

SITE C CLEAN ENERGY PROJECT

Component Application Package – Halfway River Temporary Bridges

For Canadian Navigable Waters Act

May 15, 2020

Submitted to:

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

Submitted by:

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

Site C Clean Energy Project – Halfway River Temporary Bridges

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Attachment A Location Map Figure & River Closure Figure

Attachment B Halfway River Temporary Crossing Drawings, Plan and Profile Views

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 Taylor, BC and is not named in the CNWA schedule of navigable waters. This Notice of Work application for temporary bridges is being submitted as a Notice of Work. This application package provides supporting information on six (6) proposed crossings of the lower Halfway River.

2 HALFWAY RIVER TEMPORARY ACCESS BRIDGES – 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, there would be six (6) mainstem bridge crossings needed, each being accessed using constructed causeway approaches. A map showing the crossing locations is in Attachment A. The crossings span portions of the Peace River that are Crown Land and are within the Occupance Licence to Cut (OLTC) area held by BC Hydro. The dimensions and location of each crossing are provided in Table 1.

Table 1: Location, dimensions and land description for each

Halfway River Mainstem Crossing ID	Arrangement Option	Causeway Length (m)	Bridge Length (m)	Latitude	Longitude	Land Description of River Crossing
19.3A	1	1900	36.576	56.229012	-121.492481	Crown Foreshore, bed of the Halfway River and the Halfway River located within Sections 3, 25, 34, 35 and 36 Township 83 Range 23 West of The 6th Meridian Peace River District.
19.2A	1	127	36.576	56.241457	-121.502302	
19.2C	1	82	36.576	56.243111	-121.517875	
19.2D	1	85	36.576	56.239963	-121.527388	
19.2E	1	125	36.576	56.249022	-121.539168	
19.7A	1	105	36.576	56.241634	-121.546394	

2.1 CROSSING DESIGN

The general arrangement, dimensions and specifications for each bridge 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 (Sept - April), 1 in 10 year return period (124 m³/s).

The causeways and bridge approaches would be constructed from local river bed materials and supplemented with imported riprap rock. Riprap specifications have been developed using the estimated flows level and associated scour potential. The riprap specification for each crossing is provided in the drawings in Attachment B.

2.2 CONSTRUCTION SEQUENCE AND SCHEDULE

The contractor is expected to begin constructing the crossings beginning at the downstream end (Site ID 19.3A) beginning in early September, and then move upstream after each crossing is build. The September/October construction period will be needed to complete all six crossings in advance of the winter clearing period.

Decommission of the crossings will involve bridge deck removal such that the navigation access will be reinstated by May 1st 2021.

3 PUBLIC BOATER ACCESS

Construction of temporary bridges and causeways in the Halfway River channel is expected to block boater access to lower portions of the Halfway River between September 1st 2020 and April 30th, 2021. These blockages would span the river sections between 4.7 river-kilometers upstream of the existing highway bridge (Crossing ID 19.3-A as per Attachment A), and 7 km upstream of the highway bridge (Crossing ID 19.7-A, Attachment A). A map showing the river blockage extent has been included in Attachment A. The bridges would be removed in April and boating access would be reinstated on or before May 1st, 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 Boater Communication Protocol in the Site C [Construction Safety Management Plan](#).

4 CONSULTATION WITH INDIGENOUS GROUPS

The alignment of river crossings for reservoir clearing in the Halfway River area (OLTC#19) was presented as part of the forestry management plan and short term water use package at the Site C Permitting Forum #12, held May 2nd 2019 in Fort St. John. At the time of the permitting forum, the crossings were presented as snow/ice structures for winter construction and operation, hence this application represents a change to the schedule as well as crossing materials and general arrangement.

