Supporting documentation – spreadsheet printouts and summaries

Northern route

Supporting documentation – spreadsheet printouts and summaries

Northern Option Summary

CLIENT: ROADS & MARITIME SERVICES (RMS)
PROJECT: Gerringong to Bomaderry Princess Highway Upgrade
Foxground and Berry Bypass Options Comparison
Northern Option, Duration 32mths

Item	Description	Amount (2012 Dollars)	Comments
1	Public Utility Adjustments	$2,600,000	
2	General	$19,910,400	
3	Environmental	$6,559,692	
4	Noise Mitigation	$2,890,738	
5	Flood Mitigation	$170,000	
6	Earthworks	$44,317,566	
7	Drainage	$10,098,426	
8	Pavements	$33,716,650	
9	Structures	$69,843,211	
10	Local Roads	$5,256,500	
11	Urban Design & Landscaping	$9,976,217	
12	Miscellaneous	$16,639,742	
	DIRECT COST TOTAL	**$221,979,142**	
	CONTRACTOR'S DESIGN COSTS	**$12,400,842**	Allowed 4% for TCC
	CONTRACTOR'S INDIRECT TIME RELATED COSTS	**$60,378,327**	Allowed 27.2% for indirects costs assuming D&C delivery method
	CONTRACTOR'S MARGIN	**$29,475,831**	Allowed 10% of turnover
	TOTAL CONSTRUCTION COST (TCC)	**$324,234,142**	
	BASE ESTIMATE (Excl. Contingency, Escalation & Provisional Sums)	**$324,234,142**	
	CLIENT COSTS & CONTINGENCY		
	Primary testing (RMS)	$8,105,854	Allowed 2.5% of TCC
	Independent design verification (RMS)	$4,863,512	Allowed 1.5% of TCC
	Handover (RMS) costs	$3,242,341	Allowed 1% of TCC
	Property (RMS) costs	$21,900,000	Values provided by RMS
	Client (RMS) costs	$21,075,219	Allowed as % of TCC
	Contingency P90	$162,015,329	
	Client Costs & P90 Contingency	**$221,202,255**	
	PROJECT COST (Excl. Escalation & Provisional Sums)	**$545,436,397**	
	ADJUSTMENT SUMS (Including markup and contingency)		
	E/O Reroute alignment south of STP	$0	Southern Option ONLY!
	E/O Island embankment	$0	Southern Option ONLY!
	E/O Realignment of Northern interchange	$0	Southern Option ONLY!
	Changes to vertical alignment to generate extra fill material	$0	Southern Option ONLY!
	E/O Adjustment to Southern Interchange	$0	Southern Option ONLY!
	TOTAL ADJUSTMENT SUMS	**$0**	
	TOTAL PROJECT COST (Excl. Escalation)	**$545,436,397**	
	PROVISIONAL SUMS (Including markup and contingency)		
	Additional pedestrian bridge	$4,505,250	Northern Option ONLY!
	Land acquistion to allow for future Northbound offload ramp to Woodhill Mountain Road	$405,430	Northern Option ONLY!
	E/O Adjustments to Kangaroo Valley Road (KVR) Interchange	$15,796,720	Northern Option ONLY!
	E/O Revised Northbound off-ramp Kangaroo Valley Road (KVR) Interchange	$5,247,793	Northern Option ONLY!

NOTE: 1. Refer to EXPERT file for detailed estimates
2. Escalation has been excluded

Supporting documentation – spreadsheet printouts and summaries

Northern Direct Cost Summary

Gerringong to Bomaderry Princess Highway Upgrade
Berry Bypass Route Feasibility Strategic Estimate - Northern Route Option.
May 2012 Rev4 (Amended duration 32mths)
NOTE: Extent of estimate has been amended to Chg 7600 to 20400 to allow import of site won material from Toolijooa Hill cutting

Earthworks, Pavements & Structures Chg 7600 to 20400 (12800m)

10000 Northern Option

Line	Item	Description	Quantity	Unit	Labour	Material	Plant	Subcontract	Rate	Total
8	**10100**	**Public Utility Adjustments**								
9	10110	Water	1.00	Item				150,000	150,000	$150,000
10	10120	Sewerage	1.00	Item				100,000	100,000	$100,000
11	10130	Stormwater NOT REQUIRED	1.00	Item						
12	10140	Power	1.00	Item				500,000	500,000	$500,000
13	10150	Telecommunications	1.00	Item				650,000	650,000	$650,000
14	10160	Gas	1.00	Item				1,000,000	1,000,000	$1,000,000
15	10170	Other	1.00	item				200,000	200,000	$200,000
16		**Subtotal Public Utility Adjustments**						**2,600,000**		**$2,600,000**
17										
18	**10200**	**General**								

19	10210	Mobilisation & establishment	1.00	Item				15,000,000	15,000,000	$15,000,000
20	10220	Community Liaison	1.00	Item				200,000	200,000	$200,000
21	10230	Management Plans	1.00	Item				50,000	50,000	$50,000
22	10240	Traffic Control	1.00	Item				4,660,400	4,660,400	$4,660,400
23		**Subtotal General**						**19,910,400**		**$19,910,400**
24										
25	**10300**	**Environmental**								
26	10310	Building Condition Reports	74.00	each				44,400	600	$44,400
27	10320	Site Monitoring	1.00	Item				373,120	373,120	$373,120
28	10330	Erosion & Sedimentation Control	1.00	Item	1,237,306	283,328	421,387	518,400	2,460,420	$2,460,420
29	10340	Treat contaminated water & discharge water	1.00	Item				42,667	42,667	$42,667
30	10350	Maintenance	1.00	Item				21,333	21,333	$21,333
31	10360	Fauna Control Measures	1.00	Item		60,000		235,000	295,000	$295,000
32	10370	Other Temporary Works	1.00	Item				3,322,752	3,322,752	$3,322,752
33		**Subtotal Environmental**			**1,237,306**	**343,328**	**421,387**	**4,557,672**		**$6,559,692**
34										
35	**10400**	**Noise Mitigation**								

36	10410	Properties	24.00	each				360,000	15,000	$360,000
37	10420	Noise Walls - Solid	6,200.00	m2	622,806	1,244,602	523,055	140,275	408	$2,530,738
38	10430	Noise Wall - Transparent NOT REQUIRED	1.00	m2						
39		**Subtotal Noise Mitigation**			**622,806**	**1,244,602**	**523,055**	**500,275**		**$2,890,738**
40										
41	**10500**	**Flood Mitigation**								
42	10510	Properties	17.00	each				170,000	10,000	$170,000
43		**Subtotal Flood Mitigation**						**170,000**		**$170,000**
44										
45	**10600**	**Earthworks**								
46	10610	Clearing & Grubbing	30.00	ha	59,950		316,083	16,998	13,101	$393,031
47	10620	Topsoil	104,370.00	m3	268,185	13,063	323,130		6	$604,377
48	10630	General Earthworks	1,300,863.00	m3	3,244,234	149,061	14,501,329	13,253,048	24	$31,147,672
49	10640	Removal & Treatment of Acid Sulphate Soils	10,000.00	m3	7,087	17,409	10,297		35	$34,792
50	10650	Temporary Access Roads	44,700.00	m2	344,234	230,925	411,027	1,400,474	53	$2,386,660
51	10660	Select Material	98,280.00	m3	2,236,864	1,463,851	2,448,269	821,312	71	$6,970,296
52	10670	Batter Stabilisation Works	155.00	each				37,200	240	$37,200
53	10680	Temporary dewatering	1.00	Item	74,547		423,617		498,165	$498,165

54	10690a	Wick drains	66,000.00	m	65,147	36,124	235,327	160,200	8	$496,799
55	10690b	Preloading	30,000.00	m3	720,350	36,726	991,498		58	$1,748,574
56		**Subtotal Earthworks**			**7,020,598**	**1,947,159**	**19,660,577**	**15,689,232**		**$44,317,566**
57										
58	**10700**	**Drainage**								
59	10710	Excavation	34,893.00	m3	154,954		488,349		18	$643,304
60	10720	Precast Reinforced Concrete Pipe (RCP)	24,500.00	m	1,091,628	3,664,931	1,122,266	16,372	241	$5,895,197
61	10730	Reinforced Concrete Box Culverts (RCBC)	140.00	m		90,000		372,000		$462,000
62	10740	Drainage Pits	562.00	each				1,331,200	2,369	$1,331,200
63	10750	Concrete lined catch Drains	5,000.00	m	361,826	304,308	11,727		136	$677,860
64	10760	Open Drains	12,000.00	m				122,400	10	$122,400
65	10770	Rockfilled Gabions & Mattresses	176.00	m2				11,968	68	$11,968
66	10780	Diversion Drain - Town Creek NOT REQUIRED	400.00	m	67,517	147,984	152,606	180,000	1,370	$548,107
67	10790	Secondary drainage structure - Property underpass	2.00	each	3,430	97,838	5,089	300,032	203,195	$406,389
68		**Subtotal Drainage**			**1,679,355**	**4,305,061**	**1,780,037**	**2,333,972**		**$10,098,425**
69										
70	**10800**	**Pavements**								
71	10810	Remove existing Princess Hwy pavements	74,100.00	m2	95,090	4,768	144,849	266,760	7	$511,467
72	10820	Stabilised base layer 275mm	70,527.60	m3	972,519	4,176,961	838,629	1,511,718	106	$7,499,827
73	10830	Asphalt	132,427.15	Tonne				23,283,117	176	$23,283,117
74	10840	Cold Milling	13,000.00	m2				51,040	4	$51,040
75	10850	Subgrade & Sub-pavement drainage	45,600.00	m			2,280,000	91,200	52	$2,371,200
76		**Subtotal Pavements**			**1,067,609**	**4,181,729**	**3,263,478**	**25,203,835**		**$33,716,651**
77										

78	**10900**	**Structures**								
79	10910	Toolijooa Road Underbridge Chg 7680	832.00	m2	30,613	733,607	47,337	1,217,479	2,439	$2,029,037
80	10920a	Broughton's Creek Underbridge No1 Chg 9950	3,172.00	m2	88,933	2,158,532	1,632,168	3,559,035	2,345	$7,438,667
81	10920b	Broughton's Creek Underbridge No2 Chg 10700	1,976.00	m2	69,564	1,465,551	1,229,983	2,548,188	2,689	$5,313,287
82	10920c	Broughton's Creek Underbridge No3 Chg 11200	5,200.00	m2	129,949	3,416,637	2,446,586	5,426,212	2,196	$11,419,383
83	10930	Austral Park Road Overbridge Chg 11500	562.00	m2	283,777	1,489,583	42,167	1,000,179	5,010	$2,815,705
84	10940	Tindalls Lane Overbridge Chg 14300	774.00	m2	24,909	665,738	435,927	1,280,959	3,111	$2,407,533
85	10950	Berry Bridge Viaduct Chg 16065	15,795.00	m2	462,108	10,078,363	1,203,451	17,294,434	1,838	$29,038,355
86	10960	Kangaroo Valley Road Overbridge Chg 17680	1,045.00	m2	45,418	781,504	661,835	1,909,917	3,252	$3,398,675
87	10970a	Drainage structure No1 Underbridge Chg 19400	1,040.00	m2	30,613	838,452	47,337	1,304,702	2,136	$2,221,105
88	10970b	Drainage structure No2 Underbridge Chg 19800	780.00	m2	33,885	737,996	51,987	1,150,648	2,531	$1,974,516
89	10980	Reinforced Soil Walls	1,400.00	m2	224,598	1,304,420	182,811	75,119	1,276	$1,786,948
90		**Subtotal Structures**			**1,424,368**	**23,670,383**	**7,981,589**	**36,766,872**		**$69,843,211**
91										
92	**11000**	**Local Roads**								
93	11010	Local Roads - Pavement Type 1	41,575.00	m2				3,326,000	80	$3,326,000
94	11020	Local Roads - Repairs	24,200.00	m2				1,930,500	80	$1,930,500
95		**Subtotal Local Roads**						**5,256,500**		**$5,256,500**
96										
97	**11100**	**Urban Design & Landscaping**								
98	11110	Urban Design	1.00	Item				100,000	100,000	$100,000
99	11120	Landscaping	76,800.00	m2				5,913,600	77	$5,913,600
100	11130	Vegetation	76,800.00	m2	81,385	2,247,027	151,141	1,483,064	52	$3,962,617
101		**Subtotal Urban Design & Landscaping**			**81,385**	**2,247,027**	**151,141**	**7,496,664**		**$9,976,217**
102										

103	**11200**	**Miscellaneous**								
104	11210	Demolition	1.00	Item				437,500	437,500	$437,500
105	11220	Minor Concrete Works - K & G & Medians	1.00	Item				1,508,750	1,508,750	$1,508,750
106	11230	UPVC Ducts	11,700.00	m				1,404,000	120	$1,404,000
107	11240	Guide Posts	781.00	each				19,525	25	$19,525
108	11250	Safety Barriers	30,200.00	m	17,763	2,964,880	4,492	659,600	121	$3,646,735
109	11260	Pavement Markings	1.00	Item				140,040	140,040	$140,040
110	11270	Signposting	408.00	each				3,715,500	9,107	$3,715,500
111	11280	Street Lighting	105.00	each				779,500	7,424	$779,500
112	11290	Fencing	23,400.00	m				1,591,200	68	$1,591,200
113	11300	Property adjustments	50.00	each				485,500	9,710	$485,500
114	11310	Heavy Vehicle Rest Area - Austral Park	1.00	Each	16,453	163,138	966,372	1,549,929	2,695,892	$2,695,892
115	11320	Other	1.00	Item				215,600	215,600	$215,600
116		**Subtotal Miscellaneous**			**34,216**	**3,128,018**	**970,864**	**12,506,644**		**$16,639,742**
117		**Total Direct Costs - Southern Option**			**13,167,642**	**41,067,307**	**34,752,127**	**132,992,066**		**$221,979,142**

Allowance Contractor's Design costs		$12,400,842
TOTAL		**$234,379,984**
	OVERHEAD	$89,854,158
		40%
	SPREAD FACTOR	42%
	CHECK!	$324,234,142

Supporting documentation – spreadsheet printouts and summaries

Northern Direct Cost Estimates

Line No.		Comment	Resource Name	Unit	No.	Production	Quantity	Rate	Labour	Material	Plant	Subcontract	Total
Line No 9		**Water**											
Item No 10110				**Item**			**1.000**		**Contributing**				
	1	10110 Public Utility Adjustments - Water											
	2	Spec: Nil											
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801											
	4	Site visit photo: Nil											
	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities											
	6	NOTE: Adopt allowance from Aecom - "Don't expect that major main will require protection or relocation. Allow a nominal amount for adjustment of service covers and valves / hydrants"											
	7												
	8												
	9	EE formula - =(150000) Allowance as per Aecom	UTILITY ADJUST	Item			150,000.000	1.000				150,000	150,000
	10												
	11	Estimated duration											
	12	EE formula - =(0) days											
								150,000.000				**150,000**	**150,000**
Line No 10		**Sewerage**											
Item No 10120				**Item**			**1.000**		**Contributing**				
	1	10120 Public Utility Adjustments - Sewerage											
	2	Spec: Nil											
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801											
	4	Site visit photo: Nil											
	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities											
	6	NOTE: Adopt allowance of $100k for as yet unidentified services											
	7												
	8												
	9	EE formula - =(100000) Allowance	UTILITY ADJUST	Item			100,000.000	1.000				100,000	100,000
	10												
	11	Estimated duration											
	12	EE formula - =(0) days											
								100,000.000				**100,000**	**100,000**
Line No 11		**Stormwater NOT REQUIRED**											
Item No 10130				**Item**			**1.000**		**Contributing**				
	1	10130 Public Utility Adjustments - Stormwater											
	2	Spec: Nil											
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801											
	4	Site visit photo: Nil											

	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Adopt allowance from Aecom - No scope							
	EE formula - =(0) Allowance as per Aecom - No scope	UTILITY ADJUST	Item		1.000			
	Estimated duration							
	EE formula - =(0) days							
Line No 12	**Power**							
Item No 10140			**Item**	**1.000**		**Contributing**		
	10140 Public Utility Adjustments - Power							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Adopt allowance from Aecom - O'head HV power "Not applicable"							
	NOTE: Adopt allowance from Aecom - O'head LV power " Relocate nominal amount of low voltage o'head lines and poles"							
	EE formula - =(0) Allowance as per Aecom - O'head HV power	UTILITY ADJUST	Item		1.000			
	EE formula - =(500000) Allowance as per Aecom - O'head LV power	UTILITY ADJUST	Item	500,000.000	1.000		500,000	500,000
	Estimated duration							
	EE formula - =(0) days							
					500,000.000		**500,000**	**500,000**
Line No 13	**Telecommunications**							
Item No 10150			**Item**	**1.000**		**Contributing**		
	10150 Public Utility Adjustments - Telecommunications							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Adopt allowance from Aecom - Optus Optic Fibre "Allow for adjustment at 12,950. Likely to require adjustment back to nearest node"							

	NOTE: Adopt allowance from Aecom - Telstra "Allow for adjustment at Kangaroo Valley Road"							
	EE formula - =(400000) Allowance as per Aecom - Optus Optic Fibre	UTILITY ADJUST	Item	400,000.000	1.000		400,000	400,000
	EE formula - =(250000) Allowance as per Aecom - Telstra	UTILITY ADJUST	Item	250,000.000	1.000		250,000	250,000
	Estimated duration							
	EE formula - =(0) days							
				650,000.000			**650,000**	**650,000**

Line No 14	**Gas**							
Item No 10160			**Item**	**1.000**		**Contributing**		
	10160 Public Utility Adjustments - Gas							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Adopt allowance from Aecom - "Allow for protecting 150m of main bt Jemena"							
	EE formula - =(1000000) Allowance as per Aecom, Eastern Gas Pipeline protection Chg 13550m	UTILITY ADJUST	Item	1,000,000.000	1.000		1,000,000	1,000,000
	Estimated duration							
	EE formula - =(0) days							
				1,000,000.000			**1,000,000**	**1,000,000**

Line No 15	**Other**							
Item No 10170			**item**	**1.000**		**Contributing**		
	10170 Public Utility Adjustments - Other							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Adopt general allowance							
	EE formula - =(200000) Allowance	UTILITY ADJUST	Item	200,000.000	1.000		200,000	200,000
	Estimated duration							

	12	EE formula - =(0) days						
						200,000.000	**200,000**	**200,000**
Line No 19		**Mobilisation & establishment**						
Item No 10210				**Item**	**1.000**	**Contributing**		
	1	10210 Mobilisation & Establishment						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
	4	Site visit photo: Nil						
	5	NOTE: Allow to transfer from Indirects estimate						
	6	NOTE: Allowance for following - Establish site offices, plumber, electrician, phones, site earthworks, fencing, site office hire, abultion hire, sewer pump outs, security, phone charges, electrical charges, stationary, computer charges & rubbish removal						
	7							
	8	EE formula - =(15000000) Item	RTA MOB	Item	15,000,000.000	1.000	15,000,000	15,000,000
	9							
	10	Estimated Duration						
	11	EE formula - =(0) Days						
						############	**15,000,000**	**15,000,000**
Line No 20		**Community Liaison**						
Item No 10220				**Item**	**1.000**	**Contributing**		
	1	10220 Community Liaison						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
	4	Site visit photo: Nil						
	5	NOTE: Allow for part-time community liaison person for project duration						
	6	NOTE: Post final review "Community very active" Allowance $200K						
	7							
	8	EE formula - =(1) Item	RTA COMMUNITY LIAISON	Item	1.000	200,000.000	200,000	200,000
	9							
	10	Estimated Duration						
	11	EE formula - =(0) Days						
						200,000.000	**200,000**	**200,000**
Line No 21		**Management Plans**						
Item No 10230				**Item**	**1.000**	**Contributing**		
	1	10230 Management plans						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						

	4	Site visit photo: Nil						
	5	NOTE: Allow for environmental, earthworks, traffic, OHS & QA plans						
	6							
	7	EE formula - =(1+1+1+1+1) each	RTA MANAGEMENT PLANS	each	5.000	10,000.000	50,000	50,000
	8							
	9	Estimated Duration						
	10	EE formula - =(0) Days						
						50,000.000	**50,000**	**50,000**
Line No 22		**Traffic Control**						
Item No 10240				**Item**	**1.000**	**Contributing**		
	1	10240 Traffic Control						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
	4	Site visit photo: Nil						
	5	NOTE: Adopt project duration of 32mths						
	6							
	7	EE formula - =(32) mths Construction general			32.000			
	8							
	9	EE formula - =(#LQ7*6*20*10*110) Allowance traffic control crews 6No - 20day/mth, 10hr/day @ $110/hr	RTA TRAFFIC CONTROL	Item	4,224,000.000	1.000	4,224,000	4,224,000
	10	EE formula - =(40*180) Allowance temporary signage - 40No @ $180/each	RTA TRAFFIC CONTROL	Item	7,200.000	1.000	7,200	7,200
	11	EE formula - =(400*180) Allowance installation temporary barriers - 400m @ $180/m	RTA TRAFFIC CONTROL	Item	72,000.000	1.000	72,000	72,000
	12	EE formula - =(12800*2*4*3) Allowance para web fencing - 12800m @ $4/m, allow to replace twice	RTA TRAFFIC CONTROL	Item	307,200.000	1.000	307,200	307,200
	13	EE formula - =(50*1000) Allowance provide temporary access to property drive ways - 50No @ $1000/each	RTA TRAFFIC CONTROL	Item	50,000.000	1.000	50,000	50,000
	14							
	15	Estimated Duration						
	16	EE formula - =(0) Days						
						4,660,400.000	**4,660,400**	**4,660,400**
Line No 26		**Building Condition Reports**						
Item No 10310				**each**	**74.000**	**Contributing**		
	1	10310 Building Condition Reports						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
	4	Site visit photo: Nil						
	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities						
	6	NOTE: Allow for 50No properties that require property adjustments + 24No that require noise mitigation						

	NOTE: Will need to carry out initial & final inspections &							
7	produce reports eg. x2							
8								
9	EE formula - =(50+24) each			74.000				
10								
11	EE formula - =(#LQ9*2) each	RTA BUILDING REPORT	each	148.000	300.000		44,400	44,400
12								
13	Estimated Duration							
14	EE formula - =(0) Days							
					600.000		**44,400**	**44,400**

Line No 27	**Site Monitoring**							
Item No 10320			**Item**	**1.000**		**Contributing**		
1	10320 Monitoring							
2	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-							
3	02-BR-0801							
4	Site visit photo: Nil							
5	NOTE: Adopt project duration of 32mths							
6								
7	EE formula - =(32) mths Construction general			32.000				
8	EE formula - =(24) mths Piling			24.000				
9								
	EE formula - =(#LQ7*2) mths Noise / Vibration general 2No							
10		CONS NOISE	month	64.000	1,200.000		76,800	76,800
11	EE formula - =(#LQ7*3) mths Water quality 3No	CONS WATER QUALITY	month	96.000	1,800.000		172,800	172,800
12	EE formula - =(#LQ7*2No) mths Dust 2No	CONS AIR POLLUTION	month	64.000	880.000		56,320	56,320
13	EE formula - =(#LQ8*4) mths Piling only 4No	CONS GROUND VIB	month	96.000	700.000		67,200	67,200
14								
15	Estimated Duration							
16	EE formula - =(0) Days							
					373,120.000		**373,120**	**373,120**

Line No 28	**Erosion & Sedimentation Control**							
Item No 10330			**Item**	**1.000**		**Contributing**		
1	10330 Erosion & Sedimentation Control							
2	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-							
3	02-BR-0801							
4	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of							
5	quantities							
	NOTE: Adopt allowance from Aecom - Silt Fencing "Make an							
6	allowance of 2.5 times the project length							
	NOTE: Adopt allowance from Aecom - Hay Bales "Make an							
7	allowance of 4 bales per 100m"							
	NOTE: Adopt allowance from Aecom - Sedimentation Basins							
	"Allow for 16 construction sed basins (Marked-up on							
8	drawing)upstream of watercourses"							

9	NOTE: Adopt allowance from Aecom - PitTraps "Assume there are no existing pits"									
10	NOTE: Adopt allowance from Aecom - No Go Zone "Not applicable"									
11										
12	EE formula - =(20400-7600) m Total corridor length			12,800.000						
13	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000						
14	EE formula - =(#LQ12*2.5) m Silt Fencing length			32,000.000						
15	EE formula - =(#LQ12*4/100) each Hay Bales			512.000						
16	EE formula - =(16) each Sedimentation Basins			16.000						
17	EE formula - =(0) each Pit Traps									
18	EE formula - =(0) each No Go Zone									
19	EE formula - =(7) each			7.000						
20										
21	A. Silt Fencing									
22	EE formula - =(#LQ14) m	SILT FENCE	m	32,000.000	59.256	1,208,885	265,920	421,387		1,896,191
23										
24	B. Hay Bales									
25	EE formula - =(#LQ15) each	HAY BALE OUTLET	each	512.000	89.510	28,421	17,408			45,829
26										
27	C. Sedimentation Basins									
28	EE formula - =(#LQ16*750*30) Allowance, 750m3/each @$30/m3 for excavation	RTA EROSION & SED	Item	360,000.000	1.000				360,000	360,000
29	EE formula - =(#LQ16*1000) Allowance, 1No per structure @ $1000/each for Inlet spillway	RTA EROSION & SED	Item	16,000.000	1.000				16,000	16,000
30	EE formula - =(#LQ16*150) Allowance for removal of structures at completion of project @ $150/each	RTA EROSION & SED	Item	2,400.000	1.000				2,400	2,400
31	EE formula - =st(27:30,#LQ16) each				23,650.000				378,400	378,400
32										
33	D. Shaker Bays									
34	EE formula - =(#LQ19*20000) Allowance rumble grid and wash down facilities	RTA EROSION & SED	Item	140,000.000	1.000				140,000	140,000
35										
36	Estimated Duration									
37	EE formula - =(0) Days									
					2,460,420.219	**1,237,306**	**283,328**	**421,387**	**518,400**	**2,460,420**

Line No 29	**Treat contaminated water & discharge water**									
Item No 10340			**Item**	**1.000**		**Contributing**				
1	10340 Treat contaminated water & Discharge water									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Allowance per structure for duration of construction duration									
7										

