SITE C CLEAN ENERGY PROJECT

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

Crossing WR11c

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

TABLE OF CONTENTS

List of Tables ..... **i**

List of Attachments ..... **i**

1 INTRODUCTION **1**

2 PEACE RIVER TEMPORARY CROSSINGS – WESTERN RESERVOIR CLEARING **1**

2.1 Design of Crossing WR11c 1

2.2 Location and Land Description 2

3 CONSTRUCTION SEQUENCE AND SCHEDULE **2**

4 CONSULTATION **2**

List of Tables

Table 1: Location and Land Description of WR11c Crossing **2**

List of Attachments

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

Map of WR11c Crossing

Attachment B Design Drawings, Plan and Profile Views of WR11c Crossing

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 a side channel of the Peace River, to facilitate clearing of the western segment of the Site C reservoir. The crossing is identified as WR11c.

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 WR11c. Separate applications will be submitted for each subsequent crossing within the western reservoir clearing area.

2.1 Design of Crossing WR11c

A map showing the location of crossing WR11c is included in Attachment A. The general arrangement, dimensions and specifications for the crossing is provided in Attachment B.

The crossing is a temporary bridge, approx. 25 m long and 6 m wide, with a top elevation of 440.198 m, that would be located on the south bank of the Peace River, crossing a side channel. 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 m^3/s, which is in excess of the Peace River total discharge of 1,980 m^3/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

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 WR11c 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 WR11c

ID	Longitude	Latitude	Land Description
WR11c	56.154425	-121.590826	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 WR11c 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 WR11c 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.