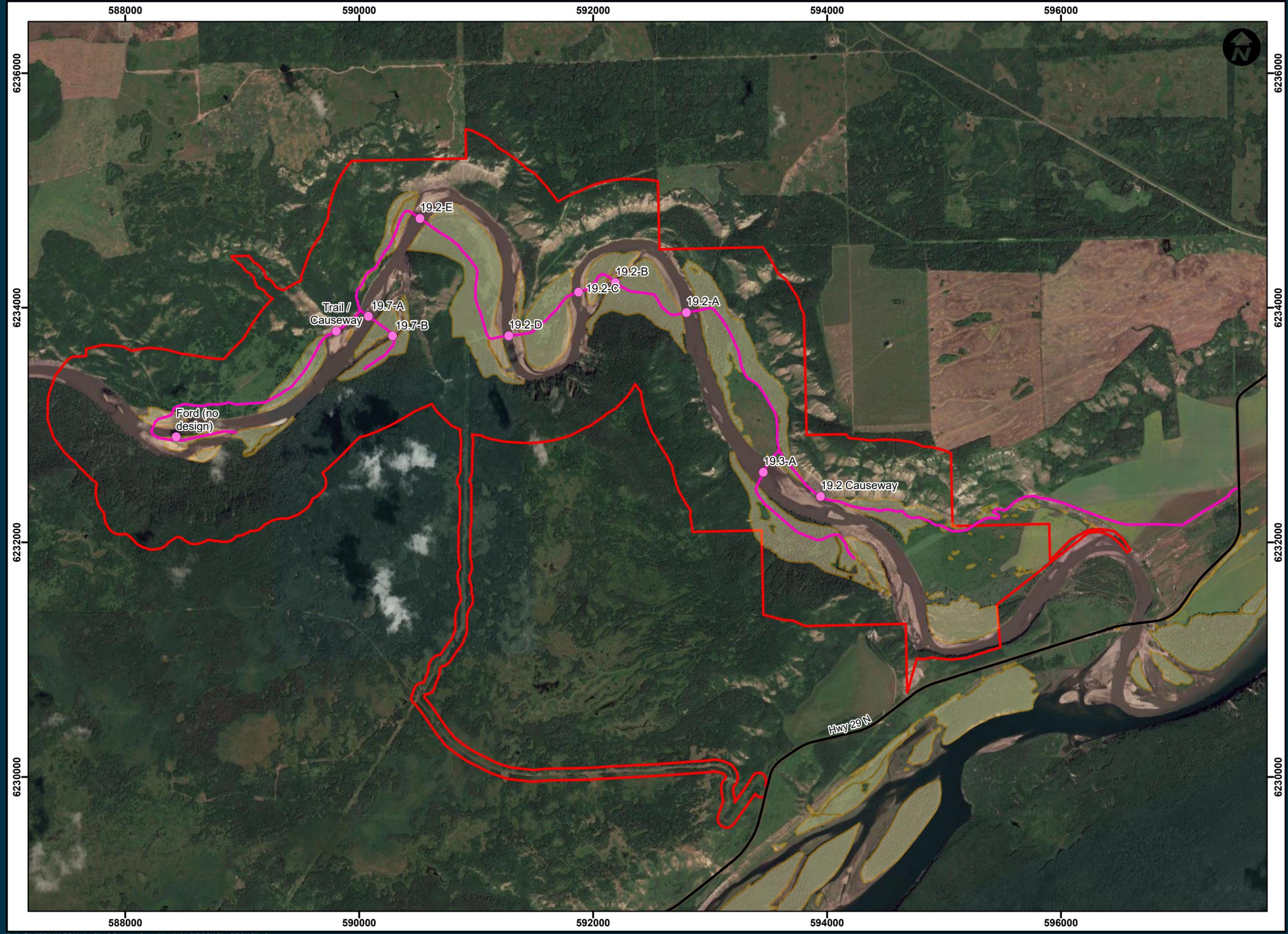
Site C Clean Energy Project – Halfway River Temporary Bridges

