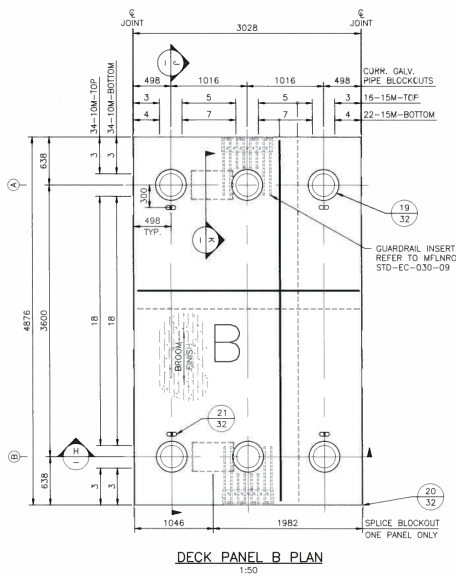


SCALE		As Noted	CAD FILE NAME			18061-204-33
			DATE			2019-08-1
REV	DATE	DESCRIPTION	DRW	CHK	ENG	
A	Jul 19	ISSUED FOR REVIEW	OK	DK	AW	
B	Aug 19	ISSUED FOR CONSTRUCTION	OK	KDHW	AW	

SENIOR DESIGNER
DATE 2019-08-13

DESIGNED	AW	DATE	2019-07-28
QUALITY CONTROL	BY	DATE	2019-07-28
QUALITY INSURANCE	DATE		
DRAWN	OK	DATE	2019-07-28

GOATHORN CREEK CROSSING	30.480m STEEL GIRDER/CONCRETE DECK BRIDGE ON PILES (110 TONNES)
STA. 13+200 ON TELKWA COALMINE ROAD	Concrete Deck Panel B Details
DRAWING NUMBER	18364-204-33
REV	B

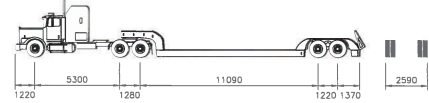
INTENDED TO BE PLOTTED ON 11"X17"
ANY COPIES OF PLOTS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION



NOTES:

1. FOR SPECIFICATION NOTES REFER TO 18364-204-25.
2. VEHICLE TRACKING ANALYSIS PERFORMED USING A TRANSPORTATION CANADA 1999 WB-19 VEHICLE, & HAS A MINIMUM CLEARANCE OF 0.5m.



WB-19 TRACKING SPECIFICATIONS

TRACTOR WIDTH	2.6m	LOCK TO LOCK TIME	6.0s
TRAILER WIDTH	2.6m	STEERING ANGLE	28.0°
TRACTOR TRACK	2.6m	ARTICULATING ANGLE	70.0°
TRAILER TRACK	2.6m		

PLAN - TOWN TO WOODS

PLAN - WOODS TO TOWN

LEGEND:

- Proposed Road Shoulder
- Vehicle Tracking - Town to Woods
- Vehicle Tracking - Woods to Town

SCALE			CAD FILENAME		18364-204-25	
			DATE		2018-08-12	
REV	DATE	DESCRIPTION	DRW	CHK	ENG	
		REVISION A NOT ISSUED				
B	Aug 15	ISSUED FOR CONSTRUCTION	DK	KD/KW	AW	



DESIGNED		AW	DATE	2018-08-02
QUALITY CONTROL		TSB	DATE	2018-08-02
QUALITY ASSURANCE			DATE	
DRAWN		DK	DATE	2018-08-02

LATITUDE		54° 37' 54.1"	NAD83	NORTHING	6050951	DRAWING NUMBER	18364-204-35	REV	B
LONGITUDE		121° 08' 07.8"	WGS 84	EASTING	620404				



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

ISSUED FOR CONSTRUCTION

INTENDED TO BE PLOTTED ON 11"x17"
ANY COPIES OF PDS MAY NOT BE TO SCALE

APPENDIX C – DETAILED CONSTRUCTION COST ESTIMATE



**Telkwa Coal Project
ENGINEERING COST ESTIMATE**

Preliminary Quantities and Cost Estimate

Project No: 18364-204

Project Name: Phase 2 Road Design - Tenas Haul Road

Revision: 2

Hourly rates from 2018-2019 Equipment Rental Rate Guide,
BC Road Builders & Heavy Construction Association

