Transport
Roads & Maritime
Services

Our ref: 19R-1005

8 February 2019

Mr Philip Charles Walker
184 Warriewood Road
WARRIEWOOD NSW 2102

Email: cabalkarma@gmail.com

Dear Mr Walker

Notice of decision on your access application under the *Government Information (Public Access) Act 2009* (GIPA Act)

Applicant:	Philip Charles Walker
File reference:	19R-1005
Decision maker:	Wayne Kosh
Received date:	18 January 2019
Due date:	18 February 2019
Date of decision:	8 February 2019

1 Your access application

1.1 On 18 January 2019 we received your access application under the GIPA Act for the following information:

> All information (initially as a list), regarding the design of the truck arrester bed for the Mona Vale Road East Upgrade, specifications and design calculations, and internal correspondence for the "PV" Arrester Bed.

1.2 By email of 30 January 2019 we requested that you contact us as a matter of urgency to discuss the intention of the words "initially as a list" and whether you request access to actual documents.

1.3 During a telephone conversation with our Unit on 5 February 2019 you indicated that you prefer access to copies of documents unless the volume is excessive.

2 Searches for information

2.1 Under the GIPA Act we must conduct reasonable searches to locate the government information for which you have applied. The following areas of this agency have conducted searches:

- Technical and Project Services Division
- Sydney Division, North West Precinct

2.2 Information has been identified as falling within the scope of your application. The searches were conducted on the Objective document management system.

3 Decision

3.1 I am authorised by the Principal Officer, for the purposes of section 9(3) of the GIPA Act, to decide your access application.

3.2 Please see below a summary of my decision:

Doc. Ref.	Information	GIPA Act ref.	Access
Document 1 Page 1 - 8	Design report for existing truck arrester bed - Thunderbolts Way - background material	Section 58(1)(a)	Full
Document 2 Page 9 - 10	Internal email - urban design principles - 21 August 2014	Section 58(1)(a)	Full
Document 3 Page 11 - 22	Road safety audit report - 12 March 2015	Section 14, Table clause 3(a) and (b)	Partial
Document 4 Page 23 - 32	Internal Memo - design changes - 30 September 2015	Section 14, Table clause 3(a) and (b)	Partial
Document 5 Page 33 - 62	Road safety audit report – 11 October 2016	Section 14, Table clause 3(a) and (b	Partial
Document 6 Page 63 - 69	Final design drawings - 26 November 2018	Section 58(1)(a)	Full

N/A	Decision and further concept design drawings available at: https://www.rms.nsw.gov.au/projects/sydney-north/mona-vale-road/index.html	Section 58(1)(c) and 59(1)(a)	Publicly available

4 Reasons for Decision

Under section 9(1) of the GIPA Act you have a legally enforceable right to access the information you requested, unless there is an overriding public interest against its disclosure.

Under section 5 of the GIPA Act there is a presumption in favour of disclosing government information unless there is an overriding public interest against its disclosure.

4.1 Public interest test

To decide whether or not there is an overriding public interest against disclosure of the information you asked for, I applied the public interest test, which is set out in section 13 of the GIPA Act.

I applied the public interest test by:

a. identifying any public interest considerations in favour of disclosure;

b. identifying any relevant public interest considerations against disclosure;

c. attributing weight to each consideration for and against disclosure; and

d. deciding where the balance between them lies.

4.2 Public interest considerations in favour of disclosure

Under section 12(1) of the GIPA Act there is a general public interest in favour of disclosing government information. Section 12(2) of the GIPA Act sets out some examples of other public interest considerations in favour of disclosure. However, I am not limited to those considerations in deciding your application.

I find the following considerations in favour of disclosure are relevant to your application:

- Release of information could be expected to promote open discussion about public affairs (major road design)
- A general public interest in favour of releasing government information

4.3 Public interest considerations against disclosure

When applying the public interest test, the only public interest considerations against disclosure that I can take into account are those set out in the table to section 14 of the GIPA Act.

I have identified the following considerations against disclosure as being relevant to your application:

- Clause 3(a) - the disclosure of the information could reasonably be expected to reveal an individual's personal information.
- Clause 3(b) - the disclosure of the information could reasonably be expected to contravene an information protection principle under the *Privacy and Personal Information Protection Act 1998* (PPIP Act).

Clause 3(a) of the Table to section 14 of the GIPA Act

Clause 4(1) of Schedule 4 to the GIPA Act sets out the definition of personal information as follows:

In this Act, personal information means information or an opinion (including information or an opinion forming part of a database and whether or not recorded

in a material form) about an individual (whether living or dead) whose identity is apparent or can reasonably be ascertained from the information or opinion.

Section 15(b) of the GIPA Act provides that agencies must have regard to any relevant guidelines issued by the Information Commissioner when determining whether there is an overriding public interest against disclosure.

The Information Commissioner has published *Guideline 4 – Personal information as a public interest consideration under the GIPA Act* in December 2018. This Guideline sets out what is meant by 'personal information' under the GIPA Act and the type of information that would be covered.

Paragraph 1.2 of this Guideline sets out examples of personal information, which includes a person's name, address and contact details (email and phone numbers).

The term 'reveal' is defined in clause 1 of Schedule 4 of the GIPA Act to mean:

To disclose information that has not already been publicly disclosed (otherwise than by lawful means).

Some of the information you have requested includes the name and contact details of third parties. For the reasons set out above, this information is considered to be *personal information* for the purposes of clause 4 of Schedule 4 of the GIPA Act. This information has not already been publicly disclosed.

Therefore, the release of this personal information could reasonably be expected to reveal an individual's personal information.

Clause 3(b) of the Table to section 14 of the GIPA Act

Disclosure of the personal information of third parties without their consent would be a breach of the information protection principle relating to disclosure (see section 18 of the PPIP Act). The disclosure of the personal information of third parties to you is not directly related to the purpose for which the information was collected.

4.4 Balancing the public interest considerations

I accorded significant weight to the public interest considerations in favour of release as regards the information that discusses specifications and reasons for the design of the truck arrester bed.

As such, I decided to release this information under section 58(1)(a) of the GIPA Act.

The requested information includes the names of private entity employees, signatures, mobile telephone numbers and direct email addresses. This information is contained in documents 3, 4, 5 and 6. I consider this information is personal information within the definition of this term in the GIPA and PPIP Acts.

I accorded minimal weight to the public interest considerations in favour of release as regards personal information. This personal information was collected by the agency for purposes of managing the design of the upgrade. Release in response to your application is not related to the purpose of original collection. Additionally, release of this personal information "*would not shed any light*" on specifications and reasons for the design of the truck arrester bed. (see the Tribunal's discussion in the case of *Pollington v Commissioner of Police* [2019] NSWCATAD 1, [60] to [62]).

As such, I decided to decline release to this personal information under section 58(1)(d) of the GIPA Act and I redacted it form the released information under section 74.

5 Access

5.1 Form of access

For documents (1) to (6), you will be provided with a copy of the information that has been identified for release. The documents have been consolidated in one 69 pages PDF.

In relation to information about the decision and further concept design drawings I decided that this information is already available to you under sections 58(1)(c) and 59(1)(a). It has been published on the agency's website. Access to it can be obtained by visiting the link provided at the table a paragraph 3.2.

6 Processing Charges

Under section 64 of the GIPA Act we may require you to pay processing charges, at a rate of $30 per hour, for the time spent dealing with your access application. The application fee of $30 counts as payment of one hour of the processing charges.

Processing the application occupied approximately 8 hours of agency staff time.

I decided not to impose any additional processing charges for dealing with your application.

7 Disclosure Log

I decided not to include details about your access application in the disclosure log.

8 Review rights

If you disagree with my decision, you may apply for this decision to be reviewed by seeking:

- an internal review by another officer of this agency, who is no less senior than me;
- an external review by the NSW Information Commissioner; or
- an external review by the NSW Civil and Administrative Tribunal (NCAT).

You have 20 working days from the date of this letter to apply for an internal review and 40 working days to apply for an external review by the NSW Information Commissioner or the NCAT.

9 More information

For your information and assistance, I enclose a fact sheet explaining your rights to have my decision reviewed.

Please do not hesitate to contact Nick Yetzotis at gip@rms.nsw.gov.au if you have any questions about this letter.

Yours sincerely

Wayne Kosh

Wayne Kosh
Manager
Information Access

Encls: 69 pages of information for release

IPC GIPA Act review rights fact sheet

Document 1

Crossroads Civil Design Pty. Ltd.

Crossroads Civil Design Pty Ltd
ABN 74 108650684
41 William Street
Tighes Hill
New South Wales 2297

Telephone: 02 49621710
Mobile: 0421 688545
Facsimile: 02 49621763
Email: crossroads_civil_design@tpg.com.au

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Roads and Traffic Authority – Newcastle

Proposed Upgrade of Existing Truck Arrester Area Thunderbolts Way, 45km from Gloucester.

Design Report.

15th June 2005
Reference CR00805RTAN
Revision 1

Table of Contents

Proposed Upgrade of Existing Truck Arrester Area
Thunderbolts Way, 45km from Gloucester.

Roads and Traffic Authority

1. Introduction

The Roads and Traffic Authority Technical Services (Newcastle) have engaged Crossroads Civil Design Pty Ltd to prepare Detailed Design Construction Documentation for the Proposed Upgrade of Existing Truck Arrester Area along Thunderbolts Way, 45km from Gloucester.

The scope of work involves;

- The upgrade of the existing Truck Arrester Bed to current design standards.
- Develop construction drawings for the above project.
- Minimise impact on the local environment.

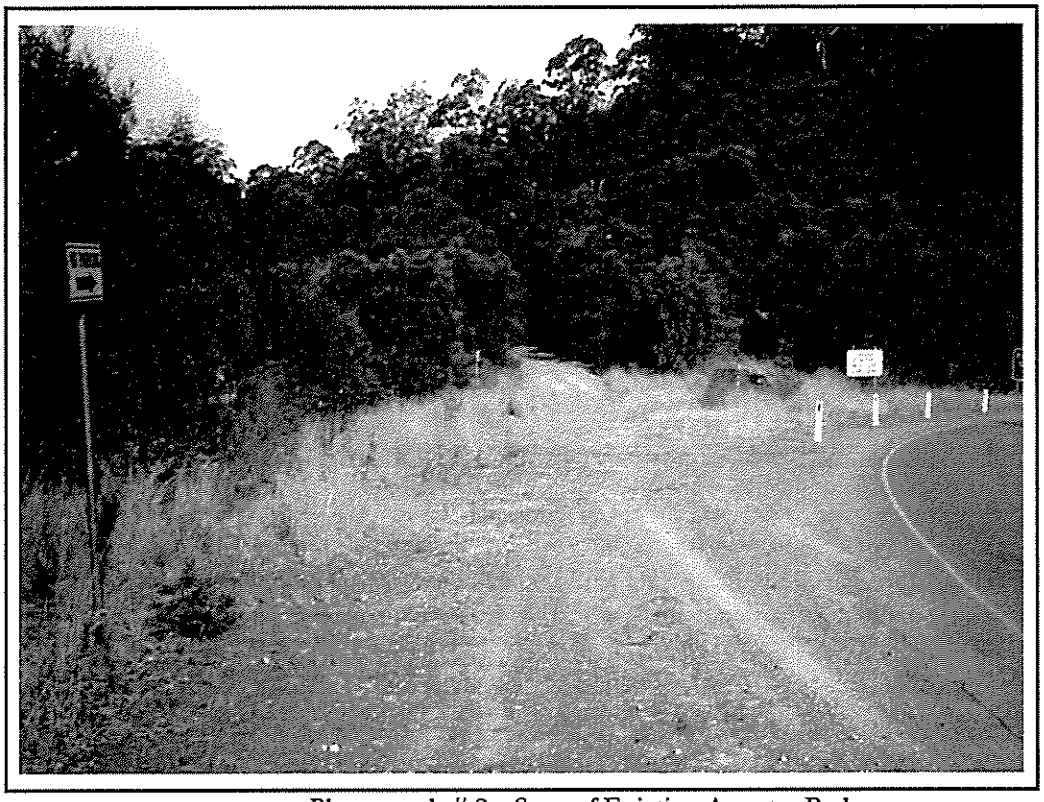
2. Description of Site

The existing Truck Arrester Bed is located along the Thunderbolts Way going towards Nowendoc, 45km from Gloucester, on the left hand side of the south bound lane.

The exiting Truck Arrester Bed consisted of;

- Tangential runoff from the formation of Thunderbolts Way south bound lane.
- Arrester Bed total length was 100.0m.
- The width of the Arrester Bed is 5.0m.
- 1:1 batters.
- Existing grade of Thunderbolts way is aprox 10.5%

Photograph # 1 – Start of Arrester Bed looking along Thunderbolts Way



Photograph # 2 – Start of Existing Arrester Bed

Photograph # 3 – Looking south bound along Thunderbolts Way.

Photograph # 4 – Approximately half way along the Existing Arrester Bed

Photograph # 5 – End of Existing Arrester Bed

Photograph # 6 – End of Existing Arrester Bed looking back to Thunderbolts Way

3. Design

3.1 Current Design Drawing

Final design for this work is shown on 9 sheets of Plans issued to RTA on 11th of June 2005.