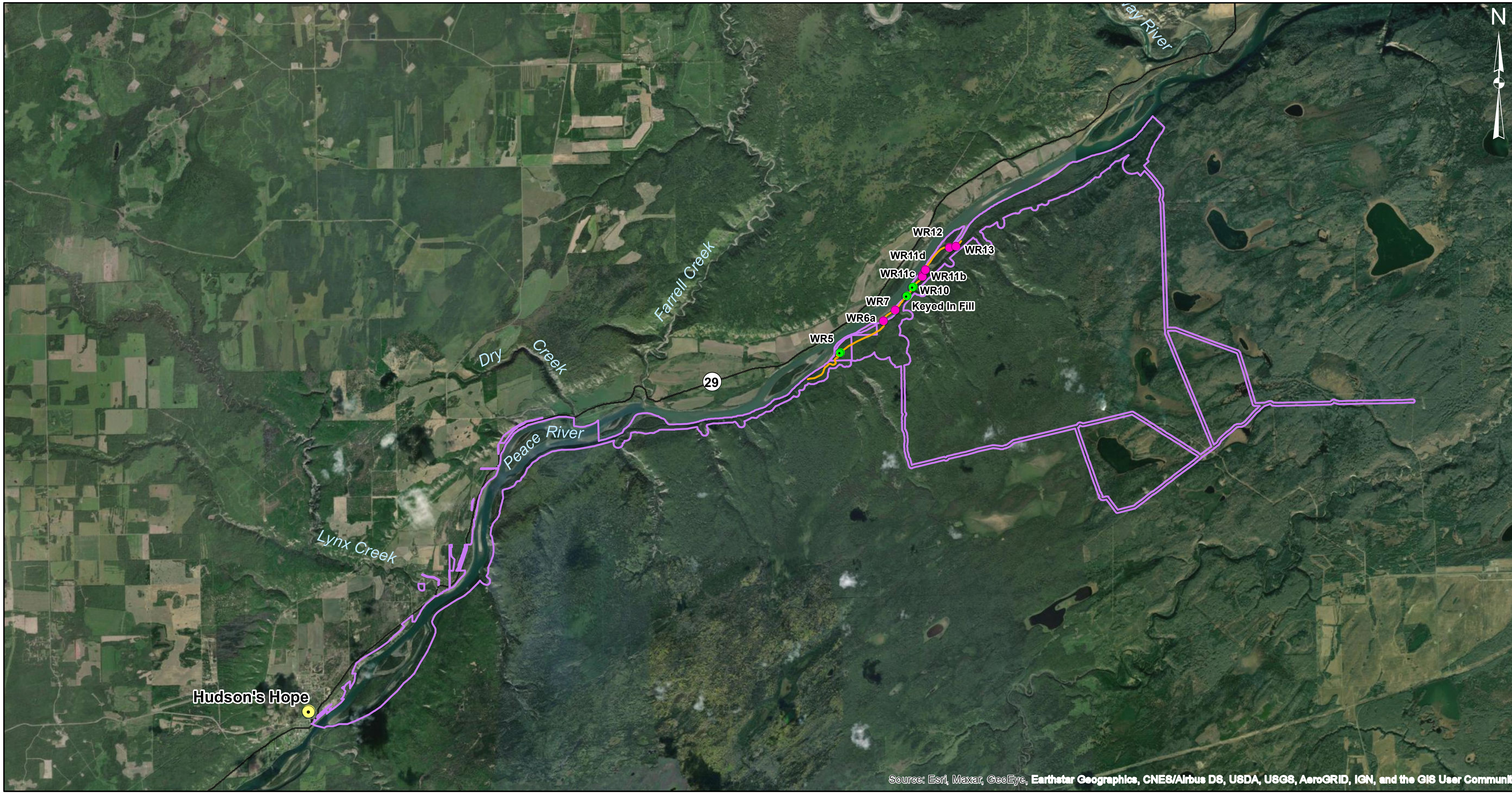
4 CONSULTATION

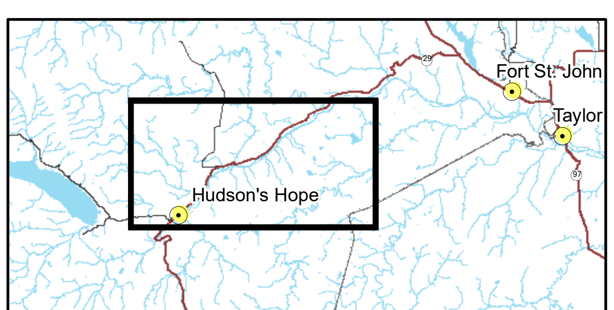
The western reservoir clearing plans, including access routes and side channel crossings were presented as part of the permit bundle to local indigenous groups at the Site C Permitting Forum #11 held February 14, 2019.

Attachment A – Maps

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

Map of WR11c Crossing





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 to 5 km

BC Hydro

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

Construction of the Site C Clean Energy Project is subject to required regulatory and permitting approvals.

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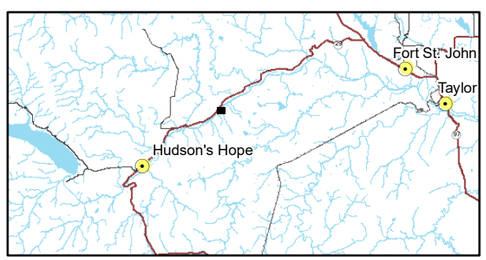

Map Notes:
1. Datum: NAD83
2. Projection: UTM Zone 10N
3. Base Data: Province of B.C.
4. Imagery: Sep. 2019 Lidar orthophotos.