Design: DWB 18364-204

ITEM	UNIT	AMOUNT	RATE	COST	SUBTOTAL	DESCRIPTION
ENGINEERING SERVICES						
- Survey layout	L.S.	1	\$36,000.00	\$36,000.00		All inclusive - Personnel, equipment, travel and LOA
- Bridge certification inspections	Day	14	\$1,200.00	\$16,800.00		All inclusive
- Bridge certification reports	ea.	9	\$2,500.00	\$22,500.00		
- Traffic management plan	L.S.	1	\$4,500.00	\$4,500.00		For construction
- Construction traffic control	Month	3	\$1,600.00	\$4,800.00		Traffic control sign rental and setup
					\$84,600	
ENVIRONMENTAL						
- Permitting	L.S.	1	\$10,000.00	\$10,000.00		
- Environmental Management Plan	L.S.	1	\$15,000.00	\$15,000.00		As per Allegiance Coal Ltd.
- Hydroseeding	ha	28	\$6,500.00	\$182,000.00		as per MOTI SS 757
- Sediment and erosion control	L.S.	1	\$306,000.00	\$306,000.00		Estimated at \$6000/km as per Allegiance Coal Ltd.
- Environmental monitoring	Days	120	\$1,250.00	\$150,000.00		As per Allegiance Coal Ltd.
					\$663,000	
MATERIALS						
Goathorn Creek Bridge						
- 30.48m Steel girder, 4.877m concrete composite deck	m	30.48	\$6,000.00	\$182,880.00		Includes superstructure, bearing assemblies, pre-cast ballast wall and pile cap, rails, hardware, and delineators
- Steel piles	m	160	\$250.00	\$40,000.00		
Other Bridges						
- 14m concrete slab on spread footings Sta. 5+635	ea.	1	\$98,000.00	\$98,000.00		Conceptual design - no site plan. Includes all materials and freight.
- 10m concrete slab on spread footings Sta. 6+324	ea.	1	\$80,000.00	\$80,000.00		Conceptual design - no site plan. Includes all materials and freight.
- 8m concrete slab on spread footings Sta. 6+503	ea.	1	\$67,500.00	\$67,500.00		Conceptual design - no site plan. Includes all materials and freight.
- 8m concrete slab on spread footings Sta. 6+659	ea.	1	\$67,500.00	\$67,500.00		Conceptual design - no site plan. Includes all materials and freight.
- 24.384 steel girder/concrete composite deck on spread footings Sta. 7+032	ea.	1	\$161,000.00	\$161,000.00		Conceptual design - no site plan. Includes all materials and freight.
- 21.336m steel girder/concrete composite deck on spread footings Sta. 7+212	ea.	1	\$151,000.00	\$151,000.00		Conceptual design - no site plan. Includes all materials and freight.
- 21.336m steel girder/concrete composite deck on spread footings Sta. 8+054	ea.	1	\$151,000.00	\$151,000.00		Conceptual design - no site plan. Includes all materials and freight.
- 21.336m steel girder/concrete composite deck on spread footings Sta. 8+540	ea.	1	\$151,000.00	\$151,000.00		Conceptual design - no site plan. Includes all materials and freight.
Cross Drains and Culverts						
- 500mm CSP	m	1015	\$130.00	\$131,950.00		Supply and install
- 600mm CSP	m	280	\$150.00	\$42,000.00		Supply and install
- 800mm CSP	m	42	\$225.00	\$9,450.00		Supply and install
- 900mm CSP	m	60	\$250.00	\$15,000.00		Supply and install
- 1000mm CSP	m	16	\$265.00	\$4,240.00		Supply and install
- 1200mm CSP	m	34	\$360.00	\$12,240.00		Supply and install
- 1400mm CSP	m	38	\$490.00	\$18,620.00		Supply and install
- 1800mm CSP	m	20	\$640.00	\$12,800.00		Supply and install
Tenas Haul Road						
- Non-woven geotextile	m ²	151,000	\$2.50	\$377,500.00		Supply and install, Nillex Inc. and RS Means Heavy Construction Costs. Includes areas of overland construction.
- Geogrid, Tensar TX130S or equivalent	m ²	131,000	\$1.72	\$225,320.00		Supply and install, Nillex Inc. and RS Means Heavy Construction Costs
- Geogrid, Tensar TX7 or equivalent	m ²	131,000	\$7.31	\$957,610.00		Supply and install, Nillex Inc. and RS Means Heavy Construction Costs
- HFSA	m ³	21,560	\$28.25	\$609,070.00		Supply, haul and place; Allegiance Coal
- 25mm WGB	m ³	16,425	\$28.25	\$464,006.25		Supply, haul and place; Allegiance Coal
- 75mm OGB	m ³	10,010	\$28.25	\$282,782.50		Supply, haul and place; Allegiance Coal



**Telkwa Coal Project
ENGINEERING COST ESTIMATE**

Preliminary Quantities and Cost Estimate

Project No: 18364-204

Project Name: Phase 2 Road Design - Tenas Haul Road

Revision: 2

Design: DWB 18364-204

Hourly rates from 2018-2019 Equipment Rental Rate Guide,
BC Road Builders & Heavy Construction Association

