floor grating, toe board plate, end plates, finishes, welding, temporary works and equipment required for platform installation and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

ITEM 4.4 REMOVAL OF EXISTING STRUCTURAL STEEL AND MISCELLANEOUS METALWORK

This Item shall include all work necessary to complete the removal all the existing structural steel and miscellaneous metalwork, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed.

The work includes, but is not limited to, removal, transportation offsite and disposal of the following existing components at McNeil Lake Dam:

- Steel access platform, including all timber flooring and anchors bolts
- Security gate and fencing on both left and right ends of the access platform, including steel tubing, wire mesh and bolts
- Existing steel handrail at right abutment

Work shall include all related items necessary to complete this component of the Work in accordance with the Contract Documents.

5. MECHANICAL ITEMS

ITEM 5.1 LOW-LEVEL OUTLET GATE

This Item shall include all work necessary to complete the installation of the Low-Level Outlet Gate, in accordance with the Contract Documents. The Gate should be installed per section A, drawing C-213.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 15% upon delivery of the Gate to site.
- 70% following complete installation of the Gate.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of low level outlet gate assembly, concrete anchor bolts, beaver screen, extension spindle, lockable handwheel, guide protections sleeve, guide supports, finishes, drain valve, duct extension, bolts, concrete surface preparation, removal of existing low-level outlet valve, spindle and downstream frame and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

This item also includes any work required to provide temporary upstream isolation to complete the Work in accordance with the Contract Documents.

ITEM 5.2 STOPLOG HOIST RACK

This Item shall include all work necessary to complete the installation of the Stoplog Hoist Rack, in accordance with the Contract Documents. Hoist Rack should be installed per section B drawing C-213.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 15% upon delivery of the Hoist Rack to site.
- 70% following complete installation of the Hoist Rack.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of stoplog hoist, lockable handwheel, stoplog raiser, stoplog guides, finishes, any necessary welding or bolts required to secure Stoplog Hoist Rack to the dam crest and access platform, concrete surface preparation, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

This item also includes any work required to provide upstream isolation to complete the Work in accordance with the Contract Documents.

ITEM 5.3 WOODEN STOPLOGS

This Item shall include all work necessary to complete the supply and installation of wooden stoplogs, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 85% following complete installation of the Stoplogs.

The Contractor shall measure and assess condition of existing equipment and provide new wooden stoplogs sized to suit existing stoplog guides

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of wooden stoplogs, removal of existing stoplogs and lifting chains, repairs and cleaning of existing stoplog guides and sill and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

6. MISCELLANEOUS ITEMS

ITEM 6.1 GRAVEL ACCESS PATH

This Item shall include all work necessary to complete the works required for the gravel access path to access the left bank of the dam, in accordance with the Contract Documents.

This Item shall be measured in square meters (m^2), installed to the thicknesses as outlined in the Contract Documents.

The work includes, but is not limited to, subgrade preparation, the supply and installation of granular fill material, adjustment of moisture content and compaction. Work also includes supply and install of timber edge boards and metal stakes, as well as all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each specified thickness for the actual area placed.

ITEM 6.2 WOODEN BOX STEPS

This Item shall include all work necessary to complete the works required for the wooden box steps to access the left bank of the dam, in accordance with the Contract Documents.

This Item shall be measured in square meters (m^2), installed with risers as outlined in the Contract Documents.

The work includes, but is not limited to, subgrade preparation, supply and install of timber edge boards and metal stakes, granular fill material, adjustment of moisture content and compaction, as well as all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for the actual area placed.

ITEM 6.3 INVESTIGATION PITS

This Item shall include all work necessary to complete the works required for the pit investigations to confirm depth of bedrock on the right bank of the dam, in accordance with the Contract Documents.

This Item shall be measured in cubic meters (m^3), based upon total volume of excavation, as directed by the Consultant.

Payment for Item shall include the following, but not be limited to:

a. Supply of the workforce, machinery and materials required for the excavation, loading and transport of the excavated materials;

b. Dewatering and water control operations;

c. Any and all temporary stockpiling the contractor elects to make during the course of executing the works;

d. Maintenance of the stockpile during stockpile development with respect to surface water management and erosion control for all access routes and maintenance thereof, including for any augmentation of access routes by geosynthetics, timber or other means to allow for proper trafficking the surface;

e. GPS RTK survey of the depth and location of the investigation pits.

f. Refilling of the investigation pits upon approval by the Consultant.

g. Proper management of surface water and erosion control, to protect areas that have been completely excavated.

h. Erosion control complying with the Construction Environmental Management Plan

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for total measured complete excavated volume in cubic meters (m^3), that conforms with the definition above of completed excavation.

ITEM 6.4 GALVANIZED STEEL HANDRAIL

This Item shall include all work necessary to complete the installation of the galvanized steel handrail, in accordance with the Contract Documents.

This Item shall be measured in lineal meters (m), based upon total length of handrail installed, in accordance with the Contract Documents.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of galvanized steel tubular handrail, based plates, anchor bolts, concrete surface preparation, coatings, welding and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for the total length of handrail installed.

ITEM 6.5 CHAIN LINK METAL SECURITY GATE AND FENCING

This Item shall include all work necessary to complete the installation of the chain link metal security gate and fencing, in accordance with the Contract Documents. Gate should be installed per detail 2 drawing C-213.

This Item shall be measured by unit, for each completed gate installed.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of galvanized steel tubular tubes and posts, steel wire woven mesh, bolts and hinges, lock, coatings, welding and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each completed chain link metal security gate and fencing

ITEM 6.6 ACCESS LADDER

This Item shall include all work necessary to complete the installation of the access ladder, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 85% following complete installation of the Access Ladder.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of extendable ladder, ladder rungs, plate extensions, any necessary welding or bolts required to secure access ladder to the access platform and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

ITEM 6.7 RIP RAP

This Item shall include all work necessary to complete the works required for rip rap erosion protection, in accordance with the Contract Documents.

This Item shall be measured in cubic meters (m^3), installed to the thicknesses as outlined in the Contract Documents.

The work includes, but is not limited to, subgrade preparation, sourcing rip rap, hauling it to the placement location, rip rap installation, as well as all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Placed rip rap comprises material placed to the lines, grade and thickness shown on the Construction Drawings, and to the gradation specified in the Technical Specifications. The Consultant may adjust the limits of rip rap placement as necessary to allow for completion of the Work.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for actual volume placed.

ITEM 6.8 STAFF GAUGE

This Item shall include all work necessary to complete the supply and installation of a vertical staff gauge on the upstream face of the dam.

Payment for this Item will be made at the lump sum price proposed.

The work includes, but is not limited to, concrete face preparation, supply and installation of gauge and anchor bolts, calibration of the gauge, as well as all related items necessary to complete this component of the Work in accordance with the Contract Documents.

CHAPMAN LAKE DAM

1. GENERAL COST

ITEM 1.1 MOBILIZATION & DEMOBILIZATION

This Item shall includes all costs with mobilization and demobilization associated with all the Contractor's equipment, safety equipment, site facilities, regulatory agency compliance and services and shall also include the cost of licenses, permits and security necessary to complete the work and all close-out submittals, except as listed elsewhere. Shall also include the establishment, removal and restoration of any temporary camps required at Chapman Lake.

The total amount of this Item shall not exceed 10% of the total tendered price. Mobilization will be processed under the first progress payment certificate and demobilization will be processed after the work has been completed and there is no Contractor's equipment or facilities remaining on the site.

Payment for this Item will be made at the lump sum price tendered for mobilization and demobilization, on the following basis:

- 50% upon mobilization.
- 50% upon demobilization.

ITEM 1.2 ENVIRONMENTAL PROTECTION

This Item shall include labour, materials and equipment necessary to carry out environmental requirements, including installation and maintenance of silt fencing, construction of temporary drainage ditches, protection of watercourses, other siltation and erosion control measures, and all other items to meet the environmental requirements outlined in the Construction Environmental Management Plan.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 75% paid over the course of construction based on the percentage of the total work completed.
- 25% upon demobilization.

2. CUTTING, CLEARING & GRUBBING

ITEM 2.1 CUTTING, CLEARING & GRUBBING

This Item shall be for all cutting, clearing and grubbing required in accordance with the Contract Documents.

This Item shall be measured in square meters (m^2),

A completely cleared and grubbed area comprises all standing timber felled, all brush and timber on the ground moved to an offsite location. This item also includes the disposal of all unneeded trees. This Item includes removal of topsoil. This Item shall also include removal of trees within the project area, including any roots larger than 50 mm in diameter. The Contractor shall observe all requirements in the Construction Environmental Management Plan.

Measurements shall be made by the Contractor and may be independently verified by the Consultant. The Consultant may adjust the limits of clearing and grubbing as necessary to allow for completion of the Work.

No interim payment will be considered for clearing and grubbing of partial areas since the Work occurs early in the schedule and should be completed in its entirety all at once. No payment shall be made for partial completion of cleared area if the condition does not meet the description for a completely cleared area defined above.

Final payment for this Item shall be made based on total survey measured complete area that conforms with the definition above which allows a subsequent phase of Work in the area to commence.

3. STRUCTURAL CONCRETE

ITEM 3.1 REINFORCED CONCRETE FOOTING

This Item shall include all work necessary to complete the concrete works required for the reinforced concrete footings, in accordance with the Contract Documents.

This Item shall be measured by unit, for each footing constructed.

The work includes, but is not limited to, the supply and installation of reinforcing steel, formwork, falsework, block outs, concrete supply and placement, bond and bond breaker activities and materials, cure and finish (wet and dry) activities and supplies, excavation to establish suitable subgrade, subgrade preparation, concrete accessories such as water stop and sealants, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each reinforced concrete footing constructed.

ITEM 3.2 25M DOWELS

This Item shall include all work necessary to complete the installation of 25M anchor dowels and 300 mm centres into the existing dam crest, in accordance with the Contract Documents.

This Item shall be measured by unit, for each dowel installed.

The dowels shall be 1.9 m long, extending minimum 0.6 m into the bedrock.

The work includes, but is not limited to, the supply and installation of 25M dowels, drilling of holes in existing dam crest, supply and installation of epoxy, locating of existing steel reinforcement and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each dowel installed.

ITEM 3.2 MASS CONCRETE STEP

This Item shall include all work necessary to complete the concrete works required for the mass concrete step at the right dam abutment, in accordance with the Contract Documents.

This Item shall be measured in cubic meters (m^3), installed to the dimensions as outlined in the Contract Documents.

The work includes, but is not limited to, the supply and installation of formwork, block outs, concrete supply and placement, bond and bond breaker activities and materials, cure and finish (wet and dry) activities and supplies, excavation to establish suitable subgrade, subgrade preparation, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for actual volume placed.

4. STRUCTURAL STEEL

ITEM 4.1 STEEL PLATFORM SUPPORT – BEAMS AND COLUMNS

This Item shall include all work necessary to complete the installation of the steel platform support beams and columns, in accordance with the Contract Documents. The beams columns are required to raise the existing steel platform.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 25% upon delivery of the materials to site.
- 60% following complete installation.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of HSS structural members, base plates, bolts, finishes, welding and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

ITEM 4.2 REMOVAL OF EXISTING STRUCTURAL STEEL PLATFORM AND REINSTALLATION

This Item shall include all work necessary to complete the removal all the existing structural steel platform and reinstallation of the existing platform onto the new raised platform supports, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 30% upon removal of existing platform and all associated equipment.
- 70% following complete reinstallation of existing platform and all associated equipment.

The work includes, but is not limited to, removal of existing platform and storage on site, removal and disposal of existing steel columns, removal of all existing electrical equipment and cabling on the platform and storage on site, reinstallation of existing platform on new supports, repair of existing handrail, supply and installation of new 100 mm high toe board plate along platform perimeter, reinstallation of all electrical equipment and cabling on the platform, any associated welding or bolting required and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Work shall include all related items necessary to complete this component of the Work in accordance with the Contract Documents.

5. MECHANICAL ITEMS

ITEM 5.1 LOW-LEVEL KNIFE VALVE AND FLANGE SPOOL PIECE

This Item shall include all work necessary to complete the installation of the Low-Level Knife Valve and spool piece, in accordance with the Contract Documents. The valve should be installed per detail 2, drawing C-011.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 15% upon delivery of the Valve and spool piece to site.
- 70% following complete installation of the Valve and spool piece.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of valve assembly and spool piece, spindle extension and coupling, adjustment to existing actuator and support, spindle support brackets, bolts, removal of existing low-level outlet valve and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

This item also includes any work required to provide upstream isolation to complete the Work in accordance with the Contract Documents.

6. MISCELLANEOUS ITEMS

ITEM 6.1 CHAIN LINK METAL SECURITY GATE AND FENCING

This Item shall include all work necessary to complete the installation of the chain link metal security gate and fencing, in accordance with the Contract Documents. Gate should be installed per detail 2 drawing C-213.

This Item shall be measured by unit, for each completed gate installed.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of galvanized steel tubular tubes and posts, steel wire woven mesh, bolts and hinges, lock, coatings, welding and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each completed chain link metal security gate and fencing.

ITEM 6.2 RIP RAP

This Item shall include all work necessary to complete the works required for rip rap erosion protection, in accordance with the Contract Documents.

This Item shall be measured in cubic meters (m^3), installed to the thicknesses as outlined in the Contract Documents.

The work includes, but is not limited to, subgrade preparation, sourcing rip rap, hauling it to the placement location, rip rap installation, as well as all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Placed rip rap comprises material placed to the lines, grade and thickness shown on the Construction Drawings, and to the gradation specified in the Technical Specifications. The Consultant may adjust the limits of rip rap placement as necessary to allow for completion of the Work.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for actual volume placed.

ITEM 6.3 DEBRIS BOOM

This Item shall include all work necessary to complete the installation of the debris boom and anchors upstream of the dam, in accordance with the Contract Documents.

This Item shall be measured in lineal meters (m) based upon total length of debris boom installed, in accordance with the Contract Documents.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of debris boom and anchors, bolts, finishes and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for the total length of debris boom installed.

ITEM 6.4 STAFF GAUGE

This Item shall include all work necessary to complete the supply and installation of a vertical staff gauge on the upstream face of the dam.

Payment for this Item will be made at the lump sum price proposed.

The work includes, but is not limited to, concrete face preparation, supply and installation of gauge and anchor bolts, calibration of the gauge, as well as all related items necessary to complete this component of the Work in accordance with the Contract Documents.

EDWARDS LAKE DAM

1. GENERAL COST

ITEM 1.1 MOBILIZATION & DEMOBILIZATION

This Item shall includes all costs with mobilization and demobilization associated with all the Contractor's equipment, safety equipment, site facilities, regulatory agency compliance and services and shall also include the cost of licenses, permits and security necessary to complete the work and all close-out submittals, except as listed elsewhere. Shall also include the establishment, removal and restoration of any temporary camps required at Edward Lake

The total amount of this Item shall not exceed 10% of the total tendered price. Mobilization will be processed under the first progress payment certificate and demobilization will be processed after the work has been completed and there is no Contractor's equipment or facilities remaining on the site.

Payment for this Item will be made at the lump sum price tendered for mobilization and demobilization, on the following basis:

- 50% upon mobilization.
- 50% upon demobilization.

ITEM 1.2 ENVIRONMENTAL PROTECTION

This Item shall include labour, materials and equipment necessary to carry out environmental requirements, including installation and maintenance of silt fencing, construction of temporary drainage ditches, protection of watercourses, other siltation and erosion control measures, and all other items to meet the environmental requirements outlined in the Construction Environmental Management Plan.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 75% paid over the course of construction based on the percentage of the total work completed.
- 25% upon demobilization.

2. CUTTING, CLEARING & GRUBBING

ITEM 2.1 CUTTING, CLEARING & GRUBBING

This Item shall be for all cutting, clearing and grubbing required in accordance with the Contract Documents.

This Item shall be measured in square meters (m^2),

A completely cleared and grubbed area comprises all standing timber felled, all brush and timber on the ground moved to an offsite location. This item also includes the disposal of all unneeded trees. This Item includes removal of topsoil. This Item shall also include removal of trees within the project area, including any roots larger than 50 mm in diameter. The Contractor shall observe all requirements in the Construction Environmental Management Plan.

Measurements shall be made by the Contractor and may be independently verified by the Consultant. The Consultant may adjust the limits of clearing and grubbing as necessary to allow for completion of the Work.

No interim payment will be considered for clearing and grubbing of partial areas since the Work occurs early in the schedule and should be completed in its entirety all at once. No payment shall be made for partial completion of cleared area if the condition does not meet the description for a completely cleared area defined above.

Final payment for this Item shall be made based on total survey measured complete area that conforms with the definition above which allows a subsequent phase of Work in the area to commence.

3. STRUCTURAL CONCRETE

ITEM 3.1 MASS CONCRETE STEPS

This Item shall include all work necessary to complete the concrete works required for the mass concrete steps at the right and left dam abutments, in accordance with the Contract Documents.

This Item shall be measured in cubic meters (m^3), installed to the dimensions as outlined in the Contract Documents.

The work includes, but is not limited to, the supply and installation of formwork, block outs, concrete supply and placement, bond and bond breaker activities and materials, cure and finish (wet and dry) activities and supplies, , concrete surface preparation, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for actual volume placed.

4. STRUCTURAL STEEL

ITEM 4.1 STEEL PLATFORM SUPPORT – BEAMS AND COLUMNS

This Item shall include all work necessary to complete the installation of the steel platform support beams and columns, in accordance with the Contract Documents. The beams columns are required to raise the existing steel platform.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 25% upon delivery of the materials to site.
- 60% following complete installation.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of HSS structural members, base plates, anchor bolts, finishes, welding and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

ITEM 4.2 REMOVAL OF EXISTING STRUCTURAL STEEL PLATFORM AND REINSTALLATION

This Item shall include all work necessary to complete the removal all the existing structural steel platform and reinstallation of the existing platform onto the new raised platform supports, in accordance with the Contract Documents.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 30% upon removal of existing platform and all associated equipment.
- 70% following complete reinstallation of existing platform and all associated equipment.

The work includes, but is not limited to, removal of existing platform and storage on site, removal and disposal of existing steel columns, removal of all existing electrical equipment and cabling on the platform and storage on site, reinstallation of existing platform on new supports, repair of existing handrail, supply and installation of new 100 mm high toe board plate along platform perimeter, reinstallation of all electrical equipment and cabling on the platform, any associated welding or bolting required and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Work shall include all related items necessary to complete this component of the Work in accordance with the Contract Documents.

5. MECHANICAL ITEMS

ITEM 5.1 SPILLWAY GATE

This Item shall include all work necessary to complete the installation of the Spillway Gate, in accordance with the Contract Documents. The Gate should be installed per detail 1, drawing C-111.

Payment for this Item will be made at the lump sum price proposed, on the following basis:

- 15% upon approval of the Shop Drawings by the Consultant.
- 15% upon delivery of the Gate to site.
- 70% following complete installation of the Gate.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of low level outlet gate assembly, concrete anchor bolts, lockable handwheel, bolts, concrete surface preparation, removal of existing stoplogs, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

This item also includes any work required to provide upstream isolation to complete the Work in accordance with the Contract Documents.

6. MISCELLANEOUS ITEMS

ITEM 6.1 GALVANIZED STEEL HANDRAIL

This Item shall include all work necessary to complete the installation of the galvanized steel handrail, in accordance with the Contract Documents.

This Item shall be measured in lineal meters (m), based upon total volume length of handrail installed, in accordance with the Contract Documents.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of galvanized steel tubular handrail, based plates, anchor bolts, concrete surface preparation, coatings, welding and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for the total length of handrail installed.

ITEM 6.2 CHAIN LINK METAL SECURITY GATE AND FENCING

This Item shall include all work necessary to complete the installation of the chain link metal security gate and fencing, in accordance with the Contract Documents. Gate should be installed per detail 3 drawing C-111.

This Item shall be measured by unit, for each completed gate installed.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of galvanized steel tubular tubes and posts, steel wire woven mesh, bolts and hinges, lock, coatings, welding and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for each completed chain link metal security gate and fencing.

ITEM 6.3 DEBRIS BOOM

This Item shall include all work necessary to complete the installation of the debris boom and anchors upstream of the dam, in accordance with the Contract Documents.

This Item shall be measured in lineal meters (m) based upon total length of debris boom installed, in accordance with the Contract Documents.

The work includes, but is not limited to, production of shop drawings, fabrication, supply and installation of debris boom and anchors, bolts, finishes and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Measurements shall be made by the Contractor and may be independently verified by the Consultant.

Payment will be made at the corresponding unit price tendered for the total length of debris boom installed.

ITEM 6.4 STAFF GAUGE

This Item shall include all work necessary to complete the supply and installation of a vertical staff gauge on the upstream face of the dam.

Payment for this Item will be made at the lump sum price proposed.

The work includes, but is not limited to, concrete face preparation, supply and installation of gauge and anchor bolts, calibration of the gauge, as well as all related items necessary to complete this component of the Work in accordance with the Contract Documents.

ITEM 6.5 ADJUST ACTUATOR SUPPORT FRAME

This Item shall include all work necessary modify the existing actuator support frame to accommodate the new relocated steel platform.

Payment for this Item will be made at the lump sum price proposed.

The work includes, but is not limited to, removing and reinstallation of existing actuator and frame, cutting and re-welding existing frame as required, re-bolting the frame to the concrete wing walls, and all related items necessary to complete this component of the Work in accordance with the Contract Documents.

Appendix D Technical Specifications

TECHNICAL SPECIFICATIONS
FOR
SUNSHINE COAST REGIONAL DISTRICT

UPGRADES TO MCNEIL, CHAPMAN AND EDWARDS CONCRETE DAMS
28th April 2023

Add Seal *Add Seal*

Structural Engineer Mechanical Engineer

WSP Canada Inc.

Engineers & Geoscientists BC, Permit to Practice Number:

Prepared by WSP Canada Inc.

TABLE OF CONTENTS

END OF SECTION

PART 1 GENERAL

1.1 List of Drawing Sheets

Drawing Number	Drawing Title	Date	Revision
C-000	COVER SHEET, LOCATION MAPS AND SHEET INDEX	2023-04-28	Rev 1
C-001	GENERAL NOTES, LEGEND AND ABBREVIATIONS	2023-04-28	Rev 1
C-010	CHAPMAN LAKE DAM KEY PLAN AND OVERALL PLAN, AND PLAN VIEW	2023-04-28	Rev 3
C-011	CHAPMAN LAKE DAM CONCRETE PROFILE AND SECTIONS	2023-04-28	Rev 3
C-110	EDWARDS LAKE DAM KEY PLAN AND OVERALL PLAN, AND PLAN VIEW	2023-04-28	Rev 3
C-111	EDWARDS LAKE DAM CONCRETE PROFILE AND SECTIONS	2023-04-28	Rev 3
C-210	MCNEIL LAKE DAM KEY PLAN AND OVERALL PLAN, AND PLAN VIEW	2023-04-28	Rev 3
C-211	MCNEIL LAKE DAM CONCRETE PLANS AND SECTIONS	2023-04-28	Rev 3
C-212	MCNEIL LAKE DAM PLAN AND DOWNSTREAM ELEVATION	2023-04-28	Rev 3
C-213	MCNEIL LAKE DAM UPSTREAM ELEVATION AND SECTION	2023-04-28	Rev 3
C-214	MCNEIL LAKE DAM STRUCTURAL STEEL MODULE A AND B	2023-04-28	Rev 3
C-215	MCNEIL LAKE DAM STRUCTURAL STEEL MODULE C	2023-04-28	Rev 3

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises general installation and construction of upgrades to McNeil Lake Dam, Chapman Lake Dam and Edwards Lake Dam. Upgrades include but are not limited to; construction of a new steel platforms, raising existing steel platform, low level outlet upgrades, stoplog lifter, spillway gate, installation of debris booms and rip rap erosion protection.

1.2 CONTRACT METHOD

.1 Construct Work under unit price contract.

1.3 DIVISION OF WORK

.1 Division of the Work among Subcontractors and Suppliers is solely Contractor's responsibility. Consultant and Owner assume no responsibility to act as an arbiter to establish subcontract limits between Sections or Divisions of the Work.

1.4 WORK BY OTHERS

.1 Work of Project executed during Work of this Contract, and which is specifically excluded from this Contract:

a. None.

.2 Co-ordinate work with other contractors. If any part of work under this Contract depends for its proper execution or result upon work of another contractor, report promptly to Engineer, in writing, any defects which may interfere with proper execution of Work.

1.5 SPECIFICATIONS LANGUAGE AND STYLE

.1 These specifications are written in the imperative mood and in streamlined form. The imperative language is directed to Contractor, unless specified otherwise.

.2 Complete sentences by reading "must", " Contractor must", "must be", and similar phrases by inference. Where a colon (:) is used within sentences and phrases, read the words "must be" by inference.

.3 Fulfill and perform all indicated requirements whether specified imperatively or otherwise.

.4 When used in the context of a Product, read the word “provide” to mean “supply and install to result in a complete installation ready for its intended use”.

.5 The terms Consultant and Engineer are used interchangeably throughout these specifications.

1.6 CONTRACT DOCUMENTS FOR CONTRUCTION PURPOSES

.1 *Owner* will supply *Contractor* with a complete set of *Contract Documents* in electronic form before commencement of the *Work*. *Contractor* may print hard copies for construction purposes as required.

.2 *Owner* will also provide *Contractor* with six (6) hard copy sets of *Contract Documents* for construction purposes. Additional hard copy sets shall be at *Contractor*'s expense for the cost of printing, handling and shipping.

1.7 DOCUMENTS AT THE SITE

.1 Keep the following documents at *Place of the Work*, stored securely and in good order and available to *Owner* and *Consultant* in hard copy and electronic form:

a. Current Contract Documents, including Drawings, Specifications and addenda.

b. Change Orders, Change Directives, and Supplementary Instructions.

c. Reviewed Shop Drawings, Product data and samples.

d. Field test reports and records.

e. Construction progress schedule.

f. Meeting minutes.

g. Manufacturer's certifications.

h. Permits, inspection certificates, and other documents required by authorities having jurisdiction.

i. Current record drawings.

j. Material Safety Data Sheets (MSDS) for all controlled *Products*.

1.8 HOURS OF WORK

.1 Working Day – Refer to CCDC 18 for definition.

.2 Perform Work in conformity with all municipal bylaws with respect to noise control, hours of work, night work and holiday work.

.3 Obtain written permission of Engineer before undertaking holiday work or night work.

1.9 CONTRACTOR'S USE OF PREMISES

.1 Ensure Work does not interrupt McNeil Lake Dam, Chapman Lake Dam and Edwards Lake Dam operations or maintenance activities. Coordinate all activities with designated Owner Operations personnel Ascertain boundaries of Site within which work must be confined.

.2 Obtain written authorization from Owner to enter private lands which are the subject of easements or rights-of-way obtained by Owner.

