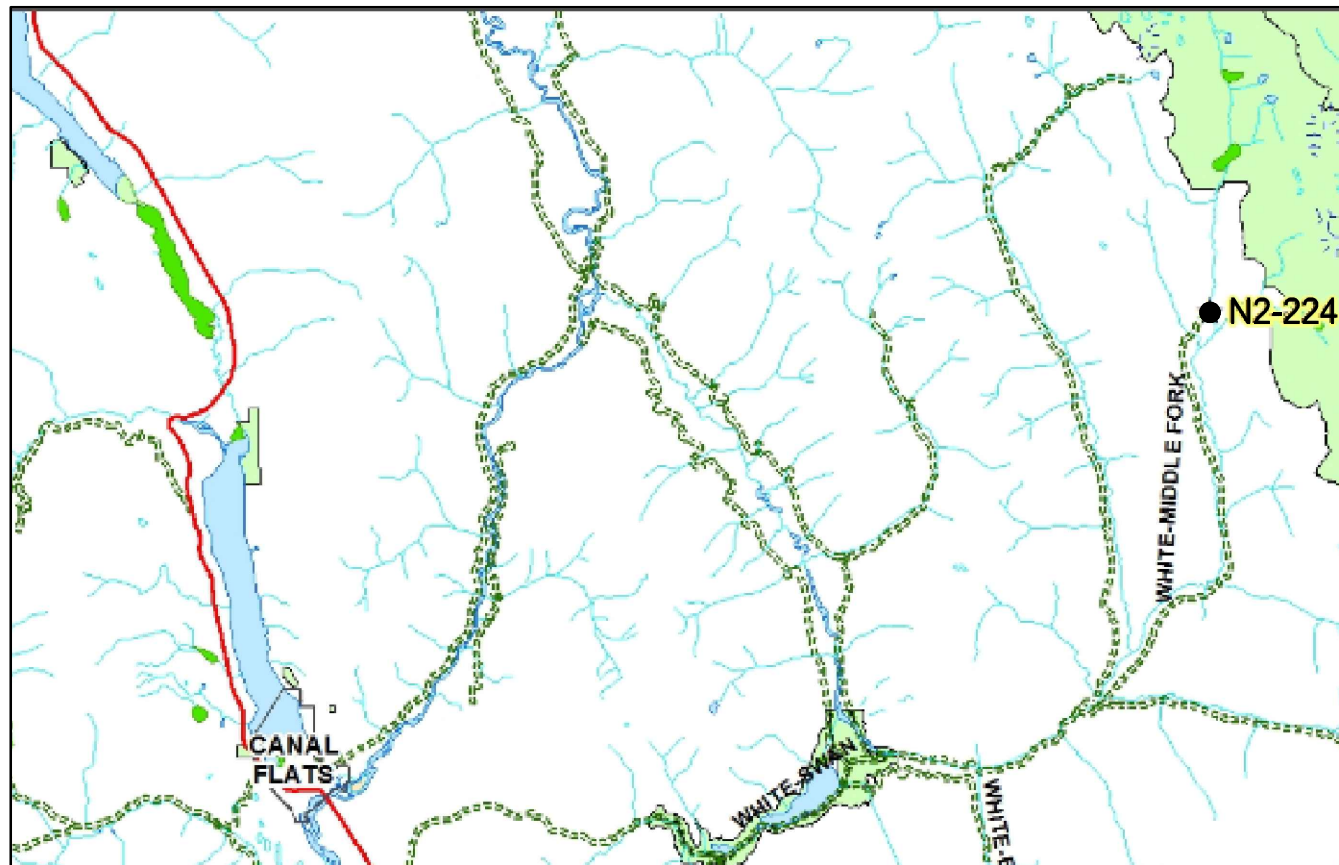




Ministry of Forests, Lands and Natural Resource Operations



KEY PLAN

REPLACEMENT OF WHITE RIVER BRIDGE

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

SITE #: **N2-224** STRUCTURE #: **N2-224A**

MINISTRY km.: **67.5 km** USER km.: **67.5km**

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

UTM E: **627792** N: **5578876** 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	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	ROAD LAYOUT PLAN & LONG CREEK PROFILE	0	JANUARY 27, 2017
SHEET 9	LONG ROAD PROFILE	0	JANUARY 27, 2017
SHEET 10	EXISTING CONDITIONS SITE PLAN	0	JANUARY 27, 2017
SHEET 11	SITE PHOTOGRAPHS	0	JANUARY 27, 2017



McElhanney

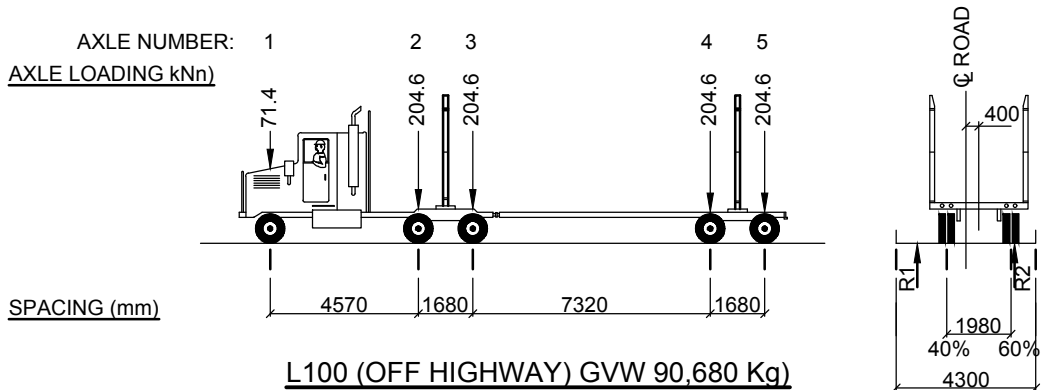
McElhanney Consulting Services Ltd.

