Appendix B – Design Costing Reference Sheet

	Drawings			
BRIDGES	**PLAN VIEW**	**LONG SECTION**	**CROSS SECTION**	**STRUCTURAL SECTIONS**
LANCEFIELD ROAD				
LR-BR-01	CIV-1022		CIV-0205	STR-0401 STR-0402 STR-0403
LR-BR-02	CIV-1033		CIV-0204	
LR-BR-03	CIV-1021		CIV-0204	
SOUTH SUNBURY				
SS-BR-01	CIV-1134		CIV-0204	STR-0102 STR-0103
SS-BR-02	CIV-1133		CIV-0204	
SS-BR-03	CIV-1132		CIV-0204	
SS-BR-04	CIV-1131		CIV-0204	

	Drawings			
ROADS	**LAYOUT PLAN**	**INTERSECTION PLAN**	**TYPICAL SECTION**	**LONG SECTION**
LANCEFIELD ROAD				
LR-RD-01	CIV-1000		CIV-202	
LR-RD-02	CIV-1020		CIV-203	
LR-RD-03	CIV-1030 CIV-1033		CIV-0201	
LR-RD-04	CIV-1030 CIV-1032		CIV-0203	
SOUTH SUNBURY				
SS-RD-01	CIV-1100		CIV-0201	
SS-RD-02	CIV-1110		CIV-0202	
SS-RD-03	CIV-1120		CIV-0201	
SS-RD-04-01	CIV-1135 CIV-1136		CIV-0201 CIV-0203	CIV-400
SS-RD-04-02	CIV-1134		CIV-0203	CIV-400
SS-RD-04-03	CIV-1132 CIV-1133		CIV-0204	CIV-400
SS-RD-04-04	CIV-1131 CIV-1132		CIV-0205	CIV-401

SS-RD-04-5	CIV-1131		CIV-0206	CIV-401
SS-RD-05	CIV-1140 CIV-1141		CIV-0203	
SS-RD-06	CIV-1151		CIV-0203	
SS-RD-07	CIV-1160 CIV-1161 CIV-1162 CIV-1163 CIV-1164		CIV-0202	
SS-RD-08	CIV-1171			
SS-RD-09	CIV-1140 CIV-1143		CIV-203	
	Drawings			
INTERSECTIONS	**LAYOUT PLAN**	**INTERSECTION PLAN**		
LANCEFIELD ROAD				
LR-IN-01	CIV-1001	CIV-1501		
LR-IN-02	CIV-1002	CIV-1502		
LR-IN-03	CIV-1004	CIV-1503		
LR-IN-04	CIV-1006	CIV-1504		
LR-IN-06	CIV-1033			
SOUTH SUNBURY				
SS-IN-01		CIV-1601		
SS-IN-02		CIV-1602		
SS-IN-03		CIV-1603		
SS-IN-04	CIV-1102	CIV-1604		
SS-IN-05	CIV-1122			
SS-IN-07	CIV-1121			
SS-IN-08	CIV-1112			
SS-IN-09	CIV-1131			
SS-IN-10	CIV-1133			
SS-IN-12	CIV-1111			
SS-IN-13	CIV-1163			

Appendix C – Cost Plans

Jacksons Hill Creek Crossing - South
SS-RD-04-01 (Approx. length 1550m, excluding Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	52,700	m2	$ 5.40	$ 284,580.00	Excluding Batters
	1.2	Earthworks					
		1.2.1 Cut and disposal	27,486	m3	$ 27.00	$ 742,115.18	Additional 10% contingency applied
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill	11,571	m3	$ 43.20	$ 499,878.86	Additional 10% contingency applied
		1.2.4 EO Allowance for rock excavation works	19,529	m3	$ 96.80	$ 1,890,359.65	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	17,980	m2	$ 156.60	$ 2,815,668.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	6,200	LM	$ 48.60	$ 301,320.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	4,650	m2	$ 59.00	$ 274,350.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	5,270	m2	$ 66.00	$ 347,820.00	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in SS-RD4
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	10,850	m2	$ 32.40	$ 351,540.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	1,550	LM		$ -	
		4.1.1 Stormwater drainage (300mm DIA)	413	LM	$ 216.00	$ 89,280.00	
		4.1.2 Stormwater drainage (450mm DIA)	1,085	LM	$ 260.00	$ 282,100.00	
		4.1.3 Stormwater drainage (525mm DIA)	465	LM	$ 383.50	$ 178,327.50	
		4.1.4 Drainage, sub grade drain	3,100	LM	$ 54.00	$ 167,400.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	41	No.	$ 2,700.00	$ 111,600.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	41	Allow.	$ 1,500.00	$ 62,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	1,550	LM	$ 32.00	$ 49,600.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	32	No.	$ 350.00	$ 11,200.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	11,900	m2	$ 3.00	$ 35,700.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	11,900	m2	$ 10.00	$ 119,000.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	31	No.	$ 12,500.00	$ 387,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls		LM			
		8.2.1 Retaining wall (0-2m high)	100	LM	$ 1,120.00	$ 112,000.00	Up to 2m high
		8.2.2 Retaining wall (3-5m high)	157	LM	$ 4,480.00	$ 703,360.00	Up to 5m high
		8.2.3 Retaining wall (6-8m high)	-	LM	$ 7,840.00	$ -	Up to 8m high
		8.2.4 Retaining wall (9-11m high)	100	LM	$ 11,200.00	$ 1,120,000.00	Up to 11m high
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
			SUB TOTAL - WORKS			**$ 10,949,199.19**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 355,848.97	
	10.2	VicRoads Fees	**1.00%**	Item		$ 109,491.99	
	10.3	Traffic Management	**5.00%**	Item		$ 547,459.96	
	10.4	Environmental Management	**0.50%**	Item		$ 54,746.00	
	10.5	Survey & Design	**5.00%**	Item		$ 547,459.96	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 985,427.93	
	10.7	Site Establishment	**2.50%**	Item		$ 273,729.98	
	10.8	Contingency	**15.00%**	Item		$ 1,642,379.88	
			SUB-TOTAL DELIVERY			**$ 4,516,544.67**	
11			**TOTAL ESTIMATED PROJECT COST**			**$ 15,465,743.86**	

Jacksons Hill Creek Crossing - South
SS-RD-04-02 (Long Options, approx. length 621m, excluding Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	21,114	m2	$ 5.40	$ 114,015.60	
	1.2	Earthworks					
	1.2.1	Cut and disposal		m3	$ 27.00	$ -	
	1.2.2	Fill	11,883	m3	$ 37.80	$ 449,182.79	Additional 10% contingency applied
	1.2.3	Cut to fill	8,905	m3	$ 43.20	$ 384,699.94	Additional 10% contingency applied
	1.2.4	EO Allowance for rock excavation works	4,453	m3	$ 96.80	$ 431,006.42	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	7,204	m2	$ 156.60	$ 1,128,083.76	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	2,484	LM	$ 48.60	$ 120,722.40	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	1,863	m2	$ 59.00	$ 109,917.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	2,111	m2	$ 66.00	$ 139,352.40	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in SS-RD4
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	4,347	m2	$ 32.40	$ 140,842.80	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	621	LM			
	4.1.1	Stormwater drainage (300mm DIA)	166	LM	$ 216.00	$ 35,769.60	
	4.1.2	Stormwater drainage (450mm DIA)	621	LM	$ 260.00	$ 161,460.00	
	4.1.3	Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	1,242	LM	$ 54.00	$ 67,068.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	17	No.	$ 2,700.00	$ 44,712.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	17	Allow.	$ 1,500.00	$ 24,840.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	621	LM	$ 32.00	$ 19,872.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	14	No.	$ 350.00	$ 4,900.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	2,432	m2	$ 3.00	$ 7,296.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	2,432	m2	$ 10.00	$ 24,320.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	12	No.	$ 12,500.00	$ 155,250.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1 8.1.1	Speed cameras	-	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls		LM			
	8.2.1	Retaining wall (0-2m high)	100	LM	$ 1,120.00	$ 112,000.00	Up to 2m high
	8.2.2	Retaining wall (3-5m high)	100	LM	$ 4,480.00	$ 448,000.00	Up to 5m high
	8.2.3	Retaining wall (6-8m high)	50	LM	$ 7,840.00	$ 392,000.00	Up to 8m high
	8.2.4	Retaining wall (9-11m high)	-	LM	$ 11,200.00	$ -	Up to 11m high
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 4,527,810.71**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 147,153.85	
	10.2	VicRoads Fees	**1.00%**	Item		$ 45,278.11	
	10.3	Traffic Management	**5.00%**	Item		$ 226,390.54	
	10.4	Environmental Management	**0.50%**	Item		$ 22,639.05	
	10.5	Survey & Design	**5.00%**	Item		$ 226,390.54	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 407,502.96	
	10.7	Site Establishment	**2.50%**	Item		$ 113,195.27	
	10.8	Contingency	**15.00%**	Item		$ 679,171.61	
		SUB-TOTAL DELIVERY				**$ 1,867,721.92**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 6,395,532.62**	

Jacksons Hill Creek Crossing - South

SS-RD-04-03 (Long Options, approx. length 925m, excluding Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	31,450	m2	$ 5.40	$ 169,830.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal	13,663	m3	$ 27.00	$ 368,904.27	Additional 10% contingency applied
	1.2.2	Fill		m3	$ 37.80	$ -	
	1.2.3	Cut to fill	15,888	m3	$ 43.20	$ 686,351.45	Additional 10% contingency applied
	1.2.4	EO Allowance for rock excavation works	14,775	m3	$ 96.80	$ 1,430,262.89	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	10,730	m2	$ 156.60	$ 1,680,318.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	3,700	LM	$ 48.60	$ 179,820.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	2,775	m2	$ 59.00	$ 163,725.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	3,145	m2	$ 66.00	$ 207,570.00	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in SS-RD4
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	6,475	m2	$ 32.40	$ 209,790.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	925	LM		$ -	
	4.1.1	Stormwater drainage (300mm DIA)	247	LM	$ 216.00	$ 53,280.00	
	4.1.2	Stormwater drainage (450mm DIA)	648	LM	$ 260.00	$ 168,350.00	
	4.1.3	Stormwater drainage (525mm DIA)	278	LM	$ 383.50	$ 106,421.25	
	4.1.4	Drainage, sub grade drain	1,850	LM	$ 54.00	$ 99,900.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	25	No.	$ 2,700.00	$ 66,600.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	25	Allow.	$ 1,500.00	$ 37,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	925	LM	$ 32.00	$ 29,600.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	14	No.	$ 350.00	$ 4,900.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	3,235	m2	$ 3.00	$ 9,705.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	3,235	m2	$ 10.00	$ 32,350.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	19	No.	$ 12,500.00	$ 231,250.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls	-	LM			
	8.2.1	Retaining wall (0-2m high)	160	LM	$ 1,120.00	$ 179,200.00	Up to 2m high
	8.2.2	Retaining wall (3-5m high)	200	LM	$ 4,480.00	$ 896,000.00	Up to 5m high
	8.2.3	Retaining wall (6-8m high)	150	LM	$ 7,840.00	$ 1,176,000.00	Up to 8m high
	8.2.4	Retaining wall (9-11m high)	50	LM	$ 11,200.00	$ 560,000.00	Up to 11m high
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
			SUB TOTAL - WORKS			**$ 8,759,627.87**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 284,687.91	
	10.2	VicRoads Fees	**1.00%**	Item		$ 87,596.28	
	10.3	Traffic Management	**5.00%**	Item		$ 437,981.39	
	10.4	Environmental Management	**0.50%**	Item		$ 43,798.14	
	10.5	Survey & Design	**5.00%**	Item		$ 437,981.39	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 788,366.51	
	10.7	Site Establishment	**2.50%**	Item		$ 218,990.70	
	10.8	Contingency	**15.00%**	Item		$ 1,313,944.18	
			SUB-TOTAL DELIVERY			**$ 3,613,346.49**	
11			**TOTAL ESTIMATED PROJECT COST**			**$ 12,372,974.36**	

Jacksons Hill Creek Crossing - South

SS-RD-04-04 (Long Options, approx. length 245m, excluding Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	8,330	m2	$ 5.40	$ 44,982.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal		m3	$ 27.00	$ -	
		1.2.2 Fill	17,632	m3	$ 37.80	$ 666,484.07	Additional 10% contingency applied
		1.2.3 Cut to fill	612	m3	$ 43.20	$ 26,434.19	Additional 10% contingency applied
		1.2.4 EO Allowance for rock excavation works	306	m3	$ 96.80	$ 29,616.08	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	2,842	m2	$ 156.60	$ 445,057.20	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	980	LM	$ 48.60	$ 47,628.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	735	m2	$ 59.00	$ 43,365.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	833	m2	$ 66.00	$ 54,978.00	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in SS-RD4
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	1,715	m2	$ 32.40	$ 55,566.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage	245	LM		$ -	
		4.1.1 Stormwater drainage (300mm DIA)	65	LM	$ 216.00	$ 14,112.00	
		4.1.2 Stormwater drainage (450mm DIA)	245	LM	$ 260.00	$ 63,700.00	
		4.1.3 Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
		4.1.4 Drainage, sub grade drain	490	LM	$ 54.00	$ 26,460.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	7	No.	$ 2,700.00	$ 17,640.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	7	Allow.	$ 1,500.00	$ 9,800.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	245	LM	$ 32.00	$ 7,840.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	4	No.	$ 350.00	$ 1,400.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	967	m2	$ 3.00	$ 2,901.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	967	m2	$ 10.00	$ 9,670.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	5	No.	$ 12,500.00	$ 61,250.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (0-2m high)	-	LM	$ 1,120.00	$ -	Up to 2m high
		8.2.2 Retaining wall (3-5m high)	190	LM	$ 4,480.00	$ 851,200.00	Up to 5m high
		8.2.3 Retaining wall (6-8m high)	-	LM	$ 7,840.00	$ -	Up to 8m high
		8.2.4 Retaining wall (9-11m high)	-	LM	$ 11,200.00	$ -	Up to 11m high
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
			SUB TOTAL - WORKS			**$ 2,492,583.54**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 81,008.97	
	10.2	VicRoads Fees	**1.00%**	Item		$ 24,925.84	
	10.3	Traffic Management	**5.00%**	Item		$ 124,629.18	
	10.4	Environmental Management	**0.50%**	Item		$ 12,462.92	
	10.5	Survey & Design	**5.00%**	Item		$ 124,629.18	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 224,332.52	
	10.7	Site Establishment	**2.50%**	Item		$ 62,314.59	
	10.8	Contingency	**15.00%**	Item		$ 373,887.53	
			SUB-TOTAL DELIVERY			**$ 1,028,190.71**	
11			**TOTAL ESTIMATED PROJECT COST**			**$ 3,520,774.25**	

Jacksons Hill Creek Crossing - South

SS-RD-04-05 (Long Options, approx. length 387m, excluding Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	13,158	m2	$ 5.40	$ 71,053.20	
	1.2	Earthworks					
	1.2.1	Cut and disposal	111,651	m3	$ 27.00	$ 3,014,578.52	Additional 10% contingency applied
	1.2.2	Fill		m3	$ 37.80	$ -	
	1.2.3	Cut to fill		m3	$ 43.20	$ -	Additional 10% contingency applied
	1.2.4	EO Allowance for rock excavation works	55,826	m3	$ 96.80	$ 5,403,911.12	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	4,489	m2	$ 156.60	$ 703,008.72	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	1,548	LM	$ 48.60	$ 75,232.80	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	1,161	m2	$ 59.00	$ 68,499.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	1,316	m2	$ 66.00	$ 86,842.80	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in SS-RD4
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	2,709	m2	$ 32.40	$ 87,771.60	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	103	LM	$ 216.00	$ 22,291.20	
	4.1.2	Stormwater drainage (450mm DIA)	271	LM	$ 260.00	$ 70,434.00	
	4.1.3	Stormwater drainage (525mm DIA)	116	LM	$ 383.50	$ 44,524.35	
	4.1.4	Drainage, sub grade drain	774	LM	$ 54.00	$ 41,796.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	10	No.	$ 2,700.00	$ 27,864.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	10	Allow.	$ 1,500.00	$ 15,480.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	387	LM	$ 32.00	$ 12,384.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees			$ -		
	6.1.1	Tree planting (2-2.5m tall)	6	No.	$ 350.00	$ 2,100.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	1,362	m2	$ 3.00	$ 4,086.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	1,362	m2	$ 10.00	$ 13,620.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	8	No.	$ 12,500.00	$ 96,750.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall (0-2m high)		LM	$ 1,120.00	$ -	Up to 2m high
	8.2.2	Retaining wall (3-5m high)		LM	$ 4,480.00	$ -	Up to 5m high
	8.2.3	Retaining wall (6-8m high)	160	LM	$ 7,840.00	$ 1,254,400.00	Up to 8m high
	8.2.4	Retaining wall (9-11m high)	300	LM	$ 11,200.00	$ 3,360,000.00	Up to 11m high
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
			SUB TOTAL - WORKS			**$ 14,489,127.31**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 470,896.64	
	10.2	VicRoads Fees	1.00%	Item		$ 144,891.27	
	10.3	Traffic Management	5.00%	Item		$ 724,456.37	
	10.4	Environmental Management	0.50%	Item		$ 72,445.64	
	10.5	Survey & Design	5.00%	Item		$ 724,456.37	
	10.6	Supervision & Project Management	9.00%	Item		$ 1,304,021.46	
	10.7	Site Establishment	2.50%	Item		$ 362,228.18	
	10.8	Contingency	15.00%	Item		$ 2,173,369.10	
			SUB-TOTAL DELIVERY			**$ 5,976,765.02**	
11			**TOTAL ESTIMATED PROJECT COST**			**$ 20,465,892.33**	

Buckland Way
SS-RD-05: Approx. length: 1084m (ex. Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	27,100	m2	$ 5.40	$ 146,340.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal	8,722	m3	$ 27.00	$ 235,496.70	Additional 10% contingency applied
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill	2,826	m3	$ 43.20	$ 122,092.06	Additional 10% contingency applied
		1.2.4 EO Allowance for rock excavation works	5,774	m3	$ 96.80	$ 558,937.96	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	12,141	m2	$ 156.60	$ 1,901,249.28	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	2,168	LM	$ 48.60	$ 105,364.80	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	3,252	m2	$ 59.00	$ 191,868.00	
		3.2.2 Cycle pathway	3,252	m2	$ 66.00	$ 214,632.00	Two way Cycle path (3m) wide of the road. Total span (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	-	m2	$ 32.40	$ -	Assumed not included
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	289	LM	$ 216.00	$ 62,438.40	
		4.1.2 Stormwater drainage (450mm DIA)	759	LM	$ 260.00	$ 197,288.00	
		4.1.3 Stormwater drainage (525mm DIA)	325	LM	$ 383.50	$ 124,714.20	
		4.1.4 Drainage, sub grade drain	2,168	LM	$ 54.00	$ 117,072.00	includes subsoil drainage
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	29	No.	$ 2,700.00	$ 78,048.00	Assumed spacing of approx. 75m
	4.3	Drainage - WSUD	29	Allow.	$ 1,500.00	$ 43,360.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	1,084	LM	$ 32.00	$ 34,688.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	20	No.	$ 350.00	$ 7,000.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	8,596	m2	$ 3.00	$ 25,786.80	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	8,596	m2	$ 10.00	$ 85,956.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	22	No.	$ 12,500.00	$ 271,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall					
		Retaining wall (3-5m high)					Allow for retaining wall heights:
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
			SUB TOTAL - WORKS			**$ 4,535,832.20**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 147,414.55	
	10.2	VicRoads Fees	1.00%	Item		$ 45,358.32	
	10.3	Traffic Management	5.00%	Item		$ 226,791.61	
	10.4	Environmental Management	0.50%	Item		$ 22,679.16	
	10.5	Survey & Design	5.00%	Item		$ 226,791.61	
	10.6	Supervision & Project Management	9.00%	Item		$ 408,224.90	
	10.7	Site Establishment	2.50%	Item		$ 113,395.80	
	10.8	Contingency	15.00%	Item		$ 680,374.83	
			SUB-TOTAL DELIVERY			**$ 1,871,030.78**	
11			**TOTAL ESTIMATED PROJECT COST**			**$ 6,406,862.98**	

Fox Hollow Drive
SS-RD-06 Approx. length: 680m (ex.Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	17,000	m2	$ 5.40	$ 91,800.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal	9,133	m3	$ 27.00	$ 246,582.46	Additional 10% contingency applied
	1.2.2	Fill		m3	$ 37.80	$ -	
	1.2.3	Cut to fill	2,669	m3	$ 43.20	$ 115,297.72	Additional 10% contingency applied
	1.2.4	EO Allowance for rock excavation works	5,901	m3	$ 96.80	$ 571,198.05	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	7,616	m2	$ 156.60	$ 1,192,665.60	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	1,360	LM	$ 48.60	$ 66,096.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	2,040	m2	$ 59.00	$ 120,360.00	
	3.2.2	Cycle pathway	2,040	m2	$ 66.00	$ 134,640.00	Two way Cycle path (3m) wide of the road. Total span (3m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	-	m2	$ -	$ -	Assumed not included
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	680	LM		$ -	
	4.1.1	Stormwater drainage (300mm DIA)	181	LM	$ 216.00	$ 39,168.00	
	4.1.2	Stormwater drainage (450mm DIA)	476	LM	$ 260.00	$ 123,760.00	
	4.1.3	Stormwater drainage (525mm DIA)	204	LM	$ 383.50	$ 78,234.00	
	4.1.4	Drainage, sub grade drain	1,360	LM	$ 54.00	$ 73,440.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	18	No.	$ 2,700.00	$ 48,960.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	18	Allow.	$ 1,500.00	$ 27,200.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	680	LM	$ 32.00	$ 21,760.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	12	No.	$ 350.00	$ 4,200.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	5,460	m2	$ 3.00	$ 16,380.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	5,460	m2	$ 10.00	$ 54,600.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	14	No.	$ 12,500.00	$ 170,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	-	LM	$ -	$ -	Assumed none
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 3,208,841.83**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 104,287.36	
	10.2	VicRoads Fees	1.00%	Item		$ 32,088.42	
	10.3	Traffic Management	5.00%	Item		$ 160,442.09	
	10.4	Environmental Management	0.50%	Item		$ 16,044.21	
	10.5	Survey & Design	5.00%	Item		$ 160,442.09	
	10.6	Supervision & Project Management	9.00%	Item		$ 288,795.76	
	10.7	Site Establishment	2.50%	Item		$ 80,221.05	
	10.8	Contingency	15.00%	Item		$ 481,326.27	
		SUB-TOTAL DELIVERY				**$ 1,323,647.25**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 4,532,489.08**	

Watsons Road
SS-RD-07 Approx. Length 1938m (ex. Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	37,210	m2	$ 5.40	$ 200,931.84	
	1.2	Earthworks					
		1.2.1 Cut and disposal	34,098	m3	$ 27.00	$ 920,632.50	Additional 10% contingency applied
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill		m3	$ 43.20	$ -	Additional 10% contingency applied
		1.2.4 EO Allowance for rock excavation works		m3	$ 96.80	$ -	Allowance for rock has been excluded from existing roads
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	16,376	m2	$ 156.60	$ 2,564,497.26	Includes pavement to Traffic lane (3m) and parking bay (2.1m) to both sides total width (10.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	3,876	LM	$ 48.60	$ 188,373.60	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	-	m2	$ 59.00	$ -	Assumed not included
		3.2.2 Cycle pathway	5,814	m2	$ 66.00	$ 383,724.00	Allow Cycle path (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	-	m2	$ 32.40	$ -	Assumed not included
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	517	LM	$ 216.00	$ 111,628.80	
		4.1.2 Stormwater drainage (450mm DIA)	1,357	LM	$ 260.00	$ 352,716.00	
		4.1.3 Stormwater drainage (525mm DIA)	581	LM	$ 383.50	$ 222,966.90	
		4.1.4 Drainage, sub grade drain	3,876	LM	$ 54.00	$ 209,304.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	52	No.	$ 2,700.00	$ 139,536.00	Assumed spacing of approx. 75m
	4.3	Drainage - WSUD	52	Allow.	$ 1,500.00	$ 77,520.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	1,938	LM	$ 32.00	$ 62,016.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	42	No.	$ 350.00	$ 14,700.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	13,200	m2	$ 3.00	$ 39,600.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	13,200	m2	$ 10.00	$ 132,000.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	39	No.	$ 12,500.00	$ 484,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ -	$ -	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 6,117,146.90**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 198,807.27	
	10.2	VicRoads Fees	1.00%	Item		$ 61,171.47	
	10.3	Traffic Management	5.00%	Item		$ 305,857.35	
	10.4	Environmental Management	0.50%	Item		$ 30,585.73	
	10.5	Survey & Design	5.00%	Item		$ 305,857.35	
	10.6	Supervision & Project Management	9.00%	Item		$ 550,543.22	
	10.7	Site Establishment	2.50%	Item		$ 152,928.67	
	10.8	Contingency	15.00%	Item		$ 917,572.04	
		SUB-TOTAL DELIVERY				**$ 2,523,323.10**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 8,640,470.00**	

Crinnion Road
SS-RD-08 Approx. length: 1630m (ex. Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	24,450	m2	$ 5.40	$ 132,030.00	Assumed 15m wide road
	1.2	Earthworks					
		1.2.1 Cut and disposal	9,770	m3	$ 27.00	$ 263,784.94	Additional 10% contingency applied
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill	-	m3	$ 43.20	$ -	
		1.2.4 EO Allowance for rock excavation works	-	m3	$ 96.80	$ -	No Allowance due to upgrade of existing road
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	11,410	m2	$ 156.60	$ 1,786,806.00	Includes pavement to Traffic lane (3.5m) total width (7m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel		LM	$ 48.60	$ -	Assumed not included based on PSP cross section
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	-	m2	$ 59.00	$ -	Excluded
		3.2.2 Cycle pathway	-	m2	$ 66.00	$ -	Two way Cycle path (3m) wide of the road. Total span (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	-	m2	$ 32.40	$ -	Assumed not included
4	**DRAINAGE**						Allow Cycle path (3m) wide
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)		LM	$ 216.00	$ -	Assumed not included
		4.1.2 Stormwater drainage (450mm DIA)		LM	$ 260.00	$ -	Assumed not included
		4.1.3 Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	Assumed not included
		4.1.4 Drainage, sub grade drain		LM	$ 54.00	$ -	Assumed not included
	4.2	Drainage - Pits					
		4.2.1 Side entry pits		No.	$ 2,700.00	$ -	Assumed not included
	4.3	Drainage - WSUD	1	Allow.	$ 50,000.00	$ 50,000.00	Allowance only
	4.4	Drainage - Miscellaneous	2	No.	$ 150,000.00	$ 300,000.00	Allowance only - Swale to each side of road way
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	1,630	LM	$ 32.00	$ 52,160.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	28	No.	$ 350.00	$ 9,800.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	-	m2	$ 3.00	$ -	
		6.2.2 Nature strip	-	m2	$ 10.00	$ -	
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	33	No.	$ 12,500.00	$ 407,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ -	$ -	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 3,014,580.94**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 97,973.88	
	10.2	VicRoads Fees	1.00%	Item		$ 30,145.81	
	10.3	Traffic Management	5.00%	Item		$ 150,729.05	
	10.4	Environmental Management	0.50%	Item		$ 15,072.90	
	10.5	Survey & Design	5.00%	Item		$ 150,729.05	
	10.6	Supervision & Project Management	9.00%	Item		$ 271,312.28	
	10.7	Site Establishment	2.50%	Item		$ 75,364.52	
	10.8	Contingency	15.00%	Item		$ 452,187.14	
		SUB-TOTAL DELIVERY				**$ 1,243,514.64**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 4,258,095.57**	

Jacksons Hill Link
SS-RD-09 Approx. Length:250m (ex. Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	6,250	m2	$ 5.40	$ 33,750.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal		m3	$ 27.00	$ -	
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill	10,256	m3	$ 43.20	$ 443,059.20	Additional 10% contingency applied
		1.2.4 EO Allowance for rock excavation works	5,128	m3	$ 96.80	$ 496,390.40	Allowance for rock has been excluded from existing roads
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	2,800	m2	$ 156.60	$ 438,480.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	500	LM	$ 48.60	$ 24,300.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	750	m2	$ 59.00	$ 44,250.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	750	m2	$ 66.00	$ 49,500.00	Two way Cycle path (3m wide) single side of the road. Total span (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	-	m2	$ 32.40	$ -	Assumed not included
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	67	LM	$ 216.00	$ 14,400.00	
		4.1.2 Stormwater drainage (450mm DIA)	250	LM	$ 260.00	$ 65,000.00	
		4.1.3 Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	Assumed not included
		4.1.4 Drainage, sub grade drain	500	LM	$ 54.00	$ 27,000.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	7	No.	$ 2,700.00	$ 18,000.00	Assumed spacing of approx. 75m
	4.3	Drainage - WSUD	7	Allow.	$ 1,500.00	$ 10,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	250	LM	$ 32.00	$ 8,000.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	4	No.	$ 350.00	$ 1,400.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	2,028	m2	$ 3.00	$ 6,084.00	Allowance of $2 per m2 to nature strip
		6.2.2 Nature strip	2,028	m2	$ 10.00	$ 20,280.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	5	No.	$ 12,500.00	$ 62,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (3-5m high)	197	LM	$ 4,480.00	$ 882,560.00	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 2,657,453.60**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 86,367.24	
	10.2	VicRoads Fees	**1.00%**	Item		$ 26,574.54	
	10.3	Traffic Management	**5.00%**	Item		$ 132,872.68	
	10.4	Environmental Management	**0.50%**	Item		$ 13,287.27	
	10.5	Survey & Design	**5.00%**	Item		$ 132,872.68	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 239,170.82	
	10.7	Site Establishment	**2.50%**	Item		$ 66,436.34	
	10.8	Contingency	**15.00%**	Item		$ 398,618.04	
		SUB-TOTAL DELIVERY				**$ 1,096,199.61**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 3,753,653.21**	

Intersection on Sunbury Road
SS-IN-01 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	31,500	m2	$ 5.40	$ 170,100.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	26,775	m3	$ 27.00	$ 722,925.00	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	13,388	m3	$ 96.80	$ 1,295,910.00	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	14,980	m2	$ 156.60	$ 2,345,868.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 149,482.80	$ 149,482.80	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,180	LM	$ 48.60	$ 57,348.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	780	m2	$ 59.00	$ 46,020.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	780	m2	$ 66.00	$ 51,480.00	Allow Cycle path (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	4,968	m2	$ 32.40	$ 160,963.20	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	201	LM	$ 216.00	$ 43,372.80	
		4.1.2 Stormwater drainage (450mm DIA)	527	LM	$ 260.00	$ 137,046.00	
		4.1.3 Stormwater drainage (525mm DIA)	226	LM	$ 383.50	$ 86,632.65	
		4.1.4 Drainage, sub grade drain	1,506	LM	$ 54.00	$ 81,324.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	8	No.	$ 2,700.00	$ 21,600.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	8	Allow.	$ 1,500.00	$ 12,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	753	LM	$ 32.00	$ 24,096.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	14	No.	$ 350.00	$ 4,900.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	2,259	m2	$ 3.00	$ 6,777.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	2,259	m2	$ 10.00	$ 22,590.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	16	No.	$ 12,500.00	$ 200,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 6,273,935.45**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 203,902.90	
	11.2	VicRoads Fees	1.00%	Item		$ 62,739.35	
	11.3	Traffic Management	5.00%	Item		$ 313,696.77	
	11.4	Environmental Management	0.50%	Item		$ 31,369.68	
	11.5	Survey & Design	5.00%	Item		$ 313,696.77	
	11.6	Supervision & Project Management	9.00%	Item		$ 564,654.19	
	11.7	Site Establishment	2.50%	Item		$ 156,848.39	
	11.8	Contingency	15.00%	Item		$ 941,090.32	
		SUB-TOTAL DELIVERY				**$ 2,587,998.37**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 8,861,933.82**	

Intersection on Sunbury Road
SS-IN-02 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	31,969	m2	$ 5.40	$ 172,632.60	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	25,975	m3	$ 27.00	$ 701,319.94	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	12,987	m3	$ 96.80	$ 1,257,180.93	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	15,039	m2	$ 156.60	$ 2,355,107.40	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 194,767.20	$ 194,767.20	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	5,890	LM	$ 48.60	$ 286,254.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	780	m2	$ 59.00	$ 46,020.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	780	m2	$ 66.00	$ 51,480.00	Allow Cycle path (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	5,827	m2	$ 32.40	$ 188,794.80	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	204	LM	$ 216.00	$ 44,006.40	
		4.1.2 Stormwater drainage (450mm DIA)	535	LM	$ 260.00	$ 139,048.00	
		4.1.3 Stormwater drainage (525mm DIA)	229	LM	$ 383.50	$ 87,898.20	
		4.1.4 Drainage, sub grade drain	1,528	LM	$ 54.00	$ 82,512.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	9	No.	$ 2,700.00	$ 24,300.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	9	Allow.	$ 1,500.00	$ 13,500.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	835	LM	$ 32.00	$ 26,720.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	16	No.	$ 350.00	$ 5,600.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	666	m2	$ 3.00	$ 1,998.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	666	m2	$ 10.00	$ 6,660.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	17	No.	$ 12,500.00	$ 212,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 6,531,799.46**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 212,283.48	
	11.2	VicRoads Fees	1.00%	Item		$ 65,317.99	
	11.3	Traffic Management	5.00%	Item		$ 326,589.97	
	11.4	Environmental Management	0.50%	Item		$ 32,659.00	
	11.5	Survey & Design	5.00%	Item		$ 326,589.97	
	11.6	Supervision & Project Management	9.00%	Item		$ 587,861.95	
	11.7	Site Establishment	2.50%	Item		$ 163,294.99	
	11.8	Contingency	15.00%	Item		$ 979,769.92	
		SUB-TOTAL DELIVERY				**$ 2,694,367.28**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 9,226,166.74**	

Sunbury Road/Lancefield Road Intersection
SS-IN-03 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
		WORKS					
1		**SITEWORKS AND EARTHWORKS**					
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	28,392	m2	$ 5.40	$ 153,316.80	
	1.2	Earthworks					
		1.2.1 Cut and disposal	10,116	m3	$ 27.00	$ 273,137.51	
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill	473	m3	$ 43.20	$ 20,412.00	With 10% additional factor
		1.2.3 EO Allowance for rock excavation works	5,294	m3	$ 96.80	$ 512,493.27	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2		**ROAD PAVEMENT**					
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	17,398	m2	$ 156.60	$ 2,724,589.44	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 306,633.60	$ 306,633.60	Allowance only
3		**CONCRETE WORKS**					
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,426	LM	$ 48.60	$ 69,303.60	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	390	m2	$ 59.00	$ 23,010.00	Allow pedestrian paths to both sides of proposed road each 1.5m wide. Total span (3.0m)
		3.2.2 Cycle pathway	442	m2	$ 66.00	$ 29,172.00	Two 1.5m wide Cycle paths (both sides of the proposed road). Total span (3.0m)
		3.2.3 Shared pathway	2,943	m2	$ 66.00	$ 194,238.00	Arterial road: Two 3m wide shared paths (both sides of the road). Total span (6.0m) wide
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	9,305	m2	$ 21.60	$ 200,988.00	Assumed levelled soil, future proofed for planting
4		**DRAINAGE**					
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	187	LM	$ 216.00	$ 40,320.00	
		4.1.2 Stormwater drainage (450mm DIA)	490	LM	$ 260.00	$ 127,400.00	
		4.1.3 Stormwater drainage (525mm DIA)	210	LM	$ 383.50	$ 80,535.00	
		4.1.4 Drainage, sub grade drain	1,400	LM	$ 54.00	$ 75,600.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	15	No.	$ 2,700.00	$ 40,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - Subsoil Drainage					
		4.3.1 Included above	2,852	LM	$ -	$ -	Included above
	4.3	Drainage - WSUD	15	Allow.	$ 1,500.00	$ 22,500.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5		**TRAFFIC**					
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	700	LM	$ 32.00	$ 22,400.00	Includes fixed signage, guide posts, line markings, traffic safety
6		**LANDSCAPE**					
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	14	No.	$ 350.00	$ 4,900.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	978	m2	$ 3.00	$ 2,932.80	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	978	m2	$ 10.00	$ 9,776.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7		**STREET LIGHTING**					
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	14	No.	$ 12,500.00	$ 175,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8		**MISCELLANEOUS**					
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ -	$ -	Assume no retaining walls
9		**SERVICES**					
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10		**MAINTENANCE**					
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
			SUB TOTAL - WORKS			**$ 5,742,658.02**	
11		**DELIVERY**					
		Fees					
	11.1	Council Fees	3.25%	Item		$ 186,636.39	
	11.2	VicRoads Fees	1.00%	Item		$ 57,426.58	
	11.3	Traffic Management	5.00%	Item		$ 287,132.90	
	11.4	Environmental Management	0.50%	Item		$ 28,713.29	
	11.5	Survey & Design	5.00%	Item		$ 287,132.90	
	11.6	Supervision & Project Management	9.00%	Item		$ 516,839.22	
	11.7	Site Establishment	2.50%	Item		$ 143,566.45	
	11.8	Contingency	15.00%	Item		$ 861,398.70	
			SUB-TOTAL DELIVERY			**$ 2,368,846.43**	
12			**TOTAL ESTIMATED PROJECT COST**			**$ 8,111,504.46**	

Intersection on Sunbury Road
SS-IN-04 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	21,127	m2	$ 5.40	$ 114,085.80	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	22,315	m3	$ 27.00	$ 602,515.63	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	11,158	m3	$ 96.80	$ 1,080,065.06	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	11,924	m2	$ 156.60	$ 1,867,220.10	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 228,171.60	$ 228,171.60	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,083	LM	$ 48.60	$ 52,633.80	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	780	m2	$ 59.00	$ 46,020.00	Allow pedestrian paths to both sides of proposed road each 1.5m wide. Total span (3.0m)
		3.2.2 Cycle pathway	780	m2	$ 66.00	$ 51,480.00	Allow 3m wide Cycle path
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	5,623	m2	$ 21.60	$ 121,456.80	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	228	LM	$ 216.00	$ 49,248.00	
		4.1.2 Stormwater drainage (450mm DIA)	599	LM	$ 260.00	$ 155,610.00	
		4.1.3 Stormwater drainage (525mm DIA)	257	LM	$ 383.50	$ 98,367.75	
		4.1.4 Drainage, sub grade drain	1,710	LM	$ 54.00	$ 92,340.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	11	No.	$ 2,700.00	$ 29,700.00	Assumed spacing of 50m
	4.3	Drainage - WSUD	11	Allow.	$ 1,500.00	$ 16,500.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	855	LM	$ 32.00	$ 27,360.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	16	No.	$ 350.00	$ 5,600.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	2,400	m2	$ 3.00	$ 7,200.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	2,400	m2	$ 10.00	$ 24,000.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	18	No.	$ 12,500.00	$ 225,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 5,528,074.54**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 179,662.42	
	11.2	VicRoads Fees	1.00%	Item		$ 55,280.75	
	11.3	Traffic Management	5.00%	Item		$ 276,403.73	
	11.4	Environmental Management	0.50%	Item		$ 27,640.37	
	11.5	Survey & Design	5.00%	Item		$ 276,403.73	
	11.6	Supervision & Project Management	9.00%	Item		$ 497,526.71	
	11.7	Site Establishment	2.50%	Item		$ 138,201.86	
	11.8	Contingency	15.00%	Item		$ 829,211.18	
		SUB-TOTAL DELIVERY				**$ 2,280,330.75**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 7,808,405.29**	

Vinyard Road/Jacksons Creek Crossing (South)
SS-IN-05 (T-intersection - Interim)

Item			Description	Quantity	Unit	Rate	Amount	Comments
	WORKS							
1	**SITEWORKS AND EARTHWORKS**							
	1.1	Pre-construction						
		1.1.1	Demolition and site preparation	17,350	m2	$ 5.40	$ 93,690.00	
	1.2	Earthworks						
		1.2.1	Cut and disposal at specified location	14,097	m3	$ 27.00	$ 380,615.63	Assuming pavement composition depth total 650mm deep including fill
		1.2.2	Fill	7,662	m3	$ 37.80	$ 289,616.51	
		1.2.3	EO Allowance for rock excavation works	7,048	m3	$ 96.80	$ 682,288.75	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out						
		1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**							
	2.1	New Pavement						
		2.1.1	Road pavement - Traffic lanes	5,773	m2	$ 156.60	$ 904,051.80	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement						
		2.2.1	Pavement profiling and reshaping	1	Allow.	$ 184,550.40	$ 184,550.40	Allowance only
3	**CONCRETE WORKS**							
	3.1	Kerb and Channel						
		3.1.1	Kerb and channel	1,391	LM	$ 48.60	$ 67,602.60	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths						
		3.2.1	Pedestrian footpath	345	m2	$ 59.00	$ 20,355.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
		3.2.2	Cycle pathway	391	m2	$ 66.00	$ 25,806.00	Allow Cycle path (3m) wide
		3.2.3	Shared pathway	630	m2	$ 66.00	$ 41,580.00	
	3.3	Median strip						
		3.3.1	Median (Levelled ground - no plants)	1,619	m2	$ 21.60	$ 34,970.40	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**							
	4.1	Drainage - Pipes						
		4.1.1	Stormwater drainage (300mm DIA)	155	LM	$ 216.00	$ 33,408.00	
		4.1.2	Stormwater drainage (450mm DIA)	580	LM	$ 260.00	$ 150,800.00	
		4.1.3	Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
		4.1.4	Drainage, sub grade drain	1,160	LM	$ 54.00	$ 62,640.00	
	4.2	Drainage - Pits						
		4.2.1	Side entry pits	14	No.	$ 2,700.00	$ 37,800.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD		14	Allow.	$ 1,500.00	$ 21,000.00	
	4.4	Drainage - Miscellaneous		-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**							
	5.1	Traffic Signals						
		5.1.1	Traffic signals (incl. conduit subset)	1	Allow.	$ 405,000.00	$ 405,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety						
		5.2.1	Line marking and Traffic Signage	580	LM	$ 32.00	$ 18,560.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**							
	6.1	Trees						
		6.1.1	Tree planting (2-2.5m tall)	10	No.	$ 350.00	$ 3,500.00	Allowance only
	6.2	Landscaping						
		6.2.1	Tube stock plantings	1,360	m2	$ 3.00	$ 4,080.00	Allowance of 2 per m2 to nature strip
		6.2.2	Nature strip	1,360	m2	$ 10.00	$ 13,600.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**							
	7.1	Street Lighting						
		7.1.1	Street lighting (incl. lighting conduits)	12	No.	$ 12,500.00	$ 150,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**							
	8.1	8.1.1	Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2	Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls						
		8.2.1	Retaining wall	-	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**							
	9.1	Services Relocation		-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection		-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**							
	10.1	10.1.1	VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
			SUB TOTAL - WORKS				**$ 3,719,015.09**	
11	**DELIVERY**							
			Fees					
	11.1	Council Fees		3.25%	Item		$ 120,867.99	
	11.2	VicRoads Fees		1.00%	Item		$ 37,190.15	
	11.3	Traffic Management		5.00%	Item		$ 185,950.75	
	11.4	Environmental Management		0.50%	Item		$ 18,595.08	
	11.5	Survey & Design		5.00%	Item		$ 185,950.75	
	11.6	Supervision & Project Management		9.00%	Item		$ 334,711.36	
	11.7	Site Establishment		2.50%	Item		$ 92,975.38	
	11.8	Contingency		15.00%	Item		$ 557,852.26	
			SUB-TOTAL DELIVERY				**$ 1,534,093.72**	
12			**TOTAL ESTIMATED PROJECT COST**				**$ 5,253,108.81**	

Vineyard Rd / Moore Rd / Old Vineyard Rd Intersection
SS-IN-07 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	14,106	m2	$ 5.40	$ 76,172.40	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	14,899	m3	$ 27.00	$ 402,285.49	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	-	m3	$ 37.80	$ -	
	1.2.3	EO Allowance for rock excavation works	7,450	m3	$ 96.80	$ 721,133.99	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	7,534	m2	$ 156.60	$ 1,179,824.40	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	1	Allow.	$ 152,344.80	$ 152,344.80	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	2,331	LM	$ 48.60	$ 113,286.60	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	872	m2	$ 59.00	$ 51,418.50	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	525	m2	$ 66.00	$ 34,650.00	Allow Cycle path (3m) wide
	3.2.3	Shared pathway	1,173	LM	$ 66.00	$ 77,418.00	
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	943	m2	$ 21.60	$ 20,368.80	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	145	LM	$ 216.00	$ 31,392.00	
	4.1.2	Stormwater drainage (450mm DIA)	545	LM	$ 260.00	$ 141,700.00	
	4.1.3	Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	1,090	LM	$ 54.00	$ 58,860.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	15	No.	$ 2,700.00	$ 40,500.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	15	Allow.	$ 1,500.00	$ 22,500.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signal for major cross intersection (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	545	LM	$ 32.00	$ 17,440.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	10	No.	$ 350.00	$ 3,500.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	2,054	m2	$ 3.00	$ 6,162.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	2,054	m2	$ 10.00	$ 20,540.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	11	No.	$ 12,500.00	$ 137,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	-	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,942,496.97**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 128,131.15	
	11.2	VicRoads Fees	1.00%	Item		$ 39,424.97	
	11.3	Traffic Management	5.00%	Item		$ 197,124.85	
	11.4	Environmental Management	0.50%	Item		$ 19,712.48	
	11.5	Survey & Design	5.00%	Item		$ 197,124.85	
	11.6	Supervision & Project Management	9.00%	Item		$ 354,824.73	
	11.7	Site Establishment	2.50%	Item		$ 98,562.42	
	11.8	Contingency	15.00%	Item		$ 591,374.55	
		SUB-TOTAL DELIVERY				**$ 1,626,280.00**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 5,568,776.97**	

Lancefield Rd/Gellies Road Intersection
SS-IN-08 (T-intersection - Interim)

Item			Description	Quantity	Unit	Rate	Amount	Comments
	WORKS							
1	**SITEWORKS AND EARTHWORKS**							
	1.1		Pre-construction					
		1.1.1	Demolition and site preparation	13,780	m2	$ 5.40	$ 74,412.00	
	1.2		Earthworks					
		1.2.1	Cut and disposal at specified location	14,555	m3	$ 27.00	$ 392,988.38	Assuming pavement composition depth total 650mm deep including fill
		1.2.2	Fill	-	m3	$ 37.80	$ -	
		1.2.3	EO Allowance for rock excavation works	7,278	m3	$ 96.80	$ 704,468.05	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3		Set-Out					
		1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**							
	2.1		New Pavement					
		2.1.1	Road pavement - Traffic lanes	9,071	m2	$ 156.60	$ 1,420,502.94	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2		Rehabilitate Existing Pavement					
		2.2.1	Pavement profiling and reshaping	1	Allow.	$ 148,824.00	$ 148,824.00	Allowance only
3	**CONCRETE WORKS**							
	3.1		Kerb and Channel					
		3.1.1	Kerb and channel	845	LM	$ 48.60	$ 41,067.00	Kerb and channel to each side of traffic lane
	3.2		Pedestrian & Cycle Paths					
		3.2.1	Pedestrian footpath	462	m2	$ 59.00	$ 27,258.00	Connector Road: Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2	Cycle pathway	462	m2	$ 66.00	$ 30,492.00	Allow Cycle path (3m) wide
		3.2.3	Shared pathway		m2	$ 66.00	$ -	
	3.3		Median strip					
		3.3.1	Median (Levelled ground - no plants)	3,205	m2	$ 21.60	$ 69,228.00	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**							
	4.1		Drainage - Pipes					
		4.1.1	Stormwater drainage (300mm DIA)	179	LM	$ 216.00	$ 38,592.00	
		4.1.2	Stormwater drainage (450mm DIA)	670	LM	$ 260.00	$ 174,200.00	
		4.1.3	Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
		4.1.4	Drainage, sub grade drain	1,340	LM	$ 54.00	$ 72,360.00	
	4.2		Drainage - Pits					
		4.2.1	Side entry pits	9	No.	$ 2,700.00	$ 24,300.00	Assumed spacing of approx. 100m
	4.3		Drainage - WSUD	9	Allow.	$ 1,500.00	$ 13,500.00	
	4.4		Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**							
	5.1		Traffic Signals					
		5.1.1	Traffic signals (incl. conduit subset)	1	Allow.	$ 405,000.00	$ 405,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2		Traffic Safety					
		5.2.1	Line marking and Traffic Signage	670	LM	$ 32.00	$ 21,440.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**							
	6.1		Trees					
		6.1.1	Tree planting (2-2.5m tall)	12	No.	$ 350.00	$ 4,200.00	Allowance only
	6.2		Landscaping					
		6.2.1	Tube stock plantings	910	m2	$ 3.00	$ 2,730.30	Allowance of 2 per m2 to nature strip
		6.2.2	Nature strip	910	m2	$ 10.00	$ 9,101.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**							
	7.1		Street Lighting					
		7.1.1	Street lighting (incl. lighting conduits)	14	No.	$ 12,500.00	$ 175,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**							
	8.1	8.1.1	Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2	Speed bumps	-	No.	$ -	$ -	Excluded
	8.2		Retaining walls					
		8.2.1	Retaining wall	-	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**							
	9.1		Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2		Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**							
	10.1	10.1.1	VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
					SUB TOTAL - WORKS		**$ 3,943,163.67**	
11	**DELIVERY**							
			Fees					
	11.1		Council Fees	3.25%	Item		$ 128,152.82	
	11.2		VicRoads Fees	1.00%	Item		$ 39,431.64	
	11.3		Traffic Management	5.00%	Item		$ 197,158.18	
	11.4		Environmental Management	0.50%	Item		$ 19,715.82	
	11.5		Survey & Design	5.00%	Item		$ 197,158.18	
	11.6		Supervision & Project Management	9.00%	Item		$ 354,884.73	
	11.7		Site Establishment	2.50%	Item		$ 98,579.09	
	11.8		Contingency	15.00%	Item		$ 591,474.55	
					SUB-TOTAL DELIVERY		**$ 1,626,555.01**	
12					**TOTAL ESTIMATED PROJECT COST**		**$ 5,569,718.68**	

Jacksons Creek Crossing (South)/ Buckland Way Intersection
SS-IN-09 (ULTIMATE) (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	15,114	m2	$ 5.40	$ 81,615.60	
	1.2	Earthworks					
		1.2.1 Cut and disposal		m3	$ 27.00	$ -	
		1.2.2 Import fill	3,908	m3	$ 37.80	$ 147,737.98	
		1.2.3 Cut to fill	12,768	m3	$ 43.20	$ 551,560.79	
		1.2.4 EO Allowance for rock excavation works	6,384	m3	$ 96.80	$ 617,952.37	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	8,004	m2	$ 156.60	$ 1,253,426.40	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,440	LM	$ 48.60	$ 69,984.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	1,511	m2	$ 59.00	$ 89,149.00	Allow Cycle path (3m) wide
		3.2.2 Cycle pathway	1,280	m2	$ 66.00	$ 84,480.00	
		3.2.3 Shared pathway	460	m2	$ 66.00	$ 30,360.00	Apparent shared pathway on western side of SS-RD4
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	451	m2	$ 32.40	$ 14,612.40	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	159	LM	$ 216.00	$ 34,329.60	
		4.1.2 Stormwater drainage (450mm DIA)	596	LM	$ 260.00	$ 154,960.00	
		4.1.3 Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
		4.1.4 Drainage, sub grade drain	1,192	LM	$ 54.00	$ 64,368.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	16	No.	$ 2,700.00	$ 43,200.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	16	Allow.	$ 1,500.00	$ 24,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	596	LM	$ 32.00	$ 19,072.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	12	No.	$ 350.00	$ 4,200.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	3,528	m2	$ 3.00	$ 10,584.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	3,528	m2	$ 10.00	$ 35,280.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	12	No.	$ 12,500.00	$ 150,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (3-5m high)	562	LM	$ 4,480.00	$ 2,517,760.00	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
			SUB TOTAL - WORKS			**$ 6,551,132.14**	
10	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 212,911.79	
	11.2	VicRoads Fees	1.00%	Item		$ 65,511.32	
	11.3	Traffic Management	5.00%	Item		$ 327,556.61	
	11.4	Environmental Management	0.50%	Item		$ 32,755.66	
	11.5	Survey & Design	5.00%	Item		$ 327,556.61	
	11.6	Supervision & Project Management	9.00%	Item		$ 589,601.89	
	11.7	Site Establishment	2.50%	Item		$ 163,778.30	
	11.8	Contingency	15.00%	Item		$ 982,669.82	
			SUB-TOTAL DELIVERY			**$ 2,702,342.01**	
11			**TOTAL ESTIMATED PROJECT COST**			**$ 9,253,474.15**	

Jacksons Creek Crossing/Fox Hollow Drive Intersection
SS-IN-10 (ULTIMATE) (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	9,605	m2	$ 5.40	$ 51,867.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal	21,601	m3	$ 27.00	$ 583,226.38	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill		m3	$ 37.80	$ -	
	1.2.3	Cut to fill	2,309	m3	$ 43.20	$ 99,734.98	
	1.2.3	EO Allowance for rock excavation works	11,955	m3	$ 96.80	$ 1,157,227.40	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	5,046	m2	$ 156.60	$ 790,203.60	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	1,395	LM	$ 48.60	$ 67,797.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	992	m2	$ 59.00	$ 58,528.00	Allow Cycle path (3m) wide
	3.2.2	Cycle pathway	1,082	m2	$ 66.00	$ 71,412.00	
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	1,417	m2	$ 32.40	$ 45,910.80	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	95	LM	$ 216.00	$ 20,563.20	
	4.1.2	Stormwater drainage (450mm DIA)	357	LM	$ 260.00	$ 92,820.00	
	4.1.3	Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	714	LM	$ 54.00	$ 38,556.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	10	No.	$ 2,700.00	$ 27,000.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	10	Allow.	$ 1,500.00	$ 15,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	1	Allow.	$ 432,000.00	$ 432,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	357	LM	$ 32.00	$ 11,424.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	6	No.	$ 350.00	$ 2,100.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	2,645	m2	$ 3.00	$ 7,935.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	2,645	m2	$ 10.00	$ 26,450.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	8	No.	$ 12,500.00	$ 100,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall (3-5m high)	100	LM	$ 4,480.00	$ 448,000.00	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 4,160,255.35**	
10	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 135,208.30	
	11.2	VicRoads Fees	1.00%	Item		$ 41,602.55	
	11.3	Traffic Management	5.00%	Item		$ 208,012.77	
	11.4	Environmental Management	0.50%	Item		$ 20,801.28	
	11.5	Survey & Design	5.00%	Item		$ 208,012.77	
	11.6	Supervision & Project Management	9.00%	Item		$ 374,422.98	
	11.7	Site Establishment	2.50%	Item		$ 104,006.38	
	11.8	Contingency	15.00%	Item		$ 624,038.30	
		SUB-TOTAL DELIVERY				**$ 1,716,105.33**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 5,876,360.69**	

Crinnion Road/Bulla-Digger Rest Road Intersection
SS-IN-11 (Roundabout)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	3,086	m2	$ 5.40	$ 16,666.84	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	264	m3	$ 27.00	$ 7,135.49	Assuming pavement composition depth total 685mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	Included above
		1.2.3 EO Allowance for rock excavation works	132	m3	$ 96.80	$ 12,791.02	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	3,086	m2	$ 156.60	$ 483,338.23	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	860	LM	$ 48.60	$ 41,796.00	Kerb and channel all sides of intersection
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	-	m2	$ 59.00	$ -	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	-	m2	$ 66.00	$ -	Allow Cycle path (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	730	m2	$ 32.40	$ 23,652.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	-	LM	$ 216.00	$ -	
		4.1.2 Stormwater drainage (450mm DIA)	400	LM	$ 260.00	$ 104,000.00	
		4.1.3 Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
		4.1.4 Drainage, sub grade drain	860	LM	$ 54.00	$ 46,440.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	6	No.	$ 2,700.00	$ 16,200.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	6	Allow.	$ 1,500.00	$ 9,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	Allow.	$ 432,000.00	$ -	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	900	LM	$ 32.00	$ 28,800.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	6	No.	$ 350.00	$ 2,100.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	-	m2	$ 3.00	$ -	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	-	m2	$ 10.00	$ -	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	6	No.	$ 12,500.00	$ 75,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (3-5m high)	-	LM	$ 4,480.00	$ -	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 879,419.58**	
10	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 28,581.14	
	11.2	VicRoads Fees	1.00%	Item		$ 8,794.20	
	11.3	Traffic Management	5.00%	Item		$ 43,970.98	
	11.4	Environmental Management	0.50%	Item		$ 4,397.10	
	11.5	Survey & Design	5.00%	Item		$ 43,970.98	
	11.6	Supervision & Project Management	9.00%	Item		$ 79,147.76	
	11.7	Site Establishment	2.50%	Item		$ 21,985.49	
	11.8	Contingency	15.00%	Item		$ 131,912.94	
		SUB-TOTAL DELIVERY				**$ 362,760.57**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 1,242,180.15**	

Lancefield Road/ Connector Road
SS-IN-12 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	9,605	m2	$ 5.40	$ 51,867.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	8,116	m3	$ 27.00	$ 219,138.08	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	4,058	m3	$ 96.80	$ 392,825.29	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	9,789	m2	$ 156.60	$ 1,532,957.40	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,361	LM	$ 48.60	$ 66,144.60	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	780	m2	$ 59.00	$ 46,020.00	Connector Road: Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	780	m2	$ 66.00	$ 51,480.00	Allow Cycle path (3m) wide
		3.2.3 Shared pathway		m2	$ 66.00	$ -	
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	618	m2	$ 32.40	$ 20,023.20	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	159	LM	$ 216.00	$ 34,329.60	
		4.1.2 Stormwater drainage (450mm DIA)	417	LM	$ 260.00	$ 108,472.00	
		4.1.3 Stormwater drainage (525mm DIA)	179	LM	$ 383.50	$ 68,569.80	
		4.1.4 Drainage, sub grade drain	1,192	LM	$ 54.00	$ 64,368.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	16	No.	$ 2,700.00	$ 43,200.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	16	Allow.	$ 1,500.00	$ 24,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	596	LM	$ 32.00	$ 19,072.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	12	No.	$ 350.00	$ 4,200.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	1,912	m2	$ 3.00	$ 5,736.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	1,912	m2	$ 10.00	$ 19,120.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	9	No.	$ 12,500.00	$ 112,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (3-5m high)	-	LM	$ 4,480.00	$ -	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,517,522.97**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 114,319.50	
	11.2	VicRoads Fees	1.00%	Item		$ 35,175.23	
	11.3	Traffic Management	5.00%	Item		$ 175,876.15	
	11.4	Environmental Management	0.50%	Item		$ 17,587.61	
	11.5	Survey & Design	5.00%	Item		$ 175,876.15	
	11.6	Supervision & Project Management	9.00%	Item		$ 316,577.07	
	11.7	Site Establishment	2.50%	Item		$ 87,938.07	
	11.8	Contingency	15.00%	Item		$ 527,628.44	
		SUB-TOTAL DELIVERY				**$ 1,450,978.22**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 4,968,501.19**	

Watsons Road/Fox Hollow Drive Intersection
SS-IN-13 (Roundabout)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	2,910	m2	$ 5.40	$ 15,714.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	8,712	m3	$ 27.00	$ 235,211.42	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	-	m3	$ 37.80	$ -	
	1.2.3	EO Allowance for rock excavation works	4,356	m3	$ 96.80	$ 421,638.25	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	1,510	m2	$ 156.60	$ 236,466.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to one side total width (8.1m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	1	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	379	LM	$ 48.60	$ 18,419.40	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	42	m2	$ 59.00	$ 2,492.16	Connector Street: Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	46	m2	$ 66.00	$ 3,057.12	Allow Cycle path (3m) wide
	3.2.3	Shared pathway	378	m2	$ 66.00	$ 24,948.00	
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	38	m2	$ 32.40	$ 1,231.20	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	77	LM	$ 216.00	$ 16,704.00	
	4.1.2	Stormwater drainage (450mm DIA)	290	LM	$ 260.00	$ 75,400.00	
	4.1.3	Stormwater drainage (525mm DIA)	-	LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	580	LM	$ 54.00	$ 31,320.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	8	No.	$ 2,700.00	$ 21,600.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	8	Allow.	$ 1,500.00	$ 12,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Safety					
	5.1.1	Line marking and Traffic Signage	290	LM	$ 32.00	$ 9,280.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	6	No.	$ 350.00	$ 2,100.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	573	m2	$ 3.00	$ 1,719.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	573	m2	$ 10.00	$ 5,730.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	6	No.	$ 12,500.00	$ 75,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall (3-5m high)	-	LM	$ -	$ -	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 1,222,530.54**	
10	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 39,732.24	
	11.2	VicRoads Fees	1.00%	Item		$ 12,225.31	
	11.3	Traffic Management	5.00%	Item		$ 61,126.53	
	11.4	Environmental Management	0.50%	Item		$ 6,112.65	
	11.5	Survey & Design	5.00%	Item		$ 61,126.53	
	11.6	Supervision & Project Management	9.00%	Item		$ 110,027.75	
	11.7	Site Establishment	2.50%	Item		$ 30,563.26	
	11.8	Contingency	15.00%	Item		$ 183,379.58	
		SUB-TOTAL DELIVERY				**$ 504,293.85**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 1,726,824.39**	

Buckland Way/Watsons Road Intersection
SS-IN-14 (Roundabout)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	2,910	m2	$ 5.40	$ 15,714.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	8,712	m3	$ 27.00	$ 235,211.42	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	4,356	m3	$ 96.80	$ 421,638.25	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	1,510	m2	$ 156.60	$ 236,466.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to one side total width (8.1m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	379	LM	$ 48.60	$ 18,419.40	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	42	m2	$ 59.00	$ 2,492.16	Connector Street: Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	46	m2	$ 66.00	$ 3,057.12	Allow Cycle path (3m) wide
		3.2.3 Shared pathway	378	m2	$ 66.00	$ 24,948.00	
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	38	m2	$ 32.40	$ 1,231.20	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	77	LM	$ 216.00	$ 16,704.00	
		4.1.2 Stormwater drainage (450mm DIA)	290	LM	$ 260.00	$ 75,400.00	
		4.1.3 Stormwater drainage (525mm DIA)	-	LM	$ 383.50	$ -	
		4.1.4 Drainage, sub grade drain	580	LM	$ 54.00	$ 31,320.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	8	No.	$ 2,700.00	$ 21,600.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	8	Allow.	$ 1,500.00	$ 12,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Safety					
		5.1.1 Line marking and Traffic Signage	290	LM	$ 32.00	$ 9,280.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	6	No.	$ 350.00	$ 2,100.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	573	m2	$ 3.00	$ 1,719.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	573	m2	$ 10.00	$ 5,730.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	6	No.	$ 12,500.00	$ 75,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (3-5m high)	-	LM	$ -	$ -	Assumed no walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 1,222,530.54**	
10	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 39,732.24	
	11.2	VicRoads Fees	1.00%	Item		$ 12,225.31	
	11.3	Traffic Management	5.00%	Item		$ 61,126.53	
	11.4	Environmental Management	0.50%	Item		$ 6,112.65	
	11.5	Survey & Design	5.00%	Item		$ 61,126.53	
	11.6	Supervision & Project Management	9.00%	Item		$ 110,027.75	
	11.7	Site Establishment	2.50%	Item		$ 30,563.26	
	11.8	Contingency	15.00%	Item		$ 183,379.58	
		SUB-TOTAL DELIVERY				**$ 504,293.85**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 1,726,824.39**	

Watsons Road, Crinnion Road Intersection
SS-IN-15 (T-intersection - Ultimate)

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Pre-construction					
1.1.1	Demolition and site preparation	9,605	m2	$ 5.40	$ 51,867.00	
1.2	Earthworks					
1.2.1	Cut and disposal at specified location	1,073	m3	$ 27.00	$ 28,957.50	Assuming pavement composition depth total 650mm deep including fill
1.2.2	Fill	-	m3	$ 37.80	$ -	
1.2.3	EO Allowance for rock excavation works	536	m3	$ 96.80	$ 51,909.00	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
1.3	Set-Out					
1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**					
2.1	New Pavement					
2.1.1	Road pavement - Traffic lanes	1,170	m2	$ 156.60	$ 183,222.00	
2.2	Rehabilitate Existing Pavement					
2.2.1	Pavement profiling and reshaping	1	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**					
3.1	Kerb and Channel					
3.1.1	Kerb and channel	385	LM	$ 48.60	$ 18,711.00	Kerb and channel to both sides of each traffic lane
3.2	Pedestrian & Cycle Paths					
3.2.1	Pedestrian footpath		m2	$ 59.00	$ -	
3.2.2	Cycle pathway		m2	$ 66.00	$ -	Allow Cycle path (3m) wide
3.2.3	Shared pathway	80	m2	$ 66.00	$ 5,280.00	
3.3	Median strip					
3.3.1	Median (Levelled ground)	150	m2	$ 32.40	$ 4,860.00	
4	**DRAINAGE**					
4.1	Drainage - Pipes					
4.1.1	Stormwater drainage (300mm DIA)	103	LM	$ 216.00	$ 22,176.00	
4.1.2	Stormwater drainage (450mm DIA)	385	LM	$ 260.00	$ 100,100.00	
4.1.3	Stormwater drainage (525mm DIA)		LM	$ 383.50	$ -	
4.1.4	Drainage, sub grade drain	770	LM	$ 54.00	$ 41,580.00	
4.2	Drainage - Pits					
4.2.1	Side entry pits	6	No.	$ 2,700.00	$ 16,200.00	Assumed spacing of 75m
4.3	Drainage - WSUD	6	Allow.	$ 1,500.00	$ 9,000.00	
4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**					
5.1	Traffic Signals					
5.1.1	Traffic signals (incl. conduit subset)	-	Allow.	$ 540,000.00	$ -	Rate includes for signals, conduits, pits, footings etc.
5.2	Traffic Safety					
5.2.1	Line marking and Traffic Signage	100	LM	$ 32.00	$ 3,200.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**					
6.1	Trees					
6.1.1	Tree planting (2-2.5m tall)	4	No.	$ 350.00	$ 1,400.00	Allowance only
6.2	Landscaping					
6.2.1	Tube stock plantings	1,250	m2	$ 3.00	$ 3,750.00	Allowance of 2 per m2 to nature strip
6.2.2	Nature strip	1,250	m2	$ 10.00	$ 12,500.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**					
7.1	Street Lighting					
7.1.1	Street lighting (incl. lighting conduits)	8	No.	$ 12,500.00	$ 100,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**					
8.1 8.1.1	Speed cameras	-	Item	$ -	$ -	Excluded
8.1.2	Speed bumps	-	No.	$ -	$ -	Excluded
8.2	Retaining walls					
8.2.1	Retaining wall (3-5m high)		LM	$ 4,480.00	$ -	Assumed no Retaining Walls
9	**SERVICES**					
9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
	SUB TOTAL - WORKS				**$ 667,212.50**	
10	**DELIVERY**					
	Fees					
11.1	Council Fees	3.25%	Item		$ 21,684.41	
11.2	VicRoads Fees	1.00%	Item		$ 6,672.13	
11.3	Traffic Management	5.00%	Item		$ 33,360.63	
11.4	Environmental Management	0.50%	Item		$ 3,336.06	
11.5	Survey & Design	5.00%	Item		$ 33,360.63	
11.6	Supervision & Project Management	9.00%	Item		$ 60,049.13	
11.7	Site Establishment	2.50%	Item		$ 16,680.31	
11.8	Contingency	15.00%	Item		$ 100,081.88	
	SUB-TOTAL DELIVERY				**$ 275,225.16**	
11	**TOTAL ESTIMATED PROJECT COST**				**$ 942,437.66**	

Jacksons Creek Crossing

LR-RD-02-01B Approx. length: 234m (excl. intersections and bridges)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	7,956	m2	$ 5.40	$ 42,962.40	
	1.2	Earthworks					
	1.2.1	Cut and disposal		m3	$ 27.00	$ -	
	1.2.2	Fill	72,299	m3	$ 37.80	$ 2,732,921.05	With 10% additional factor
	1.2.3	Cut to fill	5,153	m3	$ 43.20	$ 222,591.62	With 10% additional factor
	1.2.4	EO Allowance for rock excavation works	2,576	m3	$ 96.80	$ 249,385.05	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	2,714	m2	$ 156.60	$ 425,075.04	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Have assumed all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	936	LM	$ 48.60	$ 45,489.60	
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	936	m2	$ 59.00	$ 55,224.00	Pedestrian path to both sides of proposed road each (2.0m) wide. Total span (4.0m) wide
	3.2.2	Cycle pathway	796	m2	$ 66.00	$ 52,509.60	Cycle path to both sides of proposed road, each (1.7m wide). Total span (3.4m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in LR-RD2
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	1,404	m2	$ 32.40	$ 45,489.60	Assume median (6.0m) to be levelled soil - no landscaping assumed
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	62	LM	$ 216.00	$ 13,478.40	
	4.1.2	Stormwater drainage (450mm DIA)	234	LM	$ 260.00	$ 60,840.00	
	4.1.3	Stormwater drainage (525mm DIA)	-	LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	468	LM	$ 54.00	$ 25,272.00	Inclusive of subsoil drainage
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	6	No.	$ 2,700.00	$ 16,848.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	6	Allow.	$ 1,500.00	$ 9,360.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	Excluded
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	234	LM	$ 32.00	$ 7,488.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	2	Item	$ 350.00	$ 700.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	2,106	m2	$ 3.00	$ 6,318.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	2,106	m2	$ 10.00	$ 21,060.00	Topsoiling and seeding of nature strips (4.5m) to both sides. Total (9.0m) wide
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	5	No.	$ 12,500.00	$ 58,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
			-	LM	$ -	$ -	
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall (0-2m high)	-	LM	$ 702.00	$ -	Assume no retaining walls to LR-RD2
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 4,104,012.36**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 133,380.40	
	10.2	VicRoads Fees	1.00%	Item		$ 41,040.12	
	10.3	Traffic Management	5.00%	Item		$ 205,200.62	
	10.4	Environmental Management	0.50%	Item		$ 20,520.06	
	10.5	Survey & Design	5.00%	Item		$ 205,200.62	
	10.6	Supervision & Project Management	9.00%	Item		$ 369,361.11	
	10.7	Site Establishment	2.50%	Item		$ 102,600.31	
	10.8	Contingency	15.00%	Item		$ 615,601.85	
		SUB-TOTAL DELIVERY				**$ 1,692,905.10**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 5,796,917.46**	

Jacksons Creek Crossing
LR-RD-02-2A Approx. length:321m (excl. intersections and bridge

