

SITE C CLEAN ENERGY PROJECT

Component Application Package – Halfway River Temporary Access Bridges Revised Design for Crossing 19.7A

Notice of Work

For Canadian Navigable Waters Act

July 8, 2020

Submitted to:

Transport Canada
Navigation Protection Program
Suite 1100 - 1166 W Pender Street
Vancouver, BC V6E 2R9

Submitted by:

BC Hydro and Power Authority
Site C Clean Energy Project
9th Floor – 1111 West Georgia Street.
Vancouver BC V6E 4M3

Site C Clean Energy Project – Halfway River Temporary Access Bridges Revised Design for Crossing 19.7A

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Attachment B	Design Drawings, Plan and Profile Views of Revised Temporary Access Crossings at 19.7A over Halfway River

1 INTRODUCTION

The Canadian Navigable Waters Act (CNWA) came into 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. 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 permitted.

The Halfway River is a Peace River tributary near Hudson's Hope, BC and is not named in the CNWA schedule of navigable waters. As such, this application is being submitted as a Notice of Work for the construction of five (5) temporary bridge and causeway crossings over Halfway River. These five crossings replace the design for one bridge crossing at 19.7A that was submitted in a previous Notice of Work (Registry #1493).

2 HALFWAY RIVER TEMPORARY CROSSINGS – RESERVOIR CLEARING

Site C Reservoir clearing in forest areas of the lower Halfway River catchment requires machine access to both banks of the river. The available road networks do not provide access to areas that require clearing ahead of reservoir filling, hence new roads and access routes are proposed. Within this new road network, six (6) mainstem bridge crossings are required, each being accessed using constructed causeway approaches. These mainstem crossings are shown in the overview map in Attachment A.

This Notice of Work application is specifically for the final upstream mainstem crossing which includes a combination of five (5) structures over the Halfway River. This multi-crossing design replaces the one crossing at 19.7A, that was submitted in a previous Notice of Work (Registry #1493) and incorporates the access that was originally planned as a non-obstructive causeway along the northern bank of the river. The previous design at crossing 19.7A was for a causeway and bridge with a causeway length of 105m, and a bridge length of 36.576 m.

A map showing the revised multi-crossing locations at 19.7A is provided in Attachment A. The crossings span portions of the Halfway River that are Crown Land and are within the Occupant Licence to Cut (OLTC 19) area held by BC Hydro. The dimensions and approximate location of each crossing at site 19.7A are provided in Table 1.

Site C Clean Energy Project – Halfway River Temporary Access Bridges Revised Design for Crossing 19.7A

Table 1. Location, dimensions and land descriptions for revised Halfway River crossings at 19.7A

Halfway River Mainstem Crossing 19.7A Bridge ID	Bridge Length (m)	Latitude	Longitude	Land Description of River Crossing
1	30.480	56.242011	-121.547452	Theoretical Unsurveyed Crown land North 1/2 of Section 34 Township 83 Range 23 West of The 6th Meridian Peace River District; and Crown Foreshore, bed of the Halfway River and the Halfway River located within the North 1/2 of Section 34 Township 83 Range 23 West of The 6th Meridian Peace River District.
2	24.385	56.241527	-121.547467	
3	24.385	56.241127	-121.548261	
4	18.288	56.239539	-121.552287	
5	60.960 (2 x 30.480 m bridges)	56.241587	-121.546293	

The approximate causeways lengths are as follows:

- Northern bank of river to Bridge 1: 11 m
- Bridge 1 to Bridge 2: 47 m
- Bridge 2 to Bridge 3: 42 m
- Bridge 3 to Bridge 4: 290 m
- Bridge 4: No causeway
- Between Bridge 1 and Bridge 5: 52 m

2.1 REVISED DESIGN OF MULTI-CROSSING 19.7A

Two options for this crossing location are provided to address high and low flow river conditions. The general arrangement, dimensions and specifications for each of the five bridges under both conditions, is provided in the drawing package in Attachment B. Each bridge has been designed by an engineering professional. Each crossing would have the capacity to pass the daily average flow estimated for the seasonal (September - April), 1 in 10-year return period (124 m³/s).

Under high flow, non-frozen conditions, the causeways and bridge approaches would be constructed from local river bed materials and supplemented with imported granular material and riprap rock. Five bridge crossings using six spans (two spans combined into a single structure and supported with a lock block pier) are planned for managing higher river flows.

Under low flow and/or frozen conditions, a combination of snow and granular material may be used to develop the access and approaches. Two bridge crossings (Bridges 1 & 5) using three spans (two spans combined into a single structure and supported with a lock block pier) in combination with three sets of 2-800 mm steel culverts (in place of high flow bridges) are planned for low river conditions. Where no flow

Site C Clean Energy Project – Halfway River Temporary Access Bridges Revised Design for Crossing 19.7A

exists (western backchannel), under frozen conditions the planned culverts may be reduced in size and number.

A centre pier to support the two-bridge span configuration (Bridge 5), over the widest section of the channel, would be constructed out of concrete lock blocks. During higher flows, a riprap base may be required to provide a platform, outside of the river flow, for the lock blocks. The riprap base will be capped with granular material to ensure the platform is level and can be compacted to provide stability for the structures.

Riprap specifications have been developed using the estimated flows level and associated scour potential. The granular material requirements and riprap specifications for each crossing are summarized in the IFC drawings in Attachment B.

2.2 CONSTRUCTION SEQUENCE AND SCHEDULE

The contractor is expected to begin constructing the Hwy 29 temporary access crossings in early September, starting at the downstream end (Site ID 19.3A) and moving upstream after each crossing is built. Construction of the multi-crossing at 19.7A is planned to begin late November 2020.

Minor changes to location and bridge sizing may be required in order to field fit each crossing to site conditions that exist during construction. These changes may be required due to the dynamic changes in gravel bar and channel locations that occur frequently in this drainage.

Decommission of the crossings will involve bridge deck, abutment and pier removal such that navigation access can be reinstated by May 1, 2021. Causeway materials will remain in place, unless minor openings are required for fish migration. The future Site C reservoir would cover the causeway materials after reservoir filling is completed in 2024, and each causeway would be shown in the future reservoir maps.

3 PUBLIC BOATER ACCESS

Construction of temporary crossings in the Halfway River channel is expected to block boater access to lower portions of the Halfway River between September 1, 2020 and April 30, 2021. A map showing the river blockage extent has been included in Attachment A.

Crossings would be removed in April 2021 and boating access would be reinstated on or before May 1, 2021. The Halfway River boat launch would remain open during this period.

Communication to boaters ahead of river closures would be done in accordance with the Site C Boater Communication Protocol (Site C [Construction Safety Management Plan](#), Section 5.3.4.2). Signs that are visible to boaters would be placed upstream of the crossing location to alert them to the upcoming blockage and potential hazard. Downstream of the crossing, the river would be signed to alert approaching boaters.

Attachment A – Maps

Overview Map of Halfway River Temporary Access Crossings

Map of Revised Multi-crossing Bridge Locations at 19.7A

Map of Halfway River Blockage Extent



Projection: UTM Zone 10, NAD83
Geographic Center of Map:
E: 591,850 Longitude: 121°31'6.43"W
N: 6,232,557 Latitude: 56°13'44.48"N

No.	Revisions	Made	Chkd	Appd	Date

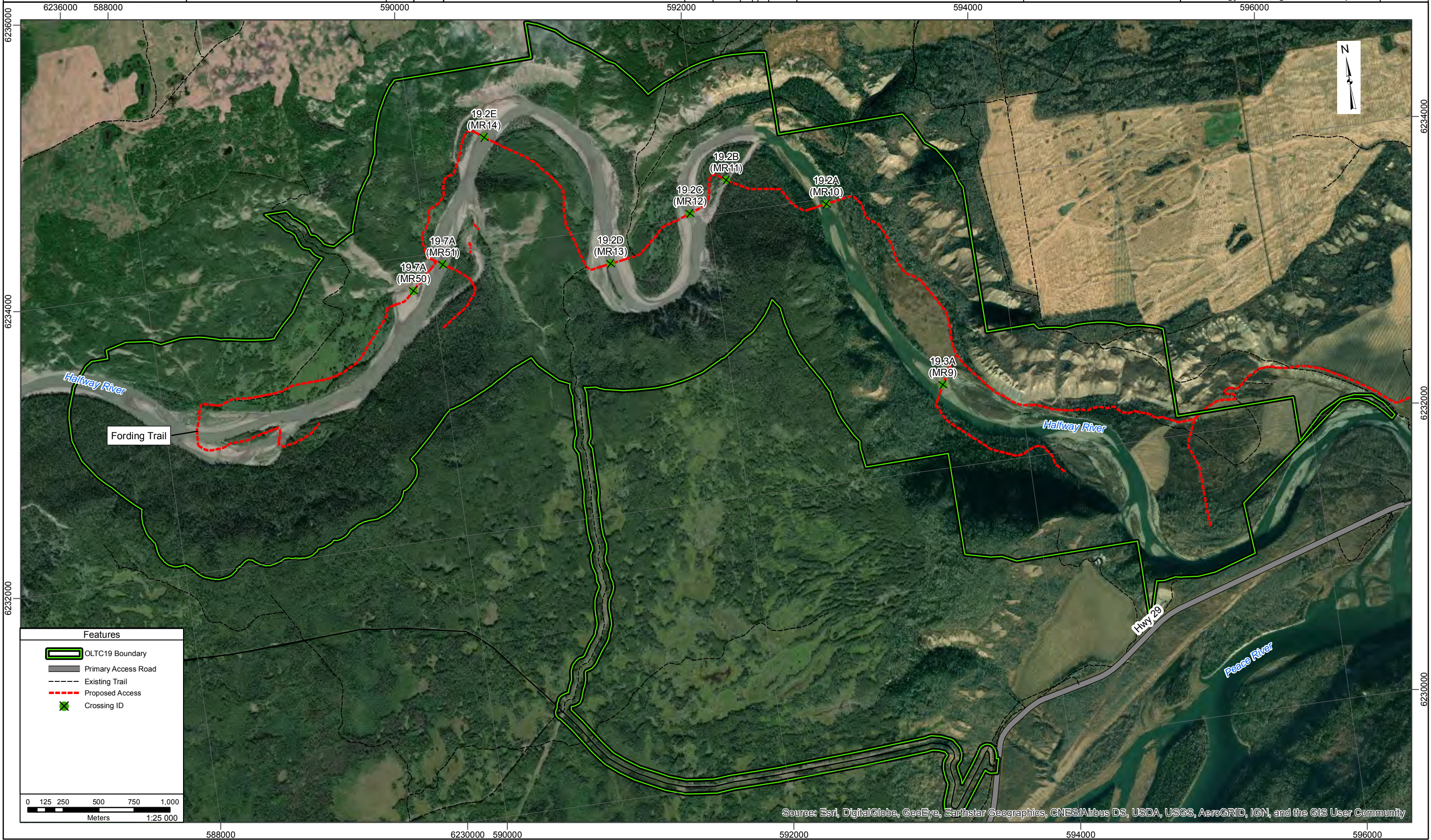
Mapsheet Reference:
Location:
Resource District:

94A.013, 023
Halfway River
Peace

Drawing No.:
Revision:
Date:

OLTC19-N11-00004B-01
0
26Jun20

Site C Clean Energy Project
Middle Reservoir
OLTC19 - Halfway River
Trilogy Crossing Location Map





Projection: UTM Zone 10, NAD83
Geographic Center of Map:
E: 589,934 Longitude: 121°32'56.08"W
N: 6,233,842 Latitude: 56°14'27.34"N

No.	Revisions	Made	Chkd	Appd	Date

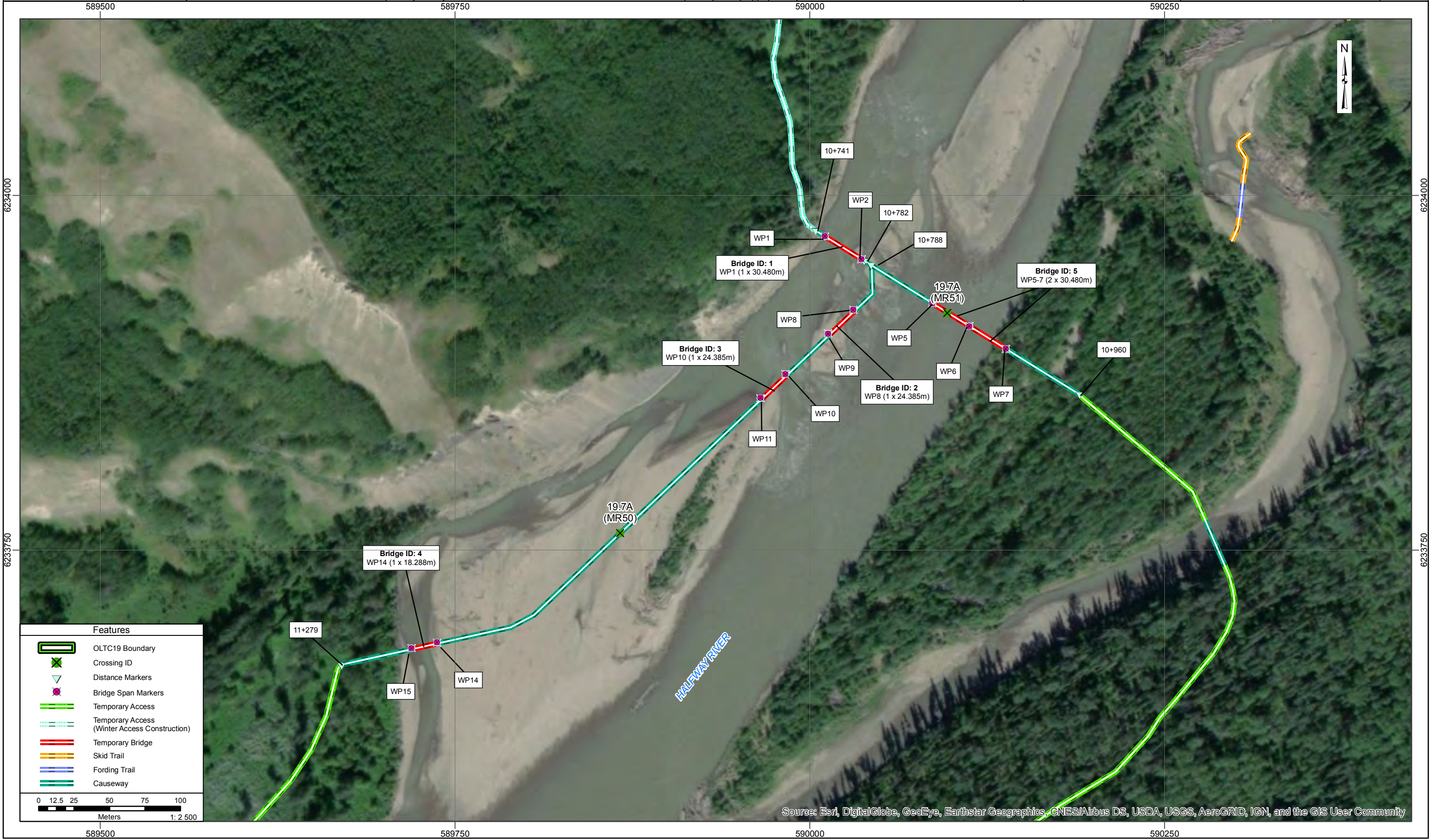
Mapsheet Reference:
Location:
Resource District:

94A.023
Halfway River
Peace

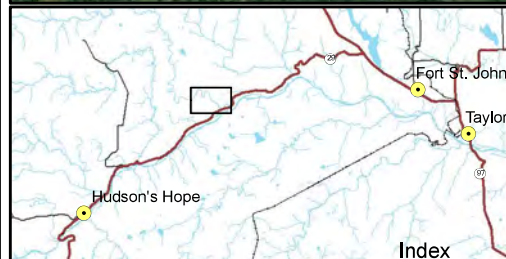
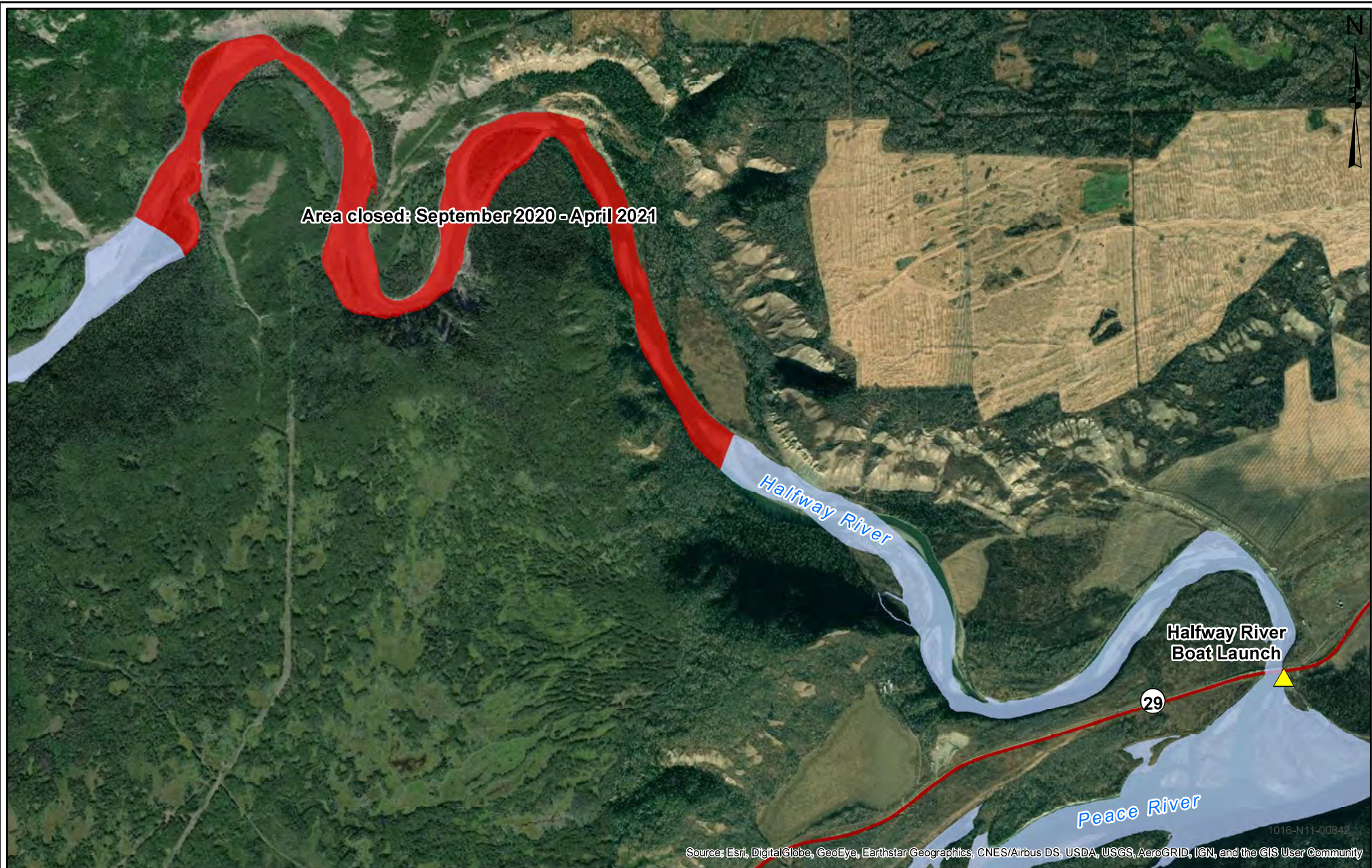
Drawing No.:
Revision:
Date:

OLTC19-N11-00005B-01
0
26Jun20

Site C Clean Energy Project
Middle Reservoir
OLTC19 - Halfway River
Trilogy Crossing ID: 19.7A Location Map



Source: Esri, DigitalGlobe, 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

- Area**
- Area closed: September 2020 - April 2021
 - ▲ Halfway River Boat Launch
 - Highway

1:30,000

0 1 km



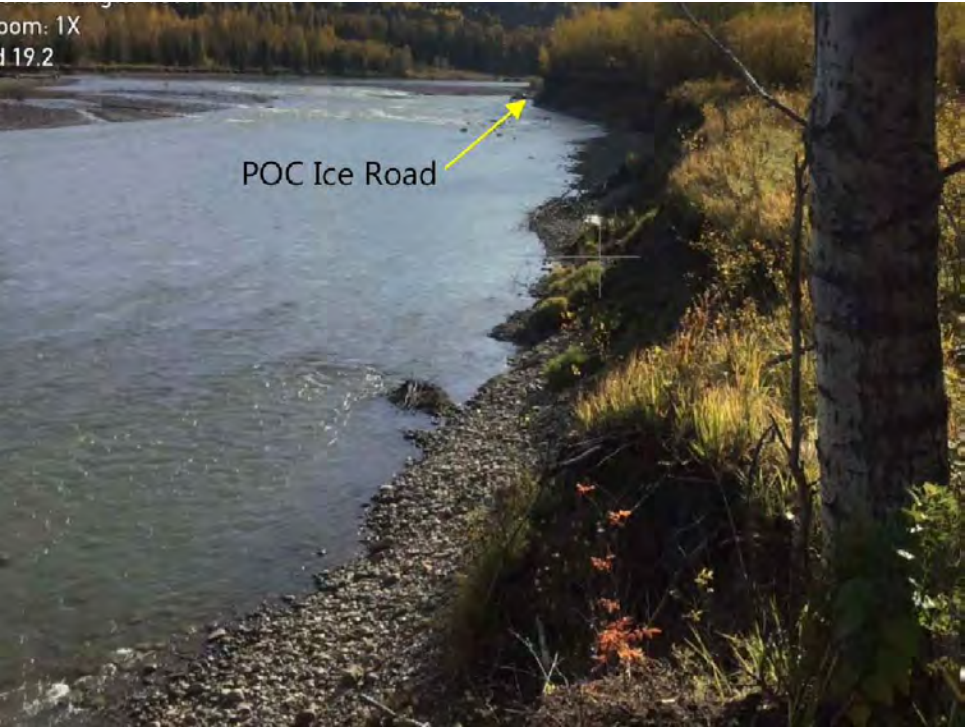
Halfway River Closure Area

DATE	May 14, 2020	1016-N11-00842	R 0
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Construction of the Site C Clean Energy Project is subject to required regulatory and permitting approvals.

