Columbia River Project Water Use Plan

Arrow Lakes Reservoir Wildlife Management Plan

CLBWORKS-30A Cartier Bay Site 15a Engineering Services

Implementation Year: Final Report

Reference: CLBWORKS-30A

Construction Completion Report

Kerr Wood Leidal Associates Ltd.
Victoria, BC

June 21, 2024

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CLBWORKS 30A Cartier Bay Site 15a Engineering Services

Construction Completion Report

Final Report
June 21, 2024
KWL Project No. 0478.237

Prepared for:
BC Hydro and Power Authority

BC Hydro
Power smart

Contents

Figures

Tables

Appendices

1. Introduction

This report summarizes the construction of a number of water control structures at Cartier Bay Wetland, located within the drawdown zone of BC Hydro's Arrow Lake Reservoir approximately 10 km south of Revelstoke, BC. An overview of Cartier Bay is shown in Figure 2-1. The project is a part of the CLBWORKS 30A Lower Arrow Lakes Reservoir Wildlife Enhancement program that seeks to create, protect, or enhance habitat for nesting and migratory birds and wildlife.

Kerr Wood Leidal Associates Ltd (KWL) was retained by BC Hydro as the professional of record to provide engineering services to design measures to mitigate future erosion at the topographic low points along the Cartier Bay wetland's north bank, as well as lower the outlet at Site 15a such that it remains the preferential drainage path for water impounded in the wetland. KWL completed part time field reviews during the construction of the works, which were completed prior to inundation of the site by Arrow Reservoir in Spring 2023. Full time construction field review and contract administration was provided by BC Hydro. KWL also provided consultation support to BC Hydro to review contractor construction material quantity claims and provide post construction review and engineer of record support.

This report includes a summary of background information, engineering design, and construction. The report also includes preliminary recommendations for monitoring, with the understanding that an Operations and Maintenance (O&M) manual will be completed by BC Hydro in the future.

2. Background

2.1 Project Team

The project team for the design and construction is shown in Table 2-1.

Table 2-1: Cartier Bay Erosion Mitigation Project Team and Roles

Organization	Role	Personnel
Project Owner: BC Hydro	Project Manager	Mark Sherrington/Margo Sadler/Shelley Moss
	Contract Officer/Site Representative	Tysyn Olynyk
	Environmental Representative	Harry van Oort
	Owner's Engineer	Martin Lawrence/David Strajt
Contractor: IDL Projects Inc.	Contract Representative	Richard Elkington
	Site Superintendent	Scott Salle
Design Engineers: Kerr Wood Leidal Associates Ltd.	Engineer of Record	Liam Mackle
	Field Inspection	Kalie Siemens
	Technical Review & Project Management	Stefan Joyce

Layout and record survey was completed by PinPoint Surveying Ltd., who were subcontracted by IDL. Environmental monitoring during construction was completed by Associated Environmental Consultants Inc. Alpine Cranes were subcontracted by IDL to place the Armorflex mats.

2.2 Pre-Construction Condition

The Cartier Bay Wetland site is located in the drawdown zone of Arrow Lake Reservoir, approximately 10 km south of Revelstoke and 20 km downstream of BC Hydro's Revelstoke Dam. It is typically inundated by up to 6 m of water as the reservoir is filled every spring to full pool. The site is used recreationally by the local community as well as by tourists to the area. Refer to the record drawings in Appendix A for a location map and overview of the project area.

The area is characterized by relatively flat terrain with subtle undulations and the site is mostly covered in reed canary grass over fine sand and silt. The wetland's Lower Compartment is separated from the Upper Compartment by an abandoned road which is flooded by the reservoir (Figure 2-1). An old railway embankment functions as a dam for the Lower Compartment. The outlet at the old railway embankment is referred to as Site 15a Dam (Figure 2-1) and is presently designated as a 'Low Consequence' dam by the province. Originally there was a wooden box culvert in the embankment that provided water flow out of the wetland, but it collapsed and became partially blocked. The culvert was replaced in 2016 by an engineered outlet excavated into the embankment that included an aggregate spillway with riprap on the west (downstream) side of the embankment. The outlet was constructed to restore reliable flow from the wetland to a small channel which conveys the flow toward the Columbia River/Arrow Reservoir.

The outlet at the Site 15a Dam is accessed by an informal road along the wetland's north bank that crosses three topographic low areas: Areas A, B and C, which had been identified as actively eroding or potentially prone to erosion (see Figure 2-1).

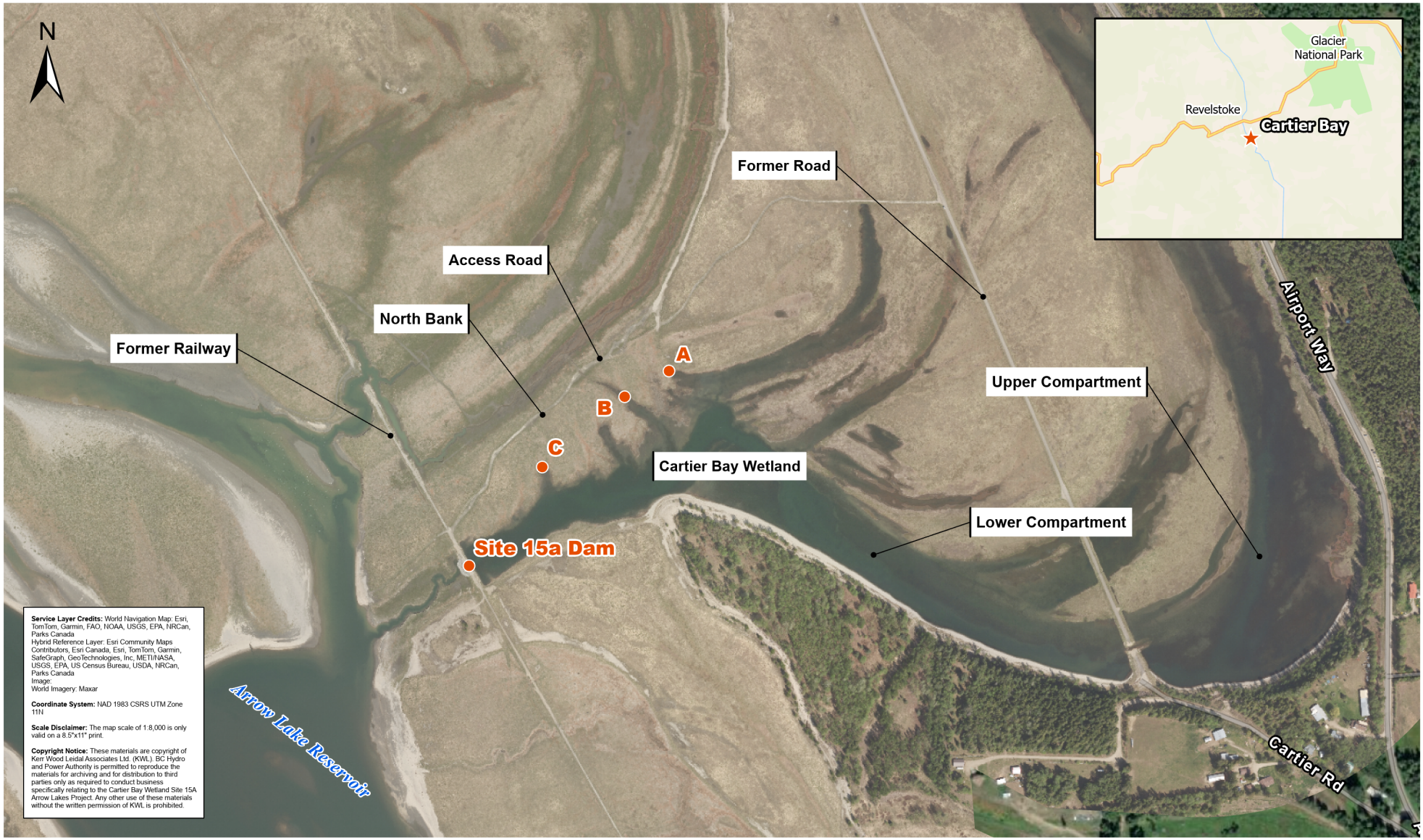
Erosion of the north bank of the wetland had occurred in Area B forming an eroded channel which had directed wetland discharge, and early reservoir inundation away from the Site 15a Dam outlet, since that channel had eroded to a lower elevation than at Site 15a. The Area B eroded channel had formed across the road and a headcut was progressing closer towards the wetland from the reservoir. A temporary measure consisting of gravel-filled bulk bags and riprap arranged as a barrier to prevent flow through this channel was installed in 2020 and subsequently upgraded in 2022.

Path: P:\0400-0499\478-237\430-GIS\Pro Projects\478237_Figures\478237_Figures.aprx Date Saved: 2023-08-08 11:59 AM | Author: tromans

BC Hydro and Power Authority

Cartier Bay Wetland Site 15A Arrow Lakes

KERR WOOD LEIDAL consulting engineers



Service Layer Credits: World Navigation Map: Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NRCan, Parks Canada
Hybrid Reference Layer: Esri Community Maps Contributors, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCan, Parks Canada
Image:
World Imagery: Maxar

Coordinate System: NAD 1983 CSRS UTM Zone 11N

Scale Disclaimer: The map scale of 1:8,000 is only valid on a 8.5"x11" print.

Project No.	478-237
Date	June 2024
Scale	1:8,000

0 50 100 200 Metres

Cartier Bay Wetland Overview

Figure 2-1

2.3 Project Objectives

The purpose of this project is to preserve the Cartier Bay Wetland as a valuable habitat for migratory bird species and aquatic life and prevent loss of the Lower Compartment water body due to undesired flow concentration and erosion along the north bank.

The objectives of the physical works were as follows:

- Mitigate against further erosion and potential flow concentration and erosion at topographic low areas along the north bank.
- Modify the Site 15a Dam to lower the outlet elevation such that is the primary surface water discharge location from the wetland (when the wetland is not fully inundated).
- Maintain safety of the area for recreational use while implementing measures that are not easily susceptible to vandalism.

Project objectives, design considerations, and analysis are detailed in the conceptual design report[1].

2.4 Design Description

The detailed design report including technical specifications and drawings[2] were submitted to BC Hydro in May 2022 based on the preferred conceptual option selected by BC Hydro. A summary of the final design is as follows:

Site 15a Dam modifications

- Lower the outlet at Site 15a Dam to a target finished grade elevation of 433.7 m;
- Widen the outlet to a bottom width of 4 m with 3 horizontal to 1 vertical (3H:1V) side slopes; and
- Place two articulated concrete block mattresses (ACBMs) on the surface of the outlet section of the dam (end to end), with granular fill upstream and downstream of the ACBMs to mitigate erosion in the outlet and maintain the design elevation.

Area B modifications

- Remove the existing temporary bulk bag berm;
- Construct a saddle dam with a target crest elevation of 434.4 m;
- Place riprap on the saddle dam side slopes to mitigate erosion;
- Repair the road in Area B across which an eroded channel had formed; and
- Fill in the eroded channel at Area B.

Area A modifications

- Raise the road at the two topographic low areas in Area A to a target surface elevation 434.4 m.

Additional design detail and rationale is provided in the detailed design report[2].

[1] KWL, 2022, CLBWORKS 30A Cartier Bay Site 15a Engineering Services – Conceptual Design Report (BCH Report 201-B-GER-00001), final report to BC Hydro dated January 27, 2022

[2] KWL, 2022, CLBWORKS 30A Cartier Bay Site 15a Engineering Services – Detailed Design Report (BCH Report 201B-GER-00002), final report to BC Hydro dated May 13, 2022

3. Construction

3.1 Construction Schedule and Sequence

Construction began on April 27, 2023 and was substantially complete on May 11, 2023. A summary of the construction sequence is listed in Table 3-1.

Table 3-1: Construction Timeline based on Field Reviews by KWL and BC Hydro

Field Review Date	Description of Progress
April 27, 2023	Layout survey, dewatering Area A, installed silt curtain at Area B.
April 28, 2023	Stripping and stockpiling for Area A road raising, set up silt curtain, installed by-pass pump and discharge hoses at Site 15a.
April 30, 2023	Excavated Area B saddle dam footprint, fish salvage completed, Area B eroded channel partially filled in, Area A road raising complete (except surfacing).
May 1, 2023	Area B saddle dam subgrade preparation and geotextile placement initiated
May 2, 2023	Set up Site 15a Dam cofferdam and bypass, started lowering pond, Area B road repair and saddle dam fill placement initiated
May 5, 2023	Excavation of the outlet at Site 15a Dam and installation of 200 mm minus granular outside of ACBM areas, riprap, and 200 mm minus placement on Area B saddle dam initiated.
May 6, 2023	ACBM subgrade preparation.
May 8, 2023	Installation of ACBMs at Site 15a completed.
May 10, 2023	Installation of 200 mm minus granular fill at Site 15a Dam, removal of cofferdam at Site 15a Dam, completed road surfacing at Areas A and B.
May 11, 2023	Final survey checks and demobilization.
November 6, 2023	Remedial work to 150 mm minus aggregate at Site 15a Dam completed following the construction substantial completion.

Appendix B contains field review forms from KWL for the field review dates: April 30, May 3-4, 8, and 11, and September 25, 2023. Appendix C contains selected site photographs during and after the construction of the works.

3.2 Construction Equipment and Crew

The contractor completed the work with a crew of approximately six persons (including a surveyor and crane operator for the ACBM placement) and the following main pieces of equipment:

- CAT CS54B vibratory roller compactor;
- Deere 524K wheel loader;
- Hitachi zx 135us excavator;
- Volvo ECR235 E Excavator;
- Wacker Neuson 1000-lb plate compactor; and
- Crane (on GVW 26000 kg dump truck).

3.3 Quality Control / Quality Assurance

Quality Control

Quality control (QC) requirements for the construction were described in the technical specifications and IFC drawings. The specifications required that construction materials be reviewed and approved by BC Hydro's Representative prior to use. They also detailed construction methods and design tolerances for the specified materials.

The ACBMs were supplied by BC Hydro. In January 2022, the ACBMs had sustained minor damage while being relocated at the Revelstoke Dam facility where they were stored over the winter season prior to construction. Some of the concrete blocks were cracked with small pieces broken off. A visual inspection of the mats was undertaken by a BC Hydro representative. Based on the description of the damages from BC Hydro and photographs provided, as well as discussions with the manufacturer, the ACBMs were deemed acceptable to use by KWL since the damage did not reduce their functionality. This assessment was confirmed by KWL during an onsite inspection prior to the installation of the ACBMs at the Site 15a Dam.

Quality Assurance

Engineering field reviews by KWL were planned prior to construction based on specific key milestones and observation (witness) points. A BC Hydro representative was on site daily and provided updates on progress and photos to KWL. The engineering field reviews conducted by KWL were primarily undertaken by a junior engineer/site inspector, with one conducted by the Engineer of Record. The purpose of the KWL field reviews were to review and document the progress and methods of the contractor, and to make observations and provide guidance at key points during the construction so that the works would be constructed in general conformance with the design.

QA results for metal leaching and acid rock drainage (ML ARD) quarry rock testing, visual inspections, sub-grade acceptance, field density, and red line as-builts were provided to BC Hydro by IDL and were reviewed for completion by KWL. The QA submissions and a summary table of these results are included in Appendix D.

A final record survey was completed following construction completion; however, some areas and fill extents of the constructed works were not fully captured in the survey as noted in the record drawings. The post-construction inspection by KWL found that the wetland side of the inlet at Site 15a had low areas of up to 12 cm below the design elevation which were subsequently corrected and filled as discussed in Section 4.1.

3.4 Construction Summary

This section provides a summary of the construction of the works. Variations from the design are documented in Section 3.5. Refer to Appendix A for the record drawings,

Area A

At Area A, the existing road was stripped to an approximate depth of 300 mm in two sections of approximately 12 m and 21 m length. Pit run 75 mm minus fill was placed and compacted in the excavated areas approximately 400 to 450 mm thick, and 100 mm of 25 mm minus surfacing aggregate was placed as road surfacing over the 75 mm minus fill. The excavated material from Area A was used as eroded channel fill at Area B.

The completed Area A works are presented on Drawings 201B-C09-00008 and 201B-C09-00009 included in Appendix A.

Area B – Saddle Dam

At Area B, the saddle dam footprint was excavated to a depth of 0.4 to 0.6 m below the existing grade. The soil excavated from the footprint was used as eroded channel fill at Area B. Non-woven geotextile (TEXEL080C) was placed on the prepared subgrade, and then 75 mm minus saddle dam fill was placed and compacted in lifts to an elevation of 434.15 m. The non-woven geotextile was placed on the saddle dam slopes (3H:1V). Riprap was placed on the north and south saddle dam slopes at a nominal thickness of approximately 700 mm, with a slightly thicker placement noted on the north end based on the submitted final record survey. The riprap was a combination of salvaged riprap from the Site 15a Dam, the existing temporary berm at Area B, the Area B temporary road repair, and imported riprap. The imported riprap size ranged from approximately 150 mm to 550 mm, with an approximate D_{50} of 300 mm. Salvaged stripped soil (silt and sand) was placed in the riprap voids to facilitate future vegetation growth.