	8 EE formula - =(16) each			16.000				
	9 EE formula - =(32) month Project duration			32.000				
	10							
	11 EE formula - =(#LQ8*1000*#LQ9/12) Allowance per structure @ $1000/each per Annum	RTA EROSION & SED	Item	42,666.667	1.000		42,667	42,667
	12							
	13 Estimated Duration							
	14 EE formula - =(0) Days							
					42,666.667		**42,667**	**42,667**
Line No 30	**Maintenance**							
Item No 10350			**Item**	**1.000**		**Contributing**		
	1 10350 Maintenance							
	2 Spec: Nil							
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4 Site visit photo: Nil							
	5 NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	6 NOTE: Allow for maintenance to Sedimentation Basins on an annual basis							
	7							
	8 EE formula - =(16) each Temporary sediment control basins			16.000				
	9 EE formula - =(32) month Project duration			32.000				
	10							
	11 EE formula - =(#LQ8*500*#LQ9/12) Allowance @ $500/each for maintenance temporary sediment control basins per Annum	RTA EROSION & SED	Item	21,333.333	1.000		21,333	21,333
	12							
	13 Estimated Duration							
	14 EE formula - =(0) Days							
					21,333.333		**21,333**	**21,333**
Line No 31	**Fauna Control Measures**							
Item No 10360			**Item**	**1.000**		**Contributing**		
	1 10360 Fauna Control Measures							
	2 Spec: Nil							
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4 Site visit photo: Nil							
	5 NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	6 NOTE: Adopt allowance from Aecom - Fishery Crossings "Assume that no additional fishery crossings are required"							
	7 NOTE: Adopt allowance from Aecom - Fauna Crossings "2 required 1.5m box cluvert - Toolijooa ridge and Tindalls Ln"							
	8 NOTE: Adopt allowance from Aecom - Fauna Rope Bridges							

	9								
	10	EE formula - =(0) each Fishery Crossings							
	11	EE formula - =(2*50) m Fauna Crossings			100.000				
	12	EE formula - =(17) m Fauna Rope Bridges			17.000				
	13								
	14	EE formula - =(#LQ11) m Single cell 1.5x1.5 RCBC	RTA RCBC 1500X1500	m	100.000	1,500.000		150,000	150,000
	15	EE formula - =(10*1500*2*2) each Allowance end wall structures @ 10m3/each	MISC MAT	Item	60,000.000	1.000	60,000		60,000
	16	EE formula - =(#LQ12*5000) Allowance fauna rope briges @ $5000/each	MISC SCON	Item	85,000.000	1.000		85,000	85,000
	17								
	18	Estimated Duration							
	19	EE formula - =(0) Days							
						295,000.000	**60,000**	**235,000**	**295,000**

Line No 32		**Other Temporary Works**							
Item No 10370				**Item**	**1.000**	**Contributing**			
	1	10270 Other Temporary Works							
	2	Spec: Nil							
	3	Dwg: Nil							
	4	Site visit photo: Nil							
	5	NOTE: Typically temporary works should be 3% of direct costs							
	6	NOTE: Allows for any temporary structures, rework etc required with the staging							
	7	NOTE: Temporary bridging structures required at Broughton's Creek Underbridges No1, 2 & 3 to allow for transportation of earthworks materials has been incl. within this allowance							
	8								
	9	EE formula - =(218656390) Amount direct costs			218,656,390.000				
	10	EE formula - =(#LQ9*0.03) DC @ 3%			6,559,691.700				
	11	EE formula - =(3236940) Allowance for environmental works above			3,236,940.000				
	12	EE formula - =(#LQ10-#LQ11) Allowance E/O temporary works	MISC SCON	Item	3,322,751.700	1.000		3,322,752	3,322,752
	13								
	14	Estimated Duration							
	15	EE formula - =(0) Days							
						3,322,751.700		**3,322,752**	**3,322,752**

Line No 36		**Properties**							
Item No 10410				**each**	**24.000**	**Contributing**			
	1	10410 Noise Mitigation - Properties							
	2	Spec: Nil							
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4	Site visit photo: Nil							

	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	6	NOTE: Adopt allowance from Aecom - "Architectural treatment"							
	7								
	8	EE formula - =(24) Item	RTA NOISE PROPERTIES	each	24.000	15,000.000		360,000	360,000
	9								
	10	Estimated Duration							
	11	EE formula - =(0) Days							
						15,000.000		**360,000**	**360,000**
Line No 37		**Noise Walls - Solid**							
Item No 10420				**m2**	**6,200.000**	**Contributing**			
	1	10420 Noise Walls - Solid							
	2	Spec: Nil							
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4	Site visit photo: Nil							
	5	NOTE: Refer to email from G. Smith - Aecom 26/4/2012 (on file) solid precast noisewall has been replaced by planted reinforced mound option							
	6	NOTE: Assume can use spoil material from general erthworks as noise mound material - NO need for import							
	7	NOTE: Adopt allowance from Aecom - "1200m noise wall adjacent to North Street. 350m adjacent to Huntingdale Park Road (NB off-ramp)"							
	8								
	9	EE formula - =(1200+350) m			1,550.000				
	10	EE formula - =((#LQ9/6)*4) m length of bore pile foundations, Allowed 4m length, 6m cts			1,033.333				
	11	EE formula - =(#LQ9/6) each No of pile caps, allowed 6m cts			258.333				
	12	EE formula - =((#LQ9/6)*8*37.3/1000) tonne weight of 200UB37.3 posts, allowed 8m length			77.087				
	13	EE formula - =(#LQ9*4) m2 area of solid precast panels, height 4m			6,200.000				
	14								
	15	A. Noise Walls - Solid							
	16	EE formula - =(#LQ10) m	BORED PILE 600	m	1,033.333	620.000			640,667	640,667
	17	EE formula - =(#LQ11) each	NW PILE CAP	each	258.333	326.384	48,945	25,794	5,558	4,018	84,316
	18	EE formula - =(#LQ12) tonne	NW GALV POST INS	tonne	77.087	7,902.180	149,910	382,045	44,967	32,231	609,153
	19	EE formula - =(#LQ13) m2	NW SOLID INS	m²	6,200.000	190.430	322,771	336,123	94,113	427,660	1,180,667
	20	EE formula - =st(16:19,#LQ13) m2									
	21								
	22	B. Noise Walls - Planted reinforced mound							
	23	EE formula - =(428) m3 Cut volume			428.000				
	24	EE formula - =(80780) m3 Fill volume			80,780.000				
	25	EE formula - =(#LQ24-#LQ23) m3 Shortfall of material, IMPORT			80,352.000				
	26	EE formula - =((ROUNDUP(4000/300))*#LQ9*3) m2 GEOGRID area, Assumed 300mm layer spacing, full length of mound, 3m width			65,100.000				

27	EE formula - =(#LQ9*20) m2 Vegetation area			31,000.000						
28										
29	1. General subgrade preparation									
30	EE formula - =(#LQ9*14) m2 Allowed 14m width typical	EWKS S/G250	m²	21,700.000	0.822	4,818		13,020		17,838
31										
32	2. Import shortfall of material									
33	EE formula - =(#LQ25*2.2*1.1) tonne Allowed 2.2tonne/m3, 10% waste	QAR GENERAL FILL	tonne	194,451.840	25.000		4,861,296			4,861,296
34										
35	3. Spread & compact									
36	NOTE: Allow CAT815 compactor to spread & compact									
37	EE formula - =(#LQ24/50), hr Allowed 50m3/hr	COM CAT815C	hr	1,615.600	161.957	98,794	9,451	153,412		261,657
38	EE formula - =(#LQ37) hr	ROL CA51	hr	1,615.600	111.270	98,794	4,726	76,247		179,767
39	EE formula - =(#LQ37), hr	GRADER CAT14G	hr	1,615.600	176.499	98,794	9,451	176,906		285,151
40	EE formula - =(#LQ37*0.5), hr	TK WCART 15KLT	hr	807.800	122.463	49,397	1,272	48,256		98,925
41	EE formula - =(#LQ37*2), hr Grade checker / Spotter	LAB CIVIL	hr	3,231.200	55.510	179,364				179,364
42	EE formula - =st(29:41,#LQ24) m3				12.660	529,961	24,900	467,841		1,022,703
43	EE formula - =st(29:41,#LQ13) m2				164.952	529,961	24,900	467,841		1,022,703
44										
45	4. Geotextile reinforcing									
46	EE formula - =(#LQ26*1.3) m2 Supply GEOGRID, Allow 30% waste & laps	GEO GEOGRID	m²	84,630.000	10.000		846,300			846,300
47	EE formula - =(#LQ26*2*1.1/100) hr Allow 2men crew, Place 100m2/hr	LAB CIVIL	hr	1,432.200	55.510	79,501				79,501
48	EE formula - =(#LQ47/2/2) hr Allow 50% assistance	BHOE	hr	358.050	85.000			30,434		30,434
49	EE formula - =(5000) Allowance materials	MISC MAT	Item	5,000.000	1.000		5,000			5,000
50	EE formula - =st(45:49,#LQ13) m2				155.038	79,501	851,300	30,434		961,236
51										
52	5. Vegetation to mound									
53	EE formula - =(#LQ27) m2 Topsoil import	EWKS TOPSOIL IMPORT	m²	31,000.000	13.639	13,343	368,402	24,780	16,275	422,800
54	EE formula - =(#LQ27) m2 Ground preparation	LAND GP100	m²	31,000.000	0.350				10,850	10,850
55	EE formula - =(#LQ27) m2	LAND HYDROMULCH	m²	31,000.000	2.500				77,500	77,500
56	EE formula - =(#LQ27) m2	LAND HYDROSEEDING	m²	31,000.000	1.150				35,650	35,650
57	EE formula - =st(52:56,#LQ27) m2				17.639	13,343	368,402	24,780	140,275	546,800
58	EE formula - =st(22:56,#LQ13) m2				408.184	622,806	1,244,602	523,055	140,275	2,530,738
59										
60	Estimated Duration									
61	EE formula - =(#LQ9/50) Days Allowed 50m2 per day			31.000						
62	EE formula - =(#LQ24/100/10) Days Allowed 100m2 per hr			80.780						
					408.184	**622,806**	**1,244,602**	**523,055**	**140,275**	**2,530,738**

Line No 38	**Noise Wall - Transparent NOT REQUIRED**					
Item No 10430		**m2**	**1.000**	**Contributing**		
1	10430 Noise Walls - Transparent					
2	Spec: Nil					
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801					
4	Site visit photo: Nil					

	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Adopt allowance from Aecom - No scope							
	EE formula - =(0) Allowance as per Aecom - No scope	NW TRANS INS	m²		395.161			
	Estimated duration							
	EE formula - =(0) days							

Line No 42	**Properties**							
Item No 10510			**each**	**17.000**		**Contributing**		
	10510 Flood Mitigation - Properties							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Allow for some form of flood mitigation works to the existing 17No low lying properties at intersection of existing Princess Hwy & Tannery Road							
	EE formula - =(17) each	RTA FLOOD MITIG	each	17.000	10,000.000		170,000	170,000
	Estimated duration							
	EE formula - =(0) days							
					10,000.000		**170,000**	**170,000**

Line No 46	**Clearing & Grubbing**							
Item No 10610			**ha**	**30.000**		**Contributing**		
	10610 Clearing & Grubbing							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Allow for increased area, as per discussions at intermediate review 21/3/2012							
	NOTE: Generally only light clearing required - existing pastures. Some heavy clearing required arround Connollys Creek, Schofields Road & atop the ridge, say 33% of total area							
	NOTE: Allowed traffic control on heavy clear & grub. Assume 0.5ha/day. Productivity light clear & grub 1.0ha/day							

	10 EE formula - =((0.1*6000*50)/10000) ha Total corridor area			3.000						
	11 EE formula - =(30) ha			30.000						
	12 EE formula - =(#LQ11*0.6667) ha Light clear & grub			20.001						
	13 EE formula - =(#LQ11*0.3333) ha Heavy clear & grub			9.999						
	14 EE formula - =(#LQ12+#LQ13) ha			30.000						
	15									
	16 EE formula - =(#LQ12) ha	EWKS CLEAR & GRUB LIGHT	ha	20.001	9,359.300	33,308		153,888		187,195
	17 EE formula - =(#LQ13) ha	EWKS CLEAR & GRUB HEAVY	ha	9.999	18,885.632	26,642		162,195		188,837
	18 EE formula - =((#LQ13*10)/0.5) hr Allowed for 0.5ha/day, 10hr/day each site	TRAF CREW 2MEND	hr	199.980	85.000				16,998	16,998
	19									
	20 Estimated duration									
	21 EE formula - =((#LQ12/1.0)+(#LQ13/0.5)) days			39.999						
					13,101.036	**59,950**		**316,083**	**16,998**	**393,031**

Line No 47	**Topsoil**									
Item No 10620			**m3**	**104,370.000**		**Contributing**				
	1 10620 Topsoil									
	2 Spec: Nil									
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
	4 Site visit photo: Nil									
	5 NOTE: Refer to file FBB Quantities .xlsx for details of quantities NOTE: Allow to strip on average 150mm depth from footprint of road corridor and haul to stockpile for future use									
	6									
	NOTE: Assume CAT 623E elevating scraper used to remove topsoil. Allow stockpile sites at 1000m cts along road corridor 7									
	8									
	9 EE formula - =(104370) m3 Volume of topsoil strip & stockpile			104,370.000						
	10									
	11 EE formula - =(80) m3/hr Allowed productivity			80.000						
	12 EE formula - =(#LQ9/#LQ11) hr	SCR CAT623E	hr	1,304.625	206.550	79,778	7,632	182,060		269,470
	13 EE formula - =(#LQ12) hr Spotter	LAB CIVIL	hr	1,304.625	55.510	72,420				72,420
	14 EE formula - =(#LQ12*0.5) hr Allowed 50%	TK WCART 30KLT	hr	652.313	202.788	39,889	1,027	91,365		132,281
	15 EE formula - =(#LQ12*0.5) hr Allowed 50% to manage stockpiles	DOZER CATD6H	hr	652.313	144.099	39,889	4,403	49,705		93,997
	16 EE formula - =(#LQ15) hr Spotter	LAB CIVIL	hr	652.313	55.510	36,210				36,210
	17									
	18 Estimated Duration									
	19 EE formula - =(#LQ12/10) Days			130.463						
					5.791	**268,185**	**13,063**	**323,130**		**604,377**

Line No 48	**General Earthworks**									
Item No 10630			**m3**	**1,300,863.000**		**Contributing**				

1	10630 General Earthworks								
2	Spec: Nil								
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801								
4	Site visit photo: Nil								
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities								
6	NOTE: Refer to file Mass Haul Northern Bypass with Plant Rev1.xlsx for details of earthworks method								
7	NOTE: From geotech report majority of material in Toolijooa cutting, C3 is latite and will require blasting								
8	NOTE: Ripping of cuttings allowed for with the relevant Plant Fleet items below. assumed depth 300mm with CATD10R dozer								
9									
10	EE formula - =(104370) m3 Topsoil			104,370.000					
11	EE formula - =(958891) m3 Placed material			958,891.000					
12	EE formula - =(93150) m3 Unsuitable material			93,150.000					
13	EE formula - =(148822) m3 Spoil material			148,822.000					
14	EE formula - =(100000) m3 Select material			100,000.000					
15	EE formula - =(#LQ11+#LQ12+#LQ13+#LQ14) m3 TOTAL			1,300,863.000					
16									
	A. Plant Fleet No1 - Unsuitable & spoil OTR, 35t excavator, Truck & dogs, CATD6H dozer & 15klt water cart								
17									
18	EE formula - =(93150) m3 Excavation			93,150.000					
19	EE formula - =(2433.9) hr Total truck hours, Allowed maximum number 6			2,433.900					
20	1. Excavation								
21	EE formula - =(#LQ18/230) hr Allowed 230m3/hr productivity	E35	hr	405.000	146.790	24,766	2,369	32,315	59,450
22	EE formula - =(#LQ19) hr	TK TRUCK&DOG	hr	2,433.900	130.000			316,407	316,407
23	EE formula - =(#LQ21) hr	DOZER CATD6H	hr	405.000	144.099	24,766	2,734	30,860	58,360
24	EE formula - =(#LQ21*0.5) hr Allowed 50%	TK WCART 15KLT	hr	202.500	122.463	12,383	319	12,097	24,799
25	EE formula - =(#LQ21) hr Spotter	LAB CIVIL	hr	405.000	55.510	22,482			22,482
26	EE formula - =st(20:25,#LQ18) m3				5.169	84,396	5,422	391,679	481,497
27	2. Place & compact								
28	NOTE: Allow 50% to Stock Bunds with nomimal compaction & 50% to stockpile with NO compaction								
29	EE formula - =(#LQ21*0.5) hr	DOZER CATD6S	hr	202.500	150.000			30,375	30,375
30	EE formula - =(#LQ29) hr Spotter	LAB CIVIL	hr	202.500	55.510	11,241			11,241
31	EE formula - =(#LQ21*0.5) hr	E35	hr	202.500	146.790	12,383	1,185	16,157	29,725
32	EE formula - =(#LQ31) hr Spotter	LAB CIVIL	hr	202.500	55.510	11,241			11,241
33	EE formula - =(#LQ21*0.5) hr Allowed 50%	TK WCART 15KLT	hr	202.500	122.463	12,383	319	12,097	24,799
34	EE formula - =st(27:33,#LQ18) m3				1.153	47,247	1,504	58,629	107,380
35	EE formula - =st(17:33,#LQ18) m3				6.322	131,643	6,926	450,308	588,877
36	EE formula - =(#LQ21/10) days			40.500					
37									
	B. Plant Fleet No2 - Select & latite material from C3 ROCK, 100t excavator, CAT 773 trucks, 30klt water cart & CAT 14G grader								
38									
39	EE formula - =(641810) m3 Excavation			641,810.000					
40	EE formula - =(7559.3) hr Total truck hours, Allowed maximum number 7			7,559.300					

41	EE formula - =(#LQ39*0.8) m3 Allowance drill & blast			513,448.000						
42	EE formula - =(121836+42713+21353+2222+308645+96408) m3 Volume fills F3, F4, F5, F6 & F7			593,177.000						
43	1. Excavation									
44	EE formula - =(910*2*8) m2 Allowance presplit to batters cutting C3	PRE SPLIT BATTERS	m²	14,560.000	68.000				990,080	990,080
45	EE formula - =(#LQ41) Allowance Drill & Blast	RTA DRILL & BLAST	m³	513,448.000	15.000			7,701,720		7,701,720
46	EE formula - =(#LQ39/419) hr Allowed 419m3/hr productivity	E100	hr	1,531.766	368.601	93,667	10,339	460,604		564,611
47	EE formula - =(#LQ40) hr	TK CAT773	hr	7,559.300	270.753	462,251	10,205	1,574,249		2,046,705
48	EE formula - =(#LQ46) hr	GRADER CAT14G	hr	1,531.766	176.499	93,667	8,961	167,726		270,354
49	EE formula - =(#LQ46*0.5) hr Allowed 50%	TK WCART 30KLT	hr	765.883	202.788	46,834	1,206	107,272		155,312
50	EE formula - =(#LQ46) hr Spotter	LAB CIVIL	hr	1,531.766	55.510	85,028				85,028
51	EE formula - =st(43:50,#LQ39) m3				18.407	781,448	30,712	10,011,570	990,080	11,813,810
52	2. Crush excavated material									
53	NOTE: Assume will need to crush excavated material so that it is suitable to be placed as general fill									
54	NOTE: Assume crusher plant productivity of 50tonne/hr will need multiple number - 3No?									
55	EE formula - =(#LQ39) m3			641,810.000						
56	EE formula - =(#LQ55*2.5*1.1) tonne Allowed 2.5tonne/m3 for Latite, 10% waste	CRUSH SCREEN SEC	tonne	1,764,977.500	5.000				8,824,888	8,824,888
57	EE formula - =(#LQ55/125m3) hr Allowed wheeled loader to load Hwy tippers 125m3/hr	LOADER CAT966F	hr	5,134.480	115.000			590,465		590,465
58	EE formula - =(#LQ57) hr Spotter	LAB CIVIL	hr	5,134.480	55.510	285,015				285,015
59	EE formula - =st(52:58,#LQ55) m3				15.114	285,015		590,465	8,824,888	9,700,368
60	3. Place & compact									
61	NOTE:Allow to compact material in fills F3, F4, F5, F6 & F7 with CAT825, smooth drum roller & 30klt water cart									
62	EE formula - =(#LQ42*2/419) hr, 2No	COM CAT825C	hr	2,831.394	199.858	173,140	16,564	376,173		565,877
63	EE formula - =(#LQ62) hr Spotter	LAB CIVIL	hr	2,831.394	55.510	157,171				157,171
64	EE formula - =(#LQ62) hr	ROL CA51	hr	2,831.394	111.270	173,140	8,282	133,626		315,048
65	EE formula - =(#LQ62*0.5) hr Allowed 50%	TK WCART 30KLT	hr	1,415.697	202.788	86,570	2,230	198,286		287,086
66	EE formula - =st(60:65,#LQ42) m3				2.234	590,020	27,075	708,086		1,325,181
67	EE formula - =st(39:65,#LQ39) m3				35.586	1,656,483	57,787	11,310,121	9,814,968	22,839,359
68	EE formula - =(#LQ41*3/10000) days			154.034						
69										
70	C. Plant Fleet No3 - C4 to C11 Sandstone cuttings + Initial stages of stage construction, 65t excavator, CAT 740 trucks, CAT D10R dozer, CAT 14G grader & 30klt water cart									
71	EE formula - =(201652) m3 Excavation			201,652.000						
72	EE formula - =(2420.3) hr Total truck hours, Allowed maximum number 5			2,420.300						
73	EE formula - =(44228+5593+35636+15333+1877+13208+25339+37630+4181+8225+4068+12222+1264+22592) m3 Volume fills F7, F8, F9, F10, F11, F12, F13, F14 & F15			231,396.000						
74	1. Excavation									
75	EE formula - =((400+1030+240+250+340+320+210+30+340)*2*8) m2 Allowance presplit to batters cuttings C4 to C11	PRE SPLIT BATTERS	m²	50,560.000	68.000				3,438,080	3,438,080

	EE formula - =(#LQ71/365) hr Allowed 365m3/hr									
76	productivity	E65	hr	552.471	239.708	33,784	3,729	94,919		132,432
77	EE formula - =(#LQ76) hr Allowed dozer to pre-rip	DOZER CATD10R	hr	552.471	326.832	33,784	6,713	140,069		180,565
78	EE formula - =(#LQ72) hr	TK ARTIC40	hr	2,420.300	187.233	148,001	3,267	301,892		453,161
79	EE formula - =(#LQ76) hr	GRADER CAT14G	hr	552.471	176.499	33,784	3,232	60,495		97,510
80	EE formula - =(#LQ76*0.5) hr Allowed 50%	TK WCART 30KLT	hr	276.236	202.788	16,892	435	38,690		56,017
81	EE formula - =(#LQ76) hr Spotter	LAB CIVIL	hr	552.471	55.510	30,668				30,668
82	EE formula - =st(74:81,#LQ71) m3				21.762	296,912	17,376	636,065	3,438,080	4,388,433
83	2. Place & compact									
84	NOTE:Allow to compact material in fills F7, F8, F9, F10, F11, F12, F13, F14 & F15 with CAT825, smooth drum roller & 30klt water cart									
85	EE formula - =(#LQ73*2/419) hr, 2No	COM CAT825C	hr	1,104.516	199.858	67,541	6,461	146,744		220,746
86	EE formula - =(#LQ85) hr Spotter	LAB CIVIL	hr	1,104.516	55.510	61,312				61,312
87	EE formula - =(#LQ85) hr	ROL CA51	hr	1,104.516	111.270	67,541	3,231	52,127		122,899
88	EE formula - =(#LQ85*0.5) hr Allowed 50%	TK WCART 30KLT	hr	552.258	202.788	33,771	870	77,351		111,991
89	EE formula - =st(83:88,#LQ73) m3				2.234	230,164	10,562	276,221		516,948
90	EE formula - =st(71:88,#LQ71) m3				24.326	527,076	27,938	912,286	3,438,080	4,905,381
91	EE formula - =(#LQ76/10) days			55.247						
92										
93	D. Plant Fleet No4 - C4 to C11 Sandstone cuttings + Final stages of stage construction, 35t excavator, Truck & dogs, CAT D10R dozer & 15klt water cart									
94	EE formula - =(127810) m3 Excavation			127,810.000						
95	EE formula - =(2297.1) hr Total truck hours, Allowed maximum number 5			2,297.100						
96	EE formula - =(23575+10222+1251+8806+16893+25087+2787+5484+2712+8148+842+15061) m3 Volume fills F7, F8, F9, F10, F11, F12, F13, F14 & F15			120,868.000						
97	1. Excavation									
	EE formula - =(#LQ94/230) hr Allowed 230m3/hr									
98	productivity	E35	hr	555.696	146.790	33,981	3,251	44,339		81,570
99	EE formula - =(#LQ98) hr Allowed dozer to pre-rip	DOZER CATD10R	hr	555.696	326.832	33,981	6,752	140,887		181,619
100	EE formula - =(#LQ95) hr	TK TRUCK&DOG	hr	2,297.100	130.000			298,623		298,623
101	EE formula - =(#LQ98*0.5) hr Allowed 50%	TK WCART 15KLT	hr	277.848	122.463	16,990	438	16,598		34,026
102	EE formula - =(#LQ98) hr Spotter	LAB CIVIL	hr	555.696	55.510	30,847				30,847
103	EE formula - =st(97:102,#LQ94) m3				4.903	115,799	10,440	500,446		626,685
104	2. Place & compact									
105	NOTE:Allow to compact material in fills F7, F8, F9, F10, F11, F12, F13, F14 & F15 with CAT825, smooth drum roller & 15klt water cart									
106	EE formula - =(#LQ96*2/230) hr, 2No	COM CAT825C	hr	1,051.026	199.858	64,270	6,149	139,637		210,056
107	EE formula - =(#LQ106) hr Spotter	LAB CIVIL	hr	1,051.026	55.510	58,342				58,342
108	EE formula - =(#LQ106) hr	ROL CA51	hr	1,051.026	111.270	64,270	3,074	49,603		116,947
109	EE formula - =(#LQ106*0.5) hr Allowed 50%	TK WCART 15KLT	hr	525.513	122.463	32,135	828	31,393		64,356
110	EE formula - =st(104:109,#LQ96) m3				3.721	219,018	10,050	220,633		449,701
111	EE formula - =st(92:109,#LQ94) m3				8.422	334,817	20,491	721,079		1,076,386
112	EE formula - =(#LQ98/10) days			55.570						
113										
114	E. Plant Fleet No5 - C12 & C13 Sandstone cuttings, 65t excavator, CAT 740 trucks, CAT D10R dozer, CAT 14G grader & 30klt water cart									