Legend

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

1:2,500 0 100 m

BC Hydro

Western Reservoir Clearing - South Bank
Phase 2 Clearing Crossings
CNWA Approval Application
Crossing WR11c

Date	Apr 9, 2021	DWG NO	1016-N11-01101-2	R 0

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 WR11c Crossing

WEST RESERVOIR
OLTC 20 - WR11c
STREAM CLASS = S1

BC Hydro
Power smart

1 - 24.384m TEMPORARY CROSSINGS (MIN. BCL-625)

BRIDGE DETAILS

COORDINATES:
LATITUDE: 56.15436°
LONGITUDE: –121.59100°

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:

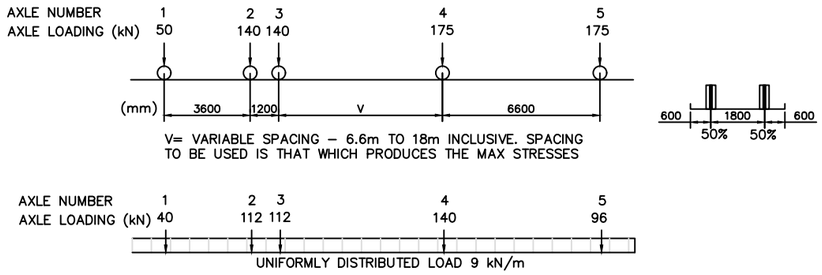
Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

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

INTENDED TO BE PLOTTED ON 11" X 17". ANY COPIES OR PDF'S MAY NOT BE TO SCALE.

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

UNIFORMLY DISTRIBUTED LOAD 9 kN/m

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 SPLICE 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 m^3/s FLOW + 1.0m 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 m^3
- ESTIMATED CUT AND FILL VOLUMES:

COMPACTED BACKFILL:	230 m^3
EXCAVATION:	100 m^3
NET FILL:	130 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:

1. TOPOGRAPHIC SURVEY DEVELOPED BASED OFF JUNE 2019 LiDAR DATA PROVIDED BY MAPLE LEAF FORESTRY.
2. COORDINATE SYSTEM NAD83, GEOID CGG2013.
3. NO GEOTECHNICAL INFORMATION HAS BEEN PROVIDED OR GATHERED TO DATE.
4. WATER DEPTH ESTIMATED AT 0.100m AT CROSSING LOCATION. TRUE WATER DEPTH UNKNOWN AND HAS BEEN ASSUMED FOR BRIDGE CONFIGURATION PURPOSES.
5. HYDROLOGICAL INFORMATION ACQUIRED BASED ON REGIONAL ANALYSIS AND NEARBY PEACE RIVER STATIONS. A VOLUME OF 2100m^3/s HAS BEEN DETERMINED FOR THIS CHANNEL.
6. BRIDGE CONFIGURATION HAS BEEN CHOSEN BY BC HYDRO.
7. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.

0	MAR.23, 2021	ISSUED FOR REVIEW	
REVISIONS			

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OLTC 20 – WR11c

NOTES AND SPECIFICATIONS

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DESIGN	DRAWN	CHECKED	FILE
B.H.	E.K.	C.D.	TC-HY014/01
DATE	DATE	DATE	PLAN
MAR.13, 2021	MAR.15, 2021	MAR.23, 2021	TC-HY014

Sheet 01 of 05

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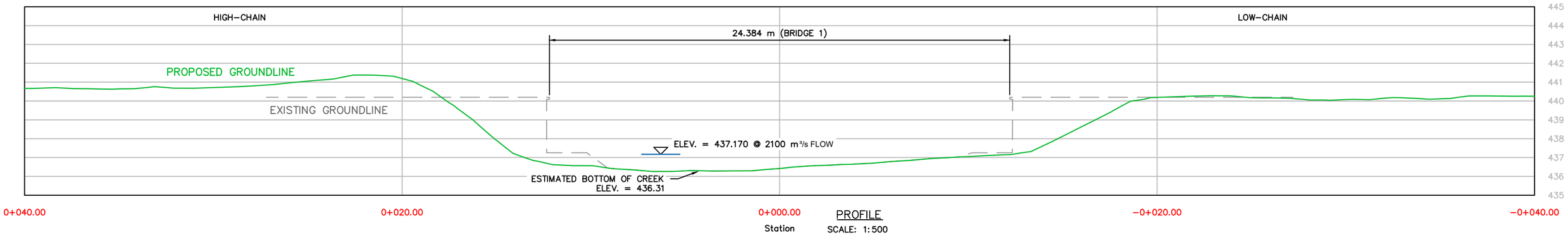

