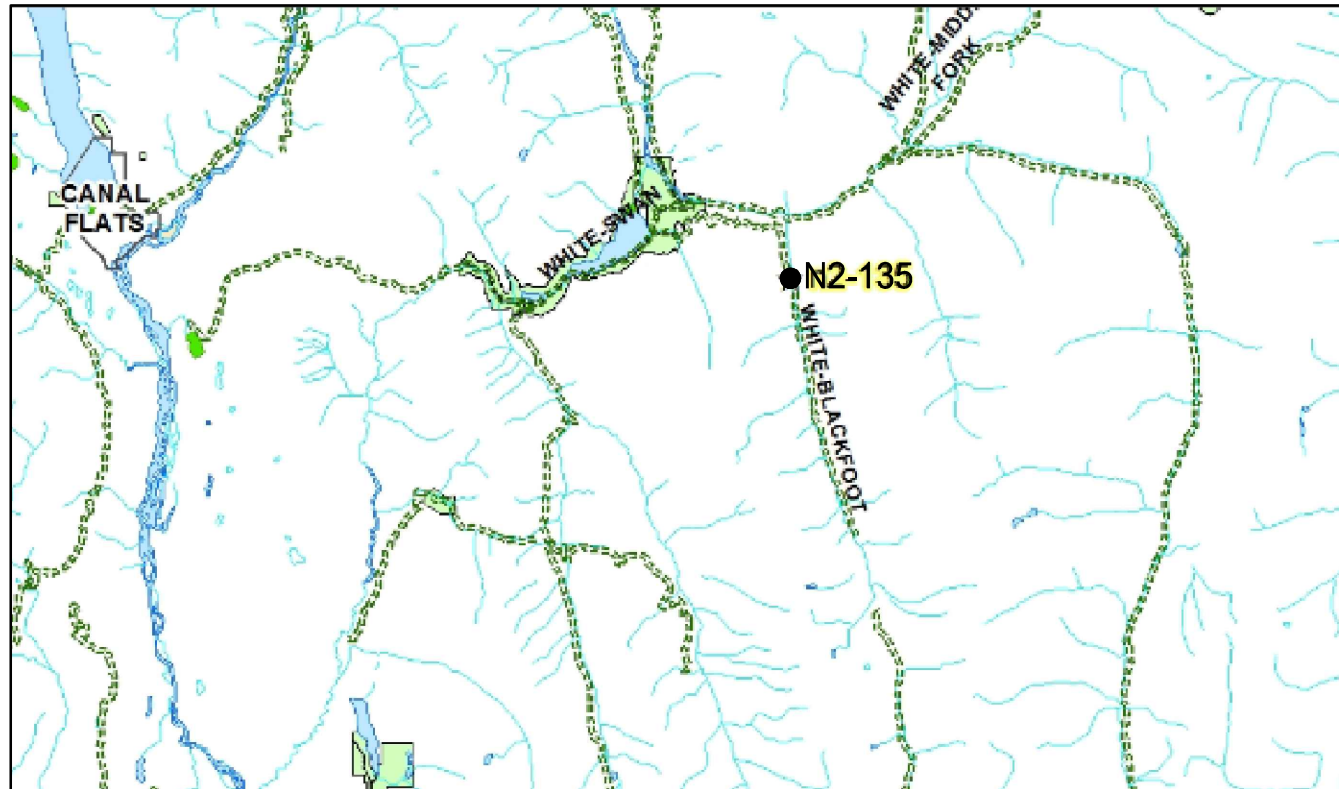




Ministry of Forests, Lands and Natural Resource Operations



KEY PLAN

REPLACEMENT OF BLACKFOOT CREEK BRIDGE

REGION: **KOOTENAY** DISTRICT: **ROCKY MOUNTAIN**

SITE #: **N2-135** STRUCTURE #: **N2-135A**

MINISTRY km.: **39.9 km** USER km.: **39.9 km**

F.S.R. #: F.S.R.: **White-Blackfoot**

UTM E: **616962** N: **5554089** ZONE: **11U**

DRAWING SCHEDULE			
DRAWING No. / MODEL TYPE	DESCRIPTION	REV.	DATE
SHEET 1	GENERAL NOTES	0	JANUARY 27, 2017
SHEET 2	GENERAL NOTES	0	JANUARY 27, 2017
SHEET 3	GENERAL ARRANGEMENT PLAN AND RIPRAP DETAILS	0	JANUARY 27, 2017
SHEET 4	BRIDGE ELEVATION DETAILS	0	JANUARY 27, 2017
SHEET 5	BRIDGE LAYOUT DETAILS	0	JANUARY 27, 2017
SHEET 6	WHEEL TRACKING TO WOODS	0	JANUARY 27, 2017
SHEET 7	WHEEL TRACKING TO TOWN	0	JANUARY 27, 2017
SHEET 8	LONG ROAD AND CREEK PROFILES	0	JANUARY 27, 2017
SHEET 9	EXISTING CONDITIONS PLAN	0	JANUARY 27, 2017
SHEET 10	SITE PHOTOGRAPHS	0	JANUARY 27, 2017



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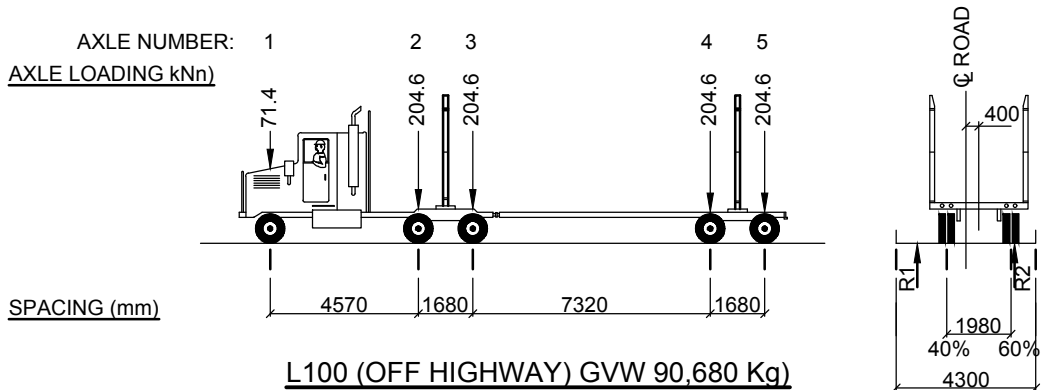
McElhanney Consulting Services Ltd.

1800 Willowbrook Drive
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Tel 250-493-3013

GENERAL

1. McELHANNEY CONSULTING SERVICES LTD. (MCSL) ASSUMES NO RESPONSIBILITY FOR THE RELIANCE UPON THIS DOCUMENT OR ANY OF ITS CONTENTS BY ANY PARTY OTHER THAN THE CLIENT FOR WHOM THE DOCUMENT WAS PREPARED. THE CONTENTS OF THIS DOCUMENT ARE NOT TO BE RELIED UPON OR USED, IN WHOLE OR IN PART, BY OR FOR THE BENEFIT OF OTHERS, WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM McELHANNEY CONSULTING SERVICES LTD.
2. THIS SET OF DRAWINGS HAS BEEN PREPARED BY McELHANNEY CONSULTING SERVICES LTD. IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING AND GEOSCIENCES' PRACTICES AND IS INTENDED FOR THE EXCLUSIVE USE AND BENEFIT OF THE CLIENT FOR WHOM IT WAS PREPARED AND FOR THE PARTICULAR PURPOSE FOR WHICH IT WAS PREPARED. NO OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE.
3. THESE DRAWINGS REPRESENT A CONCEPTUAL DESIGN FOR THE SUBJECT CROSSING AND GIVES A GENERAL ARRANGEMENT OF THE STRUCTURE COMPONENTS BASED ON THE SITE SURVEY AND SPECIFIC CONSTRAINTS OF THE SITE. THE DETAILED DESIGN OF THE STRUCTURAL COMPONENTS AND THE STRUCTURE INSTALLATION IS DESIGNED, REVIEWED AND APPROVED BY OTHERS AND IS CONSIDERED BEYOND THE SCOPE OF THESE CONCEPTUAL DRAWINGS. THE DETAILED DESIGN BY OTHERS INCLUDES COMPONENTS SUCH AS FOOTINGS, PILES, POSTS, CAP BEAM, GIRDERS, DECK PANELS, BALLAST WALL, CURB RAILS, AND CORRUGATED STEEL SECTIONS.
4. THE DIMENSIONS OF THE STRUCTURE COMPONENTS SHOWN ON THESE DRAWINGS ARE ESTIMATED. THE CONTRACTOR SHALL REFER TO THE STRUCTURE COMPONENT SHOP DRAWINGS FOR ACTUAL DIMENSIONS FOR LAYOUT AND CONSTRUCTION.
5. THE DESIGN OF THE STRUCTURAL COMPONENTS SHALL BE PERFORMED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE PROVINCE OF BC IN ACCORDANCE WITH THE LATEST CODE REQUIREMENTS TAKING INTO ACCOUNT GENERALLY ACCEPTED VARIATIONS TO ACCOUNT FOR SINGLE LANE RESOURCE ROAD BRIDGES.
6. THE EXPECTED LIFE OF THE STRUCTURE IN PLACE IS TO BE 45 YEARS.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE. LAYOUT AND ROAD STATIONING ARE IN METERS.
8. HORIZONTAL ALIGNMENT TRACKING VEHICLE = WB-19 LOWBED AND TRAILER
9. THE DESIGN VEHICLE: L100 (CSA-S6)

