

ENGINEERED COST ESTIMATE

July 2016 ECE Workbook Version 2016.0

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July 2016 ECE Workbook Version 2016.0

Licensee :	TOLKO Ind Ltd		Date : Dec.19, 2016
License # :	TFL49		
Cutting Permit # :	991		
Road Permit # :	R07602-249		
Road Group :	9		
Road Section Identifier :	ECE#4		
Road Name:	Talbot Rd, Gravel pit on private property		
Road Section Location: from	0	m to	116 m
Road Section Length :	116	m.	
Reason for Engineered Cost Estimate:	Upgrade of roads as per IAM 4.3.3.7.j		

ROAD GROUP					
1	2	3	4	5	6
	Skeena-Stikine	Nadina		Vanderhoof	
7	8	9	10	11	12
Peace Fort Nelson		Cascades	Rocky Mtn		

Biogeo. Zone :	IDF		
Site Factor :	Good		
Moisture Factor :	Dry - Moist		

Site Factor of Good selected as there is an existing road to work from. This road needs alignment and widening to allow for logging truck and lowbed traffic.

Grand Total	\$7,142.82
Cost per km	\$61,576
Cost Base Year	2014

R/W Handling Excavator Cat 336EL

NA

Clearing Area (ha)	Average Cost (\$/ha)	R/W Handling Cost
	\$0.00	\$0.00

Stumping Excavator Cat 336EL

Within a Gravel Pit. No stumping required

Stumping Width (m)	Stumping Area	Design Stumping Area	Stumping Area (ha)	Average Cost (\$/ha)	Stumping Cost
0	Estimated		0.00	\$0.00	\$0.00

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Stripping

Excavator Cat 336EL

Is endhaul of strippings required?	Stripping Volume	Design Stripping Volume	Stripping Depth	Stripping Volume (Bm3)	Stripping Area (ha)	Stripping Unit Cost (Lm3)	Stripping Cost
No ▼	Estimated ▼			0	0.00	\$0.00	\$0.00

Primary Excavation

Excavator Cat 336EL

Note: Volume will be long pushed; therefore, volumes not included in this phase.

Ensure that Primary Excavation volumes are NOT included in the Long Push phase.

OM (Bm3)		Till / Rippable Rock (Bm3)		Blast Rock (Bm3)		Total Primary Excavation Cost
Cut	Fill	Cut	Fill	Cut	Fill	
			0			\$0.00
0		0		0		
Surplus / Deficit Volume (Bm3)		Surplus / Deficit Volume (Bm3)		Surplus / Deficit Volume (Bm3)		
Swell Factor		Swell Factor		Swell Factor		
1.25		1.33		1.5		
Will Fill Be Imported		No ▼	No ▼	No ▼		

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Drilling and Blasting

M32 Tank Drill

X-section Location (m)	Subsection 1		Subsection Distance (m)	Rock Volume (Bm3)	Ditch Width (m)	Ditch Depth (m)	Bedrock Cutslope Angle (%)	Natural Slope (%)	Minimum Hole Depth (m)	Hole Spacing (m)	Total Rock Bench Width (m)
	From (m)	To (m)									
			0		1	0.5			1.8	1.5	Data Missing

D&B Category	Rock Hardness	Stand-by Negotiated	Percent ANFO	Base D&B Cost (\$/Bm3)	Cost based on design volume (\$/Bm3)	D & B Subsection Cost
3	med.	Yes	50%	\$8.62	Data Missing	Data Missing

X-section Location (m)	Subsection 2		Subsection Distance (m)	Rock Volume (Bm3)	Ditch Width (m)	Ditch Depth (m)	Bedrock Cutslope Angle (%)	Natural Slope (%)	Minimum Hole Depth (m)	Hole Spacing (m)	Total Rock Bench Width (m)
	From (m)	To (m)									
			0		1	0.5			1.8	1.5	Data Missing

D&B Category	Rock Hardness	Stand-by Negotiated	Percent ANFO	Base D&B Cost (\$/Bm3)	Cost based on design volume (\$/Bm3)	D & B Subsection Cost
3	med.	Yes	50%	\$8.62	Data Missing	Data Missing

Borrow Site Location (m)	Rock Volume (Bm3)	D&B Category	Rock Hardness	Stand-by Negotiated	Percent ANFO	D&B Cost (\$/Bm3)	D & B Subsection Cost
		1	med.	Yes	50%	\$7.64	\$0.00
Is Quarry Cost Covered in other Road Sections?							

