



PROJECT: Princes Highway – Foxground and Berry Bypass

ROAD No: HW 1

PROJECT No: D/00386

LOCATION: Foxground and Berry

PROJECT MANAGER: Ron de Rooy

REGION/ OFFICE: Southern Region

ESTIMATE STATUS: Strategic

ESTIMATE OF COST: \$570/730M (May \$ 2012)

DATE: 29 June 2012

Background

The Princes Highway between Gerringong and Bomaderry is one of the remaining sections between Waterfall and Jervis Bay Road to be upgraded to four lanes. The proposed Foxground and Berry Bypass (FBB) is approximately the middle third of the Princes Highway upgrade from Gerringong to Bomaderry, with the Gerringong section commencing construction later in 2012 and the section south of Bomaderry now in development.

The development of route options for the Princes Highway upgrade program began in March 2006 and considered all three highway upgrade projects collectively between Gerringong and Bomaderry. The preferred route for the Berry bypass was announced by Roads and Maritime Services (RMS), formerly the RTA, in 2009, and included a northern bypass of the Berry township. The concept design for the FBB section was completed in early 2012 and included the preferred bypass route to the north of Berry.

In December 2011 members of the community submitted a proposal for a bypass route to the south of Berry. Following this submission, the NSW Minister for Roads directed the RMS to perform an investigation to evaluate the costs of a southern route against the costs of the current northern preferred route.

This report concentrates on the comparison of estimates for these two route options between Foxground and Berry Bypass.

This report supersedes the report dated 20/06/12.

Scope

Northern Option

- Widening the Princes Highway to a four lane highway with median separation between Toolijooa Road and Schofields Lane (12.8km of dual carriageway)
- An interchange at Toolijooa Road.
- An interchange and heavy vehicle rest area at Austral Park Road.
- A northern interchange for Berry
- A southern interchange, at Kangaroo Valley Road for Berry

■ Structures			
	Toolijooa Road Underbridge Chg 7680*	832.00	m ²
	Broughton's Creek Underbridge No1 Chg 9950*	3,172.00	m ²
	Broughton's Creek Underbridge No2 Chg 10700*	1,976.00	m ²
	Broughton's Creek Underbridge No3 Chg 11200*	5,200.00	m ²
	Austral Park Road Overbridge Chg 11500*	562.00	m ²
	Tindalls Lane Overbridge Chg 14300*	774.00	m ²
	Berry Bridge Viaduct Chg 16065	15,795.00	m ²
	Kangaroo Valley Road Overbridge Chg 17680	1,045.00	m ²
	Drainage structure No1 Underbridge Chg 19400	1,040.00	m ²
	Drainage structure No2 Underbridge Chg 19800	780.00	m ²
	Reinforced Soil Walls	1,400.00	m ²

* Indicates bridges comment to both options

Southern Option

■ Widening the Princes Highway to a four lane highway with median separation between Toolijooa Road and Schofields Lane (13km of dual carriageway)			
■ An interchange at Toolijooa Road.			
■ An interchange and heavy vehicle rest area at Austral Park Road.			
■ A northern interchange for Berry			
■ A southern interchange for Berry			
■ Upgrade of the Princess highway from Berry to the bypass to provide a 1:100 flood access			
■ Structures			
	Toolijooa Road Underbridge Chg 7680*	832.00	m ²
	Broughton's Creek Underbridge No1 Chg 9950*	3,172.00	m ²
	Broughton's Creek Underbridge No2 Chg 10700*	1,976.00	m ²
	Broughton's Creek Underbridge No3 Chg 11200*	5,200.00	m ²
	Austral Park Road Overbridge Chg 11500*	562.00	m ²
	Tindalls Lane Overbridge Chg 14300*	774.00	m ²
	Berry Bridge Viaduct Chg 16695	30,888.00	m ²
	Wharf Road underbridge Chg 17500	572.00	m ²
	Drainage structure No1 Underbridge Chg 18600	1,300.00	m ²
	South Coast Railway Underbridge Chg 18900	572.00	m ²
	Berry South Interchange Underbridge Chg 19600	572.00	m ²
	Reinforced Soil Walls	2,800.00	m ²

* Indicates bridges comment to both options

Status/Program

The concept design for the FBB section was completed in early 2012 and included the preferred bypass route to the north of Berry.
The review and costing of the Southern Concept was completed in May 2012.

Review Methodology

1. Arithmetic checks were carried out on the estimate spreadsheets.
2. Cursory checks were carried out on some items for appropriateness of the quantities and/or rates.
3. Reality check calculations were reviewed.
4. Overall rates for pareto items were verified and compared with the rates achieved on similar projects and reasons provided for deviations from typical values where applicable.
5. The estimate was discussed with the estimator and relevant adjustments were made.
6. The construction part of the estimate has been prepared based on first principles while PMO check is based on rates paid by awarded contracts.

Assessment of Key Components

1. Project Development

Northern option

The TIG estimate has a total base allowance for Project Development is \$2.0m which includes the Project Management for the Concept stage of the project and Concept Development costs. In addition \$0.5m has been allowed BY TIG for Community liaison.

The actual costs to date are \$6.5m for development; \$2.6 for Project Management and \$825K for community liaison.

Given that this project has developed in a manner not normally experienced by other Major RMS projects, the costs will be broken down to the start of the review of the Southern option assumed to be 01/12/11.

Item	Cost prior to 1/12/11	Cost post 1/12/11	Total
Development costs	\$4.16	\$2.31	\$6.47
Project Management Costs	\$1.52	\$1.08	\$2.60
Community Costs	\$0.43	\$0.40	\$0.83

The Development costs up to 01/12/11 of \$4.59 (development + community) represents 1.4% of the Construction costs and it is within the RMS tracking performance range (1-2%) for this project size. Therefore PMO recommends that:

- The costs to date are added to the estimate as indicated in the table above
- \$1.9M of what is indicated by TIG as Project Management Services be allocated to additional Project Development costs to complete this phase of the project;
- \$0.1M of what is indicated by TIG as Project Management Services be allocated to additional Project Management costs to complete this phase of the project;
- The \$500,000 allowed by TIG for the community liaison be the sum allocated (in addition to what has been spent) for community liaison for the project
- A contingency of 40% be allowed on the future costs only.

The Development costs (cost prior to 01/12/11 + future costs) of \$6.99m represents 2.1% of construction costs, which is within the RMS tracking performance range (2-4%) for this project size.

Southern option

The TIG estimate has a total base allowance for Project Development of \$2.3M which includes the Project Management for the Concept stage of the project and Concept Development costs. In addition \$0.75M has been allowed for Community liaison.

The actual costs to date are \$6.5m for development; \$2.6 for Project Management and \$825k for community liaison have not been included.

If this option becomes the preferred option a lot of the work already completed for the Northern Option has to be undertaken.