.3 Ascertain and abide by conditions pertaining to use of easements or rights-of-way.

.4 Coordinate use of premises under direction of Owner.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 RESTRICTIONS ON USE OF PREMISES

.1 Coordinate use of premises under direction of Owner.

.2 The Contractor will be responsible for adhering to proposed environmental mitigation measures and regulatory requirements outlined in this Construction environmental Management Plan (CEMP) and regulatory approvals.

.3 Work is required to comply all with conditions of DFO and WSA Section 11 permits.

1.2 WORK SEQUENCE

.1 Schedule and construct Work in stages to accommodate Owner's intermittent use of premises during construction.

.2 Work below the high-water mark must occur during the least risk window of 1st August to 31st October 2023 and 1st August to 31st October 2024.

.3 Notify the DFO Biologist at least 10 days before starting the Work.

1.3 OWNER OCCUPANCY

.1 Cooperate with Owner in scheduling operations to minimize disruptions and to facilitate Owner usage.

1.4 WATER LEVEL

.1 The water level in McNeil Lake shall not be lowered to complete the Work under this Contract.

.2 The water level in Chapman Lake shall not be lowered to complete the Work under this Contract.

.3 The water level in Edwards Lake shall not be lowered to complete the Work under this Contract.

1.5 INSTREAM FLOWS

.1 The Contractor is required to maintain flow into the creeks downstream of the dams at all times during the construction phase.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 APPLICATIONS FOR PROGRESS PAYMENT

.1 Payment applications shall be made in accordance with CCDC 18, GC 5.5

.2 Make applications for payment on account as monthly as Work progresses.

.3 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.

.4 The Work, including any Materials, equipment and services, will be paid for in accordance with the prices set out in the Schedule of Prices. The Contractor has allowed for sufficient amounts to cover the cost of any Work or Materials not specifically listed in Schedule of Prices, but included in the Drawings and Specifications by either direct mention or implication, by including all such amounts in the items to which they pertain most closely to the Schedule of Prices. Costs of a general nature that do not pertain to any one item shall be distributed among all the items.

1.2 PROGRESS PAYMENT

.1 Progress Payments shall be made in accordance with CCDC 18, GC 5.5

.2 Measurement shall be from work in place actually complete.

.3 The Contractor shall use standard forms for submission of progress claims in the format agreed prior to the first application for payment.

a. Show previous amount claimed and the amount claimed for the period ending.

b. Show percentage of Work completed to date and holdback retained

.4 Consultant will issue to Owner, no later than 5 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Consultant determines to be due. If Consultant amends application, Consultant will give notification in writing giving reasons for amendment.

1.3 CASH FLOW PROJECTION

.1 Prior to the first application for payment submit, for Consultant's review, a forecast of approximate monthly progress payments for each month of the Contract Time.

.2 Submit revised cash flow forecasts when requested by Consultant.

1.4 WORKERS' COMPENSATION CLEARANCE

.1 Submit proof of workers' compensation clearance with each application for payment.

1.5 STATUTORY DECLARATIONS

.1 Submit a statutory declaration in the form of CCDC 9A – Statutory Declaration of Progress Payment Distribution by *Contractor* with each application for payment except the first.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 CONSTRUCTION START-UP MEETING

.1 Promptly after Contract award, Consultant will establish the time and location of a construction start-up meeting to review and discuss administrative procedures and responsibilities. Consultant will notify Contractor at least 5 Working Days before the meeting.

.2 Senior representatives of Owner, Consultant, and Contractor, including Contractor's project manager and site superintendent, shall be in attendance.

.3 Consultant's representative will chair the meeting and record and distribute the minutes.

.4 Agenda will include following:

a. Appointment of official representatives of Owner, Contractor, Subcontractors, Consultant, and subconsultants.

b. Project communications.

c. Contract Documents for construction purposes.

d. Documents at the site.

e. Contractor's use of premises.

f. Owner-supplied Products.

g. Work restrictions.

h. Payment procedures.

i. Construction progress meetings.

j. Construction progress schedule, including long lead time items.

k. Submittals schedule and procedures.

l. Quality requirements, including testing and inspection procedures.

m. Contractor's mobilization.

n. Construction facilities.

o. Temporary barriers and enclosures.

p. Temporary controls.

q. Field engineering and layout of work.

r. Site safety.

s. Site security.

1.2 CONSTRUCTION PROGRESS MEETINGS

.1 Contractor shall schedule regular bi-weekly construction progress meetings for the duration of the *Work*. *Consultant* will prepare meeting agendas, chair the meetings, and record and distribute the minutes.

.2 Contractor shall arrange for and provide physical space for meetings.

.3 *Consultant* will record in the meeting minutes significant decisions and identify action items and action dates by attendees or the parties they represent.

.4 *Consultant* shall distribute copies of minutes within three (3) Working Days after each meeting to meeting attendees and any affected parties who may not be in attendance.

.5 Topics to be discussed at bi-weekly progress meetings may include, but are not limited to:

a. The status of major project components (percent complete, amount of time ahead or behind schedule) and an explanation of how the project will be brought back on schedule if delays have occurred.

b. The progress made on critical activities indicated on the schedule.

c. Explanations for any lack of work on critical path activities planned to be performed during the previous three (3) weeks.

d. Explanations for any schedule changes.

e. The status of major material and equipment procurement.

f. Any delays encountered during the reporting period.

g. A projected schedule of work for the next three (3) week period.

h. The Contractor may include any other information pertinent to the status of the project. The Contractor shall include additional status information

requested by the Engineer or Owner. The Contractor shall provide copies of any relevant documents discussed during the progress meetings to the Owner and Engineer. The percent complete information provided in the bi-weekly progress meetings shall be used to substantiate payment requests.

.6 Agenda for each meeting shall include the following, as a minimum:

a. Approval of minutes of previous meeting.

b. Work progress since previous meeting.

c. Field observations, including any problems, difficulties, or concerns.

d. Construction progress schedule.

e. Submittals schedule.

f. Proposed changes in the *Work*.

g. Requests for information.

h. Site safety issues.

i. Other business.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 This Section specifies Contractor's responsibilities for preparation and submission of schedules and other documentation related to tracking construction progress.

.2 The purpose of submitting progress schedules is to:

a. Inform Owner and Consultant of actual progress versus planned progress, and

b. Provide assurance that scheduling issues are being proactively identified and addressed in a timely manner, and that planned progress is being maintained as closely as possible.

1.2 CONSTRUCTION PROGRESS SCHEDULE

.1 Format and Content:

a. Prepare schedule in the form of a Critical Path Method (CPM) Gantt chart using MS Project.

b. Provide a work breakdown structure identifying key activities, work packages, and major milestones, including long delivery Products, inspection and testing activities, shutdown or closure activities, and similar items, at a sufficient level of detail to effectively manage construction progress.

c. Indicate milestone date for Substantial Performance of the Work.

.2 Submission:

a. Submit initial schedule to Owner and Consultant within 5 Working Days after Notice to Proceed.

b. Submit schedule via e-mail as .pdf files.

c. Consultant will review format and content of initial schedule and request necessary changes, if any, within 5 Working Days after receipt.

d. If changes are required, resubmit finalized initial schedule within 5 Working Days after return of review copy.

e. Original Schedule Review Meeting: The Contractor shall, within fifteen (15) days from the commencement date, meet with the Consultant and Owner to review the original schedule submittal. The Contractor shall have the Project Manager and Project Superintendent in attendance. The purpose(s) of the Schedule Review Meeting shall include:

   a. Clarifications of the design intent, process and startup requirements.

   b. Directions to include activities and information missing from the submittal.

   c. Requests to the Contractor to clarify the schedule.

f. Revisions to the Original Schedule: Within twenty (20) days after the commencement date, the Contractor shall have revised the original schedule submittal to address all review comments from the original schedule review meeting and resubmit the schedule for the Consultant's review. The Consultant, within five (5) days from the date that the Contractor submitted their revised schedule will either accept the schedule as submitted or advise the Contractor in writing to review any part or parts of the schedule which either do not meet the Agreement requirements or are unsatisfactory for the Engineer to monitor the project's progress and status or evaluate monthly payment requests by the Contractor. The Consultant may accept the schedule with conditions that the first monthly schedule update be revised to correct deficiencies identified. When the schedule is accepted, it shall be considered as the "Original Construction Schedule" until an updated schedule has been submitted. The Owner reserves the right to require that the Contractor adjust, add to, or clarify any portion of the schedule which may later be discovered to be insufficient for the monitoring of the Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions or clarifications.

g. Acceptance: The acceptance of the Contractor's schedule by the Consultant and Owner will be based solely upon the schedule's compliance with the Agreement requirements. By way of the Contractor assigning activity durations and proposing the sequence of the Work, the Contractor agrees to utilize sufficient and necessary management and other resources to perform the work in accordance with the schedule. Upon submittal of a schedule update, the updated schedule shall be considered the "current" project schedule.

h. Responsibility: Submission of the Contractor's progress schedule to the Owner or Engineer shall not relieve the Contractor of total responsibility for scheduling, sequencing, and pursuing the Work to comply with the requirements of the Agreement Documents, including adverse effects such as delays resulting from ill-timed Work.

.3 Schedule Updates:

a. The Consultant may request a Schedule Update when any of the following events occur:

1. The project has experienced a change that affects the critical path.
2. The sequence of Work is changed from that in the approved schedule.
3. The project is significantly delayed.
4. Upon receiving a request for an extension of Contract time.

b. The Contractor shall submit the Schedule Update within five (5) calendar days of receiving a written request or when an update is required by any other provision of the Contract. A “significant” delay in time is defined as ten (10) working days or ten (10) percent of the original Contract time, whichever is greater.

c. In addition to the other requirements of this section, Schedule Updates shall reflect the following information:

1. The actual duration and sequence of as-constructed Work activities, including Work.
2. Approved time extensions.
3. Any construction delays or other conditions that affect the progress of the Work.
4. Any modifications to the as planned sequence or duration of remaining activities.
5. The Physical Completion of all remaining Work in the remaining Contract time.

d. Unresolved requests for time extensions shall be reflected in the Schedule Update by assuming no time extension will be granted, and by showing the effects to follow on activities necessary to physically complete the project within the currently authorized time for completion.

e. Submit updated progress schedule bi-weekly to Owner and Consultant, indicating actual and projected start and finish dates with report date line and progress, critical path, and baseline comparison to current progress.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

.1 Submit specified submittals to Consultant for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time or for Product substitutions or other deviations from the Drawings and Specifications.

.2 Do not proceed with Work affected by a submittal until review is complete.

.3 Present Shop Drawings, Product data, and samples in SI metric units. Where items or information is not produced in SI Metric units, converted values are acceptable.

.4 Review submittals, provide verified field measurements where applicable, and affix Contractor's review stamp prior to submission to Consultant. Contractor's review stamp represents that necessary requirements have been determined and verified, and that the submittal has been checked and coordinated with requirements of the Work and Contract Documents.

.5 Verify field measurements and that affected adjacent work is coordinated.

.6 Submittals not meeting specified requirements will be returned with comments.

.7 Do not propose Substitutions or deviations from Contract Documents via Shop Drawing, Product data and sample submittals.

.8 The submittal reviews do not authorize changes in cost or time. Changes involving cost or time are authorized only by a signed change order.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate Products, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of the Work.

.3 Where Products attach or connect to other Products, indicate that such items have been coordinated, regardless of Section under which adjacent items will be

supplied and installed. Indicate cross-references to Drawings, Specifications and other already reviewed Shop Drawings.

.4 Arrange for the preparation of clearly identified shop drawings as specified or as the Consultant may reasonably request. Shop drawings are to clearly indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of the Work. Where articles or equipment attach or connect to other articles or equipment, clearly indicate that all such attachments and connections have been properly coordinated, regardless of the trade under which the adjacent articles or equipment will be supplied and installed. Shop drawings must be submitted with the appropriate Specification Sections attached. Notify the Consultant in writing of any deviations in shop drawings from the requirements of the Contract Documents.

.5 Examine all shop drawings prior to submission to the Consultant to ensure that all necessary requirements have been determined and verified and that each shop drawing has been checked and coordinated with the requirements of the Work and the Contract Documents. Examination of each shop drawing shall be indicated by stamp, date and signature of a responsible person of the Subcontractor for supplied items and of the Contractor for fabricated items. Shop drawings not stamped, signed and dated will be returned without being reviewed and stamped "Resubmit".

.6 The Consultant will review and return shop drawings in accordance with the schedule agreed upon or otherwise with reasonable promptness so as to cause no delay in the Work. Allow sufficient time for review and consideration by the Consultant. Claims for costs or contract extensions due to such review time will not be allowed.

.7 Shop drawing review by the Consultant is solely to ascertain conformance with the general design concept. Responsibility for approval of detail design inherent in shop drawings rests with the Contractor and review by the Consultant shall not imply such approval.

.8 Review of Shop Drawings by the Consultant shall not relieve the Contractor of his responsibility for errors or omissions in shop drawings or for proper completion of the Work in accordance with the Contract Documents.

.9 Responsibility for verification and correlation of field dimensions, fabrication processes, techniques of construction, installation and coordination of all parts of the Work rests with the Contractor.

.10 Shop drawings will be returned to the Contractor with one of the following notations:

i. When stamped “NO EXCEPTIONS TAKEN”, distribute additional copies as required for execution of the Work.

ii. When stamped “MAKE CORRECTIONS NOTED”, ensure that all copies for use are modified and distributed, same as specified for “NO EXCEPTIONS TAKEN”. Resubmit for final records.

iii. When stamped “REVISE RESUBMIT”, make the necessary revisions, as indicated, consistent with the Contract Documents and submit again for review.

iv. When stamped “REJECTED”, submit other drawings, brochures, etc. for review consistent with the Contract Documents.

v. Only shop drawings bearing “NO EXCEPTIONS TAKEN” or “MAKE CORRECTIONS NOTED” shall be used on the Work unless otherwise authorized by the Consultant.

.11 It is understood that the following is to be read in conjunction with the wording on the Consultant shop drawing review stamp applied to each and every data sheet or drawing submitted:

a. “THESE (SHOP DRAWINGS) (SUBMITTALS), (PLANS) HAVE BEEN REVIEWED FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED BY THE OWNER FOR QUANTITIES, CORRECTNESS OR DIMENSIONS OR DETAILS.”

b. This does not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which remains with the Contractor, and such review does not relieve the Contractor of the responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. Be responsible for confirming and correlating dimensions at the Place of the Work, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all sub-trades.”

.12 After submittals are stamped “NO EXCEPTIONS TAKEN”, no further revisions are permitted unless re-submitted to the Owner for further review.

.13 Any adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If it is deemed that such adjustments affect the Contract Price, clearly Province as such in writing prior to proceeding with fabrication and installation of work.

.14 Make changes in shop drawings which the Consultant may require consistent with Contract Documents. When re-submitting, notify the Owner in writing of any revisions other than those requested by the Consultant.

.15 Shop drawings indicating design requirements not included in the Contract Documents require the seal of a qualified Professional Engineer, registered in British Columbia.

1.3 RECORD DRAWINGS

.1 Obtain from Consultant an electronic copy of the construction Drawings for the purpose of creating as-built drawings. Record information in electronic form, clearly identifying as-built deviations from the originally obtained construction Drawings.

.2 Clearly label each drawing as “AS-BUILT DRAWING”. Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.3 Record on the white prints on a daily basis, work constructed differently than shown on the Contract Documents. Record all changes in the Work caused by site conditions, or originated by the Owner, the Owner, the Contractor, or a Subcontractor and by addenda, supplemental drawings, site instructions, supplementary instructions, change orders, correspondence, and directions of regulatory authorities. Do not use these drawings for daily working purposes and make the set available for periodic inspection by the Owner.

.4 Make records in a neat and legibly printed manner with a non-smudging medium.

.5 Record actual construction including:

a. Measured depths of elements of foundation in relation to finish first floor datum.

b. Measured locations of pipes, ducts, conduits, outlets, fixtures, access panels, and appurtenances, referenced to visible and accessible features of construction.

c. Field changes of dimension and detail.

d. Changes made by Change Orders and Supplemental Instructions

e. References to Shop Drawings, where Shop Drawings show more detail.

f. Do not use as-built drawings for construction purposes.

1.4 PROGRESS PHOTOGRAPHS

.1 Arrange for periodic digital photography to document and provide a photographic record of the progress of the Work.

.2 Identify each photograph by project name and date taken.

.3 Do not use progress or any other Project photographs for promotional purposes without Owner's written consent.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TRANSMITTAL PROCEDURE

.1 Submittals shall be accompanied by Submittal Transmittal Form. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.

.2 A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: "XX"; where "XX" is the sequential number assigned by the Contractor. Resubmittals shall have the following format: "XX-Y"; where "XX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd and 3rd resubmittals, respectively. Submittal 02-B, for example, is the second resubmittal of Submittal 2.

.3 Submittal Completeness: Submittals which do not have all the information required to be submitted are not acceptable and will be returned without review.

.4 Contractor Review: Contractor shall review all submittals for completeness and conformance to the Contract Documents prior to submittal to the Engineer for review. Contractor shall mark the submittals as being accepted by the Contractor. Any submittals which are not marked by the Contractor as accepted may be rejected and returned by the Engineer without review.

.5 Submittal Priority: When multiple submittals have been sent to the Engineer for review, Contractor shall indicate priority for receipt of reviewed submittals. Consultant will attempt to review and reply to the highest priority submittals in the most timely manner when Contractor indicates that there is a priority.

3.2 REVIEW PROCEDURE

.1 Unless otherwise agreed, within ten (10) days after receipt of the submittal, Consultant will review and return the submittal indicating one of the following actions on the Submittal Transmittal Form.

a. If the review indicates that the material, equipment, test or work method is in general conformance with the design concept and complies with the Contract Documents, submittal copies will be marked “NO EXCEPTION TAKEN” and given Review Action 1 on the Submittal Transmittal Form. In this event, the Contractor may begin to incorporate the material or equipment covered by the submittal.

b. If the review indicates that the submittal is insufficient or that limited corrections are required, copies will be marked “MAKE CORRECTIONS NOTED” and be given Review Action 2 on the Submittal Transmittal Form. The Contractor may begin incorporating the material and equipment covered by the submittal in accordance with the noted corrections.

c. If the review indicates that the material, equipment, test or work method is not in general conformance with the design concept or in compliance with the Contract Documents, copies of the submittal will be marked “REVISE AND RESUBMIT” or “SUBMIT SPECIFIED ITEM” and given Review Action 3 or 4 on the Submittal Transmittal Form. Except at its own risk, the Contractor shall not undertake work covered by such submittals until a new submittal is made and returned marked either “NO EXCEPTIONS TAKEN” or “MAKE CORRECTIONS NOTED.”

d. If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked “REJECTED” and given Review Action 5. If the comments are of a nature that can be addressed with submittal of specified items without a resubmittal, copies will be further marked “SUBMIT SPECIFIED ITEM” and given Review Action 4 on the Submittal Transmittal Form. If the comments require a revision and resubmittal, copies will be further marked “REVISE AND RESUBMIT” and given a Review Action 3 on the Submittal Transmittal Form. Except at its own risk, the Contractor shall not undertake work covered by such a submittal until the attached comments have been either confirmed by a separate written communication or the submittal has been revised, resubmitted and returned marked either “NO EXCEPTION TAKEN” or “MAKE CORRECTIONS NOTED.”

3.3 EFFECT OF REVIEW OF CONTRACTOR’S SUBMITTALS

.1 Review of drawings, tests, methods of work or information regarding materials or equipment the Contractor proposes to provide, shall not relieve the Contractor of its responsibility for errors therein and shall not be regarded as an assumption of

risks or liability by the Consultant or by any officer or employee of the Consultant, and the Contractor shall have no claim under the Contract on account of the failure, or partial failure, of the method of work and test, material, or equipment so reviewed. A mark of “NO EXCEPTION TAKEN” or “MAKE CORRECTIONS NOTED” shall mean that the Consultant, or any officer or employee of the Consultant, has no objection to the Contractor, upon the Contractor’s own responsibility, providing the materials or equipment proposed.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

.1 This section specifies special procedures for detection, sampling, handling and disposal of contaminated materials, as well as handling cultural resources (i.e. historic structure protection and archaeological resources discoveries).

1.2 CONTAMINATED SOILS and GROUNDWATER

.1 Contractor's Responsibilities:

a. The Contractor shall be responsible for all matters related to work safety and for detection of contaminated soils and/or groundwater encountered during construction. The Contractor shall ensure the protection of the safety and health of construction workers, the general public and other authorized persons at the work site from exposure to potentially toxic materials.

b. In addition to the minimal requirements outlined herein, the Contractor shall fully comply with the provisions of all ordinances, regulations and permits involved in regards to worker safety and health related to the potential presence of contaminated soil, groundwater, and/or organically treated timber piles.

.2 Notification and Suspension:

a. In the event the Contractor detects the presence of a suspicious material, the Contractor shall immediately notify the Engineer. Following such notification by the Contractor, the Engineer will in turn notify the various governmental and regulatory agencies concerned with the presence of potentially dangerous materials.

.3 The Contractor will be responsible for obtaining all project permits and coordinating the required inspections.

.4 The Contractor shall arrange and pay for the regulatory submittals and inspections necessary for the completion of the Work in accordance with Federal, Provincial, regulations, and by-laws.

1.3 ARCHAEOLOGICAL FINDS

.1 Archaeological Finds are not anticipated within the project area. However, should finds of an archaeological or paleontological nature be made within the project limits, the Contractor shall immediately stop work in the vicinity of the finds and notify the Consultant. Contractor shall continue work in other areas of the project without interruption, except that the Contractor may order work stopped in other

areas if, in the Contractor opinion, the find is more extensive than may appear from uncovered material.

.2 Comply with and implement current applicable local, Province and federal standards.

.3 Protect Archaeological finds as follows and as otherwise directed by the Engineer:

a. Do not remove or disturb finds without the Consultant's written approval.

b. Cover, fence, and otherwise protect finds until notice to resume work is given by the Consultant.

c. Cover finds with plastic film held in place by earth, rocks, or other weights placed outside the find. Should additional backfilling be necessary for safety or to prevent caving, place backfill material loosely over the plastic film.

d. Sheet or shore as necessary to protect excavations.

e. Place temporary fence to prevent unauthorized access.

.4 Dewater finds made below the water table as necessary to protect construction work underway. Divert groundwater or surface runoff

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

.1 Regulations affecting the Work imposed by:

a. B.C. Ministry of Transportation and Infrastructure

b. National Transportation Agency of Canada

c. BC Ministry of Environment

d. BC Ministry of Health

e. Fisheries and Oceans Canada

f. Environment Canada

g. National Building Code

h. BC Building Code

i. WorkSafe BC

j. Municipal by-laws and servicing standards

k. Municipal utilities

1.2 COMPLIANCE WITH REGULATIONS

.1 Ascertain requirements and regulations of authorities listed above.

.2 Comply with all such requirements and regulations as applicable to the Work.

.3 Requirements set out in this Section are for guidance and information and are not necessarily complete.

1.3 PERMITS

.1 Not withstanding the provisions of GC 10.2 – Laws, Notices, Permits and Fees, the Owner has (or is in the process of) obtaining construction permits required from:

Name of Permit	*Permitting Agency*	*Permit Reference No.*
Letter of Advice or Authorization	Department of Fisheries and Ocean	McNeil Lake: 23-HPAC-00145 Chapman Lake: 23-HPAC-00153 Edward Lake: 23-HPAC-00151
Dam Safety Regulation Authorization	BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development	McNeil Lake: D420112-0123-01 Chapman Lake: D420223-00 Edward Lake: D420222-00
Water Sustainability Act Section 11 Change Approval*	BC Ministry of Forest lands and Natural Resource Operations and Rural Development	McNeil Lake: TBD Chapman Lake: TBD Edward Lake: TBD
Archeological Permit	Sechelt First Nation	N/A
Park Use Permit	Ministry of Environment and Climate Change Strategy	Chapman and Edwards: Not Required McNeil: Not Applicable

* To be provided prior to construction.

.2 The Contractor will be responsible to obtain all other permits required to perform the work.

.3 Prepare and submit to the proper authority, and a copy to the Owner, all information required for the issuance of such permits. Pay all costs thereof including agency inspections unless specifically provided otherwise in the Contract.

.4 Provide a copy of each permit to the Project Representative prior to pursuing any work covered by the permit.

.5 When required by the permit and during work progress covered by the permit, the work shall be inspected by the issuing agency. Contractor shall be responsible for coordinating these inspections.

.6 Provide a copy of the completed permit with the issuing agency acceptance.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 INSPECTION

.1 Refer to GC 2.3 – Review and Inspection of the Work.

1.2 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, offsite manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.3 PROCEDURES

.1 Notify the appropriate agency and Consultant in advance of the requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.4 REJECTED WORK

.1 Refer to GC 2.4 – Defective Work.

1.5 REPORTS

.1 Submit digital copies of inspection and test reports promptly to Consultant.

.2 Provide copies to Subcontractor of work being inspected/tested and manufacturer/fabricator of material being inspected/tested.

1.6 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by the Law of the Place of Work shall be appraised by Engineer and may be authorized as recoverable.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 TEMPORARY UTILITIES - GENERAL

.1 Provide temporary utilities as specified and as otherwise necessary to perform the *Work* expeditiously.

.2 Remove temporary utilities after use.

1.2 TEMPORARY ELECTRICAL POWER

.1 There is not any on site power available for use by the Contractor. The Contractor will be responsible for providing an onsite source of power. Power for larger construction equipment, such as welders, etc. shall be provided by the Contractor.

.2 Arrange and pay for temporary power required during construction.

1.3 TEMPORARY WATER SUPPLY

.1 Arrange and pay for a temporary supply of water required during construction.

1.4 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities.

.3 Keep area and premises in sanitary condition. Disinfect facilities frequently.

.4 Dispose of sanitary wastes, in accordance with the applicable regulations, and subject to approval of Engineer.

1.5 TEMPORARY ELECTRICAL LIGHTING

.1 Arrange and pay for temporary lighting required during construction.

1.6 TELEPHONE

.1 Provide and pay for (including monthly rental charges) telecommunications and internet for own use.

1.7 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

.1 Remove temporary utilities, equipment, facilities and materials, prior to Final Application for Payment inspection.

.2 Clean and repair damage caused by installation or use of temporary work.

.3 Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 CONTRUCTION FACILITIES - GENERAL

.1 Provide temporary construction facilities as necessary for performance of the *Work* and in compliance with applicable regulatory requirements.

.2 Maintain temporary construction facilities in good condition for the duration of the *Work*.

.3 Remove temporary construction facilities from *Place of the Wor*k when no longer required.

1.2 SITE ACCESS

.1 Existing roads may be used for access to McNeil Lake Dam, provided *Contractor* assumes responsibility for any damage caused by construction traffic, and prevents or promptly cleans up any mud tracking or material spillage.

