



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

Our file: **2020-501875**
Registry number: **931**

JULY 02, 2020

BC HYDRO
333 DUNSMUIR STREET
VANCOUVER, BC V6B 5R3

Attention : James Thomas

RE: Approval under the *Canadian Navigable Waters Act (CNWA)*, for the construction, of the following work(s) below located at Peace River, at approximately 56.20654 N x -121.47610 W, on unsurveyed Crown foreshore or land covered by water between and within the high water boundary being part of the bed of the Peace River and the Peace River lying within those portions of parcel A (J26233) of the West 1/2 of the West 1/2 of Section 19, Township 83, Range 22, West of the 6th Meridian Peace River District as shown on plan 26887, except plan 33505 and unsurveyed (theoretical) Crown land of the remainder South West 1/4 Section 19, Township 83, Range 22, West of the 6th Meridian Peace River District, in the Province of British Columbia.

Approved work(s):

- Causeway - Road

Please find enclosed an approval for the above-noted work issued by the Minister of Transport under subsection 7(6) of the CNWA. This approval replaces any previous approvals that have been issued in relation to this work (if any) and will be the sole approval for this work until such time as a new approval is issued for any future changes.

In order to issue this approval, the Minister has considered each of the factors listed in subsection 7(7) of the Act, additional information provided by you (if applicable) and any adverse effects that the decision to approve the work may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*.

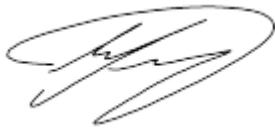
Please note that the CNWA, amongst other obligations, requires the owner to immediately notify the Minister if the work causes or is likely to cause serious and imminent danger to navigation, to take reasonable measures to mitigate potential dangers and to remedy any adverse effects that result from that danger to navigation.

This approval relates only to the interference of your work with navigation under the CNWA and does not grant any rights related to the ownership of the bed of the navigable water.

Please note that it is the owner's responsibility to comply with any other applicable laws and regulations.

Should you have any questions, please do not hesitate to contact our office in Pacific by phone at 604-775-8867 or by e-mail at NPPAC-PPNPAC@tc.gc.ca.

Respectfully,

A handwritten signature in black ink, appearing to be 'Eric Leung', enclosed within a large, loopy oval shape.

Eric Leung
NPP Officer
Programs Group
Transport Canada
Pacific Region

EL/ka

Attachment(s): **7(6) Approval Document, Reviewed Drawings**



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

Our file: **2020-501875**
Registry number: **931**

APPROVAL

OWNER: BC HYDRO
333 DUNSMUIR Street
VANCOUVER, BC V6B 5R3

WORK(S): Causeway - Road

SITE LOCATION: Located at approximately 56.20654 N x -121.47610 W, Peace River, on unsurveyed Crown foreshore or land covered by water between and within the high water boundary being part of the bed of the Peace River and the Peace River lying within those portions of parcel A (J26233) of the West 1/2 of the West 1/2 of Section 19, Township 83, Range 22, West of the 6th Meridian Peace River District as shown on plan 26887, except plan 33505 and unsurveyed (theoretical) Crown land of the remainder South West 1/4 Section 19, Township 83, Range 22, West of the 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 four plan(s), 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. The NPA Approval and its Terms and Conditions shall be posted at an easily accessible place at the worksite, and be provided to the contractor conducting the work.
3. In the event that the construction or the operation of the above works is terminated, it will be the proponent's responsibility to remove the works and associated equipment in its entirety including any anchors and pilings. The banks and bed of the waterway disturbed by the works are to be contoured to match the local conditions.
4. Construction equipment used in conjunction with this project shall be stored in such a manner that it does not obstruct navigation.
5. Upon completion of causeways, install and maintain warning signs at the confluence of the side channel and the main channel of the Peace River, approximately 1500m upstream and downstream of crossing 18.1-B, advising of the obstruction of the side channel and include an arrow indicating the direction of the main channel. Signs shall be a minimum of 72" x 48", a white background with black lettering, and the size of the text shall be at least 15cm tall with the word



“WARNING” at 1.5 times the size of the message text:

WARNING
OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL



WARNING
OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL

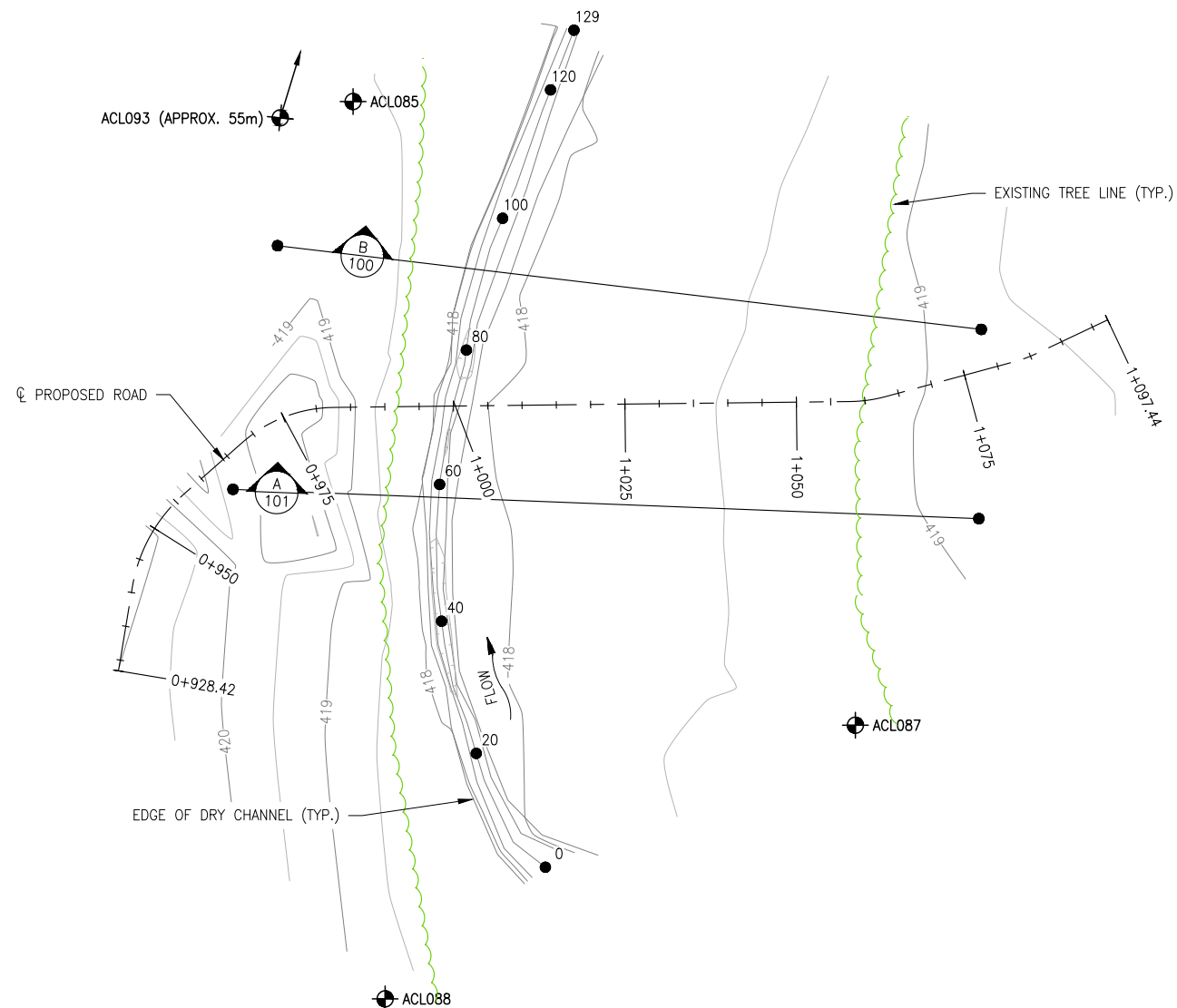


6. During construction, the outermost extent of each causeway above the surface shall be marked with orange Hi-visibility markers on the upstream and downstream corners.
7. Any construction equipment or machinery left in the water during periods of darkness or limited visibility shall be marked with a yellow flashing light visible to upstream and downstream traffic.
8. The upstream and downstream edges of the causeways shall be marked with orange Hi-visibility markers, evenly spaced every 20m on both the upstream and downstream sides, until the causeways are submerged due to inundation.
9. Prior to the causeways being submerged due to inundation, yellow buoys shall be placed and maintained at the location of each causeway. The buoys shall remain in place until the water elevation at each causeway location reaches a minimum of 5m above than the highest elevation of each causeway. Buoys are to be no more than 20 metres apart and no less than 0.6 metres in diameter. Horizontal bands of yellow reflective tape, not less than 10 cm in width and 15 cm in length, shall be either placed at intervals around the horizontal circumference of the buoys or displayed from suitable topmarks that are visible from all directions.

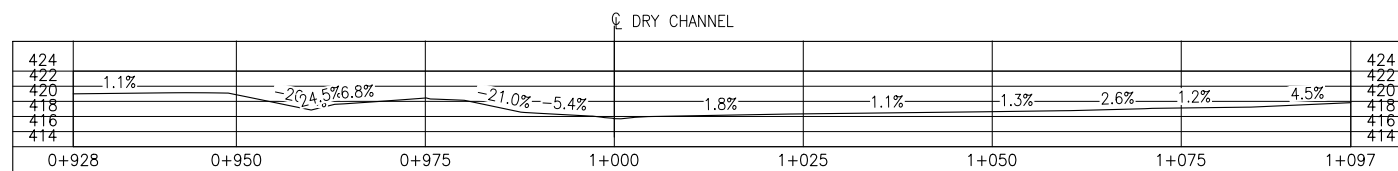
SIGNED on July 3, 2020 at the NPP regional office of Pacific

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

EL/ka



SITE PLAN
SCALE: 1:1000



GROUND PROFILE ALONG PROPOSED ROAD CENTRELINE
SCALE: 1:1000

SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL087	6230045.973	594573.909	419.013
ACL085	6230154.651	594531.243	419.012
ACL088	6230028.413	594496.559	419.059
ACL086	6230201.798	594549.349	419.048

SITE/SURVEY NOTES:

1. SITE SURVEY WAS COMPLETED ON: 2018/09/30
2. SURVEY DATA IS BASED ON A LOCALLY ESTABLISHED DATUM.
3. SITE SURVEYOR: JESSE DAVIDSON
4. SURVEYOR ASST: GURLAL BRAR
5. UTM. (10) COORDINATES: N6230103.672 E594540.255

Reviewed/Examiné

Date : **2020-06-24**

By/par: **YOUR NAME**

2020-501875 1 of 4

Navigation Protection Program/
Programme de protection de la navigation

ISSUED FOR REVIEW
NOT FOR
CONSTRUCTION

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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
A	20/02/12	ISSUED FOR REVIEW	SN	GDF



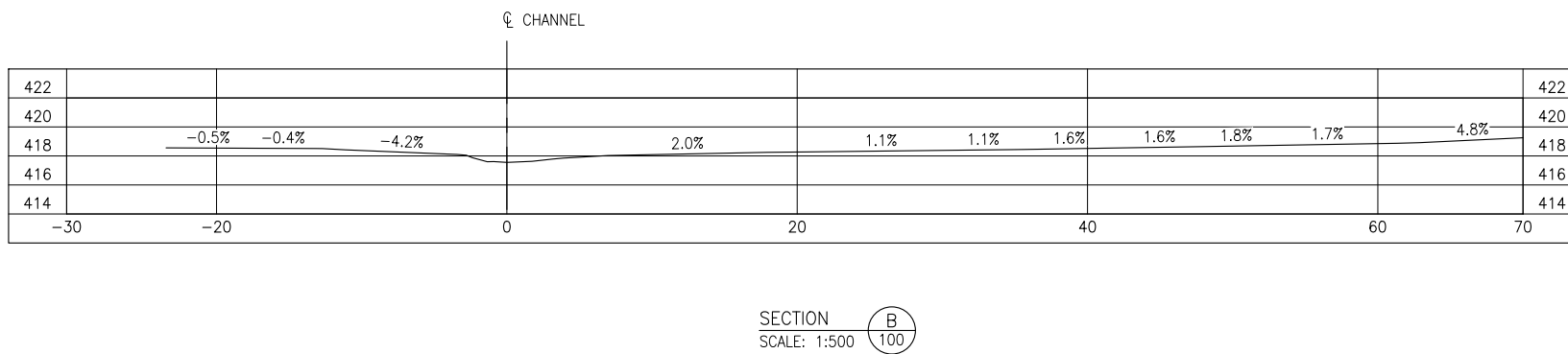
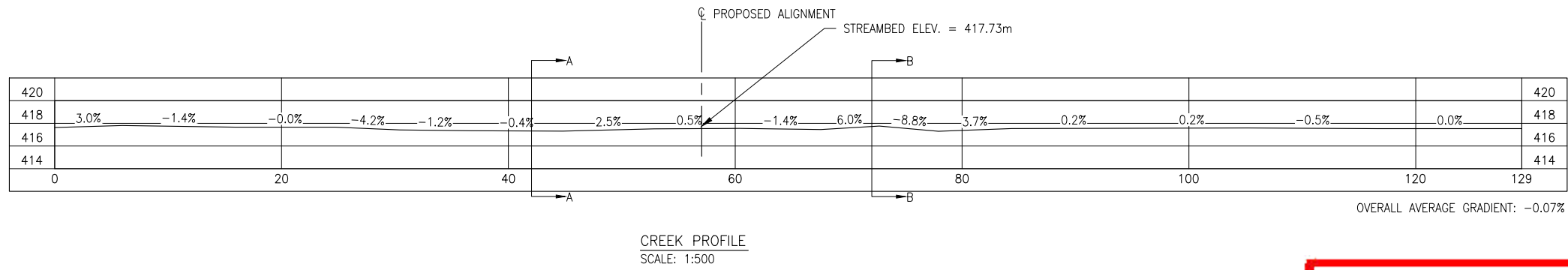
CLIENT NO:	-	DRWN:	SN	DATE:	20/02/05
PROJECT NO:	17PG0123	DSGN:	GDF	DATE:	20/02/06
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