LOADING DIAGRAM: L100



10. STEEL GIRDER ANALYSIS IS TO BE IN CONFORMANCE WITH CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES AND CANADIAN HIGHWAY DESIGN BRIDGE CODE CAN/CSA S6 AND THE FOREST SERVICE BRIDGE DESIGN AND CONSTRUCTION MANUAL.
11. FATIGUE CATEGORY: 500,000 CYCLES IN ACCORDANCE WITH CAN/CSA-S6-06 (DYNAMIC LOAD ALLOWANCE INCLUDED)
12. ANY DESIGN CHANGES PROPOSED DURING CONSTRUCTION SHALL REQUIRE WRITTEN APPROVAL FROM McELHANNEY CONSULTING SERVICES LTD. UNAUTHORIZED CHANGES MAY RESULT IN A REDUCTION OF LOAD RATING AND/OR QUALIFICATION OF THE CONSTRUCTION CONFORMANCE STATEMENT.

HYDROLOGY DESIGN PARAMETERS

1. DRAINAGE CATCHMENT AREA = 134 SQ. KM.
2. BOTTOM WIDTH = 10.7 m
3. STREAMBED MATERIAL = ROUNDED COBBLES/GRAVEL
4. OVERALL CHANNEL GRADIENT AT CROSSING: 1.50%
5. Q₂ INSTANTANEOUS FLOW: 6.3m³/s
6. V₂ ESTIMATED LOCAL MAXIMUM VELOCITY: 1.5 m/s
7. Q₂ ESTIMATED CHANNEL DEPTH: 0.4 m
8. Q₁₀₀ INSTANTANEOUS FLOW: 53.35 m³/s
9. V₁₀₀ ESTIMATED LOCAL MAXIMUM VELOCITY: 3.71 m/s
10. Q₁₀₀ ESTIMATED CHANNEL DEPTH: 1.20 m
11. FREEBOARD: 1.5 m AT UPSTREAM FACE OF BRIDGE (AS MEASURED ABOVE Q₁₀₀ LEVEL)
12. THE FREEBOARD ALLOWANCE TAKES INTO ACCOUNT THE REASONABLE LIKELIHOOD OF FLOATING DEBRIS BEING MOBILIZED BY HIGH-WATER FLOWS. IT MAY NOT ACCOMMODATE DEBRIS FLOW EVENTS AND DAMAGE OR FAILURE OF THE STRUCTURE MAY OCCUR. TERRAIN STABILITY RISK ASSESSMENT IS OUTSIDE THE SCOPE OF THIS DESIGN

GEOTECHNICAL DESIGN PARAMETERS

1. GEOTECHNICAL ENGINEERING IS NOT WITHIN THE SCOPE OF SERVICES PROVIDED BY McELHANNEY CONSULTING SERVICES LTD. UNLESS SPECIFICALLY STATED ON THE DESIGN DRAWINGS. THE FOUNDATIONS HAVE BEEN SPECIFIED USING ASSUMED GROUND CONDITIONS WITH NATIVE ALLOWABLE SOIL BEARING CAPACITY AT LEAST 200 kPa. GROUND CONDITIONS MAY VARY AND THE CONCEPTUAL DESIGN MAY REQUIRE MODIFICATION. McELHANNEY CONSULTING SERVICES LTD. IS NOT RESPONSIBLE FOR ANY INCURRED COSTS DUE TO CHANGING SOIL CONDITIONS AND MODIFICATION TO THE FOUNDATION DESIGN.

10. STEEL GIRDER ANALYSIS IS TO BE IN CONFORMANCE WITH CAN/CSA S16 LIMIT STATES DESIGN OF STEEL STRUCTURES AND CANADIAN HIGHWAY DESIGN BRIDGE CODE CAN/CSA S6 AND THE FOREST SERVICE BRIDGE DESIGN AND CONSTRUCTION MANUAL.
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DESIGN ENGINEER / COORDINATING REGISTERED PROFESSIONAL	<div><div></div><div>McElhanney McElhanney Consulting Services Ltd.</div></div> <div>1800 Willowbrook Drive Cranbrook BC Canada V1C 7H9 Tel 250-489-3013</div>					<div><div>Ministry of Forests, Lands and Natural Resource Operations</div></div>	
	MCSL FILE # 2441-00468-00					REPLACEMENT OF BLACKFOOT CREEK BRIDGE	
	Designed <u>Brandon Bolen</u>		Date: <u>JANUARY 27, 2017</u>			SITE #: N2-135 STRUCTURE #: N2-135A	
	Checked <u>Brad Nelson, P.Eng</u>		Date: <u>JANUARY 27, 2017</u>			FSR: WHITE - BLACKFOOT MIN. km: <u> </u> USER km: 39.9	
	Drawn <u>Brandon Bolen</u>		Date: <u>JANUARY 27, 2017</u>			DRAWING TITLE:	
	Rev.	Date	DESCRIPTION	Init.		GENERAL NOTES	
						DESIGNED BY:	
						Brandon Bolen	
						APPROVED BY:	
						Brad Nelson, P.Eng	
PROFESSIONAL SEAL					PROFESSIONAL OF RECORD		
					Brad Nelson, P.Eng		
					MFLNRO ENGINEER:		
					Drew Alway, P.Eng		
0	01/27/17	ISSUED FOR CONSTRUCTION	BN		FILE No:	DRAWING No:	
REVISIONS					EN17DRM009		
					SHEET 1		

MATERIALS

1. ALL MATERIALS SHALL BE NEW AND IN ACCORDANCE WITH MFLNRO NOTES DRAWING - STD-EC-030-02 - SECTION 3 - "MATERIALS AND FABRICATION".
2. HANDLING OF MATERIALS SHALL BE IN CONFORMANCE WITH WORK SAFE BC REQUIREMENTS. CARE SHALL BE EXERCISED TO ENSURE NO DAMAGE IS INCURRED TO ANY COMPONENTS WHILE UNLOADING, STORING, OR INSTALLING THE STRUCTURE COMPONENTS. THE CERTIFYING ENGINEER SHALL BE NOTIFIED OF ANY DAMAGE TO THE COMPONENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS FOR REPAIRS OR REPLACEMENT AS DETERMINED BY THE ENGINEER WHILE IN POSSESSION OF THE MATERIALS.
3. STRUCTURAL STEEL SHALL CONFORM TO CSA G40.21M AND THE FOLLOWING GRADES:

3.1. STEEL GIRDER FLANGES AND WEB PLATES - GRADE 350AT CATEGORY 3.

3.2. ALL OTHER STEEL PLATE - 350A

3.3. BRACING (DIAPHRAGMS AND PLAN BRACING) - GRADE 350A

3.4. ANY REQUIRED VARIATIONS REQUIRE MFLNRO APPROVAL. IF NON-WEATHERING STEEL IS APPROVED BY MFLNRO, A CORROSION PROTECTION SYSTEM WILL BE REQUIRED.