.2 McNeil Lake Dam can be accessed via a Forest Service Road (FSR), off the Sunshine Coast Highway. The FSR provides access close to the left bank (looking downstream) of the dam. No direct vehicular access is available to the right bank of the dam.

.3 The minimum clear width of the FSR is 3.0m to access the dam site and 3.5m to access the SCRD water treatment works.

.4 Chapman Lake Dam can only be accessed via Helicopter from Sechelt. No direct vehicular or boat access is available.

.5 Edwards Lake Dam can only be accessed via Helicopter from Sechelt. No direct vehicular or boat access is available.

.6 The Contractor is responsible for all costs associated with the use of helicopters to access Chapman Lake Dam and Edwards Lake Dam. This includes cost of transporting personnel, equipment and materials.

.7 For flights between Chapman Lake Dam, Edwards Lake Dam and Sechelt, the Contractor must allow for two (2) additional seats on the helicopter to accommodate the Consultants inspector and Owner’s representative. The cost of accommodating these additional passengers will be the responsibility of the Contractor. Transportation to the sites will need to be provided whenever work is ongoing at either Chapman Lake Dam or Edwards Lake Dam, and the Consultants inspector and/or Owners representative aren’t already staying at a camp near the sites (if provided).

.8 The Contractor must notify BC Parks prior to departure of all flights into and out of Chapman Lake and Edwards Lake.

1.3 TEMPORARY CAMPS

.1 The Contractor shall determine if they wish to provide a temporary camp at Chapman Lake Dam and/or Edwards Lake Dam for the duration of the construction works, or if they wish to fly in and out each day.

.2 If a temporary camp is to be provided, the Contractor shall allow for two (2) additional spaces at the camp to accommodate the Consultants inspector and Owner's representative.

.3 The Contractor is responsible for determining the location of all temporary camps.

.4 The location, size and layout of the camps will need to be agreed with SCRD, the Consultant and BC Parks before they are implemented. The Contractor is responsible for gaining this agreement.

.5 The Contractor's environmental monitor will be required to review the potential impact of any temporary camps and implement protection measures as required.

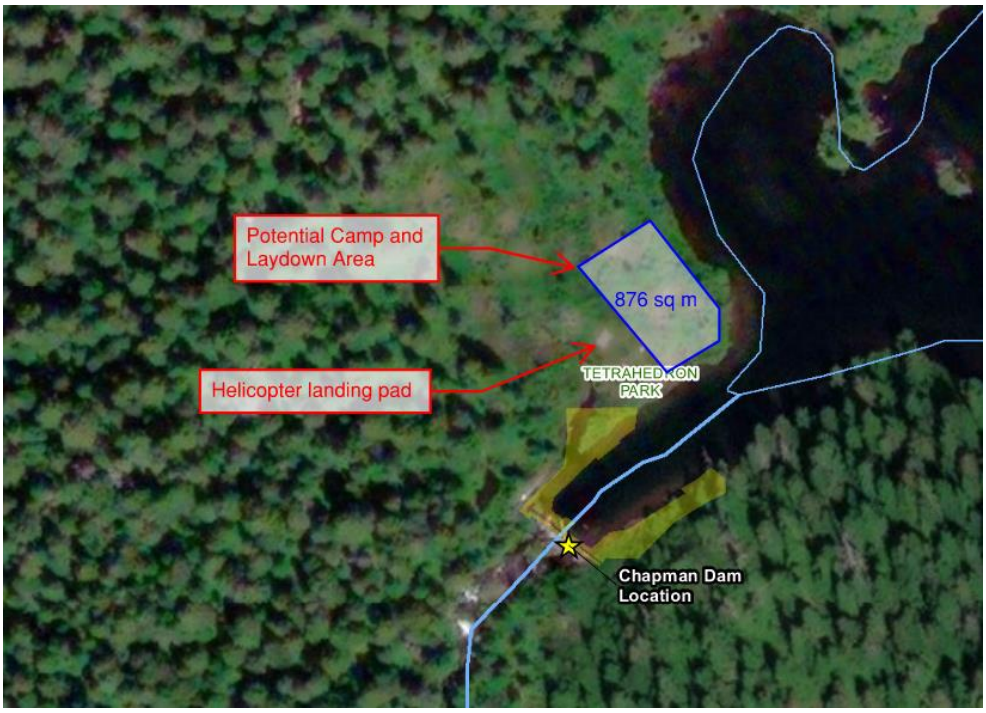
.6 Any additional clearing and grubbing required will need to be reviewed and agreed with the Contractor's environmental monitor, the Consultant, SCRD and BC Parks

.7 All costs associated with camp setup, operation and removal is included under Contractor's site mobilization. No additional cost will be paid for any grubbing or clearing required to create a camp area. Following completion of the work, the camp area will need to be fully restored by the Contractor to the satisfaction of SCRD and BC Parks.

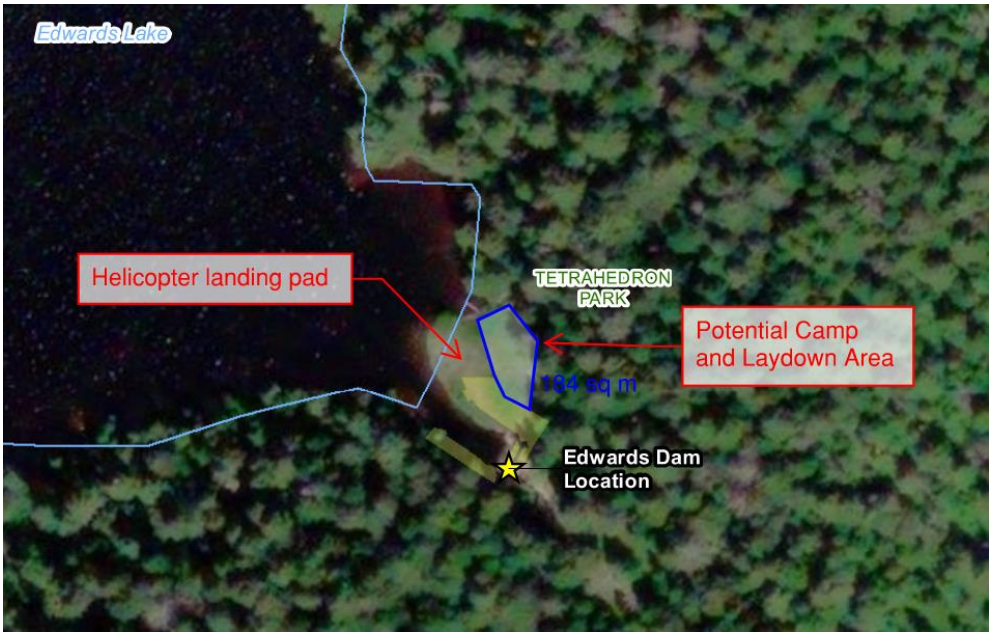
.8 The camps should consider the proximity to the helicopter landing area and provide sufficient clearance to allow uninterrupted access to the sites via helicopter.

.9 The following areas have been identified for potential camps and material laydown areas adjacent to the work area at Chapman Lake Dam and Edwards Lake Dam:

a. Chapman Lake Dam



b. Edwards Lake Dam



1.4 CONSTRUCTION PARKING AND MATERIAL LAYDOWN

.1 Limited parking and material laydown will be permitted at Place of the Work immediately adjacent to the left bank of McNeil Lake Dam. The total area adjacent to the dam is approximately 10 m x 10 m.

.2 A secondary parking and material laydown is located approximately 100 m south of the left bank of the McNeil Lake Dam The total area is approximately 15 m x 10 m.

.3 The SCRD water treatment works, located 0.8km west of McNeil Lake Dam will be available for additional parking. A total area of 25 m x 25 m will be available for the Contractor use.

.4 All parking and material laydown areas at McNeil Lake and the SCRD water treatment works will need to be reviewed and agreed with the Consultant and SCRD.

.5 Laydown areas for Edwards Lake and Chapman Lake are described above in Section 1.3

1.5 SITE OFFICES

.1 Provide lockable temporary field offices and sheds during construction as required by the Contractor.

.2 Remove promptly from Site all such facilities after use.

.3 Provide office heated to 22°C, lighted to 750 Lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.4 The SCRD water treatment works, located 0.8km west of McNeil Lake Dam will be available temporary field offices. A total area of 25m x 25m will be available for the Contractor use. The Contractor shall provide one (1) working area for the Consultants inspector.

.5 The Contractor must adhere to the following requirements for use of the SCRD water treatment works for site offices and material laydown:

a. A designated area will be assigned for storage and/or temporary office space.

b. There will be no access to the inside of the water treatment works building.

c. SCRD can provide access to a 120 V plug for an extension cord for temporary power.

d. The yard space must be returned to same or better after completion of project.

e. Contractor must provide their own washroom facility.

f. The gate must be locked at all times.

g. Contractor must supply their own lock to daisy chain.

h. SCRD does not guarantee any security of the Contractor's assets in their compound.

i. Contractor must remove or move their assets if the SCRD needs to use the compound area due to an unforeseen incident.

1.6 STORAGE SHEDS

.1 Provide adequate weathertight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.

.2 Maintain storage sheds in a neat, clean condition.

1.7 FIRST AID FACILITIES

.1 Provide and maintain on Site, in a clean orderly condition, completely equipped First-Aid facilities readily accessible at all times to Contractor's employees. Facilities and staffing to be in accordance with OH&S Legislation.

1.8 BARRIERS AND ENCLOSURES

.1 Provide temporary barriers and enclosures necessary to protect the public and to secure Place of the Work during performance of the Work.

.2 Comply with applicable regulatory requirements.

.3 Maintain temporary barriers and enclosures in good condition for the duration of the Work.

.4 Remove temporary barriers and enclosures from Place of the Work when no longer required.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 ENVIRONMENTAL PROTECTION PLAN

.1 The Contractor will be responsible for adhering to proposed environmental mitigation measures and regulatory requirements outlined in this Construction environmental Management Plan (CEMP) and regulatory approvals.

.2 The Contractor is required to appoint an Environmental Monitor (EM) to evaluate and report on compliance of the work procedures and practices with environmental requirements established in this CEMP.

.3 The EM will work under the supervision of a Qualified Environmental Professional (QEP) with experience reviewing construction activities near environmental sensitivities.

.4 The Contractor is required develop and maintain a site-specific Environmental Protection Plan (EPP) in collaboration with the EM, to be reviewed and approved by the SCRD prior to construction.

.5 Submit Site-specific Environmental Protection Plan (EPP) within ten days after date of Notice to Proceed and before mobilization to Site.

.6 In the event that the Owner, regulatory agencies or jurisdictions determine the Plan to be inadequate to protect environment:

a. Stop the work in progress until adequate environmental protection measures are implemented.

b. Modify the Plan to meet the requirements of said regulatory agencies, jurisdictions, and the Owner.

c. Submit the revisions to the Plan within 7 days of the notice of deficiency.

1.2 CONSTRUCTION CLEANING

.1 Maintain the Work in tidy condition, free from the accumulation of waste products and debris, other than that caused by Owner

.2 Remove waste material and debris from the site at the end of each working day.

.3 Promptly clean up any spillage that occurs on site roads, access roads or public roads, or other areas where construction vehicles are travelling.

1.3 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.4 DISPOSAL OF WASTES

.1 Do not bury, or permit to be buried, rubbish and waste materials on site unless approved by Consultant.

.2 Do not dispose, or permit the disposal, of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.5 DEWATERING

.1 Dewatering works should comply with requirements of CEMP

.2 Provide temporary drainage and pumping as necessary to dewater excavations, trenches, foundations, and other parts of the *Work*. Maintain such areas free of water arising from groundwater or surface run-off, as required to keep them stable, dry, and protected from damage due to flooding.

.3 Maintain standby equipment necessary to ensure continuous operation of dewatering system.

.4 Do not pump water containing suspended materials or other harmful substances into waterways, sewers or surface drainage systems. Treat or dispose of such water in accordance with applicable regulatory requirements

1.6 SITE DRAINAGE

.1 Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable liner during periods of work stoppage including at end of each *Working Day*.

.2 Control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas as required to prevent erosion and sedimentation.

1.7 WORK ADJACENT TO WATERWAYS

.1 All work adjacent to waterways should comply with requirements of CEMP

.2 Do not operate construction equipment in waterways unless specifically authorized to do so.

.3 Do not dump excavated fill, waste material, debris, or other extraneous material in waterways under any circumstances.

.4 Design and construct temporary crossings to minimize erosion to waterways.

1.8 EROSION AND SEDIMENT CONTROL

.1 Erosion and Sediment Control measures should comply with requirements of CEMP

.2 Maintain temporary erosion and pollution control features installed under this contract.

.3 Control emissions from equipment and plant to requirements of authorities having jurisdiction.

.4 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and watercourses, and repair damage caused by soil erosion and sedimentation.

.5 Provide and maintain appropriate temporary measures such as silt fences, straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, vegetative cover, dikes, and other measures that may be required to prevent erosion and migration of silt, mud, sediment, and other debris.

.6 Periodically inspect erosion and sediment control measures to detect evidence of erosion and sedimentation. Promptly take corrective measures when necessary.

1.9 POLLUTION CONTROL

.1 Pollution Control measures should comply with requirements of CEMP

.2 Take measures to prevent contamination of soil, water, and atmosphere through uncontrolled discharge of noxious or toxic substances and other pollutants, potentially causing environmental damage.

.3 Be prepared, by maintaining appropriate materials, equipment, and trained personnel on site, to intercept, clean up, and dispose of spills or releases that may occur. Promptly report spills and releases that may occur to:

a. authority having jurisdiction,

b. person causing or having control of pollution source, if known, and

c. *Owner* and *Consultant*.

.4 Contact manufacturer of pollutant, if known and applicable, to obtain material safety data sheets (MSDS) and ascertain hazards involved and precautions and measures required in cleanup or mitigating actions.

.5 Take immediate action to contain and mitigate harmful effects of the spill or release.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 Products, materials, equipment and articles (referred to as Products throughout the specifications) incorporated in Work shall be new, not damaged or defective, and of the best quality (compatible with specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.

.2 Defective Products, whenever identified prior to the completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is a precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to the quality or fitness of Products, the decision rests strictly with the Engineer based upon the requirements of the Contract Documents.

.4 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.

.5 Permanent labels, trademarks and nameplates on Products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.2 PRODUCT AVAILABILITY AND DELIVERY TIMES

.1 Promptly upon Contract award and periodically during construction, review and confirm *Product* availability and delivery times. Order *Products* in sufficient time to meet the construction progress schedule and the *Contract Time*.

.2 If a specified *Product* is no longer available, promptly notify *Consultant*. *Consultant* will take action as required.

.3 If delivery delays are foreseeable, for any reason, promptly notify *Consultant*.

a. If a delivery delay is beyond *Contractor*'s control, *Consultant* will provide direction.

b. If a delivery delay is caused by something that was or is within *Contractor*'s control, *Contractor* shall propose actions to maintain the construction progress schedule for *Consultant*'s review and acceptance.

1.3 STORAGE, HANDLING, AND PROTECTION

.1 Store, handle, and protect *Products* during transportation to *Place of the Work* and before, during, and after installation in a manner to prevent damage, adulteration, deterioration and soiling.

.2 Comply with manufacturer's instructions for storage, handling and protection.

.3 Store packaged or bundled *Products* in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in *Work*.

.4 Comply with the requirements of the workplace hazardous materials information system (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, including requirements for labeling and the provision of material safety data sheets (MSDS).

.5 Store *Products* subject to damage from weather in weatherproof enclosures.

.6 Store sheet *Products* on flat, solid, supports and keep clear of ground. Slope to shed moisture.

.7 Remove and replace damaged *Products*.

1.4 TRANSPORTATION

.1 Pay costs of transportation of Products required in the performance of Work.

.2 Transportation cost of Products supplied by Owner will be paid for by Owner. Unload, handle and store such Products.

1.5 QUANTITIES

.1 Schedules of piping, fittings, reinforcing, or other materials indicating quantity and/or dimension, which are shown on the drawings or in the specifications, are intended only to assist Contractor with quantity takeoff. Quantities and dimensions shown therein are not guaranteed to be accurate and must be checked by Contractor prior to placing an order for such materials.

.2 Claims for additional payment resulting from variations between quantities shown on the schedules and those actually installed will not be accepted.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 CONSTRUCTION STAKING

.1 The Contractor will provide all construction staking and surveying services for the Project.

.2 The Contractor shall be responsible for providing all necessary construction surveys.

1.2 SURVEYOR QUALIFICATIONS

.1 Engage a registered land surveyor, licensed to practice in *Place of the Work*.

1.3 SURVEY REFERENCE POINTS

.1 Locate and confirm permanent reference points prior to starting site work. Preserve and protect permanent reference points on site during construction.

.2 Do not change or relocate reference points without prior written notice to *Consultant*.

.3 Report to *Consultant* when a reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations. Require registered land surveyor to replace reference points in accordance with original survey.

1.4 SURVEY REQUIREMENTS

.1 Establish sufficient permanent benchmarks on site, referenced to established benchmarks by survey control points.

.2 Confirm that existing survey reference points are in accordance with *Owner*'s survey and property limits.

.3 Establish initial lines and levels for Work

.4 Maintain a complete, accurate log of control and survey work as it progresses. Record locations with horizontal and vertical data in project record documents.

1.5 EXISTING UTILITIES AND STRUCTURES

.1 Before commencing excavation, drilling or other earthwork, establish or confirm location and extent of all existing underground utilities and structures in work area.

.2 Promptly notify *Consultant* if underground utilities, structures, or their locations differ from those indicated in *Contract Documents* or in available project information. *Consultant* will provide appropriate direction.

.3 Record locations of maintained, re-routed and abandoned utility lines.

1.6 VERIFICATION OF EXISTING CONDITIONS

.1 Where work specified in any Section is dependent on the work of another Section or Sections having been properly completed, verify that work is complete and in a condition suitable to receive the subsequent work. Commencement of work of a Section that is dependent on the work of another Section or Sections having been properly completed, means acceptance of the existing conditions.

.2 Verify that ambient conditions are suitable before commencing the work of any Section and will remain suitable for as long as required for proper setting, curing, or drying of *Products* used.

.3 Ensure that substrate surfaces are clean, dimensionally stable, cured and free of contaminants.

.4 Notify *Consultant* in writing of unacceptable conditions.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Province of British Columbia

a. Workers Compensation Act, RSBC 1996 - Updated 2012.

1.2 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittals.

.2 Submit site specific Health and Safety Program: Within ten (10) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Program must include:

a. Results of site specific safety hazard assessment.

b. Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Submit Construction Safety Checklists after completion.

.4 Submit copies of all reports or directives issued by Federal and/or Provincial health and safety inspector(s).

.5 Submit copies of incident and accident reports.

.6 Submit on site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.

.7 Submit Material Safety Data Sheets (MSDS).

.8 Submit personnel training requirements including names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.

.9 Submit, and post at the Work site, the emergency numbers for police, fire and ambulance for the locale of the Work, as well as the names and after hours numbers for key site personnel related to health, safety or security of the site.

1.3 SAFETY ASSESSMENT

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

.2 Submit hazard assessment report to the Consultant.

1.4 MEETINGS

.1 Attend health and safety pre construction meeting.

.2 Arrange for "tool box" safety meetings and submit reports.

1.5 REGULATORY REQUIREMENTS

.1 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

1.6 FILING OF NOTICE

.1 Contractor shall File Notice of Project with Provincial authorities prior to beginning of Work.

.2 Contractor shall be responsible and assume the Prime Contractor role for each work zone location.

1.7 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Program based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Program must address project specifications.

.2 Correct deficiencies and re submit Health and Safety Program when so requested by Consultant.

1.8 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial, and local statutes, regulations, and ordinances, and with site specific Health and Safety Program.

1.9 COMPLIANCE REQUIREMENTS

.1 Comply with OH&S Legislation

1.10 UNFORESEEN HAZARDS

.1 Should any unforeseen or peculiar safety related factor, hazard, or condition become evident during performance of Work, immediately stop work and follow procedures in place for employee's right to refuse work in accordance with the OH&S Legislation.

.2 Advise Consultant verbally and in writing.

1.11 CORRECTION OF NON COMPLIANCE

.1 Immediately address health and safety non compliance issues identified by Engineer or designated safety inspector.

.2 Provide Consultant with written report of action taken to correct non compliance of health and safety issues identified.

.3 Be aware that Consultant may stop Work if non compliance of health and safety regulations is not corrected.

1.12 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

.2 Stop Work when necessary or advisable for reasons of health and safety.

.3 Be aware that Consultant or designated safety inspector may stop Work when deemed necessary or advisable for reasons of health and safety.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Except where otherwise specified in technical *Specifications* or otherwise indicated on *Drawings*, comply with requirements of this Section.

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Install, erect, or apply *Products* in strict accordance with manufacturer's instructions.

.2 Notify *Consultant*, in writing, of conflicts between *Contract Documents* and manufacturer's instructions where, in *Contractor*'s opinion, conformance with *Contract Documents* instead of the manufacturer's instructions may be detrimental to the *Work* or may jeopardize the manufacturer's warranty.

.3 Do not rely on labels or enclosures provided with *Products*. Obtain written instructions directly from manufacturers.

.4 Provide manufacturer's representatives with access to the *Work* at all times. Render assistance and facilities for such access so that manufacturer's representatives may properly perform their responsibilities.

1.3 WORKMANSHIP

.1 General:

a. Execute work by workers experienced and skilled in the respective duties for which they are employed. Notify Consultant immediately if required Work is such as to make it impractical to produce required results.

b. Do not employ any unfit person or anyone unskilled in their required duties. Engineer reserves the right to require the dismissal from the site, of workers deemed incompetent, careless, insubordinate or otherwise objectionable.

c. Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with Consultant, whose decision is final.

.2 Coordination:

a. Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

b. Be responsible for co-ordination and placement of openings, sleeves and accessories.

.3 Protection of Work in Progress:

a. Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by Consultant, at no increase in Contract Amount.

b. Prevent overloading of any part of the building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated, without written approval of Consultant.

.4 Remedial Work:

a. Refer to Section GC 3.13 – Cutting and Remedial Work.

b. Perform remedial work required to repair or replace the parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

c. Perform remedial work by specialists familiar with the materials affected. Perform in a manner to neither damage nor endanger any portion of Work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 REGULATORY REQUIREMENTS

.1 Comply with applicable regulatory requirements when disposing of waste materials.

.2 Obtain permits from authorities having jurisdiction and pay disposal fees where required for disposal of waste materials and recyclables.

1.2 PROGRESSIVE CLEANING AND WASTE MANAGEMENT

.1 Maintain the *Work* in a tidy and safe condition, free from accumulation of waste materials and construction debris.

.2 Provide appropriate, clearly marked, containers for collection of waste materials and recyclables

.3 Remove waste materials and recyclables from work areas, separate, and deposit in designated containers at end of each *Working Day*. Collect packaging materials for recycling or reuse.

1.3 FINAL CLEANING

.1 Remove from *Place of the Work* surplus *Products*, waste materials, recyclables, *Temporary Work*, and *Construction Equipment* not required to perform any remaining work.

.2 Re-clean as necessary areas that have been accessed by *Contractor*'s workers prior to *Owner* occupancy.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Deliver construction waste to waste processing facilities. Obtain receipt for deliveries.

.2 Dispose construction waste not capable of being recycled or adaptively reused by delivery, incinerator, or other legal disposal facility. Obtain receipt for deliveries. Note the SCRD landfill does not accept soil and concrete debris.

.3 Do not burn or bury waste materials at *Place of the Work*.

.4 Do not dispose of volatile and other liquid waste such as mineral spirits, oil, paints and other coating materials, paint thinners, cleaners, and similar materials together with dry waste materials or on the ground, in waterways, or in storm or

sanitary sewers. Collect such waste materials in appropriate covered containers, promptly remove from *Place of the Work*, and dispose of at recycling facilities or as otherwise permitted by applicable regulatory requirements.

.5 Cover or wet down dry waste materials to prevent blowing dust and debris.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

a. CCDC 18, Civil Works Contract.

1.2 SUBSTANTIAL COMPLETION

.1 The Contractor shall submit to the Consultant a written notice when the Contractor believes the work is substantially complete.

.2 Declaration of Substantial Performance: when Engineer considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.3 The Consultant may request of and the Contractor shall prepare and submit to Consultant, a list of items to be completed or corrected as determined by the inspection.

.4 The Consultant will issue a Substantial Completion letter, with appropriate conditions, accompanied by a list of the work items to be completed and corrected. Omission of any item from the list shall not relieve the Contractor from responsibility to complete all the work in accordance with the Contract.

.5 Should the Consultant consider that work is not substantially complete:

a. The Consultant shall notify the Contractor, in writing stating reasons.

b. Contractor shall complete work and send second written notice to the Engineer certifying that Project or designated portion of Project is substantially complete.

.6 Work must be substantially complete, as accepted by the Owner.

.7 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

1.3 PHYSICAL COMPLETION

.1 The Contractor shall notify the Consultant when all physical work described in the Project Manual and listed in the Substantial Completion letter is complete.

.2 If the Consultant and the Owner concur that work is physically complete.

.3 The Consultant will issue a Physical Completion letter, with appropriate conditions, accompanied by a list of the documentation items to be completed and corrected. Omission of any item from the list shall not relieve the Contractor from responsibility to complete all the work in accordance with the Contract.

1.4 FINAL INSPECTION

.1 The Contractor shall submit written certification that:

a. Contract Documents have been reviewed.

b. Work has been completed in accordance with Contract Documents.

c. Equipment and systems have been tested in presence of the Consultant and are operational.

d. Project is completed, and ready for final inspection.

.2 The Consultant will make final inspection within a reasonable time after receipt of certification.

.3 Should the Consultant consider that work is complete in accordance with requirements of Contract Documents, the Consultant shall request Contractor to make project closeout submittals.

.4 Should the Consultant consider that work is not complete:

a. Consultant shall notify Contractor, in writing, stating reasons.

b. Contractor shall take immediate steps to remedy the stated deficiencies, and send second written notice to Engineer certifying that work is complete.

c. Consultant will re-inspect work.

1.5 FINAL APPLICATION FOR PAYMENT

.1 Contractor shall submit final application in accordance with requirements of General Conditions.

1.6 FINAL CERTIFICATE FOR PAYMENT

.1 Consultant will issue a Final Certificate of Completion in accordance with provisions of General Conditions.

.2 Should final completion be materially delayed through no fault of Contractor, Consultant may issue a Final Certificate for Payment, in accordance with provisions of General Conditions and existing laws.

1.7 POST CONSTRUCTION INSPECTION

.1 Prior to expiration of the Maintenance Bond, Consultant may make visual inspection of Project in company with Contractor to determine whether correction of work is required, in accordance with provisions of General Conditions.

.2 For guarantees beyond one year, Engineer will make inspections at request of Owner, after notification to Contractor.