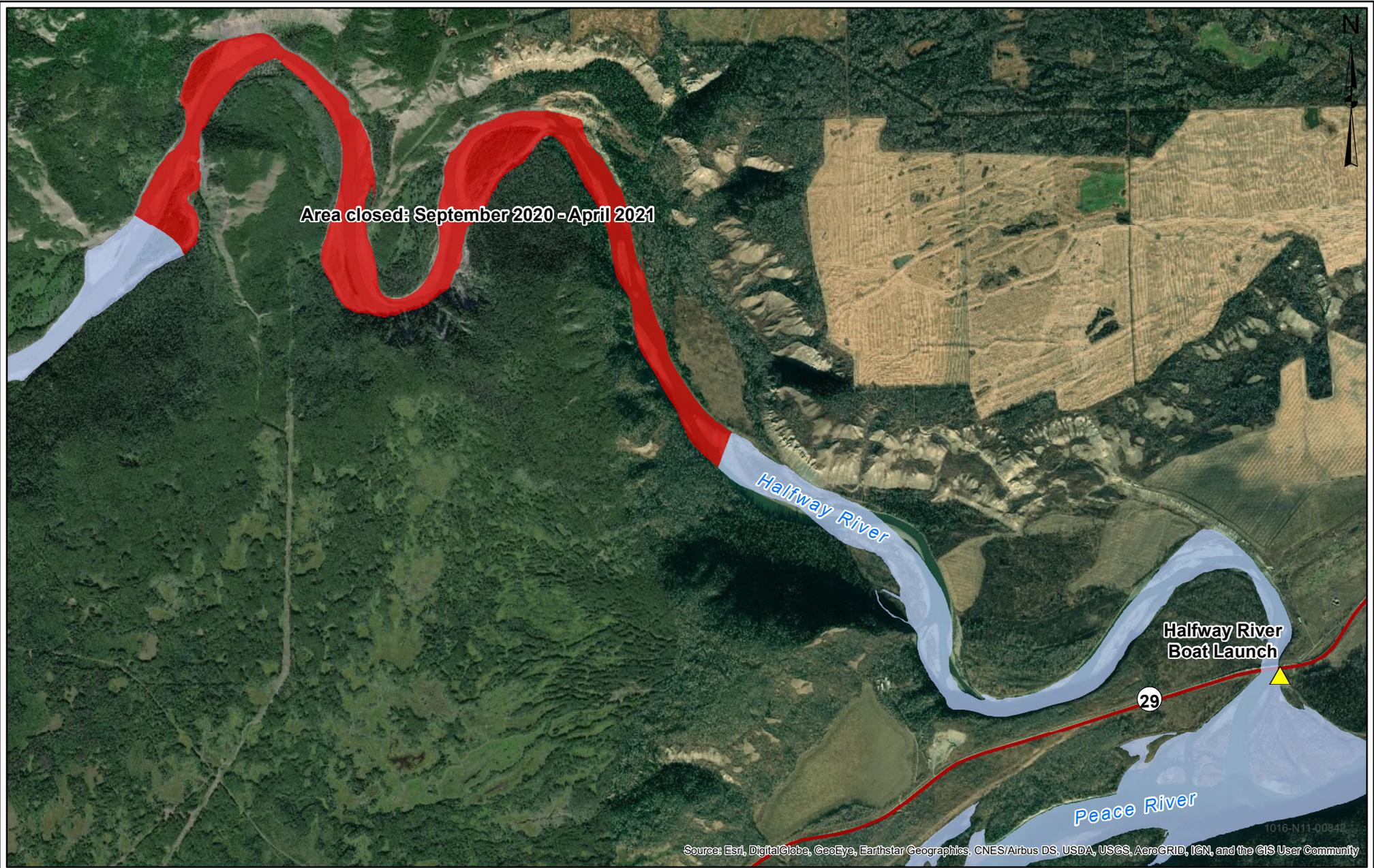
Attachment A

Overview of Highway 29 crossing over the Halfway River.

-  Crossing Points
-  Roads
-  Highway
-  Block Boundary
-  OLTC 19 Boundary

Date: 2020-02-26
Projection: NAD 1983 UTM Zone 10N
Scale: 1:30,000
Author: tkwitkoski
Last Modified By: tkwitkoski
Checked By: AK
Revision #:





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

1016-N11-00842

X:\A\GIS\Projects\Public_A\Main\Halfway River\Closure_1016_N11_00842.mxd



- 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

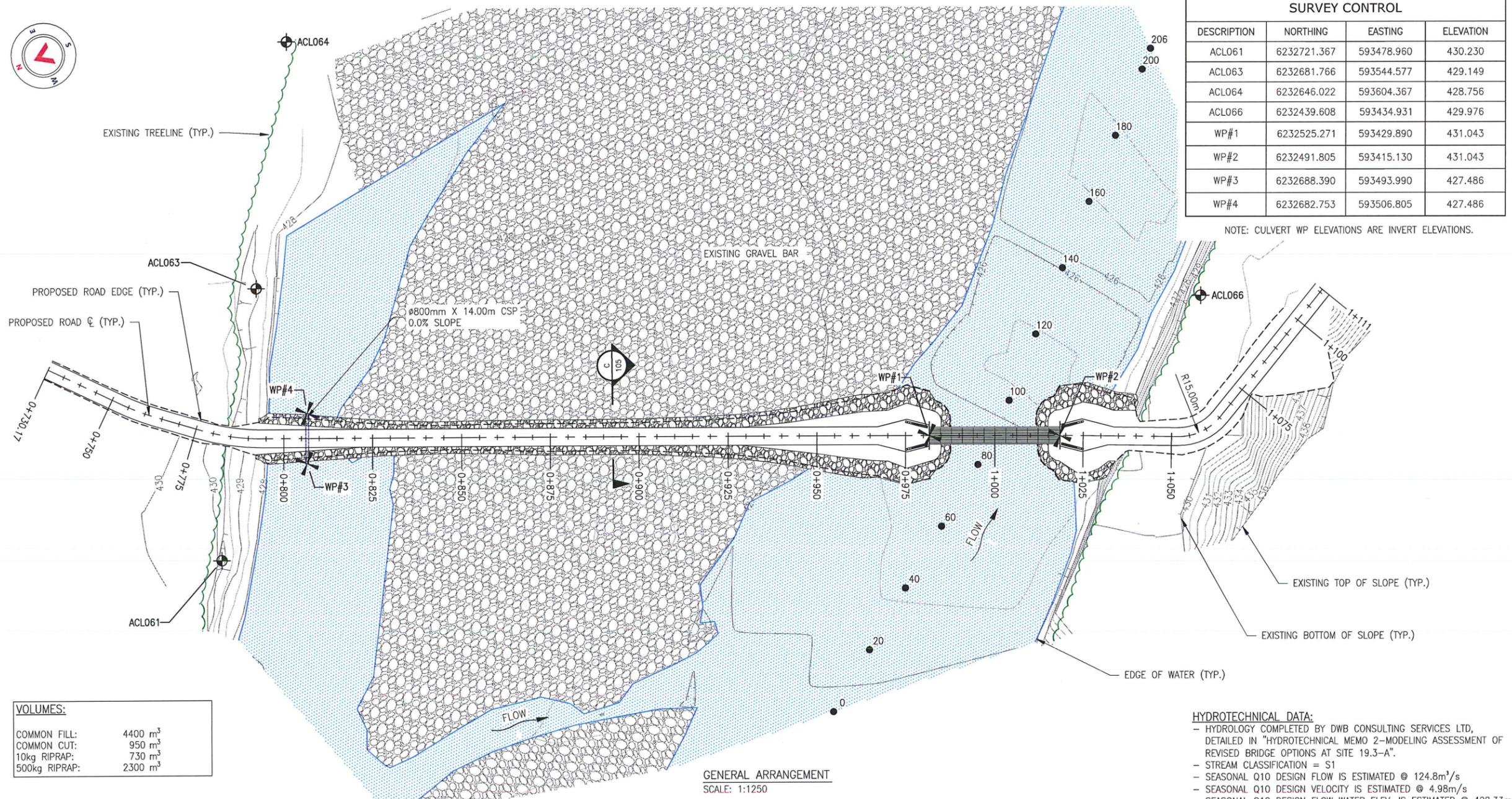
DATE	May 14, 2020	1016-N11-00842	R 0
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Site C Clean Energy Project – Halfway River Temporary Bridges

