

SITE C CLEAN ENERGY PROJECT

**Component Application Package –
Peace River Temporary Access Bridge
Crossings for Western Reservoir
Clearing**

Crossing WR11b

**Application for Approval
For Canadian Navigable Waters Act**

April 15, 2021

Submitted to:

Transport Canada
Suite 620 - 800 Burrard Street
Vancouver BC V6Z 2J8

Submitted by:

BC Hydro and Power Authority
Site C Clean Energy Project
PO Box 49260
Vancouver BC V7X 1V5

Site C Clean Energy Project – Peace River Crossing WR11b

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**Attachment A Overview Map of Western Reservoir Clearing Crossings - South Bank
Halfway River to Farrell Creek Phase 2
Map of WR11b Crossing**

Attachment B Design Drawings, Plan and Profile Views of WR11b Crossing

Site C Clean Energy Project – Peace River Crossing WR11b

1 INTRODUCTION

The Canadian Navigable Waters Act (CNWA) came in to force on August 28, 2019. The CNWA includes a Schedule of navigable waters requiring regulatory approval for works that risk a substantial interference with navigation.

The Peace River is named in the schedule of navigable waters. Works required for construction and operation of the Site C Clean Energy Project (the Project) that occur on, over, under or through navigable waterways, as defined by the CNWA, must be submitted to Transport Canada for review.

This application is being submitted for the construction of one temporary bridge across an ephemeral channel on a Peace River island, to facilitate clearing of the western segment of the Site C reservoir. The crossing is identified as WR11b.

2 PEACE RIVER TEMPORARY CROSSINGS – WESTERN RESERVOIR CLEARING

Clearing during the 2021/2022 season within the western reservoir will be conducted along the south bank of the Peace River, under two contracts:

1. Halfway River to Farrell Creek Phase 2, and
2. Farrell Creek to Peace Canyon Dam

In order to allow machine access for clearing along the south bank of the Peace River as well as Peace River islands, a series of temporary crossings are proposed. New access roads will also be constructed. The crossings will be situated along the south bank of the Peace River and cross various tributaries and side channels. The location of these crossings and access roads for the Halfway River to Farrell Creek Phase 2 works are shown on the overview map in Attachment A.

This application is specific to the crossing labelled as WR11b. Separate applications will be submitted for each subsequent crossing within the western reservoir clearing area.

2.1 Design of Crossing WR11b

A map showing the location of crossing WR11b is included in Attachment A. The general arrangement, dimensions and specifications for the crossing is provided in Attachment B.

This crossing of an ephemeral channel on an island along the south bank of the Peace River would be ~15 m long, 6 m wide, with a top elevation of 440.1 m. The estimated high water elevation at this location is estimated to be 437.170 m. A set of engineering design drawings, inclusive of elevations and profile design information, is included in Attachment A.

The bridge has been designed to a minimum flow of 2,100 m³/s, which is in excess of the Peace River total discharge of 1,980 m³/s that occurs when both upstream BC Hydro facilities (W.A.C Bennett and Peace Canyon dams) are generating at 100% capacity.

The bridge approaches would be constructed from local river bed materials and supplemented with imported granular material and riprap rock if required. Riprap specifications have been developed using the

Site C Clean Energy Project – Peace River Crossing WR11b

estimated flows level and associated scour potential. The riprap specification for the crossing is provided in the drawings in Attachment B.

2.2 Location and Land Description

The WR11b crossing is located across a side channel of the Peace River, approximately 11.5 km upstream of the Halfway River confluence. The crossing spans portions of the Peace River that are Crown Land and are within the following Occupant Licence to Cut (OLTC) area held by BC Hydro: OLTC#20A; Licence #L51499.

The location coordinates and land description for the crossing is listed in Table 1.

Table 1. Location and Land Description of Crossing WR11b

ID	Longitude	Latitude	Land Description
WR11b	56.154793	-121.590732	Unsurveyed (theoretical) Crown Land Section 31 Township 82 Range 23 West of the 6th Meridian Peace River District

3 CONSTRUCTION SEQUENCE AND SCHEDULE

Construction of the western reservoir crossings will commence with the Halfway River to Farrell Creek Phase 2 contract, starting at the downstream end (WR13) and progressing upstream as each crossing is built. Construction of crossing WR11b is scheduled to begin in September 2021. Crossings will be constructed simultaneously in the Halfway River to Farrell Creek Phase 2 and Farrell Creek to Peace Canyon contracts with construction scheduled to commence in mid-August and mid-September respectively.

Minor changes to location and bridge sizing may be required to field fit each crossing to site conditions that exist during construction.

Decommission of crossing WR11b will involve removal of bridge modules, steel superstructure, and abutments. The granular material and riprap used for the bridge approaches will remain in place and be inundated by the future Site C reservoir.

