



Navigation Protection Program (NPP)
820 - 800 Burrard St
Vancouver, BC, V6Z 2J8

Our File: 2020-502985
Registry Number: 2152

APPROVAL

OWNER: BC Hydro
9th Floor
1111 Georgia St W
Vancouver, BC, V6E 4M3

WORK: Causeway

SITE LOCATION: Located at approximately at 56°13'37.99"N, -121°29'2.40"W, on unsurveyed foreshore or land covered by water being part of the bed of Peace River, Halfway River located within Sections 3, 25, 34, 35 and 36 Township 83 Range 23 West of 6th Meridian Peace River District, in the Province of British Columbia.

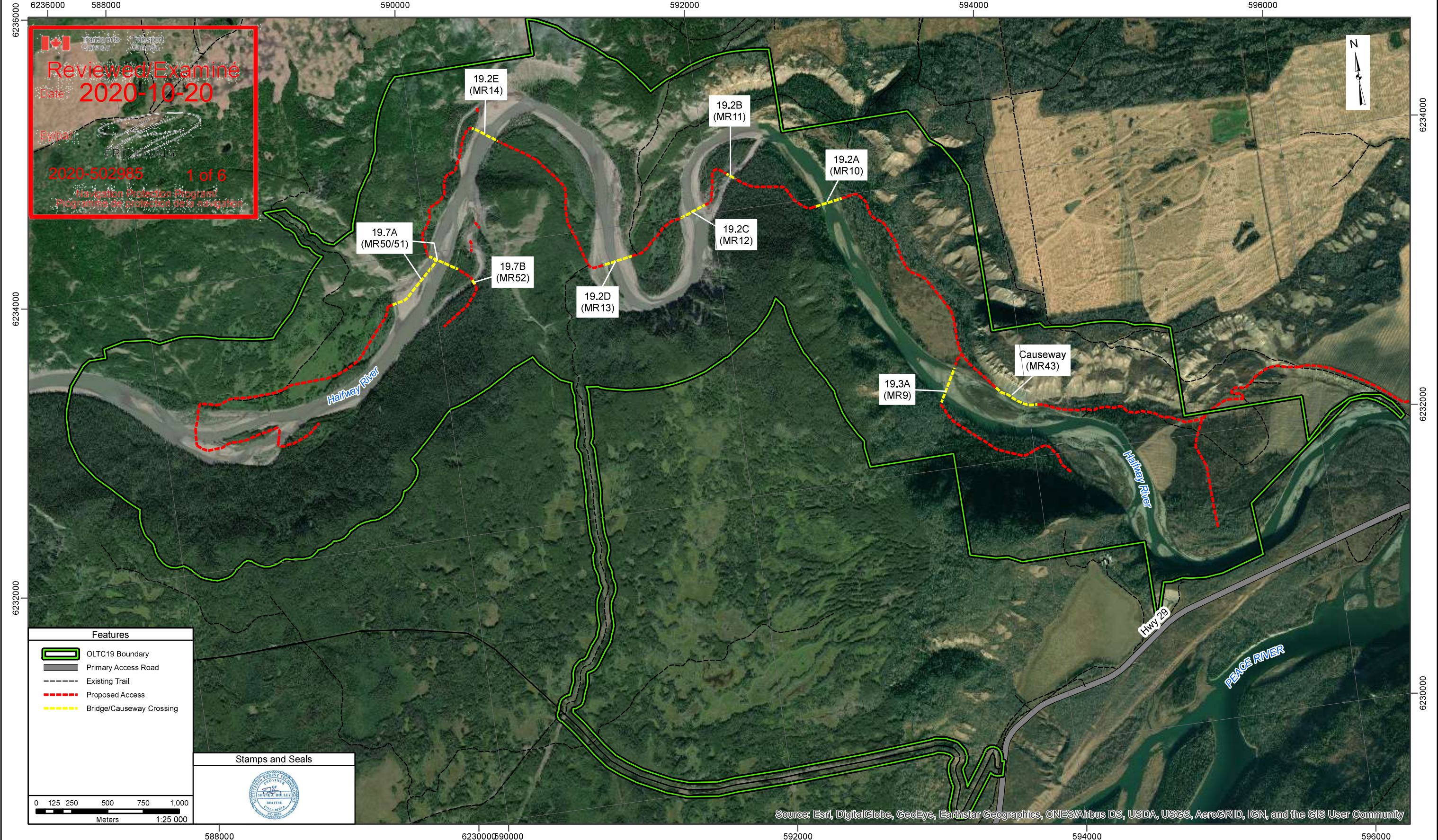
As per the application (detailed above) to the Minister of Transport, submitted pursuant to the *Canadian Navigable Waters Act*, for an approval of the work per the attached six (6) plans the Minister hereby approves the work pursuant to subsection 7(6) for the construction of the above mentioned work, in accordance with the following terms and conditions:

1. The works are to be constructed or installed in accordance with the reviewed plans.
2. Construction equipment used in conjunction with this project shall be stored in such a manner that it does not obstruct charted Aids to Navigation and does not obstruct navigation.
3. The owner shall conduct an Airborne LIDAR survey of the reservoir area post construction and clearing, but prior to the filling of the reservoir. This survey shall be the basis for mapping of the reservoir for boating.

