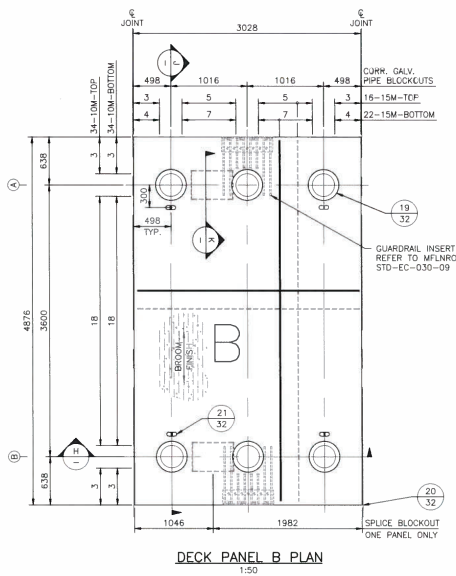


INTENDED TO BE PLOTTED ON 11"X17"
ANY COPIES OF PLOTS MAY NOT BE TO SCALE

ISSUED FOR CONSTRUCTION

SCALE		As Noted	CAD FILENAME			18364-204-33		
			DATE			2019-06-15		
REV	DATE	DESCRIPTION			DRW	CHK	ENG	
A	Jul 19	ISSUED FOR REVIEW			DK	OK	AW	
B	Aug 19	ISSUED FOR CONSTRUCTION			DK	KDH/KR	AW	

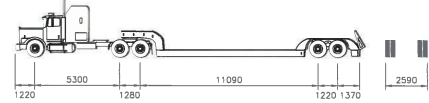
SENIOR DESIGNER
DATE 2019-08-13

DWB Consulting Services Ltd.	
2277 - 4th Avenue P.O. Box 100 V1N 3S1	Phone (250) 962-5941 Fax (250) 962-5951
DESIGNED	AW DATE 2019-07-28
QUALITY CONTROL	BY DATE 2019-07-28
QUALITY INSURANCE	DATE 2019-07-28
DRAWN	OK DATE 2019-07-28

TELKWA COAL LIMITED	
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	
LATITUDE	54° 37' 34.1"
LONGITUDE	127° 07' 07.1"
NAD83	820381
U	18364-204-33

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

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

ISSUED FOR CONSTRUCTION

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



SENIOR DESIGNER
DATE 2018-08-12

DWB Consulting Services Ltd.	
DESIGNED	AW DATE 2018-08-12
QUALITY CONTROL	TSB DATE 2018-08-12
QUALITY ASSURANCE	DATE
DRAWN	DK DATE 2018-08-12

TELKWA COAL LIMITED	
GOATHORN CREEK CROSSING	
30.480m STEEL GIRDER/CONCRETE DECK BRIDGE	
ON PILES (110 TONNES)	
STA. 13+200 ON TELKWA COALMINE ROAD	
VEHICLE TRACKING ANALYSIS	
DESIGNED	AW DATE 2018-08-12
QUALITY CONTROL	TSB DATE 2018-08-12
QUALITY ASSURANCE	DATE
DRAWN	DK DATE 2018-08-12
LATITUDE	54° 37' 54.1"
LONGITUDE	121° 08' 07.8"
NAD83	NORTHING 6058951
SU	EASTING 620404
DRAWING NUMBER	18364-204-35
REV	B

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

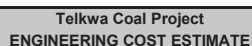
Project Name: Phase 2 Road Design - Tenas Haul Road

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	



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	

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.