Therefore PMO recommend that:

- The costs to date are added to the estimate as indicated in the table above
 - \$4.0M to be allocated to additional Project Development costs to complete this phase of the project;
 - \$1.0m in lieu of the \$2.3M to be allocated to additional Project Management costs to complete this phase of the project;
 - The \$750,000 allowed for the community liaison be sum allocated (in addition to what has been spend) for community liaison for the project
 - A contingency of 40% be allowed on the future costs only.
- The Development costs (cost prior to 01/12/11 + future costs) of \$9.34M represents 2.3% of construction costs, which is within the RMS tracking performance range (2-4%) for this project size.

Northern vs Southern Option

The Southern option will cost more in dollars terms (by \$2.35M) because some of the costs all ready spent to develop the Northern option will be redundant but they are an expense to the project.

2. Investigation & Design

Northern Option

The TIG estimate has a total base allowance for Investigation and Design (excluding project management and sponsor costs) is \$30.5M which includes \$17.56M for design, \$8.1M for Primary Testing and \$4.86m for Independent Verification.

The \$17.56M is equivalent to 5.2% of construction costs. This is outside the RMS tracking performance range (2-4%) for this project size. It appears that this item has been loaded with 42% onsite overheads, which it is not considered reasonable. An allowance of \$12.4M+ 10% margin (\$13.64M) from the main contractor (for D&C contractors) is reasonable. The \$13.64 represents 4.2% of the construction costs and it is just outside RMS's performance range but it is acceptable.

Therefore PMO recommends that \$13.64M is allowed for base cost for the Investigation and design for this project plus 44% contingency. The costs allocated (base & contingency) for primary testing and for Independent verifier be relocated under the Infrastructure portion of the estimate.

Southern Option

The TIG estimate has a total base allowance for Investigation and Design (excluding project management and sponsor costs) is \$44.1M which includes \$26.8M for design, \$11.1M for Primary testing and \$6.7M for Independent verification.

The \$26.8M is equivalent to 6.3% of construction costs. This is outside the RMS tracking performance range (2-4%) for this project size. PMO suggests that the proportion of design costs for this project be similar to Northern option at 4.0% of construction costs. Therefore PMO recommends a Design and Investigation base cost of \$16.9M be made. This represents 4.0% of the construction costs and it is within the RMS's performance range. In addition a 44% contingency shall be also added.

The costs allocated (base & contingency) for Primary Testing and for Independent Verifier be relocated under the Infrastructure portion of the estimate.

These costs are higher than the Northern route due to the more complex nature of the works involved, including more structures and more earthworks and the longer the construction period.

3. Property Acquisition

Property acquisition costs for both options are a mixture of properties at different status

- Properties which have been all ready purchased and are located on the route common to both options.
- Properties which have been all ready purchased and they are located either the Northern preferred option or Southern option.
- Properties which will be purchased for the Northern preferred option or the Southern option
- Properties which will be sold, depending on the option adopted for construction and money will reimburse for the project.

The allocation of costs of this project does not follow the standard practice of recording the outturn cost of the purchases of the properties. With the exception of the properties which have been all ready purchased and are located on the route common to both options, they all have been adjusted to present values by the Southern Region Property Branch.

The revaluations where undertaken so as to remove the bias which will exist in favour of the Northern preferred route because of the low recorded cost of properties already purchased over the past years and records the true cost recovery of properties which will be redundant if the Northern preferred route is not finally build.

Item Description	Northern preferred option			Southern option		
	Base cost	Contingency	Total	Base cost	Contingency	Total
Property which has been purchased and is located in the common route	\$19.6M	0%	\$19.6M	\$19.6M	0%	\$19.6M
Property which has been purchased and is located either in the Northern or/and Southern option	\$17.7 M#	0%	\$17.7 M	\$17.7 M#	0%	\$17.7M
Property which will be purchased and is located either on the Northern or Southern option	\$7.4M#	35%	\$10.0 M	\$12.0M#	45%	\$17.4
Properties which will be sold	(\$3.2)M#	30%	(\$2.2)	(\$10.4)#	30%	(\$9.4)
TOTAL	\$41.5M	6%	\$44.0 M	\$38.9M	8.7%	\$42.3M

Figures have been determined by RMS's Southern Region Property and are at present value.

The TIG estimate for the property to be purchased has allocated a contingency of 20%. For a strategic estimate 20% contingency for property costs is low given the volatility of the market and the extent of the purchase. PMO recommends a 35% contingency for the Northern option since the location and extent of the property requirements are reasonably advance and a 45% contingency for the Southern option due to the stage of the design and the limited knowledge of areas of acquisitions.

The TIG estimate as it stands only includes the last three items on the table above; PMO recommends that costs already incurred to purchase property in the common route area be also included in the estimate for both options.

An allowance is required to be made for the Professional Services costs associated with purchasing and selling property. PMO recommends \$0.7M plus 35% contingency for the Northern option and \$1.5M plus 40% contingency for the Southern option.

An allowance is also required for Project Management and Sponsor. We recommend \$10,000 plus 40% contingency for the Northern option and \$15,000 plus 40% contingency for the Southern option.

4. Utility Adjustment

There are number of utilities that are affected by the proposed alignments. No detail investigation has been undertaken for either of the options. An allocation has been made in the TIG estimate following the suggestion by the designers for both options. Given the lack of information on this item a contingency of 82%-83% was applied. PMO considers this to be reasonable.

5. Construction

(a) Earthworks

Northern Option

The TIG estimate has an overall average base rate is \$34/m³ for moving 1.3M m³ of material. Due to the strategic nature of the works the rate has been calculate from first Principles for all the excavation material (unsuitable, select, etc). The achieved general earthwork rate in Southern Region for similar projects is Conjola Mountain realignment \$49/m³ and Oak Flats to Dunmore \$31/m³. Given that 510k m³ (39%) have been assumed to need pre-splitting and blasting the rate is considered reasonable.

Southern Option

The TIG estimate has an overall average base rate is \$54/m³ for moving 2.0M m³ of material. Due to the strategic nature of the works the rate has been calculate from first Principles for all the excavation material (unsuitable, select, etc). Of the 2.0M m³ of material of material, 770k m³ would be imported at \$85/m³ and 460k m³ (23%) have been assumed to need pre-splitting and blasting.

If the costs (importing and placing) associated with importing the general fill is not included, the rate allowed is \$36/ m³. This is compatible to the rate allowed for the Northern option and what has been RMS experience in other Projects in the region. The additional costs associated with the Southern option are due to the transport of material from the Foxground area of the works to the Southern areas.