115	EE formula - =(75417) m3 Excavation			75,417.000					
116	EE formula - =(1475.1) hr Total truck hours, Allowed maximum number 8			1,475.100					
117	EE formula - =(9533+1767+55993+18078+1170) m3 Volume fills F15, F16 & F17			86,541.000					
118	1. Excavation								
119	EE formula - =(#LQ115/365) hr Allowed 365m3/hr productivity	E65	hr	206.622	239.708	12,635	1,395	35,499	49,529
120	EE formula - =(#LQ119) hr Allowed dozer to pre-rip	DOZER CATD10R	hr	206.622	326.832	12,635	2,510	52,385	67,531
121	EE formula - =(#LQ116) hr	TK ARTIC40	hr	1,475.100	187.233	90,202	1,991	183,994	276,188
122	EE formula - =(#LQ119) hr	GRADER CAT14G	hr	206.622	176.499	12,635	1,209	22,625	36,468
123	EE formula - =(#LQ119*0.5) hr Allowed 50%	TK WCART 30KLT	hr	103.311	202.788	6,317	163	14,470	20,950
124	EE formula - =(#LQ119) hr Spotter	LAB CIVIL	hr	206.622	55.510	11,470			11,470
125	EE formula - =st(118:124,#LQ115) m3				6.128	145,894	7,268	308,973	462,136
126	2. Place & compact								
127	NOTE:Allow to compact material in fills F15, F16 & F17 with CAT825, smooth drum roller & 30klt water cart								
128	EE formula - =(#LQ117*2/419) hr, 2No	COM CAT825C	hr	413.084	199.858	25,260	2,417	54,881	82,558
129	EE formula - =(#LQ128) hr Spotter	LAB CIVIL	hr	413.084	55.510	22,930			22,930
130	EE formula - =(#LQ128) hr	ROL CA51	hr	413.084	111.270	25,260	1,208	19,495	45,964
131	EE formula - =(#LQ128*0.5) hr Allowed 50%	TK WCART 30KLT	hr	206.542	202.788	12,630	325	28,929	41,884
132	EE formula - =st(126:131,#LQ117) m3				2.234	86,080	3,950	103,305	193,336
133	EE formula - =st(115:131,#LQ115) m3				8.691	231,975	11,218	412,279	655,472
134	EE formula - =(#LQ119/10) days			20.662					
135									
136	F. Plant Fleet No6 - C14 to C18 OTR & Siltstone cuttings + Initial stages of stage construction, CAT 651 scrapers, CAT D11R dozer & 30klt water cart								
137	EE formula - =(75539) m3 Excavation			75,539.000					
138	EE formula - =(172.1) hr Total scraper hours, Allowed maximum number 3			172.100					
139	EE formula - =(3240+20813+3838+7525+10071+10864+5800+6111+488+16114+1817) m3 Volume fills F17, F18, F19, F20, F21, F22 & F23			86,681.000					
140	1. Excavation								
141	EE formula - =(#LQ138) hr Allowed 3No scrapers	SCR CAT651G	hr	172.100	340.938	10,524	1,162	46,990	58,675
142	EE formula - =(#LQ141) hr Allowed dozer to push scrapers	DOZER CATD11R	hr	172.100	445.311	10,524	2,556	63,558	76,638
143	EE formula - =(#LQ141) hr	GRADER CAT14G	hr	172.100	176.499	10,524	1,007	18,845	30,375
144	EE formula - =(#LQ141*0.5) hr Allowed 50%	TK WCART 30KLT	hr	86.050	202.788	5,262	136	12,052	17,450
145	EE formula - =(#LQ141) hr Spotter	LAB CIVIL	hr	172.100	55.510	9,553			9,553
146	EE formula - =st(140:145,#LQ137) m3				2.551	46,387	4,860	141,445	192,692
147	2. Place & compact								
148	NOTE:Allow to compact material in fills F17, F18, F19, F20, F21, F22 & F23 with CAT825, smooth drum roller & 30klt water cart								
149	EE formula - =(#LQ139*2/419) hr, 2No	COM CAT825C	hr	413.752	199.858	25,301	2,420	54,970	82,692
150	EE formula - =(#LQ149) hr Spotter	LAB CIVIL	hr	413.752	55.510	22,967			22,967
151	EE formula - =(#LQ149) hr	ROL CA51	hr	413.752	111.270	25,301	1,210	19,527	46,038
152	EE formula - =(#LQ149*0.5) hr Allowed 50%	TK WCART 30KLT	hr	206.876	202.788	12,650	326	28,976	41,952
153	EE formula - =st(147:152,#LQ139) m3				2.234	86,220	3,957	103,473	193,649
154	EE formula - =st(137:152,#LQ137) m3				5.114	132,607	8,816	244,918	386,341

155	EE formula - =(#LQ141/10/3) days			5.737						
156										
157	G. Plant Fleet No7 - C14 to C18 OTR & Siltstone cuttings + Final stages of stage construction, 35t excavator, Truck & dogs, CAT D6H dozer & 15klt water cart									
158	EE formula - =(50359) m3 Excavation			50,359.000						
159	EE formula - =(700.6) hr Total truck hours, Allowed maximum number 4			700.600						
160	EE formula - =(2160+13876+2559+5017+6714+7243+3866+4074+326+10743+1211) m3 Volume fills F17, F18, F19, F20, F21, F22 & F23			57,789.000						
161	1. Excavation									
162	EE formula - =(#LQ158/230) hr Allowed 230m3/hr productivity	E35	hr	218.952	146.790	13,389	1,281	17,470		32,140
163	EE formula - =(#LQ162) hr Allowed dozer to pre-rip	DOZER CATD10R	hr	218.952	326.832	13,389	2,660	55,511		71,561
164	EE formula - =(#LQ159) hr	TK TRUCK&DOG	hr	700.600	130.000			91,078		91,078
165	EE formula - =(#LQ162*0.5) hr Allowed 50%	TK WCART 15KLT	hr	109.476	122.463	6,694	172	6,540		13,407
166	EE formula - =(#LQ162) hr Spotter	LAB CIVIL	hr	218.952	55.510	12,154				12,154
167	EE formula - =st(161:166,#LQ158) m3				4.375	45,626	4,114	170,599		220,339
168	2. Place & compact									
169	NOTE:Allow to compact material in fills F17, F18, F19, F20, F211, F22 & F21 with CAT825, smooth drum roller & 15klt water cart									
170	EE formula - =(#LQ160*2/230) hr, 2No	COM CAT825C	hr	502.513	199.858	30,729	2,940	66,763		100,431
171	EE formula - =(#LQ170) hr Spotter	LAB CIVIL	hr	502.513	55.510	27,894				27,894
172	EE formula - =(#LQ170) hr	ROL CA51	hr	502.513	111.270	30,729	1,470	23,716		55,914
173	EE formula - =(#LQ170*0.5) hr Allowed 50%	TK WCART 15KLT	hr	251.257	122.463	15,364	396	15,009		30,769
174	EE formula - =st(168:173,#LQ160) m3				3.721	104,716	4,805	105,488		215,010
175	EE formula - =st(156:173,#LQ158) m3				8.645	150,343	8,919	276,088		435,349
176	EE formula - =(#LQ162/10) days			21.895						
177										
178	H. Ripping of cutting floors - C2 to C18, Dozer CATD10R									
179	EE formula - =(161560) m2 Area floors in cuttings			161,560.000						
180										
181	EE formula - =(#LQ179/300) hr Allowed 300m2 per hr for 300mm depth ripping	DOZER CATD10R	hr	538.533	326.832	32,931	6,543	136,536		176,010
182	EE formula - =(#LQ181) hr Spotter	LAB CIVIL	hr	538.533	55.510	29,894				29,894
183	EE formula - =(#LQ181*0.5) hr Allowed 50%	TK WCART 30KLT	hr	269.267	202.788	16,466	424	37,714		54,604
184	EE formula - =st(178:183,#LQ179) m2				1.612	79,291	6,967	174,250		260,508
185										
186	Estimated Duration									
187	EE formula - =(#LQ36+#LQ68+#LQ91+#LQ112+#LQ134) Days Assume Plant Fleets 6 & & will operate consectively with Fleets 1, 2, 3, 4 & 5			326.013						
					23.944	**3,244,234**	**149,061**	**14,501,329**	**13,253,048**	**31,147,672**

Line No 49	**Removal & Treatment of Acid Sulphate Soils**					
Item No 10640		**m3**	**1,000.000**	**Contributing**		
1	10640 Removal & treatment of Acid Sulphate Soils					
2	Spec: Nil					

3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Likelyhood of occurrence of Acid Sulphate Soils withir the Northern Option alignment is considered LOW. NOTE: Assume excavation already covered in previous Item 10530 General Earthworks. Allow to haul to cutting - approx 5000m for treatment with lime @ kg/m3 and then haul to suitable fill for encapsulation within the embankment.									
6										
7	NOTE: Allow for unsuitable volume suggested in FBB Quantities.xlsx									
8	NOTE: Refer to email from H. Buys (Aecom) 11/5/2012 amended volume of PASS to 1000m3									
9										
10	EE formula - =(1000) m3 Allowed volume of Acid Sulphate Soils			1,000.000						
11										
12	A. Treatment with Lime									
13	EE formula - =(#LQ10*1.8*25/1000) tonne Allowed treatment 25kg CACo3 per tonne of soil, 1.8tonne/m3	QUICK LIME	tonne	45.000	190.000		8,550			8,550
14	EE formula - =(#LQ10/60) hr Allow grader to windrow ASS material and mix with CaCo3, 60m3/hr	GRADER CAT14G	hr	16.667	176.499	1,019	98	1,825		2,942
15	EE formula - =(#LQ14) hr	TK WCART 15KLT	hr	16.667	122.463	1,019	26	996		2,041
16	EE formula - =(#LQ14) hr Spotter	LAB CIVIL	hr	16.667	55.510	925				925
17	EE formula - =%(13:16,100) Allowance for inefficiency of operation					2,964	8,674	2,821		14,458
18	EE formula - =st(12:17,#LQ10) m3				28.916	5,927	17,348	5,641		28,916
19										
20	B. Haul to embankment for encapsulation, Allowed 6No trucks									
21	EE formula - =(#LQ10/230) hr Allowed 230m3/hr productivity	E35	hr	4.348	146.790	266	25	347		638
22	EE formula - =(#LQ21*6) hr	TK TRUCK&DOG	hr	26.087	130.000			3,391		3,391
23	EE formula - =(#LQ21) hr	DOZER CATD6H	hr	4.348	144.099	266	29	331		627
24	EE formula - =(#LQ21*0.5) hr Allowed 50%	TK WCART 15KLT	hr	2.174	122.463	133	3	130		266
25	EE formula - =(#LQ21) hr Spotter	LAB CIVIL	hr	4.348	55.510	241				241
26	EE formula - =st(20:25,#LQ10) m3				5.164	906	58	4,199		5,164
27	2. Place & compact									
28	EE formula - =(#LQ21*0.5) hr	DOZER CATD6S	hr	2.174	150.000			326		326
29	EE formula - =(#LQ28) hr Spotter	LAB CIVIL	hr	2.174	55.510	121				121
30	EE formula - =(#LQ21*0.5) hr Allowed 50%	TK WCART 15KLT	hr	2.174	122.463	133	3	130		266
31	EE formula - =st(27:30,#LQ10) m3				0.713	254	3	456		713
32	EE formula - =st(19:30,#LQ10) m3				5.877	1,160	62	4,655		5,877
33	EE formula - =(#LQ21/10) days			0.435						
34										
35	Estimated Duration									
36	EE formula - =((#LQ14/10)+(#LQ21/10)) Days			2.102						
					34.792	**7,087**	**17,409**	**10,297**		**34,792**

Line No 50	**Temporary Access Roads**								
Item No 10650			**m2**	**44,700.000**	**Contributing**				
	1 10650 Temporary access roads								
	2 Spec: Nil								
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801								
	4 Site visit photo: Nil								
	5 NOTE: Staged construction of the works will be necessary in a number of locations because of a common alignment with the existing Princess Hwy.								
	6 NOTE: Temporary pavements will be required for the stage construction works with cross overs & traffic contorl measures for traffic currently using the existing Princess Hwy								
	7 NOTE: Allow 30m of extra temporary pavement for each cross over								
	8 NOTE: Adopt typical temporary pavement design from similar Pacific Hwy upgrade projects, G10 Annexure A, Design travel speed: 80km/hr								
	9 NOTE: Adopt temporary pavements design as follows: Traffic lanes 2No 3.5m width, shoulders 1.5m width, sealing of shoulders - Yes, Wearing surface AC14 40mm thk, emulsion curng coat, Base 150mm thk heavily bound, Subbase 150mm thk heavily bound and 7mm spray seal to the subgrade								
	10 NOTE: Allow to load & haul site won material from crushing plant location Chg 12500 to temporary pavement locations								
	11 NOTE: Removal of temporary pavement, allow to excavate and disposal of asphalt materials off site, crush rock materials on site, maximum 5km haul								
	12								
	13 EE formula - =(1.5+3.5+3.5+1.5) m Width temporary pavement			10.000					
	14 EE formula - =(12350-12050) m			300.000					
	15 EE formula - =(12850-12700) m			150.000					
	16 EE formula - =(13100-13000) m			100.000					
	17 EE formula - =(13800-13350) m			450.000					
	18 EE formula - =(14900-14700) m			200.000					
	19 EE formula - =(15800-15200) m			600.000					
	20 EE formula - =(20400-17850) m			2,550.000					
	21 EE formula - =(4) each Cross over points			4.000					
	22 EE formula - =(30) m Length per Cross over			30.000					
	23 EE formula - =(#LQ21*#LQ22) m Total length of cross overs			120.000					
	24 EE formula - =(#LQ14+#LQ15+#LQ16+#LQ17+#LQ18+#LQ19+#LQ20+#LQ23) m			4,470.000					
	25 EE formula - =(#LQ13*#LQ24) m2 Temporary pavement area			44,700.000					
	26 EE formula - =(#LQ25*0.15) m3 Volume Subbase			6,705.000					
	27 EE formula - =(#LQ25*0.15) m3 Volume Base			6,705.000					
	28 EE formula - =(#LQ26+#LQ27) m3 Total volume			13,410.000					
	29								
	30 A. Temporary pavements - Install								
	31 EE formula - =(#LQ25) m2	EWKS S/G250	m²	44,700.000	0.822	9,925	26,820	36,745	

32	EE formula - =(#LQ25) m2 Emulsion seal	A PRIME	m²	44,700.000	2.000				89,400	89,400
33	EE formula - =(#LQ28/230) hr Allow load Subbase & Base material	E35	hr	58.304	146.790	3,565	341	4,652		8,558
34	EE formula - =(#LQ33) hr Spotter	LAB CIVIL	hr	58.304	55.510	3,236				3,236
35	EE formula - =(#LQ33*7) hr Allowed 7No trucks	TK TRUCK&DOG	hr	408.130	130.000			53,057		53,057
36	EE formula - =(7) each Allowed to establish stabilisation plant to site	EWKS STAB MOB	each	7.000	1,950.000				13,650	13,650
37	EE formula - =(#LQ25*2) m2 Insitu stabilisation of Subbase & Base coarse material	EWKS STAB MIX150	m²	89,400.000	1.910				170,754	170,754
38	EE formula - =(#LQ28*2.2*30/1000) tonne Allowed 2.2tonne/m3, 30Kg/tonne dosage	QUICK LIME	tonne	885.060	190.000		168,161			168,161
39	EE formula - =(#LQ25*2/100) hr Allowed place & compact 100m2/hr	GRADER CAT14G	hr	894.000	176.499	54,668	5,230	97,892		157,790
40	EE formula - =(#LQ39) hr	ROL SP56	hr	894.000	113.452	54,668	2,615	44,143		101,426
41	EE formula - =(#LQ39) hr	ROL CA51	hr	894.000	111.270	54,668	2,615	42,192		99,475
42	EE formula - =(#LQ39*2) hr Grade checkers / spotters	LAB CIVIL	hr	1,788.000	55.510	99,252				99,252
43	EE formula - =(#LQ39) hr	TK WCART 15KLT	hr	894.000	122.463	54,668	1,408	53,405		109,481
44	EE formula - =(#LQ25) m2	A 7MMSEAL	m²	44,700.000	1.800				80,460	80,460
45	EE formula - =(#LQ25*0.04*2.4*1.05) tonne Allowed 2.4tonne/m3, waste 5%	A AC14 DG	tonne	4,505.760	180.000				811,037	811,037
46	EE formula - =st(30:45,#LQ25) m2				44.798	334,651	180,370	322,161	1,165,301	2,002,483
47										
48	B. Remove temporary pavements									
49	EE formula - =((#LQ28+1787)/185) hr Allowed 185m3/hr	E65	hr	82.146	239.708	5,023	554	14,113		19,691
50	EE formula - =(#LQ49) hr Spotter	LAB CIVIL	hr	82.146	55.510	4,560				4,560
51	EE formula - =(#LQ49*7) hr Allowed 7No trucks	TK TRUCK&DOG	hr	575.021	130.000			74,753		74,753
52	EE formula - =(#LQ45) tonne Tip fees for asphalt	TIP INERT RECYCLE	tonne	4,505.760	30.000				135,173	135,173
53	EE formula - =st(48:52,#LQ25) m2				5.239	9,583	554	88,866	135,173	234,176
54										
55	C. Other									
56	EE formula - =(100000) Allowance temporary linemarking	MISC SCON	Item	100,000.000	1.000				100,000	100,000
57	EE formula - =(50000) Allowance temporary signage	MISC MAT	Item	50,000.000	1.000		50,000			50,000
58	EE formula - =st(55:57,#LQ25) m2				3.356		50,000		100,000	150,000
59										
60	Estimated Duration									
61	EE formula - =(#LQ28/1000) Days to install			13.410						
					53.393	**344,234**	**230,925**	**411,027**	**1,400,474**	**2,386,660**

Line No 51	**Select Material**				
Item No 10660		**m3**	**98,280.000**	**Contributing**	
1	10660 Select Material				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				
5	NOTE: Allow to load & haul site won material from crushing plant location Chg 12500 to temporary pavement locations				

6	NOTE: Assume 300mm thk layer of select required at top of formation as subgrade for pavement									
7	NOTE: Assumed 4No lane (3.5m width), 10m width central median & 2No 3m width shoulders, approx 30m subgrade width									
8	NOTE: Refer to Mass Haul calculations on file. Can process site won material for select 88000m3. Balance required will need to be imported material									
9										
10	EE formula - =(20400-7600) m Total corridor length			12,800.000						
11	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000						
12	EE formula - =(1.5+3.0+3.5+3.5+5+3.5+3.5+3.0+1.5) m Subgrade width, Incl. 2No shoulders of 1.0m each within the cntral median of 5m			28.000						
13	EE formula - =(0.3) m Subgrade depth			0.300						
14	EE formula - =((#LQ10-#LQ11)*#LQ12*#LQ13) m3 Select volume			98,280.000						
15	EE formula - =(67877) m3 Crushed select volume			67,877.000						
16	EE formula - =(#LQ14-#LQ15) m3 Shortfall of select material, IMPORT			30,403.000						
17										
18	A. General subgrade preparation									
19	EE formula - =((#LQ10-#LQ11)*#LQ12) m2	EWKS S/G250	m²	327,600.000	0.822	72,740		196,560		269,300
20										
21	B. Import shortfall of select material									
22	EE formula - =(#LQ16*2.2*1.1) tonne Allowed 2.2tonne/m3, 10% waste	QAR SELECT RSW	tonne	73,575.260	18.500		1,361,142			1,361,142
23										
24	C. Crush, screen, load & haul select fill to site									
25	NOTE: Assume crusher plant productivity of 50tonne/hr will need multiple number - 3No?									
26	EE formula - =(#LQ15) m3			67,877.000						
27	EE formula - =(#LQ26*2.2*1.1) tonne Allowed 2.2tonne/m3 for sandstone, 10% waste	CRUSH SCREEN	tonne	164,262.340	5.000				821,312	821,312
28	EE formula - =(#LQ26/230) hr Allowed 230m3/hr	E35	hr	295.117	146.790	18,046	1,726	23,547		43,320
29	EE formula - =(#LQ28) hr Spotter	LAB CIVIL	hr	295.117	55.510	16,382				16,382
30	EE formula - =(#LQ28*10) hr Allowed 10No trucks	TK TRUCK&DOG	hr	2,951.174	130.000			383,653		383,653
31	EE formula - =st(24:30,#LQ15) m3				18.632	34,428	1,726	407,200	821,312	1,264,666
32										
33	D. Spread & compact									
34	NOTE: Allow CAT815 compactor to spread & compact									
35	EE formula - =(#LQ14/15), hr Allowed 15m3/hr	COM CAT815C	hr	6,552.000	161.957	400,655	38,329	622,157		1,061,141
36	EE formula - =(#LQ35) hr	ROL CA51	hr	6,552.000	111.270	400,655	19,165	309,218		729,038
37	EE formula - =(#LQ35), hr	GRADER CAT14G	hr	6,552.000	176.499	400,655	38,329	717,434		1,156,418
38	EE formula - =(#LQ35*0.5), hr	TK WCART 15KLT	hr	3,276.000	122.463	200,327	5,160	195,700		401,187
39	EE formula - =(#LQ35*2), hr Grade checker / Spotter	LAB CIVIL	hr	13,104.000	55.510	727,403				727,403
40	EE formula - =st(35:39,#LQ14) m3				41.465	2,129,695	100,983	1,844,509		4,075,187
41	EE formula - =st(18:39,#LQ14) m3				70.923	2,236,864	1,463,851	2,448,269	821,312	6,970,296
42	EE formula - =st(18:39,#LQ19) m2				21.277	2,236,864	1,463,851	2,448,269	821,312	6,970,296
43										
44	Estimated duration									

	EE formula - =(160+165) days Assume 3No crushing plants & 4No fleets of compaction equipment			325.000					
					70.923	**2,236,864**	**1,463,851**	**2,448,269**	**821,312**	**6,970,296**
Line No 52	**Batter Stabilisation Works**									
Item No 10670			**each**	**155.000**		**Contributing**				
1	10670 Batter Stabilisation Works									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities NOTE: Refer to email H. Buys (Aecom) 11/5/2012 and comments on file FBB Quantities.xlsx for anchors "Allow a nominal number of rock bolts to allow for block failure - say 1 per 1000m2 of cut batter area" Assume rock bolt length 12m									
6										
7	NOTE: NO shotcrete batter protection allowed!									
8										
9	EE formula - =(155000) m2 Area of cut batter			155,000.000						
10	EE formula - =(#LQ9/1000) each Rock bolt number			155.000						
11	EE formula - =(0) m2 Shotcrete area									
12										
13	A. Batter protection									
14	EE formula - =(#LQ10) each	ROCK BOLT GFRB12	each	155.000	240.000				37,200	37,200
15	EE formula - =(#LQ11) m2	BATTER SHOT350	m²		271.004					
16	EE formula - =st(13:15,#LQ9) m2				0.240				37,200	37,200
17										
18	Estimated duration									
19	EE formula - =(#LQ10/5) days Allowed 5No bolts per day			31.000						
					240.000				**37,200**	**37,200**
Line No 53	**Temporary dewatering**									
Item No 10680			**Item**	**1.000**		**Contributing**				
1	10680 temporary dewatering									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Allowance for dewatering of cuttings, Length 5770m									
6										
7	EE formula - =(319.75*7/5) Day Total elasped duration of excavation works (Refer Item 10630)			447.650						
8	EE formula - =(3) each No pumps			3.000						
9										
10	A. Dewatering pumps									
11	EE formula - =(#LQ7*#LQ8) day	P MATADOR/6"	day	1,342.950	69.000			92,664		92,664

	EE formula - =(#LQ7*#LQ8*1) hr Allowed 1hr per pump per day supervision	LAB CIVIL	hr	1,342.950	55.510	74,547			74,547
	EE formula - =(0.2*2*#LQ8) week Allowed delivery & pick up each pump 1day	TK CR/12T	week	1.200	1,347.570			1,617	1,617
	EE formula - =(1000*#LQ8) Allowance suction & delivery hoses per pump	MISC PLANT	Item	3,000.000	1.000			3,000	3,000
	EE formula - =(0.1*75*#LQ7*24*#LQ8) lt Allowed 0.1lt per kwhr, 24hr operation	FUEL	litre	241,731.000	1.350			326,337	326,337
	EE formula - =st(11:15,0)					74,547		423,617	498,165
	Estimated duration								
	EE formula - =(#LQ7) days			447.650					
					498,164.639	**74,547**		**423,617**	**498,165**

Line No 54	**Wick drains**								
Item No 10690a			**m**	**66,000.000**		**Contributing**			
	10690a Wick drains								
	Spec: Nil								
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801								
	Site visit photo: Nil								
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities								
	NOTE: Adopt allowance from Aecom - "Allow for 10m wick drains on a 1.5m grid over the length of Broughton Creek fills"								
	NOTE: Refer email H. Buys (Aecom) 11/5/2012 - "Assume a 2m preload is applied to the same area as the wick drains. his quantity will need to be excavated on site. Assume 4>m = 300m length x 50m width"								
	NOTE: Place 1.333m thick drainage layer prior to installing Wick drains.								
	Defines:								
	EE formula - =def(#vol,300m*50mwide*1.333m) Volume of borrow material for capping layer. Allow for a 1.333m drainage for the entire lgth of embankment			19,995.000					
	EE formula - =def(#volT1,#vol/2.5m*0.15thk) Volume of topsoil stripping required at the borrow pit area. Assume pit is 2.5m deep			1,199.700					
	A. Strip & remove topsoil in borrow area.								
	EE formula - =(#volT1*1.44swell/150m3) allow swell factor of 25% and push distance of 60mtrs. equates approx 200Lm3. Refer Cat book pg 1-44.	DOZER CATD6H	hr	11.517	144.099	704	78	878	1,660
	EE formula - =(#lq15) allowance for a GPS	GPS - scraper	hr	11.517	45.000			518	518
	EE formula - =(#volT1*1.25loose)	*RR Gstockpile mtce	bcm	1,499.625	0.300			450	450
	EE formula - =st(14:17,#volT1) rate per m3 to strip and stockpile.				2.190	704	78	1,846	2,628

