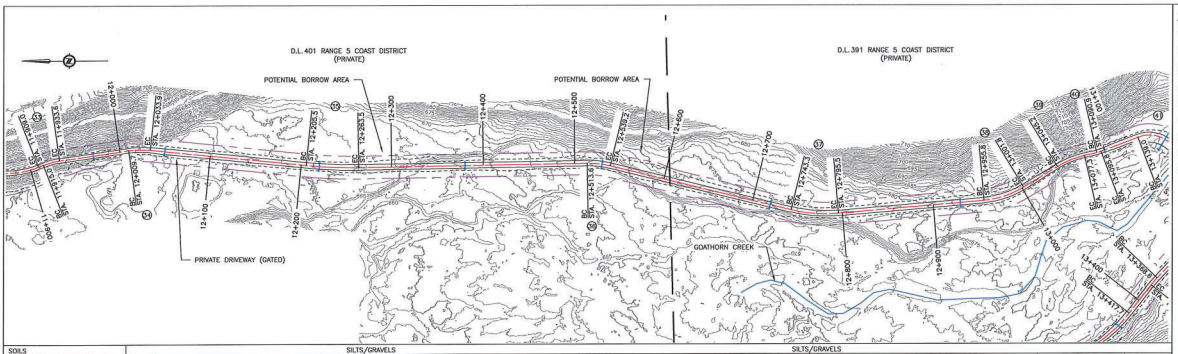
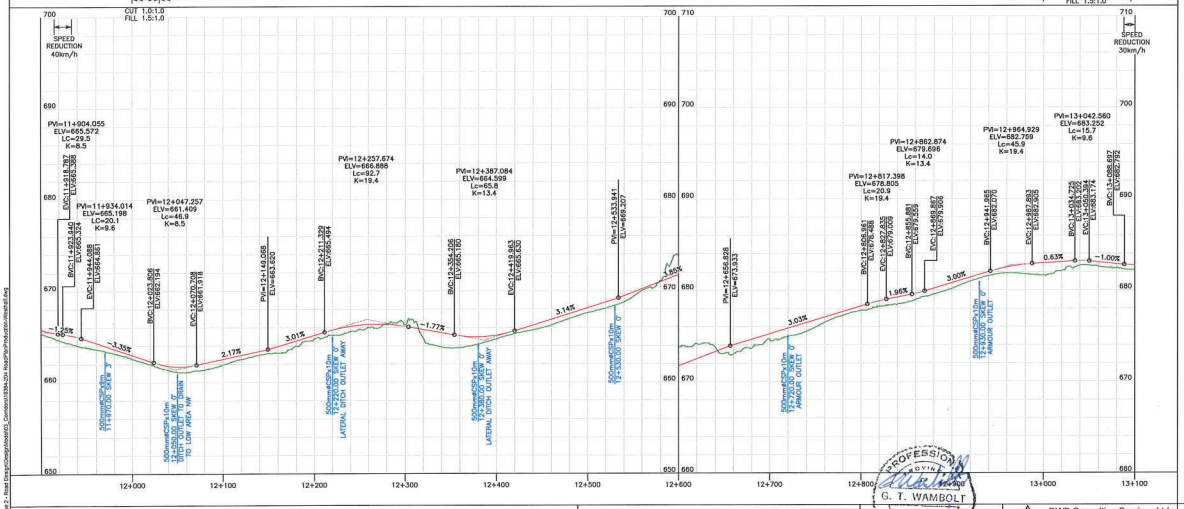




NOTES:

1. CONTOUR ELEVATIONS ARE PRESENTED AT 1.0m INTERVALS.
2. DESIGN SPEED 50km/h.
3. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.
4. PROPOSED RANGE FENCELINE IS 1.0m INSIDE PROPOSED R.O.W. FOR RANGE FENCE SPECIFICATIONS & SECTION SEE DRAWINGS 18364-204-01 & 18364-204-02.
5. PROPOSED BRIDGE CROSSINGS WILL REQUIRE A SITE PLAN SURVEY & DESIGN.
6. FOR HORIZONTAL CURVE INFORMATION SEE DRAWING 18364-204-02.
7. FOR MASS HAUL SEE DRAWINGS 18364-204-M1 TO 18364-204-M16.
8. FOR CROSS SECTIONS SEE DRAWINGS 18364-204-X1 TO 18364-204-X94.

LEGEND:

- PROPOSED ROAD
- CUT/FILL LIMITS
- HORIZONTAL CURVE
- NEW CULVERT
- PROPOSED R.O.W.
- PROPOSED FENCELINE
- PRIVATE LAND
- ROAD/UTILITY R.O.W.
- GRAZING PERMIT

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ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-WESTHALF
DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	APR.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA G. T. WAMBOLT

SENIOR DESIGNER
DATE 2019-05-24

DWB Consulting Services Ltd.
1079 9th Avenue
Prince George, B.C.
V2L 3P1
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED	RM	2019-03-04
QUALITY CONTROL	TW	2019-03-28
QUALITY ASSURANCE		
DRAWN	KAK	2019-03-15

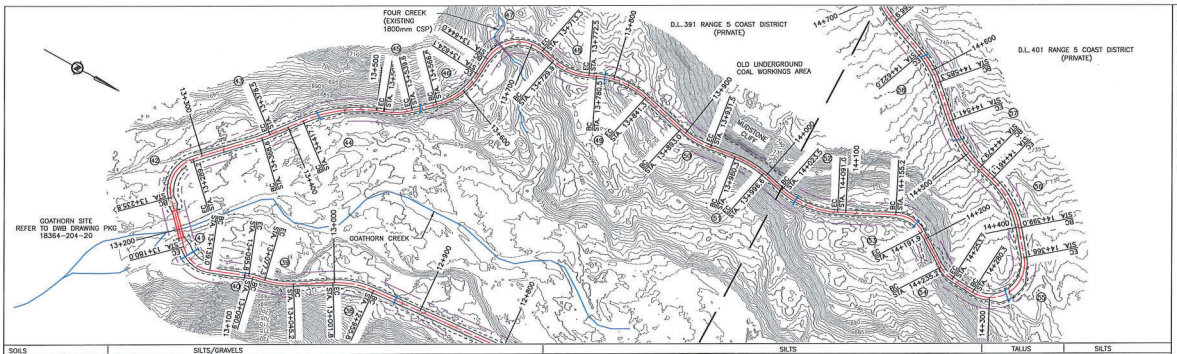
TELKWA COAL LIMITED

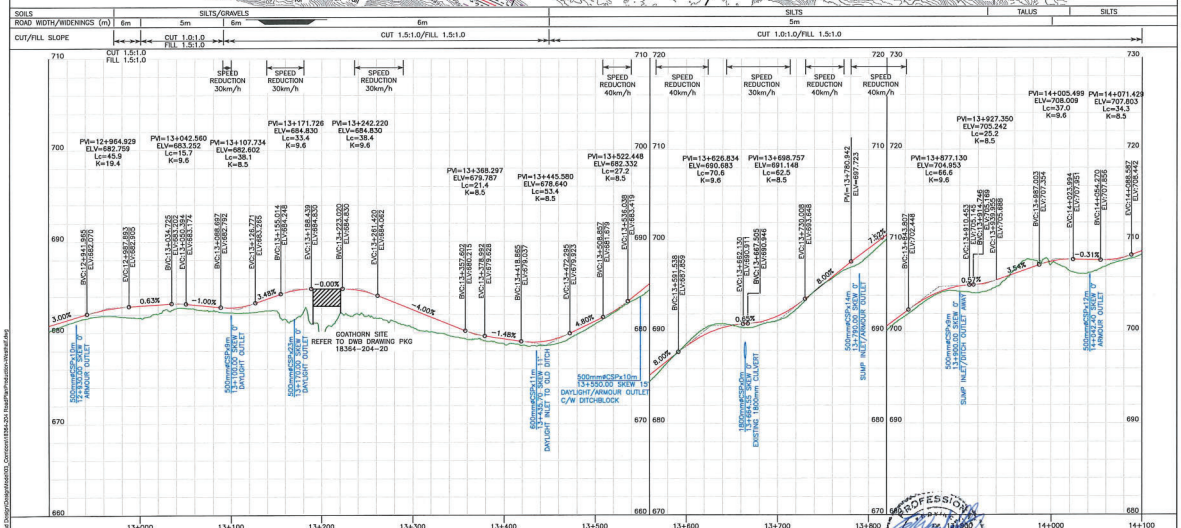
TENAS HAUL ROAD
STA. 12+000 to 13+000

PLAN & PROFILE 13

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING:	6056036	DRAWING NUMBER: 18364-204-P13
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	REV: B

I:\2018\Coal Snow (SNOW)\04 - Phase 2 - Road Design\Design\Haulroad_Combined\18364-204 - HaulPlanProfileXSHalfEng





NOTES:

1. CONTOUR ELEVATIONS ARE PRESENTED AT 1.0m INTERVALS.
2. DESIGN SPEED 50km/h.
3. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.
4. PROPOSED RANGE FENCELINE IS 1.0m INSIDE PROPOSED R.O.W. FOR RANGE FENCE SPECIFICATIONS & SECTION SEE DRAWINGS 18364-204-01 & 18364-204-02.
5. PROPOSED BRIDGE CROSSINGS WILL REQUIRE A SITE PLAN SURVEY & DESIGN.
6. FOR HORIZONTAL CURVE INFORMATION SEE DRAWING 18364-204-02.
7. FOR MASS HAUL SEE DRAWINGS 18364-204-M1 TO 18364-204-M16.
8. FOR CROSS SECTIONS SEE DRAWINGS 18364-204-X1 TO 18364-204-X94.

LEGEND:

- PROPOSED ROAD
- CUT/FILL LIMITS
- HORIZONTAL CURVE #
- NEW CULVERT
- PROPOSED R.O.W.
- PROPOSED FENCELINE
- PRIVATE LAND
- ROAD/UTILITY R.O.W.
- GRAZING PERMIT

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ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204/WESTHALF

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	APR.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JUP	KD	TW

SENIOR DESIGNER

DATE 2019-05-24

PROFESSIONAL ENGINEER
G. T. WAMBOLT

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1579 9th Avenue
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Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED ___ RM DATE 2019-03-04
QUALITY CONTROL ___ TW DATE 2019-03-29
QUALITY ASSURANCE ___ DATE ___
DRAWN ___ KAK DATE 2019-03-15

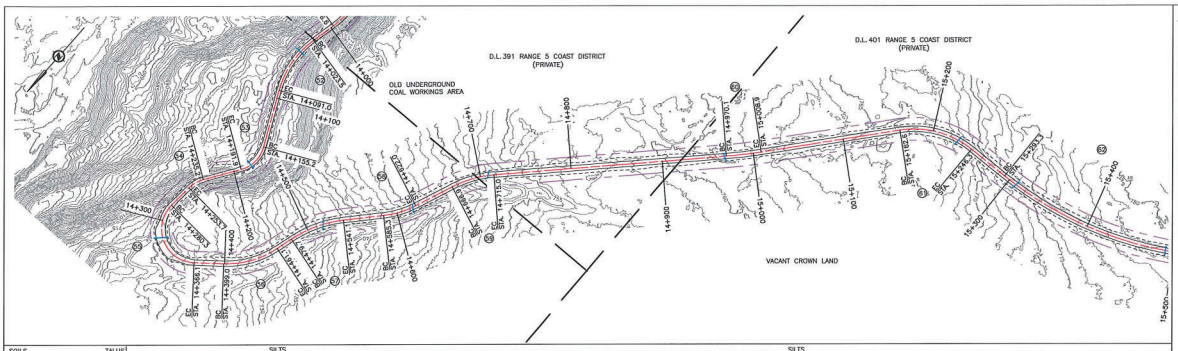
TELKWA COAL
LIMITED

TENAS HAUL ROAD
STA. 13+000 to 14+000

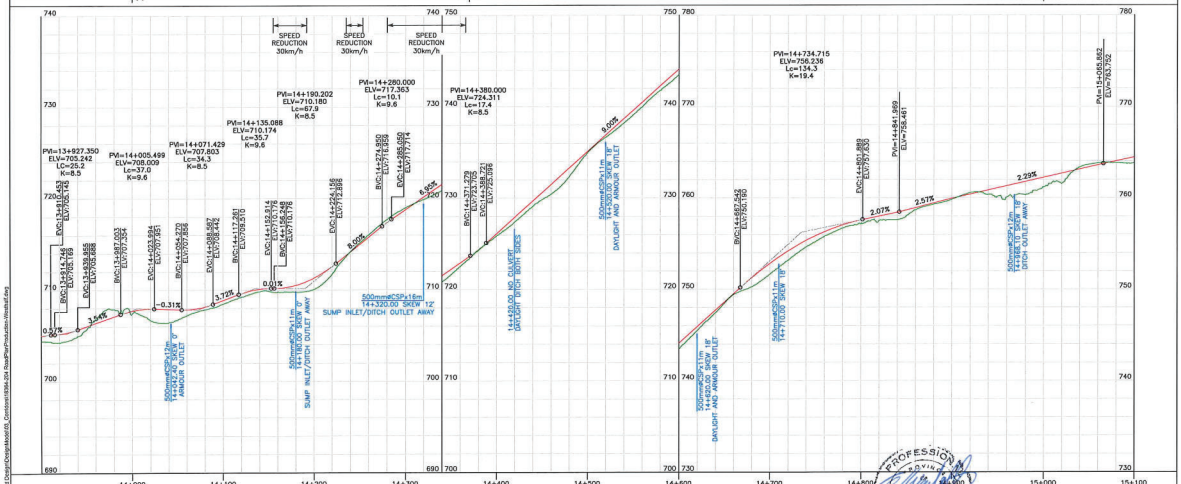
PLAN & PROFILE 14

				DRAWING NUMBER	REV
LATITUDE:	54° 39' 11.65"	NAD83	NORTHING: 6056036	18364-204-P14	B
LONGITUDE:	127° 9' 3.99"	9U	EASTING: 623633		

C:\DWB\Coal Seam (8841)\04 - Phase 2 - Road Design\Design\Haul\01_Contract\18364-204 HaulPlan\Haulation-WestHalf.dwg



SOILS	TALUS	SILTS		SILTS
ROAD WIDTH/WIDENINGS (m)		5m	6m	6m
CUT/FILL SLOPE		CUT 1.0:1.0/FILL 1.5:1.0		CUT 1.5:1.0/FILL 1.5:1.0



NOTES:

1. CONTOUR ELEVATIONS ARE PRESENTED AT 1.0m INTERVALS.
2. DESIGN SPEED 50km/h.
3. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.
4. PROPOSED RANGE FENCELINE IS 1.0m INSIDE PROPOSED R.O.W. FOR RANGE FENCE SPECIFICATIONS & SECTION SEE DRAWINGS 18364-204-01 & 18364-204-02.
5. PROPOSED BRIDGE CROSSINGS WILL REQUIRE A SITE PLAN SURVEY & DESIGN.
6. FOR HORIZONTAL CURVE INFORMATION SEE DRAWING 18364-204-02.
7. FOR MASS HAUL SEE DRAWINGS 18364-204-M1 TO 18364-204-M16.
8. FOR CROSS SECTIONS SEE DRAWINGS 18364-204-X1 TO 18364-204-X94.

LEGEND:

- PROPOSED ROAD
- CUT/FILL LIMITS
- HORIZONTAL CURVE #
- NEW CULVERT
- PROPOSED R.O.W.
- PROPOSED FENCELINE
- PRIVATE LAND
- ROAD/UTILITY R.O.W.
- GRAZING PERMIT

TELKWA COAL
LIMITED

TENAS HAUL ROAD
STA. 14+000 to 15+000

PLAN & PROFILE 15

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING:	6059036	DRAWING NUMBER	REV
LONGITUDE:	127° 0' 3.99"	9U	EASTING:	629633	18364-204-P15	B

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
G. T. WAMBOLT

DWB Consulting Services Ltd.
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V2L 3N1
Phone: (250) 562-5541 Fax: (250) 562-5591

DESIGNED	BM	DATE	2019-03-04
QUALITY CONTROL	TW	DATE	2019-03-09
QUALITY ASSURANCE		DATE	
DRAWN	KAK	DATE	2019-03-15

SENIOR DESIGNER
DATE 2019-05-24

SCALE HORIZ. 1:4000 VERT. 1:400

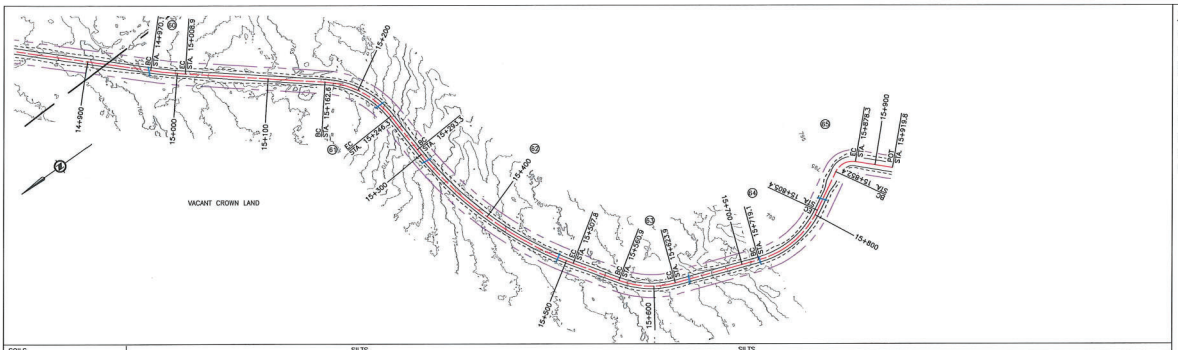
CAD FILENAME 18364-204-WESTHALE
DATE 2019-05-24

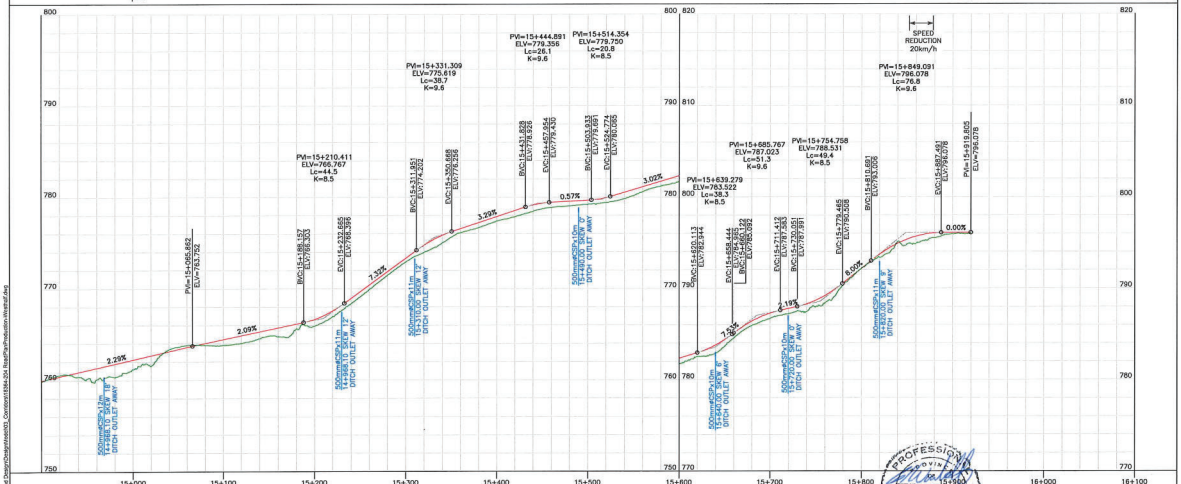
REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	APR.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

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\\DWB\Work Done 2004\2004 - Phase 2 - Haul Coops\Westhale\05_Centerline\364-204 RoadPlan\Westhale.dwg





NOTES:

1. CONTOUR ELEVATIONS ARE PRESENTED AT 1.0m INTERVALS.
2. DESIGN SPEED 50km/h.
3. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.
4. PROPOSED RANGE FENCELINE IS 1.0m INSIDE PROPOSED R.O.W. FOR RANGE FENCE SPECIFICATIONS & SECTION SEE DRAWINGS 18364-204-01 & 18364-204-02.
5. PROPOSED BRIDGE CROSSINGS WILL REQUIRE A SITE PLAN SURVEY & DESIGN.
6. FOR HORIZONTAL CURVE INFORMATION SEE DRAWING 18364-204-02.
7. FOR MASS HAUL SEE DRAWINGS 18364-204-M1 TO 18364-204-M16.
8. FOR CROSS SECTIONS SEE DRAWINGS 18364-204-X1 TO 18364-204-X94.