3.2 Length of Work

150m from the start of the vertical taper at ch80 to ch230

The calculation for the length of the Arrester Bed as Follows;

L=V^2/(26.A + 2.55.G)

Where
L= length of full depth bed excluding 50m transition at start
V= entry speed (km/h)
A= deceleration (m/sec)
G= grade (%)

The following values were used for the arrester bed design

V= 100 (km/h)
A= 3.0 (m/sec)
G= 10.5 (%) centreline of Thunderbolts Way

L=100^2/(26x3.0 + 2.55x10.5)

L=95.44m, round up to 100m.

3.3 Alignments

Horizontal Alignment

- Horizontal alignment is in accordance with the RTA Road Design Guide and Design documentation supplied by RTA.

Vertical alignment

Vertical alignment is based on the Design documentation supplied form RTA.

3.4 Cross Section

The proposed cross section is as follows;

- Arrester bed with of 5.0m
- Service road to be 3.0m
- Shoulder on LHS to be .10m
- Lhs shoulder to accommodate Thrie beam (3.5 bmt grade).

Refer to sheet 2 of construction design for more detail.

4.5 Linemarking and Signposting

- Linemarking and Signposting have been designed in accordance with the Delineation Guidelines of the RTA and Design documentation supplied form RTA.

4.6 Drainage

Subsoil Drainage

- Arrester bed to have grade f20 aggregate filter material wrapped in geotextile and 100mm diameter, type 1 class 1000 perforated plastic drainage pipe with filter sock outlets at 20m centres.
- Subsurface trench drain grade f20 aggregate filter material wrapped in geotextile and 100mm diameter, type 1 class 1000 perforated plastic drainage pipe with filter sock outlets at 20m centres.

Refer to sheet 2 of construction design for more detail.

5. Schedule of Quantities

DESCRIPTION	QUANTITY	UNIT
Guide posts	4	each
Geotextile wrapping	100	sq.m
Aggregate filter material	36	sq.m
Subsoil pipe 100mm	350	m
10mm river gravel	275	sq.m
Bulk earthworks	560	cu.m
Relocation of signs	2	qty
Additional signage	8	qty
Line marking – E1	60	m
Line marking – Chevron	1	qty
Landscape, erosion protection	1	qty

4. Quality Assurance

During the preparation of this Detail Design reference was made to the following publications:

- Road Design Guide (RTA).
- Design documentation supplied by RTA.

5. Road Safety Audit

A Road Safety Audit of this proposal has not been undertaken.

Document 2

MATHIVANAR Matty

From: JEDNIUK Andrew
Sent: Thursday, 21 August 2014 2:07 PM
To: FORREST Deanne M
Cc: SENANAYAKE Dush V
Subject: MR162- Mona Vale Road (East)- Truck Arrestor location
Attachments: arrester bed-PropertyBound.pdf; arrester bed.pdf

Deanne,
Please find attached sketches prepared showing a potential truck arrestor location. (West of cemetery). As you can see it is necessary to utilise the council triangle parcel of land to provide
such a facility to decelerate to zero.
We do have slight scope to reduce the length if this is something you wish to pursue further.

Regards
Andrew Jedniuk
Lead Designer (Road)
Road Design Engineering | Engineering Technology
T 02 8837 0562 F 02 8837 0050
www.rms.nsw.gov.au

Roads and Maritime Services
99 Phillip Street Parramatta NSW 2151

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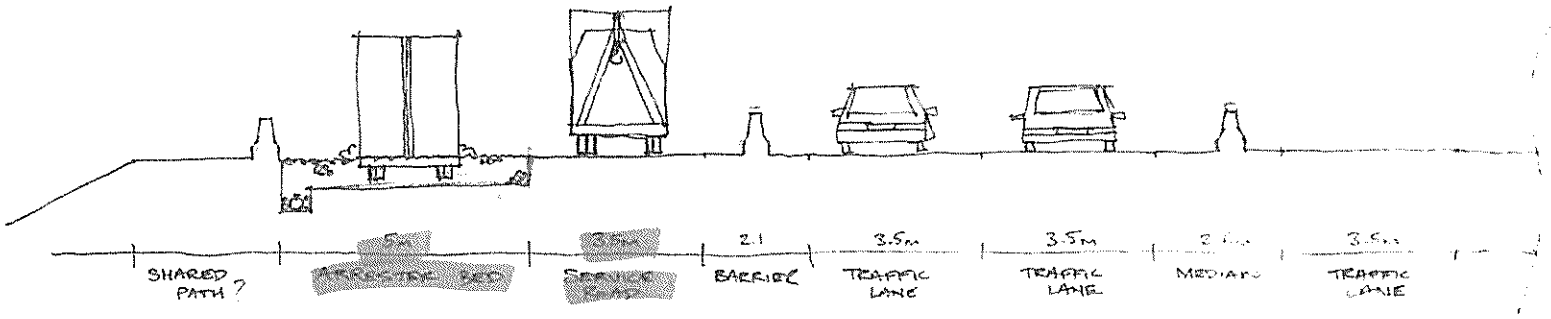
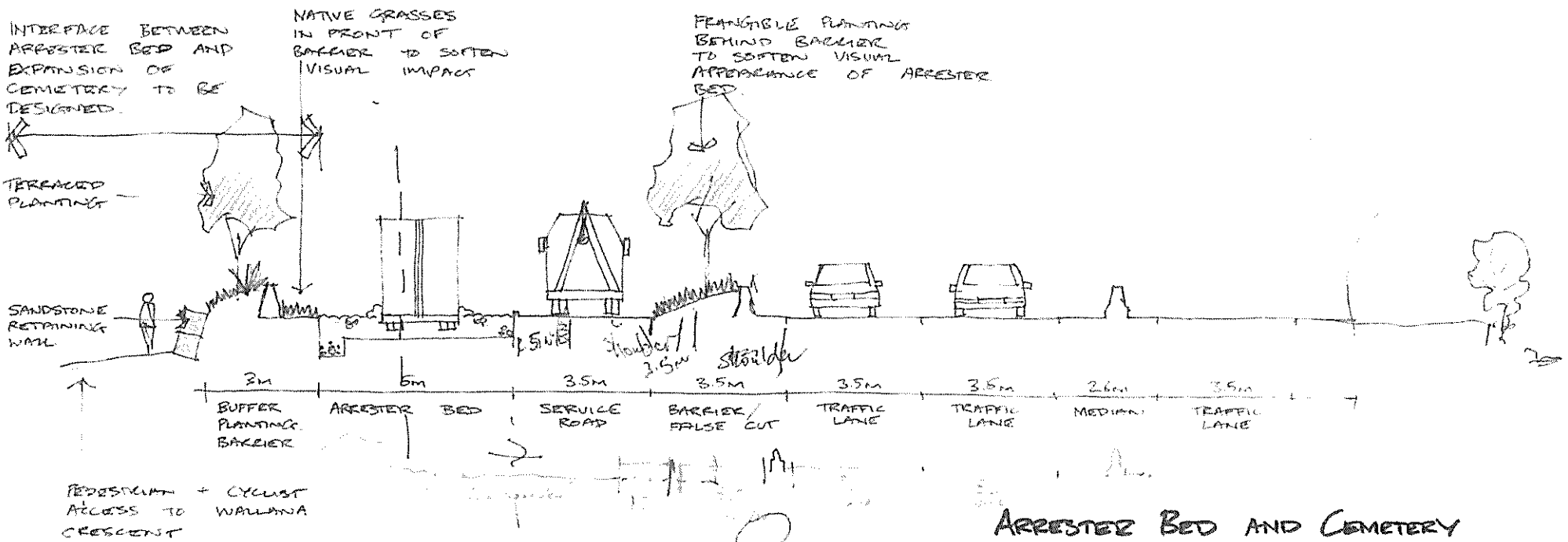


SECTION @ ST 2230 CURRENT DESIGN



SECTION @ ST 2230 URBAN DESIGN CONCEPT

ARRESTER BED AND CEMETERY EXPANSION INTERFACE

HBO + EMTB 21.11.14

Transport Roads & Maritime Services

RDR 25 - 1415

Road Safety Audit report

1. Project name

MR 162 Mona Vale Road, between Manor Road, Ingleside and Foley Street, Warriewood - Widening to 4 Lanes.

2. Formal statement

We, the undersigned, declare that we have reviewed the material and data listed in this report and identified the risks to road safety listed in the Risk Table(s). Reasons are given to explain why a risk is considered to be a safety issue.

Design or construction risks that do not cause a road user safety risk are not listed.

It should be noted that while every effort has been made to identify potential safety risks, no guarantee can be made that every risk has been identified.

The currency of accreditation, suitability and independence of road safety audit team members were checked by the Lead Auditor before commencing the audit.

It is recommended that identified risks be investigated and corrective actions implemented.

Signature	Role	Auditor identification number	Currency checked	Date
redacted	Lead Road Safety Auditor	316	☐	12-03-2015
redacted	Road Safety Auditor	272	☐	12-3-15
redacted	Road Safety Auditor	803	☐	12-3-15

3. Purpose

The purpose of this audit is shown ticked in Table 1.

Table 1 Audit purpose

Project phase	Type of Road Safety Audit	Purpose of this audit
Pre-construction	Strategic Design	☐
	Concept Design	☑
	Detailed design	☐
Construction	Roadworks	☐
	Pre-opening	☐
Post construction	Finalisation	☐
	Existing road	☐

4. Background

4.1 Project purpose

The purpose of this project is to upgrade Mona Vale Road from a two way, two lane carriageway to a two way, four lane carriage way. The carriageway upgrade will improve road safety, traffic capacity and efficiency for all road users and provide on-road cycle facilities. Intersections and their approaches along this section of road will be upgraded to suit the proposal.

4.2 Brief outline of project history

The Mona Vale to Macquarie Park Corridor Strategy (2009) provides a 25 year framework for the management of the Mona Vale Road corridor. Mona Vale Road (MR162) forms a crucial part of series of roads forming a metropolitan corridor called Metroad 3 (Route A3) linking Mona Vale in the north to the Princes Highway at Hurstville in the south.

In December 2013, the Roads Minister asked RMS to investigate the upgrade of Mona Vale Road to a four lane road between Manor Road to Foley Street.

Project Development engaged Road Design Engineering (RDE) to investigate the ultimate widening of Mona Vale Road between Manor Road and Foley Street.

5. Scope of the audit

5.1 Audit location and start and finish points

This Road Safety Audit was carried out on the Stage 2 Concept design of Mona Vale Road upgrade. The 3.2km length of road runs between Manor Road, Ingleside and Foley Street, Warriewood.

5.2 Exclusions

The Concept design report states that further investigation and assessment into safety barriers and benches for high cuttings is to be investigated at the Detail design stage.

6. Audit team and client details

Audit team and client details are shown in Table 2.

Table 2 Audit team and sponsor details

Role	Name	
Client	Deanne Forrest	
Client email	redacted	
Lead auditor	Anthony Neill	Level 3
Lead auditor email	redacted	
Audit team member	Peter Greenland	Level 3
Audit team member	Steven Ludenia	Level 1

7. Information and material supplied, used and referenced

The documents listed in Table 3 were reviewed as part of the audit.

Table 3 Documents reviewed

Documentation	Document Title/Reference
Design drawings	DS2012/001388
Design reports	Draft Concept Design Report

8. Meeting and assessment details

The audit methodology involved the activities shown in Table 4.

Table 4 Audit meetings and assessments

Activity	Date	Attendees
Opening meeting	09/02/2015	Deanne Forrest, Dush Senanayake , Peter Greenland, Steven Ludenia, Anthony Neill
Daylight inspection	12/02/2015	Peter Greenland, Steven Ludenia, Anthony Neill
Night inspection		Not Required
Closing meeting	12/03/2015	Deanne Forrest, Dush Senanayake , Peter Greenland, Steven Ludenia, Anthony Neill, Andrew Jedniuk

9. Assessment methodology and details

The audit methodology is based on the experience and skill of audit team members, rather than using checklists.

9.1 Considerations

A 3.0m sealed shoulder is provided for the semi rural section of the proposal to allow for on road cyclists and for the future provision of bus priority route along Mona Vale Road. The urban section from west of Samuel Street to Foley Street is designed for a speed of 60km/h with 4.2m wide kerbside lanes for continuity of on road cyclist facilities along Mona Vale Road.

In the vicinity of the proposed truck arrestor bed a 4.5m wide shoulder has been provided to allow for recovery vehicles to operate clear of the traffic lanes.

9.2 Activities

The audit process included:

- Review of documentation and materials (detailed in Table 3).
- Meetings with project personnel (detailed in Table 4).
- Daylight and night inspections (detailed in Table 4).