20	B. Rip, load & cart to work face.									
	EE formula - =(#vol/100m3) allowance to rip & feed digger.									
21		DOZER CATD6H	hr	199.950	144.099	12,227	1,350	15,236		28,812
22	EE formula - =(#lq21) Excavator 30T (wet)	E35	hr	199.950	146.790	12,227	1,170	15,954		29,351
23	EE formula - =(#lq21*6trucks*1.1t time) Rerer to Haul cycle cals elsewhere. allowed for travel time of 1hr.	t&d	hr	1,319.670	130.000			171,557		171,557
24	EE formula - =st(20:23,#vol) m3				11.489	24,454	2,519	202,747		229,720
25										
26	C. Place & compact									
27	EE formula - =(#lq21) Compactor - CAT 815C, Incl. operator + fuel (179kW)	COM CAT815C	hr	199.950	161.957	12,227	1,170	18,987		32,383
28	EE formula - =(#lq27*0.5) allow for 50% of place time.	TK WCART 15KLT	hr	99.975	122.463	6,113	157	5,972		12,243
29	EE formula - =(#vol)	*RR GHRM - scrapers	bcm	19,995.000	0.289			5,776		5,776
30	EE formula - =(300*50*1.3) m2 Allowed 30% laps etc	GEO BIDM A44	m^2	19,500.000	1.600		31,200			31,200
31	EE formula - =(#LQ30*2/100) hr Allowed 2men 100m2/hr install geotextile	LAB CIVIL	hr	390.000	55.510	21,649				21,649
32	EE formula - =(1000) Allowance pins, tape etc	MISC MAT	Item	1,000.000	1.000		1,000			1,000
33	EE formula - =st(26:32,#vol) m3				5.214	39,989	33,527	30,735		104,251
34										
35	D. Supply & install Wick Drains									
36	EE formula - =(66000) m Allow for a1.5m grid. Supply & install.	wickdrain	m	66,000.000	2.200				145,200	145,200
37	EE formula - =($15000) Mobilisation	MOB	$	15,000.000	1.000				15,000	15,000
38										
39	Estimated duration									
40	EE formula - =(#LQ36/200/5) days Allowed 200m/day, 5No crews			66.000						
					7.527	**65,147**	**36,124**	**235,327**	**160,200**	**496,799**

Line No 55	**Preloading**									
Item No 10690b			**m3**	**30,000.000**		**Contributing**				
1	10690b Preload									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Refer email H. Buys (Aecom) 11/5/2012 - "Assume a 2m preload is applied to the same area as the wick drains. his quantity will need to be excavated on site. Assume 4>m = 300m length x 50m width"									
7	NOTE: Allow for same level of compaction to preload material as usually required for permanent pavement layers									
8										
9	EE formula - =(#QTY) m3 Preload volume			30,000.000						
10	EE formula - =(#LQ9/2.5) m2 Topsoil strip area			12,000.000						
11	EE formula - =(#LQ10*0.150) m3 Topsoil volume			1,800.000						
12										

13	A. Strip & remove topsoil in borrow area								
14	EE formula - =(160) m3/hr Allowed productivity			160.000					
15	EE formula - =(#LQ11/#LQ14) hr	SCR CAT623E	hr	11.250	206.550	688	66	1,570	2,324
16	EE formula - =(#LQ15) hr Spotter	LAB CIVIL	hr	11.250	55.510	624			624
17	EE formula - =(#LQ15*0.5) hr Allowed 50%	TK WCART 30KLT	hr	5.625	202.788	344	9	788	1,141
18	EE formula - =(#LQ15*0.5) hr Allowed 50% to manage stockpiles	DOZER CATD6H	hr	5.625	144.099	344	38	429	811
19	EE formula - =(#LQ18) hr Spotter	LAB CIVIL	hr	5.625	55.510	312			312
20	EE formula - =st(13:19,#LQ11) m3				2.895	2,313	113	2,786	5,212
21									
22	B. Rip, load & haul to embankment								
23	EE formula - =(#LQ9/100) hr Allowance to rip and push up	DOZER CATD6H	hr	300.000	144.099	18,345	2,025	22,860	43,230
24	EE formula - =(#LQ23) hr	E35	hr	300.000	146.790	18,345	1,755	23,937	44,037
25	EE formula - =(#LQ23*6) hr Allow 6No trucks.	TK TRUCK&DOG	hr	1,800.000	130.000			234,000	234,000
26	EE formula - =st(22:25,#LQ9) m3				10.709	36,690	3,780	280,796	321,266
27									
28	C. Place & compact								
29	NOTE: Allow CAT815 compactor to spread & compact								
30	EE formula - =(#LQ9/15), hr Allowed 15m3/hr	COM CAT815C	hr	2,000.000	161.957	122,300	11,700	189,914	323,914
31	EE formula - =(#LQ30) hr	ROL CA51	hr	2,000.000	111.270	122,300	5,850	94,389	222,539
32	EE formula - =(#LQ30), hr	GRADER CAT14G	hr	2,000.000	176.499	122,300	11,700	218,997	352,997
33	EE formula - =(#LQ30*0.5), hr	TK WCART 15KLT	hr	1,000.000	122.463	61,150	1,575	59,738	122,463
34	EE formula - =(#LQ30*2), hr Grade checker / Spotter	LAB CIVIL	hr	4,000.000	55.510	222,040			222,040
35	EE formula - =st(30:34,#LQ9) m3				41.465	650,090	30,825	563,037	1,243,952
36									
37	D. Load & spoil at end of preload period								
38	NOTE: Allow to load and haul preload material to spoil with 5km of site								
39	EE formula - =(#LQ9/200) hr Allowed 200m3/hr productivity	E35	hr	150.000	146.790	9,173	878	11,968	22,018
40	EE formula - =(#LQ39*6) hr Allowed 6No trucks	TK TRUCK&DOG	hr	900.000	130.000			117,000	117,000
41	EE formula - =(#LQ39) hr	DOZER CATD6H	hr	150.000	144.099	9,173	1,013	11,430	21,615
42	EE formula - =(#LQ39*0.5) hr Allowed 50%	TK WCART 15KLT	hr	75.000	122.463	4,586	118	4,480	9,185
43	EE formula - =(#LQ39) hr Spotter	LAB CIVIL	hr	150.000	55.510	8,327			8,327
44	EE formula - =st(37:43,#LQ9) m3				5.938	31,258	2,008	144,879	178,144
45									
46	Estimated duration								
47	EE formula - =(0) days								
					58.286	**720,350**	**36,726**	**991,498**	**1,748,574**

Line No 59	**Excavation**				
Item No 10710		**m3**	**34,893.000**	**Contributing**	
1	10710 Drainage - Excavation				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				

5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
6	NOTE: Adopt allowance from Aecom - "Pavement drainage design has not been completed at this time. Allowing for pipe the full length of each carriageway will be sufficiently conservative to allow for tranverse pavement drainage and interchange ramp drainage"							
7	NOTE: Adopt allowance from Aecom - "Assume 20 piped crossings at 55m each"							
8	NOTE: Adopt same ratios as RCP for lengths							
9	NOTE: Allow for open channel drains to both sides of cuttings							
10								
11	EE formula - =(20400-7600) m Length of road corridor			12,800.000				
12	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000				
13	EE formula - =((#LQ11-#LQ12)*2) m Length of drainage lines			23,400.000				
14	EE formula - =((15700-14650)*1.5) m3 open drainage length @ 1.5m3/m			1,575.000				
15	EE formula - =(((#LQ13*0.6)+(20*55))*0.9*1.05) m3 375mm			14,307.300				
16	EE formula - =(#LQ13*0.25*1.05*1.25) m3 450mm			7,678.125				
17	EE formula - =(#LQ13*0.075*1.35*1.5) m3 750mm			3,553.875				
18	EE formula - =(#LQ13*0.075*1.5*1.75) m3 900mm			4,606.875				
19	EE formula - =((#LQ14+#LQ15+#LQ16+#LQ17+#LQ18)*1.1) m3 Volume drainage excavation, Incl. 10% allowance for unsuitable			34,893.293				
20	EE formula - =(#LQ19*0.8) m3 OTR			27,914.634				
21	EE formula - =(#LQ19*0.2) m3 ROCK			6,978.659				
22								
23	EE formula - =(#LQ20/15) hr Allowed 15m3/hr OTR	E30	hr	1,860.976	150.000		279,146	279,146
24	EE formula - =(#LQ23) hr Spotter	LAB CIVIL	hr	1,860.976	55.510	103,303		103,303
25	EE formula - =(#LQ21/7.5) hr Allowed 7.5m3/hr ROCK	E30	hr	930.488	150.000		139,573	139,573
26	EE formula - =(#LQ25) hr	E30 HAMMER	hr	930.488	35.000		32,567	32,567
27	EE formula - =(#LQ25) hr Spotter	LAB CIVIL	hr	930.488	55.510	51,651		51,651
28	EE formula - =(10000) Allowance mobilise trench box to site	MISC PLANT	Item	10,000.000	1.000		10,000	10,000
29	EE formula - =(#LQ13/7/40) week Allowed typical 7m/hr, 40hr/week	TRENCH BOX MP40L	week	83.571	264.000		22,063	22,063
30	EE formula - =(5000) Allowance lift chains etc.	MISC PLANT	Item	5,000.000	1.000		5,000	5,000
31	EE formula - =st(23:30,#LQ19) m3				18.436	154,954	488,349	643,304
32								
33	Estimated Duration							
34	EE formula - =(#LQ13/70/2) Days Allowed 70m per day. Assume 2No crews			167.143				
					18.436	**154,954**	**488,349**	**643,304**

Line No 60	**Precast Reinforced Concrete Pipe (RCP)**				
Item No 10720		**m**	**24,500.000**	**Contributing**	
1	10720 Drainage - Precast Reinforced Concrete Pipe (RCP)				

2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Adopt allowance from Aecom - "Pavement drainage design has not been completed at this time. Allowing for pipe the full length of each carriageway will be sufficiently conservative to allow for tranverse pavement drainage and interchange ramp drainage"									
7	NOTE: Adopt allowance from Aecom - "Assume 20 piped crossings at 55m each"									
8	NOTE: Allow breakdown as follows - 375mm 60%, 450mm 25%, 750mm 7.5% & 900mm 7.5%									
9										
10	EE formula - =(20400-7600) m Length of road corridor			12,800.000						
11	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000						
12	EE formula - =((#LQ10-#LQ11)*2) m Length of drainage lines			23,400.000						
13										
14	EE formula - =((#LQ12*0.60)+(20*55)) m	DRA RCP 375CL4	m	15,140.000	153.642	421,891	1,442,696	455,723	5,829	2,326,139
15	EE formula - =(#LQ12*0.25) m	DRA RCP 450CL4	m	5,850.000	233.327	330,005	697,444	332,624	4,889	1,364,962
16	EE formula - =(#LQ12*0.075) m	DRA RCP 750CL4	m	1,755.000	532.495	165,528	593,386	173,364	2,251	934,529
17	EE formula - =(#LQ12*0.075) m	DRA RCP 900CL4	m	1,755.000	723.400	174,203	931,405	160,556	3,403	1,269,567
18										
19	Estimated Duration									
20	EE formula - =(#LQ12/70/2) Days Allowed 70m per day. Assume 2No crews			167.143						
					240.620	**1,091,628**	**3,664,931**	**1,122,266**	**16,372**	**5,895,197**

Line No 61	**Reinforced Concrete Box Culverts (RCBC)**									
Item No 10730			**m**	**140.000**		**Contributing**				
1	10730 Drainage - Reinforced Concrete Box Culvert (RCBC)									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Adopt allowance from Aecom - "Single cell 3.0 x 3.0m RCBC" + "2x single cell 2.4 x 1.5m RCBC"									
7										
8	EE formula - =(60) m Single cell 3.0x3.0 RCBC	RTA RCBC 3000X3000	m	60.000	3,000.000				180,000	180,000
9	EE formula - =(2*40) m Single cell 2.4x1.5 RCBC	RTA RCBC 2400X1500	m	80.000	2,400.000				192,000	192,000
10	EE formula - =(10*1500*2*3) each Allownce end wall structures @ 10m3/each	MISC MAT	Item	90,000.000	1.000		90,000			90,000
11										
12	Estimated Duration									
13	EE formula - =((#LQ8+#LQ9)/5) Days Allowed 5m per day			28.000						

					3,300.000		**90,000**	**372,000**	**462,000**
Line No 62		**Drainage Pits**							
Item No 10740				**each**	**562.000**		**Contributing**		
	1	10740 Drainage - Pits							
	2	Spec: Nil							
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4	Site visit photo: Nil							
	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	6	NOTE: Adopt allowance from Aecom - "From 12d model"							
	7								
	8	EE formula - =(68) each Gully pits			68.000				
	9	EE formula - =(450) each Grated pits			450.000				
	10	EE formula - =(0) each Junction pits							
	11	EE formula - =(44) each headwalls / pit RCBC			44.000				
	12	EE formula - =(#LQ8+#LQ9+#LQ10+#LQ11) each Total			562.000				
	13								
	14	EE formula - =(#LQ8) each	RTA KERB PIT RCP	each	68.000	2,200.000		149,600	149,600
	15	EE formula - =(#LQ11) each	RTA KERB PIT RCBC	each	44.000	6,400.000		281,600	281,600
	16	EE formula - =(#LQ10) each	RTA JUNC PIT	each		2,200.000			
	17	EE formula - =(#LQ9) each	RTA GRATED PIT	each	450.000	2,000.000		900,000	900,000
	18								
	19	Estimated Duration							
	20	EE formula - =(#LQ12/5/2) Days Allowed 5day per pit. Assume 2No crews			56.200				
						2,368.683		**1,331,200**	**1,331,200**
Line No 63		**Concrete lined catch Drains**							
Item No 10750				**m**	**5,000.000**		**Contributing**		
	1	10750 - Concrete lined catch Drains							
	2	Spec: Nil							
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4	Site visit photo: Nil							
	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	6	NOTE: Adopt allowance from Aecom - "Assume concrete lined catch drains are required at the top of all cuts"							
	7								
	8	EE formula - =(5000) m catch drainage length			5,000.000				
	9								
	10	EE formula - =(#LQ8) m	DRA CHANNEL C3	m	5,000.000	135.572	361,826	304,308	11,727	677,860
	11								
	12	Estimated Duration							
	13	EE formula - =(#LQ8/500) Days Allowed 500m per day			10.000				
						135.572	**361,826**	**304,308**	**11,727**	**677,860**

Line No 64	**Open Drains**							
Item No 10760			**m**	**12,000.000**		**Contributing**		
1	10760 Drainage - Open drains							
2	Spec: Nil							
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
4	Site visit photo: Nil							
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
6	NOTE: Adopt allowance from Aecom - "Assume that open drains are required at the base of each fill"							
7								
8	EE formula - =(12000) m open drainage length			12,000.000				
9								
10	EE formula - =(#LQ8) m	RTA OPEN DRAIN	m	12,000.000	10.200		122,400	122,400
11								
12	Estimated Duration							
13	EE formula - =(#LQ8/750) Days Allowed 750m per day			16.000				
					10.200		**122,400**	**122,400**
Line No 65	**Rockfilled Gabions & Mattresses**							
Item No 10770			**m2**	**176.000**		**Contributing**		
1	10770 Drainage - Rock filled gabions & mattresses							
2	Spec: Nil							
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
4	Site visit photo: Nil							
5	NOTE: Allow for reno mattress protection at each headwall							
6								
7	EE formula - =(44) each			44.000				
8								
9	EE formula - =(#LQ7*4) m2 Allowed 4m2 per headwall	RENO230	m²	176.000	68.000		11,968	11,968
10								
11	Estimated Duration							
12	EE formula - =(#LQ7*5/2) Days Allowed 5days per headwall. Assume 2No crews			110.000				
					68.000		**11,968**	**11,968**
Line No 66	**Diversion Drain - Town Creek**							
Item No 10780			**m**	**400.000**		**Contributing**		
1	10780 - Diversion Drain - Town Creek							
2	Spec: Nil							
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
4	Site visit photo: Nil							

5	NOTE: Refer to email from G. Smith Aecom 17/2/2012 for details - Town creek diversion & highway bund									
6										
7	EE formula - =(400) m Length of diversion channel			400.000						
8	EE formula - =(20513+6568) m3 Cut volume			27,081.000						
9	EE formula - =(0+3875) m3 Fill volume			3,875.000						
10	EE formula - =(#LQ8-#LQ9) m3 Spoil volume			23,206.000						
11	EE formula - =(10) m Multiple cell 5No 2.1 x 2.4m RCBC			10.000						
12										
13	A. Drainage diversion channel - Spoil OTR, 35t excavator, Truck & dogs, CATD6H dozer & 15klt water cart									
14	EE formula - =(#LQ8) m3 Excavation			27,081.000						
15	EE formula - =(706) hr Total truck hours, Allowed maximum number 6			706.000						
16	1. Excavation									
17	EE formula - =(#LQ14/230) hr Allowed 230m3/hr productivity	E35	hr	117.744	146.790	7,200	689	9,395		17,284
18	EE formula - =(#LQ15) hr	TK TRUCK&DOG	hr	706.000	130.000			91,780		91,780
19	EE formula - =(#LQ17) hr	DOZER CATD6H	hr	117.744	144.099	7,200	795	8,972		16,967
20	EE formula - =(#LQ17*0.5) hr Allowed 50%	TK WCART 15KLT	hr	58.872	122.463	3,600	93	3,517		7,210
21	EE formula - =(#LQ17) hr Spotter	LAB CIVIL	hr	117.744	55.510	6,536				6,536
22	EE formula - =st(16:21,#LQ14) m3				5.161	24,536	1,576	113,663		139,776
23	2. Place & compact									
24	NOTE: Allow to spoil on nearby pasture with minimal compaction									
25	EE formula - =(#LQ17) hr	DOZER CATD6S	hr	117.744	150.000			17,662		17,662
26	EE formula - =(#LQ25) hr Spotter	LAB CIVIL	hr	117.744	55.510	6,536				6,536
27	EE formula - =(#LQ25*0.5) hr Allowed 50%	TK WCART 15KLT	hr	58.872	122.463	3,600	93	3,517		7,210
28	EE formula - =st(23:27,#LQ14) m3				1.160	10,136	93	21,178		31,407
29	EE formula - =st(13:27,#LQ14) m3				6.321	34,672	1,669	134,842		171,183
30	EE formula - =(#LQ17/10) days			11.774						
31										
32	B. Multiple cell RCBC - 5No cells									
33	EE formula - =(#LQ11*5*1.5) m Allowed 1.5x factor for multiple cell RCBC installation	RTA RCBC 2100X2400	m	75.000	2,400.000				180,000	180,000
34										
35	C. RIP RAP protection to steep slopes									
36	EE formula - =(#LQ7*10*0.5*0.5*2.7*1.2) tonne Allowed 50% of diversion channel length, width 10m, 500mm thk, 2.7tonne/m3, 20% waste	QAR RENO ROCK	tonne	3,240.000	42.000		136,080			136,080
37	EE formula - =(#LQ7*10*0.5*1.3) m2 Allowed 30% for laps & waste	GEO BIDM A44	m²	2,600.000	1.600		4,160			4,160
38	EE formula - =(#LQ36/20) hr Allowed to place 20tonne per hr	E35	hr	162.000	146.790	9,906	948	12,926		23,780
39	EE formula - =(#LQ38*2) hr Allowed 2No men	LAB CIVIL	hr	324.000	55.510	17,985				17,985
40	EE formula - =(5000) Allowance	MISC MAT	Item	5,000.000	1.000		5,000			5,000
41	EE formula - =(#LQ38*0.5) hr Allowed 50%	TK WCART 15KLT	hr	81.000	122.463	4,953	128	4,839		9,919
42	EE formula - =st(35:41,2000) m2				98.462	32,845	146,315	17,765		196,925
43										
44	Estimated Duration									
45	EE formula - =(#LQ30+(50/5)+(#LQ38/10)) Days Allowed 5m perdays for RCBC			37.974						

					1,370.268	67,517	147,984	152,606	180,000	548,107
Line No 67	**Secondary drainage structure - Property underpass**									
Item No 10790			**each**	**2.000**		**Contributing**				
1	10790 - Secondary drainage structure - Cattle crossing									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Adopt allowance from Aecom - "Allow for property underpass RCBC 4.6h x 4.6w" Required at chg 8400 & 9475									
7										
8	EE formula - =(2) each Number of structures			2.000						
9	EE formula - =(30*#LQ8) m Length			60.000						
10	EE formula - =(6) m Depth of excavation			6.000						
11	EE formula - =(67.2*#LQ8) m3 of excavation			134.400						
12	EE formula - =(4.6*4.6*#LQ8) m3/m Culvert volume			42.320						
13	EE formula - =(#LQ11-#LQ12) m3/m Backfill volume			92.080						
14	EE formula - =(16.3) m3 Approx volume of concrete to end structures			16.300						
15										
16	A, Excavation									
17	EE formula - =(30) m3/hr Productivity OTR			30.000						
18	EE formula - =(5) m3/hr Productivity ROCK			5.000						
19	EE formula - =(#LQ11*0.5/#LQ17) hr Allowed 50% OTR	E30	hr	2.240	150.000			336		336
20	EE formula - =(#LQ11*0.5/#LQ18) hr Allowed 50% ROCK	E30	hr	13.440	150.000			2,016		2,016
21	EE formula - =(#LQ11*0.5/#LQ18) hr Allowed 50% ROCK	E30 HAMMER	hr	13.440	35.000			470		470
22	EE formula - =(#LQ19+#LQ20) hr Spotter	LAB CIVIL	hr	15.680	55.510	870				870
23	EE formula - =(#LQ20*0.5) hr Allowance dust control	TK WCART 15KLT	hr	6.720	122.463	411	11	401		823
24	EE formula - =st(17:23,#LQ11) m3				33.599	1,281	11	3,224		4,516
25										
26	B. Backfill									
27	EE formula - =(#LQ13*0.5) m3 Allowed 50% handplaced	EWKS BF HPLACE	m^3	46.040	45.640	1,298	7	764	32	2,101
28	EE formula - =(#LQ13*0.5) m3 Allowed 50% Machine placed	EWKS BF MACHINE10	m^3	46.040	42.836	851	21	1,101		1,972
29	EE formula - =st(27:28,#LQ13) m3				44.238	2,149	27	1,865	32	4,073
30										
31	C. Supply & place culverts									
32	EE formula - =(#LQ9) m	DRA RCBC4600X4600	m	60.000	5,000.000				300,000	300,000
33										
34	D. Other									
35	EE formula - =(#LQ14*1500*2*#LQ8) each Allownce end wall structures	MISC MAT	Item	97,800.000	1.000		97,800			97,800
36										
37	Estimated Duration									
38	EE formula - =(20*#LQ8) Days Allowed 1month per structure			40.000						

					203,194.587	**3,430**	**97,838**	**5,089**	**300,032**	**406,389**
Line No 71	**Remove existing Princess Hwy pavements**									
Item No 10810			**m2**	**74,100.000**		**Contributing**				
1	10810 Removal of existing Princess Hwy pavements									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Adopt allowance from Aecom - "Not economical to attempt to retain any existing pavement as new Princess Highway. Demolish all existing pavement where on line"									
7										
8										
9	EE formula - =(#QTY) m2 Area existing pavement to remove			74,100.000						
10										
11	A. Remove temporary pavements									
12	EE formula - =(#LQ9) m2 Allow rip pavement 1000m2/hr	EWKS TYNE S/G	m²	74,100.000	2.320	86,445	4,335	81,138		171,918
13	EE formula - =(#LQ9/1000) hr Allowed match excavator to grader prod	E35	hr	74.100	146.790	4,531	433	5,912		10,877
14	EE formula - =(#LQ13) hr Spotter	LAB CIVIL	hr	74.100	55.510	4,113				4,113
15	EE formula - =(#LQ13*6) hr Allowed 6No trucks	TK TRUCK&DOG	hr	444.600	130.000			57,798		57,798
16	EE formula - =(#LQ9*0.05*2.4) tonne Tip fees for asphalt, Allowed 50mm thk typical, 2.4tonne/m3	TIP INERT RECYCLE	tonne	8,892.000	30.000				266,760	266,760
17	EE formula - =st(11:16,#LQ9) m2				6.902	95,090	4,768	144,849	266,760	511,467
18										
19	Estimated Duration									
20	EE formula - =(#LQ9/1000/10) Days Allowed 1000m2 per hr			7.410						
					6.902	**95,090**	**4,768**	**144,849**	**266,760**	**511,467**
Line No 72	**Stabilised base layer 275mm**									
Item No 10820			**m3**	**70,527.600**		**Contributing**				
1	10820 Stabilised base layer - 275mm thk									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file Quantities .xlsx for details of quantities									
6	NOTE: Assume quick lime used as stabilising agent, 30kg per tonne of base material (3% by mass)									
7	NOTE: Allow for insitu stabilisation using mobile plant. Allow 2No layers / passes of approx 150mm depth									
8										
9	EE formula - =(20400-7600) m Total corridor length			12,800.000						