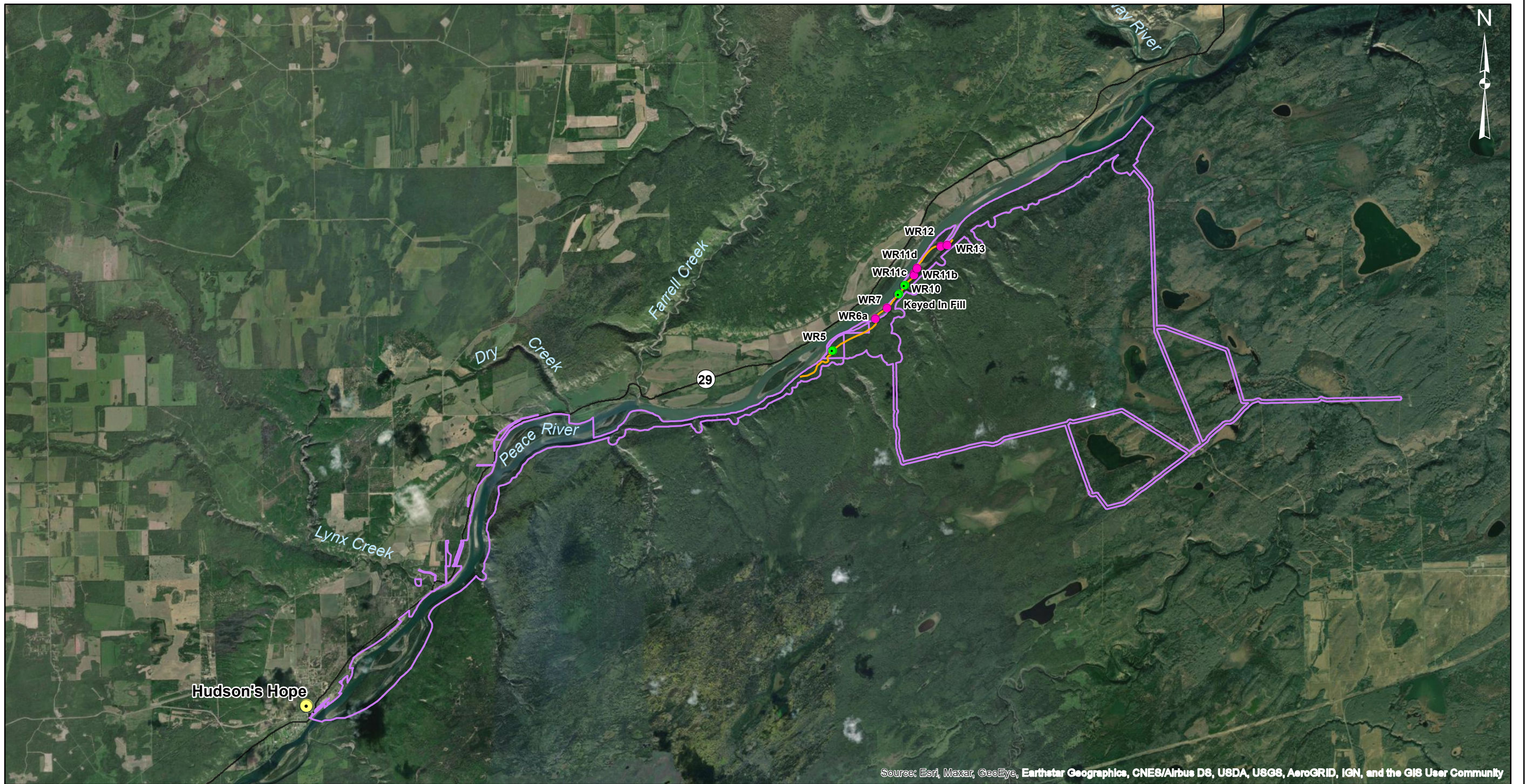
4 CONSULTATION

The western reservoir clearing plans, including access routes and side channel crossings were presented as part of the permit bundle to local indigenous groups at the Site C Permitting Forum #11 held February 14, 2019.

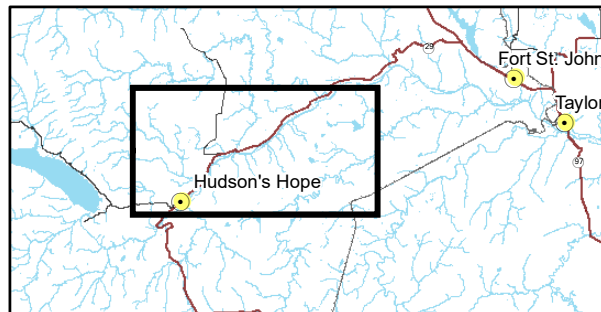
Attachment A – Maps

**Overview Map of Western Reservoir Clearing Crossings - Halfway River to Farrell Creek
Phase 2**

Map of WR11b Crossing



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Map Notes:
 1. Datum: NAD83
 2. Projection: UTM Zone 10N
 3. Base Data: Province of B.C.
 4. Imagery: ESRI Online Basemapping.