LEGEND:

- PROPOSED ROAD
- CUT/FILL LIMITS
- HORIZONTAL CURVE #
- NEW CULVERT
- PROPOSED R.O.W.
- PROPOSED FENCELINE
- PRIVATE LAND
- ROAD/UTILITY R.O.W.
- GRAZING PERMIT

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SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-WEST.DALT

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	APR.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JWP	KD	TW

SENIOR DESIGNER

DATE 2019-05-24

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — G. T. WAMBOLT — 17726

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Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED RM DATE 2019-03-04
QUALITY CONTROL TW DATE 2019-03-29
QUALITY ASSURANCE DATE
DRAWN KAK DATE 2019-03-15

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 15+000 to 15+919.805

PLAN & PROFILE 16

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING: 6056036	DRAWING NUMBER	REV
LONGITUDE:	127° 5' 3.99"	9U	EASTING: 623633	18364-204-P16	B

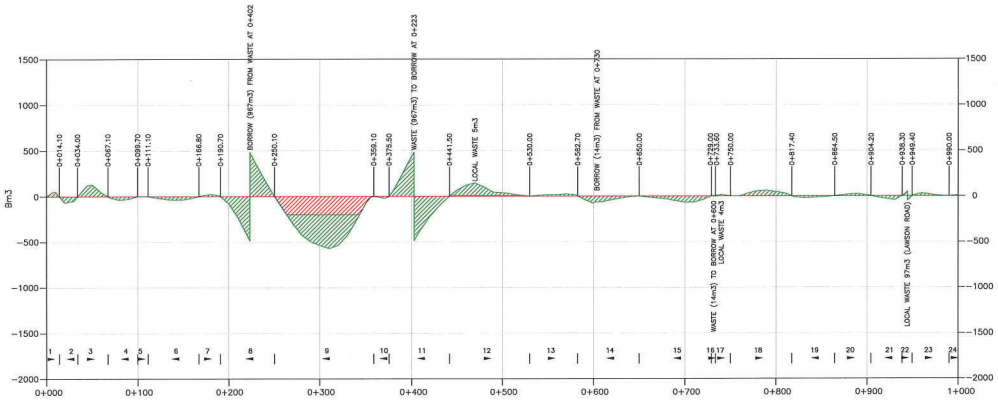
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
1	0.0	14.1	68.6	63.3	63.3	0.0	0.0	67.7	>	
2	14.1	34.0	96.0	105.3	105.3	0.0	0.0	96.5	<	
3	34.0	67.1	165.2	163.1	163.1	0.0	0.0	171.8	>	
4	67.1	99.7	173.2	64.7	64.7	0.0	0.0	184.8	<	
5	99.7	111.1	60.7	20.9	20.9	0.0	0.0	64.6	>	
6	111.1	166.8	296.1	98.9	98.9	0.0	0.0	316.2	<	
7	166.8	190.7	125.0	46.5	46.5	0.0	0.0	133.1	>	
8	190.7	250.1	251.4	2.0	969.4	967.4	0.0	246.7	<	Borrow supplied by Waste at 0+402
9	250.1	359.1	714.7	1822.5	1822.5	0.0	0.0	327.3	<	
10	359.1	375.5	88.4	83.6	83.6	0.0	0.0	49.3	<	
11	375.5	441.5	295.1	977.4	10.0	0.0	967.4	198.2	<	Waste To Borrow at 0+223
12	441.5	530.0	343.6	235.6	230.9	0.0	4.7	265.9	>	Local Waste
13	530.0	582.7	217.1	109.1	109.1	0.0	0.0	158.4	>	
14	582.7	650.0	272.7	135.3	148.7	13.5	0.0	202.1	<	Borrow supplied by Waste at 0+731
15	650.0	729.0	319.9	159.1	159.1	0.0	0.0	237.4	<	
16	729.0	733.6	19.1	18.2	4.7	0.0	13.5	13.8	>	Waste To Borrow at 0+600
17	733.6	750.0	66.2	46.2	42.7	0.0	3.6	49.1	>	Local Waste
18	750.0	817.4	277.1	148.4	148.4	0.0	0.0	202.4	>	
19	817.4	864.5	205.9	92.5	92.5	0.0	0.0	164.1	<	
20	864.5	904.2	249.3	95.7	95.7	0.0	0.0	244.3	>	
21	904.2	938.3	173.4	109.0	109.0	0.0	0.0	185.6	<	
22	938.3	949.4	31.1	100.1	2.9	0.0	97.2	54.6	>	Paper Waste Only (Lawson Road Crossing vols)
23	949.4	990.0	229.2	111.0	111.0	0.0	0.0	213.7	>	
24	990.0	1012.4	127.5	50.6	50.6	0.0	0.0	119.5	>	



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 | 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

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PROFESSIONAL ENGINEER — G. T. WAMBOLT — PROVINCE OF BRITISH COLUMBIA

SENIOR DESIGNER

DATE 2019-05-24

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHAUL

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

DWB Consulting Services Ltd.
1079 9th Avenue
Prince George, B.C.
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Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED RM DATE 2019-01-14

QUALITY CONTROL TW DATE 2019-02-06

QUALITY ASSURANCE — DATE —

DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 0+000 to 1+000

MASS HAUL 1

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6055036	
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M1 | REV: B

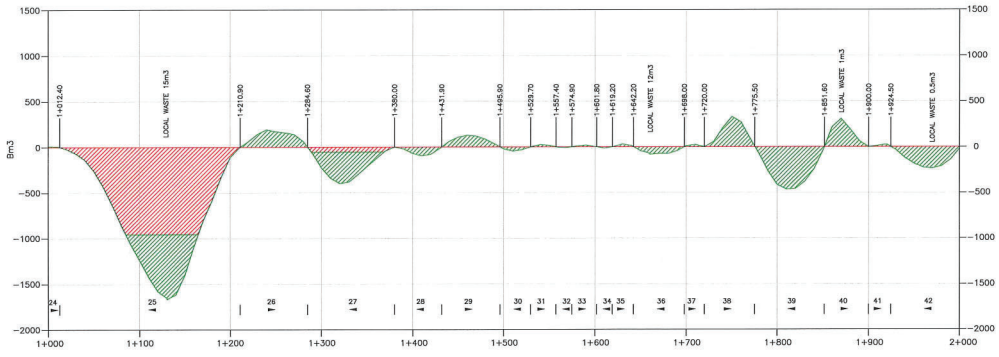
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
24	990.0	1012.4	127.5	50.6	50.6	0.0	0.0	119.5	>	
25	1012.4	1210.9	1073.5	1810.9	1795.7	0.0	15.2	754.3	<	Local Waste
26	1210.9	1284.6	380.5	456.3	456.3	0.0	0.0	221.2	>	
27	1284.6	1380.0	416.2	464.2	464.2	0.0	0.0	286.6	<	
28	1380.0	1431.9	217.4	176.4	176.4	0.0	0.0	155.9	<	
29	1431.9	1495.9	305.0	328.7	328.7	0.0	0.0	192.3	>	
30	1495.9	1529.7	160.3	143.1	143.1	0.0	0.0	101.6	<	
31	1529.7	1557.4	113.6	65.9	65.9	0.0	0.0	83.1	>	
32	1557.4	1574.9	71.8	38.6	38.6	0.0	0.0	52.6	"	
33	1574.9	1601.8	119.7	67.1	67.1	0.0	0.0	93.2	>	
34	1601.8	1619.2	95.2	74.6	74.6	0.0	0.0	83.4	<	
35	1619.2	1642.2	120.3	90.4	90.4	0.0	0.0	97.5	>	
36	1642.2	1698.0	298.0	366.8	355.0	0.0	11.7	167.7	<	Local Waste
37	1698.0	1720.0	123.7	132.6	132.6	0.0	0.0	66.0	>	
38	1720.0	1775.5	402.6	639.7	639.7	0.0	0.0	166.8	>	
39	1775.5	1851.6	453.9	692.4	692.4	0.0	0.0	228.4	<	
40	1851.6	1900.0	271.8	439.6	439.0	0.0	0.6	145.5	>	Local Waste
41	1900.0	1924.5	120.9	128.8	128.8	0.0	0.0	73.5	>	
42	1924.5	2001.4	367.2	402.1	402.5	0.5	0.0	231.0	<	Local Borrow



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 | 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER — G. T. WAMBOLT

SENIOR DESIGNER
DATE 2019-05-24

SCALE HORIZ. 1:4000 VERT. 1:400
CAD FILENAME 18364-204-EASTHAUL
DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

DWB Consulting Services Ltd.
1079 3rd Avenue
Prince George, B.C.
V2L 3H4
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED RM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-00
QUALITY ASSURANCE ___ DATE ___
DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD
STA. 1+000 to 2+000

MASS HAUL 2

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6059036	DRAWING NUMBER	REV
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	18364-204-M2	B

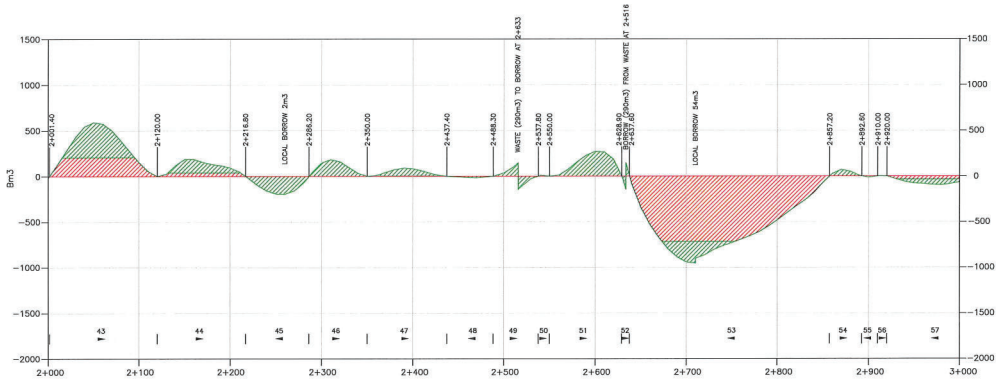
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
43	2001.4	2120.0	508.2	645.1	645.1	0.0	0.0	356.4	>	
44	2120.0	2216.8	397.9	306.3	306.3	0.0	0.0	290.7	>	
45	2216.8	2286.2	284.8	235.5	237.9	2.4	0.0	208.6	<	Local Borrow
46	2286.2	2350.0	277.3	272.3	272.3	0.0	0.0	191.6	>	
47	2350.0	2437.4	358.8	209.7	209.7	0.0	0.0	262.5	>	
48	2437.4	2488.3	206.8	100.6	100.6	0.0	0.0	152.8	<	
49	2488.3	2537.8	225.5	302.9	12.9	0.0	290.0	148.7	>	Waste To Borrow at 2+633
50	2537.8	2550.0	50.4	26.4	26.4	0.0	0.0	36.8	>	
51	2550.0	2628.9	340.3	310.4	310.4	0.0	0.0	237.0	>	
52	2628.9	2637.6	44.4	0.0	290.0	290.0	0.0	26.1	>	Borrow supplied by Waste at 2+516
53	2637.6	2857.2	960.0	932.5	986.3	53.7	0.0	659.8	<	Local Borrow
54	2857.2	2892.6	146.0	102.3	102.3	0.0	0.0	106.3	>	
55	2892.6	2910.0	71.6	37.4	37.4	0.0	0.0	52.1	<	
56	2910.0	2920.0	41.1	23.2	23.2	0.0	0.0	30.2	>	
57	2920.0	3021.1	418.7	222.2	222.2	0.0	0.0	303.5	<	



LEGEND:

- BALANCE LINE
- NET MASS LINE
- MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17"
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ISSUED FOR CONSTRUCTION

G. T. WAMBOLT
PROFESSIONAL ENGINEER

SENIOR DESIGNER
DATE 2019-05-24

SCALE HORIZ. 1:4000 VERT. 1:400
CAD FILENAME 18364-204-EASTHAUL
DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

DWB Consulting Services Ltd.
1079 3rd Avenue
Prince George, B.C.
V2L 3R8
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED BM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-00
QUALITY ASSURANCE ___ DATE ___
DRAWN KAG DATE 2019-02-13

TELKWA COAL
LIMITED

TENAS HAUL ROAD
STA. 2+000 to 3+000

MASS HAUL 3

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING:	6056036	
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M3 | REV: B

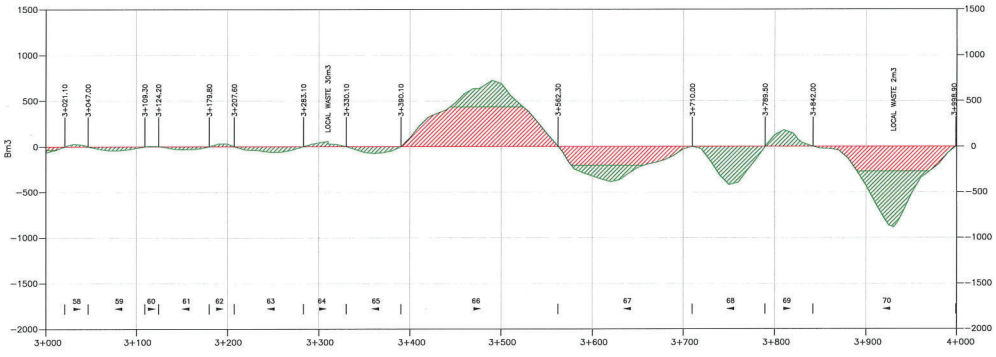
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
58	3021.1	3047.0	109.0	63.3	63.3	0.0	0.0	78.0	>	
59	3047.0	3109.3	256.2	124.5	124.5	0.0	0.0	187.1	<	
60	3109.3	3124.2	61.6	30.7	30.7	0.0	0.0	44.8	>	
61	3124.2	3179.8	223.0	103.4	103.4	0.0	0.0	166.9	<	
62	3179.8	3207.6	143.4	85.8	85.8	0.0	0.0	124.3	>	
63	3207.6	3283.1	339.1	179.7	179.7	0.0	0.0	258.0	<	
64	3283.1	3330.1	194.5	101.4	71.5	0.0	29.9	141.2	>	Local Waste
65	3330.1	3390.1	249.8	149.8	149.8	0.0	0.0	180.3	<	
66	3390.1	3562.3	736.6	844.7	844.7	0.0	0.0	517.4	>	
67	3562.3	3710.0	632.9	511.2	511.2	0.0	0.0	443.6	<	
68	3710.0	3789.5	409.0	589.5	589.5	0.0	0.0	238.9	<	
69	3789.5	3842.0	233.1	254.3	254.3	0.0	0.0	157.6	>	
70	3842.0	3998.9	698.9	1078.0	1076.1	0.0	1.9	471.4	<	Local Waste



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 | 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17"
ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER
G. T. WAMBOLT

SENIOR DESIGNER
DATE 2019-05-24

SCALE HORIZ. 1:4000 VERT. 1:400
CAD FILENAME 18364-204-EASTHAUL
DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

DWB Consulting Services Ltd.
1579 9th Avenue -
Prince George, B.C.
V2L 3N1
Phone: (250) 562-5541 Fax: (250) 562-5591

DESIGNED BM DATE 2018-01-14
QUALITY CONTROL TW DATE 2018-02-00
QUALITY ASSURANCE — DATE —
DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 3+000 to 4+000

MASS HAUL 4

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING:	6056036	
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M4 | REV: B

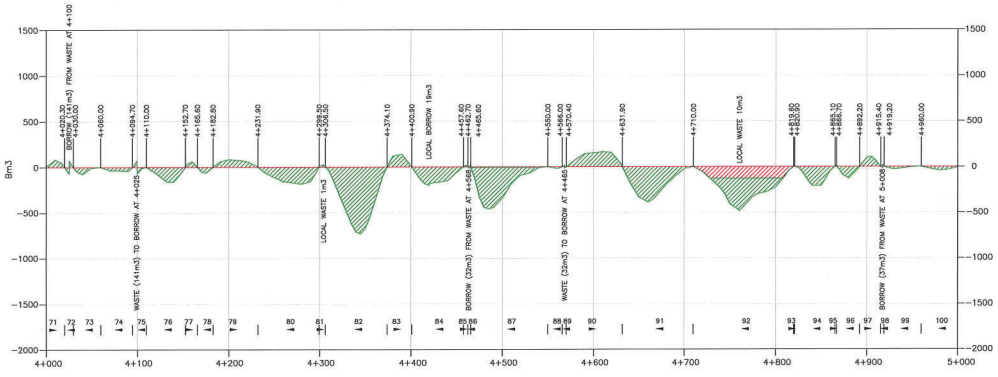
\\DWB\Local Saves (SK)\204 - Phase 2 - Road Design\Deliverables\03_Construction\18364-204-M4(Mass)-Production Contract.dwg

NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
71	3998.9	4020.3	94.6	116.7	116.7	0.0	0.0	64.2	>	
72	4020.3	4030.0	35.6	0.0	140.9	140.9	0.0	29.0	<	Borrow supplied by Waste at 4+100
73	4030.0	4060.0	134.5	145.8	145.8	0.0	0.0	90.1	<	
74	4060.0	4094.7	146.7	113.3	113.3	0.0	0.0	104.2	<	
75	4094.7	4110.0	70.7	150.8	10.0	0.0	140.9	45.9	<	Waste To Borrow at 4+025
76	4110.0	4152.7	177.4	200.7	200.7	0.0	0.0	128.2	<	
77	4152.7	4165.6	60.1	82.5	82.5	0.0	0.0	38.9	>	
78	4165.6	4182.8	69.8	79.1	79.1	0.0	0.0	51.8	<	
79	4182.8	4231.9	200.2	159.6	159.6	0.0	0.0	147.3	>	
80	4231.9	4299.5	303.8	346.8	346.8	0.0	0.0	203.3	<	
81	4299.5	4306.5	37.4	63.4	62.2	0.0	1.3	20.9	>	Local Waste
82	4306.5	4374.1	381.6	876.8	876.8	0.0	0.0	203.1	<	
83	4374.1	4400.9	114.6	182.3	182.4	0.0	0.0	80.5	>	
84	4400.9	4457.6	263.4	268.7	288.1	19.3	0.0	170.4	<	Local Borrow
85	4457.6	4462.7	22.8	27.5	27.5	0.0	0.0	15.2	>	
86	4462.7	4465.6	12.7	5.0	37.2	32.1	0.0	8.6	<	Borrow supplied by Waste at 4+568
87	4465.6	4550.0	414.0	600.0	600.0	0.0	0.0	253.6	<	
88	4550.0	4566.0	68.5	55.3	55.3	0.0	0.0	48.0	<	
89	4566.0	4570.4	22.3	33.5	1.4	0.0	32.1	13.4	<	Waste To Borrow at 4+465
90	4570.4	4631.9	316.2	360.3	360.3	0.0	0.0	184.5	>	
91	4631.9	4710.0	364.8	476.1	476.1	0.0	0.0	234.7	<	
92	4710.0	4819.6	509.5	721.0	711.0	0.0	10.0	329.1	<	Local Waste
93	4819.6	4820.9	6.1	6.9	6.9	0.0	0.0	4.1	>	
94	4820.9	4865.1	198.5	293.2	293.2	0.0	0.0	132.6	<	
95	4865.1	4866.7	7.6	11.9	11.9	0.0	0.0	4.9	>	
96	4866.7	4892.2	116.6	153.8	153.8	0.0	0.0	76.7	<	
97	4892.2	4915.4	112.3	152.0	152.0	0.0	0.0	69.7	>	
98	4915.4	4919.2	14.8	0.7	37.6	36.9	0.0	11.4	<	Borrow supplied by Waste at 5+008
99	4919.2	4960.0	170.7	112.8	112.8	0.0	0.0	122.4	<	
100	4960.0	5002.1	178.0	121.3	121.3	0.0	0.0	126.4	<	



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 | 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHALF

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER — G. T. WAMBOLT — May 23/19

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
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Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED BM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-06
QUALITY ASSURANCE — DATE —
DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 4+000 to 5+000

MASS HAUL 5

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6056036	
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M5 | REV: B

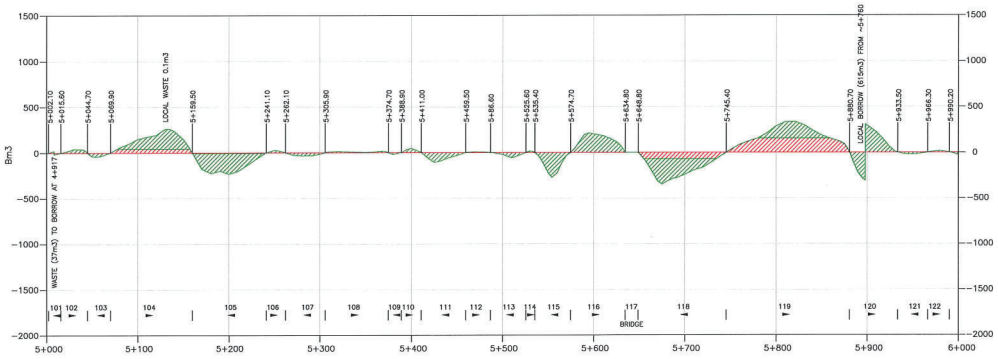
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BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
101	5002.1	5015.6	59.0	49.2	12.2	0.0	36.9	40.5	<	Waste To Borrow at 4+917
102	5015.6	5044.7	118.2	72.2	72.2	0.0	0.0	87.6	>	
103	5044.7	5069.9	108.1	78.1	78.1	0.0	0.0	75.6	<	
104	5069.9	5159.5	367.9	331.6	331.5	0.0	0.1	269.4	>	Local Waste
105	5159.5	5241.1	358.0	346.4	346.4	0.0	0.0	245.1	<	
106	5241.1	5262.1	86.0	51.0	51.0	0.0	0.0	62.9	>	
107	5262.1	5305.9	179.7	121.0	121.0	0.0	0.0	131.6	<	
108	5305.9	5374.7	281.5	158.8	158.8	0.0	0.0	206.7	>	
109	5374.7	5388.9	58.7	45.3	45.3	0.0	0.0	42.5	<	
110	5388.9	5411.0	93.1	74.5	74.5	0.0	0.0	66.7	>	
111	5411.0	5459.5	191.6	143.5	143.5	0.0	0.0	145.7	<	
112	5459.5	5486.6	106.1	45.5	45.5	0.0	0.0	81.3	>	
113	5486.6	5525.6	161.2	123.0	123.0	0.0	0.0	117.2	<	
114	5525.6	5535.4	41.4	40.4	40.4	0.0	0.0	29.5	>	
115	5535.4	5574.7	175.5	303.4	303.4	0.0	0.0	118.0	<	
116	5574.7	5634.8	381.4	309.2	309.2	0.0	0.0	259.5	>	
117	5634.8	5648.8	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
118	5648.8	5745.4	564.8	420.6	420.6	0.0	0.0	303.7	<	
119	5745.4	5880.7	755.5	434.0	434.0	0.0	0.0	406.2	>	
120	5880.7	5933.5	270.5	21.0	635.7	614.7	0.0	158.6	>	Local Borrow from ~5+760 area
121	5933.5	5966.3	184.0	76.2	76.2	0.0	0.0	98.7	<	
122	5966.3	5990.2	131.6	51.6	51.6	0.0	0.0	71.7	>	

NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 | 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHAUL

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA G. T. WAMBOLT

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1579 9th Avenue
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V2L 3N1
Phone: (250) 563-0541 Fax: (250) 563-0561

DESIGNED RM DATE 2019-01-14

QUALITY CONTROL TW DATE 2019-02-06

QUALITY ASSURANCE — DATE —

DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 5+000 to 6+000

MASS HAUL 6

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6056036	
LONGITUDE:	127° 0' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M6 | REV: B

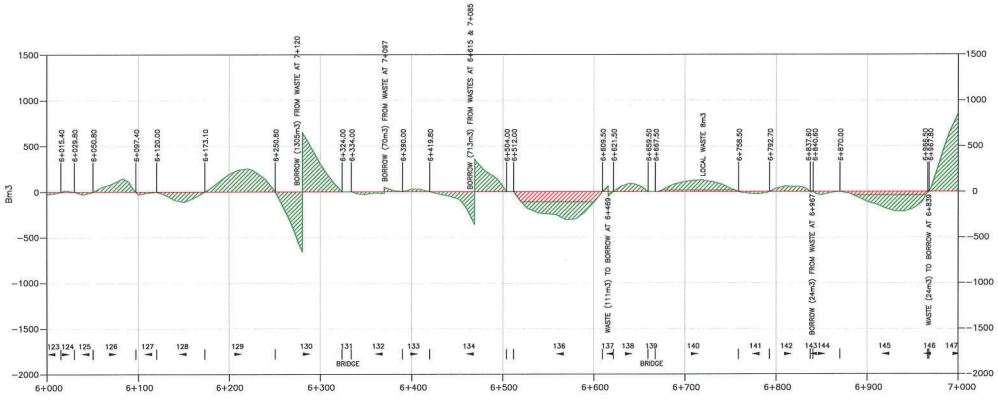
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	DM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
123	5990.2	6015.4	136.3	68.1	68.1	0.0	0.0	75.7	<	
124	6015.4	6029.8	78.0	40.3	40.3	0.0	0.0	43.3	>	
125	6029.8	6050.8	102.4	56.8	56.8	0.0	0.0	63.0	<	
126	6050.8	6097.4	203.9	208.9	208.9	0.0	0.0	139.9	>	
127	6097.4	6120.0	94.0	80.3	80.3	0.0	0.0	68.0	<	
128	6120.0	6173.1	219.8	151.2	151.2	0.0	0.0	159.6	<	
129	6173.1	6250.8	335.2	301.2	301.2	0.0	0.0	233.2	>	
130	6250.8	6324.0	352.2	21.5	1326.3	1304.8	0.0	296.8	>	Borrow supplied by Waste at 7+120
131	6324.0	6334.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
132	6334.0	6390.0	242.0	158.1	228.5	70.4	0.0	181.8	<	Borrow supplied by Waste at 7+097
133	6390.0	6419.8	124.9	69.8	69.8	0.0	0.0	89.5	>	
134	6419.8	6504.0	375.0	37.6	750.9	713.3	0.0	332.3	<	Borrow mostly supplied by Waste at 6+615 & 7+085
135	6504.0	6512.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
136	6512.0	6609.5	412.8	390.5	390.5	0.0	0.0	306.3	<	
137	6609.5	6621.5	62.6	111.4	0.0	0.0	111.4	48.8	<	Waste To Borrow at 6+469
138	6621.5	6659.5	192.5	114.5	114.5	0.0	0.0	180.3	>	
139	6659.5	6667.5	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
140	6667.5	6758.5	359.2	172.1	164.5	0.0	7.6	286.9	>	Local Waste
141	6758.5	6792.7	143.9	75.3	75.3	0.0	0.0	102.7	<	
142	6792.7	6837.6	203.6	116.5	116.5	0.0	0.0	134.8	>	
143	6837.6	6840.6	15.8	0.2	24.6	24.4	0.0	9.2	<	Borrow supplied by Waste at 6+967
144	6840.6	6870.0	129.9	75.1	75.1	0.0	0.0	88.2	<	
145	6870.0	6966.5	419.0	346.9	346.9	0.0	0.0	289.8	<	
146	6966.5	6967.8	7.5	24.4	0.0	0.0	24.4	4.0	<	Waste To Borrow at 6+839
147	6967.8	7033.0	477.6	1082.1	1082.1	0.0	0.0	274.4	>	



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 | 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17". ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-FASTHAUL

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — G. T. WAMBOLT

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1579 9th Avenue
Prince George, B.C.
V2L 3N1
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED RM DATE 2019-01-14

QUALITY CONTROL TW DATE 2019-02-06

QUALITY ASSURANCE ___ DATE ___

DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 6+000 to 7+000

MASS HAUL 7

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6056036	DRAWING NUMBER: 18364-204-M7
LONGITUDE:	127° 0' 3.99"	9U	EASTING:	623633	REV: B

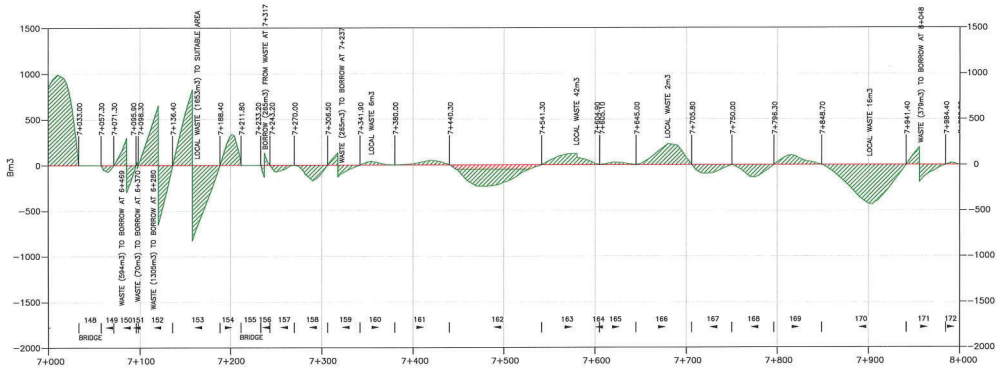
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
148	7033.0	7057.3	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
149	7057.3	7071.3	76.5	126.1	126.1	0.0	0.0	55.2	<	
150	7071.3	7095.9	169.3	601.4	7.1	0.0	594.2	74.3	<	Waste To Borrow at 6+469
151	7095.9	7098.3	16.7	70.4	0.0	0.0	70.4	7.1	<	Waste To Borrow at 6+370
152	7098.3	7136.4	251.0	1304.8	0.0	0.0	1304.8	114.3	<	Waste To Borrow at 6+280
153	7136.4	7188.4	353.9	1652.6	0.0	0.0	1652.6	194.9	<	Waste to suitable waste area
154	7188.4	7211.8	202.6	437.6	437.6	0.0	0.0	110.4	>	
155	7211.8	7233.2	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
156	7233.2	7243.2	51.0	6.6	271.4	264.8	0.0	39.2	<	Borrow supplied by Waste at 7+317
157	7243.2	7270.0	137.2	174.0	174.0	0.0	0.0	85.0	<	
158	7270.0	7306.5	186.7	195.4	195.4	0.0	0.0	109.8	<	
159	7306.5	7341.9	172.6	274.3	9.5	0.0	264.8	106.2	<	Waste To Borrow at 7+237
160	7341.9	7380.0	159.7	100.9	95.4	0.0	5.5	114.4	>	Local Waste
161	7380.0	7440.3	248.3	139.0	139.0	0.0	0.0	181.2	>	
162	7440.3	7541.3	419.4	299.5	299.5	0.0	0.0	303.2	<	
163	7541.3	7604.9	268.4	157.0	115.3	0.0	41.7	191.3	>	Local Waste
164	7604.9	7605.1	0.6	0.3	0.3	0.0	0.0	0.5	<	
165	7605.1	7645.0	154.3	61.7	61.7	0.0	0.0	119.9	>	
166	7645.0	7705.8	257.8	262.4	260.8	0.0	1.7	182.5	>	Local Waste
167	7705.8	7750.0	179.3	104.2	104.2	0.0	0.0	132.9	<	
168	7750.0	7796.1	201.3	157.5	157.5	0.0	0.0	138.6	<	
169	7796.1	7848.7	215.2	128.8	128.8	0.0	0.0	157.8	>	
170	7848.7	7941.4	384.6	425.9	441.9	16.0	0.0	278.4	<	
171	7941.4	7984.4	192.0	380.7	1.5	0.0	379.2	128.9	>	Waste To Borrow at 8+048
172	7984.4	8000.0	62.0	30.8	30.8	0.0	0.0	46.8	>	



LEGEND:

- BALANCE LINE
- NET MASS LINE
- MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

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SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-FASTHAUL

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER — G. T. WAMBOLT

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1573 9th Avenue
Prince George, B.C.
V2L 3N6
Phone: (250) 562-5541 Fax: (250) 562-5551

DESIGNED BM DATE 2019-01-14

QUALITY CONTROL TW DATE 2019-02-00

QUALITY ASSURANCE — DATE —

DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 7+000 to 8+000

MASS HAUL 8

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6059036	
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M8 | REV: B

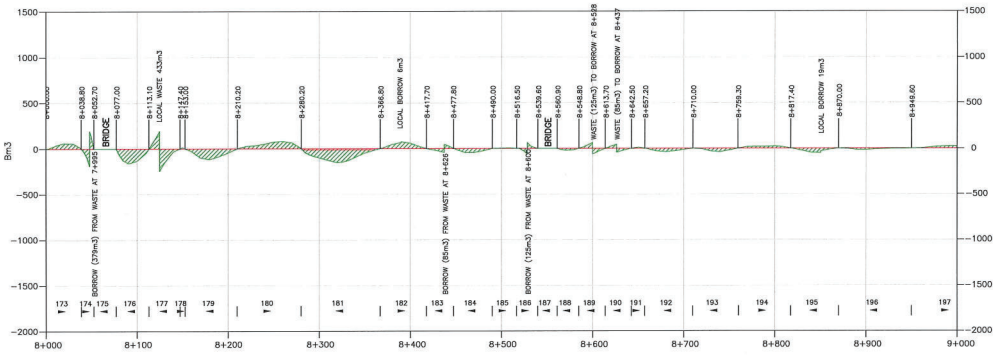
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BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
173	8000.0	8038.8	200.6	110.2	110.2	0.0	0.0	173.4	>	
174	8038.8	8052.7	78.8	1.4	380.6	379.2	0.0	64.2	>	Borrow supplied by Waste at 7+955
175	8052.7	8077.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
176	8077.0	8113.1	167.4	169.3	169.3	0.0	0.0	121.8	<	
177	8113.1	8147.4	165.0	439.2	6.1	0.0	433.1	103.0	<	Haul waste to suitable disposal area
178	8147.4	8153.0	20.7	15.3	15.3	0.0	0.0	16.8	>	
179	8153.0	8210.2	215.2	134.5	134.5	0.0	0.0	171.8	<	
180	8210.2	8280.2	256.9	116.5	116.5	0.0	0.0	210.5	>	
181	8280.2	8366.8	309.1	180.2	180.2	0.0	0.0	260.1	<	
182	8366.8	8417.7	207.4	142.5	149.0	6.4	0.0	152.7	>	Local Borrow
183	8417.7	8447.8	112.3	41.7	127.0	85.4	0.0	90.6	<	Borrow supplied by Waste at 8+626
184	8447.8	8490.0	159.2	74.4	74.4	0.0	0.0	127.0	<	
185	8490.0	8516.5	134.0	66.8	66.8	0.0	0.0	119.2	>	
186	8516.5	8539.6	142.6	58.7	183.6	124.9	0.0	108.6	>	Borrow supplied by Waste at 8+600
187	8539.6	8560.9	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
188	8560.9	8584.8	106.5	54.7	54.7	0.0	0.0	85.3	<	
189	8584.8	8613.7	123.5	126.3	1.4	0.0	124.9	86.7	<	Waste to Borrow at 8+528
190	8613.7	8642.5	119.8	94.0	8.6	0.0	85.4	86.4	<	Waste to Borrow at 8+437
191	8642.5	8657.2	56.7	25.4	25.4	0.0	0.0	44.4	>	
192	8657.2	8710.0	200.7	89.1	89.1	0.0	0.0	158.5	<	
193	8710.0	8759.3	187.9	86.5	86.5	0.0	0.0	148.0	<	
194	8759.3	8817.4	225.5	115.9	115.9	0.0	0.0	174.7	>	
195	8817.4	8870.0	201.2	89.7	108.2	18.6	0.0	158.0	<	Local Borrow
196	8870.0	8949.6	305.3	135.9	135.9	0.0	0.0	239.1	<	
197	8949.6	9027.8	296.1	114.4	112.4	0.0	2.0	234.8	>	Local Waste

NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 | 3 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

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ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHALF

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER
G. T. WAMBOLT

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
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V2L 3J1
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED BM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-06
QUALITY ASSURANCE --- DATE ---
DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 8+000 to 9+000

MASS HAUL 9

LATITUDE:	54° 35' 11.65"	NAD83	NORTHING:	6056036	DRAWING NUMBER: 18364-204-M9
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	REV: B

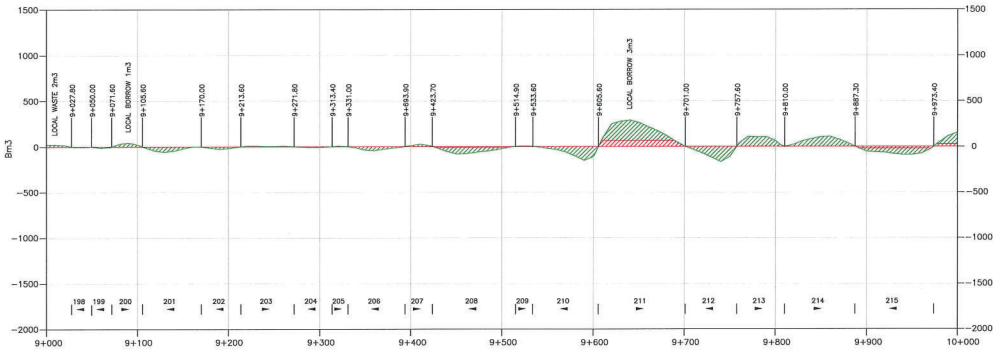
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
198	9027.8	9050.0	85.1	34.6	34.6	0.0	0.0	66.8	<	
199	9050.0	9071.6	83.7	42.7	42.7	0.0	0.0	64.9	<	
200	9071.6	9105.6	129.4	62.6	63.3	0.7	0.0	102.1	>	Local Borrow
201	9105.6	9170.0	246.1	103.7	103.7	0.0	0.0	193.5	<	
202	9170.0	9213.6	167.4	67.0	67.0	0.0	0.0	130.8	<	
203	9213.6	9271.8	222.9	89.2	89.2	0.0	0.0	174.8	>	
204	9271.8	9313.4	159.0	66.9	66.9	0.0	0.0	125.1	<	
205	9313.4	9331.0	68.2	30.4	30.4	0.0	0.0	52.7	>	
206	9331.0	9393.9	244.6	108.9	108.9	0.0	0.0	189.2	<	
207	9393.9	9423.7	111.7	44.0	44.0	0.0	0.0	89.6	>	
208	9423.7	9514.9	350.6	150.9	150.9	0.0	0.0	273.8	<	
209	9514.9	9533.6	71.8	29.7	29.7	0.0	0.0	56.3	>	
210	9533.6	9605.6	270.2	219.0	219.0	0.0	0.0	216.2	<	
211	9605.6	9701.0	363.2	339.9	343.0	3.1	0.0	286.5	>	Local Borrow
212	9701.0	9757.6	213.5	218.9	218.9	0.0	0.0	169.9	<	
213	9757.6	9810.0	206.1	172.0	172.0	0.0	0.0	157.5	>	
214	9810.0	9887.3	302.0	187.8	187.8	0.0	0.0	232.2	>	
215	9887.3	9973.4	334.9	205.2	205.2	0.0	0.0	258.8	<	



LEGEND:

- BALANCE LINE
- NET MASS LINE
- MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

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ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHAUL

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER — G. T. WAMBOLT — MAY 24/19

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1578 9th Avenue
Prince George, B.C.
V2L 3P4
Phone: (250) 562-5541 Fax: (250) 562-5551

DESIGNED RM DATE 2019-01-14

QUALITY CONTROL TW DATE 2019-02-00

QUALITY ASSURANCE — DATE —

DRAWN KAK DATE 2019-02-15

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 9+000 to 10+000

MASS HAUL 10

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6056036	
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M10 | REV: B

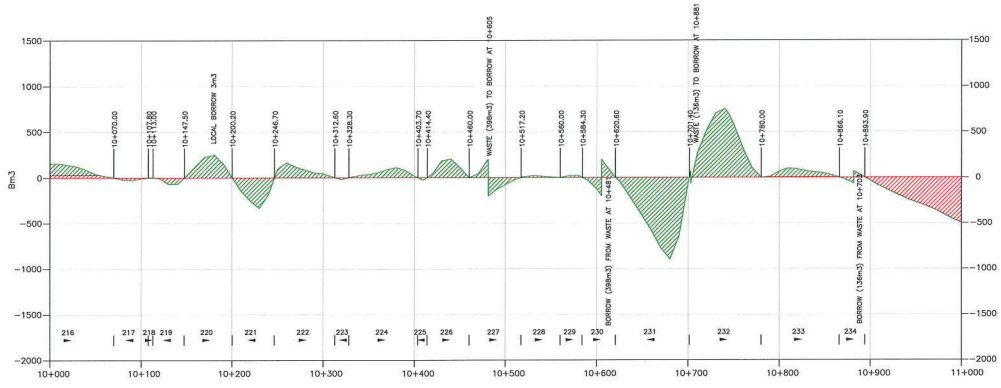
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
216	9973.4	10070.0	372.4	260.2	260.2	0.0	0.0	290.1	>	
217	10070.0	10107.8	150.7	84.1	84.1	0.0	0.0	113.4	<	
218	10107.8	10113.0	21.1	15.9	15.9	0.0	0.0	15.9	>	
219	10113.0	10147.5	134.1	146.0	146.0	0.0	0.0	103.3	<	
220	10147.5	10200.2	213.4	280.8	291.4	10.6	0.0	158.6	>	Local Borrow
221	10200.2	10246.7	196.5	384.6	384.6	0.0	0.0	139.5	<	
222	10246.7	10312.6	260.8	262.5	262.5	0.0	0.0	197.9	>	
223	10312.6	10328.3	61.2	33.4	33.4	0.0	0.0	47.1	<	
224	10328.3	10403.7	298.3	203.4	203.4	0.0	0.0	226.5	>	
225	10403.7	10414.0	41.1	45.6	45.6	0.0	0.0	31.2	<	
226	10414.0	10460.0	194.6	260.2	260.2	0.0	0.0	138.0	>	
227	10460.0	10517.2	254.1	485.6	88.0	0.0	397.6	171.8	>	Waste To Borrow at 10+605
228	10517.2	10560.0	166.9	86.9	86.9	0.0	0.0	128.5	>	
229	10560.0	10584.3	92.5	46.1	46.1	0.0	0.0	72.9	>	
230	10584.3	10620.6	127.0	2.0	399.6	397.6	0.0	109.3	>	Borrow supplied by Waste at 10+481
231	10620.6	10701.4	371.2	952.0	952.0	0.0	0.0	242.7	<	
232	10701.4	10780.0	384.2	945.7	810.1	0.0	135.6	236.0	>	Waste To Borrow at 10+881
233	10780.0	10866.1	323.3	187.9	187.9	0.0	0.0	258.5	>	
234	10866.1	10893.9	101.6	8.1	143.6	135.6	0.0	83.6	>	Borrow supplied by Waste at 10+703



LEGEND:

- BALANCE LINE
- NET MASS LINE
- MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER — G. T. WAMBOLT

SENIOR DESIGNER
DATE 2019-05-24

SCALE HORIZ. 1:4000 VERT. 1:400
CAD FILENAME 18364-204-EASTHALF
DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

DWB Consulting Services Ltd.
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DESIGNED BM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-00
QUALITY ASSURANCE — DATE —
DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD
STA. 10+000 to 11+000

MASS HAUL 11

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING:	6056036	
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	

DRAWING NUMBER 18364-204-M11 | REV B

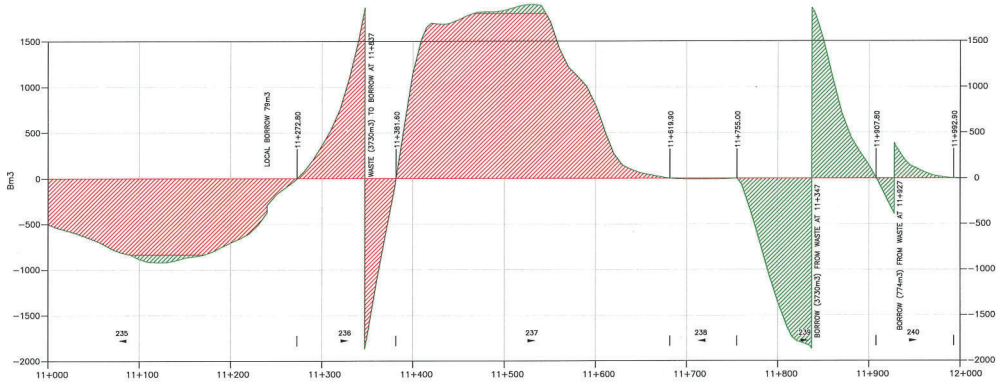
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BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
235	10893.9	11272.8	1770.0	1068.3	1147.0	78.6	0.0	1138.1	<	Local Borrow
236	11272.8	11381.6	204.2	3730.0	0.0	0.0	3730.0	399.1	>	Waste To Borrow at 11+837
237	11381.6	11681.9	447.5	2004.1	2004.1	0.0	0.0	684.1	>	
238	11681.9	11755.0	65.4	45.4	45.4	0.0	0.0	145.4	<	
239	11755.0	11907.8	322.6	35.9	3765.9	3730.0	0.0	308.7	>	Borrow supplied by Waste at 11+347
240	11907.8	11992.9	112.1	8.5	782.1	773.6	0.0	164.4	>	Borrow supplied by Waste at 12+577

NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.



LEGEND:

- BALANCE LINE
- NET MASS LINE
- MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17"
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ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHAUL
DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
G. T. WAMPOLT

SENIOR DESIGNER
DATE 2019-05-24

DWB Consulting Services Ltd.
1579 9th Avenue -
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V2L 3J5
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DESIGNED BM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-05
QUALITY ASSURANCE — DATE —
DRAWN KAK DATE 2019-02-13

TELKWA COAL
LIMITED

TENAS HAUL ROAD
STA. 11+000 to 12+000

MASS HAUL 12

LATITUDE:	54° 30' 11.65"	NAD83	NORTHING:	6056036	
LONGITUDE:	127° 5' 3.59"	9U	EASTING:	623633	

DRAWING NUMBER: 18364-204-M12 | REV: B

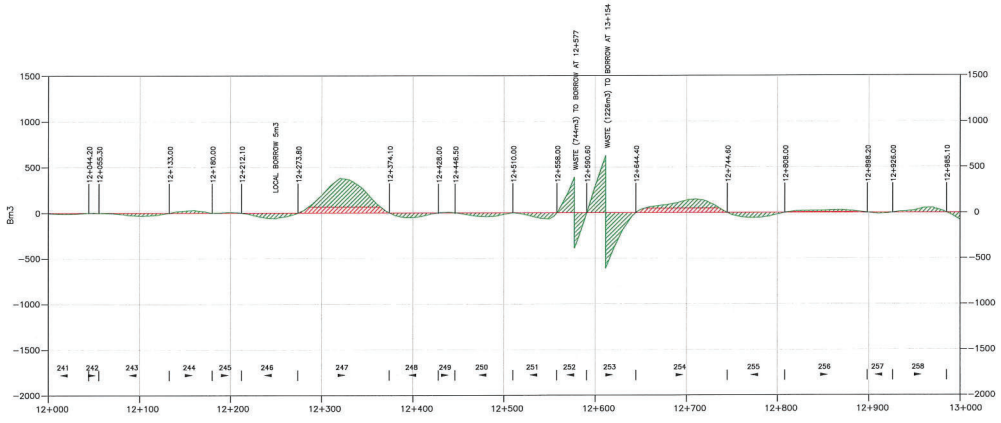
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
241	11992.9	12044.2	46.7	34.5	34.5	0.0	0.0	109.0	<	
242	12044.2	12055.3	13.0	14.6	14.6	0.0	0.0	33.6	>	
243	12055.3	12133.0	93.3	124.8	124.8	0.0	0.0	233.4	<	
244	12133.0	12180.0	56.2	81.6	81.6	0.0	0.0	141.0	>	
245	12180.0	12212.1	36.7	48.1	48.1	0.0	0.0	96.4	>	
246	12212.1	12273.8	69.3	86.9	91.7	4.8	0.0	185.2	<	Local Borrow
247	12273.8	12374.1	128.1	540.1	540.1	0.0	0.0	301.5	>	
248	12374.1	12428.0	61.7	72.5	72.5	0.0	0.0	161.9	<	
249	12428.0	12446.5	22.7	25.0	25.0	0.0	0.0	55.5	>	
250	12446.5	12510.0	78.2	126.3	126.3	0.0	0.0	190.8	<	
251	12510.0	12558.0	59.2	117.1	117.1	0.0	0.0	144.3	<	
252	12558.0	12590.6	58.2	775.5	2.0	0.0	773.6	98.0	<	Waste To Borrow at 11+927
253	12590.6	12644.4	82.0	1232.3	6.4	0.0	1225.9	161.5	>	Waste To Borrow at 13+169
254	12644.4	12744.6	130.0	361.9	361.9	0.0	0.0	301.1	>	
255	12744.6	12808.0	74.4	102.5	102.5	0.0	0.0	190.2	<	
256	12808.0	12898.2	109.2	153.8	153.8	0.0	0.0	271.1	>	
257	12898.2	12926.0	33.7	45.5	45.5	0.0	0.0	83.4	<	
258	12926.0	12985.1	77.6	172.5	172.5	0.0	0.0	177.5	>	



LEGEND:

- BALANCE LINE
- NET MASS LINE
- MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHAUL

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER — C. T. WAMBOLT — 27 — BRITISH COLUMBIA

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1579 9th Avenue -
Prince George, B.C.
V2L 3J5
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED BM DATE 2019-01-14

QUALITY CONTROL TW DATE 2019-02-05

QUALITY ASSURANCE --- DATE ---

DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 12+000 to 13+000

MASS HAUL 13

LATITUDE:	54° 35' 11.65"	NAD83	NORTHING:	6056036	DRAWING NUMBER: 18364-204-M13
LONGITUDE:	127° 5' 3.99"	9U	EASTING:	623633	REV: B

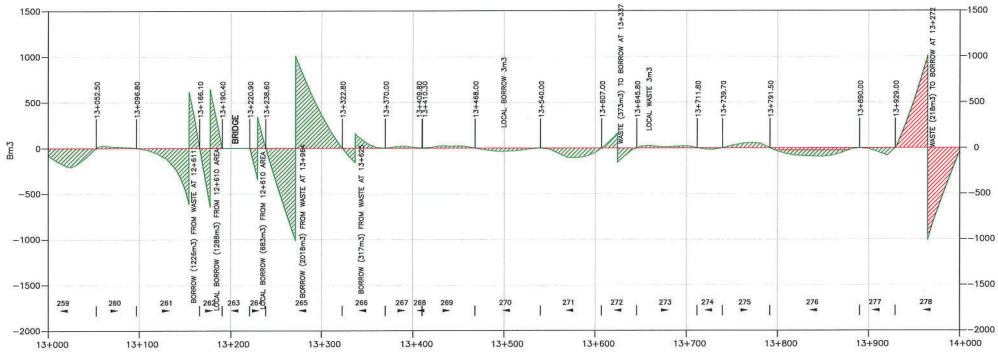
LOCATION:Local Server (\\DC1) - Projects - Phase 2 - Road Design\Design Area\02_Centerline\18364-204-MASSHAUL Production-Ready\.dwg

NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
259	12985.1	13052.5	74.3	288.5	288.5	0.0	0.0	158.6	<	
260	13052.5	13096.8	44.1	73.2	73.2	0.0	0.0	87.7	>	
261	13096.8	13166.1	168.0	8.9	1234.8	1225.9	0.0	270.3	>	Borrow supplied by Waste at 12+611
262	13166.1	13190.4	150.7	0.0	1287.6	1287.6	0.0	119.5	>	Local Borrow (Endhaul) from 12+610 area
263	13190.4	13220.9	0.0	0.0	0.0	0.0	0.0	0.0	n/a	BRIDGE CROSSING
264	13220.9	13238.6	90.5	0.0	683.2	683.2	0.0	67.7	>	Local Borrow (Endhaul) from 12+610 area
265	13238.6	13322.8	220.4	0.0	2017.8	2017.8	0.0	274.6	<	Borrow supplied by Waste at 13+964
266	13322.8	13370.0	52.1	20.9	337.4	316.6	0.0	141.7	<	Borrow supplied by Waste at 13+624
267	13370.0	13409.8	44.2	59.1	59.1	0.0	0.0	119.6	>	
268	13409.8	13410.3	0.5	0.5	0.5	0.0	0.0	1.5	<	
269	13410.3	13468.0	59.6	64.7	64.7	0.0	0.0	158.4	>	
270	13468.0	13540.0	59.6	55.9	58.5	2.6	0.0	141.3	<	Local Borrow
271	13540.0	13607.0	63.4	117.0	117.0	0.0	0.0	132.2	<	
272	13607.0	13645.8	42.8	316.6	0.0	0.0	316.6	77.4	<	Waste To Borrow at 13+337
273	13645.8	13711.8	62.5	64.0	61.4	0.0	2.6	155.3	>	Local Waste
274	13711.8	13739.7	22.8	22.3	22.3	0.0	0.0	55.4	<	
275	13739.7	13791.5	46.0	64.8	64.8	0.0	0.0	103.7	>	
276	13791.5	13890.0	92.1	121.0	121.0	0.0	0.0	191.0	<	
277	13890.0	13929.0	39.0	130.3	130.3	0.0	0.0	75.5	<	
278	13929.0	14001.4	129.9	2121.0	103.2	0.0	2017.8	140.0	<	Waste To Borrow at 13+271



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHALF

DATE 2019-05-24

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

PROFESSIONAL ENGINEER — G. T. WAMBOLT — PROVINCE OF BRITISH COLUMBIA

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1078 8th Avenue
Prince George, B.C.
V2L 3N9
Phone: (250) 562-5541 Fax: (250) 562-5581

DESIGNED BM DATE 2018-01-14

QUALITY CONTROL TW DATE 2018-02-09

QUALITY ASSURANCE — DATE —

DRAWN KAK DATE 2018-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 13+000 to 14+000

MASS HAUL 14

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING:	6055036	DRAWING NUMBER	REV
LONGITUDE:	127° 9' 3.99"	9U	EASTING:	623633	18364-204-M14	B

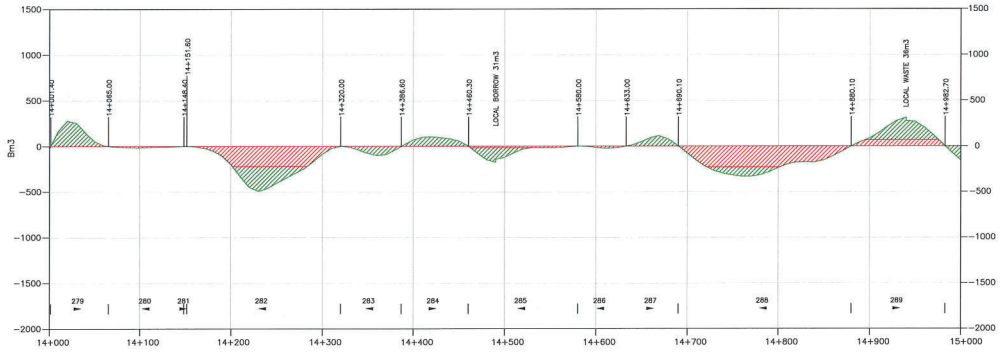
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BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
279	14001.4	14065.0	74.3	404.5	404.5	0.0	0.0	122.9	>	
280	14065.0	14148.4	67.6	42.8	42.8	0.0	0.0	161.5	<	
281	14148.4	14151.6	2.7	2.2	2.2	0.0	0.0	6.5	>	
282	14151.6	14320.0	200.7	522.3	522.3	0.0	0.0	397.9	<	
283	14320.0	14386.6	81.5	136.4	136.4	0.0	0.0	216.8	<	
284	14386.6	14460.3	87.5	154.2	154.2	0.0	0.0	221.4	>	
285	14460.3	14580.0	136.5	205.3	236.4	31.1	0.0	359.4	<	Local Borrow
286	14580.0	14633.0	61.4	74.0	74.0	0.0	0.0	159.2	<	
287	14633.0	14690.1	65.6	122.3	122.3	0.0	0.0	171.7	>	
288	14690.1	14880.1	228.7	448.7	448.7	0.0	0.0	570.6	<	
289	14880.1	14982.7	120.0	333.7	297.5	0.0	36.2	308.1	>	Local Waste

NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.