Attachment B

**Design Drawings, Plan and Profile Views of Revised Temporary Access Crossings at
19.7A over Halfway River**



HALFWAY RIVER
OLTC 19 - 7A



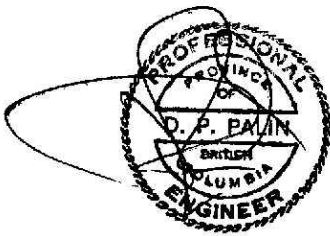
HALFWAY RIVER CROSSINGS (MIN. CL-625)
BRIDGE DETAILS

COORDINATES:
LATITUDE: 56.24172°
LONGITUDE: -121.54666°

PROPOSED SET OF PLANS FOR
LOW-FLOW OPTION

PROPOSED#2 SET OF PLANS FOR
ULTRA LOW-FLOW OPTION
(ALMOST NO FLOW PRESENT IN
CULVERT CHANNELS AT TIME OF
CONSTRUCTION)

DESCRIPTION	SHEET NUMBER	DESCRIPTION	SHEET NUMBER
EXISTING SITE PHOTOS	01	B1 C1 C3/C4 B5 PROPOSED#2 PLAN VIEW	16
B1 C1 B2 B5 EXISTING PLAN VIEW	02	C5/C6 PROPOSED#2 PLAN VIEW	17
B3 EXISTING PLAN VIEW	03	C2 PROPOSED#2 PLAN VIEW	18
C2 EXISTING PLAN VIEW	04	C7/C8 PROPOSED#2 PLAN VIEW	19
B4 EXISTING PLAN VIEW	05	B1 B5 PROPOSED#2 PROFILES AND SECTIONS	20
B1 B5 EXISTING PROFILES AND SECTIONS	06	C3/C4 C5/C6 PROPOSED#2 PROFILES AND SECTIONS	21
B2 B3 EXISTING PROFILES AND SECTIONS	07	C2 C7/C8 PROPOSED#2 PROFILES AND SECTIONS	22
C2 B4 EXISTING PROFILES AND SECTIONS	08	PROPOSED CUT AND FILL PLAN + DETAILS	23
B1 C1 B2 B5 PROPOSED PLAN VIEW	09	PROPOSED#2 CUT AND FILL PLAN + DETAILS	24
B3 PROPOSED PLAN VIEW	10	LOCKBLOCK/PULLOUT DETAILS	25
C2 PROPOSED PLAN VIEW	11		
B4 PROPOSED PLAN VIEW	12		
B1 B5 PROPOSED PROFILES AND SECTIONS	13		
B2 B3 PROPOSED PROFILES AND SECTIONS	14		
C2 B4 PROPOSED PROFILES AND SECTIONS	15		



PREPARED BY:



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.

DOWNSTREAM LOOKING AT LOW-CHAIN BANK



UPSTREAM LOOKING AT LOW-CHAIN BANK



LOW-CHAIN BANK UPSTREAM FROM CROSSING



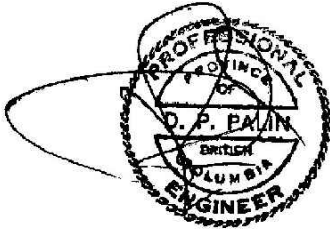


START OF CROSSING FROM LOW-CHAIN BANK

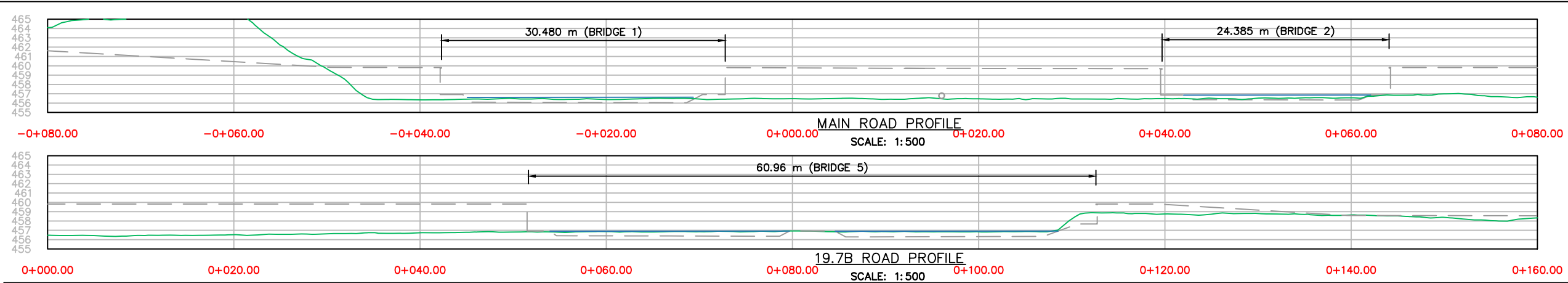


AERIAL IMAGERY



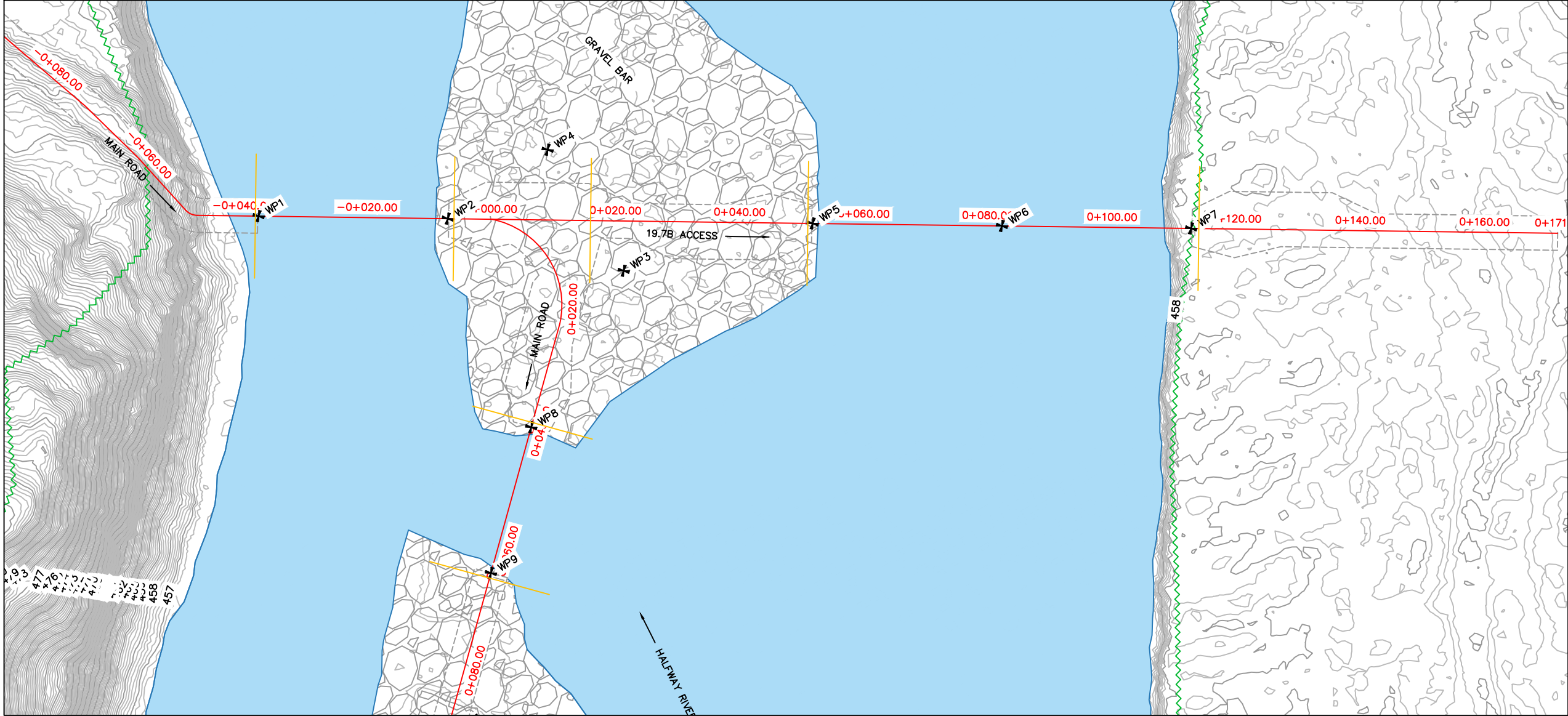
- GENERAL NOTES:
1. SITE PHOTOGRAPHS WERE TAKEN BY OTHERS IN SEPTEMBER 2018 AND REPRODUCED IN THESE PLANS FOR REFERENCE.
 2. TRILOGY CROSSING CORP. HAS NOT BEEN TO SITE AND THEREFORE IS UNABLE TO VERIFY GRAVEL BAR LOCATIONS AND CREEK BOTTOM LOCATIONS. ALL DETAILS HAVE BEEN BASED OFF IMAGERY AND TECHNICAL INFORMATION PREPARED BY OTHERS.

			 Trilogy Crossing Corp. ENGINEERING, ENVIRONMENTAL, INSPECTION			
			19.7A HALFWAY CROSSINGS			
			EXISTING SITE PHOTOS			
			 BC Hydro Power smart			
			DESIGN	DRAWN	CHECKED	FILE
1	02-JUN-2020	ISSUED FOR CONSTRUCTION	M.DARASZ	M.DARASZ	D.PALIN	TC-HY011 /01
0	28-MAY-2020	ISSUED FOR REVIEW	DATE	DATE	DATE	PLAN
		REVISIONS	28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011
			Sheet 01 of 25			



LEGEND

CREEK

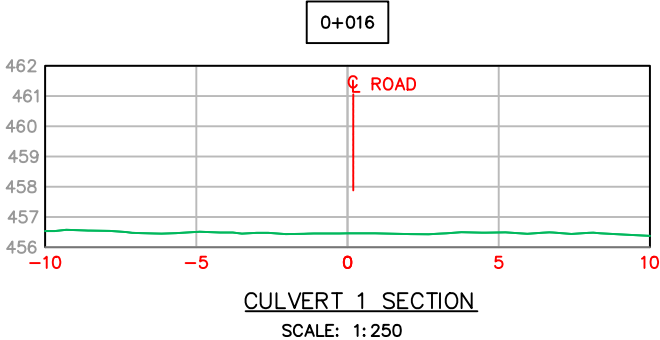
ROAD

- GENERAL NOTES:
- TOPOGRAPHIC SURVEY DEVELOPED BASED OFF LIDAR DATA PROVIDED BY MAPLE LEAF FORESTRY.
 - COORDINATE SYSTEM NAD83, GEOID CGG2013.
 - NO GEOTECHNICAL INFORMATION HAS BEEN PROVIDED OR GATHERED TO DATE.
 - HALFWAY RIVER DEPTH ESTIMATED AT 0.5m AT CROSSING LOCATIONS. TRUE RIVER DEPTH UNKNOWN AND HAS BEEN ASSUMED FOR BRIDGE CONFIGURATION PURPOSES.
 - HYDROLOGICAL INFORMATION ACQUIRED BASED ON NEARBY CROSSINGS AND HYDROTECHNICAL REPORTS PREPARED BY OTHERS. VOLUME OF 88m³/s HAS BEEN DETERMINED FOR THIS CHANNEL.
 - FLOW VELOCITY AT BRIDGES DETERMINED TO BE 1.6m/s FOR Q10 SEASONAL FLOW.
 - BRIDGE CONFIGURATION HAS BEEN CHOSEN TO SPAN DEEPEST PARTS OF CHANNELS TO CAUSE THE LEAST FLOW OBSTRUCTION POSSIBLE.
 - UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.

BENCHMARK SURVEY TABLE

MARK	ELEV. (m)	NORTHING	EASTING
✕ WP1	457.9	6233971.119	590010.5409
✕ WP2	457.9	6233955.039	590036.4342
✕ WP3	456.5	6233933.212	590056.3596
✕ WP4	456.5	6233956.244	590055.9391
✕ WP5	457.9	6233924.021	590086.3807
✕ WP6	457.9	6233907.941	590112.2741
✕ WP7	457.9	6233891.861	590138.1674
✕ WP8	457.9	6233919.301	590030.5817
✕ WP9	457.9	6233902.525	590012.8863

PLAN
SCALE: 1:700



PROFESSIONAL
ENGINEER
D. P. PALIN
BRITISH COLUMBIA

1	02-JUN-2020	ISSUED FOR CONSTRUCTION
0	28-MAY-2020	ISSUED FOR REVIEW
REVISIONS		

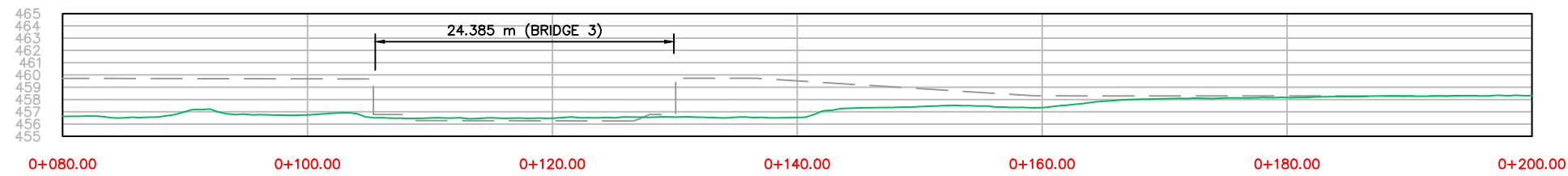
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19.7A HALFWAY CROSSINGS

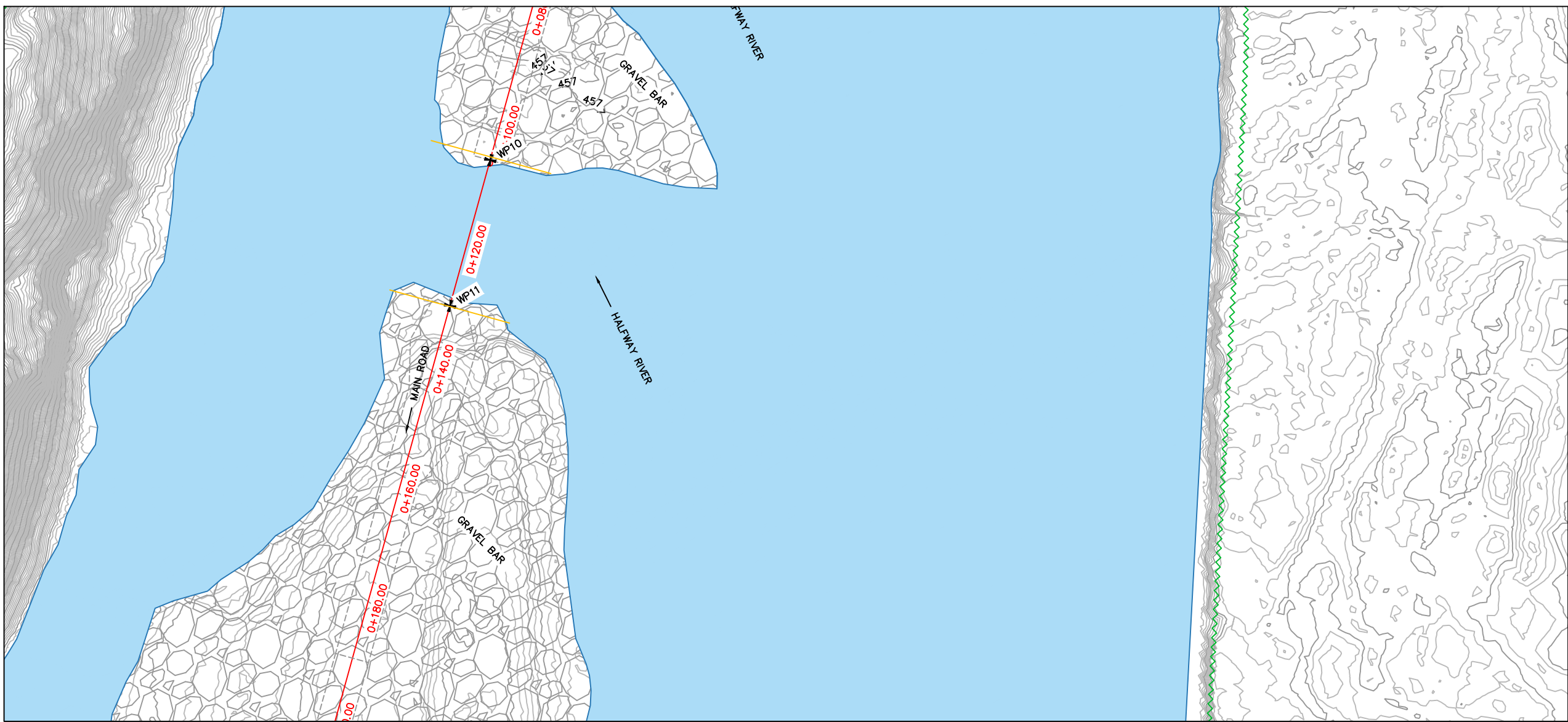
B1 C1 B2 B5 EXISTING PLAN VIEW

BC Hydro
Power smart

DESIGN	M.DARASZ	DRAWN	M.DARASZ	CHECKED	D.PALIN	FILE	TC-HY011 /02
DATE	28-MAY-2020	DATE	28-MAY-2020	DATE	28-MAY-2020	PLAN	TC-HY011
							Sheet 02 of 25



PROFILE
SCALE: 1:500



PLAN
SCALE: 1:700

✕ WP6	457.9	6233907.941	590112.2741
✕ WP7	457.9	6233891.861	590138.1674
✕ WP8	457.9	6233919.301	590030.5817
✕ WP9	457.9	6233902.525	590012.8863
✕ WP10	457.9	6233874.059	589982.8937
✕ WP11	457.9	6233857.282	589965.1983
✕ WP12	457.3	6233759.962	589869.1056
✕ WP13	457.3	6233772.149	589868.7752
✕ WP14	458.934	6233685.012	589737.2734
✕ WP15	458.934	6233681.074	589719.4145

NOTE: ELEV. IS AT BOTTOM OF GIRDERS OR CULVERT

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

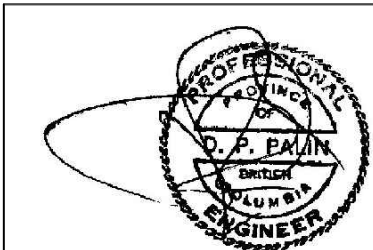
- GENERAL NOTES:
1. TOPOGRAPHIC SURVEY DEVELOPED BASED OFF LIDAR DATA PROVIDED BY MAPLE LEAF FORESTRY.
 2. COORDINATE SYSTEM NAD83, GEOID CGG2013.
 3. NO GEOTECHNICAL INFORMATION HAS BEEN PROVIDED OR GATHERED TO DATE.
 4. HALFWAY RIVER DEPTH ESTIMATED AT 0.5m AT CROSSING LOCATIONS. TRUE RIVER DEPTH UNKNOWN AND HAS BEEN ASSUMED FOR BRIDGE CONFIGURATION PURPOSES.
 5. HYDROLOGICAL INFORMATION ACQUIRED BASED ON NEARBY CROSSINGS AND HYDROTECHNICAL REPORTS PREPARED BY OTHERS. VOLUME OF 88m³/s HAS BEEN DETERMINED FOR THIS CHANNEL.
 6. FLOW VELOCITY AT BRIDGES DETERMINED TO BE 1.6m/s FOR Q10 SEASONAL FLOW.
 7. BRIDGE CONFIGURATION HAS BEEN CHOSEN TO SPAN DEEPEST PARTS OF CHANNELS TO CAUSE THE LEAST FLOW OBSTRUCTION POSSIBLE.
 8. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.