Legend

- Crossings
- No Interference with Navigation Notification of Work
- Roads
- Western Reservoir South Bank Boundary
- Existing Highway

1:120,000 0 5 km



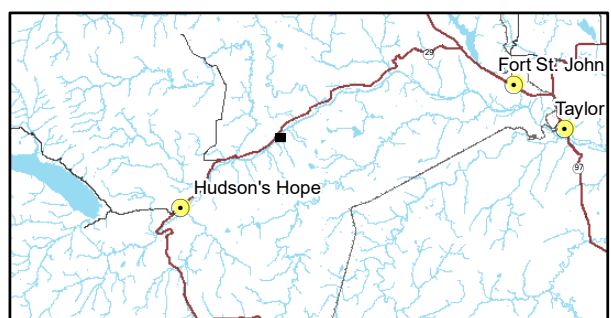
**Title: Site C Western Reservoir South Bank
 Phase 2 Clearing Crossings
 CNWA Approval Application
 Overview Map**

Date	Apr 14, 2021	DWG NO	1016-N11-01093-1	R 1
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Construction of the Site C Clean Energy Project is subject to required regulatory and permitting approvals.

Path: X:\ArcGIS\Projects\Permitting\Federal_Permitting\NavProAct\WesternReservoir_SB_Crossings_Overview_1016_N11_01093-1.mxd

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Map Notes:
 1. Datum: NAD83
 2. Projection: UTM Zone 10N
 3. Base Data: Province of B.C.
 4. Imagery: Sep. 2019 Lidar orthophotos.

Legend

- Crossings
- Roads
- Western Reservoir South Bank Boundary
- Existing Highway

1:2,500 0 100
m



**Western Reservoir Clearing - South Bank
 Phase 2 Clearing Crossings
 CNWA Approval Application
 Crossing WR11b**

Date	Apr 9, 2021	DWG NO	1016-N11-01101-1	R 0
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Construction of the Site C Clean Energy Project is subject to required regulatory and permitting approvals.

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Attachment B

Design Drawing, Plan and Profile View of WR11b Crossing

**WEST RESERVOIR
OLTC 20 - WR11b
STREAM CLASS = S1**



1 - 15.240m TEMPORARY CROSSINGS (MIN. CL-625)

BRIDGE DETAILS

COORDINATES:
LATITUDE: 56.15506°
LONGITUDE: -121.5909°

DESCRIPTION	SHEET NUMBER
NOTES AND SPECIFICATIONS	01
EXISTING PLAN VIEW	02
EXISTING PROFILES AND SECTIONS	03
PROPOSED PLAN VIEW	04
BRIDGE 1 PROFILES AND SECTIONS	05

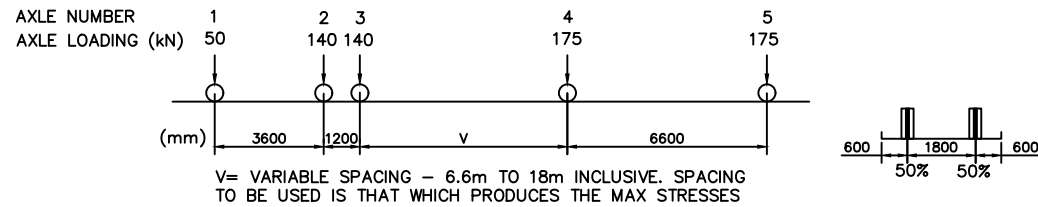
PREPARED BY:



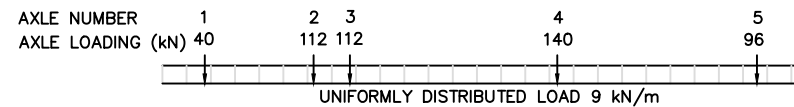
UNIT 315
7326 10TH STREET NE
CALGARY, AB
T2E 8W1

DESIGN SPECIFICATIONS:

- DESIGN CODE: CAN/CSA-S6-14/19 MODIFIED IN ACCORDANCE WITH THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS "ENGINEERING MANUAL", AND OTHER MINISTRY BRIDGE DESIGN GUIDELINES.
- LIVE LOAD: BCL-625



V= VARIABLE SPACING - 6.6m TO 18m INCLUSIVE. SPACING TO BE USED IS THAT WHICH PRODUCES THE MAX STRESSES



MATERIAL SPECIFICATIONS:

- STEEL: STRUCTURAL STEEL FOR GIRDERS SHALL BE IN ACCORDANCE WITH CSA G40.21 GRADE 350AT, CATEGORY 3. ALL OTHER STEEL SHALL COMPLY TO GRADE 350A. ALL NON-WEATHER STEEL SECTIONS ARE TO BE PAINTED USING AN EPOXY PRIMER AND POLYURETHANE TOP COAT.
- PLATE TO PLATE OR PLATE TO SECTION CONNECTION FAYING SURFACES TO BE CLASS B ACCORDING TO CSA-S16-14.

FABRICATION SPECIFICATIONS:

- GIRDERS ARE DESIGNED AS FRACTURE CRITICAL MEMBERS
- SPICE COMPONENTS AND ASSEMBLY ARE TO BE COMPLETED TO BRIDGE OWNER'S SPECIFICATIONS. NO REAMING OR MODIFICATION OF SPICE SECTIONS WILL BE PERMITTED WITHOUT ENGINEER APPROVAL.