Volume Checker	Volume Correct	No	Total Drilling and Blasting Cost	\$0.00
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Endhaul

Excavate & Load

Excavator Cat 336EL

As in a gully (trench) material must be endhaunched as sidecast is not possible.
Note: cheaper to Long Push material with Cat

Total Stripping Volume (Lm3)	Total OM Volume (Lm3)	Total Till / Rip Rock Volume (Lm3)	Total Blast Rock Volume (Lm3)	Total Volume (Lm3)		
0	0	0	0	0	Excavate & Stockpile Time (hrs)	Loading Time (hrs)
Volume Hauled from/to this Section				Total Hauled		
				0	0.00	0.00

Hauling

Articulated off-highway truck 20 to 24 tonne Volvo A25E

Load Out station (m)	Spoil station (m)	Segment from (m)	Segment to (m)	Haul distance (m)	Rolling Resistance	Hauling Site Factor	Loaded Haul Grade	Travel Time (min.)	Truck Loading Time (min)	Site Adjusted Cycle Time (min.)	Volume (Lm3)	Haul Time (hrs) by Subsection
				0	3% ▼	Good ▼	9% ▼	0.00	0.00	0.00		0.00
				0	3% ▼	Good ▼	3% ▼	0.00	0.00	0.00		0.00
				0	8% ▼	Good ▼	1% ▼	0.00	0.00	0.00		0.00
				0	16% ▼	Difficult ▼	7% ▼	0.00	0.00	0.00		0.00
				0	3% ▼	Good ▼	7% ▼	0.00	0.00	0.00		0.00
				0	3% ▼	Good ▼	-3% ▼	0.00	0.00	0.00		0.00

Volume Checker											Total Haul Time (hrs)	0.00
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Total Excavate & Load and Hauling Cost	\$0.00
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Crawler Tractor CAT D6T

Spreading / Spoil Site

Is spreading required?	Percent Spread	Spreadcat Time	Total Spreading Cost
Yes ▼	100%	0.00	\$0.00

Long Push

Crawler Tractor Cat D8T Deere 1050J

Ensure that Long Push volumes are NOT included in the Primary Excavation phase.

Push distances should not exceed 80m for OM and Till or 40m for Blast Rock. The crawler tractor is not efficiently utilized when these distances are exceeded.

Note: Cheaper to Long push material from within gully due to short push distance, then to try and End Haul.

Push From (m)	Push to (m)	Push Distance (m)	Adjusted Productivity (Bm3/hr)	Material Type	Moisture Factor	Volume (Bm3)	Push Costs by Subsection
0	116	116	38.32	Till ▼	Dry - Mois ▼	1052.2	\$7,142.82
		0	0.00	Till ▼	Dry - Mois ▼		\$0.00
		0	0.00	Blast Rock ▼	Dry - Mois ▼		\$0.00
		0	0.00	OM ▼	Wet ▼		\$0.00

Total Push Cost **\$7,142.82**

Drainage Structures

Culvert Location	Diameter (mm)	Length (metres)	Cost	Culvert Location	Diameter (mm)	Length (metres)	Cost
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00

Total Structures Cost **\$0.00**

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Grass Seeding

Hydro seed costs do not include costs for mob and demob.
 These costs are job specific and should be added.

No seeding as 100% gravel. (Within Gravel Pit)

Seeding Subsection		Subsection distance (m)	Seeding Method	Seeding Cost (\$/km)	Seeding Cost by Subsection
From (m)	To (m)				
		0	Hand Seed Fert.	\$0.00	\$0.00
		0	Hydro Seed Fert. Mulch	\$0.00	\$0.00
		0	Hydro Seed Fert. Mulch Tack	\$0.00	\$0.00
		0	Hand Seed Fert.	\$0.00	\$0.00
Total Seeding Cost					\$0.00

Surfacing

SBS		Road Width		Long-Term		Quarry Rock		Wet		Dry		Surfacing Subsection		Subsection Length (m)	Road Group	Cost (\$/km)	Surfacing Subsection Cost
No	<div>▼</div>	5	<div>▼</div>	No	<div>▼</div>	No	<div>▼</div>	No	<div>▼</div>	No	<div>▼</div>	From (m)	To (m)				
												0		0	9	\$0.00	\$0.00
														0			\$0.00
														0			\$0.00
														0			\$0.00
														0			\$0.00
Total Surfacing Cost																\$0.00	

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Mob and Demob

Additional Costs

Tolko Industries Ltd