LEGEND:

- BALANCE LINE
- NET MASS LINE
- 1 2 MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JVP	KD	TW

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHALF

DATE 2019-05-24

PROFESSIONAL ENGINEER — G. T. WAMBOLT — PROVINCE OF BRITISH COLUMBIA

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1539 8th Avenue
Prince George, B.C.
Phone: (250) 563-5541 Fax: (250) 563-5591

DESIGNED BM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-06
QUALITY ASSURANCE — DATE —
DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 14+000 to 15+000

MASS HAUL 15

LATITUDE:	54° 39' 11.65"	NAD83	NORTHING:	6056036	DRAWING NUMBER	REV
LONGITUDE:	127° 5' 3.89"	9U	EASTING:	623633	18364-204-M15	B

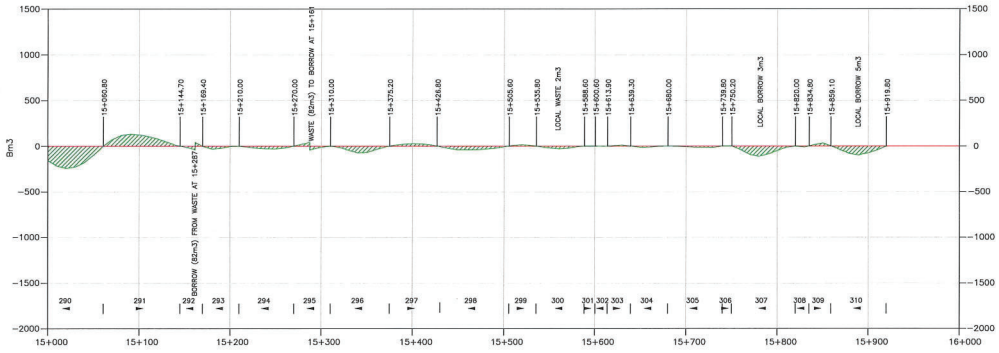
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NOTES:

1. FOR GENERAL NOTES, SPECIFICATIONS & TYPICAL SECTIONS SEE DRAWING 18364-204-01 & 18364-204-02.

BALANCE POINT VOLUME SUMMARY

Movement Number	From Station	To Station	Stripping (bm3)	OM Cut (bm3)	Fill (bm3 equiv.)	Borrow (bm3)	Waste (bm3)	Surfacing (cm3)	Mass Direction	Comment
290	14982.7	15060.8	95.3	284.1	284.1	0.0	0.0	234.6	<	
291	15060.8	15144.7	100.6	190.4	190.4	0.0	0.0	252.1	>	
292	15144.7	15169.4	28.0	26.0	107.9	81.9	0.0	74.3	<	
293	15169.4	15210.0	47.1	101.9	101.9	0.0	0.0	121.8	<	
294	15210.0	15270.0	71.7	96.9	96.9	0.0	0.0	180.2	<	
295	15270.0	15310.0	50.8	111.6	29.7	0.0	81.9	120.2	<	
296	15310.0	15375.2	80.8	167.2	167.2	0.0	0.0	195.9	<	
297	15375.2	15426.8	61.9	80.7	80.7	0.0	0.0	154.9	>	
298	15426.8	15505.6	95.1	130.8	130.8	0.0	0.0	236.7	<	
299	15505.6	15535.8	35.9	44.5	44.5	0.0	0.0	90.7	>	
300	15535.8	15588.6	63.8	89.5	87.7	0.0	1.8	158.6	<	Local Waste
301	15588.6	15600.6	14.5	22.7	22.7	0.0	0.0	35.9	>	
302	15600.6	15613.9	15.8	22.2	22.2	0.0	0.0	40.0	<	
303	15613.9	15639.3	30.3	46.6	46.6	0.0	0.0	76.4	>	
304	15639.3	15680.0	50.4	81.4	81.4	0.0	0.0	122.2	<	
305	15680.0	15739.8	72.0	102.1	102.1	0.0	0.0	179.6	<	
306	15739.8	15750.2	15.6	26.5	26.5	0.0	0.0	31.1	>	
307	15750.2	15820.0	235.4	137.8	140.5	2.6	0.0	209.8	<	Local Borrow
308	15820.0	15834.8	54.2	29.2	29.2	0.0	0.0	48.7	<	
309	15834.8	15859.1	112.9	73.3	73.3	0.0	0.0	113.0	>	
310	15859.1	15919.8	290.1	159.0	163.7	4.7	0.0	292.9	<	Local Borrow



LEGEND:

- BALANCE LINE
- NET MASS LINE
- MOVEMENT DIRECTION
- FREE HAUL (<80m)
- OVERHAUL (>80m)

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	FEB.19	ISSUED FOR REVIEW	KAK	KD	TW
B	MAY.19	ISSUED FOR CONSTRUCTION	JMP	KD	TW

SCALE HORIZ. 1:4000 VERT. 1:400

CAD FILENAME 18364-204-EASTHAUL

DATE 2019-05-24

PROFESSIONAL ENGINEER G. T. WAMBOLT

SENIOR DESIGNER

DATE 2019-05-24

DWB Consulting Services Ltd.
1579 8TH Avenue
Prince George, B.C.
V2L 3N9
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED BM DATE 2019-01-14
QUALITY CONTROL TW DATE 2019-02-06
QUALITY ASSURANCE — DATE —
DRAWN KAK DATE 2019-02-13

TELKWA COAL LIMITED

TENAS HAUL ROAD

STA. 15+000 to16+000

MASS HAUL 16

LATITUDE:	54° 38' 11.65"	NAD83	NORTHING: 6056036	DRAWING NUMBER: 18364-204-M16
LONGITUDE:	127° 5' 3.99"	9U	EASTING: 623633	REV: B

APPENDIX B – GOATHORN CREEK BRIDGE DESIGN

Sheet List Table	
Sheet Number	Sheet Title
18364-204-21	Site Plan
18364-204-22	Site Profile & Sections
18364-204-23	General Arrangement Plan
18364-204-24	General Arrangement Profile & Sections
18364-204-25	Specification Notes
18364-204-26	Steel Plan & Details
18364-204-27	Steel Elevation
18364-204-28	Steel Sections & Cap Details
18364-204-29	Steel Splice Details
18364-204-30	Steel Bearing Details
18364-204-31	Deck Layout & Connection Details
18364-204-32	Concrete Deck Panel A Details
18364-204-33	Concrete Deck Panel B Details
18364-204-34	Ballast Wall Details
18364-204-35	Vehicle Tracking Analysis

TELKWA COAL
LIMITED

GOATHORN CREEK CROSSING
30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)
STA. 13+200 ON TELKWA COALMINE ROAD

Lat. 54° 37' 04.1" Long. 127° 08' 07.8"



DOWNSTREAM FROM CROSSING



LOWCHAIN FROM CROSSING

ISSUED FOR CONSTRUCTION

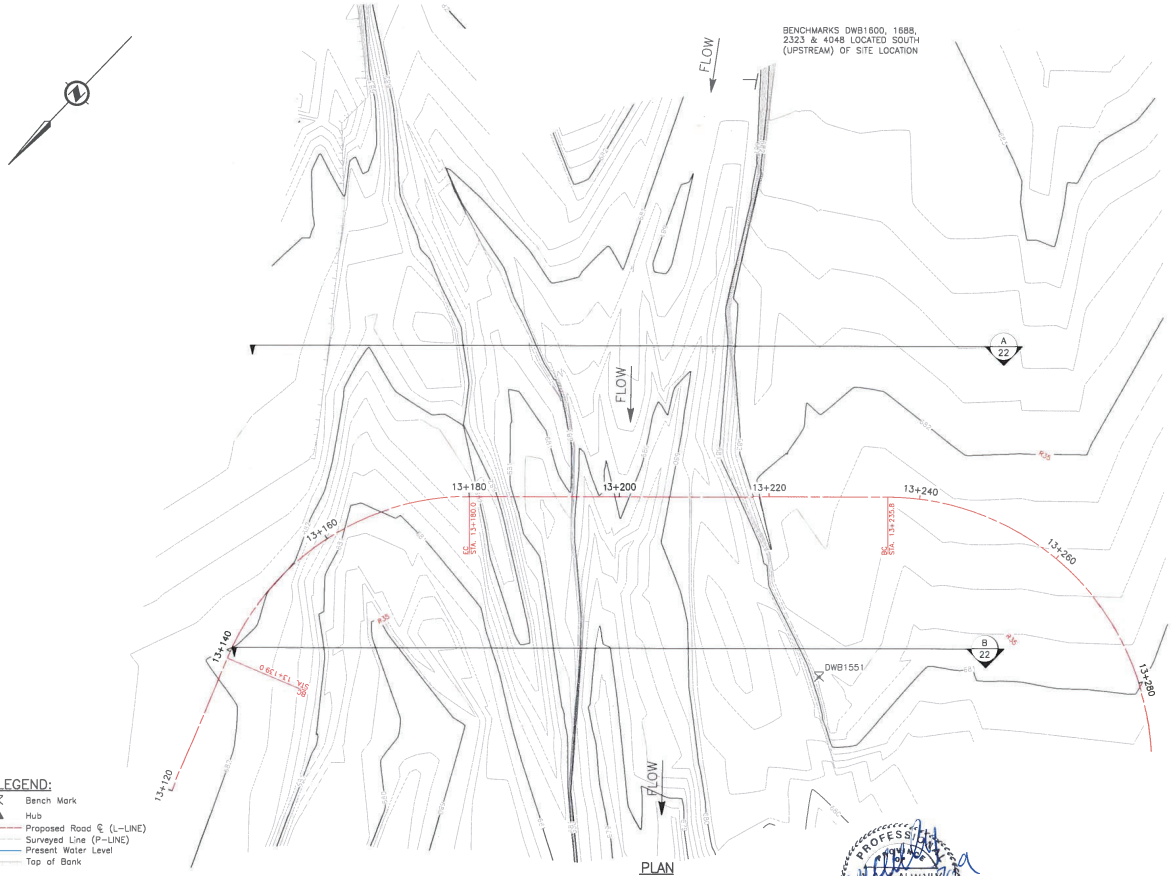
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
9775

DWB Consulting Services Ltd.
1579 6TH Avenue
Prince George, B.C.
V2L 3P8
Phone: (250) 562-5541 Fax: (250) 562-5581

CLIENT PROJECT CODE	DATE	DRAWING NUMBER	REV
----	2019-08-13	18364-204-20	B

INTENDED TO BE PLOTTED ON 11"x17"
ANY COPIES or PDFS MAY NOT BE TO SCALE

U:\18364\Civil Items\204\18364-20 - Goathorn Creek Brg Plan\Drawings\Production\00_Consulting\Plotting\18364-204-20.dwg



PLAN

GENERAL NOTES:

1. SITE PLAN SURVEY WAS PERFORMED ON November 23 & 24, 2017 AND UNDER THE FOLLOWING CONDITIONS:
   - GENERAL WEATHER CONDITIONS: SNOWING
   - SITE SUPERVISOR: NJ
   - RODMAN: SD
2. RIPARIAN STREAM ASSESSMENT:
   - CLASSIFICATION: S2 (DWB)
   - AVERAGE WIDTH: 11.1m
3. HYDROLOGICAL DATA:
   - Q100ı FLOW: 49.5m³/s
   - Q200ı FLOW 55.5m³/s
   - DRAINAGE AREA: 108.0km²
   - MEASURED STREAM VELOCITY: 1.1m/s
4. NO GEOTECHNICAL DATA GATHERED AT THIS TIME.
   - SURFACE SOILS (2016 SIEVE ANALYSIS):

     SAND and fines with trace of gravel
5. SURVEY ESTABLISHED USING NO DECLINATION.

   DATA CORRECTED TO LIDAR
6. STREAMBED COMPOSITION:
   - SAND/SILT (0–2mm): 10%
   - GRAVELS (2–50mm): 10%
   - COBBLES (50–200mm): 30%
   - BOULDERS (>200mm): 50%
7. CONTOURS SHOWN AT 0.2m INTERVALS.

CONTROL POINTS:

	NORTHING	EASTING	ELEVATION
DWB1551	6053890.786	620368.723	681.635
DWB1600	6053827.580	620480.734	684.073
DWB1688	6053783.909	620500.644	684.687
DWB2323	6053755.336	620538.412	685.795
DWB4048	6053837.353	620548.139	696.562

LEGEND:
- Bench Mark
- Hub
- Proposed Road ℄ (L–LINE)
- Surveyed Line (P–LINE)
- Present Water Level
- Top of Bank

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

SCALE 0 2.5 1:500 12.5m

CAD FILENAME 18364-204-SJ

DATE 2018-08-01

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	DK	KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	DK	KD/AW	AW

PROFESSIONAL ENGINEER — BRITISH COLUMBIA — # 37284 — A. J. ALWAILY

SENIOR DESIGNER

DATE 2019-08-13

DWB Consulting Services Ltd.
1079 8TH Avenue
Prince George, B.C.
V2L 3N6
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED EAC DATE 2019-07-24
QUALITY CONTROL TW DATE 2019-07-24
QUALITY ASSURANCE — DATE —
DRAWN DK DATE 2019-07-24

TELKWA COAL LIMITED

GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)

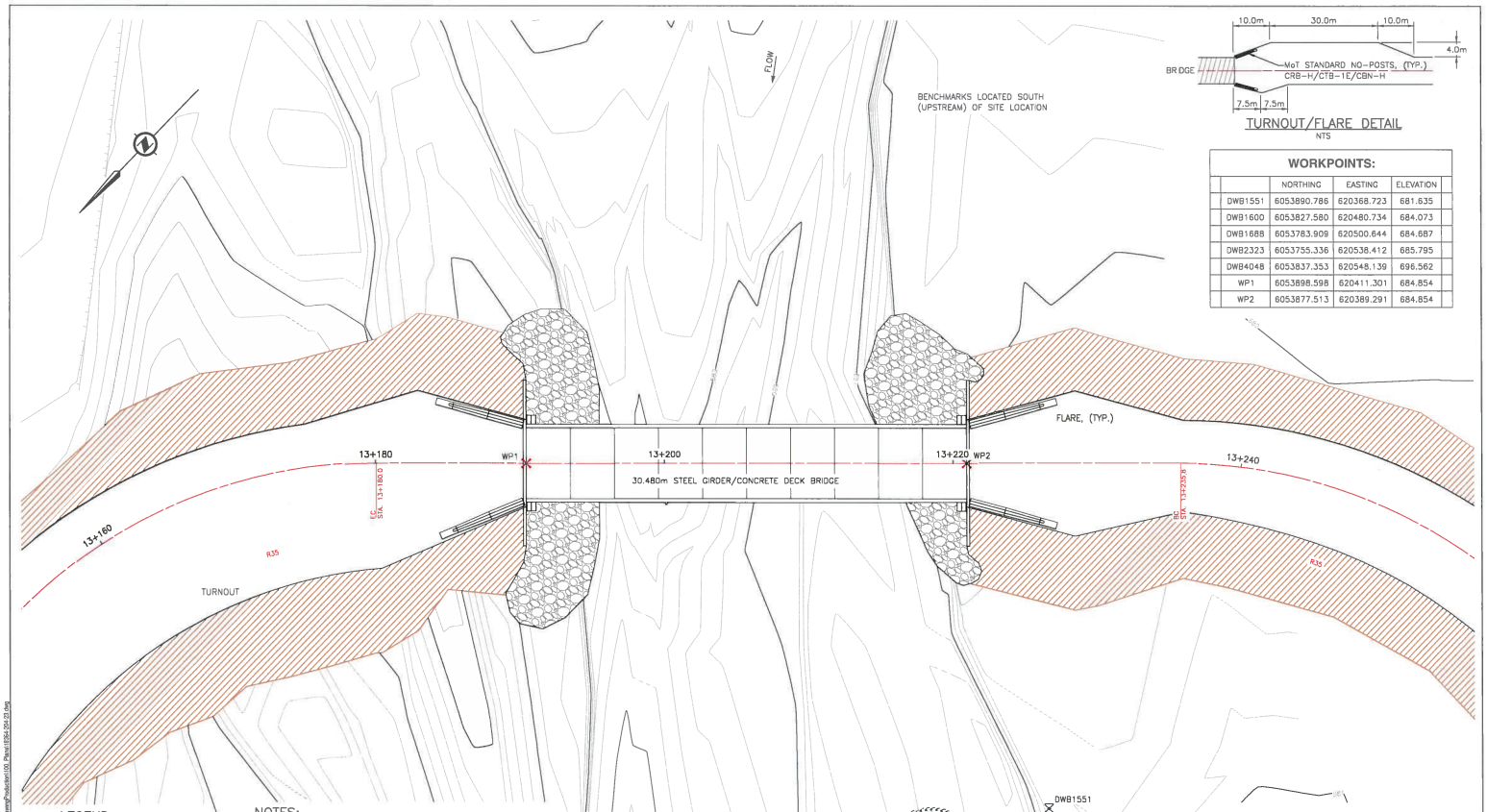
STA. 13+200 ON TELKWA COALMINE ROAD

Site Plan

LATITUDE:	54° 37' 54.1"	NAD83	NORTHING:	6053891	
LONGITUDE:	127° 08' 07.8"	9U	EASTING:	620404	

DRAWING NUMBER 18364-204-21 REV B

U:\DWB\Coal Bench\18364\05-Goathorn Creek Site Plan\Drawing\Production\06_Revit\18364-204-21.dwg



TURNOUT/FLARE DETAIL
NTS

WORKPOINTS:

	NORTHING	EASTING	ELEVATION
DWB1551	6053890.786	620368.723	681.635
DWB1600	6053827.580	620480.734	684.073
DWB1688	6053783.909	620500.644	684.687
DWB2323	6053755.336	620538.412	685.795
DWB4048	6053837.353	620548.139	696.562
WP1	6053898.598	620411.301	684.854
WP2	6053877.513	620389.291	684.854

LEGEND:
- Bench Mark
- Proposed Road ℄ (L-LINE)
- Proposed Road Shoulder
- Top of Bank
- Riprap
- Fill Areas

NOTES:
1. FOR SPECIFICATION NOTES REFER TO 18364-204-25.
2. THE CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ALL DITCHLINES.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL BENCHMARKS & ANY UTILITIES.
4. FOR VEHICLE TRACKING ANALYSIS REFER TO DWG 18364-204-35.