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	10,914	m2	$ 5.40	$ 58,935.60	
	1.2	Earthworks					
	1.2.1	Cut and disposal	201,627	m3	$ 27.00	$ 5,443,926.30	
	1.2.2	Fill		m3	$ 37.80	$ -	
	1.2.3	Cut to fill	3,053	m3	$ 43.20	$ 131,895.92	
	1.2.4	EO Allowance for rock excavation works	102,340	m3	$ 96.80	$ 9,906,514.24	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	3,724	m2	$ 156.60	$ 583,115.76	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Have assumed all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	1,284	LM	$ 48.60	$ 62,402.40	
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	1,284	m2	$ 59.00	$ 75,756.00	Pedestrian path to both sides of proposed road each (2.0m) wide. Total span (4.0m) wide
	3.2.2	Cycle pathway	1,091	m2	$ 66.00	$ 72,032.40	Cycle path to both sides of proposed road, each (1.7m wide). Total span (3.4m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in LR-RD2
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	1,926	m2	$ 32.40	$ 62,402.40	Assume median (6.0m) to be levelled soil - no landscaping assumed
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	86	LM	$ 216.00	$ 18,489.60	
	4.1.2	Stormwater drainage (450mm DIA)	225	LM	$ 260.00	$ 58,422.00	
	4.1.3	Stormwater drainage (525mm DIA)	96	LM	$ 383.50	$ 36,931.05	
	4.1.4	Drainage, sub grade drain	642	LM	$ 54.00	$ 34,668.00	Inclusive of subsoil drainage
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	9	No.	$ 2,700.00	$ 23,112.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	9	Allow.	$ 1,500.00	$ 12,840.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	Excluded
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	321	LM	$ 32.00	$ 10,272.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	32	Item	$ 350.00	$ 11,200.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	2,889	m2	$ 3.00	$ 8,667.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	2,889	m2	$ 10.00	$ 28,890.00	Topsoiling and seeding of nature strips (4.5m) to both sides. Total (9.0m) wide
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	6	No.	$ 12,500.00	$ 80,250.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
			-	LM	$ -	$ -	
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (0-2m high)		LM	$ 702.00	$ -	
		8.2.2 Retaining wall (3-5m high)		LM	$ 1,058.40	$ -	
		8.2.3 Retaining wall (6-8m high)	60	LM	$ 1,836.00	$ 110,160.00	
		8.2.4 Retaining wall (9-11m high)	370	LM	$ 2,376.00	$ 879,120.00	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
			SUB TOTAL - WORKS			**$ 17,722,502.67**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 575,981.34	
	10.2	VicRoads Fees	1.00%	Item		$ 177,225.03	
	10.3	Traffic Management	5.00%	Item		$ 886,125.13	
	10.4	Environmental Management	0.50%	Item		$ 88,612.51	
	10.5	Survey & Design	5.00%	Item		$ 886,125.13	
	10.6	Supervision & Project Management	9.00%	Item		$ 1,595,025.24	
	10.7	Site Establishment	2.50%	Item		$ 443,062.57	
	10.8	Contingency	15.00%	Item		$ 2,658,375.40	
			SUB-TOTAL DELIVERY			**$ 7,310,532.35**	
11			**TOTAL ESTIMATED PROJECT COST**			**$ 25,033,035.02**	

Jacksons Creek Crossing
LR-RD-02-3A Approx. length: 245m (excl. intersections and bridge

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	8,330	m2	$ 5.40	$ 44,982.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal	29,268	m3	$ 27.00	$ 790,237.45	With 10% additional factor
	1.2.2	Fill		m3	$ 37.80	$ -	
	1.2.3	Cut to fill		m3	$ 43.20	$ -	
	1.2.4	EO Allowance for rock excavation works	14,634	m3	$ 96.80	$ 1,416,573.80	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	2,842	m2	$ 156.60	$ 445,057.20	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Have assumed all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	980	LM	$ 48.60	$ 47,628.00	
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	980	m2	$ 59.00	$ 57,820.00	Pedestrian path to both sides of proposed road each (2.0m) wide. Total span (4.0m) wide
	3.2.2	Cycle pathway	833	m2	$ 66.00	$ 54,978.00	Cycle path to both sides of proposed road, each (1.7m wide). Total span (3.4m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in LR-RD2
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	1,470	m2	$ 32.40	$ 47,628.00	Assume median (6.0m) to be levelled soil - no landscaping assumed
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	65	LM	$ 216.00	$ 14,112.00	
	4.1.2	Stormwater drainage (450mm DIA)	245	LM	$ 260.00	$ 63,700.00	
	4.1.3	Stormwater drainage (525mm DIA)	-	LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	490	LM	$ 54.00	$ 26,460.00	Inclusive of subsoil drainage
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	7	No.	$ 2,700.00	$ 17,640.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	7	Allow.	$ 1,500.00	$ 9,800.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	Excluded
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	245	LM	$ 32.00	$ 7,840.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	2	Item	$ 350.00	$ 700.00	Allowance only - Assumed spacing of 100m
	6.2	Landscaping					
	6.2.1	Tube stock plantings	2,205	m2	$ 3.00	$ 6,615.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	2,205	m2	$ 10.00	$ 22,050.00	Topsoiling and seeding of nature strips (4.5m) to both sides. Total (9.0m) wide
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	5	No.	$ 12,500.00	$ 61,250.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
			-	LM	$ -	$ -	
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall (0-2m high)	240	LM	$ 1,120.00	$ 268,800.00	Up to 2m high
	8.2.2	Retaining wall (3-5m high)	120	LM	$ 4,480.00	$ 537,600.00	Up to 5m high
	8.2.3	Retaining wall (6-8m high)	80	LM	$ 7,840.00	$ 627,200.00	Up to 8m high
	8.2.4	Retaining wall (9-11m high)		LM	$ 11,200.00	$ -	Up to 11m high
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 4,581,171.45**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 148,888.07	
	10.2	VicRoads Fees	1.00%	Item		$ 45,811.71	
	10.3	Traffic Management	5.00%	Item		$ 229,058.57	
	10.4	Environmental Management	0.50%	Item		$ 22,905.86	
	10.5	Survey & Design	5.00%	Item		$ 229,058.57	
	10.6	Supervision & Project Management	9.00%	Item		$ 412,305.43	
	10.7	Site Establishment	2.50%	Item		$ 114,529.29	
	10.8	Contingency	15.00%	Item		$ 687,175.72	
		SUB-TOTAL DELIVERY				**$ 1,889,733.22**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 6,470,904.68**	

Jacksons Creek Crossing
LR-RD-02-03B Approx. length: 191m (excl. intersections and bridges)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	6,494	m2	$ 5.40	$ 35,067.60	
	1.2	Earthworks					
		1.2.1 Cut and disposal	24,526	m3	$ 27.00	$ 662,192.85	With 10% additional factor
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill		m3	$ 43.20	$ -	
		1.2.4 EO Allowance for rock excavation works	12,263	m3	$ 96.80	$ 1,187,042.00	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	2,216	m2	$ 156.60	$ 346,962.96	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	-	Allow.	$ -	$ -	Have assumed all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	764	LM	$ 48.60	$ 37,130.40	
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	764	m2	$ 59.00	$ 45,076.00	Pedestrian path to both sides of proposed road each (2.0m) wide. Total span (4.0m) wide
		3.2.2 Cycle pathway	649	m2	$ 66.00	$ 42,860.40	Cycle path to both sides of proposed road, each (1.7m wide). Total span (3.4m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in LR-RD2
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	1,146	m2	$ 32.40	$ 37,130.40	Assume median (6.0m) to be levelled soil - no landscaping assumed
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	51	LM	$ 216.00	$ 11,001.60	
		4.1.2 Stormwater drainage (450mm DIA)	191	LM	$ 260.00	$ 49,660.00	
		4.1.3 Stormwater drainage (525mm DIA)	-	LM	$ 383.50	$ -	
		4.1.4 Drainage, sub grade drain	382	LM	$ 54.00	$ 20,628.00	Inclusive of subsoil drainage
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	5	No.	$ 2,700.00	$ 13,752.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	5	Allow.	$ 1,500.00	$ 7,640.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	Excluded
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	191	LM	$ 32.00	$ 6,112.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	2	Item	$ 350.00	$ 700.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	1,719	m2	$ 3.00	$ 5,157.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	1,719	m2	$ 10.00	$ 17,190.00	Topsoiling and seeding of nature strips (4.5m) to both sides. Total (9.0m) wide
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	4	No.	$ 12,500.00	$ 47,750.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
			-	LM	$ -	$ -	
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (0-2m high)	120	LM	$ 1,120.00	$ 134,400.00	Up to 2m high
		8.2.2 Retaining wall (3-5m high)	120	LM	$ 4,480.00	$ 537,600.00	Up to 5m high
		8.2.3 Retaining wall (6-8m high)	120	LM	$ 7,840.00	$ 940,800.00	Up to 8m high
		8.2.4 Retaining wall (9-11m high)		LM	$ 11,200.00	$ -	Up to 11m high
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 4,198,353.22**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 136,446.48	
	10.2	VicRoads Fees	1.00%	Item		$ 41,983.53	
	10.3	Traffic Management	5.00%	Item		$ 209,917.66	
	10.4	Environmental Management	0.50%	Item		$ 20,991.77	
	10.5	Survey & Design	5.00%	Item		$ 209,917.66	
	10.6	Supervision & Project Management	9.00%	Item		$ 377,851.79	
	10.7	Site Establishment	2.50%	Item		$ 104,958.83	
	10.8	Contingency	15.00%	Item		$ 629,752.98	
		SUB-TOTAL DELIVERY				**$ 1,731,820.70**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 5,930,173.92**	

Balbethan Drive
LR-RD-03 Approx. Length 470m (ex.intersection and bridges)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	15,892	m2	$ 5.40	$ 85,816.80	
	1.2	Earthworks					
	1.2.1	Cut and disposal	-	m3	$ 27.00	$ -	
	1.2.2	Fill	1,939	m3	$ 37.80	$ 73,300.01	With 10% additional factor
	1.2.3	Cut to fill	3,202	m3	$ 43.20	$ 138,321.05	With 10% additional factor
	1.2.4	EO Allowance for rock excavation works	1,601	m3	$ 96.80	$ 154,970.81	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	5,264	m2	$ 156.60	$ 824,342.40	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	-	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	940	LM	$ 48.60	$ 45,684.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	1,410	m2	$ 59.00	$ 83,190.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	1,410	m2	$ 66.00	$ 93,060.00	Two way Cycle path. Total span (3m) wide
	3.2.3	Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in LR-RD3
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	-	m2	$ 32.40	$ -	Assumed not included in LR-RD3
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	125	LM	$ 216.00	$ 27,072.00	
	4.1.2	Stormwater drainage (450mm DIA)	470	LM	$ 260.00	$ 122,200.00	
	4.1.3	Stormwater drainage (525mm DIA)	-	LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	940	LM	$ 54.00	$ 50,760.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	13	No.	$ 2,700.00	$ 33,840.00	Assumed spacing of approx. 75m
	4.3	Drainage - WSUD	13	Allow.	$ 1,500.00	$ 18,800.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	470	LM	$ 32.00	$ 15,040.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	10	No.	$ 350.00	$ 3,500.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	7,990	m2	$ 3.00	$ 23,970.00	Allowance of 2 per m2 to nature strip
	6.2.2	Nature strip	7,990	m2	$ 10.00	$ 79,900.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	9	No.	$ 12,500.00	$ 117,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	-	LM	$ -	$ -	Assume no retaining walls to LR-RD3
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 2,003,767.08**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 65,122.43	
	10.2	VicRoads Fees	1.00%	Item		$ 20,037.67	
	10.3	Traffic Management	5.00%	Item		$ 100,188.35	
	10.4	Environmental Management	0.50%	Item		$ 10,018.84	
	10.5	Survey & Design	5.00%	Item		$ 100,188.35	
	10.6	Supervision & Project Management	9.00%	Item		$ 180,339.04	
	10.7	Site Establishment	2.50%	Item		$ 50,094.18	
	10.8	Contingency	15.00%	Item		$ 300,565.06	
		SUB-TOTAL DELIVERY				**$ 826,553.92**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 2,830,321.00**	

Ex Stockwell Drive Upgrade
LR-RD-04 Approx. length: 738m

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	18,450	m2	$ 5.40	$ 99,630.00	Assuming pavement composition depth total 650mm deep including fill
	1.2	Earthworks					
		1.2.1 Cut and disposal	7,077	m3	$ 27.00	$ 191,090.34	With 10% additional factor
		1.2.2 Fill		m3	$ 37.80	$ -	
		1.2.3 Cut to fill		m3	$ 43.20	$ -	
		1.2.4 EO Allowance for rock excavation works		m3	$ 96.80	$ -	Assumed none - Upgrade of existing road
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	8,266	m2	$ 156.60	$ 1,294,392.96	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	-	Allow.	$ -	$ -	Have assumed all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,476	LM	$ 48.60	$ 71,733.60	
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	2,214	m2	$ 59.00	$ 130,626.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3m) wide
		3.2.2 Cycle pathway	2,214	m2	$ 66.00	$ 146,124.00	Cycle path on one side of the road (3m) wide
		3.2.3 Shared pathway	-	m2	$ 66.00	$ -	Assumed not included in LR-RD2
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	-	m2	$ 32.40	$ -	Assumed none
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	197	LM	$ 216.00	$ 42,508.80	
		4.1.2 Stormwater drainage (450mm DIA)	517	LM	$ 260.00	$ 134,316.00	
		4.1.3 Stormwater drainage (525mm DIA)	221	LM	$ 383.50	$ 84,906.90	
		4.1.4 Drainage, sub grade drain	1,476	LM	$ 54.00	$ 79,704.00	Inclusive of subsoil drainage
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	20	No.	$ 2,700.00	$ 53,136.00	Assumed spacing of 75m
	4.3	Drainage - WSUD	20	Allow.	$ 1,500.00	$ 29,520.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	-	LM.	$ -	$ -	Excluded
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	738	LM	$ 32.00	$ 23,616.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	14	Item	$ 350.00	$ 4,900.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	5,756	m2	$ 3.00	$ 17,269.20	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	5,756	m2	$ 10.00	$ 57,564.00	Topsoiling and seeding of nature strips to both sides. Total (7.8m) wide
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	15	No.	$ 12,500.00	$ 184,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
			-	LM	$ -	$ -	
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ -	$ -	
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 2,658,037.80**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	3.25%	Item		$ 86,386.23	
	10.2	VicRoads Fees	1.00%	Item		$ 26,580.38	
	10.3	Traffic Management	5.00%	Item		$ 132,901.89	
	10.4	Environmental Management	0.50%	Item		$ 13,290.19	
	10.5	Survey & Design	5.00%	Item		$ 132,901.89	
	10.6	Supervision & Project Management	9.00%	Item		$ 239,223.40	
	10.7	Site Establishment	2.50%	Item		$ 66,450.95	
	10.8	Contingency	15.00%	Item		$ 398,705.67	
		SUB-TOTAL DELIVERY				**$ 1,096,440.59**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 3,754,478.39**	

Lancefield Road/Sunningdale Road Intersection
LR-IN-01 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	18,096	m2	$ 5.40	$ 97,718.40	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	15,291	m3	$ 27.00	$ 412,860.24	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	7,646	m3	$ 96.80	$ 740,090.21	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	11,351	m2	$ 156.60	$ 1,777,566.60	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 195,436.80	$ 195,436.80	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,114	LM	$ 48.60	$ 54,140.40	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	780	m2	$ 59.00	$ 46,020.00	Allow Cycle path (3m) wide
		3.2.2 Cycle pathway	780	m2	$ 66.00	$ 51,480.00	
		3.2.3 Shared pathway		m2	$ 66.00	$ -	Arterial road: Two 3m wide shared paths (both sides of the road). Total span (6.0m) wide
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	4,056	m2	$ 21.60	$ 87,609.60	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	225	LM	$ 216.00	$ 48,614.40	
		4.1.2 Stormwater drainage (450mm DIA)	591	LM	$ 260.00	$ 153,608.00	
		4.1.3 Stormwater drainage (525mm DIA)	253	LM	$ 383.50	$ 97,102.20	
		4.1.4 Drainage, sub grade drain	1,688	LM	$ 54.00	$ 91,152.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	12	No.	$ 2,700.00	$ 32,400.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	12	Allow.	$ 1,500.00	$ 18,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	844	LM	$ 32.00	$ 27,008.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	16	No.	$ 350.00	$ 5,600.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	1,615	m2	$ 3.00	$ 4,845.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	1,615	m2	$ 10.00	$ 16,150.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	17	No.	$ 12,500.00	$ 212,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ 702.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 4,803,401.85**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 156,110.56	
	11.2	VicRoads Fees	1.00%	Item		$ 48,034.02	
	11.3	Traffic Management	5.00%	Item		$ 240,170.09	
	11.4	Environmental Management	0.50%	Item		$ 24,017.01	
	11.5	Survey & Design	5.00%	Item		$ 240,170.09	
	11.6	Supervision & Project Management	9.00%	Item		$ 432,306.17	
	11.7	Site Establishment	2.50%	Item		$ 120,085.05	
	11.8	Contingency	15.00%	Item		$ 720,510.28	
		SUB-TOTAL DELIVERY				**$ 1,981,403.26**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 6,784,805.11**	

Lancefield Road/Rolling Meadows Drive Intersection
LR-IN-02 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	18,635	m2	$ 5.40	$ 100,629.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	15,747	m3	$ 27.00	$ 425,157.53	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	7,873	m3	$ 96.80	$ 762,134.23	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	12,837	m2	$ 156.60	$ 2,010,195.90	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 201,258.00	$ 201,258.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,039	LM	$ 48.60	$ 50,495.40	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	810	m2	$ 59.00	$ 47,790.00	Allow Cycle path (3m) wide
		3.2.2 Cycle pathway	810	m2	$ 66.00	$ 53,460.00	
		3.2.3 Shared pathway		m2	$ 66.00	$ -	Arterial road: Two 3m wide shared paths (both sides of the road). Total span (6.0m) wide
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	2,847	m2	$ 21.60	$ 61,495.20	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	205	LM	$ 216.00	$ 44,352.00	
		4.1.2 Stormwater drainage (450mm DIA)	539	LM	$ 260.00	$ 140,140.00	
		4.1.3 Stormwater drainage (525mm DIA)	231	LM	$ 383.50	$ 88,588.50	
		4.1.4 Drainage, sub grade drain	1,540	LM	$ 54.00	$ 83,160.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	11	No.	$ 2,700.00	$ 29,700.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	11	Allow.	$ 1,500.00	$ 16,500.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	770	LM	$ 32.00	$ 24,640.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees			$ -		
		6.1.1 Tree planting (2-2.5m tall)	14	No.	$ 350.00	$ 4,900.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	1,801	m2	$ 3.00	$ 5,403.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	1,801	m2	$ 10.00	$ 18,010.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	16	No.	$ 12,500.00	$ 200,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ 702.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 5,001,508.76**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 162,549.03	
	11.2	VicRoads Fees	1.00%	Item		$ 50,015.09	
	11.3	Traffic Management	5.00%	Item		$ 250,075.44	
	11.4	Environmental Management	0.50%	Item		$ 25,007.54	
	11.5	Survey & Design	5.00%	Item		$ 250,075.44	
	11.6	Supervision & Project Management	9.00%	Item		$ 450,135.79	
	11.7	Site Establishment	2.50%	Item		$ 125,037.72	
	11.8	Contingency	15.00%	Item		$ 750,226.31	
		SUB-TOTAL DELIVERY				**$ 2,063,122.36**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 7,064,631.12**	

Lancefield Road/Balbethan Drive Intersection
LR-IN-03 (Cross Intersection - Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	16,946	m2	$ 5.40	$ 91,508.40	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	14,319	m3	$ 27.00	$ 386,622.99	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	4,296	m3	$ 96.80	$ 415,834.50	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	12,282	m2	$ 156.60	$ 1,923,282.90	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 183,016.80	$ 183,016.80	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,049	LM	$ 48.60	$ 50,981.40	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	780	m2	$ 59.00	$ 46,020.00	Connector Road: Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	780	m2	$ 66.00	$ 51,480.00	Allow Cycle path (3m) wide
		3.2.3 Shared pathway		m2	$ 66.00	$ -	
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	-	m2	$ 21.60	$ -	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	248	LM	$ 216.00	$ 53,568.00	
		4.1.2 Stormwater drainage (450mm DIA)	651	LM	$ 260.00	$ 169,260.00	
		4.1.3 Stormwater drainage (525mm DIA)	279	LM	$ 383.50	$ 106,996.50	
		4.1.4 Drainage, sub grade drain	1,860	LM	$ 54.00	$ 100,440.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	11	No.	$ 2,700.00	$ 29,700.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	11	Allow.	$ 1,500.00	$ 16,500.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	930	LM	$ 32.00	$ 29,760.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	18	No.	$ 350.00	$ 6,300.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	3,487	m2	$ 3.00	$ 10,461.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	3,487	m2	$ 10.00	$ 34,870.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	19	No.	$ 12,500.00	$ 237,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ 702.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
			SUB TOTAL - WORKS			**$ 4,577,602.49**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 148,772.08	
	11.2	VicRoads Fees	1.00%	Item		$ 45,776.02	
	11.3	Traffic Management	5.00%	Item		$ 228,880.12	
	11.4	Environmental Management	0.50%	Item		$ 22,888.01	
	11.5	Survey & Design	5.00%	Item		$ 228,880.12	
	11.6	Supervision & Project Management	9.00%	Item		$ 411,984.22	
	11.7	Site Establishment	2.50%	Item		$ 114,440.06	
	11.8	Contingency	15.00%	Item		$ 686,640.37	
			SUB-TOTAL DELIVERY			**$ 1,888,261.03**	
12			**TOTAL ESTIMATED PROJECT COST**			**$ 6,465,863.52**	

Lancefield Road/Jacksons Creek Crossing (North) Intersection
LR-IN-04 (Cross Intersection- Interim)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	16,805	m2	$ 5.40	$ 90,747.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	14,200	m3	$ 27.00	$ 383,406.08	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	-	m3	$ 37.80	$ -	
		1.2.3 EO Allowance for rock excavation works	4,260	m3	$ 96.80	$ 412,374.53	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	13,219	m2	$ 156.60	$ 2,070,017.10	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	1	Allow.	$ 181,494.00	$ 181,494.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	1,434	LM	$ 48.60	$ 69,692.40	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	660	m2	$ 59.00	$ 38,940.00	Allow Cycle path (3m) wide
		3.2.2 Cycle pathway	660	m2	$ 66.00	$ 43,560.00	
		3.2.3 Shared pathway		m2	$ 66.00	$ -	Arterial road: Two 3m wide shared paths (both sides of the road). Total span (6.0m) wide
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	722	m2	$ 21.60	$ 15,595.20	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage (300mm DIA)	263	LM	$ 216.00	$ 56,793.60	
		4.1.2 Stormwater drainage (450mm DIA)	690	LM	$ 260.00	$ 179,452.00	
		4.1.3 Stormwater drainage (525mm DIA)	296	LM	$ 383.50	$ 113,439.30	
		4.1.4 Drainage, sub grade drain	1,972	LM	$ 54.00	$ 106,488.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	15	No.	$ 2,700.00	$ 40,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	15	Allow.	$ 1,500.00	$ 22,500.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	1	Allow.	$ 540,000.00	$ 540,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	986	LM	$ 32.00	$ 31,552.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	20	No.	$ 350.00	$ 7,000.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	1,708	m2	$ 3.00	$ 5,124.00	Allowance of 2 per m2 to nature strip
		6.2.2 Nature strip	1,708	m2	$ 10.00	$ 17,080.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	20	No.	$ 12,500.00	$ 250,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	-	LM	$ 702.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	1	No.	$ 81,000.00	$ 81,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 4,769,255.21**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 155,000.79	
	11.2	VicRoads Fees	1.00%	Item		$ 47,692.55	
	11.3	Traffic Management	5.00%	Item		$ 238,462.76	
	11.4	Environmental Management	0.50%	Item		$ 23,846.28	
	11.5	Survey & Design	5.00%	Item		$ 238,462.76	
	11.6	Supervision & Project Management	9.00%	Item		$ 429,232.97	
	11.7	Site Establishment	2.50%	Item		$ 119,231.38	
	11.8	Contingency	15.00%	Item		$ 715,388.28	
		SUB-TOTAL DELIVERY				**$ 1,967,317.77**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 6,736,572.98**	

Stockwell Drive / Balethan Drive to 3 way roundabout
LR-IN6 (Roundabout)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	1,862.00	m2	$ 5.40	$ 10,054.80	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	612.00	m3	$ 27.00	$ 16,524.00	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	-	m3	$ 37.80	$ -	
	1.2.3	EO Allowance for rock excavation works	183.60	m3	$ 96.80	$ 17,772.48	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	1	Item	$ 12,500.00	$ 12,500.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	942.00	m2	$ 156.60	$ 147,517.20	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	264.00	LM	$ 48.60	$ 12,830.40	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	180.00	m2	$ 59.00	$ 10,620.00	Allow Cycle path (3m) wide
	3.2.2	Cycle pathway	140.00	m2	$ 66.00	$ 9,240.00	
	3.2.3	Shared pathway	95.00	m2	$ 66.00	$ 6,270.00	Connecting shared path on eastern side of intersection
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	227.00	m2	$ 32.40	$ 7,354.80	Assume median (6.0m) to be levelled soil - no landscaping assumed
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage (300mm DIA)	32.00	LM	$ 216.00	$ 6,912.00	
	4.1.2	Stormwater drainage (450mm DIA)	120.00	LM	$ 260.00	$ 31,200.00	
	4.1.3	Stormwater drainage (525mm DIA)	-	LM	$ 383.50	$ -	
	4.1.4	Drainage, sub grade drain	240.00	LM	$ 54.00	$ 12,960.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	4	No.	$ 2,700.00	$ 10,800.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	4.00	Allow.	$ 1,500.00	$ 6,000.00	
	4.4	Drainage - Miscellaneous	-	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Safety					
	5.1.1	Line marking and Traffic Signage	120.00	LM	$ 32.00	$ 3,840.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	2	No.	$ 350.00	$ 700.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	548.00	m2	$ 3.00	$ 1,644.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	548.00	m2	$ 10.00	$ 5,480.00	Topsoiling and seeding of nature strips (4.5m) to both sides. Total (9.0m) wide
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	3	No.	$ 12,500.00	$ 37,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	-	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	-	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	-	LM	$ 702.00	$ -	Assume no retaining walls to LR-RD2
9	**SERVICES**						
	9.1	Services Relocation	-	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	-	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 367,719.68**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	3.25%	Item		$ 11,950.89	
	11.2	VicRoads Fees	1.00%	Item		$ 3,677.20	
	11.3	Traffic Management	5.00%	Item		$ 18,385.98	
	11.4	Environmental Management	0.50%	Item		$ 1,838.60	
	11.5	Survey & Design	5.00%	Item		$ 18,385.98	
	11.6	Supervision & Project Management	9.00%	Item		$ 33,094.77	
	11.7	Site Establishment	2.50%	Item		$ 9,192.99	
	11.8	Contingency	15.00%	Item		$ 55,157.95	
		SUB-TOTAL DELIVERY				**$ 151,684.37**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 519,404.05**	

SS-BR-01 (Long Option)
Approx. length 315m

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
	1.1 Pre-construction					
	1.1.1 Site preparation	2	Item	$ 5,500.00	$ 11,000.00	
	1.1.2 Strip Site Locally	-	sq.m	$ 2.75	$ -	
	1.2 Earthworks					
	1.2.1 Bulk excavation and fill	6,922	cu.m	$ 43.20	$ 299,008.80	
	1.2.2 EO Allowance for rock excavation works	3,461	cu.m	$ 96.80	$ 335,000.60	EO allowance of encountering rock to 50% of excavated area.
	1.2.3 Fill only	-	cu.m	$ 37.80	$ -	
	1.3 Set-Out					
	1.3.1 Allow for site setout and marking	1	Item	$ -	$ 12,500.00	
2	**STRUCTURE**					
	2.1 Slab & Foundations/Piers/Beams					
	2.1.1 Bridge structure	4,785	sq.m	$ 2,450.00	$ 11,723,250.00	Allow for reinforced single span concrete bridge (Total width 13.5m approx.) 200mm thick deck slab on top of super 1800mm deep T-Beams
	2.1.2 Elastomeric Bearings	-	Item	$ 1,650.00	$ -	
	2.1.3 Cast in-situ concrete base slab with footings	-	sq.m	$ 550.00	$ -	
	2.1.4 Bridge Columns	1,386	sq.m	$ 3,500.00	$ 4,851,000.00	
	2.1.5 Piles	80	Item	$ 3,584.70	$ 286,776.00	Driven piles Approx. 10 per pier
	2.1.6 Pile Cap	8	Item	$ 31,950.00	$ 255,600.00	
	2.1.7 Retaining Walls - Wing & Keeper Walls	-	sq.m	$ 1,100.00	$ -	
	2.1.8 Retaining Walls - Fender Wall	-	Item	$ 16,500.00	$ -	
	2.1.9 Retaining Wall	-	sq.m	$ 1,120.00	$ -	
	2.1.10 Bridge Deck	-	sq.m	$ 480.00	$ -	
	2.1.11 Constructability	1	Item		$ 2,691,649.26	Allowance for temporary works due to site conditions
	2.2 Abutments					
	2.2.1 RC Abutment / Crosshead Beam	130	cu.m	$ 2,500.00	$ 325,000.00	
	2.2.2 Anti Sliding Blocks	10	Item	$ 2,500.00	$ 25,000.00	
	2.2.3 Abutment Walls and Bearings	1	Item	$ 400,000.00	$ 400,000.00	
	2.2.4 Bored piles	8	Item	$ 9,712.80	$ 77,702.40	Bored piles behind RC retaining wall
	2.3 Bridge Containment Barriers					
	2.3.1 Bridge containment barriers	646	LM	$ 2,850.00	$ 1,841,100.00	
	2.3.2 Barriers - Medium Containment	-	LM	$ 1,750.00	$ -	
	2.3.3 Barriers - Armco (off structure)	-	LM	$ 110.00	$ -	
	2.4 Other					
3	**ON-BRIDGE WORKS**					
	3.1 Ashphalt Wearing Course Over Slab					
	3.1.1 Asphalt pavement	2,205	sq.m	$ 110.00	$ 242,550.00	Road pavement - Traffic lane Allow Traffic lane (7m) wide
	3.1.2 Road pavement under bridge	-	sq.m	$ 250.00	$ -	
	3.1.3 Cycle track	-	sq.m	$ 1,200.00	$ -	
	3.2 Kerb and Channel					
	3.2.1 Kerb and channel	630	LM	$ 75.00	$ 47,250.00	
	3.3 Footpath					
	3.3.1 Bridge walkway	-	sq.m	$ 1,500.00	$ -	
	3.3.2 Pedestrian footpath	-	sq.m	$ 155.00	$ -	
	3.3.3 Shared path	1,575	sq.m	$ 132.00	$ 207,900.00	Shared path overlay total
	3.4 Lighting On-Bridge					
	3.4.1 Lighting	11	Item	$ 17,500.00	$ 192,500.00	Assumed poles 12m high with luminaries
	3.4.2 Allowance for Conduits	-	LM	$ 16.50	$ -	
	3.5 Other					
4	**OFF-BRIDGE WORKS**					
	4.1 Approach Slabs					
	4.1.1 Reinforced concrete slabs (approach slabs)	108	sq.m	$ 500.00	$ 54,000.00	Assumed 200mm thick
	4.2 Safety Gurad Rail/Barrier					
	4.2.1 Handrails	-	Item	$ 5,000.00	$ -	
	4.2.2 Guard rails	200	LM	$ 1,500.00	$ 300,000.00	Vehicle approach barriers
	4.2.3 Safety rails	-	Item	$ 20,000.00	$ -	
	4.3 Drainage					
	4.3.1 Drainage to bridge	2	Item	$ 150,000.00	$ 300,000.00	Works to approach slabs
	4.3.2 Drainage to lowered road under	-	Item	$ 100,000.00	$ -	
	4.3.3 Rock Beaching	560	cu.m	$ 100.00	$ 56,000.00	300mm thick
	4.4 Scour Protection					
	4.5 Other					
5	**MISCELLANEOUS**					
	5.1 Architectural screens / cladding to Piers / Deck	630	LM	$ 2,000.00	$ 1,260,000.00	
	5.2 Anti Throw screens	630	LM	$ 1,650.00	$ 1,039,500.00	
	5.3 Dewatering works	1	Item	$ 250,000.00	$ 250,000.00	Allowance for dewatering works
	5.4 Melbourne Water Temp Diversion	-	sq.m	$ -	$ -	
	5.5 Linemarking	315	LM	$ 32.00	$ 10,080.00	
	5.6 Signage	-	Item	$ 25,000.00	$ -	
	5.7 Occupation costs	-	Item	$ 20,000.00	$ -	
	5.8 Construction occupation	-	Item	$ 1,035,000.00	$ -	
	5.9 Habitat compenstaion fee	1	Item	$ 88,000.88	$ 88,000.88	Estimate from DELWP
6	**RAIL RELATED ITEMS**					
	6.1 Occupation costs (minor)	-	Item	$ 20,000.00	$ -	
	6.2 Construction occupation	-	Item	$ 1,035,000.00	$ -	
	6.3 Signalling Adjustments	-	Item	$ 750,000.00	$ -	
	6.4 Rail Occupation Costs (Power Off) - N/A Vline Only	-	Note			
	6.5 Rail Occupation Costs (Major) - Vline	-	Wkend	$ 100,000.00	$ -	
	6.6 Track & Ballast	-	Item	$ 1,650.00	$ -	
	6.7 OHLE (Assume + 100m each way)	-	TM	$ 550.00	$ -	
7	**SERVICES**					
	7.1 APA Gas	-	Item	$ 4,400,000.00	$ -	
	7.2 Telstra NBN	-	Item	$ 400,000.00	$ -	
	7.3 Western Water Sewer	-	Item	$ 300,000.00	$ -	
	7.4 Services relocation	1	Item	$ 150,000.00	$ 150,000.00	Allowances for service relocation surrounding approach slabs
	7.5 Increase in Head Contractor Preliminaries (22% to 25%)	3	%	$ 27,332,367.94	$ 819,971.04	Allowance for scale of project
			SUB TOTAL - WORKS		**$ 28,152,338.98**	
8	**DELIVERY**					
	8.1 Council Fees	3%	Item		$ 914,951.02	
	8.2 VicRoads Fees	0%	Item		$ -	
	8.3 Traffic Management	5%	Item		$ 1,407,616.95	
	8.4 Environmental Management	1%	Item		$ 140,761.69	
	8.5 Survey & Design	5%	Item		$ 1,407,616.95	
	8.6 Supervision & Project Management	12%	Item		$ 3,378,280.68	Increase due to scale of project
	8.7 Site Establishment	3%	Item		$ 703,808.47	
	8.8 Contingency	20%	Item		$ 5,630,467.80	
			SUB TOTAL - DELIVERY		**$ 13,583,503.56**	
			TOTAL		**$ 41,735,842.54**	

SS-BR-02
Approx. length 22m

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
	1.1 Pre-construction					
	1.1.1 Site preparation	1	Item	$ 5,500.00	$ 5,500.00	
	1.1.2 Strip Site Locally	368	sq.m	$ 2.75	$ 1,012.00	
	1.2 Earthworks					
	1.2.1 Bulk excavation and fill	-	cu.m	$ 43.20	$ -	
	1.2.2 EO Allowance for rock excavation works	-	cu.m	$ 96.80	$ -	EO allowance of encountering rock to 50% of excavated area.
	1.2.1 Fill only	500	cu.m	$ 38.50	$ 19,250.00	Imported fill
	1.3 Set-Out					
	1.3.1 Allow for site setout and marking	1	Item	$ 5,500.00	$ 5,500.00	
2	**STRUCTURE**					
	2.1 Slab & Foundations/Piers/Beams					
	2.1.1 Bridge structure	330	sq.m	$ 2,450.00	$ 808,500.00	Single span precast 1200 mm deep Super T-beam arrangement with in-situ deck overlay.
	2.1.2 Elastomeric Bearings	-	Item	$ 1,650.00	$ -	
	2.1.3 Cast in-situ concrete base slab with footings	-	sq.m	$ 550.00	$ -	
	2.1.4 Bridge Columns	-	sq.m	$ 3,500.00	$ -	
	2.1.5 Piles	-	Item	$ 3,584.70	$ -	
	2.1.6 Pile Cap	-	Item	$ 31,950.00	$ -	
	2.1.7 Retaining Walls - Wing & Keeper Walls	160	sq.m	$ 1,100.00	$ 176,000.00	
	2.1.8 Retaining Walls - Fender Wall	2	Item	$ 16,500.00	$ 33,000.00	
	2.1.9 Retaining Wall	-	sq.m	$ 1,120.00	$ -	
	2.1.10 Bridge Deck	-	sq.m	$ 480.00	$ -	
	2.1.11 Constructability	-	Item			
	2.2 Abutments					
	2.2.1 RC Abutment / Crosshead Beam	27	LM	$ 3,147.00	$ 84,969.00	
	2.2.2 Anti Sliding Blocks	-	Item	$ 2,500.00	$ -	
	2.2.3 Abutment Walls and Bearings	1	Item	$ 400,000.00	$ 400,000.00	
	2.2.4 Bored piles	-	Item	$ 9,712.80	$ -	
	2.3 Bridge Containment Barriers					
	2.3.1 Bridge containment barriers	-	LM	$ 2,850.00	$ -	
	2.3.2 Barriers - Medium Containment	40	LM	$ 1,750.00	$ 70,000.00	
	2.3.3 Barriers - Armco (off structure)	160	LM	$ 110.00	$ 17,600.00	
	2.4 Other					
3	**ON-BRIDGE WORKS**					
	3.1 Ashphalt Wearing Course Over Slab					
	3.1.1 Asphalt pavement	154	sq.m	$ 110.00	$ 16,940.00	
	3.1.2 Road pavement under bridge	-	sq.m	$ 250.00	$ -	
	3.1.3 Cycle track	-	sq.m	$ 1,200.00	$ -	
	3.2 Kerb and Channel					
	3.2.1 Kerb and channel	60	LM	$ 75.00	$ 4,500.00	
	3.3 Footpath					
	3.3.1 Bridge walkway	-	sq.m	$ 1,500.00	$ -	
	3.3.2 Pedestrian footpath	33	sq.m	$ 155.00	$ 5,115.00	
	3.3.3 Shared path	66	sq.m	$ 155.00	$ 10,230.00	
	3.4 Lighting On-Bridge					
	3.4.1 Lighting	2	Item	$ 17,500.00	$ 35,000.00	
	3.4.2 Allowance for Conduits	178	LM	$ 16.50	$ 2,944.92	
	3.5 Other					
4	**OFF-BRIDGE WORKS**					
	4.1 Approach Slabs					
	4.1.1 Reinforced concrete slabs (approach slabs)	108	sq.m	$ 500.00	$ 54,000.00	Assumed 200mm thick
	4.2 Safety Gurad Rail/Barrier					
	4.2.1 Handrails	-	Item	$ 5,000.00	$ -	
	4.2.2 Guard rails	-	Item	$ 5,000.00	$ -	
	4.2.3 Safety rails	-	Item	$ 20,000.00	$ -	
	4.3 Drainage					
	4.3.1 Drainage to bridge	1	Item	$ 22,000.00	$ 22,000.00	
	4.3.2 Drainage to lowered road under	-	Item	$ 100,000.00	$ -	
	4.3.3 Rock Beaching	30	cu.m	$ 176.00	$ 5,280.00	300mm thick
	4.4 Scour Protection					
	4.5 Other					
5	**MISCELLANEOUS**					
	5.1 Architectural screens / cladding to Piers / Deck	-	LM	$ 2,000.00	$ -	
	5.2 Anti Throw screens	-	LM	$ 1,650.00	$ -	
	5.3 Dewatering works	-	Item	$ 250,000.00	$ -	
	5.4 Melbourne Water Temp Diversion	250	sq.m	$ 1,000.00	$ 250,000.00	
	5.5 Linemarking	1	Item	$ 1,200.00	$ 1,200.00	
	5.6 Signage	1	Item	$ 25,000.00	$ 25,000.00	
	5.7 Occupation costs	-	Item	$ 20,000.00	$ -	
	5.8 Construction occupation	-	Item	$ 1,035,000.00	$ -	
	5.9 Habitat Compensation Fee (Estimate)	-	Item	$ -	$ -	
6	**RAIL RELATED ITEMS**					
	6.1 Occupation costs (minor)	-	Item	$ 20,000.00	$ -	
	6.2 Construction occupation	-	Item	$ 1,035,000.00	$ -	
	6.3 Signalling Adjustments	-	Item	$ 750,000.00	$ -	
	6.4 Rail Occupation Costs (Power Off) - N/A Vline Only	-	Note			
	6.5 Rail Occupation Costs (Major) - Vline	-	Wkend	$ 100,000.00	$ -	
	6.6 Track & Ballast	-	Item	$ 1,650.00	$ -	
	6.7 OHLE (Assume + 100m each way)	-	TM	$ 550.00	$ -	
7	**SERVICES**					
	7.1 APA Gas	-	Item	$ 4,400,000.00	$ -	
	7.2 Telstra NBN	-	Item	$ 400,000.00	$ -	
	7.3 Western Water Sewer	-	Item	$ 300,000.00	$ -	
	7.4 Services relocation	-	Item	$ 150,000.00	$ -	
	7.5 Increase in Head Contractor Preliminaries (22% to 25%)	-	%	$ 2,053,540.92	$ -	
			SUB TOTAL - WORKS		**$ 2,053,540.92**	
8	**DELIVERY**					
	8.1 Council Fees	3%	Item		$ 66,740.08	
	8.2 VicRoads Fees	0%	Item		$ -	
	8.3 Traffic Management	5%	Item		$ 102,677.05	
	8.4 Environmental Management	1%	Item		$ 10,267.70	
	8.5 Survey & Design	5%	Item		$ 102,677.05	
	8.6 Supervision & Project Management	9%	Item		$ 184,818.68	
	8.7 Site Establishment	3%	Item		$ 51,338.52	
	8.8 Contingency	20%	Item		$ 410,708.18	
			SUB TOTAL - DELIVERY		**$ 929,227.27**	
			TOTAL		**$ 2,982,768.19**	

SS-BR-03 - Bridge
Approx. length 16m

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
	1.1 Pre-construction					
	1.1.1 Site preparation	1	Item	$ 5,500.00	$ 5,500.00	
	1.1.2 Strip Site Locally	500	sq.m	$ 2.75	$ 1,375.00	At Approach Ramps / RE Walls
	1.2 Earthworks					
	1.2.1 Bulk excavation and fill	640	cu.m	$ 43.20	$ 27,648.00	
	1.2.2 EO Allowance for rock excavation works	320	cu.m	$ 96.80	$ 30,976.00	EO allowance of encountering rock to 50% of excavated area.
	1.2.2 Fill only	-	cu.m	$ 38.50	$ -	Imported Structural Fill to over crown units, compacted in layers
	1.3 Set-Out					
	1.3.1 Allow for site setout and marking	1	Item	$ 5,500.00	$ 5,500.00	
2	**STRUCTURE**					
	2.1 Slab & Foundations/Piers/Beams					
	2.1.1 Bridge Structure	16	LM	$ 2,500.00	$ 40,000.00	Single span precast inverted concrete culvert (1.8 x 2.4m)
	2.1.2 Elastomeric Bearings	-	Item	$ 1,650.00	$ -	
	2.1.3 Cast in-situ concrete base slab with footings	110	sq.m	$ 550.00	$ 60,500.00	
	2.1.4 Bridge Columns	-	sq.m	$ 3,500.00	$ -	
	2.1.5 Piles	-	Item	$ 3,584.70	$ -	
	2.1.6 Pile Cap	-	Item	$ 31,950.00	$ -	
	2.1.7 Retaining Walls - Wing & Keeper Walls	2	Item	$ 18,000.00	$ 36,000.00	
	2.1.8 Retaining Walls - Fender Wall	-	Item	$ 16,500.00	$ -	
	2.1.9 Retaining Wall	-	sq.m	$ 1,120.00	$ -	
	2.1.10 Bridge Deck	36	sq.m	$ 480.00	$ 17,280.00	Deck Slabs 200mm thick 40 Mpa
	2.1.11 Constructability	-	Item			
	2.2 Abutments					
	2.2.1 RC Abutment / Crosshead Beam		LM	$ 3,147.00		
	2.2.2 Anti Sliding Blocks	-	Item	$ 2,500.00	$ -	
	2.2.3 Abutment Walls and Bearings	-	Item	$ 400,000.00	$ -	
	2.2.4 Bored piles	-	Item	$ 9,712.80	$ -	
	2.3 Bridge Containment Barriers					
	2.3.1 Bridge containment barriers	-	LM	$ 2,850.00	$ -	
	2.3.2 Barriers - Medium Containment	-	LM	$ 1,750.00	$ -	
	2.3.3 Barriers - Armco (off structure)	40	LM	$ 120.00	$ 4,800.00	
	2.4 Other					
3	**ON-BRIDGE WORKS**					
	3.1 Ashphalt Wearing Course Over Slab					
	3.1.1 Asphalt pavement	35	sq.m	$ 110.00	$ 3,850.00	195mm thick asphalt pavement in 3 layers
	3.1.2 Road pavement under bridge	-	sq.m	$ 250.00	$ -	
	3.1.3 Cycle track	-	sq.m	$ 1,200.00	$ -	
	3.2 Kerb and Channel					
	3.2.1 Kerb and channel	40	LM	$ 75.00	$ 3,000.00	
	3.3 Footpath					
	3.3.1 Bridge walkway	-	sq.m	$ 1,500.00	$ -	
	3.3.2 Pedestrian footpath	8	sq.m	$ 155.00	$ 1,162.50	
	3.3.3 Shared path	15	sq.m	$ 155.00	$ 2,325.00	
	3.4 Lighting On-Bridge					
	3.4.1 Lighting	1	Item	$ 12,500.00	$ 12,500.00	Pole Mounted @ 35m centres both sides
	3.4.2 Allowance for Conduits	-	LM	$ 16.50	$ -	
	3.5 Other					
4	**OFF-BRIDGE WORKS**					
	4.1 Approach Slabs					
	4.1.1 Reinforced concrete slabs (approach slabs)	108	sq.m	$ 500.00	$ 54,000.00	Assumed 200mm thick
	4.2 Safety Gurad Rail/Barrier					
	4.2.1 Handrails	-	Item	$ 5,000.00	$ -	
	4.2.2 Guard rails	-	Item	$ 5,000.00	$ -	
	4.2.3 Safety rails	-	Item	$ 20,000.00	$ -	
	4.3 Drainage					
	4.3.1 Drainage to bridge	-	Item	$ 22,000.00	$ -	
	4.3.2 Drainage to lowered road under	-	Item	$ 100,000.00	$ -	
	4.3.3 Rock Beaching	30	cu.m	$ 176.00	$ 5,280.00	300mm thick
	4.4 Scour Protection					
	4.5 Other					
	4.5.1 Grade and Level for Culvert Base and Apron Slab	500	sq.m	$ 27.50	$ 13,750.00	
5	**MISCELLANEOUS**					
	5.1 Architectural screens / cladding to Piers / Deck	-	LM	$ 2,000.00	$ -	
	5.2 Anti Throw screens	-	LM	$ 1,650.00	$ -	
	5.3 Dewatering works	-	Item	$ 250,000.00	$ -	
	5.4 Melbourne Water Temp Diversion	-	sq.m	$ 1,000.00	$ -	
	5.5 Linemarking	1	Item	$ 1,200.00	$ 1,200.00	
	5.6 Signage	-	Item	$ 25,000.00	$ -	
	5.7 Occupation costs	-	Item	$ 20,000.00	$ -	
	5.8 Construction occupation	-	Item	$ 1,035,000.00	$ -	
	5.9 Habitat Compensation Fee (Estimate)	-	Item	$ -	$ -	
6	**RAIL RELATED ITEMS**					
	6.1 Occupation costs (minor)	-	Item	$ 20,000.00	$ -	
	6.2 Construction occupation	-	Item	$ 1,035,000.00	$ -	
	6.3 Signalling Adjustments	-	Item	$ 750,000.00	$ -	
	6.4 Rail Occupation Costs (Power Off) - N/A Vline Only	-	Note			
	6.5 Rail Occupation Costs (Major) - Vline	-	Wkend	$ 100,000.00	$ -	
	6.6 Track & Ballast	-	Item	$ 1,650.00	$ -	
	6.7 OHLE (Assume + 100m each way)	-	TM	$ 550.00	$ -	
7	**SERVICES**					
	7.1 APA Gas	-	Item	$ 4,400,000.00	$ -	
	7.2 Telstra NBN	-	Item	$ 400,000.00	$ -	
	7.3 Western Water Sewer	-	Item	$ 300,000.00	$ -	
	7.4 Services relocation	-	Item	$ 150,000.00	$ -	
	7.5 Increase in Head Contractor Preliminaries (22% to 25%)	-	%	$ 326,646.50	$ -	
			SUB TOTAL - WORKS		**$ 326,646.50**	
8	**DELIVERY**					
	8.1 Council Fees	3%	Item		$ 10,616.01	
	8.2 VicRoads Fees	0%	Item		$ -	
	8.3 Traffic Management	5%	Item		$ 16,332.33	
	8.4 Environmental Management	1%	Item		$ 1,633.23	
	8.5 Survey & Design	5%	Item		$ 16,332.33	
	8.6 Supervision & Project Management	9%	Item		$ 29,398.19	
	8.7 Site Establishment	3%	Item		$ 8,166.16	
	8.8 Contingency	20%	Item		$ 65,329.30	
			SUB TOTAL - DELIVERY		**$ 147,807.54**	
			TOTAL		**$ 474,454.04**	

SS-BR-04 - Bridge
Approx. length 12m (road under rail)

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
	1.1 Pre-construction					
	1.1.1 Site preparation	1	Item	$ 5,500.00	$ 5,500.00	
	1.1.2 Strip Site Locally	-	sq.m	$ 2.75	$ -	
	1.2 Earthworks					
	1.2.1 Bulk excavation and fill	1,040	cu.m	$ 43.20	$ 44,928.00	Site excavation, compaction and rock beaching
	1.2.2 EO Allowance for rock excavation works	520	cu.m	$ 96.80	$ 50,336.00	EO allowance of encountering rock to 50% of excavated area.
	1.2.3 Fill only	-	cu.m	$ 37.80	$ -	
	1.3 Set-Out					
	1.3.1 Allow for site setout and marking		Item			Incl
2	**STRUCTURE**					
	2.1 Slab & Foundations/Piers/Beams					
	2.1.1 Bridge structure	194	sq.m	$ 1,900.00	$ 368,600.00	Single span precast prestressed 1200 mm deep Super T-beam (4no.) arrangement with in-situ deck slab overlay on top of reinforced abutment cross head.
	2.1.2 Elastomeric Bearings	-	Item	$ 1,650.00	$ -	
	2.1.3 Cast in-situ concrete base slab with footings	-	sq.m	$ 550.00	$ -	
	2.1.4 Bridge Columns	-	sq.m	$ 3,500.00	$ -	
	2.1.5 Piles	8	Item	$ 15,000.00	$ 120,000.00	Including pile caps, pile set up, drilling, concrete, and reinforcement.
	2.1.6 Pile Cap	-	Item	-		
	2.1.7 Retaining Walls - Wing & Keeper Walls	-	sq.m	$ 1,100.00	$ -	
	2.1.8 Retaining Walls - Fender Wall	-	Item	$ 16,500.00	$ -	
	2.1.9 Retaining wall	300	sq.m	$ 1,120.00	$ 336,000.00	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall
	2.1.10 Bridge Deck	-	sq.m	$ 480.00	$ -	
	2.1.11 Constructability	-	Item			
	2.2 Abutments					
	2.2.1 RC Abutment / Crosshead Beam	30	LM	$ 3,147.00	$ 94,410.00	
	2.2.2 Anti Sliding Blocks	-	Item	$ 2,500.00	$ -	
	2.2.3 Abutment Walls and Bearings	-	Item	$ 400,000.00	$ -	
	2.2.4 Bored piles	-	Item	$ 9,712.80	$ -	
	2.3 Bridge Containment Barriers					
	2.3.1 Bridge containment barriers	-	LM	$ 2,850.00	$ -	
	2.3.2 Barriers - Medium Containment	-	LM	$ 1,750.00	$ -	
	2.3.3 Barriers - Armco (off structure)	-	LM	$ 110.00	$ -	
	2.4 Other					
3	**ON-BRIDGE WORKS**					
	3.1 Ashphalt Wearing Course Over Slab					
	3.1.1 Asphalt pavement	-	sq.m	$ 110.00	$ -	
	3.1.2 Road pavement under bridge	194	sq.m	$ 250.00	$ 48,500.00	
	3.1.3 Cycle track	58	sq.m	$ 1,200.00	$ 69,840.00	(160mm thk deck slab onto of1No. Super T grider 750mm
	3.2 Kerb and Channel					
	3.2.1 Kerb and channel	30	LM	$ 75.00	$ 2,250.00	
	3.3 Footpath					
	3.3.1 Bridge walkway	-	sq.m	$ 1,500.00	$ -	
	3.3.2 Pedestrian footpath	-	sq.m	$ 155.00	$ -	
	3.3.3 Shared path	-	sq.m	$ 155.00	$ -	
	3.4 Lighting On-Bridge					
	3.4.1 Lighting	4	Item	$ 2,500.00	$ 10,000.00	Mounted to underside of bridge
	3.4.2 Allowance for Conduits	-	LM	$ 16.50	$ -	
	3.5 Other					
4	**OFF-BRIDGE WORKS**					
	4.1 Approach Slabs					
	4.1.1 Reinforced concrete slabs (approach slabs)	115	sq.m	$ 500.00	$ 57,600.00	Assume 4m long approach RC slab at each abutment (assumed also 200mm thick)
	4.2 Safety Gurad Rail/Barrier					
	4.2.1 Handrails	1	Item	$ 5,000.00	$ 5,000.00	Allowance only, Pedestrain barriers to bridge over
	4.2.2 Guard rails	1	Item	$ 5,000.00	$ 5,000.00	Allowance only, vehicle approach barriers
	4.2.3 Safety rails	1	Item	$ 20,000.00	$ 20,000.00	Allowance only, Rail safety barriers for bridge over
	4.3 Drainage					
	4.3.1 Drainage to bridge	1	Item	$ 22,000.00	$ 22,000.00	
	4.3.2 Drainage to lowered road under	1	Item	$ 100,000.00	$ 100,000.00	
	4.3.3 Rock Beaching	-	cu.m	$ 100.00	$ -	
	4.4 Scour Protection					
	4.5 Other					
5	**MISCELLANEOUS**					
	5.1 Architectural screens / cladding to Piers / Deck	2	Item	$ 44,000.00	$ 88,000.00	
	5.2 Anti Throw screens	-	LM	$ 1,650.00	$ -	
	5.3 Dewatering works	-	Item	$ 250,000.00	$ -	
	5.4 Melbourne Water Temp Diversion	-	sq.m	$ 1,000.00	$ -	
	5.5 Linemarking	1	Item	$ 1,200.00	$ 1,200.00	
	5.6 Signage	-	Item	$ 25,000.00	$ -	
	5.7 Occupation costs	3	Item	$ 20,000.00	$ 60,000.00	
	5.8 Construction occupation	2	Item	$ 1,035,000.00	$ 2,070,000.00	
	5.9 Habitat Compensation Fee (Estimate)	-	Item	$ -	$ -	
6	**RAIL RELATED ITEMS**					
	6.1 Occupation costs (minor)	-	Item	$ 20,000.00	$ -	
	6.2 Construction occupation	-	Item	$ 1,035,000.00	$ -	
	6.3 Signalling Adjustments	1	Item	$ 750,000.00	$ 750,000.00	
	6.4 Rail Occupation Costs (Power Off) - N/A Vline Only	-	Note			
	6.5 Rail Occupation Costs (Major) - Vline	-	Wkend	$ 100,000.00	$ -	
	6.6 Track & Ballast	444	TM	$ 1,650.00	$ 732,600.00	Assume + 100m each way
	6.7 OHLE (Assume + 100m each way)	444	TM	$ 550.00	$ 244,200.00	
7	**SERVICES**					
	7.1 APA Gas	1	Item	$ 4,400,000.00	$ 4,400,000.00	Figure provided by APA
	7.2 Telstra NBN	1	Item	$ 400,000.00	$ 400,000.00	
	7.3 Western Water Sewer	1	Item	$ 300,000.00	$ 300,000.00	
	7.4 Services relocation	-	Item	$ 150,000.00	$ -	
	7.5 Increase in Head Contractor Preliminaries (22% to 25%)	3	%	$ 10,405,964.00	$ 312,178.92	Increase due to project complexity
				SUB TOTAL - WORKS	**$ 10,718,142.92**	
8	**DELIVERY**					
	8.1 Council Fees	3%	Item		$ 348,339.64	
	8.2 VicRoads Fees	0%	Item		$ -	
	8.3 Traffic Management	5%	Item		$ 535,907.15	
	8.4 Environmental Management	1%	Item		$ 53,590.71	
	8.5 Survey & Design	5%	Item		$ 535,907.15	
	8.6 Supervision & Project Management	25%	Item		$ 2,679,535.73	Includes LXRA Fee
	8.7 Site Establishment	3%	Item		$ 267,953.57	
	8.8 Contingency	20%	Item		$ 2,143,628.58	
				SUB TOTAL - DELIVERY	**$ 6,564,862.54**	
				TOTAL	**$ 17,283,005.46**	

LR-BR-01 - Bridge Steel Girder

Approx. length 490m

Item	Description		Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	**Pre-construction**					
	1.1.1	Site preparation	2	Item	$ 5,500.00	$ 11,000.00	
	1.1.2	Strip Site Locally	-	sq.m	$ 2.75	$ -	
	1.2	**Earthworks**					
	1.2.1	Bulk excavation and fill	10,000	cu.m	$ 43.20	$ 432,000.00	
	1.2.2	EO Allowance for rock excavation works	5,000	cu.m	$ 96.80	$ 484,000.00	EO allowance of encountering rock to 50% of excavated area.
	1.2.3	Fill only	-	cu.m	$ 37.80	$ -	
	1.3	**Set-Out**					
	1.3.1	Allow for site setout and marking	1	Item	$ 12,500.00	$ 12,500.00	
2	**STRUCTURE**						
	2.1	**Slab & Foundations/Piers/Beams**					
	2.1.1	Bridge Structure	7,383	sq.m	$ 4,450.00	$ 32,854,350.00	Conc slab (200mm thk) including 3000mm deep steel girders Steel Girder, 50m spans with rinforced concrete deck
	2.1.2	Elastomeric Bearings	-	Item	$ 1,650.00	$ -	
	2.1.3	Cast in-situ concrete base slab with footings	-	sq.m	$ 550.00	$ -	
	2.1.4	Bridge Columns	8,970	cu.m	$ 1,100.00	$ 9,867,000.00	Pier concrete Column 12,000w x 2500d 40Mpa
	2.1.5	Pile	2,600	Lm	$ 1,800.00	$ 4,680,000.00	Foundation Concrete bored Piles 900d x 20,000l 50Mpa
	2.1.6	Pile Cap	624	cu.m	$ 650.00	$ 405,600.00	Concrete pier Pile Cap 16,000l x 2500w x 1200d 40Mpa
	2.1.7	Retaining Walls - Wing & Keeper Walls	-	sq.m	$ 1,100.00	$ -	
	2.1.8	Retaining Walls - Fender Wall	-	Item	$ 16,500.00	$ -	
	2.1.9	Retaining Wall	-	sq.m	$ 1,120.00	$ -	
	2.1.10	Bridge deck	-	sq.m	$ 480.00	$ -	
	2.1.11	Constructability	1	Item		$ 7,624,177.50	Includes site reinstatement, temproary works, staging etc.
	2.2	**Abutments**					
	2.2.1	RC Abutment / Crosshead Beam	1,208	cu.m	$ 2,500.00	$ 3,020,900.00	1200w x 1000d 40Mpa
	2.2.2	Anti Sliding Blocks	-	Item	$ 2,500.00	$ -	
	2.2.3	Abutment Walls and Bearings	-	Item	$ 400,000.00	$ -	
	2.2.4	Bored piles	-	Item	$ 9,712.80	$ -	
	2.3	**Bridge Containment Barriers**					
	2.3.1	Bridge containment barriers	1,000	Lm	$ 2,850.00	$ 2,850,000.00	
	2.3.2	Barriers - Medium Containment	-	LM	$ 1,750.00	$ -	
	2.3.3	Barriers - Armco (off structure)	-	LM	$ 110.00	$ -	
	2.4	**Other**					
3	**ON-BRIDGE WORKS**						
	3.1	**Ashphalt Wearing Course Over Slab**					
	3.1.1	Asphalt pavement	4,410	sq.m	$ 110.00	$ 485,100.00	
	3.1.2	Road pavement under bridge	-	sq.m	$ 250.00	$ -	
	3.1.3	Cycle track	-	sq.m	$ 1,200.00	$ -	
	3.2	**Kerb and Channel**					
	3.2.1	Kerb and channel	1,000	Lm	$ 75.00	$ 75,000.00	
	3.3	**Footpath**					
	3.3.1	Footpath	1,500	sq.m	$ 66.00	$ 99,000.00	
	3.3	**Footpath**					
	3.3.1	Bridge walkway	-	sq.m	$ 1,500.00	$ -	
	3.3.2	Pedestrian footpath	-	sq.m	$ 155.00	$ -	
	3.3.3	Shared path	-	sq.m	$ 155.00	$ -	
	3.4	**Lighting On-Bridge**					
	3.4.1	Lighting	34	Item	$ 17,500.00	$ 595,000.00	Includes Poles
	3.4.2	Allowance for Conduits	-	LM	$ 16.50	$ -	
	3.5	**Other**					
4	**OFF-BRIDGE WORKS**						
	4.1	**Approach Slabs**					
	4.1.1	Reinforced concrete slabs (approach slabs)	50	cu.m	$ 500.00	$ 25,000.00	
	4.2	**Safety Gurad Rail/Barrier**					
	4.2.1	Handrails	-	Item	$ 5,000.00	$ -	
	4.2.2	Guard rails	200	LM	$ 1,500.00	$ 300,000.00	Vehicle approach barriers
	4.2.3	Safety rails	-	Item	$ 1,700.00	$ -	
	4.3	**Drainage**					
	4.3.1	Drainage to bridge	-	Item	$ 22,000.00	$ -	
	4.3.2	Drainage to lowered road under	-	Item	$ 100,000.00	$ -	
	4.3.3	Rock Beaching	-	cu.m	$ 100.00	$ -	
	4.4	**Scour Protection**					
	4.5	**Other**					
5	**MISCELLANEOUS**						
	5.1	Architectural screens / cladding to Piers / Deck	1,000	LM	$ 1,200.00	$ 1,200,000.00	
	5.2	Anti Throw screens	980	LM	$ 1,650.00	$ 1,616,901.00	
	5.3	Dewatering works	-	Item	$ 250,000.00	$ -	
	5.4	Melbourne Water Temp Diversion	-	sq.m	$ 1,000.00	$ -	
	5.5	Linemarking	490	Item	$ 32.00	$ 15,680.00	
	5.6	Signage	-	Item	$ 25,000.00	$ -	
	5.7	Occupation costs	-	Item	$ 20,000.00	$ -	
	5.8	Construction occupation	-	Item	$ 1,035,000.00	$ -	
	5.9	Habitat Compensation Fee (Estimate)	1	Item	$ 19,497.12	$ 19,497.12	Estimate from DELWP
6	**RAIL RELATED ITEMS**						
	6.1	Occupation costs (minor)	-	Item	$ 20,000.00	$ -	
	6.2	Construction occupation	-	Item	$ 1,035,000.00	$ -	
	6.3	Signalling Adjustments	-	Item	$ 750,000.00	$ -	
	6.4	Rail Occupation Costs (Power Off) - N/A Vline Only	-	Note			
	6.5	Rail Occupation Costs (Major) - Vline	-	Wkend	$ 100,000.00	$ -	
	6.6	Track & Ballast	-	Item	$ 1,650.00	$ -	
	6.7	OHLE (Assume + 100m each way)	-	TM	$ 550.00	$ -	
7	**SERVICES**						
	7.1	APA Gas	-	Item	$ 4,400,000.00	$ -	
	7.2	Telstra NBN	-	Item	$ 400,000.00	$ -	
	7.3	Western Water Sewer	-	Item	$ 300,000.00	$ -	
	7.4	Services relocation	-	Item	$ 150,000.00	$ -	
	7.5	Increase in Head Contractor Preliminaries (22% to 25%)	3	%	$ 66,672,705.62	$ 2,000,181.17	
					SUB TOTAL - WORKS	**$ 68,672,886.79**	
8	**DELIVERY**						
	8.1	Council Fees	3%	Item		$ 2,231,868.82	
	8.2	VicRoads Fees	0%	Item		$ -	
	8.3	Traffic Management	5%	Item		$ 3,433,644.34	
	8.4	Environmental Management	1%	Item		$ 343,364.43	
	8.5	Survey & Design	5%	Item		$ 3,433,644.34	
	8.6	Supervision & Project Management	15%	Item		$ 10,300,933.02	Increased due to scale of project
	8.7	Site Establishment	3%	Item		$ 1,716,822.17	
	8.8	Contingency	20%	Item		$ 13,734,577.36	
					SUB TOTAL - DELIVERY	**$ 35,194,854.48**	
					TOTAL	**$ 103,867,741.27**	

LR-BR-02

Approx. Length 11m (road under rail)

Item	Description		Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	**Pre-construction**					
		1.1.1 Site preparation	1	Item	$ 5,500.00	$ 5,500.00	
		1.1.2 Strip Site Locally	-	sq.m	$ 2.75	$ -	
	1.2	**Earthworks**					
		1.2.1 Bulk excavation and fill	1,130	cu.m	$ 43.20	$ 48,816.00	
		1.2.2 EO Allowance for rock excavation works	565	cu.m	$ 96.80	$ 54,692.00	EO allowance of encountering rock to 50% of excavated area.
		1.2.3 Fill only	-	cu.m	$ 37.80	$ -	
	1.3	**Set-Out**					
		1.3.1 Allow for site setout and marking	1	Item	$ 5,000.00	$ 5,000.00	
2	**STRUCTURE**						
	2.1	**Slab & Foundations/Piers/Beams**					
		2.1.1 Bridge structure	250	sq.m	$ 1,900.00	$ 475,000.00	Single span precast prestressed 1200 mm deep Super T-beam (5no.) arrangement with in-situ deck slab overlay on top of reinforced abutment cross head
		2.1.2 Elastomeric Bearings	-	Item	$ 1,650.00	$ -	
		2.1.3 Cast in-situ concrete base slab with footings	-	sq.m	$ 550.00	$ -	
		2.1.4 Bridge Columns	-	sq.m	$ 3,500.00	$ -	
		2.1.5 Piles	8	Item	$ 15,000.00	$ 120,000.00	Pile set up, drilling, concrete, and reinforcement.
		2.1.6 Pile Cap					
		2.1.7 Retaining Walls - Wing & Keeper Walls	-	sq.m	$ 1,100.00	$ -	
		2.1.8 Retaining Walls - Fender Wall	-	Item	$ 16,500.00	$ -	
		2.1.9 Retaining wall	300	sq.m	$ 1,120.00	$ 336,000.00	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall
		2.1.10 Bridge Deck	-	sq.m	$ 480.00	$ -	
		2.1.11 Constructability	-	Item			
	2.2	**Abutments**					
		2.2.1 RC Abutment / Crosshead Beam	30	LM	$ 3,140.00	$ 94,200.00	
		2.2.2 Anti Sliding Blocks	-	Item	$ 2,500.00	$ -	
		2.2.3 Abutment Walls and Bearings	-	Item	$ 400,000.00	$ -	
		2.2.4 Bored piles	-	Item	$ 9,712.80	$ -	
	2.3	**Bridge Containment Barriers**					
		2.3.1 Bridge containment barriers	-	LM	$ 2,850.00	$ -	
		2.3.2 Barriers - Medium Containment	-	LM	$ 1,750.00	$ -	
		2.3.3 Barriers - Armco (off structure)	-	LM	$ 110.00	$ -	
	2.4	**Other**					
3	**ON-BRIDGE WORKS**						
	3.1	**Ashphalt Wearing Course Over Slab**					
		3.1.1 Asphalt pavement	154	sq.m	$ 110.00	$ 16,940.00	
		3.1.2 Road pavement under bridge	-	sq.m	$ 250.00	$ -	
		3.1.3 Cycle track	-	sq.m	$ 1,200.00	$ -	
	3.2	**Kerb and Channel**					
		3.2.1 Kerb and channel	30	LM	$ 75.00	$ 2,250.00	
	3.3	**Footpath**					
		3.3.1 Bridge walkway	25	sq.m	$ 1,500.00	$ 37,500.00	Steel mesh atop steel frame attached to side of rail bridge
		3.3.2 Pedestrian footpath	33	sq.m	$ 155.00	$ 5,115.00	
		3.3.3 Shared path	66	sq.m	$ 155.00	$ 10,230.00	
	3.4	**Lighting On-Bridge**					
		3.4.1 Lighting	4	Item	$ 2,500.00	$ 10,000.00	To underside of bridge
		3.4.2 Allowance for Conduits	-	LM	$ 16.50	$ -	
	3.5	**Other**					
4	**OFF-BRIDGE WORKS**						
	4.1	**Approach Slabs**					
		4.1.1 Reinforced concrete slabs (approach slabs)	115	sq.m	$ 500.00	$ 57,500.00	Assume 4m long approach RC slab at each abutment (200mm thick)
	4.2	**Safety Gurad Rail/Barrier**					
		4.2.1 Handrails	1	Item	$ 5,000.00	$ 5,000.00	Allowance only, Pedestrain barriers to bridge over
		4.2.2 Guard rails	1	Item	$ 5,000.00	$ 5,000.00	Allowance only, vehicle approach barriers
		4.2.3 Safety rails	1	Item	$ 20,000.00	$ 20,000.00	Allowance only, Rail safety barriers for bridge over
	4.3	**Drainage**					
		4.3.1 Drainage to bridge	1	Item	$ 22,000.00	$ 22,000.00	
		4.3.2 Drainage to lowered road under	1	Item	$ 100,000.00	$ 100,000.00	
		4.3.3 Rock Beaching	-	cu.m	$ 100.00	$ -	
	4.4	**Scour Protection**					
	4.5	**Other**					
5	**MISCELLANEOUS**						
	5.1	Architectural screens / cladding to Piers / Deck	2	Item	$ 44,000.00	$ 88,000.00	
	5.2	Anti Throw screens	-	LM	$ 1,650.00	$ -	
	5.3	Dewatering works	-	Item	$ 250,000.00	$ -	
	5.4	Melbourne Water Temp Diversion	-	sq.m	$ 1,000.00	$ -	
	5.5	Linemarking	1	Item	$ 1,200.00	$ 1,200.00	
	5.6	Signage	-	Item	$ 25,000.00	$ -	
	5.7	Occupation costs	-	Item	$ 20,000.00	$ -	
	5.8	Construction occupation	-	Item	$ 1,035,000.00	$ -	
	5.9	Habitat Compensation Fee (Estimate)	-	Item	$ -	$ -	
6	**RAIL RELATED ITEMS**						
	6.1	Occupation costs (minor)	3	Item	$ 20,000.00	$ 60,000.00	Allowance for 3 ALBF Occupations for OHL works
	6.2	Construction occupation	2	Item	$ 1,035,000.00	$ 2,070,000.00	Allowance fo 2 weekend occupations for construction works (Metro and V-Line)
	6.3	Signalling Adjustments	1	Item	$ 750,000.00	$ 750,000.00	
	6.4	Rail Occupation Costs (Power Off) - N/A Vline Only	-	Note			
	6.5	Rail Occupation Costs (Major) - Vline	2	Wkend	$ 100,000.00	$ 200,000.00	
	6.6	Track & Ballast	210	Item	$ 1,650.00	$ 346,500.00	Lowering of Track & Ballast asusme 100m each direction
	6.7	OHLE (Assume + 100m each way)	-	TM	$ 550.00	$ -	
7	**SERVICES**						
	7.1	APA Gas	-	Item	$ 4,400,000.00	$ -	
	7.2	Telstra NBN	-	Item	$ 400,000.00	$ -	
	7.3	Western Water Sewer	-	Item	$ 300,000.00	$ -	
	7.4	Services relocation	-	Item	$ 150,000.00	$ -	
	7.5	Increase in Head Contractor Preliminaries (22% to 25%)	3	%	$ 4,946,443.00	$ 148,393.29	
					SUB TOTAL - WORKS	**$ 5,094,836.29**	
8	**DELIVERY**						
	8.1	Council Fees	3%	Item		$ 165,582.18	
	8.2	VicRoads Fees	0%	Item		$ -	
	8.3	Traffic Management	5%	Item		$ 254,741.81	
	8.4	Environmental Management	1%	Item		$ 25,474.18	
	8.5	Survey & Design	5%	Item		$ 254,741.81	
	8.6	Supervision & Project Management	25%	Item		$ 1,273,709.07	Includes LXRA Fees
	8.7	Site Establishment	3%	Item		$ 127,370.91	
	8.8	Contingency	20%	Item		$ 1,018,967.26	
					SUB TOTAL - DELIVERY	**$ 3,120,587.23**	
					TOTAL	**$ 8,215,423.52**	

