

SITE C CLEAN ENERGY PROJECT

Component Application Package – Halfway River Causeway Road 19.2 / MR43

Application for Approval

For Canadian Navigable Waters Act

August 24, 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

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List of Attachments

Attachment A Overview Map - Halfway River Causeway 19.2 / MR43

Attachment B Design Drawings, Plan and Profile Views of Causeway 19.2 / MR43

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. However, once the Site C reservoir is filled, the Halfway River lower reaches will become part of the Peace River, a Schedule waterbody under the CNWA.

This application for Approval is for a causeway road that will be constructed along the Halfway River approximately 5 river km upstream of the confluence with the Peace River. The causeway road will be left in place after reservoir clearing activities are completed and will be inundated by the future reservoir.

2 HALFWAY RIVER CAUSEWAY ROAD 19.2 / MR43 – RESERVOIR CLEARING

Site C Reservoir clearing in the lower Halfway River drainage requires machine access to both banks of the river and the construction of new access roads. BC Hydro has submitted Notices of Work for six mainstem bridge/causeway crossings that are part of the new access road development (see Notices of Work: Registry #1493, #1846, #1851, #1852, #1853 and #1855). This CNWA Approval request is for one mainline causeway that will be constructed to facilitate clearing as shown in the overview map in Attachment A.

The centrepoin coordinates of the causeway are as follows: 56.227227, -121.484887. The causeway is within *Forest Act* Occupant Licence to Cut (OLTC 19) area held by BC Hydro, on land with a legal description as follows: "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".

2.1 CAUSEWAY DESIGN

The mainline causeway will be located on the left downstream bank of the Halfway River (labelled as MR43 on the overview map; Attachment A). The causeway is approximately 400 m in length and will generally be constructed of well compacted granular fill placed on non-woven filter fabric to an elevation of 0.3 m above the design flow elevation. The riverward side of the causeway will be armoured with rip rap. The causeway will have a 5 m wide running surface and a 2H:1V side slope.

The causeway will generally be constructed as per the low flow design option (see IFC drawings in Appendix B) except that it will be located approximately 5 m south (toward the river) of the location shown on the design, to provide room for a ditch between the existing shale slope and the causeway to collect and direct runoff from the shale slope. Culverts may also be required to convey this runoff to the riverward side of the causeway; alternatively, the runoff may be allowed to drain in a southerly direction to the end of the

causeway and then be conveyed south through the causeway via culverts. There is potential for the causeway to be overtopped during the high flow period (spring 2021).

The causeway has a total footprint of 4,868 m². Of this total footprint, 373 m² is within the wetted channel width (an isolated pool of standing water).

Riprap specifications have been developed using the estimated flows level and associated scour potential. The granular material requirements and riprap specifications for the causeway road are summarized in the drawings in Attachment B. Minor changes to the location and design of the causeway road may be required in order to field fit to site conditions that exist during construction.

2.2 CONSTRUCTION SCHEDULE

The contractor is expected to begin constructing the causeway in September. Causeway materials will remain in place once reservoir clearing activities are complete. The future Site C reservoir would cover the causeway materials after reservoir filling is completed in 2024. The reservoir operating range is 460 – 461.8 m elevation, meaning any remaining causeway material would be under approximately 20 m of water once the Site C dam is operating. The causeway would be shown in the future reservoir maps; however, it is not expected to have effects to boater navigation.

3 PUBLIC BOATER ACCESS

Construction of temporary bridges/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 will 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). The causeway (ID MR43) is located outside of this river blockage area. Signage to boaters associated with the causeway will be done in compliance with any listed terms and conditions included within approval documents issued by Transport Canada.

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.