.3 Consultant will promptly notify Contractor, in writing, of any observed deficiencies.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

a. Substantial completion.

b. Final inspection and reinspection.

c. Closeout submittals.

d. Final payment.

1.2 SUBSTANTIAL COMPLETION

.1 Contractor:

a. Submit written certification to Consultant that Project or designated portion of Project is substantially complete.

b. Submit list of items to be completed or corrected.

.2 Consultant will inspect after receipt of Contractor's certification, together with Owner's representative.

.3 If it appears to the Consultant that Work is substantially complete:

a. The Owner, with the assistance of the Consultant, shall compile a list of items that remain to be completed or corrected as determined during the inspection. The Owner shall provide this list of corrective items as a 'punch list' to the Contractor on an Owner prepared form.

b. If the Owner and Consultant then consider the Work to be substantially complete, the Owner may issue a Certificate of Substantial Completion letter, with appropriate conditions, accompanied by the 'punch list' of items to be completed and corrected. Omission of any item from the list shall not relieve the Contractor from responsibility to complete all the work in accordance with the Contract.

c. Owner occupancy of Project or designated portion of Project. Contractor shall perform final cleaning of the site or designated portion of the site.

d. Contractor shall complete all the Work within the time designated in the Certificate, or if not so designated within a reasonable time.

.4 Should the Consultant consider that Work is not substantially complete:

a. They shall notify the Contractor, in writing, stating reasons.

b. Contractor shall complete Work and send second written notice to Engineer certifying that Project or designated portion of Project is substantially complete.

.5 Warranties: Under Article 6.19 of the Standard General and Special Conditions in connection with any specific portion of Work certified by the Consultant as completed and its use or operation thereof for its intended purpose is assumed by the Owner, the warranty period for such portion of Work shall begin at the date of Substantial Completion for that portion of Work.

1.3 FINAL INSPECTION

.1 The Contractor shall submit written certification that:

a. Contract Documents have been reviewed.

b. Work has been completed in accordance with Contract Documents.

c. Equipment and systems have been tested in presence of Owner's representative and are operational.

.2 Project is completed and ready for final inspection.

.3 Engineer will make final inspection within a reasonable time after receipt of certification.

.4 Should Consultant consider that work is complete in accordance with requirements of Contract Documents, they shall request Contractor to make project closeout submittals.

.5 Should Consultant consider that Work is not complete:

a. They shall notify Contractor, in writing, stating reasons.

b. Contractor shall take immediate steps to remedy the stated deficiencies, and send second written notice to Consultant certifying that Work is complete.

c. Consultant will re-inspect Work.

1.4 REINSPECTION COSTS

.1 In addition to any overtime inspection due under the Standard General Conditions and Supplementary Conditions, should Consultant be required to perform second inspections because of failure of Work to comply with original certifications of Contractor, Owner will compensate Consultant for additional services as stated in said article and charge the Contractor for such fees at the Engineer's currently established billing rate.

1.5 CLOSEOUT SUBMITTALS

.1 Project Record Documents: As per requirements of the Standard General Conditions and Supplementary Conditions.

.2 Guarantees, Warranties, and Bonds required by these specifications: See Standard General Conditions and Supplementary Conditions.

.3 At the close of the Contract, the Contractor shall remove all electrical, sanitary, telephone, water, offices and any other temporary service equipment that may remain.

.4 Deliver evidence of compliance with requirements of governing authorities.

.5 Annotated Final Testing, Startup and Operation Plan with all manufacturers' Certificates of Proper Installation.

1.6 FINAL ADJUSTMENT OF ACCOUNTS

.1 Submit final statement of accounting to Engineer.

.2 Statement shall reflect all uncompleted adjustments.

.3 Additions and deductions resulting from:

a. Previous Change Orders.

b. Other Adjustments.

c. Deductions for Uncorrected Work.

d. Penalties and Bonuses.

e. Deductions for Liquidated Damages.

f. Deductions for re-inspections following Final Inspection first request.

.4 Unadjusted sum remaining due.

1.7 FINAL APPLICATION FOR PAYMENT

.1 Contractor shall submit final application in accordance with requirements of Standard General Conditions and Supplementary Conditions.

1.8 FINAL CERTIFICATE FOR PAYMENT

.1 Consultant will issue Final Certificate in accordance with provisions of Standard General Conditions and Supplementary Conditions.

.2 Should final completion be materially delayed through no fault of Contractor, Engineer may issue a Final Certificate for Payment, in accordance with provisions of Standard General Conditions and Supplementary Conditions and existing laws.

1.9 POST CONSTRUCTION INSPECTION

.1 Consultant will promptly notify Contractor in writing of any observed deficiencies.

.2 Contractor shall promptly correct any deficiencies noted prior to the end of the warranty period. Maintenance Bond will not be released until such deficiencies are corrected to the satisfaction of the Consultant.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 QUALITY ASSURANCE

.1 Operation and Maintenance Manuals for equipment and systems shall be prepared by the equipment manufacturer or system supplier.

1.2 SEQUENCE

.1 Preliminary Manuals: Submit prior to shipment date for equipment, system, subsystem, or component. Preliminary manuals for all major equipment shall be submitted prior to 50 percent completion of the Contract schedule. Include copy of warranties, bonds, and service agreements. Hard copy manuals and searchable PDF electronic copy manuals shall be provided.

.2 Final Manuals: Submit and achieve approval prior to Final Acceptance.

1.3 GENERAL

.1 Furnish for each item of equipment or system as specified in the individual Specification Sections.

.2 Hard Copy Manual Format:

a. Paper Size: Letter

b. Paper: 20-pound minimum, white for typed pages.

c. Text: Manufacturer's printed data, or neatly typewritten.

d. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.

e. Provide fly-leaf for each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment and provide with heavy section dividers with numbered plastic index tabs.

f. Provide each manual with title page, and typed table of contents with consecutive page numbers. Place contents of entire set, identified by volume number, in each binder.

g. Cover: Identify each volume with typed or printed title "OPERATION AND MAINTENANCE MANUAL, VOLUME NO. ____ OF ____," if applicable, and list:

vi. Project title.

vii. Designate the system or equipment for which it is intended.

viii. Identity of separate structure as applicable.

ix. Identity of general subject matter covered in manual. Identity of Equipment Number and Specification Section.

.3 Assemble and bind material in same order as specified as much as possible.

.4 Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs or detailed graphics.

.5 Binders:

a. Preliminary Manuals: Heavy paper covers.

b. Final Manuals: Commercial quality, substantial, permanent, three-ring slant "D" style binders with durable, cleanable, plastic covers.

.6 Product Data:

a. Include only those sheets that are pertinent to specific product.

b. Clearly annotate each sheet to:

i. Identify specific product or part installed.

ii. Identify data applicable to installation.

iii. Delete references to inapplicable information.

.7 Drawings:

a. Supplement product data with drawings as necessary to clearly illustrate:

i. Relations of component parts of equipment and systems.

ii. Control and flow diagrams.

iii. Coordinate drawings with project record documents to assure correct illustration of completed installation.

iv. Do not use project record documents as maintenance manual drawings.

v. Provide reinforced three-hole punched binder envelope, bind in with text.

vi. Identify Specification Section and product on drawings and envelopes.

.8 Instructions and Procedures: Within text as required to supplement product data.

a. Handling, storage, maintenance during storage, assembly, erection, installation, adjusting, testing, operating, shutdown in emergency, troubleshooting, maintenance, interface, and as may otherwise be required.

b. Organize in a consistent format under separate heading for each different procedure.

c. Provide a logical sequence of instructions for each procedure.

d. Provide information sheet for Owner's personnel, including:

i. Proper procedures in the event of failure.

ii. Instances that might affect the validity of warranties or bonds.

iii. Warranties, Bonds, and Service Agreements.

1.4 SUBMITTALS

.1 Preliminary Manuals:

e. Submit one searchable PDF electronic copy and three hard copies for Engineer's review.

f. Disposition and Distribution: In accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

g. Engineer's review will be based on the Operations and Maintenance Review Checklist form in Section 01 99 90, REFERENCE FORMS.

.2 Final Manuals: Submit three hard copies of the final manual.

.3 PDF Copy Manual Format:

h. The PDF copy manual shall be the same material included in the hard copy.

i. The Contractor shall provide one electronic copy of each final O&M manual in Adobe Acrobat's Portable Document Format (PDF) format.

j. At a minimum, a separate PDF file shall be created for each Specification Section for which equipment is being supplied. For sections or equipment that include multiple subassemblies or components, additional PDF files can be used if needed or if more convenient.

k. Each PDF file shall be fully bookmarked and searchable. A maximum of 80 pages shall be included between bookmarks. Bookmarks should, in general, recreate the “tab” system required for paper O&M manuals.

1.5 MANUALS FOR EQUIPMENT AND SYSTEMS

.1 Content for Each Unit (or Common Units) and System:

a. Description of unit and component parts including controls, accessories, and appurtenances:

i. Function, normal operating characteristics, and limiting conditions.

ii. Engineering data, nameplate data, and tests.

iii. Complete nomenclature and commercial number of replaceable parts.

b. Operating Procedures:

i. Start-up, break-in, routine, and normal operating instructions.

ii. Test procedures and results of factory tests where required.

iii. Regulation, control, stopping, and emergency instructions.

iv. Description of operation sequence by control manufacturer.

v. Shutdown instructions for both short and extended durations.

vi. Summer and winter operating instructions, as applicable.

vii. Safety precautions.

viii. Special operating instructions.

ix. Installation instructions.

c. Maintenance and Overhaul Procedures:

i. Routine operations.

ii. Guide to troubleshooting.

iii. Disassembly, removal, repair, reinstallation, and reassembly.

d. Installation Instructions: Including alignment, adjusting, calibrating, and checking.

e. Original manufacturer’s parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.

f. "Maintenance Summary Form" in Section 01 99 90, REFERENCE FORMS.

g. Spare parts ordering instructions and list of recommended spare parts.

h. Where applicable, identify installed spares and other provisions for future work (e.g., reserved panel space, unused components, wiring, terminals).

i. Manufacturer's printed operating and maintenance instructions.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 FORMAT

.1 Electronic Versions: Consultant will provide, upon request, all forms in Microsoft Word format for Contractor's use on this project.

.2 Forms with project specific information will be issued to Contractor at Preconstruction Meeting.

1.2 FORMS

.1 Shop Drawing Transmittal.

.2 Testing Results Transmittal.

.3 Operation and Maintenance Manual Review Check List.

.4 Maintenance Summary.

.5 Manufacturer's Installation Certification.

.6 Equipment Test Report Form.

.7 Contemplated Change Order.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 This Section includes the following:

a. Demolition and removal of buildings and structures

b. Demolition and removal of site improvements adjacent to a building or structure being demolished

c. Demolition and removal of concrete foundations

1.2 DEFINITIONS

.1 Demolition: rapid destruction of building following removal of hazardous materials.

.2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly.

.3 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19 - Construction Waste Management and Disposal

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate with Consultant for the material ownership including but not limited to:

a. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

b. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during demolition remain Owner's property.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Action Submittals: Provide the following submittals before starting any work of this Section:

a. Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in British Columbia.

b. Submit in accordance with Section 01 33 00 - Submittal Procedures

.2 Informational Submittals: Provide the following submittals when requested by the Consultant:

a. Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of Consultants

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, and applicable Provincial and Municipal regulations.

.2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.

.3 Standards: Comply with and NFPA 241.

1.6 EXISTING CONDITIONS

.1 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 EXAMINATION

.1 Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.

.2 Review Project Record Documents of existing construction provided by Consultant.

.3 Consultant does not guaranty that existing conditions are the same as those indicated in Project Record Documents.

.4 Inventory and record the condition of items being removed and salvaged.

.5 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.

.6 Promptly submit a written report to Consultant.

3.2 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

a. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: CEMP

.2 Protection of In-Place Conditions:

a. Prevent movement, settlement, or damage to adjacent structures to remain in place. Provide bracing and shoring required.

b. Keep noise, dust, and inconvenience to occupants to minimum.

c. Protect building systems, services and equipment.

d. Provide temporary dust screens, covers, railings, supports and other protection as required.

.3 Demolition/Removal:

a. Demolish parts of structure as indicated.

b. At end of each day's work, leave Work in safe and stable condition.

c. Demolish to minimize dusting. Keep materials wetted.

.4 Remove following materials and equipment, store, protect, and leave ready for installation by other sections of Work:

3.3 SITE RESTORATION & REPAIRS

.1 Below Grade Areas: Rough grade below grade areas ready for further excavation or new construction.

.2 Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes.

.3 Provide a smooth transition between adjacent existing grades and new grades.

General: Promptly repair damage to adjacent construction caused by demolition operations.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 ASTM International (ASTM)

a. ASTM C 109/C 109M-16a, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. (50-mm) Cube Specimens)

b. ASTM C 157/C 157M-17 (2014) e1, Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete

c. ASTM C 348-18, Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars

d. ASTM C 469/C 469M-14, Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression

e. ASTM C 496/C 496M-17, Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens

f. ASTM C 596-18, Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement

g. ASTM C 666/C 666M-15 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing

h. ASTM C 779/C 779M-12, Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces

i. ASTM C 1059/C 1059M-13, Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete

j. ASTM C 1202-19, Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration

.2 Canadian General Standards Board (CGSB)

a. CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound

.3 Transport Canada (TC)

a. Transportation of Dangerous Goods Act, 1992, c. 34 (TDGA)

.4 International Concrete Repair Institute (ICRI)

a. ICRI Concrete Repair Terminology 2010

.5 NACE International (NACE)

a. ANSI/NACE No. 13/SSPC-ACS-1-2016-SG, Industrial Coating and Lining Application Specialist Qualification and Certification

1.2 SECTION INCLUDES

.1 Work requirements for concrete restoration and waterproofing in accordance with Section 01 11 00 - Summary of Work including the following:

a. Chipping and breaking out all deteriorated, spalled and delaminated concrete, defective cold joints, and the subsequent filling of voids, cracks and rebuilding of exterior surface profiles.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit a proposed work plan for approval by Consultant. Work plan to include a list of materials and proposed plan to be implemented to perform the work.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Provide testing results for review by Departmental Consultant and do not proceed without written approval when deviations from mix design or parameters are found.

a. Submit in accordance with Section 01 43 00 - Quality Assurance.

1.6 EXISTING CONDITIONS

.1 Examine Site conditions and existing surfaces to be restored.

.2 Apply exterior base and finish coatings during dry weather and when imminent weather forecast is favourable for proper application and curing in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Patching compound (for 6-50 mm horizontal and 6-25 mm for vertical applications): fast setting, non-shrink, premixed, requiring addition of water only, free of wax, metal, tar, emulsion and calcium chloride.

b. Compressive Strength: To ASTM C 109/C 109M, 24 MPa at 24 h and 44 MPa at 28 days.

c. Flexural Strength: To ASTM C 348, 6.8 MPa at 7 days, 8.5 MPa at 28 days.

d. Modulus of Elasticity: To ASTM C 469/C 469M, 1.5 x 10 MPa at 28 days.

.2 Patching compound (for 6-25 mm horizontal applications): fast setting, non-shrink, one component, polymer modified cementitious based, repair mortar.

a. Compressive Strength: To ASTM C 109/C 109M, 17.4 MPa at 1 day; 38.2 MPa at 7 days; 52.1 MPa at 28 days.

b. Flexural Strength: To ASTM C 348, 5.6 MPa at 1 day; 6.9 MPa at 7 days; 10.4 MPa at 28 days.

c. Splitting Tensile Strength: To ASTM C 496/C 496M, 2.6 MPa at 1 day; 3.1 MPa at 7 days; 4.2 MPa at 28 days.

d. Bond Strength: To ASTM C 1059/C 1059M, 6.8 MPa at 1 day; 12.1 MPa at 7 days; 17.7 MPa at 28 days.

e. Drying Shrinkage: To ASTM C 596, 28 day -0.093%.

f. Rapid Chloride Permeability: To ASTM C 1202, 28 day - 365/very low.

g. Freeze/Thaw Resistance: To ASTM C 666/C 666M, (Procedure A), 300 cycles - 93.0% RDF.

h. Abrasion Resistance: To ASTM C 779/C 779M, (Procedure A), depth of wear 0.419 mm/hour.

.3 Bonding Agent: Acrylic polymer emulsion formulated for bonding new concrete to cured concrete, non-yellowing, water based, compatible with or recommended by patching compound manufacturer.

a. Compressive Strength: To ASTM C 109/C 109M, 31 MPa at 28 days.

b. Flexural Strength: To ASTM C 348, 12.4 MPa at 28 days.

.4 Water: potable.

.5 Aggregate: 6 to 9 mm clean limestone or pea gravel.

.6 Joint filler: extruded polyethylene, closed cell, Shore A hardness 20, tensile strength, 140 to 200 kPa, outsized 30 to 50%, CFC free.

2.2 EQUIPMENT

.1 Pneumatically operated scabbler with high-speed tungsten carbide tipped pistons to pulverize protective coatings, laitance, and concrete substrate in a single process, leaving surface clean with uniformly keyed texture and the following:

c. Production Rate: 1.9-2.8 m^2 /hour at 1.6 mm surface removal.

d. Size: 305 mm long x 150 mm wide x 305 mm high

e. Air consumption: 1.7 m^3 /min.

f. Vacuum flow:

i. Interfaceable with self-cleaning, high efficiency HEPA filtered vacuum.

.2 Mobile, high performance HEPA Vacuum/Drumming System as follows:

a. Two-stage positive filtration of hazardous particles.

ii. First Stage: Automatic self-cleaning by reverse-flow pulses of high pressure air. Efficiency of 95% at 1 micron.

iii. Second Stage: HEPA efficiency of 99.7% at 0.3 microns.

b. Controlled-seal drum fill system to allow filling, sealing, removal and waste drum replacement under controlled vacuum system.

c. Automatic, full-drum level alarm.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

.1 Remove protective coatings using pneumatically operated scabbler and HEPA vacuum /drumming system.

.2 Remove loose, spalled, cracked, eroded and disintegrated concrete to solid surface, 9 mm minimum depth.

.3 Chisel under perimeter of areas to be patched.

.4 Sandblast loose rust and scale from exposed steel surfaces.

.5 Utilize dustless decontamination and surface preparation system for scabbling concrete floors and slabs.

.6 Clean area of loose material, dirt, oil and scale.

.7 Clean cracks 6 mm thick or wider with pressurized water jet or sandblasting.

.8 Chip and break out all deteriorated concrete, previous repairs that are delaminated, existing delaminations and defective cold joints to sound concrete.

.9 Chip concrete away from exposed rusted surfaces of reinforcing bars, chipping to extend for a distance of about 150 mm along the bars beyond evident rusting.

.10 If chipping operation results in a bar becoming debonded from the concrete, the concrete behind the debonded bar shall be cut out to a depth of at least 25 mm.

.11 Rout out wall cracks wider than 1 mm to a minimum width and depth of 6 mm and clean free of dust and debris, for subsequent filling (after sandblasting).

3.2 MIXING

.1 Patching Compound:

a. Mix components in accordance with manufacturer's written instructions.

b. Use drill mixer to mechanically mix components. Ensure components are thoroughly mixed.

iv. Add up to 6.8 kg of aggregate to 25 kg bag of patching compound for large cavities and patches in excess of 25 mm thick.

c. Apply mix immediately.

d. Dispose of unused mix immediately, do not retemper.

.2 Base Coating:

e. Perform coating in accordance with manufacturer's written instructions.

f. Mix 1 part bonding agent to 3 parts water.

g. Add bonding mixture to base coating and mix to cement mortar consistency with 50 to 76 mm slump.

3.3 SURFACE REPAIRS

.1 Rebuild surface profile following surface preparation, previously described, and fill with patching compound and bonding agent.

.2 Install repair material in accordance with manufacturer's written instructions.

.3 Mix patching compound to batter consistency and apply by brush over dampened concrete within patching area.

.4 Slush mix over old concrete within patching area with brush coat before filling patch with heavier, trowel coat of patching compound.

.5 Place and level patching compound within five to ten minutes after mixing water is added.

.6 Apply mix in successive 12 mm to 25 mm layers.

.7 Scratch first layer, cool with water and apply second layer within 15 to 20 minutes.

.8 Sponge float surface. If patch gets hot and turns light grey, cool by wetting. Keep patch damp 30 to 45 minutes after filling.

.9 All previously embedded steel should be first thoroughly covered and slushed with brush coat before application of heavier trowel coat.

.10 Repair scaled or spalled concrete and missing corners deeper or greater than 6 mm with patching compound and bonding agent to render a regular flush surface.

.11 When rebuilding projecting concrete, such as cracked caps, key into existing concrete by means of edge cutting at a minimum depth of 20 mm.

.12 Protect other trades work and/or other prepared surfaces from patching material spills.

3.4 INSPECTION

.1 Consultant will inspect work for:

a. Adherence to specific procedures and materials

.2 Final cleanliness and completion.

.3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 CSA Group (CSA)

a. **CSA A23.1-/A23.2** -1419, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete

b. CAN/CSA O86-19, Engineering Design in Wood

c. CSA O121-17, Douglas Fir Plywood CSA O141-05 (R2014) , Softwood Lumber

d. CSA O151-17, Canadian Softwood Plywood

e. CSA O153-19, Poplar Plywood.

f. CSA O325.0-16, Construction Sheathing

g. **CSA O437** Series-93(R2011), Standards for OSB and Waferboard

h. CSA S269.1-16, Falsework and Formwork

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.3 QUALITY ASSURANCE

.1 Quality Assurance: In accordance with Section 01 43 00 - Quality Assurance.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

a. Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

b. Store and protect formwork from damages.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Formwork materials:

a. For concrete without special architectural features, use wood and wood product formwork materials to CSA O121. Plywood: New or in new condition “B-B Plyform Class 1 Exterior” grade plywood, 5/8 inch minimum thickness

b. For concrete with special architectural features, use formwork materials to CSA A23.1/A23.2 .

c. Steel Panels: Flat steel sheet or plate of sufficient thickness, or braced sufficiently, to prevent noticeable deflection from pressure of concrete. Steel forms galvanized and/or coated to prevent rust and staining.

.2 Form ties:

a. For concrete not designated 'Architectural': removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes minimum 25 mm diameter in concrete surface.

.3 Form release agent: Proprietary, non-volatile material not to stain concrete or impair subsequent application of finishes or coatings to surface of concrete, derived from agricultural sources, non-petroleum containing.

.4 Falsework materials: to CSA S269.1 .

PART 3 EXECUTION

3.1 DESIGN OF FORMWORK

.1 Design formwork to safely support vertical and lateral loads, which might be applied until such loads can be supported by the concrete structure. Carry vertical and lateral loads by formwork system to ground or to in-place construction, which has attained adequate strength for that purpose.

.2 Design forms and falsework to include assumed values of live load, dead load, weight of moving equipment operated on formwork, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, foundation pressures,

stresses, lateral stability, and other factors pertinent to safety of structure during construction.

.3 Provide shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations, using wedges or jacks or a combination thereof. Provide trussed supports when adequate foundations for shores and struts cannot be secured.

.4 Form facing materials shall be supported by structural members spaced to prevent deflection. Design camber in formwork as required for anticipated deflections.

.5 Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent material.

.6 Keep oil or other agents from getting on reinforcing steel, embedded items, or other surfaces requiring bond with concrete.

3.2 FABRICATION AND ERECTION

.1 Verify lines, levels, and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.3 Do not place shores and mud sills on frozen ground.

.4 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.5 Fabricate and erect formwork in accordance with CAN/CSA S269.1 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1/A23.2 .

.6 Align form joints and make watertight.

.7 Use 25 mm chamfer strips on external corners

.8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.10 Clean formwork in accordance with CSA A23.1/A23.2 , before placing concrete.

3.3 NOTIFICATION AND INSPECTION

.1 Prior to placing of any concrete, and after placement of reinforcing steel in the forms, notify the Consultant at least 24 hours in advance of placing concrete to permit inspection.

3.4 DEFECTIVE WORK

.1 Any form movement or deflection during construction or finished surface variations in excess of the tolerances specified will be basis for rejection of cast-in-place product and requirement for replacement of same.

3.5 REMOVAL AND RESHORING

.1 Do not remove forms and supports until concrete has attained sufficient strength to support anticipated loads.

.2 Use methods of form removal that will not cause overstressing of the concrete. Remove supports to permit the concrete to uniformly and gradually take the stress due to its own weight. Do not use high impact methods to remove supports.

.3 Ensure time period is consistent with strength and finishes required - sand blasted finish, and rubbed finish.

.4 Remove formwork when concrete has reached 70 % of its 28 day design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.5 Re-use formwork and falsework subject to requirements of CSA A23.1/A23.2.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 American Concrete Institute (ACI)

a. SP-66-04, ACI Detailing Manual 2004

.2 ASTM International (ASTM)

a. ASTM A 108-18, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

b. ASTM A 123/A 123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

c. ASTM A 143/A 143M-07(2014) , Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement

d. ASTM A 641/A 641M-19, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

e. ASTM A 775/A 775M-19, Standard Specification for Epoxy-Coated Reinforcing Steel Bars

f. ASTM A 884/A 884M-19, Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement

g. ASTM A 1064/A 1064M-18a, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.3 CSA Group (CSA):

a. CSA A23.1/A23.2-1419, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

b. CSA A283-19, Qualification code for concrete testing laboratories

c. CAN/CSA A23.3-19, Design of Concrete Structures

d. CSA G30.18-09(R2019) , Carbon Steel Bars for Concrete Reinforcement.

e. CSA G40.20/G40.21-13 (R2018) , General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

f. CSA W186-990(R2016) , Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

a. Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish, and limitations.

b. When Chromate solution used as replacement for galvanizing non-prestressed reinforcement, provide product description for review by Consultant before its use.

1.3 QUALITY ASSURANCE

.1 Quality Assurance: In accordance with Section 01 43 00 - Quality Assurance.

.2 Contractor to undertake pre-pour inspections to verify that reinforcement is per design. Contractor will submit results of pre-pour inspection to Consultant.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

a. Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.4 Handle, transport, store, and install epoxy coated reinforcing steel bars to prevent damage to coating. Prevent bar-to-bar abrasion and excessive sagging. Do not drop or drag bars. Store on suitable non-metallic supports. For lifting use nylon lifting slings, padded slings, separators or other means recommended by epoxy coated reinforcing steel supplier.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Consultant.

.2 Reinforcing Steel: Billet steel, minimum grade 400, deformed bars to CSA G30.18 , unless indicated otherwise.

.3 Reinforcing steel: Weldable low alloy steel deformed bars to CSA G30.18.

.4 Cold-drawn annealed steel wire ties: To ASTM A 1064/A 1064M.

.5 Deformed steel wire for concrete reinforcement: To ASTM A 1064/A 1064M.

.6 Epoxy Coating of non-prestressed reinforcement: to ASTM A 775/A 775M.