Date: May 30, 2019

APPENDIX D – FOUR CREEK RE-ALIGNMENT DESIGN DRAWINGS



TELKWA COAL
LIMITED

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

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

Sheet List Table

Sheet Number	Sheet Title
18364-204-P70	Plan & Profile
18364-204-M70	Mass Haul
18364-204-X70	Cross Sections 1
18364-204-X71	Cross Sections 2
18364-204-X72	Cross Sections 3
18364-204-X73	Cross Sections 4

ISSUED FOR REVIEW



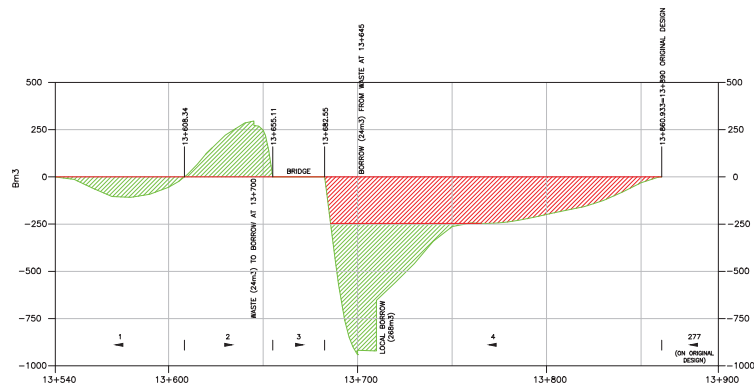
DWB Consulting Services Ltd.

1375 5th Avenue
Prince George, B.C.
V2L 5H5
Phone: (250) 562-0541 Fax: (250) 562-5581

CLIENT PROJECT CODE	DATE	DRAWING NUMBER	REV
----	2019-09-10	18364-204-70	A

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

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	3540.01	3608.3	63.0	116.9	116.9	0.0	0.0	134.4	<	
2	3608.3	34.0	67.7	302.5	278.6	0.0	23.9	153.9	>	
3	34.0	67.1	0.0	0.0	0.0	0.0	0.0	0.0	n/a	
4	67.1	99.7	192.6	773.9	1015.6	291.7	0.0	369.8	<	BRIDGE CROSSING



NOTES:

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

LEGEND:

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 REVIEW

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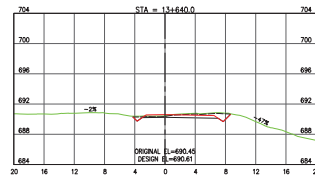
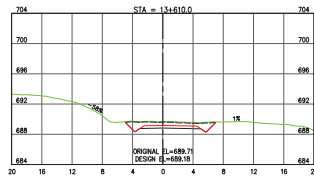
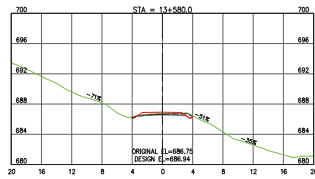
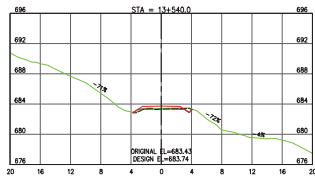
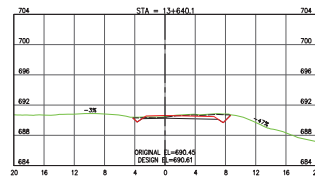
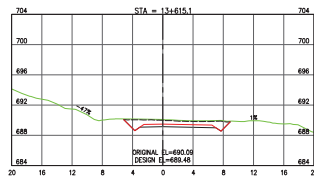
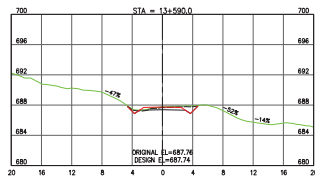
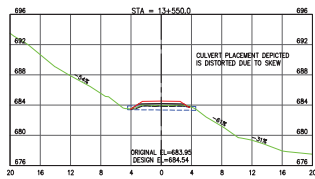
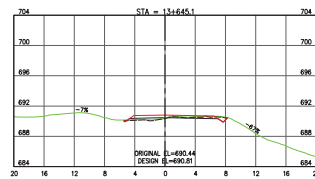
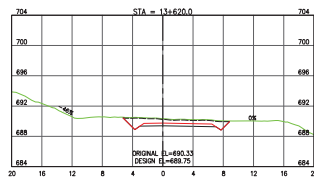
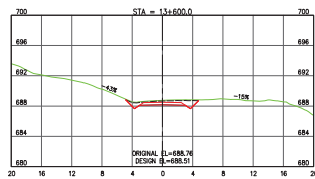
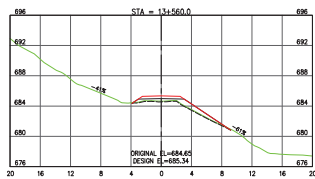
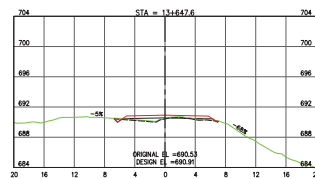
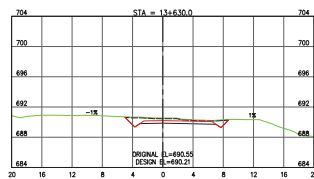
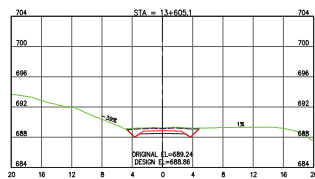
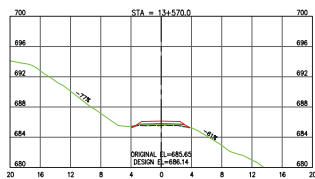
 DWB Consulting Services Ltd. 1575 9th Avenue, Prince George, B.C. V6L 3H8 Phone: (250) 562-5541 Fax: (250) 562-5561	DESIGNED	BY	DATE
	QUALITY CONTROL	TW	DATE
	QUALITY ASSURANCE		DATE
	DRAWN	KAK	DATE