1800 Willowbrook Drive
Cranbrook BC
Canada V1C 7H9
Tel 250-493-3013

GENERAL

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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 = 100.5 SQ. KM.
2. BOTTOM WIDTH = 11.3 m
3. STREAMBED MATERIAL = ROUNDED COBBLES/GRAVEL
4. OVERALL CHANNEL GRADIENT AT CROSSING: 0.50%
5. Q_2 INSTANTANEOUS FLOW: 4.0 m³/s
6. V_2 ESTIMATED LOCAL MAXIMUM VELOCITY: 1.0 m/s
7. Q_2 ESTIMATED CHANNEL DEPTH: 0.4 m
8. Q_{100} INSTANTANEOUS FLOW: 42.54 m³/s
9. V_{100} ESTIMATED LOCAL MAXIMUM VELOCITY: 1.02 m/s
10. Q_{100} ESTIMATED CHANNEL DEPTH: 1.7 m
11. FREEBOARD: 1.5 m AT UPSTREAM FACE OF BRIDGE (AS MEASURED ABOVE Q_{100} 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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<div>DESIGN ENGINEER / COORDINATING REGISTERED PROFESSIONAL</div> <div></div> <div>January 27, 2017 PROFESSIONAL SEAL</div>	<div>McElhanney McElhanney Consulting Services Ltd.<div>1800 Willowbrook Drive Cranbrook BC Canada V1C 7H8 Tel 250-489-3013</div></div> <div>MCSL FILE # 2441-00468-00</div> <div>Designed <u>Brandon Bolen</u> Date: <u>JANUARY 27, 2017</u></div> <div>Checked <u>Brad Nelson, P.Eng</u> Date: <u>JANUARY 27, 2017</u></div> <div>Drawn <u>Brandon Bolen</u> Date: <u>JANUARY 27, 2017</u></div> <table><tr><th>Rev.</th><th>Date</th><th>DESCRIPTION</th><th>Init.</th><th></th></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td>0</td><td>01/27/17</td><td>ISSUED FOR CONSTRUCTION</td><td>BRB</td><td> </td></tr><tr><td colspan="5">REVISIONS</td></tr></table>	Rev.	Date	DESCRIPTION	Init.																											0	01/27/17	ISSUED FOR CONSTRUCTION	BRB		REVISIONS					<div><div>Ministry of Forests, Lands and Natural Resource Operations</div></div> <div>REPLACEMENT OF WHITE RIVER BRIDGE</div> <div>SITE #: N2-224 STRUCTURE #: N2-224A</div> <div>FSR: WHITE - MIDDLEFORK MIN. km: USER km: 67.5</div> <div>DRAWING TITLE: GENERAL NOTES</div> <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><tr><td>FILE No: EN17DRM009</td><td>DRAWING No: SHEET 1</td></tr></table>	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 1
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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.

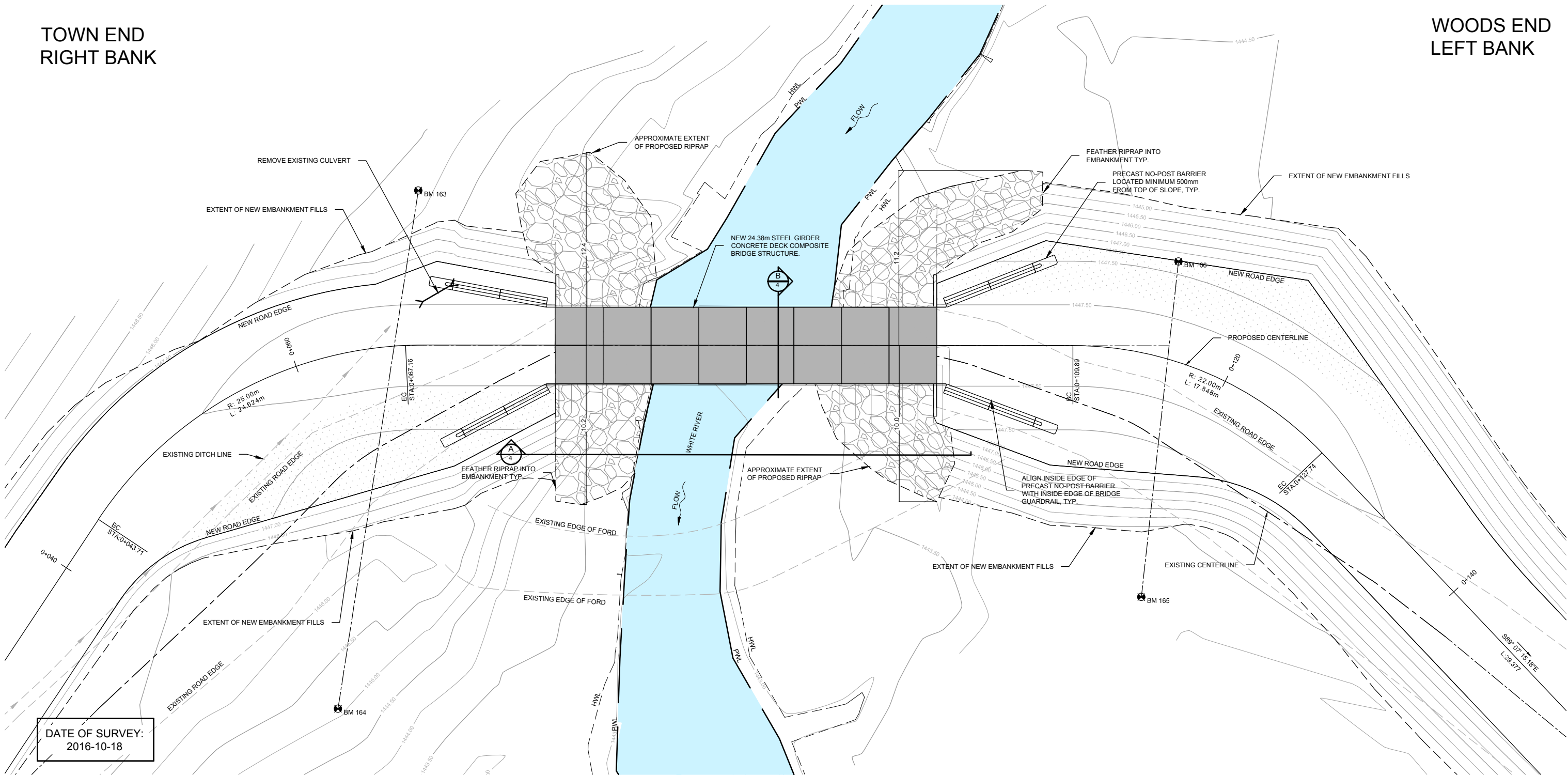
CONSTRUCTION

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.