.7 Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2.

.8 Tie wire: 1.5 mm diameter annealed wire,

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA A23.1/A23.2

.2 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

PART 3 EXECUTION

3.1 PLACING REINFORCEMENT

.1 Cutting or puncturing vapour retarder is not permitted; repair damage and reseal vapour retarder before placing concrete.

.2 Place reinforcing steel as indicated on placing drawings and in accordance with CSA A23.1/A23.2.

.3 Before placing concrete, obtain Consultant's approval of reinforcing material and placement.

.4 Maintain cover to reinforcement during concrete pour.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 ASTM International (ASTM)

a. ASTM C 260/C 260M-10a(2016) , Standard Specification for Air-Entraining Admixtures for Concrete.

b. ASTM C 309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

c. ASTM C 494/C 494M-17, Standard Specification for Chemical Admixtures for Concrete.

d. ASTM C 881/C 881M-15, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

e. ASTM C 1017/C 1017M-13e1, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

f. ASTM C C1059/C1059M- 13, Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.

g. ASTM D 412-16, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

h. ASTM D 624-2012, Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.

i. ASTM D 1751-04(2014)e1, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

j. ASTM D 1752-04a(2013) , Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 Canadian General Standards Board (CGSB)

a. CAN/CGSB-51.34-M86 Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 CSA Group (CSA)

b. CSA A23.1/A23.2-1419, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

c. CSA A283-19,Qualification Code for Concrete Testing Laboratories.

d. CSA A3000-1318, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005),

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

a. Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Site Quality Control Submittals:

a. Provide testing results for review by Consultant and do not proceed without written approval when deviations from mix design or parameters found.

b. Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken.

1.3 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 43 00 - Quality Assurance

.2 Provide Consultant, minimum 4 weeks before starting concrete work, with valid and recognized certificate from plant delivering concrete.

.3 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture meet specified requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.2 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.3 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2 .

1.5 SITE CONDITIONS

.1 Placing concrete during rain or weather events that could damage concrete is prohibited.

.2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.

.3 Cold weather protection:

a. Maintain protection equipment, in readiness on Site.

b. Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.

c. Placing concrete upon or against surface at temperature below 5°C is prohibited.

.4 Hot weather protection:

a. Protect concrete from direct sunlight when ambient temperature above 27°C.

b. Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.

.5 Protect concrete from drying.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Cast in place concrete to be normal density (min 2300 kg/m^3) unless noted otherwise.

.2 Cement to be Portland cement type GU, unless noted otherwise of or required by exposure class. Cement to conform to CSA A3000.

.3 Aggregate to conform to CSA A23.1 / A23.2. Do not use recycled concrete as aggregate.

.4 Admixtures shall not contain chlorides.

.5 All exterior applications:

a. Exposure Class: C1

b. Minimum compressive strength at 28 days: 35 MPA

c. Nominal size of coarse aggregate: 20 mm (3/4")

2.2 GROUT

.1 For equipment, beam bearings and column bases use non-shrink, non-straining, premixed grout, Masterflow 928 by BASF, or equivalent. Apply in accordance with the manufacturer's recommendations.

.2 For Anchoring Dowels and Reinforcing Bars: Epoxy grout shall be medium viscosity epoxy conforming to ASTM C881 Types I, II, III, Classes B and C. Epoxy grout shall be Burke 881 LPL epoxies, or Sikadur 31 Hi-Mod Gel by Sika Corporation, or Concresive paste LPL by BASF, or equivalent. Application shall be per the manufacturer's recommendations.

2.3 CURING MATERIALS

.1 Polyethylene Sheeting: 0.004-inch thick.

.2 Waterproof Paper: Polyethylene-coated, Federal Specification UU-B-790 Type I, Grades A, B, C, Style 4. Define lap control lines clearly by printed markings.

.3 Membrane Forming Compound: ASTM C309-81 Masterkure manufactured by BASF.

2.4 BONDING AGENT

.1 Epoxy Adhesive Bonding Agent: A two-component compound, 100 percent solids, 100 percent reactive compound suitable for use on dry or damp surfaces. Provide manufacturer's specific instructions for application. Concresive Liquid (LPL) by BASF, or Sikadur 32 Hi Mod LPL by Sika, or equivalent.

2.5 HOT WEATHER FINISHING AID

.1 Evaporation retardant used to retard rapid evaporation of water from exposed concrete. "Confilm" by BASF or equal.

PART 3 EXECUTION

3.1 PREPARATION

.1 Notify Consultant 72 hours prior to all concrete pours

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

a. Development of cold joints not allowed.

b. Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete permitted only after approval of equipment and mix.

.5 Disturbing reinforcement and inserts during concrete placement is prohibited.

.6 Before placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains before application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.

.10 In locations where new concrete dowelled to existing work, drill holes in existing concrete.

3.2 INSTALLATION/ APPLICATION

.1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2 .

.2 Finishing and curing:

a. Finish concrete to CSA A23.1/A23.2 .

3.3 SITE QUALITY CONTROL

.1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report

a. Concrete pours.

b. Slump.

c. Compressive strength at 7 and 28 days.

.2 Inspection and testing of concrete and concrete materials carried out by testing laboratory

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 American Association for State Highway and Transportation Officials (AASHTO)

a. AASHTO HB Standard Specifications for Highway Bridges-17th Edition 2002.

.2 ASTM International (ASTM)

a. ASTM A 123/A 123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

b. ASTM A 490M-09, Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints.

c. ASTM F 3125/F 3125M-15a, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

.3 CSA Group (CSA)

a. CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

b. CSA G164-M92(R2003) , Hot Dip Galvanizing of Irregularly Shaped Articles.

c. CSA S6-19, Canadian Highway Bridge Design Code.

d. .CSA S16-19, Design of Steel Structures.

e. CSA S269.1-16, Falsework & formwork.

f. CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.

g. CSA W59-13, Welded Steel Construction, (Metal Arc Welding).

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Preinstallation Meetings:

a. Convene preinstallation meeting 2 weeks before beginning work of this Section with Contractor's Representative and Consultant in accordance with Section 01 31 19 - Project Meetings to:

i. Verify project requirements.

ii. Review installation and substrate conditions.

iii. Coordination with other building subtrades.

iv. Review manufacturer's written installation instructions and warranty requirements.

.2 Before start of Work arrange for site visit with Consultant to examine existing site conditions adjacent to demolition work.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

b. Submit manufacturer's instructions, printed product literature and data sheets for structural steel and include product characteristics, performance criteria, physical size, finish and limitations.

c. Submit WHMIS Safety Data Sheet (SDS) in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 00 - Hazardous Materials.

d. Submit 2 copies of WHMIS SDS.

.3 Shop Drawings:

a. Submit drawings stamped and signed by professional engineer registered or licensed in British Columbia, Canada.

b. Indicate shop and erection details including shop splices, cuts, copes, connections, holes, bearing plates, threaded fasteners, rivets and welds. Indicate welds by CSA W59, welding symbols.

c. Proposed welding procedures to be stamped and approved by Canadian Welding Bureau.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Provide protective blocking for lifting, transportation and storing.

a. Exercise care during fabrication, transportation and erection so as not to damage girders and beams.

b. Do not notch edges of members.

c. Do not cause excessive stresses.

.3 Protect unpainted weathering steel, before erection, with waterproof covering.

.4 Ensure that no portion of steel comes into contact with ground.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

PART 2 PRODUCTS

2.1 MATERIALS

.1 All structural steel shall conform to CSA S16 and CSA-G40.20/G40.21.

.2 Material shall confirm to the following:

a. W and WWF section: Grade 350W

b. Angles, Plates and Channels: Grade 300W.

c. HSS: Grade 350W Class H.

d. Grating: GRADE 230W

e. Bolts: ASTM F3125, Grade A325.

f. Nuts: ASTM A563.

g. Washers: ASTM F436.

.3 All steel shall be hot dip galvanised as per ASTM A123M. All steel hardware shall be galvanized as per ASTM A153M.

.4 All shop connections shall be welded

.5 Anchor bolts shall be galvanized and confirm to ASTM F1554 Grade 55. Bolt

.6 All welding shall be seal weld type and conform to CSA W59 (E480XX), CSA S16 and shall be performed by a welder qualified under A CSA W47.

2.2 SOURCE QUALITY CONTROL

.1 Steel producer qualifications: certified in accordance with CSA G40.20/G40.21

.2 Submit Consultant 2 copies of certified test reports for Charpy V-notch test.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for structural steel installation in accordance with manufacturer's written instructions.

3.2 PREPARATION

.1 Clean steel surfaces as directed by Consultant when staining or defacing occurs.

.2 Verify location of substructure units, elevations of bearing seats and location of anchor bolts before erection of structural steel; report discrepancies to Consultant.

.3 Work near river banks or embankments in accordance with written instructions from Consultant.

.4 Restrict drifting during assembly to minimum required to bring parts into position without enlarging or distorting holes, and without distorting, kinking or sharply bending metal of any unit.

.5 Fabricate and install bearings as indicated.

.6 Place anchor bolts at elevations and locations indicated. Protect holes against entry of water and foreign material.

3.3 INSTALLATION

.1 Do falsework in accordance to CSA S269.1

.2 Do fabrication and erection of structural steel in accordance with CSA S6, Design of Highway Bridges

.3 Do welding in accordance with CSA W59, except where specified otherwise

a. For CSA G40.20/G40.21, grade 3500 steel, deposited weld metal to have Charpy V-Notch value not lower than that of steel.

b. Do welding in shop unless otherwise permitted by Consultant.

c. Weld only at locations indicated.

.4 High strength bolting: in accordance with CAN/CSA S6 CSA S16. Use 'turn-of-nut' tightening method.

.5 Finish: members true to line, free from twists, bends, open joints, sharp corners and sharp edges.

.6 Allowable tolerance for bolt holes:

a. Matching holes for bolts to line up so that dowel 2 mm less in diameter than hole passes freely through assembled members at right angles to such members.

b. Finish holes not more than 2 mm in diameter larger than diameter of rivet or bolt unless otherwise specified by Consultant.

c. Centre-to-centre distance between any two holes of group to vary by not more than 1 mm from dimensioned distance between such holes.

d. Correct mispunched or misdrilled members only as directed by Consultant.

.7 Span length tolerances:

a. Girders and beams: plus or minus 6 mm

b. Centre-to-centre of bearing stiffeners and bearing plates: plus or minus 3 mm.

.8 Mark members in accordance with CSA G40.20/G40.21

.9 Match marking shop mark bearing assemblies and splices.

3.4 SITE QUALITY CONTROL

3.5 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, protecting and cleaning of steel.

.2 Submit manufacturer's site services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 ASTM International (ASTM)

a. ASTM A 53/A 53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

b. ASTM A 269M, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

c. ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 CSA Group (CSA)

a. CSA G40.20 /G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

b. CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

c. CSA S16, Design of Steel Structures.

d. CSA W48, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

e. CSA W59, Welded Steel Construction (Metal Arc Welding)

.3 Green Seal Environmental Standards (GS)

a. GS-11, Paints and Coatings

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

a. Submit drawings stamped and signed by professional engineer registered or licensed in British Columbia, Canada.

b. Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.3 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

a. Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

b. Replace defective or damaged materials with new

PART 2 PRODUCTS

2.1 MATERIALS

.1 All structural steel shall conform to CSA S16 and CSA-G40.20/G40.21.

.2 Material shall confirm to the following:

a. W and WWF section: Grade 350W

b. Angles, Plates and Channels: Grade 300W.

c. HSS: Grade 350W Class H.

d. Grating: GRADE 230W

e. Bolts: ASTM F3125, Grade A325.

f. Nuts: ASTM A563.

g. Washers: ASTM F436.

.3 All steel shall be hot dip galvanised as per ASTM A123M. All steel hardware shall be galvanized as per ASTM A153M.

.4 Steel sections and plates: to CSA G40.20/G40.21

.5 Welding materials: to CSA W59.

.6 Welding electrodes: to CSA W48 Series

.7 Bolts and anchor bolts: to ASTM A 307

.8 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Where possible, fit and shop assemble work, ready for erection.

.3 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.

3.2 ERECTION - GENERAL

.1 Do welding work in accordance with CSA W59 unless specified otherwise

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Supply components for work by other trades in accordance with shop drawings and schedule.

.6 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.3 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM)

a. **ANSI/NAAMM MBG** 531, Metal Bar Grating Manual.

.2 ASTM International (ASTM)

a. **ASTM A 53/A 5** 3M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

b. ASTM A 307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

c. ASTM F 3125/F 3125M, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

.3 CSA Group (CSA)

a. **CSA G40.20- /G40.21**, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

b. CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

c. CSA W59, Welded Steel Construction (Metal Arc Welding).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

a. Submit manufacturer's instructions, printed product literature and data sheets for ladders and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

a. Submit drawings stamped and signed by professional engineer registered or licensed in British Columbia, Canada.

b. Indicate construction details, sizes of steel sections and thickness of steel sheet.

1.3 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

a. Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

b. Store and protect ladders from nicks, scratches, and blemishes.

c. Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Steel sections: to CSA G40.20/G40.21 Grade300 W.

.2 Steel plate: to CSA G40.20/G40.21 , Grade 300W.

.3 Welding materials: to CSA W59.

.4 Bolts: to ASTM A 307

.5 High strength bolts: to ASTM A F3125/F3125M

2.2 FABRICATION

.1 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.

.2 Accurately form connections with exposed faces flush:

a. Make mitres and joints tight.

b. Make risers of equal height.

.3 Grind or file exposed welds and steel sections smooth.

.4 Shop fabricate stairs in sections as large and complete as practicable.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal stairs and ladders installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION OF LADDERS

.1 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting stairs to structure.

.2 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.3 Do welding work in accordance with CSA W59 unless specified otherwise

.4 Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

3.3 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal stairs and ladders installation.

END OF SECTION

PART 1 GENERAL

1.1 DEFINITIONS

.1 Clearing: consists of cutting off trees and brush vegetative growth to not more than specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.

a. Close-cut clearing: consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.

b. Clearing isolated trees: consists of cutting off to not more than specified height above ground of designated trees, and disposing of felled trees and debris.

c. Underbrush clearing: consists of removal from treed areas of undergrowth, deadwood, and trees smaller than 50 mm trunk diameter and disposing of fallen timber and surface debris.

.2 Grubbing: consists of excavation and disposal of stumps and roots, boulders and rock fragments of specified size to not less than specified depth below existing ground surface.

1.2 REFERENCE STANDARDS

.1 Canada Labour Code, Part 2, Canada Occupational Health and Safety Regulations.

.2 Canadian Environmental Protection Act, 1999(CEPA 1999).

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Contractor is responsible for obtaining or coordinating any permits required for clearing and grubbing works.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit list of equipment that are going to be on-Site, and provide manufacturer's installation instructions for review by Consultant.

1.5 HEALTH AND SAFETY

.1 Perform clearing and grubbing work in accordance with the Site-specific HSP recommendations as directed by Consultant.

.2 Safety Requirements: worker protection. Ensure workers are wearing gloves, long sleeved clothing, eye protection, protective clothing safety boots while performing clearing and grubbing activities.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Perform clearing and grubbing work in accordance with CEMP

.2 Ensure safe use and disposal of wood preservatives complies with all Federal, Provincial/Territorial and Municipal regulations, particularly the Canadian Environmental Assessment Act (CEAA), the Canadian Environmental Protection Act, and the Pest Control Products Act.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PREPARATION

.1 Inspect site and verify with Consultant, any items designated to remain.

.2 Notify utility authorities before starting clearing and grubbing.

.3 Keep roads and walks free of dirt and debris.

3.2 APPLICATION

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

3.3 CLEARING

.1 Clearing includes felling, trimming, and cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including owned timber, snags, brush, and rubbish occurring within cleared areas.

.2 Clear as directed by Consultant, by cutting at height of not more than305 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1000 mm above ground surface.

.3 Cut off branches and cut down trees overhanging area cleared as directed by Consultant.

.4 Cut off unsound branches on trees designated to remain as directed by Consultant.

3.4 ISOLATED TREES

.1 Cut off isolated trees as indicated by Consultant at height of not more than 305 mm above ground surface.

.2 Prune individual trees as indicated.

.3 Trim trees designated to be left standing within cleared areas of dead branches 4 cm or more in diameter; and trim branches to heights as indicated.

.4 Cut limbs and branches to be trimmed close to bole of tree or main branches.

3.5 REMOVAL AND DISPOSAL

.1 Remove cleared and grubbed materials off site

END OF SECTION

PART 1 GENERAL

Not Used

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to CEMP

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

.1 Ensure that procedures are conducted in accordance with CEMP.

.2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.

.3 Handle topsoil only when it is dry and warm.

.4 Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation by alternative disposal.

.5 Strip topsoil to depths as indicate. Avoid mixing topsoil with subsoil.

.6 Dispose of unused topsoil

.7 Protect stockpiles from contamination and compaction.

.8 Cover topsoil that has been piled for long term storage, with trefoil or grass to maintain agricultural potential of soil.

3.3 PLACING OF TOPSOIL

.1 Spread topsoil during dry conditions by mechanical hoe in uniform layers not exceeding 250 mm, over unfrozen subgrade free of standing water.

.2 Establish traffic patterns for equipment to prevent driving on topsoil after it has been spread to avoid compaction.

.3 Cultivate soil following spreading procedures.

3.4 CLEANING

.1 Proceed in accordance with Section 01 74 00 - Cleaning.

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM)

a. ASTM C 144-99, Standard Specification for Aggregate for Masonry Mortar.

b. ASTM C 618-00, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.2 CSA Group (CSA)

a. CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.

b. CAN/CSA-A3000-98, Cementitions Materials Compendium.

PART 2 PRODUCTS

2.1 STONE

.1 Hard, dense with relative density (formally specific gravity) not less than 2.65, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:

a. Rip rap MOTI Class 25 kg (Chapman Lake Dam) and Rip rap MOTI Class 100kg (McNeil Lake Dam).

PART 3 EXECUTION

3.1 PLACING

.1 Where rip-rap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated.

.2 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

.3 Place rip-rap to thickness and details as indicated.

.4 Place stones in manner approved by Consultant to secure surface and create a stable mass. Place larger stones at bottom of slopes.

.5 Hand placing:

a. Use larger stones for lower courses and as headers for subsequent courses.

b. Stagger vertical joints and fill voids with rock spalls or cobbles.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 ASTM International

a. ASTM A 53/A 53M-10, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

b. ASTM A 90/A 90M-09, Standard Test Method for Weight Massof Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.

c. ASTM A 121-07, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.

d. A653/A653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

e. ASTM C 618-08a, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

f. ASTM F 1664-08, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.

g. ASTM A 123/A 123M-09, Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.

.2 Canadian General Standards Board (CGSB)

a. CAN/CGSB-138.1-96, Fabric for Chain Link Fence.

b. CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.

c. CAN/CGSB-138.3-96, Installation of Chain Link Fence.

d. CAN/CGSB-138.4-96, Gates for Chain Link Fence.

e. CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 CSA Group (CSA)

a. CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

b. CAN/CSA-A3000-08, Cementitious Materials Compendium.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

a. Submit manufacturer's instructions, printed product literature and data sheets for the gates and hoists include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

a. Submit drawings stamped and signed by professional engineer registered or licensed in British Columbia, Canada.

b. Indicate on shop drawings:

i. Construction details and materials, component layout and dimensions, clearances required for installation and service, auxiliary equipment, point loads, anchor bolt locations, etc.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

a. Store materials in accordance with manufacturer's recommendations.

b. Store and protect fence and gate materials from damage.

c. Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Chain-link fence fabric: to CAN/CGSB-138.1.

.2 Type 1, Class A, medium style, Grade 1.

.3 Height of fabric: as indicated.

.4 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.

.5 Top and bottom tension wire: to CAN/CGSB-138.2, single strand, galvanized steel wire.

.6 Tension bar: to ASTM A 653/A 653M, 5 x 20 mm minimum galvanized steel.

.7 Gate frames: to ASTM A 53/A 53M, galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.

a. Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.

b. Fasten fence fabric to gate with twisted selvage at top.

c. Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.

d. Furnish double gates with chain hook to hold gates open and centre rest with drop bolt for closed position.

2.2 FINISHES

.1 Galvanizing:

a. For chain link fabric: to CAN/CGSB-138.1 Grade2.

b. For pipe: 550g/m² minimum to ASTM A 90.

c. For barbed wire: to ASTM A 121, Class 2 CAN/CGSB-138.2.

d. For other fittings: to ASTM A 13/A 123M.

PART 3 EXECUTION

3.1 ERECTION OF FENCE

.1 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.

.2 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

.3 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.

.4 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.

3.2 INSTALLATION OF GATES

.1 Install gates in locations as indicated.

.2 Install gate stops where indicated.

3.3 TOUCH UP

.1 Clean damaged surfaces with wire brush removing loose and cracked coatings.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS FOR GATES

.1 This Specification, together with the Drawings, defines the technical requirements for the design, supply, delivery and installation of equipment at the low-level outlets at the Dams. New gates shall be manufactured by Fontaine Aquanox or by an approved equivalent.

.2 Gates shall be capable of being raised under the unbalanced head due to the maximum reservoir level upstream and atmospheric pressure downstream.

.3 Gates shall be capable of closure under maximum unbalanced pressure in an emergency.

.4 Gates and their guides and operating stems shall be subject to total immersion for long periods of time and therefore these components shall be made of stainless steel or an approved equivalent.

.5 Gates shall be vertical lift type, rising stem slide type sluice gates.

.6 Gate guide frames shall be a one-piece fabrication comprising the side guides, sill and lintel. The sealing and guiding elements shall be contained within the guides around the periphery of the opening and shall be of low friction material.

.7 At Edwards, the guide frame shall be fastened to the upstream face of the spillway wall adjacent the stoplog opening by means of stainless-steel Hilti HVA epoxy anchors or approved equivalent. At McNeil, guide frame shall be fastened in accordance with the Drawings and the manufacturer's recommendations.

.8 A neoprene rubber seal shall be provided between the frame and the concrete wall.

.9 Gates shall be operated by a manual hand wheel, and with provision for locking in both the open and closed positions.

.10 The hand wheel and reducer (if required) shall be fastened and integral to the gate frame. If rising stem is included, then stem shall be securely guided along its path.

1.2 RELATED REQUIREMENTS FOR STOPLOG & HOIST

.1 This Specification, together with the Drawings, defines the technical requirements for the design, supply, delivery and installation of the spillway stoplog & hoist for McNeil Lake Dam.

1.3 REFERENCE STANDARDS

.1 The recommended practices of the relevant codes, standards, regulations and other publications of the organizations listed below shall form a part of these Specifications within the subject areas indicated. The applicable issue shall be the latest edition in force on the date of the purchase order.

a. AWWA - American Water Works Association

b. ANSI - American National Standards Institute, Inc.

c. ASME - American Society of Mechanical Engineers

d. ASME - Pressure Vessel Code Section VIII, Division 1

e. ASTM - American Society for Testing and Materials

f. CDA - Canadian Dam Association

g. CISC - Canadian Institute of Steel Construction

h. CSA - Canadian Standards Association

i. NBCC - National Building Code of Canada

j. SSPC - Structural Steel Painting Council

k. WorkSafeBC Occupational Health and Safety Regulation of BC

.2 Any requirement not covered by the above codes shall conform to the standards defined in these Specifications.

.3 The design shall conform to utility industry standards and prudent utility practice and shall comply with all relevant legal and statutory requirements to ensure that the gate, frame and manual actuator are:

a. Safe, reliable and economical to operate;

b. Easy to maintain; and

c. Capable of intermittent operation with minimal maintenance.

1.4 DESIGN AND SPECIFIC CRITERIA

.1 Gates, stoplogs and hoists shall follow the Drawings. General arrangement and details in the Drawings govern the design.

.2 Gates, stoplogs, frames, actuators, hoists and all associated components shall be designed, manufactured and commissioned in accordance with these specifications, the Drawings and manufacturer's recommendations.

.3 Design information and shop drawings for all major components shall be submitted to the owner for review and shall be approved before fabrication begins.

.4 Gates, stoplogs, frames, actuators and hoists shall be designed to operate and withstand the most severe case of load combination for each component. Maximum head used in the load combination shall be as that shown on the Drawings.

.5 Gates and stoplogs shall be designed to open and close under the unbalanced head due to the maximum reservoir level as shown on the Drawings.

.6 The allowable stresses used in design calculations for loads shall not exceed the lesser of the following values of the materials:

d. 55 percent of the minimum yield point or;

e. 36 percent of the minimum ultimate tensile strength.

.7 The combined stresses shall be determined in accordance with the von Mises-Hencky Theory and the resultant shall not exceed the values given above.

.8 Gate seals and sealing faces shall be designed so as not to exceed the maximum permitted leakage rate stated in AWWA C 501.

.9 Gates and their frames shall be designed for permanent immersion conditions with a design life of 50 years.

.10 Gates, stoplogs, frames, actuators and hoists shall be designed to withstand the Design Basis Earthquake (DBE) without damage, permanent deformation or distortion. Earthquake loading during the DBE is the average earthquake that may reasonably be experienced during the economic life of the dam. Values of ground acceleration used for design during the DBE shall be as follows:

a. Magnitude M6.0

b. Peak horizontal ground acceleration on rock, ah: 0.15 g

c. Peak vertical ground acceleration on rock, av: 0.10 g

.11 Anchor bolts shall be designed for the full pressure acting over the complete sealed area of the gate in combination with a thrust on the gate stem

corresponding to the overload allowance provided by the manual hand wheel and any reducer.

.12 The slenderness ratio of the lifting stem, rod or rack, between guides shall not exceed 120.

.13 Ice loading will not be considered for gate design.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

d. Submit manufacturer's instructions, printed product literature and data sheets for the gates and hoists include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

e. Submit drawings stamped and signed by professional engineer registered or licensed in British Columbia, Canada.

f. Indicate on shop drawings:

ii. Construction details and materials, component layout and dimensions, clearances required for installation and service, auxiliary equipment, point loads, anchor bolt locations, etc.

1.6 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for the gates and hoists into an O&M Manual. The O&M Manual shall detail how the various elements of the gates, stoplogs and hoists are to be inspected, maintained and replaced.

.3 The O&M Manual shall provide procedures required to maintain the components for the warranty period, and to maintain the components for the expected life of the dams.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials and equipment in accordance with Section 01 61 00 - Common Product Requirements and in accordance with manufacturer's written instructions.

.2 Replace defective or damaged materials with new.

.3 Packaging Waste Management: remove for reuse and return pallets, crates, padding, and packaging materials as specified in the wasted and recycling plan.

PART 2 PRODUCTS

2.1 McNEIL LAKE AND EDWARDS LAKE LOW-LEVEL OUTLET GATE

.1 Low-level outlet gates shall be a Fontaine Series 20 or approved equivalent.