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ENGINEERING, ENVIRONMENTAL, INSPECTION

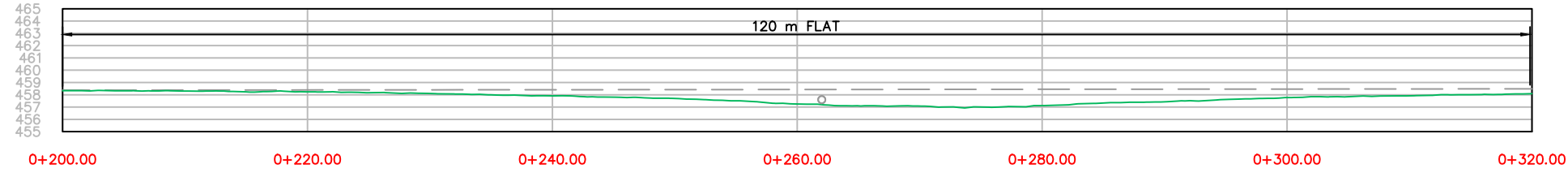
19.7A HALFWAY CROSSINGS

B3 EXISTING PLAN VIEW

BC Hydro
Power smart



DESIGN		DRAWN		CHECKED		FILE	
1	02-JUN-2020	ISSUED FOR CONSTRUCTION	M.DARASZ	M.DARASZ	D.PALIN	TC-HY011 /03	
0	28-MAY-2020	ISSUED FOR REVIEW	DATE	DATE	DATE	PLAN	TC-HY011
REVISIONS							

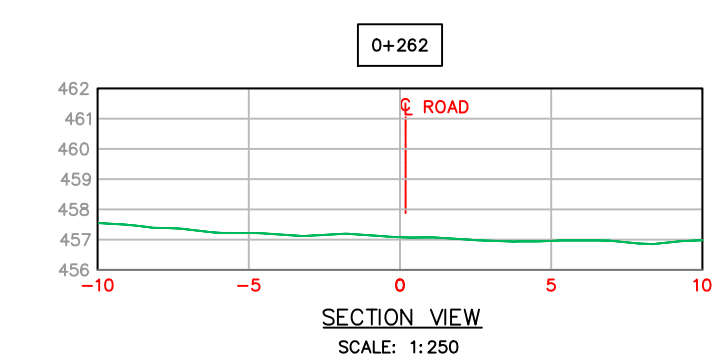


PROFILE
SCALE: 1:500



LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

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PLAN
SCALE: 1:700

✕ WP6	457.9	6233907.941	590112.2741
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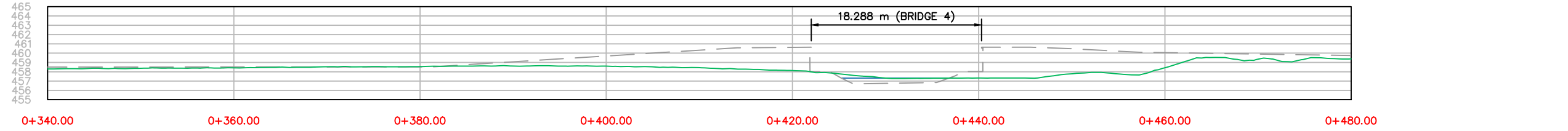
19.7A HALFWAY CROSSINGS

C2 EXISTING PLAN & PROFILE

BC Hydro
Power smart

DESIGN	M.DARASZ	DRAWN	M.DARASZ	CHECKED	D.PALIN	FILE	TC-HY011 /04
DATE	28-MAY-2020	DATE	28-MAY-2020	DATE	28-MAY-2020	PLAN	TC-HY011

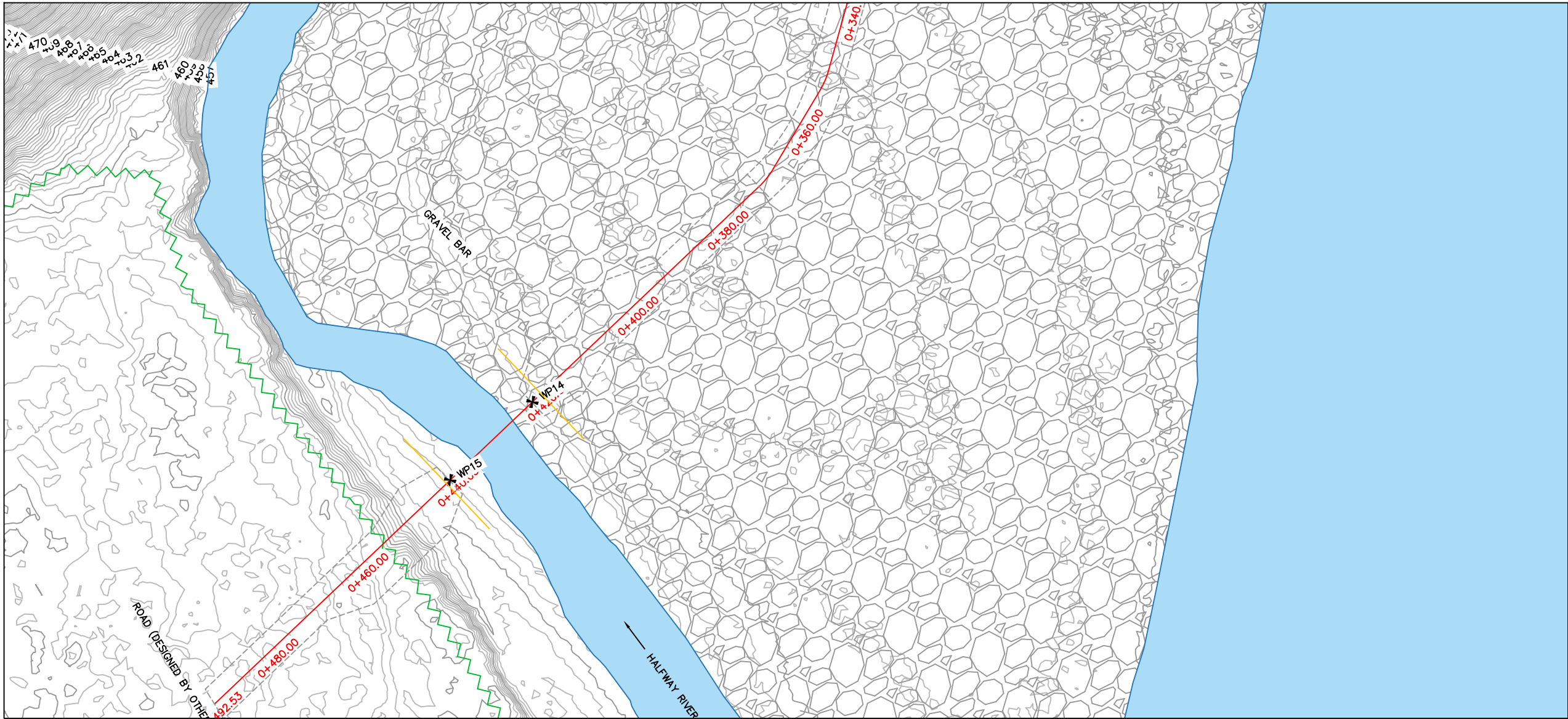
Sheet 04 of 25



PROFILE
SCALE: 1:500



LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

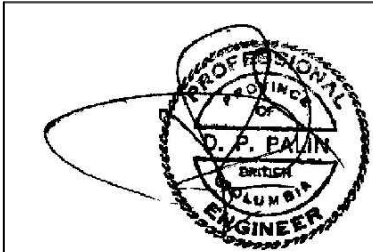


PLAN
SCALE: 1:700

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 6. FLOW VELOCITY AT BRIDGES DETERMINED TO BE 1.6m/s FOR Q10 SEASONAL FLOW.
 7. BRIDGE CONFIGURATION HAS BEEN CHOSEN TO SPAN DEEPEST PARTS OF CHANNELS TO CAUSE THE LEAST FLOW OBSTRUCTION POSSIBLE.
 8. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.



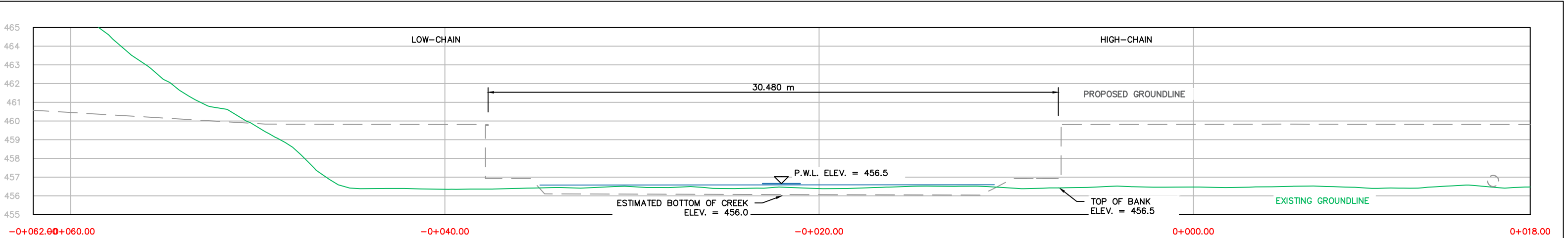
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0	28-MAY-2020	DATE	DATE	DATE	PLAN
		28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011
		REVISIONS			
		Sheet 05 of 25			

Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

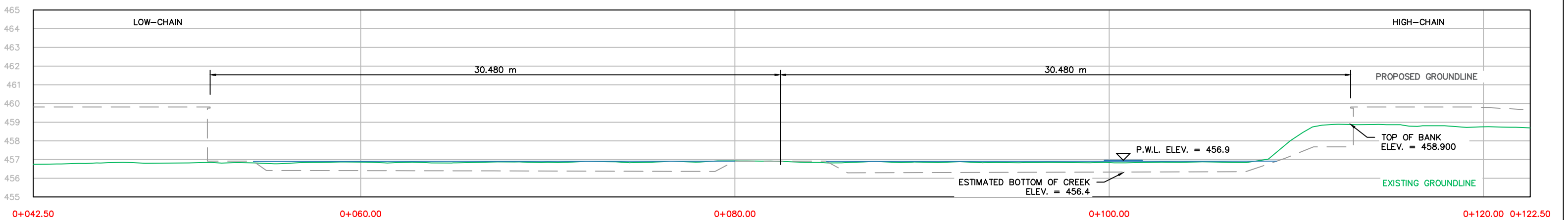
19.7A HALFWAY CROSSINGS

B1 EXISTING PLAN VIEW

BC Hydro
Power smart



BRIDGE 1 (B1) PROFILE
SCALE: 1:200



BRIDGE 5 (B5) PROFILE
SCALE: 1:200

LEGEND

CREEK

ROAD

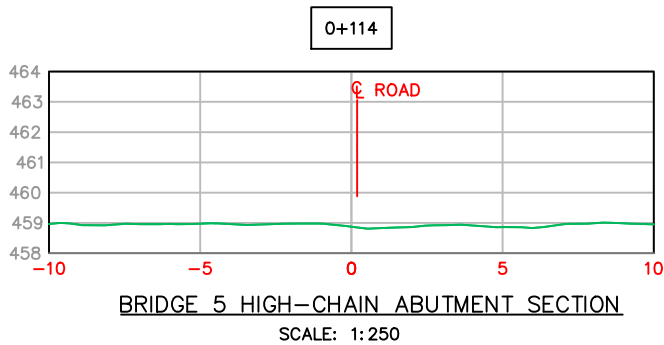
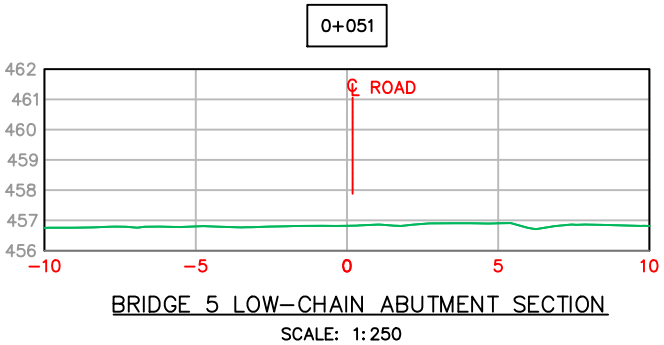
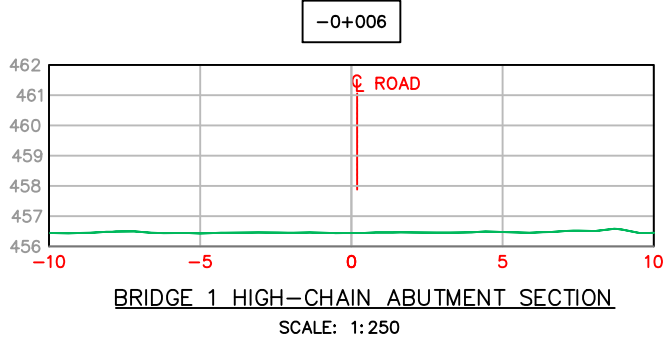
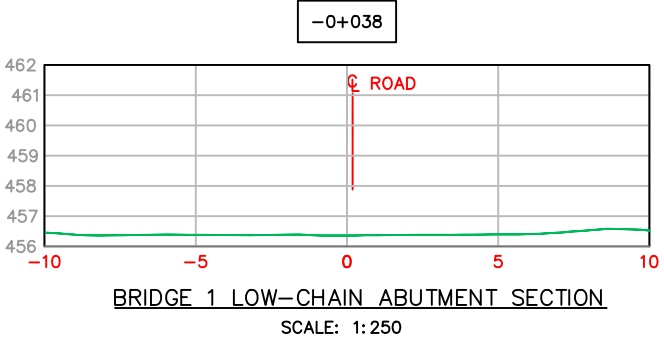
ROAD ALIGNMENT

RIPARIAN ROCK

TREE LINE

SECTION LINE

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Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

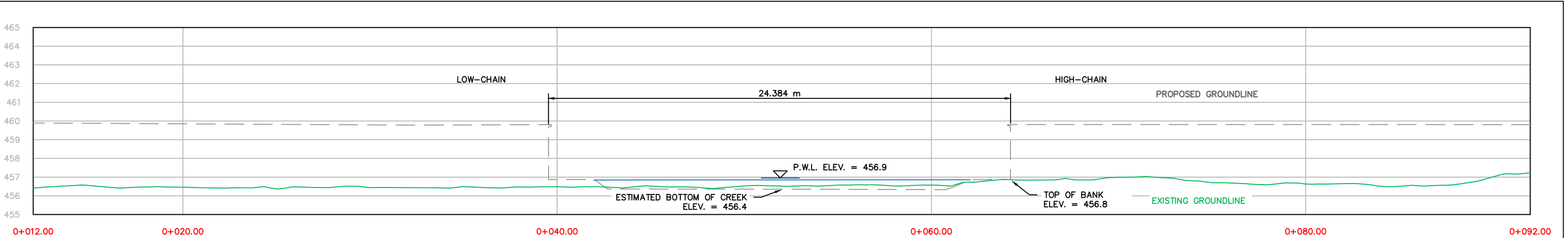
19.7A HALFWAY CROSSINGS

B1 B5 EXISTING PROFILES/SECTIONS

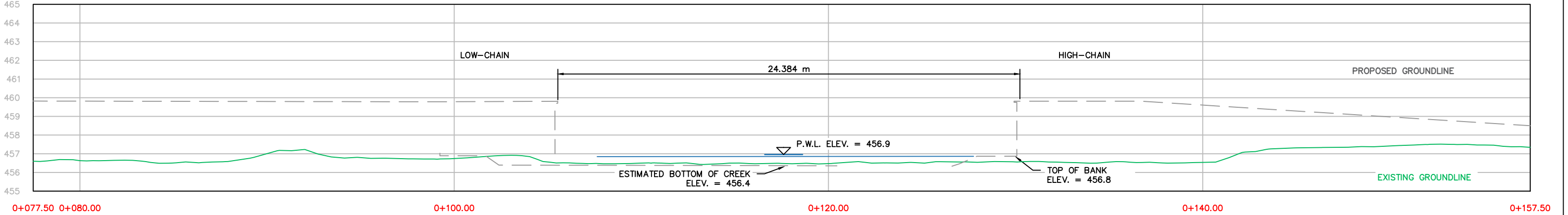
BC Hydro
Power smart

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DATE	28-MAY-2020	DATE	28-MAY-2020	DATE	28-MAY-2020	PLAN	TC-HY011
REVISIONS							Sheet 06 of 25

LAST DATE REVISED: 2-Jun-2020 6:13 PM



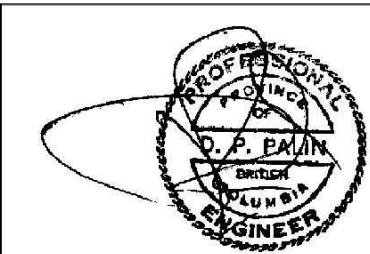
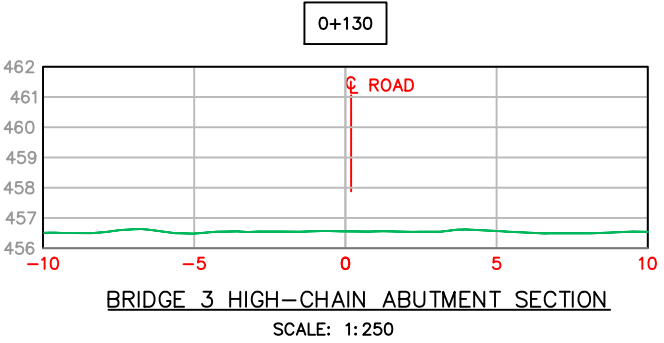
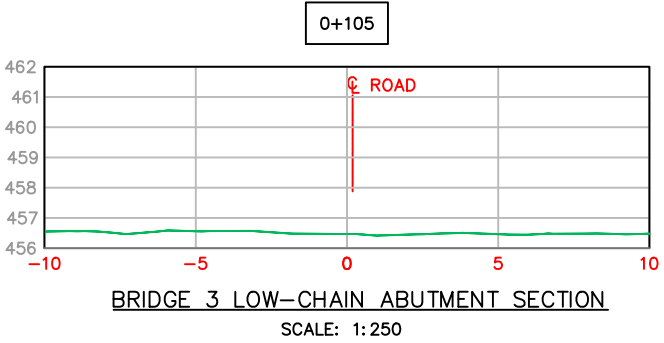
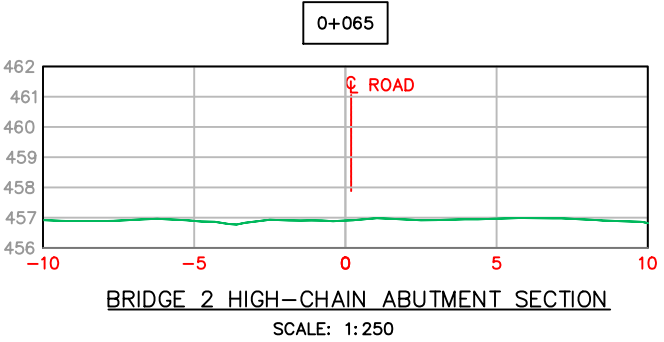
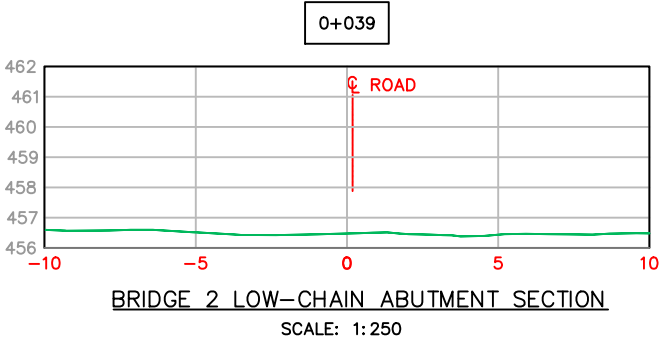
BRIDGE 2 (B2) PROFILE
SCALE: 1:200