SIGNED ON October 29, 2020 at Pacific

Eric Leung
NPP Officer
Programs Group
Transport Canada
Pacific Region
For the Minister of Transport

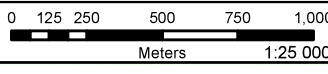
No.	Revisions	Made	Chkd	Appd	Date



Reviewed/Examine
 Date: **2020-10-20**
 By: [Signature]
 2020-502985 1 of 6
 Navigation Protection Program
 Programme de protection des navigations

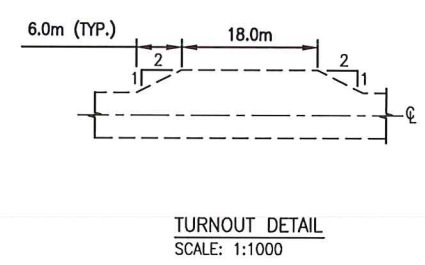
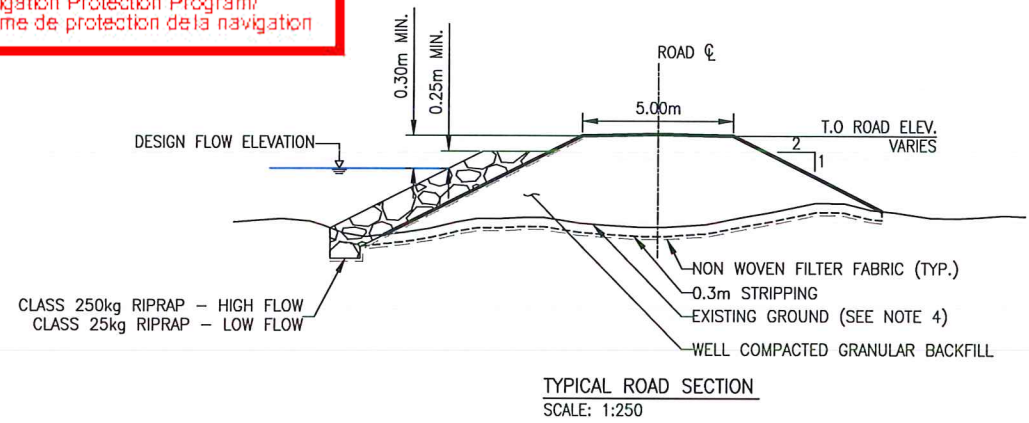
- Features**
- OLTC19 Boundary
 - Primary Access Road
 - Existing Trail
 - Proposed Access
 - Bridge/Causeway Crossing

Stamps and Seals





Reviewed/Examiné
 Date: **2020-10-20**
 By/par: 
ERIC LEUNG
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 Navigation Protection Program/
 Programme de protection de la navigation

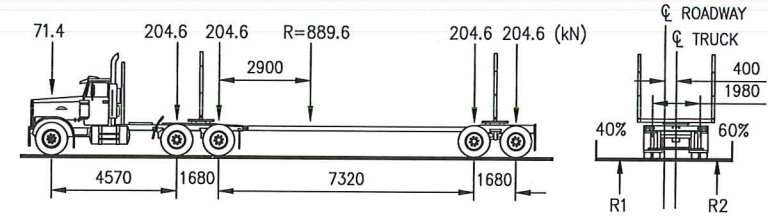


GENERAL NOTES:

1. DESIGN SPECIFICATIONS
 - 1.1. DESIGN BASED UPON LIDAR DATA AND FIELD VISIT.
 - 1.2. DESIGN SPEED: 40km/hr.
 - 1.3. FINISHED ROAD SURFACE: 5M WITH 2% CROSS SLOPE.
 - 1.4. CUT AND FILL SLOPES AS SHOWN ON THE TYPICAL ROAD TEMPLATES.
2. ALL PERMITS AND REGULATORY APPROVALS TO BE IN PLACE PRIOR TO COMMENCING WORK.
3. ENVIRONMENTAL MANAGEMENT PLAN TO BE PREPARED FOR PROJECT BY OTHERS. COMPLETION OF WORKS TO COMPLY WITH MITIGATION RECOMMENDATIONS OUTLINED IN ENVIRONMENTAL MANAGEMENT PLAN.
4. REFER TO FIRTH HOLLIN RESOURCE SCIENCE CORP REPORT DATED DECEMBER 10, 2019 FOR GEOTECHNICAL INFORMATION. EXISTING POOR SOILS ENCOUNTERED TO BE SUBEXCAVATED AND BACKFILLED WITH GRANULAR BACKFILL PRIOR TO ROADWAY CONSTRUCTION.
5. WHERE EXCAVATION SPECIFICATIONS ON THESE DRAWINGS CONFLICT WITH WORKSAFE BC (WSBC) REGULATIONS, WSBC REGULATIONS ARE TO GOVERN.
6. RIPRAP SPECIFICATIONS:

CLASS OF RIPRAP (kg.)	NOMINAL THICKNESS OF RIPRAP (mm)	ROCK GRADATION PERCENTAGE SMALLER THAN GIVEN ROCK MASS (kg)			APPROXIMATE AVERAGE DIMENSION (mm)		
		15%	50%	85%	15%	50%	85%
10	350	1	10	30	90	195	280
25	450	2.5	25	75	120	260	380
50	550	5	50	150	155	330	475
100	700	10	100	300	195	415	600
250	1000	25	250	750	260	565	815
500	1200	50	500	1500	330	715	1030

LOADING DIAGRAM L-100 OFF HIGHWAY G.V.W. = 90 680kg;
 DESIGN IN ACCORDANCE WITH CAN/CSA-S6-14 WITH MODIFIED LOADING AS FOLLOWS:




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




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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
1	20/03/16	GENERAL REVISIONS	EEG	DDW
0	20/02/25	ISSUED FOR CONSTRUCTION	SN	DDW

CLIENT:

 **BC Hydro**

 **Allnorth**

CLIENT NO:	-	DRWN:	GSB	DATE:	20/01/17
PROJECT NO:	17PG0123	DSGN:	JDS	DATE:	20/01/17
DRAWING SIZE:	ANSI "B"	CHKD:	JDS	DATE:	20/01/17
SCALE:	AS NOTED	APVD:	DDW	DATE:	20/01/31

PROJECT:

**HALFWAY RIVER
19.2 CAUSEWAY ROAD**

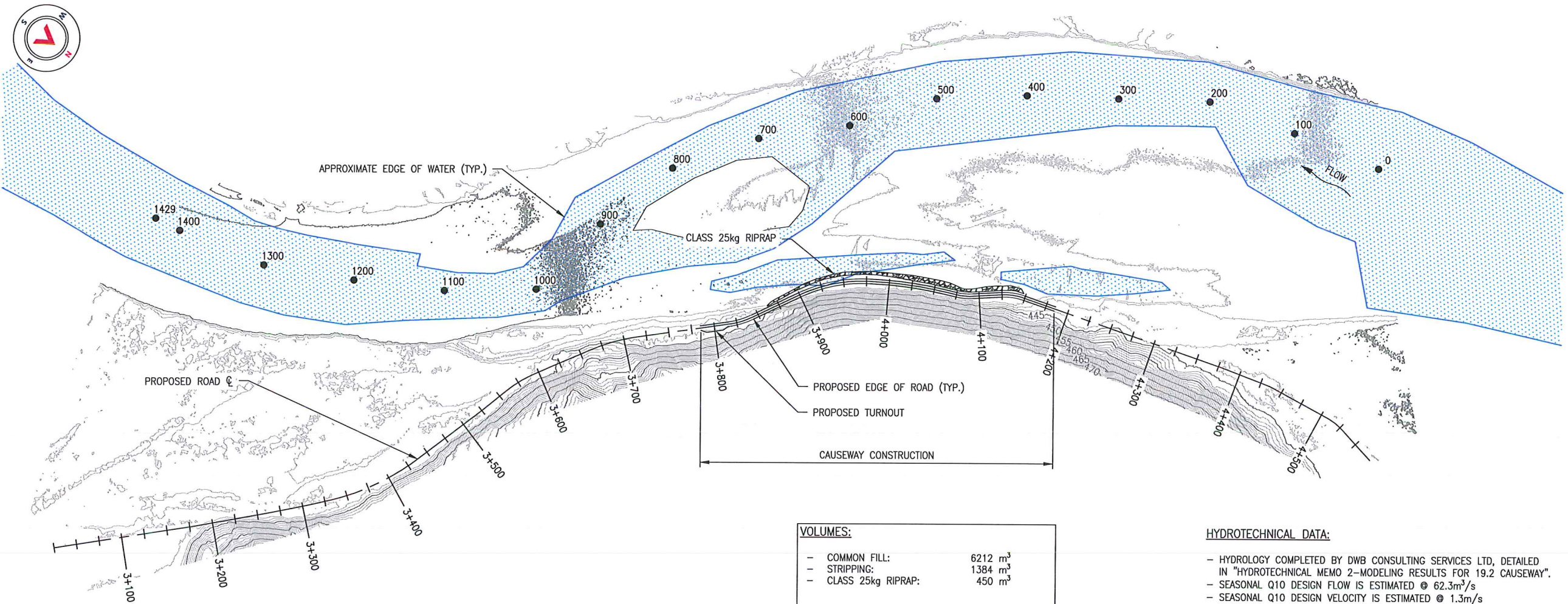
TITLE:

**TYPICAL SECTION
AND
GENERAL NOTES**

DWG NO: **17PG0123-3000-1920-001** REV: **1**

Date: 2020/04/15 12:00 PM | User: Stefanie Nouck | File: C:\Projects Drive (P)\PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1011-Cl\101-Production\SITE C-19.2 CAUSEWAY REV 2\17PG0123 19.2 CAUSEWAY LOW FLOW REV 2 | Layout: 001 | Paper Size: 598.8mm x 431.8mm

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VOLUMES:

- COMMON FILL:	6212 m ³
- STRIPPING:	1384 m ³
- CLASS 25kg RIPRAP:	450 m ³

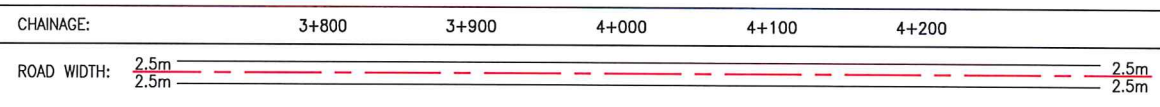
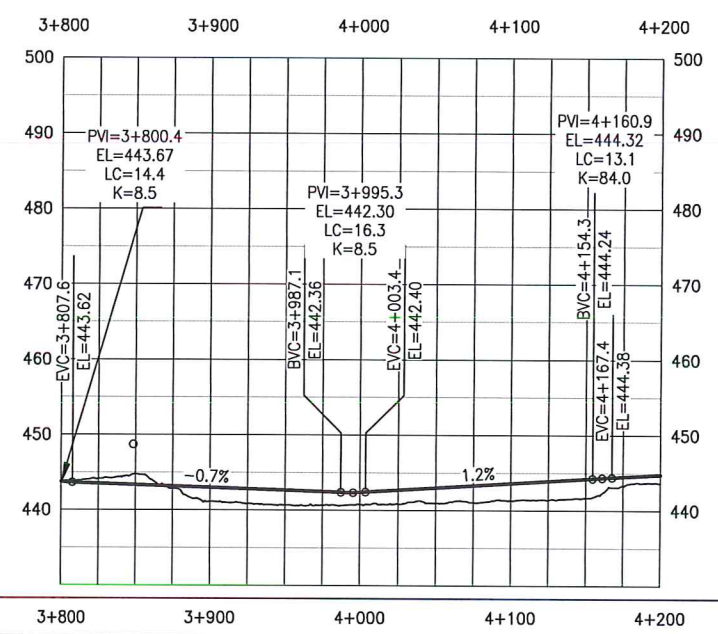
HYDROTECHNICAL DATA:

- HYDROLOGY COMPLETED BY DWB CONSULTING SERVICES LTD, DETAILED IN "HYDROTECHNICAL MEMO 2-MODELING RESULTS FOR 19.2 CAUSEWAY".
- SEASONAL Q10 DESIGN FLOW IS ESTIMATED @ 62.3m³/s
- SEASONAL Q10 DESIGN VELOCITY IS ESTIMATED @ 1.3m/s
- SEASONAL Q10 DESIGN FLOW WATER ELEV. IS ESTIMATED @ 442.6m @ 4+500 TO 440.3m @ 3+300
- SEASONAL Q10 FLOW APPLIES TO NON-PEAK FLOW SEASON FROM SEPTEMBER TO APRIL.

Reviewed/Examiné
Date: 2020-10-20

By/par:
ERIC LEUNG

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REFERENCE DRAWINGS

DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
-	-	1

NOTES:

- HORIZONTAL ALIGNMENT TO BE FIELD FIT TO BE ADJACENT TO THE EXISTING RIVER BANK.



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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
2	20/04/14	REVISED CHAINAGE	SN	DDW
1	20/03/16	GENERAL REVISIONS	EEG	DDW
0	20/02/25	ISSUED FOR CONSTRUCTION	SN	DDW

CLIENT:

BC Hydro

Allnorth

CLIENT NO:	DRWN: GSB	DATE: 20/01/17
PROJECT NO: 17PG0123	DSGN: JDS	DATE: 20/01/17
DRAWING SIZE: ANSI "B"	CHKD: JDS	DATE: 20/01/17
SCALE: H: 1:5000 V: 1:800	APVD: DDW	DATE: 20/01/31

PROJECT:

HALFWAY RIVER
19.2 CAUSEWAY ROAD

TITLE:

OPTION 1: LOW FLOW
CROSSING
PLAN AND PROFILE DRAWING

DWG NO: 17PG0123-3000-1920-002	REV: 2
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Date: 2020/04/16 11:19 AM | User: Stefanie Noack | File: C:\Projects Drive (P)\PG0207\10017PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1001-Can\101-Production\SITE C-192 CAUSEWAY\REV 2\17PG0123-3000-1920-003 CAUSEWAY-LOW FLOW REV 2 | Layout: 003 | Paper Size: 566mm x 431.8mm



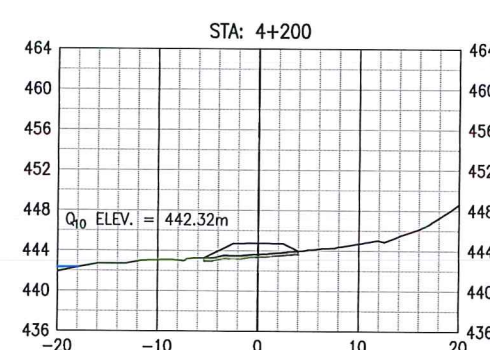
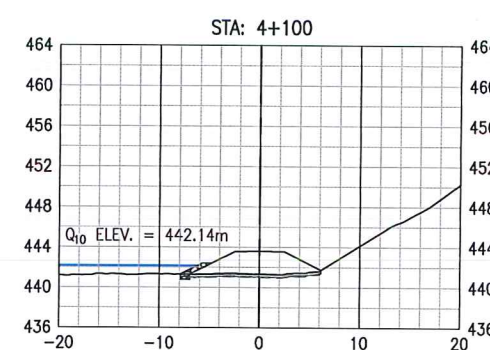
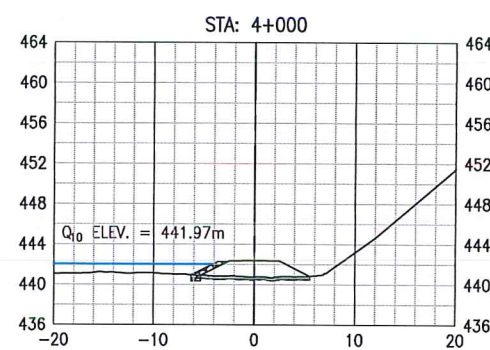
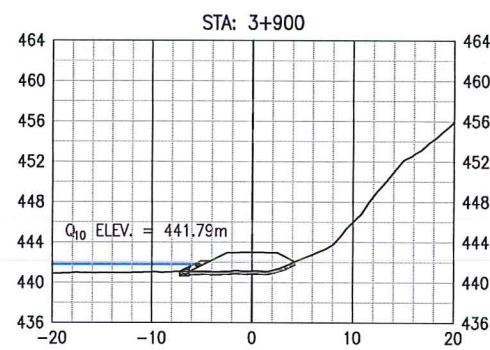
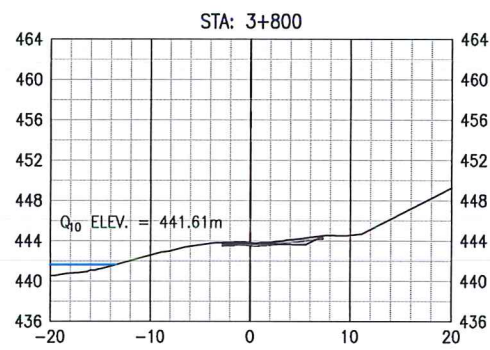
Reviewed/Examiné

Date: 2020-10-20

By/par: 
ERIC LEUNG

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Programme de protection de la navigation



REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
2	20/04/14	REVISED CHAINAGE	SN	DDW
1	20/03/16	GENERAL REVISIONS	EEG	DDW
0	20/02/25	ISSUED FOR CONSTRUCTION	SN	DDW

CLIENT:



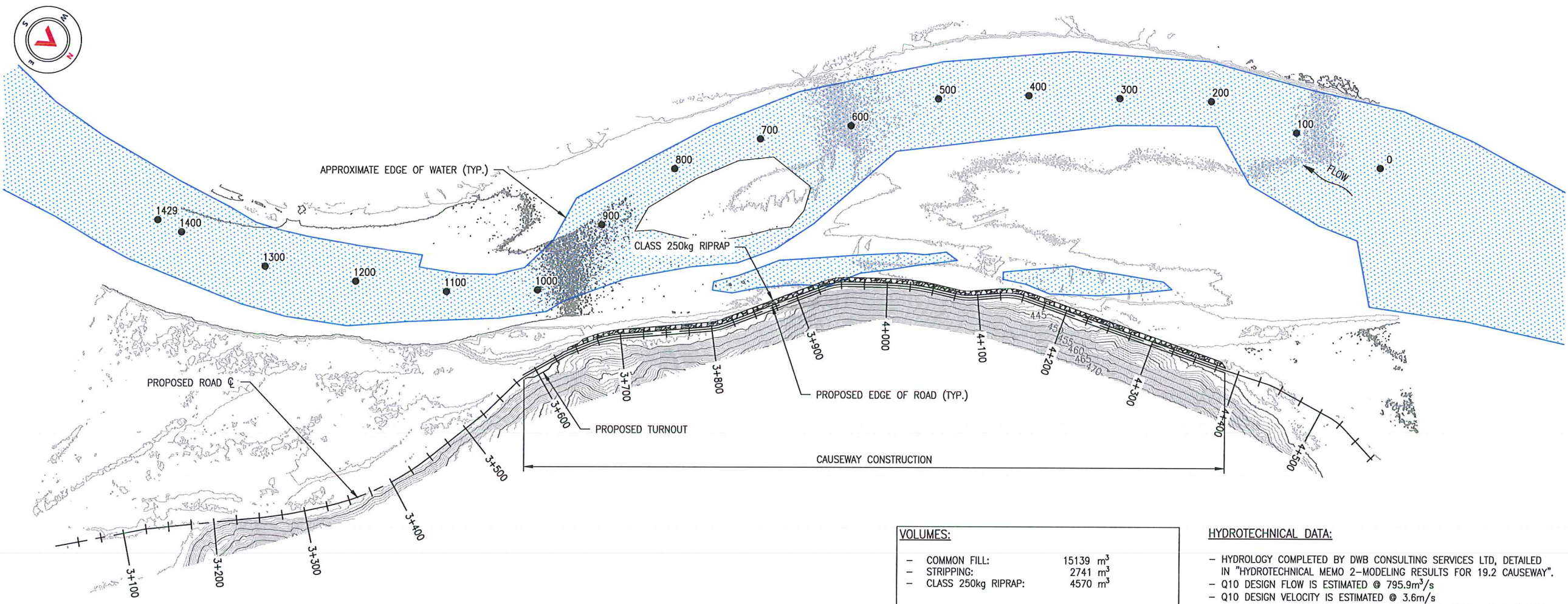

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PROJECT NO:	17PG0123	DSGN:	JDS	DATE:	20/01/17
DRAWING SIZE:	ANSI "B"	CHKD:	JDS	DATE:	20/01/17
SCALE:	AS NOTED	APVD:	DDW	DATE:	20/01/31

PROJECT:
**HALFWAY RIVER
19.2 CAUSEWAY ROAD**

TITLE:
**OPTION 1: LOW FLOW
CROSSING SECTIONS**

DWG NO:	17PG0123-3000-1920-003	REV:	2
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Date: 2020/04/16 11:30 AM | User: Stefanie Nouck | File: C:\Projects Drive (P:\02017\1001\17PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1011-Civil\01-Productions\SITE C-19.2 CAUSEWAY\REV 2\17PG0123-3000-1920-1920 CAUSEWAY-HIGH FLOW REV 2 | Layout: 004 | Paper Size: 558.8mm x 431.8mm



VOLUMES:

- COMMON FILL:	15139 m ³
- STRIPPING:	2741 m ³
- CLASS 250kg RIPRAP:	4570 m ³

HYDROTECHNICAL DATA:

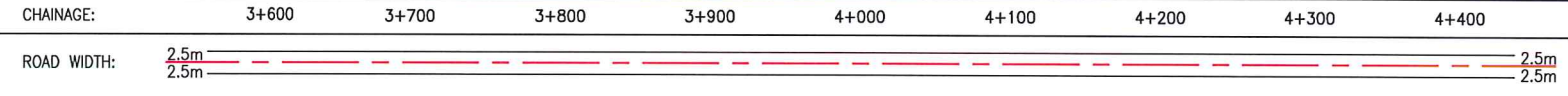
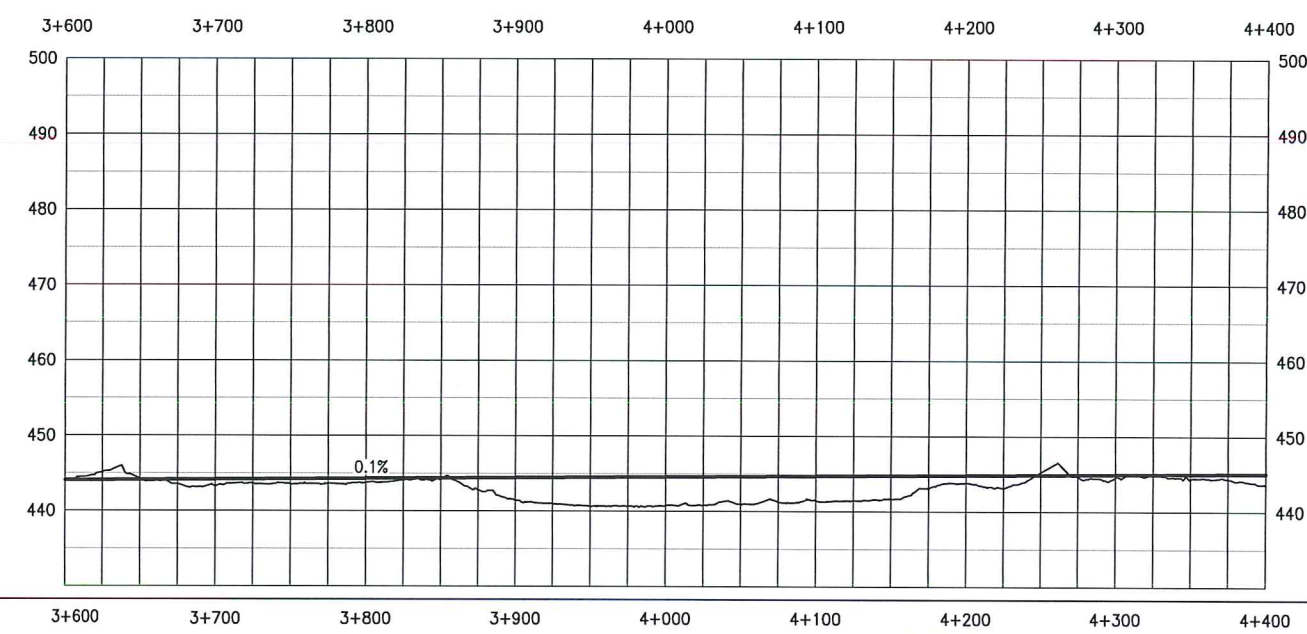
- HYDROLOGY COMPLETED BY DWB CONSULTING SERVICES LTD, DETAILED IN "HYDROTECHNICAL MEMO 2-MODELING RESULTS FOR 19.2 CAUSEWAY".
- Q10 DESIGN FLOW IS ESTIMATED @ 795.9m³/s
- Q10 DESIGN VELOCITY IS ESTIMATED @ 3.6m/s
- Q10 DESIGN FLOW WATER ELEV. IS ESTIMATED @ 444.7m @ 4+500 TO 443.1m @ 3+300

Reviewed/Examiné
 Date: **2020-10-20**

By/par:
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REFERENCE DRAWINGS

DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
-	-	1

NOTES:

- HORIZONTAL ALIGNMENT TO BE FIELD FIT TO BE ADJACENT TO THE EXISTING RIVER BANK.



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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
2	20/04/14	REVISED CHAINAGE	SN	DDW
1	20/03/16	GENERAL REVISIONS	EEG	DDW
0	20/02/25	ISSUED FOR CONSTRUCTION	SN	DDW

CLIENT:

BC Hydro

Allnorth

CLIENT NO: - DRWN: GSB DATE: 20/01/17
 PROJECT NO: 17PG0123 DSGN: JDS DATE: 20/01/17
 DRAWING SIZE: ANSI 'B' CHKD: JDS DATE: 20/01/17
 SCALE: H: 1:5000 V: 1:800 APVD: DDW DATE: 20/01/31

**HALFWAY RIVER
 19.2 CAUSEWAY ROAD**

TITLE:

**OPTION 2: HIGH FLOW
 CROSSING
 PLAN AND PROFILE DRAWING**

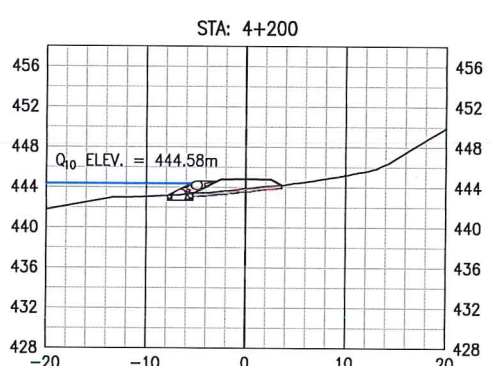
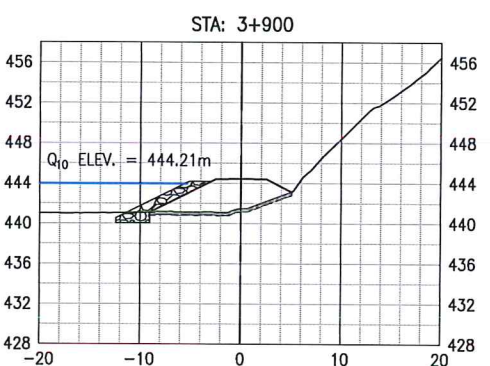
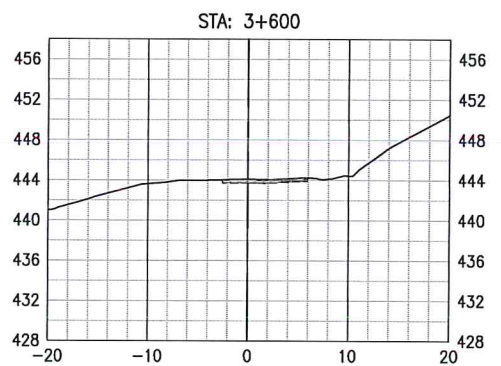
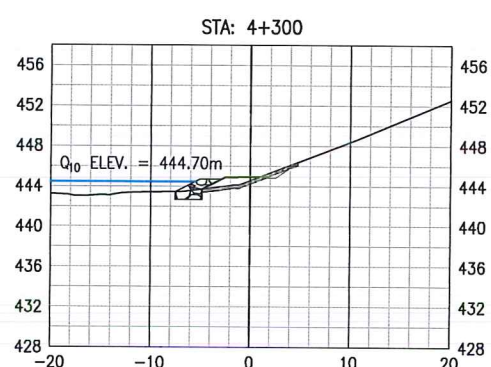
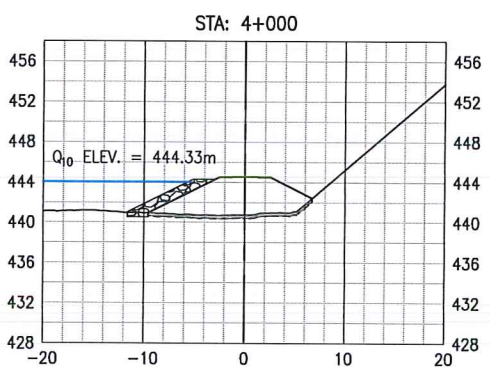
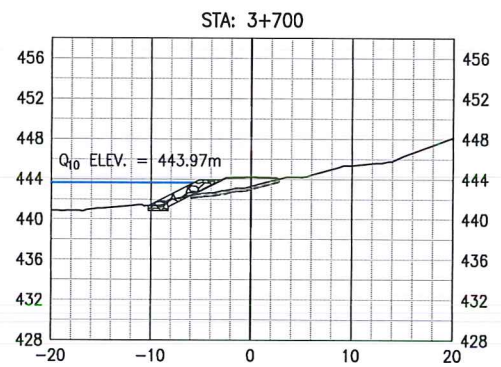
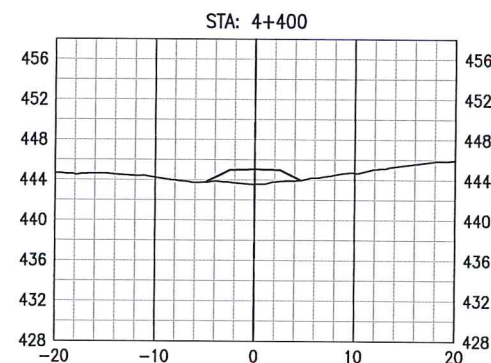
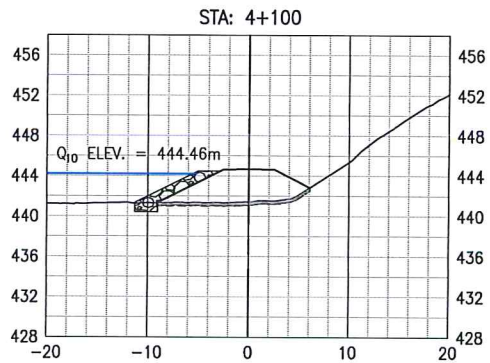
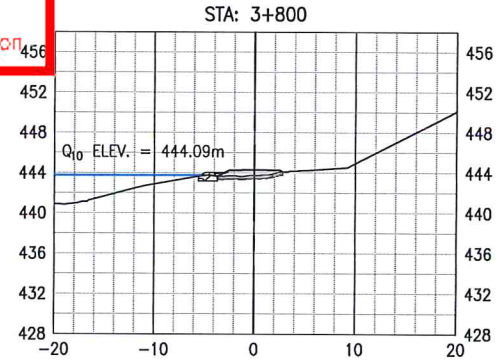
DWG NO: **17PG0123-3000-1920-004** REV: **2**

Reviewed/Examiné
Date: 2020-10-20

By/par: 
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0	20/02/25	ISSUED FOR CONSTRUCTION	SN	DDW

CLIENT:




CLIENT NO:	-	DRWN:	GSB	DATE:	20/01/17
PROJECT NO:	17PG0123	DSGN:	JDS	DATE:	20/01/17
DRAWING SIZE:	ANSI "B"	CHKD:	JDS	DATE:	20/01/17
SCALE:	AS NOTED	APVD:	DDW	DATE:	20/01/31

PROJECT:
**HALFWAY RIVER
19.2 CAUSEWAY ROAD**

TITLE:
**OPTION 2: HIGH FLOW
CROSSING SECTIONS**

DWG NO:	17PG0123-3000-1920-005	REV:	2
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