Attachment B

Halfway River Temporary Bridge Design Drawings, Plan and Profile Views

Date: 2020/03/04 2:59 PM | User: Stefanie Nowak | File: P:\P03\2017\1001\17PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1011-Civil\01-Production\Site C-19.3-A\JFC_REV_17\17PG0123-000-19.3-A-GA-OPTION 1 LOW FLOW | Layout: 104 | Paper Size: 558.8mm x 431.8mm



SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL061	6232721.367	593478.960	430.230
ACL063	6232681.766	593544.577	429.149
ACL064	6232646.022	593604.367	428.756
ACL066	6232439.608	593434.931	429.976
WP#1	6232525.271	593429.890	431.043
WP#2	6232491.805	593415.130	431.043
WP#3	6232688.390	593493.990	427.486
WP#4	6232682.753	593506.805	427.486

NOTE: CULVERT WP ELEVATIONS ARE INVERT ELEVATIONS.

REFERENCE DRAWINGS		
DRAWING NO.	DRAWING DESCRIPTION/TITLE	REF
-	-	1

- NOTES:**
- DURING HIGH WATER FLOWS ROAD MAY BE UNDER WATER AT TIMES AND MAY REQUIRE MAINTENANCE FOLLOWING HIGH FLOW EVENTS.
 - CULVERTS HAVE NOT BEEN DESIGNED TO HANDLE HIGH WATER FLOWS AND ARE INTENDED TO PROVIDE CHANNEL CONNECTIVITY ONLY.

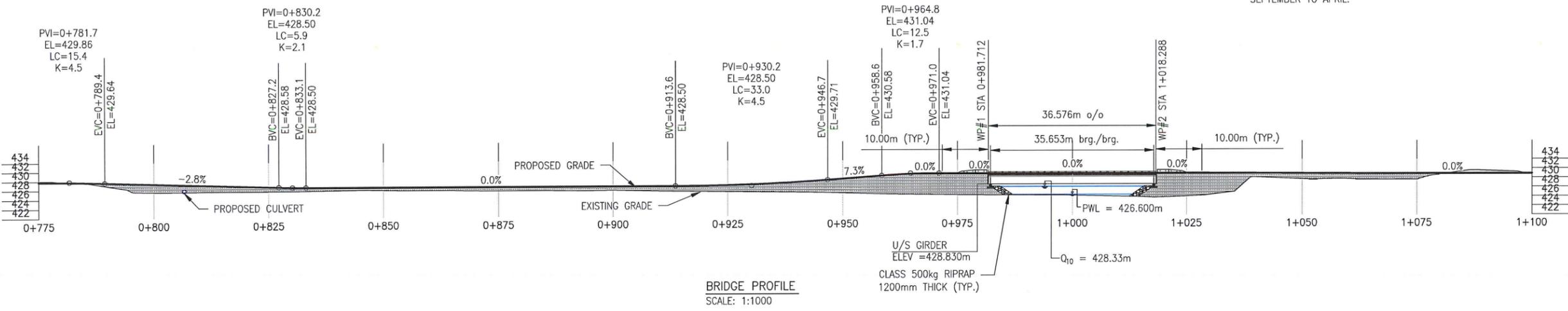
VOLUMES:

COMMON FILL:	4400 m ³
COMMON CUT:	950 m ³
10kg RIPRAP:	730 m ³
500kg RIPRAP:	2300 m ³

HYDROTECHNICAL DATA:

- HYDROLOGY COMPLETED BY DWB CONSULTING SERVICES LTD, DETAILED IN "HYDROTECHNICAL MEMO 2-MODELING ASSESSMENT OF REVISED BRIDGE OPTIONS AT SITE 19.3-A".
- STREAM CLASSIFICATION = S1
- SEASONAL Q10 DESIGN FLOW IS ESTIMATED @ 124.8m³/s
- SEASONAL Q10 DESIGN VELOCITY IS ESTIMATED @ 4.98m/s
- SEASONAL Q10 DESIGN FLOW WATER ELEV. IS ESTIMATED @ 428.33m
- SEASONAL Q10 FLOW APPLIES TO NON-PEAK FLOW SEASON FROM SEPTEMBER TO APRIL.