The achieved general earthwork rate in Southern Region for similar projects is Conjola Mountain realignment \$49/m³ and Oak Flats to Dunmore \$31/m³. Given that 38% is imported and 37% of the onsite material has been assumed to need pre-splitting and blasting the rate is considered reasonable

A review of the design was undertaken to locate areas where additional excavation could be made or where fill could be minimised to reduce the cost of importing material from off site locations. In doing so it has been estimated the cost associated with this will reduce to \$39/m³. This rate is higher than the \$34/m³ adopted in the Northern option due to the extra difficulties involved in the deeper excavations with harder rock and the distance which have to be moved using road trucks in lieu of off highway vehicles.

(b) Pavement

Northern & Southern Option

The average base rate for full construction of pavement which generally consists of 175mm base coarse (ACC20), 7mm bitumen seal, 50mm correction course ((DG14) and 30mm wearing course (SMA10) has been estimated at \$128/m² average which compares well with the rate determined by the PMO for Southern Region of \$130/m² therefore the rate is considered acceptable.

(c) Structures

Bridges

Northern Option

Total of 10 bridges are proposed for this option, 8 of the bridges with a variance in deck area from 774m² to 5200m² (14,819 m² in total) have been estimated by TIG at an average rate of \$3460/m². This rate is at the lower end of the rates recommended by PMO. But given the quantity, on site casting and complexity of the bridges PMO considers it reasonable.

The Austral Park Road Overbridge is cast in situ box girder, curved bridge constructed under traffic, including construction traffic and it has been estimated by TIG at a rate of \$7.1K/ m². Given the difficulty associated with its construction this rate is considered reasonable. Berry Bridge Viaduct is a 600m long 18/19 spans, 26m wide bridge crossing the flood plain with reasonable access and cast on site. The allowed rate of \$2,600/ m² is low normally reserved for plank bridges but given the quantities and the repetition of manufacture and erection we consider the rate reasonable.

Southern Option

Total of 11 bridges are proposed for this option, 9 of the bridges with a variance in deck area from 572m² to 5200m² (14,970 m² in total) have been estimated at an average rate of \$3598/m². This rate is at the lower end of the rates recommended by PMO. But given the quantity, on site casting and complexity of the bridges PMO considers it reasonable.

The Austral Park Road Overbridge is cast in situ box girder, curved bridge constructed under traffic, including construction traffic and it has been estimated at rate of \$7.1K/ m². Given the difficulty associated with its construction this rate is considered reasonable. Berry Bridge Viaduct is a 1200m long 33spans, 26m wide bridge crossing the flood plain with reasonable access and casted on site. The allowed rate of \$2,200/ m² is low normally reserved for plank bridges but given the quantities and the repetition of manufacture and erection we consider the rate reasonable.

(d) PA Insurance

We recommend that the PA insurance for the Northern option be reduced to \$3.1M. We recommend that the PA Insurance for the Southern option is reduced to \$3.9M.

(e) Overall costs

Northern Option

The overall base costs for this project have been estimated to be \$30M/km by TIG and \$31.9M/km after PMO's adjustments and \$7.5M by TIG and \$8.0M/lane-km after PMO's adjustments while the construction base costs have been estimated to be \$25.4M by TIG \$25.2/km after PMO's adjustments and \$6.3M/lane km by TIG and \$6.3/lane km after PMO's adjustments.

Southern Option

The overall base costs for this project have been estimated to be \$37.2*M/km by TIG and \$38.6M#/km after PMO's adjustments \$9.3*M/lane-km by TIG and \$9.7#M/lane-km after PMO's adjustments while the construction base costs have been estimated to be \$33.0*M/km by TIG and \$31.5*M/km after PMO's adjustments and \$8.2#M/lane km by and \$7.9#/lane km after PMO's adjustments.

*Project length is 13km for the Southern option allowing for 0.2km extra due to the realignment south of STP

#Project length is 52lane-km for the Southern option allowing for 0.8km extra due to the realignment south of STP

Northern vs Southern Options

The difference in the base cost between the Northern preferred option and the Southern option is approximately \$94M. This mainly due to additional costs in project development (\$2.4M – Development and community liaison) due to the extra investigation and approvals required for the Southern route option; Detail Design (\$3.3M) due to bigger scope; Infrastructure and Utilities (\$87M) due to bigger scope; Project Management (\$4M) and reduction in Property costs of \$2M.

In total project cost the Southern option is estimated to cost \$161M more consisting of \$94 base cost and \$67 contingency. The higher contingency is due to the less in depth knowledge of the Southern option.

Comparative Projects include:

Project	Total cost per km	Total cost per ln-km	Constr. Per km	Constr. Per ln- km
Oats Flat to Dunmore	\$22.1	\$5.1	\$18.5	\$4.3
Conjola Mt	\$18.8	\$7.3	\$16.1	\$6.2
Coopermook to Heron Creek	\$20.0	\$5.2	\$18.8	\$4.9

6. Contingency

Northern Option

The overall contingency in the TIG estimate is 42%, which is within the recommended range of 35-70% in the Estimating Manual for Strategic estimates. The Contingency for the Construction portion of the work is 44% which is also within the recommended ranges and represents the status of confidence and reliability of the information used to determine the base cost.

Southern Option

The overall contingency in the TIG estimate is 47%, which is within the recommended range of 35-70% in the Estimating Manual for Strategic estimates. The Contingency for the Construction portion of the work is 49% which is also within the recommended ranges and represents the status of confidence and reliability of the information used to determine the base cost.

The provisional item of (-\$32.9M) for possible alternatives have a contingency of 55%, due to the nature of the estimate policy of "NOT to be exceeded" PMO suggests a 45% contingency is adopted.

7. Project Management

Northern Option

The Project Management costs allowed by the TIG estimate with contingency is \$21.77M (after adjusting for the \$700k included in PM costs for community liaison) which in this project is 4.0% of the total Project cost. This rate is within the achieved range of 3-4% for development projects of this size and it is considered acceptable.

PMO recommends that the \$22.47M allowed for the Project Management (including Sponsor Costs) be adjusted by removing the \$700k estimated for the Community Liaison costs.

Southern Option

The Project Management costs allowed with contingency is \$29.33M (after adjusting for the \$1050k included in PM costs for community liaison) which in this project is 4.1% of the total Project cost. This rate is above the achieved range of 3-4% for development projects of this size and it is considered high.

PMO recommends that:

- The project Management costs be adjusted by removing the \$1050k estimated for the Community Liaison costs.
- The summary of Project Management costs in the "Summary Sheet" is of the costs including contingency.
- Project Management for Project Development to be reduced as recommended above.
- Project Management for Infrastructure to be reduced to \$14M.

8. Adjustments and Provisional Item

During the route study a number of options or alternatives have been identified but need further investigation and analysis in order to incorporate them in the final concept. These options/alternatives, for this cost exercise, have been divided into "Adjustments" which indicate more than likely they will be adopted and "Provisional" which indicate that they MAY be adopted.

The adjustments are included in the estimate. While the Provisional items are not included in the cost estimate.