**SITE-C
MIDDLE RESERVOIR
18.1-A**

TITLE:
SITE PLAN AND PROFILE

DWG NO:	17PG0123-900-1960-100	REV:	A
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Date: 2020/02/14 8:42 AM | User: Stefanie Noack | File: P:\PG\2017\1001\17PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1011-Civil\01-Production\Site C-18.1-A\17PG0123-900-1960-101-18.1-A.SP | Layout: 101 | Paper Size: 568.8mm x 431.8mm





Reviewed/Examiné

Date : **2020-06-24**

By/par: 
YOUR NAME

2020-501875 2 of 4

Navigation Protection Program /
Programme de protection de la navigation

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		DESCRIPTION	DRWN	APVD

CLIENT: 



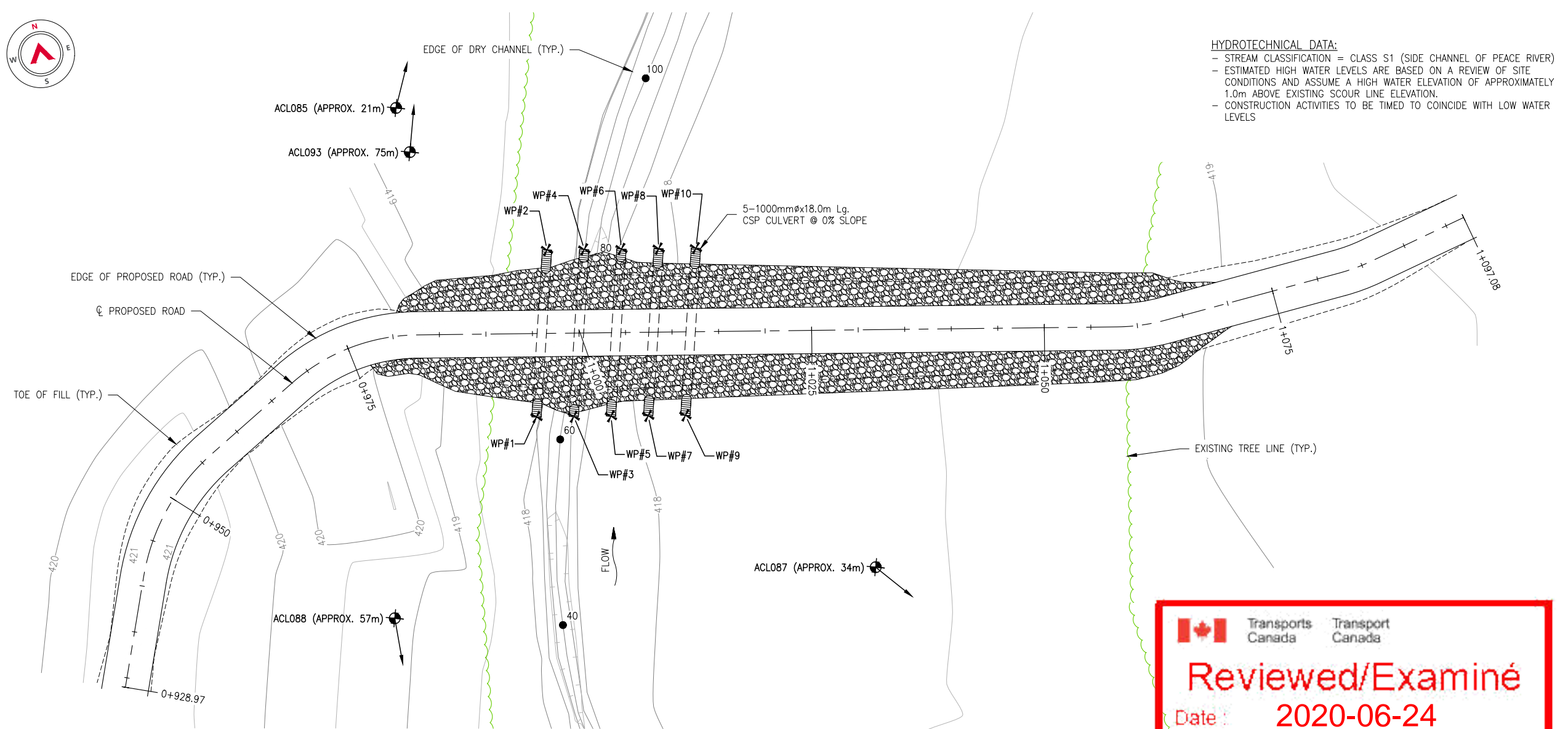
CLIENT NO:	DRWN:	SN	DATE:	20/02/05	
PROJECT NO:	17PG0123	DSGN:	GDF	DATE:	20/02/06
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

**SITE-C
MIDDLE RESERVOIR
18.1-A**

TITLE:
PROFILE AND SECTIONS

DWG NO:	REV:
17PG0123-900-1960-101	A

Date: 2020/02/14 8:42 AM | User: Stefanie Noack | File: P:\PG\2017\1001\17PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1011-Civil\01-Production\Site C-181-1A\17PG0123-900-1960-001 18.1-A.GA | Layout: 102 | Paper Size: 558.8mm x 431.8mm



HYDROTECHNICAL DATA:
 - STREAM CLASSIFICATION = CLASS S1 (SIDE CHANNEL OF PEACE RIVER)
 - ESTIMATED HIGH WATER LEVELS ARE BASED ON A REVIEW OF SITE CONDITIONS AND ASSUME A HIGH WATER ELEVATION OF APPROXIMATELY 1.0m ABOVE EXISTING SCOUR LINE ELEVATION.
 - CONSTRUCTION ACTIVITIES TO BE TIMED TO COINCIDE WITH LOW WATER LEVELS

- 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.
 - RIPRAP HAS NOT BEEN SIZED FOR HIGH FLOW AND MAY REQUIRE MAINTENANCE AFTER HIGH FLOW EVENTS.

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**SITE-C
MIDDLE RESERVOIR
18.1-A**

**CAUSEWAY OPTION
GENERAL ARRANGEMENT**

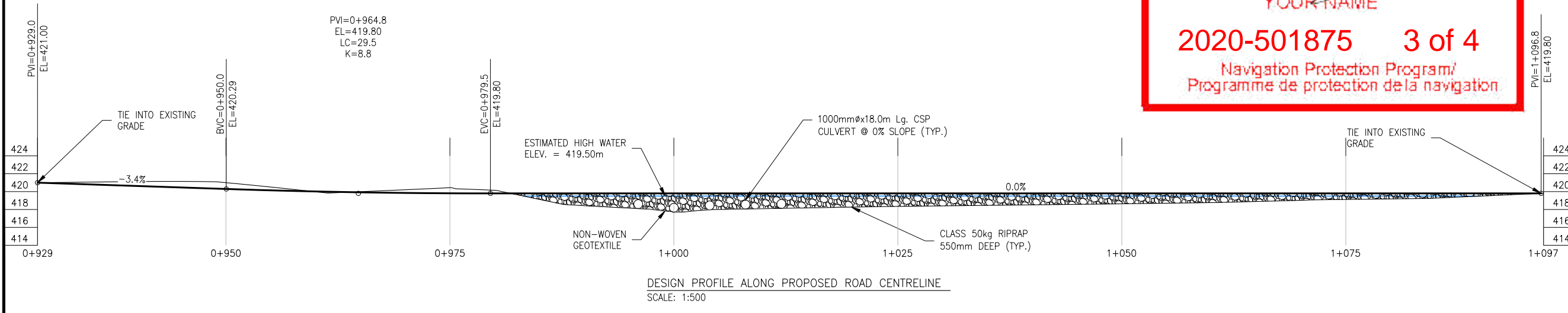
DWG NO: **17PG0123-900-1960-102** REV: **A**

Reviewed/Examiné
 Date: **2020-06-24**

By/par:
 YOUR NAME

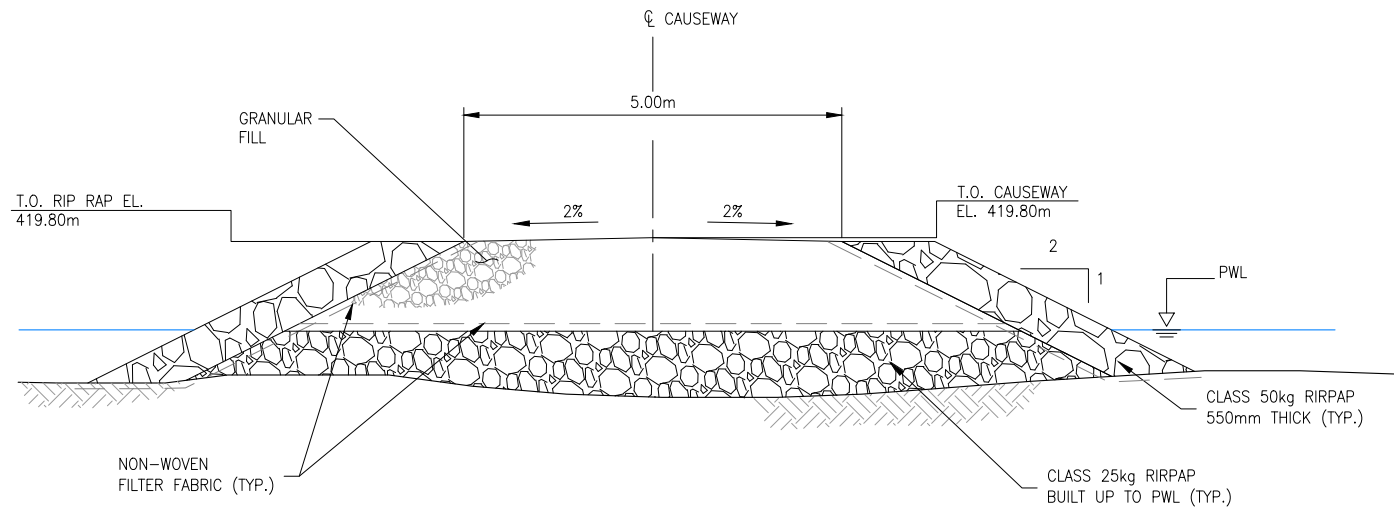
2020-501875 3 of 4
 Navigation Protection Program/
 Programme de protection de la navigation

GENERAL ARRANGEMENT
SCALE: 1:500



DESIGN PROFILE ALONG PROPOSED ROAD CENTRELINE
SCALE: 1:500

Date: 2020/02/14 8:42 AM | User: Stefanie Noack | File: P:\PG\2017\10017PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1011-Civil\01-Production\Site C-18.1-A\17PG0123-900-1960-001 18.1-A GA | Layout: 103 | Paper Size: 558.8mm x 431.8mm



TYPICAL CAUSEWAY SECTION
SCALE: 1:100

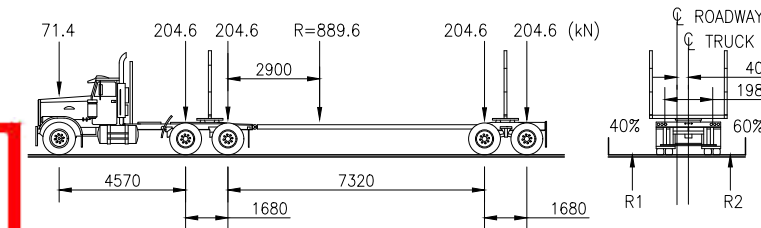
SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
WP#1	6230100.660	594524.861	418.097
WP#2	6230117.463	594531.313	418.097
WP#3	6230099.507	594528.691	417.692
WP#4	6230116.311	594535.144	417.692
WP#5	6230098.354	594532.522	417.960
WP#6	6230115.158	594538.974	417.960
WP#7	6230097.201	594536.352	418.052
WP#8	6230114.005	594542.804	418.052
WP#9	6230096.048	594540.182	418.124
WP#10	6230112.852	594546.634	418.124
ACL088	6230028.413	594496.559	419.059
ACL085	6230154.651	594531.243	419.012
ACL087	6230045.973	594573.909	419.013
ACL086	6230201.798	594549.349	419.048

NOTES:

- BACK FILL OF APPROACHES SHALL GENERALLY CONFORM TO THE LINES SHOWN ON THE DRAWINGS AND SHALL BE PLACED IN LIFTS NOT EXCEEDING 305mm THICK, COMPACTED TO 95% STANDARD PROCTOR DENSITY USING A MINIMUM 1000lbs VIBRATORY PLATE COMPACTOR. MATERIAL SHALL BE CLEAN, FREE DRAINING, WELL GRADED GRANULAR FILL OF 75mm MAXIMUM SIZE.
- NON-WOVEN FILTER FABRIC TO BE PLACED OVER EXCAVATION TO HAVE A MINIMUM MULLEN BURST STRENGTH OF 2500kPa
- ALL EXPOSED MINERAL SOILS TO BE SEEDING USING AN APPROVED RECLAMATION GRASS SEED MIXTURE AND COVERED WITH AN APPROVED EROSION CONTROL BLANKET.
- THE CONTRACTOR IS TO CONTACT THE ENGINEER PRIOR TO PLACING FOUNDATIONS. FOUNDATIONS PLACEMENT SHALL BE SUPERVISED BY THE ENGINEER TO CONFIRM BEARING REQUIREMENTS.
- ALL PERMITS AND REGULATORY APPROVALS TO BE IN PLACE PRIOR TO COMMENCING WORK.
- ENVIRONMENTAL MANAGEMENT PLAN TO BE PREPARED FOR PROJECT BY OTHERS. COMPLETION OF WORKS TO COMPLY WITH MITIGATION RECOMMENDATIONS OUTLINED IN ENVIRONMENTAL MANAGEMENT PLAN.
- NO SITE SPECIFIC GEOTECHNICAL INVESTIGATION HAS BEEN COMPLETED AS PART OF ALLNORTH CONSULTANTS LIMITED SCOPE OF WORK. THEREFORE, THIS DESIGN HAS BEEN PREPARED WITHOUT THE BENEFIT OF A SITE SPECIFIC GEOTECHNICAL FIELD INVESTIGATION OR GEOTECHNICAL ADVICE. GROUND CONDITIONS MAY VARY AND THE FOUNDATION REQUIREMENTS AND BRIDGE CONCEPT MAY NEED TO BE MODIFIED TO ACCOMMODATE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION. ALLNORTH CONSULTANTS LIMITED ACCEPTS NO RESPONSIBILITY FOR ADDITIONAL COSTS OR DELAYS THAT MAY RESULT IF THE GROUND CONDITIONS VARY FROM THOSE ASSUMED IN THE DESIGN. THE DESIGN ENGINEER SHALL BE CONTACTED IF FIELD CONDITIONS VARY FROM THE DESIGN ASSUMPTIONS SHOWN ON THE DRAWINGS OR IN THE CONSTRUCTION SPECIFICATIONS. INSTALLATIONS OF FOUNDATIONS SHALL BE SUPERVISED BY THE DESIGN ENGINEER OR THEIR REPRESENTATIVE.
- WHERE EXCAVATION SPECIFICATIONS ON THESE DRAWINGS CONFLICT WITH WORKSAFE BC (WSBC) REGULATIONS, WSBC REGULATIONS ARE TO GOVERN.
- 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:



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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD

CLIENT:

CLIENT NO:	-	DRWN:	SN	DATE:	20/02/05
PROJECT NO:	17PG0123	DSGN:	GDF	DATE:	20/02/06
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

PROJECT:
**SITE-C
MIDDLE RESERVOIR
18.1-A**

TITLE:
**CAUSEWAY OPTION
PROFILE AND NOTES**

DWG NO:	17PG0123-900-1960-103	REV:	A
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Reviewed/Examiné
Date: **2020-06-24**

By/par:
YOUR NAME

2020-501875 4 of 4
Navigation Protection Program/
Programme de protection de la navigation



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

Our file: **2020-501876**
Registry number: **940**

JULY 02, 2020

BC HYDRO
333 DUNSMUIR STREET
VANCOUVER, BC V6B 5R3

Attention : James Thomas

RE: Approval under the *Canadian Navigable Waters Act (CNWA)*, for construction of the following work(s) below located at Peace River, at approximately 56.20048 N – -121.48903 W, on unsurveyed Crown foreshore or land covered by water being part of the bed of the Peace River and the Peace River lying within the North East 1/4 Section 13 Township, 83 Range, 23 West of the 6th Meridian Peace River District, and unsurveyed (theoretical) Crown land islands within Section 13, Township 83, Range 23 West of The 6th Meridian Peace River District, in the Province of British Columbia.

Approved work(s):

- Causeway - Road

Please find enclosed an approval for the above-noted work issued by the Minister of Transport under subsection 7(6) of the CNWA. This approval replaces any previous approvals that have been issued in relation to this work (if any) and will be the sole approval for this work until such time as a new approval is issued for any future changes.

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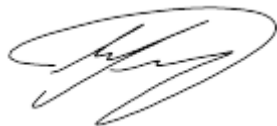
Please note that the CNWA, amongst other obligations, requires the owner to immediately notify the Minister if the work causes or is likely to cause serious and imminent danger to navigation, to take reasonable measures to mitigate potential dangers and to remedy any adverse effects that result from that danger to navigation.

This approval relates only to the interference of your work with navigation under the CNWA and does not grant any rights related to the ownership of the bed of the navigable water.

Please note that it is the owner's responsibility to comply with any other applicable laws and regulations.

Should you have any questions, please do not hesitate to contact our office in Pacific by phone at 604-775-8867 or by e-mail at NPPPAC-PPNPAC@tc.gc.ca.

Respectfully,

A handwritten signature in black ink, appearing to read 'Eric Leung', enclosed within a large, loopy oval shape.

Eric Leung
NPP Officer
Programs Group
Transport Canada
Pacific Region

EL/ka

Attachment(s): **7(6) Approval Document, Reviewed Drawings**



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

Our file: **2020-501876**
Registry number: **940**

APPROVAL

OWNER: BC HYDRO
333 DUNSMUIR STREET
VANCOUVER, BC V6B 5R3

WORK(S): Causeway - Road

SITE LOCATION: Located at approximately 56.20048 N x -121.48903 W, Peace River, on unsurveyed Crown foreshore or land covered by water being part of the bed of the Peace River and the Peace River lying within the North East 1/4 Section 13, Township 83, Range 23, West of the 6th Meridian Peace River District, and unsurveyed (theoretical) Crown land Islands within Section 13, Township 83, Range 23, West of the 6th Meridian Peace River District, in the Province of British Columbia.

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2. The NPA Approval and its Terms and Conditions shall be posted at an easily accessible place at the worksite, and be provided to the contractor conducting the work.
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“WARNING” at 1.5 times the size of the message text:

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OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL



WARNING
OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL



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7. Any construction equipment or machinery left in the water during periods of darkness or limited visibility shall be marked with a yellow flashing light visible to upstream and downstream traffic.
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SIGNED on July 3, 2020 at the NPP regional office of Pacific

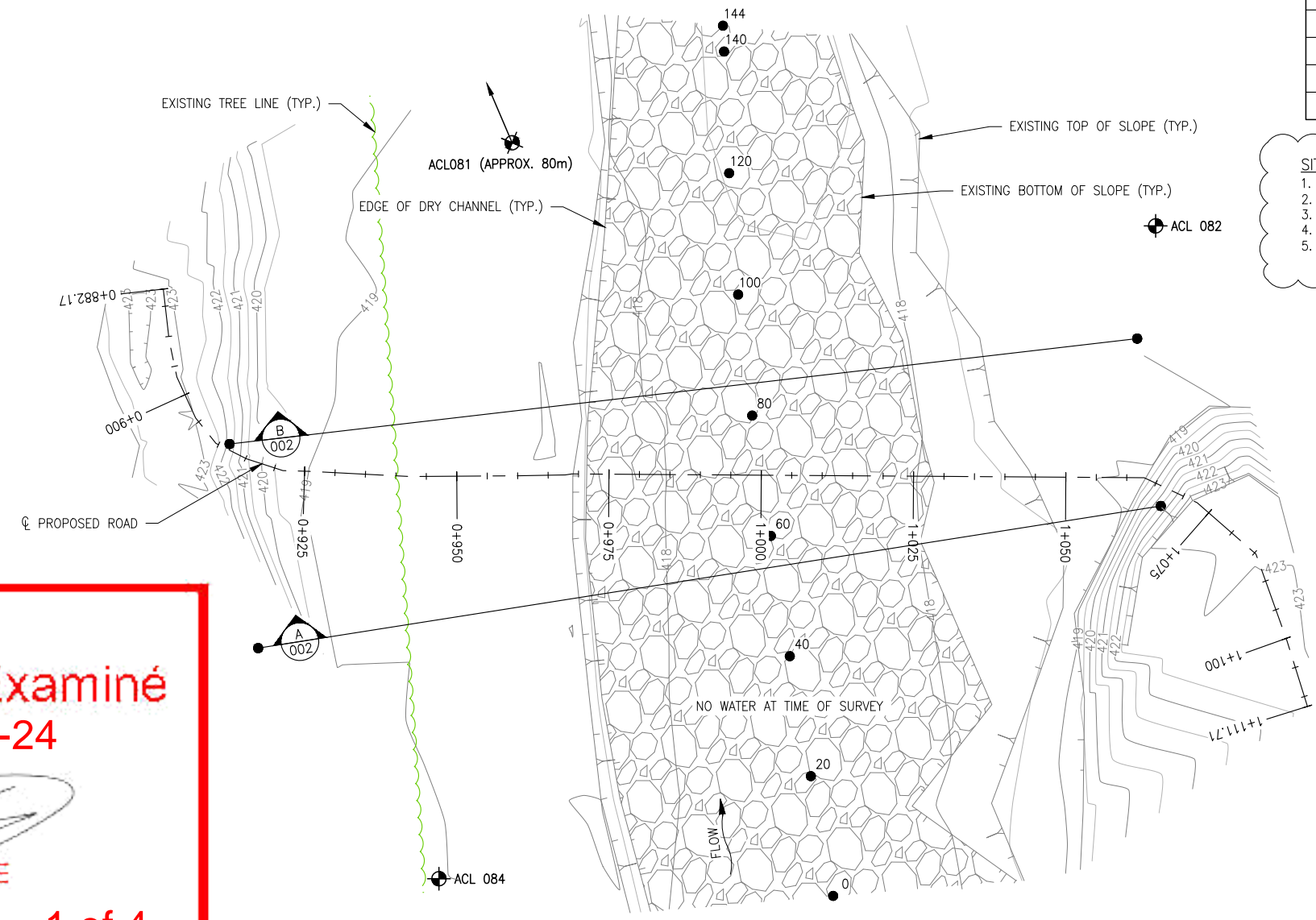
Eric Leung
NPP Officer
Programs Group
Transport Canada
Pacific Region
For the Minister of Transport

EL/ka

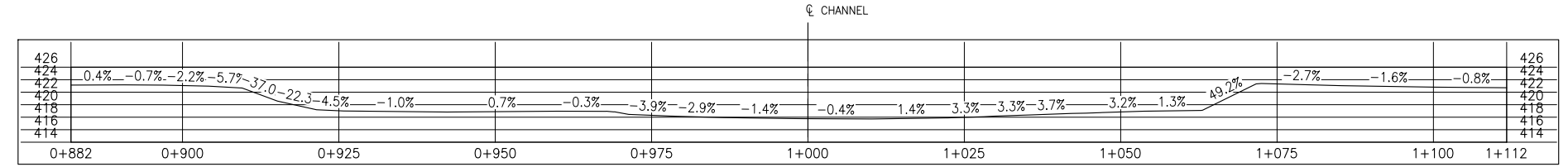


SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 081	6229540.789	593820.049	419.735
ACL 082	6229381.390	593812.321	419.399
ACL 083	6229323.049	593696.432	419.948
ACL 084	6229425.028	593659.249	419.468

SITE/SURVEY NOTES:
 1. SITE SURVEY WAS COMPLETED ON: 2018/09/30
 2. SURVEY DATA IS BASED ON A GLOBALLY ESTABLISHED DATUM.
 3. SITE SURVEYOR: JESSE DAVIDSON
 4. SURVEYOR ASST: GURLAL BRAR
 5. UTM. (10) COORDINATES: N6230103 E594540



SITE PLAN
SCALE: 1:1000



GROUND PROFILE ALONG PROPOSED ROAD CENTRELIN
SCALE: 1:1000

Reviewed/Examiné
 Date: **2020-06-24**
 By/par:
 YOUR NAME
2020-501876 1 of 4
 Navigation Protection Program/
 Programme de protection de la navigation

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NOT FOR
CONSTRUCTION

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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
B	20/02/12	ISSUED FOR REVIEW	SN	GDF
A	19/04/04	ISSUED FOR REVIEW	GSB	GDF



CLIENT NO:	DRWN: DMM	DATE: 19/03/25
PROJECT NO: 17PG0123	DSGN: JDS	DATE: 19/03/25
DRAWING SIZE: ANSI "B"	CHKD: DDW	DATE: 20/02/11
SCALE: AS NOTED	APVD: GDF	DATE: 20/02/12

**SITE-C
MIDDLE RESERVOIR
18.1-B**

TITLE:
SITE PLAN AND PROFILE

DWG NO: **17PG0123-1000-1960-001** REV: **B**

Date: 2020/02/14 8:45 AM | User: Stefanie Noack | File: P:\PG\2017\1001\17PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1011-Civil\01-Production\Site C-18.1-B\17PG0123-1000-1960-001-18.1-B-SP | Layout: 002 | Paper Size: 558.8mm x 431.8mm