INTENDED TO BE PLOTTED ON 11"x17"
ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

PLAN

SCALE 0 1 1:250 6m

CAD FILENAME 18364-204-23
DATE 2019-08-01

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	DK	KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	DK	KD/AW	AW

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA ANDREW WALWARK # 37641

SENIOR DESIGNER
DATE 2019-08-13

DWB Consulting Services Ltd.
1579-5th Avenue
Prince George, B.C.
V2L 3N6
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED AW DATE 2019-07-24
QUALITY CONTROL TW DATE 2019-07-24
QUALITY ASSURANCE — DATE —
DRAWN DK DATE 2019-07-24

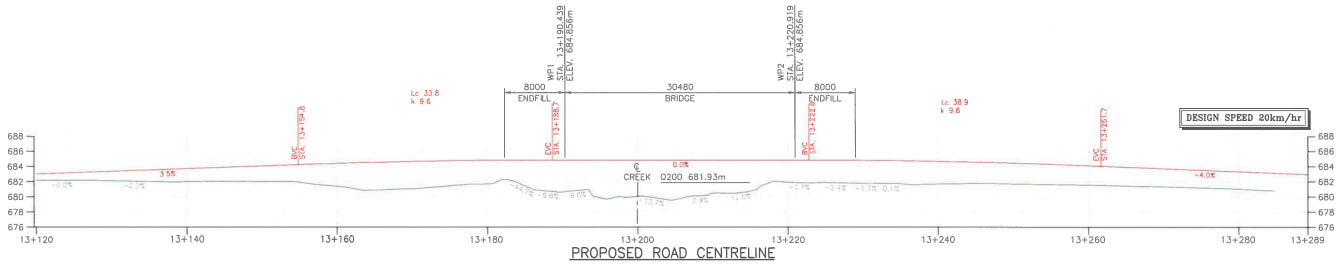
TELKWA COAL
LIMITED

GOATHORN CREEK CROSSING
30.480m STEEL GIRDER/CONCRETE DECK BRIDGE
ON PILES (110 TONNES)
STA. 13+200 ON TELKWA COALMINE ROAD
General Arrangement Plan

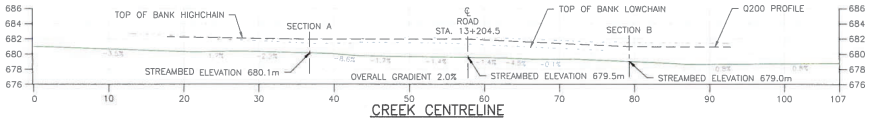
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LONGITUDE: 127° 08' 07.8" 9U EASTING: 620404

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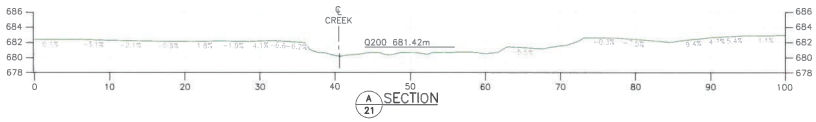
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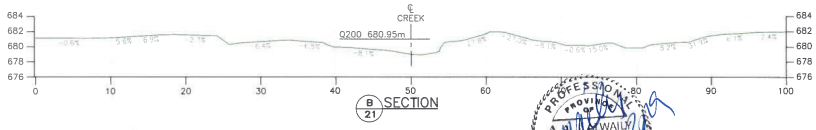
PROPOSED ROAD CENTRELINE



CREEK CENTRELINE



A/21 SECTION



B/21 SECTION

LEGEND:

- Road Design
- Existing Ground
- Present Water Level
- Top of Bank

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PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA ANDREW WAILL 37764

SENIOR DESIGNER
DATE 2019-06-13

SCALE 0 2.5 1:500 12.5m

CAD FILENAME 18364-204-22
DATE 2019-09-01

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	DK	KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	DK	KD/AW	AW

DWB Consulting Services Ltd.
1579 6th Avenue
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DESIGNED EAC DATE 2019-07-24
QUALITY CONTROL TW DATE 2019-07-24
QUALITY ASSURANCE — DATE —
DRAWN DK DATE 2019-07-24

TELKWA COAL LIMITED

GOATHORN CREEK CROSSING

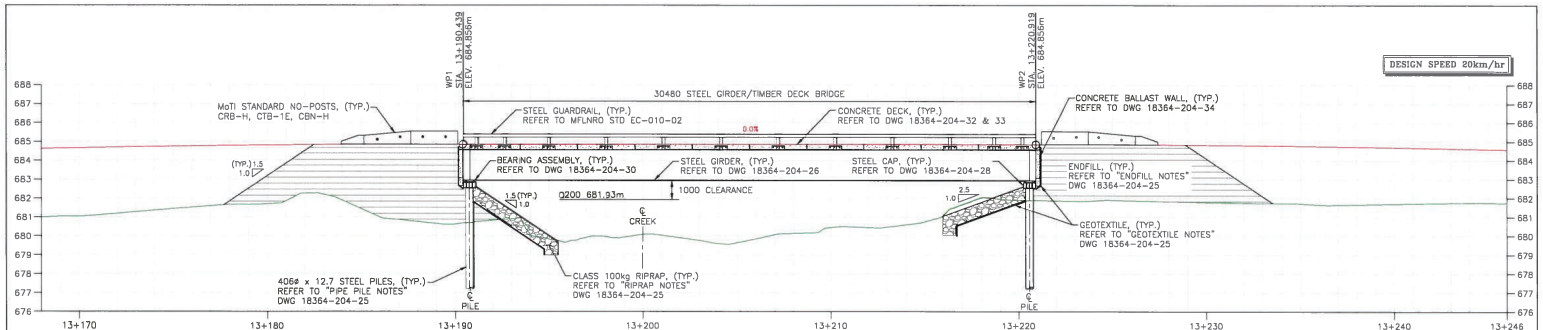
30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)

STA. 13+200 ON TELKWA COALMINE ROAD

Site Profile & Sections

LATITUDE:	54° 37' 04.1"	NAD83	NORTHING:	6053891	DRAWING NUMBER 18364-204-22 REV B
LONGITUDE:	127° 08' 07.8"	9U	EASTING:	629404	

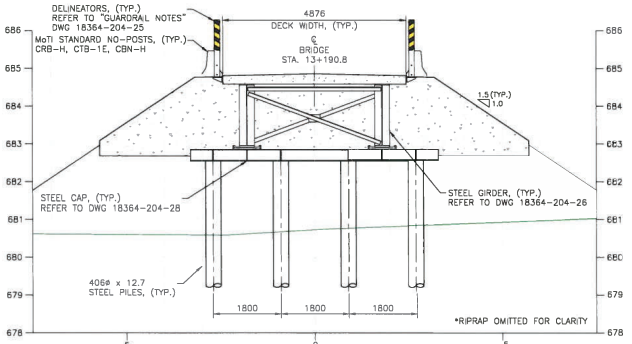
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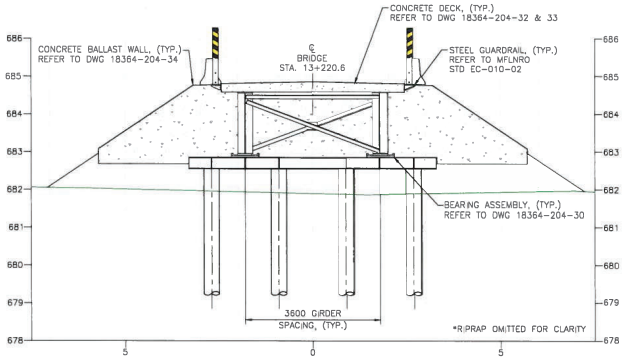
BRIDGE PROFILE
1:200

CLEARANCE NOTE:

MINIMUM UNDERSIDE OF GIRDER ELEVATION 682.93m; DEPTH OF STEEL WITH DECK TO BE 1926mm. IF STEEL VARIES FROM THIS, WORKPOINT ELEVATIONS, BALLAST WALL LENGTHS & LAYOUT MAY NEED TO BE ADJUSTED. PRIOR TO CONSTRUCTION, VERIFICATION OF WORKPOINTS BY THE DESIGN ENGINEER MUST BE COMPLETED.



LOWCHAIN BEARING SECTION
1:100



HIGHCHAIN BEARING SECTION
1:100

NOTES:

1. FOR SPECIFICATION NOTES REFER TO 18364-204-25.

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ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — ANDREW ALWAYN — # 37764 — REGISTERED PROFESSIONAL ENGINEER

SENIOR DESIGNER
DATE 2019-08-13

SCALE As Noted
CAD FILENAME 18364-204-24
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REV	DATE	DESCRIPTION	DRW	CHK	ENG
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DESIGNED AW DATE 2019-07-24
QUALITY CONTROL TW DATE 2019-07-24
QUALITY ASSURANCE — DATE —
DRAWN DK DATE 2019-07-24

TELKWA COAL LIMITED

GOATHORN CREEK CROSSING
30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)
STA. 13+200 ON TELKWA COALMINE ROAD
General Arrangement Profile & Sections

LATITUDE:	54° 27' 04.1"	NAD83	NORTHING:	6053891	DRAWING NUMBER 18364-204-24 REV B
LONGITUDE:	127° 08' 07.8"	9U	EASTING:	620404	

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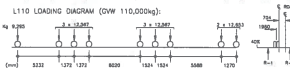
GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O.).
2. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL BENCHMARKS
3. REFER TO GEOTECHNICAL REVIEW REPORT.
4. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING SAFETY IN & AROUND THE WORK SITE. PROPER & SAFE METHODS OF CONSTRUCTION SHALL BE USED AT ALL TIMES. AS A MINIMUM, THE REQUIREMENTS OF THE LATEST EDITION OF WORK SAFE BC'S HEALTH & SAFETY REGULATIONS PUBLICATION, CANADIAN CONSTRUCTION SAFETY CODE & THE PROVINCIAL GOVERNMENT SHALL BE ADHERED TO. WHERE THERE ARE ANY DISCREPANCIES BETWEEN THE ABOVE, THE MOST STRINGENT SHALL APPLY.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DIMENSIONS IN THE FIELD TO SUIT EXISTING CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD MEASUREMENTS & CONTROL PRODUCTION OF WORK ON SITE & ELSEWHERE TO FULFILL THE INTENT OF THE DRAWINGS.

DESIGN SPECIFICATION:

1. THIS PERMANENT BRIDGE HAS BEEN DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER LICENCED TO PRACTICE IN BRITISH COLUMBIA. THE BRIDGE HAS BEEN DESIGNED IN ACCORDANCE TO CAN/CSA-S6 & THE FOLLOWING LOAD DIAGRAM:

L110 LOADING DIAGRAM (CVW 110,000kg):



REFER TO MFLNRO STD-EC-000-001 FOR ADDITIONAL INFORMATION

2. THERMAL ACTION:

MAXIMUM DAILY TEMPERATURE:	+37°C
MINIMUM DAILY TEMPERATURE:	-21°C

3. WIND LOAD (DESIGN WIND PRESSURE Q10 = 370Pa):

ON STRUCTURE:	1.26kN/m²
ON LIVE LOAD:	0.76kN/m²

4. CONSTRUCTION LIVE LOAD SHALL BE ACCORDING TO CAN/CSA-S6-14 SECTION 3.18.4.2.

CONSTRUCTION LIVE LOAD	0.5kPa

5. DESIGN SPEED: 30km/hr

BEARING ASSEMBLIES:

1. ALL BEARING PAD MATERIAL SHALL BE OZONE RESISTING NATURAL RUBBER (NATURAL POLYISOPRENE) IN ACCORDANCE WITH CAN/CSA-S6-14 WITH A DUROMETER HARDNESS OF 50.
2. ALL BEARING PAD STEEL SHIMS SHALL BE ROLLED STEEL WITH A MINIMUM Fy = 230MPa.
3. STEEL COMPONENTS OF BEARING SHALL CONFORM TO CSA G40.21-M, PLATE GRADE OF 350AT OR GALVANIZED.
4. MAXIMUM EXPANSION JOINT MOVEMENT OF 15mm.
5. ALL BEARING PAD CERTIFICATES SHALL BE PROVIDED TO THE ENGINEER FOR APPROVAL.

PIPE PILE NOTES:

1. STEEL PIPE FOR THE PILES SHALL CONFORM TO ASTM A252, GRADE 3 (fy=310MPa MINIMUM), DIAMETER & WALL THICKNESS AS INDICATED ON THE DRAWINGS. MILL CERTIFICATES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO DRIVING PILES.
2. PILES SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE DRAWINGS. MAXIMUM TOLERANCE FROM LOCATIONS SHOWN ON THE DRAWINGS SHALL BE 75mm AT GROUND & 25mm AT CUT-OFF ELEVATIONS.
3. PILES SHALL BE SPLICED, IF NECESSARY, IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS. PILING SHALL BE ALIGNED SUCH THAT PILES ARE STRAIGHT FROM END TO END.
4. ALL WELDING SHALL CONFORM IN QUALITY & WORKMANSHIP TO CURRENT CSA W59. WELDING SHALL BE UNDERTAKEN BY A COMPANY CERTIFIED FOR DIVISION 1 OR DIVISION 2 OF CSA W47.1 & APPROVED BY DWB Consulting Services Ltd. CERTIFICATION SHALL BE IN EFFECT THROUGHOUT THE CONSTRUCTION PERIOD.
5. PILE DRIVING EQUIPMENT SPECIFICATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO COMMENCEMENT OF PILE DRIVING. PILES SHALL BE DRIVEN AS SHOWN IN THE FOLLOWING TABLE:

	ABUTMENTS
SERVICE LOAD (SLS)	480kN
ULTIMATE LOAD (ULS)	900kN
PILE DEPTH	20m
PILE END	OPEN

STRUCTURAL STEEL:

1. SUPERSTRUCTURE MEMBERS SHALL BE GRADE 350AT, BRACING MEMBERS SHALL BE GRADE 350A.
2. STRUCTURAL BOLTS SHALL BE ASTM A325, TYPE 3 M22 U.N.O. INSTALLED IN ACCORDANCE WITH CAN/CSA-S6-14. ALL BOLTS SHALL BE PREVIOUSLY UNUSED. BOLTS SHALL HAVE SUFFICIENT LENGTH SUCH THAT THE FULL THREAD IS EXCLUDED FROM SHEAR PLANES BETWEEN CONNECTED PARTS.
3. NELSON STUDS SHALL BE IN ACCORDANCE WITH ASTM A108, GRADE 1015, 1018, OR 1020. SHEAR STUDS SHALL MEET THE REQUIREMENTS OF CAS W59 APPENDIX H FOR TYPE A & B STUDS.
4. NELSON STUDS SHALL BE 22#x150mm U.N.O.
5. FLANGE TO WEB FILLET WELD SHALL USE A SUBMERGED ARC WELD PROCESS AS PER CSA W59, CLAUSE 4.3.2.4.

FABRICATION SPECIFICATIONS:

1. ALL DIMENSIONS ARE CORRECT AT 15°C, GIRDER LENGTHS ARE MEASURED ALONG THE CENTRELINE OF GIRDER.
2. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION (MIN. TWO WEEK REVIEW PERIOD).
3. ALL MATERIALS OR MATERIAL COMBINATIONS SHALL CONFORM TO APPLICABLE CSA OR ASTM STANDARDS & SHALL HAVE THE APPROPRIATE SUPPORTING IDENTIFICATION.
4. GIRDER CAMBER SHALL BE 80mm.
5. ALL WELDING SHALL CONFORM TO CURRENT CSA W59. WELDING ELECTRODES SHALL BE COMPATIBLE WITH BASE METALS. ALL WELDS SHALL BE 8mm U.N.O.
6. THE FABRICATOR RESPONSIBLE FOR WELDED CONSTRUCTION SHALL BE CERTIFIED FOR DIVISION 1 OR 2 OF CSA W47.1-09 – CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES. CERTIFICATION SHALL BE IN EFFECT THROUGHOUT THE MANUFACTURING PERIOD.
7. FIELD WELDING SHALL BE COMPLETED BY A COMPANY CERTIFIED TO CSA W47.1 DIVISION 3 OR BETTER.
8. ALL WELDS SHALL BE VISUALLY INSPECTED.
9. CONTACT THE ENGINEER FOR FABRICATION INSPECTIONS A MINIMUM OF TWO WEEKS PRIOR TO SHIPPING OF FABRICATED ITEMS.