The saddle dam crest was constructed to elevation 434.40 m with a 250 mm thick layer of granular fill over the saddle dam fill to a maximum total saddle dam height of 950 mm and length of 22 m. This fill was specified as a 200 mm minus granular aggregate but during construction a 150 mm minus product was approved as an alternative, as it generally met the gradation (except for the maximum particle size) and the 200 mm minus product was difficult to source locally. The saddle dam crest width measured between 4.2 m and 4.4 m excluding the riprap. On the saddle dam crest, 11 boulders ranging from 0.3 m to 1 m diameter were randomly placed to discourage recreational activity on the saddle dam. Boulders were spaced roughly 2 m apart and were sourced from larger riprap pieces from both the salvaged and imported gradations.

The completed Area B saddle dam is presented on Drawings 201B-C09-00005 and 201B-C09-00006 included in Appendix A.

Area B – Eroded Channel and Road Repair

The eroded channel at Area B was filled with a combination of the following:

- Salvaged fill from the excavation at Area A;
- Salvaged fill from excavation at the Site 15a Dam;
- Aggregate from the bulk bags at the temporary berm at Area B;
- Material excavated from the saddle dam footprint at Area B; and
- Imported 75 mm minus pit run fill (approximately 4 m^3).

Additional salvaged and imported fill was used to extend the extents of the eroded channel fill with the approval of BC Hydro.

The road at Area B was repaired by removing the riprap that was temporarily placed in the eroded channel, filling the eroded channel (to an approximate thickness of 800 mm) with 75 mm minus pit run fill, and re-surfacing the road with 25 mm minus surfacing aggregate (approximately 400 mm thick). The final elevation of the road surface at Area B where the road was repaired is approximately 434.0 m.

The completed Area B eroded channel fill and road repair is presented on Drawing 201B-C09-00007 included in Appendix A.

Site 15a Dam

The outlet at Site 15a Dam was excavated down to an elevation of 433.5 m. The subgrade for the ACBMs was prepared by placing 25 mm minus surfacing aggregate fill along the invert and side slopes of the excavated outlet in the ACBM footprint. The top of the prepared subgrade beneath the ACBM was at an elevation 433.58 m and compacted with the 1000-lb plate compactor. The side slopes were compacted with the excavator bucket.

The two ACBMs were Armorflex Class 40 open cell mattresses, measuring 120 mm thick, 6.1 m long and 2.4 m wide. The ACBMs were placed end to end, meeting in the center of the outlet excavation and extending up the side slopes. They were placed using the crane and a spreader bar. The concrete mats make contact in the middle, and the cable loops used to lower the mats were folded underneath the concrete blocks in the middle and were covered with 150 mm minus aggregate at the outer ends. As noted for the Area B Saddle Dam, this aggregate was initially specified with a 200 mm minus gradation and changed to the approved alternative following supply issues with the original specified material.

The upstream (east) row of blocks on both ACBMs sits on an approximately 45° slope and were embedded into the 150 mm minus granular material that was placed on both sides of the ACBMs. The granular fill was placed extending 4.6 m upstream of the ACBMs and 6.1 m downstream. The open cells of the ACBMs were filled with 25 mm minus surfacing aggregate which was placed and swept into the cells with a broom. The finished outlet side slopes are approximately 3H:1V, with an invert width of 4 m and a dam crest elevation of 433.72 m.

The completed Site 15a Dam is presented on Drawings 201B-C09-00003, 201B-C09-00004, and 201B-C09-00005 included in Appendix A.

3.5 Construction Variations from Design

This section summarizes variations in the design of the constructed works as a result of either direction from BC Hydro, contractor RFIs, or due to site conditions requiring field changes. While some variations from the design were made during construction, none fundamentally change the overall design intent.

Area A

The design assumed stripping only in vegetated areas, not the full footprint including the existing road surface. During the construction, BC Hydro noted that the road surface was unexpectedly soft and needed stripping as well. As a result, additional stripping outside of the design footprint was completed to an average depth of 0.23 m in order to reach a competent subgrade and completely remove the organic/soft layer, and additional fill was required to rebuild the road base.

Area B

The saddle dam ties into vegetated “high ground” (of similar elevation to the saddle dam crest) on the north side. On the south side, an unexpected depression was created, possibly due to construction equipment driving around the saddle dam to remove the temporary berm at Area B. As a result, an unvegetated low spot with exposed erodible fine soils remains to the west of the saddle dam. Other than the approved alternative materials (non-woven geotextile, 200 mm minus aggregate, and riprap), this is the main deviation from the design intent at Area B, as the saddle dam was intended to tie into topographic features of similar elevation to the crest on either side to prevent flow around the saddle dam. This is discussed in further detail in Section 4.2.

The eroded channel on the reservoir side of the saddle dam received additional salvaged fill as well as extra imported material, extending the footprint of the fill further west beyond the road. This additional fill does not impact the design intent.

Site 15a Dam

The upstream most row of blocks in both ACBMs was to be placed on an angle for embedment into granular fill. Some of the blocks that were set in from the first row broke during placement on the upstream embedment. This was considered acceptable as it will not affect the function of the mats, and granular fill was packed into the spaces between concrete blocks.

Additional 150 mm minus granular fill was placed on either end of the ACBMs up the side slopes, on the upstream and downstream side of the outlet, east of the ACBMs, and downstream over the riprap. The extents of the fill placement are shown in the record drawings in Appendix A.

4. Post-Construction Inspection and Modifications

Following construction completion, BC Hydro staff observed potential issues requiring review at two of the project locations, the Site 15a Dam outlet, and the Area B saddle dam, as discussed below.

4.1 Site 15a Dam Outlet

As reservoir levels began to draw down in late 2023, it was observed by BC Hydro staff that some fish had become stranded on the downstream end of the dam outlet. Temporary measures including exclusion netting at the wetland side of the outlet were installed to prevent further fish entering the outlet and becoming stranded.

A site visit was conducted by Liam Mackle (KWL) and Tysyn Olynyk (BC Hydro) on September 25, 2023 to assess the site and take some elevation point measurements across the outlet. It was found that while the top of the ACBM met the design elevations and fell within the specified tolerance, the 200 mm minus fill on the wetland side of the outlet had several low areas of up to 12 cm below the design elevation. KWL recommended using excess fill that had been placed on the north and south embankment side slopes at the top of the dam outlet to fill the low spots and create a more uniform surface across the outlet length and within the specified design tolerance. These findings are summarized in a Daily Field Review Report in Appendix B, and shown in Appendix C, Photos 17-20. The repair work was completed by a BC Hydro crew in November 2023.

4.2 Area B Saddle Dam

During reservoir inundation in spring 2023, water was observed by BC Hydro staff to be flowing around the south end of the saddle dam to enter the wetland, leading to concerns about potential erosion in the area as it is unvegetated in that location. This area may have been a low point before construction of the saddle dam; however construction equipment and activities likely compacted the area further creating a depression that allows for a localised concentrated water flow. Some flow was also observed around the north end of the saddle dam, however that area is vegetated with established reed canary grass and erosion is less of a concern at that location.

The site visit conducted on September 25, 2023 with Liam Mackle (KWL) and Tysyn Olynyk (BC Hydro) found no evidence of erosion on either end of the dam, and it was recommended that the south side of the saddle dam be planted with reed canary grass to reduce the risk of future erosion per the Daily Field Review Report in Appendix B.

5. Conclusions and Recommendations

5.1 Conclusions

The work was completed in general conformance with the design, with some minor alterations as noted herein. The main work was completed between April 27 and May 11, 2023, and demobilization was complete prior to inundation of the site by Arrow Reservoir. Minor post-construction remedial work was completed in November 2023.

5.2 Recommendations

The following items are recommended for BC Hydro's consideration:

- Place additional soil and reed canary grass (seed or transplant) at the low area on the south side of the Area B Saddle Dam. Following this work, the area should be monitored for signs of erosion, and the potential need for additional mitigation or repairs.
- Conduct monitoring as recommended in the Detailed Design Report (Table 5-2) to evaluate project success in the long term.
- The north bank should continue to be monitored to identify if any other potential topographic low areas with concentrated flow that could potentially lead to erosion develop over time (in addition to Area C).
- An updated operations and maintenance plan should be developed by a qualified professional(s).

Submission

KERR WOOD LEIDAL ASSOCIATES LTD.

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Engineer of Record

Reviewed by:

Stefan Joyce, P.Eng.
Technical Reviewer

Statement of Limitations

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Revision History

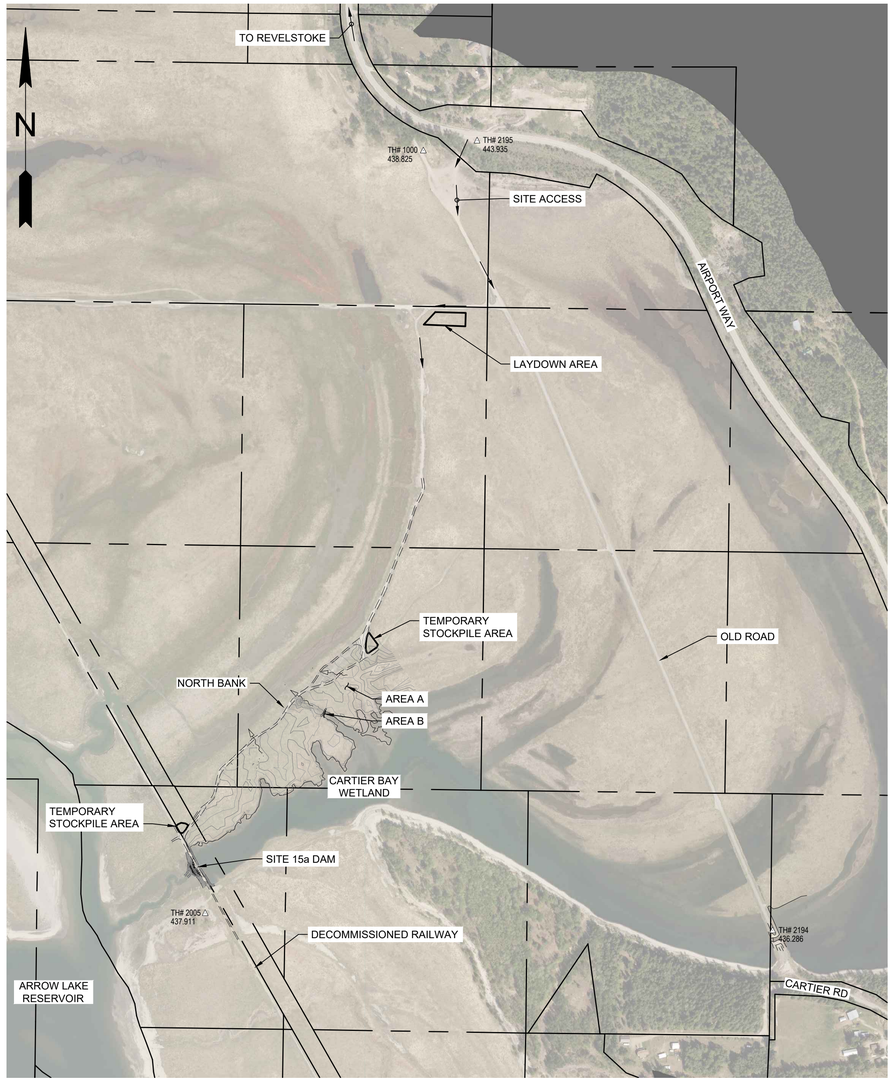
Revision #	Date	Status	Revision Description	Author
0	June 21, 2024	Final	Incorporated BC Hydro review comments.	KMS/LTM
A	December 15, 2023	Draft		KMS/LTM

KERR WOOD LEIDAL
consulting engineers

Appendix A

Engineering Record Drawings

LOCATION PLAN
NTS



KEY PLAN
1:5000

DRAWING LIST

DRAWING NUMBER	DRAWING TITLE
201B-C09-00001	LOCATION PLAN, KEY PLAN, & DRAWING LIST
201B-C09-00002	OVERVIEW AND GENERAL ARRANGEMENT - PLAN
201B-C09-00003	SITE 15a DAM - PLAN AND PROFILE
201B-C09-00004	SITE 15a DAM - SECTIONS
201B-C09-00005	AREA B SADDLE DAM - PLAN AND PROFILE
201B-C09-00006	AREA B SADDLE DAM - SECTIONS
201B-C09-00007	AREA B ERODED CHANNEL FILL - PLAN, PROFILE, & DETAILS
201B-C09-00008	AREA A ROAD RAISING - PLAN AND PROFILE
201B-C09-00009	AREA A ROAD RAISING - SECTIONS

NOTES:
1. ORTHO PHOTO TAKEN BY PEREGRINE AERIAL SURVEYS INC. ON MAY 9 & 10, 2019 FOR BC HYDRO.
2. SURVEY NOTES:
   - 2.1. HORIZONTAL DATUM: NAD83(CSRS) 2002.0 - UTM ZONE 11N
   - 2.2. VERTICAL DATUM: CVD28BC
   - 2.3. FIXED VERTICAL BENCHMARK: MASCOT GCM #666461
   - 2.4. ELEVATION VERIFIED USING NRCAN PPP SERVICE.
   - 2.5. ORIGINAL SURVEY BY MONASHEE SURVEY GEOMATICS ON APRIL 14, 2021.
   - 2.6. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.

CONTROL POINTS

POINT #	NORTHING	EASTING	ELEV.	DESCRIPTION
TH# 2005	5641906.516	418369.803	437.911	SPIKE IN GROUND
TH# 2194	5641877.631	419320.994	436.286	NAIL IN PAVEMENT
TH# 1000	5643184.609	418735.399	438.825	-
TH# 2195	5643201.246	418825.491	443.935	-

SCALE: 1:5000 — 0 — 250m

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RECORD ISSUE
Seal and signature subject to record-drawing declaration.
Reference: ES00-A0010

BC Hydro Contract No .....
ACCEPTED
This review was for observing general conformity to contract only. B.C. Hydro accepts no legal responsibility for the content, accuracy of completness of this document even if it had been accepted with or without revision based on B.C. Hydro's observations.
By ..... Date .....
Hydro's Representative

KERR WOOD LEIDAL
consulting engineers

REFERENCE DRAWINGS

NO	DRAWING NUMBER	DRAWING TITLE

REVISIONS

NO	REMARKS
2	ISSUED FOR RECORD
1	ISSUED FOR CONSTRUCTION
0	ISSUED FOR PROPOSAL

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

DATE 2024MAY13 | DIST

BC Hydro

ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
LOCATION PLAN, KEY PLAN, & DRAWING LIST

DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
201B-C09-00001			D	2

\\kwl.ca\projects\0400-0499\478-2375\01-Drawings\a_Production_Dwgs\201B-C09-00001.dwg
Drawing Unit = Metric (6)
PETER.COLLINS
5/13/2024 2:27 PM

OVERVIEW AND GENERAL ARRANGEMENT
1:1000

NOTES:
1. ORTHO PHOTO TAKEN BY PEREGRINE AERIAL SURVEYS INC. ON MAY 9 & 10, 2019 FOR BC HYDRO.
2. ORIGINAL SURVEY BY MONASHEE SURVEY GEOMATICS ON APRIL 14, 2021.
3. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.
4. SEE DRAWING 00001 FOR ADDITIONAL INFORMATION.