2.2 McNEIL LAKE STOPLOG & HOIST

.1 Spillway stoplog hoist shall be a PFAFF Silberblau model SCH-W sluice gate jack or approved equivalent.

.2 Stoplogs are to be made of wood (fir), or an acceptable material suitable for immersed service (e.g. galvanized steel, stainless steel, aluminum, fiberglass).

2.3 MATERIALS

.1 Gates shall be a one-piece fabrication, stainless steel, galvanized or epoxy coated.

.2 The brackets or linkages and connecting pins connecting the operating stem to the gate shall be stainless steel, designed for all loading conditions, and removable for assembly and maintenance.

.3 Gates shall be designed to allow free flow at full or part opening through the gate without causing flow damage to the seals, and to close without damaging the sill seal by debris in the flow.

.4 Gates shall be provided with lateral guides and bearing strips on each side made of PTFE or approved equivalent.

.5 Anchor bolts shall be stainless steel Hilti HVA adhesive anchors not less than 16 mm diameter. The anchors shall be provided with double nuts.

.6 Gate actuators shall be integral to the gate frame and shall transmit all loads directly to and only to the frame.

.7 Welding materials shall follow CSA W59.

.8 Fixing bolts and fasteners as required shall be manufactured from stainless steel to ASTM A240 Type 304L.

.9 Fixing of rack from stoplog hoist to stoplogs shall be though stainless steel or galvanized hardware.

2.4 SPECIAL TOOLS AND SPARE PARTS

.1 All special tools, devices and equipment to install, operate, maintain and repair the equipment listed in the work shall be documented, and these documents be presented as submittals.

.2 Special tools, devices and equipment shall be turned over to the owner for future maintenance work.

.3 Lists and pricing of mandatory, optional, recommended spare parts shall be submitted as defined in the Tender Documents.

2.5 FABRICATION

.1 Prior to delivery to site, gates, stoplogs, frames, actuator and hoists shall be fully assembled and tested. Inspection reports complete with pictures will document that the gate, stoplogs, frames, actuator and hoists meet the dimensions and fit as specified for the application. Owner will be notified 2 weeks prior to testing and will be permitted access to witness the testing.

.2 All fabrication will be built square, true, straight and accurate to required size, with joints closely fitted weathertight and properly secured.

.3 Exposed welds shall be continuous for length of each joint. Welding will be completed in accordance with CSA W59. Exposed welds shall be filed or ground smooth and flush.

.4 As much as possible, equipment will be shop assembled such that after delivery to site equipment is ready for installation.

2.6 FINISHES

.1 Stainless steel, brass/bronze and plastic shall not be coated.

.2 Actuators, hoists, and manufactured equipment which are factory coated shall not be re-coated.

.3 If galvanized, galvanizing shall be a minimum of 380 g/m² zinc coating to ASTM A 123/A 123M.

.4 Steel shall not be left uncoated. Contractor provided fabricated equipment shall include a two-part epoxy coating. Surface preparation shall include a SSPC – SP1 and SSPC-10 (Surface profile 50 – 75 microns). Coating shall start with one coat of Interzinc 52 (81% zinc load) organic zinc rich @ 50 – 75 microns DFT, and then one coat of Intergard 345 high build epoxy @ 150 – 200 microns DFT, or approved equivalent.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Contractor shall verify site conditions and dimensions prior to fabrication or purchasing of contractor supplied equipment.

.2 Contractor shall submit a marked-up copy of the Drawings, showing as-found conditions of existing concrete and steel which is essential to contractor provided equipment.

.3 Contractor shall provide notification of any detail or unacceptable condition found during the examination which changes the commercial contract between the owner and the contractor.

3.2 INSTALLATION

.1 Comply with requirements of provincial and local environmental regulatory agencies except where more stringent requirements are specified herein.

.2 Install gates, stoplogs, frames, actuator and hoists in accordance with the approved shop drawings and manufacturer's instructions, using qualified and trained personnel.

.3 Gates, stoplogs, frames, actuator and hoists shall be plumbed, shimmed and accurately aligned.

.4 Unused holes in concrete shall be grouted.

.5 After installation of the equipment, components shall be adjusted in accordance with the manufacturer’s recommendations and installation manual. The gate and stoplogs shall then be run through five complete open-close cycles.

3.3 START UP AND COMMISSIONING

.1 Test and adjust complete system for proper function and leave in perfect working order.

.2 Conduct demonstration to accommodate owner staff on operation and care of the equipment.

.3 Gates, stoplogs and frames, actuator and hoists will be installed and commissioned in accordance with the written instructions in the Contactor provided Installation Manual and Commissioning Manual which may include information from the Subcontractor or manufacturer.

.4 The Commissioning Manual shall include the tests specified herein and a list of tests recommended by the Subcontractor that will verify the guaranteed requirements.

.5 Site testing and commissioning will be performed by the Contractor, and witnessed and approved by the owner or his representative.

.6 Costs for repair of any design or manufacturing deficiencies shall be borne by the Contractor.

.7 Gates, stoplogs, actuator and hoists shall be dry tested after installation, and witnessed by the owner as follows:

g. Opening and closing gates and stoplogs as required to check that they move freely throughout their full travel. During these tests the seals will be hosed with water (or equivalent lubricant) to prevent damage.

h. Torque and/or effort to operate the hoists will be monitored to verify ease of operation of the gate and stoplog hoists.

.8 If unusual wear, contact or damage is witnessed during these dry tests, the Contractor shall submit a plan for review, for the Contractor to correct the deficiencies. The dry tests shall be run again to confirm the gates and stoplogs are operating properly and ready for the wet tests.

.9 When ready, gates and stoplogs will be slowly watered up against maximum unbalanced pressure to determine that they function properly. Gates and stoplogs will be inspected by the Contractor to determine if their leakage is within acceptable leakage rates.

.10 If excessive leakage is measured, the Contractor will determine why the gate or stoplog is leaking excessively, and will determine how the excessive leakage is to be repaired.

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials and facilities caused by the installation of the equipment.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM)

a. ASTM D1505-68, Standard Test Method for Density Of Plastics.

b. ASTM A572, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

c. ASTM A-123/A, Specification for Zinc (Hot-Dip Galvanized) Coatings

PART 2 PRODUCTS

2.1 DEBRIS BOOM

.1 Debris booms shall be Tuffboom Type (STD) Wortington brand, or approved equal, and produced per Manufacturers specifications.

.2 All interconnecting hardware connections shall be Worthington brand, Crosby brand, or approved equal.

.3 Booms shall be designed such that the minimum tensile strength in the connecting hardware is 120,000 lbs (54,434 kgs). Barrier supplier shall certify to owner via independent test reports that the connection system as designed meets the above design resistance.

.4 Booms shall be cylindrical in shape and be UV-stabilized for long-term environmental exposure.

.5 Booms shall include recessed longitudinal ribbing to provide impact strength and load resistance.

.6 Booms units shall be of a modular design such that each barrier with all hardware attached can be carried by two adults.

.7 Boom units shall be designed such that they resist rolling.

.8 Length of each flotation unit is to be approximately 10 feet (3 meters).

.9 Boom floats should have a minimum 12 inches (30.5 cm) of freeboard in still water conditions.

.10 When connected together, the nominal distance between boom floats should not exceed 13 inches (33.02cm cm).

.11 The boom floats shall be colored Yellow such that they are visible in low-light conditions and to individuals who suffer from color blindness. Where float color is achieved by the use of external coatings using epoxy resins, paints or similar, manufacturer shall be able to clearly demonstrate via toxicology or environmental reports that such coatings will not be harmful when ingested by aquatic or avian wildlife. Manufacturer shall also warrant any externally applied coatings for the life of the float shell.

.12 The total weight of each barrier float with all hardware attached shall be between 135 – 150 lbs (61 - 70 kg).

.13 The external encasement of each boom shall have a nominal wall thickness of not less than 0.170 inch. Manufacturer shall certify that the wall thickness as offered is suitable for the intended application. Where rotationally molded boom units are offered, such units shall be rotationally molded using linear low density polyethylene or linear medium grade polyethylene. Polyethylene encasement shall have a minimum density of 0.935 g/cm^3 as determined by ASTM D1505-68 and be UV-stabilized for long-term environmental exposure. Manufacturer shall be able to provide ultrasonic wall measurements certifying the thickness of the material.

.14 Where the external encasement includes an end-cap fitting, it shall be of the same shape as the main boom encasement. The end-cap design shall allow for a male/female style fitting to the main boom encasement and be additionally secured in place using rivets and plastic welding.

.15 Rotationally molded boom units shall contain an internal structural full-length steel channel through which all external inter-boom connections are attached. Structural steel channel shall be of material type ASTM A572, Grade 50 Steel and a weight of not less 5.4 lbs/ft (8.04 kgs/m).

.16 Boom floats shall include a solid foam core to prevent sinking. If punctured, they shall maintain their original freeboard. Foam core shall meet the requirements of ASTM C-578 with a minimum in-place density of 0.9 pounds per cubic foot. Water absorption of foam core shall not exceed 3% by volume per ASTM C-272. Foam core must take up a minimum of 95% of the interior volume of the boom.

.17 Boom floats shall be suitable for use in temperatures ranging from -38°F (-38°C) up to 130°F (55°C).

.18 Connections between boom units shall permit full freedom of motion simultaneously in horizonal and vertical planes.

.19 Shackles shall not be used to connect boom units.

.20 Wire rope connections, if used to connect boom units, must meet the minimum breaking strength requirements, spacing requirements and must include a swage fitting and thimble eye on each end. The use of Flemish eyes, and wire rope clips is not permitted.

.21 The minimum acceptable tensile strength for connection hardware shall not be less than 120,000 psi (54,434 kgs).

.22 Manufacturer shall submit to owner certified independent test results confirming the minimum breaking strength is not less than 120,000 psi (54,434 kgs).

.23 Hot dipped galvanizing should be in accordance to the current version of ASTM A-123/A 123M and ASTM A-153/A 153M as applicable.

.24 Graphics, if required, are to be millennium type Mold-In graphics, Arial, font, all caps, black, boldfaced font and shall be placed on the upstream face of the boom unit.

PART 3 EXECUTION

Not Used

END OF SECTION

Appendix E Construction Environmental Management Plan

SUNSHINE COAST REGIONAL DISTRICT

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

MCNEIL, CHAPMAN & EDWARDS DAM IMPROVEMENTS, SECHELT, BC

CONFIDENTIAL

April 28, 2023

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

MCNEIL, CHAPMAN & EDWARDS DAM IMPROVEMENTS, SECHELT, BC

SUNSINE COAST REGIONAL DISTRICT

FIRST ISSUE
CONFIDENTIAL

PROJECT NO.: 211-09410-01
DATE: APRIL 28, 2023

WSP
840 HOWE STREET, SUITE 1000
VANCOUVER, BRITISH COLUMBIA
V6Z 2M1 CANADA

WSP.COM

April 28, 2023

Confidential

Sunshine Coast Regional District
1975 Field Road
Sechelt, BC
V7Z 0A8

Attention: Bryan Shoji

Dear Sir:

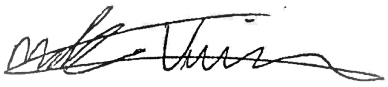
Subject: Construction Environmental Management Plan – McNeil, Chapman, and Edward Lake Dam Upgrades

WSP Canada Inc. is pleased to submit a PDF copy of the Construction Environmental Management Plan report for the above-referenced project.

We trust that the enclosed report meets your current requirements. If you have any questions regarding this project, the enclosed reports, or our services, please do not hesitate to call the undersigned at (780) 410-6856.

Thank you for utilizing our professional services. We look forward to serving your future environmental and engineering needs.

Yours sincerely,



Mark Visser, B.Sc., RP.Bio., P.Biol.
Experienced Fisheries Biologist,
Earth & Environment

Encl. Construction Environmental Management Plan

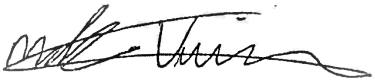
WSP ref.: 211-09410-01

REVISION HISTORY

FIRST ISSUE			
April 28, 2023	Issued for Tender		
Prepared by	Approved By		
Mark Visser, Experienced Fisheries Biologist, ECO & EIA	Michael Taylor, Group Lead, ECO&EIA – Lower Mainland		

SIGNATURES

PREPARED BY



April 28, 2023

Mark Visser, B.Sc., P.Biol., RP.Bio.
Experienced Fisheries Biologist, ECO & EIA

Date

APPROVED[1] BY

April 28, 2023

Michael Taylor, BLA, MRM, RPP, MCIP
Group Lead, ECO&EIA

Date

WSP prepared this report solely for the use of the intended recipient, Sunshine Coast Regional District, in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

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[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report.

WSP has provided services to the intended recipient in accordance with the professional services agreement between the parties and in a manner consistent with that degree of care, skill and diligence normally provided by members of the same profession performing the same or comparable services in respect of projects of a similar nature in similar circumstances. It is understood and agreed by WSP and the recipient of this report that WSP provides no warranty, express or implied, of any kind. Without limiting the generality of the foregoing, it is agreed and understood by WSP and the recipient of this report that WSP makes no representation or warranty whatsoever as to the sufficiency of its scope of work for the purpose sought by the recipient of this report.

In preparing this report, WSP has relied in good faith on information provided by others, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

Benchmark and elevations used in this report are primarily to establish relative elevation differences between the specific testing and/or sampling locations and should not be used for other purposes, such as grading, excavating, construction, planning, development, etc.

Design recommendations given in this report are applicable only to the project and areas as described in the text and then only if constructed in accordance with the details stated in this report. The comments made in this report on potential construction issues and possible methods are intended only for the guidance of the designer. The number of testing and/or sampling locations may not be sufficient to determine all the factors that may affect construction methods and costs. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

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This limitations statement is considered an integral part of this report.

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TABLES

APPENDICES

1 INTRODUCTION

The Sunshine Coast Regional District (SCRD) retained WSP Canada Inc. (WSP) to develop a Construction Environmental Management Plan (CEMP) for the rehabilitation works to the McNeil Lake Dam, Chapman Lake Dam and Edwards Lake Dam (referred to collectively as the “Project”; individually referred to as the “Site”).

The purpose of this CEMP is to assist the SCRD and its Contractor(s) in adhering to applicable environmental legislation by providing environmental requirements, standard protocols, and mitigation measures to reduce the potential for adverse environmental effects that could result from Project. Changes in the Project scope of work will require updates to the CEMP to reflect potential changes in environmental risks. An up-to-date copy of the CEMP will be kept on site for reference.

The specific objectives of this CEMP are to provide the following:

- Provide an overview of key environmental issues related to dam rehabilitation works.
- Identify relevant regulatory requirements.
- Identify responsibility for environmental management and structure.
- Identify best management practices (BMPs) and mitigation measures to mitigate, and where possible, avoid or reduce potential adverse effects to terrestrial and aquatic resources including species at risk and sensitive habitats.

This CEMP provides the template for the primary document to guide overall environmental management practices to be implemented during all phases of the Project. This CEMP, will include project specific information, is intended to be a “living” document and can be updated as new information becomes available.

2 PROJECT LOCATION CONSTRUCTION COMPONENTS AND SCHEDULE

2.1 PROJECT LOCATION

McNeil Lake Dam is located near Madeira Park, BC and Chapman Lake Dam and Edwards Lake Dam are both located within Tetrahedron Provincial Park, near Sechelt, BC (Appendix A, Figure 1).

2.2 CONSTRUCTION COMPONENTS

The SCRD is proposing to undertake improvements of three a reinforced concrete dam (McNeil Lake Dam, Chapman Lake Dam, and Edward Lake Dams).

- McNeil Lake Dam, originally built in 1965, is a reinforced concrete gravity dam, 18.3 m long and 4.0 m high that was raised by 0.9 m and four concrete buttresses installed in 1976.
- Chapman Lake Dam, originally built in 1978, is a reinforced concrete gravity dam, 35 m long and 3.7 m high and is founded on bedrock.
- Edward Lake Dam, originally built in 1991, is a reinforced concrete gravity dam, 11 m long and 5.5 m high.

During the 2020 Dam Safety Review (DSR), deficiencies and non-conformances of the dams were observed. To ensure the Dams comply to current Canadian standards, improvements to the dams are required. Table 2.1 provides a description of the proposed upgrade works for each Site.

Table 2.1 Proposed works and upgrades at each dam.

SITE NAME	PROPOSED WORK AND UPGRADES
McNeil Lake Dam	— Raising the steel walkway and platform above Inflow Design Flood (IDF) level with appropriate freeboard. The existing platform will be removed, with a new platform installed on concrete columns. — Revised access down to left bank of dam to suit new raised platform.−Replacement of handrail along right wing wall. — Replacement of existing stoplogs with new stoplogs and associated stoplog hoist rack. — Removal of existing low level outlet valve and replacement with new low level outlet gate, complete with beaver screen. — Erosion protection measures at the left abutment. — Security gate and fencing provide at and right and left ends of platform to restrict access onto the steel walkway and platform. — Installation of Standard Vertical Staff Gauge. — Provide signage in accordance with BC Dam Safety Regulations. — Undertake site investigations to confirm depth of bedrock at right abutment.

Chapman Lake Dam	— Dam strengthening. — Raising the existing steel walkway and platform above Inflow Design Flood (IDF) level with appropriate freeboard. — Installation of debris booms. — Erosion protection measures. — Modifications to low level outlet, — Security gate and fencing provide at and right ends of platform to restrict access onto the steel walkway and platform. — Installation of Standard Vertical Staff Gauge. — Provide signage in accordance with BC Dam Safety Regulations.
Edward Lake Dam	— Raising the existing steel walkway and platform above Inflow Design Flood (IDF) level with appropriate freeboard. — Installation of debris booms. — Replacement/modifications to stoplog lifters and low-level outlets. — Security gate and fencing provide at left ends of platform to restrict access onto the steel walkway and platform. — Installation of Standard Vertical Staff Gauge. — Provide signage in accordance with BC Dam Safety Regulations.

2.3 PROJECT SCHEDULE

The Project is anticipated to occur over a 3-month period in the summer of 2023. A detailed schedule outlining major phases of the Project should be detailed in the Contractor(s) Environmental Protection Plan.

Construction activities within the wetted perimeter of McNeil Lake, Chapman Lake and Edwards Lake will need to consider the below least risk fish timing window.

2.3.1 TIMING WINDOWS

2.3.1.1 *LEAST RISK TO FISH TIMING WINDOW*

The least risk to fish timing window for each Site is summarized below:

— McNeil Lake: August 1st to October 31st.

— Chapman Lake: August 1st to October 31st for Rainbow trout and June 15th to August 31st for Dolly varden

— Edwards Lake: As no fish are present there is no least risk period and work can occur anytime during the year.

Construction activity within the wetted perimeter of the above Sites will be required to occur within the least risk to fish timing window.

Refer to Section 6.2.1 for further details regarding protection of fish and fish habitat.

2.3.1.2 *WILDLIFE BIRD PROTECTION WINDOWS*

Timing windows for the protection of birds at all the Sites are as follows:

- The general bird-breeding season is March 1st to August 31st (BC MOE, 2014).
- The raptor-breeding window is January 1st to August 31st (BC, MOE, 2013).
- Nests of bald eagle, golden eagle, peregrine falcons, gyrfalcons, ospreys, and herons are protected year-round under the *Wildlife Act* (BC, MOE, 2013).

Timing window for protection of wildlife (amphibians, reptiles, mammals) surrounding McNeil Lake Dam are as follows:

- Avoid construction during amphibian breeding window for aquatic environments which is anticipated to be early spring until August before tadpole emergence.
- Avoid construction during the overwintering period when western painted turtle are potentially in a state of brumation in the soft lake substrate.

Refer to Section 6.2.5 for further details regarding protection of wildlife.

3 ENVIRONMENTAL SETTING

The information below is based on a review of the following assessment report completed for the Project:

- *Environmental Impact Assessment – McNeil Dam Improvements* (WSP, 2022a)
- *Environmental Impact Assessment – Upgrades to Chapman Lake and Edwards Lake Reinforced Concrete lake Dams* (WSP, 2022b)

A summary of existing environmental conditions is described below:

- McNeil Dam: McNeil Lake Dam controls water flow from McNeil Lake (Waterbody ID: 00741JERV) downstream into Haslam Creek (Watershed Code: 900-135300)
  - McNeil Lake (00741JERV) a man-made reservoir that contains Coastal Cutthroat Trout, and Threespine Stickleback.
  - Haslam Creek (900-135300) is a 3rd order watercourse which flows into the Malaspina Straight. According to provincial mapping and fisheries information, Haslam Creek contains Coastal Cutthroat Trout and Chum Salmon. Coastal Cutthroat Trout is a provincially blue-listed species and is a species of conservation concern. Based on the Fisheries and Oceans Canada (DFO) Aquatic Species at Risk map no critical habitat is present at the Site (DFO, 2022a).
- Chapman Lake Dam controls water flow from Chapman Lake (Waterbody ID: 00796JERV) and Chapman Creek (Watershed Code 900-120400). Chapman Creek is a 3rd order stream that flows into the Strait of Georgia and is designated as a sensitive creek in Schedule B of the *Water Sustainability Act*.
  - A series of falls downstream from the dam itself create impassable barriers upstream to fish.
  - Chapman lake has historical records for presence of Dolly varden and Rainbow trout, the latter captured in a small tributary upstream of the Lake.
  - Downstream of Chapman Lake and below the fish barriers eight species including seven salmonids have been recorded.
- Edwards Lake Dam controls water flow from Edwards Lake (Waterbody ID: 00779JERV) into a small unnamed tributary that flows to Chapman Creek.
  - Edwards Lake and the small downstream tributary has no historical fish records available and may be due to the presence of fish barriers downstream.

Mitigation measures as described below will be implemented to reduce potential effects of the dam rehabilitation works to McNeil Lake, Chapman Lake, and Edwards lake.

4 REGULATORY CONTEXT

The SCRD and the Contractor(s) will adhere to all laws and regulations of the federal, provincial, and municipal bylaws and guidelines. Where such requirements have not been identified by the CEMP, it is the responsibility of the Contractor to ensure they have obtained the necessary permits and approvals. The Contractor shall ensure that copies of all permits and approvals are always available on site.

The following are key provincial and federal approvals/permits that have/will be obtained for the Project:

- A DFO Request for Review application has been submitted to DFO for each Site on February 7, 2023.
  - A Letter of Advice (LoA # 23-HPAC-00145) was received on April 11, 2023, for the works on McNeil Lake Dam. The terms and conditions of the Letter of Advice must be followed during construction (Expires April 11, 2024).
  - A Letter of Advice (LoA # 23-HPAC-00153) was received on April 25, 2023, for the works on Chapman Lake Dam. The terms and conditions of the Letter of Advice must be followed during construction (Expires April 25, 2024).
  - A Letter of Advice (LoA # 23-HPAC-00151) was received on April 25, 2023, for the works on Edwards Lake Dam. The terms and conditions of the Letter of Advice must be followed during construction (Expires April 25, 2024).
- An application for a Change Approval has been submitted to the Ministry of Forest lands and Natural Resource Operations (MOF) for the Project on August 16, 2022. A response from MOF has not been obtained; however, the terms and conditions of the Approvals will be followed during construction.

Relevant regulatory requirements pertinent to the Project are include in Table 4.1; however, this list is not exhaustive, and the Contractor should be aware that other acts, regulations and guidelines may apply.

Table 4.1 Summary of Applicable Federal and Provincial Legislation

LEGISLATION	PURPOSE	RELATIONSHIP TO PROJECT
Federal		
Fisheries Act (1985), 2019 amendment	The *Fisheries Act* (1985) provides provisions for protection of fish and fish habitat including freshwater and marine fisheries resources. The 2019 amendment restores the prohibition against HADD of fish habitat (Subsection 35[1]) and protects all fish species and their life stages [Subsection 34.4[1]). The introduction of deleterious substances, such as soils, sediments, hydrocarbons, contaminated materials, or hydraulic fluids into any watercourse would be considered unlawful under Section 36 of the Act (Government of Canada [GOC], 1985).	As not all measures to protect fish and fish habitat can be complied with during the proposed rehabilitation works the *Fisheries Act* applies and a Request for Project Review application to DFO was submitted for each Dam on February 7, 2023. No work can occur until approval under the *Fisheries Act* has been obtained. DFO's measures to protect fish and fish habitat (DFO, 2022b) and any conditions of the approvals from DFO will be implemented to protect fish and fish habitat.
Migratory Birds Convention Act	The *Migratory Birds Convention Act* (1994) implements an internationally recognized convention between Canada and the United States to protect various species of migratory game birds, migratory insectivorous birds, and migratory non-game birds. This Act prohibits disturbance and	Due diligence will need to be demonstrated during vegetation clearing and grubbing to reduce the risk of incidental take (i.e., inadvertent destruction of migratory birds, their nests or eggs). This may include applying

	destruction of migratory birds, their nests or eggs and the deposition of substances harmful to migratory birds. The Migratory Birds Regulations and the Migratory Birds Sanctuary Regulations protect migratory birds under this Act (GOC, 1994).	timing windows, completing bird nest surveys, and establishing setback buffers around active nests. No permits or approvals are anticipated to be required.
Species at Risk Act (SARA)	The *Species at Risk Act* (2002) protects Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, provides for the recovery of endangered or threatened species, and encourages the management of other species to prevent them from becoming at-risk. It is prohibited to kill, harm, harass, capture, or take wildlife listed as Extirpated, Endangered or Threatened under this Act. The Act prohibits damage to residences or critical habitat of listed species and applies only on federal land with the exception of aquatic species and migratory birds listed in the federal *Migratory Birds Convention Act*, 1994. In some circumstances, the federal prohibitions can be applied to other species on private or provincial Crown land if it is deemed that provincial or voluntary measures do not adequately protect a species and its residence (GOC, 2002).	All three sites are located within designated critical habitat for Marbled Murrelet and McNeil Lake dam is also located within designated critical habitat for Western painted turtle. Due diligence requires assessment and measures to protect at-risk species and their habitat. Permits would be necessary for capture and relocation of any at-risk species on federal land. No permits are anticipated for the Project Works. Implementation of appropriate mitigation in Section 6 to protect these species will be required.
Provincial		
Environmental Management Act	Regulates the discharge or emission of effluent, waste or contaminants and requires spill reporting for certain substances. Prohibits causing pollution (Government of BC, 2003a).	Permits would be required for discharge or emission of effluent, waste or contaminants including pesticides and herbicides.
Integrated Pest Management Act	The *Integrated Pest Management Act* outlines regulations, prohibitions, restrictions, and permits for use of pesticides in BC (Government of BC, 2003b).	Permits may be required if pesticides are used to manage specific invasive plant species within the Project Area.
Weed Control Act	*The Weed Control Act* mandates a duty to control noxious weeds by landowners (Government of BC,1996a).	Requires the control of noxious weeds within the Project Area.
Water Sustainability Act	The *Water Sustainability Act* ensures that water quality, quantity (i.e., for licensed users), and riparian habitat are not compromised when there are changes in and about a stream (includes a lake, pond, river, creek, spring, ravine, gulch, wetland or glacier, whether or not usually containing water, including ice, but does not include an aquifer). The release of debris, refuse, carcasses, human or animal waste, pesticides, fertilizers, contaminants, or another matter of substance is prohibited unless authorized under this enactment or another. (Government of BC, 2014).	The proposed rehabilitation works require a Change Approval for changes in and about a stream under Section 11 of the WSA. No work can occur until approval under the WSA has been obtained.
Wildlife Act	The BC *Wildlife Act (1996)* protects wildlife and wildlife habitat in British Columbia by identifying wildlife areas, defining human interactions with wildlife, and regulating hunting, trapping and angling. Section 34 of the *Act* prohibits possessing, taking or destroying (Government of BC, 1996b): (i) a bird or its egg, (ii) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or	If vegetation clearing is to occur within the breeding bird window (1 March – 30 August; BC MOE, 2014a), a bird nest survey should be completed by a Qualified Environmental Professional to reduce the risk of inadvertent destruction of birds, their nests or eggs. Implementation of mitigation in Section 6 will be required to comply with the *Wildlife Act.*

	the nest of a bird not mentioned in (ii), when the nest is occupied by a bird or its egg unless authorized under permit.	