SUPERSTRUCTURE IDENTIFICATION:

- THE BRIDGE SUPERSTRUCTURE SHALL HAVE ITS STRUCTURE NUMBER, LOAD RATING, DATE OF MANUFACTURE, AND MANUFACTURER'S NAME CLEARLY STAMPED ON PERMANENTLY MARKED ON AT LEAST ONE SIDE OF THE STRUCTURE.

CERTIFICATIONS AND QUALITY CONTROL:(CONTRACTOR TO PROVIDE:)

- PROVIDE MILL CERTIFICATES FOR ALL STEEL INCORPORATED INTO THE STRUCTURE.
- PROVIDE SUPERSTRUCTURE DRAWINGS AND DOCUMENTATION OF LOAD CAPACITY FOR REVIEW PRIOR TO INSTALLATION

GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE
- FENDER SYSTEMS AND HAZARD MARKERS SHALL BE INSTALLED AT EACH END OF THE BRIDGE.
- ALL PERMITS AND REGULATORY APPROVALS ARE TO BE IN PLACE PRIOR TO COMMENCING WORK.
- ENVIRONMENTAL MANAGEMENT PLAN IS TO BE PREPARED FOR THE PROJECT BY OTHERS.
- LIMIT OF 1 VEHICLE ON BRIDGE CROSSING AT ANY GIVEN TIME.
- FISH HABITAT ASSESSMENT AND STREAM CLASSIFICATION TO BE PREPARED FOR THE PROJECT BY OTHERS
- LOAD RATING SIGNAGE MUST BE POSTED AT EACH END OF THE BRIDGE AND MUST CLEARLY INDICATE MAX GVW AND VARIOUS AXEL CONFIGURATIONS.
- ROAD DESIGN AND ALIGNMENT TO BE PREPARED FOR THE PROJECT BY OTHERS
- INSTALLATION CONSTRUCTION PROCEDURE IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR AND BC HYDRO OR SUPERVISING DELEGATE
- TOPOGRAPHIC SURVEY DEVELOPED BASED OFF LIDAR DATA PROVIDED BY MAPLE LEAF FORESTRY
- SITE VISIT CONDUCTED BY TRILOGY CROSSING CORP. ON DECEMBER 3, 2020.
- NO GEOTECHNICAL INFORMATION HAS BEEN PROVIDED OR GATHERED TO DATE
- SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED AT A MINIMUM OF BBCL-625 LOADING
- BRIDGES DESIGNED FOR A 2100 m³/s FLOW + 1.74m OF WATER CLEARANCE.
- BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED BY A PROFESSIONAL ENGINEER AND AN AS-BUILT PLAN PRODUCED AFTER CONSTRUCTION.

VOLUME NOTES:

- RIPRAP SHALL BE HARD, DURABLE, ANGULAR ROCK AND IN ACCORDANCE WITH BRITISH COLUMBIA MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE.
- AVERAGE SIZE ROCK CLASS 100kg RIPRAP, 700mm THICK WITH THE FOLLOWING

	MASS	DIAMETER
15% SMALLER THAN	10 kg	195 mm
50% SMALLER THAN	100 kg	415 mm
85% SMALLER THAN	300 kg	600 mm

- MINIMUM RIPRAP VOLUME: 70 m³
- ESTIMATED CUT AND FILL VOLUMES:

COMPACTED BACKFILL:	77 m ³
EXCAVATION:	124 m ³
NET CUT:	47 m ³

- BACKFILL AND GRANULAR FILL SHALL BE PLACED IN LAYERS NOT EXCEEDING 300mm IN LOOSE THICKNESS AND EACH LAYER SHALL BE COMPACTED TO THE CLIENTS ROAD SPECIFICATIONS WITH A PLATE TAMPER EVENLY ACROSS THE ENTIRE SURFACE TO THE DESIRED ELEVATION.

ENDFILL:

- ENDFILL SHALL BE COMPLETED WITH WELL GRADED, SELECT, GRANULAR MATERIAL (<75mm), FREE OF UNSUITABLE MATERIALS, IN LIFTS OF 300 AND COMPACTED TO 95% STANDARD PROCTOR DENSITY OVER THE ENTIRE SURFACE.

TEMPORARY SUBSTRUCTURE:

- MATS MUST BE 3-PLY BOLTED OAK, OR HYBRID STYLE AND MUST BE OF NEW CONDITION WITH NO BROKEN COMPONENTS
- MATS SHALL BE PLACED ON LEVELLED GROUND AND ANY FILL OR NATIVE SOIL MUST BE COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY OVER THE ENTIRE SURFACE.