CONCRETE NOTES:

1. PRECAST CONCRETE SHALL CONFORM TO CSA A23.1 EXPOSURE CLASS C1, f'c=35MPa AT 28 DAYS. PRECAST CONCRETE SHALL BE FABRICATED IN ACCORDANCE WITH CSA A23.4 BY A PLANT CERTIFIED IN ACCORDANCE WITH CSA A23.4. FABRICATION TOLERANCES TO CSA A23.4. FINISH SHALL BE TRANSVERSE BROOM TO TOP OF DECK PANELS, OTHERWISE TO CSA A23.1 & A23.4. ALL CORNERS SHALL COME WITH 20x20 CHAMFER U.N.O. ON THE APPLICABLE DRAWINGS.
2. THE CONCRETE MIX DESIGN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO CASTING.
3. THE ADDITION OF FLY ASH SHALL NOT EXCEED 15% BY MASS OF PORTLAND CEMENT IN SUBSTRUCTURE CONCRETE.
4. ALL CONCRETE IN CONTACT WITH NATURAL SOIL SHALL BE MADE ACCORDING TO THE CSA SPECIFICATION FOR EXPOSURE CLASSIFICATION S-2. THIS WILL REQUIRE A 56 DAY COMPRESSIVE STRENGTH OF 35MPa, A WATER CEMENT RATIO NO HIGHER THAN 40, & THE USE OF TYPE HS OR HSb PORTLAND CEMENT.

REINFORCING STEEL:

1. ALL REINFORCING STEEL SHALL HAVE A MINIMUM GRADE OF fy=400MPa.
2. TOP MAT OF DECK SHALL BE EPOXY COATED STEEL (CAN/CSA-G30.18).
3. REINFORCING SHALL CONFORM TO CAN/CSA G30.18M GRADE 400R. REINFORCING STEEL SHALL NOT BE WELDED/TACK WELDED.

GROUT NOTES:

1. GROUT SHALL BE NON-SHRINK PORTLAND CEMENT BASED WITH A MINIMUM COMPRESSIVE STRENGTH OF 35MPa AT 28 DAYS, INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. GROUT SHALL BE A MIXTURE OF FINE & COARSE GROUT DEPENDING ON APPLICATION, SEE DRAWINGS FOR DETAILS.
2. FIELD SAMPLING OF GROUT PROCEDURES SHALL CONFORM WITH DESIGN REQUIREMENTS.

GUARDRAIL NOTES:

1. STEEL RAILS SHALL BE CSA G40.21M GRADE 350W (POWDER COATED YELLOW) OR ASTM A500 GRADE C (POWDER COATED YELLOW).
2. STEEL POSTS & PLATE SHALL BE CSA G40.21M GRADE 350W (POWDER COATED YELLOW).
3. SHOP WELDING SHALL BE IN ACCORDANCE WITH CSA W59. FABRICATOR SHALL BE CERTIFIED FOR DIVISION 1, 2 OR 3 IN ACCORDANCE WITH CSA W47.1. FIELD WELDING (IF ANY) SHALL BE DONE BY COMPANY CERTIFIED TO CSA W47.1 DIVISIONS 1, 2 OR 3. MINIMUM 6mm FILLET WELD UNLESS NOTED OTHERWISE.
4. INSERTS SHALL BE GALVANIZED TO CSA G164, MINIMUM 610g/m² AFTER FABRICATION.
5. GUARDRAIL BRACKETS & POST SHALL BE GALVANIZED TO CSA G164, MINIMUM 610g/m² AFTER FABRICATION.
7. DELINEATORS REQUIRED AS PER MFLNRO STANDARD.

ERECTION SPECIFICATIONS:

1. ERECTION PROCEDURE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
2. GIRDERS SHALL BE SUPPORTED BY TEMPORARY BRACING TO PREVENT DAMAGE DURING TRANSPORTATION & ERECTION.
3. ALL PRECAST COMPONENTS SHALL UTILIZE RECESSED LIFTING INSERTS AS LIFTING DEVICES. GROUT RECESSES AFTER INSTALLATION.
4. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING GIRDERS IN CORRECT ALIGNMENT UNTIL THE DECK HAS BEEN GROUTED IN PLACE.
5. ONLY LOW IMPACT LIFTS ARE PERMITTED. THE ANGLE OF LIFT SHALL NOT EXCEED 30° FROM VERTICAL.

CERTIFICATION & QUALITY CONTROL:

1. CONCRETE TEST RESULTS BY AN APPROVED TESTING LABORATORY FOR ALL PRECAST CONCRETE COMPONENTS & FIELD GROUTING SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW.
2. MILL CERTIFICATES FOR ALL STEEL INCORPORATED INTO THE STRUCTURE SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW.
3. CERTIFICATION TO CSA STANDARDS FOR THE STEEL & PRECAST CONCRETE MANUFACTURERS SHALL BE IN EFFECT AT THE TIME OF TENDER OPENING & THROUGHOUT THE MANUFACTURING PERIOD.
4. IT IS UNDERSTOOD THAT THE OWNER WILL ARRANGE TO CARRY OUT FIELD REVIEWS BY A QUALIFIED PERSON TO CONFIRM CONFORMANCE TO DESIGN DRAWINGS.

ENDFILL NOTES:

1. BRIDGE ENDFILL SHALL CONSIST OF WELL GRADED, SELECT, GRANULAR MATERIAL (<75mm), FREE OF UNSUITABLE MATERIALS, FROZEN MATERIAL, & ORGANICS. BRIDGE ENDFILL SHALL BE CONSTRUCTED IN SUCCESSIVE HORIZONTAL LAYERS NOT EXCEEDING 200mm IN LOOSE THICKNESS, EACH LAYER SHALL BE COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DRY DENSITY. THE FINAL TWO LAYERS OF ENDFILL SHALL BE COMPACTED TO 100% STANDARD PROCTOR DRY DENSITY.
2. HEAVY EARTH COMPACTING EQUIPMENT OR OTHER HEAVY CONSTRUCTION EQUIPMENT SHALL NOT BE USED WITHIN 2.0m OF THE ABUTMENT & WALLS, WITH THE EXCEPTION OF A 10 TON VIBRATORY ROLLER FOR BASE PREPARATION.

RIPRAP NOTES:

1. CLASS 100kg RIPRAP SHALL BE HARD, DURABLE, ANGULAR ROCK AND IN ACCORDANCE TO THE "MoTI STANDARD SPECIFICATIONS" APPROXIMATE AVERAGE DIMENSION OF SPECIFIED ROCK CLASS MASS (Sg=2.640).

   CLASS 100kg AVERAGE SIZE ROCK RIPRAP, 700mm THICK, WITH THE FOLLOWING ROCK GRADATION:

	DIAMETER
15% AVERAGE DIMENSION	185ø
50% AVERAGE DIMENSION	415ø
85% AVERAGE DIMENSION	600ø
<100% AVERAGE DIMENSION	715ø

GEOTEXTILE NOTES:

1. LINE EXCAVATION & ROCK WITH NON-WOVEN GEOTEXTILE WITH THE FOLLOWING SPECIFICATIONS:

GRAB TENSILE STRENGTH	ASTM D4632 ≥900N
PUNCTURE STRENGTH	ASTM D6241 ≥2000N

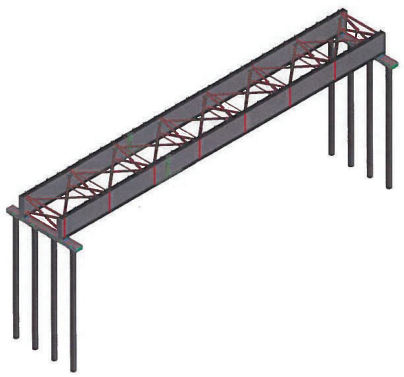
HYDROLOGY NOTES:

1. HYDRAULIC DATA:

– Q200 ELEVATION:	681.93m
– MINIMUM CLEARANCE:	1.0m
– DESIGN VELOCITY:	3.67m/s
– DESIGN DISCHARGE:	55.5m³/s

ESTIMATED QUANTITIES:

EXCAVATION:	130m³
GEOTEXTILE:	340m²
ENDFILL:	720m³
CLASS 100kg RIPRAP:	210m³



ISOMETRIC
1:250

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
ALAN D. WAILY
37764

TELKWA COAL
LIMITED

SCALE AS NOTED	CAD FILENAME 18364-204-25
	DATE 2019-08-13

REV	DATE	DESCRIPTION	DRW	CHK	ENG
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DRAWN DK DATE 2019-07-24

GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)

STA. 13+200 ON TELKWA COALMINE ROAD

Specification Notes

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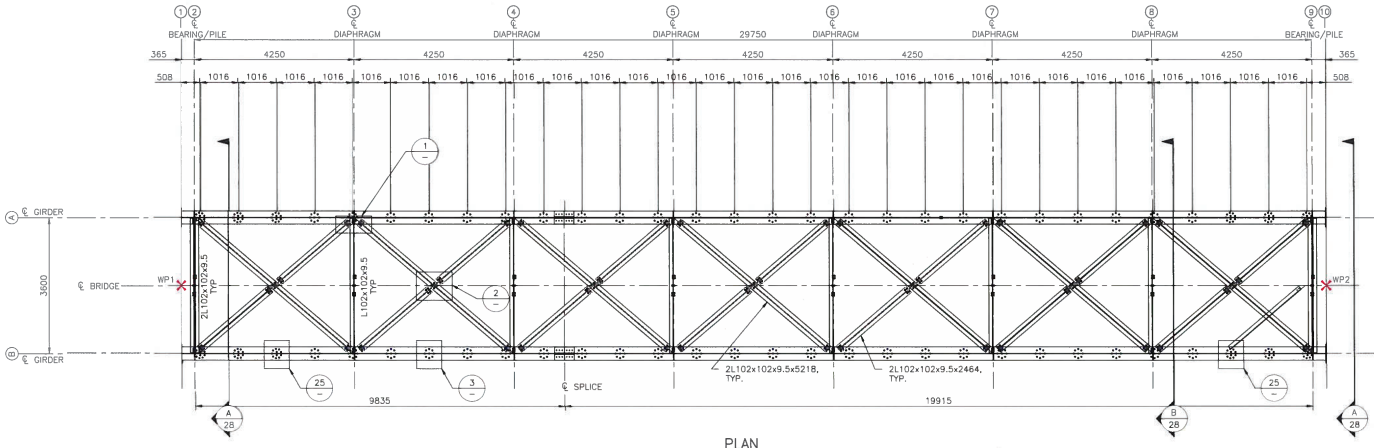
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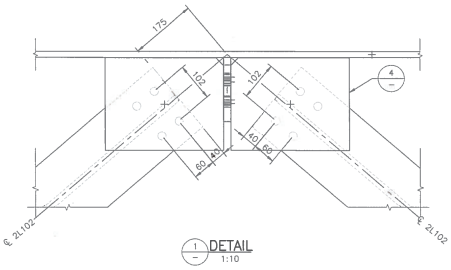
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NOTES:

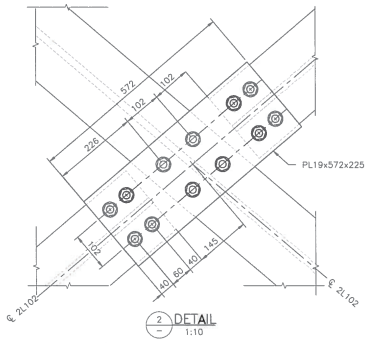
1. FOR SPECIFICATION NOTES SEE DRAWING 18364-204-25.



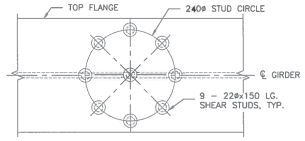
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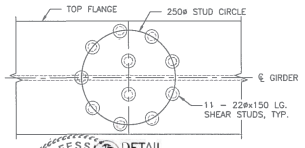
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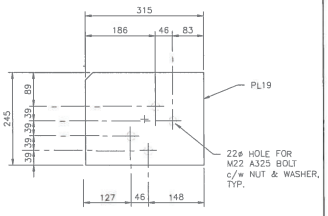
2 DETAIL
1:10



3 DETAIL
1:10
NOTE: FOR DECK PANEL B ONLY



3 DETAIL
1:10
NOTE: FOR DECK PANEL A ONLY



4 DETAIL
1:10

TELKWA COAL
LIMITED

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
37769
OF BRITISH COLUMBIA
ENGINEER

SCALE SCALE			CAD FILENAME 18364-204-26		
			DATE 2019-08-13		
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DESIGNED	AW	2019-07-26
QUALITY CONTROL	TW	2019-07-26
QUALITY ASSURANCE		
DRAWN	KD	2019-07-26

GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)

STA. 13+200 ON TELKWA COALMINE ROAD

Steel Plan & Details

LATITUDE:	54° 37' 04.1"	NAD83	NORTHING:	6053891	DRAWING NUMBER	REV.
LONGITUDE:	127° 08' 07.8"	9U	EASTING:	620404	18364-204-26	B

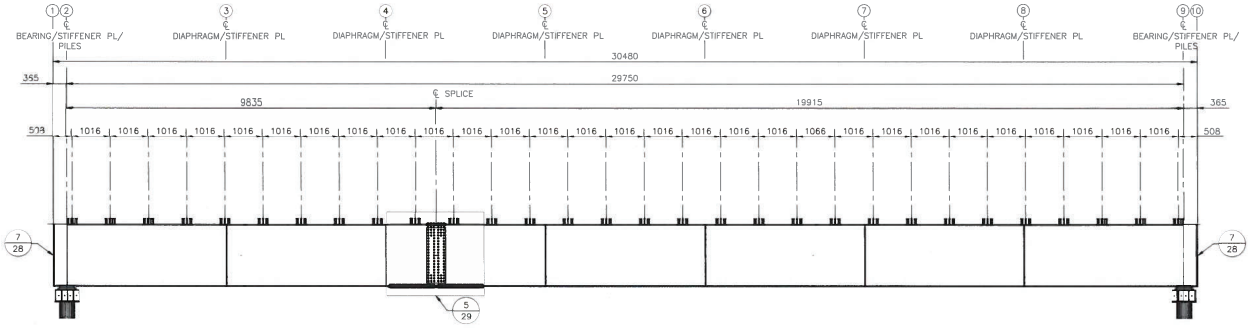
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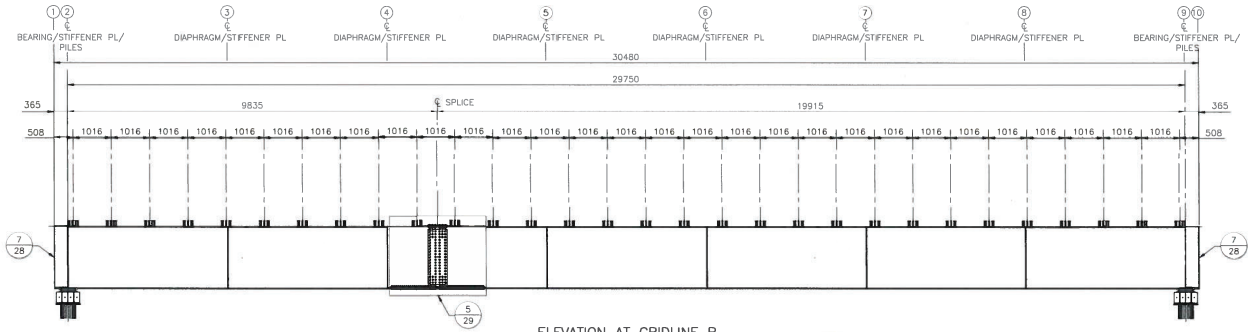
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NOTES:

1. FOR SPECIFICATION NOTES SEE DRAWING 18364-204-25.



ELEVATION AT GRIDLINE A



ELEVATION AT GRIDLINE B

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
37764
K. D. DAILY

SCALE 1:100	CAD FILENAME 18364-204-27
	DATE 2019-08-12

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	KD	AW/KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	KD	KD/AW	AW

SENIOR DESIGNER
DATE 2019-08-13

DWB Consulting Services Ltd.
1574 6th Avenue
Prince George, B.C.
V2L 3P6
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED AW DATE 2019-07-26
QUALITY CONTROL TW DATE 2019-07-26
QUALITY ASSURANCE --- DATE ---
DRAWN KD DATE 2019-07-26

TELKWA COAL
LIMITED

GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE
ON PILES (110 TONNES)

STA. 13+200 ON TELKWA COALMINE ROAD

Steel Elevation

LATITUDE: 54° 37' 04.1"	NAD83	NORTHING: 6053891	DRAWING NUMBER	REV
LONGITUDE: 127° 08' 07.9"	9U	EASTING: 629404	18364-204-27	B

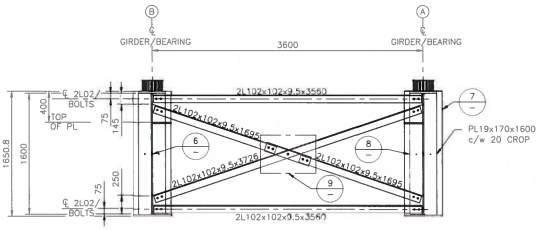
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ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

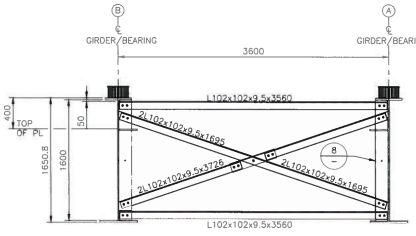
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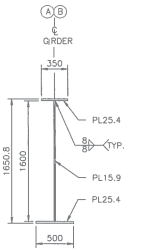
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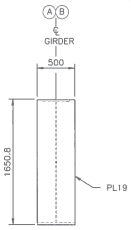
A/26 SECTION 1:50



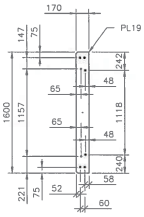
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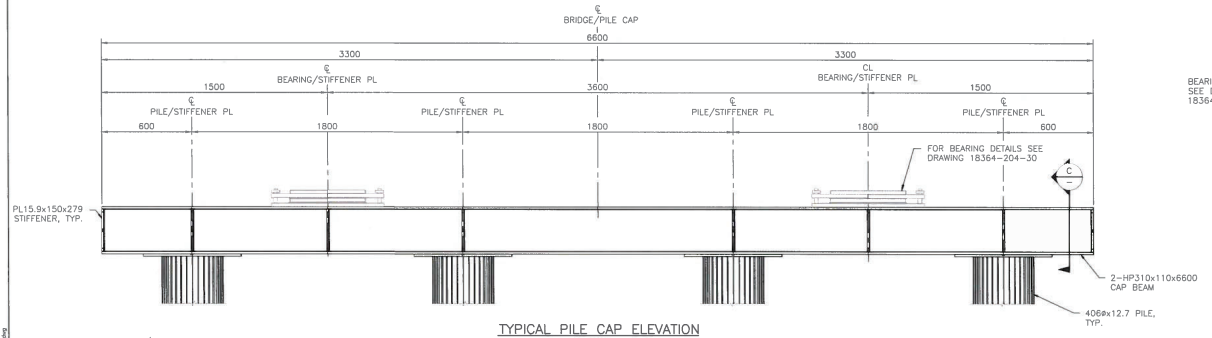
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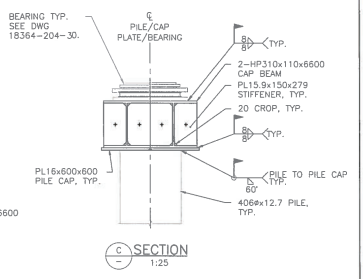
7/– DETAIL 1:50