SCALE: 1:1000 0 50m

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RECORD ISSUE
Seal and signature subject to record drawing declaration.
Reference: ES00-A0010

BC Hydro Contract No .....
ACCEPTED
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By ..... Date .....
Hydro's Representative

KERR WOOD LEIDAL consulting engineers

NO	DRAWING NUMBER	DRAWING TITLE
REFERENCE DRAWINGS		

NO	REMARKS
3	ISSUED FOR RECORD
2	ISSUED FOR CONSTRUCTION
1	LOCATION OF SADDLE DAM CHANGED AND REVISED ISSUE FOR PROPOSAL
0	ISSUED FOR PROPOSAL
REVISIONS	

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

BC Hydro

ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
OVERVIEW AND GENERAL ARRANGEMENT PLAN

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
2024MAY13		201B-C09-00002			D	3

\\kwl.ca\projects\0400-0499\478-237\501-Drawings\a_Production_Dwgs\201B-C09-00002.dwg
Drawing Unit = Metric (6)
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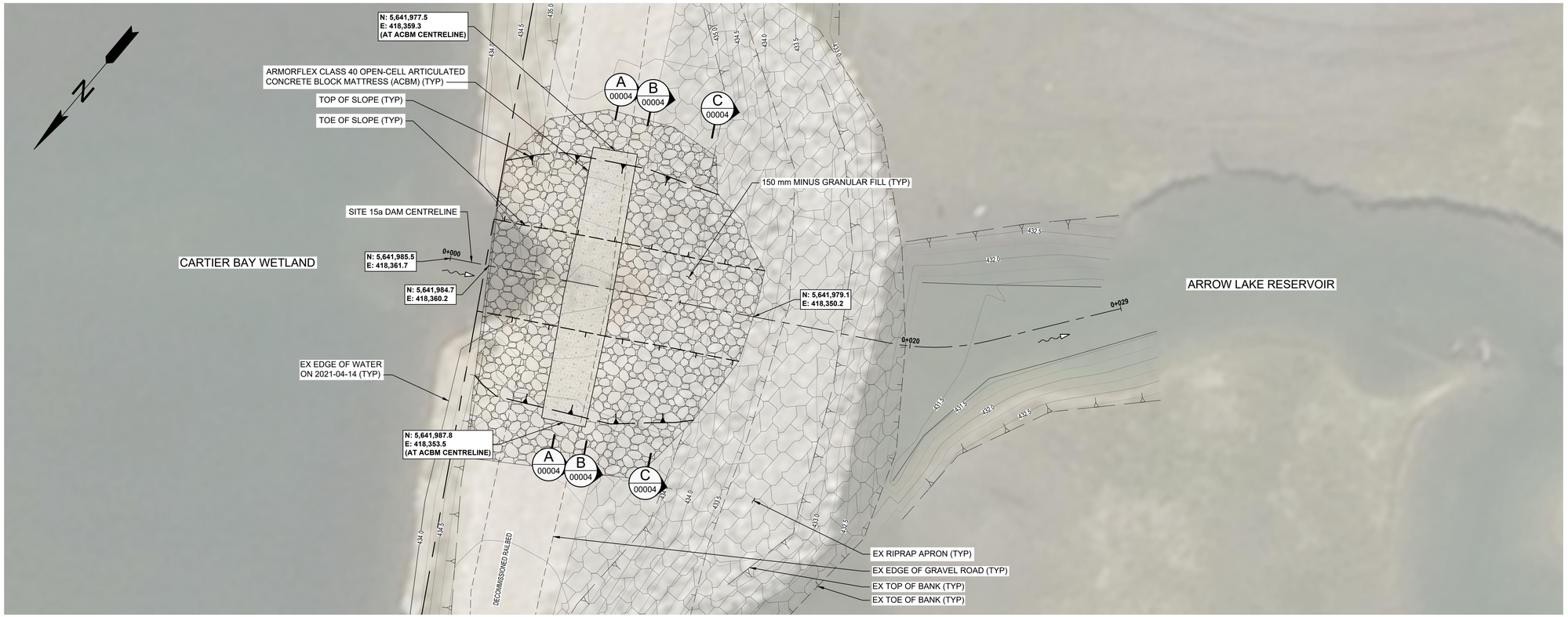
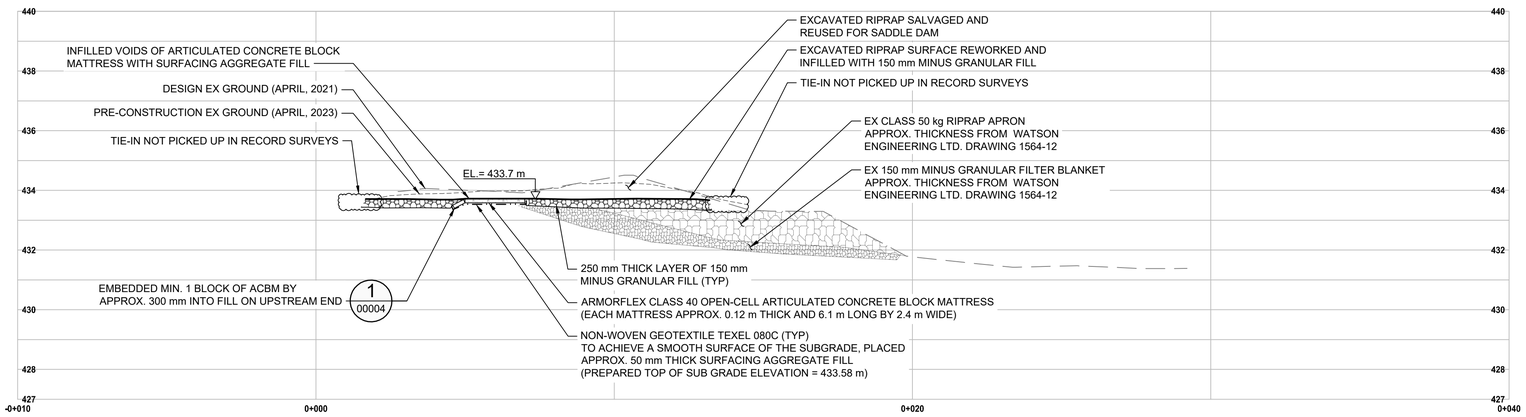
5/13/2024 2:32 PM



SITE 15a DAM - PLAN
1:100



SITE 15a DAM - PROFILE
1:100

RECORD DRAWING DISCLAIMER

THE SEAL AND SIGNATURE OF THE UNDERSIGNED ON THIS DRAWING CERTIFIES THAT THE DESIGN INFORMATION CONTAINED IN THESE DRAWINGS ACCURATELY REFLECTS THE ORIGINAL DESIGN AND THE MATERIAL DESIGN CHANGES MADE DURING CONSTRUCTION THAT WERE BROUGHT TO THE UNDERSIGNED'S ATTENTION. THESE DRAWINGS ARE INTENDED TO INCORPORATE ADDENDA, CHANGE ORDERS AND OTHER MATERIAL DESIGN CHANGES, BUT NOT NECESSARILY ALL SITE INSTRUCTIONS.

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NOTES:
1. ORTHO PHOTO TAKEN BY PEREGRINE AERIAL SURVEYS INC. ON MAY 9 & 10, 2019 FOR BC HYDRO.
2. ORIGINAL SURVEY BY MONASHEE SURVEY GEOMATICS ON APRIL 14, 2021.
3. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.
4. SEE DRAWING 00001 FOR ADDITIONAL SURVEY INFORMATION.

SCALE: 0 5m
1:100

ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SHOWN

BC Hydro Contract No .....
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Hydro's Representative

RECORD ISSUE
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KERR WOOD LEIDAL consulting engineers

NO	DRAWING NUMBER	DRAWING TITLE
REFERENCE DRAWINGS		

NO	REMARKS
3	ISSUED FOR RECORD
2	ISSUED FOR CONSTRUCTION
1	POSITION OF ACBM ADJUSTED AND SUBGRADE PREPARATION DETAIL ADDED AND REVISED ISSUE FOR PROPOSAL
0	ISSUED FOR PROPOSAL
REVISIONS	

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

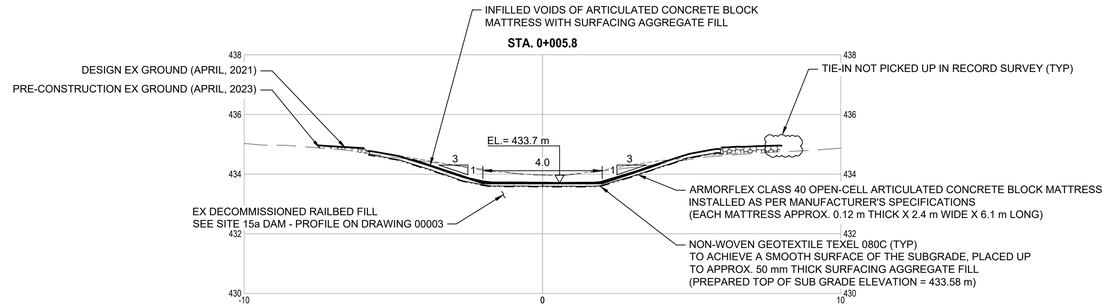
BC Hydro

ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
SITE 15a DAM
PLAN AND PROFILE

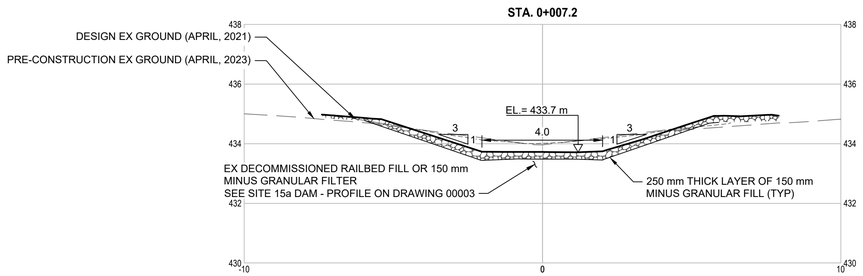
DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
2024MAY13		201B-C09-00003			D	3

\\kwl.ca\projects\0400-0499\478-227\501-Drawings\a_Production_Dwgs\201B-C09-00003.dwg
Drawing Unit = Metric (6)
PETER COLLINS
6/27/2024 11:40 AM



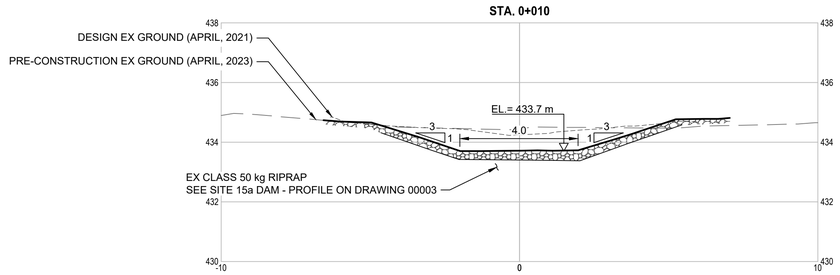
ARTICULATED CONCRETE BLOCK MATTRESS

SECTION A
SCALE:1:100 00003



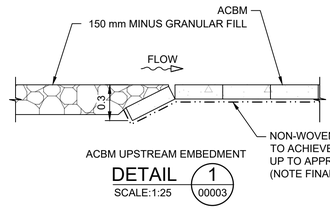
150 mm MINUS GRANULAR FILL

SECTION B
SCALE:1:100 00003



EXCAVATED RIPRAP

SECTION C
SCALE:1:100 00003



ACBM UPSTREAM EMBEDMENT

DETAIL 1
SCALE:1:25 00003

NOTES:
1. ORIGINAL SURVEY BY MONASHEE SURVEY GEOMATICS ON APRIL 14, 2021.
2. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.
3. SEE DRAWING 00001 FOR ADDITIONAL SURVEY INFORMATION.

SCALE: 1:100 0 5m

ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SHOWN

RECORD DRAWING DISCLAIMER

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BC Hydro Contract No .....

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By ..... Date .....
Hydro's Representative

RECORD ISSUE
Seal and signature subject to record drawing declaration. Reference: ES00-A0010

KERR WOOD LEIDAL consulting engineers

NO	DRAWING NUMBER	DRAWING TITLE

REFERENCE DRAWINGS

NO	REMARKS
3	ISSUED FOR RECORD
2	ISSUED FOR CONSTRUCTION
1	EMBEDMENT DETAILS TO ACBM CHANGED AND REVISED ISSUE FOR PROPOSAL
0	ISSUED FOR PROPOSAL

REVISIONS

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

DATE 2024MAY13 DIST

BC Hydro

ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
SITE 15a DAM
SECTIONS

DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
201B-C09-00004			D	3

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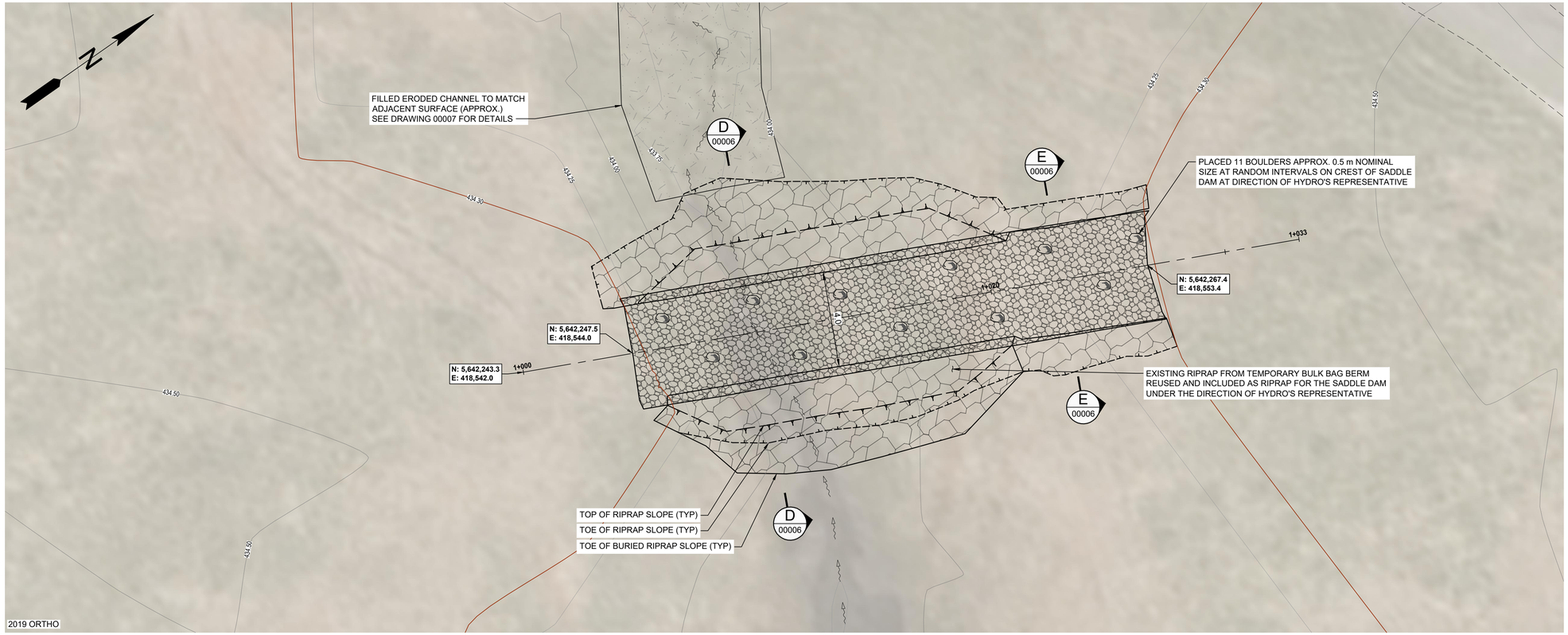
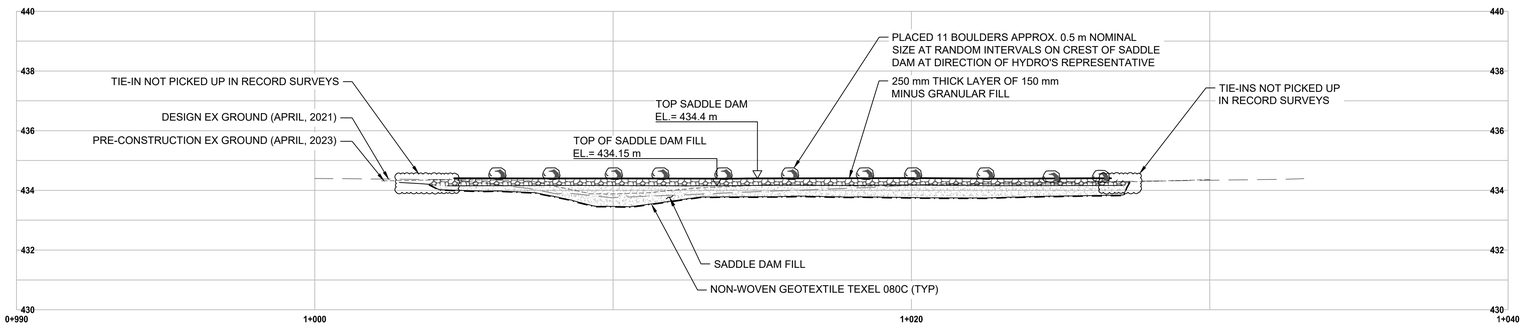
Drawing Unit = Metric (6)
PETER.COLLINS
6/10/2024 11:44 AM



AREA B SADDLE DAM - PLAN
1:100



AREA B SADDLE DAM - PROFILE
1:100

RECORD ISSUE
Seal and signature subject to record drawing declaration. Reference: ES00-A0010

RECORD DRAWING DISCLAIMER

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By ..... Date .....
Hydro's Representative

NOTES:
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3. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.
4. SEE DRAWING 00001 FOR ADDITIONAL SURVEY INFORMATION.