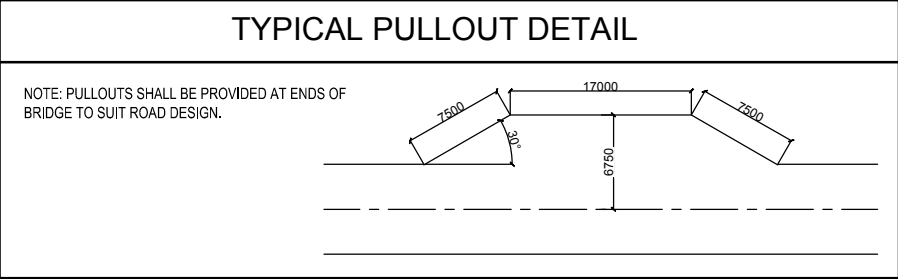
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				DREW ALWAY, P.ENG		
0	01/27/17	ISSUED FOR CONSTRUCTION	BN	FILE No:	DRAWING No:	
REVISIONS				EN17DRM009	SHEET 2	

TOWN END
RIGHT BANK

WOODS END
LEFT BANK



EXTENT OF RIPRAP	
TOWN END - UPSTREAM SIDE	12.4m
TOWN END - DOWNSTREAM SIDE	10.2m
WOODS END - UPSTREAM SIDE	11.2m
WOODS END - DOWNSTREAM SIDE	10.0m
MEASURED UPSTREAM OR DOWNSTREAM FROM ROAD CENTERLINE. (ALL DISTANCES ARE HORIZONTAL)	