ITEM	UNIT	AMOUNT	RATE	COST	SUBTOTAL	DESCRIPTION
Miscellaneous						
- Fencing	m	18,000	\$25.00	\$450,000.00		Supply and install as per Allegiance Coal Ltd.
- Security gates	ea.	6	\$15,000.00	\$90,000.00		Supply and install
- Cattle gates (level crossings)	ea.	16	\$500.00	\$8,000.00		Supply and install, 4 locations - 4 gates each
- Traffic control signage	ea.	75	\$175.00	\$13,125.00		Supply and install - permanent signage
					\$4,873,594	
BRIDGE INSTALLATIONS						
- Goathorn Creek	L.S.	1	\$300,000.00	\$300,000.00		Including stell piles
Other Bridges						
- 14m concrete slab on spread footings Sta. 5+635	ea.	1	\$40,000.00	\$40,000.00		Concept structure - no site plan.
- 10m concrete slab on spread footings Sta. 6+324	ea.	1	\$40,000.00	\$40,000.00		Concept structure - no site plan.
- 8m concrete slab on spread footings Sta. 6+503	ea.	1	\$40,000.00	\$40,000.00		Concept structure - no site plan.
- 8m concrete slab on spread footings Sta. 6+659	ea.	1	\$40,000.00	\$40,000.00		Concept structure - no site plan.
- 24.384 steel girder/concrete composite deck on spread footings Sta. 7+032	ea.	1	\$60,000.00	\$60,000.00		Concept structure - no site plan.
- 21.336m steel girder/concrete composite deck on spread footings Sta. 7+212	ea.	1	\$60,000.00	\$60,000.00		Concept structure - no site plan.
- 21.336m steel girder/concrete composite deck on spread footings Sta. 8+054	ea.	1	\$60,000.00	\$60,000.00		Concept structure - no site plan.
- 21.336m steel girder/concrete composite deck on spread footings Sta. 8+540	ea.	1	\$60,000.00	\$60,000.00		Concept structure - no site plan.
					\$700,000	
ROADWAY CONSTRUCTION						
Site Preparation						
- Clearing and grubbing: merch timber	ha	29	\$5,000.00	\$146,000.00		Unit rate from Allegiance Coal
- Clearing and grubbing: non-merch timber	ha	4	\$7,000.00	\$29,400.00		Unit rate from Allegiance Coal
- Clearing and grubbing: brush	ha	5	\$5,000.00	\$23,000.00		Unit rate from Allegiance Coal
- Stripping (topsoil salvage)	m ³	54,400	\$9.50	\$516,800.00		Unit rate from Allegiance Coal
- Trail pioneering	hr	20	\$205.25	\$4,105.00		For construction access in steep ground, Cat 329 excavator
Primary Excavation						
Cat Push Configuration						
- Cat Push (Free haul)	m ³	34441.2	\$3.63	\$125,021.56		101.4m3/hr - Cat D8T bulldozer and Cat CS533E compactor
- Spread Borrow	m ³	2894.8	\$1.23	\$3,560.60		271.8m3/hr - Cat D6T bulldozer and Cat CS533E compactor
- End Haul	m ³	435.3	\$2.93	\$1,275.43		211.3m3/hr - Cat D6T bulldozer, Cat 329 Excavator and Cat 730C rock truck
End Haul Configuration						
- End Haul	m ³	20632.3	\$6.09	\$125,650.71		114.0m3/hr - Cat D6T bulldozer, Cat 329 excavator, Cat CS533E compactor and Cat 730C rock truck
Excavator Side Cast						
- Excavator Side cast	m ³	8156.8	\$2.27	\$18,539.33		139.9m3/hr - Cat 329 excavator and Cat CS533E compactor
- End Haul	m ³	7763.8	\$5.92	\$45,961.70		101.1m3/hr - Cat D6T bulldozer, Cat 329 excavator, Cat CS533E compactor, and Cat 730C rock truck
					\$1,039,314	
TRANSPORTATION AND FREIGHT						
Mob/Demob, Crew Transport, LOA, Freight	%	5.0%	\$7,360,508.07	\$368,025.40		
					\$368,025	
SUB-TOTAL					\$7,728,533	



**Telkwa Coal Project
ENGINEERING COST ESTIMATE**

Preliminary Quantities and Cost Estimate

Project No: 18364-204

Project Name: Phase 2 Road Design - Tenas Haul Road

Revision: 2

Hourly rates from 2018-2019 Equipment Rental Rate Guide,
BC Road Builders & Heavy Construction Association

Design: DWB 18364-204

ITEM	UNIT	AMOUNT	RATE	COST	SUBTOTAL	DESCRIPTION
CONSTRUCTION SERVICES						
- Project Management	%	3.0%	\$7,728,533.48	\$231,856.00		
- Construction Supervision, QA/QC	%	8.0%	\$7,728,533.48	\$618,282.68		
					\$850,139	
	SUB-TOTAL				\$8,578,672	
CONTINGENCY						
- All items	%	10.0%	\$8,578,672.16	\$857,867.22		
					\$857,867	
	TOTAL				\$9,436,539	

Notes:

- 1) All volumes are in bank measure., unless noted otherwise.
- 2) Assumed equipment configuration for primary excavation was a Cat 329 excavator, 730C rock trucks, Cat D6 and D8 bulldozers and Cat CS533E compactors.
- 3) Site Preparation costs for clearing and grubbing and stripping were supplied by Telkwa Coal Ltd.
- 4) Assumed that all slash from logging is managed during the logging and top soil salvage operations.

Prepared by: Todd Wambolt, P.Eng

Reviewed by: Shawn Huang, P.Eng

Date: May 30, 2019

APPENDIX D – FOUR CREEK RE-ALIGNMENT DESIGN DRAWINGS



Lat. 54° 37' 9.61" Long. 127° 08' 19.33"

ISSUED FOR REVIEW

DWB Consulting Services Ltd.

1579 9th Avenue
Prince George, B.C.