5 ROLES AND RESPONSIBILITIES

The project contact list for the works proposed in this CEMP is provided in Table 5.1. Additional details on responsibilities of each role are described below.

Table 5.1 Summary of Applicable Federal and Provincial Legislation

ROLE	COMPANY	PRIMARY CONTACT	EMAIL/PHONE
Owner	Sunshine Coast Regional District	Bryan Shoji	Bryan.Shoji@scrd.ca 604-212-1200
Engineer Lead	WSP	Rob Moore	Rob.Moore@wsp.com 604-601-6842
Contractor	TBD	TBD	TBD
WSP Environmental Contact	WSP	Mark Visser	Mark.Visser@wsp.com 780-410-6856
Environmental Monitor	TBD	TBD	TBD

5.1 OWNER (SUNSHINE COAST REGIONAL DISTRICT)

SCRD has overall responsibility for the administration of contracts, including their environmental requirements which includes the following:

- Overall responsibility for compliance with all environmental regulatory requirements.
- Delegates authority and communicates requirements as required on all aspects of the Project.
- Communicates directly with regulatory agencies, interested, and potentially affected First Nations, and public stakeholders, as required.
- Ensure that the Contractor is aware of the environmental requirements of the work and are trained and competent to implement them.
- Ensure effective environmental communication with the Contractor to ensure that environmental responsibilities and requirements are understood prior to the commencement of the Project and are implemented through tailboard and other meetings.

5.2 CONTRACTOR

The Contractor will be responsible for adhering to proposed environmental mitigation measures and regulatory requirements outlined in this CEMP and regulatory approvals. In meeting the environmental requirements of the Project, the Contractor will be required to:

- Confirm the on-site crew have an appropriate level of training and competency to perform the work.

- Evaluate effective communication to confirm the on-site crew are aware of the environmental issues and requirements, and their responsibilities are understood prior to the commencement of work.
- Implement appropriate work procedures and controls to prevent and/or reduce the potential for adverse environmental impacts.
- Inspect the work practices to evaluate adherence to regulatory and CEMP requirements.
- Appoint an Environmental Monitor (EM) to evaluate and report on compliance of the work procedures and practices with environmental requirements established in this CEMP.
- Develop a site-specific Environmental Protection plan in collaboration with the EM, to be reviewed and approved by the SCRD prior to construction.
- Verify that emergency spill response materials are available on site for immediate use and appropriately stocked.
- If emergency spill response is required, the Contractor will be responsible for implementation of spill response measures and implementation of spill clean up activities.
- In the event of release of deleterious substances, that requires Spill Reporting under the Spill Reporting Regulations (Government of BC, 2017). The Contractor will be responsible for reporting the spill to the Provincial Environmental Emergency Program (24-hour phone number: 1-800-663-3456) and documenting the clean up of the spill.
- Respond immediately and effectively to environmental incidents including leaks and spills.

5.3 ENVIRONMENTAL MONITOR (EM)

The EM will work under the supervision of a Qualified Environmental Professional (QEP) with experience reviewing construction activities near environmental sensitivities. Responsibilities of the EM include the following:

- The EM in collaboration with the Contractor will need to develop a site-specific Environmental Protection Plan to be reviewed and approved by the SCRD prior to construction.
- Attend pre-job and/or tailboard meetings and communicate environmental sensitivities and environmental requirements of the work to on-site crew.
- Monitor the Contractors adherence to environmental requirements and evaluate the effectiveness of the mitigation measures being implemented.
- Available to be on site fulltime during works within 30 m of any watercourse to monitor that there are no Project interactions with McNeil, Chapman or Edward Lake and the associated environment.
    - If Operations are deemed to be low risk by the EM or QEP, monitoring can be decreased to part-time.
- Provide recommendations to the Contractor for installing and/or improving environmental controls and mitigation measures to avoid and reduce potential for environmental incidents.
- The EM has authority to stop work in circumstances that pose immediate risk to the environment or public or are in non-compliance with regulatory approvals.
    - Issuing of a stop work order must be immediately reported to the SCRD followed by a written report outlining the circumstances of the stop work order and any actions that were taken.
- Make visual observations during dam rehabilitation works and conduct water quality monitoring (as required).

- Provide the Contractor and SCRD (or there representative) with daily monitoring reports summarizing construction activities, implementation and effectiveness of mitigation measures and associated recommendations, any environmental incidents and non-compliant events, and corrective actions taken.

6 POTENTIAL EFFECTS AND MITIGATION MEASURES

6.1 POTENTIAL EFFECTS

Potential environmental effects that may be encountered during the rehabilitation works include the following:

- Potential effects on riparian and aquatic resources
- Increase in contaminant concentrations may occur from the accidental release of deleterious substances from construction equipment.
- Introduction of invasive plant species
- Direct/indirect effects to native vegetation
- Direct/indirect effects to listed wildlife species of conservation concern due to Project noise and human disturbance and changing water levels
- Attraction of wildlife to the work area due to garbage and / or food waste (e.g., bears).

6.2 ENVIRONMENTAL MITIGATION MEASURES

The following environmental mitigation measures should be implemented during the work activities to achieve compliance with the Project's environmental requirements:

6.2.1 FISH AND FISH HABITAT PROTECTION

The following mitigation measures to avoid the death of fish or the harmful alteration, disruption, or destruction (HADD) of fish habitat are to be implemented during the Project:

- Work should occur during the least-risk window for each Site described in Section 2.3.1.1.
- Schedule work to avoid wet, windy, or rainy periods.
- Limit vegetation removal and ground disturbance to as much as possible to carry out the works and delineate any riparian area setbacks or areas not to be cleared.
  - Utilize existing cleared areas for access, laydown/staging areas, etc. where possible.
- Avoid the release of deleterious or hazardous substances into watercourse or waterbody.
  - A release of a deleterious substance that enters or is likely to enter any waterbody or watercourse must be reported to the Provincial Environmental Emergency Program (1-800-663-3456) with appropriate follow up reporting.

- Erosion and sediment control (ESC) provisions will be implemented prior to construction and in accordance with DFO's *Measures to Protect Fish and Fish Habitat* (DFO, 2022b) and *Land Development Guidelines for the Protection of Aquatic Habitat* (DFO and BC MOE, 1993).
- Ensure equipment arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, or soils from other sites.
- Equipment working adjacent to or in any waterbody shall operate using biodegradable hydraulic fluids or be inspected prior to the start of work and at the beginning of each shift to ensure they have no leaks.
- All equipment operating adjacent to any waterbody will require a spill kit and a larger spill kit will be present at the top of bank. The Contractor will be responsible for providing and deploying the spill response measures, if required. Appropriate quantities of spill kit supplies should be kept on site as appropriate for the volume of deleterious substance that are present, should an uncontrolled release occur.
- Refuel and wash equipment off site or at least 30 m away from the top of bank of waterbodies or watercourses.
- All work should take place from above the top of bank. If work is required to occur below the top of bank the following will be implemented:
  - Work should be completed in such a way to prevent bank instability.
  - The site should be isolated to avoid unnecessary impacts and sedimentation to the aquatic environment.
  - A fish salvage will be undertaken, by the EM, prior to any works taking place within an isolated area.
    - A Fish Collection permit from the appropriate regulatory authorities will be required prior to the fish salvage occurring.

The Contractor is responsible for maintaining conditions that protect the environment not only during active construction on the Site, but also during periods when the Contractor has suspended its construction activity for any reason. The EM will monitor any turbidity plumes (visual and with a turbidity meter) and hydrocarbon sheens (visual) at the sites.

Requirements for Total Suspended Solids (TSS) in site runoff water are outlined in the *Land Development Guidelines for the Protection of Aquatic Habitat* (Chilibeck et al.,1993). Visual assessment and *in-situ* measurements will be taken upstream and downstream of the Project Area to provide background levels for comparison. Turbidity will be used as a substitute measure for suspended solids. If sediment-laden water is encountered as a result of construction work and/or environmental incidents, and if turbidity levels exceed the thresholds outlined in Table 6.1 below, the EM will inform the Contractor(s) and corrective measures will be implemented. A turbidity meter will be available on-site during the work.

Table 6.1 BC Summary of Water Quality Guidelines for Freshwater Aquatic Life [1]

PARAMETER	MAXIMUM ALLOWABLE
Turbidity	— Change from background of 8 NTU at any one time for a duration of 24 hours in all waters during clear flows or in clear waters — Change from background of 2 NTU at any one time for a duration of 30 days in all water during clear flows or in clear waters

	— Change from background of 5 NTU at any time when background is 8 to 50 NTU during high flows or in turbid waters — Change from background of 10% when background is >50 NTU at any time during high flows or in turbid waters
Suspended Solids	— Change from background of 25 mg/L at any one time for a duration of 24 hours in all waters during clear flows or in clear waters — Change from background of 5 mg/L at any one time for a duration of 30 days in all waters during clear flows or in clear waters — Change from background of 10 mg/L at any time when background is 25 to 100 mg/L during high flows or in turbid waters — Change from background of 10% when background is >100 mg/L at any time during high flows or in turbid waters
pH[2]	— Restricted changes in pH where background levels are less than 6.5. No statistically significant decrease in pH from background levels are permitted — Unrestricted change in pH within the range of 6.5 to 9.0 — Restricted changes in pH where background levels are greater than 9.0. No statistically significant increase in pH from background levels are permitted.

[1] Source: Tables 30, 44; NTU - nephelometric turbidity units;[2] Statistical significance is determined as outlined in Table 30 footnotes (British Columbia Ministry of Environment and Climate Change Strategy, 2021)

6.2.2 SOIL MANAGEMENT

Although it is unlikely that soil will be removed and stockpiled during the Project, proper soil storage must be implemented. The following mitigation will be implemented where soil handling or storage of uncontaminated soil is anticipated:

- Uncontaminated soil may be temporarily stockpiled on-site in a location that minimizes the risk of sediment entering any surrounding ditches, drainages, watercourses or waterbodies.
  - Erosion and sediment controls (ESC) will be installed by the Contractor around all soil stockpiles and inspected daily.
  - If soil material is to be stockpiled for more than seven days or during periods of rainfall or wind, it will be covered with polyethylene sheeting that is anchored securely to prevent displacement by wind or migration from the bottom.
  - Stockpiles will be located greater than 15 m from the top of bank of any waterbody.
- If stockpiles become a source of siltation within any ditches, drainages, watercourses or waterbodies, the Contractor must immediately remedy the siltation as necessary to the satisfaction of the EM.
- Should area constraints at the Sites be identified, the Contractor will complete a site-specific Soil Management Plan to determine appropriate locations for potential stockpiles prior to any soil stockpiling or soil removal activities.

If contaminated soils are uncovered during construction activities, the soil must be handled, transported, and disposed of in accordance with the BC *Environmental Management Act* and its Regulations (Contaminated Sites Regulation and Hazardous Waste Regulation), and the federal Canadian Council of Ministers of the Environment (CCME) Guidelines and Transportation of Dangerous Goods (TDG)

Regulations (GOC, 2001). The Contractor(s) must not remove surplus soil from the Sites before the EM has assessed the proposed soil disposal location.

If soil odour, debris, discolouration and/or water sheen is encountered during construction activities, the Contractor(s) must:

- Stop work and contact the SCRD and EM immediately to report the location and nature of the suspected contamination;
- Under the supervision of an appropriately trained Environmental Professional (or delegate), segregate these soils from potentially un-contaminated soils during excavation;
- Arrange with EM for sampling, analysis, and removal/disposal options of the contaminated soils;
- Stockpile soils on polyethylene sheeting (6 mil or greater) at least 30 metres from any ditch, drainages and/or other waterbodies;
- Cover each pile with polyethylene sheeting to prevent erosion, silt and/or contaminant runoff.
- If stockpiling the soil is not possible, the EM will arrange for the soils to be handled as inferred contaminated. The suspect soils will be removed from site by a licensed carrier for direct transport to a permitted facility.
- The contractor(s) must be prepared with the following materials in the event that contaminated soil and/or water is encountered:
  - Six mil (or greater) polyethylene sheeting to place contaminated soils on, and cover the soils with;
  - Sufficient, non-erodible ballast material to secure the polyethylene sheeting on the contaminated soil;
  - Ample oil absorbent materials;
  - Shovels;
  - Waterproof drums

6.2.3 EROSION AND SEDIMENT CONTROL

Any work with the potential for ground disturbance has the potential to result in increased suspended sediment which may affect fish and fish habitat. The following mitigation will be implemented where ground disturbance is anticipated:

- Utilize existing access routes, where possible.
  - Access route and work areas shall be clearly marked such that adjacent riparian vegetation is not disturbed.
  - Vehicles/equipment will be restricted to designated work areas and access routes
- ESC will be implemented by the Contractor prior to the start of construction activities.
  - ESC measures will be inspected daily by the Contractor. Damaged or ineffective ESC measures will be repaired or replaced within 24 hours, as required
  - ESC measures, if installed, will be removed from site when no longer needed.
  - Additional ESC materials will be stockpiled on site for use in any emergency situation that may arise
- Sandbags will be available to create check dams and/ or containment berms around the work areas. Pumps will be available to drain water within the work area if necessary.

  - Sediment-laden water will be pumped into a vegetated settling area away from any waterbody.
- Work will be suspended during intense rainfall events or whenever surface erosion occurs that may potentially affect conditions downstream.
- If ground disturbance occurs, temporarily disturbed areas will be graded, contoured, and seeded, following completion of the works to promote re-vegetation and to reduce surface erosion and/or proliferation of invasive weeds.
- Exposed areas will be stabilized and reseeded with native plants as quickly as is feasible to reduce erosion potential.

6.2.4 MATERIALS STORAGE, HANDLING AND WASTE MANAGEMENT

Cleanup of the site will be an ongoing process. Contractor(s) will, at all times, keep the work site free from accumulations of waste materials or rubbish caused by employees or by works. All garbage and recycling containment will be animal proof. Upon completion of work activities, the Contractor(s) will remove and properly dispose of all temporary structures, rubbish, and waste materials resulting from the operation.

The following mitigation measures will be implemented on-site by the Contractor(s), as required:

- All reasonable efforts will be made to reduce, reuse and/or recycle to reduce the amount of material being disposed of. All wastes will be disposed of in compliance with applicable legislation such as the *BC Environmental Management Act*.
- Hazardous waste registration, storage, permit and transportation requirements will be met, if applicable, and waste materials will be removed from the Project Area as soon as possible in accordance with applicable standards and regulations.
- If activities involve the handling, storage, and removal of hazardous wastes, the following records will be maintained: (1) Inventories of types and quantities of Hazardous Wastes generated, stored, or removed; (2) Manifests identifying Hazardous Waste haulers and disposal destinations; and (3) Disposal certification documents.
- Contractor(s) will be responsible for maintaining Safety Data Sheets (SDS) for all products used on the Project.
- Temporary sanitary facilities in the form of portable toilets will be provided during the Project. Sanitary facilities will be secured so they do not fall over and located in an area greater than 30 m from any watercourse or waterbody.
- If suspected contaminated materials are found during the works, they will be managed in accordance with the *BC Environmental Management Act* and Regulations.

The following mitigation measures will be implemented specifically for use of hydrocarbon-based materials:

- Plastic containers used to carry petroleum products will be designed for that purpose and will not be more than five years old.
- Containers will be fitted with a proper fitting cap or lid.
- All containers containing hydrocarbon products will be labelled and transported according to the Transportation of Dangerous Goods Regulations.
- Containers under 23 L (5 gallons) will be stored and transported in the equipment box of a vehicle that can contain the total quantity of the fuel in the container will it leak or spill.

- Containers greater than 23 L (5 gallons), including 205 L (45 gallon) drums, must be transported upright, and secured to prevent shifting and toppling.

6.2.5 TERRESTRIAL RESOURCE MANAGEMENT

The following mitigation measures will be implemented to prevent, reduce, or manage potential effects on terrestrial resources (wildlife and vegetation):

- The amount of new disturbance and tree clearing should be reduced where possible. Clearing boundaries should be clearly marked, and vegetation outside the work area should not be disturbed.
  - Use existing access routes and laydown areas where possible.
- No tree removal is anticipated during the Project. If tree removal is required, removal activities will be reviewed by the EM prior to removal to minimize impacts and ensure the appropriate permitting is in place as per the Tree Replacement Criteria (MELP, 1996)
- Vegetation clearing and grubbing activities at the Sites should be conducted within the appropriate "least risk windows" outlined in D*evelop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (BC MOE, 2014) to reduce potential contravention of Section 34 of the BC *Wildlife Act*, and concurrently, the federal *Migratory Birds Convention Act* for the protection of migratory birds and their nests. Where vegetation clearing and grubbing activities cannot happen within the least risk windows, pre-clearing bird nest surveys should be completed by a biologist with experience conducting these surveys. "Least risk windows" as defined by the *Develop with Care 2014* document (BC MOE, 2014) and presented in Section 2.3.1.2
  - Bird nesting window: March 1 – August 31st.
  - Raptor nesting window: January 1 – August 31st.
- Park equipment away from trees. Establish Tree Protection Zones (TPZ) if equipment is anticipated to be parked off existing access routes.
- Where vegetation is removed, native vegetation should be planted/seeded as soon as possible
- Food waste, garbage, refuse, and construction materials that could attract wildlife will be stored in an appropriate containment or removed from the Sites daily.
- Implement standard construction practices to minimize noise generation and air emissions.
- The Contractor will comply with posted driving speeds and be observant for wildlife that may cross roads or enter the Sites.
- Vehicle collisions with wildlife will be reported immediately to the EM.
  - Wildlife carcasses must not be moved or transported until permission is received from the local conservation officer (1-800-663-9453) except in the circumstances where it is required for a medical emergency or endangers personnel or road users' safety.
  - If wildlife carcasses are moved other than under the instruction of a Conservation Officer, their position and state prior to and post-moving must be documented.
  - Site personnel are reminded that carcasses or wounded animals frequently attract other, predatory, and scavenging wildlife, increasing the probability of wildlife encounters on-site.
  - Carcasses and remains located off-site but in the vicinity of the Project should, if identified, be reported as soon as possible to the EM, giving exact position and location directions, the EM will then be responsible for taking or initiating the requisite action.

— Other vegetation and wildlife-related encounters are to be reported within 24 hours to the EM and the SCRD.

In addition to the general mitigations provided above for vegetation management, a small occurrence of common spike-rush (*Eleocharis palustris*) is suspected of occurring at the McNeil Lake Dam site. Common spike-rush wetlands are a Blue listed ecological community in BC.

— Where work necessitates digging in this area, it is recommended vegetation and soils be carefully placed on tarps so that the perennial plants can be transplanted back in place following the work.
— Plants should be kept cool and moist to remain viable for transplanting.

6.2.6 INVASIVE PLANT MANAGEMENT

Introduction and proliferation of invasive plant species will be managed following measures provided below:

— Identify and flag locations of invasive plant species for avoidance during construction. Where feasible, construction should avoid areas where known or previous occurrences of invasive plants are recorded. The Contractor(s) will be required to establish a flagging convention and ensure all workers on-site understand the flagging colour for invasive plants and understand that these areas should be avoided.
— Limit disturbance of invasive plants where possible.
— All machinery, equipment, and vehicles arriving on site should be free of invasive plants, including plant parts and soil, prior to arriving on site and should be cleaned prior to leaving the Site.
— Inspect clothing and vehicle/equipment undercarriages for plant parts or propagules (i.e., seed heads, flowers) if working in an area known to contain invasive plants and document inspections.
— Limit soil disturbance to only those areas required for Project construction. Cover any exposed soil stockpiles with a tarp or geotextile to reduce invasive plant proliferation.
— Re-vegetate disturbed soils as soon as practical following disturbance with regionally appropriate, non-invasive, non-persistent seed mixtures or plants and use native species when possible
— Invasive plant species that are removed will be properly disposed of to prevent further invasion of naturally vegetated areas and to increase the chance of survival of future plantings.
— Material containing invasive plants should not be stored or piled at or near the site and should be disposed of at an acceptable licensed disposal facility located off-site, using applicable BMPs.

6.2.7 WILDFIRE PREVENTION AND RESPONSE

Under the BC *Wildfire Act*, a person who carries out an activity defined under the Act as “high risk” on or within 300 m of forest land or grass land between March 1 and November 1, unless the area is snow covered must determine the Fire Danger Class for the location of the activity. High risk activities include but are not limited to: Mechanical brush clearing and Operating power saws, grinders, or other fire or spark producing tools.

Under the Act, there are three steps to determine the restrictions associated with proposed high-risk activities:

1 Determine whether the proposed activities are considered “High Risk” as defined by the act.
2 Determine the fire danger rating at the location of the proposed work.

3 Based on the fire danger rating, determine whether there are restrictions on the proposed activities.

The follow mitigation measures are provided to aid in preventing wildfires:

- Avoid parking on vegetation;
- Smoke only in designated areas with a fire-proof receptacle available for disposal of butts. Remove receptacle from the Project area at the end of each day;
- Small engines must have spark arrestors;
- Maintain fire extinguishers with each piece of equipment. Inform all personnel of the location of fire extinguishers at the Project location;
- Ensure personnel are trained in the use of fire extinguishers;
- Fuel tanks should be stored at a sufficient distance from vegetation to minimize the risk of creating a secondary fire risk; and
- Determine whether the proposed work is considered a High-Risk activity under the BC *Wildfire Act*.
  - Implement all restrictions appropriate to the High-Risk activity (see section 6.2.7 for determining restrictions).

Wildfires must be reported to the BC Wildfire Service as soon as it is safe to do so. Report wildfires to: 1-800-663-5555 or *5555 on most cellular networks.

6.2.8 SPILL PREVENTION AND EMERGENCY RESPONSE PROCEDURES

The release of deleterious substances, such as contaminated wash water, diesel fuel and petroleum-based lubricants, can impact soil and water quality, aquatic birds, mammals, and fish as well as vegetation and other wildlife found in the Project area. The following spill prevention and emergency response measures will be implemented, where appropriate, throughout the Project:

- Prior to the commencement of construction activities, the Spill Response Procedures in Appendix B will be reviewed and updated (as required), including the names and telephone numbers of persons and organizations that may be contacted in the event of an environmental incident. The Spill Response Procedures will be made available at the worksite and will be posted in a location that is visible and accessible nearby the emergency response equipment in the event of an environmental incident.
- A release of a deleterious substance that enters or is likely to enter any watercourse or waterbody, and spills exceeding thresholds specified in the Spill Reporting Regulation must be reported to Environmental Management BC (1-800-663-3456). Immediately report all spills of deleterious substances, no matter how small, to the EM and to the Contractor's Site Supervisor.
- All equipment (excavators and trucks) and machinery (pumps) should be in good operating condition and free of leaks or excess oil and grease. If necessary, power-wash equipment prior to entering the site.
- Equipment should be inspected by the Contractor(s) prior to start up at the beginning of each day and any leaks identified should be dealt with immediately.
- A spill containment kit shall be readily accessible onsite in the event of an accidental release of a deleterious substance to the environment. Ensure all construction personnel are sufficiently trained in the location and use of spill prevention equipment. Any used spill clean-up materials should be replaced immediately, and an inventory of materials should be maintained throughout the duration of work activities within the Project Area.

- Equipment containing ethylene glycol (antifreeze), or other water-soluble chemicals will carry an appropriate number of water-soluble chemical absorbent pads in addition to absorbent pads used for petroleum products.
- Spills occurring on dry land will be contained, scraped, and stored for disposal upon project completion. Contaminated material will be stored on polyurethane tarps and covered to prevent mobilization and will be disposed of in accordance with the regulations outlined in the *BC Environmental Management Act* (Government of BC, 2003a) and *Spill Reporting Regulation* (Government of BC, 2017).
- A designated refuelling and maintenance area should be established at the Sites. Effective communication protocol should be followed to prevent accidental release or overfilling of the equipment, and equipment should not be left unattended during refuelling. This site shall be located at least 30 m from the any watercourse or waterbody.
- Any stationary equipment such as pumps or generators should have their own containment capable of holding 150% of the equipment's fluids, and mobile equipment parked for more than 24 hours should have drip trays placed beneath the equipment.
- Fuels and chemical products stored on site should be kept in a secure container and in a manner that prevents leaks, drips, and spills (i.e., containers standing upright with caps on tight).
- No bulk storage of fuel, oils, or other flammable and combustible products should occur on-site.
- Plastic containers used to carry petroleum products should be designed for that purpose, be leak free, sealed with a proper fitting cap or lid, be labelled, and should not be more than five years of age per the *Transportation of Dangerous Goods Act* (TDGA) (GOC, 1992) and Transportation of Dangerous Goods Regulations (GOC, 2001).
- Transportation of hydrocarbons to, and within, the construction areas should be in conformance with the requirements of the TDGA.
- Containers greater than 23 litres (L, 5 gallons), including 205 L (45 gallon) drums, should be transported upright, and secured to prevent shifting and toppling.
- Used oil, filters, and grease cartridge lubrication containers and other products of equipment maintenance should be collected and kept in a secure receptacle for later disposal.
- No ignition sources should be permitted within the fuelling area.
- The Contractor(s) will maintain a list of Safety Data Sheets (SDS) for all materials used by the Contractor in performing the construction activities and for materials that potentially could be spilled or found on the Site.
- To limit the likelihood of a concrete release, the cleaning of concrete trucks shall not occur on the worksite.

6.2.8.1 *SPILL RESPONSE GUIDELINES*

In the event of any release of fuel, lubricant, sludge, or other industrial chemical (including gases), the Contractor must immediately suspend activities, and implement the Emergency Spill Response Procedure in Appendix B. Additionally:

- The Contractor shall immediately notify the SCRD and the EM. If the environmental emergency is a reportable spill in quantities equal to or greater than those listed in the Spill Reporting Regulations under the BC *Environmental Management Act*, the Contractor shall immediately notify the EMBC, DFO, and Environment Canada (Appendix B).