	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000						
	EE formula - =((1.0+3.5+3.5+3.0)*2) m Base width			22.000						
	EE formula - =(0.274) m Base depth			0.274						
	EE formula - =((#LQ9-#LQ10)*#LQ11) m2 Base area			257,400.000						
	EE formula - =(#LQ13*#LQ12) m3 Base volume			70,527.600						
	A. Supply Base material - Import									
	EE formula - =(#LQ14*2.2*1.05) tonne Allowed 2.2tonne/m3, 5% waste	QAR DGB20	tonne	162,918.756	20.000		3,258,375			3,258,375
	B. Insitu stabilisation of base material									
	EE formula - =(#LQ13) m2	EWKS S/G250	m²	257,400.000	0.822	57,153		154,440		211,593
	EE formula - =(#LQ13) m2 Emulsion seal	A PRIME	m²	257,400.000	2.000				514,800	514,800
	EE formula - =(7) each Allowed to establish stabilisation plant to site, Assume same number as required plant fleet operations	EWKS STAB MOB	each	7.000	1,950.000				13,650	13,650
	EE formula - =(#LQ13*2) m2 Insitu stabilisation of Base coarse material, 2No layers of 150mm thk	EWKS STAB MIX150	m²	514,800.000	1.910				983,268	983,268
	EE formula - =(#LQ14*2.2*30/1000) tonne Allowed 2.2tonne/m3, 30Kg/tonne dosage	QUICK LIME	tonne	4,654.822	190.000		884,416			884,416
	EE formula - =(#LQ23/200) hr Allowed place & compact 200m2/hr	GRADER CAT14G	hr	2,574.000	176.499	157,400	15,058	281,849		454,307
	EE formula - =(#LQ25) hr	ROL SP56	hr	2,574.000	113.452	157,400	7,529	127,096		292,025
	EE formula - =(#LQ25) hr	ROL CA51	hr	2,574.000	111.270	157,400	7,529	121,479		286,408
	EE formula - =(#LQ25*2) hr Grade checkers / spotters	LAB CIVIL	hr	5,148.000	55.510	285,765				285,765
	EE formula - =(#LQ25) hr	TK WCART 15KLT	hr	2,574.000	122.463	157,400	4,054	153,764		315,218
	EE formula - =st(19:29,#LQ14) m3				60.139	972,519	918,586	838,629	1,511,718	4,241,451
	EE formula - =st(19:29,#LQ13) m2.				16.478	972,519	918,586	838,629	1,511,718	4,241,451
	Estimated Duration									
	EE formula - =roundup(#LQ25/10/7) Days			37.000						
					106.339	**972,519**	**4,176,961**	**838,629**	**1,511,718**	**7,499,827**

Line No 73 **Item No 10830**	**Asphalt**		**tonne**	**132,427.150**		**Contributing**				
	10830 Asphalt									
	Spec: Nil									
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
	Site visit photo: Nil									
	NOTE: Assume following pavement design 175mm thk base coarse (AC20) + 7mm bitumen seal + 30mm thk wearing course (SMA 10).									
	NOTE: Allow also for variable thk correction courses (AC14), allowed 5% of area, 50mm avg.									
	EE formula - =(20400-7600) m Total corridor length			12,800.000						
	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000						

10	EE formula - =((1.0+3.5+3.5+3.0)*2) m Base width			22.000				
11	EE formula - =(0.175) m Base thk			0.175				
12	EE formula - =(0.030) m Wearing Course thk			0.030				
13	EE formula - =((#LQ8-#LQ9)*#LQ10*#LQ11) m3 Base volume			45,045.000				
14	EE formula - =((#LQ8-#LQ9)*#LQ10*#LQ12) m3 Wearing Course volume			7,722.000				
15								
16	A. One seal atop stabilised layer							
17	EE formula - =((#LQ8-#LQ9)*#LQ10) m2	A 7MMSEAL	m²	257,400.000	1.800		463,320	463,320
18								
19	B.Base supply & place							
20	EE formula - =(#LQ13*2.4*1.05) tonne Allowed 5% waste	A AC20 DG	tonne	113,513.400	160.000		18,162,144	18,162,144
21								
22	C. Wearing Course supply & place							
23	EE formula - =(#LQ14*2.2*1.03) tonne Allowed 3% waste	A SMA10	tonne	17,498.052	250.000		4,374,513	4,374,513
24								
25	D. Correction courses supply & place							
26	EE formula - =((#LQ8-#LQ9)*#LQ10*0.05*0.05*2.2) tonne	A DG IC 14/50MM	tonne	1,415.700	200.000		283,140	283,140
27	EE formula - =(#LQ20+#LQ23+#LQ26) tonne Total			132,427.152				
28								
29	Estimated Duration							
30	EE formula - =(#LQ27/1400) Days Allowed 1400tonne per day place			94.591				
					175.818		**23,283,117**	**23,283,117**

Line No 74	**Cold Milling**							
Item No 10840			**m2**	**13,000.000**		**Contributing**		
1	10840 Cold Milling							
2	Spec: Nil							
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
4	Site visit photo: Nil							
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
6	NOTE: Adopt allowance from Aecom - "Allow for existing highway south of Toolijooa Rd (within lane reconfiguation extent) and Tindalls Ln"							
7								
8	EE formula - =(13000) m2 Allowance area			13,000.000				
9								
10	EE formula - =(2) each	A MOB/MILL	each	2.000	495.000		990	990
11	EE formula - =(#LQ8*0.05*2.2) tonne	A MILL ASPH50	tonne	1,430.000	35.000		50,050	50,050
12								
13	Estimated Duration							
14	EE formula - =(#LQ11/300) Days Allowed 300tonne per night			4.767				

					3.926		**51,040**	**51,040**
Line No 75	**Subgrade & Sub-pavement drainage**							
Item No 10850			**m**	**45,600.000**		**Contributing**		
1	10850 Sugrade & subpavenment drainage							
2	Spec: Nil							
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
4	Site visit photo: Nil							
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
6	NOTE: Adopt allowance from Aecom - "Conservative allowance of inside and outside of both mainline carriageways will provide allowance for interchange ramps"							
7								
8	EE formula - =(45600) m Allowed length subsoil drainage			45,600.000				
9	EE formula - =(#LQ8/50) each cleanout points, Allowed 50m cts			912.000				
10								
11	EE formula - =(#LQ8) m	RTA SUBSOIL	m	45,600.000	50.000		2,280,000	2,280,000
12	EE formula - =(#LQ9) each	RTA SUBSOIL CLEANOUT	each	912.000	100.000		91,200	91,200
13								
14	Estimated Duration							
15	EE formula - =(#LQ8/750) Days Allowed 750m per day			60.800				
					52.000		**2,280,000**	**91,200**	**2,371,200**
Line No 79	**Toolijooa Road Underbridge Chg 7680**							
Item No 10910			**m2**	**832.000**		**Contributing**		
1	10910 Toolijooa Road Underbridge Chg 7680							
2	Spec: Nil							
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801							
4	Site visit photo: Nil							
5	NOTE: Single span simply supported bridge							
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket							
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat							
8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span							
9	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 32m							
10	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor							
11								
12	EE formula - =(20400-7600) m Total corridor length			12,800.000				
13	EE formula - =(32) m Length bridge deck			32.000				
14	EE formula - =(26.0) m Deck width			26.000				
15								

16	A. Piling									
17	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
18	EE formula - =((32*10.0)+(1*26)) m2 Allowed for single side of bridge, width 10m	TEMPROAD	m²	346.000	10.616	372	2,771	529		3,673
19	EE formula - =(2) each Allowed 15x15m	ACCESS PAD	each	2.000	30,000.000				60,000	60,000
20	EE formula - =(#LQ17) m	PILE 900	m	210.000	900.000				189,000	189,000
21	EE formula - =(#LQ17*0.221) tonne Allowed 221kg/m for 900mm dia pile	PILE CASING PERM	tonne	46.410	3,500.000		162,435			162,435
22	EE formula - =st(16:21,#QTY) m2				498.928	372	165,206	529	249,000	415,108
23										
24	B. Substructure									
25	1. Abutments									
26	EE formula - =(((23*1.5*1.5)+(23*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	144.360	1,500.000				216,540	216,540
27	2. Diaphragms, end blocks									
28	EE formula - =(((25*1.5)-(13*1.276))*1*2) m3	CONC DIAPHRAGMS	m³	41.824	3,300.000				138,019	138,019
29	3. Bearings									
30	EE formula - =(13*2) each	BRIDGE BEARING ELASTO	each	26.000	1,500.000		39,000			39,000
31	EE formula - =(#LQ30) each	BRIDGE BEARING ELASTO INS	each	26.000	3,771.249	13,618	83,460	975		98,052
32	EE formula - =st(24:31,#QTY) m2				590.879	13,618	122,460	975	354,559	491,612
33										
34	C. Deck beams									
35	1. Supply beams									
36	EE formula - =(#LQ13*13*0.581) m3 Allowed 1500mm depth Super Tee @ 0.581m3/m	BRIDGE PSC BEAMS	m³	241.696	1,600.000		386,714			386,714
37	EE formula - =(#LQ36) m3 On site precast facility	BRIDGE OS BEAMS	m³	241.696	1,520.000		367,378			367,378
38	2. Install beams									
39	EE formula - =(1*1.5) each	CR 200T MOB	each	1.500	15,000.000			22,500		22,500
40	EE formula - =((roundup(13/5))*10) hr Allowed to install 5No per day in 10hr	CR 200T	hr	30.000	625.000			18,750		18,750
41	EE formula - =(#LQ40*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	150.000	58.950	8,843				8,843
42	EE formula - =(20000) Allowance temporary materials	MISC MAT	Item	20,000.000	1.000		20,000			20,000
43	EE formula - =st(34:38,#QTY) m2				441.560		367,378			367,378
44										
45	D. Completion of superstructure									
46	1. Insitu deck									
47	EE formula - =(#LQ13*26*0.2) m3	CONC DECK	m³	166.400	1,150.000				191,360	191,360
48	2. Central median barriers									
49	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC MEDIAN	each	11.000	10,500.000				115,500	115,500
50	3. Edge barriers									
51	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	11.000	9,600.000				105,600	105,600
52	4. Railings									
53	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	64.000	500.000		32,000			32,000
54	5. Expansion joints									
55	EE formula - =(26*2) m	EXPANSION JOINT	m	52.000	600.000				31,200	31,200
56	6. Approach slabs									

	57 EE formula - =(2*26*0.3) m3	CONC RUN ON SLAB	m³	15.600	1,265.000				19,734	19,734
	58 7. SAMI seal									
	59 EE formula - =(#LQ13*11.5*2) m2	A BRIDGE SAMI	m²	736.000	10.000				7,360	7,360
	60 8. Wearing coarse 75mm thk									
	61 EE formula - =(#LQ13*11.5*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	66.240	220.000				14,573	14,573
	62 9. Stone pitching to abutment embankments									
	EE formula - =(230*2*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste									
	63	QAR STONE PITCHING	tonne	662.400	40.000		26,496			26,496
	64 EE formula - =(230*2) m2	STONE PITCHING	m²	460.000	100.000				46,000	46,000
	EE formula - =((230*2)/50/5) m2wk Allowed 50m2 per day									
	65	SCAFFOLD	m2wk	1.840	15.000		28			28
	66 10. End walls									
	67 EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000				18,000	18,000
	68 11. Backfill at abutments									
	69 EE formula - =(2*23*4*3*0.5) m3	EWKS BF HPLACE	m³	276.000	45.640	7,781	39	4,583	193	12,597
	70 12. Safety screens									
	71 EE formula - =(#LQ13*2.0*2) m Allowed 2.0m height	SAFETY MESH	m²	128.000	250.000				32,000	32,000
	72 13. Deck stormwater drainage - Both sides									
	73 EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	64.000	350.000				22,400	22,400
	74 EE formula - =(2*5000) Allowance connections	MISC SCON	Item	10,000.000	1.000				10,000	10,000
	75 EE formula - =st(45:74,#QTY) m2				823.133	7,781	58,563	4,583	613,920	684,847
	76									
	77 Estimated Duration									
	78 EE formula - =(3*20) Days Allowed 3months per span			60.000						
					2,438.746	**30,613**	**733,607**	**47,337**	**1,217,479**	**2,029,037**

Line No 80	**Broughton's Creek Underbridge No1 Chg 9950**					
Item No 10920a		**m2**	**3,172.000**	**Contributing**		
1	10920a - Broughton's Creek Underbridge No1 Chg 9950					
2	Spec: Nil					
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801					
4	Site visit photo: Nil					
5	NOTE: Four span simply supported bridge with separate carriageways					
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket					
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat					
8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span					
9	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 32m					
10	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor					
11						
12	EE formula - =(20400-7600) m Total corridor length		12,800.000			
13	EE formula - =(122) m Length bridge		122.000			

14	EE formula - =(26.0) m Deck width			26.000						
15										
16	A. Piling									
17	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
18	EE formula - =(3*(6+3)*2) m Length of 1200mm dia bored piles @ 6m/each			54.000						
19	EE formula - =((122*10.0)+(3*26)) m2 Allowed for single side of bridge, width 10m	TEMPROAD	m²	1,298.000	10.616	1,397	10,397	1,985		13,779
20	EE formula - =(4*2) each Allowed 15x15m	ACCESS PAD	each	8.000	30,000.000				240,000	240,000
21	EE formula - =(#LQ17) m	PILE 900	m	210.000	900.000				189,000	189,000
22	EE formula - =(#LQ18) m	PILE 1200	m	54.000	1,200.000				64,800	64,800
23	EE formula - =((#LQ21*0.221)+(#LQ22*0.295)) tonne Allowed 221kg/m for 900mm dia and 295kg/m for 1200mm dia piles respectively	PILE CASING PERM	tonne	62.340	3,500.000		218,190			218,190
24	EE formula - =st(16:23,#QTY) m2				228.805	1,397	228,587	1,985	493,800	725,769
25										
26	B. Substructure									
27	1. Abutments									
28	EE formula - =(((23*1.5*1.5)+(23*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	144.360	1,500.000				216,540	216,540
29	2. Pile caps - Amended design N/A									
30	EE formula - =(6*(5*5*1.5)) m3 Detailed excavation	EWKS DETAILED	m³	225.000	46.504	5,353		5,111		10,463
31	EE formula - =(6*(3.5*3.5*1.5)) m3	CONC PILE CAP	m³	110.250	1,500.000				165,375	165,375
32	EE formula - =(#LQ30-#LQ31) m3	EWKS BF MACHINE10	m³	114.750	42.836	2,120	52	2,744		4,915
33	3. Piers, 3No 1200mm dia									
34	EE formula - =(6*(3*1.130*4.5)) m3 Allowed 3No @ 1.130m3/m, typically 4.5m height	CONC PIERS	m³	91.530	1,750.000				160,178	160,178
35	4. Headstocks									
36	EE formula - =(6*(17.25*1.5)) m3	CONC HEADSTOCKS	m³	155.250	2,500.000				388,125	388,125
37	5. Diaphragms, end blocks									
38	EE formula - =(((13*1.5)-(6*1.276))*1*5*2) m3	CONC DIAPHRAGMS	m³	118.440	3,300.000				390,852	390,852
39	6. Bearings									
40	EE formula - =(48*2) each	BRIDGE BEARING ELASTO	each	96.000	1,500.000		144,000			144,000
41	EE formula - =(#LQ40) each	BRIDGE BEARING ELASTO INS	each	96.000	3,771.249	50,280	308,160	3,600		362,040
42	EE formula - =st(26:39,#QTY) m2				364.343				1,155,695	1,155,695
43										
44	C. Deck beams									
45	1. Supply beams									
46	EE formula - =(#LQ13*12*0.581) m3 Allowed 1500mm depth Super Tee @ 0.581m3/m	BRIDGE PSC BEAMS	m³	850.584	1,600.000		1,360,934			1,360,934
47	EE formula - =(#LQ46) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	850.584	1,520.000		1,292,888			1,292,888
48	2. Install beams									
49	EE formula - =(48*1.5) each	CR 400T MOB	each	72.000	21,000.000			1,512,000		1,512,000
50	EE formula - =(roundup(48/5)*10) hr Allowed to install 5No per day in 10hr	CR 400T	hr	100.000	1,100.000			110,000		110,000
51	EE formula - =(#LQ50*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	500.000	58.950	29,475				29,475
52	EE formula - =(15000) Allowance temporary materials	MISC MAT	Item	15,000.000	1.000		15,000			15,000
53	EE formula - =st(44:48,#QTY) m2				407.594		1,292,888			1,292,888

54										
55	D. Completion of superstructure									
56	1. Insitu deck									
57	EE formula - =(#LQ13*26*0.2) m3	CONC DECK	m³	634.400	1,150.000				729,560	729,560
58	2. Central median barriers									
59	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC MEDIAN	each	41.000	10,500.000				430,500	430,500
60	3. Edge barriers									
61	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	41.000	9,600.000				393,600	393,600
62	4. Railings									
63	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	244.000	500.000		122,000			122,000
64	5. Expansion joints									
65	EE formula - =(13*2*2) m	EXPANSION JOINT	m	52.000	600.000				31,200	31,200
66	6. Approach slabs									
67	EE formula - =((4*13*0.3)*2) m3	CONC RUN ON SLAB	m³	31.200	1,265.000				39,468	39,468
68	7. SAMI seal									
69	EE formula - =(#LQ13*11.5*2) m2	A BRIDGE SAMI	m²	2,806.000	10.000				28,060	28,060
70	8. Wearing coarse 75mm thk									
71	EE formula - =(#LQ13*11.5*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	252.540	220.000				55,559	55,559
72	9. Stone pitching to abutment embankments									
73	EE formula - =((485+345)*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste	QAR STONE PITCHING	tonne	1,195.200	40.000		47,808			47,808
74	EE formula - =(485+345) m2	STONE PITCHING	m²	830.000	100.000				83,000	83,000
75	EE formula - =((485+345)/50/5) m2wk Allowed 50m2 per day	SCAFFOLD	m2wk	3.320	15.000		50			50
76	10. End walls									
77	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000				18,000	18,000
78	11. Backfill at abutments									
79	EE formula - =(2*23*4*3*0.5) m3	EWKS BF HPLACE	m³	276.000	45.640	7,781	39	4,583	193	12,597
80	12. Deck stormwater drainage - Both sides									
81	EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	244.000	350.000				85,400	85,400
82	EE formula - =((2+1)*5000) Allowance connections	MISC SCON	Item	15,000.000	1.000				15,000	15,000
83	EE formula - =st(55:82,#QTY) m2				659.458	7,781	169,897	4,583	1,909,540	2,091,801
84										
85	Estimated Duration									
86	EE formula - =(35*4) Days Allowed 35days per span, Assume single crew			140.000						
					2,345.103	**88,933**	**2,158,532**	**1,632,168**	**3,559,035**	**7,438,667**

Line No 81 **Item No 10920b**	**Broughton's Creek Underbridge No2 Chg 10700**	**m2**	**1,976.000**	**Contributing**		
1	10920b - Broughton's Creek Underbridge No2 Chg 10700					
2	Spec: Nil					
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801					
4	Site visit photo: Nil					

5	NOTE: Three span simply supported bridge with separate carriageways									
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket									
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat									
8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span									
9	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 32m									
10	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor									
11										
12	EE formula - =(20400-7600) m Total corridor length			12,800.000						
13	EE formula - =(76) m Length bridge			76.000						
14	EE formula - =(26.0) m Deck width			26.000						
15										
16	A. Piling									
17	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
18	EE formula - =(2*(6+3)*2) m Length of 1200mm dia bored piles @ 6m/each			36.000						
19	EE formula - =((76*5.0)+(3*26)) m2 Allowed for single side of bridge, width 5m	TEMPROAD	m²	458.000	10.616	493	3,669	701		4,862
20	EE formula - =(3*2) each Allowed 15x15m	ACCESS PAD	each	6.000	30,000.000				180,000	180,000
21	EE formula - =(#LQ17) m	PILE 900	m	210.000	900.000				189,000	189,000
22	EE formula - =(#LQ18) m	PILE 1200	m	36.000	1,200.000				43,200	43,200
23	EE formula - =((#LQ21*0.221)+(#LQ22*0.295)) tonne Allowed 221kg/m for 900mm dia and 295kg/m for 1200mm dia piles respectively	PILE CASING PERM	tonne	57.030	3,500.000		199,605			199,605
24	EE formula - =st(16:23,#QTY) m2				312.078	493	203,274	701	412,200	616,667
25										
26	B. Substructure									
27	1. Abutments									
28	EE formula - =(((23*1.5*1.5)+(23*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	144.360	1,500.000				216,540	216,540
29	2. Pile caps - Amended design N/A									
30	EE formula - =(4*(5*5*1.5)) m3 Detailed excavation	EWKS DETAILED	m³	150.000	46.504	3,568		3,407		6,976
31	EE formula - =(4*(3.5*3.5*1.5)) m3	CONC PILE CAP	m³	73.500	1,500.000				110,250	110,250
32	EE formula - =(#LQ30-#LQ31) m3	EWKS BF MACHINE10	m³	76.500	42.836	1,413	34	1,829		3,277
33	3. Piers, 3No 1200mm dia									
34	EE formula - =(4*(3*1.130*4.5)) m3 Allowed 3No @ 1.130m3/m, typically 4.5m height	CONC PIERS	m³	61.020	1,750.000				106,785	106,785
35	4. Headstocks									
36	EE formula - =(4*(17.25*1.5)) m3	CONC HEADSTOCKS	m³	103.500	2,500.000				258,750	258,750
37	5. Diaphragms, end blocks									
38	EE formula - =(((13*1.5)-(6*1.276))*1*4*2) m3	CONC DIAPHRAGMS	m³	94.752	3,300.000				312,682	312,682
39	6. Bearings									
40	EE formula - =(36*2) each	BRIDGE BEARING ELASTO	each	72.000	1,500.000		108,000			108,000
41	EE formula - =(#LQ40) each	BRIDGE BEARING ELASTO INS	each	72.000	3,771.249	37,710	231,120	2,700		271,530

42	EE formula - =st(26:39,#QTY) m2				452.812				894,757	894,757
43										
44	C. Deck beams									
45	1. Supply beams									
46	EE formula - =(#LQ13*12*0.581) m3 Allowed 1500mm depth Super Tee @ 0.581m3/m	BRIDGE PSC BEAMS	m³	529.872	1,600.000		847,795			847,795
47	EE formula - =(#LQ46) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	529.872	1,520.000		805,405			805,405
48	2. Install beams									
49	EE formula - =(36*1.5) each	CR 400T MOB	each	54.000	21,000.000			1,134,000		1,134,000
50	EE formula - =(roundup(36/5)*10) hr Allowed to install 5No per day in 10hr	CR 400T	hr	80.000	1,100.000			88,000		88,000
51	EE formula - =(#LQ50*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	400.000	58.950	23,580				23,580
52	EE formula - =(10000) Allowance temporary materials	MISC MAT	Item	10,000.000	1.000		10,000			10,000
53	EE formula - =st(44:48,#QTY) m2				407.594		805,405			805,405
54										
55	D. Completion of superstructure									
56	1. Insitu deck									
57	EE formula - =(#LQ13*26*0.2) m3	CONC DECK	m³	395.200	1,150.000				454,480	454,480
58	2. Central median barriers									
59	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC MEDIAN	each	26.000	10,500.000				273,000	273,000
60	3. Edge barriers									
61	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	26.000	9,600.000				249,600	249,600
62	4. Railings									
63	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	152.000	500.000		76,000			76,000
64	5. Expansion joints									
65	EE formula - =(13*2*2) m	EXPANSION JOINT	m	52.000	600.000				31,200	31,200
66	6. Approach slabs									
67	EE formula - =((4*13*0.3)*2) m3	CONC RUN ON SLAB	m³	31.200	1,265.000				39,468	39,468
68	7. SAMI seal									
69	EE formula - =(#LQ13*11.5*2) m2	A BRIDGE SAMI	m²	1,748.000	10.000				17,480	17,480
70	8. Wearing coarse 75mm thk									
71	EE formula - =(#LQ13*11.5*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	157.320	220.000				34,610	34,610
72	9. Stone pitching to abutment embankments									
73	EE formula - =((345+205)*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste	QAR STONE PITCHING	tonne	792.000	40.000		31,680			31,680
74	EE formula - =(345+205) m2	STONE PITCHING	m²	550.000	100.000				55,000	55,000
75	EE formula - =((345+205)/50/5) m2wk Allowed 50m2 per day	SCAFFOLD	m2wk	2.200	15.000		33			33
76	10. End walls									
77	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000				18,000	18,000
78	11. Backfill at abutments									
79	EE formula - =(2*23*4*3*0.5) m3	EWKS BF HPLACE	m³	276.000	45.640	7,781	39	4,583	193	12,597
80	12. Deck stormwater drainage - Both sides									
81	EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	152.000	350.000				53,200	53,200
82	EE formula - =((1+2)*5000) Allowance connections	MISC SCON	Item	15,000.000	1.000				15,000	15,000
83	EE formula - =st(55:82,#QTY) m2				688.941	7,781	107,752	4,583	1,241,232	1,361,348

	84									
	85	Estimated Duration								
	86	EE formula - =(35*3) Days Allowed 35days per span, Assume single crew			105.000					
						2,688.910	**69,564**	**1,465,551**	**1,229,983**	**2,548,188**	**5,313,287**
Line No 82		**Broughton's Creek Underbridge No3 Chg 11200**									
Item No 10920c				**m2**	**5,200.000**		**Contributing**				
	1	10920c - Broughton's Creek Underbridge No3 Chg 11200									
	2	Spec: Nil									
	3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801									
	4	Site visit photo: Nil									
	5	NOTE: Six span simply supported bridge with separate carriageways									
	6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket									
	7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat									
	8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span									
	9	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 32m									
	10	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor									
	11										
	12	EE formula - =(20400-7600) m Total corridor length			12,800.000						
	13	EE formula - =(200) m Length bridge			200.000						
	14	EE formula - =(26.0) m Deck width			26.000						
	15										
	16	A. Piling									
	17	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
	18	EE formula - =(10*(6+3)*2) m Length of 1200mm dia bored piles @ 6m/each			180.000						
	19	EE formula - =((220*10.0)+(6*26)) m2 Allowed for single side of bridge, width 10m	TEMPROAD	m²	2,356.000	10.616	2,535	18,871	3,604		25,010
	20	EE formula - =(6*2) each Allowed 15x15m	ACCESS PAD	each	12.000	30,000.000				360,000	360,000
	21	EE formula - =(#LQ17) m	PILE 900	m	210.000	900.000				189,000	189,000
	22	EE formula - =(#LQ18) m	PILE 1200	m	180.000	1,200.000				216,000	216,000
	23	EE formula - =((#LQ21*0.221)+(#LQ22*0.295)) tonne Allowed 221kg/m for 900mm dia and 295kg/m for 1200mm dia piles respectively	PILE CASING PERM	tonne	99.510	3,500.000		348,285			348,285
	24	EE formula - =st(16:23,#QTY) m2				218.903	2,535	367,156	3,604	765,000	1,138,295
	25										
	26	B. Substructure									
	27	1. Abutments									
	28	EE formula - =(((23*1.5*1.5)+(23*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	144.360	1,500.000				216,540	216,540