V21, 3018
Phone: (250) 562-5541 Fax: (250) 562-5561

CLIENT PROJECT CODE

DATE _____

2019-09-10

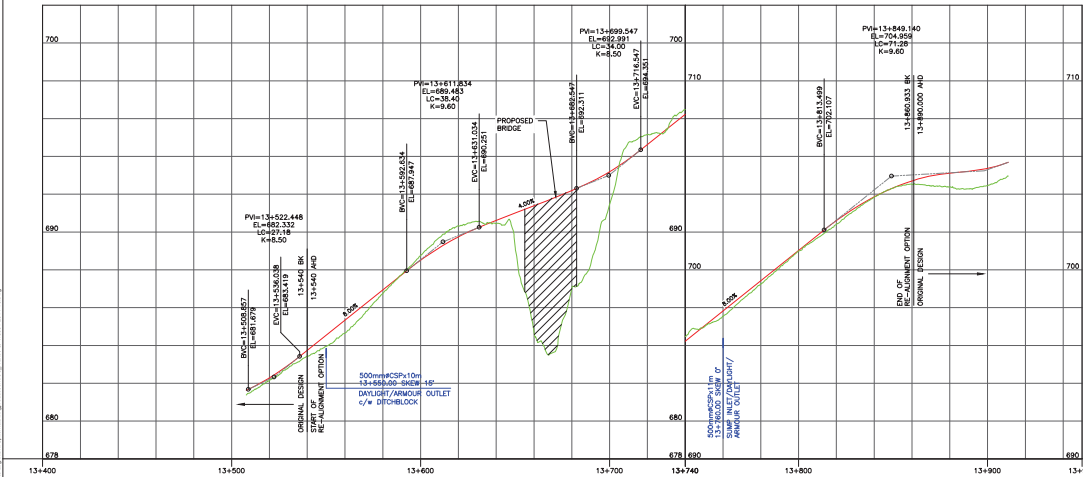
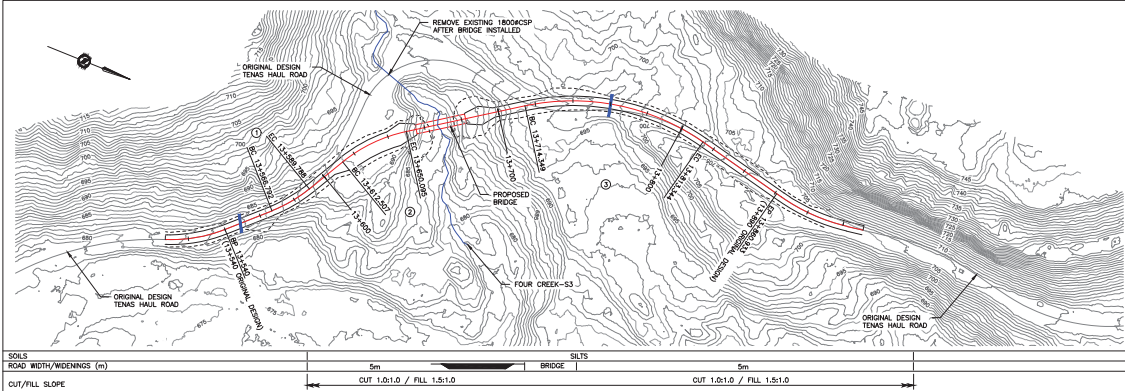
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2019-09-10

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- GENERAL NOTES:**
1. ORIGINAL GROUND INFORMATION OBTAINED FROM LDMR(2017) PROVIDED BY CLIENT. EXISTING GROUND PROFILE, STRIPPING AND SOIL DEPTHS MAY VARY. CONSTRUCTION SURVEY EQUIPMENT IS RECOMMENDED TO CONFIRM ACTUAL CROSS SECTIONS TO BE CONSTRUCTED.
 2. NO GEOTECHNICAL INFORMATION AVAILABLE AT TIME OF DESIGN. ROAD CROSS SECTION DESIGN BASED ON TYPICAL SOIL PROPERTIES FROM AASHTO 1993 GUIDE FOR DESIGN OF PAVEMENT STRUCTURES, VAN TELL et al., NCHRP 128, AND MAY CHANGE BASED ON FURTHER TESTING.
 3. LOCAL CUT MATERIAL IS ASSUMED SUITABLE FOR SUBGRADE FILLS UNLESS NOTED OTHERWISE.
 - SUBGRADE CONSTRUCTION SHALL BE COMPACTED TO 95% SPD.
 - HPSA SHALL BE COMPACTED TO 98% SPD.
 - WGB & OGB SHALL BE COMPACTED TO 98% SPD.
 4. CULVERT LENGTHS ARE ASSUMED MINIMUMS ONLY, ADJUST AS REQUIRED FOR CONSTRUCTED CROSS SECTIONS.
 5. EXCAVATION OF BELL HOLES AND CUT SLOPE ARMOURING MAY BE REQUIRED AT PROPOSED CULVERT LOCATIONS.
 6. CULVERTS ON EXISTING DRAINAGE TO MATCH DRAINAGE PATH. IF DRAINAGE PATH IS GREATER THAN 5%L, ARMOUR OUTLET POOL.
 7. AT A MINIMUM, CONSTRUCTION PRACTICES SHALL COMPLY WITH THE MFLNRD ENGINEERING MANUAL, DECEMBER 13, 2018.
 8. CONTOUR ELEVATIONS ARE PRESENTED AT 1.0m INTERVALS.
 9. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL BENCHMARKS & ANY UTILITIES.
- ROAD SPECIFICATION NOTES:**
10. DESIGN SPEED 40km/h.
 11. FINISHED ROAD SURFACE 5m.
 12. SPECIFICATIONS FOR HPSA, WGB & OGB TO BE AS PER MoT SS502 TABLE 202-C.
 13. NON-WOVEN GEOTEXTILE TO BE ARMETEC 250 OR APPROVED EQUIVALENT.
 14. GEORND TO BE TENSAR TX1305 & TENSAR TX7, OR APPROVED EQUIVALENTS, INSTALL ACCORDING TO MANUFACTURERS REQUIREMENTS & CONFIRM UPON FURTHER TESTING.
 15. TYPICAL SECTIONS MAY CHANGE BASED ON FINAL ROAD DESIGN REQUIREMENTS.
 16. CLEARING LIMITS TO BE A MINIMUM OF 12.5m FROM ROAD CENTERLINE OR 3.0m BEYOND CUT/FILL LIMITS.
 17. PROPOSED BRIDGE CROSSING WILL REQUIRE A SITE PLAN SURVEY & DESIGN.
 18. FOR TYPICAL SECTIONS SEE DRAWING 18364-204-X73.
 19. FOR MASS HULL DRAWING SEE 18364-204-M70.
 20. FOR CROSS SECTIONS SEE DRAWINGS 18364-204-X70 TO 18364-204-X73.