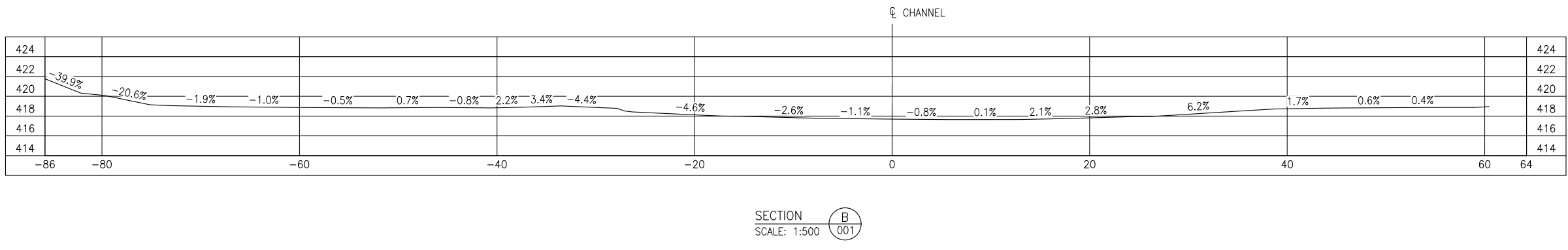
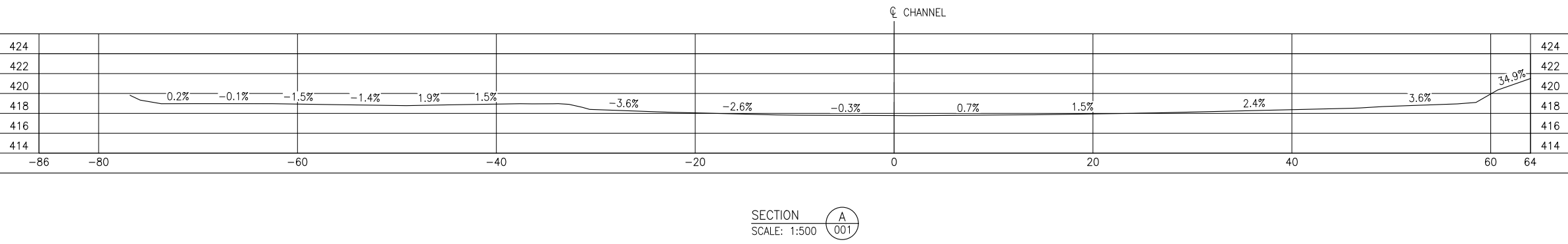
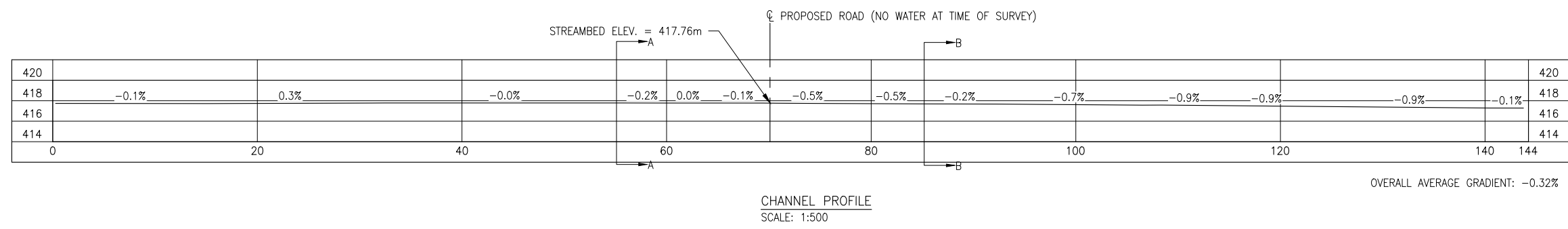
Reviewed/Examiné

Date: **2020-06-24**

By/par: 
YOUR NAME

2020-501876 2 of 4

Navigation Protection Program/
Programme de protection de la navigation



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B	20/02/12	ISSUED FOR REVIEW	SN	GDF
A	19/04/04	ISSUED FOR REVIEW	GSB	GDF

CLIENT:



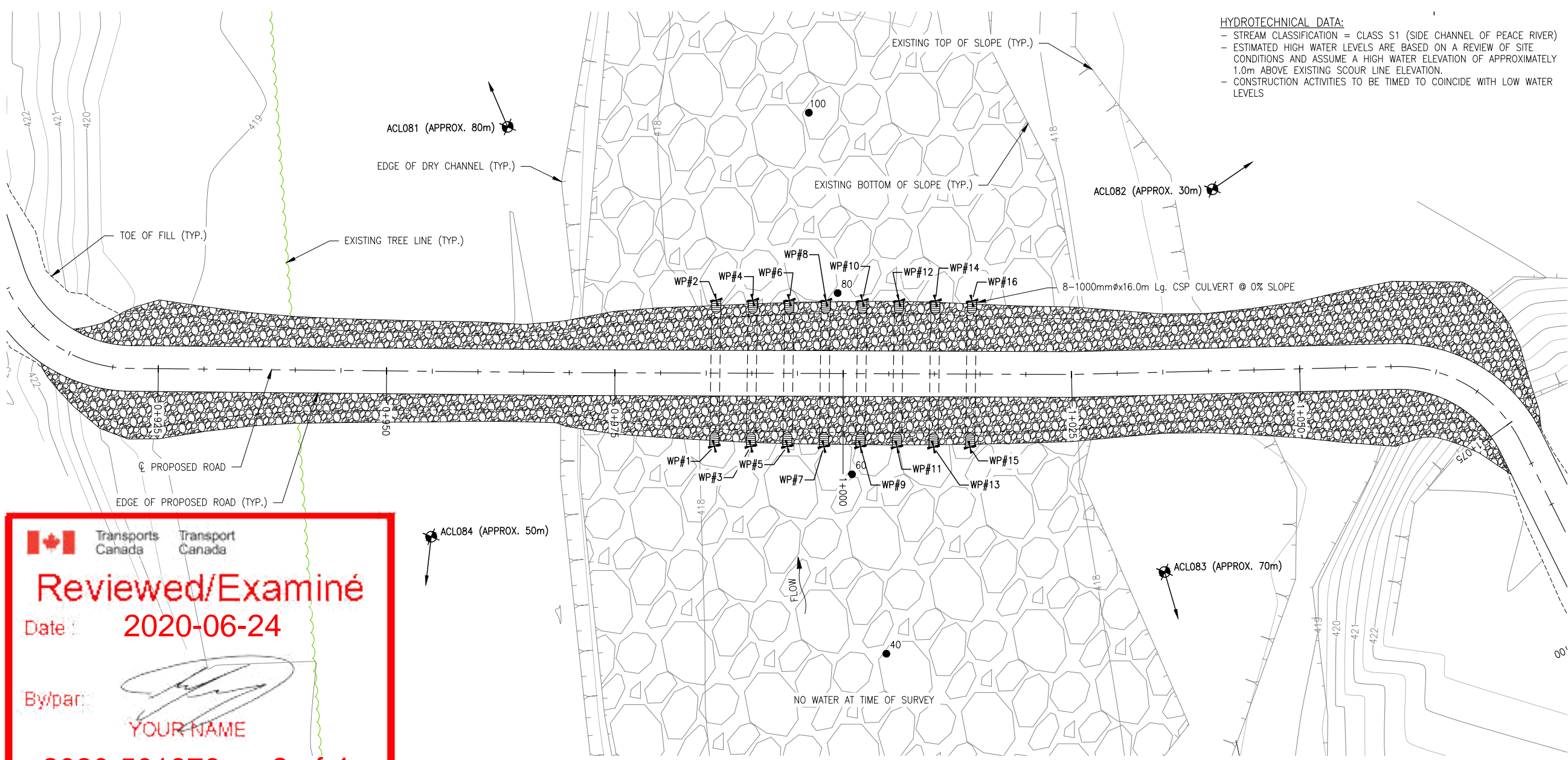
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PROJECT NO:	17PG0123	DSGN:	JDS	DATE:	19/03/25
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

PROJECT:
**SITE-C
MIDDLE RESERVOIR
18.1-B**

TITLE:
PROFILE AND SECTIONS

DWG NO: **17PG0123-1000-1960-002** REV: **B**

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HYDROTECHNICAL DATA:
 - STREAM CLASSIFICATION = CLASS S1 (SIDE CHANNEL OF PEACE RIVER)
 - ESTIMATED HIGH WATER LEVELS ARE BASED ON A REVIEW OF SITE CONDITIONS AND ASSUME A HIGH WATER ELEVATION OF APPROXIMATELY 1.0m ABOVE EXISTING SCOUR LINE ELEVATION.
 - CONSTRUCTION ACTIVITIES TO BE TIMED TO COINCIDE WITH LOW WATER LEVELS

- 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.
 - RIPRAP HAS NOT BEEN SIZED FOR HIGH FLOW AND MAY REQUIRE MAINTENANCE AFTER HIGH FLOW EVENTS.



Reviewed/Examiné

Date : 2020-06-24

By/par: 
YOUR NAME

2020-501876 3 of 4

Navigation Protection Program/
Programme de protection de la navigation

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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
B	20/02/12	ISSUED FOR REVIEW	SN	GDF
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CLIENT NO:	DRWN: DMM	DATE: 19/03/25
PROJECT NO: 17PG0123	DSGN: JDS	DATE: 19/03/25
DRAWING SIZE: ANSI "B"	CHKD: DDW	DATE: 20/02/11
SCALE: AS NOTED	APVD: GDF	DATE: 20/02/12

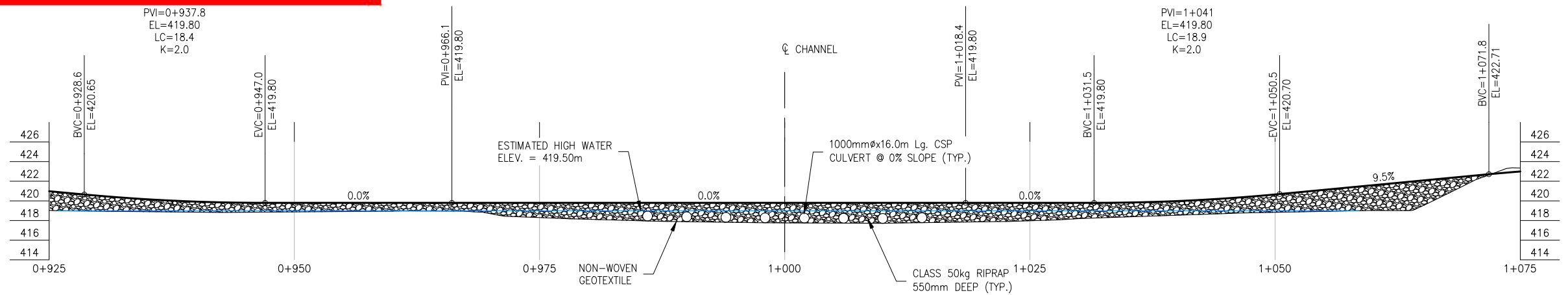
PROJECT:

SITE-C
MIDDLE RESERVOIR
18.1-B

TITLE:

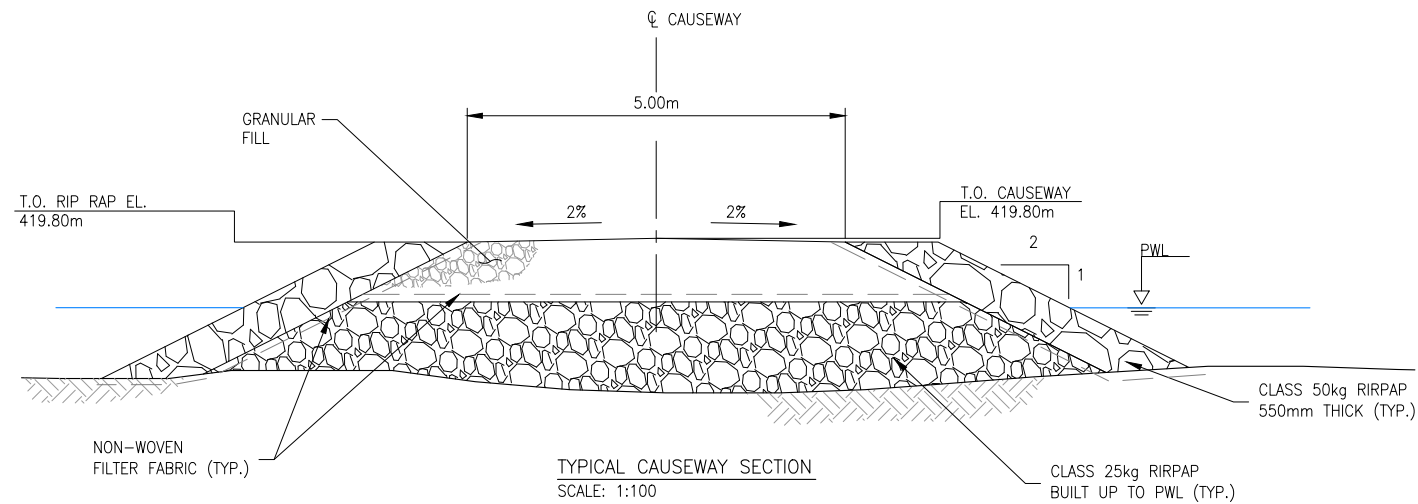
CAUSEWAY OPTION:
GENERAL ARRANGEMENT

DWG NO: **17PG0123-1000-1960-003** REV: **B**



DESIGN PROFILE ALONG PROPOSED ROAD CENTRELINE
SCALE: 1:500

Date: 2020/02/14 8:46 AM | User: Stefanie Noack | File: P:\PG\2017\1000\17PG0123-1000-1960-004-18.1-B-GA-CAUSEWAY OPTION | Layer: 004 | Paper Size: 558.8mm x 431.8mm



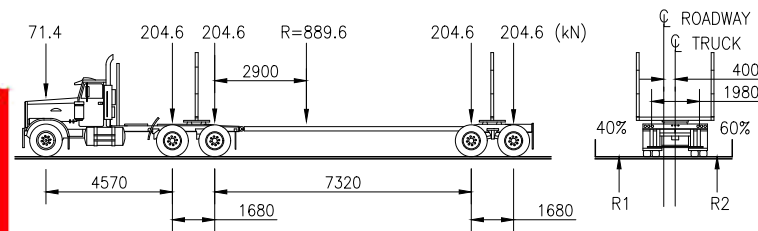
SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL 081	6229540.789	593820.049	419.735
ACL 082	6229381.390	593812.321	419.399
ACL 083	6229323.049	593696.432	419.948
ACL 084	6229425.028	593659.249	419.468
WP#1	6229423.131	593729.914	417.950
WP#2	6229431.351	593743.641	417.950
WP#3	6229419.720	593732.005	417.880
WP#4	6229427.940	593745.732	417.880
WP#5	6229416.309	593734.095	417.830
WP#6	6229424.530	593747.821	417.830
WP#7	6229412.899	593736.185	417.770
WP#8	6229421.119	593749.912	417.770
WP#9	6229409.488	593738.275	417.750
WP#10	6229417.708	593752.002	417.750
WP#11	6229406.077	593740.366	417.730
WP#12	6229414.298	593754.093	417.730
WP#13	6229402.667	593742.456	417.730
WP#14	6229410.887	593756.183	417.730
WP#15	6229399.257	593744.546	417.780
WP#16	6229407.477	593758.273	417.780