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	185 m³
WOODS END	190 m³

DESIGN ENGINEER /
COORDINATING REGISTERED
PROFESSIONAL

January 27, 2017
PROFESSIONAL SEAL

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

MCSL FILE # 2441-00468-00

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REVISIONS

REPLACEMENT OF WHITE RIVER BRIDGE

SITE #: N2-224 STRUCTURE #: N2-224A

FSR: WHITE - MIDDLEFORK MIN. km: USER km: 67.5

DRAWING TITLE:
GENERAL ARRANGEMENT PLAN AND RIPRAP DETAILS

DESIGNED BY:
BRANDON BOLEN

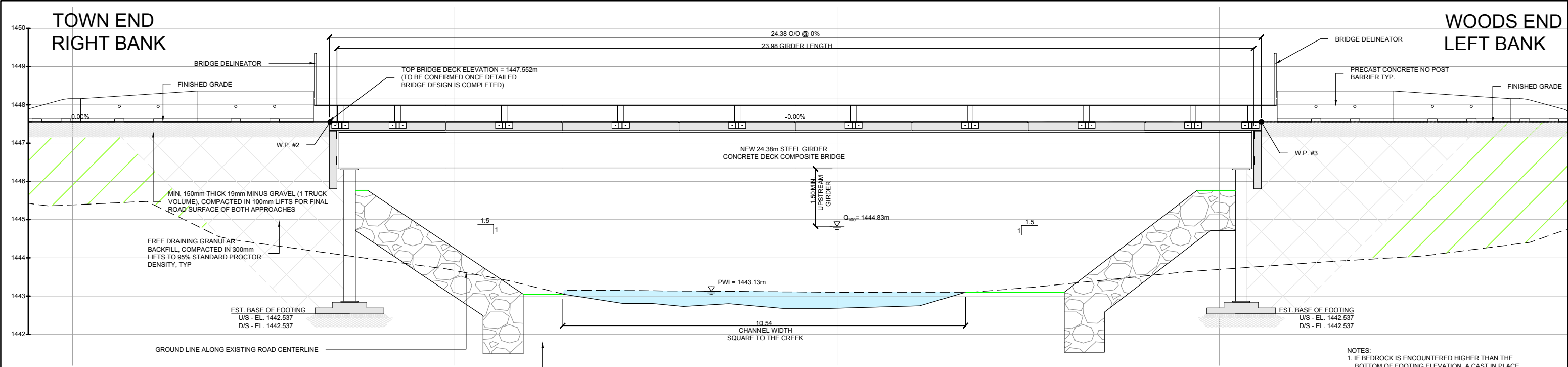