9.3 Risk assessment

Risk assessment is based on:

1. Normal operating characteristics expected of the road.
2. The risk matrix in Table 5.

Table 5 Risk matrix

**Probability	Risk level ❶ = Low through to ❻ = Extreme						
	*Severity of consequence						
	Property damage	First-aid injury	Casualty injury	Acute injury	Critical injury	Single fatality	Multiple fatality (Bus)
	Fatality equivalent 0.004	Fatality equivalent 0.009	Fatality equivalent 0.024	Fatality equivalent 0.072	Fatality equivalent 0.251	Fatality equivalent 1.000	Fatality equivalent 4.667
Almost Certain	❸ 0.400	❸ 0.900	❹ 2.400	❺ 7.200	❺ 25.100	❻ 100.000	❻ 466.700
Expected	❷ 0.180	❸ 0.405	❹ 1.080	❹ 3.24	❺ 11.295	❺ 45.000	❻ 210.015
Probable	❷ 0.080	❷ 0.180	❸ 0.480	❹ 1.440	❺ 5.020	❺ 20.000	❺ 93.340
Likely	❶ 0.040	❷ 0.090	❸ 0.240	❸ 0.720	❹ 2.510	❺ 10.000	❺ 46.670
Possible	❶ 0.018	❶ 0.041	❷ 0.108	❸ 0.324	❹ 1.130	❺ 4.500	❺ 21.002
Rare	❶ 0.008	❶ 0.018	❶ 0.048	❷ 0.144	❸ 0.502	❹ 2.000	❺ 9.334

Fatality equivalent values are based on Rural Generic Costs per Accident (Economic Analysis Manual, Appendix B, Table 12, 2003. 14 injuries are equivalent to 1 fatality).
* Severity of consequence is a log relationship y=0.0006e1.838x based on fatality-equivalent intercepts at Property Damage = 0.004, Acute = 0.072, Fatality = 1.
** Part of a power series (1.10)2n

10. Risk to Road Safety details

10.1 Road Safety risks

The findings of the Road Safety Audit are detailed in Table 6 on page 6.

10.2 Out-of Scope Road Safety risks

Risks to road safety that are outside the scope of the project under review are reported in Table 7 on page 11. The client can forward these issues to others to resolve.

11. Completing the road safety audit

The client needs to take the following steps to complete the road safety audit process:

- Attend the completion meeting.
- Accept the Road Safety Audit report.
- Review the report.
- Produce a corrective action program.
- Implement corrective actions.
- Close the corrective action program.

Further details are available in the Guidelines for Road Safety Audit Practices[1].

12. Confidentiality and copyright

The information in this Road Safety Audit Report is confidential and copyright.

This document does not form part of a contract.

[1] NSW Centre for Road Safety, Roads and Traffic Authority of New South Wales (2011), *Guidelines for Road Safety Audit Practices*, Sydney.

Table 6 Risk to Road Safety table

Project name:	MR 162 Mona Vale Road - Widening to 4 Lanes – Between Manor Road, Ingleside and Foley Street, Warriewood.

Client:

Ref No.	Location / Category	Photograph	Description of Risk to Road Safety	Reason why Risk is considered to be a safety issue	Probability	Severity of Consequence	Risk Level (1=low, 6=extreme)
1	Westbound Sht -072-RC01 Sht -087-RC16 Stn 0- Stn 380 Sht -099-RC28 Sht -108-RC37 Stn 680- Stn 920 Sht -132-RC61 Sht -142-RC71 Stn 1400- Stn 1620 Sht -150-RC79 Sht -156-RC85 Stn 1780- Stn 1900 Sht -162-RC91 Sht -172-RC101 Stn 2020- Stn 2320		There is no safety barrier at the top of the embankments with 2:1 batter slopes.	An errant vehicle could run off the carriageway and travel down the non-traversable slope, with vehicle occupants sustaining injuries.	Rare	Critical	3

2	Eastbound Sht -103-RC32 Sht -106-RC35 Stn 820- Stn 880 Sht -133-RC62 Sht -138-RC67 Stn 1440- Stn 1540 Sht -151-RC80 Sht -153-RC82 Stn 1800- Stn 1840 Sht -167-RC96 Sht -172-RC101 Stn 2140- Stn 2300		There is no safety barrier at the top of the embankments with 2:1 batter slopes.	An errant vehicle could run off the carriageway and travel down the non-traversable slope, with vehicle occupants sustaining injuries.	Rare	Critical	3

3	Westbound Sht -009-GE03 Sht -010-GE04 Stn 780- Stn 980 Sht -011-GE05 Stn 1200- Stn 1240 Sht -012-GE06 Sht -013-GE07 Stn 1500- Stn 1580 Sht -012-GE06 Sht -013-GE07 Stn 1500- Stn 1580 Sht -014-GE08 Stn 1800- Stn 1900 Sht -015-GE09 Stn 2090- Stn 2250		There is no safety fence at the top of the retaining walls.	Maintenance staff working on the batter slope above the retaining wall could lose balance and fall over the retaining wall, sustaining injuries.	Rare	Critical	3
4	Eastbound Sht -012-GE06 Sht -013-GE07 Stn 1460- Stn 1530 Sht -014-GE08 Stn 1800- Stn 1880 Sht -015-GE09 Stn 2170- Stn 2230		There is no safety fence at the top of the retaining walls.	Maintenance staff working on the batter slope above the retaining wall could lose balance and fall over the retaining wall, sustaining injuries.	Rare	Critical	3

5	Sht -015-GE09 Stn 2170		While a truck with an entry speed of 62km/h will be totally decelerated in the proposed arrestor bed, the length of the arrestor bed will be insufficient for the anticipated truck speeds of more than 62km/h.	A heavy vehicle may continue travelling through the bed, off road and either lose control and roll over or collide with the trees in the cemetery.	Rare	Critical	3
6	Sht -015-GE09 Stn 2170		The arrestor bed has a curved approach to its entry.	A heavy vehicle that has lost braking control may have difficulty in accessing the arrestor bed and may continue travelling off road and collide with the trees.	Rare	Critical	3
7	Sht -015-GE09 Stn 2170		The position of the type F safety barrier adjacent to the arrestor bed restricts entry to the arrestor bed.	A heavy vehicle that has lost braking control may fail to negotiate the entry and impact with the end of the barrier.	Rare	Critical	3
9	Sht -018-GE12 Emma Street intersection.		There is no linemarking (hold line) provided in Emma Street.' Also there is no delineation to separate the two way movement in Emma Street.	Traffic turning left from Emma street will not know how far they should travel into the intersection when they have to stop and wait for a suitable gap. Conflicts may arise from traffic occupying the incorrect area of the carriageway.	Possible	Acute	3
10	Sht -015-GE10 Sht -016-GE09 Stn 2060 - Stn 2320		Linemarking on Ponderosa Parade does not indicate the presence of auxiliary lanes.	This will result in vehicles changing lanes close to the intersection, increasing the likelihood of rear end, side swipe crashes.	Likely	Casualty	3
11	Sht -017-GE11 Stn 80-100		No T1 linemarking for dual right turns out of Ponderosa Parade.	Lack of delineation for vehicles turning right may result in side swipe crashes.	Probable	Casualty	3
12	Sht -017-GE11 Stn 20-80 Stn 60-100		The single through lane in Samuel Street changes to a exclusive right turn lane at the approach to the intersection. No auxiliary lane linemarking on the approach of Samuel Street.	Through vehicles will get trapped in the right turn lane resulting in rear end, side swipe crashes.	Probable	Casualty	3

13	Sht -009-GE03 to 015 GE09 Stn 720 – Stn 2280		As per the Concept Design Report minimum sight distance for stopping sight distance (SSD) for 80km is 103m. The installation of the central concrete safety barrier and the adjacent 3m shoulder limits the SSD to 93m.	Lack of sight distance to an object on pavement (0.2m) may cause rear end crashes due to vehicles suddenly stopping.	Possible	Casualty	2
14	Sht -017-GE11 Intersection Mona Vale Road, Manor to Foley.		Left turn Mona Vale Road to Samuel Street, Samuel Street to Mona Vale Road, Mona Vale Road to Ponderosa Avenue. The observation angle of left turning vehicles is greater than the allowable maximum, due to the size of the kerb return radius.	It will be difficult for drivers to judge whether there is a gap of sufficient length to manoeuvre.	Possible	Casualty	2

Table 7 Out of scope Risk to Road Safety table

Project name:	MR 162 Mona Vale Road - Widening to 4 Lanes – Between Manor Road, Ingleside and Foley Street, Warriewood.

Ref No.	Location	Photograph	Description of Risk to Road Safety	Reason why Risk is considered to be a safety issue	Probability	Severity of Consequence	Risk Level (1=low, 6=extreme)

Drafting items to be addressed.

Sht -015-GE10 - Sht -016-GE09 - Stn 2060 - Stn 2320.

The Truck Arrestor Bed and shoulder have the same pavement colour Sht15. On Sht16 there is no pavement colour.

Sht -016-GE10 - Stn 2400 – Stn 2500

No concrete centre median on drawing

Sht -017-GE11

Pavement arrows on through lanes on all approaches to the signalised intersection are not required.

Sht -004-TS02

Typical cross section Stn 2230.

No grade on the batter slope.

Sht -017-GE11, Stn 2580 Stn 2640

As per the delineation manual, part 9 section 9.3.5.1, Details of Bus lanes.

For Bus Only lanes the red pavement should be extended for the full length of the merge lane on the departure side of the intersection on Mona Vale Road.

Sht -019-GE13, Foley Street intersection.

Left turning vehicles may enter bus lane instead of the through traffic lane.

Sht -019-GE13, Stn 2860

As per the delineation manual, part 9 section 9.3.5.1, Details of Bus lanes.For the Bus Only lanes the red pavement should be extended for the full length of the merge lane on the departure side to the intersection with Foley Street. (no gap).

Document 3

Roads & Maritime

Memo

To:	Steve Arnold, General Manager Project Development		
CC:	Richard Hine, Senior Project Development Manager		
From:	Jennifer Mak, Project Development Manager	**Date:**	30/9/2015
Ref:	A10297335	**Pages:**	5 pages, 3 attachments
File no:	D/00546		
Subject:	Mona Vale Road East Upgrade between Manor Road and Foley Street – Proposed concept design changes following REF display and submissions received		

Issue

Approval of concept design changes for the Mona Vale Road East Upgrade project following community submissions received from Review of Environmental Factors (REF) display.

Background

On 29 July 2015, the REF for Mona Vale Road East Upgrade between Manor Road and Foley Street was displayed for community comments. Display period closed on 28 August 2015 and around 150 email and written submissions (and around 450 matters raised) were received from the community, stakeholder groups and Government agencies. The key matters raised in submissions received include:

- Left in left turn arrangement at Mona Vale Road/ Emma Street intersection and associated local traffic issues
- Property acquisition and access at the Mona Vale Road/ Ponderosa Parade/Samuel Street intersection
- Fauna connectivity, road kill

Based on preliminary design investigation regarding matters raised from the submissions received, the following changes to the project are proposed to assist in the preparation of the Submissions Report and Determination of the REF.

Comment

The following design changes are proposed in response to the submissions received.

1. Mona Vale Road/ Ponderosa Parade/ Samuel Street intersection

Issue

The current proposed intersection layout requires strip acquisitions on the north-west and north-east corners of the intersection on Samuel Street. The proposed intersection layout would impact access to a common driveway to properties 1, 3, 5 Samuel Street (north-west corner), and prohibit right turn property access for 2, 4 Samuel Street (north-east corner) due to the proposed concrete median for the traffic lights.

Proposed design changes

In response to community feedback regarding property access impacts, the proposed left slip lane from Mona Vale Road to Samuel Street (north-west corner) has been removed to minimise property access impacts to properties on Samuel Street near the signals. The length of the concrete median on Samuel Street has been revised to enable right turning property access for properties on the north east corner.

It is proposed to further widen the Mona Vale Road west approach to retain the bus priority provision (bus lanes shown in red in Figure 2). An updated intersection performance analysis by SIDRA indicated acceptable level of service for forecasted traffic at the intersection over the analysis horizon (year 2036 with the full Mona Vale Road upgrade, summary results in Attachment 1). A supplementary traffic and transport assessment will be included as part of the Submissions Report reflecting the proposed changes to this intersection.

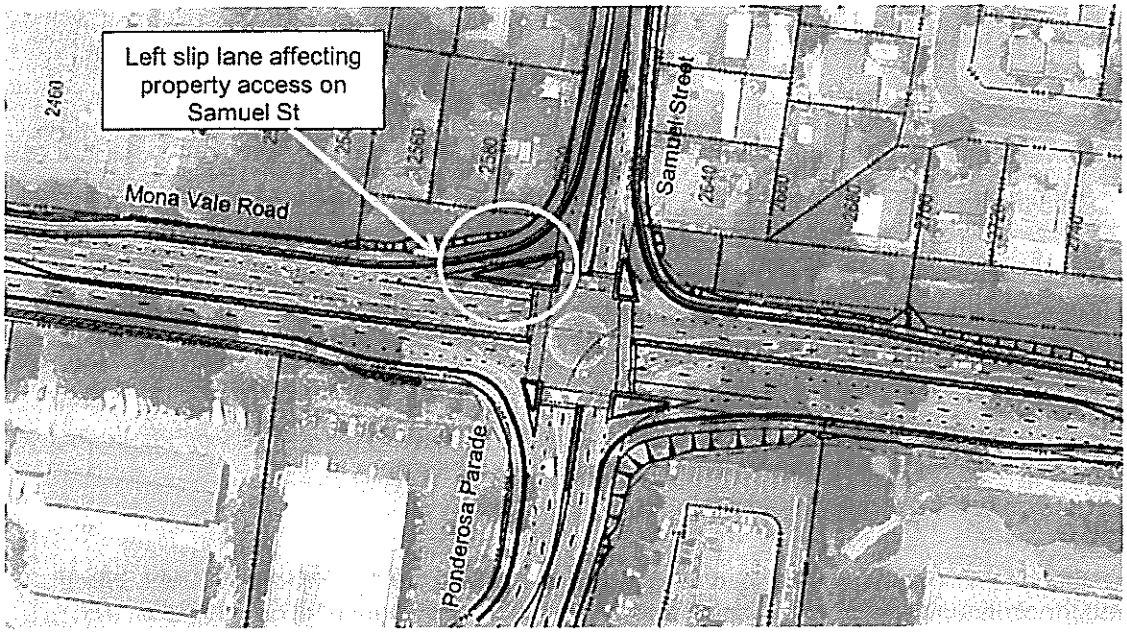


Figure 1: Original concept design displayed in REF with left slip lane from Mona Vale Road into Samuel St affecting property access on Samuel St

Figure 2: Updated proposed intersection layout showing the removal of slip lane, and retaining bus priority treatment (bus lanes in red)

Changes to project

Reduction in property cost due to no partial acquisitions required from Samuel Street properties. Property access issues resolved. Bus lanes retained in the updated design. Minor changes to strip property acquisitions located on the southern side of the intersection.