Attachment A

Overview Map – Halfway River Causeway 19.2 / MR43



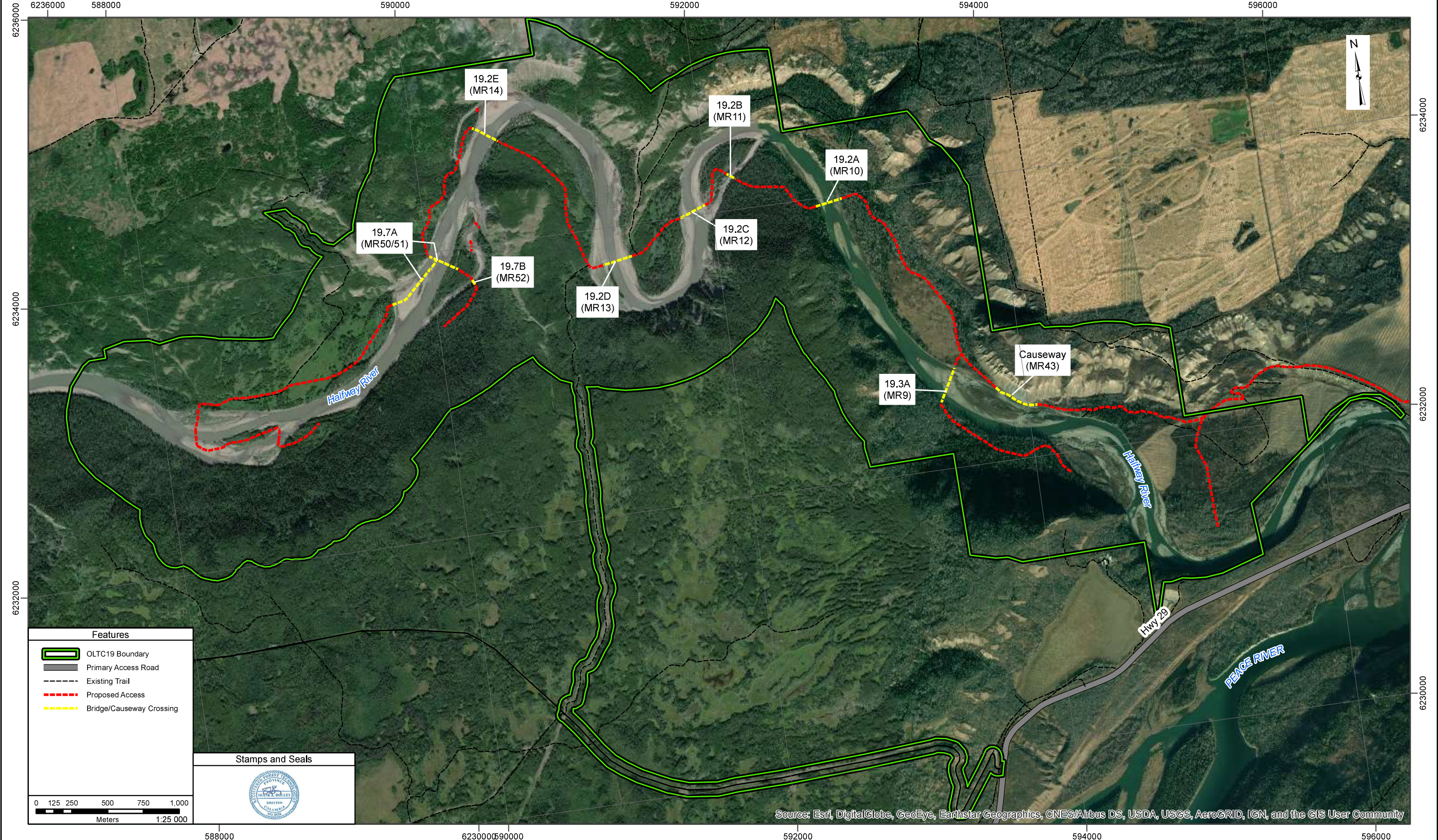
Projection: UTM Zone 10, NAD83
Geographic Center of Map:
E: 591,850 Longitude: 121°31'6.43"W
N: 6,232,557 Latitude: 56°13'44.48"N

No.	Revisions	Made	Chkd	Appd	Date

Mapsheet Reference: 94A.013, 023
Location: Halfway River
Resource District: Peace

Drawing No.: OLTC19-N11-00009B-01
Revision: 0
Date: 13Aug20

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



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

Attachment B

Design Drawings, Plan and Profile Views of Causeway 19.2 / MR43

Date: 2020/04/15 11:59 AM | User: Stelanie Moack | File: C:\Projects Drive (P)\PG0123\10017PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1001-Civil\01-Production\SITE C-19.2 CAUSEWAY-REV 2\17PG0123 19.2 CAUSEWAY-LOW FLOW REV 2 | Layout: 001 | Paper Size: 863.6mm x 558.8mm