GENERAL ARRANGEMENT
SCALE: 1:1250



BRIDGE PROFILE
SCALE: 1:1000



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0	20/01/31	ISSUED FOR CONSTRUCTION	SN	DDW

CLIENT:
BC Hydro



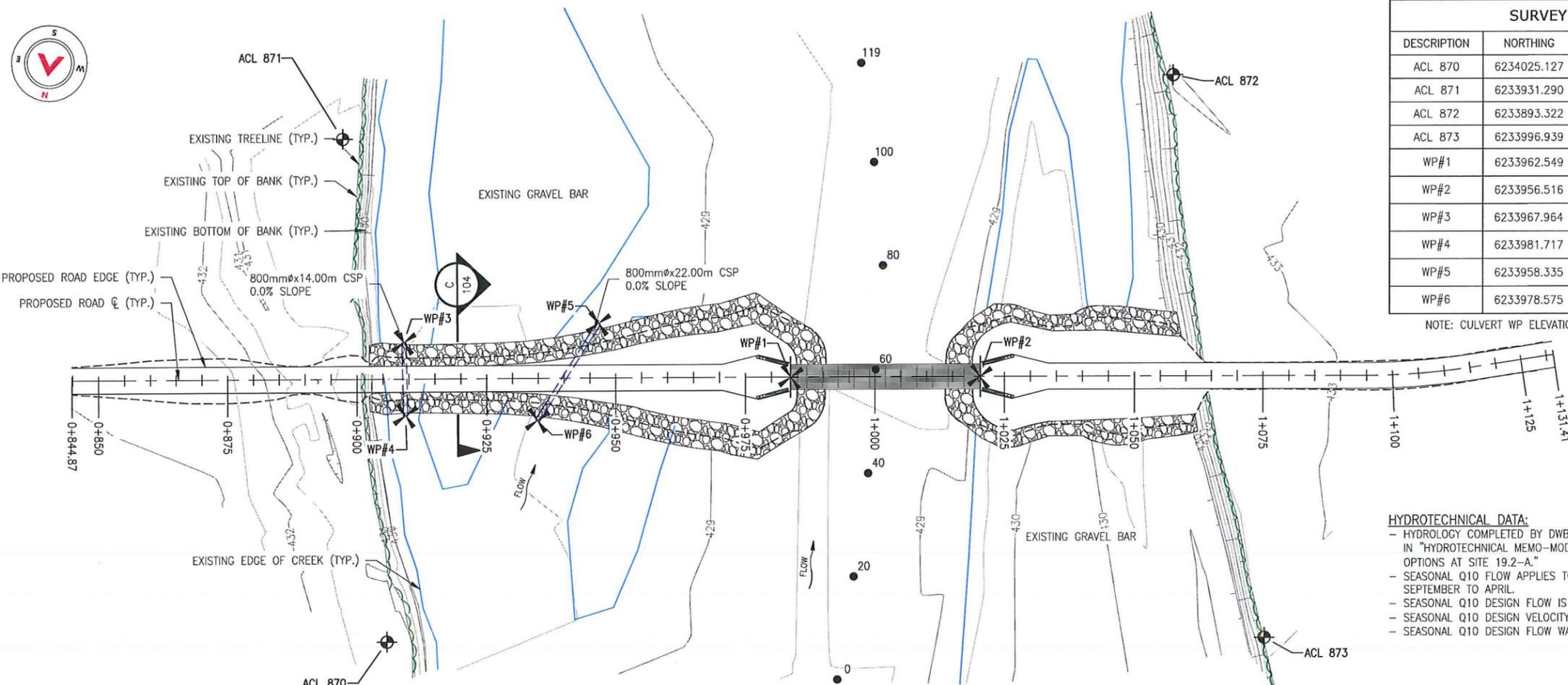
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DRAWING SIZE:	ANSI "B"	CHKD:	GDF	DATE:	19/08/22
SCALE:	AS NOTED	APVD:	DDW	DATE:	20/01/31

**HALFWAY RIVER
SITE: 19.3-A**

TITLE:
**OPTION 1:
LOW FLOW BRIDGE CROSSING
GENERAL ARRANGEMENT**

DWG NO:	17PG0123-700-1960-104	REV:	1
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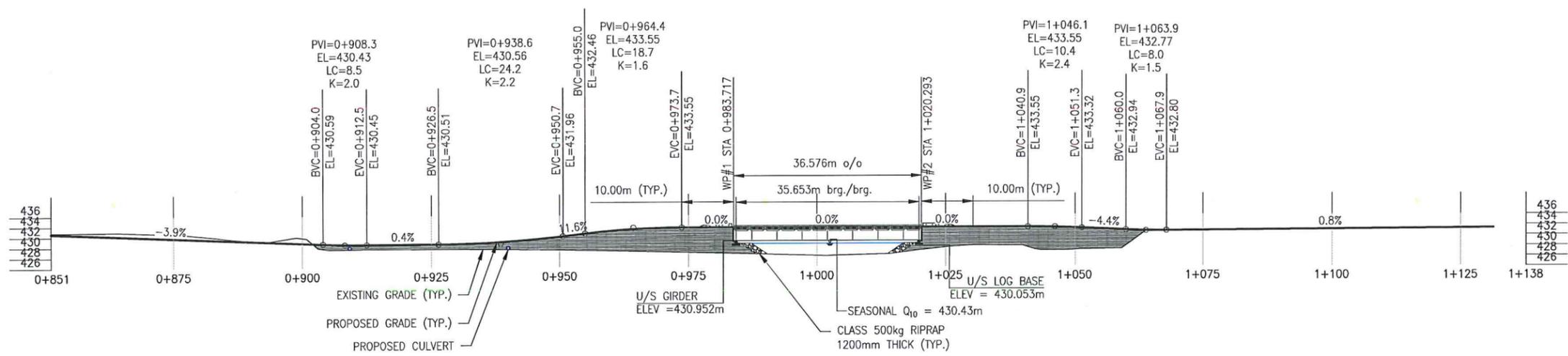
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DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 870	6234025.127	592890.719	431.488
ACL 871	6233931.290	592914.881	431.934
ACL 872	6233893.322	592758.898	433.091
ACL 873	6233996.939	592723.442	432.673
WP#1	6233962.549	592822.059	433.548
WP#2	6233956.516	592785.984	433.548
WP#3	6233967.964	592896.860	429.535
WP#4	6233981.717	592894.246	429.535
WP#5	6233958.335	592860.309	429.447
WP#6	6233978.575	592868.932	429.447