2. Emma Street

Issue

The existing Mona Vale Road and Emma Street intersection allows all turning movements in and out of Emma Street. With the upgrade of Mona Vale Road from two lanes to four lanes divided by a concrete median, the proposed treatment at the Emma Street intersection is proposed as left-in left-out access (based on MPRC approved concept in August 2014 as shown in Figure 3). A large amount of submissions received indicated opposition against the proposed left-in left-out access treatment. A popular secondary issue was also raised from community submissions regarding the potential increase in local traffic due to alternate access routes as a result of the removal of right turns.

Proposed design changes

A detailed look at the surveyed traffic counts at Emma Street intersection showed around 120 right turning vehicles (surveyed in 2014) from Emma Street to Mona Vale Road during the AM peak hour (equivalent to an average of a right turning vehicle every 30 seconds in peak hour). However, the traffic volumes at this intersection do not meet the warrants for traffic signals.

RMS Design section investigated intersection treatment options in providing the right turning movement turning in and out of Emma Street. A channelised right turn treatment is proposed (Figure 4). Visibility has been checked along Mona Vale Road for Safe Intersection Sight Distance (SISD) and Minimum Gap Sight Distance (MGSD) for the Emma Street intersection. Based on the vertical alignment, sight distances for SISD and MGSD are achievable for 60km/h and 70km/h design speeds. The proposed design changes were checked and endorsed by RMS Principal Road Design Engineer (email endorsement enclosed in Attachment 2).

An intersection performance analysis by SIDRA indicated acceptable level of performance for a channelised right turn treatment at the intersection. Further, RMS Design has verified that there is sufficient median width to install traffic signals in the future at Emma Street intersection. The proposed changes in design are within the road reserve.

This proposed change will address a large number of submissions received regarding Emma Street right turn access and the secondary comments related to the increase in local traffic. A supplementary traffic and transport assessment reflecting the proposed changes to this intersection will be included as part of the Submissions Report.

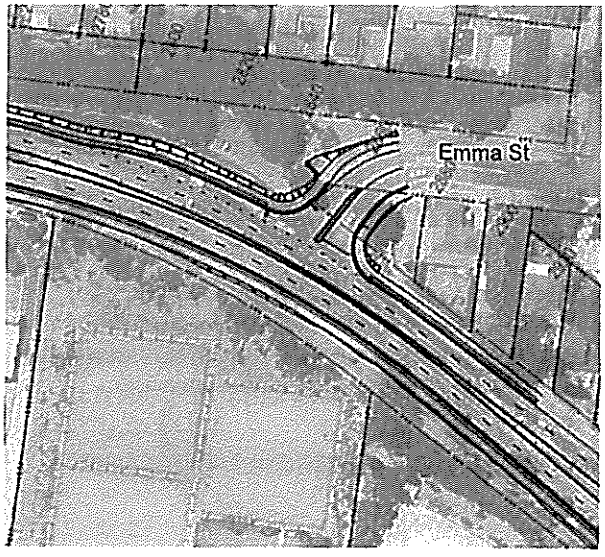


Figure 3: Emma Street left-left out access

Figure 4: Proposed channelised right turn access at Emma St

Changes to project

Proposed channelised right turn access at Emma Street intersection. No changes to property acquisition. No significant change to project cost.

3. Off road shared path on Lane Cove Road, property acquisition, arrester bed design

Issue

The concept design displayed in the REF allows for utility relocation from Mona Vale Road to Lane Cove Road with off road shared path for pedestrians or cyclists use. The concept for the off road path follows Lane Cove Road which connects further to Walana Crescent and continues to the off road foot path on Mona Vale Road (Attachment 3). However, recent consultation with Katandra Nature Reserve, Lands Department and RMS Property indicated that Kantandra Nature Reserve owns one parcel of land that disconnects the alignment of the off road shared path (previously considered to be part of the road reserve, see Attachment 3).

Proposed design changes

RMS Design section has modified alignment for the off road shared path and utility corridor on Lane Cove Road without connecting to Walana Crescent (Attachment 3). This resulted in further widening of the Mona Vale Road near property 30 Walana Crescent. The property 30 Walana Crescent has two existing access from Mona Vale Road and Walana Cresent. The proposed road upgrade would prohibit access from Mona Vale Road due to a major cutting in the design. The proposed relocation of the off road shared path would further require additional land take from this property.

It is proposed that 30 Walana Crescent be acquired in full (potential resell after the road upgrade) for the following reasons:

- Modification of the off road shared path alignment requiring more land from the property and the dwelling potentially becoming very close to the top edge of cutting
- RMS has acquired the parcel of land adjacent to this property. The full acquisition of 30 Walana Crescent would enable easier access for construction of the cutting
- Concept road safety audit has identified safety risks associated with the proposed location of the arrester bed. The acquisition of this property enables RMS Design to better position the arrester bed (Attachment 3)
- The project has not nominated a compound site and that this property could potentially be utilised as a compound site, and resell after the road upgrade project.

RMS Property section has estimated this property at around $4.9M if acquired in full, with a potential resell of the land after upgrade estimated at $1.98M based on a $350/m^2 rate. This property requires partial acquisition estimated at $1.47M based on the original concept design displayed.

Changes to project

Proposed changes to the project include:

- A new proposed alignment for the off road shared path and utility corridor on Lane Cove Road which is still within the assessment of impact described in the REF
- Full acquisition of property 30 Walana Crescent.There is an increase in property acquisition cost. However, it is expected this additional property cost could be offset by other property acquisition savings from Ponderosa Parade/ Samuel Street intersection. Further, land which would subsequently not required near Walana Crescent could potentially benefit plans for the Mona Vale cemetery expansion as indicated by the submission from Pittwater Council.
- Arrester bed relocated to a better position as a response to a corrective action from the concept design road safety audit.

Current status

The project team is currently preparing the concept cost estimate reflecting the above recommended changes to the design. Preliminary review of the concept schedule of quantities indicated a potential decrease in the overall project cost when compared to the strategic cost estimate ($115M). The estimate reduction when compared to the strategic estimate is explained broadly by the assumption of full composite pavement at strategic stage. The pavement design provided by RMS pavement branch has since provided flexible asphalt pavement design at concept stage which results in significant cost reduction (preliminary review indicated in the order of $6M in estimate reduction without contingency).

The proposed design changes as described in this memo are considered to have minor impact to the overall project cost.

Recommendation

It is recommended that the following scope and design changes be approved for the Mona Vale Road East Upgrade project.

- Design changes at the Mona Vale Road/Ponderosa Pde/Samuel St intersection
- Channelised right turn treatment at Mona Vale Road/ Emma Street intersection
- Proposed alignment for the off road multi-use path and utility corridor on Lane Cove Road
- Full acquisition of property 30 Walana Crescent due to the new alignment of multi-use path and utility corridor.

The approval to the above design changes are urgently required to assist in the preparation of the Submissions Report as a requirement for the determination of the REF, which is a Chief Executive milestone by the end of December 2015.

redacted

Jennifer Mak

Project Development Manager

redacted

Richard Hine

Senior Project Development Manager

Approved. Thanks.

redacted

12/10/15

Steve Arnold

General Manager, Project Development

Attachment 1

SIDRA results for proposed modified changes to Mona Vale Road/ Samuel Street/ Ponderosa Parade intersection

MAK Jennifer S

From: Riley, Dan (Sydney) [redacted]
Sent: Tuesday, 29 September 2015 4:20 PM
To: MAK Jennifer S
Cc: Yung, Andy; Wu, Eric
Subject: MVR/Samuel/Ponderosa Intersection

Jennifer

Please find below a summary of the SIDRA results (2036, full MVR upgrade) for the MVR / Samuel Street / Ponderosa Parade intersection with the additional through lane on MVR (west to east). The intersection has been tested with two scenarios:

1. The additional through lane is used by buses only
2. The additional through lane is used by general traffic (including buses).

Results show no difference between the previously tested layout and a new bus only lane. Utilising the additional lane space for general traffic (as well as buses) will result in a slight performance increase.

AM Peak:

Intersection Performance	Previous Layout (with slip lane (17/09/15)	New Lane (Bus Only)	New Lane (Traffic Lane with buses)
Volume	3666veh/hr	3690veh/hr	3690veh/hr
DoS	0.85 (happens at North approach right turn lane)	0.85 (happens at North approach right turn lane)	0.81 (happens at North approach go through lane)
Average Delay	38sec	38sec	36sec
Level of Service	C	C	C
Queue	218m (happens at East approach go through lane)	218m (happens at East approach go through lane)	187m (happens at East approach go through lane)

PM Peak:

Intersection Performance	Previous Layout (with slip lane (17/09/15)	New Lane (Bus Only)	New Lane (Traffic Lane with buses)
Volume	3919veh/hr	3943veh/hr	3943veh/hr
DoS	0.89 (happens at North approach go through lane)	0.89 (happens at North approach go through lane)	0.84 (happens at East approach go through lane)
Average Delay	49sec	49sec	47sec
Level of Service	D	D	D
Queue	255m (happens at East approach go through lane)	255m (happens at East approach go through lane)	221m (happens at East approach go through lane)

Assumptions:

- Bus demand for the latest tests include 12 buses at both AM and PM peak for both Eastbound and Westbound on Mona Vale Road based on 5 minute frequencies;
- Buses run with the same phase and timing as Eastbound and Westbound through traffic on Mona Vale Road. Bus jumps have not been included as they have a minimal impact on traffic / buses but reduce intersection performance.
- The short bus lane from east to west has also been assumed to reflect the same operations as the new west to east lane.

Kind Regards,

Dan Riley
Senior Transport Planner - Transport Advisory

1

Document 4

Attachment 2

RMS Design endorsement on the proposed channelised right turn treatment at Emma Street

MAK Jennifer S

From: JEDNIUK Andrew
Sent: Thursday, 17 September 2015 9:07 AM
To: MAK Jennifer S; LAMBOUS Con
Cc: LDM-HA Nay; CAMPBELL Phil B
Subject: FW: MR162- Lane Cove Road to Foley Street - Samuel Street and Emma Street reconfiguration following community consultation
Attachments: SK09 Mona Vale Rd_NthWestSlipLaneRemoval.pdf

Jen/Con,
See attached Greg Baird's concurrence re design principals along Mona Vale Road at the intersections of Emma Street and Samuel Street.

Any questions feel free to give me a call.

Regards
Andrew Jednuk
Lead Road Designer
Road Design Engineering | Engineering Technology
T 02 8837 0562
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 5, 90 Philip Street Parramatta NSW 2151

From: BAIRD Gregory J
Sent: Wednesday, 16 September 2015 4:32 PM
To: CAMPBELL Phil B
Cc: JEDNIUK Andrew; ELLIS Peter A
Subject: RE: MR162- Lane Cove Road to Foley Street - Samuel Street and Emma Street reconfiguration following community consultation

Phil and Andrew,

Given that sight distances are OK (noting that queued vehicles in the right turn bay for Foley Street may impede 70 km/h sight distance) and Emma Street is a 50 km/h residential street, provision for right turn movements in and out of Emma Street appears reasonable. As per Andrew's email below, please remove the seagull-like pavement marking from the Emma Street intersection and adjust the MVR median nose as required. Otherwise the proposed intersection is OK.

A 4.0 m wide lane adjacent to the 25 m long, mountable kerb median in Samuel Street is acceptable.