HORIZONTAL CURVE INFORMATION					
Curve #	Radius	Length	to	B.C.	E.C.
1	75.0	23.0	13+567.6	13+566.792	13+589.788
2	80.0	37.59	26.9200	13+612.507	13+650.095
3	120.0	99.0	47.2689	13+714.349	13+813.344

- LEGEND:**
- PROPOSED ROAD
 - CUT/FILL LIMITS
 - HORIZONTAL CURVE #
 - NEW CULVERT

TELKWA COAL
LIMITED

FOUR CREEK CROSSING
FOUR CREEK RE-ALIGNMENT OPTION
STA. 13+540 TO 13+860.933

Plan & Profile
DRAWING NUMBER: 18364-204-P70 | A

INTENDED TO BE PLOTTED ON 11"x17"
ANY COPIES OF THIS MAY NOT BE TO SCALE

ISSUED FOR REVIEW

REV	DATE	DESCRIPTION	DRW	CHK	ENG
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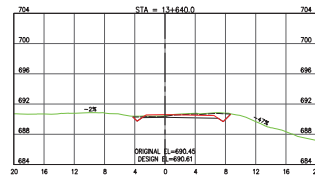
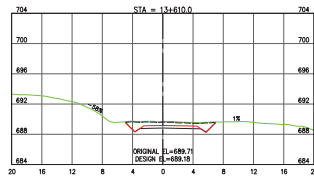
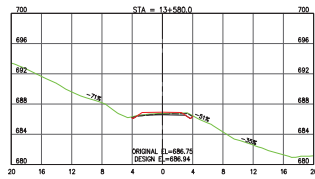
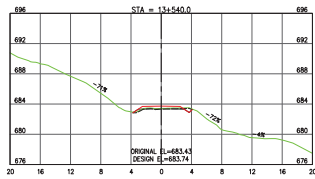
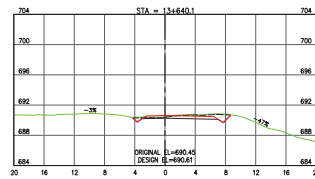
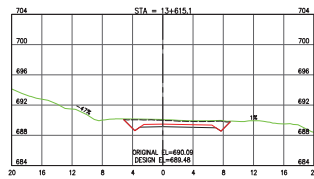
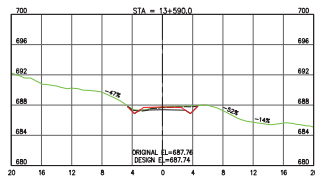
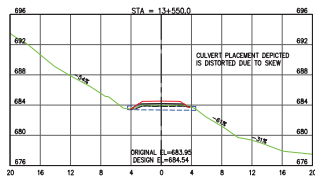
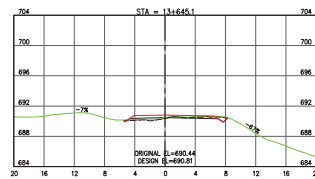
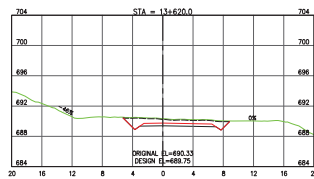
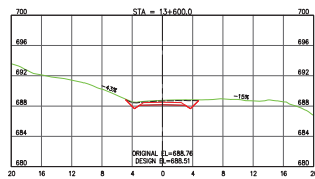
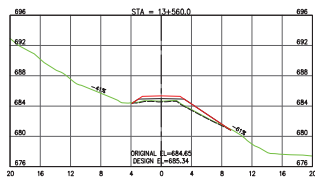
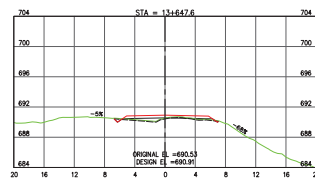
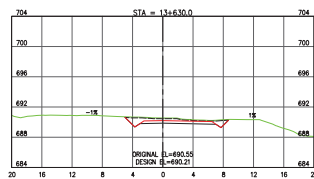
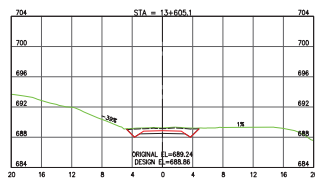
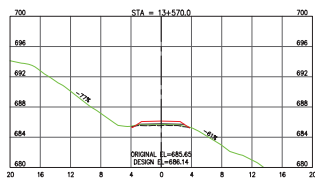
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DESIGNED BY: BM	DATE: 2019-09-19
QUALITY CONTROL: TKN	DATE: 2019-09-19
QUALITY ASSURANCE: TKN	DATE: 2019-09-19
DRAWN: JGD	DATE: 2019-09-19



DESIGNED BY: BM	DATE: 2019-09-19
QUALITY CONTROL: TKN	DATE: 2019-09-19
QUALITY ASSURANCE: TKN	DATE: 2019-09-19
DRAWN: JGD	DATE: 2019-09-19

LATITUDE: 50° 07' 58" N	NAD83	ELEVATION: 880.00	REVISION: 18364-204-P70 A
LONGITUDE: 127° 06' 18" W	NS	EASTING: 62000	

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LEGEND:

EXISTING GROUND
STRIPPED SURFACE
DESIGN LINE
SUBGRADE
NEW CULVERT

NOTES:

1. FOR GENERAL NOTES AND SPECIFICATIONS SEE DRAWING 18364-204-P70.
2. FOR TYPICAL SECTION SEE DRAWING 18364-204-X73.

ISSUED FOR REVIEW

SCALE: 1:500		CAD FILENAME: 18364-204-X70		DATE: 2019-09-19	
REV	DATE	DESCRIPTION	DRW	CHK	ENG
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DESIGNER: _____
CHECKER: _____
DATE: 2019-09-19

DWB Consulting Services Ltd.		100 8 th Avenue S.E.		Vancouver, B.C.	
Vancouver, B.C.		V6A 3B5		Phone: (604) 555-5541 Fax: (604) 555-5541	
DESIGNED BY: _____		DATE: 2019-09-19		QUALITY CONTROL: _____	
QUALITY ASSURANCE: _____		DATE: 2019-09-19		QUALITY ASSURANCE: _____	
DRAWN: _____		DATE: 2019-09-19		DRAWN: _____	