 **DWB Consulting Services Ltd.**
1579 9th Avenue
Prince George, B.C.
V2L 3R8
Phone: (250) 562-5541 Fax: (250) 562-5561

DESIGNED _____ **BM** DATE: 2019-04-_____
QUALITY CONTROL _____ **TW** DATE: 2019-05-_____
QUALITY ASSURANCE _____ **-** DATE: _____
DRAWN _____ **KAK** DATE: 2019-08-_____
CHECKED _____ **BM** DATE: 2019-08-_____
IN CHARGE _____ **BM** DATE: 2019-08-_____
DATE: 2019-08-_____
PROJECT NO. 19-001

LIMITED				
FOUR CREEK CROSSING FOUR CREEK RE-ALIGNMENT OPTION STA. 13+540 TO 13+900				
Mass Haul				
LATITUDE:	54° 37' 9.61"	NAD83	NORTHING:	6504204
LONGITUDE:	127° 06' 10.33"	GL	EASTING:	6303845
			DRAWING NUMBER	18364-204-M70
			REV	A

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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.

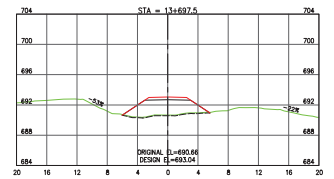
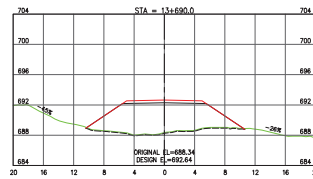
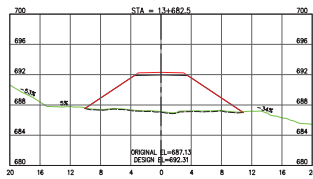
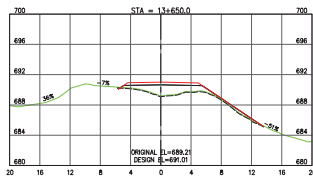
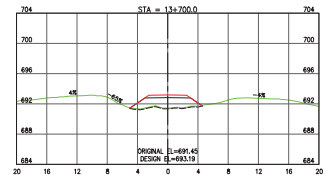
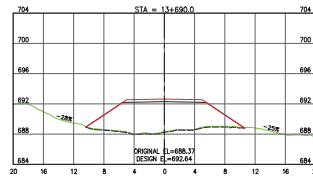
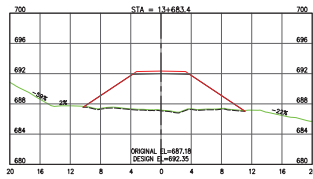
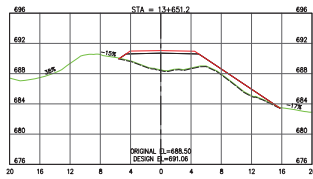
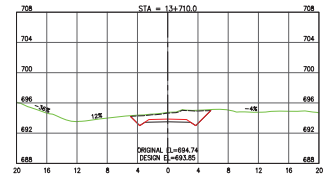
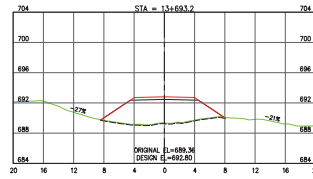
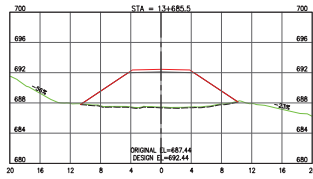
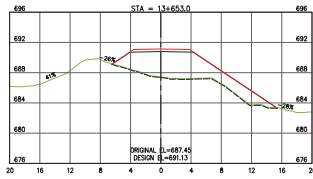
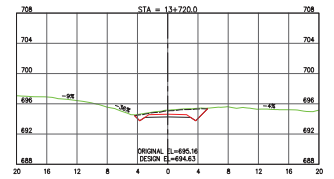
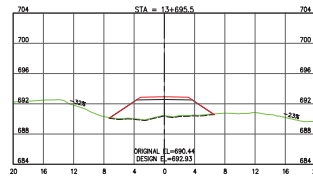
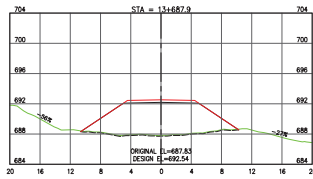
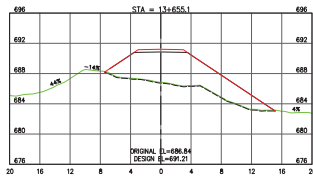
ISSUED FOR REVIEW

SCALE: 1:500		CAD FILENAME: 18364-204-X70		DATE: 2019-09-19	
REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	SEP 19	ISSUED FOR REVIEW			

DESIGNER: _____
CHECKER: _____
DATE: 2019-09-19

DWB Consulting Services Ltd.		100 K.P. Avenue E.		PO Box 389	
Quality Assurance		Date		2019-09-19	
Quality Assurance		Date		2019-09-19	
Quality Assurance		Date		2019-09-19	

TELKWA COAL LIMITED		FOUR CREEK CROSSING		FOUR CREEK RE-ALIGNMENT OPTION	
Cross Section 1		STA: 13+540 TO 13+647.6		Cross Section 1	
Latitude: 50° 57' 58" N		Longitude: 127° 58' 18" W		Easting: 62000	
North: 89404		East: 62000		Sheet: 18364-204-X70	



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

SCALE: 1:500		CADD FILENAME: 18364-204-X71		DATE: 2018-08-15	
REV	DATE	DESCRIPTION	DRW	CHK	ENG
A	SEP 19	ISSUED FOR REVIEW			

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

QUALITY CONTROL: TAD		DATE: 2018-08-15			
QUALITY ASSURANCE: JAD		DATE: 2018-08-15			
DRAWN: JAD		DATE: 2018-08-15			
SENIOR DESIGNER: JAD		DATE: 2018-08-15			