LR-BR-03

Approx. Length 29m (road over rail)

Item	Description		Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	**Pre-construction**					
	1.1.1	Site preparation	1		$ 5,500.00	$ 5,500.00	
	1.1.2	Strip Site Locally	-	sq.m	$ 2.75	$ -	
	1.2	**Earthworks**					
	1.2.1	Bulk excavation and fill	3,000	cu.m	$ 43.20	$ 129,600.00	
	1.2.2	EO Allowance for rock excavation works	1,500	cu.m	$ 96.80	$ 145,200.00	EO allowance of encountering rock to 50% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.2.3	Fill only	500	cu.m	$ 37.80	$ 18,900.00	Fill to approach
	1.3	**Set-Out**					
	1.3.1	Allow for site setout and marking	1	Item	$ 5,000.00	$ 5,000.00	
2	**STRUCTURE**						
	2.1	**Slab & Foundations/Piers/Beams**					
	2.1.1	Bridge structure	223	sq.m	$ 1,900.00	$ 423,890.00	Single span precast prestressed 1200 mm deep Super T-beam arrangement with in-situ deck slab overlay. Cast in-situ deck slab min thickness 200mm across bridge
	2.1.2	Elastomeric Bearings	8	Item	$ 1,650.00	$ 13,200.00	
	2.1.3	Cast in-situ concrete base slab with footings	-	sq.m	$ 550.00	$ -	
	2.1.4	Bridge Columns	-	sq.m	$ 3,500.00	$ -	
	2.1.5	Piles	8	Item	$ 15,000.00	$ 120,000.00	1200 diameter x 10000 long 50 Mpa Concrete Bored Piles including Reo Rate say 200kg/m3
	2.1.6	Pile Cap	-	Item			
	2.1.7	Retaining Walls - Wing & Keeper Walls	-	sq.m	$ 1,100.00	$ -	
	2.1.8	Retaining Walls - Fender Wall	-	Item	$ 16,500.00	$ -	
	2.1.9	Retaining Wall	150	sq.m	$ 1,120.00	$ 168,000.00	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall (
	2.1.10	Bridge Deck	-	sq.m	$ 480.00	$ -	
	2.1.11	Constructability	-	Item			
	2.2	**Abutments**					
	2.2.1	RC Abutment / Crosshead Beam	30	LM	$ 3,140.00	$ 94,200.00	
	2.2.2	Anti Sliding Blocks	-	Item	$ 2,500.00	$ -	
	2.2.3	Abutment Walls and Bearings	-	Item	$ 400,000.00	$ -	
	2.2.4	Bored piles	8	sq.m	$ 15,000.00	$ 120,000.00	Reinforced concrete bored piles (supporting abutment crossheads)
	2.3	**Bridge Containment Barriers**					
	2.3.1	Bridge containment barriers	-	LM	$ 2,850.00	$ -	
	2.3.2	Barriers - Medium Containment	56	LM	$ 1,750.00	$ 97,370.00	
	2.3.3	Barriers - Armco (off structure)	80	LM	$ 110.00	$ 8,800.00	
	2.4	**Other**					
3	**ON-BRIDGE WORKS**						
	3.1	**Ashphalt Wearing Course Over Slab**					
	3.1.1	Asphalt pavement	160	sq.m	$ 110.00	$ 17,600.00	Including shared path
	3.1.2	Road pavement under bridge	-	sq.m	$ 250.00	$ -	
	3.1.3	Cycle track	-	sq.m	$ 1,200.00	$ -	
	3.2	**Kerb and Channel**					
	3.2.1	Kerb and channel	45	LM	$ 75.00	$ 3,375.00	
	3.3	**Footpath**					
	3.3.1	Bridge walkway	-	sq.m	$ 1,500.00	$ -	
	3.3.2	Pedestrian footpath	60	sq.m	$ 155.00	$ 9,300.00	
	3.3.3	Shared path	-	sq.m	$ 155.00	$ -	
	3.4	**Lighting On-Bridge**					
	3.4.1	Lighting	2	Item	$ 17,500.00	$ 35,000.00	
	3.4.2	Allowance for Conduits	-	LM	$ 16.50	$ -	
	3.5	**Other**					
4	**OFF-BRIDGE WORKS**						
	4.1	**Approach Slabs**					
	4.1.1	Reinforced concrete slabs (approach slabs)	92	sq.m	$ 500.00	$ 46,000.00	
	4.2	**Safety Gurad Rail/Barrier**					
	4.2.1	Handrails	-	Item	$ 5,000.00	$ -	
	4.2.2	Guard rails	-	Item	$ 5,000.00	$ -	
	4.2.3	Safety rails	-	Item	$ 1,700.00	$ -	
	4.3	**Drainage**					
	4.3.1	Drainage to bridge	1	Item	$ 22,000.00	$ 22,000.00	
	4.3.2	Drainage to lowered road under	-	Item	$ 100,000.00	$ -	
	4.3.3	Rock Beaching	-	cu.m	$ 100.00	$ -	
	4.4	**Scour Protection**					
	4.5	**Other**					
5	**MISCELLANEOUS**						
	5.1	Architectural screens / cladding to Piers / Deck	2	Item	$ 44,000.00	$ 88,000.00	
	5.2	Anti Throw screens	-	LM	$ 1,650.00	$ -	
	5.3	Dewatering works	-	Item	$ 250,000.00	$ -	
	5.4	Melbourne Water Temp Diversion	-	sq.m	$ 1,000.00	$ -	
	5.5	Linemarking	1	Item	$ 1,200.00	$ 1,200.00	
	5.6	Signage	-	Item	$ 25,000.00	$ -	
	5.7	Occupation costs	-	Item	$ 20,000.00	$ -	
	5.8	Construction occupation	-	Item	$ 1,035,000.00	$ -	
	5.9	Habitat Compensation Fee (Estimate)	-	Item	$ -	$ -	
6	**RAIL RELATED ITEMS**						
	6.1	Occupation costs (minor)	3	Item	$ 20,000.00	$ 60,000.00	Allowance for 3 ALBF Occupations for OHL works
	6.2	Construction occupation	2	Item	$ 1,035,000.00	$ 2,070,000.00	Allowance fo 2 weekend occupations for construction works (Metro and V-Line)
	6.3	Signalling Adjustments	1	Item	$ 500,000.00	$ 500,000.00	
	6.4	Rail Occupation Costs (Power Off) - N/A Vline Only	-	Note			
	6.5	Rail Occupation Costs (Major) - Vline	2	Wkend	$ 100,000.00	$ 200,000.00	
	6.6	Track & Ballast	210	Item	$ 1,650.00	$ 346,500.00	Lowering of Track & Ballast asusme 100m each direction
	6.7	OHLE (Assume + 100m each way)	-	TM	$ 550.00	$ -	
7	**SERVICES**						
	7.1	APA Gas	-	Item	$ 4,400,000.00	$ -	
	7.2	Telstra NBN	-	Item	$ 400,000.00	$ -	
	7.3	Western Water Sewer	-	Item	$ 300,000.00	$ -	
	7.4	Services relocation	-	Item	$ 150,000.00	$ -	
	7.5	Increase in Head Contractor Preliminaries (22% to 25%)	3	%	$ 4,748,635.00	$ 142,459.05	
				SUB TOTAL - WORKS		**$ 4,891,094.05**	
8	**DELIVERY**						
	8.1	Council Fees	3%	Item		$ 158,960.56	
	8.2	VicRoads Fees	0%	Item		$ -	
	8.3	Traffic Management	5%	Item		$ 244,554.70	
	8.4	Environmental Management	1%	Item		$ 24,455.47	
	8.5	Survey & Design	5%	Item		$ 244,554.70	
	8.6	Supervision & Project Management	25%	Item		$ 1,222,773.51	Includes LXRA Fees
	8.7	Site Establishment	3%	Item		$ 122,277.35	
	8.8	Contingency	20%	Item		$ 978,218.81	
				SUB TOTAL - DELIVERY		**$ 2,995,795.11**	
				TOTAL		**$ 7,886,889.16**	

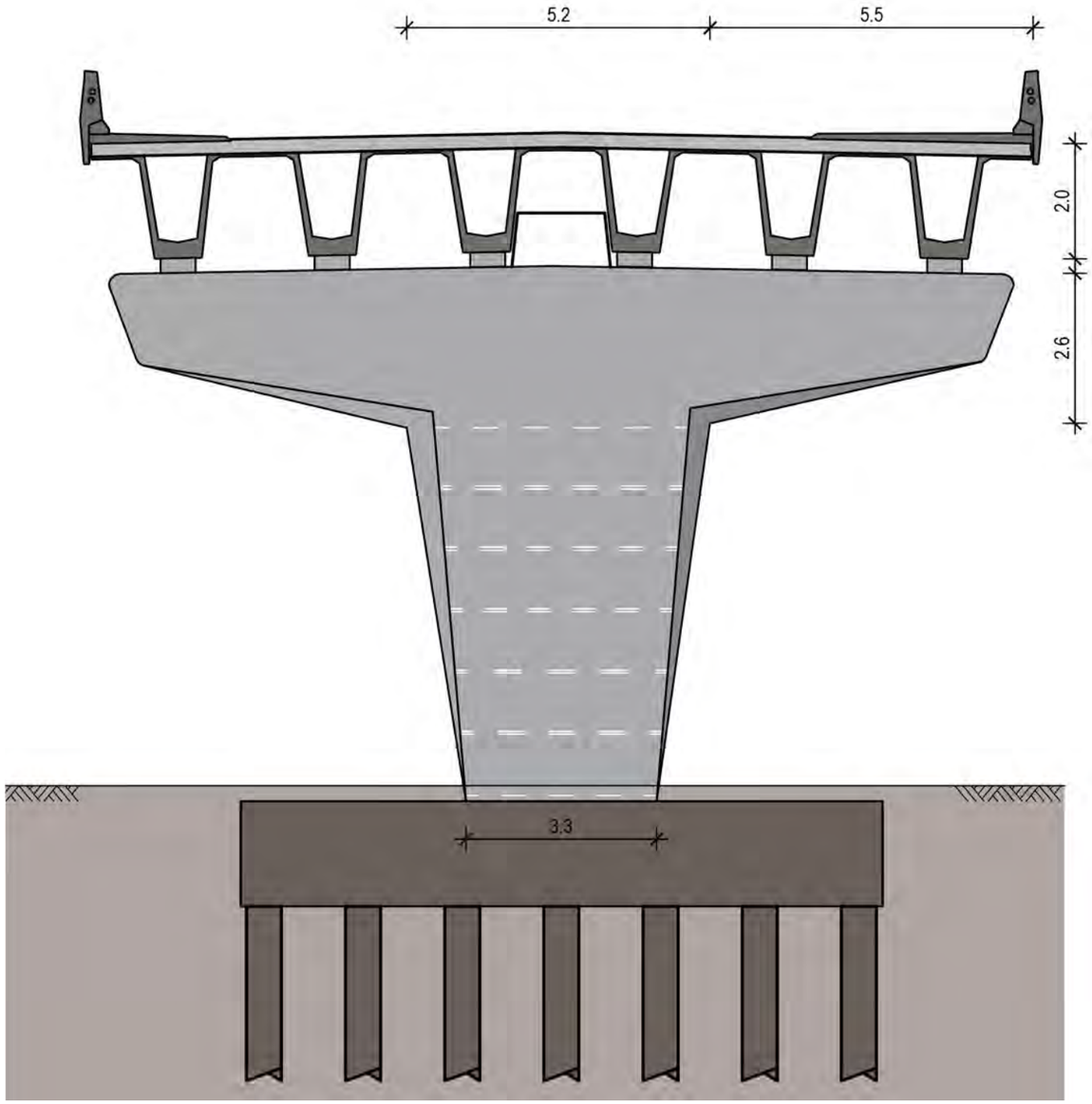
LR-BD4

Approx. Length 12m

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
	1.1 Pre-construction					
	1.1.1 Site preparation	*1*	*Item*	*$ 33,293.33*	*$ 33,293.33*	*Provisional allowance only 5% allowance*
	1.2 Earthworks					
	1.2.1 Bulk excavation and fill	*1*	*Item*	*$ -*	*$ -*	*TBC*
	1.2.2 Rock beaching	*273.00*	*cu.m*	*$ 100.00*	*$ 27,300.00*	*500mm min rock size 1:5 gradient*
	1.2.3 Compacted fill	*124.65*	*sq.m*	*$ 50.00*	*$ 6,232.38*	*Min 100 freeboard fill allowance*
	1.3 Set-Out					
	1.3.1 Allow for site setout and marking	*1.00*	*Item*	*$ -*	*$ -*	*Included 'Site Establishment'*
2	**BRIDGE**					
	2.1 Structure					
	2.1.1 Concrete slab base	*102.95*	*cu.m*	*$ 650.00*	*$ 66,920.36*	*Cast in-situ reinforced concrete slab with concrete slab edge beam (Allow for 200mm thk slab. Approx. 33000mm X 13000mm wide slab)*
	2.1.2 Pre-cast RC 2100x900 box culvert	*118.71*	*LM*	*$ 4,500.00*	*$ 534,204.00*	*Including allowance for end walls*
	2.1.3 Pre-cast reinforced wingwall	*4.00*	*no.*	*$ 2,000.00*	*$ 8,000.00*	
	2.1.4 Pre-cast end wall	*20.00*	*LM*	*$ 750.00*	*$ 15,000.00*	*Including allowance for end walls*
	2.2 Bridge Safety Rail					
	2.2.1 Handrails	*39.00*	*LM*	*$ 350.00*	*$ 13,650.00*	
	2.2.2 Guard rails	*24.00*	*LM*	*$ 350.00*	*$ 8,400.00*	
3	**ROAD PAVEMENT**					
	3.1 New Pavement					
	3.1.1 Road pavement - Traffic lane	*90.00*	*sq.m*	*$ 180.00*	*$ 16,200.00*	
	3.1.2 Shared path	*43.20*	*sq.m*	*$ 250.00*	*$ 10,800.00*	
	3.1.3 Path	*24.00*	*sq.m*	*$ 80.00*	*$ 1,920.00*	
	3.2 Rehabilitate Existing Pavement					
	3.2.1 Excluded	*0.00*	*Allow.*	*$ -*	*$ -*	*Assumed excluded*
4	**OFF- ROAD WORKS**					
	4.1 Kerb and Channel					
	4.1.1 Kerb and channel	*24.00*	*LM*	*$ 75.00*	*$ 1,800.00*	
5	**DRAINAGE**					
	5.1 Drainage Pipes	12.00	LM	$ 200.00	$ 2,400.00	Drainage allowance to rock beaching areas
	5.2 Drainage Pits	2.00	Item	$ 2,500.00	$ 5,000.00	Drainage allowance to rock beaching areas
	5.3 Drainage - miscellaneous	0.00	LM	$ -	$ -	Excluded
6	**TRAFFIC**					
	6.1 Traffic Safety	1	Allow.	$ 25,000.00	$ 25,000.00	
7	**LANDSCAPE**					
	7.1 Trees	1	Allow.	$ -	$ -	N/A
	7.2 Landscaping	1	Allow.	$ -	$ -	N/A
	7.3 Topsoil	1	Allow.	$ -	$ -	N/A
8	**LIGHTING**					
	8.1 Lighting on-bridge	1	Item	$ 20,000.00	$ 20,000.00	As no details provided on extent of lighting on bridge, assumed poles 12m high with luminaries, and assumed to poles to either end of bridge
9	**MISCELLANEOUS**					
	9.1 Linemarking	36.00	sq.m	$ 10.00	$ 360.00	
	9.2 Signage	157.20	sq.m	$ 20.00	$ 3,144.00	
10	**SERVICES**					
	10.1 Services relocation		Item	$ -	$ -	N/A
	10.2 Services on-bridge		Item	$ -	$ -	N/A
		SUB TOTAL - WORKS			**$ 799,624.07**	
11	**DELIVERY**					
	11.1 Council Fees	3.25%	Item		$ 25,987.78	
	11.2 VicRoads Fees	1.00%	Item		$ 7,996.24	
	11.3 Traffic Management	5.00%	Item		$ 39,981.20	
	11.4 Environmental Management	0.50%	Item		$ 3,998.12	
	11.5 Survey & Design	5.00%	Item		$ 39,981.20	
	11.6 Supervision & Project Management	9.00%	Item		$ 71,966.17	
	11.7 Site Establishment	2.50%	Item		$ 19,990.60	
	11.8 Contingency	20.00%	Item		$ 159,924.81	
		SUB TOTAL - DELIVERY			**$ 369,826.13**	
			TOTAL		**$ 1,169,450.20**	

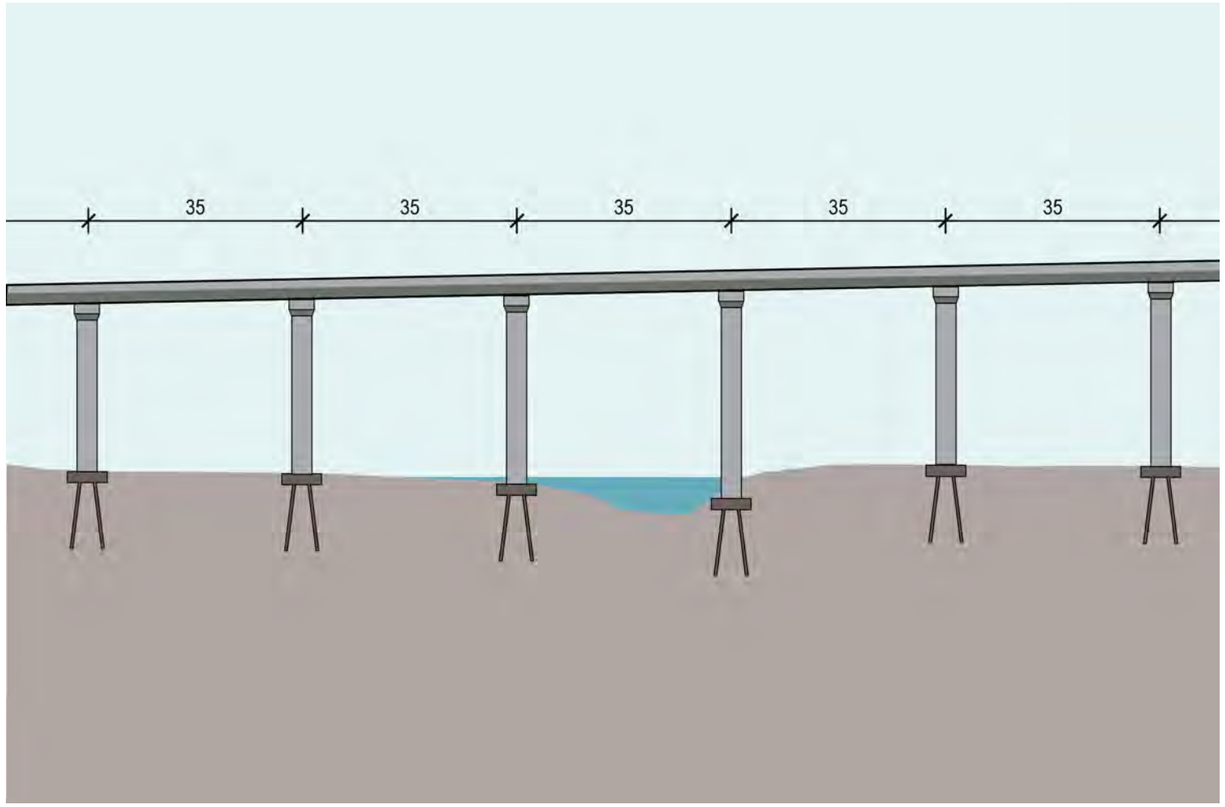
Appendix D – LR-BR-01 Options

OPTION 01 - PRECAST SUPER ‘T‘ BEAMS (REFINED BASE CASE)



TYPICAL ELEVATION

- SPAN : 35m maximum
- COST: $
- ADVANTAGE:
  - Structural cost is low
  -
  - Precast construction for piers is an option
- DISADVANTAGE:
  - Requires more structural piers due to span being “short“
  -
  -



TYPICAL CROSS - SECTION

Sunbury Sth and Lancefield

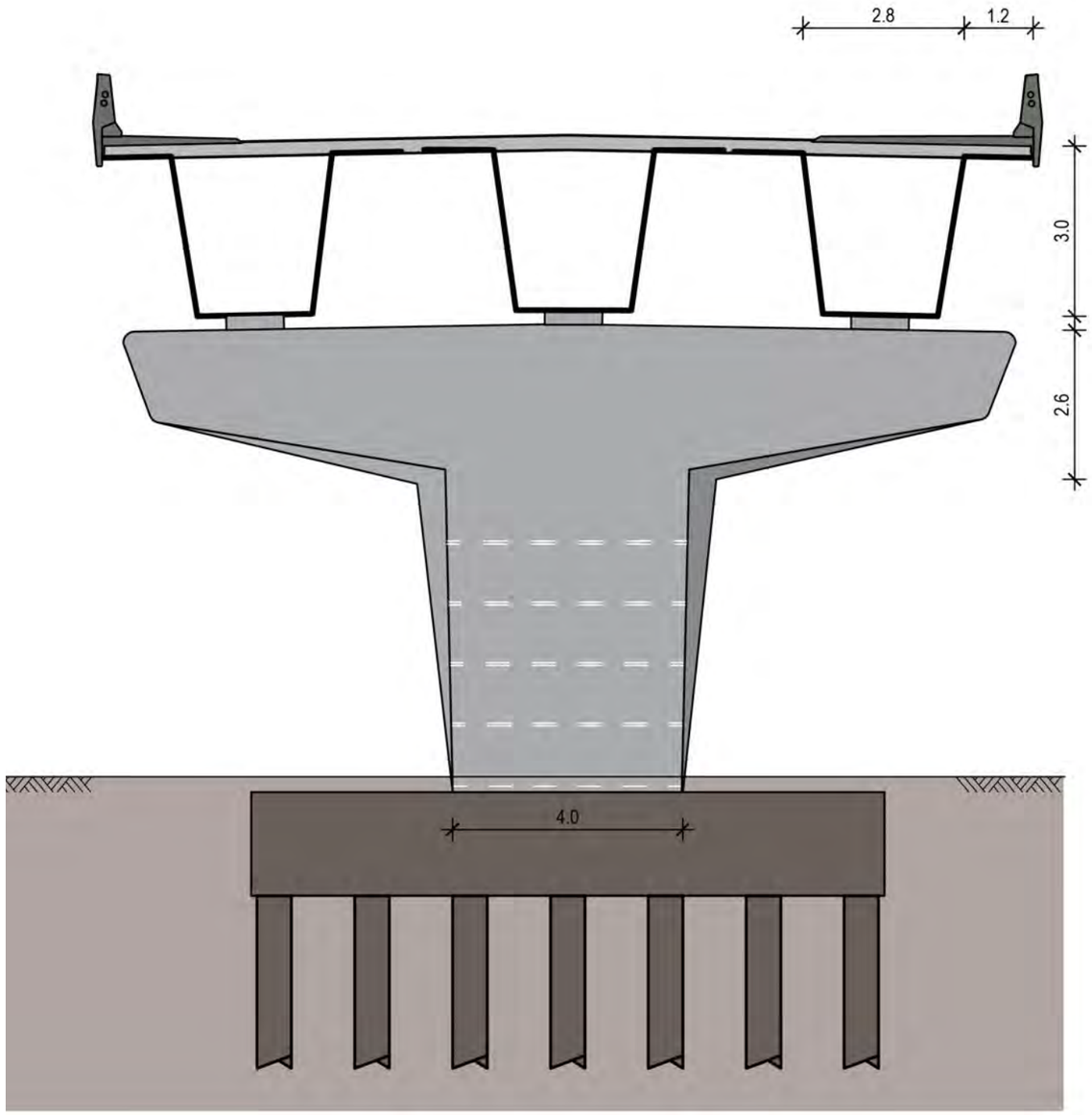
Sketch Concept

Job No: **31-36206**
Original Size: **A3**
Drawing No: **31-36206-L001**
Approved: **MC**
Date: **12/06/18**
Rev: **A**

GHDWOODHEAD
Level 8, 180 Lonsdale Street, Melbourne VIC 3000
T 61 3 8687 8000 **E** melmail@ghd.com **W** www.ghdwoodhead.com

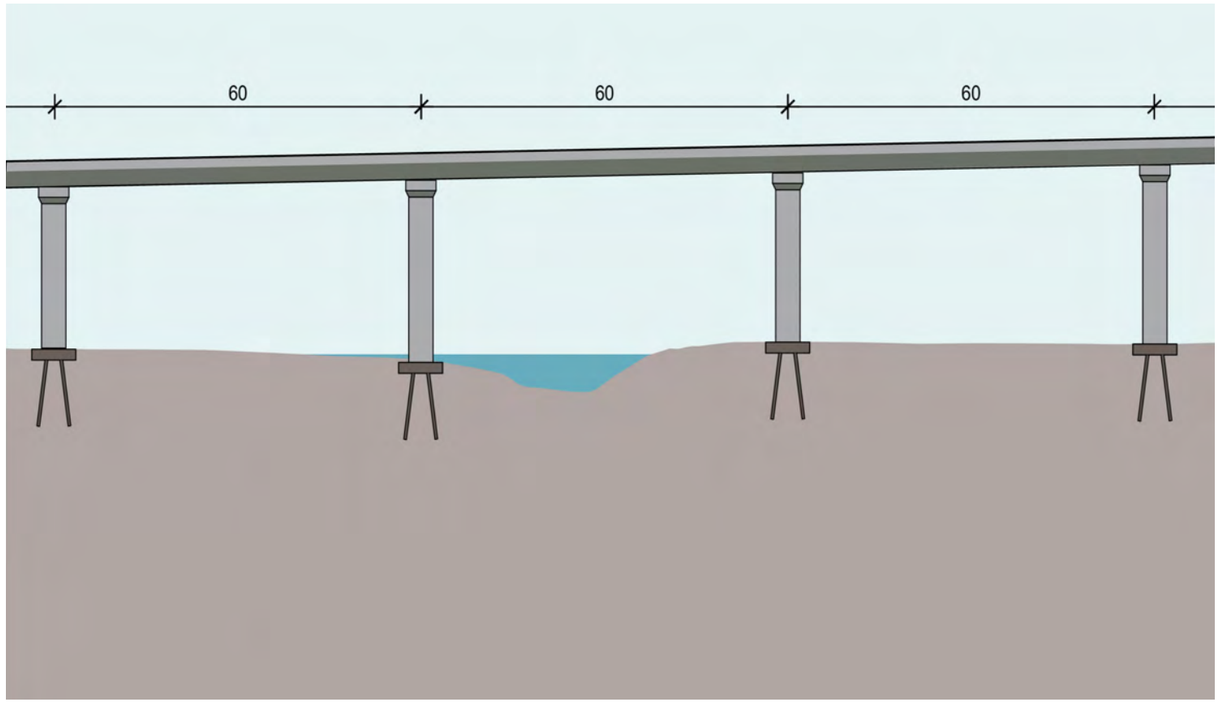
Copyright retained by GHD Woodhead Architecture Pty Ltd

OPTION 02 - STEEL GIRDERS



TYPICAL ELEVATION

- SPAN : 60m maximum
- COST: $$
- ADVANTAGE:
  - Requires less structural piers due to span
  - Less impact on surrounding environment due to span distance
  - Pier silhouette is slim
  - Precast construction for piers is an option
  - Steel girders gives bridge an overal thicker appearance
  - Elevation from a distance has a stronger visual presence
  - Less sections allows for quicker assembly
  - Less piers to construct
- DISADVANTAGE:
  - Structural cost is higher



TYPICAL CROSS - SECTION

Sunbury Sth and Lancefield

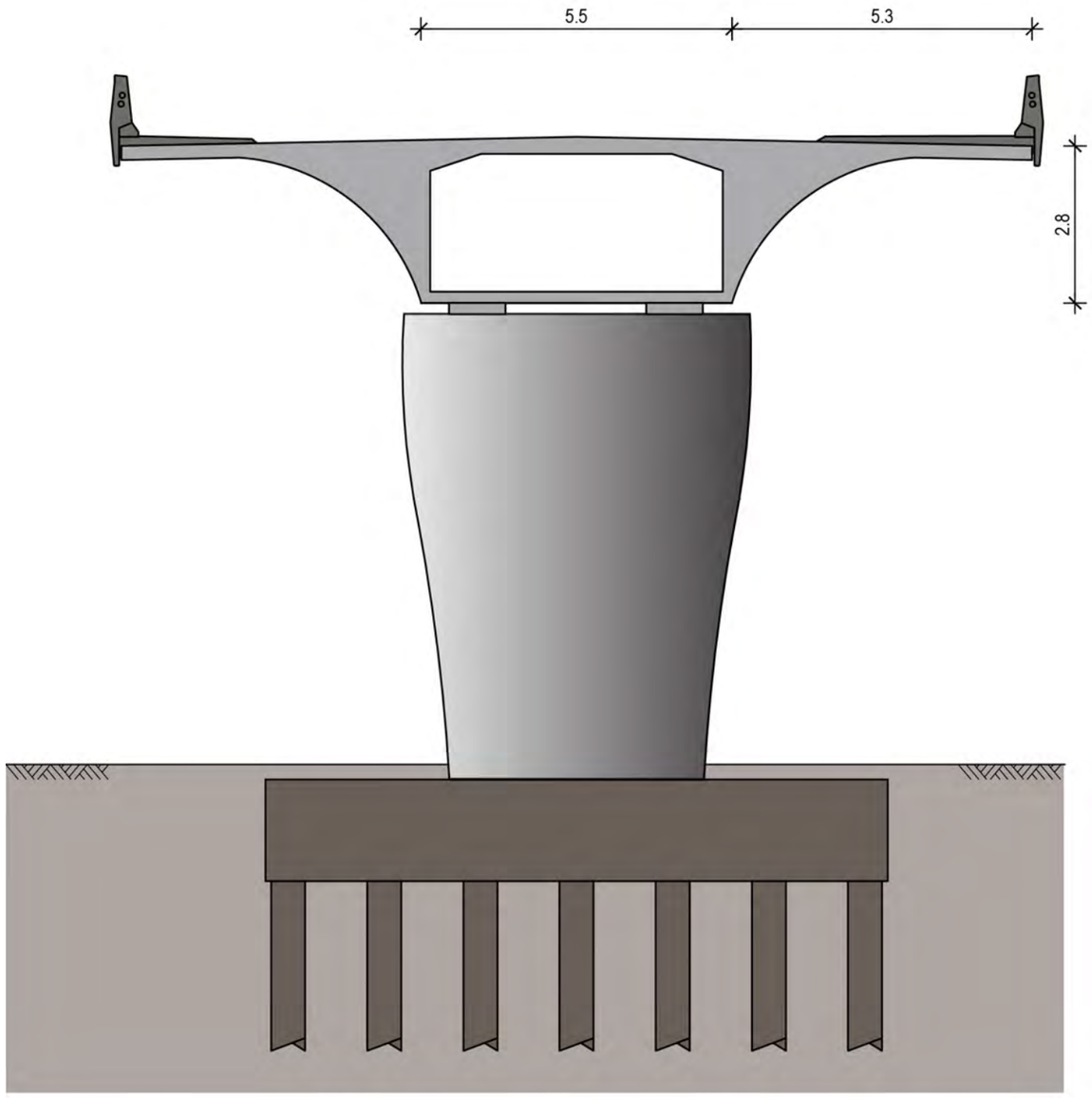
Sketch Concept

Job No: **31-36206**
Original Size: **A3**
Drawing No: **31-36206-L002**
Approved: **MC**
Date: **12/06/18**
Rev: **A**

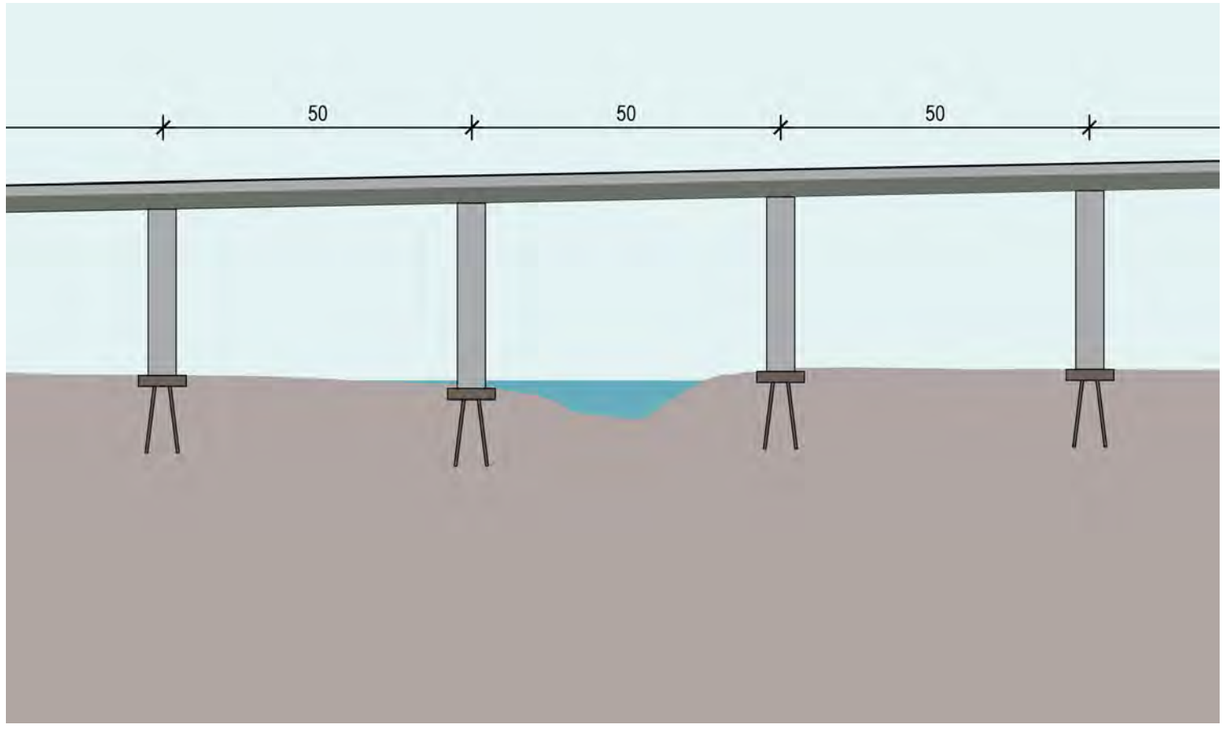
GHDWOODHEAD
Level 8, 180 Lonsdale Street, Melbourne VIC 3000
T 61 3 8687 8000 E melmail@ghd.com W www.ghdwoodhead.com

Copyright retained by GHD Woodhead Architecture Pty Ltd

OPTION 03 - CONCRETE BOX GIRDER



- SPAN : 50m maximum
- COST: $$$
- ADVANTAGE:
  - Requires less structural piers due to span
  - Less impact on surrounding environment due to span distance
  - Pier silhouette is slim
  -
  - Concrete box girder gives bridge an overal thicker appearance
  - Consistent material pallette (ie concrete) for girder and pier
  - Elevation from a distance has a stronger visual presence
- DISADVANTAGE:
  - Structural cost is higher



TYPICAL ELEVATION

TYPICAL CROSS - SECTION

Sunbury Sth and Lancefield

Sketch Concept

Job No: **31-36206**
Original Size: **A3**
Drawing No: **31-36206-L003**
Approved: **MC**
Date: **12/06/18**
Rev: **A**

GHDWOODHEAD
Level 8, 180 Lonsdale Street, Melbourne VIC 3000
T 61 3 8687 8000 E melmail@ghd.com W www.ghdwoodhead.com

Copyright retained by GHD Woodhead Architecture Pty Ltd

Appendix E – Past Reports

aurecon

Sunbury South and Lancefield Road PSP (PSP 1074 and 1075)

Infrastructure Design and Costings (Grade Separations and Harpers Creek Crossing) Draft Report

Metropolitan Planning Authority

10 June 2015
Revision: 0
Reference: 245435

Contents

1 Background **1**

1.1 Reference documents 2

2 Design inputs **3**

2.1 Introduction 3

2.2 Road Dimensions 4

3 Basis of Road Design **5**

3.1 Horizontal Alignment Controls 5

3.2 Cross Sections 6

3.3 Vertical Alignment Controls 6

4 Design Development **7**

4.1 Project A – Sunbury South Rail Grade Separation 7

4.2 Project B – Harpers Creek Connector Road Crossing (W) 9

4.3 Project C – Harpers Creek Connector Road Crossing (E) 9

4.4 Project D – Lancefield Road Northern Grade Separation 10

4.5 Project E – Lancefield Road Southern Grade Separation 11

4.6 Concept Design Plans 11

5 Cost Estimates **12**

Appendices

Appendix A

Concept Design Drawings

Appendix B

Drawings of Options Considered

Appendix C

Cost Estimates

1 Background

Aurecon has been engaged by the Metropolitan Planning Authority (MPA) to prepare concept level designs and associated cost estimates for five grade separations and/or bridges associated with strategically important road projects in the Sunbury South and Lancefield Road precincts (PSP 1074 and PSP 1075). The five specific locations, shown in Figure 1-1 are:

- Project A – Sunbury South Grade Separation
- Projects B and C - Harpers Creek Connector Road Crossings
- Project D – Lancefield Road Northern Grade Separation
- Project E – Lancefield Road Southern Grade Separation

Figure 1-1 | East Werribee EP Future Urban Structure Plan, taken form EWEP PSP 2013

For each crossing a number of horizontal and vertical alignments were considered to determine the most appropriate structures for concept design and costing. This report considers each crossing in detail, identifying functional requirements, potential constraints, options considered and preferred concept design.

1.1 Reference documents

A number of documents have been reviewed in considering potential crossing locations and road alignments. These include:

- Jacksons Creek Road Crossings PSP 1075 – Lancefield Road, Options Assessment & Development, ref 14M1881000, 13 October 2014, GTA Consultants
- Jacksons Creek Road Crossings PSP 1074 – South Sunbury, Options Assessment & Development, ref 14M1881000, 16 October 2014, GTA Consultants
- Sunbury South PSP Rail Crossing and Station Location Options, Tract
- Sunbury North Station Concept Alignment Plan, Opus for PTV, 2014
- Sunbury South Station Rail Corridor and Infrastructure Constraints Analysis, 601196-64-REP-0001, Issue 1, 24 April 2014, Arup

2 Design inputs

2.1 Introduction

The Project Brief set out the following functional design requirements in relation to each grade separation/crossing:

Project A – Sunbury South Grade Separation

- A road crossing is required of the Sunbury rail line.
- The crossing will initially be delivered as two lanes, however, the design should have regard to the potential need for future duplication to a four lane structure.
- A new railway station is proposed in the general locality.
- The road is defined as a Connector Road within the draft Future Urban Structure. The speed limit of the road is 60kph.

Projects B and C - Harpers Creek Connector Road Crossings

- Two crossings of Harpers Creek are required to connect a small residential pocket of Sunbury South to the south of Jacksons Hill, with the roads extending to the Sunbury South rail crossing forming Project A above.
- The crossing will initially be delivered as two lanes, however the design should have regard for the potential need for future duplication to a four lane structure.
- The road is defined as a Connector Road within the draft Future Urban Structure. The speed limit of the road is 60kph.

Project D – Lancefield Road Northern Grade Separation

- A road crossing is required of the extended Sunbury rail line.
- The crossing will initially be delivered as a two lane road, however the design should have regard to the potential need for future duplication to a four lane crossing.
- A new railway station is proposed in the general locality.
- The cost of the potential station (and thus its viability) will be reduced if the grade separated road is sufficiently close to avoid the need for a separate pedestrian crossing of the railway as part of the station.
- The station platforms need to be on straight track, meaning that the south end of the platforms need to be at least some 500m north of Raes Rd (and up to 230m long).
- The road is defined as a Connector Road within the draft Future Urban Structure Plan.
- The speed limit of the road is 50kph.

Project E – Lancefield Road Southern Grade Separation

- A road crossing is required of the extended Sunbury rail line.
- This crossing would be delivered as a two lane connector road, with no capacity for future duplication. As the rail line is in a cutting at this location, it is anticipated that a ‘road over’ outcome is the only likely scenario.

- The road is defined as a Connector Road within the draft Future Urban Structure Plan. The speed limit of the road is 50kph.

2.2 Road Dimensions

The connector road linking Project A, B and C in Sunbury South links with Vineyard Road to the west of the rail crossing, before crossing Harpers Creek and continuing to Sunbury Road. The section of the connector road to the east of the creek crossings has previously been subject to a study and concept design development undertaken by GTA in 2014. Within their report they have allowed for 3.5m traffic lanes and a 3m shared cycle/pedestrian path along the south side of the road and bridge crossings.

For consistency, this profile has been adopted for the creek and rail crossings in Sunbury South (Projects A, B and C), giving a minimum overall width of bridge/underpass of 11 m for the two lane configuration and 18 m for the four lane ultimate configuration.

These dimensions have also been adopted for the Lancefield Road North Grade Separation (Project D), with the shared path being along the southern kerb line, based on the assumption that the new rail station will be to the south of the crossing.

For the Lancefield South Crossing (Project E) the general profile for a two lane connector set out in MPA's design guidelines has been adopted. This has lane widths of 3.5m, with bike lanes of 1.7m and footways of 1.5m on both sides of the road.

3 Basis of Road Design

3.1 Horizontal Alignment Controls

3.1.1 Road Reserves location

Road reserve locations for South Alignment, North Alignment 1 and North Alignment 2 were based on the MPA Future Urban Structure Concept Plan, stakeholder consultation and best fit of road design parameters to existing terrain.

3.1.2 Speed

The design speed limit that was adopted to determine geometry where required is provided below:

Road	Posted Speed Limit	Design Speed
South Alignment	60km/h	70km/h
North Alignment 1	50km/h	60km/h
North Alignment 2	50km/h	60km/h

3.1.3 Sight Distances

The sight distances are based on driver reaction time of 2.5 sec as per AGRD Part 3 Table 5.2

3.1.4 Horizontal Curve Geometry

The following limits were used to determine horizontal curve geometry.

Curve Geometry Limits		Comments
Minimum radius adverse cross-fall (60km/h)	200m	VicRoads-Sup Part 3 Table V7.2
Minimum radius adverse cross-fall (70km/h)	300m	VicRoads-Sup Part 3 Table V7.2
Radius not requiring spirals (60km/h)	N/A	AGRD Part 3 Table 7.5
Radius not requiring spirals (70km/h)	>220m	AGRD Part 3 Table 7.5
Minimum horizontal curve length (60km/h)	100m	AGRD Part 3 Table 7.6
Minimum horizontal curve length (70km/h)	140m	AGRD Part 3 Table 7.6
Coordination of Horizontal and Vertical Alignment	-	AGRD Part 3 Section 6

3.2 Cross Sections

Cross sections are based on the Jackson Creek Road Crossings PSP 1074, South Sunbury Options Assessment and Development report Dated 16.10.14 by GTA Consultants.

3.2.1 Cross section summary

Component		Comment
Maximum batter slope	1:3	Subject to geotechnical analysis
Retaining wall batter slope	1:2	Subject to geotechnical analysis

3.3 Vertical Alignment Controls

3.3.1 Existing Terrain

Aerial imagery and 0.5m contour maps for the study area were provided by the MPA. In particular, the Sunbury South alignment passes through an area of undulating hills and creeks. The vertical road alignment has been chosen to balance the cut and fill requirements for construction, taking into account high level flood mapping information provided by Melbourne Water for 100yr ARI flood extents.

3.3.2 Proposed Vertical Alignment

Longitudinal grade and vertical curve limits are based on AustRoads Guide to Road Design, VicRoads Supplement to AGRD and the Jackson Creek Road Crossings report.

3.3.3 Vertical Alignment Control Limit Summary

70km/h Roads		Comments
Min SSD K value for crest VC	28.6	AGRD03 Table 8.7
Maximum grade	8%	Jackson Creek Road Crossings report
Min K value for sag VC	21	AGRD03 Figure 8.7

60km/h Roads		Comments
Min SSD K value for crest VC	19.1	AGRD03 Table 8.7
Maximum grade	9%	Jackson Creek Road Crossings report
Min K value for sag VC	16	AGRD03 Figure 8.7

4 Design Development

4.1 Project A – Sunbury South Rail Grade Separation

4.1.1 Options Considered

There is a significant level difference between the western crossing of Harpers Creek (Project B below) and the rail line at Sunbury South. The rail line itself is generally in a cutting at this location although it varies significantly within a relatively short distance.

Two options have therefore been considered for the crossing of the rail line – road over rail and rail over road. The table below summarises the relative merits and disadvantages of the two options, with positive matters for each option highlighted in green, minor negative issues highlighted in orange and significantly negative matters highlighted in red

Table 1: Comparison of "Road over Rail" and "Rail over Road" options

Consideration	Road over Rail	Road under Rail
Location of rail crossing	The crossing would be located near the point of deepest rail cutting to minimise bridge structure	The crossing location moves a little further north where rail is not in a cutting to minimise depth of underpass.
Extent of structure	To the east of the crossing the ground falls away sharply towards Harpers Creek. As a result extensive bridge structures or embankments would be needed to support the road.	To the east of the crossing the ground falls away sharply towards Harpers Creek. Apart from the underpass structure, the road can be provided with a short cutting either side of the underpass.
Road alignment	The level difference from the bridge rail crossing to Harpers Creek is significant. The road would therefore be on a significant gradient between the two crossings. This adversely impacts cyclists and pedestrians.	The level difference from the bridge rail crossing to Harpers Creek is significant. By providing an underpass under the rail line the level difference from Harpers Creek is minimised. This significantly reduces the road gradient assisting all users, particularly cyclists and pedestrians.
Link to Sunbury South Station	A road and pedestrian link can be provided from the bridge crossing to the station.	A road and pedestrian link can be provided from the underpass/cutting to the station to the west of the tracks.
Link to local roads	To the west of the crossing the road links well to the existing road network. To the east the extent of the	To the west of the crossing the road links well to the existing road network. To the east, the road can meet

	embankment or bridge structure means that intersections with local roads near the crossing would need to be elevated..	existing ground levels relatively quickly to enable simple intersections to local roads to be provided.
Visual impact	Extensive elevated structure will be intrusive on local amenity and public realm.	Underpass much more likely to be “hidden” and therefore be significantly less intrusive on local community.

As a result of the above assessment, it was decided to progress with the road under rail alignment option. (Appendix B presents the alignment of the Road over Rail option for information.

4.1.2 Preferred Design of Crossing

A new structure has been designed to carry the suburban Sunbury Up and Down rail lines over the proposed connector road. The bridge structure will also carry a minimum 3.0 m wide cycle track on the east side of the bridge.

The proposed rail bridge structure will consist of a single span precast prestressed 1200 mm deep Super-T beam arrangement with in-situ deck overlay. The cast in-situ deck slab will have a minimum thickness of 200 mm across the bridge with ballast walls to contain the ballast. The deck slab will be composite with the Super-T beams.

For the cycle bridge structure, it will consist of a single span precast prestressed 750 mm deep Super-T beam arrangement with in-situ deck overlay. The cast in-situ deck slab will have a minimum thickness of 160 mm, which will be composite with the Super-T beam.

The bridge beams will have a span of approximately 19.5 m over the rail tracks.

The substructure will consist of reinforced concrete abutment crossheads supported on reinforced concrete retaining wall bored piles. The top of the abutment crossheads will have a vertical step to account for the difference in Super-T beams.

The bridge beams will be simply supported on elastomeric laminated bearings and expansion joints will be required.

The approach slabs will be cast in-situ reinforced concrete located on both the bridge approaches. The approach slabs will run 4 m perpendicular to the bridge abutments.

The rail bridge will have a minimum of 1.2 m wide maintenance access walkway either side of the rail tracks. The cycle bridge will have a minimum of 1.3 m high hand railings.

The proposed bridge span has been lengthened to accommodate the future road widening of the connector road.

4.1.3 APA High Pressure Gas Main

To the east and parallel to the rail track is a high pressure gas main and easement. Although this is outside Victrack’s boundary, the gas main will need to be moved to accommodate the new road underpass. As part of the study, discussions have been with APA to identify options for relocating the gas main. These are summarised below.

- Divert the gas main to a new bridge structure parallel to but independent from the rail overbridge.

This option is not supported by APA, given potential vibration and disturbance from the rail tracks.

- Divert the gas main under the road.

  On the alignment of the existing gas main, the road would still be in a relatively deep cutting, and so considerable excavation in hard ground (anticipated to be volcanic basalt) would be needed.

- Divert the gas main east so that it avoids the cutting before crossing the road.

  Although this will require a greater diversion than for the other options, it would not be in hard ground and minimal excavation would be needed.

On the basis of this initial assessment, the third option would appear to have the most merit. However, it is recommended that the options are explored further as part of a later design stage, once the alignment of the road has been confirmed.

4.2 Project B – Harpers Creek Connector Road Crossing (W)

4.2.1 Options Considered

The alignment across the western crossing of Harpers Creek has been chosen to tie into the alignment of the rail crossing (A) and eastern crossing (C) to minimise cut and fill and extent of structures, taking into account the functional requirements of the road.

4.2.2 Preferred Design of Crossing

A new structure has been designed to carry Connector Road traffic over Harpers Creek. The bridge structure will also carry a minimum 3.0 m wide shared use path on the south side of the bridge.

The proposed bridge structure will consist of a single 2.5 m span precast concrete inverted culvert on cast in-situ floor slab. Cast in-situ headwalls and wing walls will be provided either ends of the culvert.

Handrails will be provided on top of the headwalls and wing walls to assist pedestrians .

4.3 Project C – Harpers Creek Connector Road Crossing (E)

4.3.1 Options Considered

The alignment across the western crossing of Harpers Creek has been chosen to tie into the alignment of the rail crossing (A) and eastern crossing (C) to minimise cut and fill and extent of structures, taking into account functional requirements of the road.

4.3.2 Preferred Design of Crossing

A new structure has been designed to carry Connector Road traffic over Harpers Creek. The bridge structure will also carry a minimum 3.0 m wide shared use path on the south side of the bridge.

The proposed bridge structure will consist of a single span precast prestressed 1200 mm deep Super-T beam arrangement with in-situ deck overlay. The cast in-situ deck slab will have a minimum thickness of 175 mm across the bridge. The deck slab will be composite with the Super-T beams.

The bridge beams will have a span of 21.6 m over Harpers Creek and have deck width of 11.0 m between barriers.

The substructure will consist of reinforced concrete abutment crossheads supported on reinforced concrete bored piles.

The bridge beams will be simply supported on elastomeric laminated bearings and expansion joints will be required.

The approach slabs will be cast in-situ reinforced concrete located on both the bridge approaches. The approach slabs will run 4 m perpendicular to the bridge abutments.

It is proposed that the bridge barriers will have a medium performance level.

4.4 Project D – Lancefield Road Northern Grade Separation

4.4.1 Options Considered

Both “Rail Over Road” and “Road Over Rail” options have been considered. However, at this location, the rail tracks are on a small embankment above the surrounding ground level. A minimum clearance of 5.26 m is required over the rail tracks. An elevated road, above rail, would therefore require a significant bridge structure. The vertical alignment must also tie into a new intersection with Lancefield Road. Again, initial optioneering indicated that this would not be ideal.

As a result of the above, the road has been designed to go under the rail tracks at this location.

4.4.2 Preferred Design of Crossing

A new structure has been designed to carry the suburban Sunbury Up and Down rail lines over the proposed Lancefield Road.

The proposed rail bridge structure will consist of a single span precast prestressed 1200 mm deep Super-T beam arrangement with in-situ deck overlay. The cast in-situ deck slab will have a minimum thickness of 200 mm across the bridge with ballast walls to contain the ballast. The deck slab will be composite with the Super-T beams.

The bridge beams will have a span of approximately 19.4 m over the rail tracks.

The substructure will consist of reinforced concrete abutment crossheads supported on reinforced concrete retaining wall bored piles.

The bridge beams will be simply supported on elastomeric laminated bearings and expansion joints will be required.

The approach slabs will be cast in-situ reinforced concrete located on both the bridge approaches. The approach slabs will run 4 m perpendicular to the bridge abutments.

The rail bridge will have a minimum of 1.2 m wide maintenance access walkway either side of the rail tracks.

The proposed bridge span has been lengthened to accommodate the future road widening of the connector road. The design of the south abutment crosshead and piles has also been designed to accommodate for the ready conversion to a future pier when the potential future train station is constructed.

The proposed shared use path under the rail bridge has been located at a different level to the proposed road underpass in order to minimise gradients, so that the potential future station entry can be accommodated and ramp lengths to station platform levels minimised.

4.5 Project E – Lancefield Road Southern Grade Separation

4.5.1 Options Considered

At this location the rail is in a deep cutting and readily presents itself to a road over rail bridge solution. Several crossing locations were considered in response to potential locations suggested by stakeholders. A key consideration is the sharp escarpment just to the west of the rail cutting. Ideally, the road alignment should maximise potential for development on both sides of the road. All crossing points can be achieve this to a different extent.

The chosen alignment is one preferred by the local developer of the area.

The alignment extends from the intersection of Balbethan Drive and Stockwell Drive to the east of the rail crossing to link up with a new connector road proposed to the west.

4.5.2 Preferred Design of Crossing

A new structure has been designed to carry Lancefield Road traffic over the suburban Up and Down rail lines. The bridge structure will also carry a minimum 2.0 m wide footpath on the both sides of the bridge.

The proposed bridge structure will consist of a single span precast prestressed 1000 mm deep Super-T beam arrangement with in-situ deck overlay. The cast in-situ deck slab will have a minimum thickness of 175 mm across the bridge. The deck slab will be composite with the Super-T beams.

The bridge beams will have a span of 19.0 m over the rail tracks.

The substructure will consist of reinforced concrete abutment crossheads sitting on a reinforced concrete spread footing founded on top of the rock cutting.

The bridge beams will be simply supported on elastomeric laminated bearings and expansion joints will be required.

The approach slabs will be cast in-situ reinforced concrete located on both the bridge approaches. The approach slabs will run 4 m perpendicular to the bridge abutments.

It is proposed that the bridge barriers will have a high performance level and a 3.0 m high anti-throw screen.

4.6 Concept Design Plans

Plans of the preferred concept road alignment and bridge/underpass structures for each crossing are provide in Appendix A.

Plans of optional road alignments not taken forward are provided in Appendix B for information.

5 Cost Estimates

High level cost estimates have been produced for the road and crossing infrastructure shown on the concept plans included in Appendix A. It is noted that the estimates are for the interim road configurations for the Sunbury South Road Lancefield South Road infrastructure only.

Unit rates are taken from historic cost estimates for similar works.

The cost estimates are inclusive of the following (provided by MPA):

- Site Establishment: 2.5%
- Survey and Design: 5%
- Supervision and Project Management: 9.0%
- Council Fees (Supervision 1.5%, project management 1% and plan checking 0.75%): 3.25%
- Contingencies for road projects: 15%
- Contingencies for bridges (including culverts): 20%

Four track occupations have been allowed for at each rail crossing to construct the road underpasses. This would need to be reviewed as part of more detailed estimate at a later design stage when construction staging and methodology has been developed.

Table 2 below summarises the cost of the road and crossing infrastructure. Details of the cost estimate are given in Appendix C.

Table 2: Cost Estimate of Infrastructure Elements

Infrastructure	Cost Estimate
Sunbury South Road Infrastructure	$52.4 million
Lancefield South Road Infrastructure (Balbethan Drive)	$9.9 million
Lancefield North Road Infrastructure	$10.3 million
Sunbury South Rail Grade Separation	$10.2 million
Harpers Creek Connector Road Crossing (W)	$0.1 million
Harpers Creek Connector Road Crossing (E)	$1.0 million
Lancefield Road Northern Grade Separation	$5.9 million
Lancefield Road Southern Grade Separation	$0.9 million

Appendix A
Concept Design Drawings

SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

NORTH 2 ALIGNMENT
NORTH 1 ALIGNMENT
SOUTH ALIGNMENT
RAES RD
BENDIGO-MELBOURNE LINE
CALDER HIGHWAY
BULLA-DIGGERS REST ROAD
SUNBURY-TOOLERN CREEK ROAD
BULLA-DIGGERS REST ROAD
BENDIGO-MELBOURNE LINE
BULLA BULLA
BULLA-DIGGERS REST ROAD
BENDIGO-MELBOURNE LINE
BULLA-DIGGERS REST ROAD
SUNBURY-TOOLERN CREEK ROAD
BENDIGO-MELBOURNE LINE
CALDER HIGHWAY
BULLA-DIGGERS REST ROAD
BENDIGO-MELBOURNE LINE
BULLA-DIGGERS REST ROAD

DRAWING INDEX

245435-0000-DRG-CC-000	COVER SHEET AND LOCALITY PLAN
245435-0000-DRG-CC-001	DRAWING INDEX
245435-0000-DRG-CC-100	SOUTH ALIGNMENT - OVERALL SCOPE OF WORKS
245435-0000-DRG-CC-150	SOUTH ALIGNMENT - TYPICAL DETAILS AND SECTIONS
245435-0000-DRG-BR-160	SUNBURY SOUTH - RAIL GRADE SEPERATION BRIDGE - GENERAL ARRANGEMENT
245435-0000-DRG-BR-170	SUNBURY SOUTH -HARPERS CREEK CULVERT - GENERAL ARRANGEMENT
245435-0000-DRG-BR-180	SUNBURY SOUTH - HARPERS CREEK BRIDGE - GENERAL ARRANGEMENT
245435-0000-DRG-CC-300	SOUTH ALIGNMENT - FUNCTIONAL LAYOUT SHEET 1
245435-0000-DRG-CC-301	SOUTH ALIGNMENT - FUNCTIONAL LAYOUT SHEET 2
245435-0000-DRG-CC-302	SOUTH ALIGNMENT - FUNCTIONAL LAYOUT SHEET 3
245435-0000-DRG-CC-303	SOUTH ALIGNMENT - FUNCTIONAL LAYOUT SHEET 4
245435-0002-DRG-CC-100	NORTH ALIGNMENT - OVERALL SCOPE OF WORKS
245435-0002-DRG-CC-150	NORTH ALIGNMENT - TYPICAL DETAILS AND SECTIONS
245435-0002-DRG-BR-160	LANCEFIELD ROAD - SOUTHERN GRADE SEPERATION BRIDGE - GENERAL ARRANGEMENT
245435-0002-DRG-BR-170	LANCEFIELD ROAD - NORTHERN GRADE SEPERATION BRIDGE - GENERAL ARRANGEMENT
245435-0002-DRG-CC-300	NORTH 1 ALIGNMENT - FUNCTIONAL LAYOUT SHEET 1
245435-0002-DRG-CC-301	NORTH 1 ALIGNMENT - FUNCTIONAL LAYOUT SHEET 2
245435-0002-DRG-CC-302	NORTH 1 ALIGNMENT - FUNCTIONAL LAYOUT SHEET 3
245435-0002-DRG-CC-310	NORTH 2 ALIGNMENT - FUNCTIONAL LAYOUT SHEET 1
245435-0002-DRG-CC-311	NORTH 2 ALIGNMENT - FUNCTIONAL LAYOUT SHEET 2
245435-0000-DRG-BR-160	SUNBURY SOUTH - RAIL GRADE SEPARATION BRIDGE - GENERAL ARRANGEMENT
245435-0000-DRG-BR-170	HARPERS CREEK CULVERT - GENERAL ARRANGEMENT
245435-0000-DRG-BR-180	HARPERS CREEK BRIDGE - GENERAL ARRANGEMENT
245435-0002-DRG-BR-160	LANCEFIELD ROAD - SOUTHERN GRADE SEPARATION BRIDGE - GENERAL ARRANGEMENT
245435-0002-DRG-BR-170	LANCEFIELD ROAD - NORTHERN GRADE SEPARATION BRIDGE - GENERAL ARRANGEMENT

10 Jun 2015 9:24 AM \\aurecon.info\shares\AUMEL\Projects\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CAD\Drawings\CIV\245435-0000-DRG-CC-001.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	15.04.15	FOR DISCUSSION ONLY	
B	10.06.15	DRAWING INDEX REVISED	

SCALE	SIZE
N.T.S.	A1

DRAWN: R.Balbastro
DESIGNED: C.Hunt
CHECKED:

CONCEPT
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: DRAWING INDEX

DRAWING No.

PROJECT No.		WBS		TYPE		DISC		NUMBER		REV
245435	-	0000	-	DRG	-	CC	-	001	-	B

40 0 80 160m
SCALE 1:4000

15 Apr 2015 11:51 AM P:\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CAD\Drawings\CIV\245435-0000-DRG-CC-100.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	09.02.15	FOR DISCUSSION ONLY	
B	13.03.15	FOR DISCUSSION ONLY	
C	18.03.15	ALIGNMENT REVISED	
D	15.04.15	FOR DISCUSSION ONLY	

SCALE	SIZE
1:4000	A1

DRAWN: R.Balbastro
DESIGNED: C.Hunt
CHECKED:

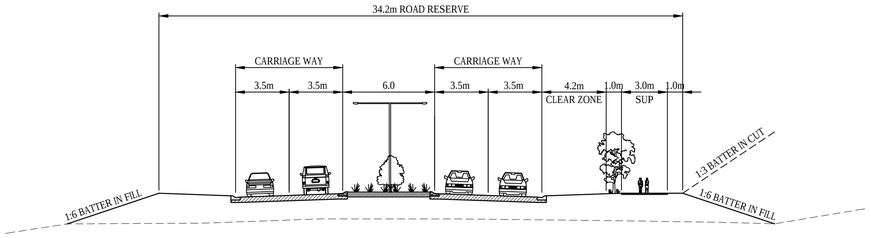
CONCEPT
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: SOUTH ALIGNMENT OVERALL SCOPE OF WORKS

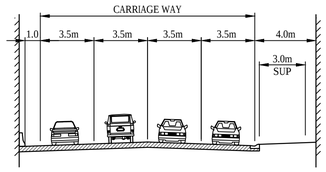
DRAWING No. PROJECT No. 245435 – WBS 0000 – TYPE DRG – DISC CC – NUMBER 100 – REV D



FUTURE (LOOKING EAST)

SECTION A CC-100

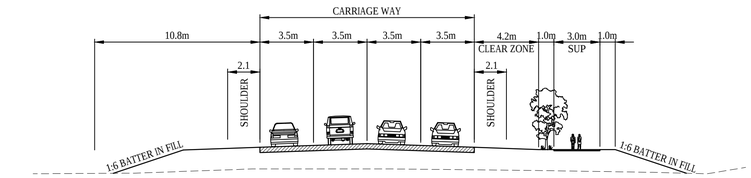
N.T.S.



FUTURE - UNDER RAILWAY (LOOKING EAST)

SECTION B CC-100

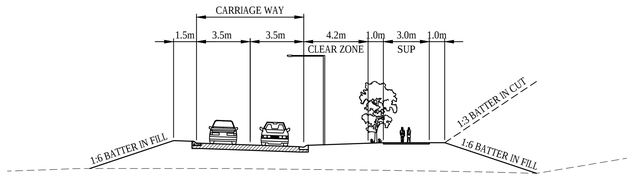
N.T.S.



FUTURE - WITHIN PARK LAND (LOOKING EAST)

SECTION C CC-100

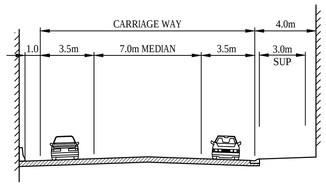
N.T.S.



PROPOSED (LOOKING EAST)

SECTION A CC-100

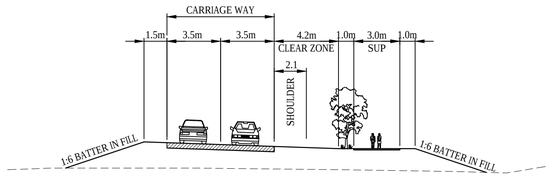
N.T.S.



PROPOSED - UNDER RAILWAY (LOOKING EAST)

SECTION B CC-100

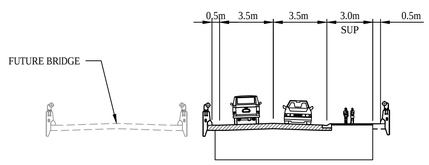
N.T.S.



PROPOSED - WITHIN PARK LAND (LOOKING EAST)

SECTION C CC-100

N.T.S.



PROPOSED BRIDGE (LOOKING EAST)

SECTION D CC-100

N.T.S.