APPROVED BY:
BRAD NELSON, P.ENG

PROFESSIONAL OF RECORD
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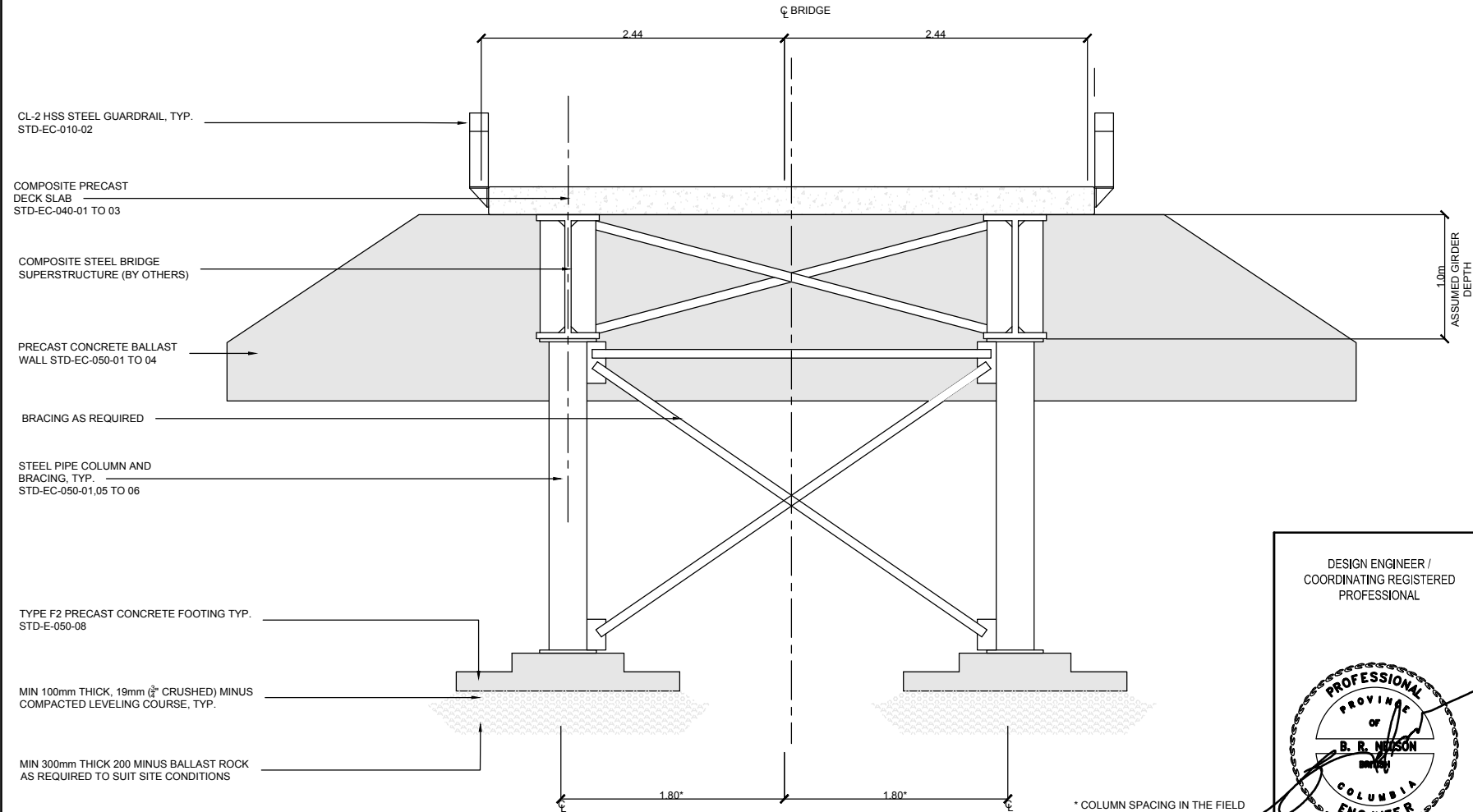
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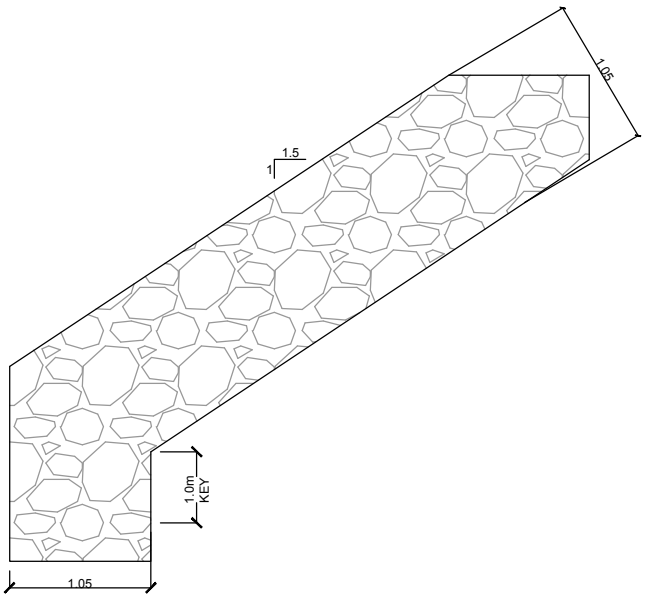
DRAWING No:
SHEET 3



A
4
SECTION "A" SCALE: 1:100
DOWNSTREAM FACE OF BRIDGE
(LOOKING UPSTREAM)



B
4
SECTION "B" SCALE: 1:50
TOWN/LEFT ABUTMENT SHOWN
WOODS/RIGHT ABUTMENT MIRRORED

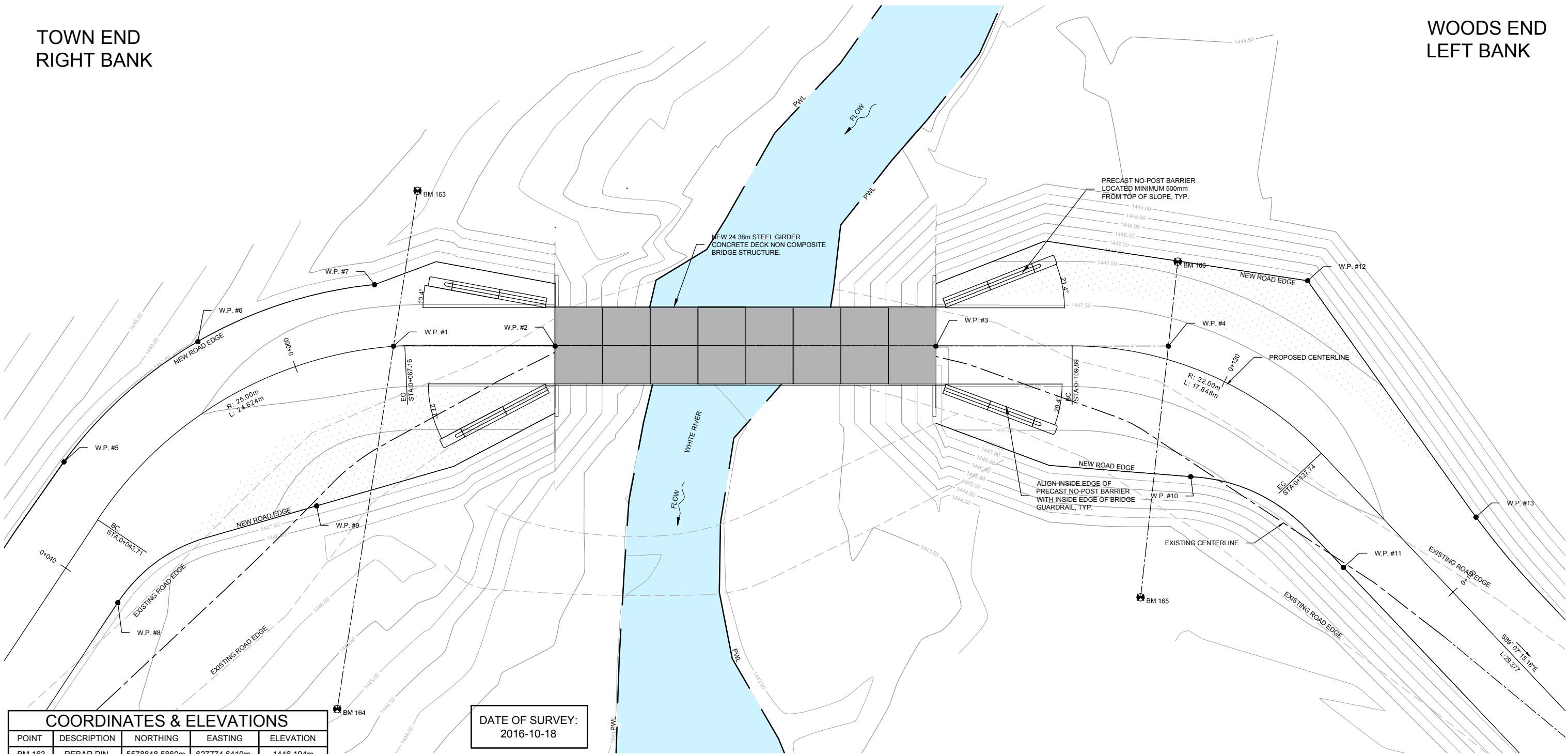


1
4
RIPRAP DETAIL SCALE: NTS
DOWNSTREAM FACE OF BRIDGE
(LOOKING UPSTREAM)