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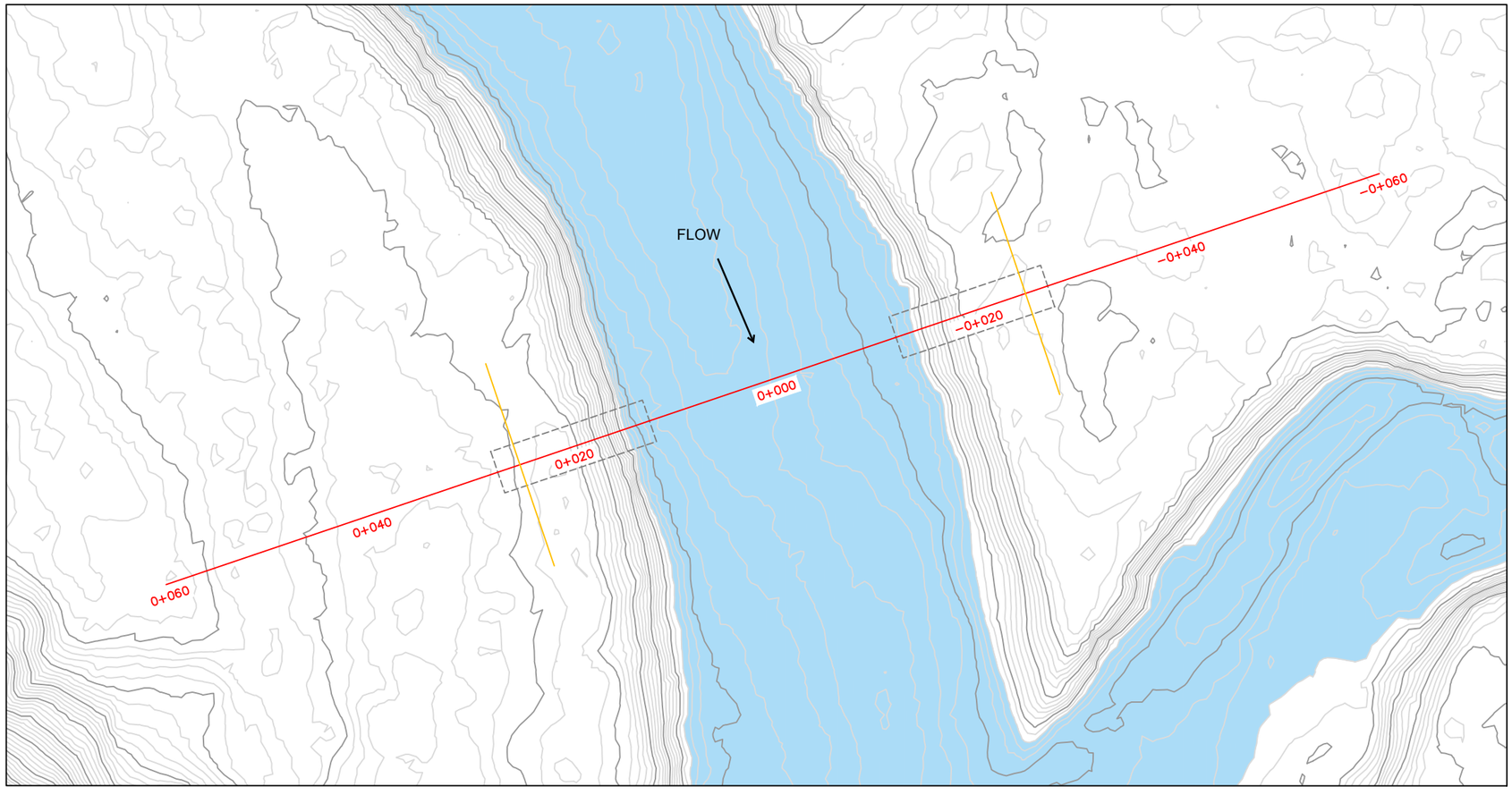