NOTES:

- BACK FILL OF APPROACHES SHALL GENERALLY CONFORM TO THE LINES SHOWN ON THE DRAWINGS AND SHALL BE PLACED IN LIFTS NOT EXCEEDING 305mm THICK, COMPACTED TO 95% STANDARD PROCTOR DENSITY USING A MINIMUM 1000lbs VIBRATORY PLATE COMPACTOR. MATERIAL SHALL BE CLEAN, FREE DRAINING, WELL GRADED GRANULAR FILL OF 75mm MAXIMUM SIZE.
- NON-WOVEN FILTER FABRIC TO BE PLACED OVER EXCAVATION TO HAVE A MINIMUM MULLEN BURST STRENGTH OF 2500kPa
- ALL EXPOSED MINERAL SOILS TO BE SEEDED USING AN APPROVED RECLAMATION GRASS SEED MIXTURE AND COVERED WITH AN APPROVED EROSION CONTROL BLANKET.
- THE CONTRACTOR IS TO CONTACT THE ENGINEER PRIOR TO PLACING FOUNDATIONS. FOUNDATIONS PLACEMENT SHALL BE SUPERVISED BY THE ENGINEER TO CONFIRM BEARING REQUIREMENTS.
- ALL PERMITS AND REGULATORY APPROVALS TO BE IN PLACE PRIOR TO COMMENCING WORK.
- ENVIRONMENTAL MANAGEMENT PLAN TO BE PREPARED FOR PROJECT BY OTHERS. COMPLETION OF WORKS TO COMPLY WITH MITIGATION RECOMMENDATIONS OUTLINED IN ENVIRONMENTAL MANAGEMENT PLAN.
- NO SITE SPECIFIC GEOTECHNICAL INVESTIGATION HAS BEEN COMPLETED AS PART OF ALLNORTH CONSULTANTS LIMITED SCOPE OF WORK. THEREFORE, THIS DESIGN HAS BEEN PREPARED WITHOUT THE BENEFIT OF A SITE SPECIFIC GEOTECHNICAL FIELD INVESTIGATION OR GEOTECHNICAL ADVICE. GROUND CONDITIONS MAY VARY AND THE FOUNDATION REQUIREMENTS AND BRIDGE CONCEPT MAY NEED TO BE MODIFIED TO ACCOMMODATE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION. ALLNORTH CONSULTANTS LIMITED ACCEPTS NO RESPONSIBILITY FOR ADDITIONAL COSTS OR DELAYS THAT MAY RESULT IF THE GROUND CONDITIONS VARY FROM THOSE ASSUMED IN THE DESIGN. THE DESIGN ENGINEER SHALL BE CONTACTED IF FIELD CONDITIONS VARY FROM THE DESIGN ASSUMPTIONS SHOWN ON THE DRAWINGS OR IN THE CONSTRUCTION SPECIFICATIONS. INSTALLATIONS OF FOUNDATIONS SHALL BE SUPERVISED BY THE DESIGN ENGINEER OR THEIR REPRESENTATIVE.
- WHERE EXCAVATION SPECIFICATIONS ON THESE DRAWINGS CONFLICT WITH WORKSAFE BC (WSBC) REGULATIONS, WSBC REGULATIONS ARE TO GOVERN.
- 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:





Reviewed/Examiné
Date: **2020-06-24**

By/par: 
YOUR NAME

2020-501876 4 of 4
Navigation Protection Program/
Programme de protection de la navigation

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A	19/04/04	ISSUED FOR REVIEW	GSB	GDF

BC Hydro

Allnorth

CLIENT NO:	DRWN: DMM	DATE: 19/03/25
PROJECT NO: 17PG0123	DSGN: JDS	DATE: 19/03/25
DRAWING SIZE: ANSI "B"	CHKD: DDW	DATE: 20/02/11
SCALE: AS NOTED	APVD: GDF	DATE: 20/02/12

**SITE-C
MIDDLE RESERVOIR
18.1-B**

**CAUSEWAY OPTION:
PROFILE AND NOTES**

DWG NO: **17PG0123-1000-1960-004** REV: **B**



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

Our file: **2020-501893**
Registry number: **966**

July 03, 2020

BC HYDRO
333 DUNSMUIR STREET
VANCOUVER, BC V6B 5R3

Attention : James Thomas

RE: Approval under the *Canadian Navigable Waters Act (CNWA)*, for the construction of the following work(s) below located at Peace River, at approximately 56.19666 N x -121.48305 W, unsurveyed Crown land Islands within Section 13 Township 83 Range 23 West of The 6th Meridian Peace River District, in the Province of British Columbia.

Approved work(s):

- Causeway - Road

Please find enclosed an approval for the above-noted work issued by the Minister of Transport under subsection 7(6) of the CNWA. This approval replaces any previous approvals that have been issued in relation to this work (if any) and will be the sole approval for this work until such time as a new approval is issued for any future changes.

In order to issue this approval, the Minister has considered each of the factors listed in subsection 7(7) of the Act, additional information provided by you (if applicable) and any adverse effects that the decision to approve the work may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*.

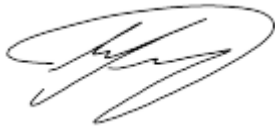
Please note that the CNWA, amongst other obligations, requires the owner to immediately notify the Minister if the work causes or is likely to cause serious and imminent danger to navigation, to take reasonable measures to mitigate potential dangers and to remedy any adverse effects that result from that danger to navigation.

This approval relates only to the interference of your work with navigation under the CNWA and does not grant any rights related to the ownership of the bed of the navigable water.

Please note that it is the owner's responsibility to comply with any other applicable laws and regulations.

Should you have any questions, please do not hesitate to contact our office in Pacific by phone at 604-775-8867 or by e-mail at NPPPAC-PPNPAC@tc.gc.ca.

Respectfully,

A handwritten signature in black ink, appearing to be 'Eric Leung', enclosed within a large, loopy oval shape.

Eric Leung
NPP Officer
Programs Group
Transport Canada
Pacific Region

EL/ka

Attachment(s): **7(6) Approval Document, Reviewed Drawings**



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

Our file: **2020-501893**
Registry number: **966**

APPROVAL

OWNER: BC HYDRO
333 DUNSMUIR STREET
VANCOUVER, BC V6B 5R3

WORK(S): Causeway - Road

SITE LOCATION: Located at approximately 56.19666 N x -121.48305 W, Peace River, on unsurveyed Crown land Islands within Section 13, Township 83, Range 23, West of the 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 four plan(s), 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. The NPA Approval and its Terms and Conditions shall be posted at an easily accessible place at the worksite, and be provided to the contractor conducting the work.
3. In the event that the construction or the operation of the above works is terminated, it will be the proponent's responsibility to remove the works and associated equipment in its entirety including any anchors and pilings. The banks and bed of the waterway disturbed by the works are to be contoured to match the local conditions.
4. Construction equipment used in conjunction with this project shall be stored in such a manner that it does not obstruct navigation.
5. Upon completion of causeways, install and maintain warning signs at the confluence of the side channel and the main channel of the Peace River, approximately 1500m upstream and downstream of crossing 18.1-B, advising of the obstruction of the side channel and include an arrow indicating the direction of the main channel. Signs shall be a minimum of 72" x 48", a white background with black lettering, and the size of the text shall be at least 15cm tall with the word "WARNING" at 1.5 times the size of the message text:



WARNING
OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL



WARNING
OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL

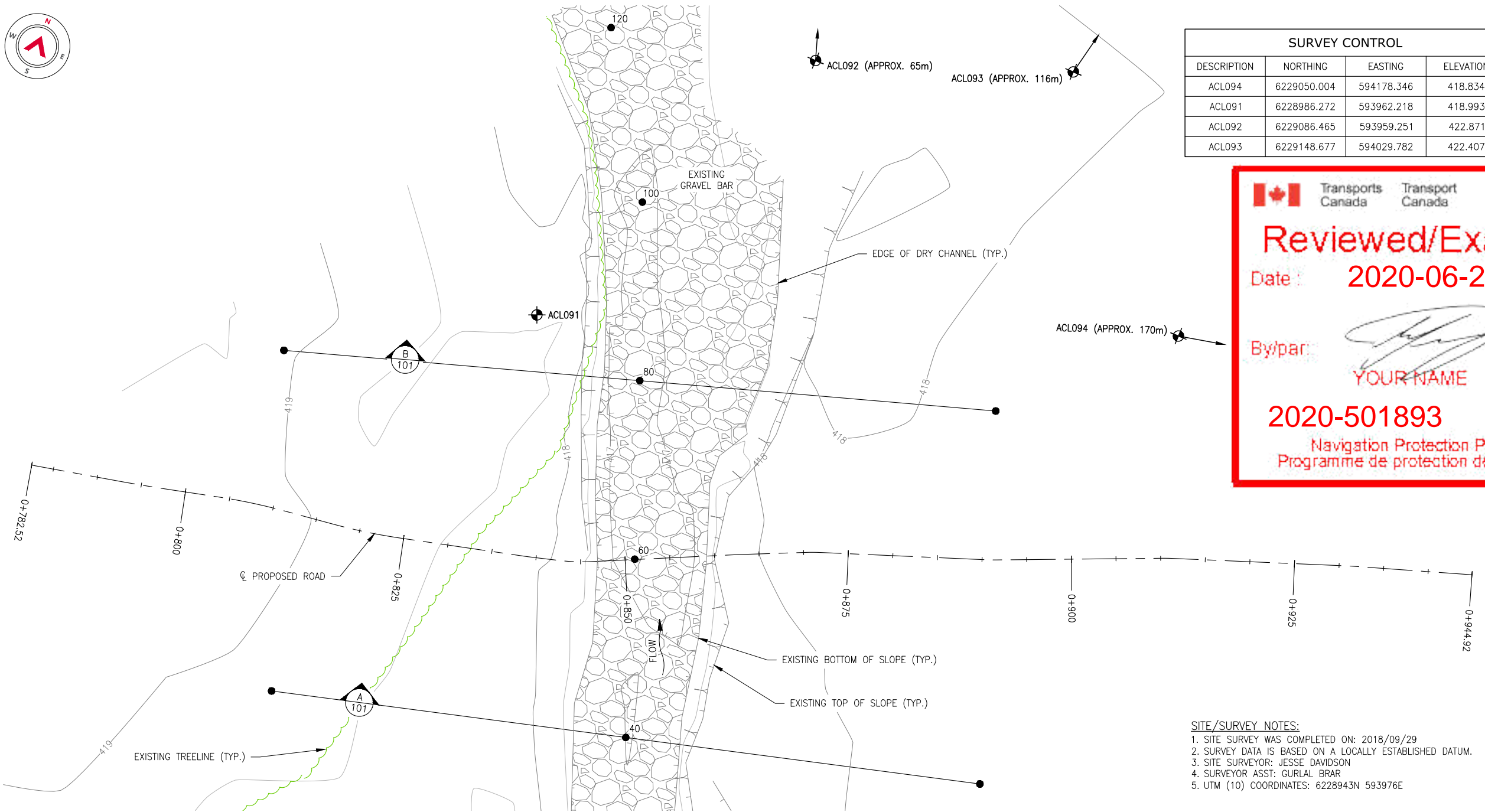


6. During construction, the outermost extent of each causeway above the surface shall be marked with orange Hi-visibility markers on the upstream and downstream corners.
7. Any construction equipment or machinery left in the water during periods of darkness or limited visibility shall be marked with a yellow flashing light visible to upstream and downstream traffic.
8. The upstream and downstream edges of the causeways shall be marked with orange Hi-visibility markers, evenly spaced every 20m on both the upstream and downstream sides, until the causeways are submerged due to inundation.
9. Prior to the causeways being submerged due to inundation, yellow buoys shall be placed and maintained at the location of each causeway. The buoys shall remain in place until the water elevation at each causeway location reaches a minimum of 5m above than the highest elevation of each causeway. Buoys are to be no more than 20 metres apart and no less than 0.6 metres in diameter. Horizontal bands of yellow reflective tape, not less than 10 cm in width and 15 cm in length, shall be either placed at intervals around the horizontal circumference of the buoys or displayed from suitable topmarks that are visible from all directions.