3.5. HSS (POST AND RAILS) - 350W (COATED) OR 350A (UNCOATED) - TO BE DETERMINED BY PROJECT SPECIFICATIONS.
4. STEEL PIPE IS TO CONFORM TO ASTM A252 GRADE 2 AND BE NON-SPIRAL PIPE.
5. STRUCTURAL BOLTS ARE TO CONFORM TO ASTM A325 TYPE 3
6. CURB ANCHORS AND CONNECTION BOLTS: ASTM A-307 GALVANIZED COMPLETE WITH GALVANIZED NUTS AND WASHERS.
7. ALL REINFORCING IS TO CONFORM TO CAN/CSA G30.18M GRADE 400R.
8. CAST IN PLACE CONCRETE IS TO CONFORM TO CSA A23.1 - EXPOSURE CLASS C1 - STRENGTH (F'c) = 35 MPa AT 28 DAYS.
9. PRECAST CONCRETE IS TO CONFORM TO CSA A23.1 - EXPOSURE CLASS C1 - STRENGTH = 35 MPa AT 28 DAYS. PRECAST CONCRETE TO BE FABRICATED IN ACCORDANCE WITH CSA-A23.4 BY A CSA CERTIFIED PLANT.
10. ALL WELDING IS TO BE IN CONFORMANCE WITH CSA W-59. WELDING ELECTRODES TO BE COMPATIBLE WITH BASE MATERIAL.
11. FIELD WELDING IS TO BE IN CONFORMANCE WITH CSA W47.1 DIVISION 3 OR BETTER.
12. BEARING PADS ARE TO CONFORM TO NATURAL RUBBER, GRADE 3, 60 DUROMETER HARDNESS.
13. GROUT: STUD POCKETS SHALL BE FILLED WITH TARGET TRAFFIC PATCH COURSE OR APPROVED EQUIVALENT. DECK JOINTS SHALL BE FILLED WITH TARGET TRAFFIC PATCH FINE OR APPROVED EQUIVALENT

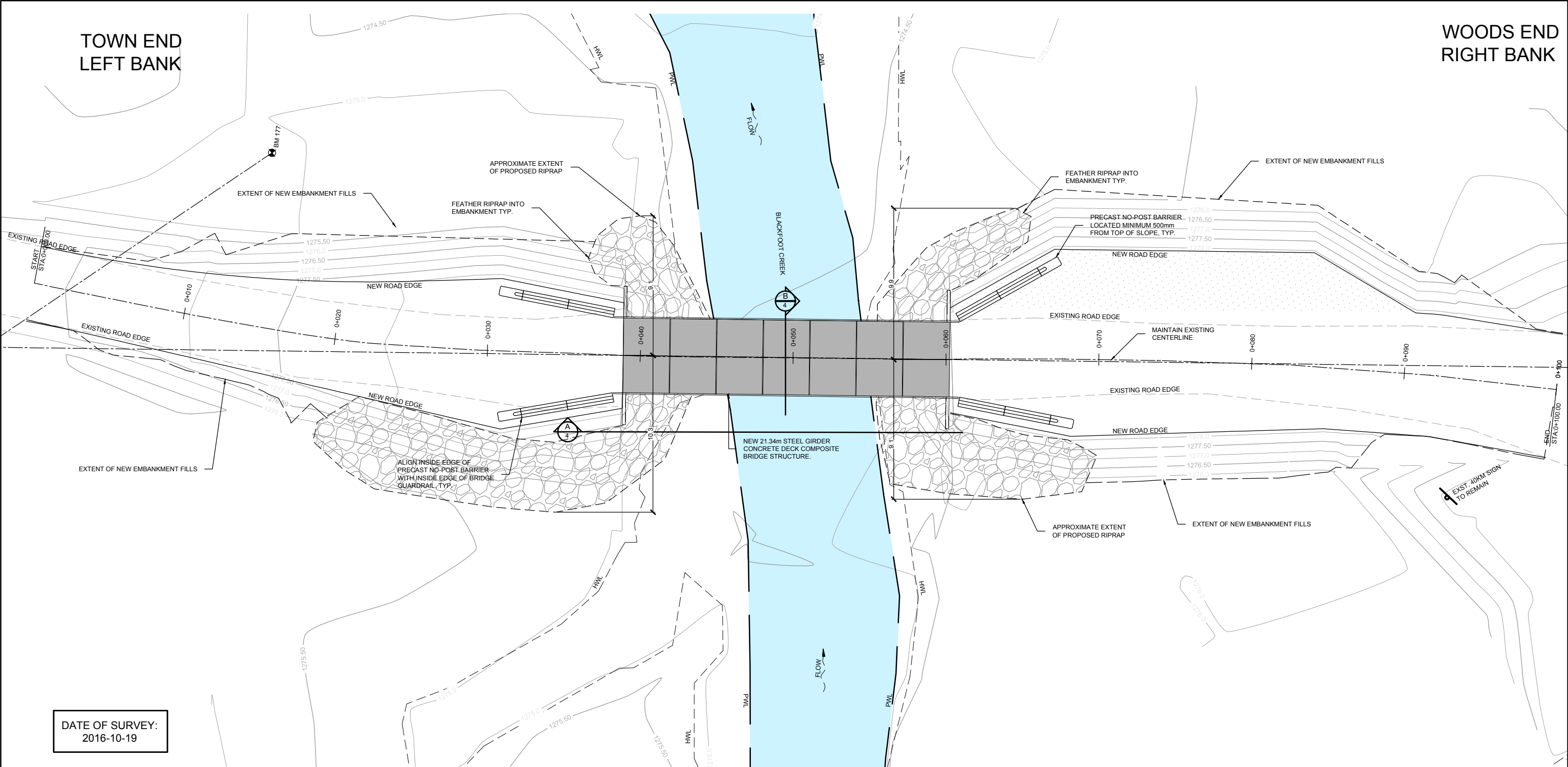
RIP RAP

1. ROCK SHAPE SHALL BE BLOCKY AND ANGULAR RATHER THAN SMOOTH, ROUND OR ELONGATED. NOT MORE THAN 25% OF THE ROCK SHALL HAVE A LENGTH EXCEEDING 2.5 TIMES ITS THICKNESS AND NO ROCK SHALL HAVE A LENGTH EXCEEDING 3.0 TIMES ITS THICKNESS.
2. ROCK SHALL BE OF A DURABLE QUALITY AND NOT EASILY FRACTURED.
3. THE GRADATION SHALL BE AS SHOWN ON THE DRAWINGS.
4. RIP RAP BLANKET THICKNESS SHALL NOT BE LESS THAN 1.2 TIMES THE LARGEST ROCK SIZE.
5. ALL RIP RAP SHALL BE UNDERLAIN WITH NON-WOVEN GEOTEXTILE MATERIAL WITH A MINIMUM TENSILE STRENGTH OF 0.9KN.

CONSTRUCTION

1. CONSTRUCTION SHALL CONFORM TO THE "FOREST SERVICE BRIDGE DESIGN & CONSTRUCTION MANUAL"..
2. EXCAVATIONS FOR ALL FOOTINGS SHALL BE KEPT FREE OF WATER DURING CONSTRUCTION. SHOULD SOIL BEARING CONDITIONS AND EXCAVATION MATERIALS BE DIFFERENT THAN EXPECTED, THEN NOTIFY THE CO-COORDINATING REGISTERED PROFESSIONAL IMMEDIATELY FOR FURTHER DIRECTION.
3. END FILLS SHALL BE PLACED IN GENERAL CONFORMANCE WITH THE DRAWINGS AND SHALL BE WELL DRAINED, GRANULAR, FROST FREE MATERIAL. EXCAVATED MATERIAL IS ASSUMED TO BE SUITABLE FOR BACKFILL. BACKFILL TO BE COMPACTED IN 300mm LIFTS TO 95% STANDARD PROCTOR DENSITY, TYP.
4. END FILLS MUST BE GRADED AT A MINIMUM 2% CROWN TO THE GRADE AND WIDTH SHOWN ON THE DRAWINGS.
5. SPOIL AREAS WILL BE DESIGNATED BY THE MFLNRO REPRESENTATIVE.
6. ALL GROUT POCKETS AND JOINTS SHALL BE CLEANED AND FREE OF ANY DEBRIS PRIOR TO PLACEMENT OF THE GROUT.
7. VERTICAL CONSTRUCTION TOLERANCE FOR POSTS SHALL BE WITHIN 0.5% OF HORIZON DISTANCE. ELEVATION TOLERANCE BETWEEN BEARINGS SHALL BE 10mm.
8. A DELINEATOR SHALL BE MOUNTED AT EACH CORNER OF THE BRIDGE WITH MINIMUM REFLECTIVE SURFACE AREA OF 0.18m2.
9. TWO BRIDGE AHEAD SIGNS SHALL BE INSTALLED APPROX. 50m FROM EACH BRIDGE END. CLEAN UP OF THE SITE MUST BE COMPLETED IMMEDIATELY FOLLOWING CONSTRUCTION. THIS SHALL INCLUDE THE REMOVAL OF ALL EQUIPMENT, MATERIALS, AND WASTE.
10. ALL FORMWORK SHALL BE REMOVED FROM THE BRIDGE. DECKS, GIRDERS AND BEARING AREAS SHALL BE SWEEPED CLEAN OF DEBRIS.
11. GROUTING IN COLD WEATHER MUST BE ACCORDING TO A SPECIFIC APPROVED PROCEDURE FOR PREHEATING AND HOARDING FOR THIS PROJECT.