PLAN
SCALE: 1:500

BENCHMARK SURVEY TABLE

MARK	ELEV. (m)	NORTHING	EASTING
WP1	438.170	6224164.539	587518.179
WP2	438.170	6224152.992	587522.092
WP3	438.170	6224141.445	587526.005

NOTE: ELEV. IS AT BOTTOM OF GIRDERS

LEGEND
- CREEK
- ROAD
- ROAD ALIGNMENT
- RIPARIAN ROCK
- TREE LINE
- SECTION LINE

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OLTC 20 – WR11c

EXISTING PLAN VIEW

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DATE	DATE	DATE	PLAN
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Sheet 02 of 05

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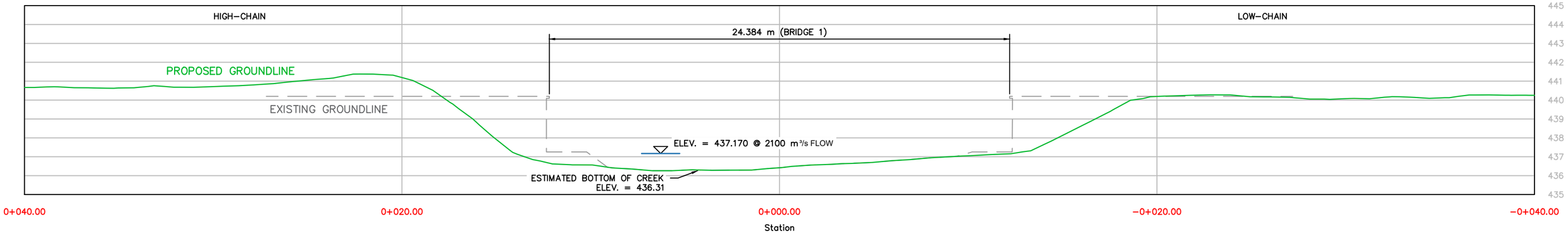
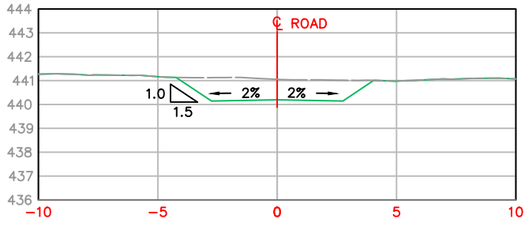


BRIDGE 1 PROFILE

SCALE: 1:200



BRIDGE 1 HIGH–CHAIN ABUTMENT SECTION

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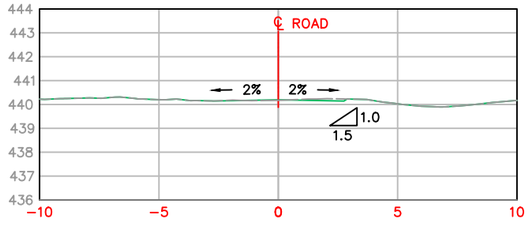

BRIDGE 1 LOW–CHAIN ABUTMENT SECTION

SCALE: 1:250

LEGEND

- CREEK
- ROAD
- ROAD ALIGNMENT
- RIPARIAN ROCK
- TREE LINE
- SECTION LINE

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EXISTING PROFILES AND SECTIONS