SCALE: 1:100 — 0 — 5m

ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SHOWN

KERR WOOD LEIDAL consulting engineers

NO	DRAWING NUMBER	DRAWING TITLE

REFERENCE DRAWINGS

NO	REMARKS
3	ISSUED FOR RECORD
2	ISSUED FOR CONSTRUCTION
1	SADDLE DAM LOCATION AND GEOMETRY AND REVISED ISSUE FOR PROPOSAL
0	ISSUED FOR PROPOSAL

REVISIONS

DESIGN NUMBER
WORK ORDER NUMBER
CSA S250 ACCURACY NAD 83 - 11UTM
BASE ACCURACY LEVEL:
ASB ACCURACY LEVEL:

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

DATE 2024MAY13 | DIST

BC Hydro

ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
AREA B SADDLE DAM
PLAN AND PROFILE

DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
201B-C09-00005			D	3

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Drawing Unit = Metric (6)
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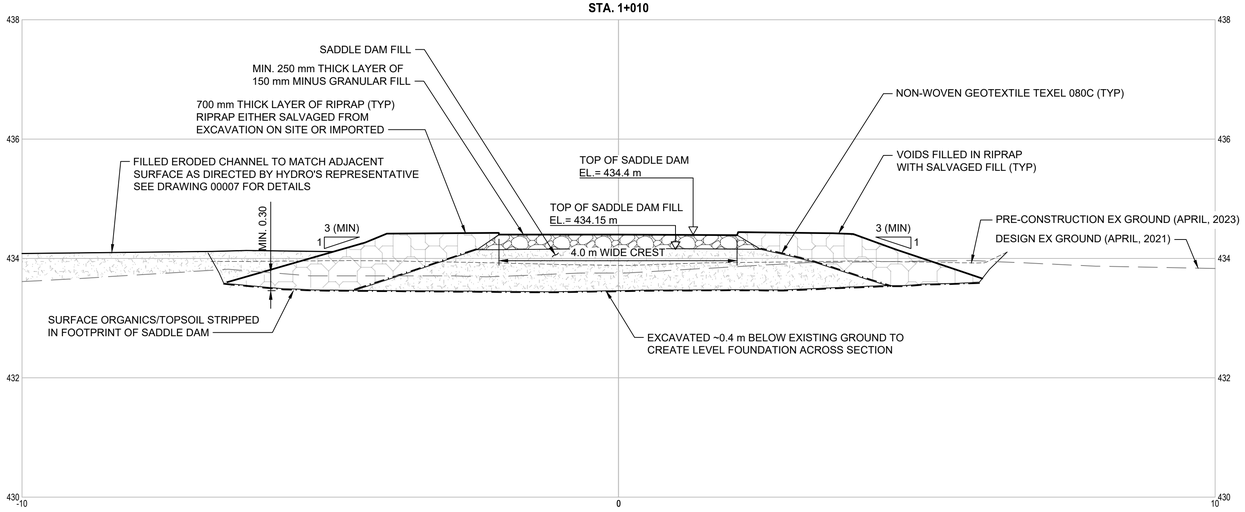
5/13/2024 4:52 PM

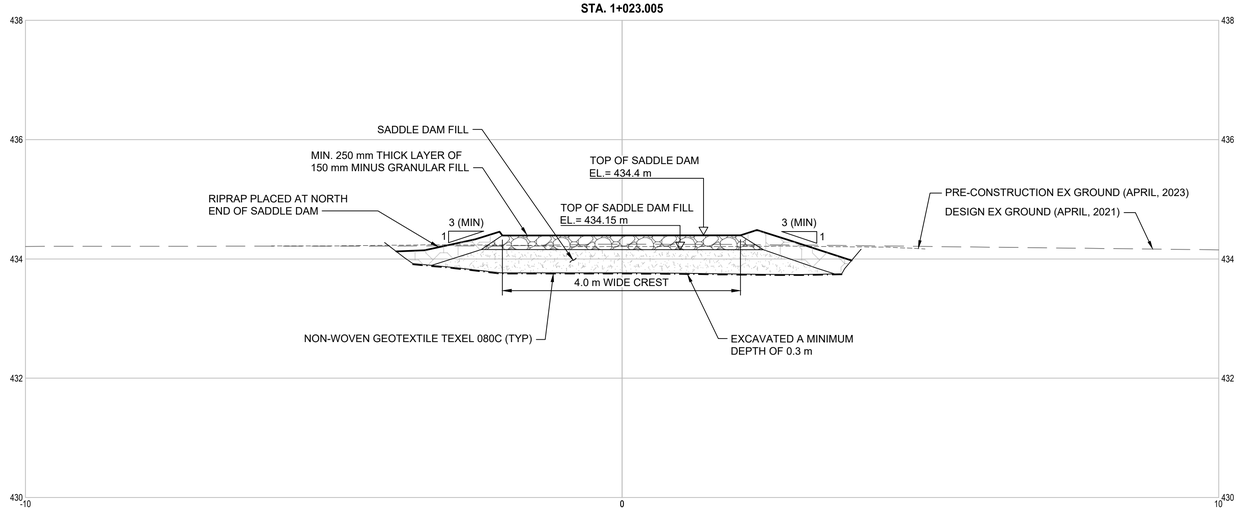
STA. 1+010



AREA B SADDLE DAM AT ERODED CHANNEL

SECTION D
SCALE:1:50 00005

STA. 1+023.005



AREA B SADDLE DAM AT SIDE TRANSITION

SECTION E
SCALE:1:50 00005

NOTES:
1. ORIGINAL SURVEY BY MONASHEE SURVEY GEOMATICS ON APRIL 14, 2021.
2. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.
3. SEE DRAWING 00001 FOR ADDITIONAL SURVEY INFORMATION.

SCALE: 1:50 0 2.5m

ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SHOWN

RECORD DRAWING DISCLAIMER

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By ..... Date .....
Hydro's Representative

RECORD ISSUE
Seal and signature subject to record drawing declaration.
Reference: ES00-A0010

KERR WOOD LEIDAL consulting engineers

NO	DRAWING NUMBER	DRAWING TITLE

REFERENCE DRAWINGS

NO	REMARKS
3	ISSUED FOR RECORD
2	ISSUED FOR CONSTRUCTION
1	EXISTING GROUND PROFILE AND MINOR LABELLING CHANGED AND REVISED ISSUE FOR PROPOSAL
0	ISSUED FOR PROPOSAL

REVISIONS

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

BC Hydro

ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
AREA B SADDLE DAM
SECTIONS

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
2024MAY13		201B-C09-00006			D	3

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PETER CLARKE
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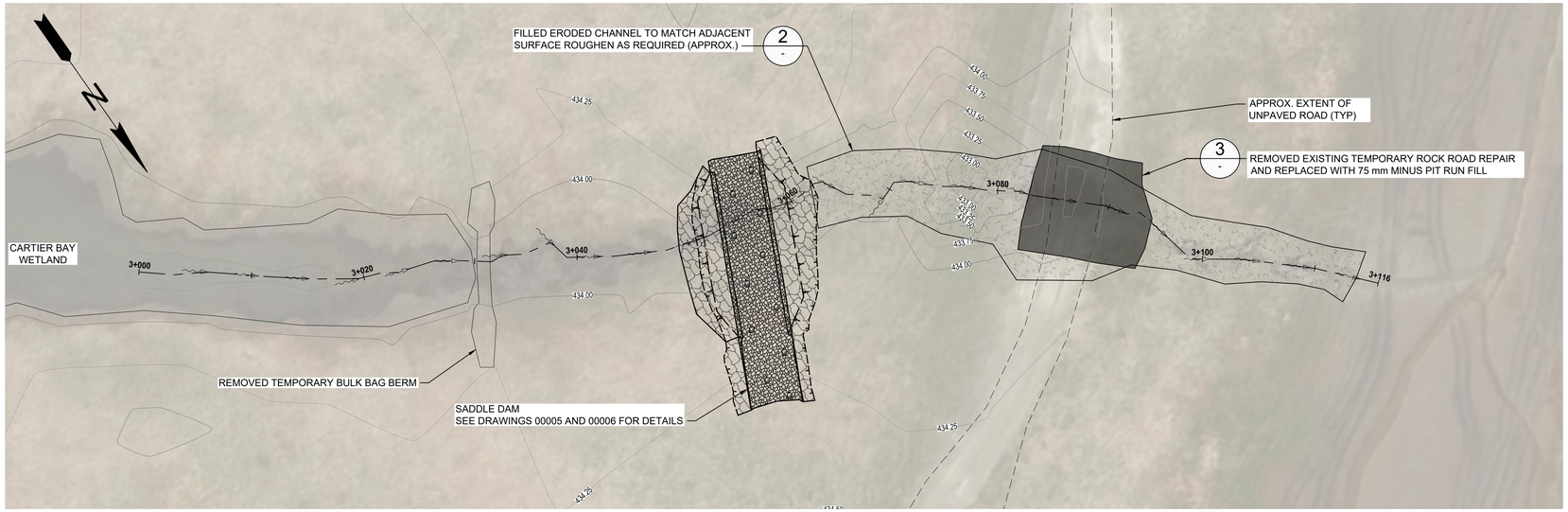
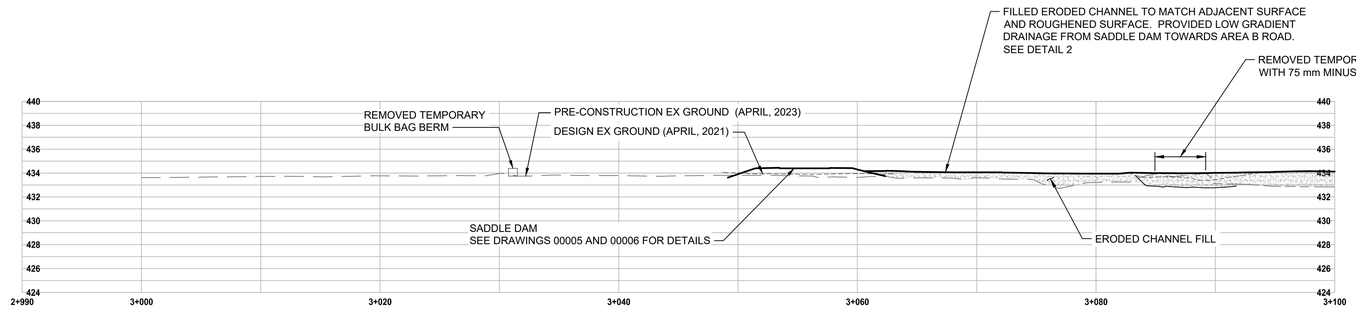


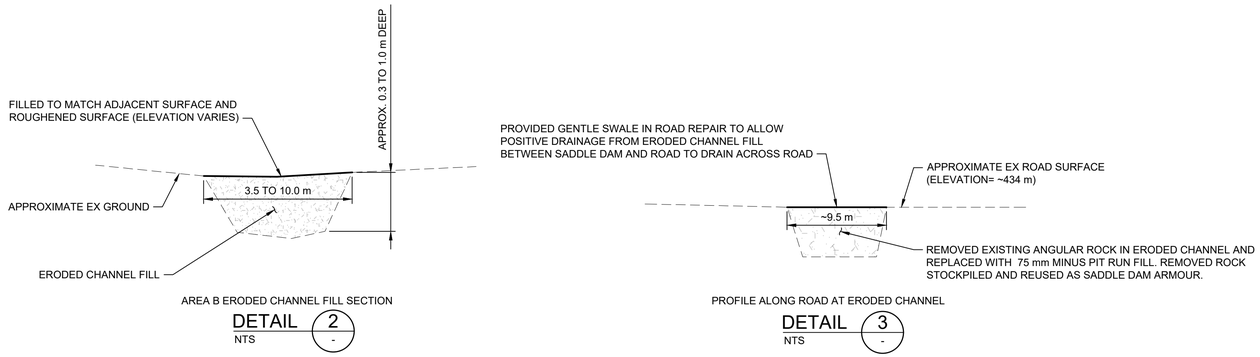
AREA B ERODED CHANNEL FILL - PLAN

1:250



AREA B ERODED CHANNEL FILL - PROFILE

1:250



AREA B ERODED CHANNEL FILL SECTION

DETAIL 2 / NTS

PROFILE ALONG ROAD AT ERODED CHANNEL

DETAIL 3 / NTS

RECORD ISSUE

Seal and signature subject to record drawing declaration. Reference: ES00-A0010

RECORD DRAWING DISCLAIMER

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By ..... Date .....

Hydro's Representative

NOTES:

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4. SEE DRAWING 00001 FOR ADDITIONAL SURVEY INFORMATION.

SCALE: 1:250 — 0 — 10m

ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SHOWN

KERR WOOD LEIDAL consulting engineers

NO	DRAWING NUMBER	DRAWING TITLE

REFERENCE DRAWINGS

NO	REMARKS
3	ISSUED FOR RECORD
2	ISSUED FOR CONSTRUCTION
1	POSITION OF SADDLE DAM CHANGED AND REVISED ISSUE FOR PROPOSAL
0	ISSUED FOR PROPOSAL

REVISIONS

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

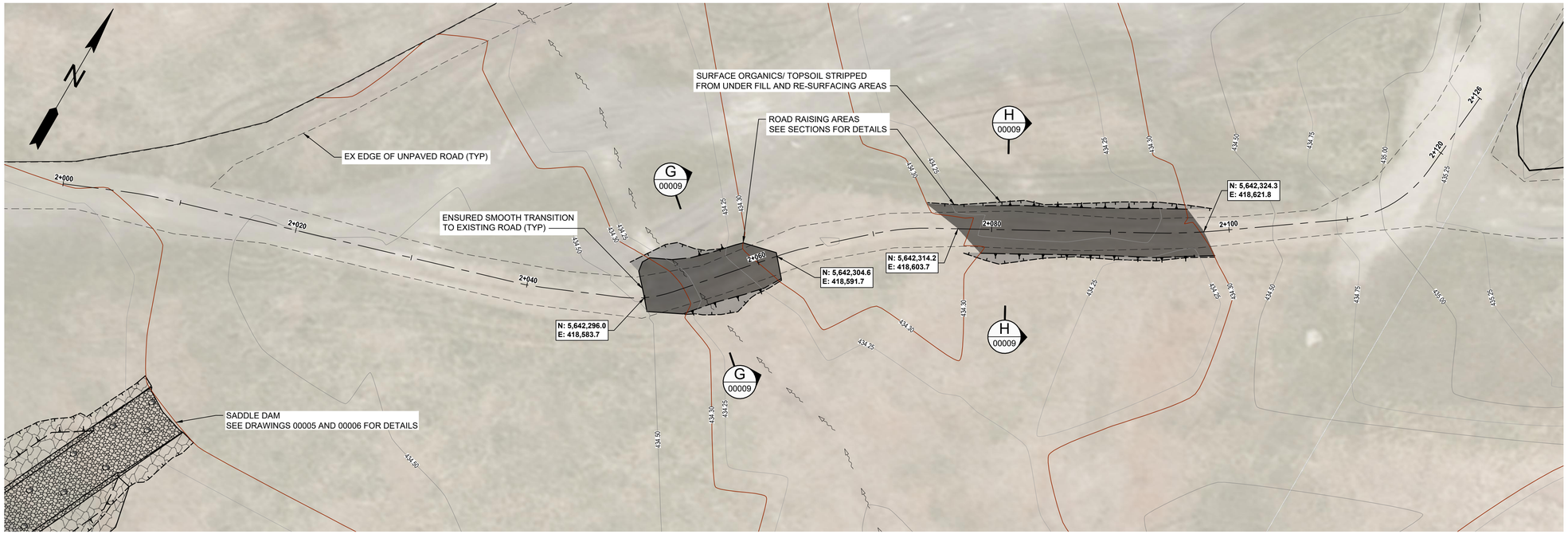
BC Hydro

ARROW LAKE RESERVOIR

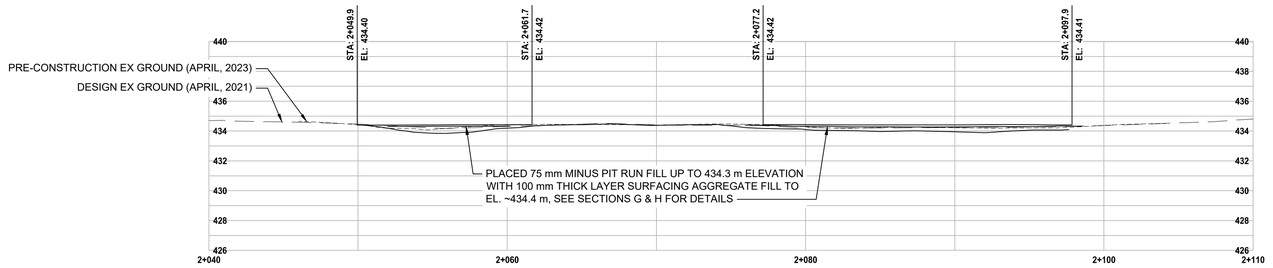
CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
AREA B ERODED CHANNEL FILL
PLAN, PROFILE, & DETAILS

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
2024MAY13		201B-C09-00007			D	3

\\kwl.ca\projects\0400-0499\478-237\501-Drawings\a_Production_Dwgs\201B-C09-00007.dwg
Drawing Unit = Metric (6)
PETER COLLINS
5/13/2024 4:58 PM



AREA A ROAD RAISING - PLAN
1:200



AREA A ROAD RAISING - PROFILE
1:200

RECORD DRAWING DISCLAIMER

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RECORD ISSUE
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Reference: ES00-A0010

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3. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.
4. SEE DRAWING 00001 FOR ADDITIONAL SURVEY INFORMATION.