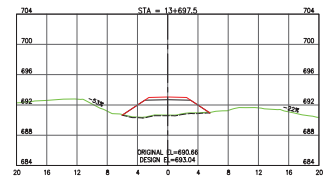
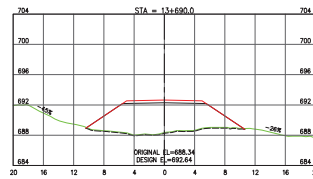
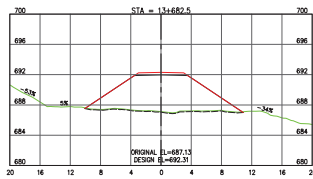
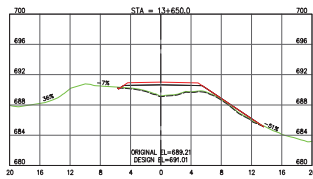
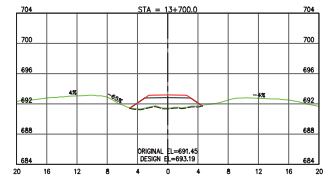
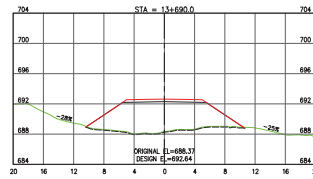
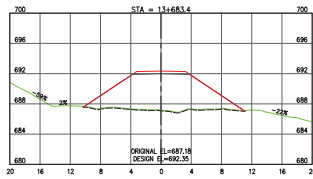
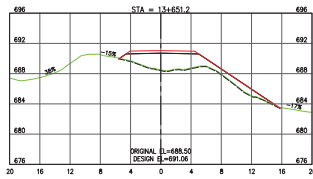
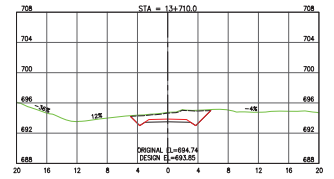
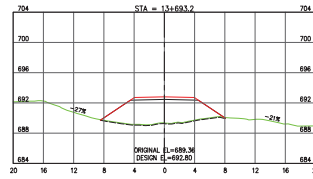
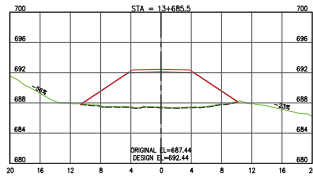
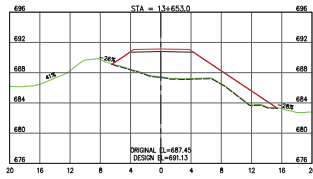
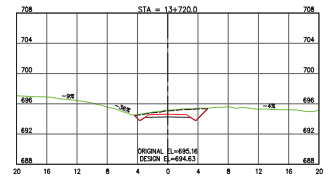
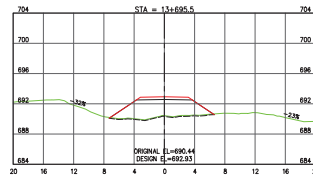
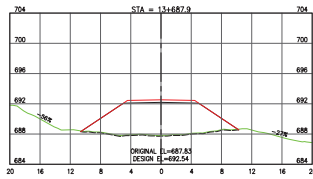
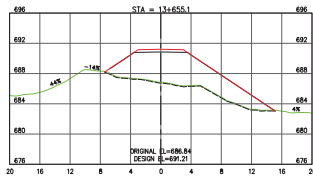
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QUALITY ASSURANCE: _____		DATE: 2019-09-19		QUALITY ASSURANCE: _____	
DRAWN: _____		DATE: 2019-09-19		DRAWN: _____	



TELKWA COAL
LIMITED

FOUR CREEK CROSSING
FOUR CREEK RE-ALIGNMENT OPTION
STA. 13+540 TO 13+647.6

Cross Section 1		DRAWING NUMBER		REV	
18364-204-X70		18364-204-X70		A	



LEGEND:

— EXISTING GROUND
 --- STRIPPED SURFACE
 — DESIGN LINE
 — SUBGRADE

NOTES:

1. FOR GENERAL NOTES AND SPECIFICATIONS SEE DRAWING 18364-204-X70.
2. FOR TYPICAL SECTION SEE DRAWING 18364-204-X73.

ISSUED FOR REVIEW

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REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	SEP 19	ISSUED FOR REVIEW			
			RAK	RD	TR

SENIOR DESIGNER
 DATE: 2018-08-15

DWB Consulting Services Ltd.		1014 8 th Avenue S.E.		Vancouver, B.C.	
V6A 3B5		Phone: (604) 552-6541		Fax: (604) 552-6541	
DESIGNED BY: BM		DATE: 2018-08-15			
QUALITY CONTROL: TKN		DATE: 2018-08-15			
QUALITY ASSURANCE: JAS		DATE: 2018-08-15			
DRAWN: JAS		DATE: 2018-08-15			