Greg

Greg Baird
Principal Road Design
Engineering Services | Asset Maintenance
T 02 8837 0500 [redacted]
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 5 Suite B, 90 Philip Street Parramatta NSW 2150

1

Document 4

Attachment 3

Proposed alignment change to the off road shared path and utility corridor on Lane Cove Road

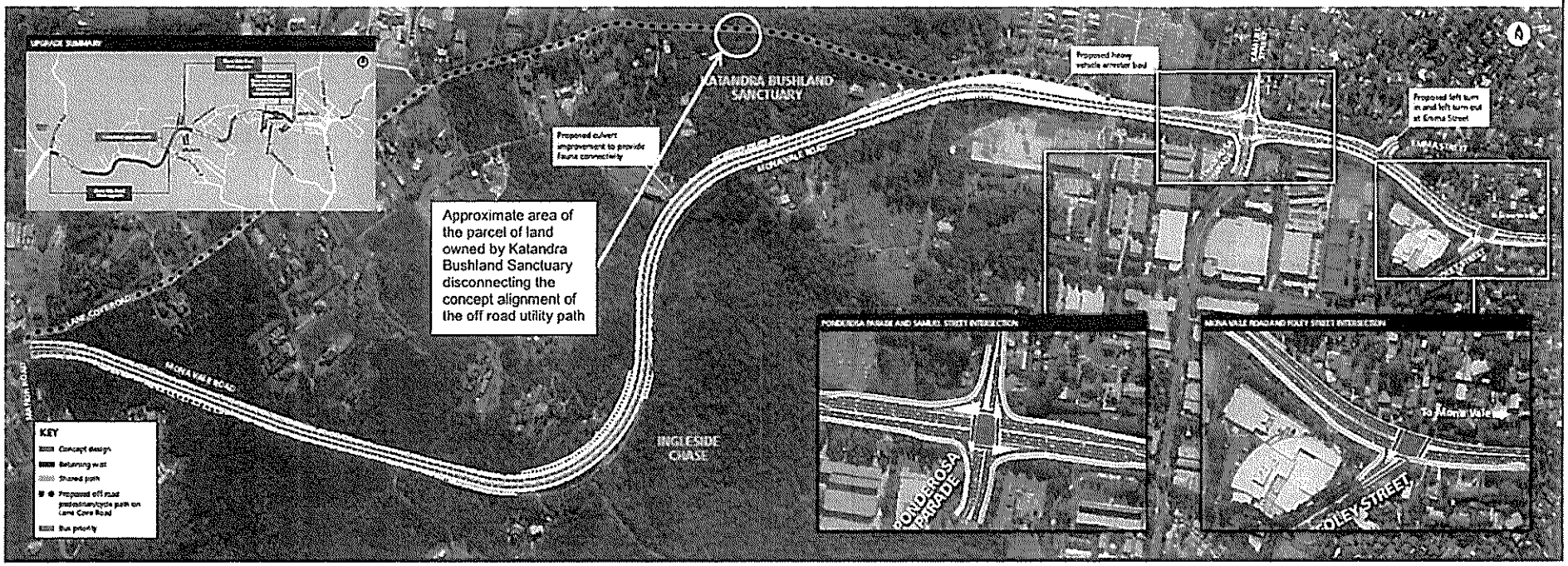


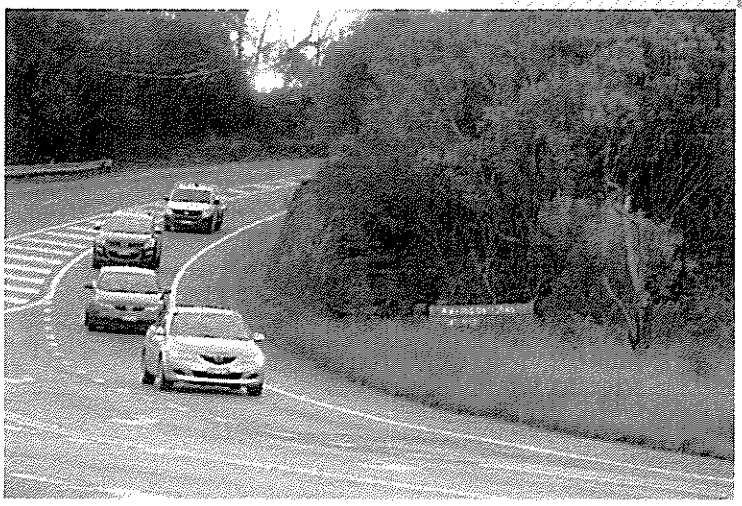
Figure 1: Concept design displayed in REF showing off road shared path and utility corridor along Lane Cove Road connecting to Walana Crescent through a 'paper road' (which was subsequently found to have one parcel of land owned by the Katandra Bushland Sancuary)

Figure 2: Proposed new alignment for the off road shared path and utility corridor

Document 5

9

24 Pages



aurecon

Transport Roads & Maritime Services

MR162 Mona Vale Road East Upgrade (Stage 2) from Manor Road to Foley Street

Detailed Design (Stage 3) Road Safety Audit Report

Ref: 250171

PSC No. 15.2615.1367

Prepared for: Roads and Maritime Services

Revision: 0

11 October 2016

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Document control record

Document prepared by:

Aurecon Australasia Pty Ltd
ABN 54 005 139 873
Level 2, 116 Military Road
Neutral Bay NSW 2089

T +61 2 9465 5599
E sydney@aurecongroup.com
W aurecongroup.com

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Document ID	Mona Vale Road Upgrade - East	**Project number**	250171			
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Client	Roads and Maritime Services	**Client contact**	Matty Mathivanar			
Rev	**Date**	**Revision details/status**	**Prepared by**	**Author**	**Verifier**	**Approver**
0	11 October 2016	Draft for Client review	TLN	TLN	MP	GD
Current revision	0					

Approval			
Author signature		Approver signature	
Name	redacted	Name	Grant Dwyer
Title	Transport Planner	Title	Project Manager

MR162 Mona Vale Road East Upgrade (Stage 2) from Manor Road to Foley Street

Date 11 October 2016
Reference 250171
Revision 0

Aurecon Australasia Pty Ltd
ABN 54 005 139 873
Level 2, 116 Military Road
Neutral Bay NSW 2089
PO Box 538
Neutral Bay NSW 2089
Australia
T +61 2 9465 5599
F +61 2 9465 5598
E sydney@aurecongroup.com
W aurecongroup.com

Contents

Figures

Tables

Appendices

1 Road Safety Audit Summary

Report number	**250171-EAST-RPT-RS-0001 MVR EAST- Detailed Design Road Safety Audit Report.docx**
Audited project	MR162 Mona Vale Road East Upgrade (Stage 2) from Manor Road to Foley Street
Audit for	Roads and Maritime Services
Address	71-79 Pyrmont Bridge Road, PYRMONT NSW 2009
Telephone	
Project manager	Matty Mathivanar
Auditors	redacted Tim Hufton (Audit team member) – Level 3 (TfNSW Centre for Road Safety) redacted
Audit type	Detailed Design (Stage 3)
Commencement meeting	Friday 9 September 2016 10.30 am, Aurecon, 116 Military Road, Neutral Bay NSW 2089
Audit Date	Friday 9 September 2016 Day time visit 2.00 pm – 3.30 pm
Completion meeting	TBC
Previous audit number	RDR 25 – 1415, Road Safety Audit Report – Mona Vale Road, Manor Road to Foley Street, Roads and Maritime Services, 12 March 2015
Summary of audit	The key findings of the Road Safety Audit for the **MR162 Mona Vale Road East Upgrade (Stage 2) from Manor Road to Foley Street**, where issues were raised in terms of risks to road safety, can be categorised in the following: ▪ Road alignment and cross section ▪ Pedestrian / cyclist infrastructure ▪ Heavy vehicle infrastructure ▪ Auxiliary lanes ▪ Bus infrastructure ▪ Traffic signs ▪ Speed zoning Detailed descriptions of the risks to road safety findings can be found in Section 4.

1.1 Formal Statement

We have examined the documents as referred to in Section 3.3 and have undertaken the audit as described in Section 3 of this report. This audit has been carried out for the sole purpose of identifying any hazardous features in relation to the Detailed Design for the **MR162 Mona Vale Road East Upgrade (Stage 2) from Manor Road to Foley Street** that may lead to future incidents for road users. The identified risks to road safety have been documented in this report, in Section 4, and are presented for consideration by the design team for the appropriate remedial actions. It is up to the discretion of the design team to accept or dismiss the findings in this report and consequently the responsibility of the respective owning organisation/s to address the risks identified.

This report addresses physical features of the road environment, potential safety hazards and risks from the proposed design which may affect road user safety, and has sought to identify and risk assess these safety hazards. However, the auditors would like to point out that no guarantee is made that every possible safety risk and hazard has been identified. Moreover, if all the risks in this report were to be addressed, this would not confirm that the road environment or proposed design is "safe", rather, addressing these issues should improve the level of safety.

We confirm that we are independent from the design team and have not provided any advice or made any design contribution to the project to date. We confirm that, as Road Safety Auditors, we have exercised the full capacity of our professional judgement and experience in undertaking this Road Safety Audit.

Name	Role	Level	Auditor ID
redacted			
Tim Hufton	Audit team member	3	RSA-02-0372
redacted			

** As per www.roadsafetyregister.com.au at September 2016. From July 2014, TfNSW is currently undertaking a major review of road safety audit policy at the time of preparing this report. The development of new policy has the potential to impact on the current registration requirements and processes for road safety auditors. TfNSW has agreed that while the review process is undertaken, road safety auditors currently listed on the NSW Register of Road Safety Auditors will be able to maintain their existing certification as at 30 June 2014.*

11 / 09 / 2016

redacted

Lead Road Safety Auditor

Transport Planner, Aurecon

11 / 09 / 2016

Tim Hufton

Audit team member

Roads and Maritime Services

11 / 09 / 2016

redacted

Audit team member

Road Designer, Aurecon

2 Introduction

2.1 Project Overview

Roads and Maritime Services (Roads and Maritime) propose to upgrade two sections of MR162 Mona Vale Road – East (Stage 2) and West (Stage 3). Mona Vale Road East is approximately 3.2 kilometres of Mona Vale Road between Manor Road/ Lane Cove Road, Ingleside and Foley Street, Mona Vale. Mona Vale Road West is approximately 3.2 kilometres in length between McCarrs Creek Road, Terrey Hills and Powder Works Road, Ingleside.

Roads and Maritime seeks to upgrade and widen both sections of Mona Vale Road from an existing two lanes (one in each direction) undivided road to a four lane (two lanes in each direction) divided road.

Two separate environmental assessment reports, Review of Environmental Factors (REF), are being prepared by Roads and Maritime. The REF for Mona Vale Road East was displayed from 29 July 2015 to 28 August 2015 and determined in December 2015. The REF and Species Impact Statement (SIS) for Mona Vale Road West is expected to be placed on display for public comment in October 2016.

A concept design has been prepared by Roads and Maritime for both East and West upgrade works, which Aurecon will carry forward with the detailed design and tender documentation to construction.

Figure 1 Mona Vale Road East Upgrade (Stage 2)

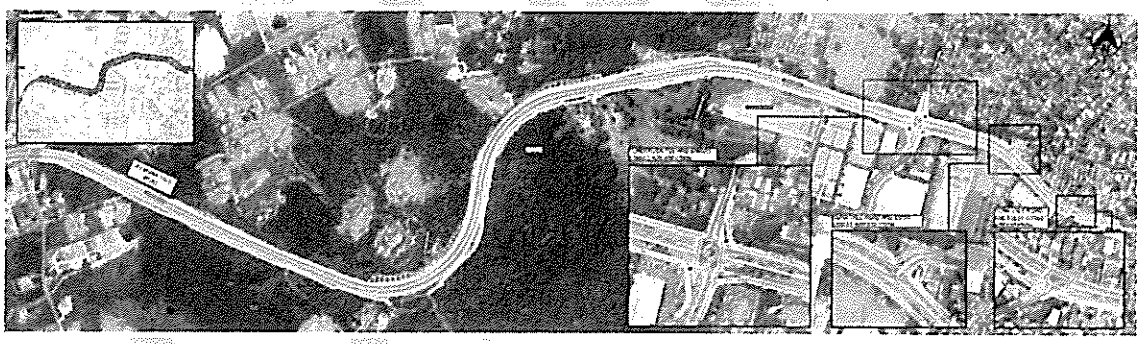
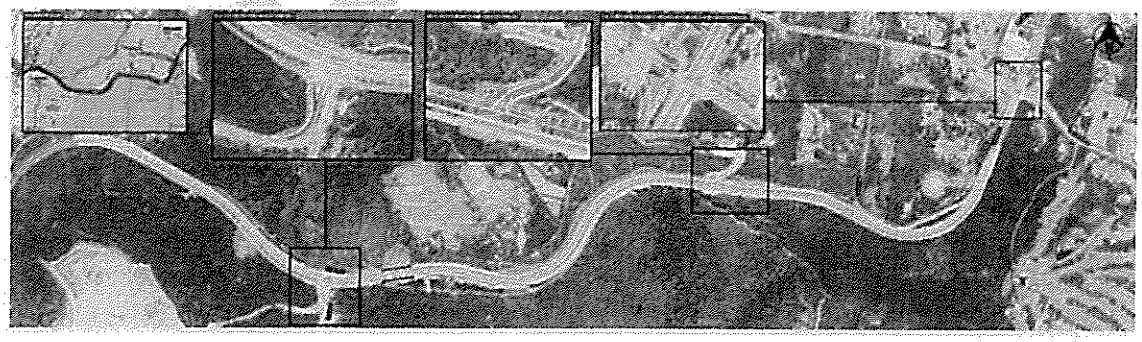


Figure 2 Mona Vale Road West Upgrade (Stage 3)



2.2 Project Scope

The scope of the detailed project is described below for each of the sections as described in the project brief.