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Sheet 03 of 05

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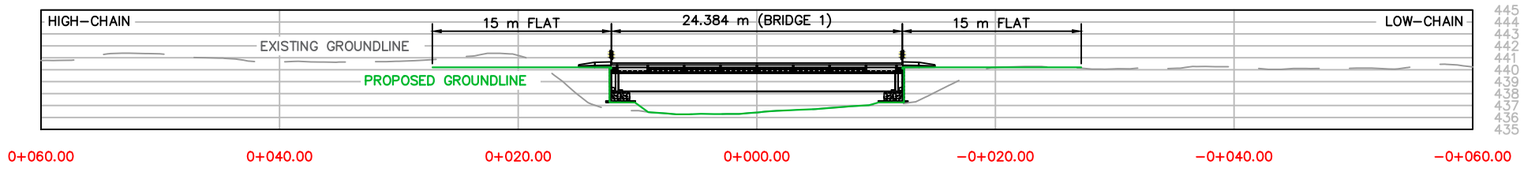

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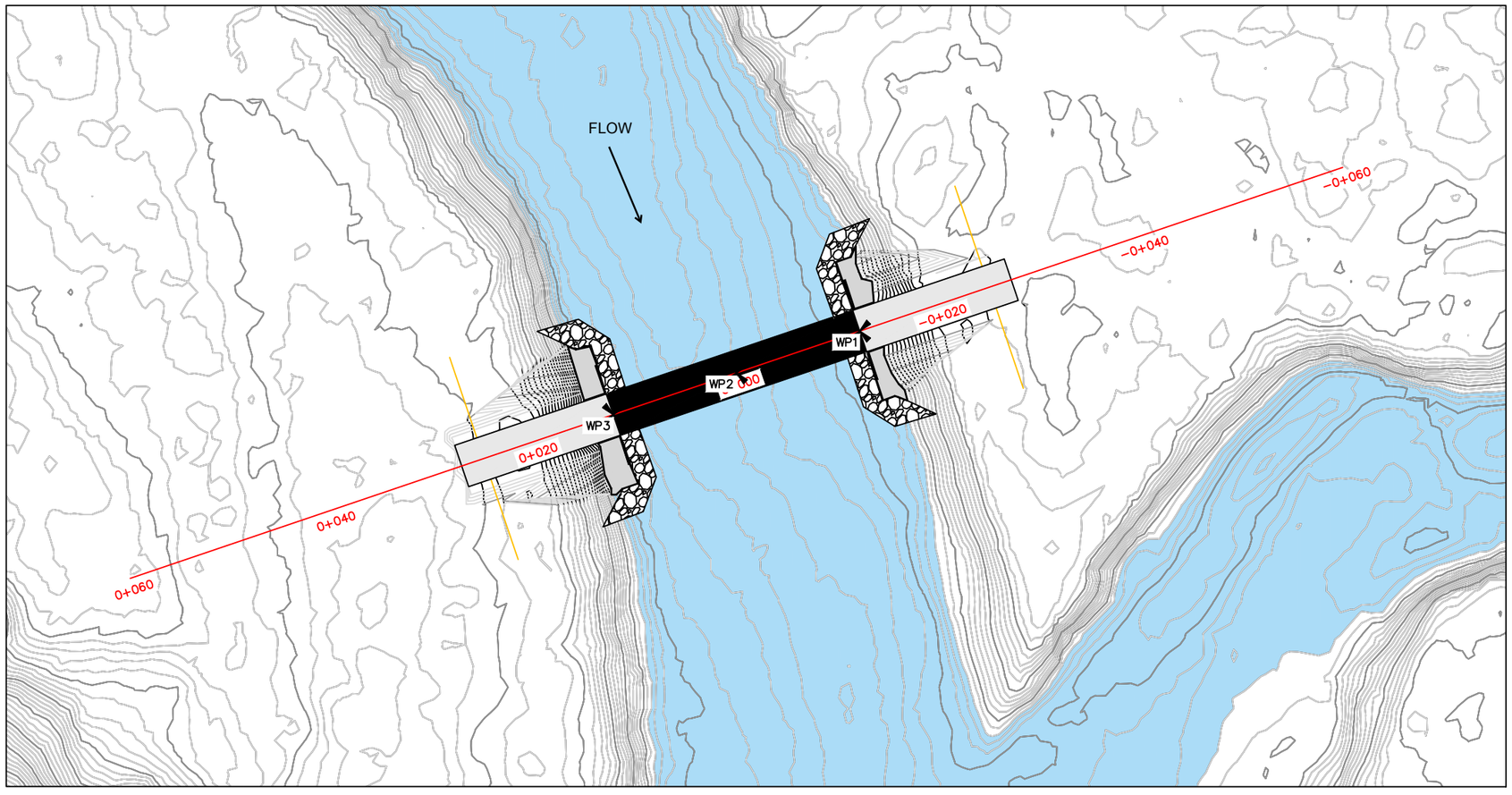