HALFWAY RIVER
19.2 CAUSEWAY ROAD

DRAWING LIST		
DRAWING NO	DRAWING TITLE	REVISION
17PG0123-3000-1920-001	TYPICAL SECTIONS AND GENERAL NOTES	1
17PG0123-3000-1920-002	OPTION 1: LOW FLOW CROSSING PLAN AND PROFILE DRAWING	2
17PG0123-3000-1920-003	OPTION 1: LOW FLOW CROSSING SECTIONS	2
17PG0123-3000-1920-004	OPTION 2: HIGH FLOW CROSSING PLAN AND PROFILE DRAWING	2
17PG0123-3000-1920-005	OPTION 2: HIGH FLOW CROSSING SECTIONS	2

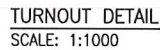
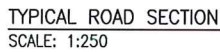


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1	20/03/16	GENERAL REVISIONS	EEG	DDW
0	20/02/25	ISSUED FOR CONSTRUCTION	SN	DDW



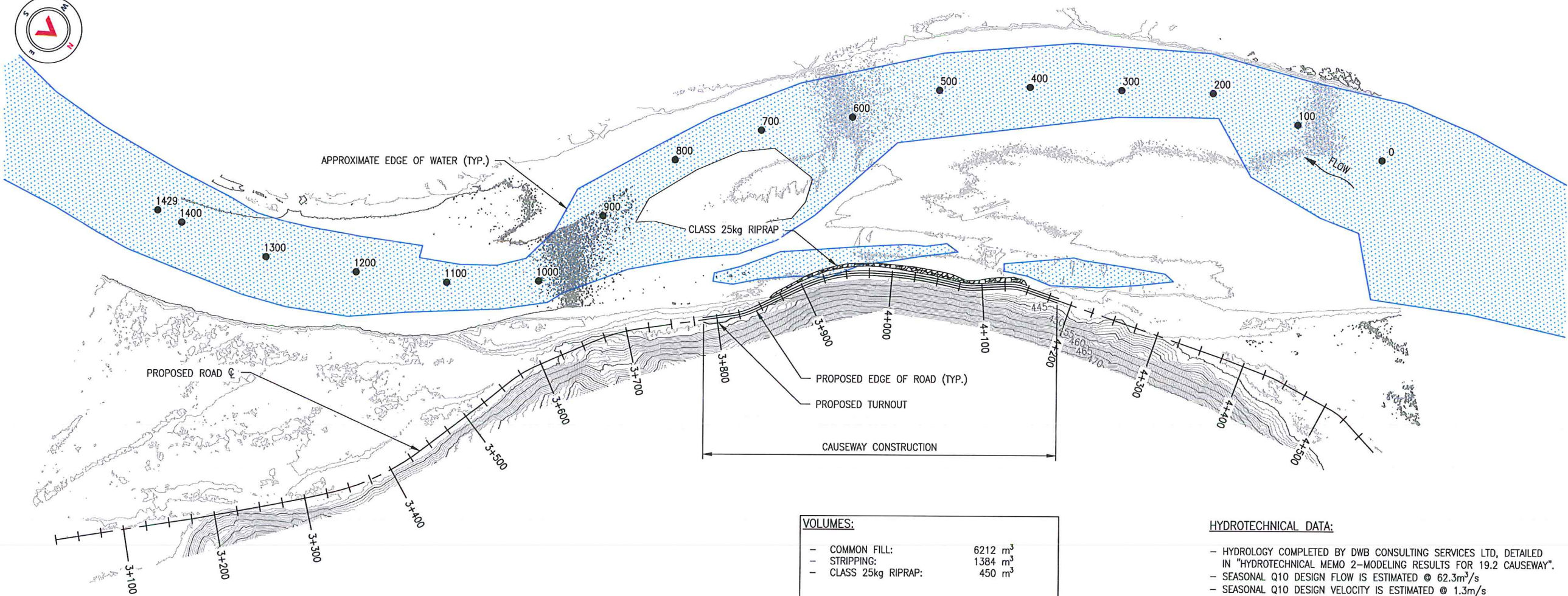
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ISSUE DATE: 20/04/14