The elements of the project to be designed that are discussed within this report include:

- Roadworks.
- Bridgeworks.
- Earthworks.
- Storm water drainage, pipes work and other culverts.
- Pavements.
- Property adjustments.
- Local roads.
- Service adjustments.
- Emergency vehicle access.
- Street or general lighting.
- Access.
- Safety barriers.
- Signposting.
- Noise mitigation.
- Traffic control.
- Open drains, channels, drainage basins and related watercourses.
- Security and fauna fencing.
- Urban design, landscape and visual.
- Traffic signals.
- Temporary works.
- Miscellaneous works.

2.2.1 MVR East (Stage 2)

The upgrade of Mona Vale Road East includes the following elements:

- Widening of an existing 3.2 km length of Mona Vale Road from a two lane two way carriageway to a four lane dual carriageway (3.5 m lane width) from Manor Road to Foley Street.
- Upgrade the existing pavement and cross drainage systems including the construction, reconstruction and extension of pavement drainage lines.
- Widening and upgrading the roundabout intersection of Ponderosa Parade and Samuel Street, to a new signalised intersection.
- Upgrade the intersection of Emma Street to provide a channelised right turn.
- Upgrade the signalised T-Intersection at Foley Street, to provide a left turn into Foley Street.
- Provision of a 3.0 m wide shared path along the southern side of Mona Vale Road between Ponderosa Parade and Foley Street.
- Provision of a 3.0 m wide shared path along the northern side of Mona Vale Road between Ponderosa Parade and the closed off Lane Cove Road.
- Provision of a new underpass Fauna crossing under Mona Vale Road.

- Provision of a new rope crossing above Mona Vale Road.
- Provision of a Truck Arrester Bed.
- Provide new signage for an 80 km/hr posted speed limit from 70 km/hr west of the Ponderosa Parade and Samuel Street intersection.
- Utilities relocation for all impacted assets within the project footprint.
- Upgrade all signalised intersections to have CCTV facility.

2.3 Project Objectives

The project objectives for the Mona Vale Road East Upgrade (Stage 2) have been defined in Section 1.1 of the design services brief and are summarised below:

- Provide a safe road environment that reduces the frequency and severity of crashes.
- Reduce congestion on Mona Vale Road between Manor Road and Foley Street during peak periods.
- Reduce delays on Mona Vale Road between Manor Road and Foley Street during peak periods.
- Deliver infrastructure that provides effective network performance for at least ten years after opening. Improve traffic capacity and efficiency for road users now and into the future.
- Improve access to bus services. Strengthen integration between land use and all other modes of road use.
- Contribute to safe and effective pedestrian and cycling infrastructure that supports local and State Government initiatives for active transport.
- Provide the best economic outcome and deliver a positive BCR.
- Minimise impacts to the local environment including adjacent bushland, whilst enhancing urban design and transport outcomes.

2.4 Report purpose

This Detailed Design (formerly known as Stage 3 audit) Road Safety Audit (RSA) report aims to identify potential risks to road safety in the existing environment, taking into account the proposed Detailed Design of the **MR162 Mona Vale Road East Upgrade (Stage 2) from Manor Road to Foley Street** that may affect road user safety which may lead to future incidents, and has sought to identify and assess these potential safety hazards.

The RSA focuses on the perspective of the expected road users, those accessing the proposed design, however also considering the needs of other road users in the vicinity such as residents and vulnerable road users (pedestrians and cyclists). The RSA considers the potential road safety issues with the intention to reduce or eliminate the risks identified at the key life cycle stage for the project.

It should be understood this report contains no recommendations from the auditors to address the audit findings, as this is not part of the RSA process, as stipulated in the reference documents listed in Section 2.5. The actions for each finding are supplied by the design team to assist in any changes to the proposed design. This RSA report is a standalone document, the closeout of which shall be undertaken as described in Section 3.6 of this report. Future audits are described in Section 2.6.

2.5 Road Safety Audit reference materials

The supplied information was audited in accordance with:

- Austroads Guide to Road Safety Part 6: Road Safety Audit, 2009
- Roads and Maritime Services, Guidelines for Road Safety Audit Practices, 2011

2.6 Future Road Safety Audits

In accordance with the above listed RSA guidelines and practices, a future audit would be required to be undertaken as the project progresses along key stages. The audit stage would consist of, but not be limited to:

- Post-construction Finalisation RSA (formerly known as Stage 4 audit)

Future audits should include a review of the previous stage audits to ensure the findings and associated actions have been appropriately addressed. The future audit is not included in this report scope, being the responsibility of the commissioning organisation at the appropriate stage of the project lifecycle.

3 Road Safety Audit

3.1 Commencement meeting

A commencement meeting was held on Friday 9 September 2016, at approximately 10.30 am, between the audit team and design team representative at Aurecon's Neutral Bay office. A Roads and Maritime representative was invited to join the audit team and was present at the commencement meeting.

The purpose of the commencement meeting was to allow the audit team members to attain an understanding of the project scope and design elements and allow the provision of reports, drawings and other documentation for the audit team's examination.

The design team representative provided background information to the proposed scope of works and outlined elements that have been modified as a result from discussions/correspondence with Roads and Maritime Services from the previous Concept Design stage.

3.2 Audit team details

The Road Safety Audit was undertaken by a three-person team comprising of Tony Nguyen (Lead auditor), Tim Hufton (Audit team member) and Zayd Shaheed (Audit team member). The auditors are independent from the project or any design team relating to the project. The auditors possess the required current certification from Transport for NSW Centre for Road Safety's Register of Road Safety Auditors (http://www.roadsafetyregister.com.au) at the time of this audit. The table below outlines each auditor's details, where their Auditor ID includes a link to their corresponding profiles on the register website where applicable.

Table 3-1 Road Safety Auditors details

Name	Role	Level	Auditor ID
redacted			
Tim Hufton	Audit team member	3	RSA-02-0372
redacted			

3.3 Audited information

The RSA was carried out in accordance with the referenced documents, as listed in Section 2.5 of this report, with the exception of stating recommendations as stipulated in the Austroads and Roads and Maritime guidelines.

At this stage of the project lifecycle, for the Detailed Design, the supplied audit materials helped the auditors understand the context of the project and identify potential risks to road safety in conjunction with the audit site inspection. The following drawing packages and documents that were supplied and examined for the RSA consisted of:

- Road Alignment and Detail (RD)
- Road Cross Sections (RC)
- Roadside Furniture, Signposting and Pavement Marking (RF)
- Stormwater Management (SM)
- 80% Detailed Design Report

- RDR 25 – 1415, Road Safety Audit Report – Mona Vale Road, Manor Road to Foley Street, Roads and Maritime Services, 12 March 2015
- Design Issues Log, DS2012_001388-design_issues_log

A list of the drawings packages supplied for the RSA is included in Appendix A.

3.3.1 Exclusions and considerations

The following exclusions and considerations were noted as part of this audit whereby the audit team wish to highlight:

- Road lighting design drawings were not provided for the audit team to examine.
- Construction traffic management for temporary works or traffic staging arrangements/requirements were not supplied for the Detailed Design RSA nor any drawings relating to the layouts and plans.

3.4 Audit site inspection

An audit site inspection were carried during the day time on Friday 9 September 2016, at approximately 2.00 pm – 3.30 pm, where site photographs and video recording drive-through was undertaken during which the weather was fine, sunny and dry.

3.5 Risk assessment process

Based on the Roads and Maritime *Safety Assessment Methods: deciding which one to use (TSR 11/01)*, the following guidelines are referenced to select the most appropriate method/s for assessing road safety for a project or situation:

- Guide to Road Safety Part 2: Road Safety Strategy and Evaluation, 2009, Austroads
- Guide to Road Safety Part 6: Road Safety Audit, 2009, Austroads
- Guide to Road Safety Part 7: Road Network Crash Risk Assessment and Management, 2009, Austroads

Of the abovementioned guides, Section 4.8.C of the *Austroads Guide to Road Safety Part 6: Road Safety Audit* provides an indication of the level of risk and how to respond to it. Details of these are reproduced in Table 3-2 to Table 3-5.

Table 3-2 How often is the problem likely to lead to a crash?

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 3-3 What is the likely severity of the resulting crash type?

Severity	Description	Examples
Catastrophic	Likely multiple deaths	High-speed, multi-vehicle crash on freeway Car runs into crowded bus stop Bus and petrol tanker collide Collapse of a bridge or tunnel
Serious	Likely death or serious injury	High or medium-speed vehicle/vehicle collision High or medium-speed collision with a fixed roadside object Pedestrian or cyclist struck by a car
Minor	Likely minor injury	Some low-speed vehicle collisions Cyclists falls from bicycle at low speed Left-turn rear-end crash in a slip lane
Limited	Likely trivial injury or property damage only	Some low speed vehicle collisions Pedestrian walks into object (no head injury) Car reverses into post

Table 3-4 The resulting level of risk

		Frequency			
		Frequent	Probable	Occasional	Improbable
Severity	Catastrophic	Intolerable	Intolerable	Intolerable	High
	Serious	Intolerable	Intolerable	High	Medium
	Minor	Intolerable	High	Medium	Low
	Limited	High	Medium	Low	Low

Table 3-5 Suggested treatment approach and indicative timeframe

Risk rating	Suggested treatment approach
Intolerable	Must be corrected
High	Should be corrected or the risk significantly reduced, even if the treatment costs is high
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high
Low	Should be corrected or the risk reduced, if the treatment cost is low

3.6 Responding to audit findings

It should be noted that Table 3-5, the priority ratings are based on the Centre for Road Safety's Road Safety Audit Practices Information Sheet for Risk Assessment, where the project sponsor (also known as the project manager) assigns a priority rating for each identified risk in road safety. This priority rating shows the importance of putting the treatment into action.

In terms of recommendations for suggested treatments for each identified risk to road safety, generally these are not provided by the audit team, as this is not part of the auditing process and not in accordance with Austroads/Roads and Maritime practices and guidelines. Rather it is the responsibility of the client, also known as project sponsor, (or an appropriate representative of the client such as the project manager from the design team contracted for delivering/overseeing the project) to devise the

appropriate corrective actions and implement them for the identified risks to road safety in the RSA report.

It will be up to the discretion of the respective owning organisation/s to address their corresponding risks in the instance where local and state road authorities are responsible for a particular audit finding. The project manager's responsibility is to ensure all corrective actions are appropriately addressed and closed out following the completion of the audit.

For each corrective action addressing each audit finding, project managers must respond to follow-up and/or close-out each finding. Where it is decided not to respond to a particular finding, justification should be given for the determination that no action will follow. Furthermore, **it is not the responsibility of the auditors to approve the corrective actions or the project manager's responses/close-out to the audit findings**. The audit team are however able to provide input (not recommendations) to assist the project manager, and ultimately the audited project, in determining appropriate design responses to reach a suitable outcome for the proposed design.

4 Road Safety Audit Findings

4.1 RSA Findings

The Road Safety Audit findings have been documented in this section. The following tables provide details of the risks to road safety identified in relation to the supplied 80% Detailed Design drawings. The identified risks are assigned according to the road safety categories as per TfNSW RSA practices to assist in the management of corrective actions by Roads and Maritime.

The identified risks are assessed with a rating as Intolerable, High, Medium or Low, derived as a function of Frequency and Severity, as outlined in the tables of Section 3.5. The Corrective Action Request (CAR) forms are provided in Appendix B for Roads and Maritime action and completion.

The risks to road safety findings for the design packages are presented herein as:

- Table 4-1: Road Alignment and Detail (RD-2001)
- Table 4-2: Roadside Furniture, Signposting and Pavement Marking (RF-2001)

Table 4-1 Risks to road safety findings – Road Alignment and Detail (RD-2001)

Ref No	Location (Chainage)	Package (Drawing)	Description of risk to road safety (by Lead Road Safety Auditor)	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety (by person/s designated responsible)	Follow-up and Close-out (by Project Manager) (Comments, Accepted or Alternative Proposals)
1	MCA0, MCB0 CH900-1600	RD-2092 to RD-2094	There is potential for increased rear-end crashes along the reverse S-bend curves along Mona Vale Road. This may be contributed by an insufficient forward sight distance for drivers to see around the bends whether there is queuing up ahead. Short sight distance results in a shorter reaction and response time available to the driver when the change is sighted, which results in a higher crash risk.	Should there be congestion along Mona Vale Road around the bends, approaching drivers may not have appropriate warning to brake to time. With restricted longitudinal sight distance drivers may assume continuation of the present conditions, yet there may be sudden alignment changes or traffic hazards ahead.	Improbable	Serious	Medium	Road alignment and cross section	The road alignment upgrade is generally driven by the existing topography; hence the alignment itself is constraint by the objective of minimising impact to the existing bushland on both sides of the alignment and its associated environmental constraints. Stopping sight distance normal criteria is not achievable; however, the Extended Design Domain of Austroads has been adopted as a guideline for the minimum manoeuvre sight distance requirements. These EDD requirements were discussed and accepted by RMS. Refer to the design report calculations for details.	