- The Contractor shall submit written incident reports to the SCRD within 24 hours of any environmental incident or spill/release. The incident report shall identify the reporting organization, date, time, location, hazardous materials involved, source and persons or organizations notified. In addition, the report shall describe how the spill or release occurred, remedial action taken or planned, and actions necessary to prevent recurrence.
- The Contractor will be responsible for ensuring personnel are competent to adequately respond to a spill.

6.2.8.2 *SPILL REPORTING*

All spills, regardless of volume, and other environmental incidents, must be reported to the SCRD and the EM. In addition to reporting internally to the SCRD and the EM, the Contractor is responsible for ensuring personnel know when to notify regulatory agencies. Incidents where reporting to regulatory agencies is required are shown in the Spill Response Plan in Appendix B.

It is the responsibility of the Contractor and the SCRD to report spills in excess of the quantities included in Appendix B to the appropriate environmental agency. It is the responsibility of SCRD to report applicable spills and other environmental incidents internally.

*****ALL SPILLS TO WATER ARE REPORTABLE*****

*****ALL SPILLS TO STORM SEWER ARE REPORTABLE TO THE APPLICABLE MUNICIPALITY AND/OR REGIONAL DISTRICT*****

The Contractor will ensure their staff are aware of and/or appropriately trained on their responsibilities of the environmental incident reporting requirements.

6.2.9 ARCHAEOLOGICAL AND HERITAGE RESOURCE MANAGEMENT

An archaeological site is a location where evidence of past human activity exists. Archaeological sites are the only physical evidence for 98% of the past history of BC. BC recognizes the importance of these sites and controls damaging activities by protecting them by law and requiring a permit to develop within site boundaries. Damaging an archaeological site without a permit is unlawful. Some examples of an archaeological site include stone carvings, remains of ancient houses and campsites, shell middens, culturally modified trees, and early trading posts. Items of interest that may be uncovered during construction activities include human bones, pithouses, stone tools and rock paintings (pictographs).

Archaeological sites (both recorded and unrecorded) are protected under the *Heritage Conservation Act* and must not be altered or damaged without a site alteration permit from the Archaeology Branch. In the event that archaeological material is encountered during construction activities, work must be halted immediately pending archaeological investigations. The Contractor should immediately inform the SCRD and the EM and the Archaeology Branch should be contacted for direction.

7 CLOSURE

We trust the information contained in this report is sufficient for your present needs. Should you have any additional questions regarding the Project please do not hesitate to contact Mark Visser (780-410-6856) or Michael Taylor (778) 836-2677.

8 REFERENCES

British Columbia Ministry of Environment and Climate Change Strategy. 2021. *British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture – Guideline Summary*. Water Quality Guideline Series, WQG-20. Prov. B.C., Victoria, BC.

BC MOE. 2013. *Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia*. [accessed February 2023]. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/raptor_conservation_guidelines_2013.pdf

BC MOE. 2014. *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development In British Columbia*. [accessed February 2023]. https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/laws-policies-standards-guidance/best-management-practices/develop-with-care

Chilibeck B, Chislett G, Norris G. 1993. *Land Development Guidelines for the Protection of Aquatic Habitat*. Produced by DFO and MOE. [accessed February 2023]. http://www.sxd.sala.ubc.ca/9_resources/fed_%20files/fed%20land%20development%20guidelines.pdf

DFO. 2022a. *Aquatic Species at Risk Map* [accessed February 2023]. Available at: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

DFO. 2022b. *Measures to protect fish and fish habitat*. [accessed February 2023] Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html.

DFO and BC MOE. 1993. Land Development Guidelines for the Protection of Aquatic Habitat. Produced by DFO and MOE. [accessed September 2022]. Available at: http://www.sxd.sala.ubc.ca/9_resources/fed_%20files/fed%20land%20development%20guidelines.pdf

Government of BC. 1996a. BC *Weed Control Act, 1996. R.S.B.C. 1996, c. 487.* Current to 14 December 2022. Victoria BC: King's Printer. [accessed February 2023]. https://www.bclaws.ca/civix/document/id/complete/statreg/96487_01

Government of BC. 1996b. BC *Wildlife Act, 1996. R.S.B.C. 1996, c. 488.* Current to 23 November 2022. Victoria BC: King's Printer. [accessed February 2023]. https://www.bclaws.ca/civix/document/id/complete/statreg/96488_01

Government of BC. 2003a. *Environmental Management Act, 2003. S.B.C. 2003, c. 53.* Current to 23 November 2022. Victoria BC: King's Printer. [accessed February 2023]. https://www.bclaws.ca/civix/document/id/complete/statreg/03053_00

Government of BC. 2003b. *Integrated Pest Management Act, 2003*. S.B.C. 2003, c. 58. Current to 23 November 2022. Victoria BC: King's Printer. [accessed January 2023]. https://www.bclaws.ca/civix/document/id/complete/statreg/00_03058_01

Government of BC. 2014. *Water Sustainability Act, 2014. S.B.C. 2014, c. 15.* Current to 23 November 2022. Victoria BC: King's Printer. [accessed February 2023]. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/14015#section32

Government of BC. 2017. *Environmental Management Act, Spill Reporting Regulation*. 2017. Current to 20 December 2022. Victoria BC: King's Printer. [accessed February 2023]. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/187_2017

Government of Canada. 1985. Fisheries Act, 1985. R.S.C., 1985, c. F-14. Current to November 2022. Ottawa ON: Minister of Justice. [accessed February 2023]. https://laws-lois.justice.gc.ca/eng/acts/f-14/

Government of Canada. 1992. *Transportation of Dangerous Goods Act, 1992*. S.C. 1992, c. 34. Assented to 23 June 1992. Current to November 2022. Ottawa ON: Minister of Justice. [accessed February 2023]. https://laws-lois.justice.gc.ca/eng/acts/t-19.01/FullText.html

Government of Canada. 1994. Migratory Birds Convention Act,1994. S.C. 1994, c. 22. Current to November 2022. Ottawa ON: Minister of Justice. [*accessed February 2023*]. https://laws-lois.justice.gc.ca/eng/acts/m-7.01/page-1.html.

Government of Canada. 2001. *Transportation of Dangerous Goods Regulations. SOR/2001-286 under the Transportation of Dangerous Goods Act, 1992*. Current to November 2022. Ottawa ON: Minister of Justice. [accessed February 2023]. https://laws-lois.justice.gc.ca/eng/regulations/sor-2001-286/

Government of Canada. 2002. *Species at Risk Act, 2002. S.C. 2002, c. 29.* Current to November 2022. Ottawa ON: Minister of Justice. [*accessed February 2023*]. https://laws.justice.gc.ca/eng/acts/S-15.3/

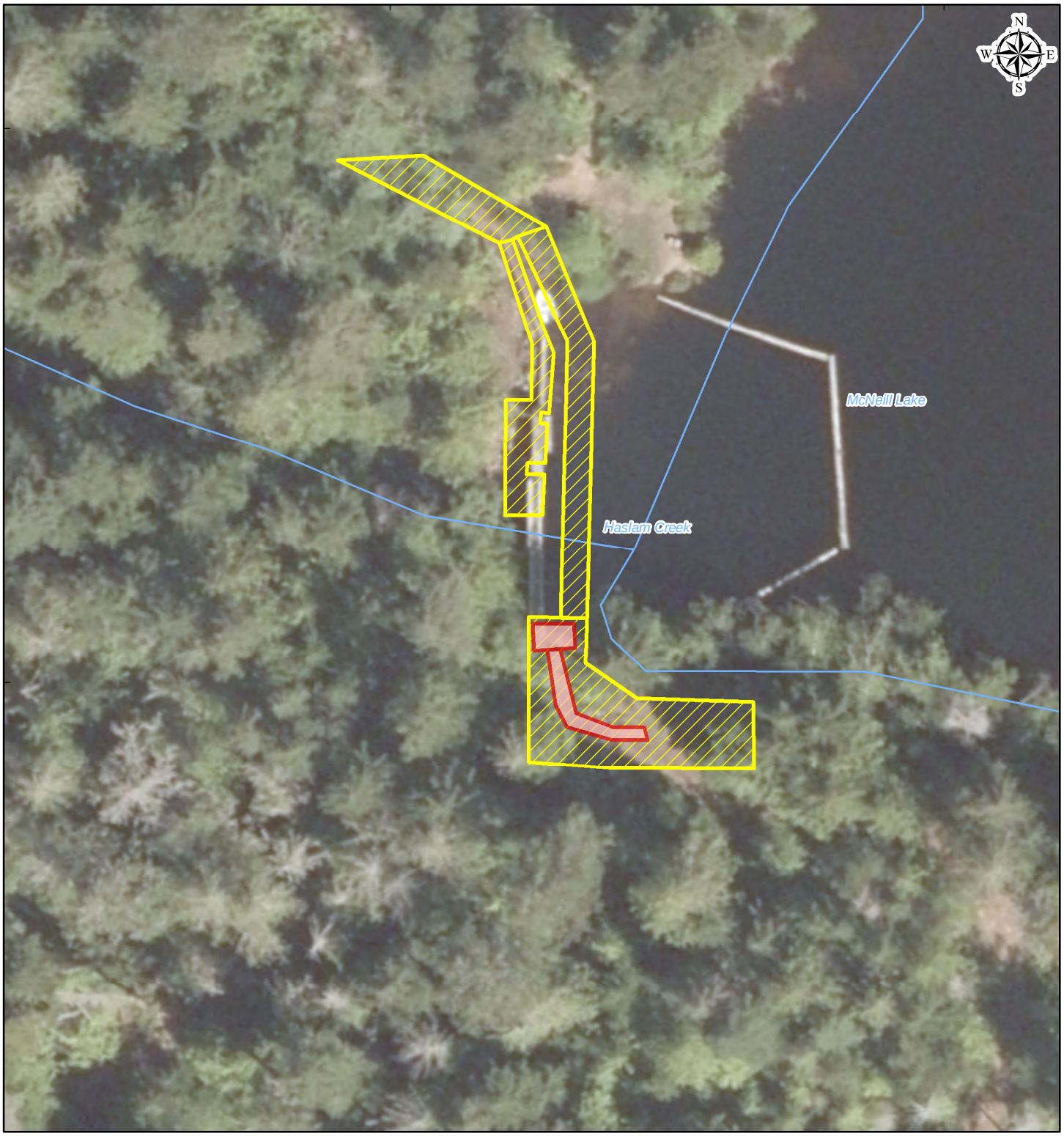
MELP. 1996. *Tree Replacement Criteria*. 1 pp. [accessed February 2023]. http://www.env.gov.bc.ca/wld/documents/bmp/treereplcrit.pdf

WSP Canada Inc. 2022a. *Environmental Impact Assessment – McNeil Dam Improvements*. Prepared for Sunshine Coast Regional District.

WSP Canada Inc. 2022b. *Environmental Impact Assessment – Upgrades to Chapman Lake and Edwards Lake Reinforced Concrete lake Dams*. Prepared for Sunshine Coast Regional District.

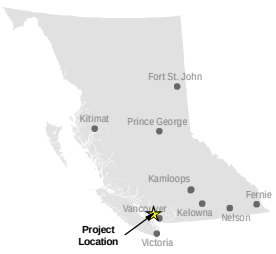
APPENDIX

A SITE FIGURES



Legend

- Watercourse
- Waterbody
- Temporary Ground Disturbance
- Permanent Ground Disturbance



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References:
Data BC - BC Catalogue
Open Government License
(http://www.data.gov.bc.ca/)
NRCAN Geogratis
Open Government License
(http://geogratis.cgdi.gc.ca/)

CLIENT:
Sunshine Coast Regional District

PROJECT:
Upgrades to Reinforced Concrete Lake Dams

TITLE:
McNeil Lake Dam
Temporary and Permanent Ground Disturbance

DATE:	PROJECT NO:	
July 12, 2022	211-09410-00	**Figure 1**

GIS FILE: 01-01-015_McNeil_Dam_Ground_Disturbance.mxd

COORDINATE SYSTEM:	ANALYST:	REVIEWED:
NAD 1983 UTM Zone 10N	MY	TG

wsp

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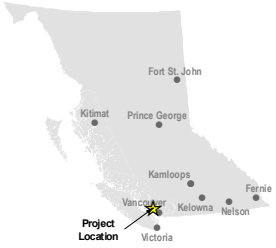
Legend

- Chapman Dam Location
- Populated Place
- Watercourse
- Waterbody
- Park
- Permanent Ground Disturbance
- Temporary Ground Disturbance



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Meters
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References:
Data BC - BC Catalogue
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NRCAN Geogratis
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(http://geogratis.cgdi.gc.ca/)

CLIENT: Sunshine Coast Regional District

PROJECT: Upgrades to Reinforced Concrete Lake Dams

TITLE: Chapman Lake Dam
Temporary and Permanent Ground Disturbance

DATE:	PROJECT NO:	
February 24, 2023	211-09410-01	**Figure 2**

GIS FILE: 01-01-002_Chapman_Dam_Temporary_and_Permanent_Ground_Disturbance.mxd

COORDINATE SYSTEM:	ANALYST:	REVIEWED:
NAD 1983 UTM Zone 10N	KP	MV

wsp

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Legend

- Edwards Dam Location
- Populated Place
- Waterbody
- Temporary Ground Disturbance

0 10 20 30 40 50 Meters

Scale: 1:2,000

References:
Data BC - BC Catalogue
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NRCAN Geogratis
Open Government License
(http://geogratis.cgdi.gc.ca/)

CLIENT:	Sunshine Coast Regional District
PROJECT:	Upgrades to Reinforced Concrete Lake Dams
TITLE:	Edwards Lake Dam Temporary and Permanent Ground Disturbance
DATE:	February 24, 2023
PROJECT NO:	211-09410-01
	Figure 3
GIS FILE:	01-01-003_Edwards_Dam_Temporary_and_Permanent_Ground_Disturbance.mxd
COORDINATE SYSTEM:	NAD 1983 UTM Zone 10N
ANALYST:	KP
REVIEWED:	MV

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APPENDIX

B SPILL RESPONSE PLAN

SPILL RESPONSE PLAN

1.1 SPILL REPONSE STEPS

In the event of spilled fuel, oils, lubricants or other harmful substances, the following procedure will be implemented.

Spill Response Steps

1. Ensure Safety
2. Stop the Flow (if possible and SAFE to do so)
3. Secure the Area
4. Contain the Spill
5. Notify and Report to the Sunshine Coast Regional District and Environmental Monitor
6. Notify (EMBC 1-800-663-3456) see table below for reportable spill volumes and flow chart below for reporting method
7. Cleanup

Circumstances may dictate another sequence of events

1. Ensure Safety
   - Ensure personnel, public and environmental safety
   - Wear appropriate Personal Protective Equipment (PPE)
   - Never Rush in, always determine the product spilled before taking action, refer to MSDS when available
   - Warn people in the immediate vicinity
   - If spilled material is flammable, ensure no ignition sources are nearby
2. Stop the Flow (If possible and SAFE to do so)
   - Act quickly to reduce environmental impacts
   - Close valves, shut off pumps, plug or block holes or leaks, and set containers upright
   - Stop the flow of the spill at its source
3. Secure the Area
   - Limit access to the spill area
   - Prevent unauthorized entry onto site and spill area
4. Contain the Spill
   - Block off and protect any ditches and culverts in the vicinity of the spill
   - Prevent spilled material from entering any drainage structures (ditches, culverts, drains)
   - Use spill absorbent material to contain spill
   - If necessary, use a dike, berm, or any other method to prevent any discharge off-site
   - Make every effort to minimize contamination
   - Contain the spill as close to the source as possible
5. Notify and Report

- Notify the SCRD and EM of incident (Table 2)
- **When necessary**, the first external call should be made to **Emergency Management BC 1-800-663-3456** (see spill reporting requirements in Table 1)
- Provide necessary spill details to other external agencies

1.2 REPORTABLE SPILL QUANTITIES BY PRODUCT TYPE

If the spill occurs that exceeds the following quantities, it must be reported externally (EMBC and Environment Canada).

Table 1 Reportable Spill Quantities by product

SUBSTANCE	QUANTITY	EXTERNAL REPORTING REQUIREMENT	INTERNAL REPORTING REQUIREMENT
Any Spill	Any amount in aquatic habitat	EMBC, DFO and MoE	Environmental Incident Report (EIR)
Gasoline, Diesel, Oil and Waste Oil	>100 litres	EMBC	EIR
Oil with >50 ppm PCB	>25 Kg or litres	EMBC	EIR
Flammable or Non-Flammable Gas	10 kg	EMBC	EIR
Flammable Liquids	100 litres	EMBC	EIR
Toxic Gas or Corrosive	≥ 5 litres or kilograms	EMBC	EIR
Hazardous waste containing PAHs	>5 kg or litres	EMBC	EIR
Pesticides and Herbicides	5kg or litres	EMBC	EIR
Leachable Toxic Waste (e.g., antifreeze)	≥25 litres or kilograms	EMBC	EIR
A substance not covered by Items 1 to 23 of the Spill Reporting Regulation that can cause pollution	200 kilograms or 200 litres	EMBC	EIR

* Quantities are subject to change. Refer to Regulations for latest figures

*****ALL SPILLS TO WATER ARE REPORTABLE*****
*****ALL SPILLS TO STORM SEWER ARE REPORTABLE TO THE APPLICABLE MUNICIPALITY AND/OR REGIONAL DISTRICT*****

1.3 SPILL KIT REQUIREMENTS

Spill kits and equipment, including absorbent pads, booms and leak-proof waste containers, will be provided by the Contractor(s) and be readily available on-site and on each piece of mobile equipment (*e.g.* Light trucks, excavators, backhoes, Bobcats, etc.) in the quantities required for the equipment being used and the quantities of fluids on-board. An equipment emergency spill kit should be kept fully stocked and include at a minimum:

- 50 Absorbent Pads (Oil, Gas & Diesel)

- 25 Universal Absorbent Pads (Antifreeze and Non-Hazardous)
- 6 – 3” x 4’ Absorbent Socks (Oil, Gas & Diesel)
- 4 – 3” x 8’ Absorbent Socks (Oil, Gas & Diesel)
- HD Hazmat Disposal Bags
- Minimum 10 pairs of Nitrile Gloves (sized for crew)
- 1 Spill Instruction Sheet

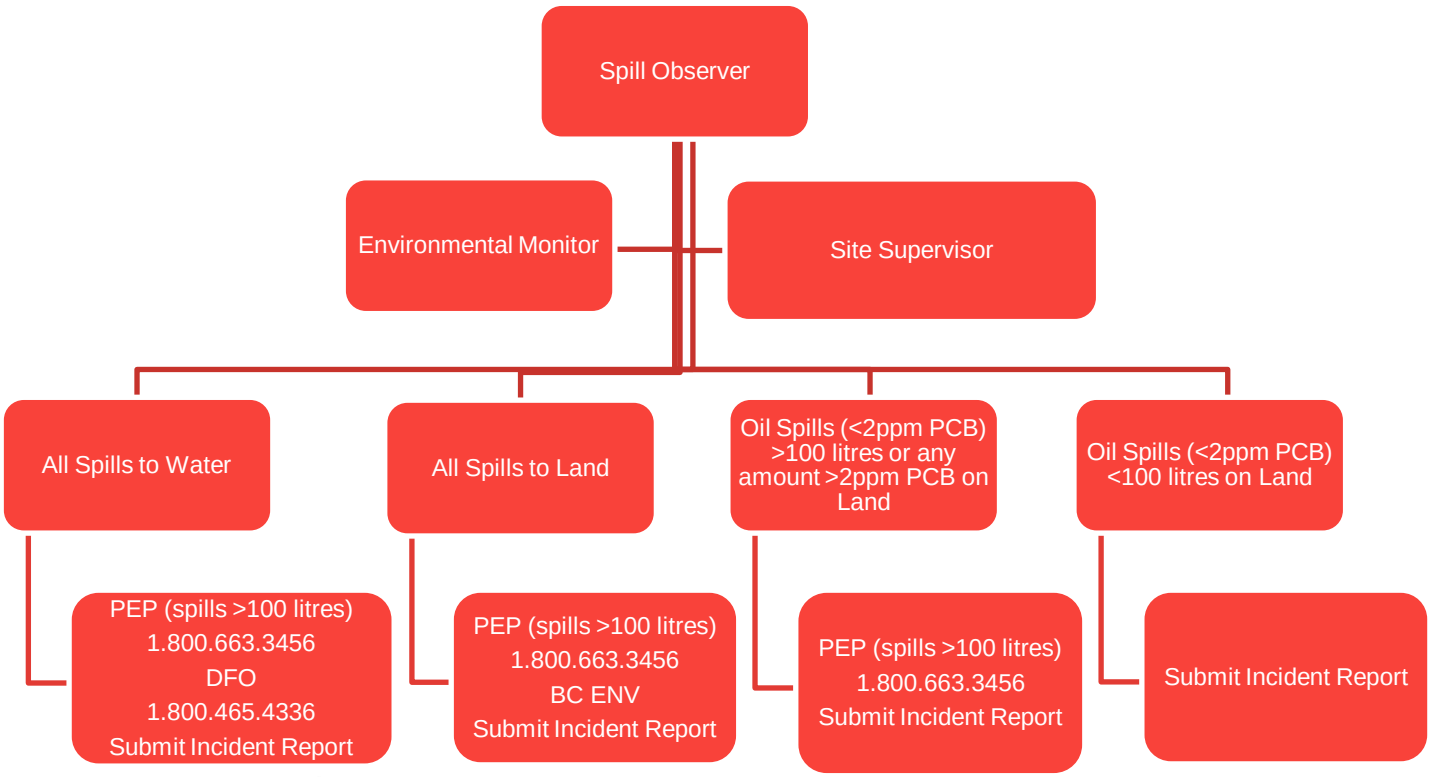
1.4 EMERGENCY CONTACT LIST

Contact the following in the event of any Environmental Emergency

Table 2 Emergency Contact List

CONTACT	NAME	OFFICE PHONE	MOBILE PHONE
Engineer Lead	David Daw	604 278-1411	604-601-6765
SCRD Contact	Stephen Misiurak	604 885-6800 ex 6494	
Subcontractor Contact	TBD	TBD	TBD
WSP Environmental Contact	Mark Visser	780-410-6856	780-271-6602
Environmental Monitor	TBD		
Emergency Management BC (EMBC)	1-800-663-3456		
DFO Spill Reporting Line	1-800-465-4336		
Environment Canada Environmental Emergencies	1-604-666-6100		
RCMP/Fire/Emergency	911		

SPILL RESPONSE FLOW CHART



Appendix F CCDC 18 Contract

(attached as a separate document)

Appendix G Supplementary General Conditions

Supplementary General Conditions

The Canadian Construction Documents Committee, Standard Construction Document CCDC 18 – Civil Works Contract, 2001, is hereby modified as follows:

GC 6.5 DELAYS

Section GC6.5 is amended by the addition of the following:

6.5.6 It is agreed by the Parties to the *Contract* that in case all the Work called for under the Contract is not finished by the completion date specified in the *contract* or as amended by the *Owner*, damage will be sustained by the *Owner*, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the Owner will sustain in the event of and by reason of such delay. The Parties therefore agree that the *Owner* may deduct from monies owing to the Contractor the sum of $2,500 per day, or all direct out-of-pocket costs, such as safety, security, or equipment rental, reasonably incurred by the Owner as a direct result of such delay, for Liquidated Damages for each and every calendar days delay in completing the Work beyond the date of completion prescribed and it is agreed that amount is an estimate of actual damage to the Owner which will accrue during the period in excess of the prescribed date of completion.

The Contractor shall not be assessed with Liquidated Damages for any delay caused by Acts of God, or of the Public Enemy, Act of the Owner, the Owner, or of any Foreign State, Fire, Epidemics, Quarantine Restrictions, Embargoes, or Delays of Sub-Contractors due to such causes. If the Contractor is delayed by reason of alterations or changes made under GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT, PART 6, GC 6.1 CHANGES, the t i m e of completion shall be extended as determined by the Owner in his sole discretion.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

Subsection GC 10.2 is amended by the addition of the following paragraph:

10.2.8 The Contractor will notify, obtain inspections and approvals from, and co-operate with other organizations involved or affected by the Work, such as telephone, light and power, gas, railway companies, government agencies.

Subsection GC 10.2 Subsection 10.2.4 is replaced with the following paragraph:

10.2.4 The *Contractor* shall give the required notices and comply with the laws, orders, ordinances, rules, regulations, or codes which are or become in force during the performance of the *Work* and which relate to the *Work*, to the preservation of the public health, and to construction safety.

GC 11.1 INSURANCE

Section GC11.1 subsection 11.1.3 is amended by the following:

Delete in its entirety:

“11.1.1.1 General Liability Insurance:

General liability insurance shall be in the joint names of the Contractor, the Owner, and the Consultant, with limits of not less than $2,000,000 per occurrence and with a property damage deductible not exceeding $2,500. The insurance coverage shall not be less than the insurance required by IBC Form 2100, or its equivalent replacement, provided that IBC Form 2100 shall contain the latest edition of the relevant CCDC endorsement form. To achieve the desired limit, umbrella, or excess liability insurance may be used. All liability coverage shall be maintained for completed operations hazards from the date of Substantial Performance of the Work, as set out in the certificate of Substantial Performance of the Work, on an ongoing basis for a period of 6 years following Substantial Performance of the Work. Where the Contractor maintains a single,

blanket policy, the addition of the Owner and the Consultant is limited to liability arising out of the Work and all operations necessary or incidental thereto. The policy shall be endorsed to provide the Owner with not less than 30 days notice in writing in advance of any cancellation, and of change or amendment restricting coverage."

Add / Replace with:

"11.1.1.1 General Liability Insurance:

General liability insurance shall be in the joint names of the Contractor, the Owner, and the Consultant, with limits of not less than $5,000,000 per occurrence and with a property damage deductible not exceeding $2,500. The insurance coverage shall not be less than the insurance required by IBC Form 2100, or its equivalent replacement, provided that IBC Form 2100 shall contain the latest edition of the relevant CCDC endorsement form. To achieve the desired limit, umbrella, or excess liability insurance may be used. All liability coverage shall be maintained for completed operations hazards from the date of Substantial Performance of the Work, as set out in the certificate of Substantial Performance of the Work, on an ongoing basis for a period of 6 years following Substantial Performance of the Work. Where the Contractor maintains a single, blanket policy, the addition of the Owner and the Consultant is limited to liability arising out of the Work and all operations necessary or incidental thereto. The policy shall be endorsed to provide the Owner with not less than 30 days notice in writing in advance of any cancellation, and of change or amendment restricting coverage."

END OF SECTION