HYDRAULIC DATA:

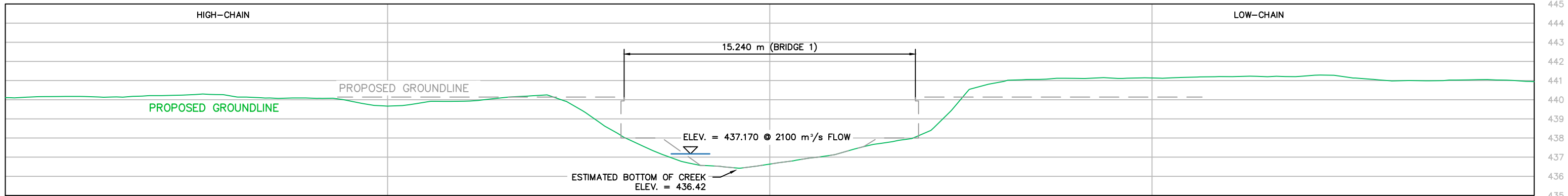
- COMPLETED BY OTHERS

GENERAL NOTES:

- TOPOGRAPHIC SURVEY DEVELOPED BASED OFF JUNE 2019 LIDAR DATA PROVIDED BY MAPLE LEAF FORESTRY.
- COORDINATE SYSTEM NAD83, GEOID CGG2013.
- NO GEOTECHNICAL INFORMATION HAS BEEN PROVIDED OR GATHERED TO DATE.
- WATER DEPTH ESTIMATED AT 0.100m AT CROSSING LOCATION. TRUE WATER DEPTH UNKNOWN AND HAS BEEN ASSUMED FOR BRIDGE CONFIGURATION PURPOSES.
- HYDROLOGICAL INFORMATION ACQUIRED BASED ON REGIONAL ANALYSIS AND NEARBY PEACE RIVER STATIONS. A VOLUME OF 2100m³/s HAS BEEN DETERMINED FOR THIS CHANNEL.
- BRIDGE CONFIGURATION HAS BEEN CHOSEN BY BC HYDRO.
- UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.

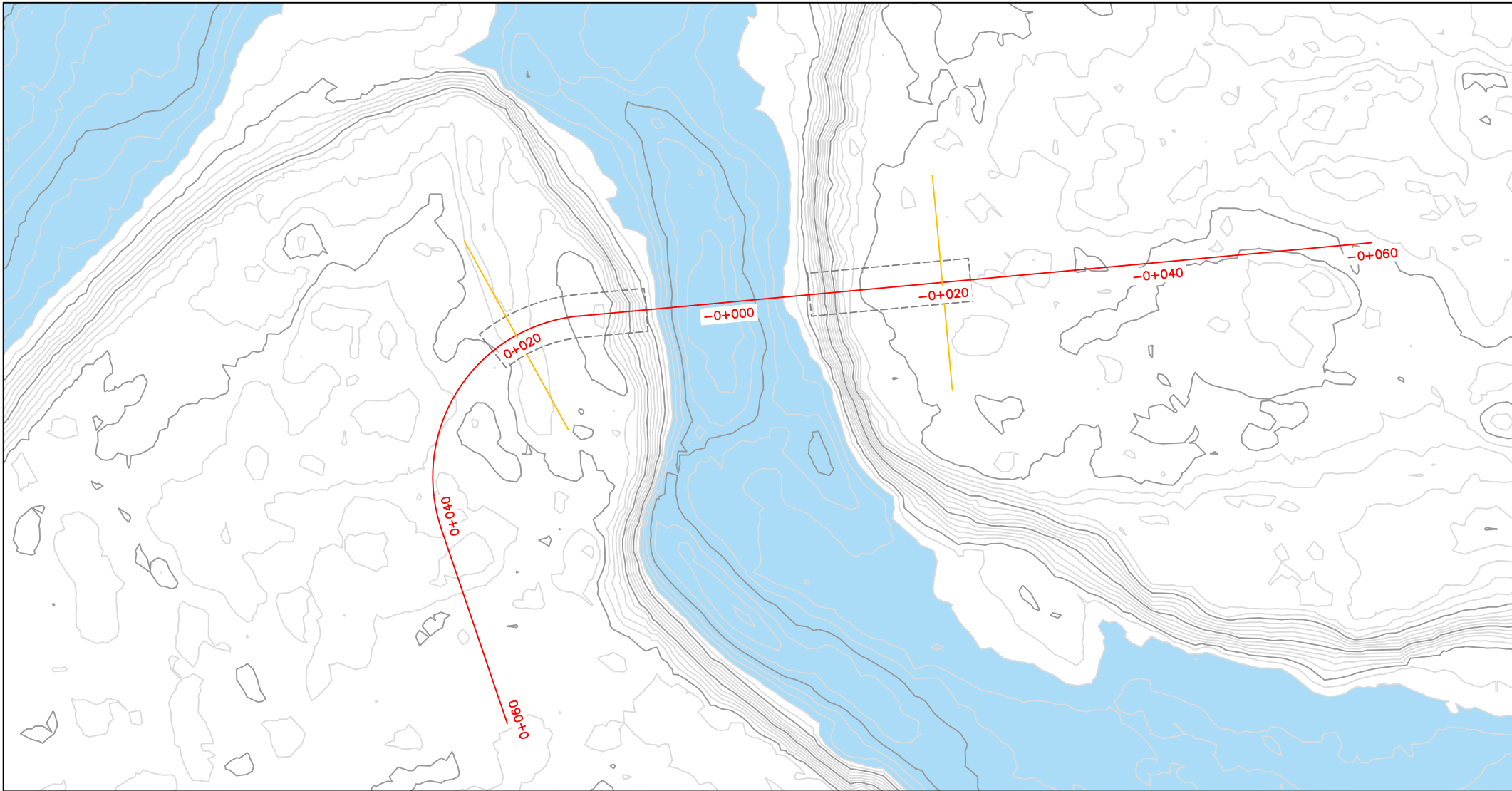
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<p>OLTC 20 - WR11b</p>			
<p>NOTES AND SPECIFICATIONS</p>			
<p>Power smart</p>			
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CHECKED	C.D.	FILE	TC-HY014/01
DATE	MAR.13, 2021	DATE	MAR.15, 2021
ISSUED FOR REVIEW		DATE	MAR.23, 2021
PLAN	TC-HY014		
REVISIONS			
Sheet 01 of 05			