NOTE: CULVERT WP ELEVATIONS ARE INVERT ELEVATIONS.

HYDROTECHNICAL DATA:
 - HYDROLOGY COMPLETED BY DWB CONSULTING SERVICES LTD, DETAILED IN "HYDROTECHNICAL MEMO-MODELING ASSESSMENT OF BRIDGE OPTIONS AT SITE 19.2-A."
 - SEASONAL Q10 FLOW APPLIES TO NON-PEAK FLOW SEASON FROM SEPTEMBER TO APRIL.
 - SEASONAL Q10 DESIGN FLOW IS ESTIMATED @ 125m³/s
 - SEASONAL Q10 DESIGN VELOCITY IS ESTIMATED @ 4.67m³/s
 - SEASONAL Q10 DESIGN FLOW WATER ELEV. IS ESTIMATED @ 430.43m

VOLUMES:	
COMMON FILL:	3700 m ³
COMMON CUT:	210 m ³
10kg RIPRAP:	1120 m ³
500kg RIPRAP:	770 m ³

GENERAL ARRANGEMENT
SCALE: 1:1000



BRIDGE PROFILE
SCALE: 1:1000

- NOTES:**
- DURING HIGH WATER FLOWS ROAD MAY BE UNDER WATER AT TIMES AND MAY REQUIRE MAINTENANCE FOLLOWING HIGH FLOW EVENTS.
 - CULVERTS HAVE NOT BEEN DESIGNED TO HANDLE HIGH WATER FLOWS AND ARE INTENDED TO PROVIDE CHANNEL CONNECTIVITY ONLY.



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0	20/01/10	ISSUED FOR CONSTRUCTION	EEG	DDW



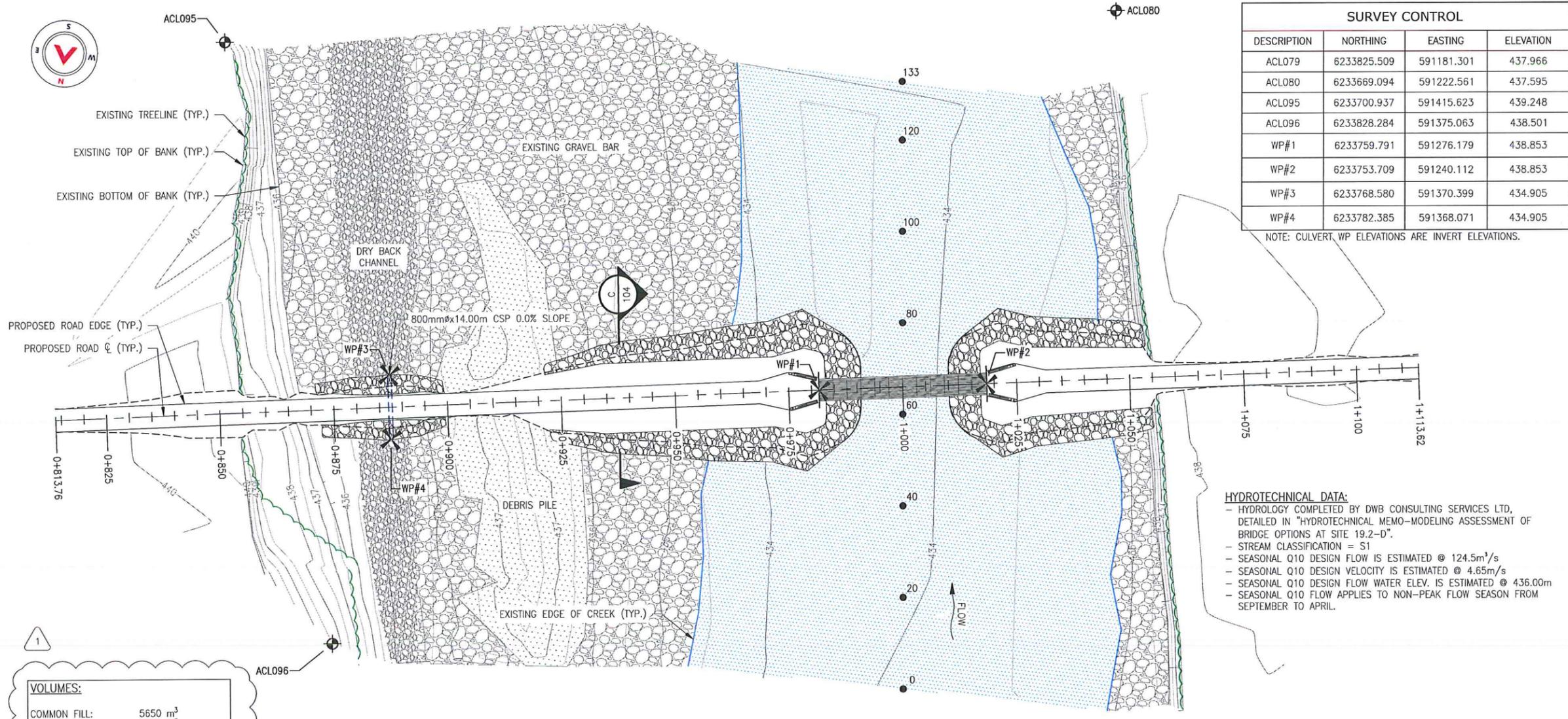
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SCALE:	AS NOTED	APVD:	DDW	DATE:	20/01/10