<div>DESIGN ENGINEER / COORDINATING REGISTERED PROFESSIONAL</div> <div></div> <div>January 27, 2017</div> <div>PROFESSIONAL SEAL</div>	<div>McElhanney McElhanney Consulting Services Ltd.</div> <div>1800 Willowbrook Drive Cranbrook BC Canada V1C 7H9 Tel 250-489-3013</div>				<div>Ministry of Forests, Lands and Natural Resource Operations</div>	
	MCSL FILE # 2441-00468-00					
	Designed <u>Brandon Bolen</u>		Date: <u>JANUARY 27, 2017</u>		REPLACEMENT OF BLACKFOOT CREEK BRIDGE	
	Checked <u>Brad Nelson, P.Eng</u>		Date: <u>JANUARY 27, 2017</u>		SITE #: N2-135 STRUCTURE #: N2-135A	
	Drawn <u>Brandon Bolen</u>		Date: <u>JANUARY 27, 2017</u>		FSR: WHITE - BLACKFOOT MIN. km: <u> </u> USER km: 39.9	
	Rev.	Date	DESCRIPTION	Init.	DRAWING TITLE:	
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					APPROVED BY:	
					PROFESSIONAL OF RECORD	
				MFLNRO ENGINEER:		
				FILE No:		
				DRAWING No:		
0	01/27/17	ISSUED FOR CONSTRUCTION	BN	EN17DRM009 SHEET 2		
REVISIONS						



DATE OF SURVEY:
2016-10-19

EXTENT OF RIPRAP	
TOWN END - UPSTREAM SIDE	9.10m
TOWN END - DOWNSTREAM SIDE	10.30m
WOODS END - UPSTREAM SIDE	9.90m
WOODS END - DOWNSTREAM SIDE	9.10m
MEASURED UPSTREAM OR DOWNSTREAM FROM ROAD CENTERLINE. (ALL DISTANCES ARE HORIZONTAL)	

TYPICAL PULLOUT DETAIL	
NOTE: PULLOUTS SHALL BE PROVIDED AT ENDS OF BRIDGE TO SUIT ROAD DESIGN.	

RIPRAP TABLE							
CLASS OF RIPRAP (kg)	NOMINAL THICKNESS OF RIPRAP (mm)	ROCK GRADATION: PERCENT LARGER THAN GIVEN ROCK MASS					
		85%		50%		15%	
300	1050	35 kg	300mm	300 kg	610mm	900 kg	850mm

ESTIMATED RIPRAP VOLUME	
TOWN END	250 m³
WOODS END	175 m³

DESIGN ENGINEER /
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January 27, 2017

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McElhanney Consulting Services Ltd.

1800 Willowbrook Drive
Cranbrook BC
Canada V1C 7H9
Tel 250-489-3013

MCSL FILE # 2441-00468-00

Designed Brandon Bolen Date: JANUARY 27, 2017

Checked Brad Nelson, P.Eng Date: JANUARY 27, 2017

Drawn Brandon Bolen Date: JANUARY 27, 2017

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REVISIONS

REPLACEMENT OF BLACKFOOT CREEK BRIDGE

SITE #: N2-135 STRUCTURE #: N2-135A

FSR: WHITE - BLACKFOOT MIN. km: USER km: 39.9

DRAWING TITLE:
GENERAL ARRANGEMENT PLAN AND RIPRAP DETAILS

DESIGNED BY:
Brandon Bolen

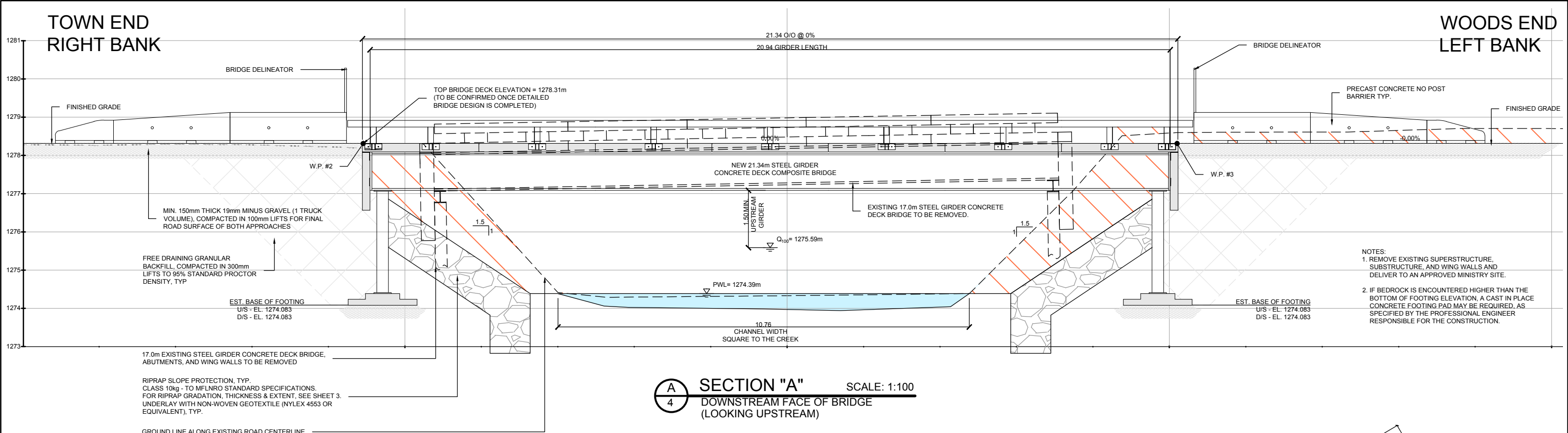
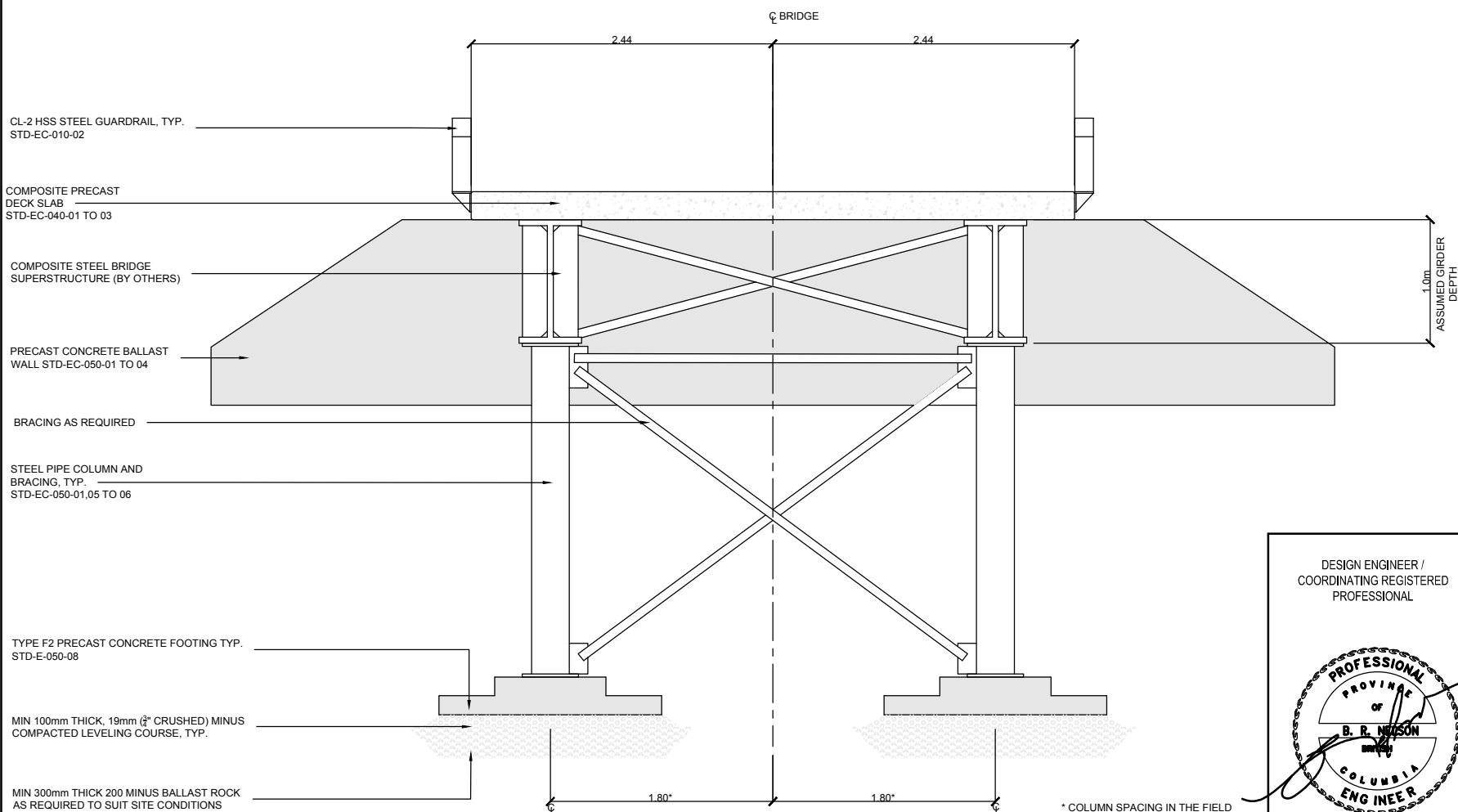
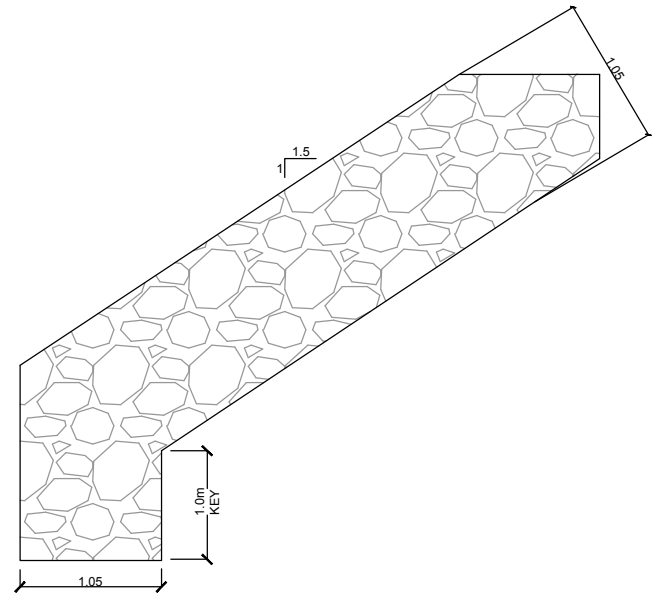
APPROVED BY:
Brad Nelson, P.Eng