BRIDGE 3 (B3) PROFILE
SCALE: 1:200

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

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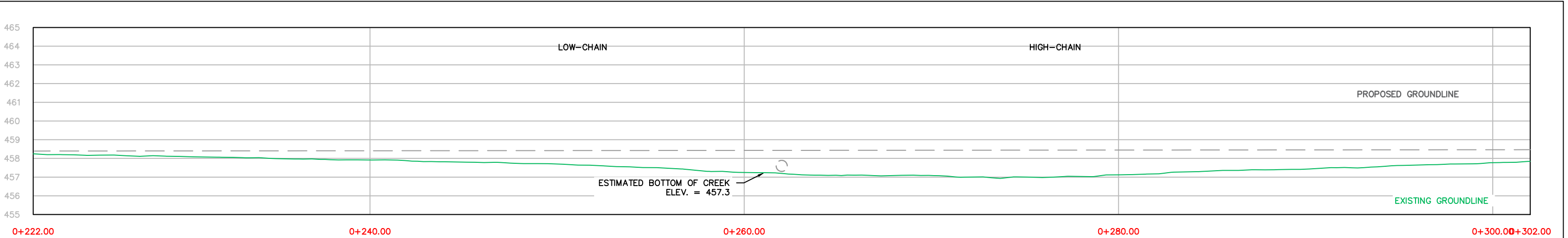
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0	28-MAY-2020	ISSUED FOR REVIEW							
REVISIONS									TC-HY011
									Sheet 07 of 25



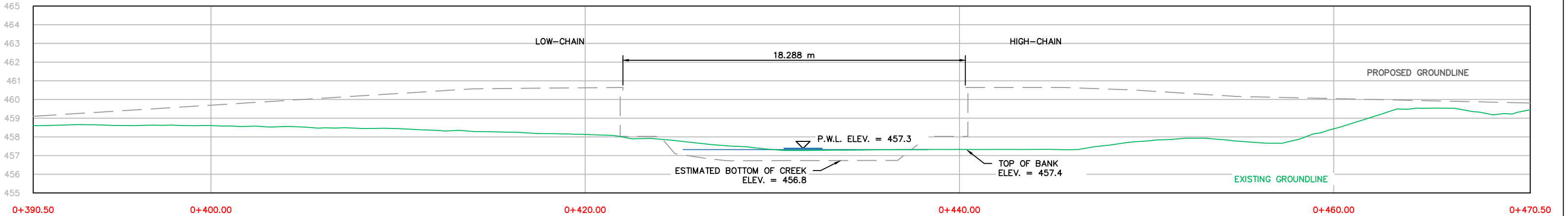
19.7A HALFWAY CROSSINGS

B2 B3 EXISTING PROFILES/SECTIONS





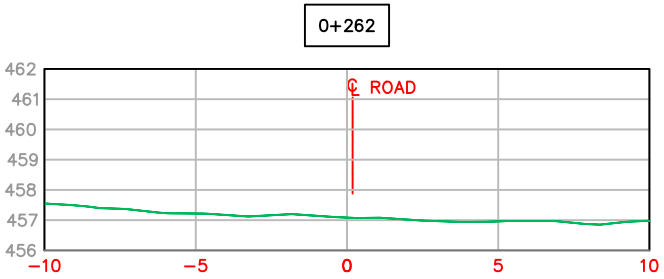
CULVERT 2 (C2) PROFILE
SCALE: 1:200



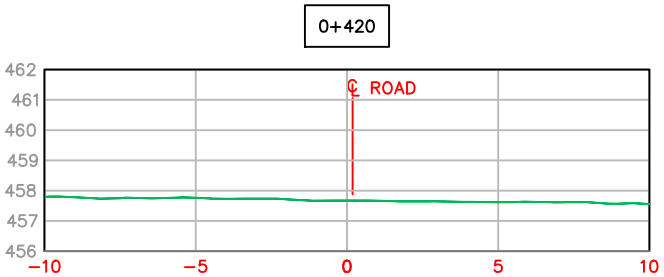
BRIDGE 4 (B4) PROFILE
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LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

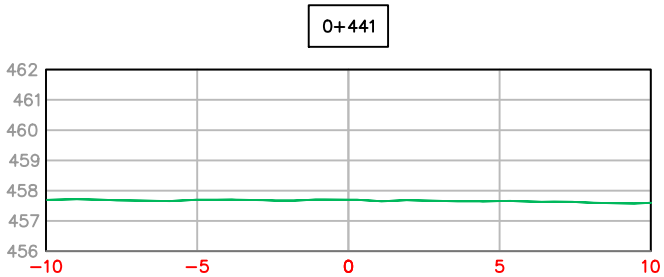
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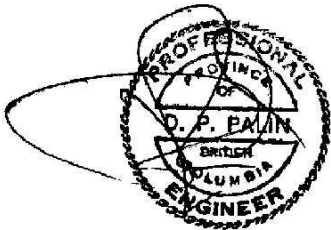
CULVERT 2 SECTION
SCALE: 1:250



BRIDGE 4 LOW-CHAIN ABUTMENT SECTION
SCALE: 1:250



BRIDGE 4 HIGH-CHAIN ABUTMENT SECTION
SCALE: 1:250



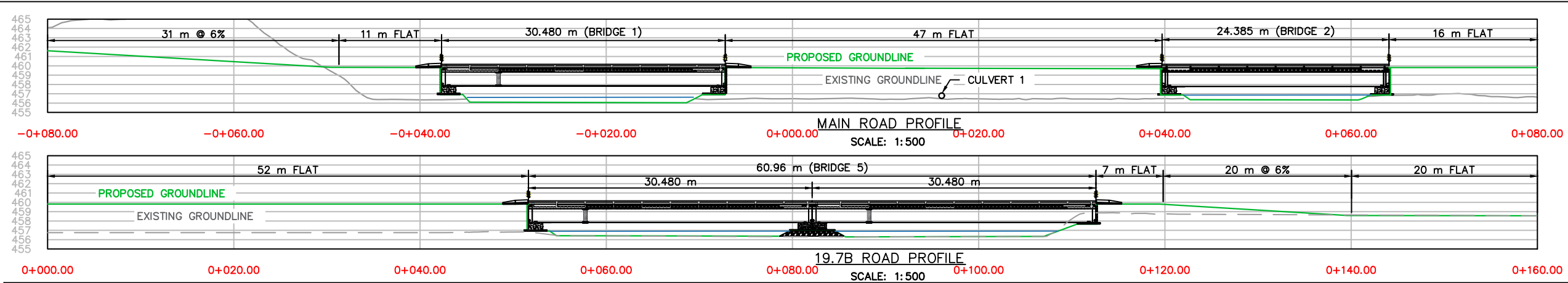
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0	28-MAY-2020	ISSUED FOR REVIEW	28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011	Sheet 08 of 25
REVISIONS							



19.7A HALFWAY CROSSINGS

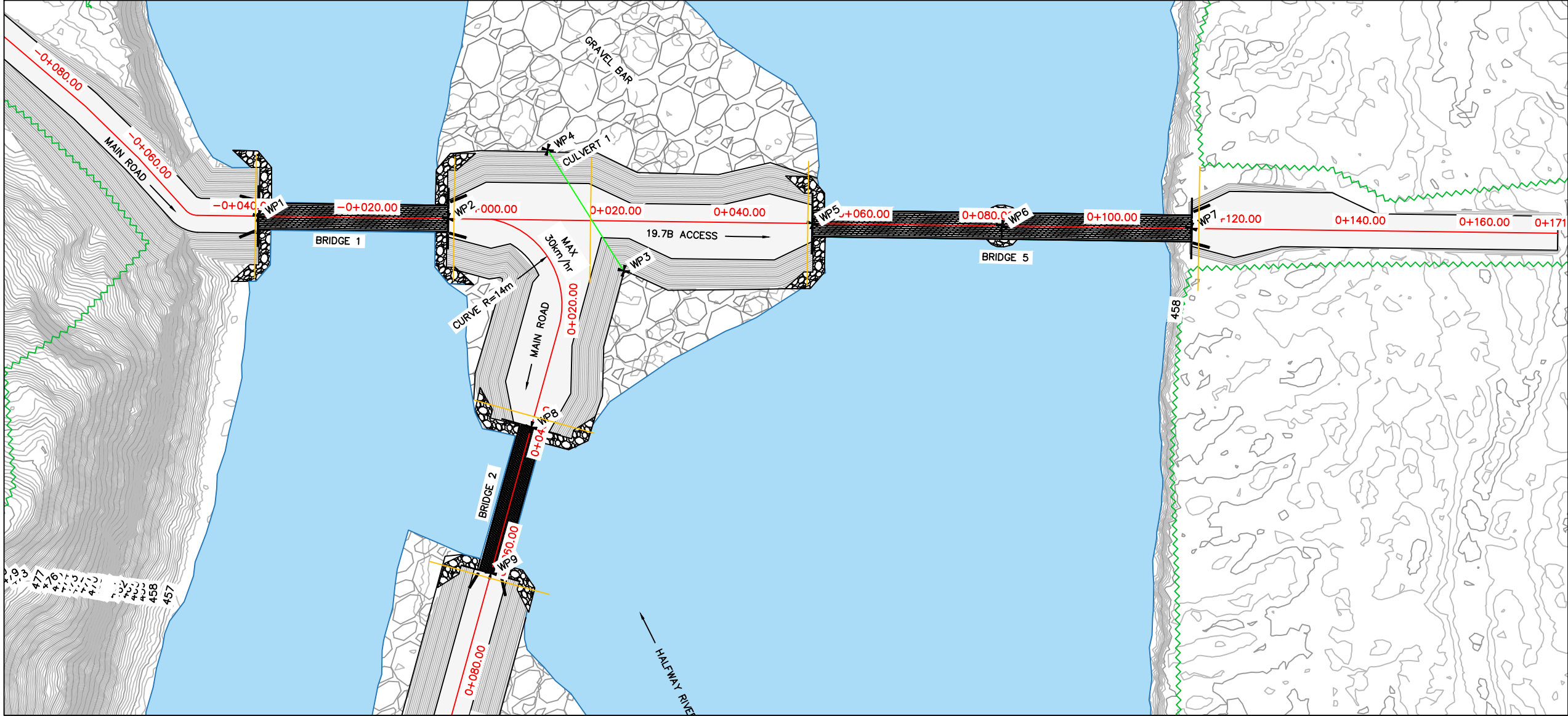
C2 B4 EXISTING PROFILES/SECTIONS





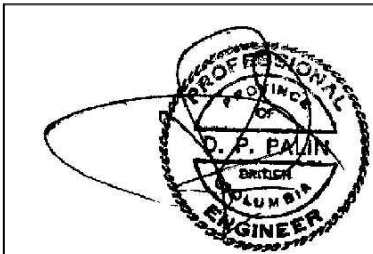
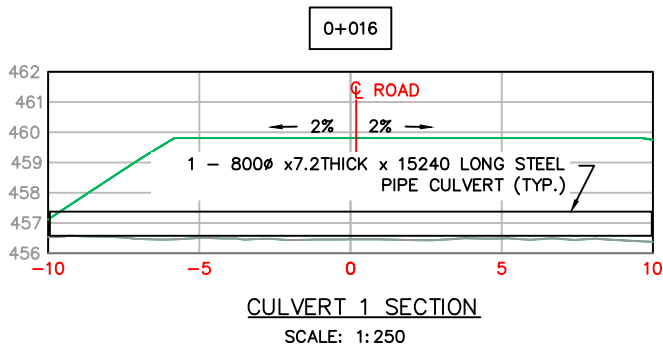
LEGEND

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



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BENCHMARK SURVEY TABLE			
MARK	ELEV. (m)	NORTHING	EASTING
✕ WP1	457.9	6233971.119	590010.5409
✕ WP2	457.9	6233955.039	590036.4342
✕ WP3	456.5	6233933.212	590056.3596
✕ WP4	456.5	6233956.244	590055.9391
✕ WP5	457.9	6233924.021	590086.3807
✕ WP6	457.9	6233907.941	590112.2741
✕ WP7	457.9	6233891.861	590138.1674
✕ WP8	457.9	6233919.301	590030.5817
✕ WP9	457.9	6233902.525	590012.8863



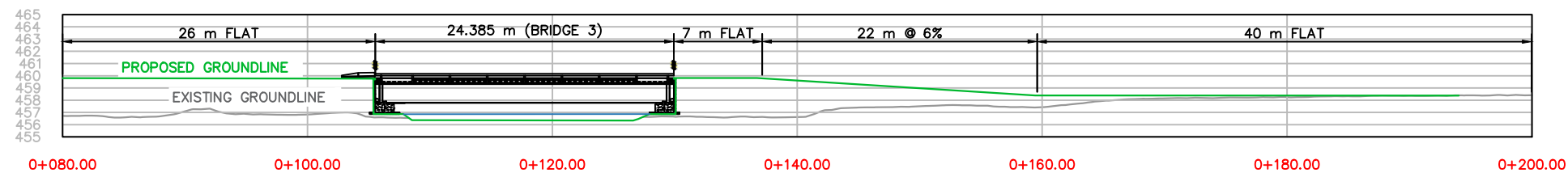
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REVISIONS							Sheet 09 of 25

Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

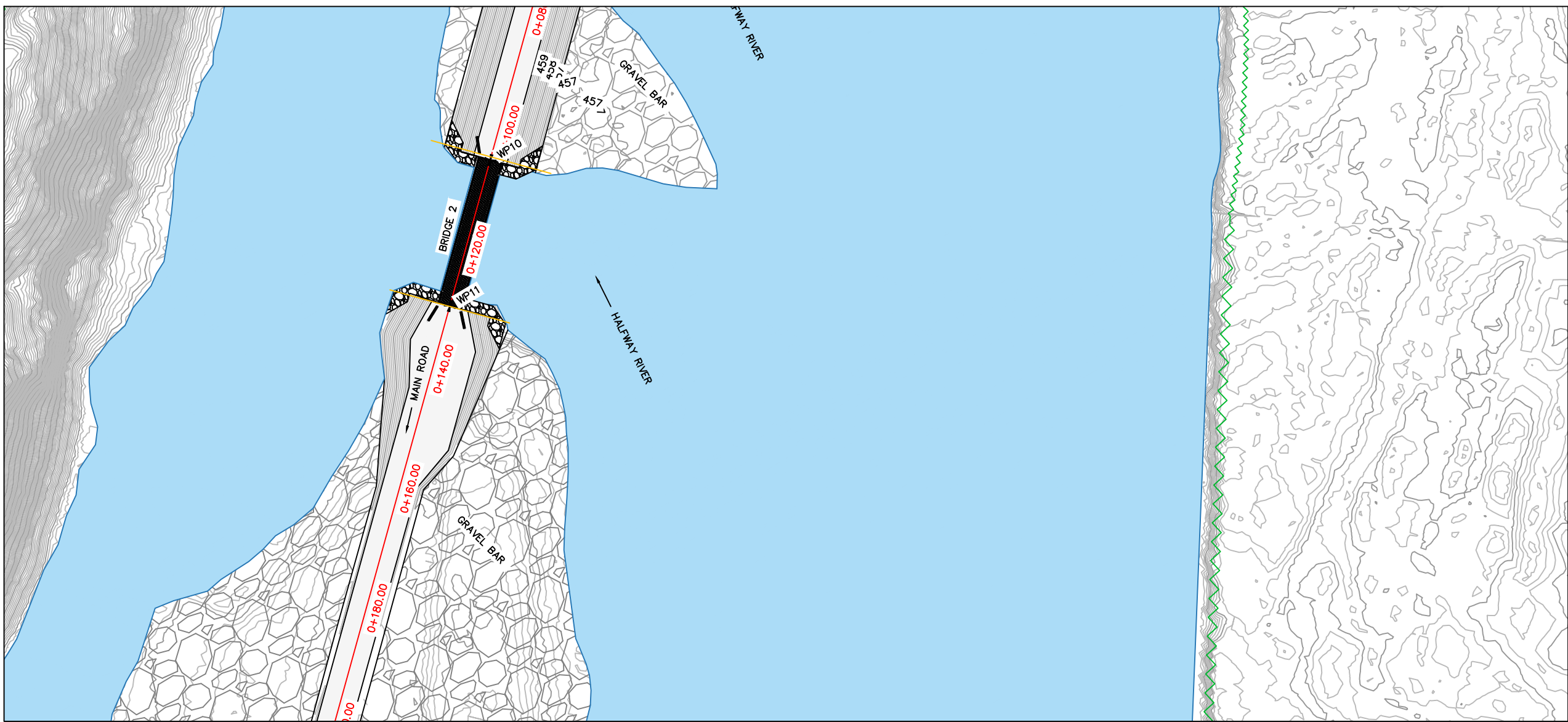
19.7A HALFWAY CROSSINGS

B1 C1 B2 B5 PROPOSED PLAN VIEW

BC Hydro
Power smart



PROFILE
SCALE: 1:500



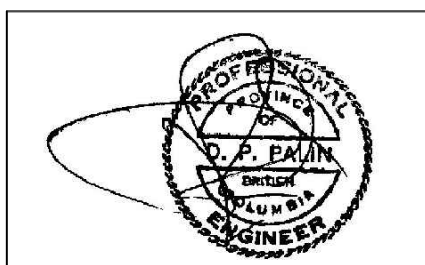
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SCALE: 1:700

✕ WP6	457.9	6233907.941	590112.2741
✕ WP7	457.9	6233891.861	590138.1674
✕ WP8	457.9	6233919.301	590030.5817
✕ WP9	457.9	6233902.525	590012.8863
✕ WP10	457.9	6233874.059	589982.8937
✕ WP11	457.9	6233857.282	589965.1983
✕ WP12	457.3	6233759.962	589869.1056
✕ WP13	457.3	6233772.149	589868.7752
✕ WP14	458.934	6233685.012	589737.2734
✕ WP15	458.934	6233681.074	589719.4145

NOTE: ELEV. IS AT BOTTOM OF GIRDERS OR CULVERT

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

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REVISIONS	
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0	28-MAY-2020 ISSUED FOR REVIEW

Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

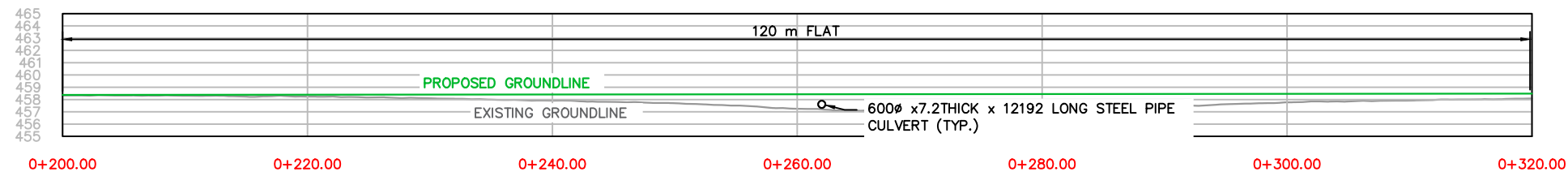
19.7A HALFWAY CROSSINGS

B3 PROPOSED PLAN VIEW

BC Hydro
Power smart

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DATE	28-MAY-2020	DATE	28-MAY-2020	DATE	28-MAY-2020	PLAN	TC-HY011