LATITUDE: 49° 07' 58" N		NAD83		EASTING: 650000	
LONGITUDE: 122° 58' 18" W		UT		DRAWING NUMBER: 18364-204-X71	
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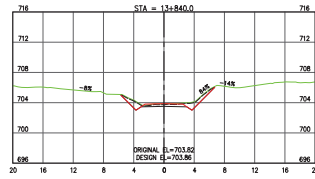
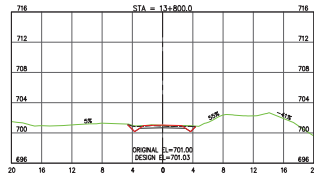
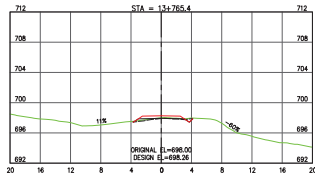
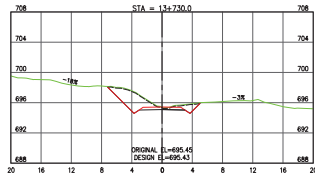
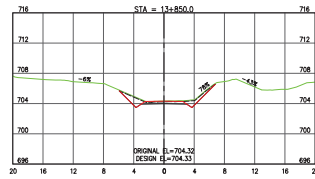
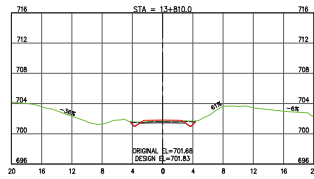
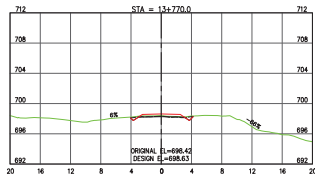
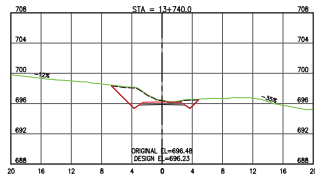
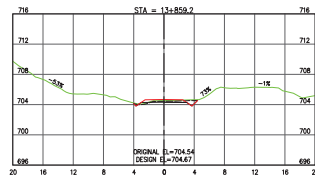
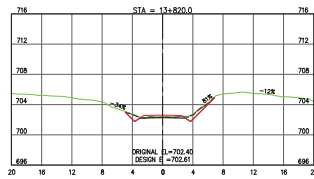
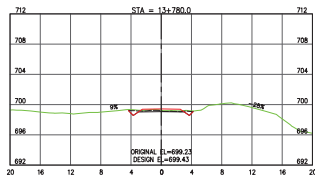
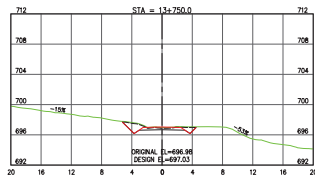
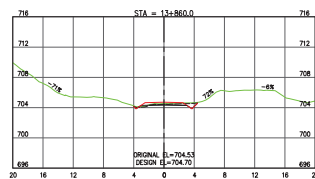
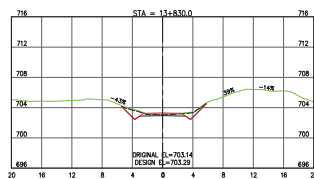
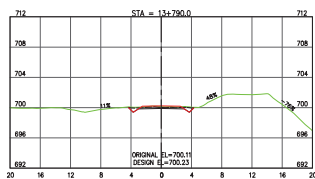
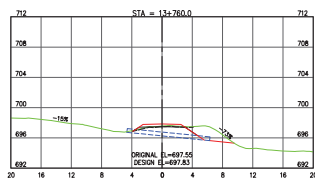


FOUR CREEK CROSSING FOUR CREEK RE-ALIGNMENT OPTION STA: 13+650 TO 13+720

Cross Section 2

INTENDED TO BE PLOTTED ON 11"x17"
 ANY COPIES OF PAPER MAY NOT BE TO SCALE

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LEGEND:

— EXISTING GROUND
— STRIPPED SURFACE
— DESIGN LINE
— SUBGRADE
- - - - - NEW CULVERT

NOTES:

1. FOR GENERAL NOTES AND SPECIFICATIONS SEE DRAWING 18364-204-X70.
2. FOR TYPICAL SECTION SEE DRAWING 18364-204-X73.

ISSUED FOR REVIEW

SCALE: 1:500		CAD FILENAME: 18364-204-X72		DATE: 2019-09-10	
REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	SEP 19	ISSUED FOR REVIEW			

DESIGNER:
DATE: 2019-09-10

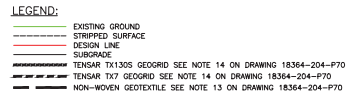
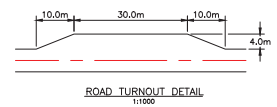
DWB Consulting Services Ltd.		1014 8 th Avenue S.E.		Vancouver, B.C.	
V6A 3H5		Phone: (604) 552-5541		Fax: (604) 552-5541	
DESIGNED: DATE: 2019-09-10		TWO DATE: 2019-09-10		LATITUDE: 49° 07' 58" N	
QUALITY ASSURANCE: DATE: 2019-09-10		LONGITUDE: 122° 58' 18" W		EASTING: 620000	



TELKWA COAL
LIMITED

FOUR CREEK CROSSING
FOUR CREEK RE-ALIGNMENT OPTION
STA: 13+730 TO 13+850

Cross Section 3
DRAWING NUMBER: 18364-204-X72 | A



NOTES:

1. FOR GENERAL NOTES AND SPECIFICATIONS
SEE DRAWING 18364-204-P70.



TELKWA COAL
LIMITED

FOUR CREEK CROSSING
FOUR CREEK RE-ALIGNMENT OPTION
STA. 13+860.933

Cross Sections 4

D83	NORTHING:	6054024	DRAWING NUMBER	REV
	EASTING:	620180	18364-204-X73	A

ISSUED FOR REVIEW

SCALE 1:500			CAD FILENAME: <u>SE342-206-V7</u>		
			DATE: <u>2019-09-15</u>		
REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	SEP-19	ISSUED FOR REVIEW	KAK	KD	TW



DWB Consulting Services Ltd.