The TIG estimate calculates the cost of these options as one number with everything inclusive. PMO has separated the costs for the options and adjustments have been made accordingly.

9. Probabilistic

A probabilistic estimate has not been undertaken due to time constraints but it is recommended at the next phase of the project.

10. Outturn

Outturn dollars could not be calculated as the option to be taken forward to the next phase or the key milestone dates have not been determined at this stage.

11. Attachments

- The TIG Summaries have been attached.
- The recommended amendments have been made to the TIG estimate and an adjusted estimate has been also been attached.

Conclusion

In general we concur with the TIG estimates but we recommend some changes which will adjust the total costs by 4% for the Northern option and 3% for the Southern option.

The Table below shows the relevant item cost comparison

Difference Between Two Route Estimates

Item	Route Options		Difference
	Northern millions	Southern millions	
Design (base cost) <i>(Includes Development, Design & Investigation and Community liaison)</i>	\$23	\$29	\$6
Acquisition (base cost) <i>(Includes Professional Services for Property)</i>	\$42	\$40	-\$2
Construction (base cost) <i>(Includes utilities, Infrastructure and PA Insurance)</i>	\$315	\$402	\$77
Finalisation (base cost) <i>(Includes Refurbish old route and Project Data & post completion review)</i>	\$11	\$11	\$0
Project Management (base cost) <i>(Includes Sponsor)</i>	\$16	\$20	\$4
Total Base Cost	\$408	\$502	\$94
Contingency	\$159 39%	\$226 45%	\$67
TOTAL	\$567	\$728	\$161
	Rounded to:		
	\$570	\$730	