SIGNED on July 3rd, 2020 at the NPP regional office of Pacific

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

EL/ka



SITE PLAN
SCALE: 1:500

SITE/SURVEY NOTES:
 1. SITE SURVEY WAS COMPLETED ON: 2018/09/29
 2. SURVEY DATA IS BASED ON A LOCALLY ESTABLISHED DATUM.
 3. SITE SURVEYOR: JESSE DAVIDSON
 4. SURVEYOR ASST: GURLAL BRAR
 5. UTM (10) COORDINATES: 6228943N 593976E

SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL094	6229050.004	594178.346	418.834
ACL091	6228986.272	593962.218	418.993
ACL092	6229086.465	593959.251	422.871
ACL093	6229148.677	594029.782	422.407

Transports Canada / Transport Canada
Reviewed/Examiné
 Date: **2020-06-24**
 By/par:
YOUR NAME
2020-501893 1 of 4
 Navigation Protection Program / Programme de protection de la navigation

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CLIENT: **BC Hydro**

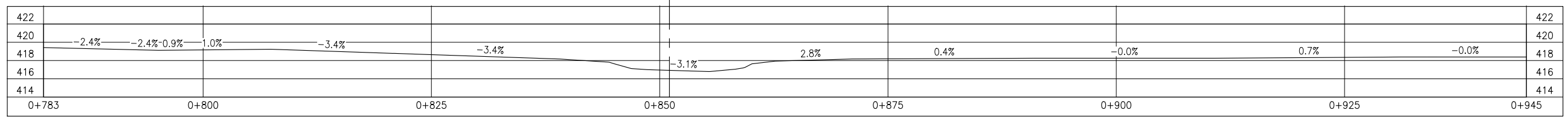
Allnorth

CLIENT NO:	-	DRWN:	GB	DATE:	18/10/11
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DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

**SITE - C
MIDDLE RESERVOIR
18.1-C**

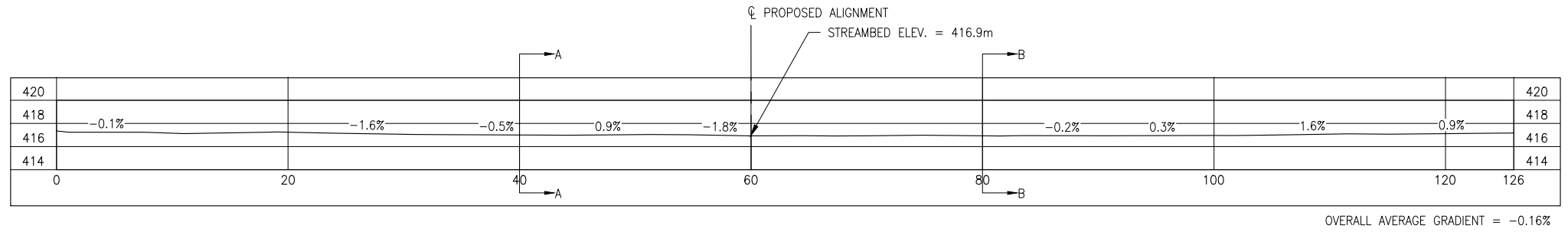
**SITE PLAN
AND
PROFILE**

DWG NO: **17PG0123-500-1960-100** REV: **A**

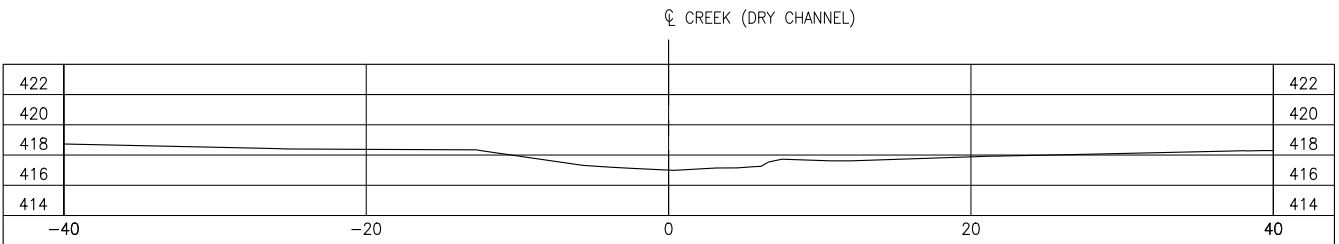


GROUND PROFILE ALONG PROPOSED ROAD CENTRELINE
SCALE: 1:500

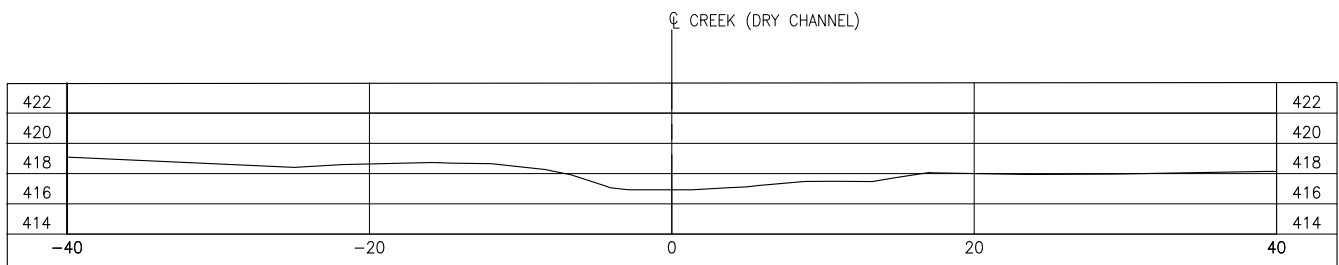
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CHANNEL PROFILE
SCALE: 1:500



SECTION A
SCALE: 1:500



SECTION B
SCALE: 1:500



Reviewed/Examiné

Date : 2020-06-24

By/par: 
YOUR NAME

2020-501893 2 of 4

Navigation Protection Program/
Programme de protection de la navigation

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DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

PROJECT:

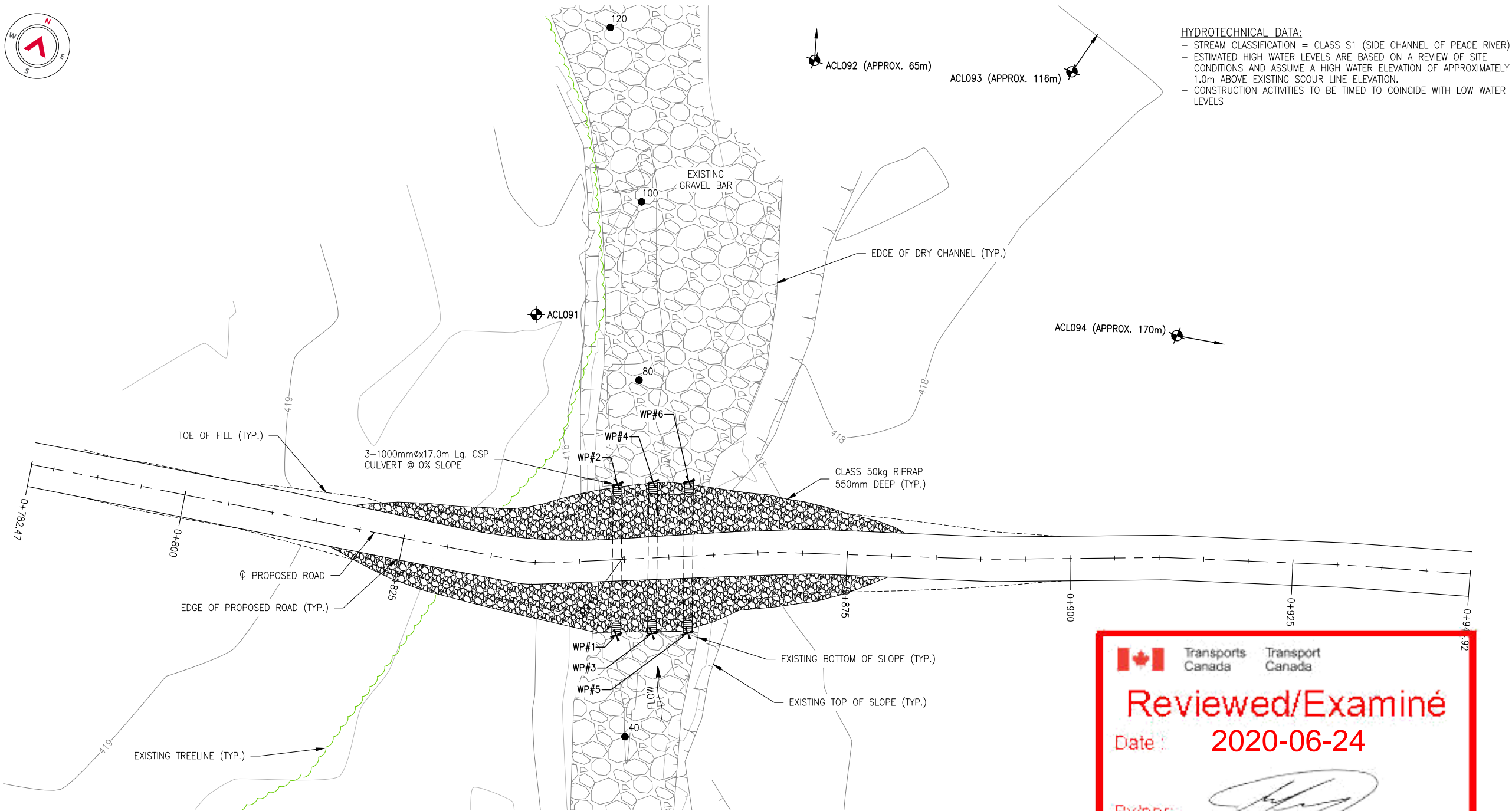
SITE - C
MIDDLE RESERVOIR
18.1-C

TITLE:

PROFILE
AND
SECTIONS

DWG NO:	17PG0123-500-1960-101	REV:	A
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HYDROTECHNICAL DATA:

- STREAM CLASSIFICATION = CLASS S1 (SIDE CHANNEL OF PEACE RIVER)
- ESTIMATED HIGH WATER LEVELS ARE BASED ON A REVIEW OF SITE CONDITIONS AND ASSUME A HIGH WATER ELEVATION OF APPROXIMATELY 1.0m ABOVE EXISTING SCOUR LINE ELEVATION.
- CONSTRUCTION ACTIVITIES TO BE TIMED TO COINCIDE WITH LOW WATER LEVELS

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

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PROJECT NO:	17PG0123	DSGN:	GB	DATE:	18/10/21
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

**SITE - C
MIDDLE RESERVOIR
18.1-C**

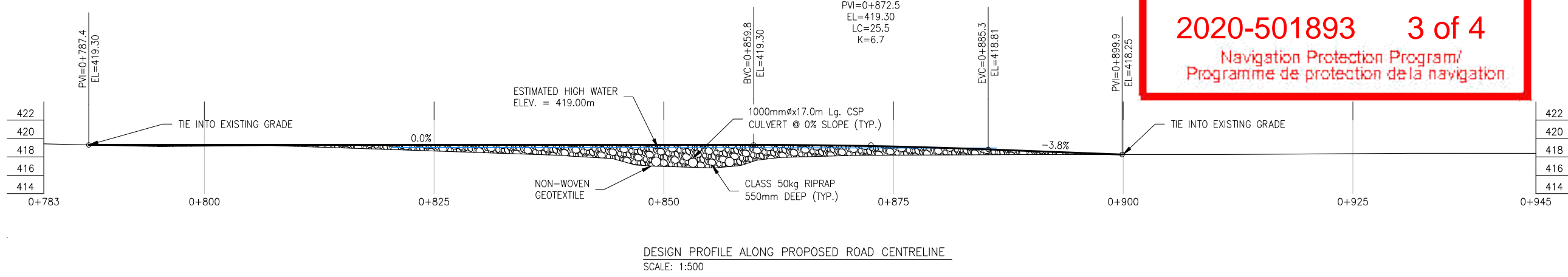
**CAUSEWAY OPTION
GENERAL ARRANGEMENT**

DWG NO: **17PG0123-500-1960-102** REV: **A**

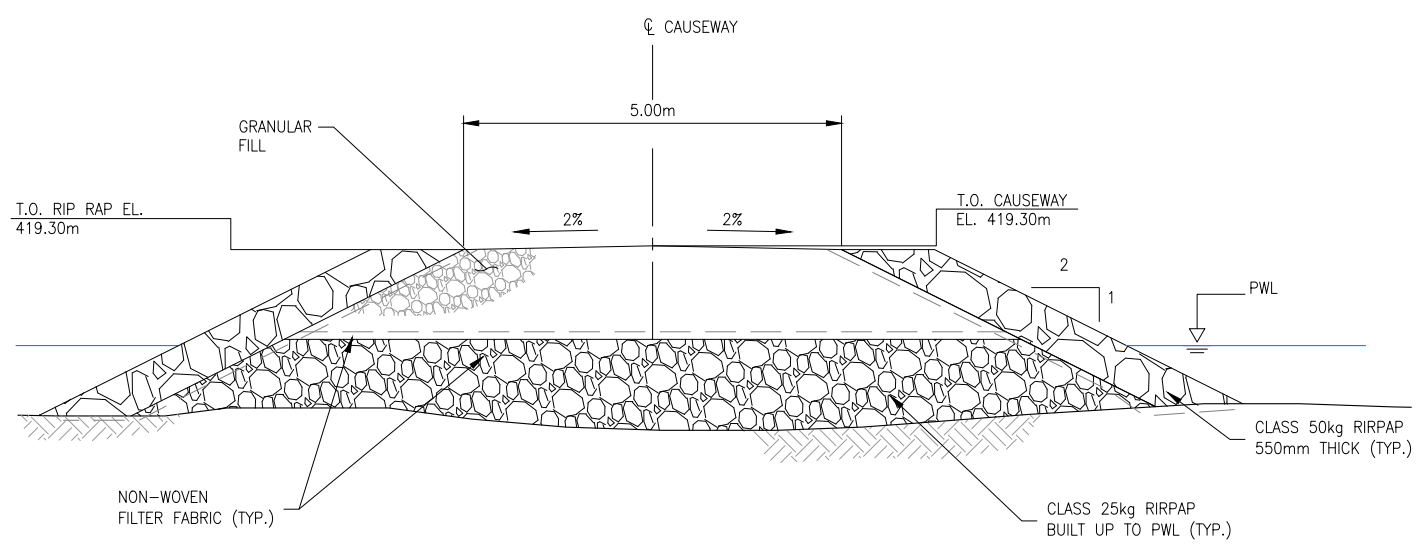
Reviewed/Examiné
 Date : 2020-06-24

 By/par:
YOUR NAME

2020-501893 3 of 4
Navigation Protection Program/
Programme de protection de la navigation