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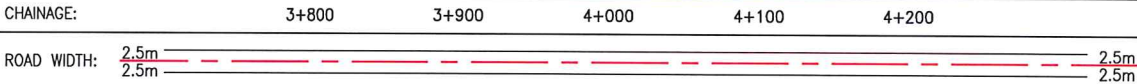
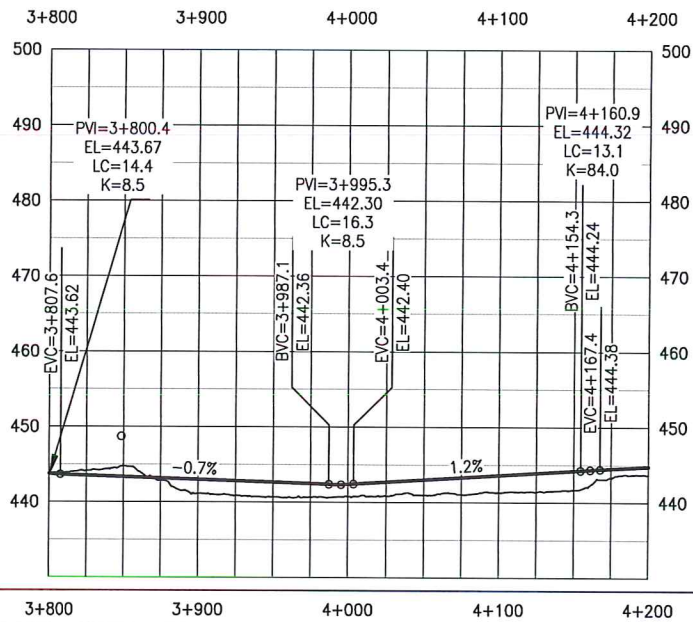
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VOLUMES:	
- COMMON FILL:	6212 m ³
- STRIPPING:	1384 m ³
- CLASS 25kg RIPRAP:	450 m ³

- 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.



REFERENCE DRAWINGS		
DRAWING NO	DRAWING DESCRIPTION/TITLE	REF
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- NOTES:**
1. HORIZONTAL ALIGNMENT TO BE FIELD FIT TO BE ADJACENT TO THE EXISTING RIVER BANK.



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1	20/03/16	GENERAL REVISIONS	EEG	DDW
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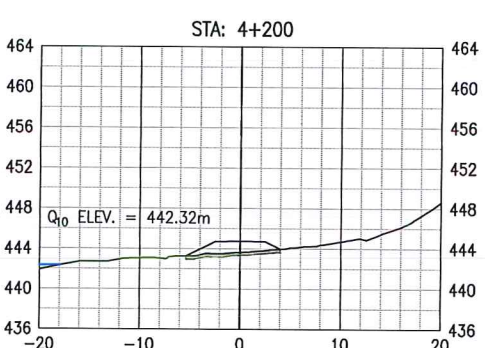
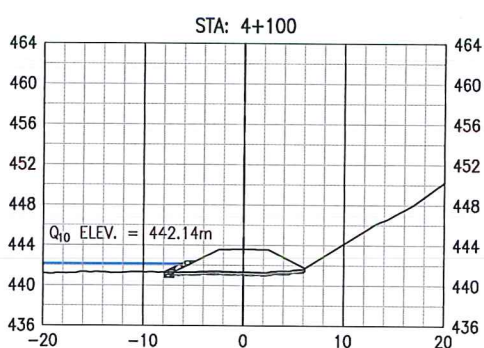
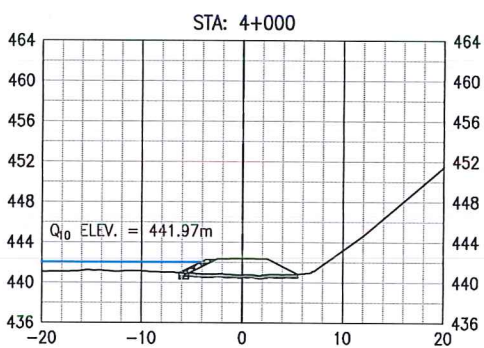
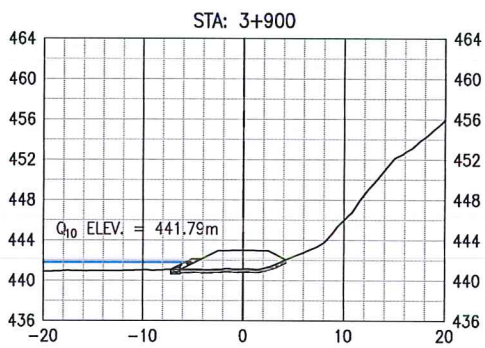
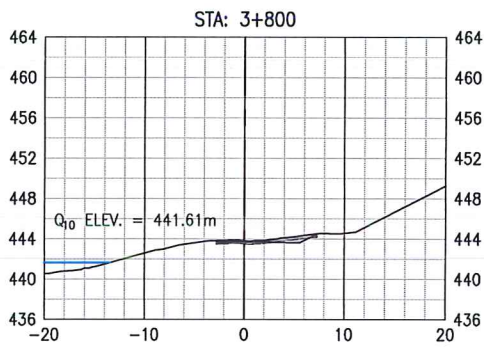