Sheet 10 of 25

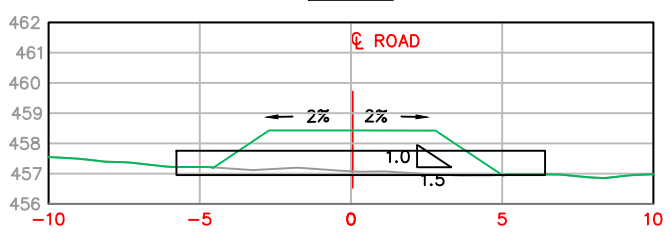


PROFILE
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PLAN
SCALE: 1:700

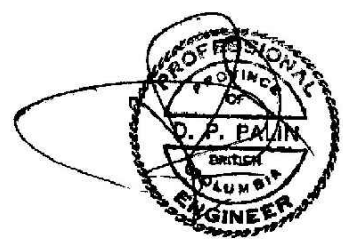
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SECTION VIEW
SCALE: 1:250

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✕ WP7	457.9	6233891.861	590138.1674
✕ WP8	457.9	6233919.301	590030.5817
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NOTE: ELEV. IS AT BOTTOM OF GIRDERS OR CULVERT



REV	DATE	DESCRIPTION
1	02-JUN-2020	ISSUED FOR CONSTRUCTION
0	28-MAY-2020	ISSUED FOR REVIEW



19.7A HALFWAY CROSSINGS

C2 PROPOSED PLAN & PROFILE

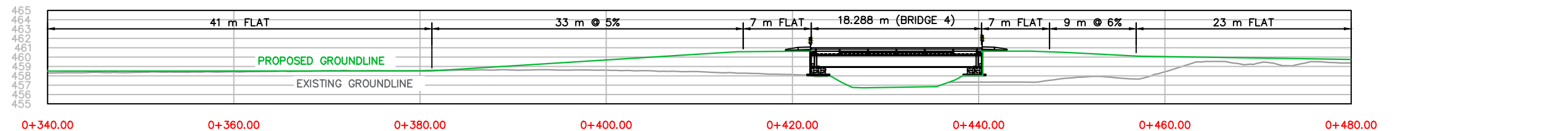


Power smart

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DATE	28-MAY-2020	DATE	28-MAY-2020	DATE	28-MAY-2020	PLAN	TC-HY011

Sheet 11 of 25

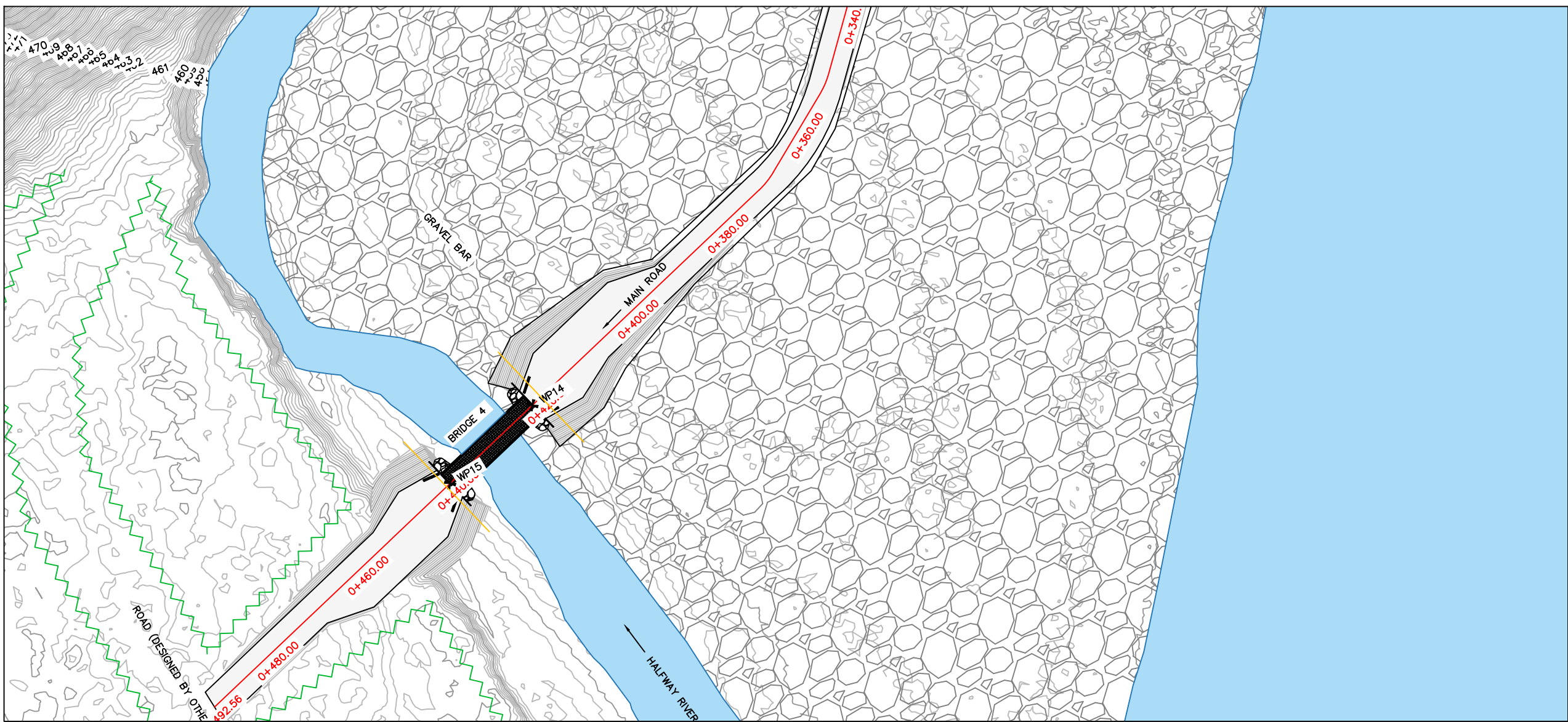
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PROFILE
SCALE: 1:500



LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

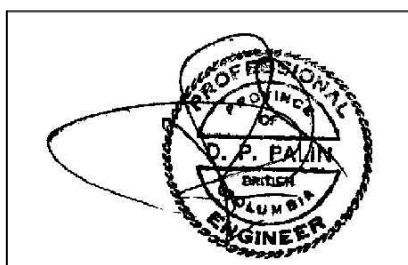


PLAN
SCALE: 1:700

✕ WP6	457.9	6233907.941	590112.2741
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Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

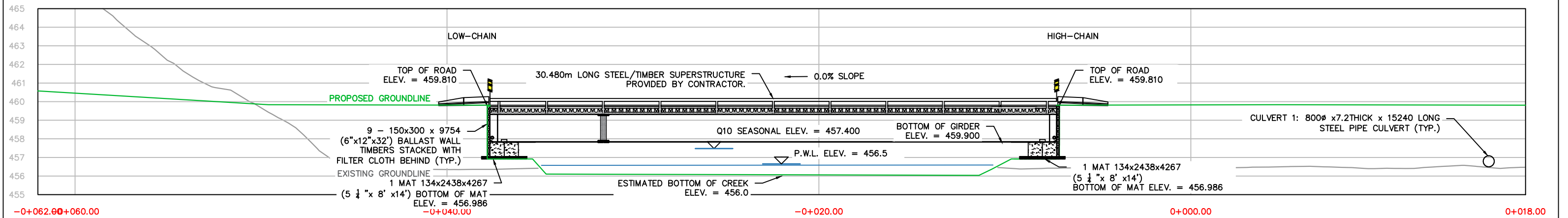
19.7A HALFWAY CROSSINGS

B4 PROPOSED PLAN VIEW

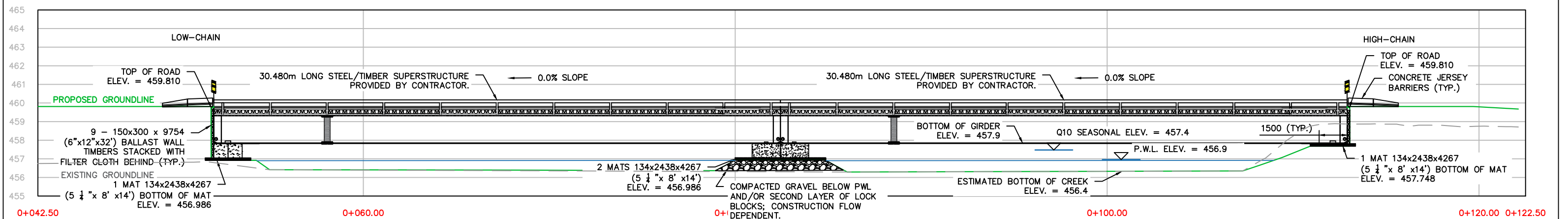
BC Hydro
Power smart

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REVISIONS							Sheet 12 of 25

LAST DATE REVISED: 2-Jun-2020 6:13 PM

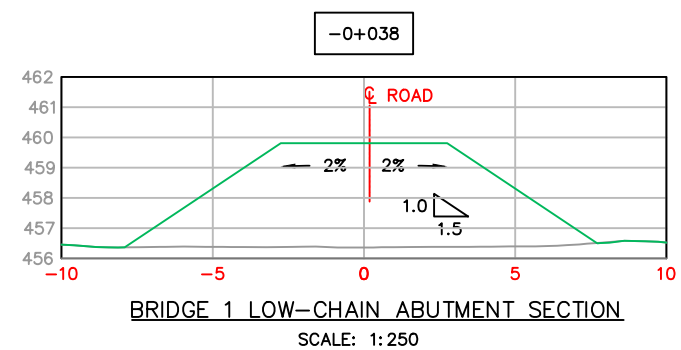


BRIDGE 1 (B1) PROFILE
SCALE: 1:200

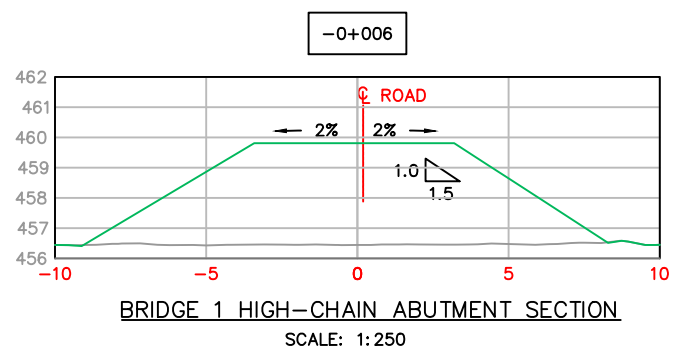


BRIDGE 5 (B5) PROFILE
SCALE: 1:200

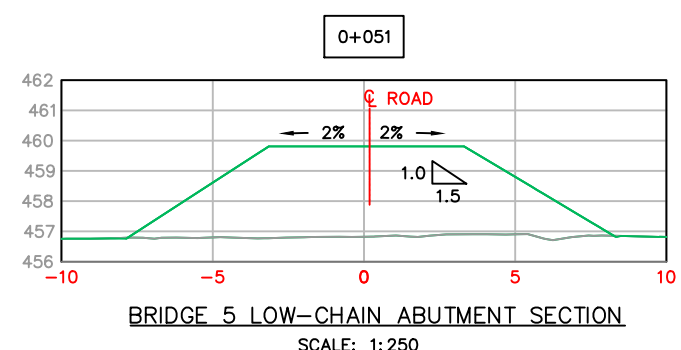
LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE



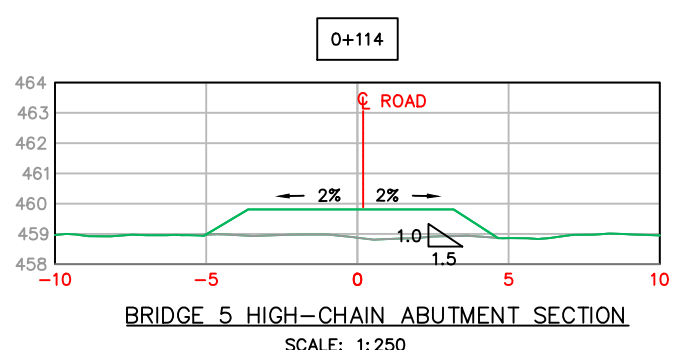
BRIDGE 1 LOW-CHAIN ABUTMENT SECTION
SCALE: 1:250



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

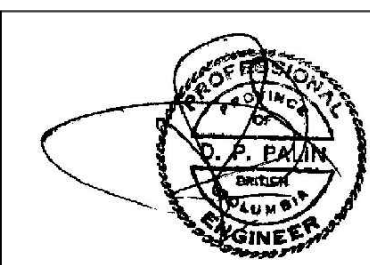


BRIDGE 5 LOW-CHAIN ABUTMENT SECTION
SCALE: 1:250



BRIDGE 5 HIGH-CHAIN ABUTMENT SECTION
SCALE: 1:250

- GENERAL NOTES:
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 2. COORDINATE SYSTEM NAD83, GEOID CGG2013.
 3. NO GEOTECHNICAL INFORMATION HAS BEEN PROVIDED OR GATHERED TO DATE.
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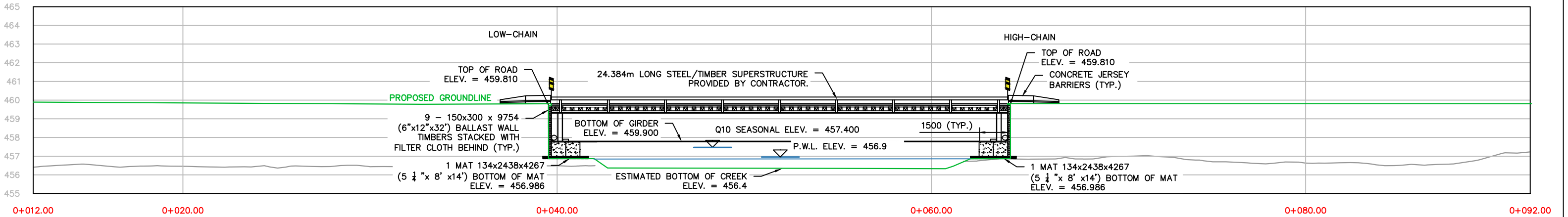


19.7A HALFWAY CROSSINGS

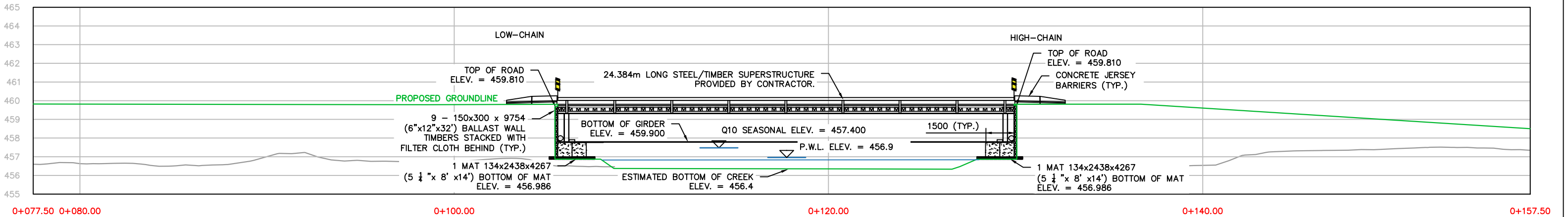
B1 B5 PROPOSED PROFILES/SECTIONS



NO.	DATE	DESCRIPTION	DESIGN	DRAWN	CHECKED	FILE
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0	28-MAY-2020	ISSUED FOR REVIEW				TC-HY011
REVISIONS						



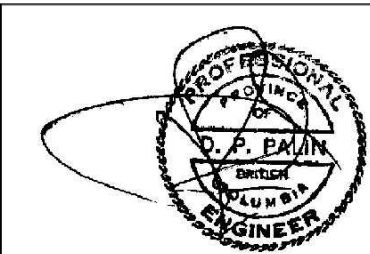
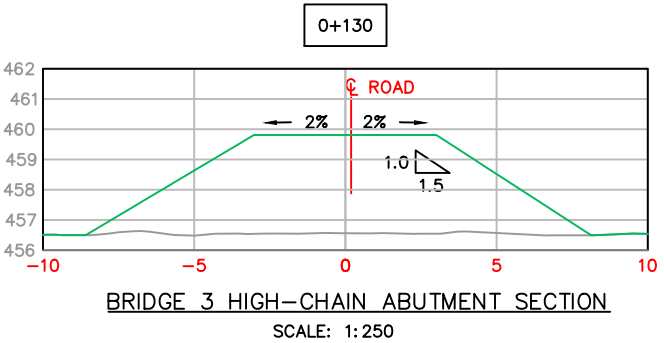
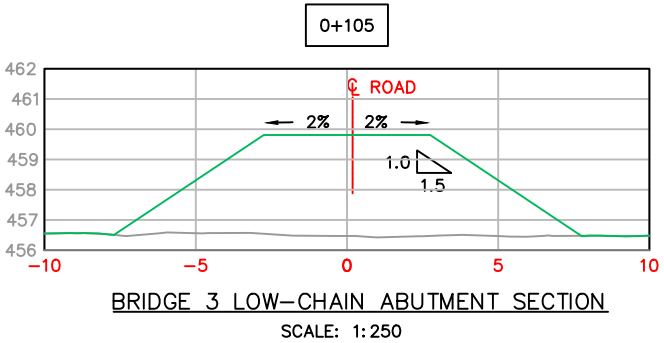
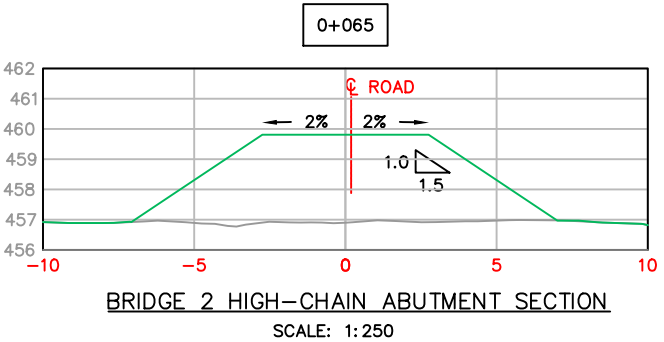
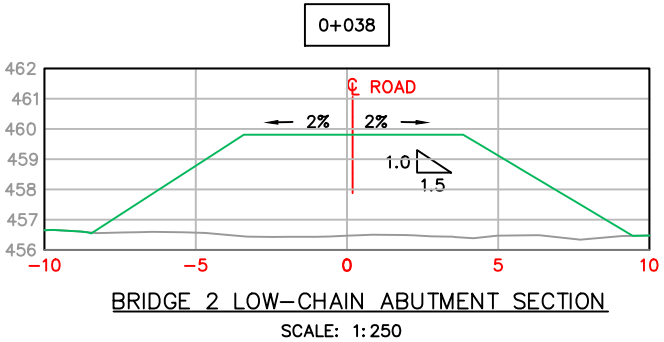
BRIDGE 2 (B2) PROFILE
SCALE: 1:200



BRIDGE 3 (B3) PROFILE
SCALE: 1:200

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

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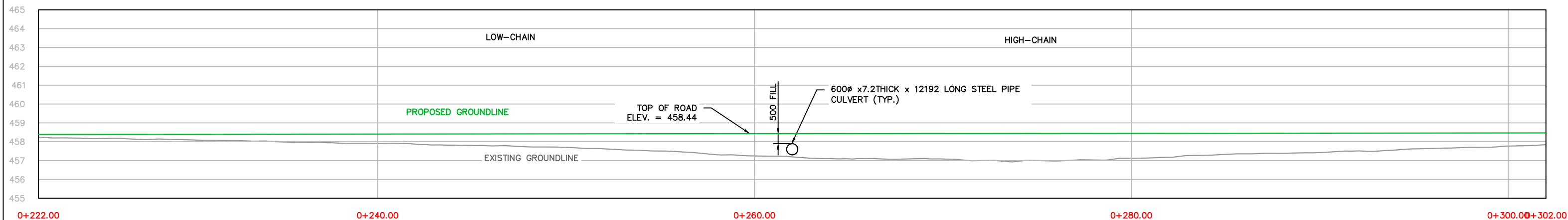
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0	28-MAY-2020	ISSUED FOR REVIEW	28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011	PLAN
REVISIONS							Sheet 14 of 25

Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

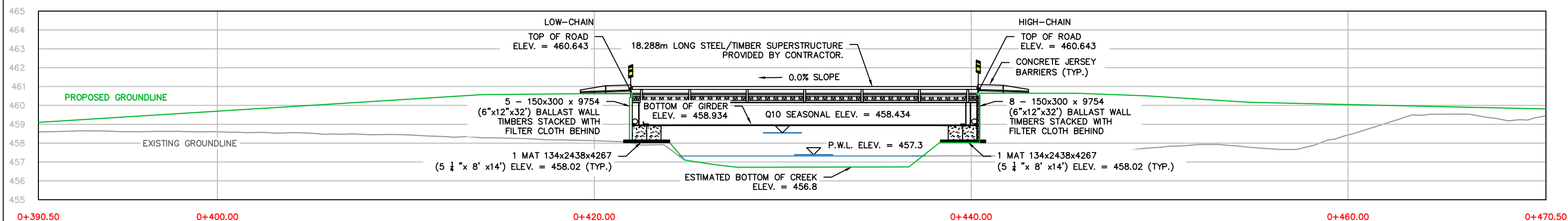
19.7A HALFWAY CROSSINGS

B2 B3 PROPOSED PROFILES/SECTIONS







BC Hydro
Power smart

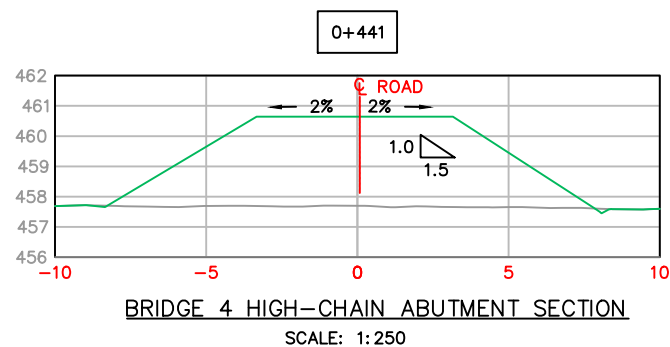
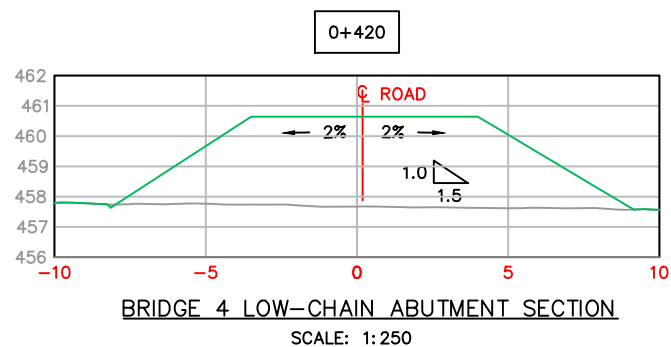
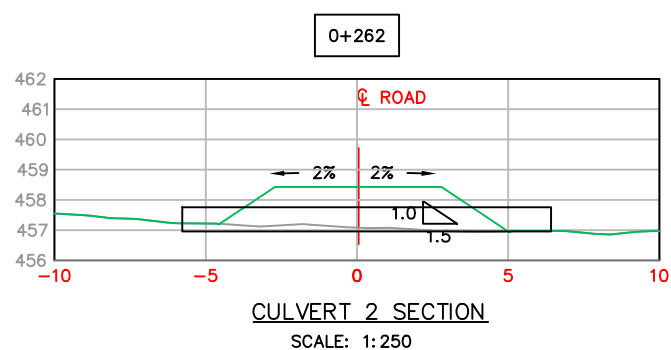


CULVERT 2 (C2) PROFILE
SCALE: 1:200



BRIDGE 4 (B4) PROFILE
SCALE: 1:200

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE



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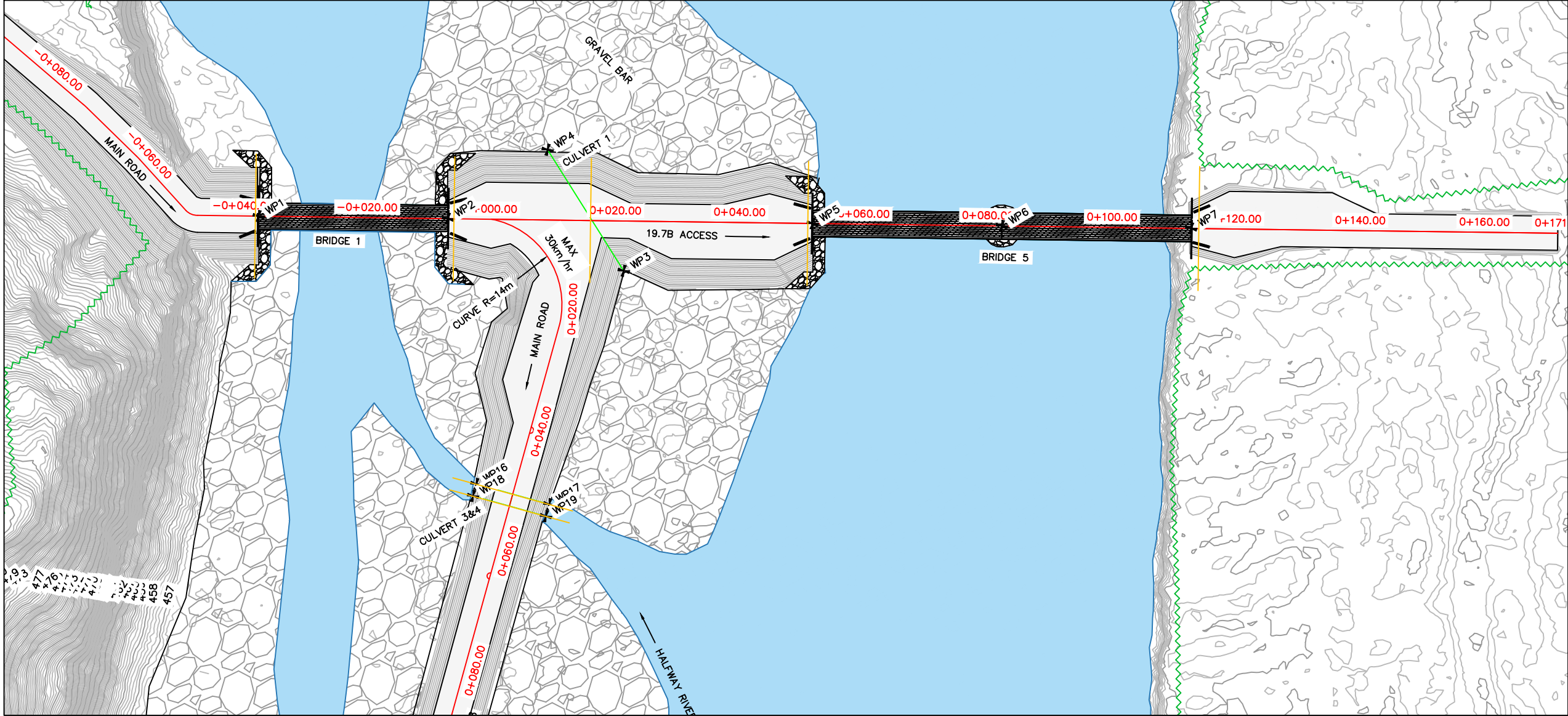
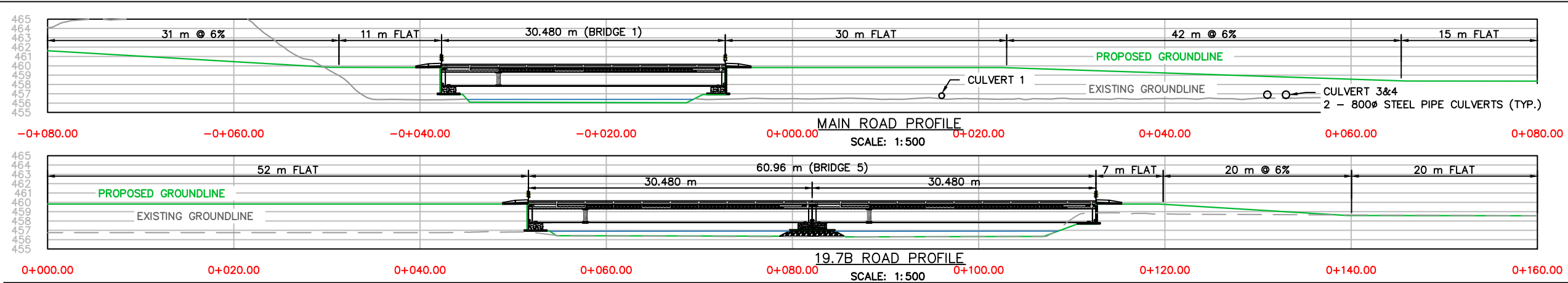


19.7A HALFWAY CROSSINGS

C2 B4 PROPOSED PROFILES/SECTIONS



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0	28-MAY-2020	ISSUED FOR REVIEW	DATE	DATE	DATE	PLAN
		REVISIONS	28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011
						Sheet 15 of 25



- NO FLOW FOR BRIDGE NOTES:**
1. DEPICTED CULVERT PAIRS TO REPLACE BRIDGES IF NO FLOW IS PRESENT IN CHANNEL AT TIME OF CONSTRUCTION AND NO MAJOR PRECIPITATION OR SNOW MELT IS FORESEEABLE UNTIL APRIL.
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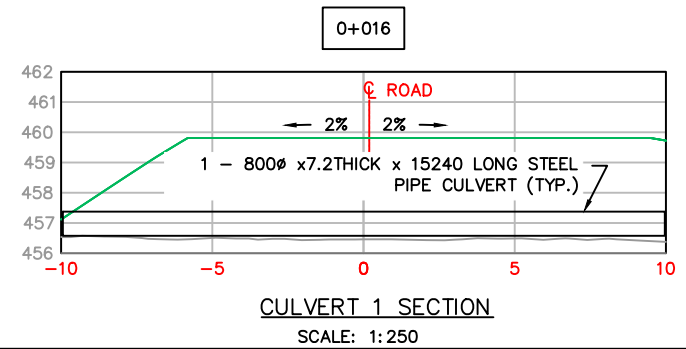
BENCHMARK SURVEY TABLE

MARK	ELEV. (m)	NORTHING	EASTING
✕ WP1	457.9	6233971.119	590010.5409
✕ WP2	457.9	6233955.039	590036.4342
✕ WP3	456.5	6233933.212	590056.3596
✕ WP4	456.5	6233956.244	590055.9391
✕ WP5	457.9	6233924.021	590086.3807
✕ WP6	457.9	6233907.941	590112.2741
✕ WP7	457.9	6233891.861	590138.1674

✕ WP18	456.5	6233914.662	590016.8323
✕ WP19	456.5	6233905.796	590025.2017
✕ WP20	456.5	6233870.796	589970.5953
✕ WP21	456.5	6233861.93	589978.9648
✕ WP22	456.5	6233869.423	589969.141
✕ WP23	456.5	6233860.557	589977.5105
✕ WP24	457.3	6233677.408	589731.0886
✕ WP25	457.3	6233689.362	589728.6921
✕ WP26	457.3	6233676.756	589727.9967
✕ WP27	457.3	6233688.71	589725.6002

NOTE: ELEV. IS AT BOTTOM OF GIRDERS OR CULVERT

PLAN
SCALE: 1:700



Professional Engineer
D. P. PALIN
BC
COLUMBIA

1 02-JUN-2020 ISSUED FOR CONSTRUCTION
0 28-MAY-2020 ISSUED FOR REVIEW

DESIGN M.DARASZ
DATE 28-MAY-2020

DRAWN M.DARASZ
DATE 28-MAY-2020

CHECKED D.PALIN
DATE 28-MAY-2020

FILE TC-HY011/16
PLAN TC-HY011

REVISIONS

Sheet 16 of 25

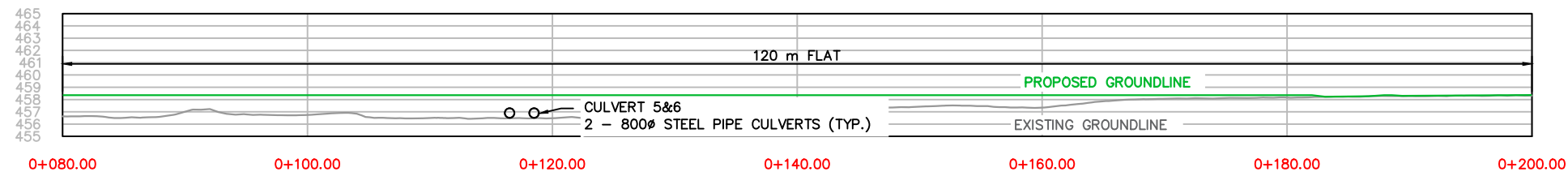


19.7A HALFWAY CROSSINGS

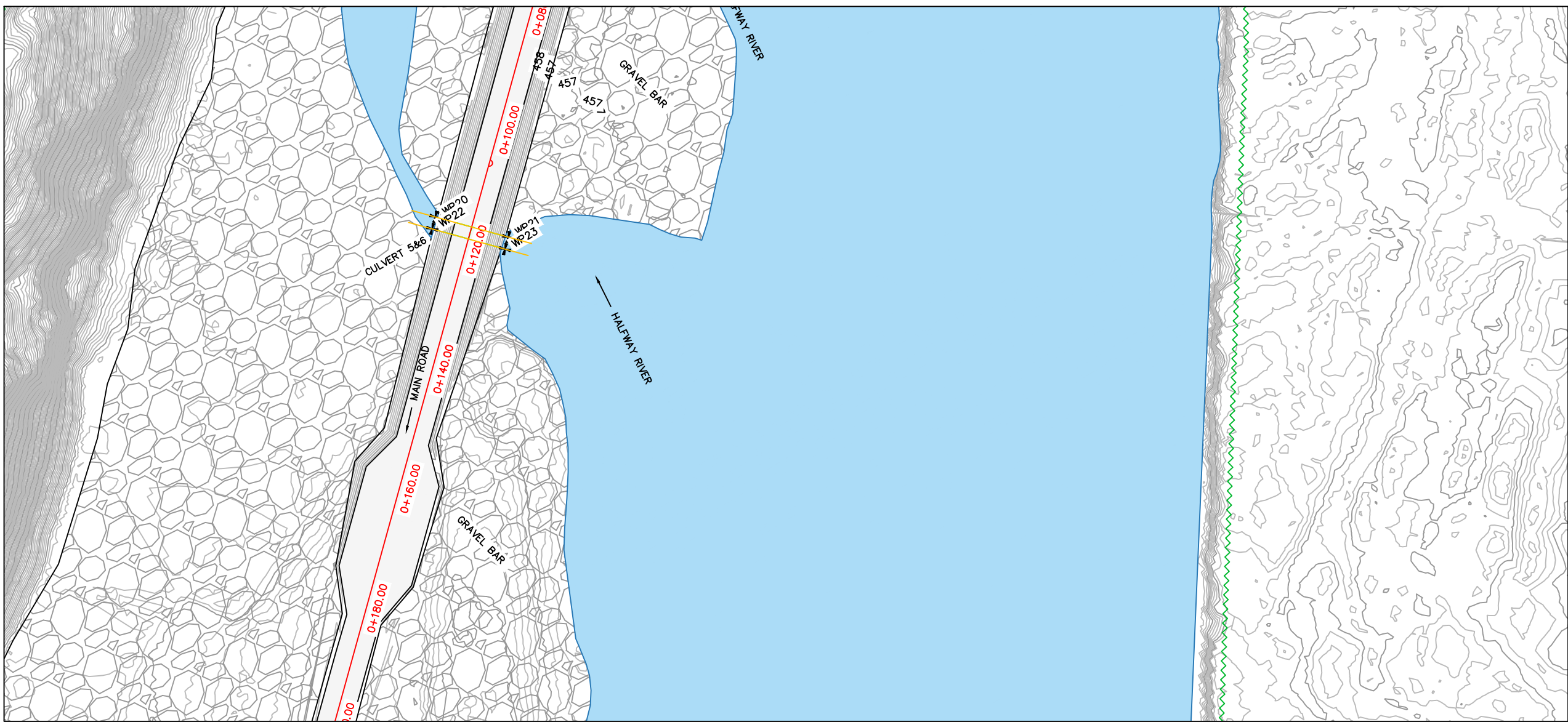
B1 C1 C3/C4 B5 PROPOSED#2 PLAN VIEW



LAST DATE REVISED: 2-JUN-2020 6:13 PM



PROFILE
SCALE: 1:500



LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

NO FLOW FOR BRIDGE NOTES:

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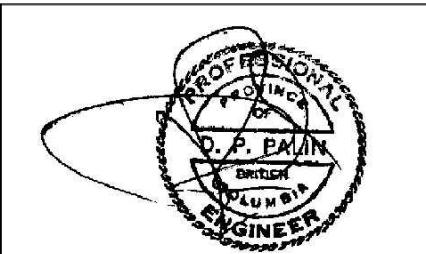
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NOTE: ELEV. IS AT BOTTOM OF GIRDERS OR CULVERT

PLAN
SCALE: 1:700



DESIGN		DRAWN		CHECKED		FILE	
1	02-JUN-2020	ISSUED FOR CONSTRUCTION		M.DARASZ	M.DARASZ	D.PALIN	TC-HY011 /17
0	28-MAY-2020	ISSUED FOR REVIEW		DATE	DATE	DATE	PLAN
		REVISIONS		28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011

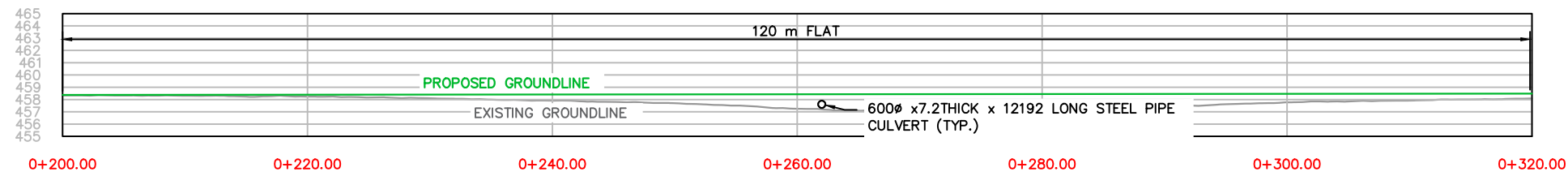
Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

19.7A HALFWAY CROSSINGS

C5 C6 PROPOSED#2 PLAN VIEW

BC Hydro
Power smart

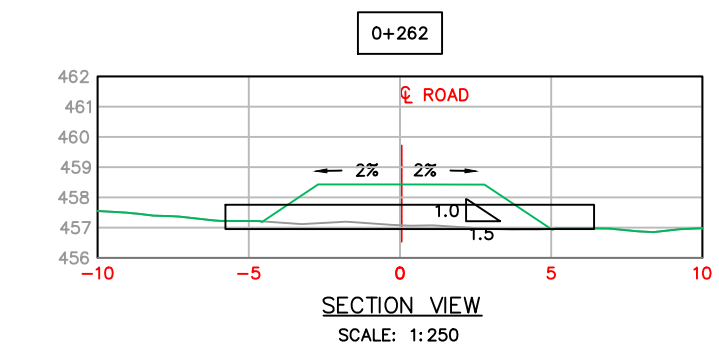
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DATE	28-MAY-2020	DATE	28-MAY-2020	DATE	28-MAY-2020	PLAN	TC-HY011