SCALE: 1:200 — 0 — 10m

ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SHOWN

KERR WOOD LEIDAL consulting engineers

REFERENCE DRAWINGS

NO	DRAWING NUMBER	DRAWING TITLE

REVISIONS

NO	REMARKS
2	ISSUED FOR RECORD
1	ISSUED FOR CONSTRUCTION
0	ISSUED FOR PROPOSAL

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

BC Hydro

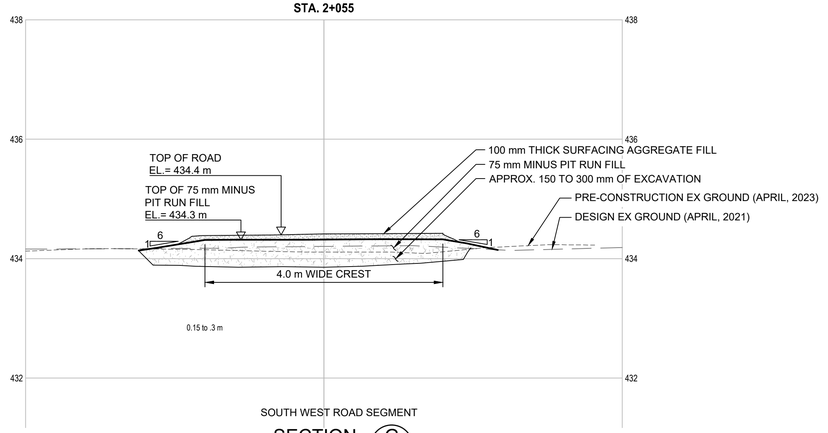
ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
AREA A ROAD RAISING
PLAN AND PROFILE

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
2024MAY13		201B-C09-00008			D	2

\\wl.ca\projects\0400-04599478-237\501-Drawings\a_Production_Dwgs\201B-C09-00008.dwg
Drawing Unit = Metric (6)
PETER.COLLINS
5/13/2024 3:02 PM

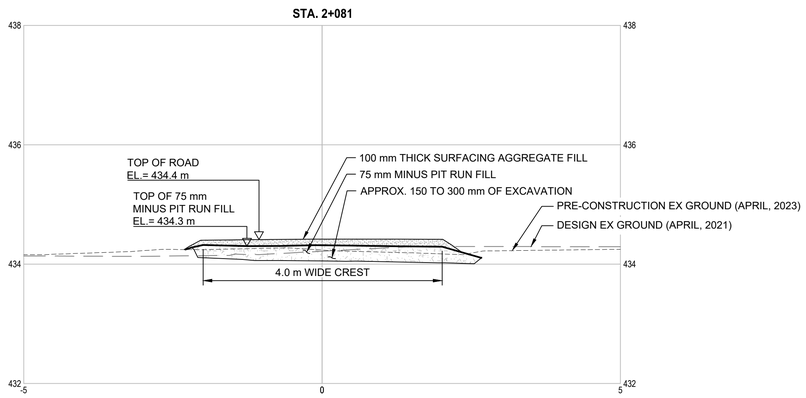
STA. 2+055



SOUTH WEST ROAD SEGMENT

SECTION G
SCALE:1:50 00008

STA. 2+081



NORTH EAST ROAD SEGMENT

SECTION H
SCALE:1:50 00008

NOTES:
1. ORIGINAL SURVEY BY MONASHEE SURVEY GEOMATICS ON APRIL 14, 2021.
2. RECORD SURVEY BY PIN POINT SURVEYING Ltd. IN APRIL AND MAY 2023.
3. SEE DRAWING 00001 FOR ADDITIONAL SURVEY INFORMATION.

SCALE: 1:50 — 0 — 2.5m

ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SHOWN

KERR WOOD LEIDAL consulting engineers

RECORD DRAWING DISCLAIMER

THE SEAL AND SIGNATURE OF THE UNDERSIGNED ON THIS DRAWING CERTIFIES THAT THE DESIGN INFORMATION CONTAINED IN THESE DRAWINGS ACCURATELY REFLECTS THE ORIGINAL DESIGN AND THE MATERIAL DESIGN CHANGES MADE DURING CONSTRUCTION THAT WERE BROUGHT TO THE UNDERSIGNED'S ATTENTION. THESE DRAWINGS ARE INTENDED TO INCORPORATE ADDENDA, CHANGE ORDERS AND OTHER MATERIAL DESIGN CHANGES, BUT NOT NECESSARILY ALL SITE INSTRUCTIONS.

THE UNDERSIGNED DOES NOT WARRANT OR GUARANTEE, NOR ACCEPT ANY RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE AS-CONSTRUCTED INFORMATION SUPPLIED BY OTHERS CONTAINED IN THESE DRAWINGS, BUT DOES, BY SEALING AND SIGNING, CERTIFY THAT THE AS-CONSTRUCTED INFORMATION, IF ACCURATE AND COMPLETE, PROVIDES AN AS-CONSTRUCTED SYSTEM WHICH SUBSTANTIALLY COMPLIES IN ALL MATERIAL RESPECTS WITH THE ORIGINAL DESIGN INTENT.

BC Hydro Contract No .....
ACCEPTED
This review was for observing general conformity to contract only. B.C. Hydro accepts no legal responsibility for the content, accuracy of completness of this document even if it had been accepted with or without revision based on B.C. Hydro's observations.
By ..... Date .....
Hydro's Representative

RECORD ISSUE
Seal and signature subject to record drawing declaration.
Reference: ES00-A0010

NO	DRAWING NUMBER	DRAWING TITLE

REFERENCE DRAWINGS

NO	REMARKS
2	ISSUED FOR RECORD
1	ISSUED FOR CONSTRUCTION
0	ISSUED FOR PROPOSAL

REVISIONS

DESIGN NUMBER	
WORK ORDER NUMBER	
CSA S250 ACCURACY NAD 83 - 11UTM	
BASE ACCURACY LEVEL:	
ASB ACCURACY LEVEL:	

DSGN	L. MACKLE
INDEP CHK	S. JOYCE
DFTG	P. COLLINS
DFTG CHK	
INSP	
REV	S. JOYCE
ACPT	

BC Hydro

ARROW LAKE RESERVOIR

CARTIER BAY SITE 15a
MODIFICATION & MITIGATION WORKS
AREA A ROAD RAISING
SECTIONS

DATE	DIST	DRAWING NUMBER	REPORT NUMBER	FIG NO	SIZE	REV
2024MAY13		201B-C09-00009			D	2

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Drawing Unit = Metric (6)
PETER.COLLINS
5/13/2024 3:13 PM

KERR WOOD LEIDAL
consulting engineers

Appendix B

Field Review Forms

Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

PROJECT: CLBWORKS 30A Cartier Bay Site 15a Engineering Services
Client: BC Hydro
Contractor: IDL
Contract No.:**0478.237**

PREPARED BY	Kalie Siemens	**CHK IN**	**1230pm**	**CHK OUT**	**230pm**
DATE	April 30, 2023				
WEATHER	Sunny, ~30°				

TAILGATE MEETING NOTES

*This area may be used in lieu of KWL "Appendix B11-Tailgate Meeting"

KWL Staff:
Kalie Siemens

KWL Activities:
1. Inspect saddle dam subgrade surface
2. Measure saddle dam excavation footprint
3. Inspect Area A road raises

Site Activities:
1. Bypass pumping at Site 15a
2. Fish salvage at Site 15a

Identified Hazards:
Construction equipment (not operating), water/wetland, soft ground (slip/trip/fall)

Contractor Tailgate Meeting Notes Reviewed?
(check one) Yes ☒ No ☐ n/a ☐

EMERGENCY CONTACTS

Nearest Medical Clinic Address
Queen Victoria Hospital (1200 Newlands Rd, Revelstoke)
250-837-2131

Emergency Phone Numbers
Emergency Services: 911
Medical Clinic: 250-837-2131
Police (non-emergency): 250-837-5255
Other:
On-site First Aid Attendant:

EQUIPMENT AND WORKFORCE ON SITE

CAT CS54B vibratory roller compactor
Deere 524K wheel loader
Sheeps foot compactor
Hitachi zx 135us excavator
Volvo excavator (for pump at 15a)

BCH: Tysyn O
IDL: Scott, 2 excavator operators, 2 laborers

CONSTRUCTION PROGRESS

Area A:
- 0.3 m stripped from raise areas
- Road raised with imported 75 mm minus pit run fill

Area B:
- Saddle dam footprint has been excavated
- Fish salvage complete and water being pumped
- Eroded channel has been filled in with excavated material from saddle dam footprint

Site 15a:
- Fish salvage in progress
- Pumping has started

OBSERVATIONS

Area A:
- Road raise areas measure 8.5m x 4.5m and 4.5m x 22m. Matches drawings.
- 75 mm minus is quite sandy but there are some bigger pieces in it

Area B:
- Saddle dam subgrade surface smooth
- Lots of organics have been dug out and some still on the surface
- Excavation 0.6 m deep in center, 0.4 m deep at edges. Approx 11 m across, 23 m width (paced off, survey not on site)
- Eroded channel filled in, top is quite flat
- Road repair has not started

Site 15a:
- Silt barrier set up and pumping into riprap south of outlet.

DISCUSSIONS WITH CONTRACTOR

Area A:
- Just surfacing left to complete.

Area B:
- Subgrade is soft/spongy. Contractor is concerned about meeting compaction on it.
- Plan to install geotextile east-west on the bottom, north-south on the riprap slopes
- Top of saddle dam fill should come above the edges of the excavation
- Fill in void over riprap toe with eroded channel fill/excavated material. Just cover it.
- Would like to put material excavated for Area A road raise north of Area B road repair.
- Geotextile

Site 15a:
- If approval received based on fish salvage (730 am tomorrow morning), can start setting up cofferdam and pump reservoir down.

DISCUSSIONS WITH OTHERS
- None

ACTION REQUIRED

Area B:
- Remove organics from the subgrade surface and smooth out those areas.
- Confirm excavation extents with survey.

General:
- Ahead of schedule. If fish salvage approved, site 15a excavation could start Monday afternoon with sugrade ready for Tuesday. Tysyn to update.

PHOTOGRAPHS (\\kwl.ca\projects\0400-0499\478-237\800-Photos\2023-04-30)

Saddle dam excavation footprint, looking west

Saddle dam excavation footprint, looking east:

Saddle dam excavation/subgrade, looking north. Bulk bag barrier still in place:

Looking south along filled eroded channel:

Pumping at Site 15a:

Area A road raise fill (looking east):

Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

PROJECT: CLBWORKS 30A Cartier Bay Site 15a Engineering Services
Client: BC Hydro
Contractor: IDL
Contract No.:**0478.237**

PREPARED BY	Kalie Siemens	**CHK IN**	**1230pm**	**CHK OUT**	**230pm**
DATE	May 3, 2023				
WEATHER	Sunny, ~26°				

TAILGATE MEETING NOTES

*This area may be used in lieu of KWL "Appendix B11-Tailgate Meeting"

KWL Staff:
Kalie Siemens, Liam Mackle

KWL Activities:
1. Inspect and measure saddle dam crest and riprap placement
2. Inspect filled eroded channel and Area B road repair

Site Activities:
1. Placing riprap on the saddle dam slopes
2. Placing 150 mm fill over the riprap/in the voids
3. Surveyor checking elevations
4. Pumping at Site 15a

Identified Hazards:
Construction equipment (excavators), water/wetland, soft ground and riprap (slip/trip/fall)

Contractor Tailgate Meeting Notes Reviewed?
(check one) Yes ☐ No ☐ n/a ☒

EMERGENCY CONTACTS

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Queen Victoria Hospital (1200 Newlands Rd, Revelstoke)
250-837-2131

Emergency Phone Numbers
Emergency Services: 911
Medical Clinic: 250-837-2131
Police (non-emergency): 250-837-5255
Other:
On-site First Aid Attendant:

EQUIPMENT AND WORKFORCE ON SITE

CAT CS54B vibratory roller compactor
Deere 524K wheel loader
Sheeps foot compactor
Hitachi zx 135us excavator
Volvo excavator (for pump at 15a)

BCH: Tysyn O
IDL: Scott, 2 excavator operators, 2 laborers, 1 surveyor, 1 biologist

CONSTRUCTION PROGRESS

Area A:
- 0.3 m stripped from raise areas
- Road raised with imported 75 mm minus pit run fill

Area B:
- Road repair completed (except for surfacing), riprap stockpiled
- Placement of saddle dam fill complete, geotextile on slopes
- Salvaged riprap placed on the south slope of the saddle dam
- Eroded channel is filled (material salvaged from Area A excavation placed in eroded channel downstream of Area B road repair)

Site 15a:
- Bulk bag wrapped with poly cofferdam in place
- Reservoir level has reduced further, still pumping
- Have started excavating and salvaged some riprap from Site 15a dam

OBSERVATIONS

Area B:
- Saddle dam crest elevation 434.14m-434.15m
- Saddle dam crest width 4.2m-4.4m
- Geotextile overlap 0.45 m
- Top thickness of riprap = 1.9 m
- Salvaged riprap size range from 200mm-450 mm with D50 of 300 mm approx.
- Rocks salvaged for boulders range 600-750 mm B dimension
- Bulk bags still in place but riprap has been salvaged and used

Site 15a:
- Reservoir level lower, excavation for subgrade marked out

DISCUSSIONS WITH CONTRACTOR

Area A:
- Surfacing of Area A road raises will probably be the last thing they do on their way out.

Area B:
- Waiting on compaction testing on saddle dam crest
- Struggling to source the 200 mm minus granular fill, can only find 150.
- Have not imported riprap yet but will need to to finish saddle dam.
- Filling riprap with salvaged will from 15a.
- Salvaged Area A road fill was placed in eroded channel downstream of Area B road repair.
-

Site 15a:
- Pond was lowered 9 cm.
- Pumping at 70% capacity
- Started excavating but too much sediment downstream.
- Need extra pump with 250 m hose to discharge into Columbia river. To arrive today.
- Will excavate to site 15a subgrade tomorrow.
- Crane and acbm placement likely Saturday. Need to build out a platform for crane since railway not wide enough.

DISCUSSIONS WITH OTHERS
- Biologist: the sediment might just be backwatering from the Columbia river. But the turbidity is quite high. Sticking around to monitor.

ACTION REQUIRED

Area B:
- Compaction testing on saddle dam crest
- Sourcing a granular fill for saddle dam crest surface
- Continue riprap placement

General:
- Contractor likely to submit an RFI for use of a 150 mm minus instead of 200.

PHOTOGRAPHS (\\kwl.ca\projects\0400-0499\478-237\800-Photos\2023-05-03-KS)

Riprap placement on south slope of saddle dam, looking east

North slope of saddle dam, looking east:

Area B road repair and eroded channel filled north of road, looking north:

Looking south along Site 15a outlet:

Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

PROJECT: CLBWORKS 30A Cartier Bay Site 15a Engineering Services
Client: BC Hydro
Contractor: IDL
Contract No.:**0478.237**

PREPARED BY	Kalie Siemens	**CHK IN**	**1130pm**	**CHK OUT**	**200pm**
DATE	May 4, 2023				
WEATHER	Sunny, ~26°				

TAILGATE MEETING NOTES

*This area may be used in lieu of KWL "Appendix B11-Tailgate Meeting"

KWL Staff:

Kalie Siemens, Liam Mackle

KWL Activities:

1. Inspect and measure excavation of Site 15a outlet

Site Activities:

1. Excavating Site 15a outlet
2. Layout survey for ACBM's
3. Pumping to lower reservoir

Identified Hazards:

Construction equipment (excavators), water/wetland, soft ground and riprap (slip/trip/fall)

Contractor Tailgate Meeting Notes Reviewed?

(check one) Yes ☒ No ☐ n/a ☐

EMERGENCY CONTACTS

Nearest Medical Clinic Address

Queen Victoria Hospital (1200 Newlands Rd, Revelstoke)
250-837-2131

Emergency Phone Numbers

Emergency Services: 911
Medical Clinic: 250-837-2131
Police (non-emergency): 250-837-5255
Other:
On-site First Aid Attendant:

EQUIPMENT AND WORKFORCE ON SITE

CAT CS54B vibratory roller compactor
Deere 524K wheel loader
Sheeps foot compactor
Hitachi zx 135us excavator
Volvo excavator
Rock trucks

IDL: Scott, 2 excavator operators, 2 laborers, 1 surveyor, 1 biologist

CONSTRUCTION PROGRESS

Area A:

- 0.3 m stripped from raise areas
- Road raised with imported 75 mm minus pit run fill

Area B:

- Road repair completed (except for surfacing)
- Placement of saddle dam fill complete, geotextile on slopes
- Salvaged riprap placed on the south slope of the saddle dam
- Eroded channel is filled

Site 15a:

- Bulk bag wrapped with poly cofferdam in place
- Reservoir level has reduced further, still pumping
- Have continued excavating the outlet down to the subgrade elevation

Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

OBSERVATIONS

Area B:
- Started placing riprap on north slope

Site 15a:
- Reservoir level lower
- Site 15a outlet has been excavated and surveyor has marked extents for ACBM's

DISCUSSIONS WITH CONTRACTOR

Area A:

Area B:
- Compaction testing completed on saddle dam. Results were 99.6% and 102%.
- Got Class 10 kg riprap from Enderby for the north slope of the saddle dam.
- 150mm minus granular material expected to arrive today and will place on the saddle dam crest.