PROFESSIONAL OF RECORD:
Brad Nelson, P.Eng

MFLNRO ENGINEER:
Drew Alway, P.Eng

FILE No:
EN17DRM009

DRAWING No:
SHEET 3



1
4

RIPRAP DETAIL
DOWNSTREAM FACE OF BRIDGE
(LOOKING UPSTREAM)

SCALE: NTS

B
4

SECTION "B"
TOWN/LEFT ABUTMENT SHOWN
WOODS/RIGHT ABUTMENT MIRRORED

SCALE: 1:50

* COLUMN SPACING IN THE FIELD
MAY BE ADJUSTED BASED ON THE
FABRICATION DRAWINGS.

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January 27, 2017

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Rev.	Date	DESCRIPTION	Init.
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REVISIONS

BRITISH COLUMBIA
Ministry of
Forests, Lands and
Natural Resource Operations

REPLACEMENT OF BLACKFOOT CREEK BRIDGE

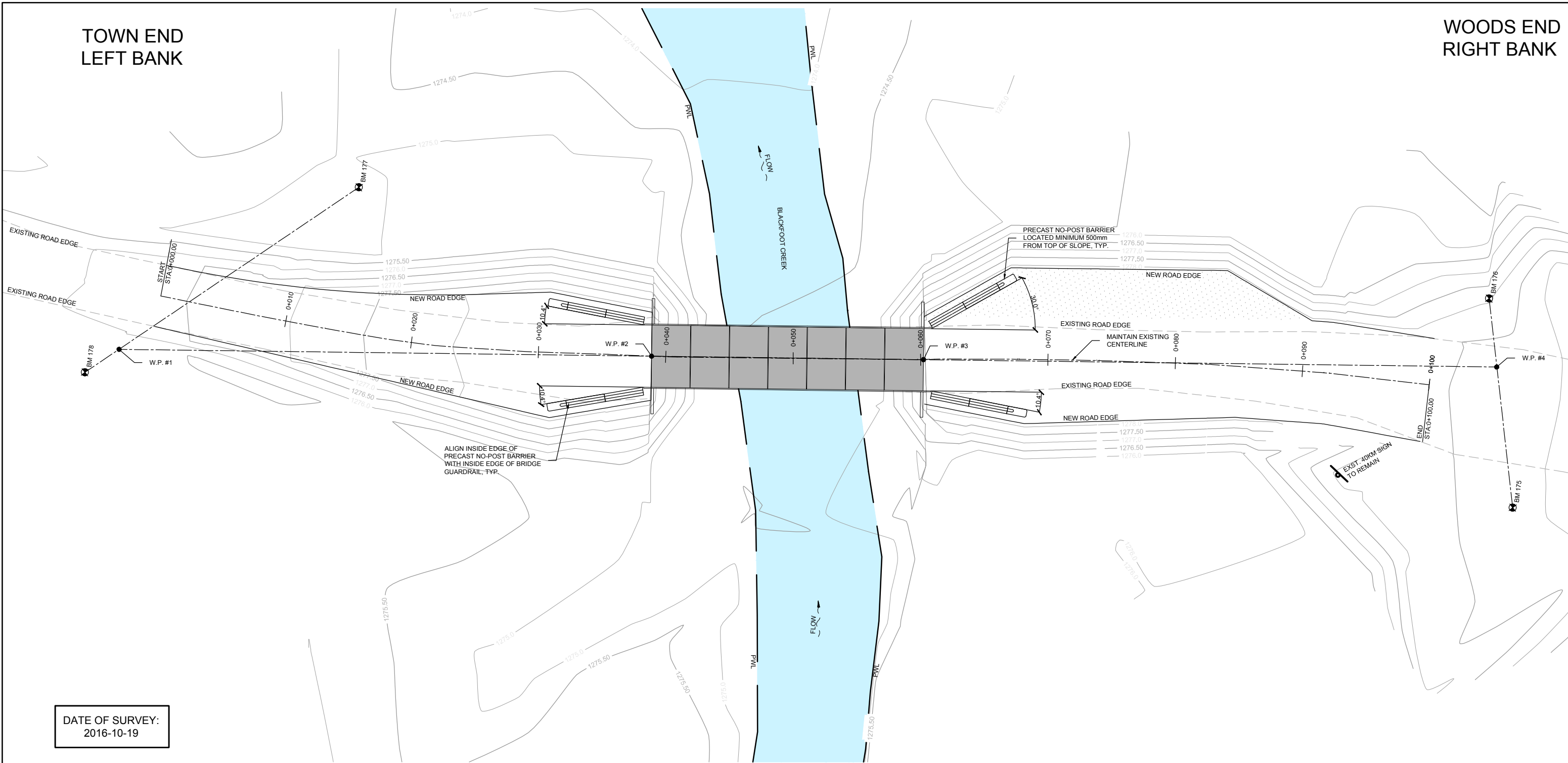
SITE #: N2-135	STRUCTURE #: N2-135A
FSR: WHITE - BLACKFOOT	MIN. km: USER km: 39.9

DRAWING TITLE:
BRIDGE ELEVATION DETAILS

DESIGNED BY: Brandon Bolen	APPROVED BY: Brad Nelson, P.Eng
PROFESSIONAL OF RECORD Brad Nelson, P.Eng	MFLNRO ENGINEER: Drew Alway, P.Eng
FILE No: EN17DRM009	DRAWING No: SHEET 4

TOWN END
LEFT BANK

WOODS END
RIGHT BANK



DATE OF SURVEY:
2016-10-19

COORDINATES & ELEVATIONS				
POINT	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM 175	REBAR PIN	5554031.6670m	617002.1230m	1278.811m
BM 176	REBAR PIN	5554045.7020m	617010.8120m	1277.935m
BM 177	REBAR PIN	5554109.2750m	616920.6090m	1275.886m
BM 178	REBAR PIN	5554107.3920m	616946.4780m	1274.916m
W.P. #1	NEW BRIDGE CL	5554109.275m	616923.822m	1275.810m
W.P. #2	NEW BRIDGE CL	5554082.783m	616956.345m	1278.310m
W.P. #3	NEW BRIDGE CL	5554069.375m	616972.952m	1278.310m
W.P. #4	NEW BRIDGE CL	5554107.392m	617007.966m	1278.680m

LAYOUT SCHEDULE		
BM 177 TO BM 178		25.94m
BM 177 TO WP #1		22.72m
BM 178 TO WP #1		3.22m
WP #1 TO WP #2		41.80m
WP #2 TO WP #3		21.34m
WP #3 TO WP #4		45.00m
BM 175 TO BM 176		16.51m
BM 175 TO WP #4		11.10m
BM 176 TO WP #4		5.41m