Ref No	Location *[Chainage]*	Package *[Drawing]*	Description of risk to road safety *[By Lead Road Safety Auditor]*	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety *[By persons designer responsible]*	Follow-up and Close-out (by Project Manager) *[Typically Accepted or Alternative proposed is*]
2	MCA0 CH1580 Proposed Shared Use Path (SUP)	RD-2094	Vulnerable road users of the SUP may have nowhere to continue along as the connectivity of the SUP ends suddenly and leads to nowhere. To access Mona Vale Road East, pedestrians and cyclists would need to traverse the batter and table drain to continue westbound.	There may be an interim period between the construction of the east and west projects where connection of the SUP is incomplete. Users of the path may attempt to traverse the open drain and potentially experience slip, trip or fall incidents.	Occasional	Serious	High	Pedestrian / cyclist infrastructure	The SUP in the eastbound direction is from Lane Cove Road East which will connect ultimately to the local road SUP and then into the urban side of Mona Vale Road East. The 3m wide shoulder is there as an option for on-road cyclists wanting to take Mona Vale Road. Like any practice in NSW, this 3m wide shoulder is sufficient for on-road cyclists if need be. This approach was taken from RMS direction.	

Ref No	Location (Chainage)	Package (Drawing)	Description of risk to road safety (By Lead Road Safety Auditor)	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety (by Person responsible)	Follow-up and Close-out (by Project Manager) (Indicate acceptance of alternative proposals)
3	MCA0 CH1800-1880 Arrester bed	RD-2094	The Truck arrester bed length appears to be short due to possible location/environmental constraints. Austroads recommends a design entry speed of 130 km/h. The proposed design speed for the arrester bed is 80 km/h. An errant heavy vehicle entering at speeds greater than 80 km/h may crash into surrounding road users along the SUP or adjacent carriageway.	In the event an out of control vehicle enters the arrester bed above the design speed of 80 km/h, the momentum of the vehicle may not be reduced enough to prevent the errant vehicle crashing into the shared user path.	Occasional	Catastrophic	High	Heavy vehicle infrastructure	This is an existing departure to the design guideline which cannot be directly addressed by alignment design due to the natures of the existing topography and environmental constraints. However, design mitigation is in place so heavy vehicle users are made aware of the escape ramp facility ahead. This design departure is documented in the design issues register which has been tabled with RMS for acceptance. All trucks and buses are signposted as 60 km/h and an advisory of using low gear in advance of the descent. Sufficient advance signs are also provided.	
4	MCA0 CH1780 – CH1880	RD-2095	The entry length/distance to the arrester bed may be too narrow to cater for the lateral shift of an out of control vehicle travelling in excess of 80 km/h. This may increase the likelihood of the crash cushion being hit as errant vehicles attempt to swerve into the arrestor bed.	Out of control vehicles would be required to veer left towards the arrester bed and enter within a 100 m longitudinal opening at the taper.	Improbable	Serious	Medium	Heavy vehicle infrastructure	Lateral shift calculations has been carried out, and to provide sufficient lateral shift, the 3m wide shoulders are used as an extra 120m in length for out of control vehicle to veer left and into the arrester bed. Pavement marking "Safety Ramp" is also provided with associated sign posting in advance.	

Ref No	Location [Chainage]	Package [Drawing]	Description of risk to road safety [By Lead Road Safety Auditor]	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety [the person/s/designer responsible]	Follow-up and Close-out (by Project Manager) [typically "Accepted" or "Alternative proposed is ..."]
5	MCB0 CH2050 Proposed 1.5 m foot path adjacent to Boundary Street	RD-2095	Vulnerable road users of the 1.5 m foot path adjacent to Boundary Street may have nowhere to continue along as the connectivity of the path ends suddenly and leads to nowhere. Users may be encouraged to continue along the shoulder and risk crashes with passing vehicles or experience slip, trip, fall incidents.	The proposed 1.5m path ends abruptly which may encourage vulnerable road users to continue along the shoulder. In an attempt to access Boundary Street a pedestrian may experience slip, trip or fall incidents down the batter.	Occasional	Serious	High	Pedestrian / cyclist infrastructure	This footpath will connect as future works at Boundary Street. Signposting is provided to inform pedestrians of no access beyond the extent of the footpath. Cyclist is given the opportunity if they wish to take the 3m wide road shoulder towards Mona Vale Road westbound. Pedestrian behaviour is a factor in this finding of vulnerability, which is a current issue of how the design can be further mitigated. The design diligence has provided an informed design for user's awareness.	
6	MCA0 CH2070 SUP	RD-2095	Cyclists travelling down the steep grade may not be able to steer appropriately due to the kink in the SUP near the end of the arrester bed. This has the potential to cause cyclists crashing into the fence and/or 2:1 batter. Refer to cross section 2080. There is a 2:1 batter with 0.0 m offset to the path located at the kink.	Cyclists may travel downhill at inappropriate speeds and lose control at the kink in the SUP forcing users to change steering direction abruptly that may contribute to cyclists crashes.	Occasional	Serious	High	Cyclist infrastructure	Sufficient design delineation via pavement markings are provided in the design to mitigate cyclists' inappropriate speed. Sufficient street lighting is also provided to enhance awareness at night.	

Ref No	Location (Chainage)	Package (Drawing)	Description of risk to road safety (By Lead Road Safety Auditor)	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety (by person designing responsible)	Follow-up and Close-out (by Project Manager) (Agreed, Accepted or Alternative proposed)
7	MCA0 CH2380-CH2400	RD-2096	In the event there are cyclists travelling on-road, the 3.0 m shoulder ending along the EB carriageway may force riders into the vehicle lane and potentially result in vehicle-cyclist side-swipe crashes.	Cyclists travelling along the shoulder who are forced into the road lane may collide with passing traffic.	Occasional	Serious	High	Cyclist infrastructure	The likelihood of cyclist behaviour taking the on-road shoulders while there is a clear provision of a shared path is an event that can't be mitigated by design. The design sufficiently provided delineation and signposting for road user's awareness of the SUP. Also, the posted speed at this section of Mona Vale Road is reduced to 60 km/h which should contribute to road user's awareness of the area. Furthermore, this is in the section (200m prior to intersection) where it is leading to a signalised intersection in which driver's perception tend to slow down rather than speed up.	

Ref No	Location [Chainage]	Package [Drawing]	Description of risk to road safety [By Lead Road Safety Auditor]	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety [for person designer responsible]	Follow-up and Close-out (by Project Manager) [typically 'Accepted' or 'Alternative proposed']
8	MC95 CH40 Emma Street footpath crossing, north of Mona Vale Road EB carriageway	RD-2098	Vulnerable road users may be confused as to where to cross Emma Street, either using the existing pedestrian crossing (which has a skewed desire line and set of kerb ramps approx. 30 m north of the existing intersection) or at the proposed pedestrian crossing at the approach/departure with Mona Vale Road. Multiple formal pedestrian crossings within a close proximity have the potential to cause pedestrian-vehicle related crashes.	Drivers negotiating Emma Street may not expect vulnerable road users to be crossing at two locations close to one another. Conversely, pedestrians/cyclists may become confused which path leads to or continues along which direction, causing confusion as to where the designated crossing location to cross Emma Street.	Occasional	Serious	High	Pedestrian / cyclist infrastructure	There is only one pedestrian crossing at Emma St designated by the refuge island and pavement marking on plan. The re-alignment of the footpath connects to an existing footpath which leads to Emma Street residential areas. This is an option for pedestrians wanting to go to Emma Street from the northeast side of Mona Vale Road.	
9	MCA0 CH2820 Mona Vale Road EB carriageway lanes	RD-2097	There may be an increase of vehicle side-swipe crashes due to poor lane discipline contributed by the inconsistent/wide lane widths for the EB carriageway.	The plans and cross sections show different lane widths (3.5 m as opposed to 3.8 m).	Improbable	Minor	Low	Auxiliary lanes	Lane widths varies and are not inconsistent as curve widening is provided where required to comply with Austroads. 3.5m lane width is the minimum width for through traffic, auxiliary lanes for right turn movements has a minimum of 3.0m.	

Ref No	Location *[Chainage]*	Package *[Drawing]*	Description of risk to road safety *[By Lead Road Safety Auditor]*	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety *[By persons/designer responsible]*	Follow-up and Close-out (by Project Manager) *[typically "Accepted" or Alternative proposed]*
10	MCB0 CH3020 Bus shelter adjacent to SUP	RD-2098	The relocated bus shelter has the potential to create movement conflicts between commuters and SUP passing manoeuvres.	Bus commuters would be required to cross out in front of the SUP, particularly when cyclists are approaching at speed.	Probable	Minor	High	Bus infrastructure	Theoretically the delineation as a shared path within the bus shelter is terminated prior and after the bus shelter location to reduce conflict. Furthermore, the location of the bus shelter is less than 40m from the intersection which is highly unlikely that cyclists will have the opportunity to speed up.	
11	MCA0 CH3140- CH3180 Mona Vale Road EB carriageway, east of Foley Street	RD-2098	The removal of the EB carriageway shoulder between CH3140 to CH3180 may make access/egress to existing driveways more difficult and as a result increase the likelihood of crashes involving vehicles manoeuvring to/from their property.	With the kerbside lane now adjacent to the gutter, residents no longer have a buffer space to slowly poke out from their driveways to check for oncoming EB vehicles. The incidence of crashes entering from a driveway may increase. The direct causes of these crashes often involve selection of inappropriate gaps in the major road traffic by the entering driver. This may be due to lack of sufficient clearance between the traffic and the property (e.g. narrow nature strip/footpath), insufficient turning radius into or out of the property and/or lack of sufficient gaps in traffic.	Improbable	Serious	Medium	Road alignment and cross section	The existing line marked area is not technically there as a shoulder but more of a transition from one lane to two lanes after the signalised intersection. Hence, this space is not the sole purpose to service property driveway movements. There is sufficient sightline distance from the property driveway location towards the signalised intersection so vehicles exiting from driveways should be able to pick a gap to join the traffic. It should also be noted, that this is a pre-existing condition at this location; where the area is constraint by property boundaries.	

Ref No	Location *(Chainage)*	Package *(Drawing)*	Description of risk to road safety *(By Lead Road Safety Auditor)*	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety *(by person designer responsible)*	Follow-up and Close-out (by Project Manager) *(Action accepted or alternative proposed is*
12	MCA0 CH3140-CH3180 Mona Vale Road EB carriageway, east of Foley Street	RD-2098	The combination of the crest-curve through the intersection with Foley Street and narrowing lanes along the EB carriageway on Mona Vale Road (to 3m at LOW) may increase the incidence of side-swipe crashes.	As drivers continue through the intersectionthe lanes narrow from 3.8m to 3.0m at LOW Furthermore, the crest-curve combination limits EB driver's ability to see, comprehend and react to the lane narrowing approaching the limit of works. This is NOT an existing condition. The proposed design compounds the existing combination of minimums	Occasional	Minor	Medium	Auxiliary lanes	The crest curve at Foley Street is a pre-existing condition in which modification to the alignment will significantly impact to the private properties at the northern side of Mona Vale Road. This is an existing constraint where RMS is aware of. The lanes does not narrow to one lane, but maintains a dual carriageway as it ends to the limit of works. The line marking may appear terminated prior to the limit of works but this matches to the existing pavement line marking.	

Table 4-2 Risks to road safety findings – Roadside Furniture, Signposting and Pavement Marking (RF-2001)

Ref No	Location [Chainage]	Package [Drawing]	Description of risk to road safety [By Lead Road Safety Auditor]	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety [by persons/designer responsible]	Follow-up and Close-out (by Project Manager) [Typically "Accepted" or "Alternative proposed"]
13	MCA0, CH100, CH200 Mona Vale Road (eastbound)	RF-2200	Westbound drivers may not have sufficient warning of the approaching traffic signals at Lane Cove Road and Manor Road as a result of the proposed removal of the existing duplicated traffic lights symbolic sign with distance markers 200 m and 100 m. Should inattentive drivers, particularly those unfamiliar with the route, miss seeing the warning signs, there may be an increased potential for rear-end crashes at the westbound approach to the intersection.	There may be insufficient sight distance for westbound approaching drivers to the signalised intersection potentially contributed by the horizontal curvature of Mona Vale Road. Insufficient sight distance is likely to increase the crash risk as drivers will be unable to see the signal displays in sufficient time to respond to the signal or to avoid conflict with other vehicles at the signals. Insufficient stopping sight distance to the signal displays may result in more red light running. Also, there may be a higher risk of rear end crashes due to drivers not reacting early enough to the current phase and having to brake suddenly in the event of the red signal.	Improbable	Serious	Medium	Traffic signs	The design road geometry upgrade has been checked for sight distance which is provided as an Appendix B2 in the detailed design report. Result outcomes shows a compliant sight distance from half a kilometre prior to the intersection; hence the need for an advance warning sign of a signalised intersection is not warranted. It should be noted that with the road upgrade to the approach of Lane Cove Road/Manor Road intersection, its horizontal alignment has been provided with a flatter curve radius hence the sightline distance passed.	

Ref No	Location *[Chainage]*	Package *[Drawing]*	Description of risk to road safety *[By Lead Road Safety Auditor]*	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety *[Transport/Designer responsible]*	Follow-up and Close-out (by Project Manager) *[Typically Accepted or Alternative proposed]*
14	Mona Vale Road, Manor Road, Lane Cove Road intersection Mona Vale Road EB & WB approaches to intersection	RF-2200	There may be an increased incidence of left turning vehicles crashing vulnerable road users as they cross the signalised crossing across Manor Road and Lane Cove Road due to potential blind corners for drivers.	The existing LEFT TURN WATCH FOR PEDESTRIANS sign (R2-210) is marked as being removed. The removal of the warning sign may not provide adequate warning to approaching left turning drivers and increase the likelihood of vehicle-pedestrian related crashes.	Improbable	Serious	Medium	Traffic signs	Signposting R2-210 will be considered to be reinstated.	