Site 15a:
- Have had both pumps running since this morning, but still not enough. Water level at 433.89m. Going to get another 4" pump
- Excavated down to 433.467m.
- May need more than 50 mm thick of surfacing aggregate to get smooth surface
- Will need to remove the ACBM loops with a grinder. They have one.
- Will need to use a broom to sweep the surfacing aggregate into the voids (clear concrete surface)

DISCUSSIONS WITH OTHERS
- Bulk bags at cofferdam are filled with 25 mm minus surfacing aggregate. Will use that material for Area A surfacing once done with the cofferdam.
- Can they track an excavator over the outlet to retrieve their pump afterward? Yes, but not over the ACBMs

ACTION REQUIRED

Area B:
- Finish riprap on north slope and fill voids
- Place 150 mm minus granular material on crest surface once it arrives
- Place boulders on surface

Site 15a:
- Continue to draw reservoir down. Subgrade to be ready for Saturday, crane coming Saturday with ACBMs.

PHOTOGRAPHS (\\kwl.ca\projects\0400-0499\478-237\800-Photos\2023-05-04-KS)

Site 15a outlet excavation, looking north:

Site 15a outlet excavation, looking south:

Subgrade surface of excavated railbed at Site 15a:

Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

PROJECT: CLBWORKS 30A Cartier Bay Site 15a Engineering Services
Client: BC Hydro
Contractor: IDL
Contract No.:**0478.237**

PREPARED BY	Kalie Siemens	**CHK IN**	**9am**	**CHK OUT**	**430pm**
DATE	May 8, 2023				
WEATHER	Overcast, ~19°				

TAILGATE MEETING NOTES

*This area may be used in lieu of KWL "Appendix B11-Tailgate Meeting"

KWL Staff:

Kalie Siemens

KWL Activities:

1. Inspect subgrade of Site 15a
2. Witness placement of geotextile and ACBM's at Site 15a
3. Inspect finished saddle dam at Area B (minus boulders)
4. Measure riprap

Site Activities:

1. Finish preparing Site 15a subgrade
2. Place geotextile and ACBM's
3. Start filling open cells of ACBM's

Identified Hazards:

Construction equipment (excavators and crane), water/wetland, soft ground and riprap (slip/trip/fall)

Contractor Tailgate Meeting Notes Reviewed?

(check one) Yes ☒ No ☐ n/a ☐

EMERGENCY CONTACTS

Nearest Medical Clinic Address

Queen Victoria Hospital (1200 Newlands Rd, Revelstoke)
250-837-2131

Emergency Phone Numbers

Emergency Services: 911
Medical Clinic: 250-837-2131
Police (non-emergency): 250-837-5255
Other:
On-site First Aid Attendant:

EQUIPMENT AND WORKFORCE ON SITE

CAT CS54B vibratory roller compactor
Deere 524K wheel loader
Sheeps foot compactor
Hitachi zx 135us excavator
Volvo excavator
Rock trucks
Crane

BCH: Tysyn O
IDL: Scott, 1 excavator operator, 2 laborers, 1 surveyor, 1 crane operator

CONSTRUCTION PROGRESS

Area A:

- 0.3 m stripped from raise areas
- Road raised with imported 75 mm minus pit run fill

Area B:

- Road repair completed
- Eroded channel is filled
- Bulk bag berm removed

- Saddle dam fill placed and compacted
- Riprap on saddle dam slopes
- 200 mm minus granular fill on saddle dam crest

Site 15a:
- Cofferdam in place, pumping reservoir
- Site 15a outlet excavated
- 200 mm minus granular fill placed on either side of ACBM subgrade
- ACBM subgrade completed
- Geotextile placed
- ACBM's placed
- Started filling cells with 25 mm minus surfacing aggregate fill

OBSERVATIONS

Area B:
- The side slopes with no riprap are quite deep and could use riprap
- Boulders need placed, and are adequate size (smallest measured 650 mm)

Site 15a:
- Removed a few cobbles from subgrade
- Surveyor clarifies bottom elevation of subgrade is 433.53 m (should be 433.58 m)
- Additional 25 mm minus surfacing aggregate fill is used to bring the subgrade to 433.58 m
- Bucket packed on slopes, used sheeps foot to compact the bottom part
- Full surface smoothed out with a rake.
- Side slopes 3H:1V
- Subgrade 2.0 m wide on surface, remaining 0.4 m part of the upstream embedment
- Bottom width 4.3 m before ACBM placement
- Geotextile has 1 m overlap
- ACBM measures 0.12 m thick
- First mat placed, 2 blocks break because of staggered design
- IDL manually moved individual blocks along the cables to fold first row of blocks into embedded portion
- Second mat placed over the cable loops of first mat
- Second mat's cables tucked under the blocks
- IDL manually worked the blocks to have concrete touching on all blocks except the embedded ones
- IDL used a broom to fill the open cells with 25 mm minus surfacing aggregate fill
- Surveyor not present for ACBM placement

General:
- Arrow reservoir has risen considerably. Approx 2 m below outlet.
- Measured imported riprap: Dmin= 150 mm; Dmax = 550 mm; and Davg = ~300 mm

DISCUSSIONS WITH CONTRACTOR

Area B:
- Will place remaining riprap at saddle dam

Site 15a:
- Will place remaining 200 mm minus granular fill over riprap at outlet (but must maintain 433.7 m elev)
- Cutting the cable loops off is not necessary to achieve contact between concrete blocks
- Will finish filling open cells and bring 200 mm minus granular fill to grade on either side of the ACBMs

General:
- Surveyor will be back Tuesday to confirm final grades

DISCUSSIONS WITH OTHERS

- BCH Tysyn may wish to have “floating” staggered second row of blocks above embedded upstream row broken to fit the contour better as the ones sticking up may pose a hazard to bikers etc.
- BCH Tysyn will direct crest boulder placement.
- Fill in bulk bags at Area B was placed in the eroded channel, north of the road repair at Area B.

ACTION REQUIRED

Area A:

- Complete surfacing of road raises

Area B:

- Place riprap on side slopes and cover with salvaged fill
- Place boulders on crest

Site 15a:

- Finish filling cells and grading outlet (200 mm minus granular fill)
- Cover cable loops at outer ends
- Remove pumps, cofferdam, and demob

PHOTOGRAPHS (\\kwl.ca\projects\0400-0499\478-237\800-Photos\2023-05-08-KS)

Saddle dam crest, looking east. Riprap on the side slopes does not extend to the eastern end of the saddle dam

Raising and bucket-packing Site 15a outlet subgrade, looking south:

Subgrade at Site 15a with centerline marked out, looking south:

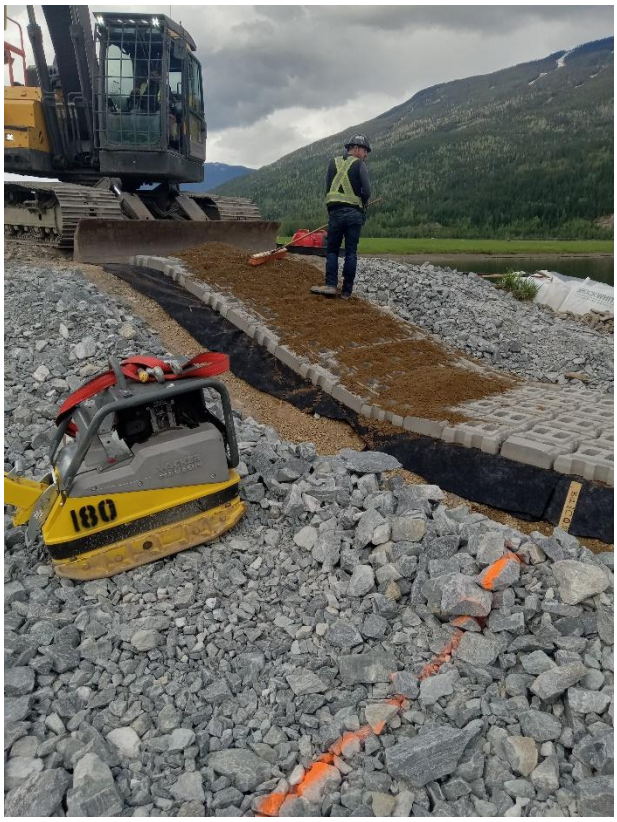
Geotextile placed over subgrade for first (south) ACBM, looking north:

Crane and excavator placing south ACBM, looking east:

Upstream row of blocks on slope (to be embedded with 200 mm minus granular fill), looking south:

Second ACBM placed and in contact with first ACBM, looking west:

Broom used to fill open cells with 25 mm minus surfacing aggregate fill (looking northeast):



Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

PROJECT: CLBWORKS 30A Cartier Bay Site 15a Engineering Services
Client: BC Hydro
Contractor: IDL
Contract No.:**0478.237**

PREPARED BY	Kalie Siemens	**CHK IN**	**10am**	**CHK OUT**	**1130pm**
DATE	May 11, 2023				
WEATHER	Sunny, 20°C+				

TAILGATE MEETING NOTES

*This area may be used in lieu of KWL "Appendix B11-Tailgate Meeting"

KWL Staff:

Kalie Siemens

KWL Activities:

1. Final inspection of Site 15a outlet, saddle dam crest, and Area A road raises

Site Activities:

1. Demobilization

Identified Hazards:

Construction equipment (1 excavator), water/wetland, soft ground and riprap (slip/trip/fall)

Contractor Tailgate Meeting Notes Reviewed?

(check one) Yes ☐ No ☐ n/a ☒

EMERGENCY CONTACTS

Nearest Medical Clinic Address

Queen Victoria Hospital (1200 Newlands Rd, Revelstoke)
250-837-2131

Emergency Phone Numbers

Emergency Services: 911
Medical Clinic: 250-837-2131
Police (non-emergency): 250-837-5255
Other:
On-site First Aid Attendant:

EQUIPMENT AND WORKFORCE ON SITE

Sheeps foot compactor
Hitachi zx 135us excavator

IDL: 1 foreman, 1 laborer, 1 surveyor

CONSTRUCTION PROGRESS

Area A:
- Surfacing aggregate fill placed and compacted over road raise areas

Area B:
- Saddle dam complete and boulders placed on crest

Site 15a:
- Open cells of ACBMs have been filled with surfacing aggregate fill
- 200 mm minus granular fill has been placed up to the sides of the ACBMs and over the embedded first row of blocks on the upstream side
- Outer ends of mats have been covered

OBSERVATIONS

Area A:
- 2 road raise areas complete with surfacing aggregate fill
- Road surfaces 4.2 m wide

Area B:
- Riprap has been placed on the side slopes to the eastern extent of the saddle dam and voids topped with salvaged fill.
- 11 boulders have been placed on the crest, ranging in size from 300 mm to 1 m diameter
- Boulder spacing is approx. 2 m

Site 15a:
- Cables are covered at the outer ends of the ACBM's
- Some riprap has been placed on the upstream (wetland) embankment slope outside of the outlet opening (2 m length on north end and 3.5 m length on south end)
- Cofferdam removed and water coming over outlet, approx. 1 cm deep
- 200 mm minus granular fill extends 4.6 m towards reservoir from eastern edge of ACBM's, and 6.1 m towards Arrow reservoir from western edge of ACBM's

DISCUSSIONS WITH CONTRACTOR

Area A:
- Road raise elevations 434.4 m
- Surfacing came from Site 15a cofferdam

Area B:
- Tysyn from BCH directed boulder placement on saddle dam
- Salvaged vegetation from the saddle dam footprint was placed to either side of the saddle dam

Site 15a:
- Placed left over riprap at upstream embankment to prevent erosion
- Biologist had to relocate some western toads during removal of the cofferdam

DISCUSSIONS WITH OTHERS
- Pinpoint survey – pick up some points in eroded channel fill for record drawings

ACTION REQUIRED
- Provide final survey for record drawings

PHOTOGRAPHS (\\kwl.ca\projects\0400-0499\478-237\800-Photos\2023-05-08-KS)

Finished saddle dam, looking west

Finished Site 15a outlet, looking south:

Finished Area A road raise, looking west:

Finished Site 15a outlet, looking east:

Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

PROJECT: Cartier Bay Wetlands
Client: BC Hydro
Contractor: IDL
Contract No.:**0478.237**

PREPARED BY	Liam Mackle	**CHK IN**	**10am**	**CHK OUT**	**1130pm**
DATE	September 25, 2023				
WEATHER	Partly cloudy, 18°C+				

TAILGATE MEETING NOTES

*This area may be used in lieu of KWL "Appendix B11-Tailgate Meeting"

KWL Staff:

Liam Mackle

KWL Activities:

1. Post construction inspection of Site 15a outlet and saddle dam

Site Activities:

1. None

Identified Hazards:

Working near water/wetland, soft ground and riprap (slip/trip/fall)

Contractor Tailgate Meeting Notes Reviewed?

(check one) Yes ☐ No ☐ n/a ☒

EMERGENCY CONTACTS

Nearest Medical Clinic Address

Queen Victoria Hospital (1200 Newlands Rd, Revelstoke)
250-837-2131

Emergency Phone Numbers

Emergency Services: 911
Medical Clinic: 250-837-2131
Police (non-emergency): 250-837-5255
Other:
On-site First Aid Attendant:

EQUIPMENT AND WORKFORCE ON SITE

None

CONSTRUCTION PROGRESS

- Construction complete

OBSERVATIONS

Area B Saddle Dam:

- Prior to this site inspection, BCH had observed water flowing around both sides of the saddle dam as the reservoir filled.
- It is likely that the low area on the south side of the saddle dam existed before dam was constructed, however construction activities may have packed it down further.
- Sediment had deposited on the wetland side of the saddle dam, presumably deposited as water spread out behind the saddle dam.
- No erosion was observed on either end of the saddle dam.

Site 15a:

- Based on the record survey, the ACBM is at design elevation and within the specified design tolerance.
- It was observed that the downstream section of 200 mm minus varies from the ACBM elevation in some spots by up to ~5 cm, but is not uniformly high or low.
- The upstream section of 200 mm minus at the wetland inlet has several low spots of up to ~12 cm.

DISCUSSIONS WITH CONTRACTOR

N/A

DISCUSSIONS WITH OTHERS

N/A

Daily Field Review Report

KERR WOOD LEIDAL
consulting engineers

ACTION REQUIRED
The following recommendations were made:

Area B Saddle Dam:
There are many paths into the wetland, and attempting to plug all of them is not feasible. It is likely that the establishment of reed canary grass in the currently bare areas will slow down flow around the dam, and reduce the likelihood of erosion. It is recommended that soil and reed canary grass be planted to reduce the potential for erosion. Following that, this location should be included in the regular dam inspection activities and operation and maintenance manual.

Site 15a:
It is recommended that excess 200 mm material used on the side slopes and on the downstream side be moved to the wetland inlet side of Site 15a to provide a more uniform surface across its length.

PHOTOGRAPHS (\\kwl.ca\projects\0400-0499\478-237\800-Photos\20230925)

Site 15a looking towards the reservoir – the wetland side section of rock shown here is lower than the ACBM:

South end of the saddle dam where flow was observed outflanking it. The area is still predominantly bare of vegetation. Deposited material is circled on the photograph. See photograph below:

KERR WOOD LEIDAL
consulting engineers

Appendix C

Photo Appendix

Appendix C: Photo Appendix

Photo 1: Excavated saddle dam footprint and prepared subgrade at Area B saddle dam. Looking west. April 30, 2023.

Photo 2: Placement of saddle dam fill at Area B saddle dam. Looking east. May 3, 2023.
Photo provided by BC Hydro

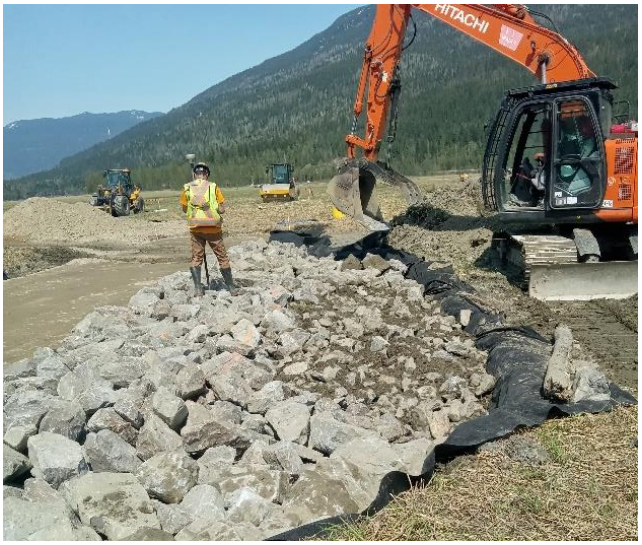


Photo 3: Placement of riprap on the south slope of the Area B saddle dam and filling voids. Looking east. May 3, 2023.