1075-8th Avenue
Prince George, B.C.
V2L 3B8
Phone: (250) 562-5000

DESIGNED _____ BM DATE _____
QUALITY CONTROL _____ TW DATE _____

DRAWN KAK DATE 2019-08-21

LATITUDE:	54° 37' 9.61"	NAD83	NORTHING:	6054024	DRAWING NUMBER 18364-204-X73	REV A
LONGITUDE:	127° 08' 10.33"	99	EASTING:	830182		

[illegible]

11/2018 zo al Bureau 0167/2016-773 Four Creek Road gmina rd. Qd kwi/dla wsiogroduktu nr110.0. Plam/Se diane/ 110342-2016-X773.dwg

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

APPENDIX E – FOUR CREEK RE-ALIGNMENT CONSTRUCTION COST ESTIMATE



**Telkwa Coal Project
ENGINEERING COST ESTIMATE**

Approximate Quantities and Unit Prices

Project No: 18364-204

Project Name: Phase 2 Road Design - Four Creek Re-Alignment Option

Design: 18364-204-70

Revision 1

Hourly rates from 2018-2019 Equipment Rental Rate Guide, BC Road Builders & Heavy Construction Association

ITEM	UNIT	AMOUNT	RATE	COST	SUBTOTAL	DESCRIPTION
ENGINEERING SERVICES						
- Survey layout	L.S.	1	\$9,000.00	\$9,000.00		All inclusive - Personnel, equipment, travel and LOA
- Bridge certification inspections	Day	3	\$1,200.00	\$3,600.00		All inclusive
- Bridge certification reports	ea.	1	\$2,500.00	\$2,500.00		
- Traffic management plan	L.S.	1	\$4,500.00	\$4,500.00		For construction
- Construction traffic control	Month	1	\$1,600.00	\$1,600.00		Traffic control sign rental and setup
					\$21,200	
ENVIRONMENTAL						
- Permitting	L.S.	1	\$2,500.00	\$2,500.00		
- Environmental Management Plan	L.S.	1	\$4,500.00	\$4,500.00		As per Allegiance Coal Ltd.
- Hydroseeding	ha	1	\$6,500.00	\$6,500.00		as per MOTI SS 757
- Sediment and erosion control	L.S.	1	\$2,500.00	\$2,500.00		Estimated at \$6000/km as per Allegiance Coal Ltd.
- Environmental monitoring	Days	20	\$2,500.00	\$50,000.00		As per Allegiance Coal Ltd.
					\$66,000	
MATERIALS						
- 500mm X 10m cross drain	ea.	1	\$1,300.00	\$1,300.00		Supply and install
- 500mm X 11m cross drain	ea.	1	\$1,430.00	\$1,430.00		Supply and install
- 27.4m steel girder/concrete composite deck on spread footings Sta. 13+655	ea.	1	\$261,000.00	\$261,000.00		Supply and install, concept structure - no site plan
- Non-woven geotextile	m ²	792	\$2.50	\$1,980.00		Supply and install, Nillex Inc. and RS Means Heavy Construction Costs. Includes areas of overland construction.
- Geogrid, Tensar TX130S or equivalent	m ²	792	\$1.72	\$1,362.24		Supply and install, Nillex Inc. and RS Means Heavy Construction Costs
- Geogrid, Tensar TX7 or equivalent	m ²	792	\$7.31	\$5,789.52		Supply and install, Nillex Inc. and RS Means Heavy Construction Costs
- 25mm WGB	m ³	194	\$28.25	\$5,491.80		Supply, haul and place; Allegiance Coal
- 75mm OGB	m ³	108	\$28.25	\$3,051.00		Supply, haul and place; Allegiance Coal
					\$281,405	
ROADWAY CONSTRUCTION						
Site Preparation						
- Clearing and grubbing: merch timber	ha	0.3	\$5,000.00	\$1,500.00		Unit rate from Allegiance Coal
- Stripping (topsoil salvage)	m ³	323.3	\$9.50	\$3,071.35		Unit rate from Allegiance Coal
- Trail pioneering	hr	10	\$205.25	\$2,052.50		For construction access in steep ground, Cat 329 excavator
Primary Excavation						
Cat Push Configuration						
- Cat Push	m ³	419.4	\$4.64	\$1,946.02		Cat D8 bulldozer, Cat CS533E compactor @94.8m3/hr
- End Haul	m ³	23.9	\$5.02	\$119.98		Cat 329 excavator, D6 bulldozer, CS533E compactor, and 730C rock truck @108.6m3/hr
End Haul Configuration						
- End Haul	m ³	723.9	\$6.36	\$4,604.11		Cat 329 excavator, D6 bulldozer, CS533E compactor, and 730C rock truck @112.6m3/hr
					\$13,294	
TRANSPORTATION AND FREIGHT						
Mob/Demob, Crew Transport, LOA, Freight	%	5.0%	\$381,898.52	\$19,094.93		
					\$19,095	
	SUB-TOTAL				\$400,993	
CONSTRUCTION SERVICES						
- Project Management	%	3.0%	\$400,993.44	\$12,029.80		
- Construction Supervision, QA/QC	%	8.0%	\$400,993.44	\$32,079.48		
					\$44,109	
	SUB-TOTAL				\$445,103	
CONTINGENCY						
- All items	%	10.0%	\$445,102.72	\$44,510.27		
					\$44,510	
TOTAL					\$489,613	

Notes:

- 1) Cost items not included in this estimate:
- Contingency for unknown factors (rock excavation / blasting, additional gravel development, etc.)
 - Geotechnical review
 - PST on materials
- 2) Equipment configurations used in this estimate include D8 primary excavation, D8/329 excavator primary excavation, CS533E compactor and rock truck for surface material.
- 3) Optimum number of trucks for primary earthworks and riprap was estimated at 1.
- 4) All units are bank cubic metres unless specified otherwise.

Prepared by: _____ Todd Wambolt, P.Eng

Date: _____ September 12, 2019