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Ministry of
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REPLACEMENT OF BLACKFOOT CREEK BRIDGE

SITE #: N2-135 STRUCTURE #: N2-135A

FSR: WHITE - BLACKFOOT MIN. km: ____ USER km: 39.9

DRAWING TITLE:
BRIDGE LAYOUT

DESIGNED BY:
Brandon Bolen

PROFESSIONAL OF RECORD
Brad Nelson, P.Eng

FILE No:
EN17DRM009

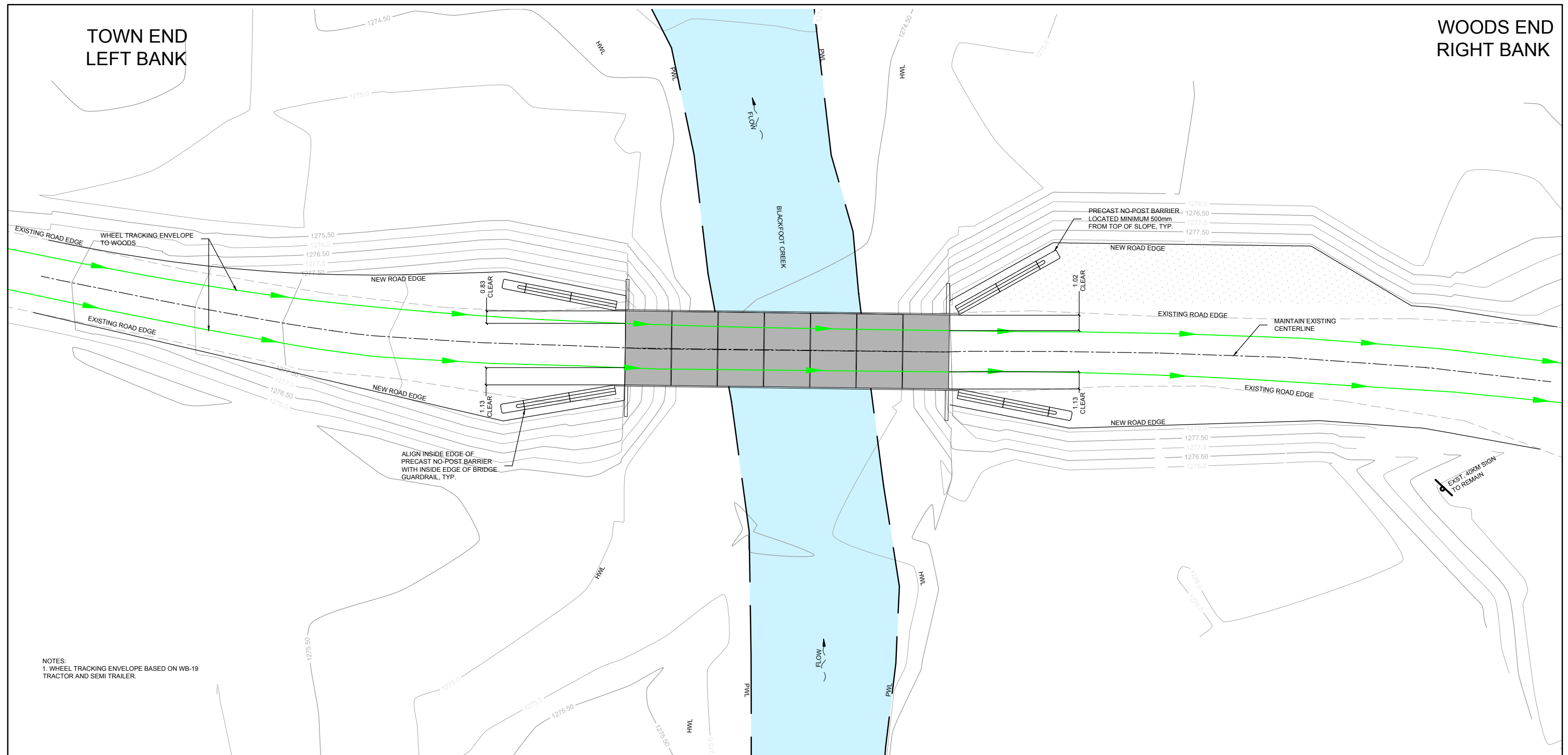
APPROVED BY:
Brad Nelson, P.Eng

MFLNRO ENGINEER:
Drew Alway, P.Eng

DRAWING No:
SHEET 5

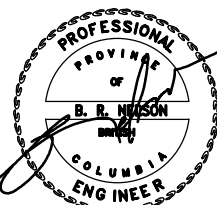
TOWN END
LEFT BANK

WOODS END
RIGHT BANK



NOTES:
1. WHEEL TRACKING ENVELOPE BASED ON WB-19
TRACTOR AND SEMI TRAILER.

DESIGN ENGINEER /
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January 27, 2017

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Ministry of
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Natural Resource Operations

REPLACEMENT OF BLACKFOOT CREEK BRIDGE

SITE #: N2-135

STRUCTURE #: N2-135A

FSR: WHITE - BLACKFOOT

MIN. km: _____ USER km: 39.9

DRAWING TITLE:

WHEEL TRACKING - TO WOODS

DESIGNED BY:	
--------------	--

Brandon Bolen

APPROVED BY:

Brad Nelson, P.Eng

PROFESSIONAL OF RECORD

MFLNRO ENGINEER:

FILE No:	
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EN17DRM009

DRAWING No:

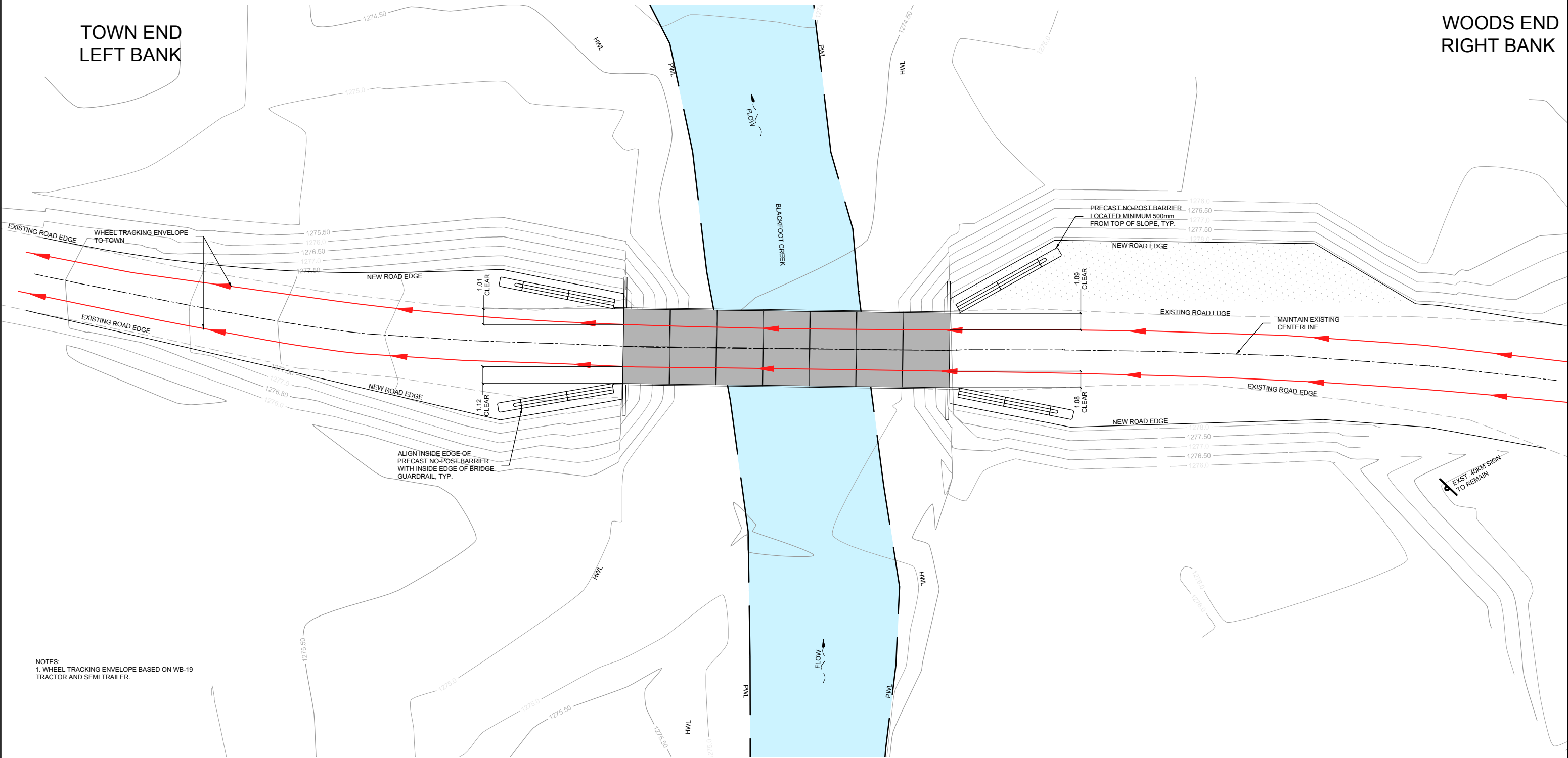
SHEET 6

Rev.	Date	DESCRIPTION	Init.
0	01/27/17	ISSUED FOR CONSTRUCTION	RN

REVISIONS

TOWN END
LEFT BANK

WOODS END
RIGHT BANK

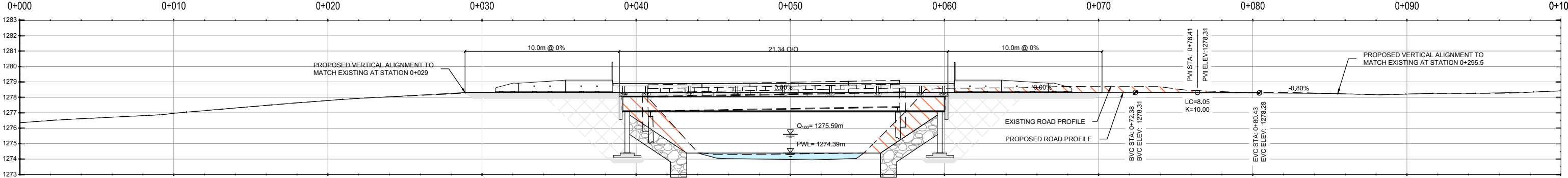


NOTES:
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TRACTOR AND SEMI TRAILER.

<div>DESIGN ENGINEER / COORDINATING REGISTERED PROFESSIONAL</div> <div></div> <div>January 27, 2017 PROFESSIONAL SEAL</div>	<div>McElhanney McElhanney Consulting Services Ltd.</div> <div>1800 Willowbrook Drive Cranbrook BC Canada V1C 7H9 Tel 250-489-3013</div>		<div>Ministry of Forests, Lands and Natural Resource Operations</div>			
	MCSL FILE # 2441-00468-00		REPLACEMENT OF BLACKFOOT CREEK BRIDGE			
	Designed <u>Brandon Bolen</u> Date: <u>JANUARY 27, 2017</u>		SITE #: N2-135 STRUCTURE #: N2-135A			
	Checked <u>Brad Nelson, P.Eng</u> Date: <u>JANUARY 27, 2017</u>		FSR: WHITE - BLACKFOOT MIN. km: <u> </u> USER km: 39.9			
	Drawn <u>Brandon Bolen</u> Date: <u>JANUARY 27, 2017</u>		DRAWING TITLE: WHEEL TRACKING - TO TOWN			
Rev.	Date	DESCRIPTION	Init.		DESIGNED BY: Brandon Bolen	APPROVED BY: Brad Nelson, P.Eng
					PROFESSIONAL OF RECORD Brad Nelson, P.Eng	MFLNRO ENGINEER: Drew Alway, P.Eng
0	01/27/17	ISSUED FOR CONSTRUCTION	BN		FILE No: EN17DRM009	DRAWING No: SHEET 7
REVISIONS						

TOWN END
LEFT BANK

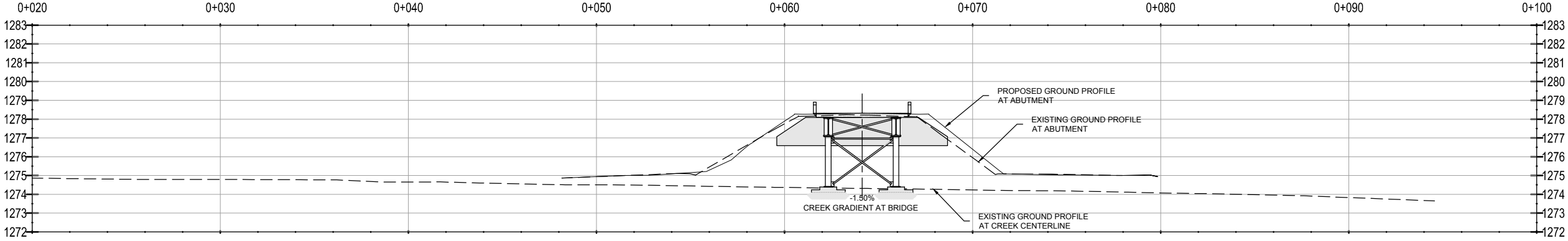
WOODS END
RIGHT BANK



TOWN END CUT/FILL VOLUMES	
ESTIMATED CUT VOLUME	70 m ³
ESTIMATED FILL VOLUME	135 m ³
NET VOLUME	FILL 65 m ³
ALL VOLUMES ARE UNFACTORED AND ESTIMATED FOR TENDERING PURPOSES	

A
8 ROAD PROFILE (LOOKING UPSTREAM)
SCALE: 1:250

WOODS END CUT/FILL VOLUMES	
ESTIMATED CUT VOLUME	140 m ³
ESTIMATED FILL VOLUME	445 m ³
NET VOLUME	FILL 305 m ³
ALL VOLUMES ARE UNFACTORED AND ESTIMATED FOR TENDERING PURPOSES	



B
8 LONG CREEK PROFILE (LOOKING TOWARDS TOWN END, LEFT BANK)
SCALE: 1:250

DESIGN ENGINEER /
COORDINATING REGISTERED
PROFESSIONAL

**PROFESSIONAL
OF
B. P. NELSON
COLUMBIA
ENGINEER**

January 27, 2017

PROFESSIONAL SEAL

McElhanney
McElhanney Consulting Services Ltd.

1800 Willowbrook Drive
Cranbrook BC
Canada V1C 7H9
Tel 250-489-3013

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**Ministry of
Forests, Lands and
Natural Resource Operations**

REPLACEMENT OF BLACKFOOT CREEK BRIDGE

SITE #: N2-135 STRUCTURE #: N2-135A
FSR: WHITE - BLACKFOOT MIN. km: USER km: 39.9

DRAWING TITLE:
LONG ROAD AND CREEK PROFILES

DESIGNED BY:
Brandon Bolen

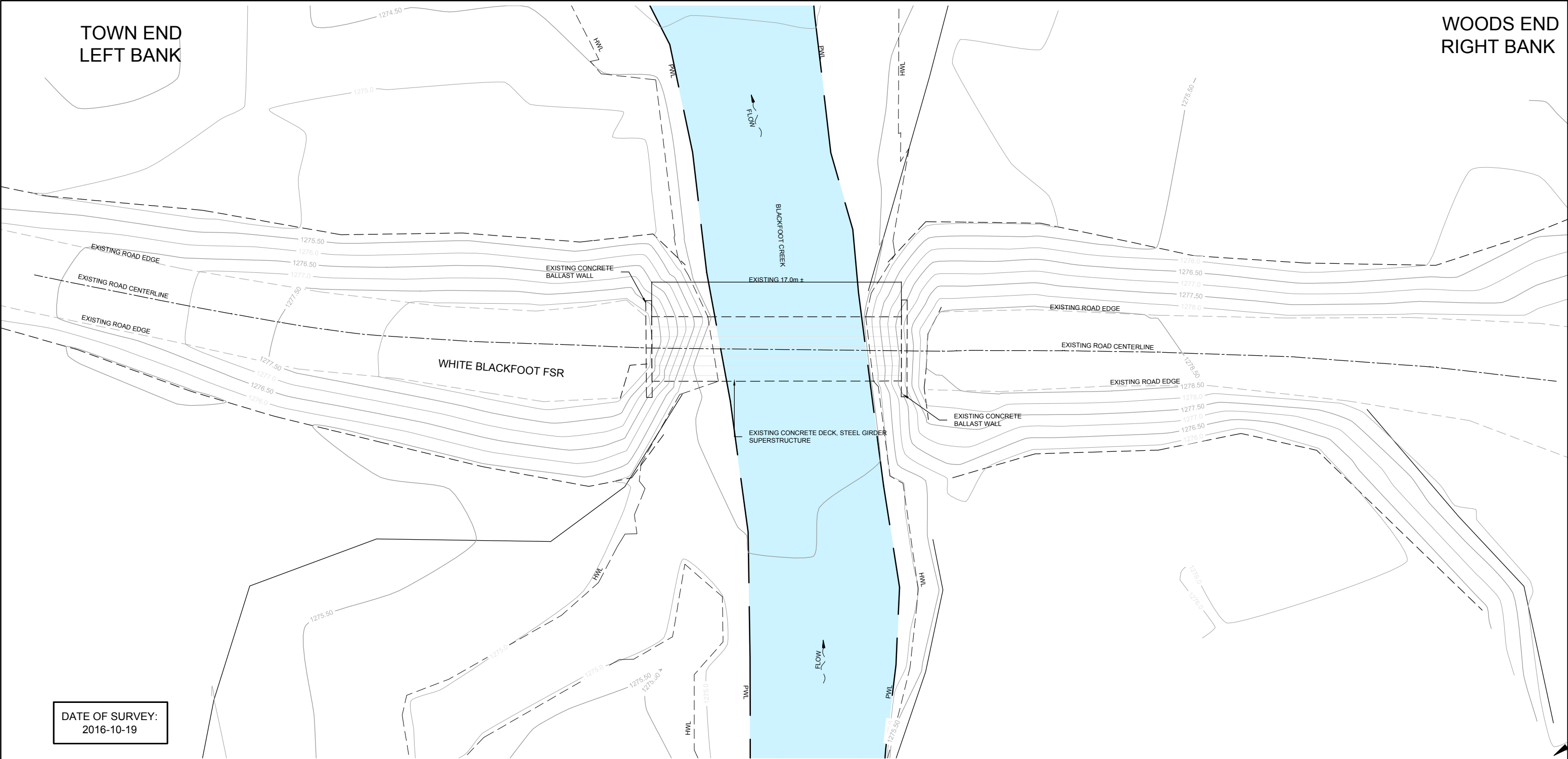
PROFESSIONAL OF RECORD
Brad Nelson, P.Eng