Photo 4: Excavation of the Site 15a outlet in progress. The cofferdam can be seen to the left in the photo. Looking north. May 4, 2023.

Appendix C: Photo Appendix

Photo 5: Preparation of the subgrade for the ACBM's at the Site 15a outlet in progress. Looking north. May 8, 2023.

Photo 6: Preparation of the subgrade for the ACBM's at the Site 15a outlet in progress. Looking east. May 8, 2023.

Photo 7: Finished subgrade prior to placement of the ACBM's at the Site 15a outlet. Looking north. May 8, 2023.

Photo 8: Placement of geotextile over the subgrade prior to placement of the first ACBM at the Site 15a outlet. Looking north. May 8, 2023.

Appendix C: Photo Appendix

Photo 9: The first ACBM after placement. The upstream/eastern row of blocks was placed on an angle for embedment in granular material. Looking north. May 8, 2023.

Photo 10: Placement of the second ACBM to contact the first in the middle of the Site 15a outlet. Looking north. May 8, 2023.

Photo 11: Both ACBM's at the Site 15a outlet in place prior to covering with surfacing aggregate. Looking south. May 8, 2023.

Photo 12: Filling the ACBM open cells with 25 mm minus surfacing aggregate at the Site 15a outlet. Looking northeast. May 8, 2023.

Appendix C: Photo Appendix

Photo 13: Finished Site 15a outlet immediately following removal of the cofferdam. Looking south. May 11, 2023.

Photo 14: Finished saddle dam at Area B. Looking north. May 11, 2023.

Photo 15: Finished saddle dam at Area B. Looking west. May 11, 2023

Photo 16: Area A road repairs. Looking east. May 11, 2023

Appendix C: Photo Appendix

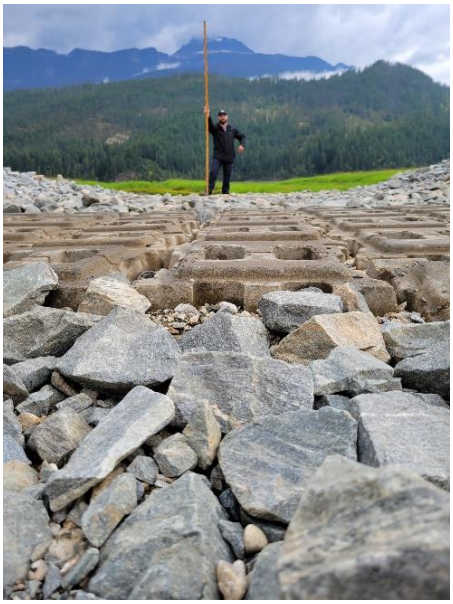


Photo 17: Site 15a looking towards the reservoir – the wetland side section of rock shown here is lower than the ACBM. September 25, 2023.

Photo 18: South end of the saddle dam where flow was observed flanking it. The area is still predominantly bare of vegetation. September 25, 2023.

Photo 19: Site 15a outlet before post-construction remedial work on the upstream (wetland) side. November 6, 2023.

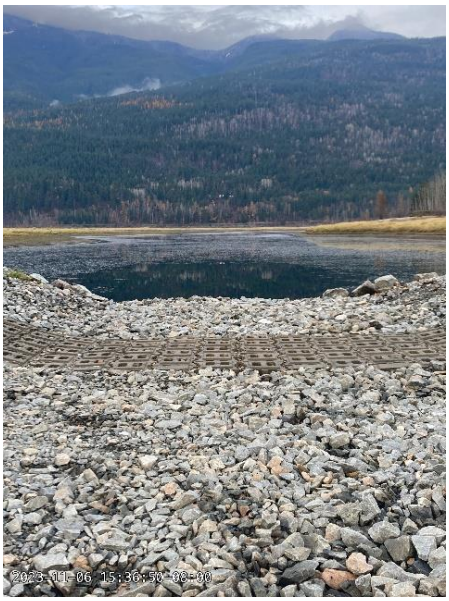


Photo 20: Wetland side of Site 15a inlet filled to provide a more uniform surface across its length. November 6, 2023.

KERR WOOD LEIDAL
consulting engineers

Appendix D

Contractor QA Submission

Item	Reported Value	Specification	Specified Value	Result
Area B Saddle Dam Stripping and Grubbing	Remove all topsoil and organics to a clean mineral soil/rock surface or a maximum excavated depth of 0.3 m	SP 5.3.1.2	0.3 m	Meets specifications
Area B Saddle Dam/Eroded Channel 75 mm Minus Subgrade Inspection	Firm, dense, and compacted base surface	SP 5.3.4	n/a	Passed inspection (BCH)
Saddle Dam Field Density Test - 75 mm Minus Pit Run	Pass (3 locations)	SP 5.3.6	95% maximum dry density	Meets specifications
Saddle Dam Field Density Test - 25 mm Surfacing Aggregate	Pass (2 locations)	SP 5.3.6	95% maximum dry density	Meets specifications
Area B Saddle Dam 200 mm Minus Granular Fill Inspection	Firm, dense, and compacted base surface	SP 5.3.5	n/a	Passed inspection (BCH)
Area B Saddle Dam Riprap Subgrade Inspection	Firm, dense, and compacted base surface	SP 5.3.5	n/a	Passed inspection (BCH)
Area B Saddle Dam Crest Boulder Locations	Placed on the completed surface in random spacing	SP 5.3.14	n/a	Passed inspection (BCH)
Area B Saddle Dam Finish Site Grading	Final grades within 25 mm of design elevations (or tolerances provided in RFI-001) but not uniformly high or low	SP 5.3.15	+/- 25 mm of design elevations but not uniformly high or low	Meets specifications
Eroded Channel Fill 75 mm Minus Subgrade Inspection	Firm, dense, and compacted base surface	SP 5.3.10	n/a	Passed inspection (BCH)
Eroded Channel Fill Inspection	Channel surface prepared to create surface suitable for accepting new fill	SP 5.3.10	n/a	Passed inspection (BCH)
Area A Road Raising Stripping and Grubbing	Remove all topsoil and organics to a clean mineral soil/rock surface or a maximum excavated depth of 0.3 m	SP 5.3.1.2	0.3 m	Meets specifications
Area B Road Fill/Eroded Channel 75 mm Minus Subgrade Inspection	Firm, dense, and compacted base surface	SP 5.3.10	n/a	Passed inspection (BCH)
Area A Road Raising 25 mm Minus Surfacing Aggregate Subgrade Inspection	Firm, dense, and compacted base surface	SP 5.3.5	n/a	Passed inspection (BCH)
Area B Road Fill and Area A Road Raising Finish Grading	Final grades within 25 mm of design elevations (or tolerances provided in RFI-001) but not uniformly high or low	SP 5.3.15	+/- 25 mm of design elevations but not uniformly high or low	Meets specifications
ACBM Subgrade Inspection	Firm, dense, and compacted base surface	SP 6.3.2	n/a	Passed inspection (BCH)
ACBM Finish Grade Elevation Inspection/Infilling of Voids with Surfacing Aggregate	ACBM placed and voids infilled with surfacing aggregate	SP 6.3.4.4	+/- 25 mm of design elevations but not uniformly high or low	Meets specifications
Site 15a Dam 200 mm Minus Subgrade Inspection	Firm, dense, and compacted base surface	SP 6.3.2	n/a	Passed inspection (BCH)
Site 15a Dam Finish Grading	Final grades within 25 mm of design elevations (or tolerances provided in RFI-001) but not uniformly high or low	SP 6.3.6	+/- 25 mm of design elevations but not uniformly high or low	Meets specifications
ML/ARD Testing	Non-acid generating, extremely low leachable sulphur	SP 3.2, SP 5.2	Non acid rock draining or metal leaching	Meets specifications

IDLPROJECTS	MRR Material Receiving Report	Document:	IDL-MM-002F1	
		Date & Rev:	11/04/04	0
		Department:	Procurement	

Shipment Data

PO Number:	SU 63348	Packg Slip Number:	N/A	Report Number:	001
Vendor:	Baird Bros. Ltd.	Shipper:	N/A	Job:	4-23-300
Carrier:	Baird Bros. Ltd.	Shipped From:	N/A	Date Rcvd:	May 4, 2023
Freight Bill Number:	N/A	Number of Pieces:	N/A	Rcvd By:	Britney Mathieson

Shipped: ☐ Collect ☐ Pre Paid | Status of Purchase Order: ☐ Incomplete ☒ Complete | Type of Shipment: ☐ Partial ☒ Final | Page: 1 of 1

Material Details

P.O. Item	Qty on ORD	Qty RCVD	Qty on BO	Material Description	Heat/Lot Number	MTR Rcv'd	Dimens. Checked
SU 63348	42.01 t	42.01 t	42.01 t	Class 10kg Riprap	N/A	Yes	Yes

Material Exception Details

P.O. Item	Excptn Qty	UNIT	Material Description and Exception Notes	Over	Short	Damage	Not As Ordered

Recorded By:

Brittney Mathieson — *Print or Type Name*

Scott Salle — *Material Manager*

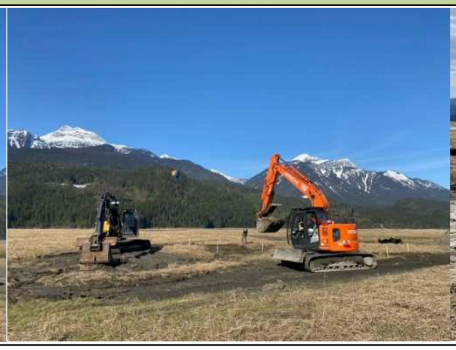
May 5, 2023 — *Date*

IDLPROJECTS	Visual Inspection Report	Document:	IDL-QC-010F1	
		Date & Rev:	11/06/10	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair		
Inspected by:	Britney Mathieson	**Date:**	April 30, 2023
Location/Area:	Drawing 201B-C09-00007 – Area B Eroded Channel		
Item(s) Inspected:	Area B Saddle Dam Stripping and Grubbing Location		
Spec/Code:	SP5.3.1.2		

ACCEPTANCE CRITERIA
Remove all topsoil and organics to a clean mineral soil/rock surface or a maximum excavated depth of 0.3 m.

COMMENTS


Items Pass Inspection: ☒**Yes** ☐**No**

Documentation Required: ☐**Yes** ☒**No**

Document	Document Ref. #	Actioned by	Date
☐RFI			
☐NCR			
☐PAR/CAR			
☐Other:			

APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Area B Saddle Dam – Eroded Channel Fill/75mm Minus Pit Run Subgrade
Drawing Number/Area:	201B-C09-00005
Equipment # (if applicable):	N/A

	Item		**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	Surface organic/topsoil stripped from under fill area.
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☐ Yes ☒ No	
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to geotextile and saddle dam/75mm minus pit run fill and approved for install. Base conditions were predominantly firm, dense and compact.

Base Condition Descriptors:

- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: Geotextile and Saddle Dam Fill Placement

Inspected by:	Briteny Mathieson	May 1, 2023
	Print Name	Date

APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

	Compaction Log		
		Document:	IDL-CON-601F1
		Date & Rev:	09/04/12 / 0
		Department:	Construction

Item #	Date	Location	Specifications	Material (List fill material used)	Standard Proctor Max Dry Density (kg/m3)	Test #	Disposition	Restest Required	Comments
1	May 4, 2023	Saddle Dam - 5m From SW End Of Subgrade Shoulder Elevation 434.14M	ASTM D698 - 95%	75mm Minus Pit Run	2190	1	☒ Pass ☐ Fail	☐ Yes ☒ No	
2	May 4, 2023	Saddle Dam - 11m From SW End Of Subgrade Shoulder Elevation 434.14M	ASTM D698 - 95%	75mm Minus Pit Run	2190	2	☒ Pass ☐ Fail	☐ Yes ☒ No	
3	May 4, 2023	Saddle Dam - 2.5m From NE End Of Subgrade Shoulder Elevation 434.14M	ASTM D698 - 95%	75mm Minus Pit Run	2190	3	☒ Pass ☐ Fail	☐ Yes ☒ No	
4	May 12, 2023	Saddle Dam - Top Of Base 2.6m From SW End of Subgrade Shoulder	ASTM D698 - 95%	25mm Surfacing Aggregate	2160	1	☒ Pass ☐ Fail	☐ Yes ☒ No	
5	May 12, 2023	Saddle Dam - Top Of Base 6m From SW End of Subgrade Shoulder	ASTM D698 - 95%	25mm Surfacing Aggregate	2160	2	☒ Pass ☐ Fail	☐ Yes ☒ No	
6	May 12, 2023	Saddle Dam - Top Of Base 4m From NE End of Subgrade Shoulder	ASTM D698 - 95%	25mm Surfacing Aggregate	2160	3	☒ Pass ☐ Fail	☐ Yes ☒ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
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							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	
							☐ Pass ☐ Fail	☐ Yes ☐ No	

METRO TESTING + ENGINEERING

5421 Auto Road, SE Unit #4, Salmon Arm, B.C.

Ph: (250) 803 - 0248

FIELD DENSITY REPORT

PROJECT NO. SA43781
CLIENT IDL PROJECTS INC.
C.C.

TO
IDL PROJECTS INC.
1088 GREAT STREET
PRINCE GEORGE, BC
V2N 2K8

ATTN: MATTHEW MARAK

PROJECT CARTIER BAY EROSION REPAIR
MATERIALS

AIRPORT WAY
REVELSTOKE

REPORT NO. 1 NO. OF DENSITIES 3 TESTED BY AK DATE TESTED 2023.May.04

CONTRACTOR IDL PROJECTS
AREA SADDLE DAM
CONSTRUCTION TYPE 75MM MINUS

TIME TESTED 09:30

DENSITY NUMBER	LOCATION	LAB REFERENCE AND MATERIAL TYPE	MOISTURE		OVERSIZE MATERIAL	DRY DENSITY		COMPACTION %
			FIELD	OPTIMUM		FIELD	LAB	
1	5M FROM SW END OF SUBGRADE SHOULDER ELEVATION 434.14M	Proctor 1 75MM SAND & GRAVEL MEDIUM	3.3	6.0	22.0	2197	2190	100
2	11M FROM SW END OF SUBGRADE SHOULDER ELEVATION 434.14M	Proctor 1 75MM SAND & GRAVEL MEDIUM	3.6	6.0	22.0	2183	2190	100
3	2.5M FROM NE END OF SUBGRADE SHOULDER ELEVATION 434.15M	Proctor 1 75MM SAND & GRAVEL MEDIUM	3.0	6.0	22.0	2207	2190	101

FIELD METHOD Nuclear ASTM D6938
LABORATORY METHOD Standard Proctor ASTM D698
ROCK CORRECTION METHOD ASTM D4718 Proctor Density Correction
OVERSIZE SCREEN SIZE Passing 3/4" - 19mm

SPECIFIED COMPACTION 100
LOW DENSITIES INDICATED WITH *

COMMENTS

2023.May.09 METRO TESTING + ENGINEERING PER. _____

METRO TESTING + ENGINEERING

5421 Auto Road, SE Unit #4, Salmon Arm, B.C.

Ph: (250) 803 - 0248

FIELD DENSITY REPORT

PROJECT NO. SA43781
CLIENT IDL PROJECTS INC.
C.C.

TO
IDL PROJECTS INC.
1088 GREAT STREET
PRINCE GEORGE, BC
V2N 2K8

ATTN: MATTHEW MARAK

PROJECT CARTIER BAY EROSION REPAIR
MATERIALS

AIRPORT WAY
REVELSTOKE

REPORT NO. 2 NO. OF DENSITIES 3 TESTED BY AK DATE TESTED 2023.May.12

CONTRACTOR IDL PROJECTS
AREA SADDLE DAM
CONSTRUCTION TYPE 25MM MINUS

TIME TESTED 09:00

DENSITY NUMBER	LOCATION	LAB REFERENCE AND MATERIAL TYPE	MOISTURE		OVERSIZE MATERIAL	DRY DENSITY		COMPACTION %
			FIELD	OPTIMUM		FIELD	LAB	
1	TOP OF BASE 2.6M FROM SW END OF SUBGRADE SHOULDER	Proctor 2 25MM CRUSH MEDIUM	4.6	6.5	8.1	2136	2160	99
2	TOP OF BASE 6M FROM SW END OF SUBGRADE SHOULDER	Proctor 2 25MM CRUSH MEDIUM	5.1	6.5	8.1	2129	2160	99
3	TOP OF BASE 4M FROM NE END OF SUBGRADE SHOULDER	Proctor 2 25MM CRUSH MEDIUM	4.7	6.5	8.1	2134	2160	99

FIELD METHOD Nuclear ASTM D6938
LABORATORY METHOD Standard Proctor ASTM D698
ROCK CORRECTION METHOD ASTM D4718 Proctor Density Correction
OVERSIZE SCREEN SIZE Passing 3/4" - 19mm

SPECIFIED COMPACTION 98
LOW DENSITIES INDICATED WITH *

COMMENTS

2023.May.17 METRO TESTING + ENGINEERING PER. _____

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Area B Saddle Dam – 200mm Minus Granular Fill Subgrade
Drawing Number/Area:	201B-C09-00005 & 201B-C09-00006
Equipment # (if applicable):	N/A

Item			**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☐ Yes ☒ No	
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to 200mm Minus Granular Fill placement and approved for install. Base conditions were predominantly firm, dense and compact.