PLAN

SCALE: 1:500

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WP3	438.170	6224141.445	587526.005

NOTE: ELEV. IS AT BOTTOM OF GIRDERS

LEGEND

- CREEK
- ROAD
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PROPOSED PLAN VIEW

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B.H.	E.K.	C.D.	TC–HY014/04
DATE MAR.13, 2021	DATE MAR.15, 2021	DATE MAR.23, 2021	PLAN TC–HY014

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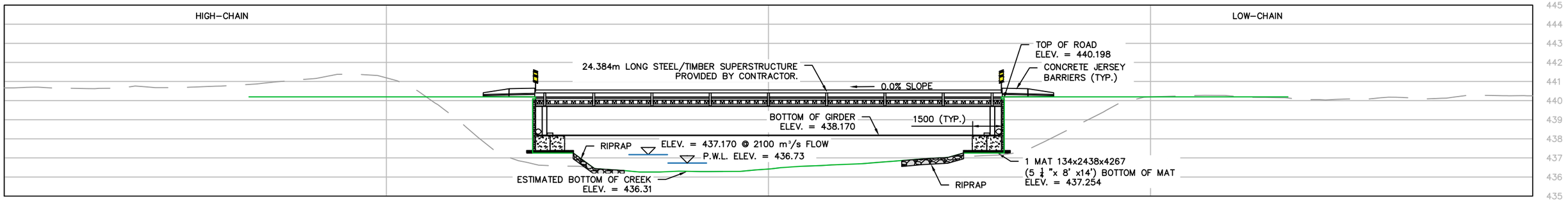

BRIDGE 1 PROFILE

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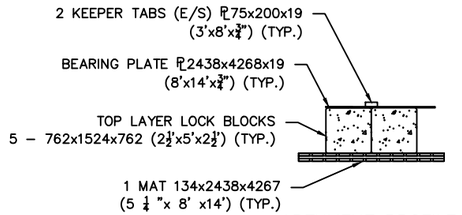

ABTUMENT PROFILE

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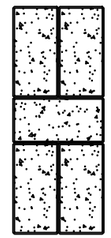
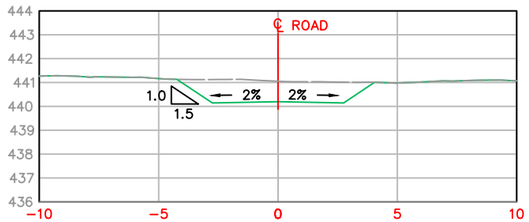


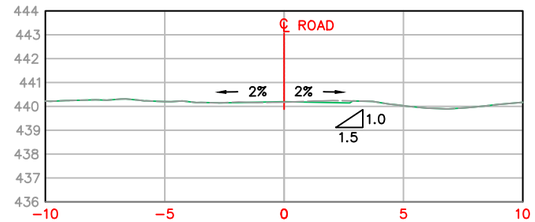
ABUTMENT BOTTOM LAYER PLAN

SCALE: 1:100



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

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OLTC 20 – WR11c

BRIDGE 1 PROFILES AND SECTIONS

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Sheet 05 of 05

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