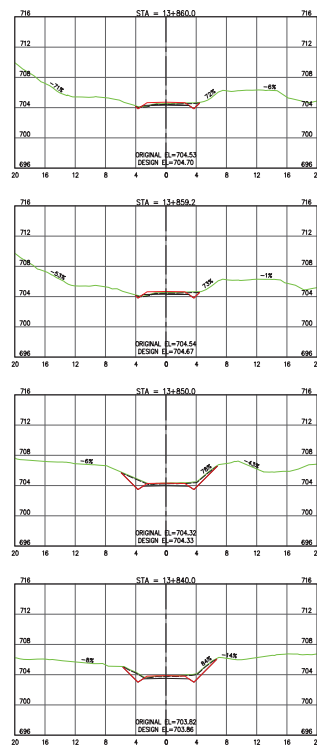
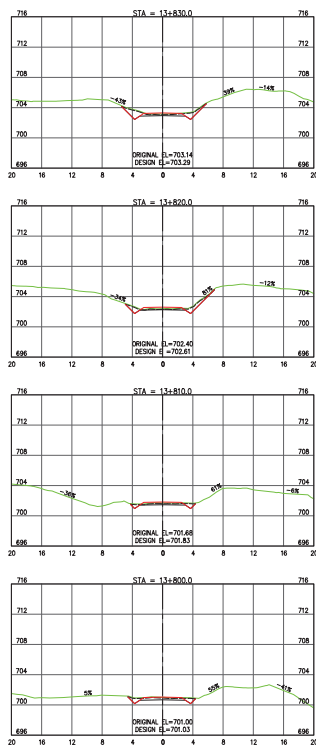
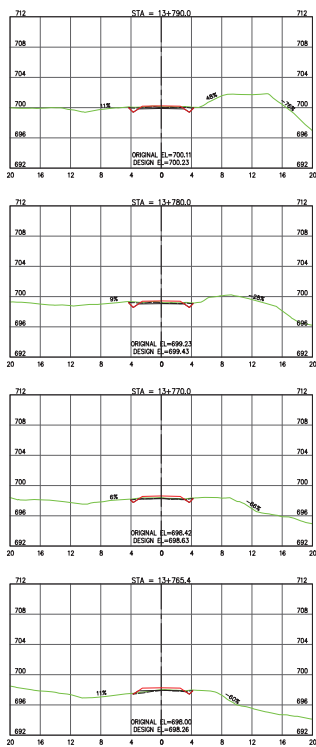
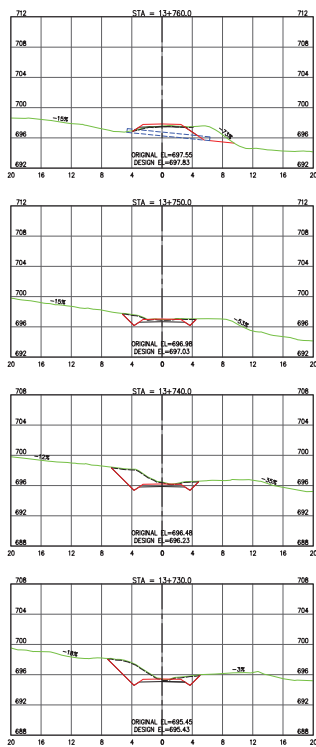


FOUR CREEK CROSSING FOUR CREEK RE-ALIGNMENT OPTION STA: 13+650 TO 13+720

Cross Section 2		DRAWING NUMBER: 18364-204-X71		REV: A	
EASTING: 620000		NORTHING: 884000		LATITUDE: 49° 07' 58" N	
				LONGITUDE: 127° 58' 18" W	

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

U:\2019\18364-204\18364-204-X72.dwg 2019-09-10 10:00:00 18364-204-X72.dwg



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 8th Avenue S.E.		Vancouver, B.C.	
QUALITY CONTROL:		DATE: 2019-09-10		BY: [Signature]	
QUALITY ASSURANCE:		DATE: 2019-09-10		BY: [Signature]	
DRAWN:		DATE: 2019-09-10		BY: [Signature]	

DESIGNED:		DATE: 2019-09-10		BY: [Signature]	
LATITUDE:		49° 00' 00" N		NAD83	
LONGITUDE:		127° 00' 00" W		NAD83	
EASTING:		620000		NAD83	



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

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

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