27 May 2015 1:03 PM \\aurecon.info\shares\AUMEL\Projects\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\GIV\245435-0000-DRG-CC-150.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	09.02.15	FOR DISCUSSION ONLY	
B	18.03.15	ALIGNMENT REVISED	
C	15.04.15	FOR DISCUSSION ONLY	
D	27.05.15	LIGHTPOLES ADDED	

SCALE	SIZE
AS SHOWN	A1

DRAWN: R.Balbastro

DESIGNED: C.Hunt

CHECKED:

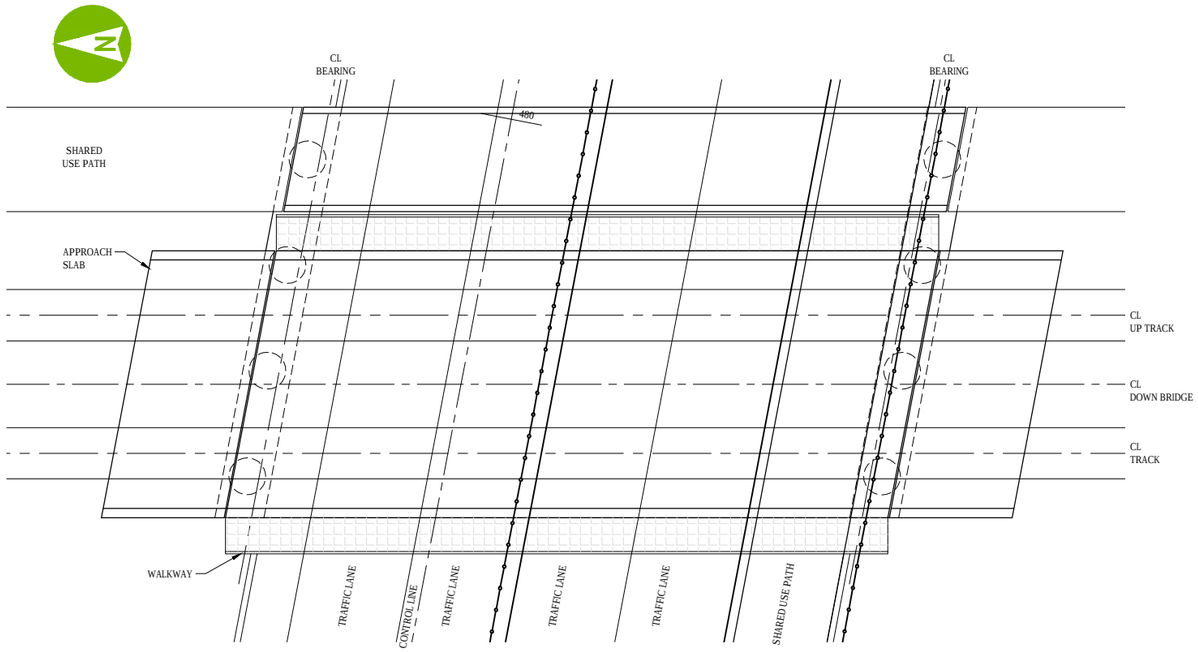
CONCEPT
NOT FOR CONSTRUCTION

APPROVED
DATE

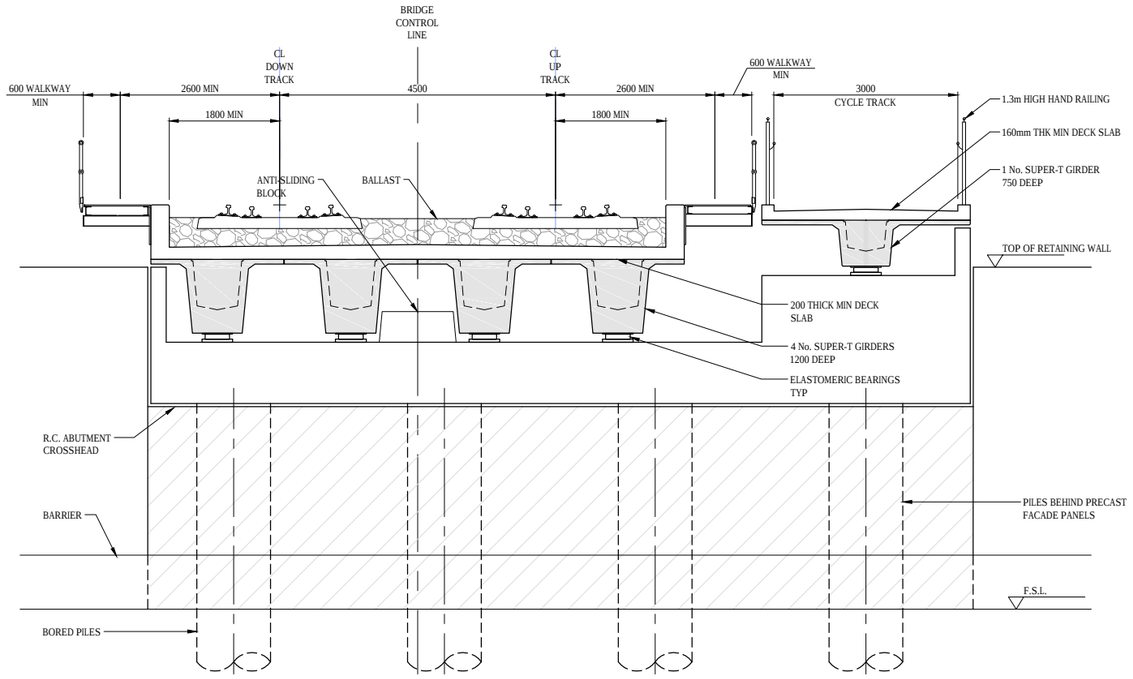
PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: SOUTH ALIGNMENT TYPICAL DETAILS AND SECTIONS

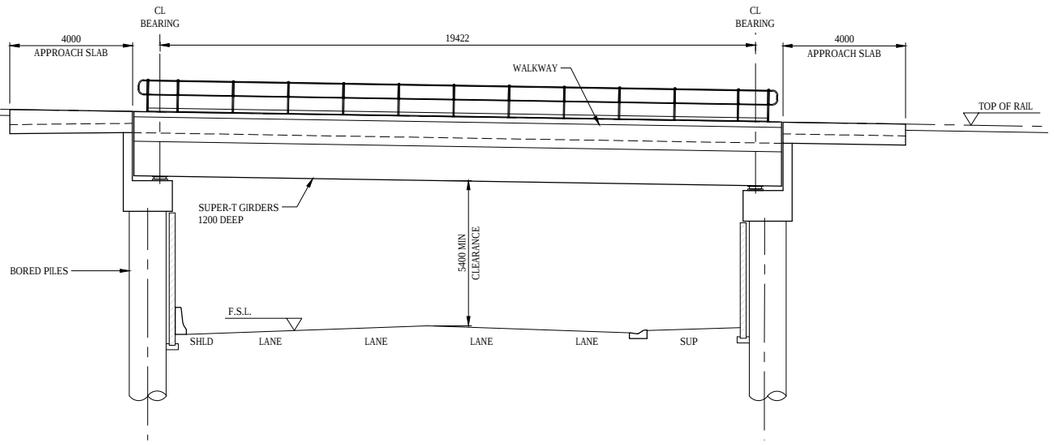
DRAWING No.: PROJECT No. 245435 – WBS 0000 – TYPE DRG – DISC CC – NUMBER 150 – REV D



PLAN
1:100



ABUTMENT ELEVATION
1:50



ELEVATION
1:100

500 0 1000 2000mm
SCALE 1:50

1 0 2 4m
SCALE 1:100

02 Apr 2015 12:12 PM P:\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CAD\Drawings\STR\245435-0000-DRG-BR-160.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A		FOR INFORMATION ONLY	

SCALE	SIZE
AS SHOWN	A1

DRAWN: J.Yost
DESIGNED: C.Ng
CHECKED:

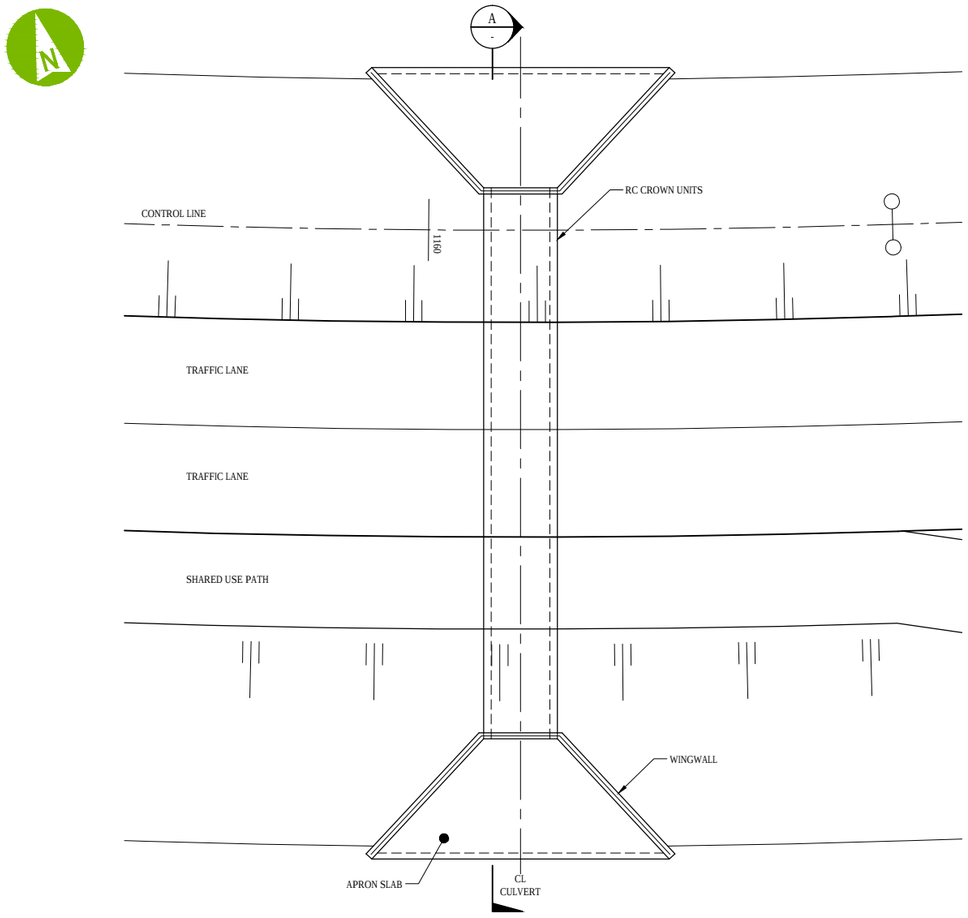
DRAFT
NOT FOR CONSTRUCTION

APPROVED
DATE

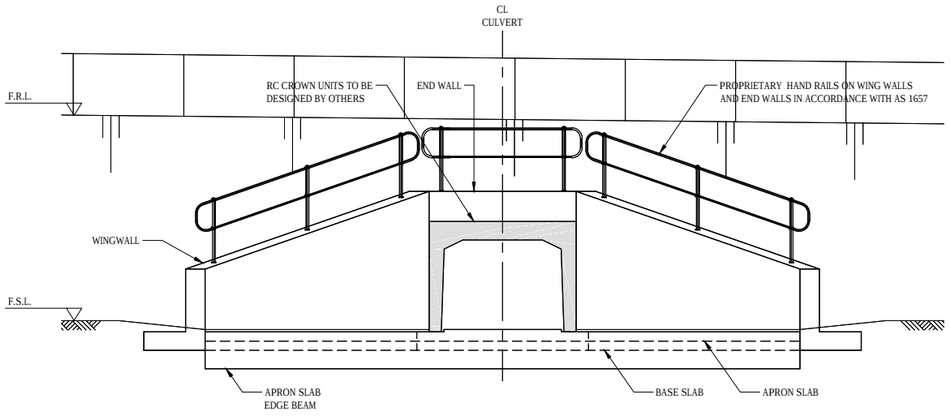
PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: SUNBURY SOUTH RAIL GRADE SEPARATION BRIDGE GENERAL ARRANGEMENT

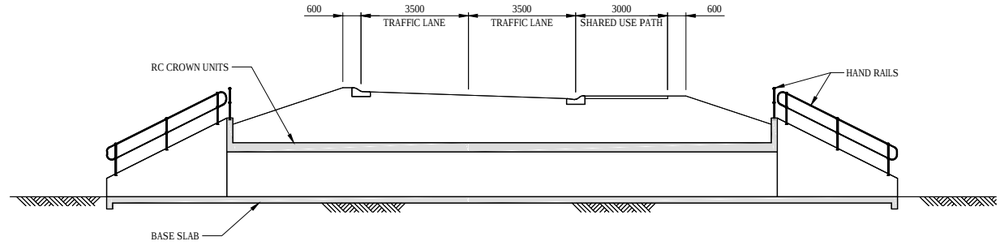
DRAWING No. PROJECT No. 245435 – WBS 0000 – TYPE DRG – DISC BR – NUMBER 160 – REV A



PLAN
1:100



ABUTMENT ELEVATION
1:50



SECTION A
1:100

NOTES

1. ASSUMED INTERNAL DIMENSION OF CULVERT OPENING IS 1.5m HIGH BY 2.0m WIDE
2. NO HYDRAULIC ASSESSMENT UNDERTAKEN TO CONFIRM IS PROPOSED CULVERT OPENING IS SUFFICIENT

500 0 1000 2000mm
SCALE 1:50

30 Mar 2015 12:14 PM P:\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\STR\245435-0000-DRG-BR-170.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A		FOR INFORMATION ONLY	

SCALE	SIZE
AS SHOWN	A1

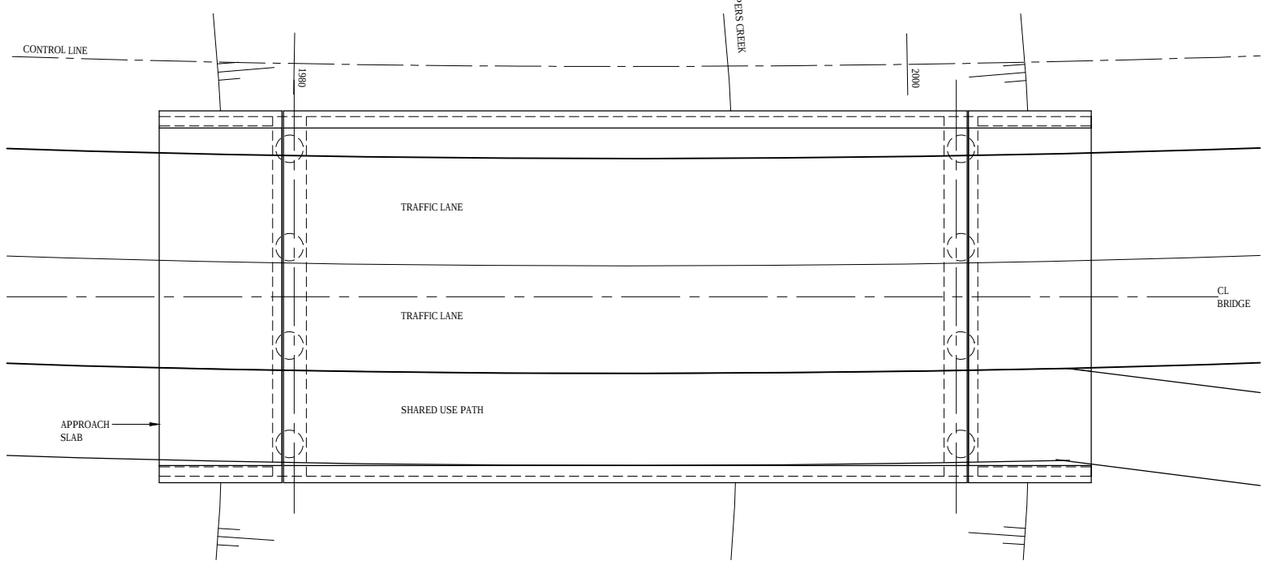
DRAWN: J.Yost
DESIGNED: C.Ng
CHECKED:

DRAFT
NOT FOR CONSTRUCTION
APPROVED
DATE

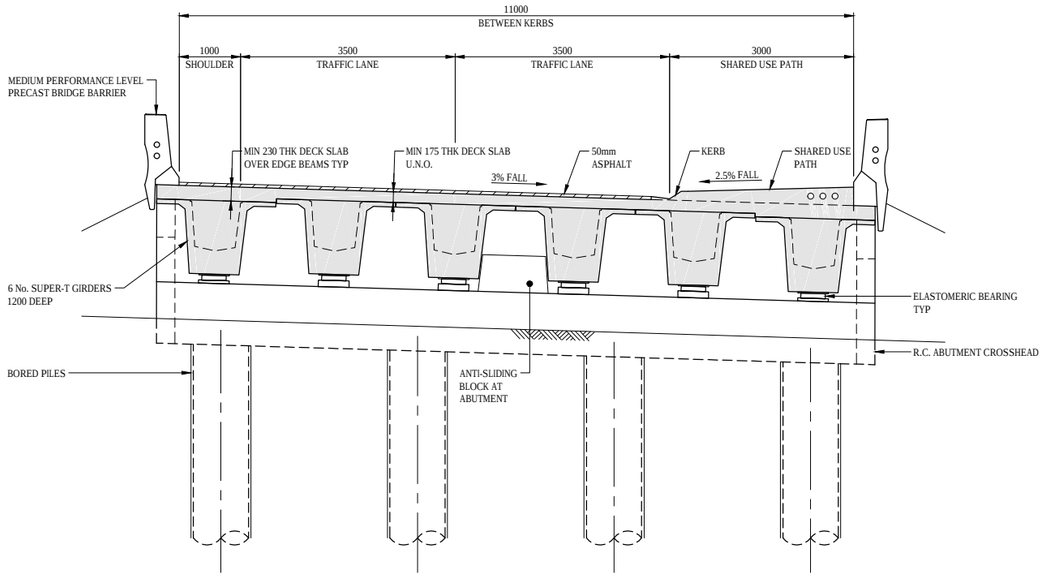
PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: HARPERS CREEK CULVERT GENERAL ARRANGEMENT

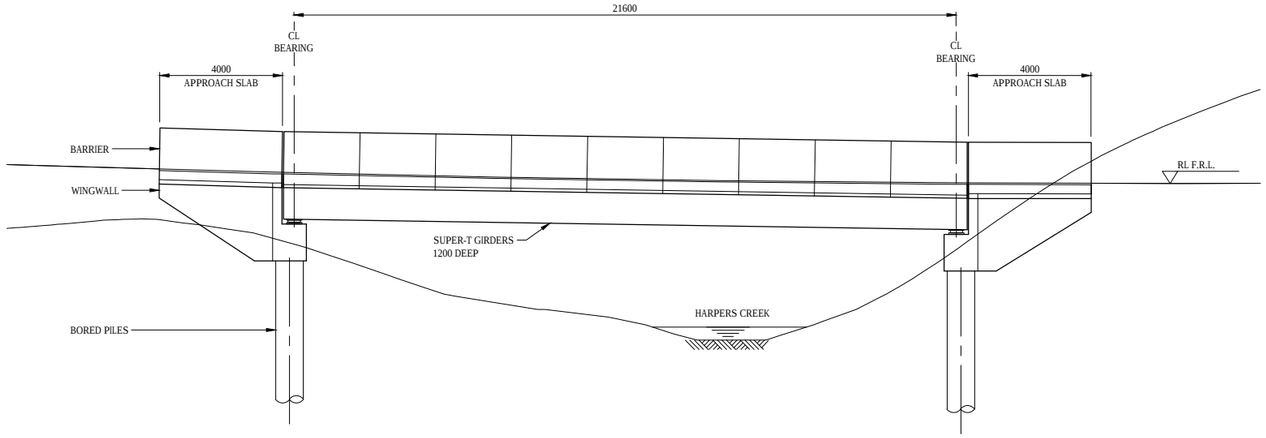
DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	245435	0000	DRG	BR	170	A



PLAN
1:100



ABUTMENT ELEVATION
1:50



ELEVATION
1:100

500 0 1000 2000mm
SCALE 1:50

1 0 2 4m
SCALE 1:100

30 Mar 2015 12:14 PM P:\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\STR\245435-0000-DRG-BR-180.dwg

aurecon
www.aurecongroup.com

CLIENT
MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A		FOR INFORMATION ONLY	

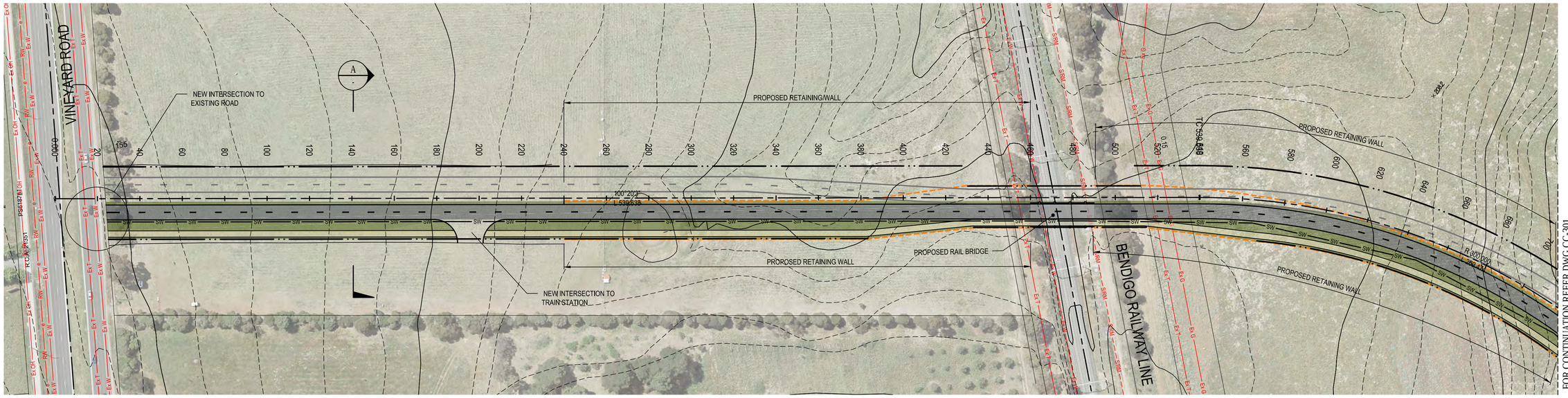
SCALE	SIZE
AS SHOWN	A1

DRAWN: J.Yost
DESIGNED: C.Ng
CHECKED:

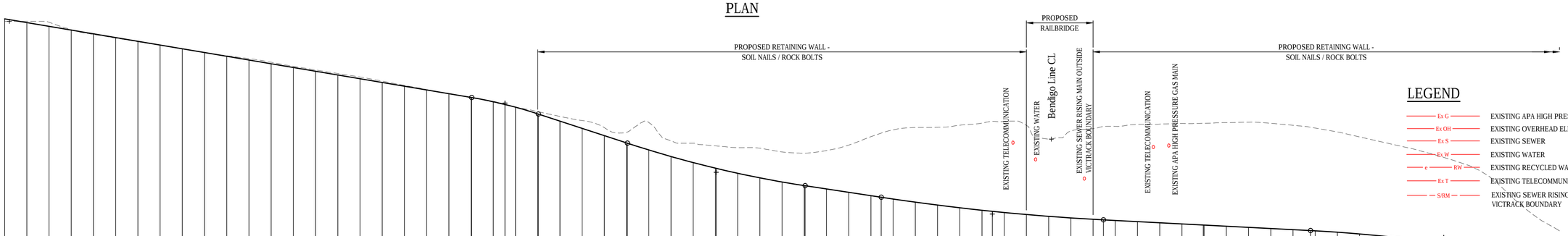
DRAFT
NOT FOR CONSTRUCTION
APPROVED
DATE

PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN
TITLE: HARPERS CREEK BRIDGE GENERAL ARRANGEMENT

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	245435	0000	DRG	BR	180	A



PLAN



LEGEND

- Ex G — EXISTING APA HIGH PRESSURE GAS MAIN
- Ex OH — EXISTING OVERHEAD ELECTRICAL
- Ex S — EXISTING SEWER
- Ex W — EXISTING WATER
- e RW — EXISTING RECYCLED WATER
- Ex T — EXISTING TELECOMMUNICATION
- S/RM — EXISTING SEWER RISING MAIN OUTSIDE VICTRACK BOUNDARY

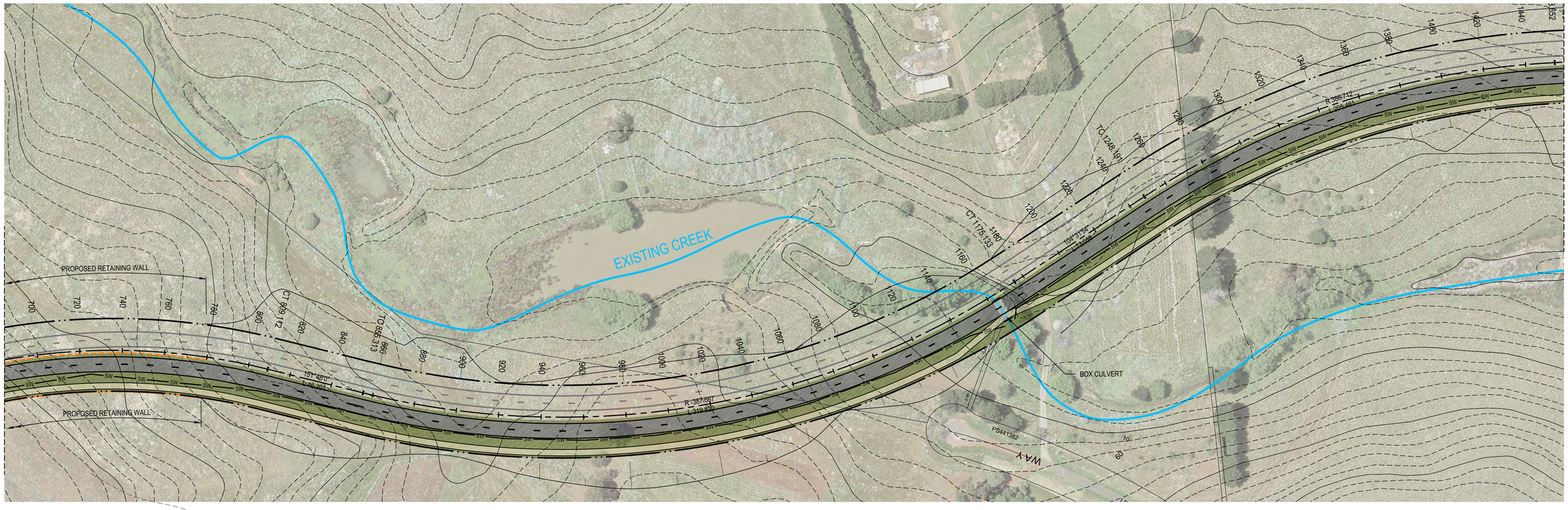
Horiz Curve Data

Vertical Geometry Grade (%) / Vertical Grade Length: -3.374 % / 225.259m; -6.558 % / 95.095m; -3.034 % / 124.29m; -1.037 % / 203.231m; -4.731 % / 252.54m

Vertical Curve Length (m) / Vertical Curve Radius (m) K value: 30m VC R=942 K=9.4; 80m VC R=2270 K=22.7; 100m VC R=5008 K=50.1; R300m; 120m VC R=3249 K=32.5

DATUM R.L.184.500

| | | |


EXISTING CREEK
PROPOSED RETAINING WALL
PROPOSED RETAINING WALL
BOX CULVERT
CT 1175.133
TC 1248.197
TC 935.313
CT 808.121
R=387.667
L=349.800
R=386.712
L=305.481
151°48'0"
L=46.201
PS441382
WAY
Creek CL
SAG CH:1273.511 RL:185.427

Horiz Curve Data
R300m
R-387.67m
R386.71m
Vertical Geometry Grade (%)
Vertical Grade Length
4.731 %
252.54m
-1.006 %
389.531m
2.41 %
237.761m
Vertical Curve Length (m)
Vertical Curve Radius (m) K value
120m VC
R=3249
K=32.5
80m VC
R=2148
K=21.5
80m VC
R=2342
K=23.4
DATUM R.L.168.500

| | | |

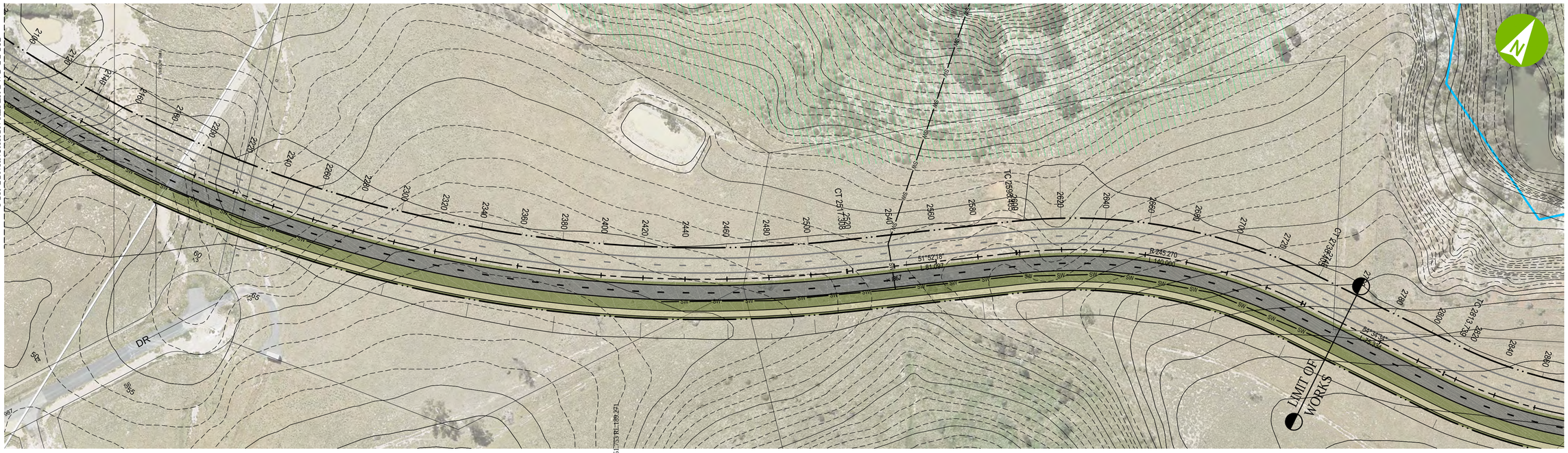
PLAN

LEGEND

- CREEK PARK AND CONSERVATION AREA
- S/RM — EXISTING SEWER RISING MAIN

| | | |

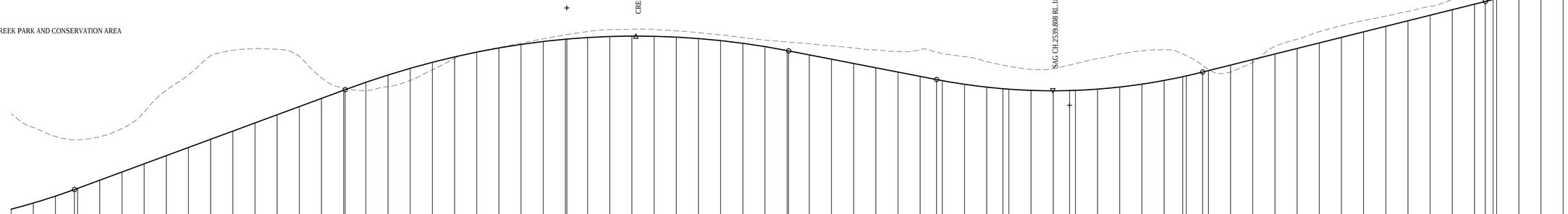
FOR CONTINUATION REFER DWG CC-302



PLAN

LEGEND

CREEK PARK AND CONSERVATION AREA



Horiz Curve Data: R-520.52m; R245.27m

Vertical Geometry Grade (%): 7.385 %; -3.879 %; 5 %

Vertical Grade Length: 297.066m; 226.752m; 227.491m

Vertical Curve Length (m): 150m VC; 200m VC; 120m VC; 80m VC

Vertical Curve Radius (m) K value: R=1213 K=12.1; R=1775 K=17.8; R=1351 K=13.5; R=2725 K=27.3

DATUM R.L.159.500

| | | |

15 Apr 2015 11:55 AM P:\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\CIV\245435-0002-DRG-CC-100.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	09.02.15	FOR DISCUSSION ONLY	
B	18.03.15	ALIGNMENT REVISED	
C	25.03.15	NORTH 1 ALIGNMENT REVISED	
D	15.04.15	FOR DISCUSSION ONLY	

SCALE	SIZE
1:4000	A1

DRAWN: R.Balbastro
DESIGNED: C.Hunt
CHECKED:

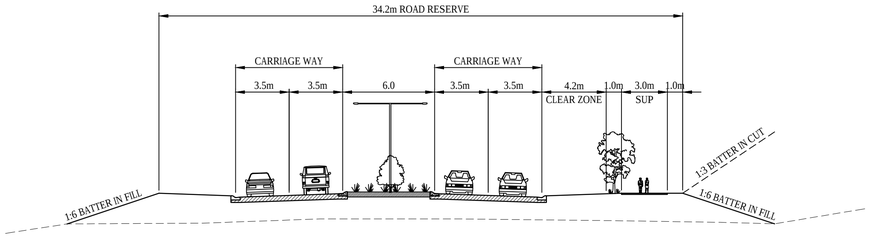
CONCEPT
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: NORTH ALIGNMENT OVERALL SCOPE OF WORKS

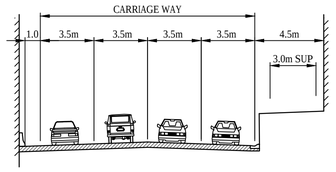
DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	245435	0002	DRG	CC	100	D



FUTURE (LOOKING EAST)

SECTION E CC-100

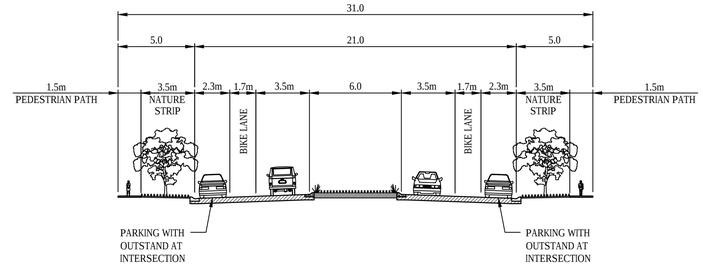
N.T.S.



FUTURE - UNDER RAILWAY (LOOKING EAST)

SECTION F CC-100

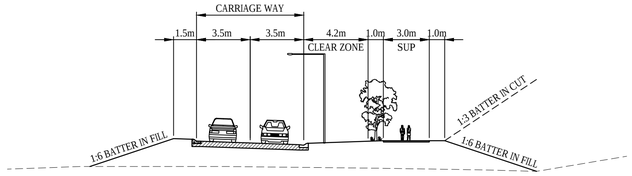
N.T.S.



BOULEVARD CONNECTOR STREET (LOOKING EAST)

SECTION H CC-100

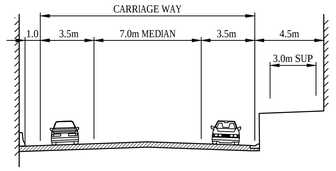
N.T.S.



PROPOSED (LOOKING EAST)

SECTION E CC-100

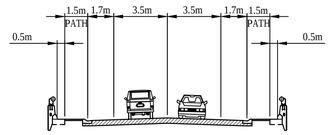
N.T.S.



PROPOSED - UNDER RAILWAY (LOOKING EAST)

SECTION F CC-100

N.T.S.



PROPOSED - NORTH 1 BRIDGE (LOOKING EAST)

SECTION J CC-100

N.T.S.

27 May 2015 1:05 PM \\aurecon.info\shares\AUMEL\Projects\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\GIV\245435-0002-DRG-CC-150.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	09.02.15	FOR DISCUSSION ONLY	
B	18.03.15	ALIGNMENT REVISED	
C	15.04.15	FOR DISCUSSION ONLY	
D	27.05.15	LIGHTPOLES ADDED	

SCALE	SIZE
AS SHOWN	A1

DRAWN: R.Balbastro

DESIGNED: C.Hunt

CHECKED:

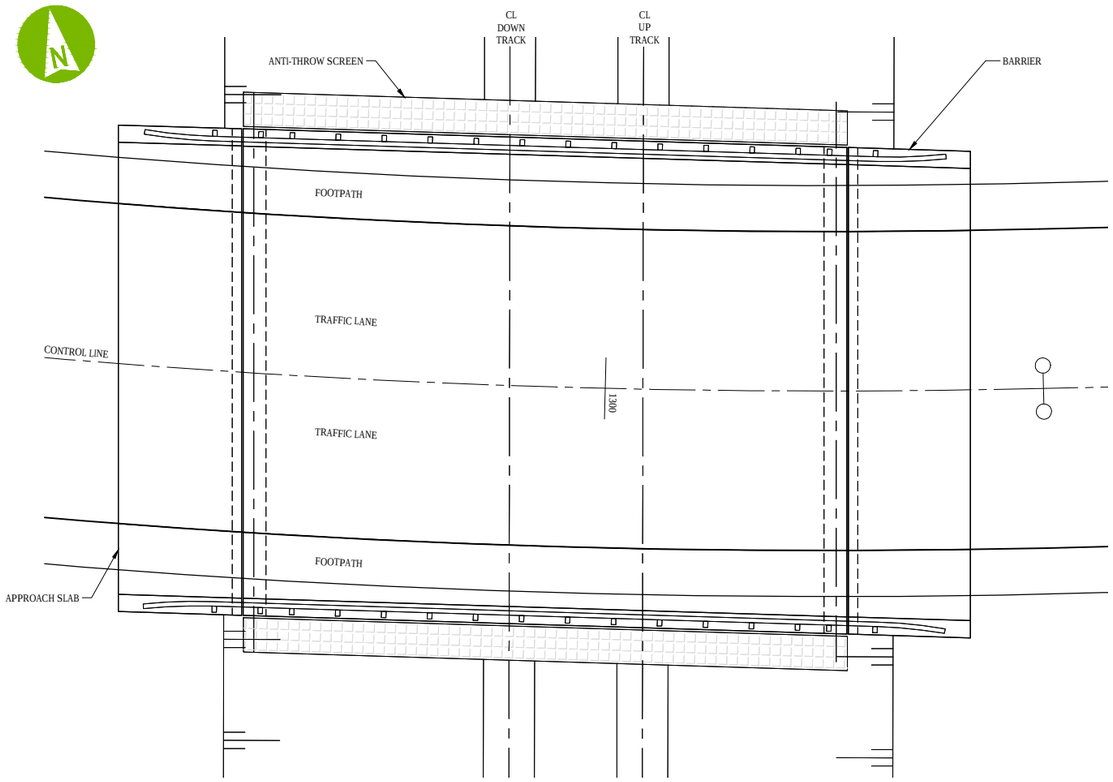
CONCEPT
NOT FOR CONSTRUCTION

APPROVED
DATE

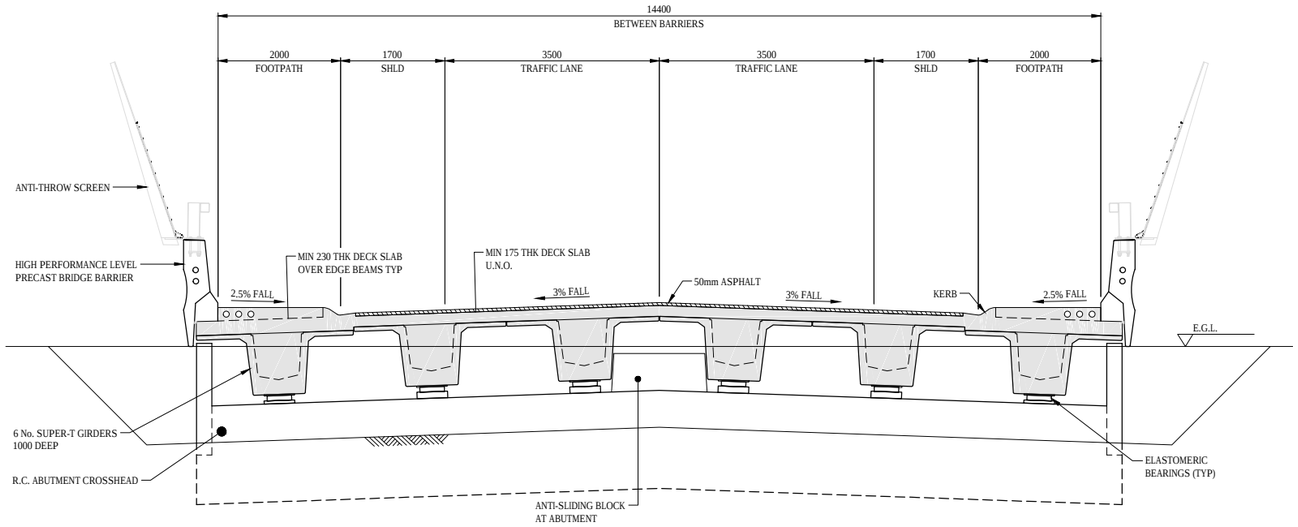
PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: NORTH ALIGNMENT TYPICAL DETAILS AND SECTIONS

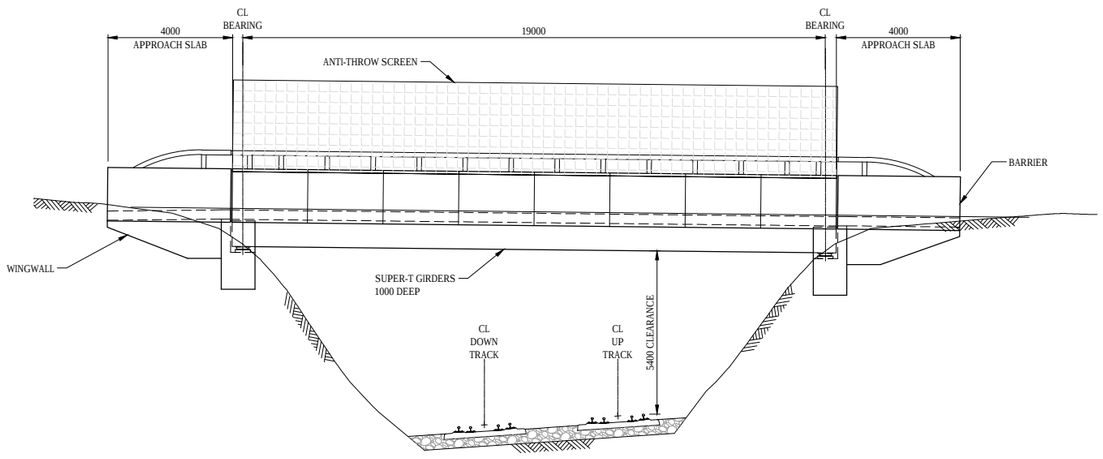
DRAWING No.: PROJECT No. 245435 – WBS 0002 – TYPE DRG – DISC CC – NUMBER 150 – REV D



PLAN
1:100



ABUTMENT ELEVATION
1:50



ELEVATION
1:100

30 Mar 2015 12:14 PM P:\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\STR\245435-0002-DRG-BR-160.dwg

500 0 1000 2000mm
SCALE 1:50

1 0 2 4m
SCALE 1:100

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A		FOR INFORMATION ONLY	

SCALE	SIZE
AS SHOWN	A1

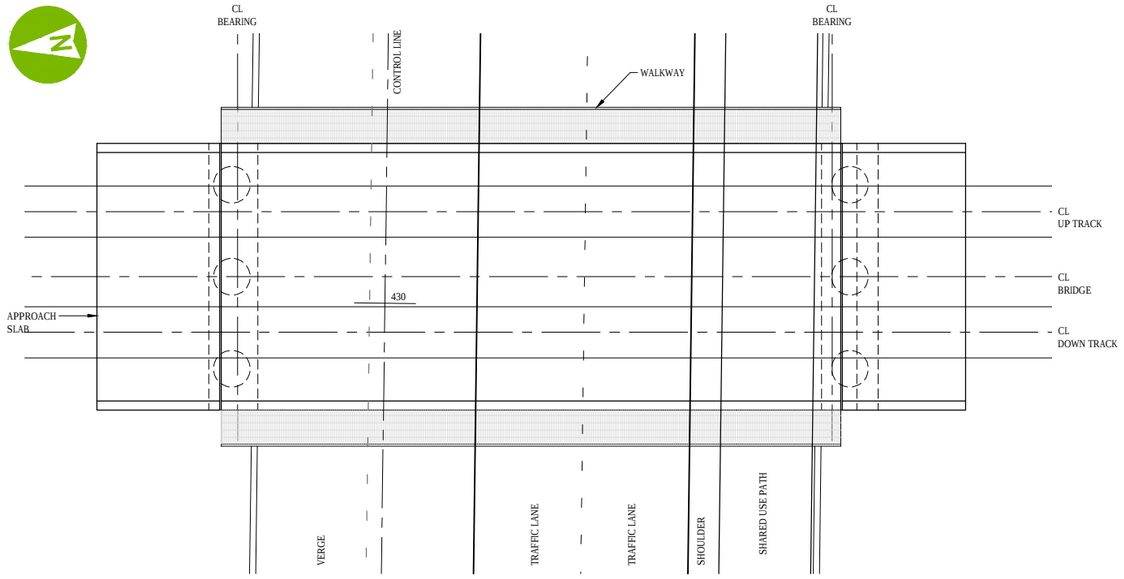
DRAWN: J.Yost
DESIGNED: C.Ng
CHECKED:

DRAFT
NOT FOR CONSTRUCTION

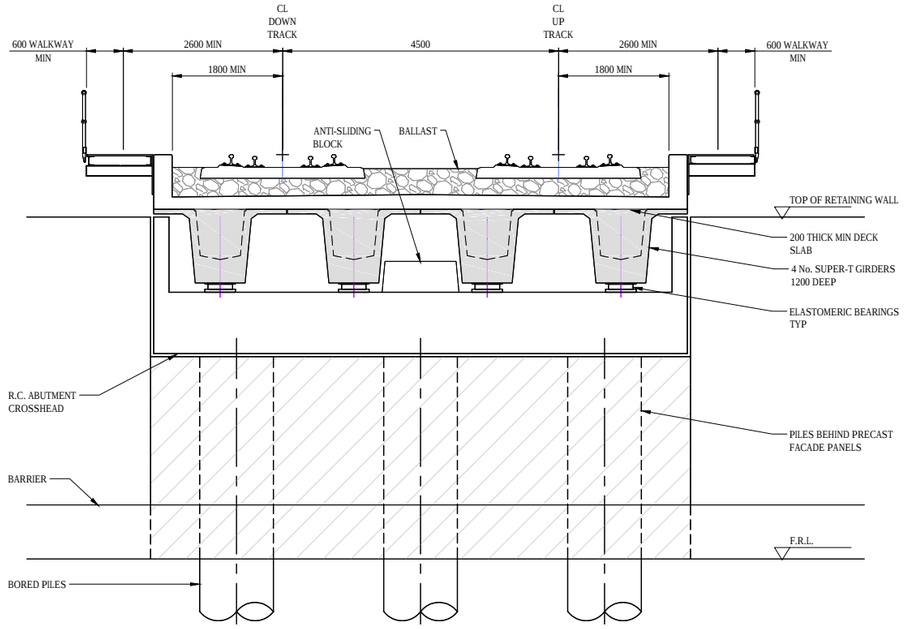
APPROVED
DATE

PROJECT	SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN
TITLE	LANCEFIELD ROAD SOUTHERN GRADE SEPARATION BRIDGE GENERAL ARRANGEMENT

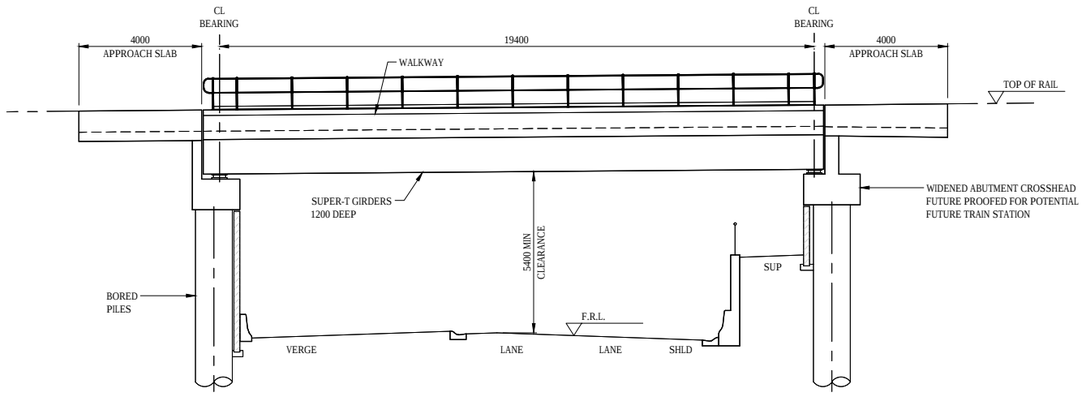
DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	245435	0002	DRG	BR	160	A



PLAN
1:100



ABUTMENT ELEVATION
1:50



ELEVATION
1:100

500 0 1000 2000mm
SCALE 1:50

1 0 2 4m
SCALE 1:100

01 Apr 2015 4:51 PM P:\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\STR\245435-0002-DRG-BR-170.dwg

aurecon
www.aurecongroup.com

CLIENT
MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A		FOR INFORMATION ONLY	

SCALE	SIZE
AS SHOWN	A1

DRAWN: J.Yost
DESIGNED: C.Ng
CHECKED:

DRAFT
NOT FOR CONSTRUCTION
APPROVED
DATE

PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: LANCEFIELD ROAD NORTHERN GRADE SEPARATION BRIDGE GENERAL ARRANGEMENT

DRAWING No.

PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
245435	0002	DRG	BR	170	A

PLAN

Horiz Curve Data — R140m — R-430m

Vertical Geometry Grade (%) — 0.608 % — -1.09 %

Vertical Grade Length — 236.98m — 765.535m

Vertical Curve Length (m) — 200m VC

Vertical Curve Radius (m) K value — R=11779 K=117.8

DATUM R.L.242.500

CHAINAGE	NATURAL SURFACE	CUT/FILL DEPTH	DESIGN C.L.	SUPER ELEVATION
0	259.956	0.476	260.432	
10	259.967	0.526	260.493	
20	259.962	0.592	260.554	
30	259.986	0.629	260.615	
40	260.051	0.625	260.675	
50	260.12	0.617	260.736	
60	260.224	0.573	260.797	
70	260.333	0.525	260.858	
80	260.412	0.507	260.919	
90	260.47	0.51	260.979	
100	260.604	0.436	261.04	
110	260.771	0.33	261.101	
120	260.879	0.283	261.162	
123.578	260.888	0.296	261.184	
130	260.967	0.256	261.223	
136.98	261.051	0.215	261.265	
140	261.066	0.217	261.283	
150	261.126	0.211	261.337	
160	261.138	0.245	261.383	
170	261.086	0.334	261.42	
180	261.013	0.435	261.448	
190	260.881	0.587	261.468	
200	260.791	0.689	261.48	
210	260.707	0.775	261.483	
220	260.638	0.839	261.477	
230	260.561	0.903	261.463	
236.98	260.509	0.94	261.449	
240	260.501	0.94	261.441	
250	260.463	0.948	261.41	
260	260.402	0.969	261.371	
270	260.387	0.936	261.323	
280	260.37	0.896	261.267	
290	260.372	0.83	261.202	
300	260.38	0.748	261.128	
310	260.294	0.752	261.046	
320	260.237	0.719	260.956	
324.247	260.23	0.685	260.915	
330	260.206	0.651	260.857	
336.98	260.16	0.623	260.783	
340	260.147	0.603	260.75	
350	260.107	0.535	260.641	
360	260.081	0.451	260.532	
370	260.036	0.387	260.423	
380	259.963	0.351	260.314	
390	260	0.206	260.206	
400	259.892	0.205	260.097	
410	259.827	0.161	259.988	
420	259.718	0.16	259.879	
430	259.646	0.123	259.77	
440	259.562	0.098	259.661	
450	259.477	0.074	259.552	
460	259.345	0.097	259.443	
470	259.226	0.108	259.334	
480	259.126	0.098	259.225	
490	259.017	0.098	259.116	
500	258.9	0.106	259.007	
510	258.833	0.064	258.898	
520	258.734	0.054	258.789	
530	258.61	0.069	258.68	
540	258.485	0.086	258.571	
550	258.338	0.124	258.462	
560	258.177	0.176	258.353	
570	258.009	0.235	258.244	
580	257.868	0.267	258.135	
590	257.754	0.272	258.026	
600	257.631	0.286	257.917	
610	257.522	0.286	257.808	
620	257.448	0.25	257.699	
630	257.369	0.221	257.59	
640	257.294	0.187	257.481	
650	257.237	0.135	257.372	
660	257.185	0.078	257.263	
670	257.112	0.042	257.154	
672.314	257.092	0.037	257.129	
680	257.038	0.007	257.045	
690	256.965	-0.03	256.936	
700	256.858	-0.031	256.827	

LONGITUDINAL SECTION SUNBURY NORTH 1 CL

SCALE H 1:1000
SCALE V 1:200

SCALE 1:1000

27 May 2015 1:05 PM \\aurecon.info\shares\AUMEL\Projects\TransportProject Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\GIV\245435-0002-DRG-CC-300.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	09.02.15	FOR DISCUSSION ONLY	
B	18.03.15	ALIGNMENT REVISED	
C	15.04.15	FOR DISCUSSION ONLY	
D	27.05.15	INTERSECTION NOTE ADDED	

SCALE	SIZE
1:1000	A1

DRAWN: R.Balbastro
DESIGNED: C.Hunt
CHECKED:

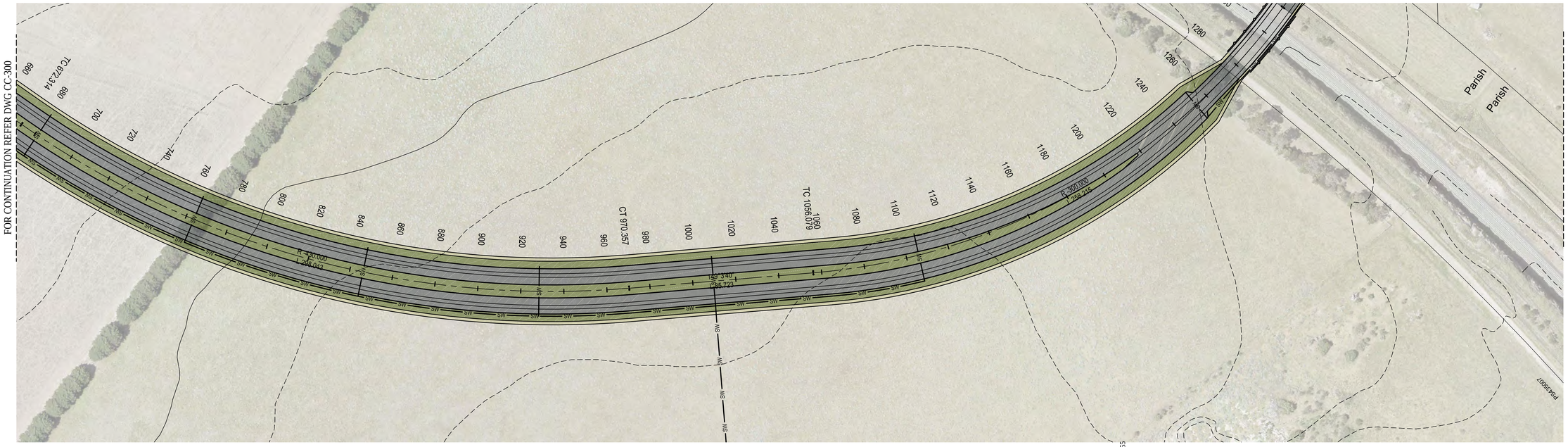
CONCEPT
NOT FOR CONSTRUCTION

APPROVED
DATE

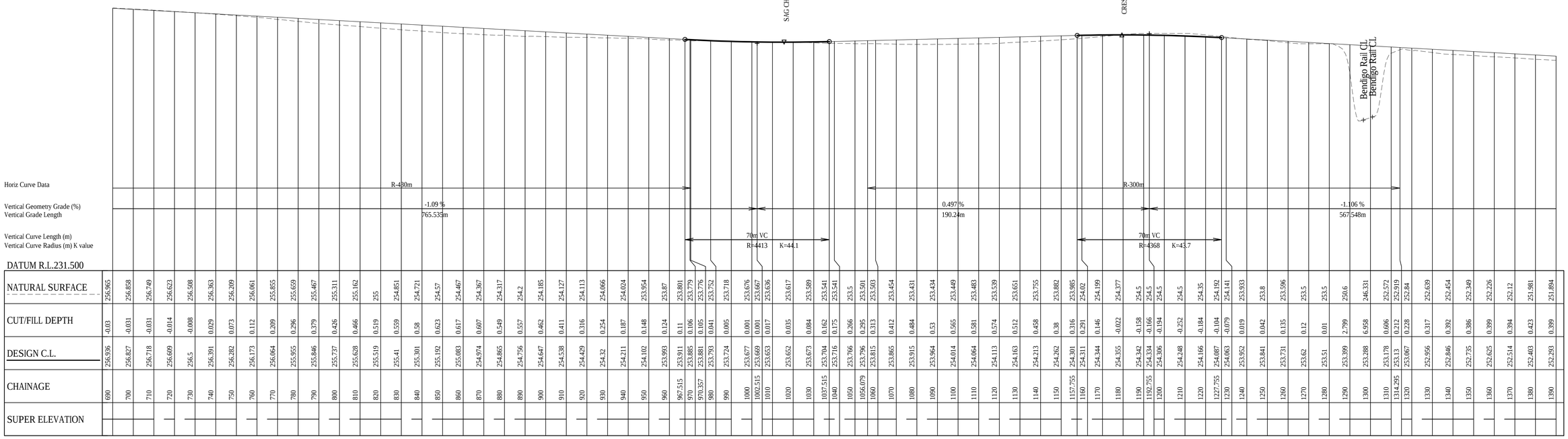
PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

TITLE: NORTH 1 ALIGNMENT FUNCTIONAL LAYOUT SHEET 1

DRAWING No. | PROJECT No. | WBS | TYPE | DISC | NUMBER | REV
245435 - 0002 - DRG - CC - 300 - D

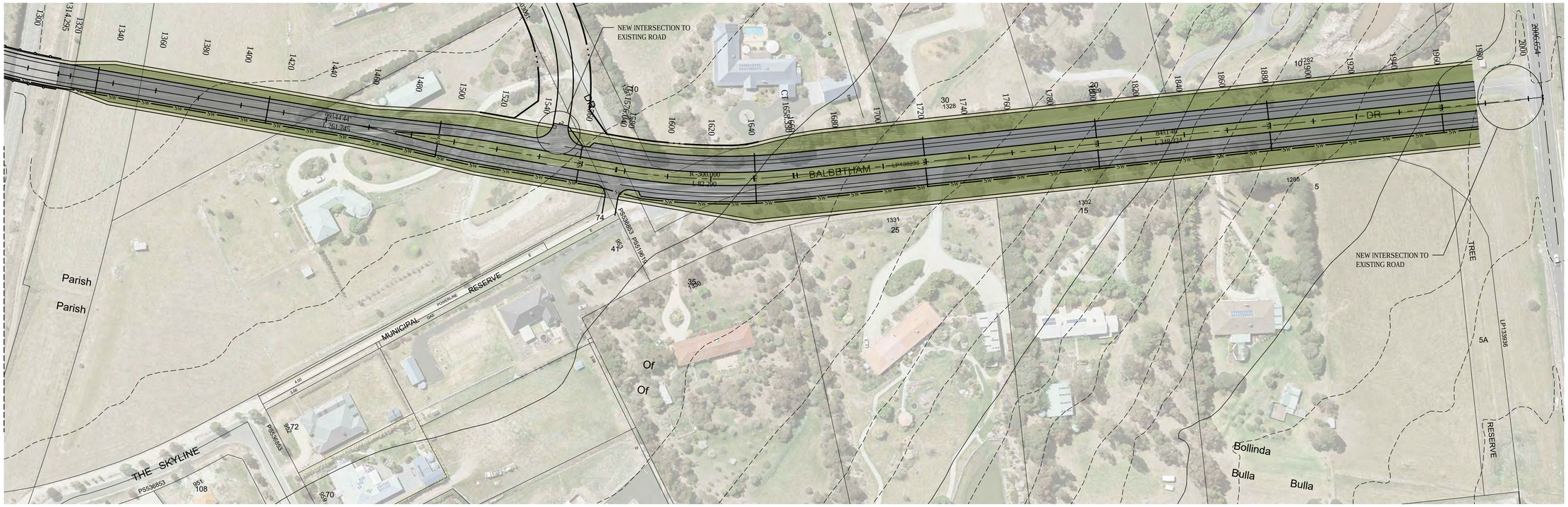

FOR CONTINUATION REFER DWG CC-300
FOR CONTINUATION REFER DWG CC-302
TC 672.314
CT 970.357
TC 1056.079
R=430.000
L=295.043
R=300.000
L=295.723
R=300.000
L=256.215
Parish
Parish
PS638021

PLAN

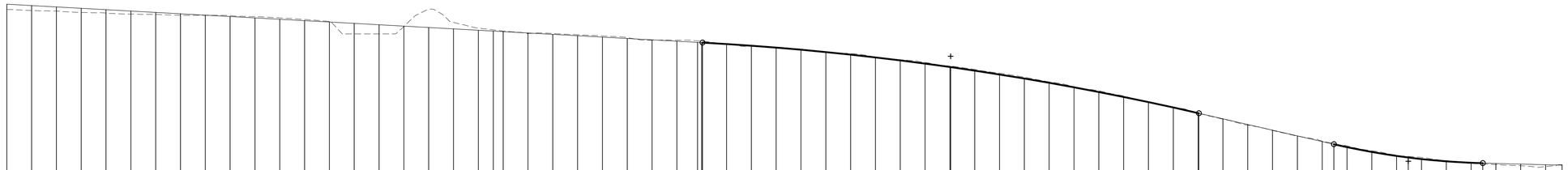

SAG CH.1015.606 RL.253.649
CREST CH.1179.442 RL.254.355
Bendigo Rail CL
Bendigo Rail CL
Horiz Curve Data
R-430m
R-300m
Vertical Geometry Grade (%)
Vertical Grade Length
-1.09 %
765.533m
0.497%
190.24m
-1.106 %
567.548m
Vertical Curve Length (m)
Vertical Curve Radius (m) K value
70m VC
R=4413 K=44.1
70m VC
R=4368 K=43.7
DATUM R.L.231.500

| | | |

FOR CONTINUATION REFER DWG CC-301



PLAN



Horiz Curve Data — R-300m

Vertical Geometry Grade (%) — -1.106 % | -4.591 % | -0.497 %

Vertical Grade Length — 567.548m | 184.4m | 61.952m

Vertical Curve Length (m) — 200m VC | 60m VC

Vertical Curve Radius (m) K value — R=5738 K=57.4 | R=1466 K=14.7

DATUM R.L.225.000

CHAINAGE	NATURAL SURFACE	CUT/FILL DEPTH	DESIGN C.L.	SUPER ELEVATION
1380	251.981	0.423	252.403	
1390	251.894	0.399	252.293	
1400	251.846	0.336	252.182	
1410	251.735	0.336	252.072	
1420	251.68	0.281	251.961	
1430	251.605	0.245	251.85	
1440	251.576	0.164	251.74	
1450	251.505	0.125	251.629	
1460	251.5	0.019	251.519	
1470	251.486	-0.078	251.408	
1480	251.395	-0.098	251.297	
1490	251.294	-0.108	251.187	
1500	251.168	-0.092	251.076	
1510	251.01	-0.045	250.965	
1520	250	0.855	250.855	
1530	250	0.744	250.744	
1540	250.598	0.035	250.634	
1550	252	-1.477	250.523	
1560	250.931	-0.519	250.412	
1570	250.471	-0.169	250.302	
1576.04	250.327	-0.092	250.235	
1580	250.235	-0.044	250.191	
1590	250.022	0.058	250.081	
1600	250.038	-0.068	249.97	
1610	249.937	-0.078	249.859	
1620	249.844	-0.095	249.749	
1630	249.704	-0.066	249.638	
1640	249.5	0.028	249.528	
1650	249.5	-0.083	249.417	
1658.33	249.446	-0.121	249.325	
1660	249.417	-0.111	249.306	
1660.303	249.411	-0.108	249.303	
1670	249.185	0.002	249.187	
1680	249	0.051	249.051	
1690	248.945	-0.048	248.898	
1700	248.787	-0.06	248.727	
1710	248.524	0.014	248.538	
1720	248.41	-0.078	248.332	
1730	248.147	-0.038	248.109	
1740	247.926	-0.058	247.868	
1750	247.708	-0.098	247.61	
1760	247.413	-0.079	247.334	
1760.303	247.407	-0.082	247.326	
1770	247.138	-0.097	247.041	
1780	246.843	-0.113	246.731	
1790	246.514	-0.112	246.403	
1800	246.137	-0.08	246.057	
1810	245.756	-0.061	245.695	
1820	245.419	-0.105	245.314	
1830	245.005	-0.088	244.917	
1840	244.549	-0.047	244.502	
1850	244.089	-0.011	244.069	
1860	243.612	0.007	243.619	
1860.303	243.598	0.008	243.605	
1870	243.129	0.031	243.16	
1880	242.645	0.056	242.701	
1890	242.219	0.023	242.242	
1900	241.767	0.016	241.783	
1910	241.358	-0.034	241.324	
1914.702	241.163	-0.055	241.108	
1920	240.973	-0.099	240.874	
1930	240.574	-0.088	240.485	
1940	240.23	-0.065	240.165	
1944.702	240.126	-0.089	240.037	
1950	240.042	-0.13	239.912	
1960	239.792	-0.064	239.728	
1970	239.568	0.044	239.612	
1974.702	239.515	0.066	239.581	
1980	239.466	0.089	239.555	
1990	239.373	0.132	239.505	
2000	239.309	0.146	239.455	
2006.654	239.424	-0.001	239.422	

LONGITUDINAL SECTION SUNBURY NORTH 1 CL

SCALE H 1:1000
SCALE V 1:200

SCALE 1:1000

27 May 2015 1:06 PM \\aurecon.info\shares\AUMEL1\Projects\Transport\Project Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\CIV\245435-0002-DRG-CC-302.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	09.02.15	FOR DISCUSSION ONLY	
B	18.03.15	ALIGNMENT REVISED	
C	15.04.15	FOR DISCUSSION ONLY	
D	27.05.15	INTERSECTION NOTE ADDED	

SCALE	SIZE
1:1000	A1

DRAWN: R.Balbastro
DESIGNED: C.Hunt
CHECKED:

CONCEPT
NOT FOR CONSTRUCTION

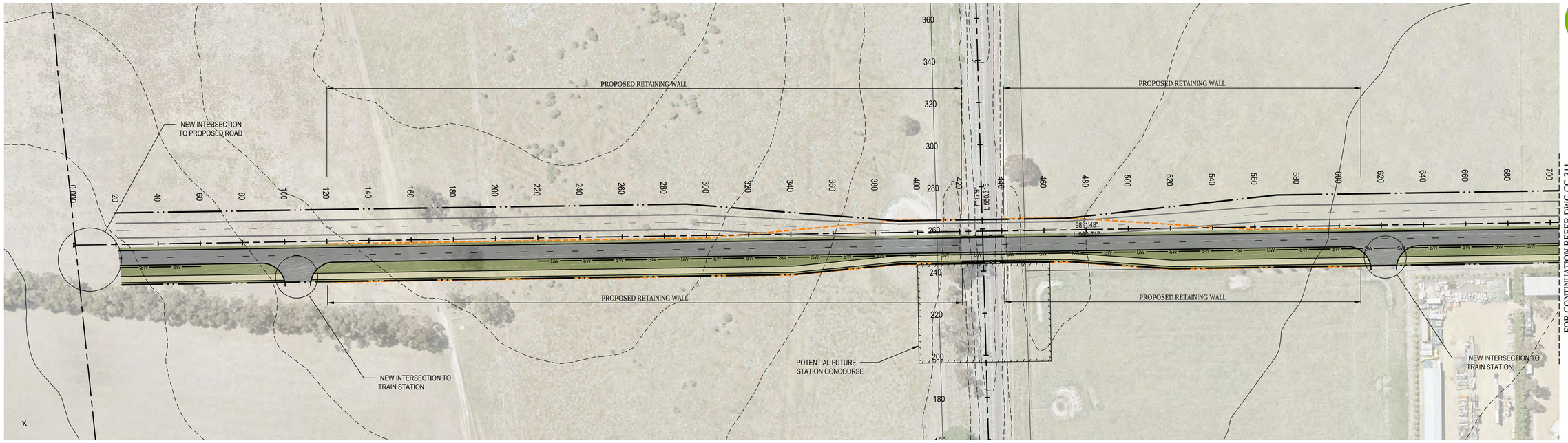
APPROVED
DATE

PROJECT: SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN

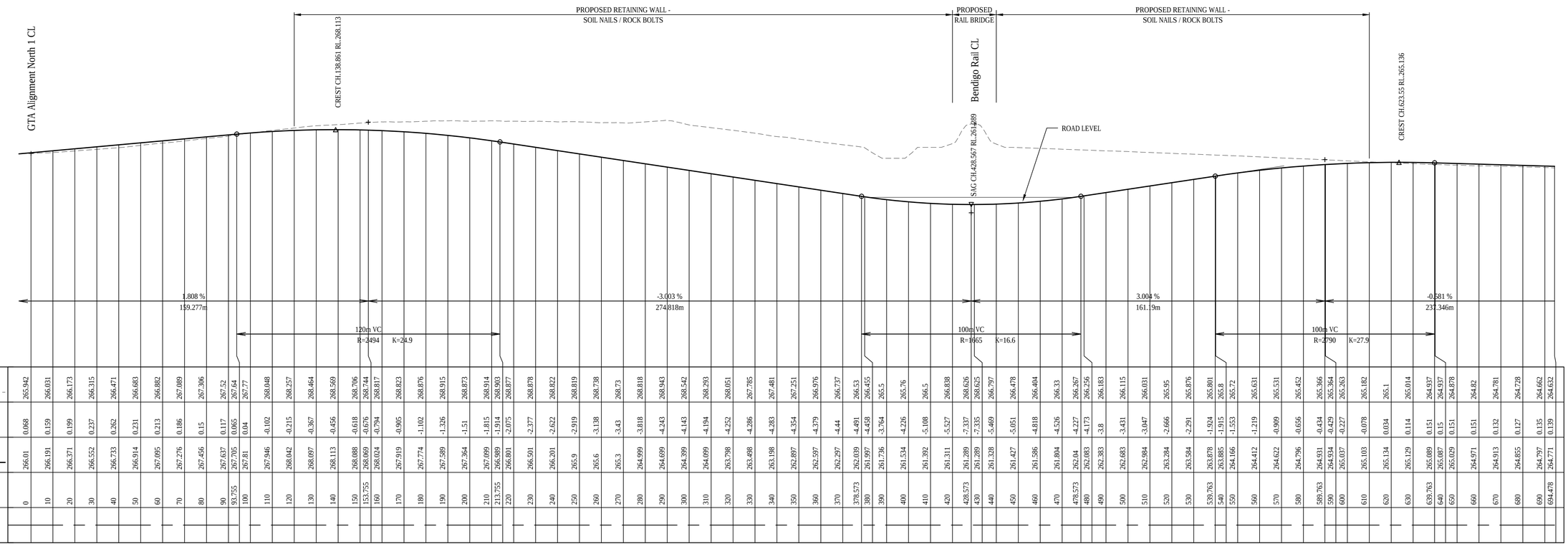
TITLE: NORTH 1 ALIGNMENT FUNCTIONAL LAYOUT SHEET 3

DRAWING No.

PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
245435	0002	DRG	CC	302	D



PLAN



CHAINAGE	NATURAL SURFACE	CUT/FILL DEPTH	DESIGN C.L.
0	265.942	0.068	266.01
10	266.031	0.159	266.191
20	266.173	0.199	266.371
30	266.315	0.237	266.552
40	266.471	0.262	266.733
50	266.683	0.231	266.914
60	266.882	0.213	267.095
70	267.089	0.186	267.276
80	267.306	0.15	267.456
90	267.52	0.117	267.637
93.755	267.64	0.065	267.705
100	267.77	0.04	267.81
110	268.048	-0.102	267.946
120	268.257	-0.215	268.042
130	268.464	-0.367	268.097
140	268.569	-0.456	268.113
150	268.706	-0.618	268.088
153.755	268.744	-0.676	268.069
160	268.817	-0.794	268.024
170	268.823	-0.905	267.919
180	268.876	-1.102	267.774
190	268.915	-1.326	267.589
200	268.873	-1.51	267.364
210	268.914	-1.815	267.099
213.755	268.903	-1.914	266.989
220	268.877	-2.075	266.801
230	268.878	-2.377	266.501
240	268.822	-2.622	266.201
250	268.819	-2.919	265.9
260	268.738	-3.138	265.6
270	268.73	-3.43	265.3
280	268.818	-3.818	264.999
290	268.943	-4.243	264.699
300	268.542	-4.143	264.399
310	268.293	-4.194	264.099
320	268.051	-4.252	263.798
330	267.785	-4.286	263.498
340	267.481	-4.283	263.198
350	267.251	-4.354	262.897
360	266.976	-4.379	262.597
370	266.737	-4.44	262.297
378.573	266.53	-4.491	262.039
380	266.455	-4.458	261.997
390	265.5	-3.764	261.736
400	265.76	-4.226	261.534
410	266.5	-5.108	261.392
420	266.838	-5.527	261.311
428.573	268.626	-7.337	261.289
430	268.625	-7.335	261.289
440	266.797	-5.469	261.328
450	266.478	-5.051	261.427
460	266.404	-4.818	261.586
470	266.33	-4.526	261.804
478.573	266.267	-4.227	262.04
480	266.256	-4.173	262.083
490	266.183	-3.8	262.383
500	266.115	-3.431	262.683
510	266.031	-3.047	262.984
520	265.95	-2.666	263.284
530	265.876	-2.291	263.584
539.763	265.801	-1.924	263.878
540	265.8	-1.915	263.885
550	265.72	-1.553	264.166
560	265.631	-1.219	264.412
570	265.531	-0.909	264.622
580	265.452	-0.656	264.796
589.763	265.366	-0.434	264.931
590	265.364	-0.429	264.934
600	265.263	-0.227	265.037
610	265.182	-0.078	265.103
620	265.1	0.034	265.134
630	265.014	0.114	265.129
639.763	264.937	0.151	265.089
640	264.937	0.15	265.087
650	264.878	0.151	265.029
660	264.82	0.151	264.971
670	264.781	0.132	264.913
680	264.728	0.127	264.855
690	264.662	0.135	264.797
694.478	264.632	0.139	264.771

LONGITUDINAL SECTION SUNBURY NORTH 2 CL

SCALE H 1:1000
SCALE V 1:200

SCALE 1:1000

27 May 2015 1:07 PM \\aurecon.info\shares\AUMEL\Projects\TransportProject Work\245435 - Sunbury South\3 Project Delivery\CADD\Drawings\CIV\245435-0002-DRG-CC-310.dwg

aurecon
www.aurecongroup.com

CLIENT

MPA METROPOLITAN PLANNING AUTHORITY

REV	DATE	REVISION DETAILS	APPROVED
A	09.02.15	FOR DISCUSSION ONLY	
B	18.03.15	ALIGNMENT REVISED	
C	15.04.15	FOR DISCUSSION ONLY	
D	27.05.15	INTERSECTION NOTE ADDED	

SCALE	1:1000
SIZE	A1
DRAWN	R.Balbastro
DESIGNED	C.Hunt
CHECKED	

CONCEPT
NOT FOR CONSTRUCTION

APPROVED
DATE

PROJECT	SUNBURY SOUTH AND LANCEFIELD ROAD PRECINCT STRUCTURE PLAN
TITLE	NORTH 2 ALIGNMENT FUNCTIONAL LAYOUT SHEET 1

DRAWING No.

PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
245435	0002	DRG	CC	310	D

PLAN

Melbourne Lancefield Rd CL

Horiz Curve Data

Vertical Geometry Grade (%) -0.581 % -1.469 % 0.712 %

Vertical Grade Length 237.346m 111.974m 20.368m

Vertical Curve Length (m)

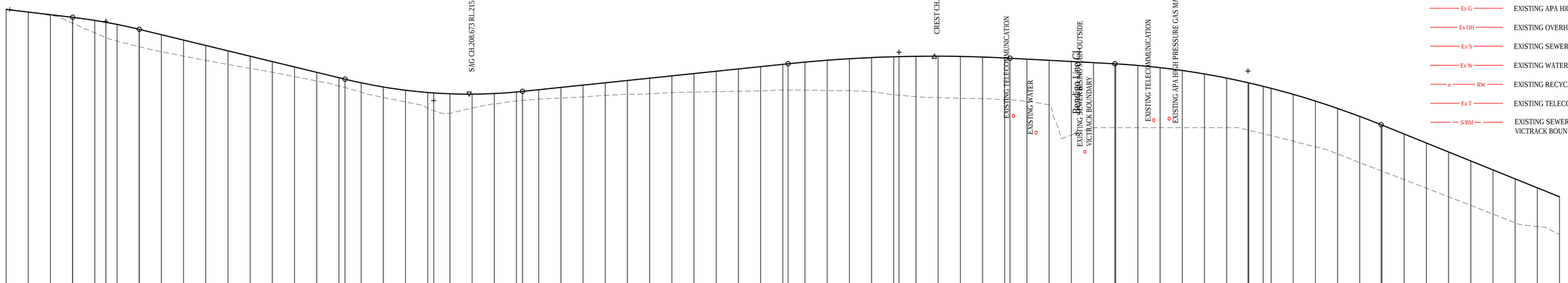
Vertical Curve Radius (m) K value

DATUM R.L.248.000

| | | |

Appendix B
Drawings of Options Considered

PLAN

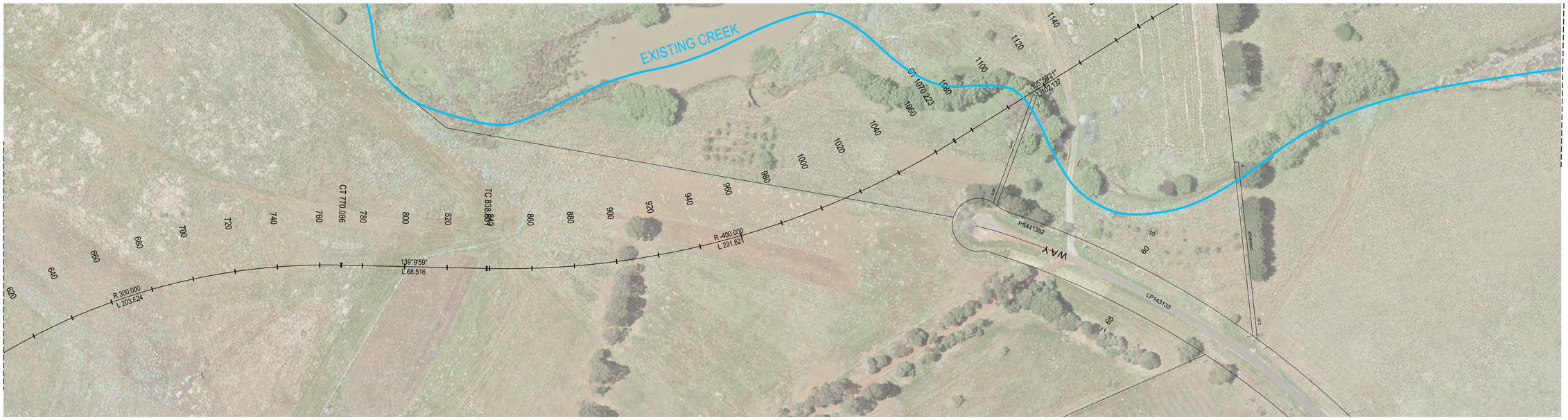


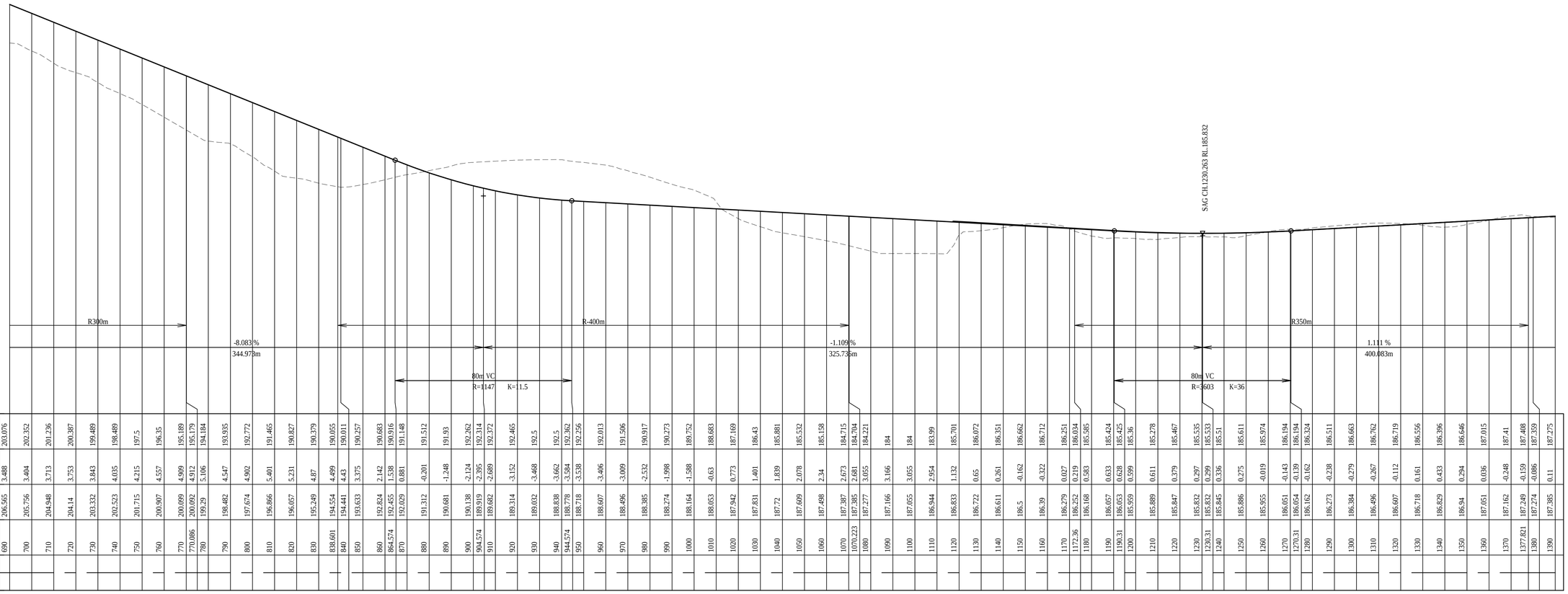
LEGEND

- Ex G — EXISTING APA HIGH PRESSURE GAS MAIN
- Ex OH — EXISTING OVERHEAD ELECTRICAL
- Ex S — EXISTING SEWER
- Ex W — EXISTING WATER
- e RW — EXISTING RECYCLED WATER
- Ex T — EXISTING TELECOMMUNICATION
- S/RM — EXISTING SEWER RISING MAIN OUTSIDE VICTRACK BOUNDARY

Horiz Curve Data

| | | |


EXISTING CREEK
CT 1070.223
105°39'21"
L 112.137
R 400.000
L 231.627
TC 838.849
CT 770.086
139°9'59"
L 68.516
R 300.000
L 203.624
PS441382
LP143133
WAY
SWANSEA DRIVE
SAG CH.1230.263 RL.185.832


Horiz Curve Data
R300m
R-400m
R350m
Vertical Geometry Grade (%)
Vertical Grade Length
-8.083 %
344.973m
-1.109 %
325.736m
1.111 %
400.083m
Vertical Curve Length (m)
Vertical Curve Radius (m) K value
80m VC
R=1147 K= 1.5
80m VC
R=3603 K=36
DATUM R.L.169.500

| | | |

Appendix C
Cost Estimates

Appendix C: Sunbury South and Lancefield Road Cost Estimate

Sunbury South Road Infrastructure					
	WORKS	**Quantity**	**Unit**	**Rate**	**Cost**
1	**SITEWORKS AND EARTHWORKS**				
1.2	Earthworks	278000	m3	$26	$7,228,000
1.3	Rock Excavation	260000	m3	$95	$24,700,000
1.4	Set-Out	1	Item	$20,000	$20,000
2	**ROAD PAVEMENT CONSTRUCTION**				
2.1	New pavement	18800	m2	$110	$2,068,000
3	**OFF ROAD WORKS**				
3.1	Kerb and Channel and Agi	5600	LM	$65	$364,000
3.2	Pedestrian & Cycle Paths	8100	m2	$120	$972,000
4	**DRAINAGE**				
4.1	Drainage pipes	2600	LM	$350	$910,000
4.2	Drainage pits	50	No.	$2,600	$130,000
4.3	Drainage endwalls	5	No.	$3,500	$17,500
5	**TRAFFIC**				
5.1	Traffic Safety	1	Item	$20,000	$20,000
6	**LANDSCAPE**				
6.1	Trees	180	No.	$210	$37,800
6.2	Landscaping	1	Item	$50,000	$50,000
6.3	Topsoil	18800	m2	$22	$413,600
7	**LIGHTING**				
7.1	Lights and poles	46	No.	$4,000	$184,000
7.2	trench and cable (LV)	2760	LM	$150	$414,000
8	**INTERSECTIONS**				
8.1	Vineyard intersection	1	Item	$50,000	$50,000
8.2	Train station intersection	1	Item	$20,000	$20,000
9	**MISCELLANEOUS**				
9.1	Linemarking	1	Item	$15,000	$15,000
9.2	Regulatory Signage	1	Item	$10,000	$10,000
10	**CONTRACTOR MANAGEMENT SYSTEMS**				
10.1	Environmental, Traffic & Quality Systems	1	Item	$50,000	$50,000
11	**RAIL OCCUPATION**				
11.1	Rail occupation	4	Item	$100,000	$400,000
12	**SERVICES**				
12.1	Services relocation	1	Item	$4,000,000	$4,000,000
	SUB-TOTAL WORKS				$38,073,900
13	**DELIVERY**				
13.1	Site Establishment	1	Item	2.5%	$951,848
13.2	Survey & Design	1	Item	5%	$1,903,695
13.3	Supervision & Project Management	1	Item	9%	$3,426,651
13.4	Council Fees	1	Item	3.25%	$1,237,402
	SUB-TOTAL DELIVERY				$7,519,595
	SUB-TOTAL WORKS + DELIVERY				$45,593,495
14	**CONTINGENCY**	1	Item	15%	$6,839,024
	TOTAL				$52,432,520

Lancefield South Road Infrastructure (Balbethan Drive)						
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Earthworks	23000	m3	$26	$598,000	
1.2	Rock Excavation	0	m3	$95	$0	
1.3	Set-Out	1	Item	$20,000	$20,000	
2	**ROAD PAVEMENT CONSTRUCTION**					
2.1	New pavement	27700	m2	$110	$3,047,000	
3	**OFF ROAD WORKS**					
3.1	Kerb and Channel and Agi	7500	LM	$65	$487,500	
3.2	Pedestrian & Cycle Paths	5800	m2	$120	$696,000	
4	**DRAINAGE**					1in10yr for road only
4.1	Drainage pipes	1300	LM	$350	$455,000	375 to 825dia approx
4.2	Drainage pits	50	No.	$2,600	$130,000	
4.3	Drainage endwalls	1	No.	$3,500	$3,500	
5	**TRAFFIC**					
5.1	Traffic Safety	1	Item	$20,000	$20,000	
6	**LANDSCAPE**					
6.1	Trees	245	No.	$210	$51,450	16m centres approx.
6.2	Landscaping	1	Item	$40,000	$40,000	
6.3	Topsoil	24100	m2	$22	$530,200	
7	**LIGHTING**					
7.1	Lights and poles	33	No.	$6,000	$198,000	
7.2	trench and cable (LV)	1980	LM	$150	$297,000	
8	**INTERSECTIONS**					
8.1	Major road intersection	2	Item	$50,000	$100,000	
8.2	Minor road intersection	1	Item	$20,000	$20,000	
9	**MISCELLANEOUS**					
9.1	Linemarking	1	Item	$15,000	$15,000	
9.2	Regulatory Signage	1	Item	$10,000	$10,000	
10	**CONTRACTOR MANAGEMENT SYSTEMS**					
10.1	Environmental, Traffic & Quality Systems	1	Item	$50,000	$50,000	
11	**RAIL OCCUPATION**					
11.1	Rail occupation	3	Item	$100,000	$300,000	
12	**SERVICES**					
12.1	Services relocation	1	Item	$100,000	$100,000	
	SUB-TOTAL WORKS				$7,168,650	
13	**DELIVERY**					
13.1	Site Establishment	1	Item	2.5%	$179,216	
13.2	Survey & Design	1	Item	5%	$358,433	
13.3	Supervision & Project Management	1	Item	9%	$645,179	
13.4	**Council Fees**	1	Item	3.25%	$232,981	
	SUB-TOTAL DELIVERY				$1,415,808	
	SUB-TOTAL WORKS + DELIVERY				$8,584,458	
14	**CONTINGENCY**	1	Item	0.15	$1,287,669	
	TOTAL				$9,872,127	

Lancefield North Road Infrastructure						
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Earthworks	42000	m3	$26	$1,092,000	
1.2	Rock Excavation	40000	m3	$95	$3,800,000	
1.3	Set-Out	1	Item	$20,000	$20,000	
2	**ROAD PAVEMENT CONSTRUCTION**					
2.1	New pavement	6400	m2	$110	$704,000	
3	**OFF ROAD WORKS**					
3.1	Kerb and Channel and Agi	1900	LM	$65	$123,500	
3.2	Pedestrian & Cycle Paths	2800	m2	$120	$336,000	
4	**DRAINAGE**					1in10yr for road only
4.1	Drainage pipes	730	LM	$350	$255,500	375 to 825dia approx
4.2	Drainage pits	10	No.	$2,600	$26,000	
4.3	Drainage pumping station	1	No.	$20,000	$20,000	
5	**TRAFFIC**					
5.1	Traffic Safety	1	Item	$20,000	$20,000	
6	**LANDSCAPE**					
6.1	Trees	60	No.	$210	$12,600	16m centres approx.
6.2	Landscaping	1	Item	$40,000	$40,000	
6.3	Topsoil	6000	m2	$22	$132,000	
7	**LIGHTING**					
7.1	Lights and poles	16	No.	$4,000	$64,000	
7.2	trench and cable (LV)	940	LM	$150	$141,000	
8	**INTERSECTIONS**					
8.1	Major road intersection	2	Item	$50,000	$100,000	
8.2	Train station intersection	2	Item	$20,000	$40,000	
9	**MISCELLANEOUS**					
9.1	Linemarking	1	Item	$15,000	$15,000	
9.2	Regulatory Signage	1	Item	$10,000	$10,000	
10	**CONTRACTOR MANAGEMENT SYSTEMS**					
10.1	Environmental, Traffic & Quality Systems	1	Item	$50,000	$50,000	
11	**RAIL OCCUPATION**					
11.1	Rail occupation	4	Item	$100,000	$400,000	
12	**SERVICES**					
12.1	Services relocation	1	Item	$100,000	$100,000	
	SUB-TOTAL WORKS				$7,501,600	
13	**DELIVERY**					
13.1	Site Establishment	1	Item	2.5%	$187,540	
13.2	Survey & Design	1	Item	5%	$375,080	
13.3	Supervision & Project Management	1	Item	9%	$675,144	
13.4	**Council Fees**	1	Item	3.25%	$243,802	
	SUB-TOTAL DELIVERY				$1,481,566	
	SUB-TOTAL WORKS + DELIVERY				$8,983,166	
14	**CONTINGENCY**	1	Item	15%	$1,347,475	
	TOTAL				$10,330,641	

2	**BRIDGE**					
2.1	**Sunbury South Rail Grade Separation**					
2.1.1	Structure		Item		$561,650	Including the cycle bridge
2.1.2	Safety Rail	120	m	$205.00	$24,600	Assume 30m long approach on both sides
2.1.3	Retaining Wall	1020	m	$6,400.00	$6,528,000	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall
	SUB-TOTAL WORKS				$7,114,250	
10	**DELIVERY**					
10.1	Site Establishment	1	Item	2.5%	$177,856	
10.2	Survey & Design	1	Item	5%	$355,713	
10.3	Supervision & Project Management	1	Item	9%	$640,283	
10.4	**Council Fees**	1	Item	3.25%	$231,213	
	SUB-TOTAL DELIVERY				$1,405,064	
	SUB-TOTAL WORKS + DELIVERY				$8,519,314	
11	**CONTINGENCY**	1	Item	20%	$1,703,863	
	TOTAL				$10,223,177	

2.2	**Harpers Creek Connector Road Crossing (W)**					
2.2.1	Structure		Item		$54,720	
2.2.2	Safety Rail	120	m	$205.00	$24,600	Assume 30m long approach on both sides
	SUB-TOTAL WORKS				$79,320	
10	**DELIVERY**					
10.1	Site Establishment	1	Item	2.5%	$1,983	
10.2	Survey & Design	1	Item	5%	$3,966	
10.3	Supervision & Project Management	1	Item	9%	$7,139	
10.4	**Council Fees**	1	Item	3.25%	$2,578	
	SUB-TOTAL DELIVERY				$15,666	
	SUB-TOTAL WORKS + DELIVERY				$94,986	
11	**CONTINGENCY**	1	Item	20%	$18,997	
	TOTAL				$113,983	

2.3	**Harpers Creek Connector Road Crossing (E)**					
2.3.1	Structure	1	Item		$652,600	
2.3.2	Safety Rail	120	m	$205.00	$24,600	Assume 30m long approach on both sides
	SUB-TOTAL WORKS				$677,200	
10	**DELIVERY**					
10.1	Site Establishment	1	Item	2.5%	$16,930	
10.2	Survey & Design	1	Item	5%	$33,860	
10.3	Supervision & Project Management	1	Item	9%	$60,948	
10.4	**Council Fees**	1	Item	3.25%	$22,009	
	SUB-TOTAL DELIVERY				$133,747	
	SUB-TOTAL WORKS + DELIVERY				$810,947	
11	**CONTINGENCY**	1	Item	20%	$162,189	
	TOTAL				$973,136	

2.4	**Lancefield Road Southern Grade Separation**					
2.4.1	Structure	1	Item		$627,000	
2.4.2	Safety Rail	120	m	$205.00	$24,600	Assume 30m long approach on both sides
	SUB-TOTAL WORKS				$651,600	
10	**DELIVERY**					
10.1	Site Establishment	1	Item	2.5%	$16,290	
10.2	Survey & Design	1	Item	5%	$32,580	
10.3	Supervision & Project Management	1	Item	9%	$58,644	
10.4	**Council Fees**	1	Item	3.25%	$21,177	
	SUB-TOTAL DELIVERY				$128,691	
	SUB-TOTAL WORKS + DELIVERY				$780,291	
11	**CONTINGENCY**	1	Item	20%	$156,058	
	TOTAL				$936,349	

2.5	**Lancefield Road Northern Grade Separation**					
2.5.1	Structure	1	Item		$459,250	
2.5.2	Safety Rail	120	m	$205.00	$24,600	Assume 30m long approach on both sides
2.5.3	Retaining Wall	900	m	$4,050.00	$3,645,000	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall
	SUB-TOTAL WORKS				$4,128,850	
10	**DELIVERY**					
10.1	Site Establishment	1	Item	2.5%	$103,221	
10.2	Survey & Design	1	Item	5%	$206,443	
10.3	Supervision & Project Management	1	Item	9%	$371,597	
10.4	**Council Fees**	1	Item	3.25%	$134,188	
	SUB-TOTAL DELIVERY				$815,448	
	SUB-TOTAL WORKS + DELIVERY				$4,944,298	
11	**CONTINGENCY**	1	Item	20%	$988,860	
	TOTAL				$5,933,157	

SUMMARY				
Sunbury South Road Infrastructure				$52,432,520
Lancefield South Road Infrastructure (Balbethan Drive)				$9,872,127
Lancefield North Road Infrastructure				$10,330,641
Sunbury South Rail Grade Separation				$10,223,177
Harpers Creek Connector Road Crossing (W)				$113,983
Harpers Creek Connector Road Crossing (E)				$973,136
Lancefield Road Southern Grade Separation				$936,349
Lancefield Road Northern Grade Separation				$5,933,157
				$90,815,091

Aurecon Australasia Pty Ltd
ABN 54 005 139 873

Aurecon Centre
Level 8, 850 Collins Street
Docklands VIC 3008

PO Box 23061
Docklands VIC 8012
Australia

T +61 3 9975 3000
F +61 3 9975 3444
E melbourne@aurecongroup.com
W aurecongroup.com

Aurecon offices are located in:
Angola, Australia, Botswana, Chile, China, Ethiopia, Ghana, Hong Kong, Indonesia, Lesotho, Libya, Malawi, Mozambique, Namibia, New Zealand, Nigeria, Philippines, Qatar, Singapore, South Africa, Swaziland, Tanzania, Thailand, Uganda, United Arab Emirates, Vietnam.

Victorian Planning Authority

Sunbury South and Lancefield Road Precinct Structure Plans (PSPs) – Infrastructure Design Study

Design report

15 December 2016

PARSONS BRINCKERHOFF

Document information
Client: Victorian Planning Authority Title: Sunbury South and Lancefield Road Precinct Structure Plans (PSPs) – Infrastructure Design Study Subtitle: Design report Document No: 2113308A-CIV-REP-002 RevC Date: 15 December 2016

Rev	Date	Details
A	10/12/2015	Draft issue
B	28/10/2016	For information
C	02/12/2016	Final issue
D	15/12/2016	Final issue

Author, Reviewer and Approver details			
Prepared by:	Ryan McCormack, Tim Page, Guy Wilkinson	Date: 02/12/2016	Signature:
Reviewed by:	Guy Wilkinson	Date: 15/12/2016	Signature:
Approved by:	David Rotton	Date: 15/12/2016	Signature:

Distribution
Victorian Planning Authority, Parsons Brinckerhoff file, Parsons Brinckerhoff Library

©Parsons Brinckerhoff Australia Pty Limited 2015
Copyright in the drawings, information and data recorded in this document (the information) is the property of Parsons Brinckerhoff. This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by Parsons Brinckerhoff. Parsons Brinckerhoff makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information.

Document owner
Parsons Brinckerhoff Australia Pty Limited *ABN 80 078 004 798* Level 15 28 Freshwater Place Southbank VIC 3006 Tel: +61 3 9861 1111 Fax: +61 3 9861 1144 www.pbworld.com *Certified to ISO 9001, ISO 14001, OHSAS 18001*

Contents

Page number

1. Introduction 1
   - 1.1 Background 1
   - 1.2 Scope 1
2. Reference information 3
   - 2.1 Externally supplied information 3
   - 2.2 Design standards 3
3. Basis of design 5
   - 3.1 Road and intersection projects 5
   - 3.2 Bridge and culvert projects 8
4. Road and intersection projects 9
5. Bridge projects and culvert projects 11
   - 5.1 Review of structures 11
   - 5.2 Concept designs 14

List of tables

Page number

Table 1.1 Sunbury South PSP infrastructure projects 1
Table 1.2 Lancefield Road PSP infrastructure projects 2
Table 2.1 Externally supplied information and data 3
Table 3.1 Design speed adopted for each road type 5
Table 3.2 Horizontal geometry design limits 5
Table 3.3 Typical turn lane lengths adopted for ultimate arrangement 6
Table 3.4 Road projects and the corresponding cross section adopted 6
Table 3.5 Design Vehicles 7
Table 3.6 Vertical geometry limits 7

List of appendices

Appendix A Minutes of meetings
Appendix B Concept design drawings
Appendix C Culvert calculations

1. Introduction

1.1 Background

The Victorian Planning Authority (VPA) is currently preparing Precinct Structure Plans (PSPs) for the expansion of the Sunbury Township. The Sunbury South and Lancefield Road PSPs, in the City of Hume, represent large scale development areas in the Sunbury-Diggers Rest Growth Corridor.

To inform the infrastructure contributions plans and the land use budgets, the VPA required concept designs to be prepared for proposed road, intersection, bridge and culvert projects within these PSPs.

1.2 Scope

Parsons Brinckerhoff was engaged by the VPA to undertake an infrastructure design study in the Sunbury South and Lancefield Road Precinct Structure Plans (PSPs). The original scope of this study was to:

- Prepare 2D concept designs for the:
  - Interim and ultimate arrangement of 11 intersections (SS-IT1 to SS-IT6, LR-IT1 to LR-IT5)
  - Ultimate arrangement of the arterial roads Lancefield Road (LR-RD1, SS-RD2), Sunbury Road (SS-RD1) and Vineyard Road (SS-RD3)
  - Ultimate arrangement of connector roads designated as SS-RD4, SS-RD5, SS-RD6, SS-RD7, SS-RD8, LR-RD2, LR-RD3 and a connector road known as Jacksons Hill Link Road (SS-RD9).
- Review existing concept design for each bridge and culvert project: LR-BD1, LR-BD2, LR-BD3, SS-BD2, SS-BD3 and SS-BD4.
- Develop a concept design for bridge projects LR-BD4 and SS-BD1.

During the study the following scope was added:

- Prepare concept designs for:
  - Interim and ultimate arrangement of SS-IT7 and SS-IT8
  - Ultimate intersection arrangement of SS-IT9 and SS-IT10.

Table 1.1 Sunbury South PSP infrastructure projects

Infrastructure project name	Project type	Scope	Comment
SS-RD1	Road	Ultimate concept design	
SS-RD2	Road	Ultimate concept design	
SS-RD3	Road	Ultimate concept design	
SS-RD4	Road	Ultimate concept design	
SS-RD5	Road	Ultimate concept design	
SS-RD6	Road	Ultimate concept design	
SS-RD7	Road	Ultimate concept design	

Infrastructure project name	Project type	Scope	Comment
SS-RD8	Road	Ultimate concept design	Ultimate concept design involves resurfacing works only (2 x 3.5 m lanes with a sprayed sealed shoulder)
SS-RD9	Road	Ultimate concept design	
SS-IT1	Intersection	Interim and ultimate concept design	
SS-IT2	Intersection	Interim and ultimate concept design	
SS-IT3	Intersection	Interim and ultimate concept design	
SS-IT4	Intersection	Interim and ultimate concept design	
SS-IT5	Intersection	Interim and ultimate concept design	
SS-IT6	Intersection	Interim and ultimate concept design	Intersection no longer required
SS-IT7	Intersection	Interim and ultimate concept design	
SS-IT9	Intersection	Ultimate concept design	
SS-IT8	Intersection	Interim and ultimate concept design	
SS-IT10	Intersection	Ultimate concept design	
SS-BD1	Bridge	Review design by others and prepare concept design	
SS-BD2	Culvert	Review design by others	
SS-BD3	Culvert	Review design by others	
SS-BD4	Bridge (road underpass)	Review design by others	

Table 1.2 Lancefield Road PSP infrastructure projects

Infrastructure project name	Project type	Scope	Comment
LR-RD1	Road	Ultimate concept design	
LR-RD2	Road	Ultimate concept design	
LR-RD3	Road	Ultimate concept design	
LR-IT1	Intersection	Interim and ultimate concept design	
LR-IT2	Intersection	Interim and ultimate concept design	
LR-IT3	Intersection	Interim and ultimate concept design	
LR-IT4	Intersection	Interim and ultimate concept design	
LR-IT5	Intersection	Interim and ultimate concept design	
LR-BD1	Bridge	Ultimate concept design	
LR-BD2	Bridge	Review design by others	
LR-BD3	Bridge (road underpass)	Review design by others	
LR-BD4	Culvert	Ultimate concept design	

Refer to drawings CIV-501 and CIV-502 in Appendix B for infrastructure project locations and extents.

2. Reference information

2.1 Externally supplied information

The following information was made available to Parsons Brinckerhoff by the VPA for use in this study:

Table 2.1 Externally supplied information and data

Document name	Author	Version/ date
Jacksons Creek Road Crossing PSP 1075 – Lancefield Road, Options Assessment and Development	GTA Consultants	A-Dr
Sunbury South and Lancefield Road PSP – Infrastructure Design and Costings (Grade Separations and Harpers Creek Crossing) draft report	Aurecon	0
Jacksons Creek Road Crossing PSP 1074 – Sunbury South, Options Assessment and Development	GTA Consultants	A-Dr
Jackson Hill Factsheet	Hume City Council	-
Future urban structure	Supplied by VPA	
Design Base Yirrangan way Option 2 sketches	Hume City Council	22/05/2012
Sketch CG130479SK05 – P2 Interim functional layout plan	Cardno	26/06/2014
Aerial imagery	Supplied by VPA	-
LIDAR data	Supplied by VPA	-
Development Services Schemes (Confidential)	Supplied by VPA	-
Creek and Grade Separation Crossing	Hume City Council	-
Cadastral boundaries	data.vic.gov.au	4/08/2015
PAO boundaries	data.vic.gov.au	12/08/2015
Growth Area Road Network Planning – Guidance and Policy Principles	VicRoads & VPA	-
VicRoads Tree Planting Policy	-	Feb-15
Tree data and cross sections of Vineyard Road	Hume City Council	-

A significant amount of investigative work had already been completed in the study area by others, as noted in Table 2.1, and this study relies on the outcomes of this previously completed work.

2.2 Design standards

The following design standards were used for the intersection and road design projects:

- Austroads Guide to Road Design (AGRD) – Part 3: Geometric Design
- Austroads Guide to Road Design (AGRD) – Part 4: Intersections and Crossings - General
- Austroads Guide to Road Design (AGRD) – Part 4A: Unsignalised and Signalised Intersections
- Austroads Guide to Road Design (AGRD) – Part 6A: Pedestrian and Cyclist Paths

- Austroads Guide to Road Design (AGRD) – Part 5B: Drainage – Open Channels, Culverts and Floodways
- VicRoads Supplement to the Austroads Guide to Road Design: Part 3 – Geometric Design
- VicRoads Supplement to the Austroads Guide to Road Design: Part 3 – Geometric Design
- VicRoads Supplement to the Austroads Guide to Road Design: Part 4 – Intersections & Crossings – General
- VicRoads Supplement to the Austroads Guide to Road Design: Part 6A – Pedestrian and Cyclist Paths
- VicRoads Traffic Engineering Manual Volume 2 – Chapter 16: Longitudinal Lines
- VicRoads Traffic Engineering Manual Volume 2 – Chapter 17: Transverse Lines
- Transport and Main Roads (QLD) Road Drainage Manual

3. Basis of design

The following sections identify the basis of design adopted for the concept design of the infrastructure projects.

3.1 Road and intersection projects

3.1.1 Design speed

Table 3.1 Design speed adopted for each road type

Road Type	Road Environment	Posted Speed Limit	Design Speed	Reference
Connector Street - Boulevard	Urban (when developed)	60 km/h	60 km/h	Growth Area Road Network Planning – Guidance and Policy Principles
Connector Street	Urban (when developed)	60 km/h	60 km/h	Growth Area Road Network Planning – Guidance and Policy Principles
Arterial (primary)	Urban (when developed)	80 km/hr	80 km/hr	Growth Area Road Network Planning – Guidance and Policy Principles

3.1.2 Horizontal geometry

Table 3.2 Horizontal geometry design limits

Criteria	Value	Comment	Reference
Minimum radius for adverse cross fall	60 km/h = 200 m 80 km/h = 500 m	Urban Side friction factor = 0.17 Urban Side friction factor = 0.13	VicRoads Supplement to AGRD, Part 3, Table V7.2
Minimum radius for horizontal curves with superelevation	60 km/h = 98 m 80 km/h = 240 m	Desirable min. friction factor	AGRD, Part 3, Table 7.5
Minimum horizontal curve length	60 km/h = 100 m 80 km/h = 180 m		AGRD, Part 3, Table 7.6
Merge Taper Length	100 m (60 km/h) 130 m (80 km/h)		AGRD Part 3 Table 9.8

3.1.3 Intersection turn lane lengths

The VPA provided sketches of the desired intersection arrangements required at each of the intersection locations. The turn lane lengths are based on the values nominated in *Table 4-1* from the *Growth Area Road Network Planning – Guidelines & Policy Principles* document, and as shown below:

Table 3.3 Typical turn lane lengths adopted for ultimate arrangement

Road Type	Turn Lane	Assumed turn volume	Total turn lane length (inc. taper)
Primary Arterial	Left	400 veh/hr	100 m (inc. 25 m taper)
	Single Right	200 veh/hr	200 m (inc. 25 m taper)
	Double Right	400 veh/hr	170 m (inc. 55 m taper)
Secondary Arterial	Left	400 veh/hr	100 m (inc. 20 m taper)
	Single Right	200 veh/hr	200 m (inc. 20 m taper)
Connector Street	Left	500 veh/hr	100 m (inc. 15 m taper)
	Right	500 veh/hr	100 m (inc. 30 m taper)

3.1.4 Typical cross sections

The cross sections shown in the figures below were used for the various road projects as summarised in Table 3.4.

Table 3.4 Road projects and the corresponding cross section adopted

Road project number	Road name (if applicable)	Cross section
LR-RD1	Lancefield Road (north)	Primary arterial
LR-RD2	Jacksons Creek Crossing – North	Boulevard connector
LR-RD3	Balbethan Drive	Connector
SS-RD1	Sunbury Road	Primary arterial
SS-RD2	Lancefield Road (south)	Primary arterial
SS-RD3	Vineyard Road	Primary arterial
SS-RD4	Jacksons Creek Crossing – South	Boulevard connector
SS-RD5	Buckland Way	Connector
SS-RD6	Fox Hollow Drive	Connector
SS-RD7	Watsons Road	Connector
SS-RD8	Crinnion Road	N/A
SS-RD9	Jackson Hill Link Road	Connector

The arterial road cross sections were workshopped with VicRoads, Hume City Council and the VPA.

SS-RD8 only requires upgrade works to the existing pavement to allow for 2 x 3.5 m lanes with sprayed sealed shoulders.

The adopted cross sections are shown on drawings CIV-0201, CIV-0202, CIV-0203 and CIV-0204 in Appendix B.

3.1.5 Design vehicles and swept paths

The design vehicles adopted for the intersection configurations are as per *Austroads Design Vehicles and Turning Path Templates Guide*. The design vehicles were used to establish the intersection size and configuration. The FLPs shown in the drawings do not consider the swept path of a check vehicle (a larger vehicle than the design vehicle which may need to operate with reduced clearances or encroach into adjacent lanes) as the location of signs and traffic signals have not yet been established and therefore would provide limited benefit.

The left turn movements have been assessed at a 5 km/h design speed and the right turn movements at 15 km/h. Clearances provided for opposing right turn movements are 1 m for single opposing vehicles and 2 m for two opposing vehicles as per Section 7.2 of *Austroads Guide to Road Design Part 4A*.

Table 3.5 Design Vehicles

Intersection Type	Intersections	Design Vehicle
Arterial/Arterial	SS-IT3*	Prime mover and semi-trailer (19 m)
Arterial/Collector (Connector)	SS-IT1, SS-IT2, SS-IT4, SS-IT5, SS-IT7 LR-IT1, LR-IT2, LR-IT3, LR-IT4	Single unit truck/bus (12.5 m)
Collector/Collector (Connector/Connector)	LR-IT5 SS-IT9, SS-IT10	Single unit truck/bus (12.5 m)

*The turning movements into and out of SS-RD4 (Collector/Connector Road) have been designed for the Single unit truck/bus (12.5 m).

3.1.6 Vertical geometry

Table 3.6 Vertical geometry limits

Vertical Geometry Limits	Value	Comments	Reference
Minimum k value for a Crest Curve	60 km/h = 11.8 80 km/h = 29.3	Desirable minimum value for a 2.0s reaction time (2.5s is not available for these speeds)	AGRD, Part 3, Table 8.7
Minimum k value for a Sag Curve	60 km/h = 10 80 km/h = 17	Other Urban and Rural Roads without street lighting	AGRD, Part 3, Figure 8.7
Minimum Longitudinal Grade	1.0%	Desirable minimum value for drainage purposes	AGRD, Part 3, Table 8.5
Maximum Longitudinal Grade	60 km/h = 7–9 % 80 km/h = 5–7%	Rolling Terrain	AGRD, Part 3, Table 8.3

Preliminary vertical design was completed for SS-RD4, SS-RD5 and SS-RD9 only using the previous designs completed by GTA, Aurecon and Hume City Council as a base. Indicative earthworks batters and retaining wall extents have been shown on the drawings for these road projects only using the following criteria:

- Fill batter – 6:1
- Cut batter – 3:1

- Fill retaining wall when fil height >5 m
- Cut retaining wall when cut height >3 m.

3.2 Bridge and culvert projects

3.2.1 Bridge design criteria

The standards, procedures and codes relevant to the bridge concept design include those listed as follows:

- Austroads Guide to Road Design
- AS 3845.1 – 2015 – Road safety barrier systems and devices
- AS 4678 – 2002 – Earth retaining structures
- AS5100 Parts 1 to 7 – 2004 – Bridge design (SM1600 vehicle loading)
- VicRoads Bridge Technical Notes
- VicRoads Standard Specification for Roadworks and Bridgeworks.

3.2.2 Culvert design criteria

The culvert design process outlined in AGRD Part 5B was used to size the culvert for project LR-BD4. The following information was provided by the VPA in order to size the culvert:

- The existing 100yr Annual Recurrence Interval (ARI) flood level at the proposed culvert location is RL 248.81 AHD
- The flow width at this location is approximately 15 m.

The standards, procedures and codes relevant to the culvert bridge concept design include those listed for the bridge design criteria in section 3.2.1 above, in addition to the following:

- AS 1597.2 – 2013 – Precast reinforced concrete box culverts – large culverts
- AS 1657 – 2015 – Fixed platforms, walkways, stairways and ladders – design, construction and installation.

4. Road and intersection projects

High level, 2-dimensional concept designs were developed for the nominated road and intersection projects. The desired lane arrangement for each intersection was provided by the VPA. As no feature survey information was made available, concept design were developed using base aerial imagery and cadastral information.

The road alignments used were drawn from those established by GTA, Aurecon, Hume City Council and from those identified in the future urban structure as supplied by the VPA. Refer to the respective documents outlined in section 2. In some cases the alignment was adjusted slightly to conform to the basis of design as described in section 3. In addition, the designs were subject to a number of iterations in response to comments received following review by the VPA.

4.1.1 Interim on ultimate

To minimise redundant work, the interim design of intersections was completed after the ultimate configuration was established. The outside kerbs are established for the ultimate arrangement and used in the interim. When the road is upgraded to the ultimate arrangement in the future, construction occurs from the outside in and thus the outside kerb should not need to be altered.

On the concept design drawings for the interim intersection arrangement, as the outside kerb line is set for the ultimate arrangement, a nominal transition has been shown to tie back into the existing road cross section.

4.1.2 Land take calculations

Using the cadastral information, the land take required for the ultimate arrangement of the intersections and roads was calculated. It should be noted that, as advised by the VPA, the proposed right of way (ROW) boundary was taken from the back of path rather than at the extent of the batters. The area of land take was calculated and shown on the drawings in Appendix B.

To minimise small pieces of land take in certain situations the cross section applied along a road was locally narrowed as requested by the VPA. This was done by reducing the verge/nature strip width locally and by narrowing foot or cycle path. Verge reduction has been applied locally along LR-RD3 (refer to drawing 2113308A-CIV-1033) and a reduction in the path and verge/nature strip width has been applied along SS-RD1 (refer to drawing 2113308A-CIV-1102).

4.1.3 Cross sections at structures

To minimise the span of structures required, the connector road cross sections were reduced to a 13.5 m cross section at the structure as agreed with the VPA. This cross section removes parking bays and allows for one shared path and one pedestrian path to be carried on or under the structure. On either side of the structure, the cross section transitions back to the relevant connector street cross section. These cross sections are shown on drawing 2113308A-CIV-0204.

4.1.4 LR-BD1 and LR-RD2

The VPA is currently undertaking a review of the alignment for road LR-RD2 and bridge LR-BD1. Thus the alignment of both of these projects is subject to change based on the outcome of this review.

5. Bridge projects and culvert projects

5.1 Review of structures

A number of structures exist within the Sunbury South and Lancefield Road PSP area which have had varying levels of design completed by others. A review of these designs was undertaken in particular with respect to how they integrate with the design work undertaken in this study. The cross sections for the roads in the previous studies differ from those adopted by the concept design shown of the drawing in Appendix B. These differences are noted below.

5.1.1 LR-BD1

LR-BD1 is the structure carrying LR-RD2 over Jacksons Creek in the Lancefield Road PSP area. A previous high level concept design of this structure was completed by GTA Consultants (Option B). In undertaking a review of this work, the following has been noted:

- The GTA report nominated an 11m cross section for the structure however, the cross section adopted for LR-RD2 on the structure is 13.5 m.
- While some of the details are provided in the report section, the concept design drawing is generally lacking detail. Concept design drawings should include a plan and elevation as well as typical section(s). Span lengths, bridge articulation, substructure details (piles, piers, crossheads, abutments etc.), number and size of girders, barrier type have not been included in this design.
- No 100 year ARI flood water level is noted on elevation, indicating level of freeboard to bridge soffit (pending availability of flood/flow data from Melbourne Water):
  - Without flood data, the bridge and approach heights cannot be established and appropriate scour treatment cannot be specified and as such, a contingency amount should be built into any cost estimates to allow for this.
- Wing walls and scour protection treatment should be shown on the plan and elevation.
- An end port to guard rail termination should be shown.

The VPA is currently undertaking a review of the alignment for road LR-RD2 and bridge LR-BD1. The alignment of LR-BD1 is subject to change based on the outcome of this review.

5.1.2 LR-BD2

LR-BD2 is a road bridge (for LR-BD2) crossing over the Bendigo rail line in the southern part of the Lancefield Road PSP area. Aurecon completed a concept design of this structure and the following comments have been made on this design:

- The 14.5 m cross section adopted by Aurecon differs to the 13.5 m cross section adopted for LR-BD2 over the structure.
- The span and skew of the bridge is suitable for integral or semi-integral abutments. It is preferable to use integral or semi-integral abutments to remove expansion joints and/or bearings which will reduce the future maintenance requirements and provide improved serviceability, ride quality and structural

redundancy. Given the shallow depth foundations and potential requirement for quick construction time over the railway, semi-integral abutments may be more appropriate.

- There is a risk of slope failure/stability issues with a shallow foundation adjacent to the cutting. We suggest using a pile socketed into the rock at this stage, until more geotechnical information is available to prove the suitability of a shallow foundation option.
- We note that the flange width is fairly large which may require a thicker deck slab to span the longer distance.

5.1.3 LR-BD3

LR-BD3 is a rail bridge over the connector street LR-RD2 in the northern part of the Lancefield Road PSP area. Aurecon completed a concept design of this structure and the following comments have been made on this design:

- Aurecon have adopted a 19.4m span, however the cross section width adopted for LR-RD2 through the underpass is 13.5m. Aurecon's design appears to allow for future widening however, LR-RD2 has been designed for a connector street ultimate cross section.
- The span and skew of the bridge is suitable for integral or semi-integral abutments. It is preferable to use integral or semi-integral abutments to remove expansion joints and/or bearings which will reduce the future maintenance requirements and provide improved serviceability, ride quality and structural redundancy.
- Reinforcement couplers could be cast-in to enable a continuous connection over the intermediate pier for the future proofing for a future train station.
- Offset to the edge of the walkway is insufficient per VRIOGS 011.1, Appendix B. A minimum of 2400 mm offset from the centreline of the track to the nearest bridge element is required.
- Note that Accredited Rail Operator (ARO) approval is required for a reduction of the walkway width to 600mm on the rural network. A minimum 1700 mm wide walkway is required otherwise under VRIOGS 011.1
- The geogrid for the retaining wall should be shown to illustrate the extent of the reinforced earth.

5.1.4 SS-BD2

SS-BD2 is a bridge carrying SS-RD4 over Harpers Creek in the Sunbury South PSP area. Aurecon completed a concept design of this structure and the following comments have been made on this design:

- Aurecon have adopted an 11 m cross section over the structure, however the cross section width adopted for SS-RD4 over the bridge is 13.5 m.
- 100 year ARI flood water level should be shown on the elevation, indicating level of freeboard to bridge soffit (pending availability of flood/flow data from Melbourne Water):
  - We note without flood data, the bridge and approach heights cannot be established and appropriate scour treatment cannot be specified and as such, a contingency amount should be built into any cost estimates to allow for this.
- Wing walls and scour protection treatment should be shown on plan and elevation.
- An end port to guard rail termination should be shown.
- Due to nature of span and low skew angle, we suggest an integral bridge be considered as the preferred structural form, hence minimising bridge maintenance over the structures life.

5.1.5 SS-BD3

SS-BD3 is a culvert carrying SS-RD4 over Harpers Creek in the Sunbury South PSP area. Aurecon completed a concept design of this structure and the following comments have been made on this design:

- Adequate allowance/capacity for blockage due to debris in the single cell culvert should be provided to minimise afflux
- The debris size/flow velocity/ARI assumed for sizing of the culvert had not been documented (it is understood this is pending availability of flood/flow data from Melbourne Water)
- The 100 year ARI flood water level should be shown on elevation, indicating level of freeboard to crown unit (pending availability of flood/flow data from Melbourne Water)
- Wire rope barrier/guard rail treatment over culvert extents should be considered as required
- Scour protection on GA's should be shown
- 2.1 m wide shoulders were indicated in GTA's initial options assessment report
- Culvert crossing extents on long section should be shown
- We note without flood data, the culvert sizes and extents (single or multi cell) and scour treatment cannot be established with relative accuracy and as such, a contingency amount should be built into the any cost estimates to allow for this.

5.1.6 SS-BD4

SS-BD4 is a rail bridge over the connector street SS-RD4 in the Sunbury South PSP area. Aurecon completed a concept design of this structure and the following comments have been made on this design:

- Aurecon have adopted a 19.4 m span, however the cross section width adopted for LR-RD2 through the underpass is 13.5 m. Aurecon’s design appears to allow for future widening however, LR-RD2 has been designed for a connector street ultimate cross section
- Draft of AS 5100.2 requires hold down system for ‘floating’ bridges. This should be considered for costing purposes
- Wing Wall extents should be shown on the drawings
- Transition barrier/end post extents should be shown
- Derailment kerb height above rail should be shown
- Consider anti-throw screens on shared user path to prevent unauthorised access onto tracks and objects falling onto road way.

5.2 Concept designs

Concept designs were prepared for the below mentioned structures. No geotechnical information was made available regarding the local ground conditions and as such the design work completed should be reviewed once information on the existing ground conditions is known.

5.2.1 LR-BD4 – Culvert

The VPA advised that LR-DB4 was to be a standard culvert crossing. A preliminary culvert sizing was completed for the 1 in 100 year ARI event following the method outlined in AGRD part 5B and using the inlet and outlet control nomographs. The VPA advised that the 100 year flood level at the culvert location was RL 248.81.

Manning's formula was used to calculate the velocity (V) in the existing channel from the 100 year ARI flood level provided. From inspection of the aerial photo, a Manning's Roughness 'n' value of 0.5 was deemed appropriate for the existing channel as it appears to be grassed with some shrubs and weeds. A cross section was cut from the LIDAR contours provided to calculate the waterway area (A) of the channel flow and the wetted perimeter (P). The discharge (Q) was then calculated for the 100yr ARI event.

The tailwater level was calculated by developing a stage discharge curve for the downstream channel by assuming that it can be approximated by a trapezoidal shape. Using the discharge (Q) calculated for the existing channel the tailwater depth was established from the staged discharge curve.

Results of the calculations showed that 4No. 2100 mm(W) x 900 mm(H) box culverts are required and calculations are provided in Appendix C.

The box culverts were designed to minimise afflux upstream and to maintain the existing flow paths. Rock protection is required at the outlet as the outlet velocity is approximately 4 m/s and the flow at the outlet is supercritical (Fr=1.08). A rock apron 21 m long with minimum rock size of 500 mm has been specified to reduce the effects of scour on the downstream channel. The headwater level was calculated as being 1.35 m and a 100 mm freeboard is required to this level. Thus, the minimum shoulder level should be RL249.75 at the culvert location.

It should be noted that this design is a high level concept only and the culvert design should be reviewed and modelled during detailed design to further investigate the hydraulic performance, backwater effects and, in particular, the scour impact on the downstream channel.

The proposed structural arrangement is as follows:

- Length of the culvert crossing will be approximately 25 m
- Main elements of the culvert crossing include: a cast-in-situ reinforced concrete slab, precast reinforced concrete crown units, precast reinforced concrete end walls, precast reinforced concrete wing walls, and cast-in-situ reinforced concrete apron slabs
- The precast reinforced concrete crown units shall be designed and supplied by a reputable proprietary supplier/manufacturer such as Humes and Rocla.

Nominal heights and extents of wing walls have been provided. These shall be confirmed and designed accordingly once flood levels and flow speeds are more accurately known/established.

5.2.2 SS-BD1 – Bridge

5.2.2.1 Short option

A new bridge structure (SS-BD1) has been designed to carry Lancefield Road over Jacksons Creek.

The proposed bridge will be supported on intermediate piers and abutments at the northern and southern ends.

The proposed structural arrangement is as follows:

- The bridge will have equal spans of approximately 35 m.
- Deck width between barriers will be 13.5 m (to provide two traffic lanes, a shared use path and pedestrian walkway).
- The superstructure will consist of 1800 mm deep precast prestressed Super-T girders with a composite in-situ deck slab.
- The girders will be simply supported on elastomeric bearings with link slabs over the intermediate piers and expansion joints at each abutment.
- The substructure will consist of reinforced concrete columns supported on a reinforced concrete pile cap and driven piles.
- For construction within the creek, it is proposed to use a precast pile cap infilled with in-situ concrete.
- The reinforced concrete abutment crossheads will be supported on bored piles.
- A 4 m long reinforced concrete approach slab will be provided at each abutment.
- Medium performance level barriers have been proposed for this bridge.
- Deck drainage will be required as the bridge is at the low-point of the vertical alignment.

Drainage has been assumed to be captured via scupper drains set into the shared path and collected at the abutment before being discharged.

Flood levels, flow speed and scour depths are not known accurately at this stage. Further design development will be required as more information becomes available to confirm pile, pile cap, pier design as well as any scour protection requirements such as rock beaching.

Driven pile construction with a precast pile cap was considered for ease of construction within the creek. There is potential to use bored piles with a column extension to simplify construction (eliminating pile caps) depending on the creek depths and ground profile. A mix of driven and bored piles may also be considered (i.e. driven piles within the creek, and bored piles outside of the creek).

5.2.2.2 Long option alternative

A second alternative option was developed for SS-BD1 to reduce the likely earthworks required. The structural arrangement is per the short option described in section 5.2.2.1 with nine spans and up to 43 m high piers required. In addition, an alternative road alignment has also been proposed to further reduce the likely earthworks required. However, whilst the earthworks cost may be reduced by adopting the long option bridge solution, further costs will be incurred from the additional structural works required for the longer and taller structure.

Whilst super-T beams are likely to provide the most cost effective solution, an alternative structural system may be desired as it could provide more favourable aesthetic outcomes. Using an alternative system, such as box girders, would reduce the number of spans required (thus reducing the number of piers) however the construction costs would likely to be significantly more expensive as the construction may require the girders to be incrementally launched due to the height of the structure. This would also increase the construction time frame.

Appendix A

Minutes of meetings

Parsons Brinckerhoff Australia Pty Limited

ABN 80 078 004 798

Level 15 28 Freshwater Place
Southbank VIC 3006
Tel: +61 3 9861 1111
Fax: +61 3 9861 1144

www.pbworld.com

Certified to ISO 9001, ISO 14001, OHSAS 18001

Minutes

Client	Metropolitian Planning Authority	**Meeting No.**	01
Project	Sunbury South and Lancefield Rd PSP Infrastructure costing study	**Date**	14 July 2015
Subject	Inception Meeting	**Time**	9:30 pm
Venue	Level 25, 35 Collins St, Melbourne	**Ref**	201505459-CIV-MIN-001 RevA
Chair	Mat Garner (MPA)		
Attendees	Guy Wilkinson (Parsons Brinckerhoff), Ryan McCormack (Parsons Brinckerhoff), Chris Bright (MPA), John Petrakos (MPA), Gareth Edgley (Hume City Council)		

Item	Status
General	
Future roads don't need to be where they are shown, they can be moved. However, existing roads are constraints. Intersection locations are fixed. PB needs to design road geometry appropriate to fit with intersection locations. Connector Roads are to be designed as self-enforcing low speed roads	Noted
Second workshop – Lancefield Road, Vineyard Road and Sunbury Road is included in PB scope.	Noted
Interim on Ultimate design principle: - MPA has agreed this approach with VicRoads - Important to get outside kerb line in place in the ultimate arrangement. As road is upgraded to the ultimate, widening occurs in the median - Curves to transition back to interim based on 60km'hr to minimise the tie in section.	Noted
Cost estimates to be undertaken as the final task, once all concept designs have been finalised to avoid rework.	Noted
MPA to provide input information prior to the commencement of any work including: ▪ LIDAR data ▪ Georeferenced aerial image ▪ Relevant reports and designs (GTA, Aurecon and others) ▪ Intersection configurations, lane arrangements and SIDRA outputs ▪ Geotechnical reports ▪ Future urban strucutre ▪ Other advices, strategies or documents that are to be considered	Noted

Item	Status
Cadastral information to be obtained from data.vic.gov.au	
MPA can use PB's large file transfer site if required: https://ftp.pbworld.com/	Noted
PB will not commence work on an infrastructure project until all input information is received. PB to provide a breakdown of each infrastructure project listing the required input information for comment by MPA. Work will not commence until all information has been received for that project. An indicative program will be developed once a common understanding of the inputs required for each infrastructure project has been developed.	PB to provide break down of inputs required per projects
Lancefield Road PSP	
Aurecon report on grade separation will be provided by MPA which includes CAD information - PB to review how this connects into the road network and whether it satisfies road requirements	Noted
Intersection 5 – intersection connects to Australand development. Further information is to be provided before PB commences work on this intersection. All other intersections are existing with additional legs being added.	MPA to provide advice prior to commencement of work
Lancefield Rd: - Tight cross section - PAO switches sides - Ultimate design to show where relocations might occur "Boulevard" treatment consideration to be provided to PB prior to work commencing (to be provided by Hume City Council).	MPA/Hume to provide advice on Boulevard treatment prior to commencement of work
Sunbury South	
Roads 6-8 – not enough road reserve width (<25m). MPA to provide advice on how to proceed.	MPA to provide advice prior to commencement of work
Jacksons Hill Link (connection with Buckland Rd). Aurecon report did not focus on how the grade separation (road under rail) connects with Jacksons Hill and this will need to be considered by PB. Significant cut and fill issues here. The road alignment can be moved to accommodate an appropriate solution. It is important to lock down the road alignment due to the topographical constraints. Cut material is not suitable for fill material in the location and hence, earthworks will be the most significant cost item. PB to review all input information (to be provided by MPA) prior to the workshop to discuss Jacksons Hill link. It is envisioned that PB will assist in developing a solution at the workshop.	MPA to provide input information prior to commencement of work. PB to review all input information ahead of the workshop.
Contract Admin	
MPA to provide purchase order before works can commence	MPA provide purchase order

Item	Status
Invoicing to be monthly. Invoices to note the following: - Purchase order - Itemise tasks and percentage complete/claimed	Noted
Notices served by email are acceptable	Noted
MPA approves Aquenta to be engaged by PB to undertake the cost estimates	Noted
Deliverable due dates to be confirmed as the project progresses.	Noted
Regular progress reporting will be in the form of a brief email report	Noted

TAYLORS
Urban Development | Built Environments
Infrastructure | Engineering and Project Management
8/270 Ferntree Gully Road, Notting Hill VIC 3168
Phone: (03) 9501 2800 | www.taylorsds.com.au

Our Ref: *20623/P*
Doc Name: *L-Submission Sunbury South PSP*
NJH/aho

25 May 2017

Victorian Planning Authority
Re: Amendment C207 Sunbury South PSP
Level 25, 35 Collins Street
MELBOURNE VIC 3000

Attn: Mat Garner

Dear Mat,

Amendment C207 to the Hume Planning Scheme
Submission to the Sunbury South PSP

We act on behalf of Asia-Pacific Property Pty Ltd, being the purchasers of land known as 35 - 60 Fox Hollow Drive, Sunbury. The land they have purchased comprises a total of eight (8) parcels (No.'s 35, 37, 45, 50, 55, 60, 65 Fox Hollow Drive and 95 Watsons Road).

We refer to our ongoing discussions in relation to development at the above site.

Connector Boulevard
As exhibited, the alignment of the Connector Boulevard creates inefficient areas of land between conservation areas and the road reserve and would not deliver an orderly and efficient planning outcome. It is also our view that the exhibited alignment does not respond to the terrain in the most effective manner and would result in excessive cut and fill.

Following our detailed review of the alignment of the Connector Boulevard that traverses the northern portion of the property, we submit a revised alignment as per Appendix A. The revised alignment seeks to retain the same crossing points in the north east (over Jacksons Creek) and to the north west and has been designed in accordance with relevant Standards. Both the existing (PB alignment) and proposed (Taylors alignment) have been costed and this is attached as Appendix B. As detailed in the costing, both alignments would require a similar contribution and adoption of the Taylors alignment would therefore not represent a significant departure from the exhibited documents. *It also results in a more orderly design response with significant cost savings due to reduced cut and fill with the Taylors design*.

The Taylors alignment also seeks to utilise the existing Fox Hollow Drive court head to ensure the existing road reserve is utilised.

We would be pleased to discuss our findings with yourself, Council and PB so that all parties are comfortable that a superior solution has been achieved with the Taylors design.

Supplementary Mapping

Given the particulars of this site, detailed urban design work has been undertaken for the site in order to ensure the outcomes being sought within the PSP can be achieved in a realistic manner. A preferred subdivision layout has therefore been prepared for the site. This level of detail was necessary to ensure development could be realised onsite in a manner that sought to balance all relevant objectives.

We were made aware by Council and the VPA that Council were looking to expand the area that Figure 3 (p21 of the PSP) applied to. To that end we have expanded it to include our client's site in a similar format to that applied in the exhibited version. One will note that we have applied principles espoused in the PSP and shown in the exhibited Figure 3 in our revised version. Of particular note, consistent with our original submission, we have added a local road intersection with the Boulevard Connector at our western boundary.

We accept that Council and the VPA may wish to include other properties on this plan and to that end we would be pleased to forward an electronic copy of our plan for incorporation into the final plan if appropriate.

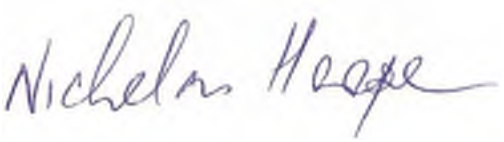
Either way, we expect there will be the need for further discussion on matters of detail and welcome that opportunity once you have perused and absorbed what we have provided to you at this time.

In order to provide clarity as to the outcomes that should be delivered onsite, it is requested that the following documentation be included within the PSP, in lieu of the existing plans:

- Appendix C: plan in lieu of Plan 3 (p. 8)
- Appendix D: plan in lieu of Figure 3 (p. 21)

We would welcome the opportunity to discuss this in further detail. If you have any queries, please don't hesitate to contact the undersigned on 9501 2800.

Yours faithfully



NICK HOOPER
Director

Enc.

Cc Wuzhong P/L
Cc Gallagher Jeffs P/L

Appendix A

Preferred Connector Boulevard alignment

PLAN NOTES
- Plan is indicative only and has not yet had Council approval.
- Layout & lot yield will change as a result of further strategic planning outcomes yet to be finalized by the VPA and Council.
- Further requirements may be needed but not finalized until the appropria investigations have been reported, including but not limited to:
  - Feature Survey, Flora and Fauna, Arboricultural Survey,
  - Archaeological, Engineering Services, Traffic Engineering.

SOURCE DATA
- Site boundary, contours & dteails via Taylors Survey 20623/D1.
- Subject site boundary derived from: survey
- Surrounding boudanries derived from Vicmap digital data.

ASSUMPTIONS
- No landscape Reserves, break of slope buffers shown on this plan.
- Connector Rd alignment & width agreeable to approval.
- Re-located local park locations and shapes agreeable.
- Roseberry Ave road connection required for initial access to northern site
- Lot access allowed along Sunbury Ring Rd Connector.
- Interface with pubic realm likely to be required by Council.

TAYLORS

0 20 40 60 80 100 metres
Scale 1:2000 @ A1

Job No. 20623 | MP 9 | LAYOUT
Date 26/04/17
By AGT Ckd PRELIM

FOX HOLLOW DRIVE
SUNBURY
HUME COUNCIL

CONCEPTUAL MASTERPLAN

Appendix B

Costing Comparison

Methodology

- Model PB road alignment in 12d software.
- Model Taylors road alignment in 12d software. Taylors vertical grading within AustRoads guidelines and similar to PB.
- Apply collector road template with cut/fill batters at 1v : 4h
- Volumetric analysis for earthworks calculated by 12d for each alignment
- Take off 2d quantities for PB Road alignment in AutoCAD. Road design provided by PB
- Take off 2d quantities for Taylors Road alignment in AutoCAD.
- Prepare bill of quantities with Taylors rates for construction items.

Assumptions

- Road Design level at Harpers Creek is similar for both models resulting in minimal changes to culvert design, therefore cost of culvert excluded from comparison.
- No road grades to exceed 8%
- Road Design level and grade at Jacksons Creek is similar for both models. No impact to bridge design, therefore bridge excluded from cost comparison.
- Design for Intersection of Fox Hollow Drive & Collector Road is similar for both models. No impact to intersection design, therefore excluded from cost comparison.

Results

- PB Road Length = 1,200 lin.m
- Taylors Road Length = 1,260 lin.m
- Taylors Road design while having more pavement area is more efficient in earthworks design
- Location of Taylors' Fox Hollow Drive & Collector Road intersection is further south than PB resulting in less road length in Fox Hollow Drive project.

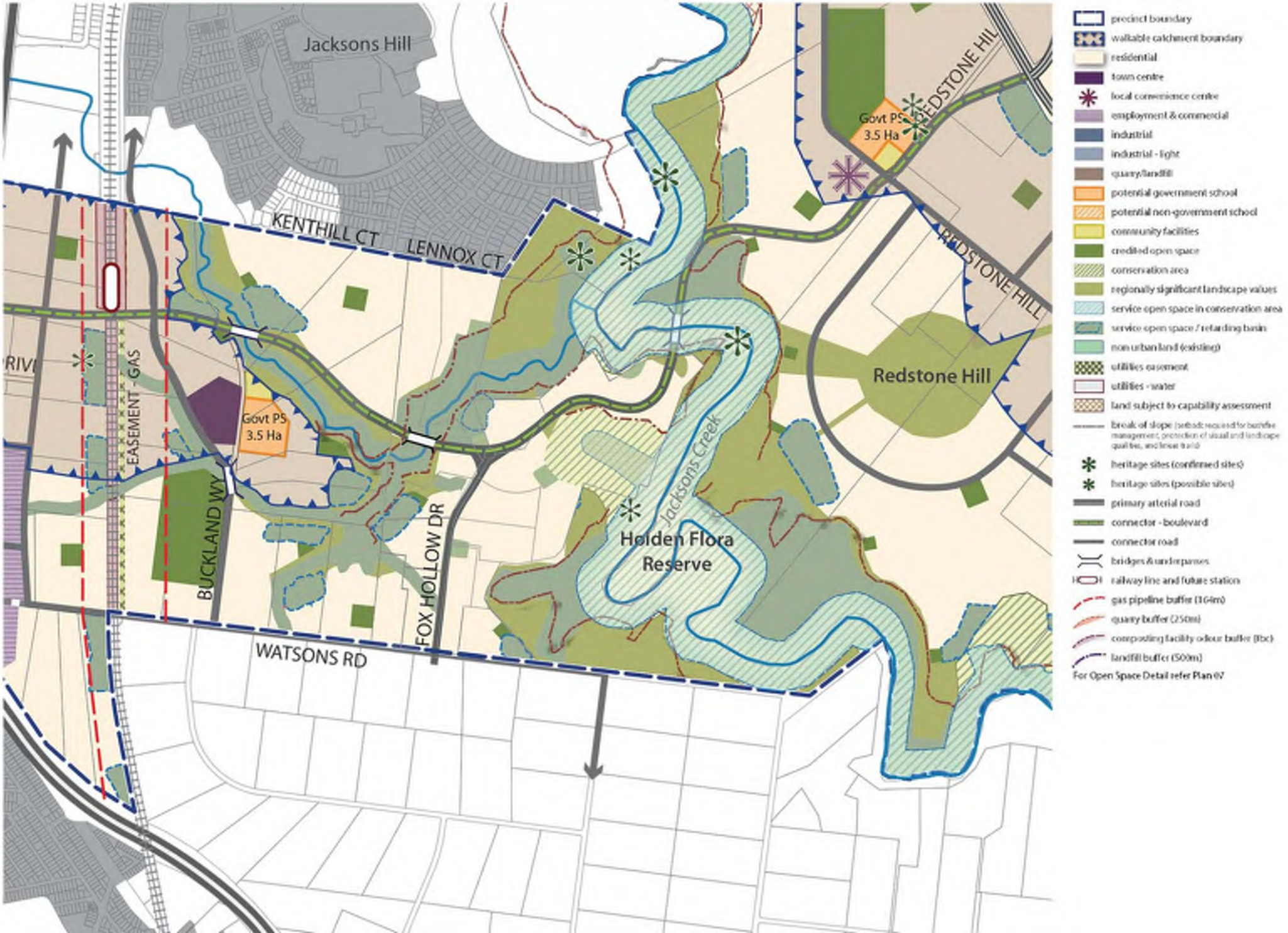
	PB	Taylors
Preliminaries	$46,500	$46,500
Earthworks	$2,970,000	$2,640,000
Pavement & Drainage	$2,399,762	$2,549,765
Utilities	$342,000	$360,780
Signage & Linemarking	$205,000	$225,000

Total Cost	**$5,963,262**	**$5,822,045**
Cost per Lin.m	**$4,969.39**	**$4,620.67**

Appendix C

Revised Future Urban Structure Plan

Proposed Revised Plan 3 Future Urban Structure



Appendix D

Harpers Creek Residential Concept Plan

Proposed Revised Figure 3 HCRCP

Level 15, 28 Freshwater Place
Southbank VIC 3006

Tel: +61 3 9861 1111
Fax: +61 3 9861 1144

www.wsp-pb.com

MEMO

TO:	John Petrakos (Victorian Planning Authority)
FROM:	Guy Wilkinson
SUBJECT:	**Sunbury South and Lancefield Road PSP – Infrastructure cost estimates**
OUR REF:	2113308A-CIV-MEM-006 RevB
DATE:	**28 April 2017**

1. BACKGROUND:

WSP | Parsons Brinckerhoff was engaged by the Victorian Planning Authority (VPA) to undertake an infrastructure design and costing study for the Sunbury South and Lancefield Road Precinct Structure Plans (PSPs).

High level functional layout plans were prepared for nominated road, intersection and bridge/culvert projects in both the Sunbury South and Lancefield Road PSPs. These designs have been documented in the "Sunbury South and Lancefield Road Precinct Structure Plans (PSPs) – Infrastructure Design report" *(document number: 2113308A-CIV-REP-002)* prepared by WSP | Parsons Brinckerhoff.

Jacksons Hill Link investigation

During the course of the project, further investigation was required for route selection of the Jacksons Creek crossings in the Sunbury South area. As the terrain through this area is steep, to be able to properly compare the options more detailed design work was completed to establish approximate cut and fill earthwork volumes and locations of retaining walls. The results of this investigation are documented in the report "Jacksons Hill Link – Alignment assessment" *(document number: 2113308A-CIV-REP-003)* and the memo "Jacksons Hill Link Options Evaluation" *(document number: 2113308A-CIV-MEM-002)* by WSP | Parsons Brinckerhoff. The following road and intersection projects were covered by this additional investigation:

- SS-RD4
- SS-RD5
- SS-RD9
- SS-IT9

2. SCOPE OF COST ESTIMATES:

WSP | Parsons Brinckerhoff engaged Aquenta Consulting Pty Ltd to undertake the high level cost estimate element of the study. The scope of the cost estimates was to:

1. Prepare high level cost estimates for:
   - **a)** 14 Intersection projects (SS-IT1, SS-IT2, SS-IT3, SS-IT4, SS-IT5, SS-IT7, SS-IT8, SS-IT9, SS-IT10, LR-IT1, LR-IT2, LR-IT3, LR-IT4, LR-IT5)
   - **b)** 8 Road projects (SS-RD4, SS-RD5, SS-RD6, SS-RD7, SS-RD8, SS-RD9, LR-RD2 and LR-RD3)
   - **c)** 3 Bridge/culvert projects (SS-BD1, LR-BD1, LR-BD4)

2. Review existing bridge/culvert cost estimates by others and adjust accordingly:
   a) 6 Bridge/culvert projects (LR-BD2, LR-BD3, SS-BD1, SS-BD2, SS-BD3 and SS-BD4).

Aquenta produced the following reports covering the above scope items:

Table 1 Cost estimate reports prepared by Aquenta

SCOPE ITEM	COST ESTIMATE REPORT TITLE	REFERENCE
1(a) and 1(b)	VPA Infrastructure Costings – Sunbury Sth & Lancefield Rd PSP: Roads and Intersections	Included in Appendix A
1(c)	VPA Infrastructure Costings – Sunbury Sth & Lancefield Rd PSP: Bridges	Included in Appendix B
2(a)	VPA Infrastructure Costings – Sunbury Sth & Lancefield Rd PSP: Report Reviews	Included in Appendix C

For further details of WSP | Parsons Brinckerhoff's scope, refer to our original fee proposal 201505459-TPT-PRP-001.

3. INPUT INFORMATION AND ASSUMPTIONS

Input information used by Aquenta in preparing the cost estimates is summarised in each of Aquenta's reports mentioned in Table 1. Some additional cometary and details are provided below for clarity.