29	2. Pile caps - Amended design N/A									
30	EE formula - =(10*(5*5*1.5)) m3 Detailed excavation	EWKS DETAILED	m³	375.000	46.504	8,921		8,518		17,439
31	EE formula - =(10*(3.5*3.5*1.5)) m3	CONC PILE CAP	m³	183.750	1,500.000				275,625	275,625
32	EE formula - =(#LQ30-#LQ31) m3	EWKS BF MACHINE10	m³	191.250	42.836	3,533	86	4,573		8,192
33	3. Piers, 3No 1200mm dia									
34	EE formula - =(10*(3*1.130*4.5)) m3 Allowed 3No @ 1.130m3/m, typically 4.5m height	CONC PIERS	m³	152.550	1,750.000				266,963	266,963
35	4. Headstocks									
36	EE formula - =(10*(17.25*1.5)) m3	CONC HEADSTOCKS	m³	258.750	2,500.000				646,875	646,875
37	5. Diaphragms, end blocks									
38	EE formula - =(((13*1.5)-(6*1.276))*1*7*2) m3	CONC DIAPHRAGMS	m³	165.816	3,300.000				547,193	547,193
39	6. Bearings									
40	EE formula - =(72*2) each	BRIDGE BEARING ELASTO	each	144.000	1,500.000		216,000			216,000
41	EE formula - =(#LQ40) each	BRIDGE BEARING ELASTO INS	each	144.000	3,771.249	75,420	462,240	5,399		543,060
42	EE formula - =st(26:39,#QTY) m2				322.610				1,677,570	1,677,570
43										
44	C. Deck beams									
45	1. Supply beams									
46	EE formula - =(#LQ13*12*0.581) m3 Allowed 1500mm depth Super Tee @ 0.581m3/m	BRIDGE PSC BEAMS	m³	1,394.400	1,600.000		2,231,040			2,231,040
47	EE formula - =(#LQ46) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	1,394.400	1,520.000		2,119,488			2,119,488
48	2. Install beams									
49	EE formula - =(72*1.5) each	CR 400T MOB	each	108.000	21,000.000			2,268,000		2,268,000
50	EE formula - =(roundup(72/5)*10) hr Allowed to install 5No per day in 10hr	CR 400T	hr	150.000	1,100.000			165,000		165,000
51	EE formula - =(#LQ50*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	750.000	58.950	44,213				44,213
52	EE formula - =(20000) Allowance temporary materials	MISC MAT	Item	20,000.000	1.000		20,000			20,000
53	EE formula - =st(44:48,#QTY) m2				407.594		2,119,488			2,119,488
54										
55	D. Completion of superstructure									
56	1. Insitu deck									
57	EE formula - =(#LQ13*26*0.2) m3	CONC DECK	m³	1,040.000	1,150.000				1,196,000	1,196,000
58	2. Central median barriers									
59	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC MEDIAN	each	67.000	10,500.000				703,500	703,500
60	3. Edge barriers									
61	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	67.000	9,600.000				643,200	643,200
62	4. Railings									
63	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	400.000	500.000		200,000			200,000
64	5. Expansion joints									
65	EE formula - =(13*2*2) m	EXPANSION JOINT	m	52.000	600.000				31,200	31,200
66	6. Approach slabs									
67	EE formula - =((4*13*0.3)*2) m3	CONC RUN ON SLAB	m³	31.200	1,265.000				39,468	39,468
68	7. SAMI seal									
69	EE formula - =(#LQ13*11.5*2) m2	A BRIDGE SAMI	m²	4,600.000	10.000				46,000	46,000
70	8. Wearing coarse 75mm thk									
71	EE formula - =(#LQ13*11.5*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	414.000	220.000				91,080	91,080
72	9. Stone pitching to abutment embankments									

	EE formula - =((345+205)*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20%									
73	waste	QAR STONE PITCHING	tonne	792.000	40.000		31,680			31,680
74	EE formula - =(345+205) m2	STONE PITCHING	m²	550.000	100.000				55,000	55,000
	EE formula - =((345+205)/50/5) m2wk Allowed 50m2 per									
75	day	SCAFFOLD	m2wk	2.200	15.000		33			33
76	10. End walls									
77	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000				18,000	18,000
78	11. Backfill at abutments									
79	EE formula - =(2*23*4*3*0.5) m3	EWKS BF HPLACE	m³	276.000	45.640	7,781	39	4,583	193	12,597
80	12. Deck stormwater drainage - Both sides									
81	EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	400.000	350.000				140,000	140,000
82	EE formula - =((2+2)*5000) Allowance connections	MISC SCON	Item	20,000.000	1.000				20,000	20,000
83	EE formula - =st(55:82,#QTY) m2				620.723	7,781	231,752	4,583	2,983,641	3,227,758
84										
85	Estimated Duration									
86	EE formula - =(35*6) Days Allowed 35days per span, Assume single crew			210.000						
					2,196.035	**129,949**	**3,416,637**	**2,446,586**	**5,426,212**	**11,419,383**

Line No 83	**Austral Park Road Overbridge Chg 11500**									
Item No 10930			**m2**	**562.000**		**Contributing**				
1	10930 - Austral Park Road Overbridge Chg 11500									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Single span curved bridge, cast insitu box girder									
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket									
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat									
8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span									
9	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 56m cast insitu span									
10										
11	EE formula - =(20400-7600) m Total corridor length			12,800.000						
12	EE formula - =(56.2) m Length bridge deck			56.200						
13	EE formula - =(10.0) m Deck width			10.000						
14										
15	A. Piling									
16	EE formula - =(5*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			150.000						
17	EE formula - =(2*100*10) m2 Allowed for 100m road either side of bridge, width 10m	TEMPROAD	m²	2,000.000	10.616	2,152	16,020	3,059		21,231
18	EE formula - =(2) each Allowed 15x15m	ACCESS PAD	each	2.000	30,000.000				60,000	60,000
19	EE formula - =(#LQ16) m	PILE 900	m	150.000	900.000				135,000	135,000

20	EE formula - =(#LQ19*0.221) tonne Allowed 221kg/m for 900mm dia pile	PILE CASING PERM	tonne	33.150	3,500.000		116,025			116,025
21	EE formula - =st(15:20,#QTY) m2				591.203	2,152	132,045	3,059	195,000	332,256
22										
23	B. Substructure									
24	1. Abutments									
25	EE formula - =(((10*1.5*1.8)+(10*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	83.160	1,500.000				124,740	124,740
26	2. Diaphragms, end blocks									
27	EE formula - =(((10*2.5)-(15.75))*1*2) m3	CONC DIAPHRAGMS	m³	18.500	3,300.000				61,050	61,050
28	3. Bearings									
29	EE formula - =(2*2) each	BRIDGE BEARING ELASTO	each	4.000	1,500.000		6,000			6,000
30	EE formula - =(#LQ29) each	BRIDGE BEARING ELASTO INS	each	4.000	3,771.249	2,095	12,840	150		15,085
31	EE formula - =st(23:30,#QTY) m2				368.105	2,095	18,840	150	185,790	206,875
32										
33	C. Deck structure - Cast insitu									
34	EE formula - =(10.50*#LQ12) m2 Internal formwork Allowed 10.50m2/m	FW SOFFIT	m²	590.100	152.828	69,182	14,659	6,343		90,184
35	EE formula - =(13.50*#LQ12) m2 External formwork Allowed 13.50m2/m	FW SOFFIT	m²	758.700	152.828	88,948	18,847	8,155		115,951
36	EE formula - =%L(34:35,50) Allowance labour to assemble / disassemble soffit forms 50%					79,065				79,065
37	EE formula - =((11.25*#LQ12)/10) m3 Concrete placed Allowed 10m3/hr @ 11.25m3/m	CONC CREW5	hr	63.225	304.755	18,043		1,225		19,268
38	EE formula - =(11.25*#LQ12) m3 Concrete pumped	CONC PUMPED 10M3	m³	632.250	57.174	11,024		18,802	6,323	36,148
39	EE formula - =(#LQ38*1.05) m3 Concrete supplied Allowed 5% waste	CONC 40MPA-B2	m³	663.863	205.000		136,092			136,092
40	EE formula - =(#LQ38*150/1000) tonne Reinforcing @ 200kg/m3	REBAR	tonne	94.838	2,612.964	4,383	184,174	2,347	56,903	247,807
41	EE formula - =(#LQ38*30/1000) tonne Internal prestressing @ 30kg/m3	POST TENSIONING	tonne	18.968	10,000.000				189,675	189,675
42	EE formula - =(#LQ12*10) m2 Cure	CONC CURE	m²	562.000	2.482	1,040	280	75		1,395
43	EE formula - =(#LQ42) m2 Finish	CONC FINISH	m²	562.000	7.970	4,461		18		4,479
44	EE formula - =(1.5*#LQ12*1*4.33) m2wk Allowed 1.5m width, length of bridge, 1months duration @ 1No side only	SCAFFOLD	m2wk	365.019	15.000		5,475			5,475
45	EE formula - =(#LQ12*10*5*1*4.33) m3wk Allowed length of bridge, 10m width, 5m high, 1months	FALSEWORK	m3wk	12,167.300	75.000		912,547			912,547
46	EE formula - =(2*7*1*4.33) lmwk Allowed 2No towers, 7m high, 1months	ACCESSSTAIR	lm/wk	60.620	48.000		2,910			2,910
47	EE formula - =st(33:46,#QTY) m2				3,275.794	276,146	1,274,985	36,965	252,900	1,840,996
48										
49	D. Completion of superstructure									
50	1. Edge barriers									
51	EE formula - =roundup(#LQ12*2/6) m Supplied in 6m lengths	PC PARAPETS	each	19.000	9,600.000				182,400	182,400
52	2. Railings									
53	EE formula - =(#LQ12*2) m	BRIDGE BARRIER	m	112.400	500.000		56,200			56,200
54	3. Expansion joints									

55	EE formula - =(10*2) m	EXPANSION JOINT	m	20.000	600.000				12,000	12,000
56	4. Approach slabs									
57	EE formula - =(2*10*0.3) m3	CONC RUN ON SLAB	m³	6.000	1,265.000				7,590	7,590
58	5. SAMI seal									
59	EE formula - =(#LQ12*10) m2	A BRIDGE SAMI	m²	562.000	10.000				5,620	5,620
60	6. Wearing coarse 75mm thk									
61	EE formula - =(#LQ12*10*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	101.160	220.000				22,255	22,255
62	7. Stone pitching to abutment embankments									
63	EE formula - =(65*2*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste	QAR STONE PITCHING	tonne	187.200	40.000		7,488			7,488
64	EE formula - =(65*2) m2	STONE PITCHING	m²	130.000	100.000				13,000	13,000
65	EE formula - =((65*2)/50/5) m2wk Allowed 50m2 per day	SCAFFOLD	m2wk	0.520	15.000		8			8
66	8. End walls									
67	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000				18,000	18,000
68	9. Backfill at abutments									
69	EE formula - =(2*10*4*3*0.5) m3	EWKS BF HPLACE	m³	120.000	45.640	3,383	17	1,993	84	5,477
70	10. Safety screens									
71	EE formula - =(#LQ12*2.0*2) m Allowed 2.0m height	SAFETY MESH	m²	224.800	250.000				56,200	56,200
72	11. Deck stormwater drainage - Both sides									
73	EE formula - =(#LQ12*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	112.400	350.000				39,340	39,340
74	EE formula - =(2*5000) Allowance connections	MISC SCON	Item	10,000.000	1.000				10,000	10,000
75	EE formula - =st(49:74,#QTY) m2				775.049	3,383	63,713	1,993	366,489	435,578
76										
77	Estimated Duration									
78	EE formula - =(3*20) Days Allowed 3months per span			60.000						
					5,010.151	**283,777**	**1,489,583**	**42,167**	**1,000,179**	**2,815,705**

Line No 84	**Tindalls Lane Overbridge Chg 14300**				
Item No 10940		**m2**	**774.000**	**Contributing**	
1	10940 - Tindalls Lane Overbridge Chg 14300				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				
5	NOTE: Three span simply supported two lane overbridge				
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket				
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat				
8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span				
9	NOTE: Assume Girders 1.2m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 20m				
10	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor				
11					
12	EE formula - =(20400-7600) m Total corridor length		12,800.000		

13	EE formula - =(60) m Length bridge			60.000						
14	EE formula - =(12.9) m Deck width			12.900						
15										
16	A. Piling									
17	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
18	EE formula - =(3*(6+3)*2) m Length of 1200mm dia bored piles @ 6m/each			54.000						
19	EE formula - =(2*100*10) m2 Allowed for 100m road either side of bridge, width 10m	TEMPROAD	m²	2,000.000	10.616	2,152	16,020	3,059		21,231
20	EE formula - =(2) each Allowed 15x15m	ACCESS PAD	each	2.000	30,000.000				60,000	60,000
21	EE formula - =(#LQ17) m	PILE 900	m	210.000	900.000				189,000	189,000
22	EE formula - =(#LQ18) m	PILE 1200	m	54.000	1,200.000				64,800	64,800
23	EE formula - =((#LQ21*0.221)+(#LQ22*0.295)) tonne Allowed 221kg/m for 900mm dia and 295kg/m for 1200mm dia piles respectively	PILE CASING PERM	tonne	62.340	3,500.000		218,190			218,190
24	EE formula - =st(16:23,#QTY) m2				714.756	2,152	234,210	3,059	313,800	553,221
25										
26	B. Substructure									
27	1. Abutments									
28	EE formula - =(((13*1.5*1.5)+(13*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	90.360	1,500.000				135,540	135,540
29	2. Pile caps - Amended design N/A									
30	EE formula - =(2*(5*14.5*1.5)) m3 Detailed excavation	EWKS DETAILED	m³	217.500	46.504	5,174		4,940		10,115
31	EE formula - =(2*(3.5*13.0*1.5)) m3	CONC PILE CAP	m³	136.500	1,500.000				204,750	204,750
32	EE formula - =(#LQ30-#LQ31) m3	EWKS BF MACHINE10	m³	81.000	42.836	1,496	36	1,937		3,470
33	3. Piers, 3No 1200mm dia									
34	EE formula - =(3*1.130*6.0*2) m3 Allowed 3N0 @ 1.130m3/m, typically 6.0m height	CONC PIERS	m³	40.680	1,750.000				71,190	71,190
35	4. Headstocks									
36	EE formula - =(13*1.2*1.2*2) m3	CONC DIAPHRAGMS	m³	37.440	3,300.000				123,552	123,552
37	5. Bearings									
38	EE formula - =(6*2) each	BRIDGE BEARING ELASTO	each	12.000	1,500.000		18,000			18,000
39	EE formula - =(#LQ38) each	BRIDGE BEARING ELASTO INS	each	12.000	3,771.249	6,285	38,520	450		45,255
40	EE formula - =(13*2*2) m Bearing strip under girders on headstocks	BRIDGE BNGS200	m	52.000	76.800		3,994			3,994
41	EE formula - =(#LQ40*2/10) hr Install bearing strips	LAB CIVIL	hr	10.400	55.510	577				577
42	EE formula - =st(26:41,#QTY) m2				514.351	6,862	60,514	450	330,282	398,108
43										
44	C. Deck beams									
45	1. Supply beams									
46	EE formula - =(#LQ13*6*0.490) m3 Allowed 1200mm depth Super Tee @ 0.490m3/m	BRIDGE PSC BEAMS	m³	176.400	1,600.000		282,240			282,240
47	EE formula - =(#LQ46) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	176.400	1,520.000		268,128			268,128
48	2. Install beams									
49	EE formula - =(18*1.5) each	CR 200T MOB	each	27.000	15,000.000			405,000		405,000
50	EE formula - =(roundup(18/5)*10) hr Allowed to install 5No per day in 10hr	CR 200T	hr	40.000	625.000			25,000		25,000
51	EE formula - =(#LQ50*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	200.000	58.950	11,790				11,790

52	EE formula - =(10000) Allowance temporary materials	MISC MAT	Item	10,000.000	1.000		10,000		10,000
53	EE formula - =st(44:48,#QTY) m2				346.419		268,128		268,128
54									
55	D. Completion of superstructure								
56	1. Insitu deck								
57	EE formula - =(#LQ13*#LQ14*0.2) m3	CONC DECK	m³	154.800	1,150.000			178,020	178,020
58	2. Edge barriers								
59	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	20.000	9,600.000			192,000	192,000
60	3. Railings								
61	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	120.000	500.000		60,000		60,000
62	4. Expansion joints								
63	EE formula - =(13*2*2) m	EXPANSION JOINT	m	52.000	600.000			31,200	31,200
64	5. Approach slabs								
65	EE formula - =(2*13*0.3) m3	CONC RUN ON SLAB	m³	7.800	1,265.000			9,867	9,867
66	6. SAMI seal								
67	EE formula - =(#LQ13*13.0) m2	A BRIDGE SAMI	m²	780.000	10.000			7,800	7,800
68	7. Wearing coarse 75mm thk								
69	EE formula - =(#LQ13*13.0*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	140.400	220.000			30,888	30,888
70	8. Stone pitching to abutment embankments								
71	EE formula - =(285*2*0.5*2.4*1.2) tonne Allowed 285m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste	QAR STONE PITCHING	tonne	820.800	40.000		32,832		32,832
72	EE formula - =(285*2) m2	STONE PITCHING	m²	570.000	100.000			57,000	57,000
73	EE formula - =((285*2)/50/5) m2wk Allowed 50m2 per day	SCAFFOLD	m2wk	2.280	15.000		34		34
74	9. End walls								
75	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000			18,000	18,000
76	10. Backfill at abutments								
77	EE formula - =(2*13*4*2.8*0.5) m3	EWKS BF HPLACE	m³	145.600	45.640	4,105	21	2,418	102	6,645
78	11. Safety screens								
79	EE formula - =(#LQ13*2.0*2) m Allowed 2.0m height	SAFETY MESH	m²	240.000	250.000			60,000	60,000
80	12. Deck stormwater drainage - Both sides								
81	EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	120.000	350.000			42,000	42,000
82	EE formula - =(2*5000) Allowance connections	MISC SCON	Item	10,000.000	1.000			10,000	10,000
83	EE formula - =st(55:82,#QTY) m2				951.274	4,105	92,887	2,418	636,877	736,286
84									
85	Estimated Duration								
86	EE formula - =(35*3) Days Allowed 35days per span, Assume single crew			105.000					
					3,110.508	**24,909**	**665,738**	**435,927**	**1,280,959**	**2,407,533**

Line No 85	**Berry Bridge Viaduct Chg 16065**				
Item No 10950		**m2**	**15,795.000**	**Contributing**	
1	10950 Berry Bridge Viaduct Chg 16065				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				

5	NOTE: North & South bound carraigeways of viaduct have different lengths 610m & 590m respectively									
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket									
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat									
8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span									
9	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 32m									
10	NOTE: RSW will be required at abutments - refer to item 10980									
11	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor									
12										
13	EE formula - =(20400-7600) m Total corridor length			12,800.000						
14	EE formula - =(((16360-15750)+(16360-15770))/2) m Length Viaduct			600.000						
15	EE formula - =(26.0) m Viaduct deck width			26.000						
16	EE formula - =(18+19) each No spans			37.000						
17										
18	A. Piling									
19	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
20	EE formula - =((18+19)*(6+3)*2) m Length of 1200mm dia bored piles @ 6m/each			666.000						
21	EE formula - =((600*10.0)+(19*26)) m2 Allowed for single side of bridge, width 10m	TEMPROAD	m²	6,494.000	10.616	6,988	52,016	9,933		68,937
22	EE formula - =(18+19) each Allowed 15x15m	ACCESS PAD	each	37.000	30,000.000				1,110,000	1,110,000
23	EE formula - =(#LQ19) m	PILE 900	m	210.000	900.000				189,000	189,000
24	EE formula - =(#LQ20) m	PILE 1200	m	666.000	1,200.000				799,200	799,200
25	EE formula - =((#LQ23*0.221)+(#LQ24*0.295)) tonne Allowed 221kg/m for 900mm dia and 295kg/m for 1200mm dia piles respectively	PILE CASING PERM	tonne	242.880	3,500.000		850,080			850,080
26	EE formula - =st(18:24,#QTY) m2				137.204	6,988	52,016	9,933	2,098,200	2,167,137
27										
28	B. Substructure									
29	1. Abutments									
30	EE formula - =(((23*1.5*1.5)+(23*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	144.360	1,500.000				216,540	216,540
31	2. Pile caps - Amended design N/A									
32	EE formula - =((18+19)*(5*5*1.5)) m3 Detailed excavation	EWKS DETAILED	m³	1,387.500	46.504	33,009		31,516		64,525
33	EE formula - =((18+19)*(3.5*3.5*1.5)) m3	CONC PILE CAP	m³	679.875	1,500.000				1,019,813	1,019,813
34	EE formula - =(#LQ32-#LQ33) m3	EWKS BF MACHINE10	m³	707.625	42.836	13,073	318	16,920		30,312
35	3. Piers, 3No 120mm dia									
36	EE formula - =((18+19)*(3*1.130*4.5)) m3 Allowed 3No @ 1.130m3/m, typically 4.5m height	CONC PIERS	m³	564.435	1,750.000				987,761	987,761
37	4. Headstocks									
38	EE formula - =((18+19)*(17.25*1.5)) m3	CONC HEADSTOCKS	m³	957.375	2,500.000				2,393,438	2,393,438
39	5. Diaphragms, end blocks									

40	EE formula - =(((25*1.5)-(13*1.276))*1*41) m3	CONC DIAPHRAGMS	m³	857.392	3,300.000				2,829,394	2,829,394
41	6. Bearings									
42	EE formula - =((18+19)*(6*2)) each	BRIDGE BEARING ELASTO	each	444.000	1,500.000		666,000			666,000
43	EE formula - =(#LQ42) each	BRIDGE BEARING ELASTO INS	each	444.000	3,771.249	232,546	1,425,240	16,648		1,674,435
44	EE formula - =st(28:41,#QTY) m2				406.909				6,427,132	6,427,132
45										
46	C. Deck beams									
47	1. Supply beams									
48	EE formula - =(#LQ14*12*0.581) m3 Allowed 1500mm depth Super Tee @ 0.581m3/m	BRIDGE PSC BEAMS	m³	4,183.200	1,600.000		6,693,120			6,693,120
49	EE formula - =(#LQ48) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	4,183.200	1,520.000		6,358,464			6,358,464
50	2. Install beams									
51	EE formula - =(20*1.5) each	CR 400T MOB	each	30.000	21,000.000			630,000		630,000
52	EE formula - =(roundup(222/5)*10) hr Allowed to install 5No per day in 10hr	CR 400T	hr	450.000	1,100.000			495,000		495,000
53	EE formula - =(#LQ52*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	2,250.000	58.950	132,638				132,638
54	EE formula - =(4*10*(18+19)) hr Allow 4Men @ 10hr per span install temporary handrails	LAB CIVIL	hr	1,480.000	55.510	82,155				82,155
55	EE formula - =(#LQ54/40) week temporary handrails, 40wk per week	BOOMLIFT	week	37.000	1,278.000			47,286		47,286
56	EE formula - =(100000) Allowance temporary materials	MISC MAT	Item	100,000.000	1.000		100,000			100,000
57	EE formula - =st(46:50,#QTY) m2				402.562		6,358,464			6,358,464
58										
59	D. Completion of superstructure									
60	1. Insitu deck									
61	EE formula - =(#LQ14*26*0.2) m3	CONC DECK	m³	3,120.000	1,150.000				3,588,000	3,588,000
62	2. Central median barriers									
63	EE formula - =roundup(#LQ14*2/6) m Supplied in 6m lengths	PC MEDIAN	each	200.000	10,500.000				2,100,000	2,100,000
64	3. Edge barriers									
65	EE formula - =roundup(#LQ14*2/6) m Supplied in 6m lengths	PC PARAPETS	each	200.000	9,600.000				1,920,000	1,920,000
66	4. Railings									
67	EE formula - =(#LQ14*2) m	BRIDGE BARRIER	m	1,200.000	500.000		600,000			600,000
68	5. Expansion joints									
69	EE formula - =(13*2*2) m	EXPANSION JOINT	m	52.000	600.000				31,200	31,200
70	6. Approach slabs									
71	EE formula - =((4*13*0.3)*2) m3	CONC RUN ON SLAB	m³	31.200	1,265.000				39,468	39,468
72	7. SAMI seal									
73	EE formula - =(#LQ14*11.5*2) m2	A BRIDGE SAMI	m²	13,800.000	10.000				138,000	138,000
74	8. Wearing coarse 75mm thk									
75	EE formula - =(#LQ14*11.5*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	1,242.000	220.000				273,240	273,240
76	9. Stone pitching to abutment embankments									
77	EE formula - =(230*2*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste	QAR STONE PITCHING	tonne	662.400	40.000		26,496			26,496
78	EE formula - =(230*2) m2	STONE PITCHING	m²	460.000	100.000				46,000	46,000
79	EE formula - =((230*2)/50/5) m2wk Allowed 50m2 per day	SCAFFOLD	m2wk	1.840	15.000		28			28

80	10. End walls									
81	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000				18,000	18,000
82	11. Backfill at abutments									
83	EE formula - =(2*23*4*3*0.5) m3	EWKS BF HPLACE	m³	276.000	45.640	7,781	39	4,583	193	12,597
84	12. Deck stormwater drainage - Both sides									
85	EE formula - =(#LQ14*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	1,200.000	350.000				420,000	420,000
86	EE formula - =((18+19+2)*5000) Allowance connections	MISC SCON	Item	195,000.000	1.000				195,000	195,000
87	EE formula - =st(59:86,#QTY) m2				595.633	7,781	626,563	4,583	8,769,101	9,408,028
88										
89	Estimated Duration									
90	EE formula - =(35*20/2) Days Allowed 35days per span, Assume 2No crews			350.000						
					1,838.452	**462,108**	**10,078,363**	**1,203,451**	**17,294,434**	**29,038,355**