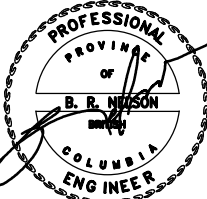
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APPROVED BY:
Brad Nelson, P.Eng

MFLNRO ENGINEER:
Drew Alway, P.Eng

DRAWING No:
SHEET 8



<div>DESIGN ENGINEER / COORDINATING REGISTERED PROFESSIONAL</div> <div></div> <div>January 27, 2017</div> <div>PROFESSIONAL SEAL</div>	<div>McElhanney McElhanney Consulting Services Ltd.<div>1800 Willowbrook Drive Cranbrook BC Canada V1C 7H9 Tel 250-489-3013</div></div> <div>MCSL FILE # 2441-00468-00</div> <table><tr><td>Designed</td><td>Brandon Bolen</td><td>Date:</td><td>JANUARY 27, 2017</td></tr><tr><td>Checked</td><td>Brad Nelson, P.Eng</td><td>Date:</td><td>JANUARY 27, 2017</td></tr><tr><td>Drawn</td><td>Brandon Bolen</td><td>Date:</td><td>JANUARY 27, 2017</td></tr><tr><td>Rev.</td><td>Date</td><td>DESCRIPTION</td><td>Init.</td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td>0</td><td>01/27/17</td><td>ISSUED FOR CONSTRUCTION</td><td>BN</td></tr><tr><td colspan="4">REVISIONS</td></tr></table>	Designed	Brandon Bolen	Date:	JANUARY 27, 2017	Checked	Brad Nelson, P.Eng	Date:	JANUARY 27, 2017	Drawn	Brandon Bolen	Date:	JANUARY 27, 2017	Rev.	Date	DESCRIPTION	Init.																					0	01/27/17	ISSUED FOR CONSTRUCTION	BN	REVISIONS				<div><div>Ministry of Forests, Lands and Natural Resource Operations</div></div> <table><tr><td colspan="2">REPLACEMENT OF BLACKFOOT CREEK BRIDGE</td></tr><tr><td>SITE #: N2-135A</td><td>STRUCTURE #: N2-135A</td></tr><tr><td>FSR: WHITE - BLACKFOOT</td><td>MIN. km: __ USER km: 39.9</td></tr><tr><td colspan="2">DRAWING TITLE:</td></tr><tr><td colspan="2">EXISTING CONDITIONS PLAN</td></tr><tr><td>DESIGNED BY:</td><td>APPROVED BY:</td></tr><tr><td>Brandon Bolen</td><td>Brad Nelson, P.Eng</td></tr><tr><td>PROFESSIONAL OF RECORD</td><td>MFLNRO ENGINEER:</td></tr><tr><td>Brad Nelson, P.Eng</td><td>Drew Alway, P.Eng</td></tr><tr><td>FILE No:</td><td>DRAWING No:</td></tr><tr><td>EN17DRM009</td><td>SHEET 9</td></tr></table>	REPLACEMENT OF BLACKFOOT CREEK BRIDGE		SITE #: N2-135A	STRUCTURE #: N2-135A	FSR: WHITE - BLACKFOOT	MIN. km: __ USER km: 39.9	DRAWING TITLE:		EXISTING CONDITIONS PLAN		DESIGNED BY:	APPROVED BY:	Brandon Bolen	Brad Nelson, P.Eng	PROFESSIONAL OF RECORD	MFLNRO ENGINEER:	Brad Nelson, P.Eng	Drew Alway, P.Eng	FILE No:	DRAWING No:	EN17DRM009	SHEET 9
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1
10 PHOTO 1 - SITE OVERVIEW
SCALE: NTS



2
10 PHOTO 2 - LOOKING DOWNSTREAM
SCALE: NTS



3
10 PHOTO 3 - LOOKING UPSTREAM
SCALE: NTS



4
10 PHOTO 4 - EXISTING BRIDGE FROM UPSTREAM
SCALE: NTS



5
10 PHOTO 5 - EXISTING BRIDGE FROM DOWNSTREAM
SCALE: NTS



6
10 PHOTO 6 - EXISTING ABUTMENTS
SCALE: NTS

<p>DESIGN ENGINEER / COORDINATING REGISTERED PROFESSIONAL</p> <p> January 27, 2017 PROFESSIONAL SEAL</p>	<p> McElhanney McElhanney Consulting Services Ltd.</p> <p>Suite 200 42 Eighth Avenue South Cranbrook BC Canada V1C 2K3 Tel 250 489 3013</p> <p>MCSL FILE # 2441-00468-00</p> <table><tr><td>Designed</td><td>Brandon Bolen</td><td>Date:</td><td>JANUARY 27, 2017</td></tr><tr><td>Checked</td><td>Brad Nelson, P.Eng</td><td>Date:</td><td>JANUARY 27, 2017</td></tr><tr><td>Drawn</td><td>Brandon Bolen</td><td>Date:</td><td>JANUARY 27, 2017</td></tr></table> <table><tr><th>Rev.</th><th>Date</th><th>DESCRIPTION</th><th>Init.</th></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td>0</td><td>01/27/17</td><td>ISSUED FOR CONSTRUCTION</td><td>BN</td></tr></table> <p>REVISIONS</p>	Designed	Brandon Bolen	Date:	JANUARY 27, 2017	Checked	Brad Nelson, P.Eng	Date:	JANUARY 27, 2017	Drawn	Brandon Bolen	Date:	JANUARY 27, 2017	Rev.	Date	DESCRIPTION	Init.																	0	01/27/17	ISSUED FOR CONSTRUCTION	BN	<p> Ministry of Forests, Lands and Natural Resource Operations</p> <p>REPLACEMENT OF BLACKFOOT CREEK BRIDGE</p> <table><tr><td>SITE #:</td><td>N2-135</td><td>STRUCTURE #:</td><td>N2-135A</td></tr><tr><td>FSR:</td><td>WHITE - BLACKFOOT</td><td>MIN. km:</td><td> </td></tr><tr><td>USER km:</td><td>39.9</td><td> </td><td> </td></tr></table> <p>DRAWING TITLE: SITE PHOTOGRAPHS</p> <table><tr><td>DESIGNED BY: Brandon Bolen</td><td>APPROVED BY: Brad Nelson, P.Eng</td></tr><tr><td>PROFESSIONAL OF RECORD Brad Nelson, P.Eng</td><td>MFLNRO ENGINEER: Drew Alway, P.Eng</td></tr></table> <table><tr><td>FILE No: EN17DRM009</td><td>DRAWING No: SHEET 10</td></tr></table>	SITE #:	N2-135	STRUCTURE #:	N2-135A	FSR:	WHITE - BLACKFOOT	MIN. km:		USER km:	39.9			DESIGNED BY: Brandon Bolen	APPROVED BY: Brad Nelson, P.Eng	PROFESSIONAL OF RECORD Brad Nelson, P.Eng	MFLNRO ENGINEER: Drew Alway, P.Eng	FILE No: EN17DRM009	DRAWING No: SHEET 10
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