

ENGINEERED COST ESTIMATE

July 2016 ECE Workbook Version 2016.0

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Tolko Industries Ltd

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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#1

Road Name:

Onion Road (Gully/Trench)

Road Section Location: from

0

m

to

141

m

Road Section Length :

141

m.

Reason for Engineered Cost Estimate:

Upgrade of roads as per IAM 4.3.3.7.j

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 grade alignment and widening to allow for logging truck and lowbed traffic.

Grand Total \$8,005.55

Cost per km \$56,777

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

Stumping width of 8m selected as there is a narrow road (<4m) existing, but will require additional stumping to realign and widen the road.

Stumping Width (m)	Stumping Area	Design Stumping Area	Stumping Area (ha)	Average Cost (\$/ha)	Stumping Cost
8	Estimated		0.11	\$826.81	\$93.26

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 Road Section Location: from 0 m to 141 m
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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	0.11	\$0.00	\$0.00

Primary Excavation

Excavator Cat 336EL

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	
		890.1				\$3.06
0		890.1		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

	Subsection 3	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

Total Stripping Volume (Lm3)	Total OM Volume (Lm3)	Total Till / Rip Rock Volume (Lm3)	Total Blast Rock Volume (Lm3)	Total Volume (Lm3)		
0	0	1183	0	1183	Excavate & Stockpile Time (hrs)	Loading Time (hrs)
		SURPLUS				
	Volume Hauled from/to this Section			Total Hauled		
		1183		1183	8.81	5.57

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
65	141	0	141	141	3% ▼	Good ▼	9% ▼	4.68	4.24	8.92	1183	11.72
				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	Volume Correct	Total Haul Time (hrs)	11.72
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Excavator Controlled Cycle Time - Total "Excavate & Stockpile" and "Loading Time" is greater than the Total Haul Time. Haul time increased to 14.38

Total Excavate & Load and Hauling Cost	\$5,471.57
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 Crawler Tractor CAT D6T

Spreading / Spoil Site

Is spreading required?	Percent Spread	Spreadcat Time	Total Spreading Cost
Yes ▼	100%	6.39	\$1,170.15

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.

Push From (m)	Push to (m)	Push Distance (m)	Adjusted Productivity (Bm3/hr)	Material Type	Moisture Factor	Volume (Bm3)	Push Costs by Subsection
		0	0.00	Till ▼	Dry - Mois ▼	100	\$0.00
		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 **\$0.00**

Drainage Structures

Culvert Location	Diameter (mm)	Length (metres)	Cost	Culvert Location	Diameter (mm)	Length (metres)	Cost
0	400	10	\$546.00				\$0.00
128	400	10	\$546.00				\$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 **\$1,092.00**

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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.

Seeding Subsection		Subsection distance (m)	Seeding Method	Seeding Cost (\$/km)	Seeding Cost by Subsection
From (m)	To (m)				
0	141	141	Hand Seed Fert.	\$1,244.78	\$175.51
		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					\$175.51

Surfacing

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

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Mob and Demob

Machine Type	Number of Low bed round trips (min. 2 per machine)	Equipment Mobilization - on Lowbed		Truck Mobilization *If not by Lowbed.		Mob / demob Cost
		Number of round trips	Hours per round trip	Round trip distance (km)	Number of trucks	
Excavator		0				\$0.00
Spread Cat						
Push Cat						
Drill						
Truck						

[illegible]