Basil Pazzinis

Estimating Manager, PMO

Date: 02/07/12



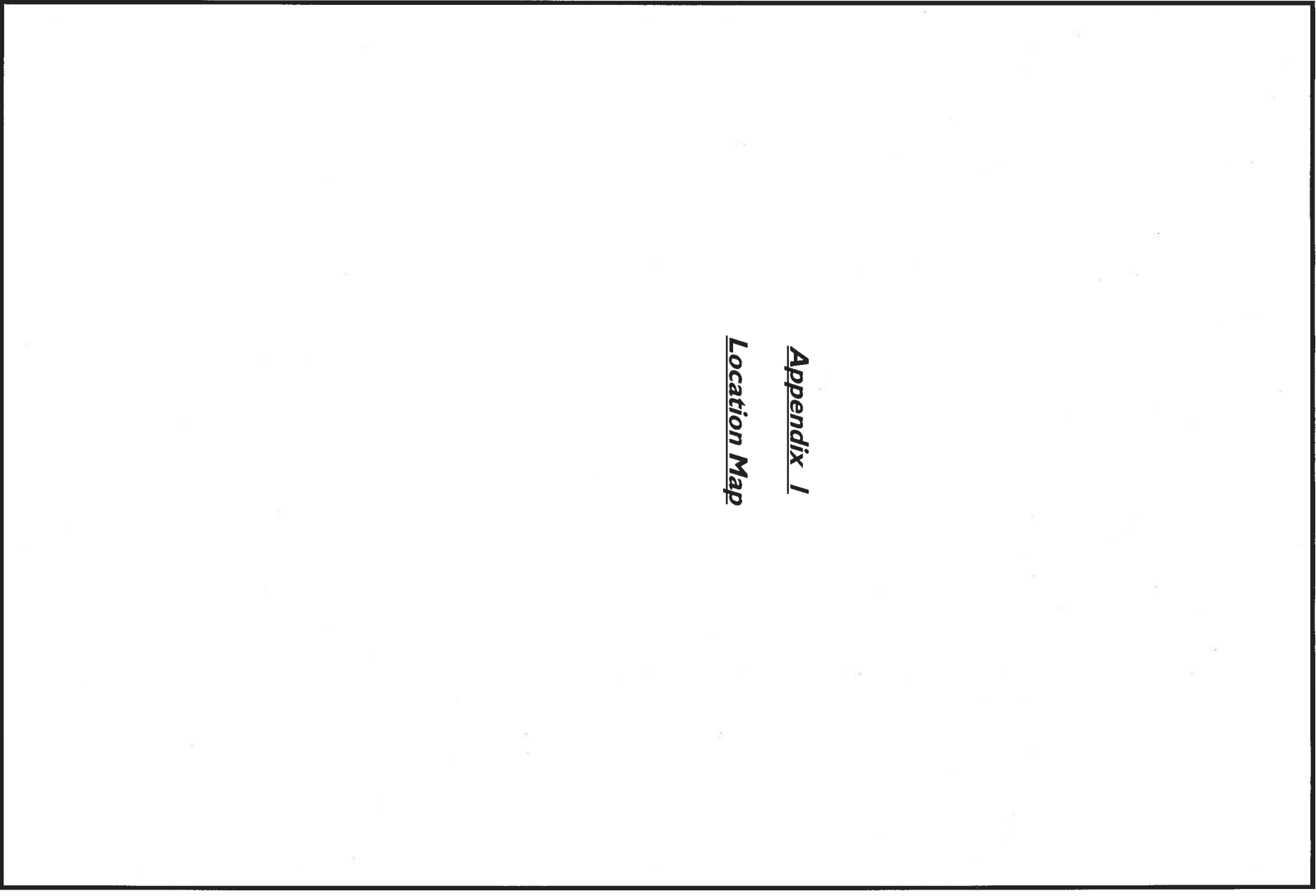
Bruce Taggart

A/Manager, PMO

Date: 2/7/12

Appendix 1

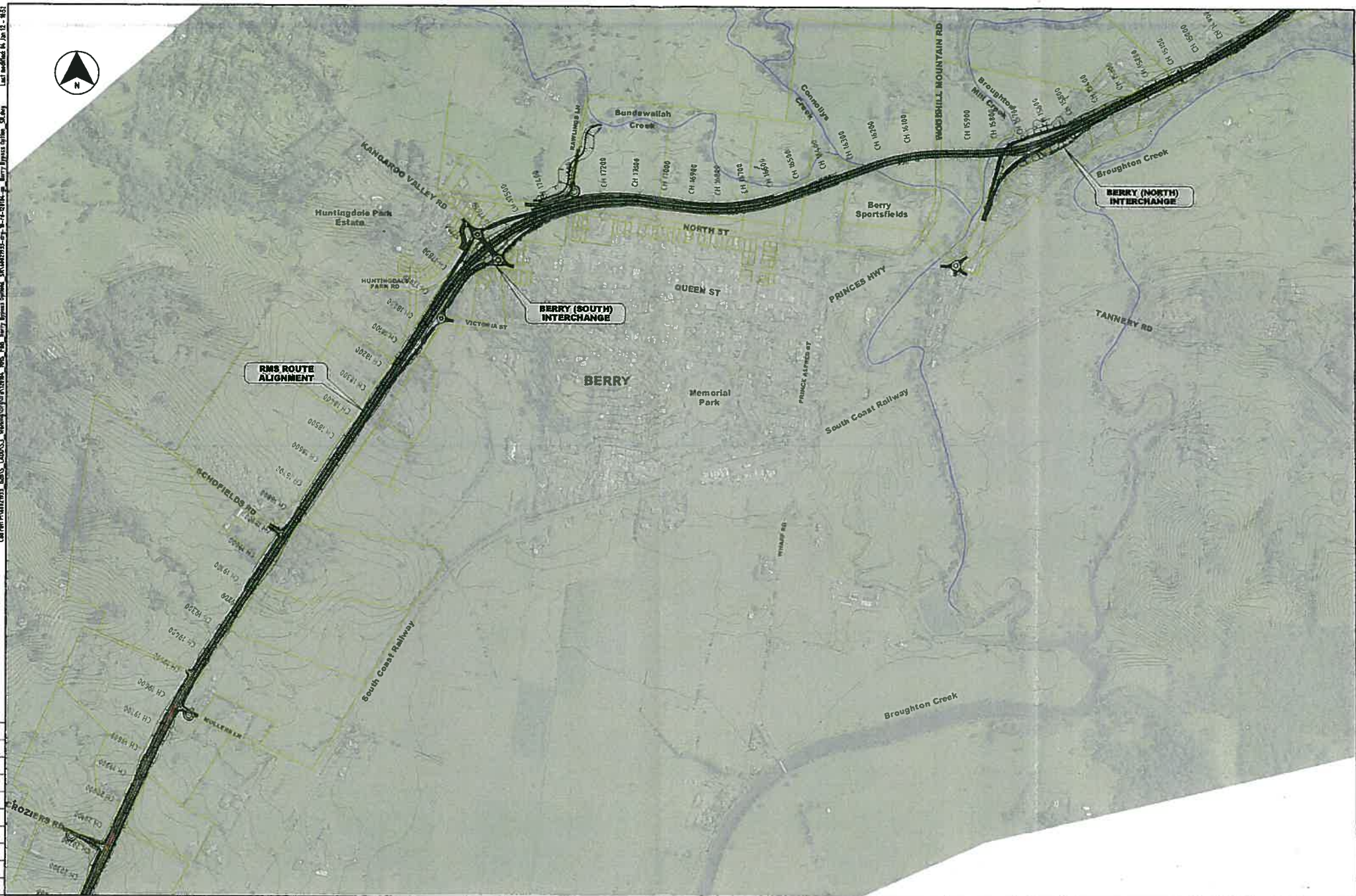
Location Map



Calref: P:\121933\GIS\CAD\13\33_Berry Bypass System_SLA\021933-drg-10-rd-120104-gs_Revised Berry Alignment.dwg
 Last modified: 14 Jan 12 - 08:52



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REGION:
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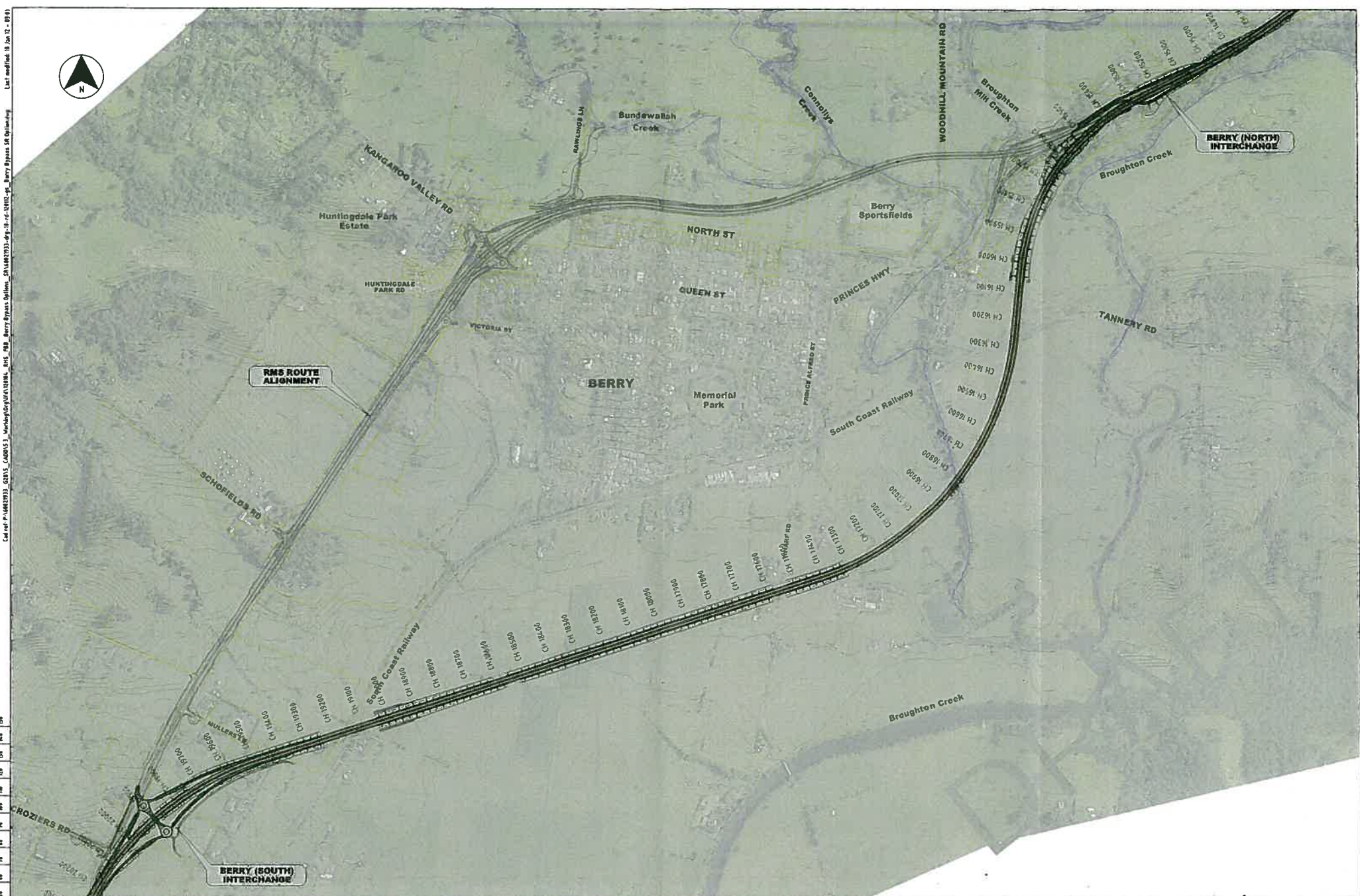
FOXGROUND & BERRY BYPASS
CONCEPT DESIGN
 BERRY BYPASS OPTIONS
 REVISED BYPASS ALIGNMENT
 TINDALLS LN TO CROZIERS RD
 GENERAL ARRANGEMENT PLAN