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FILE No: EN17DRM009	DRAWING No: SHEET 4																															

TOWN END
RIGHT BANK

WOODS END
LEFT BANK



COORDINATES & ELEVATIONS				
POINT	DESCRIPTION	NORTHING	EASTING	ELEVATION
BM 163	REBAR PIN	5578848.5860m	627774.6410m	1446.194m
BM 164	REBAR PIN	5578821.7240m	627794.7610m	1445.114m
BM 165	REBAR PIN	5578863.5060m	627825.6090m	1444.212m
BM 166	REBAR PIN	5578880.2210m	627811.9150m	1444.724m
W.P. #1	NEW BRIDGE CL	5578840.542m	627780.666m	1447.550m
W.P. #2	NEW BRIDGE CL	5578847.941m	627787.901m	1447.550m
W.P. #3	NEW BRIDGE CL	5578865.375m	627804.948m	1447.550m
W.P. #4	NEW BRIDGE CL	5578876.021m	627815.356m	1447.550m
W.P. #5	EDGE OF ROAD	5578820.277m	627771.214m	1447.360m
W.P. #6	EDGE OF ROAD	5578831.780m	627771.702m	1447.440m
W.P. #7	EDGE OF ROAD	5578842.423m	627777.006m	1447.470m
W.P. #8	EDGE OF ROAD	5578816.431m	627780.061m	1447.310m
W.P. #9	EDGE OF ROAD	5578829.872m	627784.537m	1447.550m
W.P. #10	EDGE OF ROAD	5578871.204m	627822.333m	1447.500m
W.P. #11	EDGE OF ROAD	5578874.133m	627833.323m	1447.420m
W.P. #12	EDGE OF ROAD	5578885.315m	627818.591m	1447.500m
W.P. #13	EDGE OF ROAD	5578882.453m	627836.951m	1447.380m

DATE OF SURVEY:
2016-10-18

LAYOUT SCHEDULE	
BM 163 TO BM 164	33.56m
BM 163 TO WP #1	10.05m
BM 164 TO WP #1	23.51m
WP #1 TO WP #2	10.35m
WP #2 TO WP #3	24.38m
WP #3 TO WP #4	14.89m
BM 165 TO BM 166	21.61m
BM 165 TO WP #4	16.18m
BM 166 TO WP #4	5.43m

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

REVISIONS

REPLACEMENT OF WHITE RIVER BRIDGE

SITE #: N2-224	STRUCTURE #: N2-224A
FSR: WHITE - MIDDLEFORK	MIN. km: __ USER km: 67.5

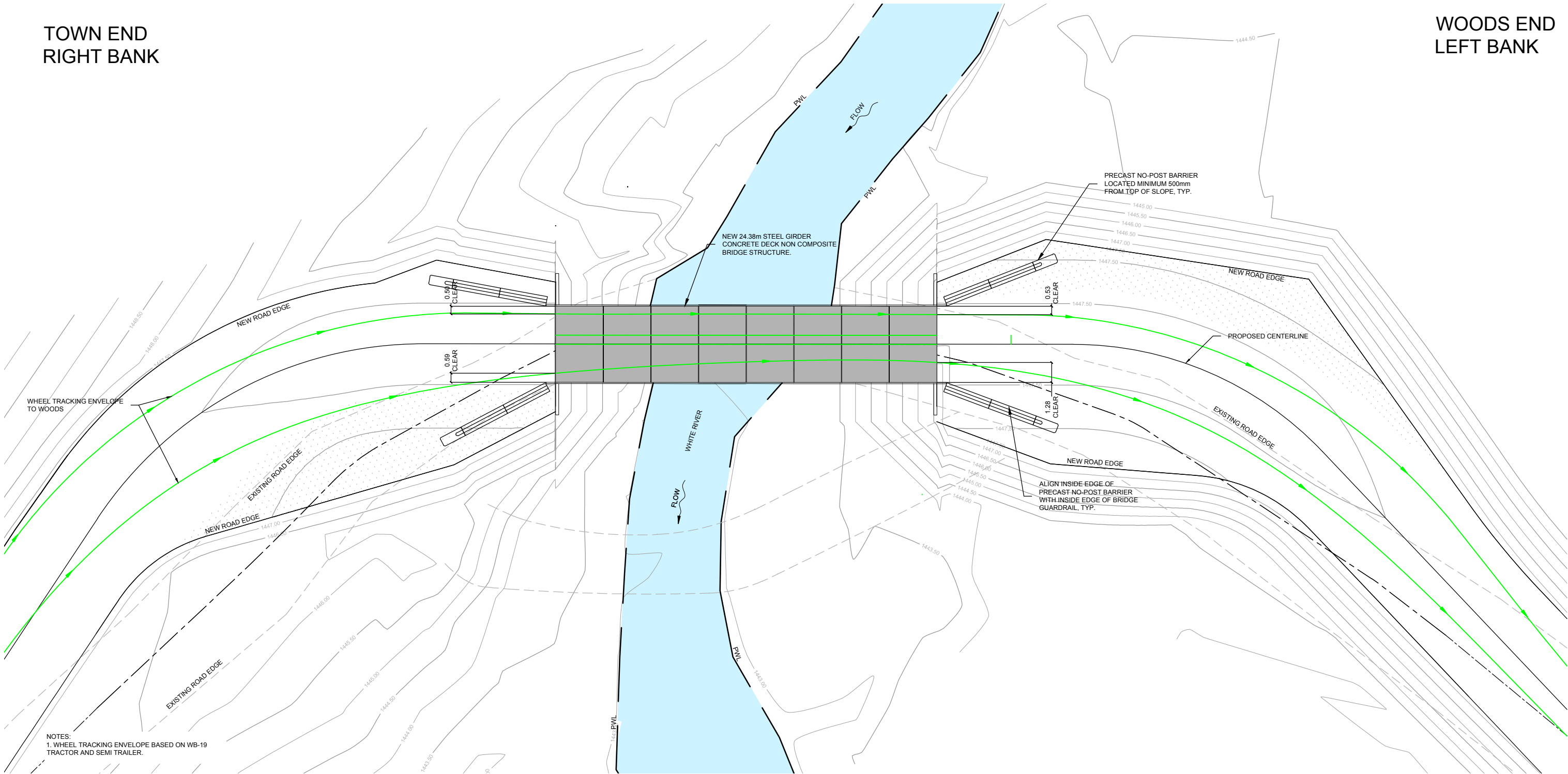
DRAWING TITLE:
BRIDGE LAYOUT

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 5

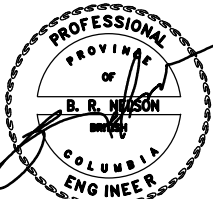
TOWN END
RIGHT BANK

WOODS END
LEFT BANK



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

DESIGN ENGINEER /
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PROFESSIONAL