Line No 86	**Kangaroo Valley Road Overbridge Chg 17680**									
Item No 10960			**m2**	**1,045.000**		**Contributing**				
1	10960 - Kangaroo Valley Road Overbridge Chg 17680									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Three span simply supported two lane overbridge									
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket									
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat									
8	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span									
9	NOTE: Assume Girders 1.2m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 18m									
10	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor									
11										
12	EE formula - =(20400-7600) m Total corridor length			12,800.000						
13	EE formula - =(55) m Length bridge			55.000						
14	EE formula - =(19.0) m Deck width			19.000						
15										
16	A. Piling									
17	EE formula - =(6*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			180.000						
18	EE formula - =(3*(6+3)*2) m Length of 1200mm dia bored piles @ 6m/each			54.000						
19	EE formula - =(2*100*10) m2 Allowed for 100m road either side of bridge, width 10m	TEMPROAD	m²	2,000.000	10.616	2,152	16,020	3,059		21,231
20	EE formula - =(2) each Allowed 15x15m	ACCESS PAD	each	2.000	30,000.000				60,000	60,000
21	EE formula - =(#LQ17) m	PILE 900	m	180.000	900.000				162,000	162,000
22	EE formula - =(#LQ18) m	PILE 1200	m	54.000	1,200.000				64,800	64,800

23	EE formula - =((#LQ21*0.221)+(#LQ22*0.295)) tonne Allowed 221kg/m for 900mm dia and 295kg/m for 1200mm dia piles respectively	PILE CASING PERM	tonne	55.710	3,500.000		194,985			194,985
24	EE formula - =st(16:23,#QTY) m2				481.355	2,152	211,005	3,059	286,800	503,016
25										
26	B. Substructure									
27	1. Abutments									
28	EE formula - =(((19*1.5*1.5)+(19*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	122.760	1,500.000				184,140	184,140
29	2. Pile caps									
30	EE formula - =(2*(5*20.5*1.5)) m3 Detailed excavation	EWKS DETAILED	m³	307.500	46.504	7,315		6,985		14,300
31	EE formula - =(2*(3.5*19.0*1.5)) m3	CONC PILE CAP	m³	199.500	1,500.000				299,250	299,250
32	EE formula - =(#LQ30-#LQ31) m3	EWKS BF MACHINE10	m³	108.000	42.836	1,995	49	2,582		4,626
33	3. Piers, 3No 1200mm dia									
34	EE formula - =(2*3*1.130*3.5) m3 Allowed 2No with 3No @ 1.130m3/m, typically 3.5m height	CONC PIERS	m³	23.730	1,750.000				41,528	41,528
35	4. Headstocks									
36	EE formula - =(19*1.2*1.2*2) m3	CONC DIAPHRAGMS	m³	54.720	3,300.000				180,576	180,576
37	5. Bearings									
38	EE formula - =(9*2) each	BRIDGE BEARING ELASTO	each	18.000	1,500.000		27,000			27,000
39	EE formula - =(#LQ38) each	BRIDGE BEARING ELASTO INS	each	18.000	3,771.249	9,428	57,780	675		67,882
40	EE formula - =(19*2*2) m Bearing strip under girders on headstocks	BRIDGE BNGS200	m	76.000	76.800		5,837			5,837
41	EE formula - =(#LQ40*2/10) hr Install bearing strips	LAB CIVIL	hr	15.200	55.510	844				844
42	EE formula - =st(26:41,#QTY) m2				790.414	19,582	90,665	10,242	705,494	825,983
43										
44	C. Deck beams									
45	1. Supply beams									
46	EE formula - =(#LQ13*9*0.490) m3 Allowed 1200mm depth Super Tee @ 0.490m3/m	BRIDGE PSC BEAMS	m³	242.550	1,600.000		388,080			388,080
47	EE formula - =(#LQ46) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	242.550	1,520.000		368,676			368,676
48	2. Install beams									
49	EE formula - =(27*1.5) each	CR 200T MOB	each	40.500	15,000.000			607,500		607,500
50	EE formula - =(roundup(27/5)*10) hr Allowed to install 5No per day in 10hr	CR 200T	hr	60.000	625.000			37,500		37,500
51	EE formula - =(#LQ50*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	300.000	58.950	17,685				17,685
52	EE formula - =(10000) Allowance temporary materials	MISC MAT	Item	10,000.000	1.000		10,000			10,000
53	EE formula - =st(44:48,#QTY) m2				352.800		368,676			368,676
54										
55	D. Completion of superstructure									
56	1. Insitu deck									
57	EE formula - =(#LQ13*26*0.2) m3	CONC DECK	m³	286.000	1,150.000				328,900	328,900
58	2. Edge barriers									
59	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	19.000	9,600.000				182,400	182,400
60	3. Median barrier									
61	EE formula - =roundup(#LQ13/6) m Supplied in 6m lengths	PC MEDIAN	each	10.000	10,500.000				105,000	105,000

62	4. Railings									
63	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	110.000	500.000		55,000			55,000
64	5. Expansion joints									
65	EE formula - =(13*2*2) m	EXPANSION JOINT	m	52.000	600.000				31,200	31,200
66	6. Approach slabs									
67	EE formula - =(2*19*0.3) m3	CONC RUN ON SLAB	m^3	11.400	1,265.000				14,421	14,421
68	7. SAMI seal									
69	EE formula - =(#LQ13*18.0) m2	A BRIDGE SAMI	m^2	990.000	10.000				9,900	9,900
70	8. Wearing coarse 75mm thk									
71	EE formula - =(#LQ13*18.0*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	178.200	220.000				39,204	39,204
72	9. Stone pitching to abutment embankments									
	EE formula - =(400*2*0.5*2.4*1.2) tonne Allowed 285m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste									
73		QAR STONE PITCHING	tonne	1,152.000	40.000		46,080			46,080
74	EE formula - =(400*2) m2	STONE PITCHING	m^2	800.000	100.000				80,000	80,000
	EE formula - =((400*2)/50/5) m2wk Allowed 50m2 per day									
75		SCAFFOLD	m2wk	3.200	15.000		48			48
76	10. End walls									
77	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m^3	12.000	1,500.000				18,000	18,000
78	11. Backfill at abutments									
79	EE formula - =(2*19*4*2.8*0.5) m3	EWKS BF HPLACE	m^3	212.800	45.640	5,999	30	3,533	149	9,712
80	12. Safety screens									
81	EE formula - =(#LQ13*2.0*2) m Allowed 2.0m height	SAFETY MESH	m^2	220.000	250.000				55,000	55,000
82	13. Footpaths and median paving on bridge deck									
83	EE formula - =((3.0+1.5+1.5)*#LQ13) m2	CONC FOOTPATHS	m^2	330.000	15.000				4,950	4,950
84	14. Deck stormwater drainage - Both sides									
85	EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	110.000	350.000				38,500	38,500
86	EE formula - =(2*5000) Allowance connections	MISC SCON	Item	10,000.000	1.000				10,000	10,000
87	EE formula - =st(55:86,#QTY) m2				984.034	5,999	101,158	3,533	917,624	1,028,315
88										
89	Estimated Duration									
90	EE formula - =(35*3) Days Allowed 35days per span, Assume single crew			105.000						
					3,252.321	**45,418**	**781,504**	**661,835**	**1,909,917**	**3,398,675**

Line No 87	**Drainage structure No1 Underbridge Chg 19400**				
Item No 10970a		**m2**	**1,040.000**	**Contributing**	
1	10970a - Drainage structure No1 Underbridge Chg 19400				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				
5	NOTE: Single span simply supported bridge, currently no details provided, assume similar to Toolijooa Road				
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket				
7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat				

	NOTE: Allow 1No crane mobilisation to site per bridge span. Allow a further 50% mobilisation costs for move on site									
8	between piers eg. 2No setups per span									
	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m									
9	depth, Parapet Wall 0.8m high & Spans of 35m									
	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by									
10	subcontractor									
11										
12	EE formula - =(20400-7600) m Total corridor length			12,800.000						
13	EE formula - =(40) m Length bridge deck			40.000						
14	EE formula - =(26.0) m Deck width			26.000						
15										
16	A. Piling									
17	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
18	EE formula - =((32*10.0)+(1*26)) m2 Allowed for single side of bridge, width 10m	TEMPROAD	m²	346.000	10.616	372	2,771	529		3,673
19	EE formula - =(2) each Allowed 15x15m	ACCESS PAD	each	2.000	30,000.000				60,000	60,000
20	EE formula - =(#LQ17) m	PILE 900	m	210.000	900.000				189,000	189,000
21	EE formula - =(#LQ20*0.221) tonne Allowed 221kg/m for 900mm dia pile	PILE CASING PERM	tonne	46.410	3,500.000		162,435			162,435
22	EE formula - =st(16:21,#QTY) m2				399.142	372	165,206	529	249,000	415,108
23										
24	B. Substructure									
25	1. Abutments									
26	EE formula - =(((23*1.5*1.5)+(23*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	144.360	1,500.000				216,540	216,540
27	2. Diaphragms, end blocks									
28	EE formula - =(((25*1.5)-(13*1.276))*1*2) m3	CONC DIAPHRAGMS	m³	41.824	3,300.000				138,019	138,019
29	3. Bearings									
30	EE formula - =(13*2) each	BRIDGE BEARING ELASTO	each	26.000	1,500.000		39,000			39,000
31	EE formula - =(#LQ30) each	BRIDGE BEARING ELASTO INS	each	26.000	3,771.249	13,618	83,460	975		98,052
32	EE formula - =st(24:31,#QTY) m2				472.704	13,618	122,460	975	354,559	491,612
33										
34	C. Deck beams									
35	1. Supply beams									
36	EE formula - =(#LQ13*13*0.581) m3 Allowed 1500mm depth Super Tee @ 0.581m3/m	BRIDGE PSC BEAMS	m³	302.120	1,600.000		483,392			483,392
37	EE formula - =(#LQ36) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	302.120	1,520.000		459,222			459,222
38	2. Install beams									
39	EE formula - =(1*1.5) each	CR 200T MOB	each	1.500	15,000.000			22,500		22,500
40	EE formula - =((roundup(13/5))*10) hr Allowed to install 5No per day in 10hr	CR 200T	hr	30.000	625.000			18,750		18,750
41	EE formula - =(#LQ40*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	150.000	58.950	8,843				8,843
42	EE formula - =(25000) Allowance temporary materials	MISC MAT	Item	25,000.000	1.000		25,000			25,000
43	EE formula - =st(34:38,#QTY) m2				441.560		459,222			459,222
44										
45	D. Completion of superstructure									
46	1. Insitu deck									

47	EE formula - =(#LQ13*26*0.2) m3	CONC DECK	m³	208.000	1,150.000				239,200	239,200
48	2. Central median barriers									
49	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC MEDIAN	each	14.000	10,500.000				147,000	147,000
50	3. Edge barriers									
51	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	14.000	9,600.000				134,400	134,400
52	4. Railings									
53	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	80.000	500.000		40,000			40,000
54	5. Expansion joints									
55	EE formula - =(26*2) m	EXPANSION JOINT	m	52.000	600.000				31,200	31,200
56	6. Approach slabs									
57	EE formula - =(2*26*0.3) m3	CONC RUN ON SLAB	m³	15.600	1,265.000				19,734	19,734
58	7. SAMI seal									
59	EE formula - =(#LQ13*11.5*2) m2	A BRIDGE SAMI	m²	920.000	10.000				9,200	9,200
60	8. Wearing coarse 75mm thk									
61	EE formula - =(#LQ13*11.5*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	82.800	220.000				18,216	18,216
62	9. Stone pitching to abutment embankments									
63	EE formula - =(230*2*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste	QAR STONE PITCHING	tonne	662.400	40.000		26,496			26,496
64	EE formula - =(230*2) m2	STONE PITCHING	m²	460.000	100.000				46,000	46,000
65	EE formula - =((230*2)/50/5) m2wk Allowed 50m2 per day	SCAFFOLD	m2wk	1.840	15.000		28			28
66	10. End walls									
67	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000				18,000	18,000
68	11. Backfill at abutments									
69	EE formula - =(2*23*4*3*0.5) m3	EWKS BF HPLACE	m³	276.000	45.640	7,781	39	4,583	193	12,597
70	12. Deck stormwater drainage - Both sides									
71	EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	80.000	350.000				28,000	28,000
72	EE formula - =(2*5000) Allowance connections	MISC SCON	Item	10,000.000	1.000				10,000	10,000
73	EE formula - =st(45:72,#QTY) m2				750.067	7,781	66,563	4,583	701,143	780,070
74										
75	Estimated Duration									
76	EE formula - =(3*20) Days Allowed 3months per span			60.000						
					2,135.678	**30,613**	**838,452**	**47,337**	**1,304,702**	**2,221,105**

Line No 88	**Drainage structure No2 Underbridge Chg 19800**				
Item No 10970b		**m2**	**780.000**	**Contributing**	
1	10970b - Drainage structure No2 Underbridge Chg 19800				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-BR-0100 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				
5	NOTE: Single span simply supported bridge, currently no details provided, assume similar to Toolijooa Road				
6	NOTE: Assume bored pile required 1:1 embedded vs retainied, end bearing on rock below NSL 3m rock socket				

7	NOTE: Assume piling equipment of pile rig, 50t crawler crane, 20t rough terrain crane & bobcat NOTE: Allow 1No crane mobilisation to site per bridge span.									
8	Allow a further 50% mobilisation costs for move on site between piers eg. 2No setups per span									
9	NOTE: Assume Girders 1.5m depth, Supporting Deck 0.3m depth, Parapet Wall 0.8m high & Spans of 30m									
10	NOTE: Assumed currently that precast beams will be precast On Site. Risk exists for Off Site precast operation by subcontractor									
11										
12	EE formula - =(20400-7600) m Total corridor length			12,800.000						
13	EE formula - =(30) m Length bridge deck			30.000						
14	EE formula - =(26.0) m Deck width			26.000						
15										
16	A. Piling									
17	EE formula - =(7*2*(6+6+3)) m Length of 900mm dia bored piles @ 15m/each			210.000						
18	EE formula - =((32*105.0)+(1*26)) m2 Allowed for single side of bridge, width 10m	TEMPROAD	m²	3,386.000	10.616	3,644	27,121	5,179		35,944
19	EE formula - =(2) each Allowed 15x15m	ACCESS PAD	each	2.000	30,000.000				60,000	60,000
20	EE formula - =(#LQ17) m	PILE 900	m	210.000	900.000				189,000	189,000
21	EE formula - =(#LQ20*0.221) tonne Allowed 221kg/m for 900mm dia pile	PILE CASING PERM	tonne	46.410	3,500.000		162,435			162,435
22	EE formula - =st(16:21,#QTY) m2				573.563	3,644	189,556	5,179	249,000	447,379
23										
24	B. Substructure									
25	1. Abutments									
26	EE formula - =(((23*1.5*1.5)+(23*1.5*0.3)+(1.5*1.2*0.3*2)+(15*0.3*2))*2) m3	CONC ABUTMENT	m³	144.360	1,500.000				216,540	216,540
27	2. Diaphragms, end blocks									
28	EE formula - =(((25*1.5)-(13*1.276))*1*2) m3	CONC DIAPHRAGMS	m³	41.824	3,300.000				138,019	138,019
29	3. Bearings									
30	EE formula - =(13*2) each	BRIDGE BEARING ELASTO	each	26.000	1,500.000		39,000			39,000
31	EE formula - =(#LQ30) each	BRIDGE BEARING ELASTO INS	each	26.000	3,771.249	13,618	83,460	975		98,052
32	EE formula - =st(24:31,#QTY) m2				630.271	13,618	122,460	975	354,559	491,612
33										
34	C. Deck beams									
35	1. Supply beams									
36	EE formula - =(#LQ13*13*0.581) m3 Allowed 1500mm depth Super Tee @ 0.581m3/m	BRIDGE PSC BEAMS	m³	226.590	1,600.000		362,544			362,544
37	EE formula - =(#LQ36) m3 Onsite precast facility	BRIDGE OS BEAMS	m³	226.590	1,520.000		344,417			344,417
38	2. Install beams									
39	EE formula - =(1*1.5) each	CR 200T MOB	each	1.500	15,000.000			22,500		22,500
40	EE formula - =((roundup(13/5))*10) hr Allowed to install 5No per day in 10hr	CR 200T	hr	30.000	625.000			18,750		18,750
41	EE formula - =(#LQ40*5) hr Allowed 5No men, 10hr per day	LAB RIGGER	hr	150.000	58.950	8,843				8,843
42	EE formula - =(25000) Allowance temporary materials	MISC MAT	Item	25,000.000	1.000		25,000			25,000
43	EE formula - =st(34:38,#QTY) m2				441.560		344,417			344,417
44										

45	D. Completion of superstructure								
46	1. Insitu deck								
47	EE formula - =(#LQ13*26*0.2) m3	CONC DECK	m³	156.000	1,150.000			179,400	179,400
48	2. Central median barriers								
49	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC MEDIAN	each	10.000	10,500.000			105,000	105,000
50	3. Edge barriers								
51	EE formula - =roundup(#LQ13*2/6) m Supplied in 6m lengths	PC PARAPETS	each	10.000	9,600.000			96,000	96,000
52	4. Railings								
53	EE formula - =(#LQ13*2) m	BRIDGE BARRIER	m	60.000	500.000		30,000		30,000
54	5. Expansion joints								
55	EE formula - =(26*2) m	EXPANSION JOINT	m	52.000	600.000			31,200	31,200
56	6. Approach slabs								
57	EE formula - =(2*26*0.3) m3	CONC RUN ON SLAB	m³	15.600	1,265.000			19,734	19,734
58	7. SAMI seal								
59	EE formula - =(#LQ13*11.5*2) m2	A BRIDGE SAMI	m²	690.000	10.000			6,900	6,900
60	8. Wearing coarse 75mm thk								
61	EE formula - =(#LQ13*11.5*0.075*2.4) tonne	A BRIDGE AC10 OG	tonne	62.100	220.000			13,662	13,662
62	9. Stone pitching to abutment embankments								
63	EE formula - =(230*2*0.5*2.4*1.2) tonne Allowed 230m2 per abutment, 500mm thk, 2.4tonne/m3. 20% waste	QAR STONE PITCHING	tonne	662.400	40.000		26,496		26,496
64	EE formula - =(230*2) m2	STONE PITCHING	m²	460.000	100.000			46,000	46,000
65	EE formula - =((230*2)/50/5) m2wk Allowed 50m2 per day	SCAFFOLD	m2wk	1.840	15.000		28		28
66	10. End walls								
67	EE formula - =(6*4*0.5) m3	CONC ABUTMENT	m³	12.000	1,500.000			18,000	18,000
68	11. Backfill at abutments								
69	EE formula - =(2*23*4*3*0.5) m3	EWKS BF HPLACE	m³	276.000	45.640	7,781	39	4,583	193	12,597
70	12. Deck stormwater drainage - Both sides								
71	EE formula - =(#LQ13*2) m Allowed 375mm UPVC	BRIDGE DRAIN 375	m	60.000	350.000			21,000	21,000
72	EE formula - =(2*5000) Allowance connections	MISC SCON	Item	10,000.000	1.000			10,000	10,000
73	EE formula - =st(45:72,#QTY) m2				789.764	7,781	56,563	4,583	547,089	616,016
74									
75	Estimated Duration								
76	EE formula - =(3*20) Days Allowed 3months per span			60.000					
					2,531.431	**33,885**	**737,996**	**51,987**	**1,150,648**	**1,974,516**

Line No 89	**Reinforced Soil Walls**				
Item No 10980		**m2**	**1,400.000**	**Contributing**	
1	10980 Reinforced Soil Walls (RSW)				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				
5	NOTE: RSW will be required at abutments - refer to item 10950				

6	NOTE: Refer to file FBB Quantities .xlsx for details of quantities										
7	NOTE: Adopt allowance from Aecom - "Berry Nth interchange - 190m SB off-ramp & 90m NB on-ramp (approx 5m height)"										
8	NOTE: Rate for RSW Components has been increased to allow for potential architectural finish requirements to panel faces										
9											
10	EE formula - =(20400-7600) m Total corridor length			12,800.000							
11	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000							
12	EE formula - =((190+90)*5) m2 Wall face area			1,400.000							
13	EE formula - =((190*5)+(90*5)) m2 Foundation preparation area			1,400.000							
14	EE formula - =(190+90) m Length strip footing			280.000							
15	EE formula - =((190*5*5)+(90*5*5)) m3 Volume of select fill			7,000.000							
16											
17	A. Supply of components for RSW										
18	EE formula - =(#LQ12) m2	RSW COMPONENTS	m²	1,400.000	659.402	8,787	911,750	2,625		923,162	
19											
20	B. Preparation of foundation for RSW										
21	EE formula - =(#LQ13) m2	EWKS S/G250	m²	1,400.000	0.822	311		840		1,151	
22											
23	C. Base concrete strip footing										
24	EE formula - =(#LQ14) m	RSW FOOTING	m	280.000	70.911	14,025	5,605	37	189	19,855	
25											
26	D. RSW erection										
27	EE formula - =(#LQ12) m2	RSW ERECT	m²	1,400.000	118.551	99,441	4,200	62,330		165,971	
28											
29	E. RSW capping / Barrier										
30	EE formula - =(#LQ14) m	RSW CAPPING	m	280.000	75.000		21,000			21,000	
31											
32	F. RSW Imported / Select fill										
33	EE formula - =(#LQ15*2.2*1.1) tonne Allowed 2.2t/m3, 10% waste	QAR SELECT RSW	tonne	16,940.000	18.500		313,390			313,390	
34	EE formula - =(#LQ15) m3	RSW BACKFILL	m³	7,000.000	31.245	98,027	1,527	115,730	3,430	218,714	
35											
36	G. Other										
37	1. Dish drain										
38	EE formula - =(40+675) m	DRA DISH375	m	715.000	73.013	4,007	46,948	1,249		52,204	
39	2. Handrail										
40	EE formula - =(40+675) m	MONOWILS HANDRAIL	m	715.000	100.000				71,500	71,500	
41											
42	Estimated Duration										
43	EE formula - =(#LQ12/50) Days Allowed 50m2 per day			28.000							
					1,276.391	**224,598**	**1,304,420**	**182,811**	**75,119**	**1,786,948**	

Line No 93	**Local Roads - Pavement Type 1**				
Item No 11010		**m2**	**41,575.000**	**Contributing**	

	1	11010 Local roads - Pavement type 1						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
	4	Site visit photo: Nil						
	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities						
	6	NOTE: Allow to modify / repair existing road once new viaduct structure is constructed above						
	7	NOTE: Adopt allowance from Aecom - "Allow for Toolijooa Road, Austral Park Road, Tindalls Lane, Kangaroo Valley Road, Rawlings Lane & Victoria Street						
	8	NOTE: Allowed two seal atop 300mm thk DGB20 base layer						
	9							
	10	EE formula - =(10.5*200) m2 Area of repairs Woodhill Mountain Road			2,100.000			
	11	EE formula - =(39475) m2 Area of other local roads			39,475.000			
	12							
	13	EE formula - =(#LQ10+#LQ11) m2	RTA MINOR ROAD MODS	m²	41,575.000	80.000	3,326,000	3,326,000
	14							
	15	Estimated Duration						
	16	EE formula - =(#LQ13/1000) Days Allowed 1000m2 per day			41.575			
						80.000	**3,326,000**	**3,326,000**
Line No 94		**Local Roads - Repairs**						
Item No 11020				**m2**	**24,200.000**	**Contributing**		
	1	11020 Local roads - Repairs						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
	4	Site visit photo: Nil						
	5	NOTE: Allow for repair work to local roads, as per discussions at intermediate review 21/3/2012 + emails from R. Lyster 12/4/2012 & 23/4/2012						
	6	NOTE: Allow for typical width of 10m at the following locations: Length of Woodhill Mountain Road used by heavy construction equipment						
	7	NOTE: "Through Berry we only maintain the central 7m. The pavement in this area is of lesser quality than south of Berry, so is likely torequire a more substantial treatment. I would allow for 150mm asphalt replacement for the full length"						
	8							
	9	EE formula - =(7) m Width township			7.000			
	10	EE formula - =(10) m Width Princess Hwy			10.000			
	11	EE formula - =(2600) m Length of through Berry township			2,600.000			
	12	EE formula - =(0) m Length of Princess Hwy						
	13	EE formula - =(600) m Length of Existing Woodhill Mountain Road			600.000			
	14	EE formula - =(#LQ11*#LQ9) m2 Area of pavement to repair through Berry township			18,200.000			

	EE formula - =((#LQ12+#LQ13)*#LQ10) m2 Area of pavement to repair Princess Hwy			6,000.000				
	EE formula - =(#LQ14+#LQ15) m2 Total area			24,200.000				
	A. Dilapidation survey							
	EE formula - =(1.5) Allow 1.5mth	CONSULTANT	month	1.500	35,000.000		52,500	52,500
	B. Pavement repair							
	EE formula - =(#LQ14) m3 Pavement repair	RTA PAVE REPAIR HEAVY	m²	18,200.000	90.000		1,638,000	1,638,000
	EE formula - =(#LQ15*0.05) m2 Patching, Allow 5% of repair area	RTA PAVE REPAIR LIGHT	m²	300.000	100.000		30,000	30,000
	EE formula - =(#LQ15) m2 Resheeting, depth 50mm	RTA RESHEET50	m²	6,000.000	35.000		210,000	210,000
	Estimated Duration							
	EE formula - =(0) Days							
					79.773		**1,930,500**	**1,930,500**

Line No 98	**Urban Design**							
Item No 11110			**Item**	**1.000**		**Contributing**		
	11110 Urban Design							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Allow to provide hard landscaping structure at Berry (North) & Kangaroo Valley Road Interchanges							
	EE formula - =(50000*2) each Hard landscaping structure			100,000.000				
	EE formula - =(#LQ7) each	MISC SCON	Item	100,000.000	1.000		100,000	100,000
	Estimated Duration							
	EE formula - =(0) Days							
					100,000.000		**100,000**	**100,000**

Line No 99	**Landscaping**							
Item No 11120			**m2**	**76,800.000**		**Contributing**		
	11120 Landscaping							
	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	Site visit photo: Nil							
	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	NOTE: Adopt allowance from Aecom - "Allow for an average of 3m width each side of the highway to be landscaped"							