INFORMATION DOCUMENT
 DOCUMENT NO:
 PROJECT NO - DISC TYPE - PROJECT PHASE - DISCIPLINE - DATE (YYYYMM) - DRAFTER INITIALS - DESCRIPTION
 60021933-drg-10-rd-120104-gs_Revised Berry Alignment

Last modified: 10 Jun 17 - 09:01

Call ref: P:\44219\3\GIS\CAD\0013\Working\00131314.dwg - RMS_Berry Bypass Options_SRA\00131313.dwg - rd-120118-gs_Berry Bypass SR0


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RMS ROUTE ALIGNMENT

BERRY (NORTH) INTERCHANGE

BERRY (SOUTH) INTERCHANGE

 AECOM Australia Pty Ltd A.B.N. 20 093 846 925	DESIGNED: _____ SCALE: _____ FOXGROUND & BERRY BYPASS CONCEPT DESIGN BERRY BYPASS OPTIONS SOUTHERN ROUTE OPTION TINDALLS LN TO CROZIERS RD GENERAL ARRANGEMENT PLAN	DOCUMENT NO. _____ PROJECT NO. - DOC TYPE - PROJECT PHASE - DISCIPLINE - DATE (YYYYMM) - DRAFTER INITIALS - DESCRIPTION 60021933-drg-10-rd-120118-gs_Berry Bypass SR0
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Appendix 2

Estimates

Estimate Summary Sheet

Project: BERRY BYPASS - PRINCESS HIGHWAY - FOXGROUND AND BERRY BYPASS
 SOUTHERN BYPASS
 Estimate prepared by PMO - with a list of adjustments

Estimate Prepared by: TIG
 Quantities Prepared by:
 Design Prepared by:

Project No: D000386

Date: May 2012

Estimate Type: STRATEGIC

Item	Base Estimate (excluding contingencies) millions	% Contingency	Contingency Amount millions	Estimate (including contingencies) millions	% of Total Estimate	Comments/Assumptions
1. Concept Development						
1 (a) Route/Concept/EIS	Past costs \$6.47 Future Costs \$4.00	0% 0% 40%	\$0.00 \$0.00 \$1.60	\$0.00 \$6.47 \$5.60		
1 (b) Project Management Services	Past costs \$2.60 Future Costs \$0.00	0% 0% 0%	\$0.00 \$0.40 \$0.00	\$2.60 \$1.40 \$0.00		Included in PMS costs
1 (c) Sponsor	Past costs \$0.83 Future Costs \$0.75	0% 40%	\$0.00 \$0.30	\$0.83 \$1.05		
1 (d) Community Liaison						
Sub Total	\$15.7	15%	\$2.3	\$18.0	0.00%	
2. Detail Design & Documentation						
2 (a) Investigation and Design	\$16.94	44%	\$7.45	\$24.39		
2 (b) Project Management Services	\$178	40%	\$0.71	\$2.50		Included in PMS costs
2 (c) Sponsor	\$0.00	0%	\$0.00	\$0.00		
Sub Total	\$18.7	44%	\$8.2	\$26.9	0.00%	
3. Property Acquisitions						
3 (a) Acquire Property	Have been purchased in common route					Property which all ready has been purchased and is located in the common route
	Has been purchased in the Northern option		\$0.00	\$19.60		Property which all ready has been purchased and is located either in the Northern or Southern option
	To be purchased in the Northern option		\$0.00	\$17.70		Property which will be purchased and is located either on the Northern or Southern option
	Properties which will be sold		\$5.40	\$17.40		Properties which will be sold
3 (b) Professional Services for Property		45%	-\$3.12	-\$13.52		
3 (c) Project Management Services		30%	\$0.60	\$2.10		
3 (d) Sponsor		40%	\$0.01	\$0.02		
3 (e) Sponsor		0%	\$0.00	\$0.00		
Sub Total	\$40.4	7%	\$2.9	\$43.3	0.00%	Included in PMS costs
4. Utility Adjustments						
4 (a) Adjust Utilities	\$4.86	89%	\$4.01	\$8.87		
4 (b) Project Management Services	\$0.10	40%	\$0.04	\$0.14		
4 (c) Sponsor	\$0.00	0%	\$0.00	\$0.00		
Sub Total	\$5.0	82%	\$4.1	\$9.0	0.00%	
5. Infrastructure Construction						
5(a) - 5(c) Infrastructure	\$404.14	50%	\$200.57	\$604.71		
Adjustments						
E/O Review alignment south of STP	-\$5.38	55%	-\$2.96	-\$8.33		
E/O Island embankment	-\$3.14	45%	-\$1.41	-\$4.55		
E/O Realignment of Northern Interchange	\$0.00	45%	\$0.00	\$0.00		
Vertical alignment	-\$30.83	45%	-\$13.88	-\$44.71		
E/O Adjustment of Southern Interchange	\$0.00	45%	\$0.00	\$0.00		
Primary Testing	\$11.10	44%	\$4.88	\$15.98		
5(d) Project Management Services	\$4.00	40%	\$2.80	\$10.80		Included in PMS costs
5(e) Sponsor	\$0.00	0%	\$0.00	\$0.00		
5(f) PA Insurance	\$3.90	40%	\$1.56	\$5.46		
Sub Total	\$411.2	49%	\$203.2	\$614.5	0.00%	
6. Finalization						
6 (a) Refurbish old route	\$7.44	47%	\$3.50	\$10.94		
6 (b) Project data and post completion review	\$3.24	40%	\$1.30	\$4.54		
6 (c) Project Management Services	\$0.43	40%	\$0.17	\$0.60		Included in PMS costs
6 (d) Sponsor	\$0.00	0%	\$0.00	\$0.00		
Sub Total	\$11.1	45%	\$5.0	\$16.1	0.00%	
TOTAL	\$592	45%	\$226	\$728	0.00%	
TOTAL PROJECT ESTIMATE:				\$730,000,000		

Project Management: \$27 3.7%
 Sponsor: \$0 0.00%

Length of the Project: 13.00 km
 52.00 lane-km

Really Costs:	Base cost:	Estimate with contingencies
1 Cost of land	\$38.6	\$38.0
2 Cost of Easement	\$58.6	\$58.0
3 Cost of bridge deck area	\$9.7	\$14.0
4 Cost of earthworks cut		
5 Cost of pavement cut		
6 Cost of drainage		

Assumptions:

Estimate Summary Sheet

Project: PRINCESS HIGHWAY - FOXGROUND AND BERRY BYPASS
NORTHERN BYPASS
Estimate adjusted by PMO

Estimate Prepared by: TIG
Quantities Prepared by:
Design Prepared by:

Project No: D100396

Date: May 2012

Estimate Type: STRATEGIC

Item	Base Estimate (excluding contingency) millions	Contingency %	Amount millions	Estimate (including contingency) millions	% of Total Estimate	Comments/Assumptions
1. Concept Development						
1 (a) Route/Concept/EIS	Past costs Future Costs	0% 40%	\$0.00 \$0.76	\$6.47 \$2.86		
1 (b) Project Management Services	Past costs Future Costs	0% 40%	\$0.00 \$0.04	\$2.60 \$0.14		Included in PMS costs
1 (c) Sponsor	Past costs	0%	\$0.00	\$0.83		
1 (d) Community Liaison	Past costs Future Costs	0% 40%	\$0.00 \$0.20	\$0.83 \$0.70		
Sub total		8%	\$1.0	\$13.4	0.00%	
2. Detail Design & Documentation						
2 (a) Investigation and Design		44%	\$6.00	\$19.64		
2 (b) Project Management Services		40%	\$0.49	\$1.71		
2 (c) Sponsor		0%	\$0.00	\$0.00		
Sub total		44%	\$6.5	\$21.4	0.00%	Included in PMS costs
3. Property Acquisitions						
3 (a) Acquire Property	Have been purchased in common route	0%	\$0.00	\$19.60		Property which all ready has been purchased and is located in the common route
	Has been purchased in the Northern option	0%	\$0.00	\$17.70		Property which all ready has been purchased and is located either in the Northern or Southern option
	Utilities and Infrastructure					Properties which will be sold
	Properties which will be sold	35% 30%	\$7.40 -\$3.20	\$9.99 -\$4.16		
3 (b) Professional Services for Property		35%	\$0.70	\$0.95		
3 (c) Project Management Services		40%	\$0.00	\$0.01		
3 (d) Sponsor		0%	\$0.01	\$0.00		
Sub total		4%	\$1.9	\$44.1	0.00%	Included in PMS costs
4. Utility Adjustments						
4 (a) Adjust Utilities		82%	\$3.68	\$3.03	\$6.71	
4 (b) Project Management Services		40%	\$0.07	\$0.03	\$0.10	
4 (c) Sponsor		0%	\$0.00	\$0.00	\$0.00	
Sub total		82%	\$3.8	\$3.1	\$6.8	0.00%
5. Infrastructure Construction						
5(a) - 5(c) Infrastructure	Infrastructure Items Adjustments Primary Testing Verifier	44% 44% 44% 44%	\$295.55 \$8.10 \$4.86 \$11.82	\$129.86 \$0.00 \$3.56 \$2.14	\$425.41 \$0.00 \$11.66 \$7.00	
5(d) Project Management Services		40%	\$0.00	\$4.73	\$16.55	
5(e) Sponsor		0%	\$0.00	\$0.00	\$0.00	
5(f) PA Insurance		40%	\$3.10	\$1.24	\$4.34	Included in PMS costs
Sub total		44%	\$323.4	\$141.5	\$465.0	0.00%
6. Finalisation						
6 (a) Refurbish old route		47%	\$7.44	\$3.50	\$10.94	
6 (b) Project data and post completion review.		40%	\$3.24	\$1.30	\$4.54	
6 (c) Project Management Services		40%	\$0.43	\$0.17	\$0.60	
6 (d) Sponsor		0%	\$0.00	\$0.00	\$0.00	
Sub total		45%	\$11.1	\$5.0	\$16.1	0.00%
TOTAL		39%	\$408	\$159	\$567	
TOTAL PROJECT ESTIMATE:						\$570,000,000
Project Management: \$22 3.8%						
Sponsor: \$0 0.00%						

Length of the Project:

12.80 km
51.20 lane-km

Reality Costs:

	Base cost	Estimate with contingency
1. Cost per km	\$31.9	\$44.3
2. Cost per lane-km	\$8.0	\$11.1
3. Cost per m ² of bridge deck area		
4. Cost of earthworks /m ³		
5. Cost of pavement /m ²		
6. Cost of drainage /m		

Assumptions:

Estimate Summary Sheet

Project: Berry Bypass, Strategic Route Feasibility, Northern Option

Estimate Prepared by: Evans & Peck (P/J)
Quantities Prepared by: Aecom
Design Prepared by: Aecom

Project No: D/00386

Date: 27/06/2012

Estimate Type: Strategic Route Feasibility

Item	Base Estimate (excluding contingency)	Contingency		Estimate (including contingency)	% of Total Estimate	Comments/Assumptions
		%	Amount			
1. Concept Development						
1(a) Route/Concept/EIS	\$0	0%	\$0	\$0		Refer Note 1. below Incl. in above item Allowance RMS
1(b) Project Management Services	\$2,006,404	40%	\$802,562	\$2,808,966		
1(c) Sponsor	\$0	0%	\$0	\$0		
1(d) Community Liaison	\$500,000	40%	\$200,000	\$700,000		
Sub total	\$2,506,404	40%	\$1,002,562	\$3,508,966	0.64%	
2. Detail Design & Documentation						
2(a) Investigation and Design	\$30,528,679	44%	\$13,451,556	\$43,980,235		Contractor's design costs + Primary Testing + Design IV Allowance 4% of Investigation and design costs Incl. in above item
2(b) Project Management Services	\$1,221,147	40%	\$488,459	\$1,709,606		
2(c) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$31,749,827	44%	\$13,940,015	\$45,689,841	8.38%	
3. Property Acquisitions						
3(a) Acquire Property	\$21,900,000	11%	\$2,440,000	\$24,340,000		Value provided by RMS Incl. in above item Incl. in above item Incl. in above item
3(b) Professional Services for Property	\$0	0%	\$0	\$0		
3(c) Project Management Services	\$0	0%	\$0	\$0		
3(d) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$21,900,000	11%	\$2,440,000	\$24,340,000	4.46%	
4. Utility Adjustments						
4(a) Adjust Utilities	\$3,681,542	82%	\$3,032,617	\$6,714,158		Refer to "RMS Infrastructure - Northern" worksheet for detail Allowance 2% of Utilities costs Incl. in above item
4(b) Project Management Services	\$73,631	40%	\$29,452	\$103,083		
4(c) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$3,755,172	82%	\$3,062,069	\$6,817,241	1.25%	
5. Infrastructure Construction						
5(a) - 5(c) Infrastructure	\$295,550,200	44%	\$129,861,248	\$425,411,448		Refer to "RMS Infrastructure - Northern" worksheet for detail Additional items to base case scope Refer to Note 3. below Allowance 4% of Construction costs Incl. in above item PA Insurance allowed 1.0% of Project Costs
5(d) Adjustment Sums (Including markup and contingency)	\$0	0%	\$0	\$0		
5(e) Provisional Sums (Including markup and contingency)	\$17,307,083	50%	\$8,648,110	\$25,955,193		
5(f) Project Management Services	\$11,822,008	40%	\$4,728,803	\$16,550,811		
5(g) Sponsor	\$0	0%	\$0	\$0		
5(h) PA Insurance	\$5,024,612	40%	\$2,009,845	\$7,034,456		
Sub total	\$312,396,820	44%	\$136,599,895	\$448,996,715	82.32%	
6. Finalisation						
6(a) Refurbish old route	\$7,443,086	47%	\$3,502,884	\$10,945,970		Refer to "RMS Infrastructure - Northern" worksheet for detail Handover (RMS) Costs Allowance 4% sum item 6(a) & 6(b) costs Incl. in above item
6(b) Project data and post completion review.	\$3,242,341	40%	\$1,296,937	\$4,539,278		
6(c) Project Management Services	\$427,417	40%	\$170,967	\$598,384		
6(d) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$11,112,844	45%	\$4,970,788	\$16,083,632	2.95%	
TOTAL	\$383,421,058	42%	\$162,015,329	\$545,436,387		
TOTAL PROJECT ESTIMATE:				\$546,000,000		
Project Management: \$22,470,850		Sponsor: \$0		4.1%	0.00%	