Date: 2020/02/14 8:50 AM | User: Stefanie Noack | File: P:\PG\2017\1001\17PG0123-500-1960\18.1-C_GA CAUSEWAY OPTION | Layout: 103 | Paper Size: 558.8mm x 431.8mm



TYPICAL CAUSEWAY SECTION
SCALE: 1:100

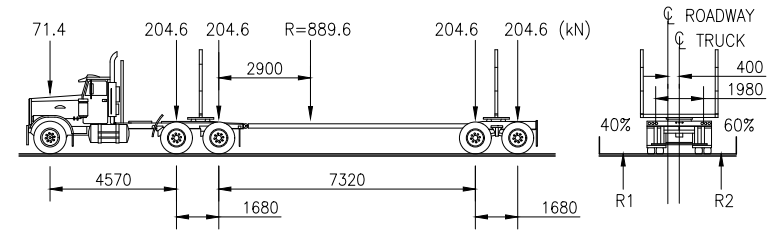
SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL094	6229050.004	594178.346	418.834
ACL091	6228986.272	593962.218	418.993
ACL092	6229086.465	593959.251	422.871
ACL093	6229148.677	594029.782	422.407
WP#1	6228956.600	593984.438	416.986
WP#2	6228972.260	593978.005	416.986
WP#3	6228958.304	593988.062	416.862
WP#4	6228974.029	593981.603	416.862
WP#5	6228959.913	593991.726	416.948
WP#6	6228975.638	593985.266	416.948

NOTES:

- BACK FILL OF APPROACHES SHALL GENERALLY CONFORM TO THE LINES SHOWN ON THE DRAWINGS AND SHALL BE PLACED IN LIFTS NOT EXCEEDING 305mm THICK, COMPACTED TO 95% STANDARD PROCTOR DENSITY USING A MINIMUM 1000lbs VIBRATORY PLATE COMPACTOR. MATERIAL SHALL BE CLEAN, FREE DRAINING, WELL GRADED GRANULAR FILL OF 75mm MAXIMUM SIZE.
- NON-WOVEN FILTER FABRIC TO BE PLACED OVER EXCAVATION TO HAVE A MINIMUM MULLEN BURST STRENGTH OF 2500kPa
- ALL EXPOSED MINERAL SOILS TO BE SEEDED USING AN APPROVED RECLAMATION GRASS SEED MIXTURE AND COVERED WITH AN APPROVED EROSION CONTROL BLANKET.
- THE CONTRACTOR IS TO CONTACT THE ENGINEER PRIOR TO PLACING FOUNDATIONS. FOUNDATIONS PLACEMENT SHALL BE SUPERVISED BY THE ENGINEER TO CONFIRM BEARING REQUIREMENTS.
- ALL PERMITS AND REGULATORY APPROVALS TO BE IN PLACE PRIOR TO COMMENCING WORK.
- ENVIRONMENTAL MANAGEMENT PLAN TO BE PREPARED FOR PROJECT BY OTHERS. COMPLETION OF WORKS TO COMPLY WITH MITIGATION RECOMMENDATIONS OUTLINED IN ENVIRONMENTAL MANAGEMENT PLAN.
- NO SITE SPECIFIC GEOTECHNICAL INVESTIGATION HAS BEEN COMPLETED AS PART OF ALLNORTH CONSULTANTS LIMITED SCOPE OF WORK. THEREFORE, THIS DESIGN HAS BEEN PREPARED WITHOUT THE BENEFIT OF A SITE SPECIFIC GEOTECHNICAL FIELD INVESTIGATION OR GEOTECHNICAL ADVICE. GROUND CONDITIONS MAY VARY AND THE FOUNDATION REQUIREMENTS AND BRIDGE CONCEPT MAY NEED TO BE MODIFIED TO ACCOMMODATE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION. ALLNORTH CONSULTANTS LIMITED ACCEPTS NO RESPONSIBILITY FOR ADDITIONAL COSTS OR DELAYS THAT MAY RESULT IF THE GROUND CONDITIONS VARY FROM THOSE ASSUMED IN THE DESIGN. THE DESIGN ENGINEER SHALL BE CONTACTED IF FIELD CONDITIONS VARY FROM THE DESIGN ASSUMPTIONS SHOWN ON THE DRAWINGS OR IN THE CONSTRUCTION SPECIFICATIONS. INSTALLATIONS OF FOUNDATIONS SHALL BE SUPERVISED BY THE DESIGN ENGINEER OR THEIR REPRESENTATIVE.
- WHERE EXCAVATION SPECIFICATIONS ON THESE DRAWINGS CONFLICT WITH WORKSAFE BC (WSBC) REGULATIONS, WSBC REGULATIONS ARE TO GOVERN.
- RIPRAP SPECIFICATION:

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:



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CONSTRUCTION

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A	20/02/12	ISSUED FOR REVIEW	SN	GDF
REV	YY/MM/DD	DESCRIPTION	DRWN	APVD

CLIENT:
BC Hydro

Allnorth

CLIENT NO:	-	DRWN:	GB	DATE:	18/10/11
PROJECT NO:	17PG0123	DSGN:	GB	DATE:	18/10/21
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

**SITE - C
MIDDLE RESERVOIR
18.1-C**

TITLE:
**CAUSEWAY OPTION
PROFILE AND NOTES**

DWG NO:	17PG0123-500-1960-103	REV:	A
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Reviewed/Examiné
Date: **2020-06-24**

By/par: 
YOUR NAME

2020-501893 4 of 4
Navigation Protection Program/
Programme de protection de la navigation



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

Our file: **2020-501894**
Registry number: **967**

JULY 02, 2020

BC HYDRO
333 DUNSMUIR STREET
VANCOUVER, BC V6B 5R3

Attention : James Thomas

RE: Approval under the *Canadian Navigable Waters Act (CNWA)*, for the construction of the following work(s) below located at Peace River, at approximately 56.19634 N x -121.48532 W, on unsurveyed Crown land Islands within Section 13, Township 83, Range 23, West of the 6th Meridian Peace River District, in the Province of British Columbia.

Approved work(s):

- Causeway - Road

Please find enclosed an approval for the above-noted work issued by the Minister of Transport under subsection 7(6) of the CNWA. This approval replaces any previous approvals that have been issued in relation to this work (if any) and will be the sole approval for this work until such time as a new approval is issued for any future changes.

In order to issue this approval, the Minister has considered each of the factors listed in subsection 7(7) of the Act, additional information provided by you (if applicable) and any adverse effects that the decision to approve the work may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*.

Please note that the CNWA, amongst other obligations, requires the owner to immediately notify the Minister if the work causes or is likely to cause serious and imminent danger to navigation, to take reasonable measures to mitigate potential dangers and to remedy any adverse effects that result from that danger to navigation.

This approval relates only to the interference of your work with navigation under the CNWA and does not grant any rights related to the ownership of the bed of the navigable water.

Please note that it is the owner's responsibility to comply with any other applicable laws and regulations.

Should you have any questions, please do not hesitate to contact our office in Pacific by phone at 604-775-8867 or by e-mail at NPPPAC-PPNPAC@tc.gc.ca.

Respectfully,

A handwritten signature in black ink, appearing to read 'Eric Leung', enclosed within a large, loopy oval shape.

Eric Leung
NPP Officer
Programs Group
Transport Canada
Pacific Region

EL/ka

Attachment(s): **7(6) Approval Document, Reviewed Drawings**



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

Our file: **2020-501894**
Registry number: **967**

APPROVAL

OWNER: BC HYDRO
333 DUNSMUIR STREET
VANCOUVER, BC V6B 5R3

WORK(S): Causeway - Road

SITE LOCATION: Located at approximately 56.19634 N x -121.48532 W, Peace River, unsurveyed Crown land Islands within Section 13, Township 83, Range 23 West of the 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 four plan(s), 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. The NPA Approval and its Terms and Conditions shall be posted at an easily accessible place at the worksite, and be provided to the contractor conducting the work.
3. In the event that the construction or the operation of the above works is terminated, it will be the proponent's responsibility to remove the works and associated equipment in its entirety including any anchors and pilings. The banks and bed of the waterway disturbed by the works are to be contoured to match the local conditions.
4. Construction equipment used in conjunction with this project shall be stored in such a manner that it does not obstruct navigation.
5. Upon completion of causeways, install and maintain warning signs at the confluence of the side channel and the main channel of the Peace River, approximately 1500m upstream and downstream of crossing 18.1-B, advising of the obstruction of the side channel and include an arrow indicating the direction of the main channel. Signs shall be a minimum of 72" x 48", a white background with black lettering, and the size of the text shall be at least 15cm tall with the word "WARNING" at 1.5 times the size of the message text:



WARNING
OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL



WARNING
OBSTRUCTION AHEAD
KEEP TO THE MAIN CHANNEL



6. During construction, the outermost extent of each causeway above the surface shall be marked with orange Hi-visibility markers on the upstream and downstream corners.
7. Any construction equipment or machinery left in the water during periods of darkness or limited visibility shall be marked with a yellow flashing light visible to upstream and downstream traffic.
8. The upstream and downstream edges of the causeways shall be marked with orange Hi-visibility markers, evenly spaced every 20m on both the upstream and downstream sides, until the causeways are submerged due to inundation.
9. Prior to the causeways being submerged due to inundation, yellow buoys shall be placed and maintained at the location of each causeway. The buoys shall remain in place until the water elevation at each causeway location reaches a minimum of 5m above than the highest elevation of each causeway. Buoys are to be no more than 20 metres apart and no less than 0.6 metres in diameter. Horizontal bands of yellow reflective tape, not less than 10 cm in width and 15 cm in length, shall be either placed at intervals around the horizontal circumference of the buoys or displayed from suitable topmarks that are visible from all directions.

SIGNED on July 3rd, 2020 at the NPP regional office of Pacific

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

EL/ka



SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
ACL091	6228986.272	593962.218	418.993
ACL092	6229086.465	593959.251	422.871
ACL093	6229148.677	594029.782	422.407
ACL094	6229050.004	594178.346	418.834



SITE PLAN
SCALE: 1:500

- SITE/SURVEY NOTES:**
1. SITE SURVEY WAS COMPLETED ON: 2018/09/29
 2. SURVEY DATA IS BASED ON A LOCALLY ESTABLISHED DATUM.
 3. SITE SURVEYOR: JESSE DAVIDSON
 4. SURVEYOR ASST: GURLAL BRAR
 5. UTM (10) COORDINATES: 6229050N 594178E



Reviewed/Examiné

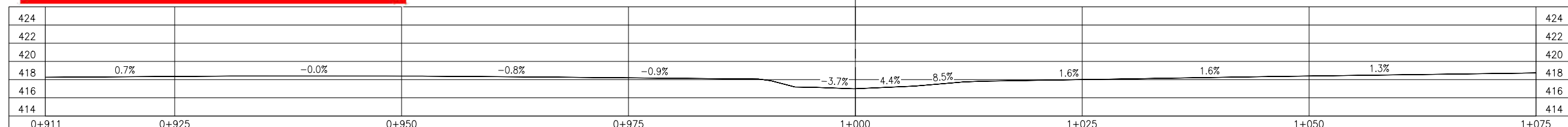
Date: **2020-06-24**

By/par: 

YOUR NAME

2020-501894 1 of 4

Navigation Protection Program/
Programme de protection de la navigation



GROUND PROFILE ALONG PROPOSED ROAD CENTRELINE
SCALE: 1:500

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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
A	20/02/12	ISSUED FOR REVIEW	SN	GDF

CLIENT: 



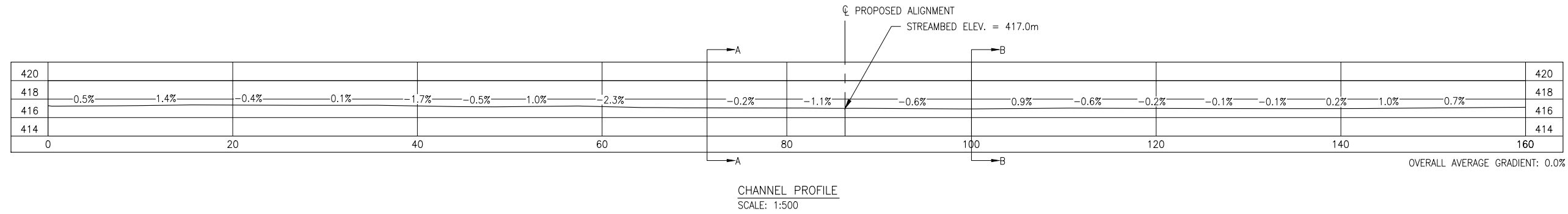
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PROJECT NO:	17PG0123	DSGN:	GB	DATE:	18/10/21
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