Retaining wall details (details and locations)

Retaining wall extents and details were only established for projects involved in the Jacksons Hill Link investigation (see Section 1) and thus details were documented in Section 3.6 of report *2113308A-CIV-REP-003*. A drawing from this report showing the indicative soil nail retaining wall detail is included in Appendix D.

Earthwork quantities

Similar to the retaining walls described above, approximate cut and fill volumes were generated for projects involved in the Jacksons Hill Link investigation (see Section 1) and for a section of LR-RD2. A high level 3d model was created for the roads SS-RD4, SS-RD5, SS-RD9 and LR-RD2 only using the Bentley Inroads software package. The volume between the design surface and the existing surface (generated from the LIDAR data provided by the VPA) was calculated by using the "triangle volume" method which calculates the exact volume between the two surfaces (refer to Appendix E). The accuracy of the results is only limited by the accuracy of the surfaces being used. In this case that is the LIDAR data and the high level 3d design model (which is approximate given the concept level of design detail). The approximate bulk earthworks quantities were provided to Aquenta for the purpose of preparing the cost estimates (refer to Appendix E).

Likely rock excavation

A geotechnical investigation report was provided by the VPA after completion of the infrastructure design and investigations. This report titled "Sunbury South and Lancefield Road (PSP 1074 and 1075) – Geotechnical Investigation Report For Jackson's Creek Road Crossing (Northern and Southern Line)" prepared by Aurecon provides borehole results in the vicinity of the proposed bridges over Jacksons Creek. While it provides some insight into the geotechnical conditions of the area, specific conclusions cannot be drawn in relation to all of the road, intersection and bridge projects as the scope of this geotechnical investigation was limited to the crossings of Jacksons Creek.

Below is and extract from *Section 10.2 Excavation for Road* of the Aurecon geotechnical report.

> *"Excavation for the road construction will encounter rock with varying degrees of weathering from extremely weathered to moderately weathered. The rock type can be Siltstone, Basalt or*

very hard Quartzite. Therefore depending upon the hardness of the rock, the excavation can be carried out using excavator or rock breaker.

The south alignment options D & E (short), the excavations for the road, could encounter very hard rock to extremely weathered and boulders/ floaters depending upon the location. Therefore a combination of rock breaker and excavator will be required during excavation. South alignment option E (Long), will involve only negligible to localised excavation of rock and soil."

Boreholes were only located in the vicinity of SS-BD1 Long option (referred to by Aurecon as South alignment option E Long). As such, without boreholes close to significant areas of cut, only general assumptions can be made at this time.

Thus for the purpose of making an allowance for the likelihood of rock excavation for road construction in the estimates it is assumed that rock will be encountered that can be dealt with using an excavator or rock breaker as directed by Aurecon.

For the deep cut associated with the road construction along SS-RD4, for the purpose of preparing a high level cost estimate it is assumed that basalt bedrock might be encountered from a depth of 5m. However, this is subject to change once further geotechnical boreholes are completed in the vicinity of significant cut.

GTA and Aurecon reports for scope item 2(a)

For scope item 2(a), the review of cost estimates prepared by others (GTA and Aurecon), the following reports were provided to Aquenta:

- Sunbury South and Lancefield Road PSP (PSP 1074 and 1075) – Infrastructure Design and Costings (Grade Separations and Harpers Creek Crossing) Draft Report, 10 June 2015, Aurecon
- Jacksons Creek Road Crossings PSP 1074 – South Sunbury, Options Assessment & Development, ref 14M1881000, 16 October 2014, GTA Consultants
- Jacksons Creek Road Crossings PSP 1075 – Lancefield Road, Options Assessment & Development, ref 14M1881000, 13 October 2014, GTA Consultants

Aquenta reviewed, provided comments and revised estimates (see Aquenta's "Report Reviews" cost estimate report in Appendix B) for the following projects designed and documented by Aurecon and GTA in the above mentioned reports:

- GTA reports:
  - SS-BD1 (Option E – Long, Connector)
- Aurecon report:
  - SS-BD2 (Project C)
  - SS-BD2 (Project B)
  - SS-BD4 (Project A)
  - LR-BD2 (Project E)
  - LR-BD3 (Project D)

Note that the review of the estimate prepared by GTA for project LR-BD1 was in the original scope, a new estimate has been prepared on a new design of LR-BD1 by WSP | Parsons Brinckerhoff. Also, a separate estimate of the version of SS-BD1 designed by WSP | Parsons Brinckerhoff was documented in Aquenta's "Bridges" estimate report.

Guidance on occupation costs

Occupation costs are sometimes difficult to quantify especially for future years and largely depend on factors associated with the operator's requirements. Following discussions with VicRoads for the purpose of estimating approximate occupation costs the following assumptions were made. These assumptions should be reviewed in conjunction with consultation with rail operators during subsequent design phases.

For SS-BD4 (road under existing rail) assume similar construction methodology as Taylors Rd, St Albans rail underpass project on Bendigo Rail line 2007 is appropriate

- New rail bridge constructed adjacent to existing rail line
- New bridge slid over in one 56hr shut down (1 weekend occupation). Excavation of road after new bridge in place
- Assume on other weekend occupation for preparatory works (such as pouring of foundations)
- Possibly require additional after last before first (ALBF) occupations for overhead line (OHL) works
- Affects V/Line and Metro services to Sunbury

For LR-BD2 and LR-DB3 (road bridge over existing rail line) assume level of disruption is less to rail line below

- Likely one weekend occupation for deck pours and barrier attachment and beam lifts
- Possibly could be done at night via smaller occupations
- Affects only V/Line services

VicRoads suggest that an indicative allowance of $600,000 per day could be appropriate for occupation costs associated with Metro disruptions.

There is an upcoming occupation on the Bendigo Line and according to the PTV website below are the bus replacement that are planned. It is assumed that a similar bus replacement philosophy would be appropriate for occupations associated with the Sunbury South and Lancefield Road PSP works.

Weekend services (V/Line)
Bendigo – Melb. (Bus replacement between Southern Cross and Gisborne)
- Sunday - 12 services each way (24 in total)
- Saturday – 13 services each way (26 in total)

Swan Hill (Entire route bus replacement)
- Saturday – 2 services each way (4 in total)
- Sunday – 2 services each way (4 in total)

Assumed pavement detail

Pavement design was not included in WSP | Parsons Brinckerhoff's scope. For the purpose of preparing the cost estimate, the Hume City Council – Trunk Collector Street pavement detail was assumed to be appropriate. This detail is included in Appendix F.

SS-RD8 scope of works

Upgrade of existing pavement only. Scope of works as advised by the VPA is new pavement for 2 x 3.5m lanes with 0.5m spray sealed shoulders (i.e. total width of 8m.) for a length of 1.76km.

This document may contain confidential and legally privileged information, neither of which are intended to be waived, and must be used only for its intended purpose. Any unauthorised copying, dissemination or use in any form or by any means other than by the addressee, is strictly prohibited. If you have received this document in error or by any means other than as authorised addressee, please notify us immediately and we will arrange for its return to us.

APPENDIX A – AQUENTA COST ESTIMATE REPORT: ROADS AND INTERSECTIONS

REPORT

AQUENTA
A Jacobs Company

VPA INFRASTRUCTURE COSTINGS – SUNBURY STH & LANCEFIELD RD PSP : ROADS AND INTERSECTION

Cost Estimates and Report
April 2017

DOCUMENT TITLE: **VPA INFRASTRUCTURE COSTINGS – SUNBURY STH & LANCEFIELD RD PSP : ROADS AND INTERSECTION**

PROJECT REFERENCE: **316056**

PURPOSE OF ISSUE: **Cost Report**

Correspondence:

Aquenta Consulting Pty Ltd
Level 11, 452 Flinders Street
Melbourne VIC 3000

PO Box 312 Flinders Lane
Melbourne VIC 8009

Tel + 61 3 8668 3000
melbourne@aquenta.com.au

ISSUE	DESCRIPTION OF AMENDMENT	AUTHOR	CHECKED	APPROVED	DATE
1	Draft Report	JK	SB	SB	18/11/16
2	Final Report – incl VPA comments	SB	SB	SB	16/03/17
3	Updated LR-RD2 and includes VPA comments	MD	SB	SB	12/04/17

Previous issues of this document shall be destroyed or marked SUPERSEDED.

CONTENTS

1	Executive Summary	4
2	Scope of Project	4
3	Drawings and Information Used	5
4	Cost Estimate Summary	6
5	Specific Inclusions	7
6	Specific Exclusions	7
7	Assumptions	7

Appendix 1:

Cost Estimates – Sunbury South

Appendix 2:

Cost Estimates – Lancefield Road

1 Executive Summary

This Cost Estimate Report has been prepared by Aquenta Consulting for the Victorian Planning Authority in relation to the Sunbury South and Lancefield Rd PSP Infrastructure project cost estimate.

The estimated Total Construction Cost of the project options based on two key areas are:

SUNBURY SOUTH

- 6 No. Roads $69,513,710.23 excl GST; and
- 9 No. Intersections $49,957,438.81 excl GST;

LANCEFIELD ROADS

- 2 No. Roads $27,041,440.55 excl GST; and.
- 5 No. Intersections $26,738,872.71 excl GST;

2 Scope of Project

Parsons Brinckerhoff have been engaged by the Victorian Planning Authority (VPA) to undertake an infrastructure costing study for infrastructure projects in the Sunbury South and Lancefield Road Precinct Structure Plans (PSPs). This study includes individual segmented roads and intersections to support and facilitate future population growth in Sunbury. The following Roads and Intersections that form part of this report as proposed by VPA are as follows:

LOCATION		
SUNBURY SOUTH	ROADS	INTERSECTION
	Road 4 (RD4)	Intersection 1 (IT1)
	Road 5 (RD5)	Intersection 2 (IT2)
	Road 6 (RD6)	Intersection 3 (IT3)
	Road 7 (RD7)	Intersection 4 (IT4)
	Road 8 (RD8)	Intersection 5 (IT5)
	Road 9 (RD9)	Intersection 7 (IT7)
		Intersection 8 (IT8)
		Intersection 9 (IT9)
		Intersection 10 (IT10)

LANCEFIELD ROAD	ROADS	INTERSECTION
	Road 2 (RD2)	Intersection 1 (IT1)
	Road 3 (RD3)	Intersection 2 (IT2)
		Intersection 3 (IT3)
		Intersection 4 (IT4)
		Intersection 5 (IT5)

As part of that scope of works Aquenta is required to provide high level cost estimates for the proposed Road and Intersections.

3 Drawings and Information Used

These high level Cost Estimates has been prepared on the basis of the following documentation:

- Drawings – MPA Sunbury South and Lancefield Road PSP – 1- 74 pages
- Indicative retaining wall heights marked up provided by WSP Parsons Brinckerhoff (16.11.2016)
- Approximate bulk earthwork excavation and fill (SS-RD4, SS-RD9, SS-RD5, SS-IT9) provided WSP Parsons Brinckerhoff (9.11.2016)
- Sunbury South and Lancefield Rd PSP – Typical Sections CIV203, CIV205 and Layout Plan LR-RD2 (1020-1025) (29.03.2017)
- Approximate bulk earthwork quantities (LR-RD2), provided by WSP Parsons Brinkerhoff (29.03.2017)

4 Cost Estimate Summary

The Total Construction Cost excl. GST for each option is summarised below. Refer to Appendix 1 for a full breakdown of the cost estimates.

ESTIMATE	**Construction Costs $ (EXCL. GST)**	Other Project Costs $ (EXCL. GST)	TOTAL $ (EXCL. GST)
Sunbury South works			
ROADS			
SS-RD4	**$ 26,641,177.50**	$ 12,321,544.59	$ 38,962,722.09
SS-RD5	**$ 4,919,040.00**	$ 2,275,056.00	$ 7,194,096.00
SS-RD6	**$ 2,861,538.75**	$ 1,323,461.67	$ 4,185,000.42
SS-RD7	**$ 7,153,824.17**	$ 3,308,643.68	$ 10,462,467.84
SS-RD8	**$ 3,824,130.63**	$ 1,768,660.41	$ 5,592,791.04
SS-RD9	**$ 2,131,031.00**	$ 985,601.84	$ 3,116,632.84
SUB-TOTAL	**$ 47,530,742.04**	**$ 21,982,968.19**	**$ 69,513,710.23**
INTERSECTIONS			
SS-IT1	**$ 4,494,424.33**	$ 2,078,671.25	$ 6,573,095.58
SS-IT2	**$ 3,655,943.11**	$ 1,690,873.69	$ 5,346,816.79
SS-IT3	**$ 5,074,355.94**	$ 2,346,889.62	$ 7,421,245.56
SS-IT4	**$ 3,976,361.63**	$ 1,839,067.25	$ 5,815,428.88
SS-IT5	**$ 3,598,347.86**	$ 1,664,235.89	$ 5,262,583.75
SS-IT7	**$ 3,416,349.45**	$ 1,580,061.62	$ 4,996,411.06
SS-IT8	**$ 2,870,061.05**	$ 1,327,403.24	$ 4,197,464.29
SS-IT9	**$ 5,083,043.00**	$ 2,350,907.39	$ 7,433,950.39
SS-IT10	**$ 1,990,046.16**	$ 920,396.35	$ 2,910,442.51
SUB-TOTAL	**$ 34,158,932.52**	**$ 15,798,506.29**	**$ 49,957,438.81**
Lancefield Road			
ROADS			
LR-RD2	**$ 16,057,477.39**	$ 7,426,583.29	$ 23,484,060.68
LR-RD3	**$ 2,432,396.49**	$ 1,124,983.38	$ 3,557,379.87
SUB-TOTAL	**$ 18,489,873.88**	**$ 8,551,566.67**	**$ 27,041,440.55**
INTERSECTIONS			
LR-IT1	**$ 3,680,758.12**	$ 1,702,350.63	$ 5,383,108.75
LR-IT2	**$ 3,875,122.64**	$ 1,792,244.22	$ 5,667,366.86
LR-IT3	**$ 3,772,657.25**	$ 1,744,853.98	$ 5,517,511.22
LR-IT4	**$ 3,916,932.16**	$ 1,811,581.13	$ 5,728,513.29
LR-IT5	**$ 3,037,519.72**	$ 1,404,852.87	$ 4,442,372.59
SUB-TOTAL	**$ 18,282,989.89**	**$ 8,455,882.82**	**$ 26,738,872.71**
TOTAL	**$ 118,462,538.32**	**$ 54,788,923.97**	**$ 173,251,462.30**

5 Specific Inclusions

The cost estimates include allowances for the following:

- Council Fees
- VicRoads Fees
- Traffic Management
- Environmental Management
- Survey & Design
- Supervision & Project Management
- Site Establishment (Preliminaries)
- Project Contingency

6 Specific Exclusions

Below is a list of exclusions that apply to the Cost Estimates for the Options:

- GST
- Legal & holding costs
- Other Authority Costs and Fees
- Adverse ground conditions
- Additional allowances for removal of any Contamination / Hazardous Materials
- Any other electrical and lighting costs other than the included in the cost estimate
- Services relocations
- Soft landscaping maintenance
- Escalation
- WSUD Drainage

7 Assumptions

The following assumptions have been taken into consideration within each high level cost estimate:

- The cost estimates assume a traditional lump sum competitively tendered procurement method.
- The cost estimates are based on carrying out the works during normal working hours.
- The cost estimates assume road works outside the alignments for each option are excluded.
- Aquenta has used a VPA provided template for our cost estimates.
- Aquenta have assumed the general cut and fill quantities provided by Parsons Brinckerhoff are reasonable and no check of these quantities have been carried out for SS-RD4, SS-RD9, SS-RD5, and SS-IT9. For all other road and intersection areas we have allowed for an approximate cut and fill volume assuming for a 650mm thick pavement composition. The bulk excavation and fill quantities allowed in the estimate will need to be tested and revised subsequent to further analysis and details.
- Aquenta have allowed an extra over allowance rate for rock excavation, based on the assumption of the possibility of rock being encountered everywhere, under the assumption based off the geotechnical reports that indicate that

rock should be breakable through normal excavation means, however production rates would be slower. We have applied this extra over allowance to 30% of the excavated area.

- Aquenta have now assumed to have lighting poles placed every 50m for roads. We have assumed 12m high poles with luminaires at $8,500 per pole.
- Aquenta have revised approach taken for traffic signals and made an item allowance based on type and size of intersection at locations.
- We have excluded any quantities and areas of Bridges on the Roads.
- The rates used in the cost estimates are based on recent project data and benchmarked rates for concept cost estimates for projects of a similar nature in the Melbourne region.
- The cost estimates are based on the information provided to Aquenta and our knowledge of similar projects.
- All other assumptions have been noted in the cost estimates for each option.

Appendix 1: Cost Estimates – Sunbury South

Jacksons Hill Creek Crossing - South
SS_RD4 (Long Options, approx. length 3500m, excluding Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
		WORKS					
1		**SITEWORKS AND EARTHWORKS**					
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**120,227.00**	m2	$ 5.00	$ 601,135.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location		m3			
	1.2.3	Cut and fill	**240,790.00**	m3	$ 40.00	$ 9,631,600.00	As guided by WSPPB with 10% additional factor
	1.2.4	EO Allowance for rock excavation works	**57,288.00**	m3	$ 45.00	$ 2,577,960.00	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable" (Based on cut volume previously provided by WSPPB)
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 250,000.00	$ 250,000.00	
2		**ROAD PAVEMENT**					
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**40,727.60**	m2	$ 145.00	$ 5,905,502.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**-**	Allow.	$ -	$ -	Assume all new works.
3		**CONCRETE WORKS**					
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**14,044.00**	LM	$ 45.00	$ 631,980.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**9,837.00**	m2	$ 80.00	$ 786,960.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	**11,937.40**	m2	$ 80.00	$ 954,992.00	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included in SS-RD4
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	**22,953.00**	m2	$ 30.00	$ 688,590.00	
4		**DRAINAGE**					
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**3,511.00**	LM	$ 200.00	$ 702,200.00	
	4.1.2	Drainage, sub grade drain	**3,511.00**	LM	$ 50.00	$ 175,550.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**36**	No.	$ 2,500.00	$ 90,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5		**TRAFFIC**					
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**3,511.00**	LM	$ 10.00	$ 35,110.00	Includes fixed signage, guide posts, line markings, traffic safety
6		**LANDSCAPE**					
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**14,755.50**	m2	$ 2.00	$ 29,511.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**14,755.50**	m2	$ 25.00	$ 368,887.50	Topsoiling and seeding of nature strips, varying in widths
7		**STREET LIGHTING**					
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**71**	No.	$ 8,500.00	$ 603,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8		**MISCELLANEOUS**					
	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls	**2,220.00**	LM			
	8.2.1	Retaining wall (0-2m high)					Allow for retaining wall heights:
		CH1400-1500	100	LM	$ 650.00	$ 65,000.00	1.2m high
		CH2550-2650	100	LM	$ 650.00	$ 65,000.00	1.6m high
		CH3400-3550	150	LM	$ 650.00	$ 97,500.00	0.9m high
		CH3550-3650	100	LM	$ 650.00	$ 65,000.00	1.8m high
	8.2.2	Retaining wall (3-5m high)					
		CH350-550	400	LM	$ 980.00	$ 392,000.00	3m high
		CH650-750	200	LM	$ 980.00	$ 196,000.00	4.5m high
		CH1400-1600	200	LM	$ 980.00	$ 196,000.00	4.5m high
		CH2010-2100	90	LM	$ 980.00	$ 88,200.00	4.5m high
		CH2510-2660	150	LM	$ 980.00	$ 147,000.00	2.5m high
	8.2.3	Retaining wall (6-8m high)					
		CH600-650	100	LM	$ 1,700.00	$ 170,000.00	6.6m high
		CH1600-1900	300	LM	$ 1,700.00	$ 510,000.00	6m high
		CH1800-1900	100	LM	$ 1,700.00	$ 170,000.00	7.5m high
		CH2000-2100	100	LM	$ 1,700.00	$ 170,000.00	7.5m high
		CH2985-3000	30	LM	$ 1,700.00	$ 51,000.00	6m high
	8.2.4	Retaining wall (9-11m high)					
		CH550-600	100	LM	$ 2,200.00	$ 220,000.00	10.8m high
9		**SERVICES**					
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 26,641,177.50**	
10		**DELIVERY**					
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 865,838.27	
	10.2	VicRoads Fees	**1.00%**	Item		$ 266,411.78	
	10.3	Traffic Management	**5.00%**	Item		$ 1,332,058.88	
	10.4	Environmental Management	**0.50%**	Item		$ 133,205.89	
	10.5	Survey & Design	**5.00%**	Item		$ 1,332,058.88	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 2,397,705.98	
	10.7	Site Establishment	**2.50%**	Item		$ 666,029.44	
	10.8	Contingency	**20.00%**	Item		$ 5,328,235.50	
		SUB-TOTAL DELIVERY				**$ 12,321,544.59**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 38,962,722.09**	

Buckland Way

SS_RD5: Approx. length: 1150m (ex. Intersections)

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Pre-construction					
1.1.1	Demolition and site preparation	**28,785.00**	m2	$ 5.00	$ 143,925.00	
1.2	Earthworks					
1.2.1	Cut and disposal at specified location	**-**	m3	$ 25.00	$ -	
1.2.2	Fill	**-**	m3	$ 35.00	$ -	
1.2.3	Cut and fill	**18,370.00**	m3	$ 45.00	$ 826,650.00	As guided by WSPPB with 10% additional factor
1.2.4	EO Allowance for rock excavation works	**1,815.00**	m3	$ 45.00	$ 81,675.00	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable" (Based on cut volume previously provided by WSPPB)
1.3	Set-Out					
1.3.1	Allow for site set out	**1**	Item	$ 51,000.00	$ 51,000.00	
2	**ROAD PAVEMENT**					
2.1	New Pavement					
2.1.1	Road pavement - Traffic lanes	**12,880.00**	m2	$ 145.00	$ 1,867,600.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
2.2	Rehabilitate Existing Pavement					
2.2.1	Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**					
3.1	Kerb and Channel					
3.1.1	Kerb and channel	**2,300.00**	LM	$ 45.00	$ 103,500.00	Kerb and channel to both sides of each traffic lane
3.2	Pedestrian & Cycle Paths					
3.2.1	Pedestrian footpath	**3,450.00**	m2	$ 80.00	$ 276,000.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
3.2.2	Cycle pathway	**3,450.00**	m2	$ 160.00	$ 552,000.00	Two way Cycle path (3m) wide of the road. Total span (3m) wide
3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
3.3	Median strip					
3.3.1	Median (Levelled ground)	**-**	m2	$ 30.00	$ -	Assumed not included
4	**DRAINAGE**					
4.1	Drainage - Pipes					
4.1.1	Stormwater drainage	**1,150.00**	LM	$ 200.00	$ 230,000.00	
4.1.2	Drainage, sub grade drain	**1,150.00**	LM	$ 50.00	$ 57,500.00	includes subsoil drainage
4.2	Drainage - Pits					
4.2.1	Side entry pits	**12**	No.	$ 2,500.00	$ 30,000.00	Assumed spacing of approx. 100m
4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**					
5.1	Traffic Signals					
5.1.1	Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	
5.2	Traffic Safety					
5.2.1	Line marking and Traffic Signage	**1,150.00**	LM	$ 10.00	$ 11,500.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**					
6.1	Trees					
6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
6.2	Landscaping					
6.2.1	Tube stock plantings	**8,970.00**	m2	$ 2.00	$ 17,940.00	Allowance of $2 per m2 to nature strip
6.2.2	Nature strip	**8,970.00**	m2	$ 25.00	$ 224,250.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**					
7.1	Street Lighting					
7.1.1	Street lighting (incl. lighting conduits)	**23**	No.	$ 8,500.00	$ 195,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**					
8.1 8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
8.2	Retaining walls					
8.2.1	Retaining wall					
	Retaining wall (3-5m high)					Allow for retaining wall heights:
	1500-1750	250	LM	$ 980.00	$ 245,000.00	3.3m high
9	**SERVICES**					
9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
	SUB TOTAL - WORKS				**$ 4,919,040.00**	
10	**DELIVERY**					
	Fees					
10.1	Council Fees	**3.25%**	Item		$ 159,868.80	
10.2	VicRoads Fees	**1.00%**	Item		$ 49,190.40	
10.3	Traffic Management	**5.00%**	Item		$ 245,952.00	
10.4	Environmental Management	**0.50%**	Item		$ 24,595.20	
10.5	Survey & Design	**5.00%**	Item		$ 245,952.00	
10.6	Supervision & Project Management	**9.00%**	Item		$ 442,713.60	
10.7	Site Establishment	**2.50%**	Item		$ 122,976.00	
10.8	Contingency	**20.00%**	Item		$ 983,808.00	
	SUB-TOTAL DELIVERY				**$ 2,275,056.00**	
11	**TOTAL ESTIMATED PROJECT COST**				**$ 7,194,096.00**	

Fox Hollow Drive

SS_RD6 Approx. length: 700m (ex.Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**17,500.00**	m2	$ 5.00	$ 87,500.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**14,787.50**	m3	$ 25.00	$ 369,687.50	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**-**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**4,436.25**	m3	$ 45.00	$ 199,631.25	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 30,000.00	$ 30,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**7,840.00**	m2	$ 145.00	$ 1,136,800.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**-**	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,400.00**	LM	$ 45.00	$ 63,000.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**2,100.00**	m2	$ 80.00	$ 168,000.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	**2,100.00**	m2	$ 160.00	$ 336,000.00	Two way Cycle path (3m) wide of the road. Total span (3m) wide
	3.2.3	Shared pathway	**-**	m2	$ -	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	**-**	m2	$ -	$ -	Assumed not included
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**700.00**	LM	$ 200.00	$ 140,000.00	
	4.1.2	Drainage, sub grade drain	**700.00**	LM	$ 50.00	$ 35,000.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**7**	No.	$ 2,500.00	$ 17,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**700.00**	LM	$ 10.00	$ 7,000.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**5,460.00**	m2	$ 2.00	$ 10,920.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**5,460.00**	m2	$ 25.00	$ 136,500.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**14**	No.	$ 8,500.00	$ 119,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ 650.00	$ -	Assumed none
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 2,861,538.75**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 93,000.01	
	10.2	VicRoads Fees	**1.00%**	Item		$ 28,615.39	
	10.3	Traffic Management	**5.00%**	Item		$ 143,076.94	
	10.4	Environmental Management	**0.50%**	Item		$ 14,307.69	
	10.5	Survey & Design	**5.00%**	Item		$ 143,076.94	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 257,538.49	
	10.7	Site Establishment	**2.50%**	Item		$ 71,538.47	
	10.8	Contingency	**20.00%**	Item		$ 572,307.75	
		SUB-TOTAL DELIVERY				**$ 1,323,461.67**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 4,185,000.42**	

Watsons Road

SS_RD7 Approx. Length 2200m (ex. Intersections)

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Pre-construction					
1.1.1	Demolition and site preparation	**32,282.00**	m2	$ 5.00	$ 161,410.00	
1.2	Earthworks					
1.2.1	Cut and disposal at specified location	**27,278.29**	m3	$ 25.00	$ 681,957.25	Assuming pavement composition depth total 650mm deep including fill
1.2.2	Fill	**0**	m3	$ 35.00	$ -	
1.2.3	EO Allowance for rock excavation works	**8,183.49**	m3	$ 45.00	$ 368,256.92	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
1.3	Set-Out					
1.3.1	Allow for site set out	**1**	Item	$ 72,000.00	$ 72,000.00	
2	**ROAD PAVEMENT**					
2.1	New Pavement					
2.1.1	Road pavement - Traffic lanes	**22,440.00**	m2	$ 145.00	$ 3,253,800.00	Includes pavement to Traffic lane (3m) and parking bay (2.1m) to both sides total width (10.2m)
2.2	Rehabilitate Existing Pavement					
2.2.1	Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**					
3.1	Kerb and Channel					
3.1.1	Kerb and channel	**4,400.00**	LM	$ 45.00	$ 198,000.00	Kerb and channel to both sides of each traffic lane
3.2	Pedestrian & Cycle Paths					
3.2.1	Pedestrian footpath	**-**	m2	$ 80.00	$ -	Excluded
3.2.2	Cycle pathway	**6,600.00**	m2	$ 160.00	$ 1,056,000.00	Two way Cycle path (3m) wide of the road. Total span (3m) wide
3.2.3	Shared pathway	**0**	m2	$ 250.00	$ -	Assumed not included
3.3	Median strip					
3.3.1	Median (Levelled ground)	**-**	m2	$ 30.00	$ -	Assumed not included
4	**DRAINAGE**					
4.1	Drainage - Pipes					
4.1.1	Stormwater drainage	**2,200.00**	LM	$ 200.00	$ 440,000.00	
4.1.2	Drainage, sub grade drain	**2,200.00**	LM	$ 50.00	$ 110,000.00	
4.2	Drainage - Pits					
4.2.1	Side entry pits	**22**	No.	$ 2,500.00	$ 55,000.00	Assumed spacing of approx. 100m
4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**					
5.1	Traffic Signals					
5.1.1	Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	
5.2	Traffic Safety					
5.2.1	Line marking and Traffic Signage	**2,200.00**	LM	$ 10.00	$ 22,000.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**					
6.1	Trees					
6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
6.2	Landscaping					
6.2.1	Tube stock plantings	**13,200.00**	m2	$ 2.00	$ 26,400.00	Allowance of $2 per m2 to nature strip
6.2.2	Nature strip	**13,200.00**	m2	$ 25.00	$ 330,000.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**					
7.1	Street Lighting					
7.1.1	Street lighting (incl. lighting conduits)	**44**	No.	$ 8,500.00	$ 374,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**					
8.1 8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
8.2	Retaining walls					
8.2.1	Retaining wall	**-**	LM	$ -	$ -	
9	**SERVICES**					
9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
	SUB TOTAL - WORKS				**$ 7,153,824.17**	
10	**DELIVERY**					
	Fees					
10.1	Council Fees	**3.25%**	Item		$ 232,499.29	
10.2	VicRoads Fees	**1.00%**	Item		$ 71,538.24	
10.3	Traffic Management	**5.00%**	Item		$ 357,691.21	
10.4	Environmental Management	**0.50%**	Item		$ 35,769.12	
10.5	Survey & Design	**5.00%**	Item		$ 357,691.21	
10.6	Supervision & Project Management	**9.00%**	Item		$ 643,844.17	
10.7	Site Establishment	**2.50%**	Item		$ 178,845.60	
10.8	Contingency	**20.00%**	Item		$ 1,430,764.83	
	SUB-TOTAL DELIVERY				**$ 3,308,643.68**	
11	**TOTAL ESTIMATED PROJECT COST**				**$ 10,462,467.84**	

Crinnion Road

SS_RD8 Approx. length: 1550m (ex. Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**23,250.00**	m2	$ 5.00	$ 116,250.00	Assumed 15m wide road
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**19,646.25**	m3	$ 25.00	$ 491,156.25	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**5,893.88**	m3	$ 45.00	$ 265,224.38	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 40,000.00	$ 40,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**14,080.00**	m2	$ 145.00	$ 2,041,600.00	Includes pavement to Traffic lane (3m) and parking bay (2.1m) to both sides total width (10.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**3,520.00**	LM	$ 45.00	$ 158,400.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**-**	m2	$ 80.00	$ -	Excluded
	3.2.2	Cycle pathway	**-**	m2	$ 160.00	$ -	Two way Cycle path (3m) wide of the road. Total span (3m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	**-**	m2	$ 30.00	$ -	Assumed not included
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**1,550.00**	LM	$ 200.00	$ 310,000.00	
	4.1.2	Drainage, sub grade drain	**1,550.00**	LM	$ 50.00	$ 77,500.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**16**	No.	$ 2,500.00	$ 40,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**1,550.00**	LM	$ 10.00	$ 15,500.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**-**	m2	$ 2.00	$ -	
	6.2.2	Nature strip	**-**	m2	$ 25.00	$ -	
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**31**	No.	$ 8,500.00	$ 263,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	**-**	LM	$ -	$ -	
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 3,824,130.63**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 124,284.25	
	10.2	VicRoads Fees	**1.00%**	Item		$ 38,241.31	
	10.3	Traffic Management	**5.00%**	Item		$ 191,206.53	
	10.4	Environmental Management	**0.50%**	Item		$ 19,120.65	
	10.5	Survey & Design	**5.00%**	Item		$ 191,206.53	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 344,171.76	
	10.7	Site Establishment	**2.50%**	Item		$ 95,603.27	
	10.8	Contingency	**20.00%**	Item		$ 764,826.13	
		SUB-TOTAL DELIVERY				**$ 1,768,660.41**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 5,592,791.04**	

Jacksons Hill Link

SS_RD9 Approx. Length:260m (ex. Intersections)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	**6,500.00**	m2	$ 5.00	$ 32,500.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	**-**	m3	$ 25.00	$ -	
		1.2.2 Fill	**-**	m3	$ 35.00	$ -	
		1.2.3 Cut and fill	**18,150.00**	m3	$ 45.00	$ 816,750.00	As guided by WSPPB with 10% additional factor, rates includes for rock removal
		1.2.4 EO Allowance for rock excavation works	**5,445.00**	m3	$ 45.00	$ 245,025.00	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable" (Based on cut volume previously provided by WSPPB)
	1.3	Set-Out					
		1.3.1 Allow for site set out	**1**	Item	$ 25,000.00	$ 25,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	**2,912.00**	m2	$ 145.00	$ 422,240.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping		Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	**520.00**	LM	$ 45.00	$ 23,400.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	**780.00**	m2	$ 80.00	$ 62,400.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	**780.00**	m2	$ 160.00	$ 124,800.00	Two way Cycle path (3m) wide of the road. Total span (3m) wide
		3.2.3 Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	**-**	m2	$ 30.00	$ -	Assumed not included
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage	**260.00**	LM	$ 200.00	$ 52,000.00	
		4.1.2 Drainage, sub grade drain	**260.00**	LM	$ 50.00	$ 13,000.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	**3**	No.	$ 2,500.00	$ 7,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	**260.00**	LM	$ 10.00	$ 2,600.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	**2,028.00**	m2	$ 2.00	$ 4,056.00	Allowance of $2 per m2 to nature strip
		6.2.2 Nature strip	**2,028.00**	m2	$ 25.00	$ 50,700.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	**6**	No.	$ 8,500.00	$ 51,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (3-5m high)	**197.00**	LM	$ 980.00	$ 193,060.00	
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 2,131,031.00**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 69,258.51	
	10.2	VicRoads Fees	**1.00%**	Item		$ 21,310.31	
	10.3	Traffic Management	**5.00%**	Item		$ 106,551.55	
	10.4	Environmental Management	**0.50%**	Item		$ 10,655.16	
	10.5	Survey & Design	**5.00%**	Item		$ 106,551.55	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 191,792.79	
	10.7	Site Establishment	**2.50%**	Item		$ 53,275.78	
	10.8	Contingency	**20.00%**	Item		$ 426,206.20	
		SUB-TOTAL DELIVERY				**$ 985,601.84**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 3,116,632.84**	

Intersection on Sunbury Road
SS_IT1 (Cross intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**24,564.00**	m2	$ 5.00	$ 122,820.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**20,756.58**	m3	$ 25.00	$ 518,914.50	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**-**	m3	$ 35.00	$ -	Included above
	1.2.3	EO Allowance for rock excavation works	**6,226.97**	m3	$ 45.00	$ 280,213.83	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 45,000.00	$ 45,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**14,079.00**	m2	$ 145.00	$ 2,041,455.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 138,410.00	$ 138,410.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,124.00**	LM	$ 45.00	$ 50,580.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**1,425.00**	m2	$ 80.00	$ 114,000.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	**810.00**	m2	$ 160.00	$ 129,600.00	Allow two way Cycle path (3m) wide of the road. Total span (3m) wide
	3.2.3	Shared pathway	**-**	m2	$ -	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	**6,367.00**	m2	$ 30.00	$ 191,010.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**708.00**	LM	$ 200.00	$ 141,600.00	
	4.1.2	Drainage, sub grade drain	**708.00**	LM	$ 50.00	$ 35,400.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**8**	No.	$ 2,500.00	$ 20,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**708.00**	LM	$ 10.00	$ 7,080.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**1,883.00**	m2	$ 2.00	$ 3,766.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**1,883.00**	m2	$ 25.00	$ 47,075.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**15**	No.	$ 8,500.00	$ 127,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1.1	VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 4,494,424.33**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 146,068.79	
	11.2	VicRoads Fees	**1.00%**	Item		$ 44,944.24	
	11.3	Traffic Management	**5.00%**	Item		$ 224,721.22	
	11.4	Environmental Management	**0.50%**	Item		$ 22,472.12	
	11.5	Survey & Design	**5.00%**	Item		$ 224,721.22	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 404,498.19	
	11.7	Site Establishment	**2.50%**	Item		$ 112,360.61	
	11.8	Contingency	**20.00%**	Item		$ 898,884.87	
		SUB-TOTAL DELIVERY				**$ 2,078,671.25**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 6,573,095.58**	

Intersection on Sunbury Road
SS_IT2 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	**18,034.00**	m2	$ 5.00	$ 90,170.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	**15,238.73**	m3	$ 25.00	$ 380,968.25	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	**0**	m3	$ 35.00	$ -	Included above
		1.2.3 EO Allowance for rock excavation works	**4,571.62**	m3	$ 45.00	$ 205,722.86	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	**1**	Item	$ 38,000.00	$ 38,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	**9,303.00**	m2	$ 145.00	$ 1,348,935.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	**1**	Allow.	$ 180,340.00	$ 180,340.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	**2,527.00**	LM	$ 45.00	$ 113,715.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	**1,461.00**	m2	$ 80.00	$ 116,880.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	**777.00**	m2	$ 160.00	$ 124,320.00	Allow two way Cycle path (3m) wide of the road. Total span (3m) wide
		3.2.3 Shared pathway	**0**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	**5,827.00**	m2	$ 30.00	$ 174,810.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage	**835.00**	LM	$ 200.00	$ 167,000.00	
		4.1.2 Drainage, sub grade drain	**835.00**	LM	$ 50.00	$ 41,750.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	**9**	No.	$ 2,500.00	$ 22,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	**835.00**	LM	$ 10.00	$ 8,350.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	**666.00**	m2	$ 2.00	$ 1,332.00	Allowance of $2 per m2 to nature strip
		6.2.2 Nature strip	**666.00**	m2	$ 25.00	$ 16,650.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	**17**	No.	$ 8,500.00	$ 144,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,655,943.11**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 118,818.15	
	11.2	VicRoads Fees	**1.00%**	Item		$ 36,559.43	
	11.3	Traffic Management	**5.00%**	Item		$ 182,797.16	
	11.4	Environmental Management	**0.50%**	Item		$ 18,279.72	
	11.5	Survey & Design	**5.00%**	Item		$ 182,797.16	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 329,034.88	
	11.7	Site Establishment	**2.50%**	Item		$ 91,398.58	
	11.8	Contingency	**20.00%**	Item		$ 731,188.62	
		SUB-TOTAL DELIVERY				**$ 1,690,873.69**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 5,346,816.79**	

Sunbury Road/Lancefield Road Intersection
SS_IT3 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
		WORKS					
1		**SITEWORKS AND EARTHWORKS**					
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**28,392.00**	m2	$ 5.00	$ 141,960.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**23,991.24**	m3	$ 25.00	$ 599,781.00	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**7,197.37**	m3	$ 45.00	$ 323,881.74	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 50,000.00	$ 50,000.00	
2		**ROAD PAVEMENT**					
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**17,398.40**	m2	$ 145.00	$ 2,522,768.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 283,920.00	$ 283,920.00	Allowance only
3		**CONCRETE WORKS**					
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,426.00**	LM	$ 45.00	$ 64,170.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**318.00**	m2	$ 80.00	$ 25,440.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	**393.00**	m2	$ 80.00	$ 31,440.00	Allow Cycle path (1.5m) wide
	3.2.3	Shared pathway	**0**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	**9,305.00**	m2	$ 20.00	$ 186,100.00	Assumed levelled soil, future proofed for planting
4		**DRAINAGE**					
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**700.00**	LM	$ 200.00	$ 140,000.00	
	4.1.2	Drainage, sub grade drain	**700.00**	LM	$ 50.00	$ 35,000.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**15.00**	No.	$ 2,500.00	$ 37,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - Subsoil Drainage					
	4.3.1	Included above	**2,852.00**	LM	$ -	$ -	Included above
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5		**TRAFFIC**					
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**700.00**	LM	$ 10.00	$ 7,000.00	Includes fixed signage, guide posts, line markings, traffic safety
6		**LANDSCAPE**					
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**977.60**	m2	$ 2.00	$ 1,955.20	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**977.60**	m2	$ 25.00	$ 24,440.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7		**STREET LIGHTING**					
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**14**	No.	$ 8,500.00	$ 119,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8		**MISCELLANEOUS**					
	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9		**SERVICES**					
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10		**MAINTENANCE**					
	10.1.1	VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 5,074,355.94**	
11		**DELIVERY**					
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 164,916.57	
	11.2	VicRoads Fees	**1.00%**	Item		$ 50,743.56	
	11.3	Traffic Management	**5.00%**	Item		$ 253,717.80	
	11.4	Environmental Management	**0.50%**	Item		$ 25,371.78	
	11.5	Survey & Design	**5.00%**	Item		$ 253,717.80	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 456,692.03	
	11.7	Site Establishment	**2.50%**	Item		$ 126,858.90	
	11.8	Contingency	**20.00%**	Item		$ 1,014,871.19	
		SUB-TOTAL DELIVERY				**$ 2,346,889.62**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 7,421,245.56**	

Intersection on Sunbury Road
SS_IT4 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	**21,127.00**	m2	$ 5.00	$ 105,635.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	**17,852.32**	m3	$ 25.00	$ 446,307.88	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	**0**	m3	$ 35.00	$ -	
		1.2.3 EO Allowance for rock excavation works	**5,355.69**	m3	$ 45.00	$ 241,006.25	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	**1**	Item	$ 40,000.00	$ 40,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	**11,923.50**	m2	$ 145.00	$ 1,728,907.50	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	**1**	Allow.	$ 211,270.00	$ 211,270.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	**1,083.00**	LM	$ 45.00	$ 48,735.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	**766.50**	m2	$ 80.00	$ 61,320.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
		3.2.2 Cycle pathway	**414.00**	m2	$ 80.00	$ 33,120.00	Allow Cycle path (1.5m) wide
		3.2.3 Shared pathway	**0**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	**5,623.00**	m2	$ 20.00	$ 112,460.00	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage	**855.00**	LM	$ 200.00	$ 171,000.00	
		4.1.2 Drainage, sub grade drain	**855.00**	LM	$ 50.00	$ 42,750.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	**11.00**	No.	$ 2,500.00	$ 27,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	**855.00**	LM	$ 10.00	$ 8,550.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	**2,400.00**	m2	$ 2.00	$ 4,800.00	Allowance of $2 per m2 to nature strip
		6.2.2 Nature strip	**2,400.00**	m2	$ 25.00	$ 60,000.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	**18**	No.	$ 8,500.00	$ 153,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,976,361.63**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 129,231.75	
	11.2	VicRoads Fees	**1.00%**	Item		$ 39,763.62	
	11.3	Traffic Management	**5.00%**	Item		$ 198,818.08	
	11.4	Environmental Management	**0.50%**	Item		$ 19,881.81	
	11.5	Survey & Design	**5.00%**	Item		$ 198,818.08	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 357,872.55	
	11.7	Site Establishment	**2.50%**	Item		$ 99,409.04	
	11.8	Contingency	**20.00%**	Item		$ 795,272.33	
		SUB-TOTAL DELIVERY				**$ 1,839,067.25**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 5,815,428.88**	

Vinyard Road/Jacksons Creek Crossing (South)
SS_IT5 (T-intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**17,088.00**	m2	$ 5.00	$ 85,440.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**14,439.36**	m3	$ 25.00	$ 360,984.00	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	Included above
	1.2.3	EO Allowance for rock excavation works	**4,331.81**	m3	$ 45.00	$ 194,931.36	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 38,000.00	$ 38,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**12,581.50**	m2	$ 145.00	$ 1,824,317.50	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 170,880.00	$ 170,880.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,391.00**	LM	$ 45.00	$ 62,595.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**283.50**	m2	$ 80.00	$ 22,680.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	**1,279.00**	m2	$ 80.00	$ 102,320.00	Allow Cycle path (1.5m) wide and Dual cycle lanes (3.5m) wide
	3.2.3	Shared pathway	**0**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	**1,584.00**	m2	$ 20.00	$ 31,680.00	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**580.00**	LM	$ 200.00	$ 116,000.00	
	4.1.2	Drainage, sub grade drain	**580.00**	LM	$ 50.00	$ 29,000.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**14.00**	No.	$ 2,500.00	$ 35,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 300,000.00	$ 300,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**580.00**	LM	$ 10.00	$ 5,800.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**1,360.00**	m2	$ 2.00	$ 2,720.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**1,360.00**	m2	$ 25.00	$ 34,000.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**12**	No.	$ 8,500.00	$ 102,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	**-**	LM	$ -	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,598,347.86**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 116,946.31	
	11.2	VicRoads Fees	**1.00%**	Item		$ 35,983.48	
	11.3	Traffic Management	**5.00%**	Item		$ 179,917.39	
	11.4	Environmental Management	**0.50%**	Item		$ 17,991.74	
	11.5	Survey & Design	**5.00%**	Item		$ 179,917.39	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 323,851.31	
	11.7	Site Establishment	**2.50%**	Item		$ 89,958.70	
	11.8	Contingency	**20.00%**	Item		$ 719,669.57	
		SUB-TOTAL DELIVERY				**$ 1,664,235.89**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 5,262,583.75**	

Old Vinyard Road/Calder Fwy Ramps Intersection

SS_IT7 (Cross Intersection and T-Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	**14,106.00**	m2	$ 5.00	$ 70,530.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	**11,919.57**	m3	$ 25.00	$ 297,989.25	Assuming pavement composition depth total 650mm deep including fill
		1.2.2 Fill	**0**	m3	$ 35.00	$ -	
		1.2.3 EO Allowance for rock excavation works	**3,575.87**	m3	$ 45.00	$ 160,914.20	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
		1.3.1 Allow for site set out	**1**	Item	$ 38,000.00	$ 38,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	**10,743.00**	m2	$ 145.00	$ 1,557,735.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	**1**	Allow.	$ 141,060.00	$ 141,060.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	**1,771.00**	LM	$ 45.00	$ 79,695.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	**429.00**	m2	$ 80.00	$ 34,320.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
		3.2.2 Cycle pathway	**222.00**	m2	$ 160.00	$ 35,520.00	Allow Cycle path (1.5m) wide
		3.2.3 Shared pathway	**203.00**	LM	$ 250.00	$ 50,750.00	Allow (3.5m) wide
	3.3	Median strip					
		3.3.1 Median (Levelled ground - no plants)	**1,724.00**	m2	$ 20.00	$ 34,480.00	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage	**843.00**	LM	$ 200.00	$ 168,600.00	
		4.1.2 Drainage, sub grade drain	**843.00**	LM	$ 50.00	$ 42,150.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	**18.00**	No.	$ 2,500.00	$ 45,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signal for major cross intersection (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
		5.1.2 Traffic signal for minor T-intersection (incl. conduit subset)	**1**	Allow.	$ 150,000.00		Allowance for minor intersection traffic signals, conduits, pits and footings
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	**843.00**	LM	$ 10.00	$ 8,430.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	**988.00**	m2	$ 2.00	$ 1,976.00	Allowance of $2 per m2 to nature strip
		6.2.2 Nature strip	**988.00**	m2	$ 25.00	$ 24,700.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	**17**	No.	$ 8,500.00	$ 144,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,416,349.45**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 111,031.36	
	11.2	VicRoads Fees	**1.00%**	Item		$ 34,163.49	
	11.3	Traffic Management	**5.00%**	Item		$ 170,817.47	
	11.4	Environmental Management	**0.50%**	Item		$ 17,081.75	
	11.5	Survey & Design	**5.00%**	Item		$ 170,817.47	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 307,471.45	
	11.7	Site Establishment	**2.50%**	Item		$ 85,408.74	
	11.8	Contingency	**20.00%**	Item		$ 683,269.89	
		SUB-TOTAL DELIVERY				**$ 1,580,061.62**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 4,996,411.06**	

Lancefield Rd/Gellies Road Intersection
SS_IT8 (T-intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**13,780.00**	m2	$ 5.00	$ 68,900.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**11,644.10**	m3	$ 25.00	$ 291,102.50	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	Included above
	1.2.3	EO Allowance for rock excavation works	**3,493.23**	m3	$ 45.00	$ 157,195.35	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 30,000.00	$ 30,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**9,070.90**	m2	$ 145.00	$ 1,315,280.50	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 137,800.00	$ 137,800.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**842.00**	LM	$ 45.00	$ 37,890.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**388.50**	m2	$ 80.00	$ 31,080.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	**205.50**	m2	$ 80.00	$ 16,440.00	Allow Cycle path (1.5m) wide and Dual cycle lanes (3.5m) wide
	3.2.3	Shared pathway	**-**	LM	$ 250.00	$ -	
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	**3,205.00**	m2	$ 20.00	$ 64,100.00	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**670.00**	LM	$ 200.00	$ 134,000.00	
	4.1.2	Drainage, sub grade drain	**670.00**	LM	$ 50.00	$ 33,500.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**9.00**	No.	$ 2,500.00	$ 22,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 300,000.00	$ 300,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**670.00**	LM	$ 10.00	$ 6,700.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**910.10**	m2	$ 2.00	$ 1,820.20	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**910.10**	m2	$ 25.00	$ 22,752.50	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**14**	No.	$ 8,500.00	$ 119,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 2,870,061.05**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 93,276.98	
	11.2	VicRoads Fees	**1.00%**	Item		$ 28,700.61	
	11.3	Traffic Management	**5.00%**	Item		$ 143,503.05	
	11.4	Environmental Management	**0.50%**	Item		$ 14,350.31	
	11.5	Survey & Design	**5.00%**	Item		$ 143,503.05	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 258,305.49	
	11.7	Site Establishment	**2.50%**	Item		$ 71,751.53	
	11.8	Contingency	**20.00%**	Item		$ 574,012.21	
		SUB-TOTAL DELIVERY				**$ 1,327,403.24**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 4,197,464.29**	

Jacksons Creek Crossing (South)/ Buckland Way Intersection
SS_IT9 (ULTIMATE) (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
		1.1.1 Demolition and site preparation	**15,114.00**	m2	$ 5.00	$ 75,570.00	
	1.2	Earthworks					
		1.2.1 Cut and disposal at specified location	**-**	m3	$ 25.00	$ -	
		1.2.2 Fill	**-**	m3	$ 35.00	$ -	
		1.2.3 Cut and fill	**44,660.00**	m3	$ 40.00	$ 1,786,400.00	As guided by WSPPB with 10% additional factor
		1.2.4 EO Allowance for rock excavation works	**6,831.00**	m3	$ 45.00	$ 307,395.00	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable" (Based on cut volume previously provided by WSPPB)
	1.3	Set-Out					
		1.3.1 Allow for site set out	**1**	Item	$ 55,000.00	$ 55,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
		2.1.1 Road pavement - Traffic lanes	**6,913.60**	m2	$ 145.00	$ 1,002,472.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
		2.2.1 Pavement profiling and reshaping	**1**	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
		3.1.1 Kerb and channel	**2,384.00**	LM	$ 45.00	$ 107,280.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
		3.2.1 Pedestrian footpath	**1,788.00**	m2	$ 80.00	$ 143,040.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
		3.2.2 Cycle pathway	**2,026.40**	m2	$ 80.00	$ 162,112.00	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
		3.2.3 Shared pathway	**0**	m2	$ 250.00	$ -	Assumed not included in SS-RD4
	3.3	Median strip					
		3.3.1 Median (Levelled ground)	**1,788.00**	m2	$ 30.00	$ 53,640.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
		4.1.1 Stormwater drainage	**596.00**	LM	$ 200.00	$ 119,200.00	
		4.1.2 Drainage, sub grade drain	**596.00**	LM	$ 50.00	$ 29,800.00	
	4.2	Drainage - Pits					
		4.2.1 Side entry pits	**12**	No.	$ 2,500.00	$ 30,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
		5.1.1 Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
		5.2.1 Line marking and Traffic Signage	**596.00**	LM	$ 10.00	$ 5,960.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
		6.1.1 Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
		6.2.1 Tube stock plantings	**2,682.00**	m2	$ 2.00	$ 5,364.00	Allowance of $2 per m2 to nature strip
		6.2.2 Nature strip	**2,682.00**	m2	$ 25.00	$ 67,050.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
		7.1.1 Street lighting (incl. lighting conduits)	**12**	No.	$ 8,500.00	$ 102,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall (3-5m high)	**562.00**	LM	$ 980.00	$ 550,760.00	
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 5,083,043.00**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 165,198.90	
	11.2	VicRoads Fees	**1.00%**	Item		$ 50,830.43	
	11.3	Traffic Management	**5.00%**	Item		$ 254,152.15	
	11.4	Environmental Management	**0.50%**	Item		$ 25,415.22	
	11.5	Survey & Design	**5.00%**	Item		$ 254,152.15	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 457,473.87	
	11.7	Site Establishment	**2.50%**	Item		$ 127,076.08	
	11.8	Contingency	**20.00%**	Item		$ 1,016,608.60	
		SUB-TOTAL DELIVERY				**$ 2,350,907.39**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 7,433,950.39**	

Jacksons Creek Crossing/Fox Hollow Drive Intersection

SS_IT10 (ULTIMATE) (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**9,605.00**	m2	$ 5.00	$ 48,025.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**8,116.23**	m3	$ 25.00	$ 202,905.63	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	Included above
	1.2.3	EO Allowance for rock excavation works	**2,434.87**	m3	$ 45.00	$ 109,569.04	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 22,000.00	$ 22,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**3,862.80**	m2	$ 145.00	$ 560,106.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,332.00**	LM	$ 45.00	$ 59,940.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**999.00**	m2	$ 80.00	$ 79,920.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	**1,132.20**	m2	$ 80.00	$ 90,576.00	Two way Cycle path (1.7m) wide each side of the road. Total span (3.4m) wide
	3.2.3	Shared pathway	**0**	m2	$ 250.00	$ -	
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	**1,165.50**	m2	$ 30.00	$ 34,965.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**333.00**	LM	$ 200.00	$ 66,600.00	
	4.1.2	Drainage, sub grade drain	**333.00**	LM	$ 50.00	$ 16,650.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**7**	No.	$ 2,500.00	$ 17,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**333.00**	LM	$ 10.00	$ 3,330.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**1,498.50**	m2	$ 2.00	$ 2,997.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**1,498.50**	m2	$ 25.00	$ 37,462.50	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**7**	No.	$ 8,500.00	$ 59,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall (3-5m high)	**100.00**	LM	$ 980.00	$ 98,000.00	
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 1,990,046.16**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 64,676.50	
	11.2	VicRoads Fees	**1.00%**	Item		$ 19,900.46	
	11.3	Traffic Management	**5.00%**	Item		$ 99,502.31	
	11.4	Environmental Management	**0.50%**	Item		$ 9,950.23	
	11.5	Survey & Design	**5.00%**	Item		$ 99,502.31	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 179,104.15	
	11.7	Site Establishment	**2.50%**	Item		$ 49,751.15	
	11.8	Contingency	**20.00%**	Item		$ 398,009.23	
		SUB-TOTAL DELIVERY				**$ 920,396.35**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 2,910,442.51**	

Appendix 2: Cost Estimates – Lancefield Road

Jacksons Creek Crossing

LR_RD2 Approx. length: 2550m (excl. intersections and bridges)

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Pre-construction					
1.1.1	Demolition and site preparation	**87,533.60**	m2	$ 5.00	$ 437,668.00	
1.2	Earthworks					
1.2.1	Cut and disposal (CH253 - CH2000)	**95,141.20**	m3	$ 25.00	$ 2,378,530.00	For CH253-CH2000, volumes have been provided by WSPPB. Incl. additional 10% factor
1.2.2	Fill (CH253 - CH2000)	**49,646.30**	m3	$ 35.00	$ 1,737,620.50	For CH253-CH2000, volumes have been provided by WSPPB. Incl Additional 10% factor
1.2.3	Cut and disposal (CH2000 - CH3370)	**37,158.88**	m3	$ 25.00	$ 928,971.88	For CH2000-3370, have assumed pavement composition depth total of 650mm deep including fill
1.2.4	EO Allowance for rock excavation works	**39,690.02**	m3	$ 45.00	$ 1,786,051.01	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
1.3	Set-Out					
1.3.1	Allow for site set out	**1**	Item	$ 160,000.00	$ 160,000.00	
2	**ROAD PAVEMENT**					
2.1	New Pavement					
2.1.1	Road pavement - Traffic lanes	**30,368.80**	m2	$ 145.00	$ 4,403,476.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
2.2	Rehabilitate Existing Pavement					
2.2.1	Pavement profiling and reshaping	**-**	Allow.	$ -	$ -	Have assumed all new works.
3	**CONCRETE WORKS**					
3.1	Kerb and Channel					
3.1.1	Kerb and channel	**10,208.00**	LM	$ 45.00	$ 459,360.00	Kerb and channel to both sides of each traffic lane
3.2	Pedestrian & Cycle Paths					
3.2.1	Pedestrian footpath	**10,208.00**	m2	$ 80.00	$ 816,640.00	Pedestrian path to both sides of proposed road each (2.0m) wide. Total span (4.0m) wide
3.2.2	Cycle pathway	**8,676.80**	m2	$ 80.00	$ 694,144.00	Cycle path to both sides of proposed road, each (1.7m wide). Total span (3.4m) wide
3.2.3	Shared pathway	**-**	m2	$ -	$ -	Assumed not included in LR-RD2
3.3	Median strip					
3.3.1	Median (Levelled ground)	**15,312.00**	m2	$ 30.00	$ 459,360.00	Assume median (6.0m) to be levelled soil - no landscaping assumed
4	**DRAINAGE**					
4.1	Drainage - Pipes					
4.1.1	Stormwater drainage	**2,552.00**	LM	$ 200.00	$ 510,400.00	
4.1.2	Drainage, sub grade drain	**2,552.00**	LM	$ 50.00	$ 127,600.00	Inclusive of subsoil drainage
4.2	Drainage - Pits					
4.2.1	Side entry pits	**26**	No.	$ 2,500.00	$ 65,000.00	Assumed spacing of approx. 100m
4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**					
5.1	Traffic Signals					
5.1.1	Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	Excluded
5.2	Traffic Safety					
5.2.1	Line marking and Traffic Signage	**2,552.00**	LM	$ 10.00	$ 25,520.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**					
6.1	Trees					
6.1.1	Tree planting (2-2.5m tall)	**1**	Item	$ 5,000.00	$ 5,000.00	Allowance only
6.2	Landscaping					
6.2.1	Tube stock plantings	**22,968.00**	m2	$ 2.00	$ 45,936.00	Allowance of $2 per m2 to nature strip
6.2.2	Nature strip	**22,968.00**	m2	$ 25.00	$ 574,200.00	Topsoiling and seeding of nature strips (4.5m) to both sides. Total (9.0m) wide
7	**STREET LIGHTING**					
7.1	Street Lighting					
7.1.1	Street lighting (incl. lighting conduits)	**52**	No.	$ 8,500.00	$ 442,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
		-	LM	$ -	$ -	
8	**MISCELLANEOUS**					
8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
8.2	Retaining walls					
	8.2.1 Retaining wall	**-**	LM	$ -	$ -	Assume no retaining walls to LR-RD2
9	**SERVICES**					
9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
	SUB TOTAL - WORKS				**$ 16,057,477.39**	
10	**DELIVERY**					
	Fees					
10.1	Council Fees	**3.25%**	Item		$ 521,868.02	
10.2	VicRoads Fees	**1.00%**	Item		$ 160,574.77	
10.3	Traffic Management	**5.00%**	Item		$ 802,873.87	
10.4	Environmental Management	**0.50%**	Item		$ 80,287.39	
10.5	Survey & Design	**5.00%**	Item		$ 802,873.87	
10.6	Supervision & Project Management	**9.00%**	Item		$ 1,445,172.96	
10.7	Site Establishment	**2.50%**	Item		$ 401,436.93	
10.8	Contingency	**20.00%**	Item		$ 3,211,495.48	
	SUB-TOTAL DELIVERY				**$ 7,426,583.29**	
11	**TOTAL ESTIMATED PROJECT COST**				**$ 23,484,060.68**	

Balbethan Drive

LR_RD3 Approx. Length 550m (ex.intersection and bridges)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**15,892.00**	m2	$ 5.00	$ 79,460.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**13,428.74**	m3	$ 25.00	$ 335,718.50	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**-**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**4,028.62**	m3	$ 45.00	$ 181,287.99	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 25,000.00	$ 25,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**6,160.00**	m2	$ 145.00	$ 893,200.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**-**	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,100.00**	LM	$ 45.00	$ 49,500.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**1,650.00**	m2	$ 80.00	$ 132,000.00	Pedestrian path to both sides of proposed road each (1.5m) wide. Total span (3.0m) wide
	3.2.2	Cycle pathway	**1,650.00**	m2	$ 160.00	$ 264,000.00	Two way Cycle path. Total span (3m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included in LR-RD3
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	**-**	m2	$ 30.00	$ -	Assumed not included in LR-RD3
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**550.00**	LM	$ 200.00	$ 110,000.00	
	4.1.2	Drainage, sub grade drain	**550.00**	LM	$ 50.00	$ 27,500.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**6**	No.	$ 2,500.00	$ 15,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**-**	LM.	$ -	$ -	
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**550.00**	LM	$ 10.00	$ 5,500.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**7,990.00**	m2	$ 2.00	$ 15,980.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**7,990.00**	m2	$ 25.00	$ 199,750.00	Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**11**	No.	$ 8,500.00	$ 93,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ -	$ -	Assume no retaining walls to LR-RD3
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
		SUB TOTAL - WORKS				**$ 2,432,396.49**	
10	**DELIVERY**						
		Fees					
	10.1	Council Fees	**3.25%**	Item		$ 79,052.89	
	10.2	VicRoads Fees	**1.00%**	Item		$ 24,323.96	
	10.3	Traffic Management	**5.00%**	Item		$ 121,619.82	
	10.4	Environmental Management	**0.50%**	Item		$ 12,161.98	
	10.5	Survey & Design	**5.00%**	Item		$ 121,619.82	
	10.6	Supervision & Project Management	**9.00%**	Item		$ 218,915.68	
	10.7	Site Establishment	**2.50%**	Item		$ 60,809.91	
	10.8	Contingency	**20.00%**	Item		$ 486,479.30	
		SUB-TOTAL DELIVERY				**$ 1,124,983.38**	
11		**TOTAL ESTIMATED PROJECT COST**				**$ 3,557,379.87**	

Lancefield Road/Sunningdale Road Intersection
LR_IT1 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**18,096.00**	m2	$ 5.00	$ 90,480.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**15,291.12**	m3	$ 25.00	$ 382,278.00	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**4,587.34**	m3	$ 45.00	$ 206,430.12	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 40,000.00	$ 40,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**11,351.00**	m2	$ 145.00	$ 1,645,895.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 180,960.00	$ 180,960.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,114.00**	LM	$ 45.00	$ 50,130.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**723.00**	m2	$ 80.00	$ 57,840.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	**351.00**	m2	$ 80.00	$ 28,080.00	Allow Cycle path (1.5m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	**4,056.00**	m2	$ 20.00	$ 81,120.00	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**844.00**	LM	$ 200.00	$ 168,800.00	
	4.1.2	Drainage, sub grade drain	**844.00**	LM	$ 50.00	$ 42,200.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**12.00**	No.	$ 2,500.00	$ 30,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**844.00**	LM	$ 10.00	$ 8,440.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**1,615.00**	m2	$ 2.00	$ 3,230.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**1,615.00**	m2	$ 25.00	$ 40,375.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**17**	No.	$ 8,500.00	$ 144,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1.1	VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,680,758.12**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 119,624.64	
	11.2	VicRoads Fees	**1.00%**	Item		$ 36,807.58	
	11.3	Traffic Management	**5.00%**	Item		$ 184,037.91	
	11.4	Environmental Management	**0.50%**	Item		$ 18,403.79	
	11.5	Survey & Design	**5.00%**	Item		$ 184,037.91	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 331,268.23	
	11.7	Site Establishment	**2.50%**	Item		$ 92,018.95	
	11.8	Contingency	**20.00%**	Item		$ 736,151.62	
		SUB-TOTAL DELIVERY				**$ 1,702,350.63**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 5,383,108.75**	

Lancefield Road/Rolling Meadows Drive Intersection
LR_IT2 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**18,635.00**	m2	$ 5.00	$ 93,175.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**15,746.58**	m3	$ 25.00	$ 393,664.38	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**4,723.97**	m3	$ 45.00	$ 212,578.76	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 40,000.00	$ 40,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**12,836.50**	m2	$ 145.00	$ 1,861,292.50	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 186,350.00	$ 186,350.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,039.00**	LM	$ 45.00	$ 46,755.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**763.50**	m2	$ 80.00	$ 61,080.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	**387.00**	m2	$ 80.00	$ 30,960.00	Allow Cycle path (1.5m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	**2,847.00**	m2	$ 20.00	$ 56,940.00	Assumed levelled soil, future proofed for planting
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**770.00**	LM	$ 200.00	$ 154,000.00	
	4.1.2	Drainage, sub grade drain	**770.00**	LM	$ 50.00	$ 38,500.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**11.00**	No.	$ 2,500.00	$ 27,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**770.00**	LM	$ 10.00	$ 7,700.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**1,801.00**	m2	$ 2.00	$ 3,602.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**1,801.00**	m2	$ 25.00	$ 45,025.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**16**	No.	$ 8,500.00	$ 136,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
8.1	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
10.1	10.1.1	VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,875,122.64**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 125,941.49	
	11.2	VicRoads Fees	**1.00%**	Item		$ 38,751.23	
	11.3	Traffic Management	**5.00%**	Item		$ 193,756.13	
	11.4	Environmental Management	**0.50%**	Item		$ 19,375.61	
	11.5	Survey & Design	**5.00%**	Item		$ 193,756.13	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 348,761.04	
	11.7	Site Establishment	**2.50%**	Item		$ 96,878.07	
	11.8	Contingency	**20.00%**	Item		$ 775,024.53	
		SUB-TOTAL DELIVERY				**$ 1,792,244.22**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 5,667,366.86**	

Lancefield Road/Balbethan Drive Intersection

LR_IT3 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
		WORKS					
1		**SITEWORKS AND EARTHWORKS**					
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**16,946.00**	m2	$ 5.00	$ 84,730.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**14,319.37**	m3	$ 25.00	$ 357,984.25	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**4,295.81**	m3	$ 45.00	$ 193,311.50	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 40,000.00	$ 40,000.00	
2		**ROAD PAVEMENT**					
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**12,281.50**	m2	$ 145.00	$ 1,780,817.50	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 169,460.00	$ 169,460.00	Allowance only
3		**CONCRETE WORKS**					
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,049.00**	LM	$ 45.00	$ 47,205.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**762.00**	m2	$ 80.00	$ 60,960.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	**415.50**	m2	$ 80.00	$ 33,240.00	Allow Cycle path (1.5m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	**-**	m2	$ 20.00	$ -	
4		**DRAINAGE**					
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**930.00**	LM	$ 200.00	$ 186,000.00	
	4.1.2	Drainage, sub grade drain	**930.00**	LM	$ 50.00	$ 46,500.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**11.00**	No.	$ 2,500.00	$ 27,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5		**TRAFFIC**					
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**930.00**	LM	$ 10.00	$ 9,300.00	Includes fixed signage, guide posts, line markings, traffic safety
6		**LANDSCAPE**					
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**3,487.00**	m2	$ 2.00	$ 6,974.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**3,487.00**	m2	$ 25.00	$ 87,175.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7		**STREET LIGHTING**					
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**19**	No.	$ 8,500.00	$ 161,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8		**MISCELLANEOUS**					
8.1	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9		**SERVICES**					
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10		**MAINTENANCE**					
10.1	10.1.1	VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
			SUB TOTAL - WORKS			**$ 3,772,657.25**	
11		**DELIVERY**					
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 122,611.36	
	11.2	VicRoads Fees	**1.00%**	Item		$ 37,726.57	
	11.3	Traffic Management	**5.00%**	Item		$ 188,632.86	
	11.4	Environmental Management	**0.50%**	Item		$ 18,863.29	
	11.5	Survey & Design	**5.00%**	Item		$ 188,632.86	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 339,539.15	
	11.7	Site Establishment	**2.50%**	Item		$ 94,316.43	
	11.8	Contingency	**20.00%**	Item		$ 754,531.45	
			SUB-TOTAL DELIVERY			**$ 1,744,853.98**	
12			**TOTAL ESTIMATED PROJECT COST**			**$ 5,517,511.22**	

Lancefield Road/Jacksons Creek Crossing (North) Intersection
LR_IT4 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**16,805.00**	m2	$ 5.00	$ 84,025.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**14,200.23**	m3	$ 25.00	$ 355,005.63	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**4,260.07**	m3	$ 45.00	$ 191,703.04	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 40,000.00	$ 40,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**13,218.50**	m2	$ 145.00	$ 1,916,682.50	Includes pavement to Traffic lane (3.5m) and parking bay (2.1m) to both sides total width (11.2m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ 168,050.00	$ 168,050.00	Allowance only
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,434.00**	LM	$ 45.00	$ 64,530.00	Kerb and channel as per drawing outlined
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**624.00**	m2	$ 80.00	$ 49,920.00	Allow pedestrian path to both sides of proposed road each (1.5m) wide
	3.2.2	Cycle pathway	**532.50**	m2	$ 80.00	$ 42,600.00	Allow Cycle path (1.5m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground - no plants)	**722.00**	m2	$ 20.00	$ 14,440.00	
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**986.00**	LM	$ 200.00	$ 197,200.00	
	4.1.2	Drainage, sub grade drain	**986.00**	LM	$ 50.00	$ 49,300.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**15.00**	No.	$ 2,500.00	$ 37,500.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**986.00**	LM	$ 10.00	$ 9,860.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**1,708.00**	m2	$ 2.00	$ 3,416.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**1,708.00**	m2	$ 25.00	$ 42,700.00	Allow for total (3m) wide. Topsoiling and seeding of nature strips, varying in widths
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**20**	No.	$ 8,500.00	$ 170,000.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1	8.1.1 Speed cameras	**-**	Item	$ -	$ -	Excluded
		8.1.2 Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
		8.2.1 Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1	10.1.1 VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,916,932.16**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 127,300.30	
	11.2	VicRoads Fees	**1.00%**	Item		$ 39,169.32	
	11.3	Traffic Management	**5.00%**	Item		$ 195,846.61	
	11.4	Environmental Management	**0.50%**	Item		$ 19,584.66	
	11.5	Survey & Design	**5.00%**	Item		$ 195,846.61	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 352,523.89	
	11.7	Site Establishment	**2.50%**	Item		$ 97,923.30	
	11.8	Contingency	**20.00%**	Item		$ 783,386.43	
		SUB-TOTAL DELIVERY				**$ 1,811,581.13**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 5,728,513.29**	

Racecourse Road/Jacksons Creek Crossing (North) Intersection
LR_IT5 (Cross Intersection)

Item		Description	Quantity	Unit	Rate	Amount	Comments
	WORKS						
1	**SITEWORKS AND EARTHWORKS**						
	1.1	Pre-construction					
	1.1.1	Demolition and site preparation	**11,376.00**	m2	$ 5.00	$ 56,880.00	
	1.2	Earthworks					
	1.2.1	Cut and disposal at specified location	**9,612.72**	m3	$ 25.00	$ 240,318.00	Assuming pavement composition depth total 650mm deep including fill
	1.2.2	Fill	**0**	m3	$ 35.00	$ -	
	1.2.3	EO Allowance for rock excavation works	**2,883.82**	m3	$ 45.00	$ 129,771.72	EO allowance of encountering rock to 30% of excavated area. Based on limited geotech information, which states" that some rock everywhere, but breakable"
	1.3	Set-Out					
	1.3.1	Allow for site set out	**1**	Item	$ 32,000.00	$ 32,000.00	
2	**ROAD PAVEMENT**						
	2.1	New Pavement					
	2.1.1	Road pavement - Traffic lanes	**9,830.00**	m2	$ 145.00	$ 1,425,350.00	Includes pavement to Traffic lane (3.5m) and parking bay (2.3m) to both sides total width (11.6m)
	2.2	Rehabilitate Existing Pavement					
	2.2.1	Pavement profiling and reshaping	**1**	Allow.	$ -	$ -	Assume all new works.
3	**CONCRETE WORKS**						
	3.1	Kerb and Channel					
	3.1.1	Kerb and channel	**1,914.00**	LM	$ 45.00	$ 86,130.00	Kerb and channel to both sides of each traffic lane
	3.2	Pedestrian & Cycle Paths					
	3.2.1	Pedestrian footpath	**1,000.00**	m2	$ 80.00	$ 80,000.00	Pedestrian path to both sides of proposed road each (2.0m) wide. Total span (4.0m) wide
	3.2.2	Cycle pathway	**875.00**	m2	$ 80.00	$ 70,000.00	Cycle path to both sides of proposed road, each (1.7m wide). Total span (3.4m) wide
	3.2.3	Shared pathway	**-**	m2	$ 250.00	$ -	Assumed not included
	3.3	Median strip					
	3.3.1	Median (Levelled ground)	**1,500.00**	m2	$ 30.00	$ 45,000.00	Assume median (6.0m) to be levelled soil - no landscaping assumed
4	**DRAINAGE**						
	4.1	Drainage - Pipes					
	4.1.1	Stormwater drainage	**707.00**	LM	$ 200.00	$ 141,400.00	
	4.1.2	Drainage, sub grade drain	**707.00**	LM	$ 50.00	$ 35,350.00	
	4.2	Drainage - Pits					
	4.2.1	Side entry pits	**8**	No.	$ 2,500.00	$ 20,000.00	Assumed spacing of approx. 100m
	4.3	Drainage - WSUD	**-**	Allow.	$ -	$ -	Excluded
	4.4	Drainage - Miscellaneous	**-**	No.	$ -	$ -	Assumed none.
5	**TRAFFIC**						
	5.1	Traffic Signals					
	5.1.1	Traffic signals (incl. conduit subset)	**1**	Allow.	$ 400,000.00	$ 400,000.00	Rate includes for signals, conduits, pits, footings etc.
	5.2	Traffic Safety					
	5.2.1	Line marking and Traffic Signage	**707.00**	LM	$ 10.00	$ 7,070.00	Includes fixed signage, guide posts, line markings, traffic safety
6	**LANDSCAPE**						
	6.1	Trees					
	6.1.1	Tree planting (2-2.5m tall)	**1**	No.	$ 5,000.00	$ 5,000.00	Allowance only
	6.2	Landscaping					
	6.2.1	Tube stock plantings	**2,250.00**	m2	$ 2.00	$ 4,500.00	Allowance of $2 per m2 to nature strip
	6.2.2	Nature strip	**2,250.00**	m2	$ 25.00	$ 56,250.00	Topsoiling and seeding of nature strips (4.5m) to both sides. Total (9.0m) wide
7	**STREET LIGHTING**						
	7.1	Street Lighting					
	7.1.1	Street lighting (incl. lighting conduits)	**15**	No.	$ 8,500.00	$ 127,500.00	Assume install poles 12m high with luminaries placed every 50m (roads) to one side. Rate includes for electrical lighting conduits
8	**MISCELLANEOUS**						
	8.1.1	Speed cameras	**-**	Item	$ -	$ -	Excluded
	8.1.2	Speed bumps	**-**	No.	$ -	$ -	Excluded
	8.2	Retaining walls					
	8.2.1	Retaining wall	**-**	LM	$ 650.00	$ -	Assume no retaining walls to LR-RD2
9	**SERVICES**						
	9.1	Services Relocation	**-**	Allow.	$ -	$ -	Excluded
	9.2	Services Protection	**-**	Allow.	$ -	$ -	Excluded
10	**MAINTENANCE**						
	10.1.1	VicRoads maintenance fee	**1**	No.	$ 75,000.00	$ 75,000.00	Allowance for VicRoads maintenance fee to each intersection, as advised by WSPPB
		SUB TOTAL - WORKS				**$ 3,037,519.72**	
11	**DELIVERY**						
		Fees					
	11.1	Council Fees	**3.25%**	Item		$ 98,719.39	
	11.2	VicRoads Fees	**1.00%**	Item		$ 30,375.20	
	11.3	Traffic Management	**5.00%**	Item		$ 151,875.99	
	11.4	Environmental Management	**0.50%**	Item		$ 15,187.60	
	11.5	Survey & Design	**5.00%**	Item		$ 151,875.99	
	11.6	Supervision & Project Management	**9.00%**	Item		$ 273,376.77	
	11.7	Site Establishment	**2.50%**	Item		$ 75,937.99	
	11.8	Contingency	**20.00%**	Item		$ 607,503.94	
		SUB-TOTAL DELIVERY				**$ 1,404,852.87**	
12		**TOTAL ESTIMATED PROJECT COST**				**$ 4,442,372.59**	

APPENDIX B : AQUENTA COST ESTIMATE REPORT: BRIDGES

REPORT

AQUENTA
A Jacobs Company

VPA INFRASTRUCTURE COSTINGS – SUNBURY STH & LANCEFIELD RD PSP : BRIDGES

Cost Estimates and Report
April 2017

DOCUMENT TITLE: **VPA INFRASTRUCTURE COSTINGS – SUNBURY STH & LANCEFIELD RD PSP : BRIDGES**

PROJECT REFERENCE: **316056**

PURPOSE OF ISSUE: **Cost Report**

Correspondence:

Aquenta Consulting Pty Ltd
Level 11, 452 Flinders Street
Melbourne VIC 3000

PO Box 312 Flinders Lane
Melbourne VIC 8009

Tel + 61 3 8668 3000
melbourne@aquenta.com.au

ISSUE	DESCRIPTION OF AMENDMENT	AUTHOR	CHECKED	APPROVED	DATE
1	Draft Report	JK	SB	SB	29/11/16
2	Final Report – incl. VPA comments	SB	SB	SB	15/03/17
3	Final Report – incl. LR-BD1	MD	SB	SB	12/04/17

Previous issues of this document shall be destroyed or marked SUPERSEDED.