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Ministry of
Forests, Lands and
Natural Resource Operations

REPLACEMENT OF WHITE RIVER BRIDGE

SITE #: N2-224 STRUCTURE #: N2-224A
FSR: WHITE - MIDDLEFORK MIN. km: USER km: 67.5

DRAWING TITLE:
WHEEL TRACKING - TO WOODS

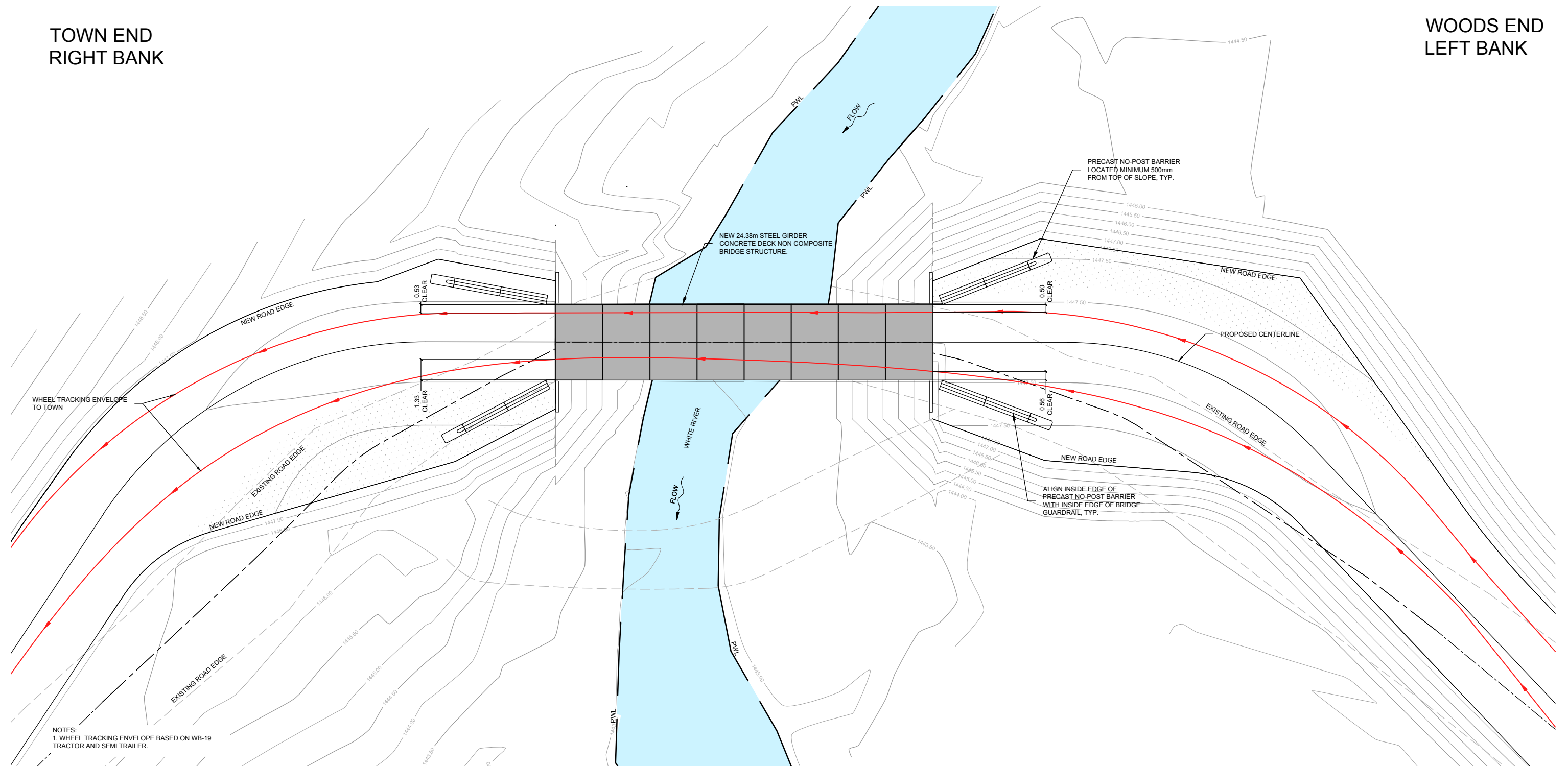
DESIGNED BY:
BRANDON BOLEN
APPROVED BY:
BRAD NELSON, P.ENG

PROFESSIONAL OF RECORD
BRAD NELSON, P.ENG
MFLNRO ENGINEER:
DREW ALWAY, P.ENG

FILE No:
EN17DRM009
DRAWING No:
SHEET 6

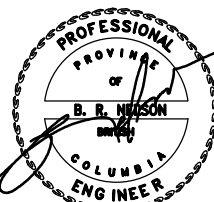
TOWN END
RIGHT BANK

WOODS END
LEFT BANK



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

DESIGN ENGINEER /
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REPLACEMENT OF WHITE RIVER BRIDGE

SITE #: N2-224	STRUCTURE #: N2-224A
FSR: WHITE - MIDDLEFORK	MIN. km: _____ USER km: 67.5

DRAWING TITLE:
WHEEL TRACKING - TO TOWN

DESIGNED BY:	APPROVED BY:
BRANDON BOLEN	BRAD NELSON, P.ENG

PROFESSIONAL OF RECORD	MFLNRO ENGINEER:
BRAD NELSON, P.ENG	DREW ALWAY, P.ENG

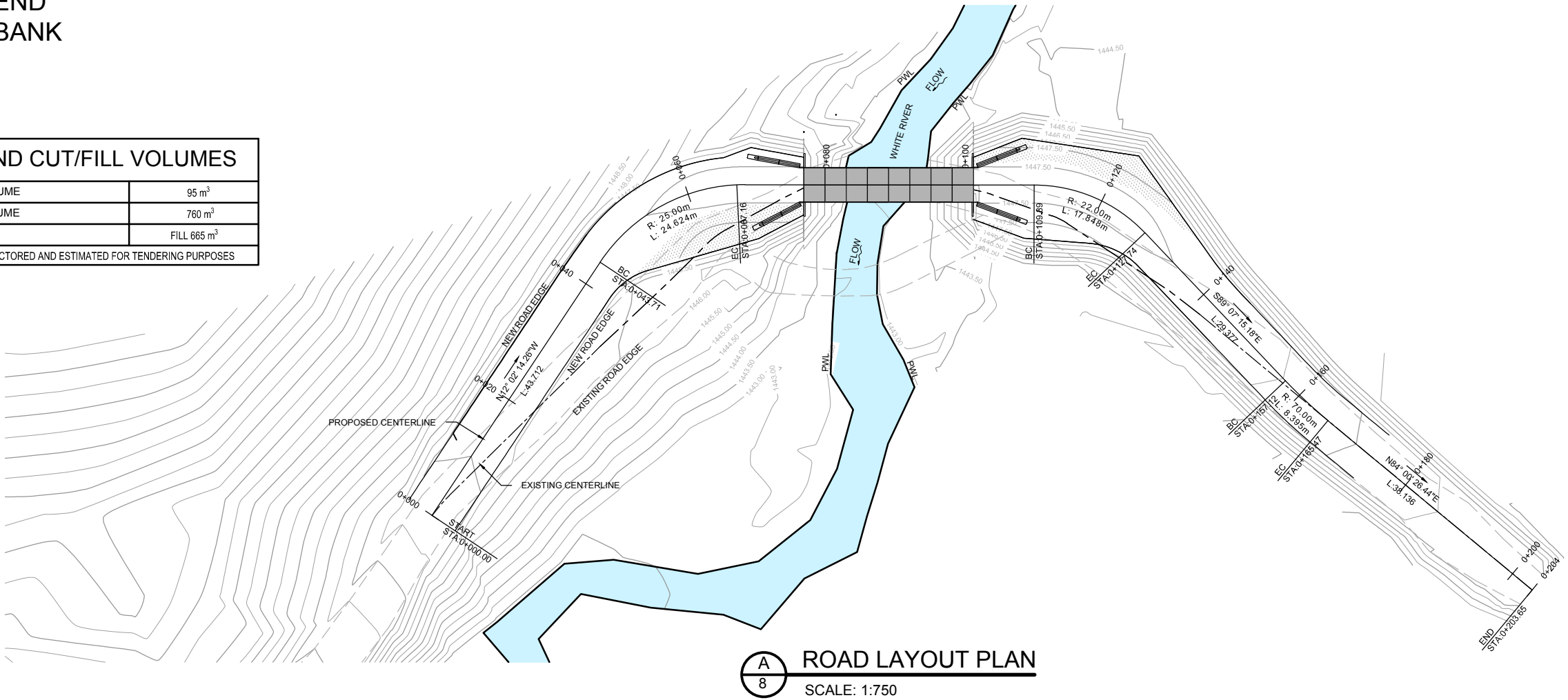
FILE No:	DRAWING No:
EN17DRM009	SHEET 7

TOWN END
RIGHT BANK

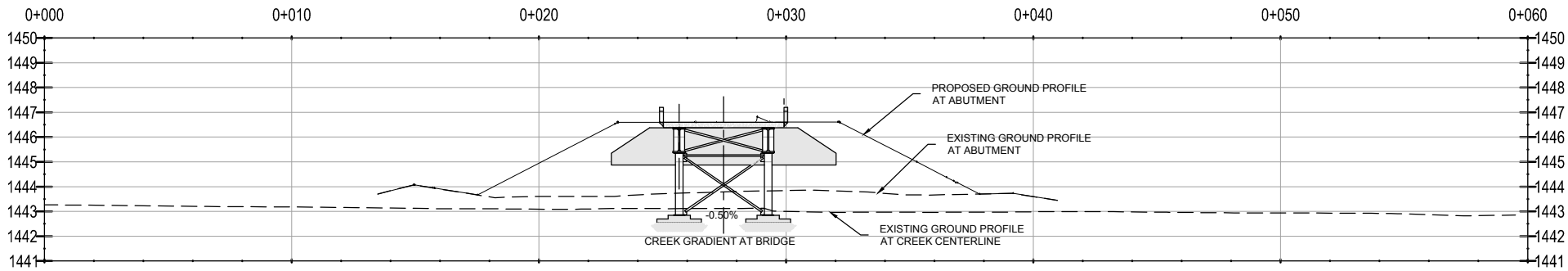
WOODS END
LEFT BANK

TOWN END CUT/FILL VOLUMES	
ESTIMATED CUT VOLUME	95 m ³
ESTIMATED FILL VOLUME	760 m ³
NET VOLUME	FILL 665 m ³
ALL VOLUMES ARE UNFACTORED AND ESTIMATED FOR TENDERING PURPOSES	

WOODS END CUT/FILL VOLUMES	
ESTIMATED CUT VOLUME	0 m ³
ESTIMATED FILL VOLUME	3070m ³
NET VOLUME	FILL 3070 m ³
ALL VOLUMES ARE UNFACTORED AND ESTIMATED FOR TENDERING PURPOSES	