Base Condition Descriptors:

- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: 200mm Minus Granular Fill

Inspected by:	Briteny Mathieson	May 5, 2023
	Print Name	Date

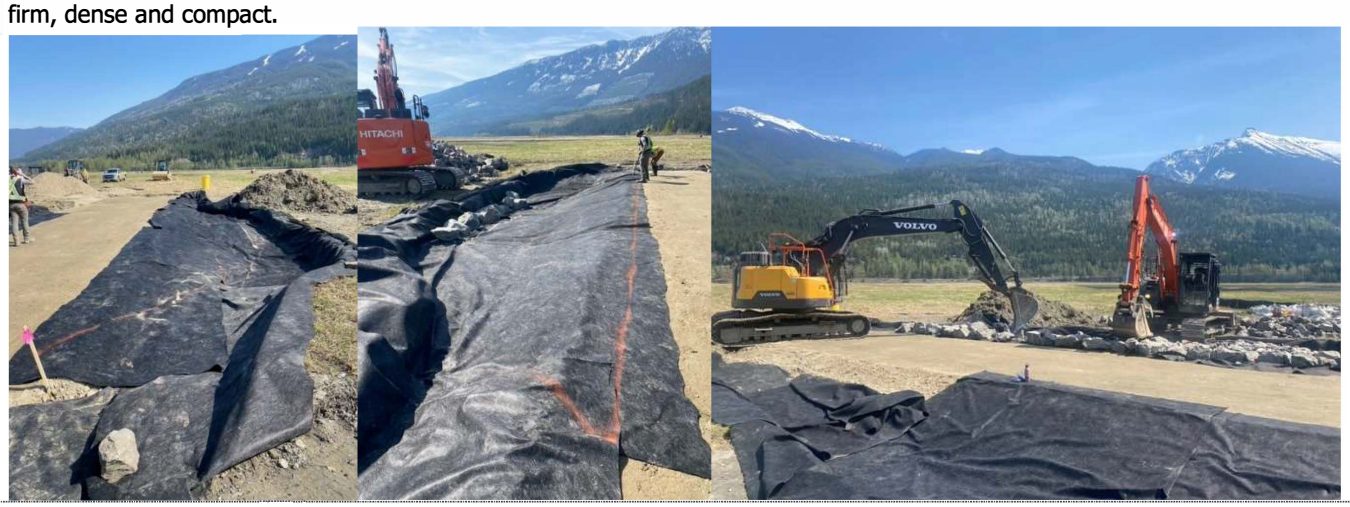
APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Area B Saddle Dam – Riprap Subgrade
Drawing Number/Area:	201B-C09-00005 & 201B-C09-00006
Equipment # (if applicable):	N/A

Item			**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☐ Yes ☒ No	
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to riprap and geotextile placement and approved for install. Base conditions were predominantly firm, dense and compact.



Base Condition Descriptors:

- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: Geotextile and Saddle Dam Fill Placement

Inspected by:	Briteny Mathieson	May 3, 2023
	Print Name	Date

APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	Visual Inspection Report	Document:	IDL-QC-010F1	
		Date & Rev:	11/06/10	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair		
Inspected by:	Britney Mathieson	**Date:**	May 9, 2023
Location/Area:	Drawing 201B-C09-00005 – Area B Saddle Dam – Saddle Dam Crest		
Item(s) Inspected:	Saddle Dam Crest Boulder Locations		
Spec/Code:	SP5.3.14		

ACCEPTANCE CRITERIA

Saddle Dam Crest Boulders shall be placed in random spacing on the completed surface of the crest of the saddle dam at the direction of Hydro's representative.

COMMENTS

Items Pass Inspection: ☒Yes ☐No

Documentation Required: ☐Yes ☒No

Document	Document Ref. #	Actioned by	Date
☐RFI			
☐NCR			
☐PAR/CAR			
☐Other:			

APPROVALS

IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	Visual Inspection Report	Document:	IDL-QC-010F1	
		Date & Rev:	11/06/10	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair		
Inspected by:	Britney Mathieson	**Date:**	May 11, 2023
Location/Area:	Drawing 201B-C09-00005 – Area B Saddle Dam		
Item(s) Inspected:	Area B Saddle Dam – Finish Site Grading		
Spec/Code:	SP5.3.15		

ACCEPTANCE CRITERIA

Finish all areas covered by work to final lines and grades shown on the Contract Drawings to within 25 mm of design elevations or the tolerances provided in RFI-001 but not uniformly high or low. All finished surfaces shall be uniformly compact and completely smooth and free from any irregular surface changes. Perform scarifying, blading, compacting or other work as necessary to provide a thoroughly compacted roadbed shaped to grades and cross sections shown on the Contract Drawings. Finish all side slopes to a neat condition, true to lines and grades and in accordance with the Contract Drawings. Remove any loose rock material encountered in any cut slopes and fill any resulting cavities

COMMENTS

Items Pass Inspection: ☒**Yes** ☐**No**

Documentation Required: ☐**Yes** ☒**No**

Document	Document Ref. #	Actioned by	Date
☐RFI			
☐NCR			
☐PAR/CAR			
☐Other:			

APPROVALS

IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Area A Road Raising – Eroded Channel Fill/75mm Minus Pit Run Subgrade
Drawing Number/Area:	201B-C09-00008
Equipment # (if applicable):	N/A

Item			**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	Surface organic/topsoil stripped from under fill and re-surfacing area.
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☐ Yes ☒ No	
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to 75mm minus pit run fill and approved for install. Base conditions were predominantly firm, dense and compact.

Base Condition Descriptors:

- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: 75mm Minus Pit Run Fill Placement

Inspected by:	Briteny Mathieson	April 28, 2023
	Print Name	Date

APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

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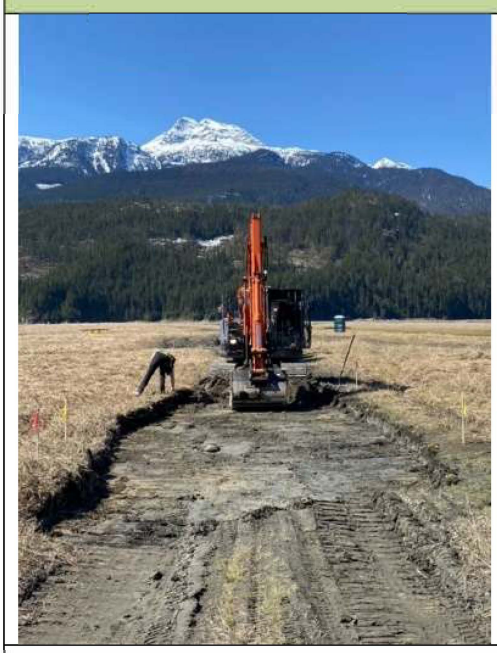
IDLPROJECTS	Visual Inspection Report	Document:	IDL-QC-010F1	
		Date & Rev:	11/06/10	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair		
Inspected by:	Britney Mathieson	**Date:**	April 28, 2023
Location/Area:	Drawing 201B-C09-00008 – Area A Road Raising		
Item(s) Inspected:	Area A Road Raising Stripping and Grubbing Location		
Spec/Code:	SP5.3.1.2		

ACCEPTANCE CRITERIA

Remove all topsoil and organics to a clean mineral soil/rock surface or a maximum depth of 0.3m.

COMMENTS



Items Pass Inspection: ☒**Yes** ☐**No**

Documentation Required: ☐**Yes** ☒**No**

Document	Document Ref. #	Actioned by	Date
☐RFI			
☐NCR			
☐PAR/CAR			
☐Other:			

APPROVALS

IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Area B Road Fill – Eroded Channel Fill/75mm Minus Pit Run Subgrade
Drawing Number/Area:	201B-C09-00007
Equipment # (if applicable):	N/A

Item			**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☐ Yes ☒ No	
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to 75mm minus pit run fill and approved for install. Base conditions were predominantly firm, dense and compact.

Base Condition Descriptors:

- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: 75mm Minus Pit Run Fill Placement

Inspected by:	Briteny Mathieson	May 1, 2023
	Print Name	Date

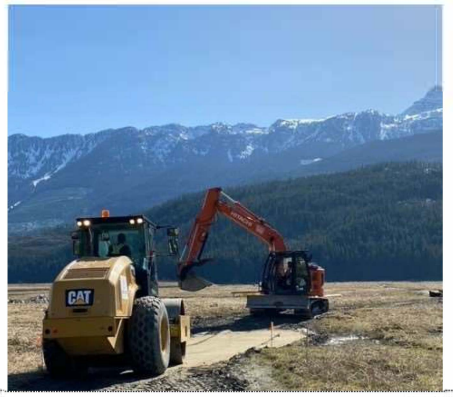
APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Area A Road Raising – 25mm Minus Surfacing Aggregate Subgrade
Drawing Number/Area:	201B-C09-00008
Equipment # (if applicable):	N/A

Item			**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☐ Yes ☒ No	
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to 25mm minus surfacing aggregate and approved for install. Base conditions were predominantly firm, dense and compact.



Base Condition Descriptors:
- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: 25mm Minus Surfacing Aggregate Placement

Inspected by:	Briteny Mathieson	May 8, 2023
	Print Name	Date

APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	Visual Inspection Report	Document:	IDL-QC-010F1	
		Date & Rev:	11/06/10	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair		
Inspected by:	Britney Mathieson	**Date:**	May 11, 2023
Location/Area:	Drawing 201B-C09-00007 – Area B Eroded Channel Fill & 201B-C09-00008 – Area A Road Raising		
Item(s) Inspected:	Area B Road Fill & Area A Road Raising Finish Grading		
Spec/Code:	SP5.3.15		

ACCEPTANCE CRITERIA

Finish all areas covered by work to the final lines and grades shown in the Contract Drawings. All finished surfaces shall be uniformly compact and completely smooth and free from any surface irregularities. Constructed surfaces shall be within 25 mm of design elevations or those provided in RFI-001 but not uniformly high or low. Finish all side slopes to a neat condition, true to lines and grades and in accordance with the Contract Drawings. Remove any loose rock material encountered in any cut slopes and fill any resulting cavities.

COMMENTS

Items Pass Inspection: ☒**Yes** ☐**No**

Documentation Required: ☐**Yes** ☒**No**

Document	Document Ref. #	Actioned by	Date
☐RFI			
☐NCR			
☐PAR/CAR			
☐Other:			

APPROVALS

IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Site 15a Dam – Subgrade of Articulated Concrete Block Mattress (ACBM)
Drawing Number/Area:	201B-C09-00003
Equipment # (if applicable):	Alpine Crane – 23.5 Tonne Crane Truck

	Item		**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☒ Yes ☐ No	Minimal water seepage present, water levels managed by ongoing pumping and cofferdam.
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to geotextile and ACBM placement and approved for install. Base conditions were predominantly firm, dense and compact.

Base Condition Descriptors:

- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: Geotextile & ACBM Placement

Inspected by:	Briteny Mathieson	May 8, 2023
	Print Name	Date

APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

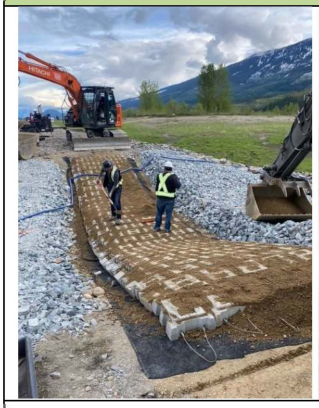
IDLPROJECTS	**Visual Inspection Report**	Document:	IDL-QC-010F1	
		Date & Rev:	11/06/10	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair		
Inspected by:	Britney Mathieson	**Date:**	May 10, 2023
Location/Area:	Drawing 201B-C09-00003 – Site 15a Dam – ACBM		
Item(s) Inspected:	Finish Grade Elevation of ACBM Upon Completion of Infilling Voids with Surfacing Aggregate		
Spec/Code:	SP6.3.4.4		

ACCEPTANCE CRITERIA

Infill voids of articulated concrete block mattress with surfacing aggregates to the satisfaction of Hydro's Representative.

COMMENTS



Items Pass Inspection: ☒**Yes** ☐**No**

Documentation Required: ☐**Yes** ☐**No**

Document	Document Ref. #	Actioned by	Date
☐RFI			
☐NCR			
☐PAR/CAR			
☐Other:			

APPROVALS

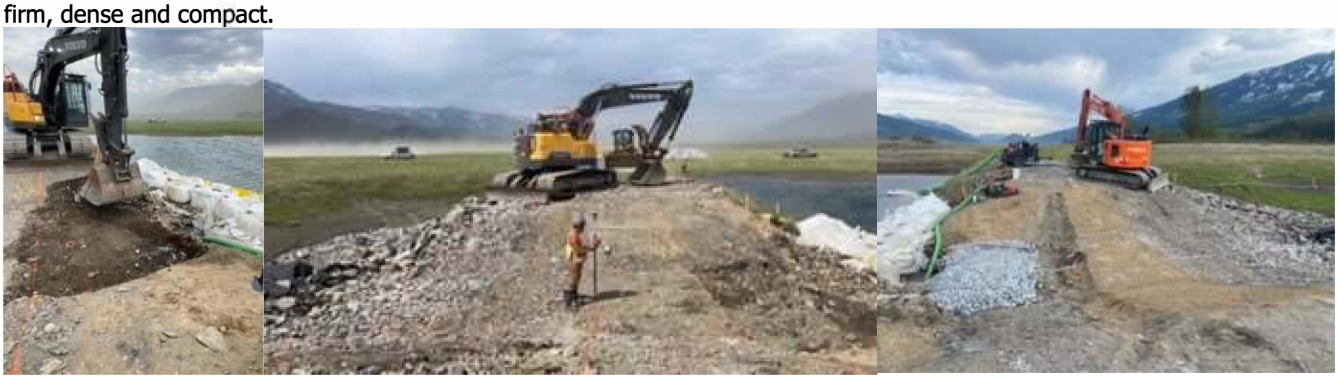
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Sub Grade Acceptance Report**	Document:	IDL-CON-600F1	
		Date & Rev:	11/04/19	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair
Location/Description:	Site 15a Dam – Subgrade of 200mm Minus Granular Subgrade
Drawing Number/Area:	201B-C09-00003
Equipment # (if applicable):	N/A

	Item		**Action Taken** (if required)
1	Organic soil present?	☐ Yes ☒ No	
2	Snow/ice present?	☐ Yes ☒ No	
3	Frozen soil present?	☐ Yes ☒ No	
4	Water seepage?	☒ Yes ☐ No	Minimal water seepage present, water levels managed by ongoing pumping and cofferdam.
5	Ponded water present?	☐ Yes ☒ No	
6	Loose soil present?	☐ Yes ☒ No	

Overall Base Condition *refer to descriptors below:
Subgrade inspected prior to 200mm Minus Granular Subgrade and approved for install. Base conditions were predominantly firm, dense and compact.



Base Condition Descriptors:

- Clean, dry
- Clays – firm, stiff, hard, soft
- Cohesionless soils – dense, compact, loose

Is Base ready for Backfill? ☒ Yes ☐ No Comments: 200mm Minus Granular Subbase Placement

Inspected by:	Briteny Mathieson	May 5, 2023
	Print Name	Date

APPROVALS			
IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date

IDLPROJECTS	**Visual Inspection Report**	Document:	IDL-QC-010F1	
		Date & Rev:	11/06/10	0
		Revised for:		
		DDR No.:		

Contract Number:	RFQ17501-CLBWORKS-30A – Cartier Bay Erosion Repair		
Inspected by:	Britney Mathieson	**Date:**	May 11, 2023
Location/Area:	Drawing 201B-C09-00003 – Site 15a Dam		
Item(s) Inspected:	Site 15a Dam Finish Grading		
Spec/Code:	SP6.3.6		

ACCEPTANCE CRITERIA

Finish all areas covered by work to the final lines and grades shown in the Contract Drawings. All finished surfaces shall be uniformly compact and completely smooth and free from any surface irregularities. Constructed surfaces shall be within 25 mm of design elevations or those provided in RFI-001 but not uniformly high or low. Finish all side slopes to a neat condition, true to lines and grades and in accordance with the Contract Drawings. Remove any loose rock material encountered in any cut slopes and fill any resulting cavities.

COMMENTS

Items Pass Inspection: ☒**Yes** ☐**No**

Documentation Required: ☐**Yes** ☒**No**

Document	Document Ref. #	Actioned by	Date
☐RFI			
☐NCR			
☐PAR/CAR			
☐Other:			

APPROVALS

IDL	Matthew Marak		October 23, 2023
	Print Name	Signature	Date
Client			
	Print Name	Signature	Date
Client rep			
	Print Name	Signature	Date