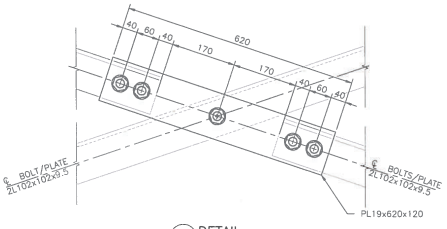
8/– DETAIL 1:50



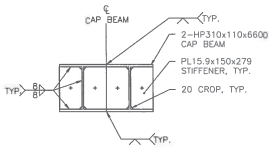
TYPICAL PILE CAP ELEVATION
1:25



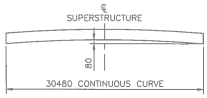
C/– SECTION 1:25



9/– DETAIL 1:10



PILE CAP WELDING DETAIL
1:25



CAMBER
NTS

TELKWA COAL
LIMITED

GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)

STA. 13+200 ON TELKWA COALMINE ROAD

Steel Sections & Cap Details

SCALE	As Noted	CAD FILENAME	18364-204-28
		DATE	2019-08-14

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	KD	AW/KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	KD	KD/AW	AW

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — # 22724 — A. J. ALWARD

SENIOR DESIGNER
DATE 2019-08-13

DWB Consulting Services Ltd.
1574 7th Avenue,
Prince George, B.C.
V2L 3P6
Phone: (250) 562-5541 Fax: (250) 562-5551

DESIGNED	AW	DATE	2019-07-26
QUALITY CONTROL	TYE	DATE	2019-07-26
QUALITY ASSURANCE	---	DATE	---
DRAWN	KD	DATE	2019-07-26

LATITUDE:	54° 37' 04.1"	NAD83	NORTHING:	6053891	DRAWING NUMBER: 18364-204-28 REV: B
LONGITUDE:	127° 08' 07.9"	9U	EASTING:	620404	

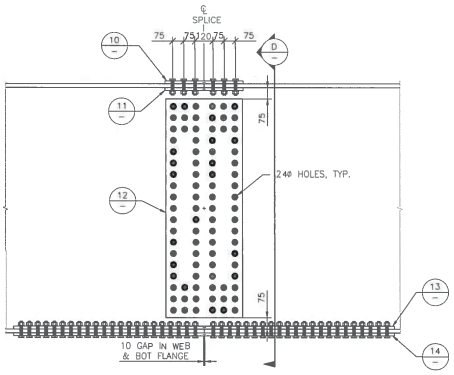
INTENDED TO BE PLOTTED ON 11"x17"
ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

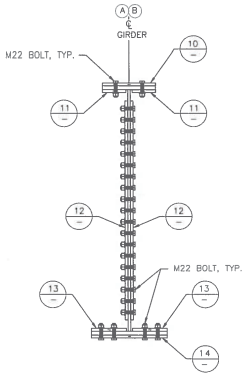
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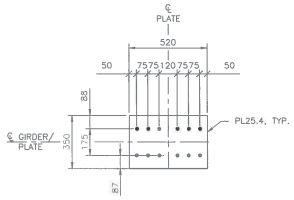
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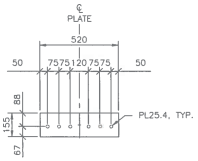
5/27 DETAIL 1:10



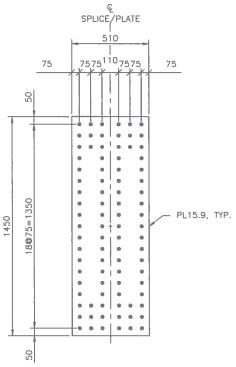
D SECTION 1:10



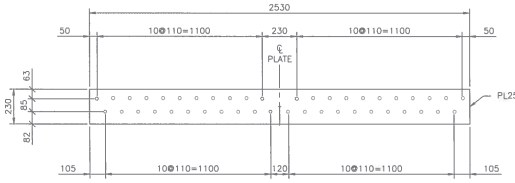
10 DETAIL 1:10
(2 REQUIRED)



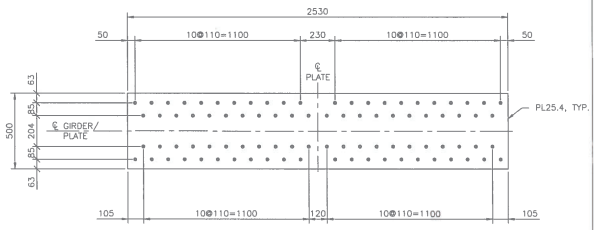
11 DETAIL 1:10
(4 REQUIRED)



12 DETAIL 1:10
(4 REQUIRED)



13 DETAIL 1:10
(4 REQUIRED)



14 DETAIL 1:10
(2 REQUIRED)

INTENDED TO BE PLOTTED ON 11"x17"
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ISSUED FOR CONSTRUCTION

SCALE As Noted

CAD FILENAME 18364-204-29
DATE 2019-08-12

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	KD	AW/KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	KD	KD/AW	AW

SENIOR DESIGNER
DATE 2019-08-13

PROFESSIONAL ENGINEER # 37704 PROVINCE OF BRITISH COLUMBIA

DWB Consulting Services Ltd.
1070 5th Avenue
Prince George, B.C.
V2L 3K9
Phone: (250) 562-5541 Fax: (250) 562-5581

DESIGNED AW DATE 2019-07-26
QUALITY CONTROL TW DATE 2019-07-26
QUALITY ASSURANCE — DATE —
DRAWN KD DATE 2019-07-26

TELKWA COAL LIMITED

GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)

STA. 13+200 ON TELKWA COALMINE ROAD

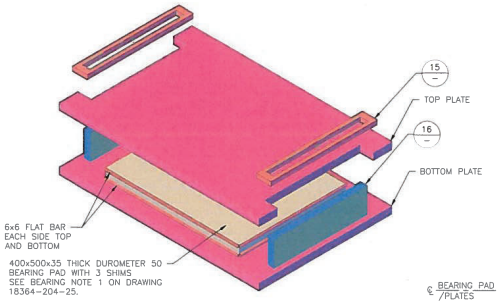
Steel Splice Details

LATITUDE:	54° 37' 04.1"	NAD83	NORTHING:	6053891	
LONGITUDE:	127° 08' 07.8"	9U	EASTING:	620404	

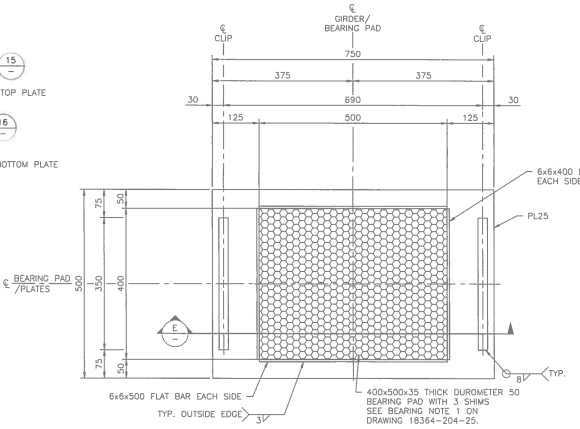
DRAWING NUMBER 18364-204-29 REV B

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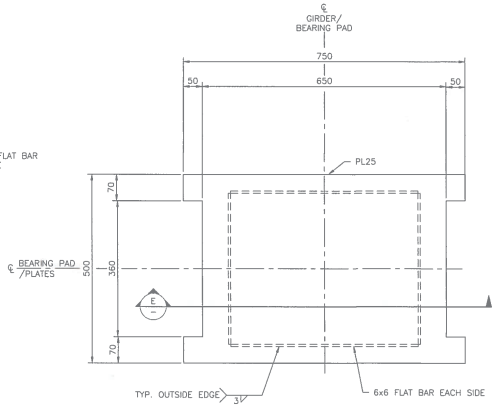
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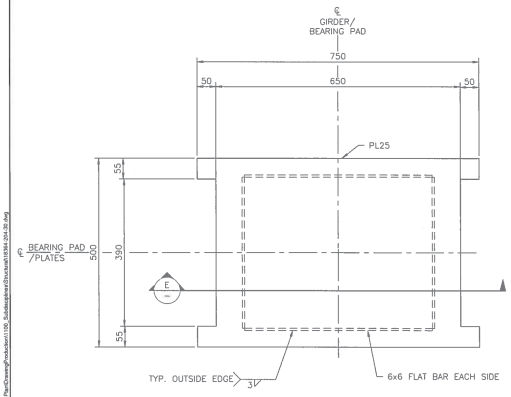
BEARING ASSEMBLY
1:10
GIRDER NOT SHOWN FOR CLARITY



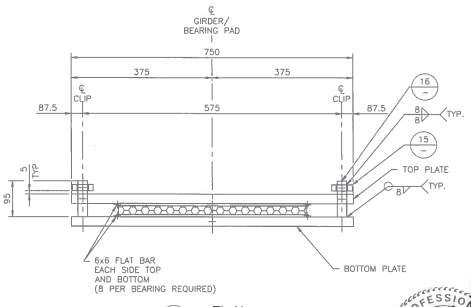
BOTTOM BEARING PLATE
1:10
(4 REQUIRED)



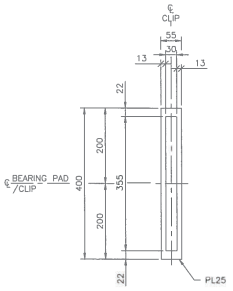
TOP BEARING PLATE (FIXED END)
1:10
(2 REQUIRED)



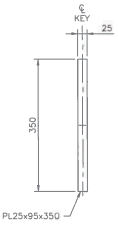
TOP BEARING PLATE (EXP. END)
1:10
(2 REQUIRED)



E SECTION
1:10



15 CLIP DETAIL
1:10
(8 REQUIRED)



16 KEY DETAIL
1:10
(8 REQUIRED)

TELKWA COAL
LIMITED

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. J. ALWAILY
37709

SCALE	As Noted	CAD FILENAME	18364-204-30
		DATE	2019-08-12

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	DK	KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	KD	KD/AW	AW

SENIOR DESIGNER
DATE 2019-08-13

DWB Consulting Services Ltd.
1079 5th Avenue
Prince George, B.C.
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Phone: (250) 562-5541 Fax: (250) 562-5581

DESIGNED	AW	DATE	2019-07-29
QUALITY CONTROL	TW	DATE	2019-07-29
QUALITY ASSURANCE	---	DATE	---
DRAWN	KD	DATE	2019-07-29

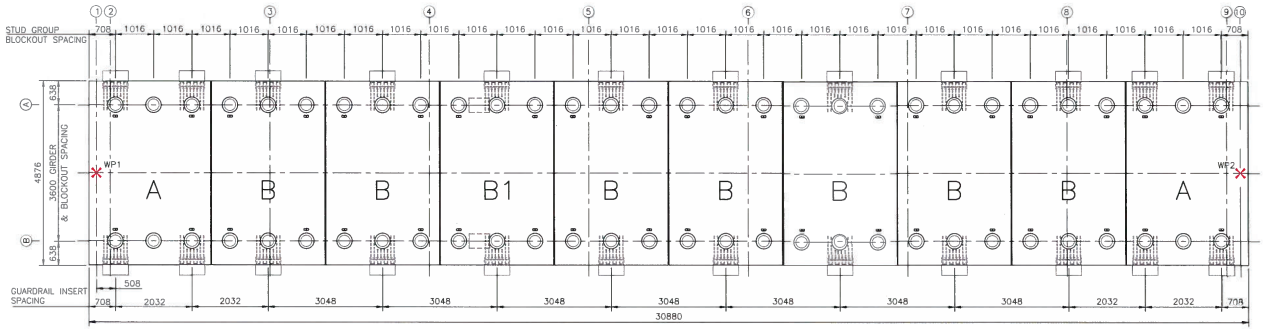
GOATHORN CREEK CROSSING
30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)
STA. 13+200 ON TELKWA COALMINE ROAD
Steel Bearing Details

LATITUDE:	54° 37' 04.1"	NAD83	6053891	NORTHING:	DRAWING NUMBER	REV
LONGITUDE:	127° 08' 07.8"	9U	620464	EASTING:	18364-204-30	B

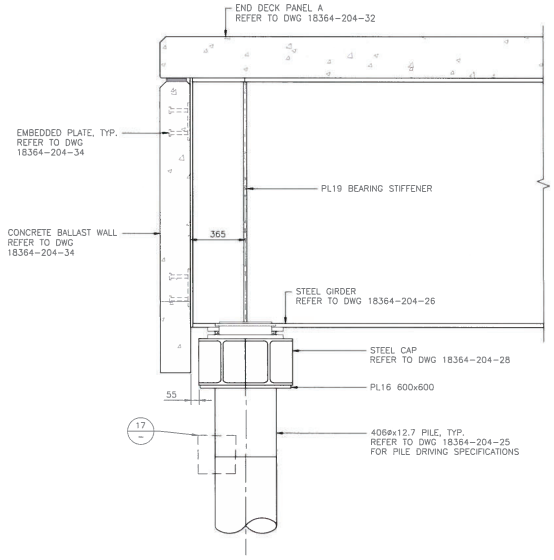
INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

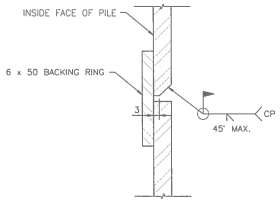
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DECK PANEL LAYOUT
1:100



TYPICAL ABUTMENT DETAIL
1:25



17 TYPICAL PILE SPLICE
1:2

INTENDED TO BE PLOTTED ON 11"x17"
ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. WALWAILY
#37764

TELKWA COAL
LIMITED

SCALE	As Noted	CAD FILENAME	18364-204-31
		DATE	2019-08-12

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	DK	KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	DK	KD/AW	AW

SENIOR DESIGNER
DATE 2019-08-13

DWB Consulting Services Ltd.
1079 6TH Avenue
Prince George, B.C.
V2L 3A5
Phone: (250) 562-5541 Fax: (250) 562-5581

DESIGNED AW DATE 2019-07-26
QUALITY CONTROL TW DATE 2019-07-26
QUALITY ASSURANCE --- DATE ---
DRAWN DK DATE 2019-07-26

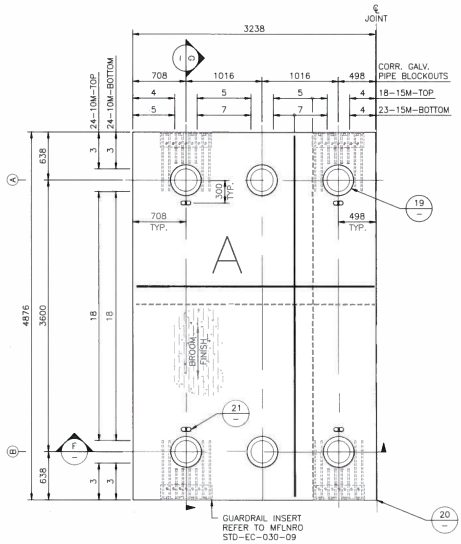
GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE
ON PILES (110 TONNES)

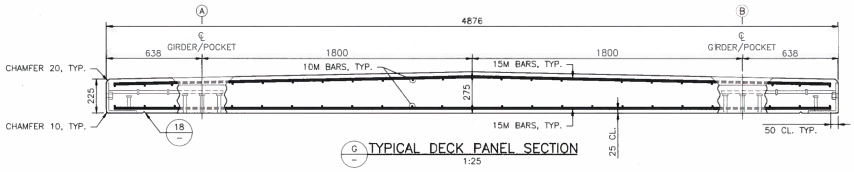
STA. 13+200 ON TELKWA COALMINE ROAD
Deck Layout & Connection Details

LATITUDE:	54° 37' 04.1"	NAD83	NORTHING:	6053251	DRAWING NUMBER	REV.
LONGITUDE:	127° 08' 07.8"	9U	EASTING:	626404	18364-204-31	B

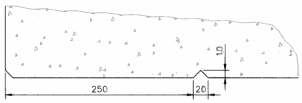
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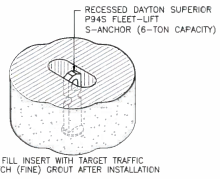
DECK PANEL A PLAN
1:50



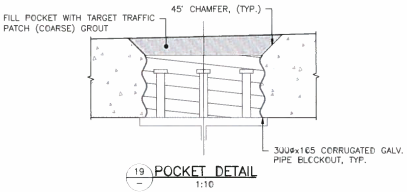
G TYPICAL DECK PANEL SECTION
1:25



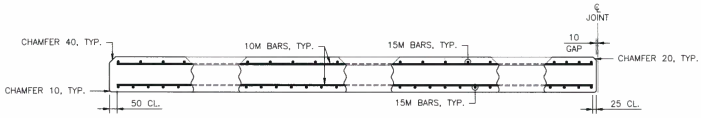
18 DRIP GROOVE DETAIL
1:5



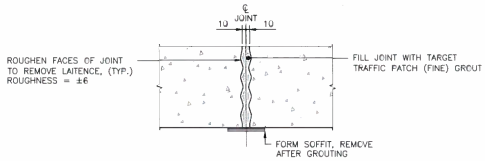
21 LIFTING INSERT DETAIL
NTS (4 PER PANEL)



19 POCKET DETAIL
1:10



F DECK PANEL A – REBAR LAYOUT
1:25



20 DECK JOINT DETAIL
1:10

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA
ALAN WAILY
37764

TELKWA COAL LIMITED

SCALE As Noted	CAD FILENAME 18364-204-32
	DATE 2019-08-12

REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	Jul.19	ISSUED FOR REVIEW	DK	KD	AW
B	Aug.19	ISSUED FOR CONSTRUCTION	DK	KD/AW	AW

SENIOR DESIGNER
DATE 2019-08-13

DWB Consulting Services Ltd.
1079 5TH Avenue – Prince George, B.C. V2L 3X6
Phone: (250) 562-5641 Fax: (250) 562-5661

DESIGNED AW DATE 2019-07-26
QUALITY CONTROL TW DATE 2019-07-26
QUALITY ASSURANCE --- DATE ---
DRAWN DK DATE 2019-07-26

GOATHORN CREEK CROSSING

30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)

STA. 13+200 ON TELKWA COALMINE ROAD

Concrete Deck Panel A Details

LATITUDE:	54° 37' 04.1"	NAD83	NORTHING:	6053851	DRAWING NUMBER	REV
LONGITUDE:	127° 08' 07.8"	9U	EASTING:	620404	18364-204-32	B

INTENDED TO BE PLOTTED ON 11"x17" ANY COPIES or PDFS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

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