A ROAD LAYOUT PLAN
8 SCALE: 1:750



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

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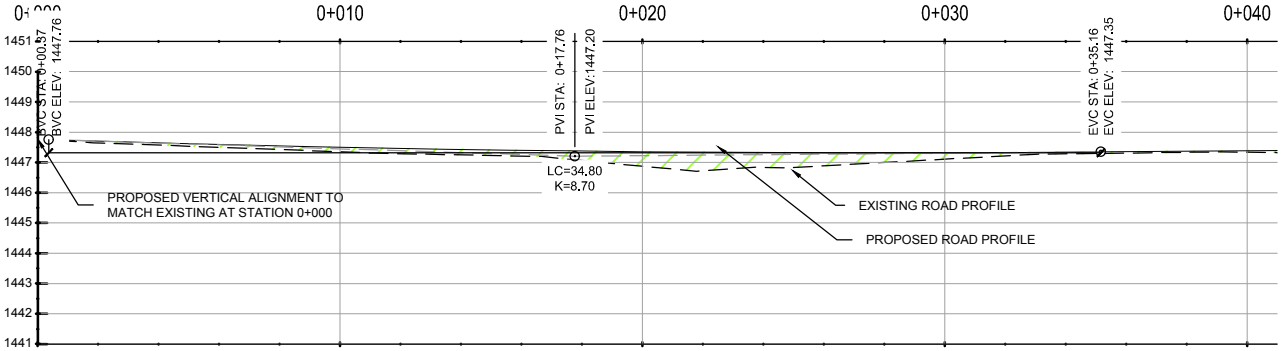
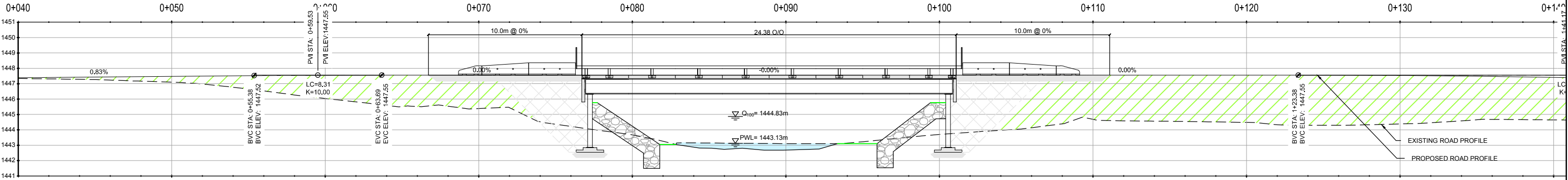
DRAWING TITLE:
ROAD LAYOUT PLAN & LONG CREEK PROFILE

DESIGNED BY: BRANDON BOLEN APPROVED BY: BRAD NELSON, P.ENG

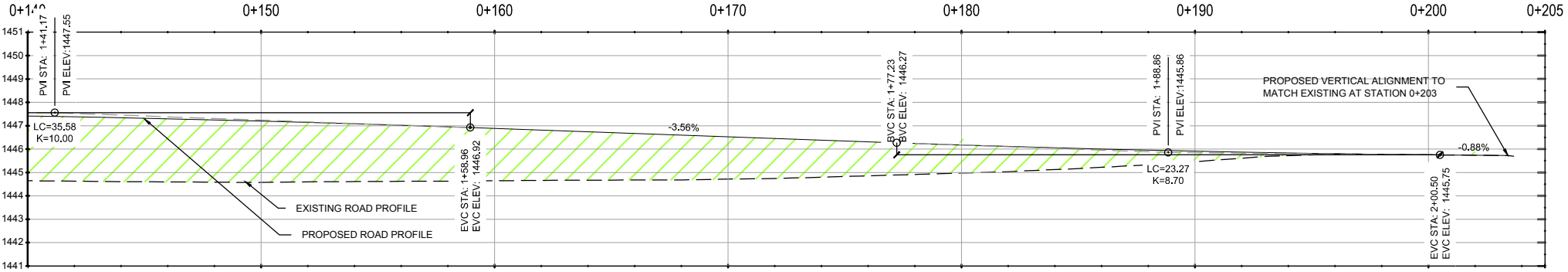
PROFESSIONAL OF RECORD: BRAD NELSON, P.ENG MFLNRO ENGINEER: DREW ALWAY, P.ENG

FILE No: EN17DRM009 DRAWING No: SHEET 8

TOWN END
RIGHT BANK

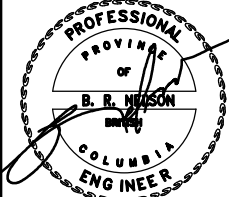


WOODS END
LEFT BANK



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

LEGEND	
BVC	BEGINNING OF VERTICAL CURVE
EVC	END OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
LC	LENGTH OF CURVE
K	K VALUE OF CURVE
	INDICATES FILL DEPTH EXTENTS CENTERLINE
	INDICATES CUT EXTENTS AT CENTERLINE

<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>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> </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>Ministry of Forests, Lands and Natural Resource Operations</div> <div>REPLACEMENT OF WHITE RIVER BRIDGE</div> <table><tr><td>SITE #:</td><td>N2-224</td><td>STRUCTURE #:</td><td>N2-224A</td></tr><tr><td>FSR:</td><td>WHITE - MIDDLEFORK</td><td>MIN. km:</td><td> </td></tr><tr><td>USER km:</td><td>67.5</td><td> </td><td> </td></tr></table> <div>DRAWING TITLE: LONG ROAD PROFILE</div> <table><tr><td>DESIGNED BY:</td><td>BRANDON BOLEN</td><td>APPROVED BY:</td><td>BRAD NELSON, P.ENG</td></tr><tr><td>PROFESSIONAL OF RECORD</td><td>BRAD NELSON, P.ENG</td><td>MFLNRO ENGINEER:</td><td>DREW ALWAY, P.ENG</td></tr><tr><td>FILE No:</td><td>EN17DRM009</td><td>DRAWING No:</td><td>SHEET 9</td></tr></table>		SITE #:	N2-224	STRUCTURE #:	N2-224A	FSR:	WHITE - MIDDLEFORK	MIN. km:		USER km:	67.5			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 9
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TOWN END
RIGHT BANK

WOODS END
LEFT BANK



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	SITE #: N2-224 STRUCTURE #: N2-224A		
	FSR: WHITE - MIDDLEFORK MIN. km: USER km: 67.5		
	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 10	

Rev.	Date	DESCRIPTION	Init.
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1
11 PHOTO 1 - SITE OVERVIEW
SCALE: NTS



2
11 PHOTO 2 - LOOKING DOWNSTREAM
SCALE: NTS



3
11 PHOTO 3 - LOOKING UPSTREAM
SCALE: NTS



4
11 PHOTO 4 - UPSTREAM INTERSECTION
SCALE: NTS



5
11 PHOTO 5 - DOWNSTREAM INTERSECTION
SCALE: NTS



6
11 PHOTO 6 - EXISTING BRIDGE UP CHAINAGE
SCALE: NTS

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DRAWING TITLE: SITE PHOTOGRAPHS																											
DESIGNED BY: BRANDON R. BOLEN		APPROVED BY: BRAD R. NELSON																									
PROFESSIONAL OF RECORD BRAD R. NELSON		MFLNRO ENGINEER: DREW ALWAY																									
FILE No: EN17DRM009		DRAWING No: SHEET 11																									