**HALFWAY RIVER
SITE: 19.2-A**

**TITLE:
OPTION 1:
LOW FLOW BRIDGE CROSSING
GENERAL ARRANGEMENT**

DWG NO:	17PG0123-2200-1960-103	REV:	1
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SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL079	6233825.509	591181.301	437.966
ACL080	6233669.094	591222.561	437.595
ACL095	6233700.937	591415.623	439.248
ACL096	6233828.284	591375.063	438.501
WP#1	6233759.791	591276.179	438.853
WP#2	6233753.709	591240.112	438.853
WP#3	6233768.580	591370.399	434.905
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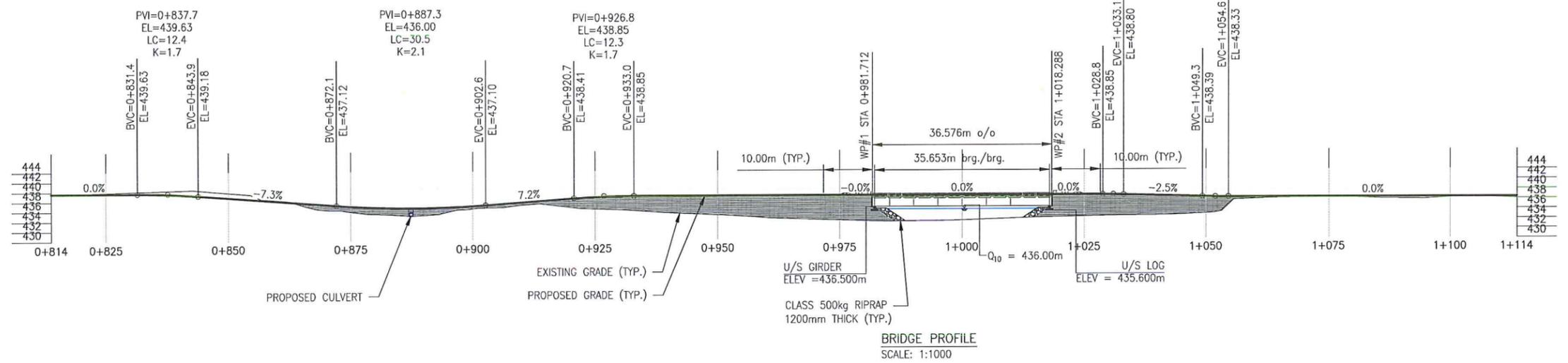
NOTE: CULVERT WP ELEVATIONS ARE INVERT ELEVATIONS.

HYDROTECHNICAL DATA:

- HYDROLOGY COMPLETED BY DWB CONSULTING SERVICES LTD, DETAILED IN "HYDROTECHNICAL MEMO-MODELING ASSESSMENT OF BRIDGE OPTIONS AT SITE 19.2-D".
- STREAM CLASSIFICATION = S1
- SEASONAL Q10 DESIGN FLOW IS ESTIMATED @ 124.5m³/s
- SEASONAL Q10 DESIGN VELOCITY IS ESTIMATED @ 4.65m/s
- SEASONAL Q10 DESIGN FLOW WATER ELEV. IS ESTIMATED @ 436.00m
- SEASONAL Q10 FLOW APPLIES TO NON-PEAK FLOW SEASON FROM SEPTEMBER TO APRIL.

VOLUMES:

COMMON FILL:	5650 m ³
COMMON CUT:	190 m ³
10kg RIPRAP:	700 m ³
500kg RIPRAP:	970 m ³



- NOTES:**
1. DURING HIGH WATER FLOWS ROAD MAY BE UNDER WATER AT TIMES AND MAY REQUIRE MAINTENANCE FOLLOWING HIGH FLOW EVENTS.
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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
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0	20/01/17	ISSUED FOR CONSTRUCTION	EEG	DDW