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**HALFWAY RIVER
19.2 CAUSEWAY ROAD**

**OPTION 1: LOW FLOW
CROSSING
PLAN AND PROFILE DRAWING**

DWG NO:	17PG0123-3000-1920-002	REV:	2
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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD

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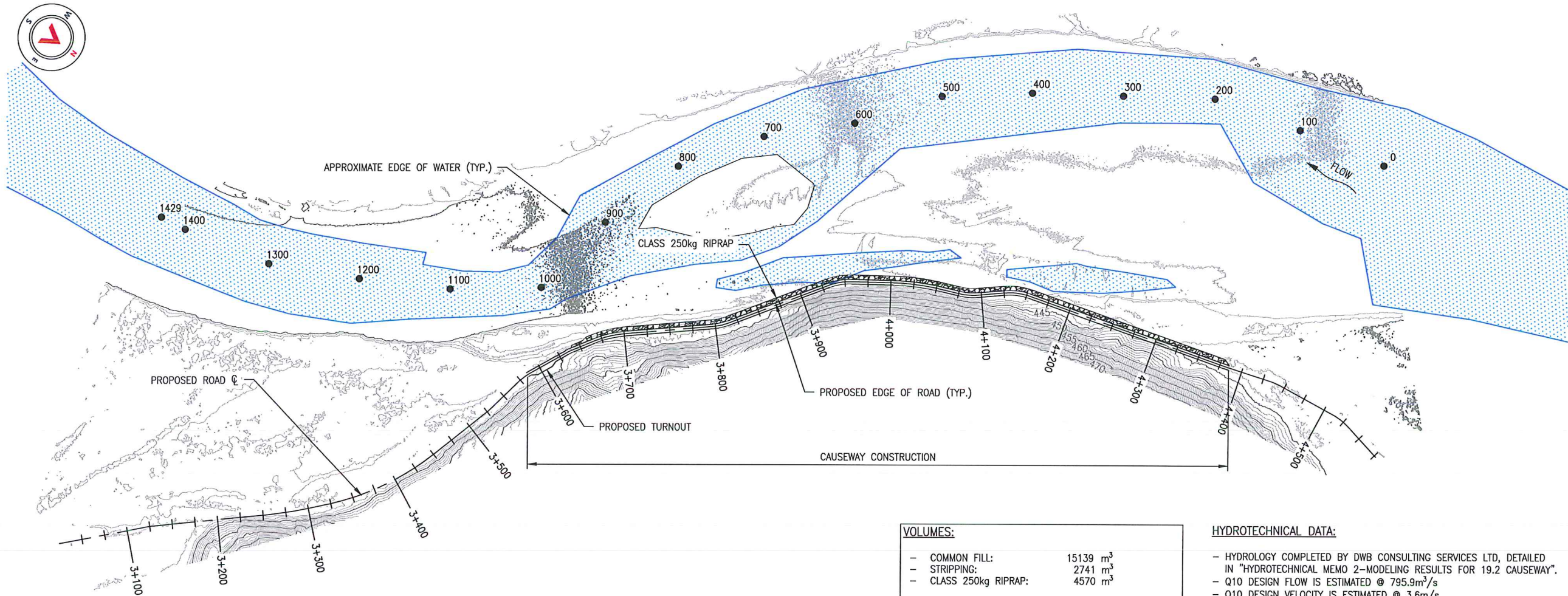
HALFWAY RIVER
19.2 CAUSEWAY ROAD

TITLE:

OPTION 1: LOW FLOW
CROSSING SECTIONS

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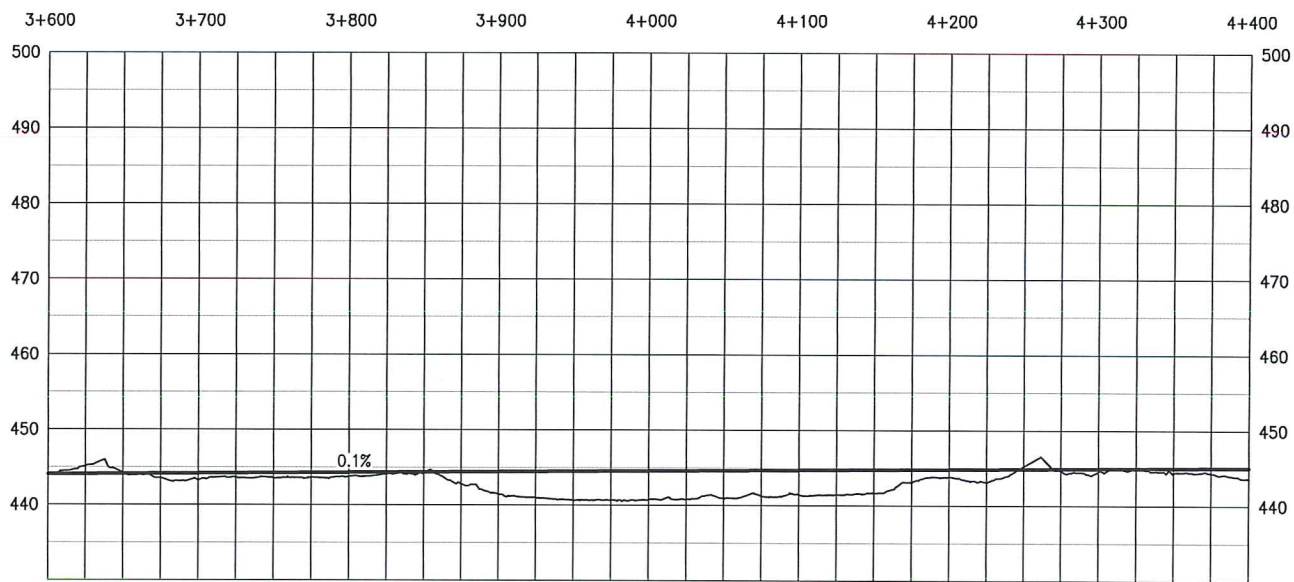


VOLUMES:

- COMMON FILL: 15139 m³
- STRIPPING: 2741 m³
- CLASS 250kg RIPRAP: 4570 m³

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



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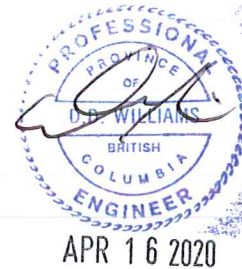
2.5m

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NOTES:

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



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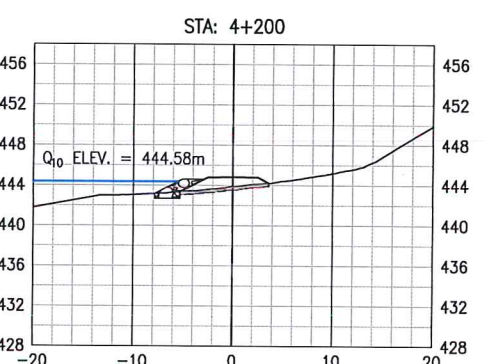
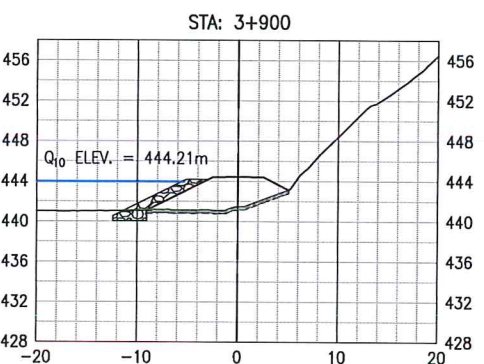
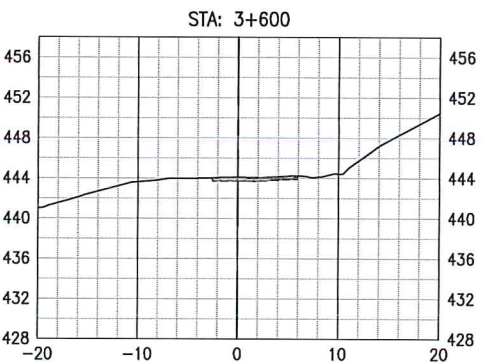
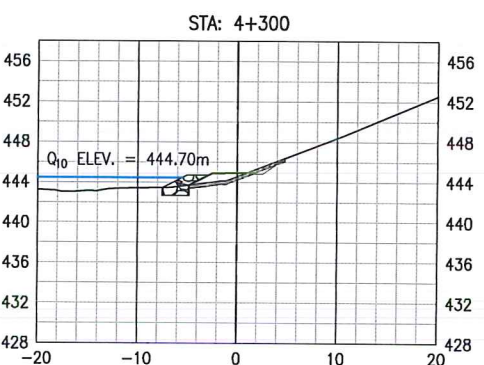
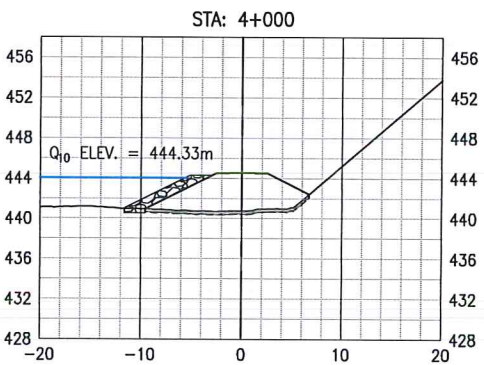
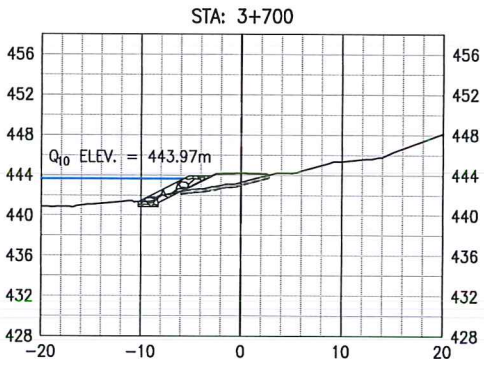
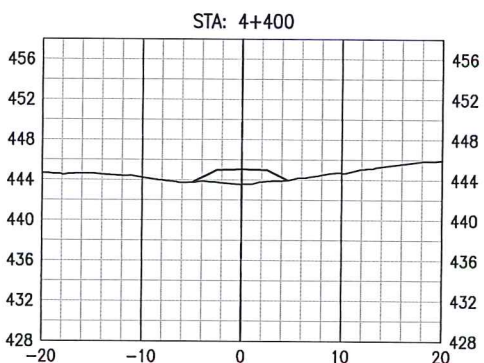
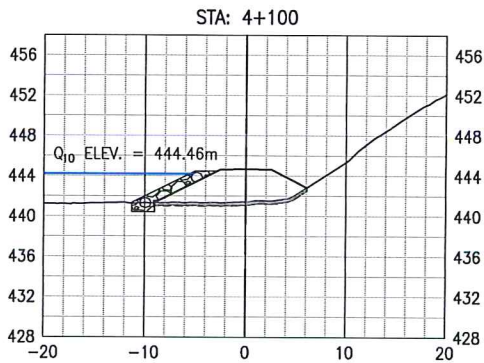
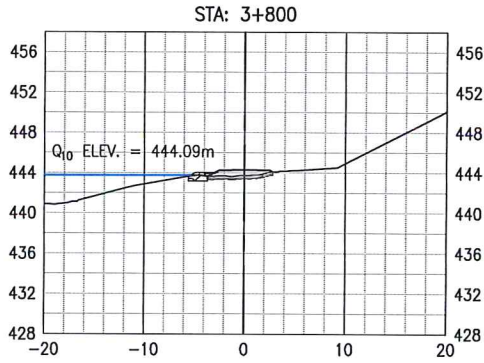
**HALFWAY RIVER
19.2 CAUSEWAY ROAD**

TITLE:

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

DWG NO:
17PG0123-3000-1920-004

REV:
2



REFERENCE DRAWINGS		
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PROJECT:

HALFWAY RIVER
19.2 CAUSEWAY ROAD

TITLE:

OPTION 2: HIGH FLOW
CROSSING SECTIONS

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