LAST DATE REVISED: 23-Mar-2021 4:18 PM



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Station PROFILE SCALE: 1:500



PLAN SCALE: 1:500

BENCHMARK SURVEY TABLE

MARK	ELEV. (m)	NORTHING	EASTING
✕ WP1	438.170	6224232.362	587536.741
✕ WP2	438.170	6224231.660	587529.153
✕ WP3	438.170	6224230.958	587521.566

NOTE: ELEV. IS AT BOTTOM OF GIRDERS

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

NO.	DATE	DESCRIPTION
0	MAR.23, 2021	ISSUED FOR REVIEW

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ENGINEERING, ENVIRONMENTAL, INSPECTION

OLTC 20 – WR11b

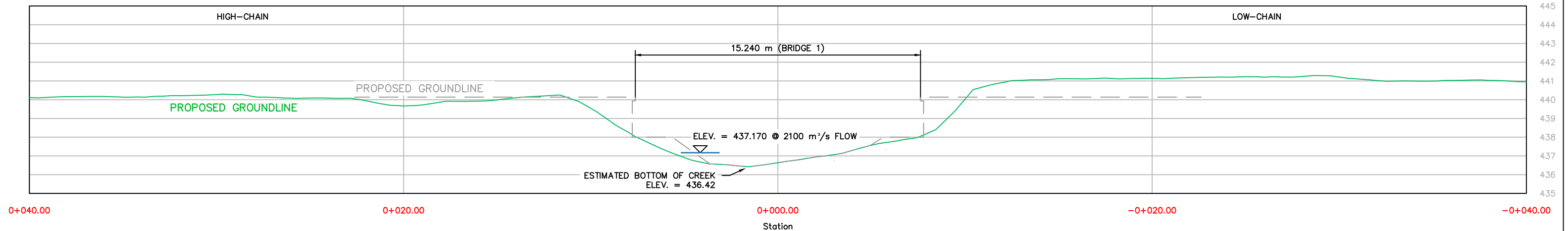
EXISTING PLAN VIEW

BC Hydro
Power smart

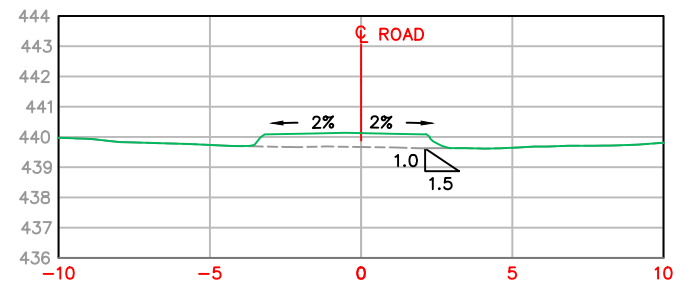
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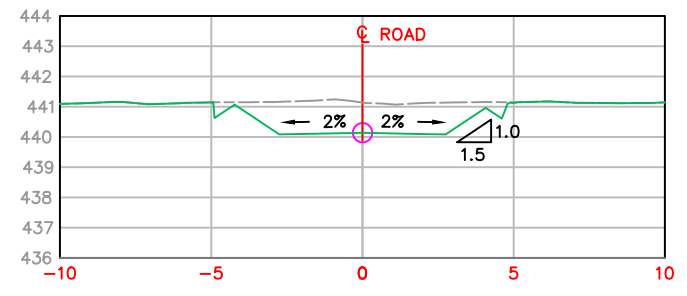
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BRIDGE 1 PROFILE
SCALE: 1:200