CONTENTS

1	Executive Summary	4
2	Scope of Project	4
3	Drawings and Information Used	4
4	Cost Estimate Summary	5
5	Specific Inclusions	5
6	Specific Exclusions	5
7	Assumptions	6
Appendix 1:		
	Cost Estimates	

1 Executive Summary

This Cost Estimate Report has been prepared by Aquenta Consulting for the Victorian Planning Authority in relation to the Sunbury South and Lancefield Rd PSP Infrastructure project cost estimate.

The estimated Total Project Cost of each bridge areas are:

SUNBURY SOUTH

- 1 No. Bridge (SS-BD4 Long Option) $17,400,970.62 excl. GST

LANCEFIELD ROAD

- 1 No. Bridge (LR-DB1) $36,051,770.14 excl. GST
- 1 No. Bridge (LR-BD4) $1,022,251.28 excl. GST

2 Scope of Project

WSP Parsons Brinckerhoff have been engaged by the Victorian Planning Authority (VPA) to undertake an infrastructure costing study for infrastructure projects in the Sunbury South and Lancefield Road Precinct Structure Plans (PSPs). This study includes individual segmented roads and intersections to support and facilitate future population growth in Sunbury. Further the proposed road and intersection developments, there are numerous bridge proposals throughout the span of Sunbury South and Lancefield road.

As part of that scope of works Aquenta is required to provide high level cost estimates for the proposed three bridges that were evaluated and estimated were SS-BD1 (long option) spanning approximately 315m, LR-BD1 spanning approximately 560m, and LR-BD4 (culvert).

3 Drawings and Information Used

These high level Cost Estimates has been prepared on the basis of the following documentation:

- Drawings – MPA Sunbury South and Lancefield Road PSP – 1 to 74 pages
- Indicative retaining wall heights marked up provided by WSP Parsons Brinckerhoff (16.11.2016)
- Approximate bulk earthwork excavation and fill (SS-RD4, SS-RD9, SS-RD5, SS-IT9) provided by WSP Parsons Brinckerhoff (9.11.2016)
- Drawings – 0401 to 0403 Jackson Creek Bridge (LR-BD1) Rev A (29.03.2017)

4 Cost Estimate Summary

The table below summarises the cost estimate for each bridge.

DESCRIPTION	CONSTRUCTION WORKS $ (Excl. GST)	TOTAL PROJECT COST $ (Excl. GST)
SS-BD1 (Long option)	$11,898,099.57	$17,400,970.62
LR-BD1	$24,650,783.00	$36,051,770.14
LR-BD4	$699,159.85	$1,022,521.28

Refer to Appendix 1 for a full breakdown of the cost estimates.

5 Specific Inclusions

The cost estimates includes allowances for the following:

- Council Fees
- VicRoads Fees
- Traffic management
- Environmental management
- Survey & Design
- Supervision & Project management
- Site establishment (Preliminaries)
- Project contingency
- Contractor overheads and margins / Inherent risks

6 Specific Exclusions

Below is a list of exclusions that apply to the Cost Estimates for the Options:

- GST
- Legal & holding costs

- Other authority costs and fees
- Adverse ground conditions
- Additional allowances for removal of any Contamination / Hazardous Materials
- Any other electrical and lighting costs other than the included in the cost estimate
- Services relocations
- Soft landscaping maintenance
- Escalation
- WSUD Drainage

7 Assumptions

The following assumptions have been taken into consideration within each high level cost estimate:

- The cost estimates assume a traditional lump sum competitively tendered procurement method.
- The cost estimates are based on carrying out the works during normal working hours.
- The cost estimates assume road works outside the alignments for each option are excluded.
- Aquenta has used a VPA provided template for our cost estimates.
- Aquenta has not received any cut and fill quantities, and therefore we have made an allowance based on best estimates.
- Aquenta have now assumed to have lighting poles are placed at each pier for bridges and one to either end of bridge. We have assumed 12m high poles with luminaires at $8,500 per pole.
- Aquenta notes that at this stage, all structural rates are high level allowances based on concept drawings. We anticipate adjustments to structural rates upon further structural design developments.
- The rates used in the cost estimates are based on recent project data and benchmarked rates for concept cost estimates for projects of a similar nature in the Melbourne region.
- The cost estimates are based on the information provided to Aquenta and our knowledge of similar projects.
- All other assumptions have been noted in the cost estimates for each option.

Appendix 1: Cost Estimates

SS-BD 1 (Long Option)
Approx. length 315m

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Pre-construction					
1.1.1	Site preparation	1	Item	$ 566,576.17	$ 566,576.17	Provisional allowance only. 5% allowance
1.2	Earthworks					
1.2.1	Bulk excavation and fill	1	Item	$ -	$ -	TBC
1.2.2	Rock beaching	565.20	m3	$ 100.00	$ 56,520.00	Allow for stone beaching (300mm deep crushed rock on top of bitumus fabric)
1.2.3	Compacted fill		m2	$ -	$ -	Included above
1.3	Set-Out					
1.3.1	Allow for site setout and marking	1.00	Item	$ -	$ -	Included 'Site Establishment'
2	**BRIDGE**					
2.1	Structure					
2.1.1	Allow for reinforced single span concrete bridge (Total width 13.5m approx. 4m deep)	4,252.50	m2	$ 1,900.00	$ 8,079,750.00	200mm thick deck slab on top of super T-Beams (including kerb and channel works) 6No. 1800mm deep Super T beams. Total length 315m long Including Precast reinforced concrete cross head with Anti-sliding block
2.1.2	Precast reinforced concrete segments	229.00	LM	$ 1,800.00	$ 412,200.00	Varying heights total approx. LM (229m)
2.1.3	Driven piles (Piers)	80.00	no	$ 3,584.70	$ 286,776.00	Approx. number of driven piles
2.1.4	Bored piles (Abutment)	8.00	no	$ 9,712.80	$ 77,702.40	Bored piles behind RC retaining wall, diameter to be confirmed
2.1.5	Pier pile cap (Total 168m3)	8.00	no	$ 31,950.00	$ 255,600.00	Allow pile cap dimension (1400mmX600mmX 2500mm deep)
2.1.6	Concrete approach slab	108.00	m2	$ 500.00	$ 54,000.00	Assume 200mm thick 4m long approach slab
2.2	Bridge Safety Rail					
2.2.1	Handrails	646.00	LM	$ 350.00	$ 226,100.00	Allowance only (not shown on drawings)
2.2.2	Guard rails	0.00	LM	$ -	$ -	
2.2.3	Bridge barrier	646.00	LM	$ 450.00	$ 290,700.00	Medium level barriers
3	**ROAD PAVEMENT**					
3.1	New Pavement					
3.1.1	Road pavement - Traffic lane	2,205.00	m2	$ 145.00	$ 319,725.00	Allow Traffic lane (7m) wide
3.1.2	Shared path	1,260.00	m2	$ 250.00	$ 315,000.00	Shared path overlay total (4m) wide
3.1.3	Path	787.50	m2	$ 80.00	$ 63,000.00	Path overlay total (2.5m) wide
3.2	Rehabilitate Existing Pavement					
3.2.1	Excluded	0.00	Allow.	$ -	$ -	Assumed excluded
4	**OFF- ROAD WORKS**					
4.1	Kerb and Channel					
4.1.1	Kerb and channel	0.00	LM	$ -	$ -	
5	**DRAINAGE**					
5.1	Drainage Pipes	0.00	LM	$ -	$ -	Assumed water run off
5.2	Drainage Pits	0.00	No.	$ -	$ -	Assumed water run off
5.3	Drainage - Works to approach slabs	2	No.	$ 150,000.00	$ 300,000.00	Allow drainage works surrounding approach slabs
6	**TRAFFIC**					
6.1	Traffic Safety	1	Allow.	$ 50,000.00	$ 50,000.00	Allowance only
7	**LANDSCAPE**					
7.1	Trees	1	Allow.	$ -	$ -	Excluded
7.2	Landscaping	1	Allow.	$ -	$ -	Excluded
7.3	Topsoil	1	Allow.	$ -	$ -	Excluded
8	**LIGHTING**					
8.1	Lighting on-bridge	10	No.	$ 8,500.00	$ 85,000.00	As no details provided on extent of lighting on bridge, assumed poles 12m high with luminaries, and assumed one pole per pier and one to either end of bridge
9	**MISCELLANEOUS**					
9.1	Linemarking	945.00	m	$ 10.00	$ 9,450.00	
9.2	Signage	1	Item	$ 50,000.00	$ 50,000.00	
9.3	Dewatering works	1	Item	$ 250,000.00	$ 250,000.00	Allowance for dewatering works
10	**SERVICES**					
10.1	Services relocation	1	Item	$ 150,000.00	$ 150,000.00	Allowances for service relocation surrounding approach slabs
10.2	Services on-bridge		Item	$ -	$ -	N/A
	SUB TOTAL - WORKS				**$ 11,898,099.57**	
11	**DELIVERY**					
11.1	Council Fees	3.25%	Item		$ 386,688.24	
11.2	VicRoads Fees	1.00%	Item		$ 118,981.00	
11.3	Traffic Management	5.00%	Item		$ 594,904.98	
11.4	Environmental Management	0.50%	Item		$ 59,490.50	
11.5	Survey & Design	5.00%	Item		$ 594,904.98	
11.6	Supervision & Project Management	9.00%	Item		$ 1,070,828.96	
11.7	Site Establishment	2.50%	Item		$ 297,452.49	
11.8	Contingency	20.00%	Item		$ 2,379,619.91	
	SUB TOTAL - DELIVERY				**$ 5,502,871.05**	
	TOTAL				**$ 17,400,970.62**	

LR-BD 1 - Bridge
Approx. length 560m

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Pre-construction					
1.1.1	Site preparation	1	Item	$ 1,194,006.52	$ 951,758.10	Provisional allowance only. 5% allowance
1.2	Earthworks					
1.2.1	Bulk excavation and fill	1	Item	$ -	$ -	TBC
1.2.2	Rock beaching	563	m3	$ 100.00	$ 56,310.00	Allow for stone beaching (300mm deep crushed rock on top of bitumus fabric)
1.3	Set-Out					
1.3.1	Allow for site setout and marking	1.00	Item	$ -	$ -	Included 'Site Establishment'
2	**BRIDGE**					
2.1	Structure					
2.1.1	Allow for reinforced single span concrete bridge (Total width 15.5m approx. 4m deep)	8,680.00	m2	$ 1,900.00	$ 16,492,000.00	200mm thick composite in-situ deck slab on top of super T-Beams (including kerb and channel works) 6No. 1800mm deep Super T beams. Total length 560m long Including Precast reinforced concrete cross head with Anti-sliding block
2.1.2	Precast reinforced concrete segments	426.00	LM	$ 1,800.00	$ 766,800.00	Varying heights total approx. Varying heights total to 426m and assumed 2 segments per height measured.
2.1.3	Driven piles (Piers)	75.00	no	$ 3,584.70	$ 268,852.50	Approx. number of driven piles (assumed 5 per pier)
2.1.4	Bored piles (Abutment)	8.00	no	$ 9,712.80	$ 77,702.40	Bored piles behind RC retaining wall, diameter to be confirmed (assumed 4 pier abutment)
2.1.5	Pier pile cap (Total 156m3)	15.00	no	$ 167,808.00	$ 2,517,120.00	Allow pile cap dimension (13000mmX5000mmX 2400mm deep)
2.1.6	Concrete approach slab	124.00	m2	$ 500.00	$ 62,000.00	Assume 4m long approach RC slab at each abutment (assumed also 200mm thick)
2.1.7	RC Retaining wall to abutment 5.7m high	15.50	m	$ 1,700.00	$ 26,350.00	
	RC Retaining wall to abutment 2.5m high	15.50	m	$ 980.00	$ 15,190.00	
2.1.8	Footing to Abutments	1,054.00	m3	$ 150.00	$ 158,100.00	
2.2	Bridge Safety Rail					
2.2.1	Handrails	1,136.00	LM	$ 350.00	$ 397,600.00	Allowance only (not shown on drawings)
2.2.2	Guard rails	0.00	LM	$ -	$ -	
2.2.3	Bridge barrier	1,136.00	LM	$ 450.00	$ 511,200.00	Medium performance level barriers
3	**ROAD PAVEMENT**					
3.1	New Pavement					
3.1.1	Road pavement - Traffic lane	5,600.00	m2	$ 145.00	$ 812,000.00	Allow Traffic lane (total 7m) wide and shoulder to road (total 3m)
3.1.2	Shared path	1,960.00	m2	$ 250.00	$ 490,000.00	Shared path overlay total (3m) wide and shoulder to shared path (0.5m), incl. forming of scupper drain
3.1.3	Path	1,120.00	m2	$ 80.00	$ 89,600.00	Path overlay total (2m) wide
4	**OFF- ROAD WORKS**					
4.1	Kerb and Channel					
4.1.1	Kerb and channel		LM	$ -	$ -	
5	**DRAINAGE**					
5.1	Drainage Pipes		LM	$ -	$ -	Assumed water run off
5.2	Drainage Pits	1	No.	$ 2,500.00	$ 2,500.00	Assumed water run off
5.3	Drainage - Works to approach slabs	2	No.	$ 150,000.00	$ 300,000.00	Allow drainage works surrounding approach slabs
6	**TRAFFIC**					
6.1	Traffic Safety	1	Allow.	$ 100,000.00	$ 100,000.00	Allowance for signage, indicators
7	**LANDSCAPE**					
7.1	Trees	1	Allow.	$ -	$ -	Excluded
7.2	Landscaping	1	Allow.	$ -	$ -	Excluded
7.3	Topsoil	1	Allow.	$ -	$ -	Excluded
8	**LIGHTING**					
9.1	Lighting on-bridge	17	No.	$ 8,500.00	$ 144,500.00	As no details provided on extent of lighting on bridge, assumed poles 12m high with luminaries, and assumed one pole per pier and one to either end of bridge
9	**MISCELLANEOUS**					
9.1	Linemarking	1,120.00	m	$ 10.00	$ 11,200.00	Allow for both sides
9.2	Dewatering works	1	Item	$ 250,000.00	$ 250,000.00	Allowance for dewatering works
10	**SERVICES**					
10.1	Services relocation	1	Item	$ 150,000.00	$ 150,000.00	Allowances for service relocation surrounding approach slabs
10.2	Services on-bridge		Item	$ -	$ -	N/A
	SUB TOTAL - WORKS				**$ 24,650,783.00**	
11	**DELIVERY**					
12.1	Council Fees	3.25%	Item		$ 801,150.45	
12.2	VicRoads Fees	1.00%	Item		$ 246,507.83	
12.3	Traffic Management	5.00%	Item		$ 1,232,539.15	
12.4	Environmental Management	0.50%	Item		$ 123,253.92	
12.5	Survey & Design	5.00%	Item		$ 1,232,539.15	
12.6	Supervision & Project Management	9.00%	Item		$ 2,218,570.47	
12.7	Site Establishment	2.50%	Item		$ 616,269.58	
12.8	Contingency	20.00%	Item		$ 4,930,156.60	
	SUB TOTAL - DELIVERY				**$ 11,400,987.14**	
12	**TOTAL**				**$ 36,051,770.14**	

LR-BD4
Approx. Length 12m

Item	Description	Quantity	Unit	Rate	Amount	Comments
	WORKS					
1	**SITEWORKS AND EARTHWORKS**					
1.1	Pre-construction					
1.1.1	Site preparation	1	Item	$ 33,293.33	$ 33,293.33	Provisional allowance only 5% allowance
1.2	Earthworks					
1.2.1	Bulk excavation and fill	1	Item	$ -	$ -	TBC
1.2.2	Rock beaching	273.00	m3	$ 100.00	$ 27,300.00	500mm min rock size 1:5 gradient
1.2.3	Compacted fill	124.65	m2	$ 50.00	$ 6,232.38	Min 100 freeboard fill allowance
1.3	Set-Out					
1.3.1	Allow for site setout and marking	1.00	Item	$ -	$ -	Included 'Site Establishment'
2	**BRIDGE**					
2.1	Structure					
2.1.1	Concrete slab base	102.95	m3	$ 841.52	$ 86,638.14	Cast in-situ reinforced concrete slab with concrete slab edge beam (Allow for 200mm thk slab. Approx. 33000mm X 13000mm wide slab)
2.1.2	Pre-cast RC 2100x900 box culvert	118.71	LM	$ 3,500.00	$ 415,492.00	Including allowance for end walls
2.1.3	Pre-cast reinforced wingwall	4.00	no.	$ 2,000.00	$ 8,000.00	
2.1.4	Pre-cast end wall	20.00	LM	$ 750.00	$ 15,000.00	Including allowance for end walls
2.2	Bridge Safety Rail					
2.2.1	Handrails	39.00	LM	$ 350.00	$ 13,650.00	
2.2.2	Guard rails	24.00	LM	$ 450.00	$ 10,800.00	
3	**ROAD PAVEMENT**					
3.1	New Pavement					
3.1.1	Road pavement - Traffic lane	90.00	m2	$ 145.00	$ 13,050.00	
3.1.2	Shared path	43.20	m2	$ 250.00	$ 10,800.00	
3.1.3	Path	24.00	m2	$ 80.00	$ 1,920.00	
3.2	Rehabilitate Existing Pavement					
3.2.1	Excluded	0.00	Allow.	$ -	$ -	Assumed excluded
4	**OFF- ROAD WORKS**					
4.1	Kerb and Channel					
4.1.1	Kerb and channel	24.00	LM	$ 45.00	$ 1,080.00	
5	**DRAINAGE**					
5.1	Drainage Pipes	12.00	LM	$ 200.00	$ 2,400.00	Drainage allowance to rock beaching areas
5.2	Drainage Pits	2.00	No.	$ 2,500.00	$ 5,000.00	Drainage allowance to rock beaching areas
5.3	Drainage - miscellaneous	0.00	LM	$ -	$ -	Excluded
6	**TRAFFIC**					
6.1	Traffic Safety	1	Allow.	$ 25,000.00	$ 25,000.00	
7	**LANDSCAPE**					
7.1	Trees	1	Allow.	$ -	$ -	N/A
7.2	Landscaping	1	Allow.	$ -	$ -	N/A
7.3	Topsoil	1	Allow.	$ -	$ -	N/A
8	**LIGHTING**					
8.1	Lighting on-bridge	1	No.	$ 20,000.00	$ 20,000.00	As no details provided on extent of lighting on bridge, assumed poles 12m high with luminaries, and assumed to poles to either end of bridge
9	**MISCELLANEOUS**					
9.1	Linemarking	36.00	m2	$ 10.00	$ 360.00	
9.2	Signage	157.20	m2	$ 20.00	$ 3,144.00	
10	**SERVICES**					
10.1	Services relocation		Item	$ -	$ -	N/A
10.2	Services on-bridge		Item	$ -	$ -	N/A
	SUB TOTAL - WORKS				**$ 699,159.85**	
11	**DELIVERY**					
11.1	Council Fees	3.25%	Item		$ 22,722.70	
11.2	VicRoads Fees	1.00%	Item		$ 6,991.60	
11.3	Traffic Management	5.00%	Item		$ 34,957.99	
11.4	Environmental Management	0.50%	Item		$ 3,495.80	
11.5	Survey & Design	5.00%	Item		$ 34,957.99	
11.6	Supervision & Project Management	9.00%	Item		$ 62,924.39	
11.7	Site Establishment	2.50%	Item		$ 17,479.00	
11.8	Contingency	20.00%	Item		$ 139,831.97	
	SUB TOTAL - DELIVERY				**$ 323,361.43**	
	TOTAL				**$ 1,022,521.28**	

APPENDIX C : AQUENTA COST ESTIMATE REPORT: REPORT REVIEWS

REPORT

AQUENTA
A Jacobs Company

VPA INFRASTRUCTURE COSTINGS – SUNBURY STH & LANCEFIELD RD PSP : REPORT REVIEWS

Cost Estimates and Report
March 2017

DOCUMENT TITLE: **VPA INFRASTRUCTURE COSTINGS – SUNBURY STH & LANCEFIELD RD PSP : REPORT REVIEWS**

PROJECT REFERENCE: **316056**

PURPOSE OF ISSUE: **Cost Report**

Correspondence:

Aquenta Consulting Pty Ltd
Level 2, 500 Collins Street
Melbourne VIC 3000

Tel + 61 3 8535 6000
melbourne@aquenta.com.au

ISSUE	DESCRIPTION OF AMENDMENT	AUTHOR	CHECKED	APPROVED	DATE
1	Draft Report	JK	SB	SB	30/11/16
2	Final Report – incl. VPA comments	SB	SB	SB	15/03/17

Previous issues of this document shall be destroyed or marked SUPERSEDED.

CONTENTS

1 Executive Summary 4

2 Scope of Projects 4

2.1 Scope for SS-BD1 Option E Long, Connector 4

2.1.1 Review and comments on cost estimates 5

2.2 Scope for SS-BD2 – Aurecon: project C (Harpers Creek Connector Rd Crossing [E]) 5

2.2.1 Review and comments on cost estimates 6

2.3 Scope for SS-BD3 – Aurecon: project B (Harpers Creek Connector Rd Crossing [W]) 6

2.3.1 Review and comments on cost estimates 6

2.4 Scope for SS-BD4 – Aurecon: project A (Subury south rail grade separation) 7

2.4.1 Review and comments on cost estimates 8

2.5 Scope for LR-BD2 – Aurecon: project E (Lancefield road Southern grade separation) 8

2.5.1 Review and comments on cost estimates 9

2.6 Scope for LR-BD3 – Aurecon: project D (Lancefield road Northern grade separation) 9

2.6.1 Review and comments on cost estimates 9

3 Report exclusions and clarifications: 10

4 Drawings and Information Used 10

5 Cost Estimate Summary 11

6 Specific Inclusions 11

7 Specific Exclusions 12

8 Assumptions 12

Appendix 1:

Cost Estimate 13

1 Executive Summary

This Cost Estimate Report has been prepared by Aquenta Consulting, in review of existing cost estimates carried out by Aurecon and GTA. The reports by Aurecon and GTA were carried out for the Victorian Planning Authority (formally known as the Metropolitan Planning Authority) in relation to the Sunbury South and Lancefield road PSP Infrastructure project cost estimate. Aquenta's specific task was to review cost estimates of select bridges and culverts along Sunbury South and Lancefield road.

The bridges and culverts reviewed included:

GTA Reports:

- SS-BD1 (Option E – Long, Connector)

Aurecon Reports:

- SS-BD2 (Project C)
- SS-BD3 (Project B)
- SS-BD4 (Project A)
- LR-BD2 (Project E)
- LR-BD3 (Project D)

2 Scope of Projects

WSP Parsons Brinckerhoff have been engaged by the Victorian Planning Authority (VPA) to undertake an infrastructure costing study for infrastructure projects in the Sunbury South and Lancefield Road Precinct Structure Plans (PSPs). Part of this project includes numerous bridges and culverts throughout the proposed development. Aurecon and GTA were previously engaged to carry out a feasibility study report of the proposed development for roads, bridges and culverts. Aquenta was requested by WSP to review the bridge cost estimates provided by both GTA and Aurecon.

The reports (Aurecon and GTA) provided by WSP analysed and studied landscape properties, earthwork analysis for bulk excavation and fill, in addition to preliminary bridge and culvert designs.

2.1 SCOPE FOR SS-BD1 OPTION E LONG, CONNECTOR

The bridge assessed by Aquenta from GTA's report included SS-BD1 (Option E long) Connector, and LR-BD1 (Option B) Connector which has yet to be reviewed.

As per GTA's report (Ref Table 7.13), the broad level costing for the Connector level road (long option) was estimated in the order of $19,250,000 (excl. GST) for a 350m long span, with proposed width of 11m wide Connector Bridge. The estimate outlined by GTA reflects a rate of $5,000 per square, which is within the benchmark rate of $3,500 - $5,000 per square meter as advised by Pit & Sherry (Ref 4.2 Indicative costs. Dated 26 September 2016).

The anticipated cost of $19.2m provided by GTA takes into the following bridge design considerations and allowances:

- Precast prestressed concrete Super-T beams (simply supported) .
- 180mm thick cast insitu reinforced concrete deck with asphalt surfacing.
- Medium performance level traffic barriers (to AS5100 standard).
- Cast insitu abutments (including sill beams, fender walls and wingwalls).
- Spill through batters with rock beaching.
- Cast in-situ pier columns and crossheads.
- Precast matchcast segment concrete blocks for piers.
- Bulk excavation and fill quantities of 71,000m3 outlined as per GTA's report (Ref Table 5.1 in GTA's Report).

2.1.1 Review and comments on cost estimates

Based on the evaluation and review of the estimated cost for SS-BD1 by GTA, the square metre rate of $5,000/m2 for the proposed bridge is on the upper range of benchmark rates. As noted above in item 2.1, the benchmark bridge estimate rate ranging from $3,000/m2 to $5,000/m2 although varying is reasonable at a Concept design stage. Aquenta has carried out a high level cost estimate in order to compare and provide a breakdown of the lump sum item allowances made by GTA, and have anticipated approximately $3,243/m2 for the proposed bridge.

The key areas requiring further analysis and clarification are outlined below:

- We have applied and allowed for the same 'Bulk earthwork' quantity 71,000m3. However a breakdown nor calculations of this quantity has not been provided.
- Calculations for the total area for pavements 44,000m2 has not been provided.
- Further breakdown of works should be provided in order for a thorough review of the rates, quantities and allowances made.

2.2 SCOPE FOR SS-BD2 – AURECON: PROJECT C (HARPERS CREEK CONNECTOR RD CROSSING [E])

The proposed bridge for SS-BD2, or alternatively labelled Project C (Harper's creek connector road crossing [E]) defines a single span bridge of 21.9m long with a proposed width of 11m including a 3m wide shared pathway. Aurecon's estimated cost for construction including civil works was in the order of $677,200 (excl. GST. The total project end cost including other project costs and contingency was estimated at $973,136 (excl. GST).

Proposed design of SS-BD2 crossing:

- Single span precast prestressed 1200mm deep super T- Beam arrangement.

- 175mm thick (min) cast in-situ deck slab across the bridge.
- Total bridge span of 21.6m over Harpers Creek, and width of 11m between barriers.
- Reinforced concrete abutment crossheads supported on reinforced concrete bored piles.
- Cast in-situ approach slabs runs 4m perpendicular to the bridge abutments.
- Medium level performance of bridge barriers.

2.2.1 Review and comments on cost estimates

The bridge cost estimates for SS-BD2 based on Aurecon's report represented approximately $2,811/m2 for construction works (assuming for a total bridge area of 241m2). As there were no breakdowns of costs for the bridge, Aquenta has carried out a high level cost estimate of the proposed bridge and anticipate approximately $3,228/m2 for SS-BD2.

The key areas requiring further analysis and clarification are outlined below:

- Further breakdown of the cost estimate should be provided in order to carry out a thorough review of the rates, quantities and allowances made.
- Review and check of Aurecon's quantity for safety rails at 120m long.
- Extent of earth work allowed within bridge/culvert estimate.

2.3 SCOPE FOR SS-BD3 – AURECON: PROJECT B (HARPERS CREEK CONNECTOR RD CROSSING [W])

Similar to bridge SS-BD2, the preferred proposed bridge design for SS-BD3 outlines a 2.5m single span inverted culvert on cast in-situ floor slab. The width of the bridge has is assumed 11m wide. SS-BD3 also includes for a 3m wide shared used path on the south side of the bridge, and adequate handrails for pedestrians.

Aurecon's estimated cost for construction including civil works was in the order of $79,320 (excl. GST. The total project end cost including other project costs and contingency was estimated at $113,983 (excl. GST).

Proposed design of SS-BD3 crossing:

- Precast concrete inverted culvert on cast in-situ floor slab.
- Cast in-situ headwalls and wing walls to either ends of the culvert.
- Handrails/safety rails on each side (assumed 30m long approach on each side).

2.3.1 Review and comments on cost estimates

The bridge cost estimates for SS-BD3 based on Aurecon's report represented approximately $2,884/m2 for construction works (assuming for a total culvert area of 27.5m2). As there were no breakdowns of costs for the SS-

BD3, Aquenta has carried out a high level cost estimate of the proposed bridge and anticipate approximately $3,468/m2 for construction works only.

The key areas requiring further analysis and clarification are outlined below:

- Further breakdown of the cost estimate should be provided in order to carry out a thorough review of the rates, quantities and allowances made.
- Review and check of Aurecon's quantity for safety rails at 120m long.
- Extent of earth work allowed within bridge/culvert estimate.

2.4 SCOPE FOR SS-BD4 – AURECON: PROJECT A (SUBURY SOUTH RAIL GRADE SEPARATION)

The proposed preferred design option for SS-BD4 describes a rail track bridge with a span of 19.5m designed to carry the Sunbury 'Up' and 'Down' rail lines over the proposed connector road. The 19.5m bridge is assumed to be 10m wide, single span precast prestressed 1200mm deep super T-Beam in arrangement with typical minimum 200mm thick in-situ deck overlay. The design also includes a minimum allowance of a 1.2m wide maintenance access walk way on either side of the rail tracks.

SS-BD4 includes a separate 3m wide cycle bridge structure designed on a single span precast prestressed 750mm deep Super T-beam arrangement with in-situ deck overlay.

Aurecon's estimated cost for construction including civil works was in the order of $7,114,250 (excl. GST). The total project end cost including other project costs and contingency was estimated at $10,223,177 (excl. GST).

Proposed design of SS-BD4 Rail Bridge:

- Single span precast prestressed 1200 mm deep Super-T beam.
- Deck overlay as cast in-situ deck slab will have a minimum thickness of 200 mm across the bridge with ballast walls to contain the ballast.
- Cycle bridge structure designed as a single span prestressed 750mm deep Super T-beam arrangement with in-situ deck overlay. Deck overlay to have minimum thickness of 160mm composite structure.
- Substructure to consist of reinforced concrete abutment crossheads supported on reinforced concrete retaining wall bored piles.
- Approach slabs cast in-situ that runs 4m perpendicular to the bridge abutments.
- High pressure gas main and easement required to be relocated. Resolution and proposal for the gas man relocation has yet to be defined.
- Minimum of 1.2m wide maintenance access walkway on either side of the rail tracks.

2.4.1 Review and comments on cost estimates

The bridge cost estimates for SS-BD4 based on Aurecon's report represented approximately $2,325/m2 for the bridge structure (assuming for a total area including cycle track 252m2) which appears low. Although Aurecon has estimated total construction works as $7,114,250 (excl. GST), the largest component of this amount is derived from the retaining wall costs at $6,528,000, and the cost for bridge works were estimated at $586,250.

As there were no breakdowns of costs for the SS-BD4, it's difficult to comment on Aurecon's cost breakdown, quantities, rates and allowances. Therefore Aquenta had carried out a high level cost estimate for the proposed bridge and anticipate approximately $3,842/m2 for construction works only (excl. retaining wall costs).

The key areas requiring further analysis and clarification are outlined below:

- Further breakdown of the cost estimate should be provided in order to carry out a thorough review of the rates, quantities and allowances made.
- Review and check of Aurecon's quantity for safety rails at 120m long.
- Clarification on the retaining wall length of 1020m as per Aurecon's report.
- Extent of earth work allowed within bridge/culvert estimate.

2.5 SCOPE FOR LR-BD2 – AURECON: PROJECT E (LANCEFIELD ROAD SOUTHERN GRADE SEPARATION)

The preferred LR-BD2 proposes a new structure designed to carry Lancefield road traffic over the rail lines. The proposed structure will consist of a single span precast prestressed 1000mm deep super T-Beam arrangement with in-situ deck overlay spanning 19m over that rail tracks. The composite deck slab includes a 2m wide footpath on both sides of the bridge.

Aurecon's estimated cost for construction including civil works was in the order of $651,600 (excl. GST. The total project end cost including other project costs and contingency was estimated at $936,349 (excl. GST).

Proposed design of LR-BD2 Bridge:

- Single span precast prestressed 1000 mm deep Super-T beam.
- Deck overlay as cast in-situ deck slab will have a minimum thickness of 1750 mm across the bridge with ballast walls to contain the ballast.
- Substructure to consist of reinforced concrete abutment crossheads supported on reinforced concrete strip (spread) footing founded on top of the rock cutting.
- Approach slabs cast in-situ that runs 4m perpendicular to the bridge abutments.
- 3m high anti-throw screen bridge barrier.

2.5.1 Review and comments on cost estimates

The bridge cost estimates for LR-BD2 based on Aurecon's report represented approximately $2,381/m2 for construction works (assuming for a total bridge area of 274m2). As there were no breakdowns of costs for the LR-BD2, Aquenta has carried out a high level cost estimate of the proposed bridge and anticipate approximately $3,111/m2 for construction works only.

The key areas requiring further analysis and clarification are outlined below:

- Further breakdown of the cost estimate should be provided in order to carry out a thorough review of the rates, quantities and allowances made.
- Review and check of Aurecon's quantity for safety rails at 120m long.
- Extent of earth work allowed within bridge/culvert estimate.

2.6 SCOPE FOR LR-BD3 – AURECON: PROJECT D (LANCEFIELD ROAD NORTHERN GRADE SEPARATION)

The preferred design option for LR-BD3 proposed for a new structure has been designed to carry the suburban Sunbury Up and Down rail lines over the proposed Lancefield Road. The single span 19.4m long Rail Bridge consists of precast prestressed 1200mm deep super T-Beams with minimum 200mm thick cast in-situ deck overlay across the bridge with ballast walls to contain the ballast. The bridge has been designed in consideration of future works and proposals.

Aurecon's estimated cost for construction including civil works was in the order of $4,128,850 (excl. GST. The total project end cost including other project costs and contingency was estimated at $5,933,157 (excl. GST).

Proposed design of LR-BD3 Rail Bridge:

- Single span precast prestressed 1200 mm deep Super-T beam.
- Deck overlay as cast in-situ deck slab will have a minimum thickness of 200 mm across the bridge with ballast walls to contain the ballast.
- Substructure to consist of reinforced concrete abutment crossheads supported on reinforced concrete retaining wall bored piles.
- Approach slabs cast in-situ that runs 4m perpendicular to the bridge abutments.
- Minimum of 1.2m wide maintenance access walkway on either side of the rail tracks.

2.6.1 Review and comments on cost estimates

The bridge cost estimates for LR-BD3 based on Aurecon's report represented approximately $2,168/m2 for construction works (assuming for a total bridge area of 223m2). As there were no breakdowns of costs for the LR-BD3, Aquenta has carried out a high level cost estimate of the proposed bridge and anticipate approximately $3,284/m2 for construction works only (excl. retaining wall costs). The above cost per square meter excludes

retaining wall costs. Aurecon has included an estimate for retaining wall costs in the order of $3,645,000, which forms part of the total $4,128,850 for total construction works.

The key areas requiring further analysis and clarification are outlined below:

- Further breakdown of the cost estimate should be provided in order to carry out a thorough review of the rates, quantities and allowances made.
- Review and check of Aurecon's quantity for safety rails at 120m long.
- Extent of earth work allowed within bridge/culvert estimate.
- Clarification on the retaining wall length of 900m as per Aurecon's report.

3 Report exclusions and clarifications:

- Cut and fill depths were not defined within the breakdown of each bridge estimates.
- Approximate height of each overpass bridge/rail bridge are not defined.
- Any allowances for Electrical lighting and associated services not defined.
- Aurecon and GTA have both noted further Geotechnical investigations were required.
- GTA's reports and cost findings exclude other project costs such as (Site establishment, Authority costs, Survey and Design fees, Supervision, etc).
- Aquenta's review of each bridges culverts cost estimates by GTA and Aurecon have been assessed as a high level analysis. Due to the lack of cost breakdown of each bridge and culverts by GTA and Aurecon, a fair review and comparison of costs could not be determined.

4 Drawings and Information Used

These high level Cost Estimates has been prepared on the basis of the following documentation:

- Drawings – MPA Sunbury South and Lancefield Road PSP – 1- 74 pages
- Indicative retaining wall heights marked up provided by WSP Parson Brinkerhoff (16.11.2016)
- Jacksons Creek Road Crossing, PSP 1074 – South Sunbury : Options assessment and Development GTA
- Jacksons Creek Road Crossing, PSP 1075 – Lancefield Road : Options assessment and Development GTA
- Sunbury South and Lancefield Road PSP 1074-1075 : Infrastructure design and costings (Grade separations and Harpers Creek Crossing) AURECON

5 Cost Estimate Summary

The table below summarises the construction works only cost estimate for each bridge.

PROJECT NAME	DESCRIPTION	$ (Excl. GST) AS PER REPORTS	$ (Excl. GST) AQUENTA
SUNBURY SOUTH BRIDGES			
SS-BD 1	Review cost estimate by GTA. **Option E – Long Option Bridge.**	34,653,281	18,227,281
SS-BD2	Review cost estimate by Aurecon. **Project C.**	677,200	777,523
SS-BD3	Review cost estimate by Aurecon. **Project B.**	79,320	95,363
SS-BD4	Review cost estimate by Aurecon. **Project A.**	7,114,250	9,627,020
LANCEFIELD ROAD BRIDGES			
LR-BD2	Review cost estimate by Aurecon. **Project E.**	651,600	1,351,160
LR-BD3	Review cost estimate by Aurecon. **Project D.**	4,128,850	4,877,518

Refer to Appendix 1 for a full breakdown and allowances of each cost estimates.

6 Specific Inclusions

The cost estimates includes allowances for the following:

- Council Fees
- VicRoads Fees
- Traffic Management
- Environmental Management
- Survey & Design
- Supervision & Project Management
- Site Establishment (Preliminaries)
- Project Contingency

7 Specific Exclusions

Below is a list of exclusions that apply to the Cost Estimates for the Options:

- GST
- Legal & holding costs
- Other Authority Costs and Fees
- Adverse ground conditions
- Additional allowances for removal of any Contamination / Hazardous Materials
- Any other electrical and lighting costs other than the included in the cost estimate
- Services relocations
- Soft landscaping maintenance
- Escalation
- WSUD Drainage

8 Assumptions

The following assumptions have been taken into consideration within each high level cost estimate:

- The cost estimates assume a traditional lump sum competitively tendered procurement method.
- The cost estimates are based on carrying out the works during normal working hours.
- The cost estimates assumes road works outside the bridge alignments for each option are excluded.
- Aquenta has not received any cut and fill quantities, and therefore we have made an allowances to the rates based on best estimates.
- We have excluded any quantities and areas of Roads.
- Ground conditions and required substructure works have been assumed at this stage based on drawings and documents provided.
- The rates used in the cost estimates are based on recent project data and benchmarked rates for concept cost estimates for projects of a similar nature in the Melbourne region.
- The cost estimates are based on the information provided to Aquenta and our knowledge of similar projects.
- All other assumptions have been noted in the cost estimates for each option.
- Occupation costs allowances have been included based on advice from WSPPB:
    - For SS-BD4 (road under existing rail): it has been assumed that the construction work will require 2 weekend occupations and 3 no ALBF occupations. Work will affects V/Line and Metro services.
    - For LR-BD2 and LR-BD3 (road bridge over existing rail line): it is assumed that the construction work will required 1 weekend occupation. Works will affect V/Line services.

Appendix 1: Cost Estimates

SUNBURY SOUTH AND LANCEFIELD ROAD PSP

REPORT AND COST ESTIMATE REVIEW : GTA REPORTS

GTA COST ESTIMATES							AQUENTA ESTIMATES							DIFF (-/+)
SUNBURY SOUTH (CONNECTOR) - OPTION E LONG					A		SUNBURY SOUTH (CONNECTOR) - OPTION E LONG				B			A-B
WORKS		QTY	UNIT	RATE	TOTAL	COMMENTS	WORKS		QTY	UNIT	RATE	TOTAL	COMMENTS	
1	**Civil works**						1	**Civil works**						
1.1	Bulk Eearthworks	71,000.00	m3	60.00	$ 4,260,000.00	Rate inclusive of excavation to proposed levels, incl. trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of spoil, surplus unapprovaled soil, etc. Subgrade and fill is also included within this rate.	1.1	Bulk Eearthworks	71,000.00	m3	65.00	$ 4,615,000.00	Assuming same bulk earth work quantites.. The rate allowed is also inclusive of excavation to proposed levels, incl. trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of spoil, surplus unapprovaled soil. Inclusive of Subgrade. fill and site setout.	-355,000
1.2	Pavements, Flexible	**44,000.00**	m2	250.00	$ 11,000,000.00		1.2	Pavements, Flexible	**3,938.00**	m2	250.00	$ 984,500.00	Aquenta finds the overall rate for the supply and installed for compacted asphalt and bituminour prime coat is reasonable and reflects market rates. However the quantity of 44,000m2 needs clarification and a breakdown. Assuming this includes parts of the road? ** Updated m2 area reflecting bridge area and 4m long approach slab**	10,015,500
2	**Bridge**						2	**Bridge**						
								STRUCTURE						
2.1	Concrete bridge (span 11m wide)	3,850.00	m2	**5,000.00**	$ 19,250,000.00	As per Pitt & Sherry's engineering advice. • Precast prestressed concrete Super-T beams (simply supported) • 180mm thick cast insitu reinforced concrete deck with asphalt surfacing • Medium performance level traffic barriers (to AS5100 standard) • Cast insitu abutments (including sill beams, fender walls and wingwalls) • Spill through batters with rock beaching • Cast insitu pier columns and crossheads • Precast matchcast segment concrete blocks for piers	2.1	Concrete bridge (span 11m wide)	3,850.00	m2	**3,242.73**	$ 12,484,500.00	Length of SS-BD1 as 350m long and 11m wide. The following rates take into consideration the following bridge design: • Precast prestressed concrete Super-T beams (simply supported) • 180mm thick cast insitu reinforced concrete deck with asphalt surfacing • Medium performance level traffic barriers (to AS5100 standard) • Cast insitu abutments (including sill beams, fender walls and wingwalls) • Spill through batters with rock beaching • Cast insitu pier columns and crossheads • Precast matchcast segment concrete blocks for piers	6,765,500
								Allow for reinforced single span concrete bridge (Total width 11m approx. 4m deep)	*3,850.00*	*m2*	*1,900.00*	*$ 7,315,000.00*		
								Allow for piling and surrounding structural works	*3,850.00*	*m2*	*450.00*	*$ 1,732,500.00*		
								Bridge pavement (shared path, traffic lane, bike path)	*3,850.00*	*m2*	*250.00*	*$ -*	*Assumed included above in '1.2 Pavements, Flexible'*	
								Kerb and Channel	*700.00*	*LM*	*55.00*	*$ 38,500.00*		
								Drainage works	*1.00*	*Item*		*$ 450,000.00*		
								LIGHTING and MISCELLANEOUS						
								Lighting on-bridge	*1.00*	*Item*		*$ 1,500,000.00*	*Provisional allowance for lighting including conduits*	
								Hand rails	*700.00*	*LM*	*350.00*	*$ 245,000.00*		
								Guard rails	*700.00*	*LM*	*450.00*	*$ 315,000.00*		
								Linemarking	*3,850.00*	*m2*	*10.00*	*$ 38,500.00*		
								Signage	*1.00*	*Item*		*$ 100,000.00*		
								Traffic safety	*1.00*	*Item*		*$ 100,000.00*		
								Dewatering works	*1.00*	*Item*		*$ 350,000.00*	*Allow for any dewatering works during excavation and earthworks*	

SUNBURY SOUTH AND LANCEFIELD ROAD PSP

REPORT AND COST ESTIMATE REVIEW : GTA REPORTS

GTA COST ESTIMATES							AQUENTA ESTIMATES							DIFF (-/+)
SUNBURY SOUTH (CONNECTOR) - OPTION E LONG					**A**		**SUNBURY SOUTH (CONNECTOR) - OPTION E LONG**				**B**		**A-B**
WORKS		QTY	UNIT	RATE	TOTAL	COMMENTS	**WORKS**	QTY	UNIT	RATE	TOTAL	COMMENTS	
							Service relocation	*1.00*	*Item*		*$ 300,000.00*	*Allow for service relocation and connection works*	
3	**Ecological**						3 **Ecological**						
3.1	Proposed Ecological works	1.00	Item	143,281.00	$ 143,281.00		3.1 Proposed Ecological works	1.00	Item	143,281.00	$ 143,281.00	Associated ecological works appear reasonable	0
	SUB-TOTAL WORKS				**$ 34,653,281.00**		**SUB-TOTAL WORKS**				**$ 18,227,281.00**		**16,426,000**
DELIVERY							**DELIVERY**						
	Council fees	3.25%	Item		$ 1,126,231.63		Council fees	3.25%	Item		$ 592,386.63		
	VicRoads Fees	1.00%	Item		$ 346,532.81		VicRoads Fees	1.00%	Item		$ 182,272.81		
	Traffic Management	5.00%	Item		$ 1,732,664.05		Traffic Management	5.00%	Item		$ 911,364.05		
	Environmental Management	0.50%	Item		$ 173,266.41		Environmental Management	0.50%	Item		$ 91,136.41		
	Survey & Design	5.00%	Item		$ 1,732,664.05		Survey & Design	5.00%	Item		$ 911,364.05		
	Supervisions & Project management	9.00%	Item		$ 3,118,795.29		Supervisions & Project management	9.00%	Item		$ 1,640,455.29		
	Site Establishment	2.50%	Item		$ 866,332.03		Site Establishment	2.50%	Item		$ 455,682.03		
	Contingency	20.00%	Item		$ 6,930,656.20		Contingency	20.00%	Item		$ 3,645,456.20		
	SUB-TOTAL DELIVERY				**$ 16,027,142.46**		**SUB-TOTAL DELIVERY**				**$ 8,430,117.46**		
	TOTAL				**$ 50,680,423.46**		**TOTAL**				**$ 26,657,398.46**		**$ 24,023,025.00**

SUNBURY SOUTH AND LANCEFIELD ROAD PSP

REPORT AND COST ESTIMATE REVIEW

AURECON COST ESTIMATES							AQUENTA REVIEW				
2	**BRIDGE**										
2.1	**Sunbury South Rail Grade Separation (SS-BD4)**										
2.1.1	Structure		Item		$ 561,650	Including the cycle bridge		Item		**$ 926,340**	
2.1.1.1	*Single span precast prestressed 1200 mm deep Super T-beam (4no.) arrangement with in-situ deck slab overlay on top of reinforced abutment cross head (depth tbc)*						*194*	*m2*	*$1,900*	*$ 368,600*	*Cast in-situ deck slab min thickness 200mm across bridge ontop of 4 no. super T girders 1200mm deep. Approx. 10m wide*
2.1.1.2	*Cycle track (160mm thk deck slab onto of1No. Super T grider 750mm deep)*						*58.2*	*m2*	*$1,200*	*$ 69,840*	*3m wide cycle track adjacent. 160mm thk concrete deck slab*
2.1.1.3	*Reinforced concrete bored piles*						*8*	*no*	*$15,000*	*$ 120,000*	*Depth of piles to be confirmed. Including pile caps, pile set up, drilling, concrete, and reinforcement.*
2.1.1.4	*Reinforced concrete slabs (approach slabs)*						*115.2*	*m2*	*$500*	*$ 57,600*	*4m long approach slab*
2.1.1.5	*Earthworks*						*194*	*m2*	*$400*	*$ 77,600*	*Including site excavation, compaction, and rock beaching*
2.1.1.6	*Bridge pavement : (balast ontop of concrete slab)*						*194*	*m2*	*$250*	*$ 48,500*	*50mm thk Asphalt surface with 2.5m wide shared concrete path (incl. built in kerb)*
2.1.1.7	*Bridge pavement : (Rail tracks two tracks)*						*38.8*	*m*	*$0*	*$ -*	*Included 2.2.1.1*
2.1.1.8	*Miscellaneous : Traffic/Train signage*						*114*	*m2*	*$300*	*$ 34,200*	*Assume no drainage required (surface runoff), no traffic lights. Including line marking and bridge signage*
2.1.1.9	*Miscellaneous : APA High pressure gas main relocation works*						*1*	*Item*	*$150,000*	*$ 150,000*	*Assume no drainage required (surface runoff), no traffic lights. Including line marking and bridge signage*
2.1.2	Safety Rail	120	m	$205	$ 24,600	Assume 30m long approach on	38.8	m	$300	$ 11,640	
2.1.2.1	Hand Railing						38.8	m	$350	$ 13,580	1.3m high handrailing
2.1.2.2	Guard Railing						38.8	m	$450	$ 17,460	Allow for high level barriers
2.1.3	Retaining Wall	1020	m	$6,400	$ 6,528,000	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall	1020	m	$6,400	$ 6,528,000	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall
2.1.4.1	Occupation Costs						2	no	$1,035,000	$ 2,070,000	Allowance for 2 No. weekend occupation for construction works (Metro and Vline)
2.1.4.2	Occupation Costs						3	no	$20,000	$ 60,000	Allowance for 3 No. ALBF Occupations for OHL works
	SUB-TOTAL WORKS				**$ 7,114,250**					**$ 9,627,020**	
10	**DELIVERY**										
10.1	Site Establishment	1	Item	2.50%	$ 177,856		1	Item	2.50%	$ 240,676	
10.2	Survey & Design	1	Item	5%	$ 355,713		1	Item	5%	$ 481,351	
10.3	Supervision & Project Management	1	Item	9%	$ 640,283		1	Item	9%	$ 866,432	
10.4	Council Fees	1	Item	3.25%	$ 231,213		1	Item	3.25%	$ 312,878	
	SUB-TOTAL DELIVERY				**$ 1,405,064**					**$ 1,901,336**	
	SUB-TOTAL WORKS + DELIVERY				**$ 8,519,314**					**$ 11,528,356**	
11	**CONTINGENCY**	1	Item	20%	$ 1,703,863		1	Item	20%	$ 2,305,671	
	TOTAL				**$ 10,223,177**					**$ 13,834,028**	
2.2	**Harpers Creek Connector Road Crossing (W) - (SS-BD3)**										
2.2.1	Structure		Item		$ 54,720			Item		**$ 91,463**	Assume single span of 2.5m precast concrete inverted culvert on cast in-situ floor slab. Assume width 11m.
2.2.1.1	*Single span precast inverted concrete culvert*						*27.5*	*m2*	*$600*	*$ 16,500*	
2.2.1.2	*Cast in-situ concrete slab with footings*						*27.5*	*m2*	*$500*	*$ 13,750*	
2.2.1.3	*Reinforced concrete slabs (approach slabs)*						*88*	*m2*	*$500*	*$ 44,000*	*4m long approach slab*
2.2.1.4	*Cast in-situ concrete head walls and wing walls*						*2*	*no*	*$4,000*	*$ 8,000*	
2.2.1.5	*Earthworks*						*17.875*	*m3*	*$100*	*$ 1,788*	*Including site excavation, compaction, and rock beaching*
2.2.1.6	*Bridge pavement*						*27.5*	*m2*	*$250*	*$ 6,875*	*Including (3m) wide shared path*
2.2.1.7	*Miscellaneous*						*27.5*	*m2*	*$20*	*$ 550*	*Assume no drainage required (surface runoff), no traffic lights. Including line marking and bridge signage*
2.2.2	Safety Rail	120	m	$205.00	$ 24,600	Assume 30m long approach on both sides	13	m	$300	$ 3,900	Aurecon's length of 120m needs to be clarified.
	SUB-TOTAL WORKS				**$ 79,320**					**$ 95,363**	
10	**DELIVERY**										
10.1	Site Establishment	1	Item	2.5%	$ 1,983		1	Item	2.50%	$ 2,384	
10.2	Survey & Design	1	Item	5%	$ 3,966		1	Item	5%	$ 4,768	
10.3	Supervision & Project Management	1	Item	9%	$ 7,139		1	Item	9%	$ 8,583	
10.4	Council Fees	1	Item	3.25%	$ 2,578		1	Item	3.25%	$ 3,099	
	SUB-TOTAL DELIVERY				**$ 15,666**					**$ 18,834**	
	SUB-TOTAL WORKS + DELIVERY				**$ 94,986**					**$ 114,197**	
11	**CONTINGENCY**	1	Item	20%	$ 18,997		1	Item	20%	$ 22,839	
	TOTAL				**$ 113,983**					**$ 137,036**	

SUNBURY SOUTH AND LANCEFIELD ROAD PSP

REPORT AND COST ESTIMATE REVIEW

AURECON COST ESTIMATES							AQUENTA REVIEW				
2.3	**Harpers Creek Connector Road Crossing - (E) (SS-BD2)**										
2.3.1	Structure	1	Item		$ 652,600		1	Item		**$ 759,523**	
2.3.1.1	*Single span precast prestressed 1200 mm deep Super T-beam arrangement with in-situ deck overlay.*						*240.9*	*m2*	*$1,800*	*$ 433,620*	*Cast in-situ deck slab min thickness 175mm across bridge*
2.3.1.2	*Concrete bored piles (supporting abutment crossheads)*						*240.9*	*m2*	*$550*	*$ 132,495*	*Bored concrete piles with abutment cross heads above. Depth of piles to be confirmed. Including pile caps, pile set up, drilling, concrete, and reinforcement.*
2.3.1.3	*Reinforced concrete slabs (approach slabs)*						*88*	*m2*	*$350*	*$ 30,800*	*Cast in-situ reinforced concrete slabs 4m span*
2.3.1.4	*Earthworks*						*240.9*	*m2*	*$400*	*$ 96,360*	*Including site excavation, compaction, and rock beaching. Cut and fill needs to be determined. Provisional area allowance only.*
2.3.1.5	*Bridge pavement*						*240.9*	*m2*	*$250*	*$ 60,225*	*Including shared path*
2.3.1.6	*Miscellaneous*						*240.9*	*m2*	*$25*	*$ 6,023*	*Assume no drainage required (surface runoff), no traffic lights. Including line marking and bridge signage*
2.3.2	Safety Rail	120	m	$205.00	$ 24,600	Assume 30m long approach on	60	m	$300	$ 18,000	Assume 30m long approach on both sides
	SUB-TOTAL WORKS				**$ 677,200**					**$ 777,523**	
10	**DELIVERY**										
10.1	Site Establishment	1	Item	2.5%	$ 16,930		1	Item	2.50%	$ 19,438	
10.2	Survey & Design	1	Item	5%	$ 33,860		1	Item	5%	$ 38,876	
10.3	Supervision & Project Management	1	Item	9%	$ 60,948		1	Item	9%	$ 69,977	
10.4	Council Fees	1	Item	3.25%	$ 22,009		1	Item	3.25%	$ 25,269	
	SUB-TOTAL DELIVERY				**$ 133,747**					**$ 153,561**	
	SUB-TOTAL WORKS + DELIVERY				**$ 810,947**					**$ 931,083**	
11	**CONTINGENCY**	1	Item	20%	$ 162,189		1	Item	20%	$ 186,217	
	TOTAL				**$ 973,136**					**$ 1,117,300**	
2.4	**Lancefield Road Southern Grade Separation (LR-BD2)**										
2.4.1	Structure	1	Item		$ 627,000		1	Item		**$ 832,160**	Assume single span of 19m precast Super T bridge stucture. Total width 14.4m wide
2.4.1.1	*Single span precast prestressed 1000 mm deep Super T-beam arrangement with in-situ deck slab overlay on top of reinforced abutment cross head*						*273.6*	*m2*	*$1,800*	*$ 492,480*	*Cast in-situ deck slab min thickness 175mm across bridge ontop of 6 no. super T girders 1000mm deep*
2.4.1.2	*Reinforced concrete stip footing*						*77.6*	*m3*	*$550*	*$ 42,680*	*RC concrete footing provisional depth of 2m deep*
2.4.1.3	*Reinforced concrete slabs (approach slabs)*						*115.2*	*m2*	*$500*	*$ 57,600*	*4m long approach slab*
2.4.1.4	*Earthworks*						*273.6*	*m2*	*$400*	*$ 109,440*	*Including site excavation, compaction, and rock beaching*
2.4.1.5	*Bridge pavement (balast ontop of concrete slab)*						*273.6*	*m2*	*$350*	*$ 95,760*	*50mm thk Asphalt surface with 2.5m wide shared concrete path (incl. built in kerb)*
2.4.1.6	*Miscellaneous : 3m high Anti-throw screen*						*114*	*m2*	*$300*	*$ 34,200*	*3m high Anti-throw screen above barrier*
2.4.2	Safety Rail	120	m	$205.00	$ 24,600	Assume 30m long approach on	38	m	$500	$ 19,000	Allow for high performance level precast bridge barrier
2.4.3	Occupation Costs						1	no	$500,000	$ 500,000	Allowance for 1 No. of weekend occupation including safeworking costs (V/line only)
	SUB-TOTAL WORKS				**$ 651,600**					**$ 1,351,160**	
10	**DELIVERY**										
10.1	Site Establishment	1	Item	2.50%	$ 16,290		1	Item	2.50%	$ 33,779	
10.2	Survey & Design	1	Item	5%	$ 32,580		1	Item	5%	$ 67,558	
10.3	Supervision & Project Management	1	Item	9%	$ 58,644		1	Item	9%	$ 121,604	
10.4	Council Fees	1	Item	3.25%	$ 21,177		1	Item	3.25%	$ 43,913	
	SUB-TOTAL DELIVERY				**$ 128,691**					**$ 266,854**	
	SUB-TOTAL WORKS + DELIVERY				**$ 780,291**					**$ 1,618,014**	
11	**CONTINGENCY**	1	Item	20%	$ 156,058		1	Item	20%	$ 323,603	
	TOTAL				**$ 936,349**					**$ 1,941,617**	

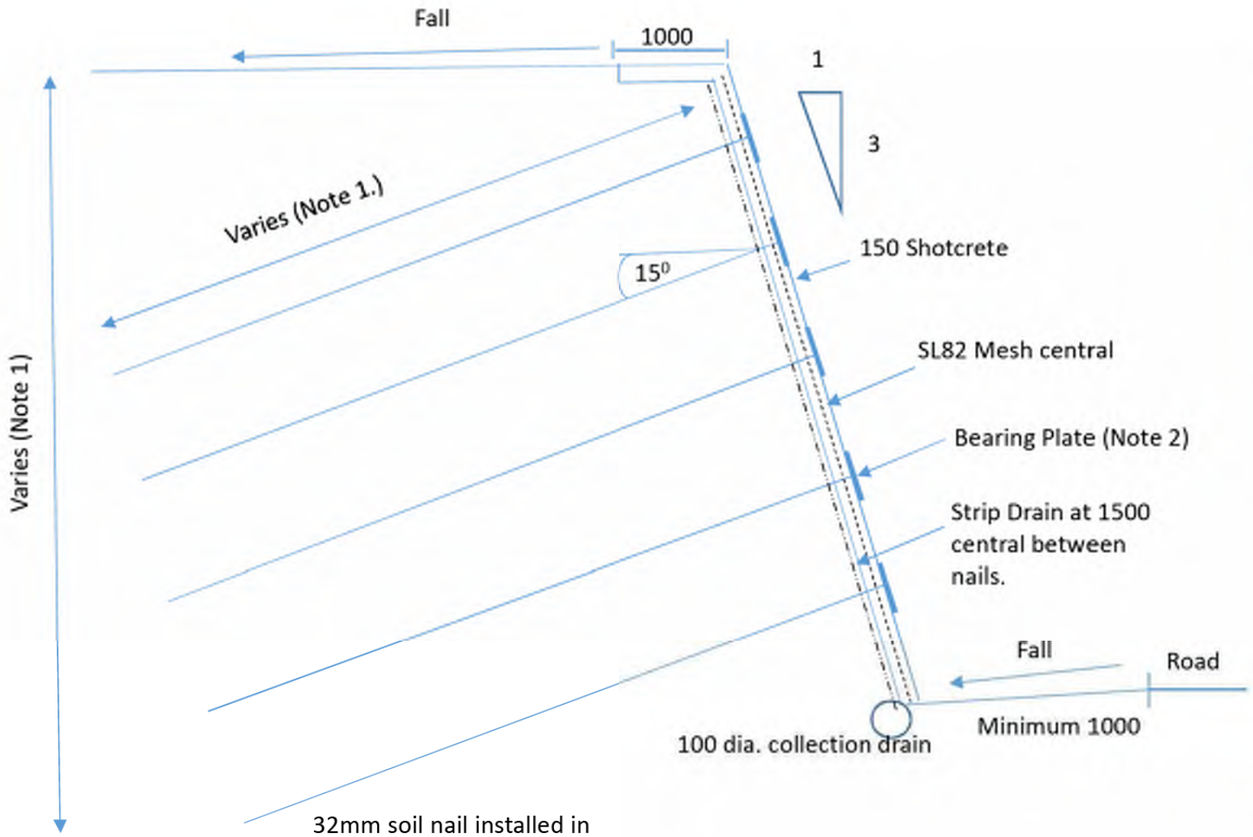
SUNBURY SOUTH AND LANCEFIELD ROAD PSP

REPORT AND COST ESTIMATE REVIEW

AURECON COST ESTIMATES							AQUENTA REVIEW				
2.5	**Lancefield Road Northern Grade Separation (LR-BD3)**										
2.5.1	Structure	1	Item		$ 459,250		1	Item		**$ 720,878**	Assume span of 19.4m span rail tracks, allow total width of 11.5m (incl. min 1.2m access walkway either side)
2.5.1.1	*Single span precast prestressed 1200 mm deep Super T-beam arrangement with in-situ deck slab overlay.*						*223.1*	*m2*	*$1,800*	*$ 401,580*	*Cast in-situ deck slab min thickness 200mm across bridge*
2.5.1.2	*Reinforced concrete bored piles (supporting abutment crossheads)*						*223.1*	*m2*	*$550*	*$ 122,705*	*Bored concrete piles with abutment cross heads above*
2.5.1.3	*Reinforced concrete slabs (approach slabs)*						*92*	*m2*	*$500*	*$ 46,000*	
2.5.1.4	*Earthworks*						*223.1*	*m2*	*$400*	*$ 89,240*	*Including site excavation, compaction, and rock beaching*
2.5.1.5	*Bridge pavement (balast ontop of concrete slab)*						*223.1*	*m2*	*$250*	*$ 55,775*	*Including shared path*
2.5.1.6	*Miscellaneous*						*223.1*	*m2*	*$25*	*$ 5,578*	*Assume no drainage required (surface runoff), no traffic lights. Including line marking and bridge signage*
2.5.2	Safety Rail	120	m	$205.00	$ 24,600	Assume 30m long approach on	38.8	m	$300	$ 11,640	Assume 30m long approach on both sides
2.5.3	Retaining Wall	900	m	$4,050.00	$ 3,645,000	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall	900	m	$4,050	$ 3,645,000	Assume rock bolts at 1.5mx1.5m grid with 75mm thick steel fibre shotcrete wall (Doesn't outline in report Project D of required retaining wall - check 900m requirement)
2.5.4	Occupation Costs						1	no	$500,000	$ 500,000	Allowance for 1 No. of weekend occupation including safeworking costs (V/line only)
	SUB-TOTAL WORKS				**$ 4,128,850**					**$ 4,877,518**	
10	**DELIVERY**										
10.1	Site Establishment	1	Item	2.50%	$ 103,221		1	Item	2.50%	$ 121,938	
10.2	Survey & Design	1	Item	5%	$ 206,443		1	Item	5%	$ 243,876	
10.3	Supervision & Project Management	1	Item	9%	$ 371,597		1	Item	9%	$ 438,977	
10.4	Council Fees	1	Item	3.25%	$ 134,188		1	Item	3.25%	$ 158,519	
	SUB-TOTAL DELIVERY				**$ 815,448**					**$ 963,310**	
	SUB-TOTAL WORKS + DELIVERY				**$ 4,944,298**					**$ 5,840,827**	
11	**CONTINGENCY**	1	Item	20%	$ 988,860		1	Item	20%	$ 1,168,165	
	TOTAL				**$ 5,933,157**					**$ 7,008,993**	

APPENDIX D : SOIL NAIL RETAINING WALL DETAIL

Extracted from “Jacksons Hill Link – Alignment assessment” *(document number: 2113308A-CIV-REP-003)* by WSP | Parsons Brinckerhoff.