Length of the Project:

12.8 km
51.2 lane-km

Reality Costs:

	Base cost	Estimate with contingency
1. Cost per km	\$29,954,771	\$42,612,218
2. Cost per lane-km	\$7,488,693	\$10,653,055
3. Cost per m ² of bridge deck area	\$3,172	\$4,441
4. Cost of earthworks /m ³	\$37	\$59
5. Cost of pavement /m ²	\$186	\$261
6. Cost of drainage /m	\$584	\$934

NOTE:

1. Costs for Route/Concept/EIS covered by Client Project Management Services (Item 1(b))
2. Sponsor costs NOT included in this estimate
3. Provisional Sum amount NOT incl. in Project Estimate total because derived from a discretionary item currently under consideration

Date: 2/07/2012
Time: 11:42 AM

Estimate Summary Sheet

Project: Barry Bypass, Strategic Route Feasibility, Southern Option

Estimate Prepared by: Evans & Peck (PJ)

Quantities Prepared by: Aecom

Design Prepared by: Aecom

Project No: D/00386

Date: 27/06/2012

Estimate Type: Strategic Route Feasibility

Item	Base Estimate (excluding contingency)	Contingency		Estimate (including contingency)	% of Total Estimate	Comments/Assumptions
		%	Amount			
1. Concept Development						
1(a) Route/Concept/IS	\$0	0%	\$0	\$0		Refer Note 1. below Incl. in above item Allowance RMS
1(b) Project Management Services	\$2,325,499	40%	\$930,200	\$3,255,698		
1(c) Sponsor	\$0	0%	\$0	\$0		
1(d) Community Liaison	\$750,000	40%	\$300,000	\$1,050,000		
Sub total	\$3,075,499	40%	\$1,230,200	\$4,305,698	0.61%	
2. Detail Design & Documentation						
2(a) Investigation and Design	\$44,591,758	44%	\$19,744,610	\$64,336,368		Contractor's design costs + Primary Testing + Design IV Allowance 4% of Investigation and design costs Incl. in above item
2(b) Project Management Services	\$1,783,670	40%	\$713,468	\$2,497,138		
2(c) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$46,375,429	44%	\$20,458,078	\$66,833,506	9.40%	
3. Property Acquisitions						
3(a) Acquire Property	\$19,300,000	18%	\$3,440,000	\$22,740,000		Value provided by RMS Incl. in above item Incl. in above item Incl. in above item
3(b) Professional Services for Property	\$0	0%	\$0	\$0		
3(c) Project Management Services	\$0	0%	\$0	\$0		
3(d) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$19,300,000	18%	\$3,440,000	\$22,740,000	3.20%	
4. Utility Adjustments						
4(a) Adjust Utilities	\$4,857,935	83%	\$4,014,674	\$8,872,609		Refer to "RMS Infrastructure - Southern" worksheet for detail Allowance 2% of Utilities costs Incl. in above item
4(b) Project Management Services	\$97,159	40%	\$38,863	\$136,022		
4(c) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$4,955,094	82%	\$4,053,537	\$9,008,631	1.27%	
5. Infrastructure Construction						
5(a) - 5(c) Infrastructure	\$404,144,165	50%	\$200,566,450	\$604,710,615		Refer to "RMS Infrastructure - Southern" worksheet for detail Additional items to base case scope Refer to NOTE 3. below Allowance 4% of Construction costs Incl. in above item PA Insurance allowed 1.0% of Project Costs
5(d) Adjustment Sums (Including markup and contingency)	-\$32,922,131	55%	-\$18,228,156	-\$51,150,287		
5(e) Provisional Sums (Including markup and contingency)	\$0	0%	\$0	\$0		
5(f) Project Management Services	\$16,165,767	40%	\$6,466,307	\$22,632,073		
5(g) Sponsor	\$0	0%	\$0	\$0		
5(h) PA Insurance	\$7,136,901	40%	\$2,854,760	\$9,991,661		
Sub total	\$394,524,702	49%	\$191,659,360	\$586,184,062	82.48%	
6. Finalisation						
6(a) Refurbish old route	\$7,803,099	47%	\$3,675,795	\$11,478,894		Refer to "RMS Infrastructure - Southern" worksheet for detail Handover (RMS) Costs Allowance 4% sum item 6(a) & 6(b) costs Incl. in above item
6(b) Project data and post completion review.	\$6,654,764	40%	\$2,661,905	\$9,316,669		
6(c) Project Management Services	\$578,314	40%	\$231,326	\$809,640		
6(d) Sponsor	\$0	0%	\$0	\$0		
Sub total	\$15,036,166	44%	\$6,569,027	\$21,605,193	3.04%	
TOTAL	\$483,266,889	47%	\$227,410,202	\$710,677,091		
TOTAL PROJECT ESTIMATE:						\$711,000,000

Project Management:	\$21,700,409	3.1%
Sponsor:	\$0	0.00%

Length of the Project: 12.8 km
51.2 lane-km

Reality Costs:	Base cost	Estimate with contingency
1. Cost per km	\$37,755,226	\$55,521,648
2. Cost per lane-km	\$9,438,806	\$13,880,412
3. Cost per m ² of bridge deck area	\$2,822	\$3,950
4. Cost of earthworks /m ³	\$55	\$97
5. Cost of pavement /m ²	\$186	\$260
6. Cost of drainage /m	\$805	\$967

NOTE:

1. Costs for Route/Concept/IS covered by Client Project Management Services (Item 1(b))
2. Sponsor costs NOT included in this estimate
3. Provisional Sum amount NOT incl. in Project Estimate total because derived from a discretionary item currently under consideration

Date: 20/07/2012

Time: 11:42 AM