BRIDGE 1 HIGH-CHAIN ABUTMENT SECTION
SCALE: 1:250



BRIDGE 1 LOW-CHAIN ABUTMENT SECTION
SCALE: 1:250

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

NO.	DATE	DESCRIPTION
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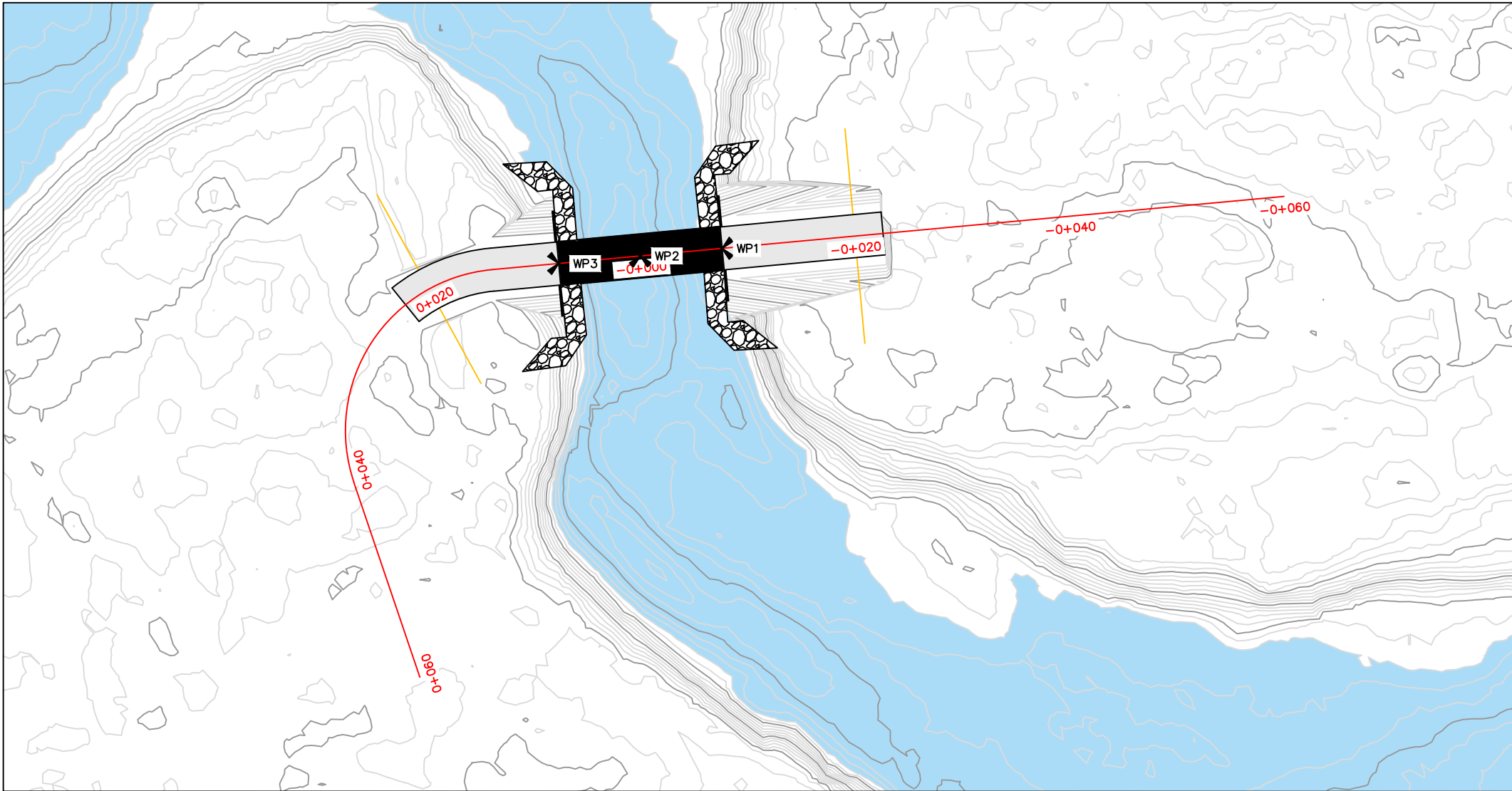
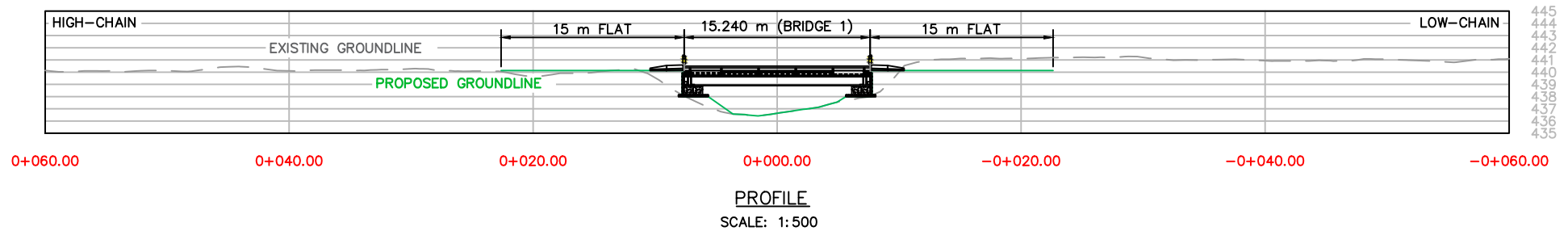
ENGINEERING, ENVIRONMENTAL, INSPECTION
 OLTC 20 – WR11b
 EXISTING PROFILES AND SECTIONS