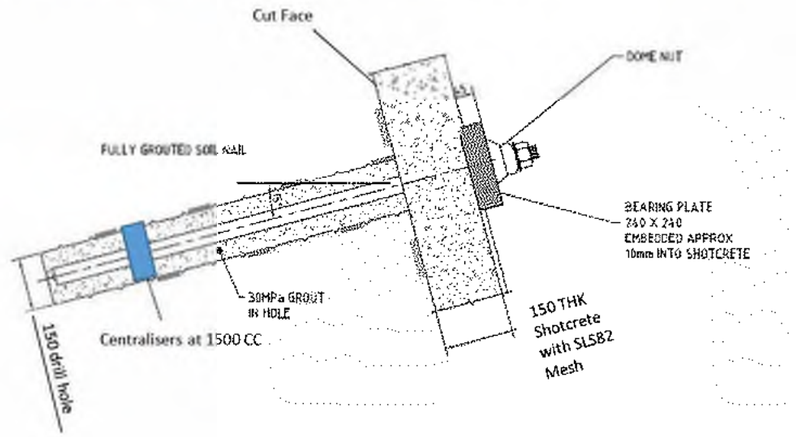


32mm soil nail installed in 150mm inclined (15^0) drill hole (Note 2.)

Note 1: Soil nail details for varying retained wall heights.

Retained Wall Height	Length of Soil Nails (m)	Vertical Nail Spacing (m)	Horizontal Spacing (m)
12m	10	1.2	1.5
10m	8	1.2	1.5
7m	6	1.2	1.5
5m	5	1.2	1.5
3m	4	1.2	1.5
<3m	Use of gabion walls / Mass Bloc ® Instant Wall or equivalent.		

Note 2: Soil nail bearing plate and grouting details.



2015

50mm AT FULL SIZE

DIAL BEFORE YOU DIG www.1100.com.au The Essential First Step.

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRAWN	CHECK	DESIGN	VERIFY
B	07/03/16	ISSUED FOR INFORMATION	RAM	GW	RAM	DR
A	19/10/15	ISSUED FOR INFORMATION	RAM	GW	RAM	DR

© Parsons Brinckerhoff Australia Pty Limited ("PB") Copyright in the drawings, information and data recorded in this document ("the information") is the property of PB. This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by PB. PB makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information.

NCSI certified Quality System to ISO 9001

SCALES: N.T.S.

A3 ORIGINAL
DO NOT SCALE THIS DRAWING - USE FIGURED DIMENSIONS ONLY
VERIFY ALL DIMENSIONS ON SITE

APPROVED FOR AND ON BEHALF OF PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED
SIGNED
DATE

PARSONS BRINCKERHOFF
Level 15
28 Freshwater Place
Southbank, Melbourne
VIC 3006
PO BOX 19016
Melbourne VIC 3006
Australia
ABN 80 078 004 798
Telephone +61 3 9861 1111
Facsimile +61 3 9861 1144
Email: melbourne@pb.com.au

CLIENT: MPA Metropolitan Planning Authority

PROJECT: SUNBURY STH AND LANCEFIELD RD PSP
JACKSONS HILL LINK INVESTIGATION
RETAINING WALL
SOIL NAIL DETAILS

PROJECT No.	DISCIPLINE	NUMBER	REV.
2113308A	CIV	2015	B

7/03/2016 5:32:54 PM

\\APMELFIL01\proj\M\METROPOLITAN_PLANNING\2113308A_SUNBURY_SOUTH_AND_LANCEFIELD\09_CADD\Drawings\02_Civil\02_Drawings\2113308a-civ-2015.dgn

APPENDIX E : EARTHWORKS QUANTITIES

Sunbury South and Lancefield Road PSP

Bulk earthwork quantities estimate

Rev A 9/11/2016

Road	SS-RD4 (Long bridge option)			
Section Chainage		**Volume (m3)**		
Start	**End**	**Cut**	**Fill**	**Comment**
249	617	77700	400	
617	628	-	-	Grade Sep (underpass)
628	648	1900	0	
648	911	-	-	Intersection
911	1156	1000	13200	
1156	1168	-	-	Culvert
1168	1979	69300	8500	
1979	2001	-	-	Culvert
2001	2052	8300	100	
2052	2271	-	-	Intersection
2271	2400	1100	2800	
2400	2980	4400	12600	
2980	3295	-	-	Bridge (Long option)
3295	4941	9900	7700	

Road	SS-RD9			
Section Chainage		**Volume (m3)**		
Start	**End**	**Cut**	**Fill**	**Comment**
1482	1737	16500	0	

Road	SS-RD5			
Section Chainage		**Volume (m3)**		
Start	**End**	**Cut**	**Fill**	**Comment**
0	1153	5500	11200	

Intersection	SS-IT9			
Section Chainage		**Volume (m3)**		
Start	**End**	**Cut**	**Fill**	**Comment**
-	-	20700	19900	

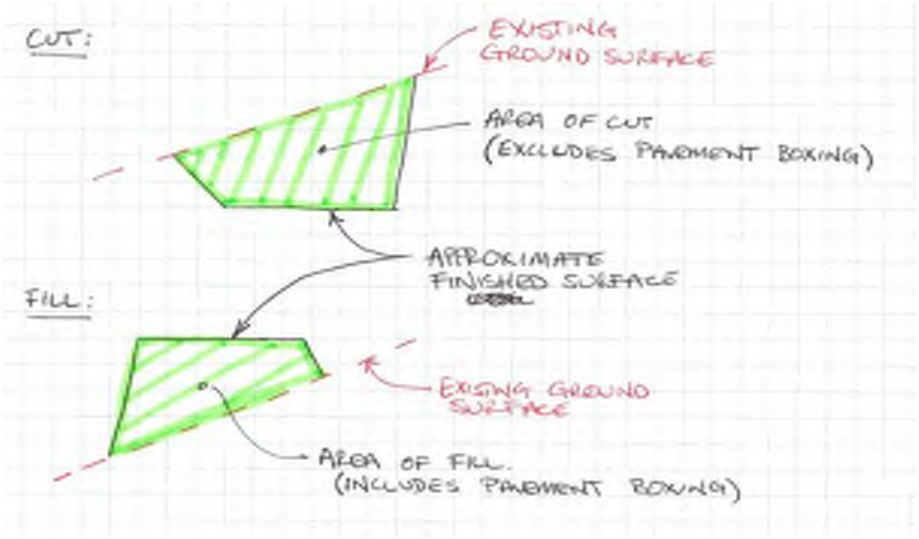


Figure 1 (above): Explanation of bulk earthworks volume calculation

Limitations:

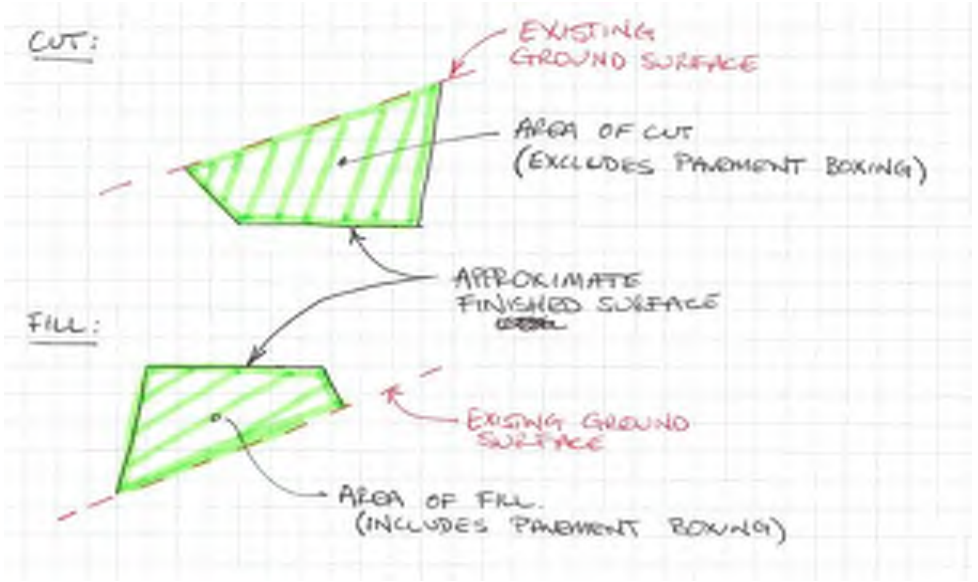
- Bulk earthworks quantities are approximate only and are provided to give an indication of the likely order of magnitude only
- Volumes based on existing surface generated from LIDAR data with unknown accuracy and a design surface that is high level concept only.
- 3D design excludes a number of elements including superelevation, raised medians, kerbs, barriers and any additional excavations or material required for other infrastructure (e.g. footings, drainage etc.)
- Volumes do not consider bulking factors
- Volumes are generated by comparing the difference between surface triangulations and the order of magnitude was cross checked using the end area method at 10m intervals

Sunbury South and Lancefield Road PSP

Bulk earthwork quantities estimate - LR-RD2

Rev A 29/03/2017

Road	LR-RD2			
Section Chainage		**Volume (m3)**		
Start	**End**	**Cut**	**Fill**	**Comment**
253	540	6669	27230	from intersection extent
1100	2000	79823	17903	



Limitations:

- Bulk earthworks quantities are approximate only and are provided to give an indication of the likely order of magnitude only
- Volumes based on existing surface generated from LIDAR data with unknown accuracy and a design surface that is high level concept only.
- 3D design excludes a number of elements including superelevation, raised medians, kerbs, barriers and any additional excavations or material required for other infrastructure (e.g. footings, drainage etc.)
- Volumes do not consider bulking factors
- Volumes are generated by comparing the difference between surface triangulations and the order of magnitude was cross checked using the end area method at 10m intervals

APPENDIX F : ASSUMED PAVEMENT DETAIL

TRUNK COLLECTOR STREET – (>3000vpd)

ROAD CHARACTERISTICS – TRUNK COLLECTOR STREET

Road Type	Max. VPD	Parking	Kerb & Channel Type	Minimum Width (mm) *
Trunk Collector Street	6000	Parking not permitted	SM2 Type – Refer Std Dwg SD101	7000 2x3.5m Dual Carriageway
Trunk Collector Street with parking	6000	Parking on carriageway	SM2 Type – Refer Std Dwg SD101	11000 2x5.5m Dual Carriageway
Abutting a Reserve	6000		B2 Type – Refer Std Dwg SD101	

* Measured invert to invert.

PAVEMENT COMPOSITION – DESIGN TRAFFIC LOADING

The DTL for roads carrying in excess of 3000vpd must be determined in accordance with Clause 3.1.2, "Pavement Design Guidelines For New Subdivisions – April 2002". Pavements with DTL's less than $1x10^6$ ESA's may be selected from the following tabulation.

PAVEMENT COMPOSITION – TRUNK COLLECTOR STREET – ESA<10^6

Pavement Layer	Pavement Material	Pavement Thickness (mm)							
		Non Expansive Subgrade				Expansive Subgrade **			
		CBR 2%	CBR 3%	CBR 4%	CBR 5%	CBR 2%	CBR 3%	CBR 4%	CBR 5%
Surfacing	Size 14 Type N Asphalt	40	40	40	40	40	40	40	40
Bituminous Prime	Prime or Primerseal								
Base	20mm Class 2 Crushed Rock	160	160	160	160	160	160	160	160
Upper Subbase	20mm Class 3 Crushed Rock	170	170	170	170	170	170	170	170
Lower Subbase	20 or 40mm Class 4 Crushed Rock or Approved Equivalent	315	210	120	55	315	230	230	230
Total		**685**	**580**	**490**	**425**	**685**	**600**	**600**	**600**

** EXPANSIVE SOILS ARE CLASSIFIED AS FOLLOWS:

Liquid Limit	>70%
Plasticity Index	>45
PI x % < 0.425mm	>2200
Potential Swell	>2.5

PAVEMENT COMPOSITION – TRUNK COLLECTOR STREET – ESA>10^6

Pavements with a Design Traffic Loading greater than $1x10^6$ ESA's, shall be modelled mechanistically to determine the overall thickness and composition of the pavement. A granular unbound pavement with a thin asphalt surfacing (<40mm thick), would not be acceptable for these situations.

Amendments			
No.	Detail	Initials	Date

DRAWN : K. GRAHAM
CHECKED : P. TUTTLE
APPROVED : S. PLATER
SCALE :
ISSUE DATE: JUNE 2004

HUME CITY COUNCIL
PO Box 119
1079 Pascoe Vale Road
Broadmeadows
Victoria 3047
Telephone
03) 9205 2200
Facsimile
03) 9309 0109

TYPE :
ROAD CHARACTERISTICS AND PAVEMENT COMPOSITION – TRUNK COLLECTOR STREET

DRAWING NO: SD 06

Appendix F – Utility Correspondence

Luke Morrison

From: Butler, Craig <Craig.A.Butler@team.telstra.com>
Sent: Tuesday, 3 July 2018 12:34 PM
To: Glenn Kerr
Subject: MR228767-1 175 Vineyard Rd Sunbury#
Attachments: Telstra Duty of Care v28.1.pdf; MR228767-1 175 Vineyard Rd, Sunbury Vic.pptx

Hi Glenn,

With the proposed underpass works required, which potentially impacts Telstra direct buried assets., including a major interstate (60F) fibre approx. 3klm continuous between FAPS (west side of tracks) and 2 copper cables east side of tracks.
The relocation alignments will need to be determined once surveying and service location etc. has been undertaken.
No easements will be required, and any cable installations will be as per the Telecommunications act. and land access notices will be severed on property owner if required.
The lead times could be anywhere from start to finish, approx. 3-6 months.
An estimated cost to relocate the existing direct buried network, installation pits/manholes and cutovers of all the existing copper/optic fibre cables, I feel this could be anywhere in the vicinity of $300,000.00 - $400,000.00.

Please note; that this is a budgetary estimate only, and is not to be considered a quotation. For a more accurate cost, a detailed design would need to be completed to assess full impact, and then sent out to Telstra's Industry Specialists for pricing.

If you wish for us to proceed with a detailed design impact study of Telstra's requirements, please let me know and a quotation will be sent through to you.

Please feel free to contact me if I can be of any further assistance.

Kind regards,

Craig Butler
Field Operative
Network Integrity SA/ VIC/ TAS
Network Construction & Services, Networks
Telstra Operations

Bldg 1, 301 Burwood Hwy

Burwood Vic, 3125

P + 03 8697 1446
M + 0409 540 355
E craig.a.butler@team.telstra.com
W www.telstra.com or internal Network Construction & Services

WEB
http://www.in.telstra.com.au/ism/networkintegrity/index.asp

Network Integrity

- Front of House contact - **1800 810 443**
- Email new job request - Networkintegrity@team.telstra.com
- Network Integrity online request form - https://say.telstra.com.au/customer/general/forms/request-asset-relocation-or-commercial-works
- Report damaged network - https://say.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment

NBN Co

- If NBN works are required please contact on **1800 687 626** or email: RelocationWorks@nbnco.com.au

This email may contain confidential information.
If I've sent it to you by accident, please delete it immediately.

From: Glenn Kerr [mailto:Glenn.Kerr@ghd.com]
Sent: Wednesday, 6 June 2018 3:18 PM
To: Meath, Ken J <Kenneth.J.Meath@team.telstra.com>
Subject: RE: MR228767-1 Vineyard Rd Sunbury#

Hi Ken

Thanks for making contact

GHD writes to Telstra to seek advice on a possible utility relocation arising from a PSP (Precinct Structure Plan) currently underway by VPA (Victorian Planning Authority).

The township of Sunbury is undergoing a PSP which is the first step to land rezoning to create a new suburb/expanded township as such its early days however planning for any major utility relocations is best addressed at this stage.

A road underpass (structure SS-BD4 on dwg 1131) is proposed under the Bendigo railway line which may cause the relocation of Telstra conduit/cables. See dwg 0204 'Underpass (SS-BD4, SS-LR-BD3) for details of the underpass.

The road underpass location is at the rear of property No.175 Vineyard Rd Sunbury.

Information sought is:

- Asset description and its accurate location/depth.
- Relocation requirements, approx. relocation alignment
- Land requirements, easements required?
- Is it a major long lead item to relocate
- Idea of likely cost of relocation

Authority approvals process

If you have any queries please call.

Regards

Glenn Kerr CPEng
Senior Engineer
Urban Development

GHD
T: +61 3 8687 8586 | M: +61 412 928 116 | V: 318 586 | E: glenn.kerr@ghd.com
Level 8, 180 Lonsdale Street Melbourne VIC 3000 | **www.ghd.com**
Water | Energy & Resources | Environment | Property & Buildings | Transportation

From: Meath, Ken J <Kenneth.J.Meath@team.telstra.com>
Sent: Wednesday, 6 June 2018 2:43 PM
To: Glenn Kerr <Glenn.Kerr@ghd.com>
Subject: MR228767-1 Vineyard Rd Sunbury

Hi Glenn,

Could you contact me on 0427 064593 For further discussions on this Request

Kind regards,

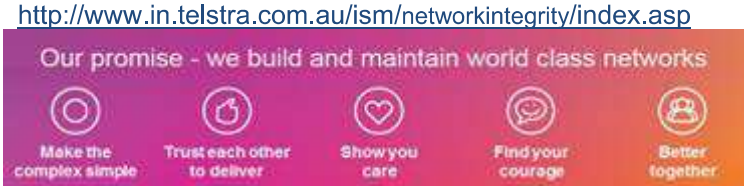
Ken Meath
Network Integrity Field Operative
SA/ VIC/ TAS
Network Construction & Services, Networks
Telstra Operations

Bldg 1, 301 Burwood Hwy

Burwood Vic, 3125

P + 03 8647 6192
M + 0427 064593 **E** Kenneth.J.Meath@team.telstra.com
W www.telstra.com or internal Network Construction & Services

WEB
http://www.in.telstra.com.au/ism/networkintegrity/index.asp



Network Integrity

- Front of House contact - **1800 810 443**
- Email new job request - Networkintegrity@team.telstra.com
- Network Integrity online request form - https://say.telstra.com.au/customer/general/forms/request-asset-relocation-or-commercial-works
- Report damaged network - https://say.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment

NBN Co

- If NBN works are required please contact on **1800 687 626** or email: RelocationWorks@nbnco.com.au

This email may contain confidential information.
If I've sent it to you by accident, please delete it immediately.

This e-mail has been scanned for viruses

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

Luke Morrison

From: Adam Heaton <Adam.Heaton@westernwater.com.au>
Sent: Tuesday, 12 June 2018 10:48 PM
To: Glenn Kerr
Subject: RE: Pre Development Advice Sunbury PSP
Attachments: Tame SPS Rising Main.pdf; Plot 12.pdf

Hi Glenn,

Thanks for your email and queries regarding WW infrastructure within Sunbury South PSP.

As you would be aware this is an active DN225 DICL sewer rising main, for which is transferring all wastewater from Diggers Rest to our existing Sunbury South SPS (located adjacent to existing bluestone aquaduct a few properties to north of 175 Vineyard). I have attached an overall plan detailing this, just ignore the flow direction as everything is pumped from south to north and then pumped again to east to Jacksons Hill / Sunbury treatment plant.

The alignment is predominately along the eastern boundary of the railway reserve, at this location behind 175 Vineyard being approx. 6.0m offset within the reserve, however does meander at different points (crosses back to west. Depth I believe ranges between 1.2m to 2.5m in areas. Process to relocate would follow our standard Works and LD process, for which is contained primarily in our Land Development Manual. This would essentially applying to WW seeking conditions for relocation, an accredited consultant undertaking detailed design and an accredited contractor to complete the works. Obviously the consultant will need to undertake an amount of work in seeking WW's and VicTrack endorsement for relocation works, although I daresay VicTrack approval would be more exhaustive than WW's approvals process.

From my brief understanding I do not believe we have an easement over the existing rising main, however would likely have a VicTrack license/agreement. Note that Diggers Rest SPS will be ultimately upgraded and as such WW at this time undergoing concept design for the SPS and rising main upgrades, which could result in the rising main being upgraded to DN375, however would need to ascertain timing with this work (I would expect perhaps 5-10 years depending on growth rates). We could entertain these discussions further at detailed design and optioneering of relocation works.

Please let me know should you require any additional information.

Regards,

WESTERN WATER
Adam Heaton | Land Development Coordinator
P: (03) 9218 5594 | **M:** 0428 908 981
E: adam.heaton@westernwater.com.au
36 Macedon Street Sunbury 3429 | PO Box 2371 Sunbury DC 3429

From: Glenn Kerr [mailto:Glenn.Kerr@ghd.com]
Sent: Friday, 1 June 2018 10:31 AM
To: Property Services <Property.Services@westernwater.com.au>
Subject: Pre Development Advice Sunbury PSP

To: Western Water
Developer.services@westernwater.com.au

Hello

GHD writes to Western Water to seek advice on a possible utility relocation arising from a PSP (Precinct Structure Plan) currently underway by VPA (Victorian Planning Authority).
The township of Sunbury is undergoing a PSP which is the first step to land rezoning to create a new suburb/expanded township as such its early days however planning for any major utility relocations is best addressed at this stage.
A road underpass (structure SS-BD4 on dwg 1131) is proposed under the Bendigo railway line which may cause the relocation of 225dia DICL rising main sewer. See dwg 0204 'Underpass (SS-BD4, SS-LR-BD3) for details of the underpass.

The road underpass location is at the rear of property No.175 Vineyard Rd Sunbury.

Information sought is:

- Asset description and its accurate location/depth.
- Relocation requirements/options, approx. relocation alignment
- Land requirements, easements required?
- Is it a major long lead item to relocate
- Idea of likely cost of relocation

Authority approvals process

Note the dwgs are not showing sewer at the moment

If you have any queries please call.

Regards

Glenn Kerr CPEng
Senior Engineer
Urban Development

GHD
T: +61 3 8687 8586 | M: +61 412 928 116 | V: 318 586 | E: glenn.kerr@ghd.com
Level 8, 180 Lonsdale Street Melbourne VIC 3000 | **www.ghd.com**
Water | Energy & Resources | Environment | Property & Buildings | Transportation

_____
CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.
_____

At Western Water we value: People, Integrity, Respect, Teamwork, Excellence

---

Please consider the environment before printing this email

Western Water
36 Macedon Street, Sunbury, Vic, 3429
PO Box 2371, Sunbury DC, 3429

Permanent Water Saving Rules are in place for all Western Water customers. For more information, call the restrictions hotline 1300 650 422 or visit www.westernwater.com.au/PWSR

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify mail@westernwater.com.au or Western Water directly.

Western Water is committed to the information principles contained in the Freedom of Information Act 1982 and the Privacy and Data Protection Act 2014. For a copy of our Personal Privacy Charter please contact us, or visit our website www.westernwater.com.au

---

This e-mail has been scanned for viruses

From: Zhang, Jimmy <jimmy.zhang@victrack.com.au>
Sent: Wednesday, 1 August 2018 2:05 PM
To: Luke Morrison
Cc: Mark Whalen
Subject: FW: Sunbury PSP
Attachments: 2113308A - CIV - 1131 - Rev D.PDF; 0204.pdf

CompleteRepository: 3136206
Description: Sunbury Sth Lancefield Rd ICP
JobNo: 36206
OperatingCentre: 31
RepoEmail: 3136206@ghd.com
RepoType: Job

Hi Luke,

Sorry for the delay in getting back to you, there was some conflicting information when comparing the services recorded in our system with your attached drawings. Specifically the two gas assets which seemingly aren't in VicTrack land, a Western Water sewer asset missing from your plans and another water asset which I am still waiting to hear back on.

Our team primarily deals with Third Party Services, the relocation of the VicTrack comms asset would go through our Telecommunications team who can be contacted at external.property@victrack.com.au

Regarding the other services, please see the below responses in blue.

- Relocation requirements, approx. relocation alignment: Depending on the depths of the existing assets, relocation may or may not be necessary. If it is required, VicTrack would prefer to keep the alignment as close to the original as possible, only with the asset at a greater depth.
- Land requirements, easements required? No easements required, specific land requirements regarding environmental/infrastructure would be provided by VicTrack's internal stakeholders once an application has been received.
- Is it a major long lead item to relocate? Given/If the works were approved by PTV, the application process for the relocation will approximately take between 3-6 months.
- Idea of likely cost of relocation: VicTrack's application fee would be $2200 per service to be relocated
- Authority approvals process: VicTrack would initially require PTV approval for the road underpass, once a formal application is received we would liaise and obtain requirements from VicTrack's internal stakeholders followed by consulting with the rail operator MTM. For more information of the entire application process please refer to our website: https://victrack.com.au/utilities

Regards
Jimmy Zhang
Graduate Engineer
Property Group

VicTrack

Level 8, 1010 La Trobe St Docklands VIC 3008
T +61 3 9619 8843
services@victrack.com.au
victrack.com.au

From: Morgan, Michael
Sent: Monday, 23 July 2018 1:55 PM
To: Luke Morrison <Luke.Morrison@ghd.com>; Services <services@victrack.com.au>; External Plant PTW <external.plant@victrack.com.au>
Cc: Mark Whalen <Mark.Whalen@ghd.com>
Subject: FW: Sunbury PSP

Hi Services, External Plant,

The request below has come to VicTrack Infrastructure form GHD who are doing some work at a PSP (Precinct Structure Plan) currently underway by VPA (Victorian Planning Authority) at Sunbury [175 VINEYARD RD, SUNBURY VIC 3429]. They are looking for information on requirements for service relocation. I note there are VicTrack comms assets and third part services at this location. Please liaise with Luke from GHD on this matter.

Hi Luke,

This seemed to be broader than just looking at services in our conversation on Friday.

Regards

Michael Morgan
Asset Engineering Manager
Property Group
T 9619 8861
M 0408 586 032

From: Luke Morrison
Sent: Friday, 20 July 2018 2:27 PM
To: 'michel.morgan@victrack.com.au' <michel.morgan@victrack.com.au>
Cc: Mark Whalen <Mark.Whalen@ghd.com>
Subject: Sunbury PSP

Hi Michael thanks for your time on the phone earlier

GHD is seeking advice on a possible utility relocation arising from a PSP (Precinct Structure Plan) currently underway by VPA (Victorian Planning Authority).

The township of Sunbury is undergoing a PSP which is the first step to land rezoning to create a new suburb/expanded township as such its early days however planning for any major utility relocations is best addressed at this stage.
A road underpass (structure SS-BD4 on dwg 1131) is proposed under the Bendigo railway line. See dwg 0204 'Underpass (SS-BD4, SS-LR-BD3) for details of the underpass.
The road underpass location is at the rear of property No.175 Vineyard Rd Sunbury.
Information sought is a summary of the following

- Relocation requirements, approx. relocation alignment
- Land requirements, easements required?
- Is it a major long lead item to relocate
- Idea of likely cost of relocation
- Authority approvals process

If you have any queries please call.

Luke Morrison
Project Manager, Urban Development

GHD
Proudly employee owned
T: +61 3 8687 8784 | M: +61 419 348 626 | E: Luke.morrison@ghd.com
180 Lonsdale Street Melbourne VIC 3000 Australia | www.ghd.com

Connect

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY& BUILDINGS | TRANSPORTATION

Please consider our environment before printing this email

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

Email disclaimer: This email and any attachment to it, is confidential and may be privileged. If you are not the intended recipient, you must not use, disclose, or act on the email. If you have received this email in error, please notify the sender by return email and permanently delete the email. To the maximum extent permissible by law, VicTrack takes no responsibility for, and makes no representations in relation to, the completeness, accuracy or quality of any information contained in the email.

This e-mail has been scanned for viruses

From: Morgan, Michael <michael.morgan@victrack.com.au>
Sent: Thursday, 26 July 2018 5:07 AM
To: Luke Morrison
Subject: RE: Sunbury PSP

Hi Luke

I have put together a high level summary of matters to consider for the proposed underpass at Sunbury, This will need input from a number of parties to flesh out and many of the costs will be unknown under further down the track when the impact on various items is understood.. I have added some additional points below also.

Item	Party	Process	Cost
Future rail requirements to allow for in the design	TfV	TfV to advise	
Clearance to sell land for the underpass to council	DEDJTR, VicTrack	Application to purchase land on VicTrack website	
Working around VicTrack comms cables (including locating, working close to and/or relocating	VicTrack Telecommunications	VicTrack Telecommunications to advise	VicTr Telec to ad on im
Working around third party utilities (including locating, working close to and/or relocating	Asset owner, VicTrack	Application on VicTrack website	Appli asset
Concept approval based on future rail requirements, clearance to sell land, council confirmation to purchase land, AS5100, PYV and MTM standards, etc	TfV, PTV, MTM, VicTrack	MTM have costs	MTM
Purchase of land	VicTrack Property	Application to purchase land on VicTrack website	Base Gene plus
Design review including workshops	TfV, PTV, MTM, VicTrack	MTM have costs	MTM
Access to the rail corridor to carry out the works including occupation, safe working requirements, site access permits (MTM).	PTV, MTM	MTM costs	MTM

General Requirements

1. The bridge must be designed in accordance with the AS5100 Bridge Code.
2. The design documentation of the rail bridge must be proof checked by an appropriately experienced engineer, independent of the designer.
3. Temporary works must also be designed and proof checked in a similar manner to the permanent works.
4. Drawings to be submitted to TfV, PTV, VicTrack and MTM at both preliminary/concept stage and construction stage for review.
5. Staging of construction, arrangements for occupations, speed restrictions, and permission to enter the land for preliminary survey or geotechnical works must first be discussed with the access provider (MTM).
6. Likely times for occupations and track protection appropriate for the works to be discussed with the access provider (MTM).
7. The number of tracks to be allowed for in the design to be confirmed with TfV planning area.
8. Cant and curve effect should be taken into account for clearance requirements.
9. All land transfer issues to be addressed with the property section of VicTrack.

10. Clearances must be agreed with PTV and MTM (standards).
11. Access providers may require an investigation fee up front to provide information on occupations etc.
12. A site safety plan will be required which will detail construction methodology affecting rail safety and this will require approval prior to entry to the land.
13. A full rail safety risk analysis is required to be carried out by the developer/contractor with all stakeholders to identify any risks associated with the construction activities, and determine procedures to reduce those risks to an acceptable level.

Rail over road specific requirements (applies to road lowering or deck raising also)

14. The Bridge must be designed to support railway traffic loading as defined in AS5100 and MTM standards, satisfying any relevant fatigue requirements.
15. Minimum vertical clearance beneath the rail bridge, for a bridge not designed to withstand road vehicle impact, is 5.3 metres. [check to confirm clearance is correct]
16. Where bridge soffit is less than 5.3 metres above road beneath, the bridge superstructure must either be designed to withstand loads defined in Bridge Design Code, or it must be protected by other independent structures designed to withstand those loads. The intent should be to remove the need for crash beams in advance of the bridge structure.
17. The bridge superstructure shall be designed to accommodate rail tracks with minimum track as set out in PTV and MTM standards. Advice from TfV on future rail requirements may also define the track centres. Other clearance effects such as cant and curve effect need to be considered.
18. Location of all components of the bridge above rail track level must satisfy clearance requirements indicated in PTV and MTM standards.
19. Deck and track design including a pedestrian walkway or walkways must meet PTV and MTM standards.

Regards

Michael Morgan
Asset Engineering Manager
Property Group
T 9619 8861
M 0408 586 032

From: Luke Morrison [mailto:Luke.Morrison@ghd.com]
Sent: Tuesday, 24 July 2018 9:05 AM
To: Morgan, Michael <michael.morgan@victrack.com.au>
Subject: RE: Sunbury PSP

Hi Michael.

Just checking to see if you are able to send the high level summary email as discussed yesterday through this morning?

Just need to include VicTrack preliminary advice in my report.

Cheers

Luke Morrison
Project Manager, Urban Development

GHD
Proudly employee owned
T: +61 3 8687 8784 | M: +61 419 348 626 | E: Luke.morrison@ghd.com
180 Lonsdale Street Melbourne VIC 3000 Australia | www.ghd.com

Connect

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY& BUILDINGS | TRANSPORTATION

Please consider our environment before printing this email

From: Morgan, Michael <michael.morgan@victrack.com.au>
Sent: Monday, 23 July 2018 1:55 PM
To: Luke Morrison <Luke.Morrison@ghd.com>; Services <services@victrack.com.au>; External Plant PTW <external.plant@victrack.com.au>
Cc: Mark Whalen <Mark.Whalen@ghd.com>
Subject: FW: Sunbury PSP

Hi Services, External Plant,

The request below has come to VicTrack Infrastructure form GHD who are doing some work at a PSP (Precinct Structure Plan) currently underway by VPA (Victorian Planning Authority) at Sunbury [175 VINEYARD RD, SUNBURY VIC 3429]. They are looking for information on requirements for service relocation. I note there are VicTrack comms assets and third part services at this location. Please liaise with Luke from GHD on this matter.

Hi Luke,

This seemed to be broader than just looking at services in our conversation on Friday.

Regards

Michael Morgan
Asset Engineering Manager
Property Group
T 9619 8861
M 0408 586 032

From: Luke Morrison
Sent: Friday, 20 July 2018 2:27 PM
To: 'michel.morgan@victrack.com.au' <michel.morgan@victrack.com.au>
Cc: Mark Whalen <Mark.Whalen@ghd.com>
Subject: Sunbury PSP

Hi Michael thanks for your time on the phone earlier

GHD is seeking advice on a possible utility relocation arising from a PSP (Precinct Structure Plan) currently underway by VPA (Victorian Planning Authority).

The township of Sunbury is undergoing a PSP which is the first step to land rezoning to create a new suburb/expanded township as such its early days however planning for any major utility relocations is best addressed at this stage.
A road underpass (structure SS-BD4 on dwg 1131) is proposed under the Bendigo railway line. See dwg 0204 'Underpass (SS-BD4, SS-LR-BD3) for details of the underpass.
The road underpass location is at the rear of property No.175 Vineyard Rd Sunbury.
Information sought is a summary of the following

- Relocation requirements, approx. relocation alignment
- Land requirements, easements required?
- Is it a major long lead item to relocate
- Idea of likely cost of relocation
- Authority approvals process

If you have any queries please call.

Luke Morrison
Project Manager, Urban Development

GHD
Proudly employee owned
T: +61 3 8687 8784 | M: +61 419 348 626 | E: Luke.morrison@ghd.com
180 Lonsdale Street Melbourne VIC 3000 Australia | www.ghd.com

Connect

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY& BUILDINGS | TRANSPORTATION

Please consider our environment before printing this email

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

Email disclaimer: This email and any attachment to it, is confidential and may be privileged. If you are not the intended recipient, you must not use, disclose, or act on the email. If you have received this email in error, please notify the sender by return email and permanently delete the email. To the maximum extent permissible by law, VicTrack takes no responsibility for, and makes no representations in relation to, the completeness, accuracy or quality of any information contained in the email.

This e-mail has been scanned for viruses

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email

communications through their networks.

Email disclaimer: This email and any attachment to it, is confidential and may be privileged. If you are not the intended recipient, you must not use, disclose, or act on the email. If you have received this email in error, please notify the sender by return email and permanently delete the email. To the maximum extent permissible by law, VicTrack takes no responsibility for, and makes no representations in relation to, the completeness, accuracy or quality of any information contained in the email.

This e-mail has been scanned for viruses

PROPOSAL INFORMATION PLAN (PIP)

PROJECT DETAILS AND APPROVALS

PROJECT NAME: Sunbury South Railway Bridge (SS-BR4) Relocation	**PIP No: ID to Assign**
CUSTOMER/SHIPPER: Victoria Planning Authority	**Rev: 0**
LOCATION: Sunbury	
STATE: VIC	**RELATED ASSET: Sunbury South Pipeline (T62, PL122)**

COMMERCIAL – PROJECT OVERVIEW:

APA has been approached by Victoria Planning Authority (VPA) to provide cost input on their new growth area urban plan.

CONCEPT STAGE

COMMERCIAL – CUSTOMER PARAMETERS

	Receipt Point	Delivery Point
Location		
MDQ (TJ/day)		
MHQ (TJ/hr)		
PRESSURE (MPag)		
Storage/Imbalance Limits (TJ):		

Other Comments:

COMMERCIAL – ESTIMATED PROJECT APPROVAL DATE:			
COMMERCIAL – TARGET GAS ON DATE:	2028		
COMMERCIAL – TERM/DURATION OF CONTRACT			
COMMERCIAL – INDICATIVE LEVEL OF DETAIL:	**± 30%** ☒	**± 50%** ☐	**+/- %**

ORIGINATOR NAME:	**DATE:**	
Chris Karambelas	**RESPONSE REQUIRED BY DATE:**	

ID – PROJECT BRIEF:

The conflict location is described as SS-BR4 in Section 4.4 of Sunbury South/Lancefield Road-ICP Infrastructure Design and Costing report prepared by GHD dated August 2018. Please refer to Appendix B for the extract.

APA preferred solution is to lower the existing pipeline section by means of an HDD construction with the following parameters:

- 142 meters of HDD for existing 6" pipeline
- 164 meters of 4" temporary bypass during construction
- hot tap, stopple and tie in new section of pipeline to existing pipeline
- abandon existing pipeline section that is being replaced

ID – PRICING – CONCEPT STAGE ESTIMATE: *Indicative*

The cost estimate benchmarks against projects recently completed and currently in progress.

Recent pipeline relocation estimate

	Western Ring Road (M80) BCP Relocation, VIC (forecast)
Diameter (inch)	14
HDD Length (meter)	306.5
Price	$ 4.8mil

Improvement to the accuracy of this estimate will require a FEED process to be conducted. At this stage, the cost of HDD construction is based on a budget quote for a 10" pipeline.

The cost estimate based on the scope of work is as follows:

WBS	142 meter HDD Construction for 6" Pipeline	Estimate
100	**Project Management**	$ 680,073
110	**Land & Approvals**	$ 67,375
120	**Design**	$ 533,632
130	**Procurement**	$ 289,380
140	**Construction**	$ 2,089,221
150	**Commissioning and Handover**	$ 110,243
	Sub-Total =	**$ 3,769,924**
	Contingency (18%)	$ 664,749
	P90 Total =	**$ 4,400,000**

Concept Stage - Contingency Report

Contract Name	SS-BR4	Project	Sunbury South Relocation
Client Name	Victoria Planning Authority	Organisation	APA
Bid Manager	Matt Felvus	Reference	
Assessment	30/20/2018	Project Start Date	01-Feb-28
Version	1	PL Date	01-Jan-29

ONLY PINK CELLS BELOW SHOULD BE UPDATED MANUALLY

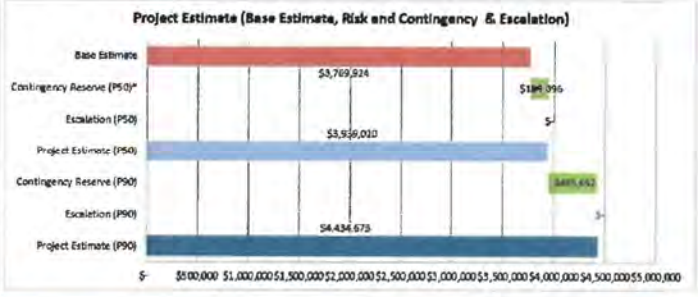
Project TOC (Total Outturn Cost)

Base Estimate (Total Capex Excl. Contingency & Escalation)		$ 3,769,924
	P50	P90
Contingency Reserve (CR) $	$ 169,096	$ 664,749
Contingency Reserve (CR) %	4%	18%
Project Estimate Incl. Contingency	$ 3,939,020	$ 4,434,673
Escalation $	$ -	$ -
Total Outturn Cost (TOC)	$ 3,939,020	$ 4,434,673

Pipeline (Sell Price) TOC (Total Outturn Cost)

Base Estimate (Total Capex Excl. Contingency & Escalation)		$ 3,769,924
	P50	P90
Contingency Reserve (CR) $	$ 169,096	$ 664,749
Contingency Reserve (CR) %	4%	18%
Project Estimate Incl. Contingency	$ 3,939,020	$ 4,434,673
Escalation* $		
Total Outturn Cost (TOC)	$ 3,939,020	$ 4,434,673

*The range of 'Escalation' figures should be assessed separately also with consideration of schedule delay.



Meter Station TOC (Total Outturn Cost)

Base Estimate (Total Capex Excl. Contingency & Escalation)		$ -
	P50	P90
Contingency Reserve (CR) $	$ -	$ -
Contingency Reserve (CR) %	#DIV/0!	#DIV/0!
Project Estimate Incl. Contingency	$ -	$ -
Escalation* $		
Total Outturn Cost (TOC)	$ -	$ -

*The range of 'Escalation' figures should be assessed separately also with consideration of schedule delay.

Contingency Reserve (CR) Breakdown

	Base Estimate	P50	P90
Total Project	$ 3,769,924	$ 169,096	$ 664,749
[redacted]	$ 3,769,924	$ 169,096	$ 664,749
[redacted]	$ -	$ -	$ -
[redacted]	$ -	$ -	$ -

Compressor Station TOC (Total Outturn Cost)

Base Estimate (Total Capex Excl. Contingency & Escalation)		$ -
	P50	P90
Contingency Reserve (CR) $	$ -	$ -
Contingency Reserve (CR) %	#DIV/0!	#DIV/0!
Project Estimate Incl. Contingency	$ -	$ -
Escalation* $		
Total Outturn Cost (TOC)	$ -	$ -

*The range of 'Escalation' figures should be assessed separately also with consideration of schedule delay.

Assumptions:

1. There is no contingency in the base estimate. A P90 value has been used to determine the appropriate level of contingency.
2. The project schedule assumes clear sky construction.
3. Construction schedule assumed to be 5 day week, 10 hours day.
5. The estimate has allowed for HDD construction up to 150MPa ground condition.
7. The estimate has assumed construction within existing pipeline easement.
9. The estimate has not allowed for cultural heritage and native title costs.
10. The estimate has allowed for approval cost.
11. Prices of material and services were based upon prices at 1st Oct 2018. Price escalation has not been applied.
12. The estimate does not include physical protection requirements (e.g. slabbing).
13. The estimate has not factored in borrowing cost.
14. The estimate utilises sell rate for APA labour component and 22.5% margin applied on fees, outsourced services, procurement and construction items.

OTHER COMMENTS:

GATE 1 APPROVALS (CONCEPT TO DEVELOPMENT)

Name: Matt Felvus	**Name: Kevin Lester**
Position: General Manager – Development and Support	**Position: Group Executive, Infrastructure Development**
Date: 31/10/18	**Date: 31/10/18**

DEVELOPMENT STAGE

COMMERCIAL – COMMENTS:	
COMMERCIAL – PROPOSAL SUBMISSION DATE:	
COMMERCIAL – FUNDING AMOUNT ($):	
COMMERCIAL – COST CODE:	
COMMERCIAL – INDICATIVE LEVEL OF DETAIL:	+/- %

ID – PROJECT INPUTS & REQUIREMENTS

- ☐ Design Brief
- ☐ Preliminary Design Basis Memorandum
- ☐ PFD
- ☐ P&IDs
- ☐ Single Line Diagrams
- ☐ Site Visit for initial survey
- ☐ Site Plot Layout
- ☐ Preliminary Pipeline Route Survey
- ☐ Route Feasibility Study (Desktop)
- ☐ Geotechnical Study
- ☐ Project Management
- ☐ Initial Consultation with Statutory body
- ☐ Preliminary HAZOP
- ☐ Preliminary Risk Assessment
- ☐ Likely Procurement Strategy
- ☐ Budget
- ☐ Schedule
- ☐ Organisation Chart & Personnel Bar Chart
- ☐ Table of Approvals & Land Requirements
- ☐ Other (Specify)

ID - TOTAL DEVELOPMENT STAGE PROJECT ESTIMATE:
PROJECT PLANNING STAGE ESTIMATE:

OTHER COMMENTS:

GATE 2 APPROVALS (DEVELOPMENT TO PLANNING)

Name:	**Name:**
Position:	**Position:**
Date:	**Date:**

ATTACHMENT A: GAS SUPPLY REQUIREMENTS				
PROJECT LOCATION:				
SCOPE AND OWNERSHIP DEMARCATION:				
GAS DELIVERY POINT (CONNECTION POINT): (SUPPLY MAP WITH LOCATION OR COORDINATES, IF POSSIBLE)				
TECHNICAL PARAMETERS	***NORMAL RANGE***	***MAXIMUM***	***NORMAL***	***MAX/MIN TRIP LIMITS***
GAS DELIVERY PRESSURE (KPA):				
GAS DELIVERY TEMPERATURE (°C):				
GAS DAILY FLOW (SCM/DAY, TJ/DAY):				
GAS HOURLY FLOW (SCM/HR):				
SPECIAL REQUIREMENTS BY CUSTOMER: (COMMISSIONING GAS, SPECIFIC LOAD PROFILES)				
GAS SPECIFICATION (INCL. MIN HHV):				
GAS QUALITY MONITORING				
FILTRATION REQUIREMENT:				
AVAILABILITY OF POWER ELECTRICITY:				
AVAILABILITY / RELIABILITY TARGET:				
SCADA AND COMMUNICATIONS INTERFACE:				
FUTURE EXPANSION REQUIREMENTS:				
DESIGN LIFE:				
OWNERSHIP/OPERATOR:				
MAINTENANCE BASE (INCL RESPONSE TIME):				
SPECIAL MAINTENANCE TOOLS & SPARE:				
ATTACHMENTS / ADDITIONAL INFORMATION:				

4.4 APA Gas

APA has advised the proposed rail bridge works will have an impact on the existing Deer Park and Sunbury pipeline PL122. The pipeline is a 150mm diameter high pressure transmission gas line which is operated by APA in accordance with AS2885 Pipelines – Gas and liquid petroleum.

In accordance with AS 2885, a Safety Management Study was completed by the VPA and APA to identify risk and how they need to be managed for the implementation of the Sunbury PSP.

Following the SMS study and subsequent conversations with APA regarding the relocation of the pipeline to facilitate the construction of SS-BR4, APA provided 2 options.

1. Pipeline to remain within its existing easement and be lowered under the proposed roadway.
2. Reroute the pipeline around SS-BR4 structure.

Based on the limited information available, installation within the current easement, option 1, is favoured by APA. The lowered pipe would likely be offset from the existing pipeline numerous metres but still within the existing easement. This is APA's preferred solution as no further land acquisition is likely to be required outside of the existing easement.

If the pipeline remains within the existing easement then no amended licence agreement would be required. Pipe abandonment would need to be addressed through acceptance of a decommissioning plan by the Department.

Following receipt of the option noted above, a meeting was held on 29 June between APA Gas, VPA and GHD to further understand the project requirements, risks and potential costs. Attendees from APA included representatives from their commercial and planning groups. During the meeting APA advised that for them to provide an indicative cost plan for the works VPA would need to enter into an Agreement. The purpose of this agreement is to facilitate a concept design upon which a cost plan could be developed. A program and fees associated with the development of the concept design and cost plan could not be provided at that time.

GHD has further investigated APA's preferred option of lowering the transmission pipeline within the current easement and note the pipeline could be laid by either open cut, horizontal directional drilling or pipe jacking. All methods would most likely require installation of a stopple bypass to allow continuous flow of gas to occur throughout the works. Construction techniques would need to be discussed with VicTrack and other service authorities whose assets may be impacted to ascertain the preferred methodology. Concept design can also be reviewed through the Safety Management Study process specified in AS2885.

Preliminary discussions with APA revealed a preference for horizontal direction drilling (HDD) to be utilised as this process minimises excavation and impacts on the surrounding environment. GHD has further investigated the HDD option and prepared a preliminary specification for the works which is outlined below.

- a trajectory radius of 1000 D = 168.3 m,
- use a high strength steel for this radius as the bending stress will be relatively high for low strength,
- 12 degree entry and exit angle,
- Current pipe cover 0.75 m, under road we need minimum 1.2 m,
- A depth margin of 2 m,
- The depth of the HDD below current surface levels will be approximately 10.3 m.

Noting the above assumptions, the overall HDD span will be about 132 m from entry to exit.

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.

The existing exclusion zone for the in-service pipeline could be about 5 m, therefore the new HDD pipeline would be offset 5 m. Allowance for another 10 m for horizontal dog-leg piping to meet the existing alignment is required resulting in a total new pipeline section length of approximately 142 m.

The temporary stopple bypass pipeline will be 154 m along x 5 m offset or total length of 164 m.

GHD has undertaken a high level engineering cost estimate for the transmission pipeline relocations works which has been inserted in the overall cost plan, the works have been estimated at $2,800,000.

DRAFT

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by Law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.

Luke Morrison

From: Mielczarek, Michael <Michael.Mielczarek@apa.com.au>
Sent: Thursday, 21 June 2018 8:33 AM
To: Ben Weiner
Cc: Glenn Kerr; Daniel Tucci (InTouch)
Subject: RE: APA gas contacts for Sunbury South

Hi Ben,

Further to our discussion yesterday, the 2 options tabled each have their own difficulties & time/cost impacts.

Option 1 - Lowering the pipe in the existing easement
Lowering the pipe would require a very large open cut excavation area to get to the depths that are required, but it is possible, it would have impact on adjacent land owners for construction lay down areas and work areas, which would require a temporary licence agreement with these parties.

Another method would be a horizontal directional drilling (HDD). This would likely be the favoured option in this case, which would require construction work areas at either end of the HDD, again potentially affecting adjacent land owners during construction. The lowered pipe would likely be installed a number of metres offset from the existing pipeline within the existing easement, therefore no further land acquisition would be required outside of the existing easement. This was previously done for a project in Cardinia.

Given no land acquisition is required and the pipeline stays within the existing easement then no amended licence agreement is required. Pipe abandonment would have to be addressed through acceptance of a decommissioning plan by the Department.

Option 2 - Relocating the pipeline to the east (so as not to significantly lower the pipe)
The option for relocation would require acquisition of further easement and an amended licence agreement with owners and occupiers. Land acquisition of an easement is a time consuming process and I assume there would be multiple land owners to deal with. Having spoken to our access and approvals team, depending on the attitude of owners and the number that we would have to consult, it may take at approximately 12 months to get necessary approval to alter the pipeline alignment and acquire the easement (if land owners are agreeable). Environmental and cultural heritage impacts will also need to be considered. Cost of acquiring new easement will likely be costly given the approved PSP will have increased land values. Pipe abandonment would have to be addressed as well.

It is likely that once designs are finalised and works approval is given, the works for either option could be completed within 5 – 6 months (dependent on weather, etc).

I would imagine cost and time wise the lowering option is the cheaper and quicker option of the two. I'm trying to get some rough cost estimates at the moment (as mentioned it will likely be in the millions of dollars). If you require a detailed cost estimate then an early works agreement may be required so that APA can recoup its cost for time spent in preparing such a costing.

As previously mentioned, I would be happy to arrange a meeting to discuss further.

Kind regards,

Michael Mielczarek
Senior Urban Planner

APA Group
Infrastructure Planning and Protection
Level 14, IBM Building
60 City Road
Southbank VIC 3006

d 03 8533 2141
m +61 472 876 288
e Michael.Mielczarek@apa.com.au
w www.apa.com.au

From: Ben Weiner <Ben.Weiner@vpa.vic.gov.au>
Sent: Wednesday, 20 June 2018 10:22 AM
To: Mielczarek, Michael <Michael.Mielczarek@apa.com.au>
Subject: [EXT]: RE: APA gas contacts for Sunbury South

Hi Michael

Just following up on the matter of Sunbury South PSP gas pipeline relocation at the railway line due to a planned underpass.

Have you been able to gather any preliminary advice? Thanks
Ben

Ben Weiner // Senior Strategic Planner
Victorian Planning Authority
Level 25, 35 Collins Street, Melbourne VIC 3000
T: 03 8644 8824 // E: ben.weiner@vpa.vic.gov.au

Victorian Planning Authority
Your partner in planning great places for a growing Victoria

From: Ben Weiner
Sent: Tuesday, 5 June 2018 4:22 PM
To: 'Glenn Kerr' <Glenn.Kerr@ghd.com>; Mielczarek, Michael <Michael.Mielczarek@apa.com.au>
Subject: RE: APA gas contacts for Sunbury South

Hi thanks Glenn and Michael.

Is there any way we can progress the matter sooner than 5 weeks?

Michael I just gave you a call. Perhaps we can discuss. Thanks
Ben

Ben Weiner // Senior Strategic Planner
Victorian Planning Authority
Level 25, 35 Collins Street, Melbourne VIC 3000
T: 03 8644 8824 // E: ben.weiner@vpa.vic.gov.au

Victorian Planning Authority
Your partner in planning great places for a growing Victoria

From: Glenn Kerr [mailto:Glenn.Kerr@ghd.com]
Sent: Tuesday, 5 June 2018 3:58 PM
To: Mielczarek, Michael <Michael.Mielczarek@apa.com.au>
Cc: Ben Weiner <Ben.Weiner@vpa.vic.gov.au>
Subject: FW: APA gas contacts for Sunbury South

Hi Michael

As discussed APA recommends a mtg with relevant APA people and VPA/GHD to better understand the issues and options.

At present it is being reviewed by your engineers.

The timing will be in approx. 5 weeks when Daniel Tucci returns to work

Regards

Glenn Kerr CPEng
Senior Engineer
Urban Development

GHD
T: +61 3 8687 8586 | M: +61 412 928 116 | V: 318 586 | E: glenn.kerr@ghd.com
Level 8, 180 Lonsdale Street Melbourne VIC 3000 | **www.ghd.com**
Water | Energy & Resources | Environment | Property & Buildings | Transportation

From: Glenn Kerr
Sent: Monday, 28 May 2018 4:02 PM
To: 'Michael.Mielczarek@apa.com.au' <Michael.Mielczarek@apa.com.au>
Cc: 'Ben Weiner' <Ben.Weiner@vpa.vic.gov.au>
Subject: FW: APA gas contacts for Sunbury South

Hi Michael

Thanks for the chat earlier.

The project is in its early planning phase so as discussed it would be good to assess long lead items. This will include land acquisition/easements and general alignment

Sketch options attached for discussion.

If you could please let me know APA's process/timelines

Talk soon, Regards

Glenn Kerr CPEng
Senior Engineer
Urban Development

GHD
T: +61 3 8687 8586 | M: +61 412 928 116 | V: 318 586 | E: glenn.kerr@ghd.com
Level 8, 180 Lonsdale Street Melbourne VIC 3000 | **www.ghd.com**
Water | Energy & Resources | Environment | Property & Buildings | Transportation

---

From: Ben Weiner <Ben.Weiner@vpa.vic.gov.au>
Sent: Monday, 28 May 2018 10:47 AM
To: Glenn Kerr <Glenn.Kerr@ghd.com>
Subject: APA gas contacts for Sunbury South

Michael Mielczarek
Senior Urban Planner

APA Group
Infrastructure Planning and Protection
Level 14, IBM Building
60 City Road
Southbank VIC 3006

d 03 8533 2141
m +61 472 876 288
e Michael.Mielczarek@apa.com.au
w www.apa.com.au

Ben Weiner // Senior Strategic Planner
Victorian Planning Authority
Level 25, 35 Collins Street, Melbourne VIC 3000
T: 03 8644 8824 // E: ben.weiner@vpa.vic.gov.au

Victorian Planning Authority
Your partner in planning great places for a growing Victoria

This message is for the designated recipient(s) only and may contain privileged or confidential information. If you have received this message in error, please contact the sender immediately and destroy this message. Any other copying, delivery or use of the email by you is prohibited. It is the responsibility of the recipient to check for and remove viruses. Confidentiality and legal privilege are not waived or lost by reason of mistaken delivery to you.

This e-mail has been scanned for viruses

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

This message is for the designated recipient(s) only and may contain privileged or confidential information. If you have received this message in error, please contact the sender immediately and destroy this message. Any other copying, delivery or use of the email by you is prohibited. It is the responsibility of the recipient to check for and remove viruses. Confidentiality and legal privilege are not waived or lost by reason of mistaken delivery to you.

This email and any attachment is confidential, may be subject to legal privilege, and is for the use of the intended recipient only. If received in error, please notify APA by reply and delete the email. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is prohibited. Views expressed are those of the author and not APA. APA does not guarantee nor accept liability for the reliability, completeness or confidentiality of any email communication, nor its freedom from harmful viruses or software.

APA handles personal information in accordance with relevant privacy laws and our privacy policy is accessible on APA's website.

This e-mail has been scanned for viruses

Appendix G – Chainages and Lengths of South Sunbury Projects

Table 10: SS-RD-04-05

Project	Description	Chainage Start	Chainage End
Intersection	SS-IN-05	117	250
Road	From SS-IN-05 to SS-BR-04	250	617
Bridge	SS-BR-04	617	629
Road	From SS-BR-04 to SS-IN-09	629	648
Intersection	SS-IN-09	649	793
		Road Length (m)	**387**
		Project Length (m)	**676**

Table 11: SS-RD-04-04

Project	Description	Chainage Start	Chainage End
Intersection	SS-IN-09	793	911
Road	From SS-IN-09 to SS-BR-03	911	1156
		Road Length (m)	**245**
		Project Length (m)	**363**

Table 12: SS-BR-03

Project	Description	Chainage Start	Chainage End
Bridge	SS-BR-03	1156	1172
		Road Length (m)	**16**
		Project Length (m)	**16**

Table 13: SS-RD-04-03

Project	Description	Chainage Start	Chainage End
Road	From SS-BR-03 to SS-BR-02	1172	1984
Bridge	SS-BR-02	1984	2006
Road	From SS-BR-02 to SS-IN-10	2006	2119
Intersection	SS-IN-10	2119	2221
		Road Length (m)	**925**
		Project Length (m)	

Table 14: SS-RD-04-02

Project	Description	Chainage Start	Chainage End
Intersection	SS-IN-10	2221	2376
Road	From SS-IN-10 to SS-BR-01	2390	3011
		Road Length (m)	**621**
		Project Length (m)	**776**

Table 15: SS-BR-01

Project	Description	Chainage Start	Chainage End
Bridge	SS-BR-01	2997	3312
		Road Length (m)	**315**
		Project Length (m)	**315**

Table 16: SS-RD-04-01

Project	Description	Chainage Start	Chainage End
Road	From SS-BR-01 to SS-IN-03	3312	4862
Intersection	SS-IN-03	4862	5010
		Road Length (m)	**1550**
		Project Length (m)	**1698**

Table 17: SS-RD-05 (Buckland Way)

Project	Description	Chainage Start	Chainage End
Intersection	SS-IN-14	-21	21
Road	From SS-IN-09 to SS-IN-14	21	1105
Intersection	SS-IN-09	1105	1272
		Road Length (m)	**1084**
		Project Length (m)	**1293**

Table 18: SS-RD-06 (Fox Hollow Drive)

Project	Description	Chainage Start	Chainage End
Intersection	SS-IN-13	-22	20
Road	From SS-IN-10 to SS-IN-13	20	700
Intersection	SS-IN-10	700	801
		Road Length (m)	**680**
		Project Length (m)	**823**

Table 19: SS-RD-07 (Watsons Road)

Segment	Description	Chainage Start	Chainage End
Road	From PSP Boundary to Level Crossing	300	596
Road	Level Crossing	596	619
Road	Level Crossing to SS-IN-14	619	940
Intersection	SS-IN-14	940	1062
Road	From SS-IN-14 to SS-IN-13	1062	1809
Intersection	SS-IN-13	1808	1930
Road	From SS-IN-13 to SS-IN-15	1930	2480
Intersection	SS-IN-15	2480	2536
		Road Length (m)	**1938**
		Project Length (m)	**2237**

Table 20: SS-RD-08 (Crinnion Road)

Segment	Description	Chainage Start	Chainage End
Intersection	SS-IN-11	-11	85
Road	From SS-IN-11 to SS-IN-15	85	1715
Intersection	SS-IN-15	1715	1757
		Road Length (m)	**1630**
		Project Length (m)	**1768**

Table 21: SS-RD-09

Segment	Description	Chainage Start	Chainage End
Intersection	SS-IN-09	1272	1450
Road	From SS-IN-09 to PSP Boundary	1450	1700
		Road Length (m)	**250**
		Project Length (m)	**429**

Plan - Road lengths

SUNBURY SOUTH ICP

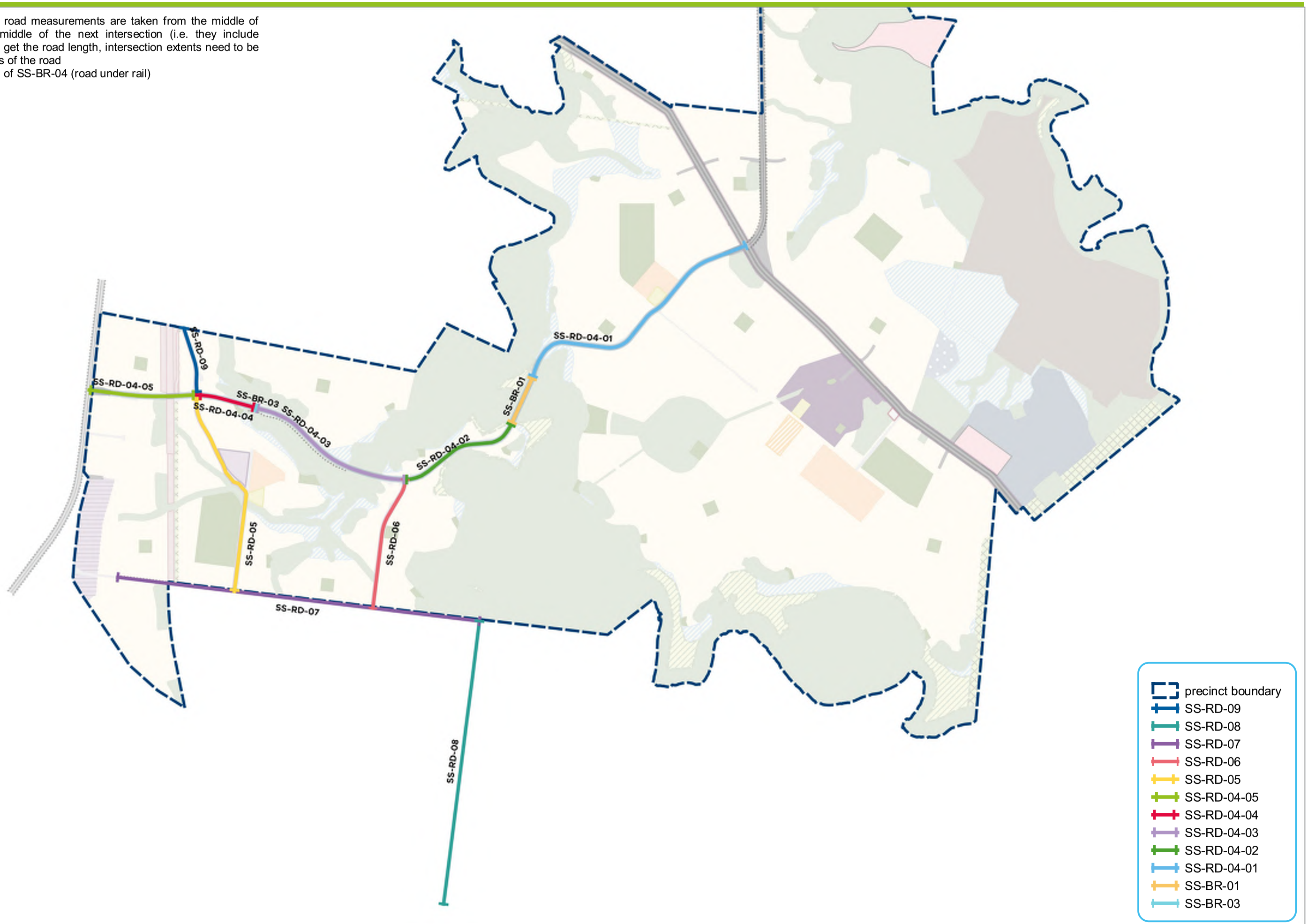
1:22,000 @A3

0 250 500 750 1000 m

N

Unless otherwise stated, road measurements are taken from the middle of the intersection to the middle of the next intersection (i.e. they include intersections in them). To get the road length, intersection extents need to be subtracted from both ends of the road

SS-RD-04-05 includes all of SS-BR-04 (road under rail)



Copyright, Victorian Planning Authority, 2019. The state of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the state of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omission in the information.

Appendix H – Chainages and Lengths of Lancefield Road - Road Projects

Table 22: LR-RD-02-01B

Segment	Description	Chainage Start	Chainage End
Road	From LR-RD-02-01A to LR-BR-01	376	610
		Road Length (m)	**234**
		Project Length (m)	**234**

Table 23: LR-RD-02-02A

Segment	Description	Chainage Start	Chainage End
Road	From LR-BR-01 to LR-RD-02-02B	1099	1420
		Road Length (m)	**321**
		Project Length (m)	**321**

Table 24: LR-RD-02-03A

Segment	Description	Chainage Start	Chainage End
Road	From LR-IN-07 to LR-BR-02	2743	2988
Bridge	LR-BR-02	2988	2993
		Road Length (m)	**245**
		Project Length (m)	**250.5**

Table 25: LR-RD-02-03B

Segment	Description	Chainage Start	Chainage End
Bridge	LR-BR-02	2993	2999
Road	From LR-BR-02 to LR-RD-02-03C	2999	3190
		Road Length (m)	**191**
		Project Length (m)	**196.5**

Table 26: LR-RD-03-01(Balbethan Drive)

Segment	Description	Chainage Start	Chainage End
Bridge	LR-BR-03	1273	1302
Road	From LR-BR-03 to LR-IN-06	1302	1516
Intersection	LR-IN-06	1516	1549
		Road Length (m)	**214**
		Project Length (m)	**276**

Table 27: LR-RD-03-02 (Balbethan Drive)

Segment	Description	Chainage Start	Chainage End
Intersection	LR-IN-06	1549	1583
Road	From LR-IN-06 to LR-IN-03	1583	1839
Intersection	LR-IN-03	1839	1983
		Road Length (m)	**256**
		Project Length (m)	**434**

Table 28: LR-RD-04 (Stockwell Drive)

Segment	Description	Chainage Start	Chainage End
Intersection	LR-IN-06	-	-
Road	From LR-IN-06 to PSP Boundary	-	-
		Road Length (m)	**738**
		Project Length (m)	**772**

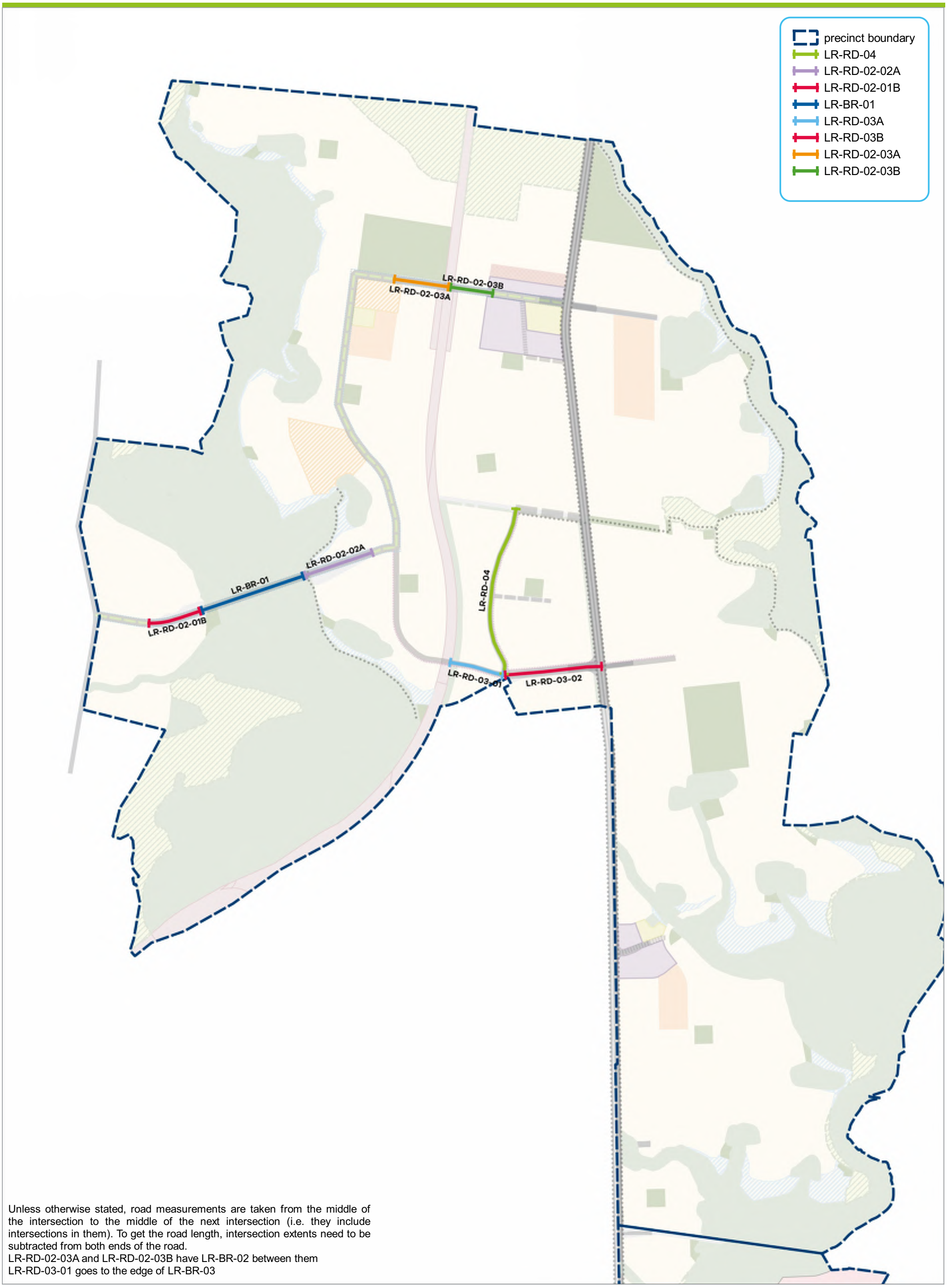
Plan - Road lengths

LANCEFIELD ROAD ICP

1:15,000 @A3

0 250 500 750 1000 m

N



Unless otherwise stated, road measurements are taken from the middle of the intersection to the middle of the next intersection (i.e. they include intersections in them). To get the road length, intersection extents need to be subtracted from both ends of the road.
LR-RD-02-03A and LR-RD-02-03B have LR-BR-02 between them
LR-RD-03-01 goes to the edge of LR-BR-03

Copyright, Victorian Planning Authority, 2019. The state of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the state of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omission in the information.

GHD

Level 8

180 Lonsdale Street

T: 61 3 8687 8000 F: 61 3 8687 8111 E: melmail@ghd.com

© GHD 2019

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
4	L.Morrison	M.Whalen	* M.Whalen	M.Whalen	* M.Whalen	26/8/19
5	L.Morrison	M.Whalen	* M.Whalen	M.Whalen	* M.Whalen	19/09/19
6	L.Morrison	M.Whalen	* M.Whalen	M.Whalen	* M.Whalen	09/10/19
7	L.Morrison	M.Whalen	* M.Whalen	M.Whalen	* M.Whalen	14/11/19
8	L.Morrison	M.Whalen	* M.Whalen	M.Whalen	* M.Whalen	20/11/19

www.ghd.com