**SITE -C
MIDDLE RESERVOIR
18.1-D**

**SITE PLAN
AND
PROFILE**

DWG NO: **17PG0123-400-1960-100** REV: **A**

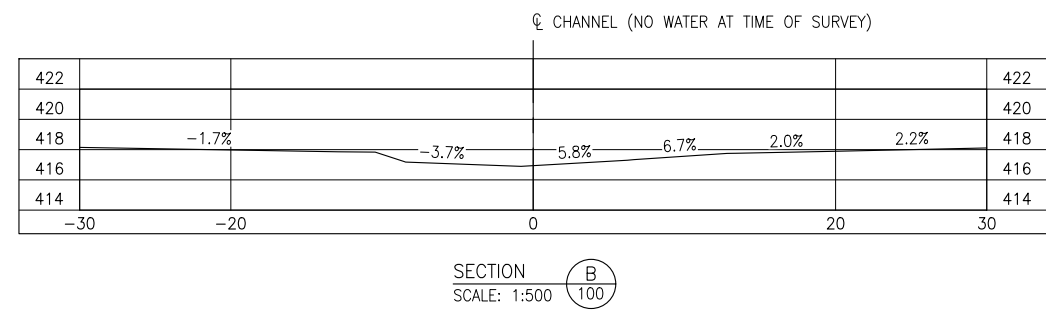
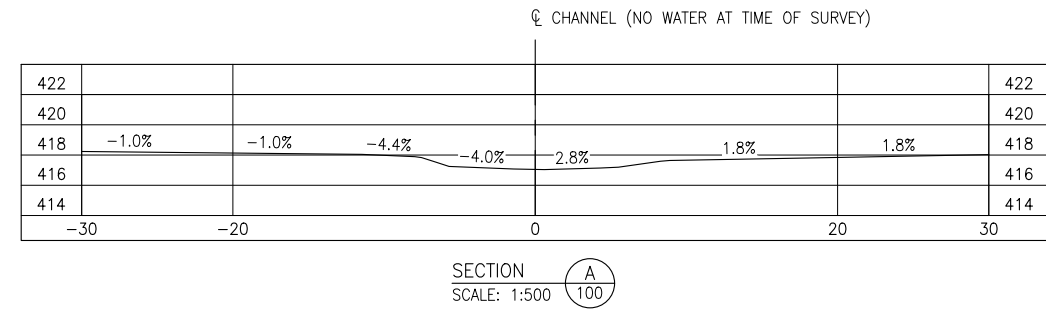
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Reviewed/Examiné
Date: **2020-06-24**

By/par:
YOUR NAME

2020-501894 2 of 4
Navigation Protection Program/
Programme de protection de la navigation



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CLIENT:

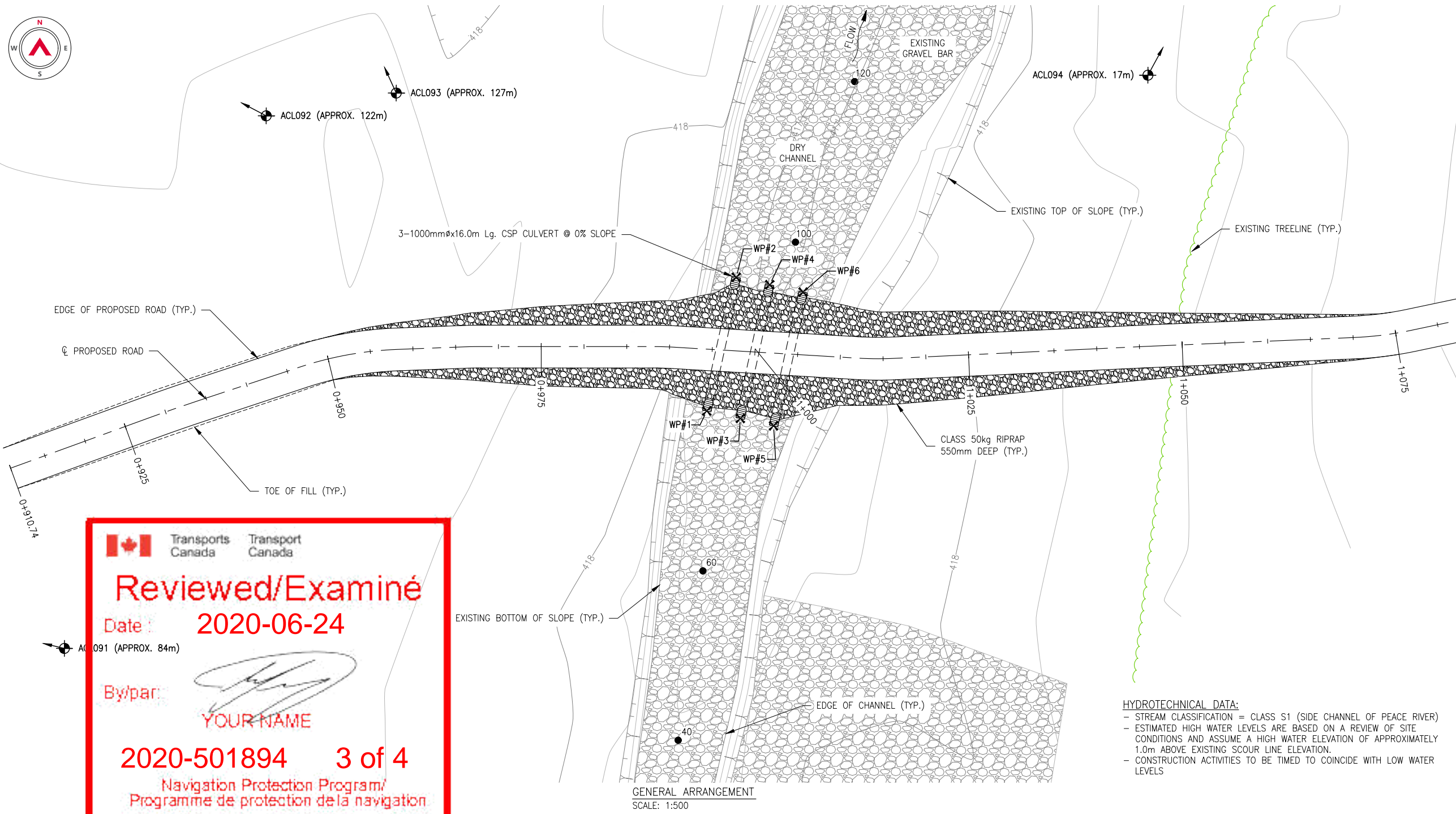
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PROJECT NO:	17PG0123	DSGN:	GB	DATE:	18/10/21
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

PROJECT:
**SITE -C
MIDDLE RESERVOIR
18.1-D**

TITLE:
PROFILE AND SECTIONS

DWG NO: **17PG0123-400-1960-101** REV: **A**

Date: 2020/02/14 8:55 AM | User: Stefanie Noack | File: P:\PG\2017\10017PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1011-Civil\01-Production\Site C-18-1-D\17PG0123-400-1960-18-1-D GA CAUSEWAY OPTION | Layout: 102 | Paper Size: 598.8mm x 431.8mm



Reviewed/Examiné

Date: **2020-06-24**

By/par:

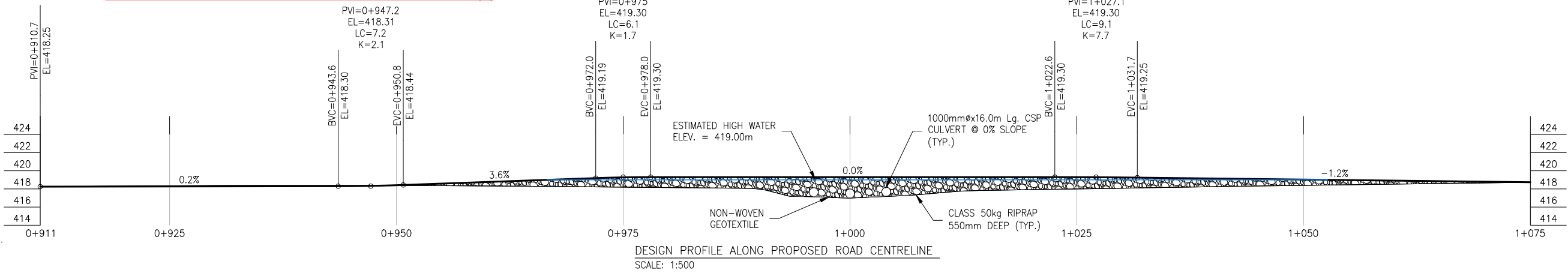
YOUR NAME

2020-501894 3 of 4

Navigation Protection Program/
Programme de protection de la navigation

HYDROTECHNICAL DATA:

- STREAM CLASSIFICATION = CLASS S1 (SIDE CHANNEL OF PEACE RIVER)
- ESTIMATED HIGH WATER LEVELS ARE BASED ON A REVIEW OF SITE CONDITIONS AND ASSUME A HIGH WATER ELEVATION OF APPROXIMATELY 1.0m ABOVE EXISTING SCOUR LINE ELEVATION.
- CONSTRUCTION ACTIVITIES TO BE TIMED TO COINCIDE WITH LOW WATER LEVELS



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

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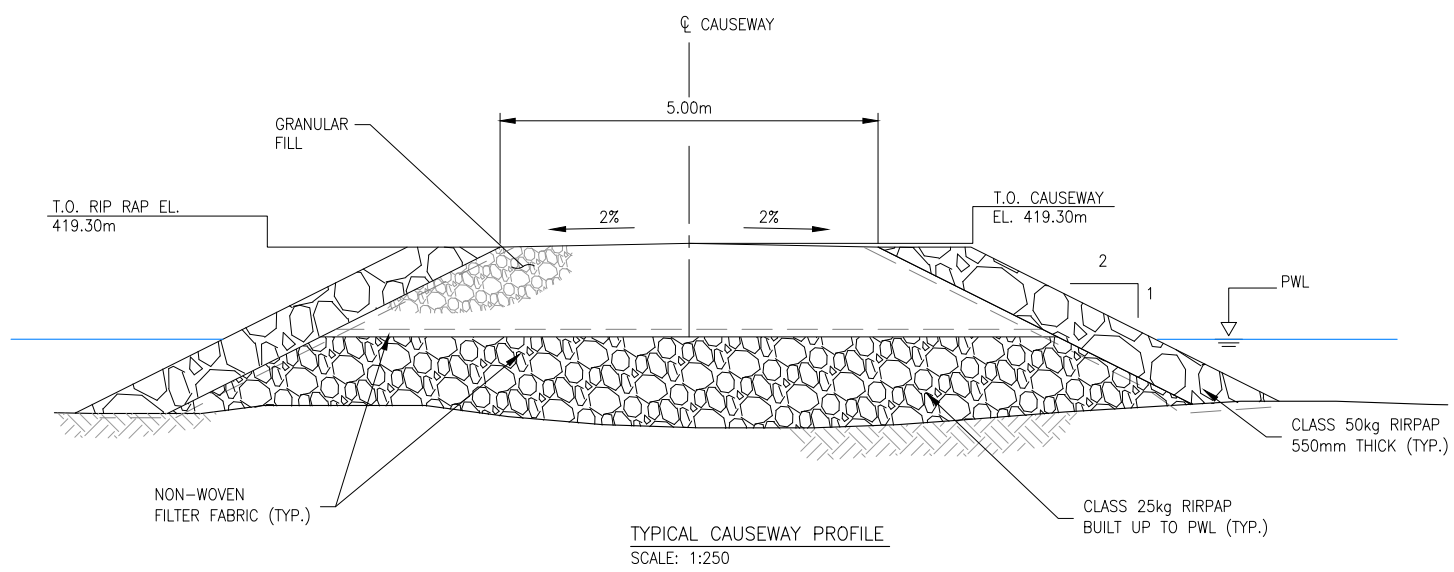
CLIENT NO:	DRWN:	GB	DATE:	18/10/11	
PROJECT NO:	17PG0123	DSGN:	GB	DATE:	18/10/21
DRAWING SIZE:	ANSI "B"	CHKD:	DDW	DATE:	20/02/11
SCALE:	AS NOTED	APVD:	GDF	DATE:	20/02/12

**SITE -C
MIDDLE RESERVOIR
18.1-D**

**CAUSEWAY OPTION
GENERAL ARRANGEMENT**

DWG NO: **17PG0123-400-1960-102** REV: **A**

Date: 2020/02/14 8:55 AM | User: Stefanie Noack | File: P:\PG\2017\10017PG0123 BC Hydro Site C Forestry Consulting\1000-Drawings\1000-Drawings\1011-Civil\01-Production\Site C-18-1-D\17PG0123-400-1960-18-1-D GA CAUSEWAY OPTION | Layout: 103 | Paper Size: 598.8mm x 431.8mm



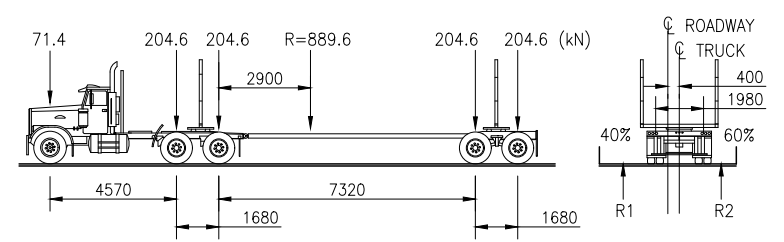
SURVEY CONTROL			
DESCRIPTION	NORTHING	EASTING	ELEVATION
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WP#1	6228995.747	594119.175	417.130
WP#2	6229011.393	594122.517	417.130
WP#3	6228994.902	594123.105	417.000
WP#4	6229010.551	594126.436	417.000
WP#5	6228994.067	594126.996	417.180
WP#6	6229009.713	594130.338	417.180

NOTES:

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



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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD

CLIENT:
BC Hydro

Allnorth

CLIENT NO:	-	DRWN:	GB	DATE:	18/10/11
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PROJECT:
**SITE -C
MIDDLE RESERVOIR
18.1-D**

TITLE:
**CAUSEWAY OPTION
PROFILE AND NOTES**

DWG NO: **17PG0123-400-1960-103** REV: **A**

Reviewed/Examiné
 Date: 2020-06-24

 By/par:
YOUR NAME

2020-501894 4 of 4
 Navigation Protection Program/
 Programme de protection de la navigation