 Power smart

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MAR.13, 2021	MAR.15, 2021	MAR.23, 2021	TC-HY014

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LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

BENCHMARK SURVEY TABLE

MARK	ELEV. (m)	NORTHING	EASTING
✕ WP1	438.170	6224232.362	587536.741
✕ WP2	438.170	6224231.660	587529.153
✕ WP3	438.170	6224230.958	587521.566

NOTE: ELEV. IS AT BOTTOM OF GIRDERS

PLAN
SCALE: 1:500

NO.	DATE	DESCRIPTION
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Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

OLTC 20 – WR11b

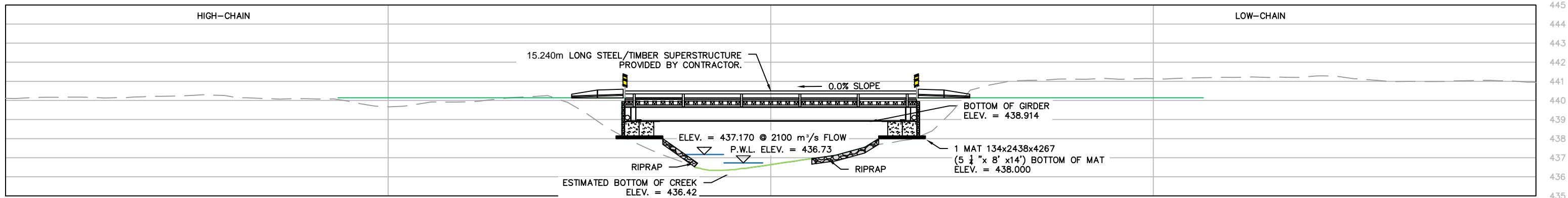
PROPOSED PLAN VIEW

BC Hydro
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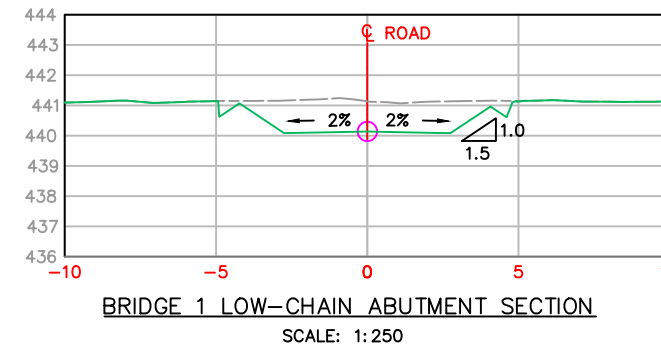
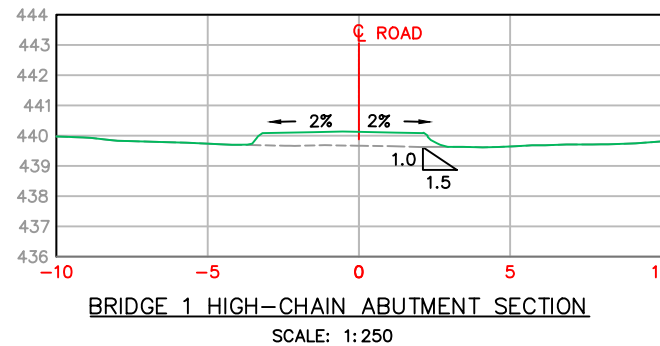
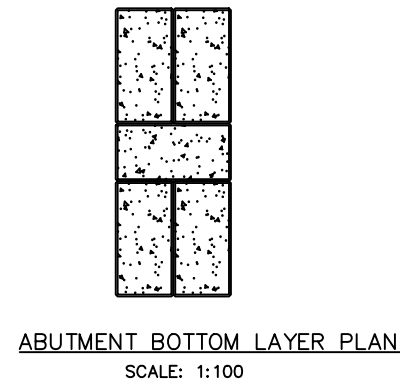
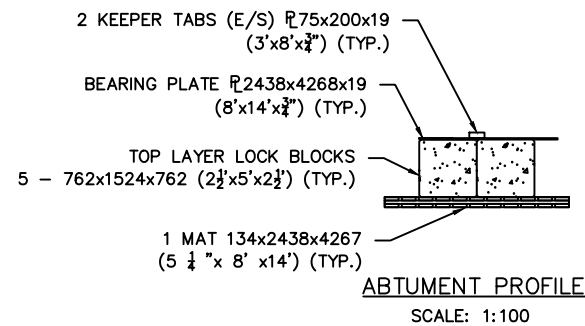
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BRIDGE 1 PROFILE
SCALE: 1:200



LEGEND	
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	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

NO.	DATE	REVISIONS
0	MAR.23, 2021	ISSUED FOR REVIEW

ENGINEERING, ENVIRONMENTAL, INSPECTION
 OLTC 20 - WR11b
 BRIDGE 1 PROFILES AND SECTIONS

 Power smart

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DATE	DATE	DATE	PLAN
MAR.13, 2021	MAR.15, 2021	MAR.23, 2021	TC-HY014

Sheet 05 of 05

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