	8 EE formula - =(76800) m2 Landscaping area			76,800.000						
	9									
	10 EE formula - =(#LQ8) m2	LAND TURF SMALL	m²	76,800.000	28.000				2,150,400	2,150,400
	11 EE formula - =(#LQ8) m2	LAND REVEG	m²	76,800.000	35.000				2,688,000	2,688,000
	12 EE formula - =(#LQ8/20) m2 Allowed 1No per 20m2	LAND TREE 45LT	each	3,840.000	280.000				1,075,200	1,075,200
	13 EE formula - =st(10:12,#LQ8) m2				77.000				5,913,600	5,913,600
	14									
	15 Estimated Duration									
	16 EE formula - =(0) Days									
					77.000				**5,913,600**	**5,913,600**

Line No 100	**Vegetation**									
Item No 11130			**m2**	**76,800.000**		**Contributing**				
	1 11130 Vegetation									
	2 Spec: Nil									
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
	4 Site visit photo: Nil									
	5 NOTE: Refer to file FBB Quantities .xlsx for details of quantities NOTE: Adopt allowance from Aecom - Topsoil Batters and Medians "Allow for fill bater area plus full length of median"									
	6									
	7 NOTE: Adopt allowance from Aecom - Grass / Hydro "Assume same as the 'landscaped' area"									
	8									
	9 EE formula - =(104) wk Allowed maintenance duration			104.000						
	10 EE formula - =(189081) m2 Topsoil Batters and Medians			189,081.000						
	11 EE formula - =(76800) m2 Grass / Hydro			76,800.000						
	12									
	13 EE formula - =(#LQ10) m2 Topsoil import	EWKS TOPSOIL IMPORT	m²	189,081.000	13.639	81,385	2,247,027	151,141	99,268	2,578,820
	14 EE formula - =(#LQ10) m2 Ground preparation	LAND GP100	m²	189,081.000	0.350				66,178	66,178
	15 EE formula - =(#LQ11) m2	LAND HYDROMULCH	m²	76,800.000	2.500				192,000	192,000
	16 EE formula - =(#LQ11) m2	LAND HYDROSEEDING	m²	76,800.000	1.150				88,320	88,320
	17 EE formula - =(#LQ10*(#LQ9-26)/10000) ha	LAND MAINTAIN >26	wk/ha	1,474.832	470.000				693,171	693,171
	18 EE formula - =(#LQ10*26/10000) ha	LAND MAINTAIN <26	wk/ha	491.611	700.000				344,127	344,127
	19 EE formula - =st(13:18,#LQ12) m2					81,385	2,247,027	151,141	1,483,064	3,962,617
	20									
	21 Estimated Duration									
	22 EE formula - =(0) Days									
					51.597	**81,385**	**2,247,027**	**151,141**	**1,483,064**	**3,962,617**

Line No 104	**Demolition**									
Item No 11210			**Item**	**1.000**		**Contributing**				
	1 11210 Demolition									
	2 Spec: Nil									
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									

4	Site visit photo: Nil							
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
6	NOTE: Adopt allowance from Aecom - Kerbs "Assume no exisitng sections of highway or local road ared kerbed - hence no kerb demolition"							
7	NOTE: Adopt allowance from Aecom - Conc Pave "No existing concrete pavement to be removed"							
8	NOTE: Adopt allowance from Aecom - Guardrail / Barriers "Assume all of the barriers to be removed where on line widening. Nominal amount for off line. Assume 30% has barriers"							
9	NOTE: Adopt allowance from Aecom - Signs "Assume 3 signs per 500m (this will capture minor and major signage)"							
10	NOTE: Adopt allowance from Aecom - Commercial Properties "No commercial properties affected"							
11	NOTE: Adopt allowance from Aecom - Houses "23 houses are directly impacted and require demolition"							
12	NOTE: Adopt allowance from Aecom - Fences "Allow for 50% of the Project length to be removed"							
13	NOTE: Adopt allowance from Aecom - Pits / Headwalls "Approximately 8 existing cross drainage structures to remove mostlt pipe or small culvert"							
14	NOTE: Adopt allowance from Aecom - Pipework "Allow for removal of 25m of cross drainage pipework at each of the existing 8 cross drainage structures"							
15								
16	EE formula - =(1800*12) Guardrail / Barriers Allowed @ $12/m			21,600.000				
17	EE formula - =(77*100) Signs Allowed @ $100/each			7,700.000				
18	EE formula - =(23*14000) Houses Allowed @ $14k/house, assuming presence of asbestos			322,000.000				
19	EE formula - =(5700*12) Fences Allowed @ $12/m			68,400.000				
20	EE formula - =(8*475) Pits / Headwalls Allowed @ $475/each			3,800.000				
21	EE formula - =(200*70) Pipework Allowed @ $70/m			14,000.000				
22	EE formula - =(#LQ16+#LQ17+#LQ18+#LQ19+#LQ20+#LQ21) m3 Total Demolition value			437,500.000				
23								
24	EE formula - =(#LQ22) each	MISC SCON	Item	437,500.000	1.000		437,500	437,500
25								
26	Estimated Duration							
27	EE formula - =(0) Days							
					437,500.000		**437,500**	**437,500**

Line No 105	**Minor Concrete Works**				
Item No 11220		**Item**	**1.000**	**Contributing**	
1	11220 Minor Concrete Works				
2	Spec: Nil				
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801				
4	Site visit photo: Nil				

	NOTE: Refer to file FBB Quantities .xlsx for details of							
5	quantities							
6	NOTE: Allow to provide traffic island infills + kerb & gutter							
	NOTE: Adopt allowance from Aecom - Kerbing SO							
7	"Extracted directly from 12d model (SO in cuts only)"							
	NOTE: Adopt allowance from Aecom - Kerbing Type SF "Not							
8	applicable"							
	NOTE: Adopt allowance from Aecom - "Allow 500m for local							
9	road intersections"							
10								
11	EE formula - =(2500) m2 Traffic Island infill			2,500.000				
12	EE formula - =(3500) m K&G type SA			3,500.000				
13	EE formula - =(0) m K&G type SF							
14	EE formula - =(10900) m K&G type SO			10,900.000				
15								
16	EE formula - =(#LQ11) each	RTA INFILL CONC	m^2	2,500.000	50.000		125,000	125,000
17	EE formula - =(#LQ12) m	RTA K&G SA	m	3,500.000	45.000		157,500	157,500
18	EE formula - =(#LQ13) m	RTA K&G SF	m		25.000			
19	EE formula - =(#LQ14) m	RTA K&G SO	m	10,900.000	112.500		1,226,250	1,226,250
20								
21	Estimated Duration							
22	EE formula - =((#LQ12+#LQ13+#LQ14)/1000) Days Allowed 1000m per day			14.400				
					1,508,750.000		**1,508,750**	**1,508,750**

Line No 106	**UPVC Ducts**							
Item No 11230			**m**	**11,700.000**		**Contributing**		
1	11230 UPVC Duct							
2	Spec: Nil							
	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-							
3	02-BR-0801							
4	Site visit photo: Nil							
	NOTE: Allow for four 150mm dia conduit for length of road							
5	corridor for ITS system							
6								
7	EE formula - =(20400-7600) m Total corridor length			12,800.000				
	EE formula - =(32+122+76+200+600+40+30) m Length							
8	bridges & Viaduct			1,100.000				
9	EE formula - =(#LQ7-#LQ8) m Duct length			11,700.000				
10								
11	EE formula - =(#LQ9*4) m	RTA CONDUIT 150	m	46,800.000	30.000		1,404,000	1,404,000
12								
13	Estimated Duration							
14	EE formula - =(0) Days							
					120.000		**1,404,000**	**1,404,000**

Line No 107	**Guide Posts**							
Item No 11240			**each**	**781.000**		**Contributing**		
1	11240 Guide Posts							

2	Spec: Nil						
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
4	Site visit photo: Nil						
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities						
6	NOTE: Adopt allowance from Aecom - "Allow for 1 every 30m both sides for full length"						
7							
8	EE formula - =(20400-7600) m Total corridor length			12,800.000			
9	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000			
10	EE formula - =roundup((#LQ8-#LQ9)*2/30) each Guide Posts			781.000			
11							
12	EE formula - =(#LQ10) m	RF GUIDE POSTS	each	781.000	25.000	19,525	19,525
13							
14	Estimated Duration						
15	EE formula - =(0) Days						
					25.000	**19,525**	**19,525**

Line No 108	**Safety Barriers**						
Item No 11250			**m**	**30,200.000**	**Contributing**		
1	11250 Safety Barrier						
2	Spec: Nil						
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
4	Site visit photo: Nil						
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities						
6	NOTE: Adopt allowance from Aecom - Wire Rope Barrier "Extracted directly from 12d model (median and fills > 1.5m). Preference is for wire rope. Assume 500m @ Toolijooa, 1000m @ Austral Pk Rd, 200m @ rest area, 1000m @ Tindalls, 1000m @ Berry Nth, 4000m @ KVR & 300m @ Huntingdale"						
7	NOTE: Adopt allowance from Aecom - Guardrail						
8	NOTE: Adopt allowance from Aecom - Type 'F' Barrier " Assume nominal amount where deflection is an issue" MOTE: Adopt allowance from Aecom - Special Barrier on RSS Wall " RSS walls have not been included at this point"						
9							
10							
11	EE formula - =(20400-7600) m Total corridor length			12,800.000			
12	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000			
13	EE formula - =(21300) m Wire Rope Barrier length			21,300.000			
14	EE formula - =(7*2) each Anchor blocks			14.000			
15	EE formula - =(8500) m Guard Rail length			8,500.000			
16	EE formula - =(10*4) each Trie Beam terminals Allowed 4No per structure			40.000			
17	EE formula - =(10*4) each ET terminals Allowed 4No per structure			40.000			

18	EE formula - =(400) m Type 'F' Barrier length			400.000						
19	EE formula - =(0) m Special Barrier on RSS Wall length									
20										
21	EE formula - =(#LQ13) m	RF WR SUPPLY 3S	m	21,300.000	93.000		1,980,900			1,980,900
22	EE formula - =(#LQ13) m	RF WR FENCE 3S	m	21,300.000	17.000				362,100	362,100
23	EE formula - =(#LQ14) each	RF WR ANCHOR3S	each	14.000	390.000		5,460			5,460
24	EE formula - =(#LQ15) m	RF WBEAM	m	8,500.000	100.000		850,000			850,000
25	EE formula - =(#LQ15) m	RF WBEAM INS	m	8,500.000	35.000				297,500	297,500
26	EE formula - =(16) each	RF WBEAM ET	each	16.000	2,000.000		32,000			32,000
27	EE formula - =(16) each	RF TRIE BEAM	each	16.000	1,140.000		18,240			18,240
28	EE formula - =(#LQ18) m	BARRIER NJB	m	400.000	195.700		78,280			78,280
29	EE formula - =(#LQ18*2*10/25) hr Allowed 2No men, 25m per day, 10hr per day	LAB CIVIL	hr	320.000	55.510	17,763				17,763
30	EE formula - =(#LQ18/24/5) week Allowed 24m per day, 5days per week	TK CR/12T	week	3.333	1,347.570			4,492		4,492
31										
32	Estimated Duration									
33	EE formula - =(0) Days									
					120.753	**17,763**	**2,964,880**	**4,492**	**659,600**	**3,646,735**

Line No 109	**Pavement Markings**									
Item No 11260			**Item**	**1.000**		**Contributing**				
1	11260 Pavement Markings									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Adopt allowance from Aecom - Linemark - lines "Assume 6 times length of project + 20% for existing road, ramps and local roads"									
7	NOTE: Adopt allowance from Aecom - Linemark - Arrows/Sym " Assume 3 arows per ramp (12 ramps)" NOTE: Adopt allowance from Aecom - Linemark - Chevrons " Allow 50m2 per ramp of interchange (12 ramps)"									
8										
9										
10	EE formula - =(20400-7600) m Total corridor length			12,800.000						
11	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000						
12	EE formula - =(#LQ10) m Length linemark			12,800.000						
13	EE formula - =(3*12) each Arrows / Symbols			36.000						
14	EE formula - =(12*50) m2 Chevrons			600.000						
15										
16	EE formula - =(#LQ12*2) m	LINE PTPMM E2	m	25,600.000	2.000				51,200	51,200
17	EE formula - =(#LQ12*2) m	LINE NTPMM C1	m	25,600.000	1.850				47,360	47,360
18	EE formula - =(#LQ12) m	LINE NTPMM L1	m	12,800.000	0.550				7,040	7,040
19	EE formula - =(#LQ12) m	LINE NTPMM E6	m	12,800.000	1.500				19,200	19,200
20	EE formula - =(#LQ13) each	LINE NTPMM ARROW	each	36.000	90.000				3,240	3,240

	21 EE formula - =(#LQ14) m2	LINEMARKING MARKING	m²	600.000	20.000		12,000	12,000
	22							
	23 Estimated Duration							
	24 EE formula - =(0) Days							
					140,040.000		**140,040**	**140,040**
Line No 110	**Signposting**							
Item No 11270			**each**	**408.000**		**Contributing**		
	1 11270 Signposting							
	2 Spec: Nil							
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4 Site visit photo: Nil							
	5 NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	6 NOTE: Adopt allowance from Aecom - Signs Large " Allow for 4 major sign structures at each interchange"							
	7 NOTE: Adopt allowance from Aecom - Meduim Signs "Allow an average of 1 sign per 100m"							
	8 NOTE: Adopt allowance from Aecom - Signs Small "Allow 2 signs per 100m"							
	9 NOTE: Adopt allowance from Aecom - VMS "1 VMS included northbound and 1 southbound, locations to be determined"							
	10							
	11 EE formula - =(20400-7600) m Total corridor length			12,800.000				
	12 EE formula - =(4*6) each Signs Large			24.000				
	13 EE formula - =(#LQ11/100) each Meduim Signs			128.000				
	14 EE formula - =(#LQ11*2/100) each Signs Small			256.000				
	15 EE formula - =(2) each VMS large			2.000				
	16							
	17 EE formula - =(#LQ12) each Advanced directional	RTA SIGN ADIRECT	each	24.000	30,000.000		720,000	720,000
	18 EE formula - =(#LQ13) each Directional	RTA SIGN DIRECT	each	128.000	15,000.000		1,920,000	1,920,000
	19 EE formula - =(#LQ14) each Directional small	RTA SIGN DIRECT SMALL	each	256.000	1,000.000		256,000	256,000
	20 EE formula - =(60) each Warning	RTA SIGN WARNING	each	60.000	200.000		12,000	12,000
	21 EE formula - =(30) each Hazard boards	RTA SIGN HAZARD	each	30.000	250.000		7,500	7,500
	22 EE formula - =(#LQ15) each	VMS LARGE	each	2.000	400,000.000		800,000	800,000
	23							
	24 Estimated Duration							
	25 EE formula - =(0) Days							
					9,106.618		**3,715,500**	**3,715,500**
Line No 111	**Street Lighting**							
Item No 11280			**each**	**105.000**		**Contributing**		
	1 11280 Street Ligthing							
	2 Spec: Nil							
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4 Site visit photo: Nil							

	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities NOTE: Adopt allowance from Aecom - Lights Single "Assume that only local road junctions and interchanges are to be lit. Allow 4 lights per local road junction and 9 (8 per on ramp and 1 per off ramp) per interchange + rest area"						
	6							
	7	NOTE: Adopt allowance from Aecom - New Trafic Lights " Not applicable"						
	8							
	9	EE formula - =(20400-7600) m Total corridor length			12,800.000			
	10	EE formula - =(105) each Lights Single			105.000			
	11							
	12	EE formula - =(#LQ10*100) m UPVC conduit	RTA CONDUIT 150	m	10,500.000	30.000	315,000	315,000
	13	EE formula - =(#LQ10*6) each	RTA CABLE PIT	each	630.000	200.000	126,000	126,000
	14	EE formula - =(8) each	RTA CONTROL CAB	each	8.000	9,500.000	76,000	76,000
	15	EE formula - =(#LQ10) each	RTA LIGHTING PLINTH	each	105.000	1,000.000	105,000	105,000
	16	EE formula - =(#LQ10) each	RTA LIGHT POLE 10.5M	each	105.000	1,500.000	157,500	157,500
	17							
	18	Estimated Duration						
	19	EE formula - =(0) Days						
						7,423.810	**779,500**	**779,500**

Line No 112		**Fencing**						
Item No 11290				**m**	**23,400.000**	**Contributing**		
	1	11290 Fencing						
	2	Spec: Nil						
	3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801						
	4	Site visit photo: Nil						
	5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities						
	6	NOTE: Adopt allowance from Aecom - Wire Fence "Ass boundary fence is required for the full length both sides"						
	7	NOTE: Adopt allowance from Aecom - Floppy top fence "Not applicable"						
	8							
	9	EE formula - =(20400-7600) m Total corridor length			12,800.000			
	10	EE formula - =(32+122+76+200+600+40+30) m Length bridges & Viaduct			1,100.000			
	11	EE formula - =((#LQ9-#LQ10)*2) m Fencing length			23,400.000			
	12							
	13	EE formula - =(#LQ11) m	FENCE CW1.8BW	m	23,400.000	68.000	1,591,200	1,591,200
	14	EE formula - =(0) m No scope	FENCE FAUNA	m		48.000		
	15							
	16	Estimated Duration						
	17	EE formula - =(0) Days						
						68.000	**1,591,200**	**1,591,200**

Line No 113	**Property adjustments**							
Item No 11300			**each**	**50.000**		**Contributing**		
	1 11300 Property Adjustments							
	2 Spec: Nil							
	3 Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801							
	4 Site visit photo: Nil							
	5 NOTE: Refer to file FBB Quantities .xlsx for details of quantities							
	6 NOTE: Adopt allowance from Aecom - "Details not known at this stage. 50 properties affected say $10,000 avg each property"							
	7 NOTE: Allow for construction of a new driveway, small length of fencing & installation of gate							
	8 NOTE: Allow for same number as in item 10240 Traffic Control							
	9							
	10 EE formula - =(50) each Number of affected properties			50.000				
	11 EE formula - =(150) m Length of fencing per property			150.000				
	12 EE formula - =(1) each Vechcile gates per property			1.000				
	13							
	14 EE formula - =(#LQ10) each	RTA DRIVEWAY ADJ	each	50.000	1,000.000		50,000	50,000
	15 EE formula - =(#LQ10*#LQ11) m	FENCE FAUNA	m	7,500.000	48.000		360,000	360,000
	16 EE formula - =(#LQ10*#LQ12) each	FENCE GATE 6M BB	each	50.000	1,510.000		75,500	75,500
	17							
	18 Estimated Duration							
	19 EE formula - =(0) Days							
					9,710.000		**485,500**	**485,500**

Line No 114	**Heavy Vehicle Rest Area - Austral Park**							
Item No 11310			**Each**	**1.000**		**Contributing**		
	1 11310 Heavy Vehicle Rest Area - Austral Park							
	2 Spec: Nil							
	3 Dwg: 60021933-DRG-10-02-RD-1011							
	4 Site visit photo: Nil							
	5 NOTE: Refer to email from Annette Beedles (RMS 11/4/2012), on file, for details of quantities							
	6 NOTE: Assume that separate traffic contorl allowance NOT required - done as part of the larger project							
	7 NOTE: Assume that pavement for HVRA is the same as required for Nungarry site, for simplicity							
	8							
	9 EE formula - =(6915) m2 Pavement area			6,915.000				
	10 EE formula - =(40185) m3 Total Cut volume			40,185.000				
	11 EE formula - =(17468) m3 Total Fill volume			17,468.000				
	12							
	13 A. Control of traffic							
	14 EE formula - =(0) Incl in general project scope							
	15							
	16 B. General items							
	17 EE formula - =(1) each Picnic table table and shelter	RTA PICNIC TABLE	each	1.000	17,500.000		17,500	17,500

18	EE formula - =(1) each Supply & install garbage bins	RTA GARBAGE BIN	each	1.000	750.000				750	750
19	EE formula - =(50) each Supply & install bollards	RTA BOLLARDS	each	50.000	350.000				17,500	17,500
20	EE formula - =(1) each Self composting toilet block	RTA TOILET BLOCK	each	1.000	91,200.000				91,200	91,200
21	EE formula - =(2) each Supply & install solar light	RTA SOLAR LIGHT	each	2.000	11,200.000				22,400	22,400
22	EE formula - =st(16:21,0)								149,350	149,350
23										
24	C. Earthworks									
25	EE formula - =(((400+150)/2)*75/10000) ha Clear & grub	EWKS CLEAR & GRUB LIGHT	ha	2.063	9,359.300	3,435		15,869		19,304
26	EE formula - =(#LQ25*10000*0.15) m3 Remove & stockpile topsoil	EWKS TOPSOIL STOCKPILE	m³	3,093.750	16.975	7,117	209	31,036	14,154	52,516
27	EE formula - =(#LQ11) m3 Cut to fill	RTA CUT/FILL	m³	17,468.000	16.000			279,488		279,488
28	EE formula - =(#LQ10-#LQ11) m3 Disposal of spoil	RTA CUT TO SPOIL	m³	22,717.000	20.000			454,340		454,340
29	EE formula - =(#LQ27*0.1) m3 Unsuitable material, Allowed 10% of Cut/Fill material	RTA UNSUITABLE	m³	1,746.800	100.000			174,680		174,680
30	EE formula - =(#LQ9*0.3) m3 SMZ Supply & place, Allowed 300mm thk	RTA SMZ	m³	2,074.500	80.000				165,960	165,960
31	EE formula - =st(24:30,0)					10,552	209	955,413	180,114	1,146,288
32										
33	D. Drainage									
34	EE formula - =(250) m Stormwater drainage, typically 375mm dia RCP	RTA STORMWATER RCP	m	250.000	450.000				112,500	112,500
35	EE formula - =(4) each pits	RTA GRATED PIT	each	4.000	2,000.000				8,000	8,000
36	EE formula - =(100) m Trench drain	RTA TRENCH DRAIN	m	100.000	50.000				5,000	5,000
37	EE formula - =(10) m Open channel drain	RTA OPEN DRAIN	m	10.000	10.200				102	102
38	EE formula - =st(33:37,0)								125,602	125,602
39										
40	E. Pavements									
41	EE formula - =(0) m Modified Type F NJB used as combination barrier & wall, NOT required	BARRIER RT INSITU	m		1,350.000					
42	EE formula - =(0) m Concrete encasement of utilities, located under acceleration lane, NOT required	UTILITY CONC ENCASE <150M	m		102.500					
43	EE formula - =(#LQ9*0.15) m3 Insitu stabilisation of top 150mm of SMZ layer	RTA STAB INSITU	m³	1,037.250	75.000				77,794	77,794
44	EE formula - =(#LQ9*0.3) m3 Heavily bound subbase layer 300mm thk	RTA SUBBASE BFS	m³	2,074.500	145.000				300,803	300,803
45	EE formula - =(#LQ9*0.3) m3 Insitu stabilisation of 300mm thk base layer	RTA STAB INSITU	m³	2,074.500	75.000				155,588	155,588
46	EE formula - =(#LQ9*2) m2 7mm primer seal	A 7MMSEAL	m²	13,830.000	1.800				24,894	24,894
47	EE formula - =(#LQ9*0.05*2.4*1.05) tonne AC14 base coarse, 50mm thk, 2.4tonne/m3, 5% waste	A AC14 DG	tonne	871.290	180.000				156,832	156,832
48	EE formula - =(#LQ9*0.05*2.4*1.03) tonne AC14 wearing coarse, 50mm thk, 2.4tonne/m3, 3% waste	A DG IC 14/50MM	tonne	854.694	200.000				170,939	170,939
49	EE formula - =st(40:48,#LQ9) m2				128.250				886,849	886,849
50										
51	F. Miscellaneous									
52	EE formula - =() Allowance erosion & sedimentation controls, Not required	RTA EROSION & SED	Item		1.000					
53	EE formula - =(0) Allowance demolition of existing, Not required	MISC SCON	Item		1.000					
54	EE formula - =(500) m Kerb & Gutter, Type SO	RTA K&G SO	m	500.000	112.500				56,250	56,250

55	EE formula - =(30) each guide posts	RF GUIDE POSTS	each	30.000	25.000				750	750
56	EE formula - =(400*110) m Wire rope safety fence, 400m length @ $110/m supplied & installed	MISC SCON	Item	44,000.000	1.000				44,000	44,000
57	EE formula - =(10000) Allowance signage	MISC SCON	Item	10,000.000	1.000				10,000	10,000
58	EE formula - =(7500) Allowance linemarking & RPM's	MISC SCON	Item	7,500.000	1.000				7,500	7,500
59	EE formula - =(400) m Fencing	FENCE CW1.8BW	m	400.000	68.000				27,200	27,200
60	EE formula - =(250) m2 Concrete paving	RTA INFILL CONC	m²	250.000	50.000				12,500	12,500
61	EE formula - =((#LQ25*10000)-#LQ9) m2 Topsoiling, site won material	EWKS TOPSOIL IMPORT	m²	13,710.000	13.639	5,901	162,929	10,959	7,198	186,987
62	EE formula - =(1000) m2 Turfing	LAND TURF SMALL	m²	1,000.000	28.000				28,000	28,000
63	EE formula - =(#LQ61-#LQ62) m2 Hydroseeding	LAND HYDROSEEDING	m²	12,710.000	1.150				14,617	14,617
64	EE formula - =st(51:63,0)					5,901	162,929	10,959	208,014	387,803
65										
66	Estimated Duration									
67	EE formula - =(60) Days			60.000						
					2,695,891.519	**16,453**	**163,138**	**966,372**	**1,549,929**	**2,695,892**

Line No 115	**Other**									
Item No 11320			**Item**	**1.000**		**Contributing**				
1	11320 Other									
2	Spec: Nil									
3	Dwg: 60021933-DRG-10-02-GE-0001 to 60021933-DRG-10-02-BR-0801									
4	Site visit photo: Nil									
5	NOTE: Refer to file FBB Quantities .xlsx for details of quantities									
6	NOTE: Adopt allowance from Aecom - Breakdown Bays "Actual figure from the design model"									
7										
8	EE formula - =(160*7) m2 Approx area of breakdown bay pavements			1,120.000						
9										
10	A. Breakdown Bays									
11	EE formula - =(#LQ8) m2	RTA MAJOR ROAD TYPE2	m²	1,120.000	130.000				145,600	145,600
12	EE formula - =(7*10000) Allowance fit out breakdown bays - Emergency phones	MISC SCON	Item	70,000.000	1.000				70,000	70,000
13										
14	Estimated Duration									
15	EE formula - =(0) Days									
					215,600.000				**215,600**	**215,600**