PROFILE
SCALE: 1:500



PLAN
SCALE: 1:700



SECTION VIEW
SCALE: 1:250

✕ WP6	457.9	6233907.941	590112.2741
✕ WP7	457.9	6233891.861	590138.1674
✕ WP12	457.3	6233759.962	589869.1056
✕ WP13	457.9	6233772.149	589868.7752
✕ WP16	457.9	6233916.035	590018.2863
✕ WP17	456.5	6233907.17	590026.6558
✕ WP18	456.5	6233914.662	590016.8323
✕ WP19	456.5	6233905.796	590025.2017
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✕ WP22	456.5	6233869.423	589969.141

1	02-JUN-2020	ISSUED FOR CONSTRUCTION
0	28-MAY-2020	ISSUED FOR REVIEW
REVISIONS		

LEGEND

CREEK

ROAD

ROAD ALIGNMENT

RIPARIAN ROCK

TREE LINE

SECTION LINE

NO FLOW FOR BRIDGE NOTES:

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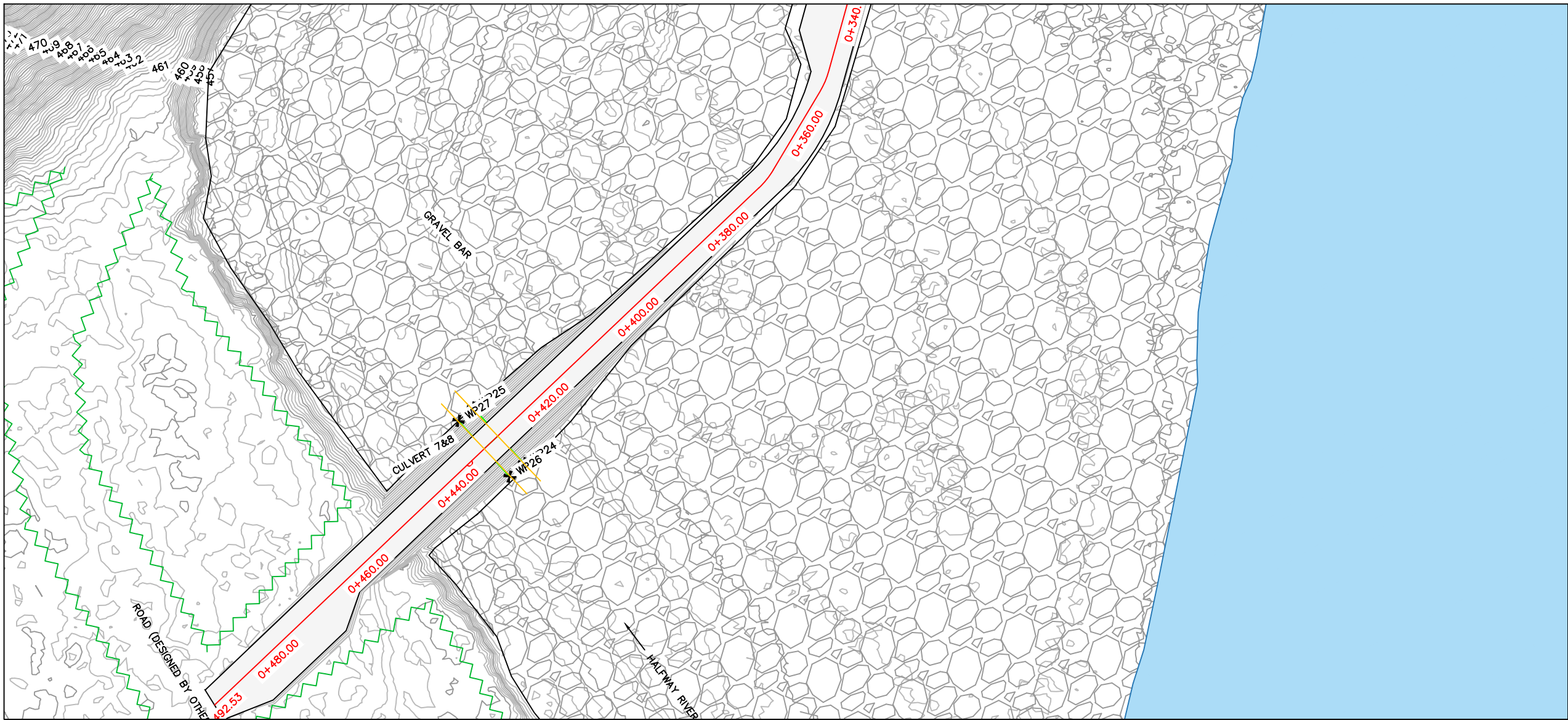
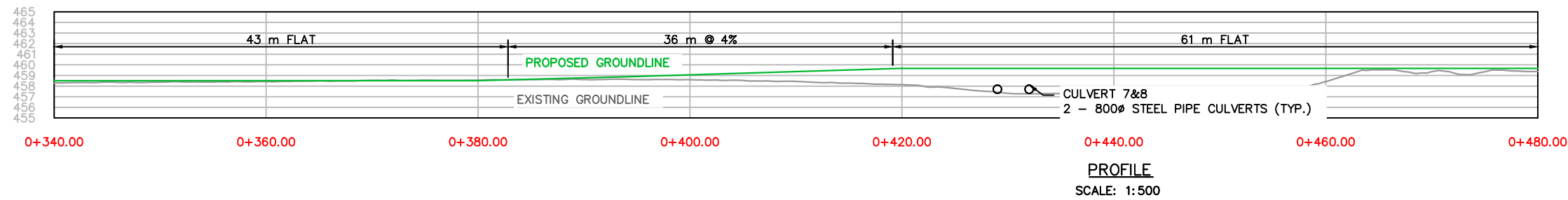
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Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

19.7A HALFWAY CROSSINGS
C2 PROPOSED#2 PLAN & PROFILE

BC Hydro
Power smart

DESIGN	M.DARASZ	DRAWN	M.DARASZ	CHECKED	D.PALIN	FILE	TC-HY011 /18
DATE	28-MAY-2020	DATE	28-MAY-2020	DATE	28-MAY-2020	PLAN	TC-HY011
REVISIONS							Sheet 18 of 25



LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

NO FLOW FOR BRIDGE NOTES:

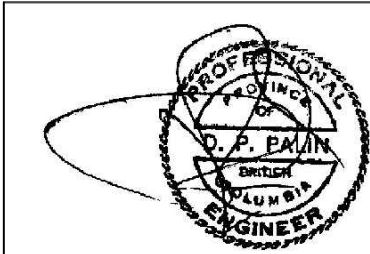
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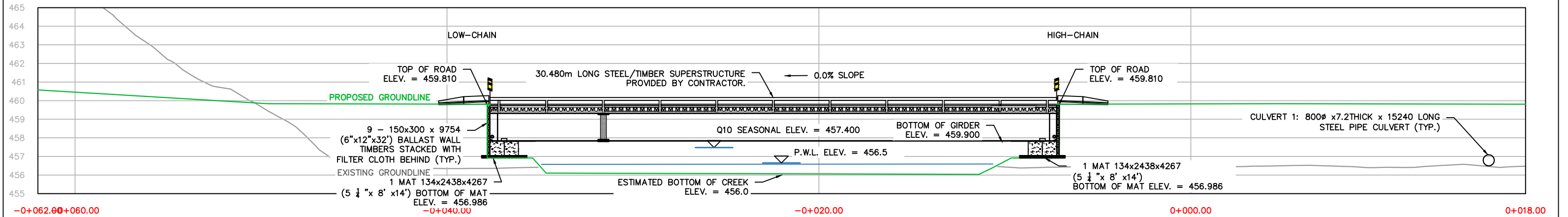
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1	02-JUN-2020	ISSUED FOR CONSTRUCTION	M.DARASZ	M.DARASZ	D.PALIN	TC-HY011 /19	
0	28-MAY-2020	ISSUED FOR REVIEW	DATE	DATE	DATE	PLAN	TC-HY011
REVISIONS							Sheet 19 of 25

Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

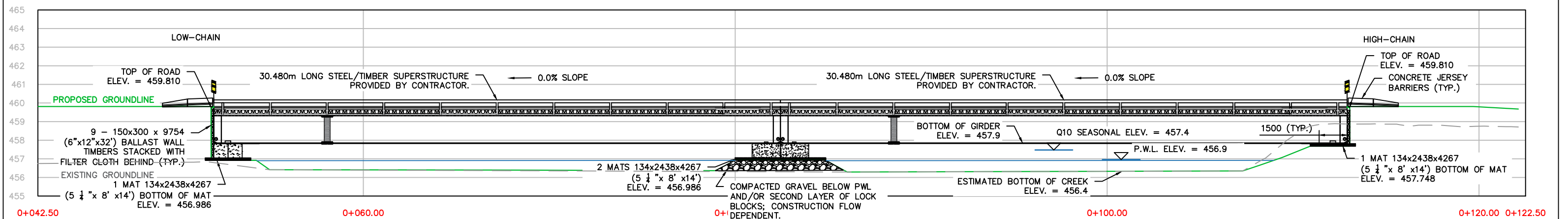
19.7A HALFWAY CROSSINGS

C7 C8 PROPOSED#2 PLAN VIEW

BC Hydro
Power smart

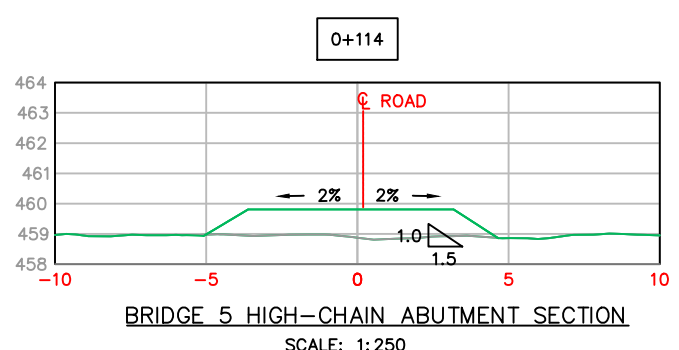
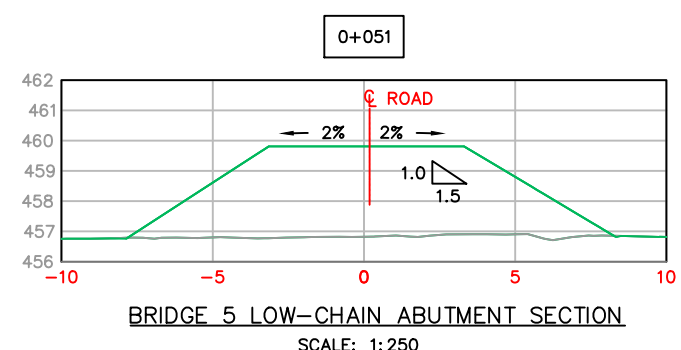
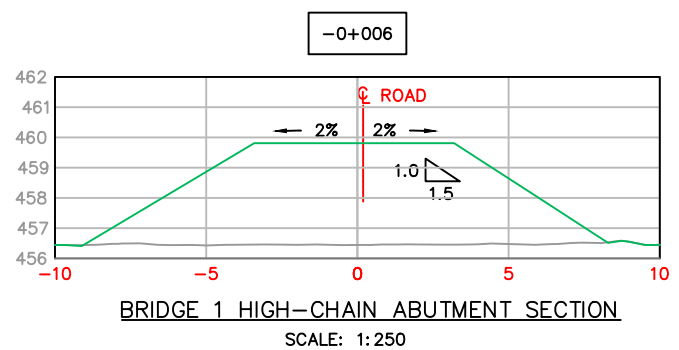
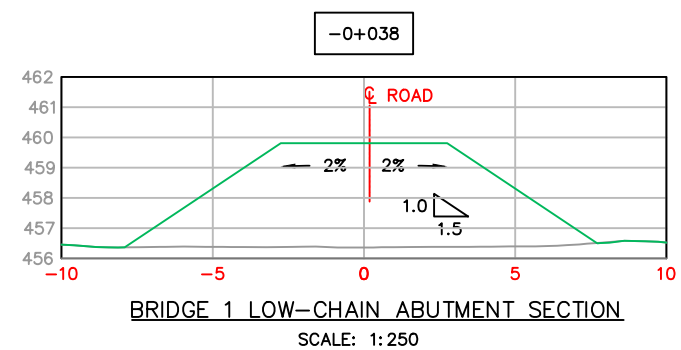


BRIDGE 1 (B1) PROFILE
SCALE: 1:200

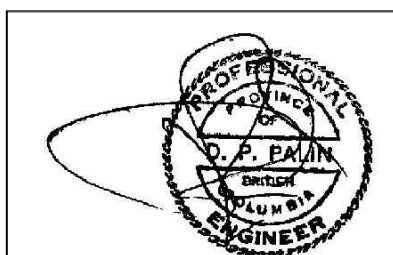


BRIDGE 5 (B5) PROFILE
SCALE: 1:200

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE



- GENERAL NOTES:
1. TOPOGRAPHIC SURVEY DEVELOPED BASED OFF 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. HALFWAY RIVER DEPTH ESTIMATED AT 0.5m AT CROSSING LOCATIONS. TRUE RIVER DEPTH UNKNOWN AND HAS BEEN ASSUMED FOR BRIDGE CONFIGURATION PURPOSES.
 5. HYDROLOGICAL INFORMATION ACQUIRED BASED ON NEARBY CROSSINGS AND HYDROTECHNICAL REPORTS PREPARED BY OTHERS. VOLUME OF 88m³/s HAS BEEN DETERMINED FOR THIS CHANNEL.
 6. FLOW VELOCITY AT BRIDGES DETERMINED TO BE 1.6m/s FOR Q10 SEASONAL FLOW.
 7. BRIDGE CONFIGURATION HAS BEEN CHOSEN TO SPAN DEEPEST PARTS OF CHANNELS TO CAUSE THE LEAST FLOW OBSTRUCTION POSSIBLE.
 8. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.



Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

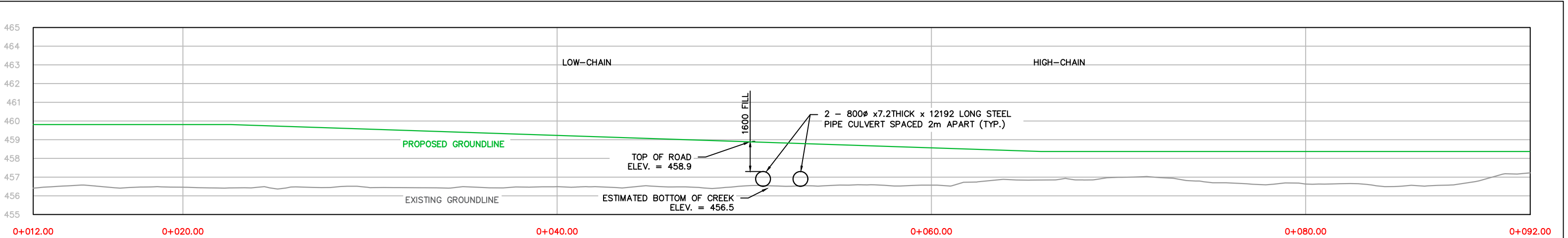
19.7A HALFWAY CROSSINGS
B1 B5 PROPOSED#2 PROFILES/SECTIONS

BC Hydro
Power smart

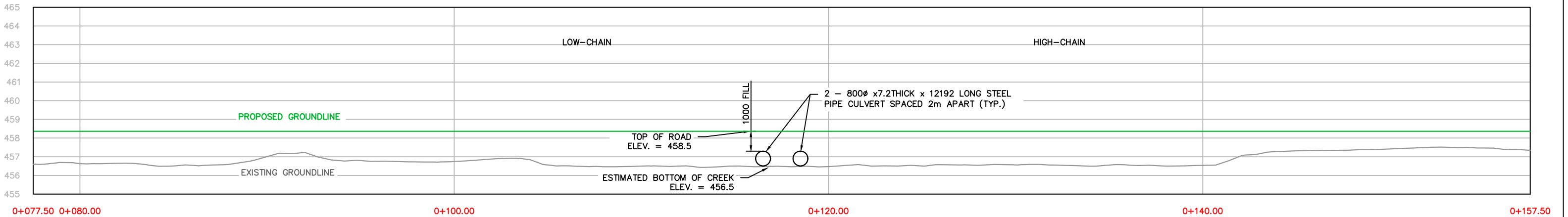
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0	28-MAY-2020	ISSUED FOR REVIEW				TC-HY011
REVISIONS						

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LAST DATE REVISED: 2-Jun-2020 6:13 PM

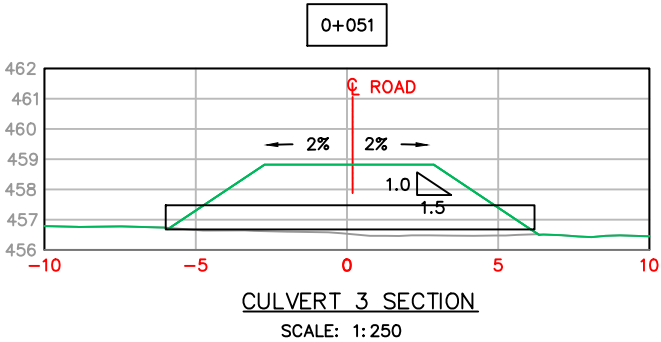


CULVERT 3/4 (C3/C4) PROFILE
SCALE: 1:200

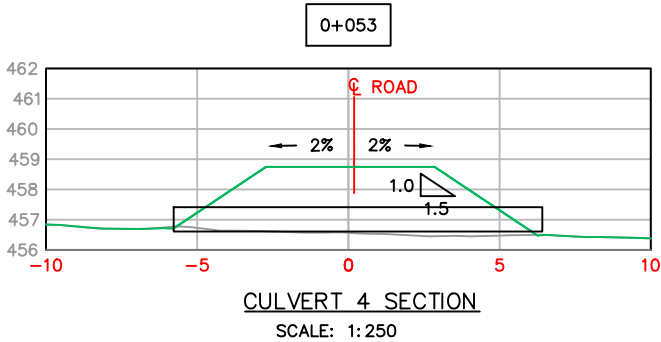


CULVERT 5/6 (C5/C6) PROFILE
SCALE: 1:200

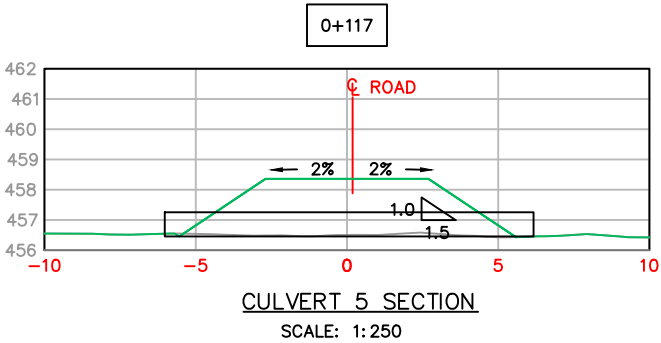
LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE



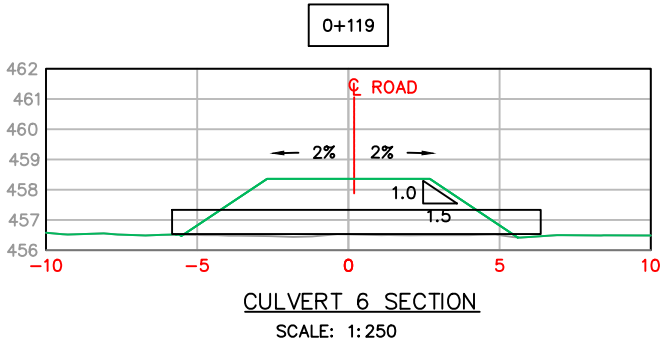
CULVERT 3 SECTION
SCALE: 1:250



CULVERT 4 SECTION
SCALE: 1:250

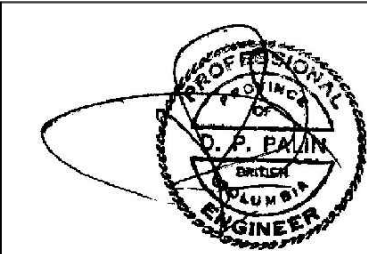


CULVERT 5 SECTION
SCALE: 1:250



CULVERT 6 SECTION
SCALE: 1:250

- GENERAL NOTES:
1. TOPOGRAPHIC SURVEY DEVELOPED BASED OFF LIDAR DATA PROVIDED BY MAPLE LEAF FORESTRY.
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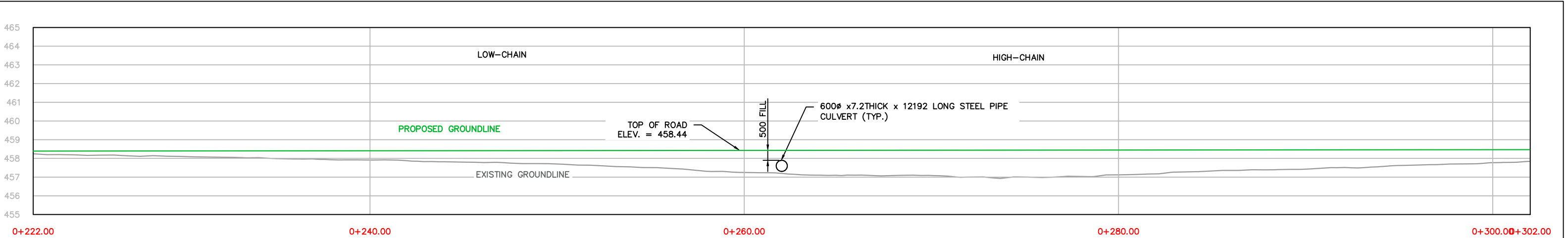
Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

19.7A HALFWAY CROSSINGS

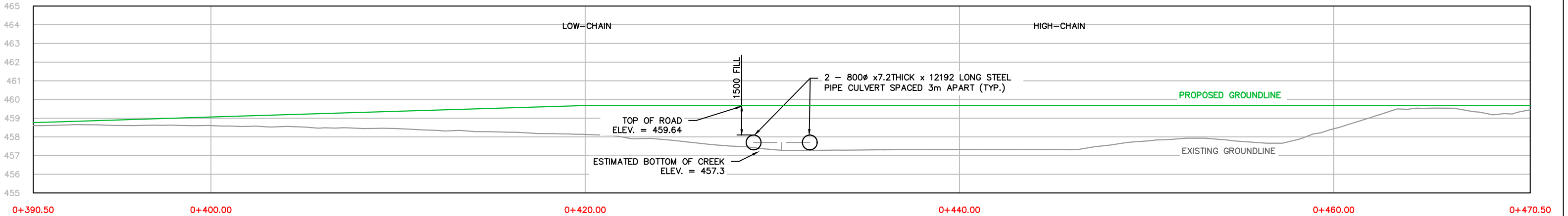
C3/C4 C5/C6 PROPOSED PROFILES/SECTIONS

BC Hydro
Power smart

		DESIGN	DRAWN	CHECKED	FILE
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0	28-MAY-2020	ISSUED FOR REVIEW	28-MAY-2020	28-MAY-2020	28-MAY-2020
		REVISIONS			
		Sheet 21 of 25			

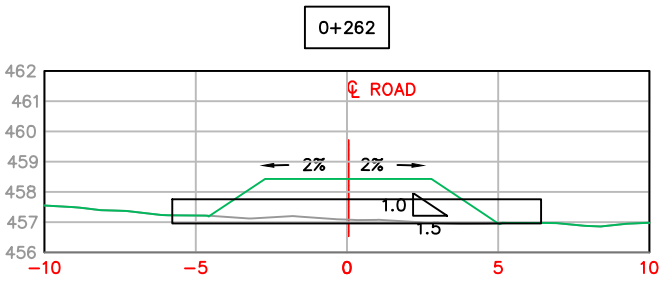


CULVERT 2 (C2) PROFILE
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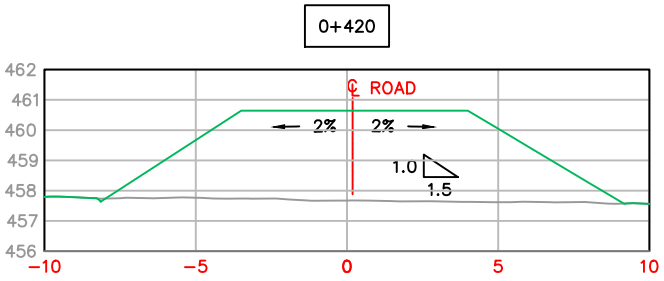


CULVERT 7/8 (C7/C8) PROFILE
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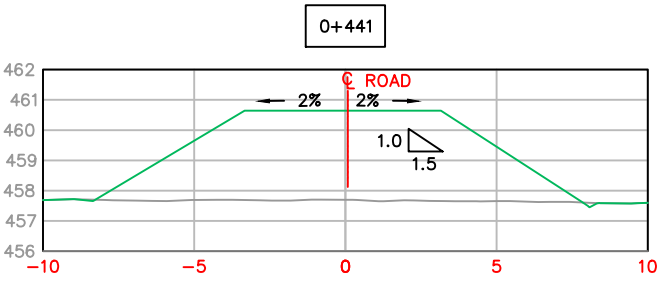
LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE



CULVERT 2 SECTION
SCALE: 1:250

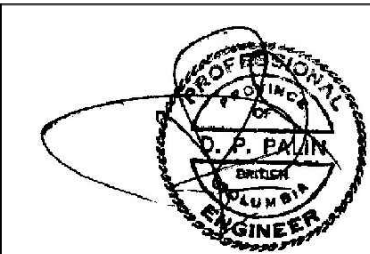


CULVERT 7 SECTION
SCALE: 1:250



CULVERT 8 SECTION
SCALE: 1:250

- GENERAL NOTES:
1. TOPOGRAPHIC SURVEY DEVELOPED BASED OFF 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. HALFWAY RIVER DEPTH ESTIMATED AT 0.5m AT CROSSING LOCATIONS. TRUE RIVER DEPTH UNKNOWN AND HAS BEEN ASSUMED FOR BRIDGE CONFIGURATION PURPOSES.
 5. HYDROLOGICAL INFORMATION ACQUIRED BASED ON NEARBY CROSSINGS AND HYDROTECHNICAL REPORTS PREPARED BY OTHERS. VOLUME OF 88m³/s HAS BEEN DETERMINED FOR THIS CHANNEL.
 6. FLOW VELOCITY AT BRIDGES DETERMINED TO BE 1.6m/s FOR Q10 SEASONAL FLOW.
 7. BRIDGE CONFIGURATION HAS BEEN CHOSEN TO SPAN DEEPEST PARTS OF CHANNELS TO CAUSE THE LEAST FLOW OBSTRUCTION POSSIBLE.
 8. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.



DESIGN		DRAWN		CHECKED		FILE	
1	02-JUN-2020	ISSUED FOR CONSTRUCTION	M.DARASZ	M.DARASZ	D.PALIN	TC-HY011 /22	
0	28-MAY-2020	ISSUED FOR REVIEW	28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011	
REVISIONS							Sheet 22 of 25

Trilogy Crossing Corp.
ENGINEERING, ENVIRONMENTAL, INSPECTION

19.7A HALFWAY CROSSINGS







C2 C7 C8 PROPOSED#2 PROFILES/SECTIONS

BC Hydro
Power smart



Minimum Elevation	Maximum Elevation	Color
-6.500	-6.000	Red
-6.000	-5.500	Red
-5.500	-5.000	Red
-5.000	-4.500	Red
-4.500	-4.000	Red
-4.000	-3.500	Red
-3.500	-3.000	Red
-3.000	-2.500	Red
-2.500	-2.000	Red
-2.000	-1.500	Red
-1.500	-1.000	Red
-1.000	-0.500	Red
-0.500	0.000	Red
0.000	0.500	Green
0.500	1.000	Green
1.000	1.500	Green
1.500	2.000	Green
2.000	2.500	Green
2.500	3.000	Green
3.000	3.500	Green
3.500	4.000	Green

LEGEND

	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE

GENERAL NOTES:

1. BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED AT A MINIMUM CL-625 LOADING.
2. INITIAL BRIDGE LENGTHS DETERMINED USING LiDAR IMAGERY IN COMBINATION WITH IMAGERY; BRIDGE LENGTH AND FINAL LOCATION TO BE VERIFIED BY MEASUREMENT PRIOR TO INSTALLATION.
3. BRIDGE DESIGNED FOR A MINIMUM Q10 SEASONAL FLOW +0.5m OF WATER CLEARANCE.
4. BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED AT A MINIMUM CL-625 LOADING.
5. BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED BY A PROFESSIONAL ENGINEER AND AN AS-BUILT PLAN PRODUCED AFTER CONSTRUCTION.
6. PERMITS: OBTAINING, SUBMITTING, AND RECEIVING APPROVAL SHALL BE THE RESPONSIBILITY OF THE OWNER PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
7. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.
8. THIS IS AN ENVIRONMENTALLY SENSITIVE LOCATION DUE TO STREAM PROXIMITY; ALL FILTER CLOTH, LOCK BLOCKS, ROAD ACCESS MATS, FENDER SYSTEMS AND DECKING TO BE FREE OF SOIL AND FOREIGN MATERIAL PRIOR TO TRANSPORT TO SITE. SPILL KITS AND TRAYS HIGHLY RECOMMENDED.

VOLUME NOTES:

- RIPRAP SHALL BE HARD, DURABLE, ANGULAR ROCK AND IN ACCORDANCE TO THE MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS "ENGINEERING MANUAL", APRIL 7, 2016.

CLASS 250 kg AVERAGE SIZE ROCK RIPRAP, 500 THICK
WITH THE FOLLOWING ROCK GRADATION:

		MASS	DIAMETER
85%	LARGER THAN	25 kg	300
50%	LARGER THAN	250 kg	600
15%	LARGER THAN	750 kg	900

MINIMUM RIPRAP VOLUME: 218 m³

- LINE EXCAVATION WITH NON-WOVEN GEO-TEXTILE, MINIMUM MULLEN BURST STRENGTH OF 2619 KPA (Armtec 250/ProPex 4553 OR APPROVED EQUIVALENT).

TOTAL GEOTEXTILE: 7205 m²

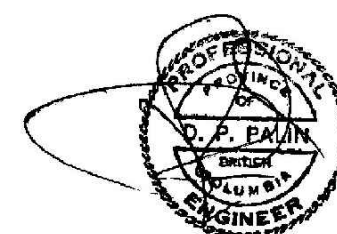
— ESTIMATED CUT AND FILL VOLUMES:

COMPACTED BACKFILL:	8664 m ³
EXCAVATION:	1871 m ³
NET FILL:	6793 m ³

– ESTIMATED GRANULAR BASE FILL: 130 m³

- 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.

*** IF CONDITIONS ADEQUATE AT TIME OF INSTALLATION,
SUBSTITUTE FILL FOR A SNOW/ICE SLURRY WITH A MINIMUM
OF 1m OF ICE/SNOW BELOW ALL BRIDGE MATS IF BUILT UP.
(LOCK BLOCKS & RIP-RAP NOT REQUIRED)



19.7A HALFWAY CROSSINGS

PROPOSED CUT AND FILL PLAN ± DETAILS



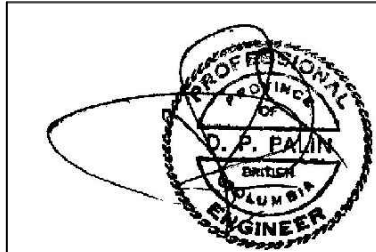
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0	28-MAY-2020	ISSUED FOR REVIEW	DATE	DATE	DATE	PLAN
		REVISIONS	28-MAY-2020	28-MAY-2020	28-MAY-2020	TC-HY011



CUT AND FILL PLAN
SCALE: N.T.S.

Elevations Table		
Minimum Elevation	Maximum Elevation	Color
-6.500	-6.000	Red
-6.000	-5.500	Red
-5.500	-5.000	Red
-5.000	-4.500	Red
-4.500	-4.000	Red
-4.000	-3.500	Red
-3.500	-3.000	Red
-3.000	-2.500	Red
-2.500	-2.000	Red
-2.000	-1.500	Red
-1.500	-1.000	Red
-1.000	-0.500	Red
-0.500	0.000	Red
0.000	0.500	Green
0.500	1.000	Green
1.000	1.500	Green
1.500	2.000	Green
2.000	2.500	Green
2.500	3.000	Green
3.000	3.500	Green
3.500	4.000	Green

LEGEND	
	CREEK
	ROAD
	ROAD ALIGNMENT
	RIPARIAN ROCK
	TREE LINE
	SECTION LINE



DESIGN	DRAWN	CHECKED	FILE
1 02-JUN-2020	ISSUED FOR CONSTRUCTION	M.DARASZ	M.DARASZ
0 28-MAY-2020	ISSUED FOR REVIEW	D.PALIN	TC-HY011 /24
REVISIONS			

- NO FLOW FOR BRIDGE NOTES:
1. DEPICTED CULVERT PAIRS TO REPLACE BRIDGES IF NO FLOW IS PRESENT IN CHANNEL AT TIME OF CONSTRUCTION AND NO MAJOR PRECIPITATION OR SNOW MELT IS FORESEEABLE UNTIL APRIL.

- GENERAL NOTES:
1. BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED AT A MINIMUM CL-625 LOADING.
 2. INITIAL BRIDGE LENGTHS DETERMINED USING LIDAR IMAGERY IN COMBINATION WITH IMAGERY; BRIDGE LENGTH AND FINAL LOCATION TO BE VERIFIED BY MEASUREMENT PRIOR TO INSTALLATION.
 3. BRIDGE DESIGNED FOR A MINIMUM Q10 SEASONAL FLOW +0.5m OF WATER CLEARANCE.
 4. BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED AT A MINIMUM CL-625 LOADING.
 5. BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO BE CERTIFIED BY A PROFESSIONAL ENGINEER AND AN AS-BUILT PLAN PRODUCED AFTER CONSTRUCTION.
 6. PERMITS: OBTAINING, SUBMITTING, AND RECEIVING APPROVAL SHALL BE THE RESPONSIBILITY OF THE OWNER PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
 7. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS.
 8. THIS IS AN ENVIRONMENTALLY SENSITIVE LOCATION DUE TO STREAM PROXIMITY; ALL FILTER CLOTH, LOCK BLOCKS, ROAD ACCESS MATS, FENDER SYSTEMS AND DECKING TO BE FREE OF SOIL AND FOREIGN MATERIAL PRIOR TO TRANSPORT TO SITE. SPILL KITS AND TRAYS HIGHLY RECOMMENDED.

- VOLUME NOTES:
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CLASS 250 kg AVERAGE SIZE ROCK RIPRAP, 500 THICK WITH THE FOLLOWING ROCK GRADATION:

	MASS	DIAMETER
85%	LARGER THAN 25 kg	300
50%	LARGER THAN 250 kg	600
15%	LARGER THAN 750 kg	900

MINIMUM RIPRAP VOLUME: 101 m³

- LINE EXCAVATION WITH NON-WOVEN GEO-TEXTILE, MINIMUM MULLEN BURST STRENGTH OF 2619 KPA (Armtec 250/ProPex 4553 OR APPROVED EQUIVALENT).

TOTAL GEOTEXTILE: 8802 m²

- ESTIMATED CUT AND FILL VOLUMES:

COMPACTED BACKFILL:	7756 m ³
EXCAVATION:	1895 m ³
NET FILL:	5861 m ³

- ESTIMATED GRANULAR BASE FILL: 90 m³

- 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.

*** IF CONDITIONS ADEQUATE AT TIME OF INSTALLATION, SUBSTITUTE FILL FOR A SNOW/ICE SLURRY WITH A MINIMUM OF 1m OF ICE/SNOW BELOW ALL BRIDGE MATS IF BUILT UP. (LOCK BLOCKS & RIP-RAP NOT REQUIRED)

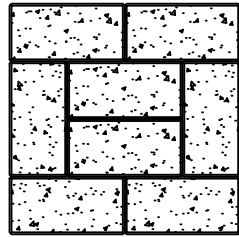


19.7A HALFWAY CROSSINGS

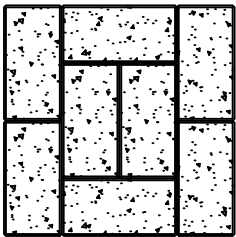
PROPOSED#2 CUT AND FILL PLAN + DETAILS



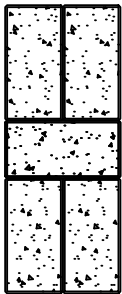
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0 28-MAY-2020	ISSUED FOR REVIEW	D.PALIN	TC-HY011 /24
REVISIONS			



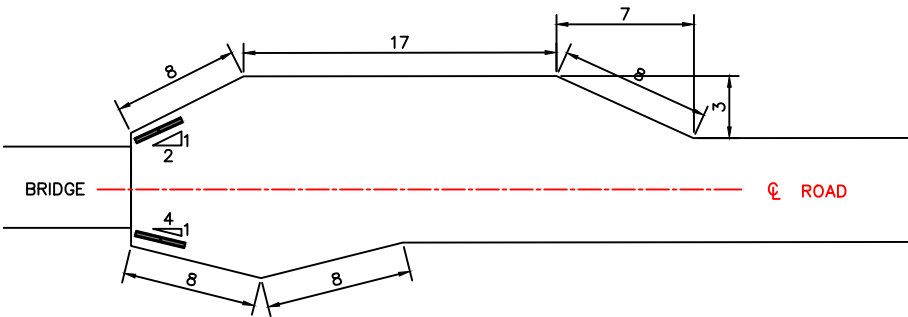
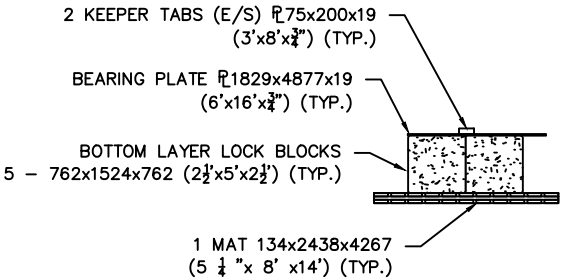
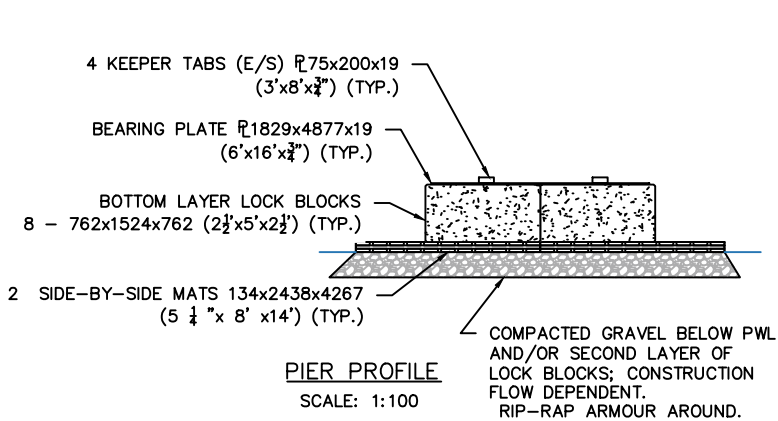
PIER BOTTOM LAYER PLAN
SCALE: 1:100



PIER TOP LAYER PLAN
SCALE: 1:100 ** IF REQUIRED



ABUTMENT BOTTOM LAYER PLAN
SCALE: 1:100



- GENERAL NOTES:
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 3. BRIDGE DESIGNED FOR A MINIMUM Q10 SEASONAL FLOW +0.5m OF WATER CLEARANCE.
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19.7A HALFWAY CROSSINGS
LOCKBLOCK/PULLOUT DETAILS

BC Hydro
Power smart

DESIGN	DRAWN	CHECKED	FILE
M.DARASZ	M.DARASZ	D.PALIN	TC-HY011 /25
1 02-JUN-2020	ISSUED FOR CONSTRUCTION	DATE	DATE
0 28-MAY-2020	ISSUED FOR REVIEW	28-MAY-2020	28-MAY-2020
REVISIONS		DATE	DATE
		28-MAY-2020	28-MAY-2020

TC-HY011
Sheet 25 of 25