CLIENT: **BC Hydro**



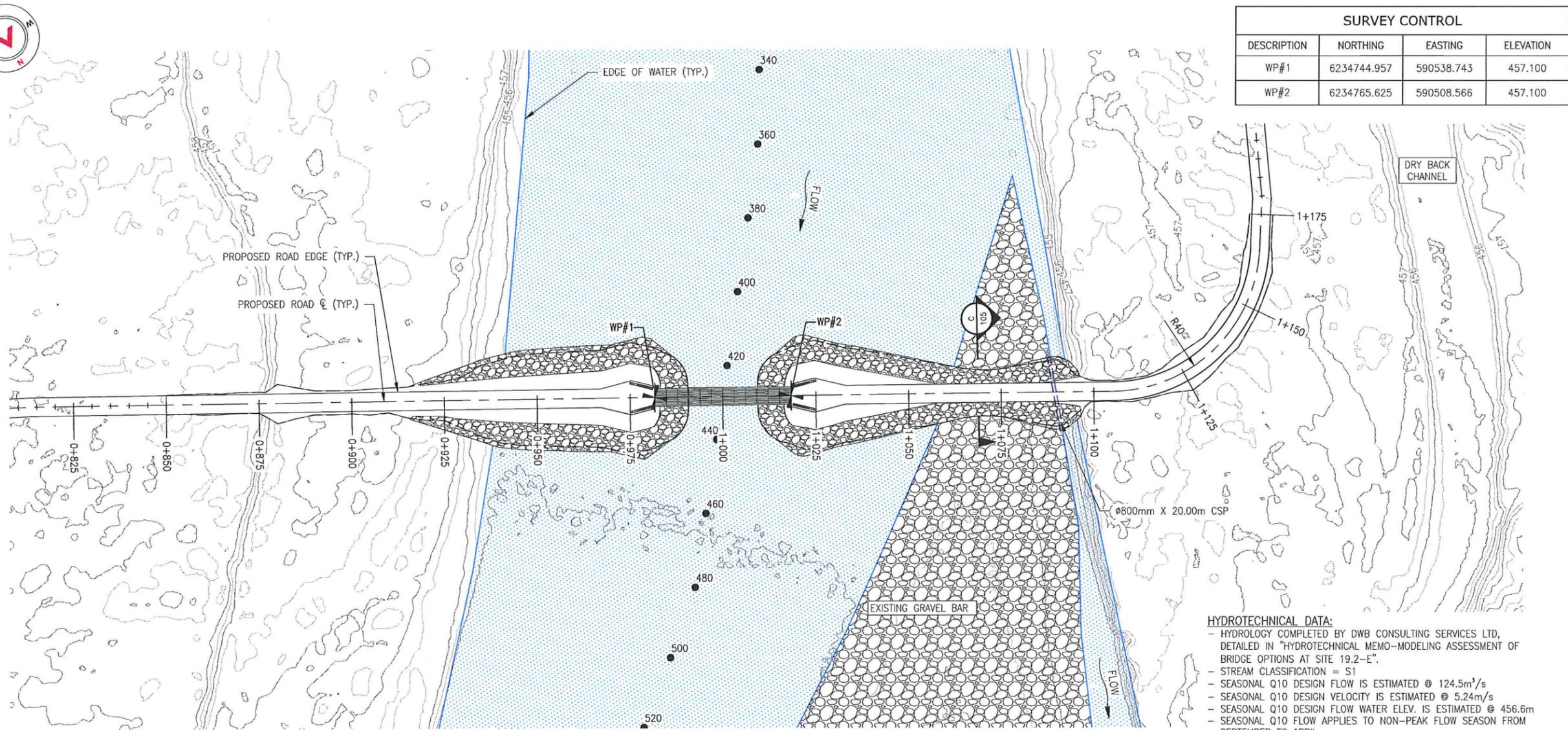
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DRAWING SIZE:	ANSI 'B'	CHKD:	JDS	DATE:	19/10/28
SCALE:	AS NOTED	APVD:	DDW	DATE:	20/01/17

PROJECT:
**HALFWAY RIVER
SITE: 19.2-D**

TITLE:
**OPTION 1:
LOW FLOW BRIDGE CROSSING
GENERAL ARRANGEMENT**

DWG NO:	17PG0123-2400-1960-103	REV:	1
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SURVEY CONTROL			
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WP#1	6234744.957	590538.743	457.100
WP#2	6234765.625	590508.566	457.100

REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
-	-	1

- NOTES:**
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HYDROTECHNICAL DATA:

- HYDROLOGY COMPLETED BY DWB CONSULTING SERVICES LTD, DETAILED IN "HYDROTECHNICAL MEMO-MODELING ASSESSMENT OF BRIDGE OPTIONS AT SITE 19.2-E".
- STREAM CLASSIFICATION = S1
- SEASONAL Q10 DESIGN FLOW IS ESTIMATED @ 124.5m³/s
- SEASONAL Q10 DESIGN VELOCITY IS ESTIMATED @ 5.24m/s
- SEASONAL Q10 DESIGN FLOW WATER ELEV. IS ESTIMATED @ 456.6m
- SEASONAL Q10 FLOW APPLIES TO NON-PEAK FLOW SEASON FROM SEPTEMBER TO APRIL.

REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
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DRAWING SIZE:	ANSI "B"	CHKD:	JDS	DATE:	19/10/29
SCALE:	AS NOTED	APVD:	DDW	DATE:	20/01/31

**HALFWAY RIVER
SITE: 19.2-E**

**OPTION 1:
LOW FLOW BRIDGE CROSSING
GENERAL ARRANGEMENT**

DWG NO:	17PG0123-2500-1960-104	REV:	0
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