Ref No	Location *[Chainage]*	Package *[Drawing]*	Description of risk to road safety *[By Lead Road Safety Auditor]*	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety *[by persons/designer responsible]*	Follow-up and Close-out (by Project Manager) *[typically "Accepted" or Alternative proposed"]*
15	MCA0 CH20, CH80 Mona Vale Road EB	RF-2200	Drivers may be confused as to which speed limit sign applies with the 80 km/h and 60 km/h posted speed limit signs being located one after another. This has the potential to contribute to speed related crashes. Furthermore drivers are not advised when the speed limit ends for trucks and buses and what the normal speed limit is.	Inconsistent speed zone limit signs has the potential to confuse approaching drivers. The speed limit signs at CH20 & CH80 are different to the downstream one at CH320.	Improbable	Serious	Medium	Speed zoning	The speed zone limit signs are not inconsistent. There is a well-defined speed for all vehicles and trucks and buses hence the variance of posted speed. The 80 km/h sign located at Ch 20 is reinforcing the speed limit posted prior to the Lane Cove Rd/Manor Rd intersection. The next posted speed of 60 km/h for trucks and buses is located 60m after the 80 km/h speed sign. The 60m distance complies with the placement distance requirements of speed signs as per RMS Delineation Manual and Australian standards.	

Ref No	Location [Chainage]	Package [Drawing]	Description of risk to road safety [By Lead Road Safety Auditor]	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level	Road Safety Category	Action on risk to road safety [by persons/designer responsible]	Follow-up and Close-out (by Project Manager) [typically "Accepted" or "Alternative proposed is ..."]
16	MCA0 CH320 CH800 CH1710 Mona Vale Road EB	RF-2201 RF-2202 RF-2204	There are inconsistent speed limit signs for trucks and buses (R4-246 and R4-1 combined with G9-358). Moreover, the speed limit signs are interspersed with TRUCKS & BUSES MUST USE LOW GEAR (R6-22) which may be contradictory to the 60 km/h speed limit. This has the potential to result in	Heavier vehicles slowing downhill may be advised to travel at inappropriate speeds and increase the likelihood of out of control run-off road crashes.	Improbable	Serious	Medium	Speed zoning	There is no inconsistencies of the trucks and buses speed limit just because it's using a different sign face in combination with other sign face. Content of the sign faces are consistent. The low gear advance signs for trucks are specific signs marked up by RMS Network Operations in conjunction with the speed zone limit signs. Using low gear for heavy vehicles seems unlikely that this types of vehicles will likely use inappropriate speed when there are advance warning signs and repetitive signs along the route.	

Appendix A
Drawings supplied for audit

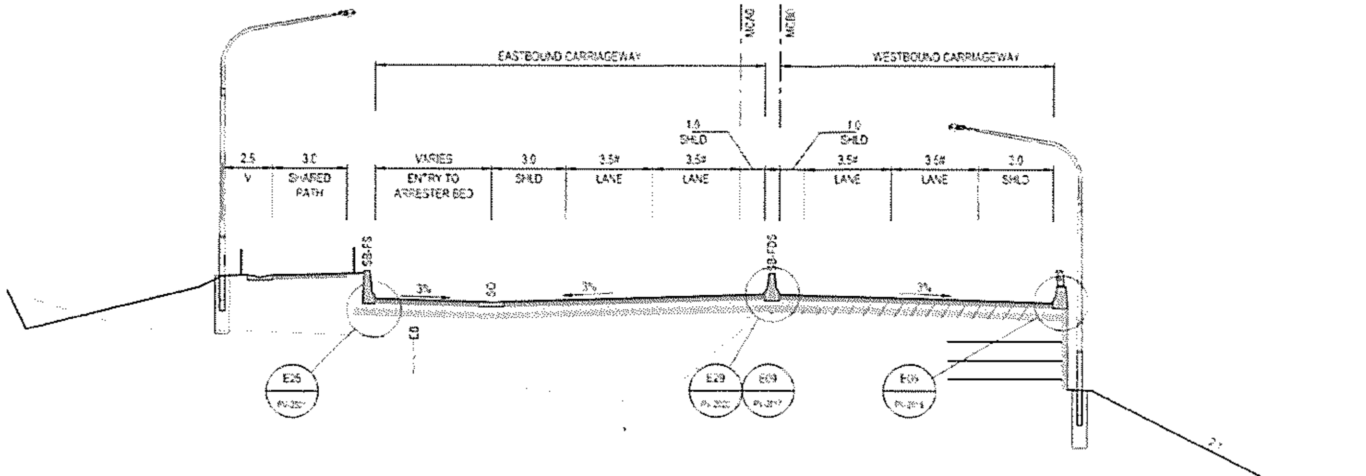
Appendix B
Corrective Action Requests

aurecon

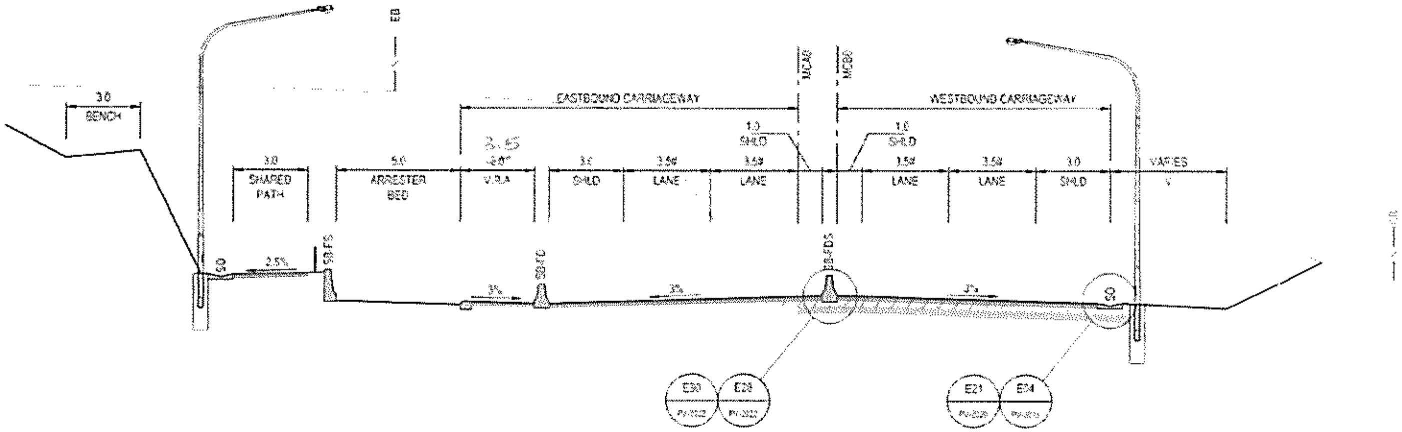
Aurecon Australasia Pty Ltd
ABN 54 005 139 873
Level 2, 116 Military Road
Neutral Bay NSW 2089
PO Box 538
Neutral Bay NSW 2089
Australia
T +61 2 9465 5599
F +61 2 9465 5598
E sydney@aurecongroup.com
W aurecongroup.com

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, Zimbabwe.

Document 6



TYPICAL SECTION
MONA VALE ROAD - CHAINAGE 1790 - 1880 (MCA0)



TYPICAL SECTION
MONA VALE ROAD - CHAINAGE 1880 - 2020 (MCA0)

NOTES:
1. FOR PAVEMENT EDGE DETAILS, REFER TO PV PACKAGE.
2. STREET LIGHTING DETAILS SHOWN ARE INDICATIVE ONLY. REFER TO ASP3 STREET LIGHTING DESIGN PACKAGE.

LEGEND

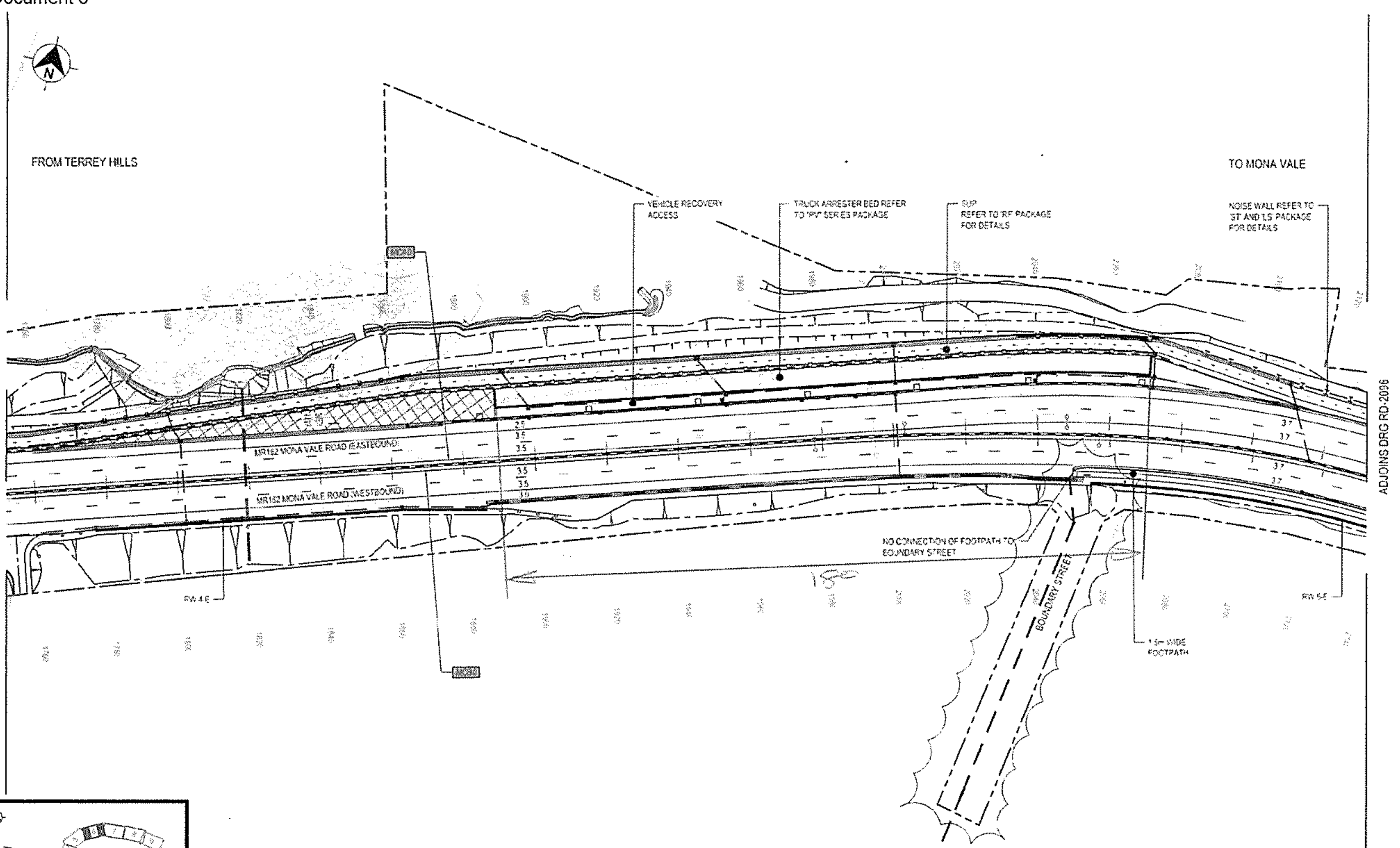
CB	CONSTRUCTION BOUNDARY
AB	ACQUISITION BOUNDARY
EB	EXISTING DP LOT BOUNDARY (CADASTRAL)
	G4 W-BEAM SAFETY BARRIER (SB-GR)
(M)	ROUNDING TO BE APPLIED REFER TO ALIGNMENT PLAN NOTE 6
SHLD	SHOULDER (ABBREVIATION)
V	VERGE (ABBREVIATION)
DD	DIVERSION DRAIN (ABBREVIATION)
3.5#	# INDICATES LANE WIDTH VARIES FOR CURVE WIDENING OR TIE INTO EXISTING
	EXISTING PAVEMENT (INDICATIVE)
EL	ELSHOLZ KERB (SHEET NO. RF-2030)
SE	MODIFIED TYPE SE KERB (SHEET NO. RF-2030)
SF	MODIFIED TYPE SF KERB (SHEET NO. RF-2030)
SA	MODIFIED TYPE SA1 KERB (SHEET NO. RF-2030)
SB	MODIFIED TYPE SB KERB (SHEET NO. RF-2030)
SD	MODIFIED TYPE SA2 KERB (SHEET NO. RF-2030)
SH	MODIFIED TYPE SA2 KERB (SHEET NO. RF-2030)
SO	MODIFIED TYPE SO KERB (SHEET NO. RF-2030)
SM	MODIFIED TYPE SM KERB (SHEET NO. RF-2030)
SFM	MODIFIED TYPE SFM KERB (SHEET NO. RF-2030)
SB-FDC	TYPE F DOUBLE SIDED SAFETY BARRIER SPLIT CARRIAGEWAY (SHEET NO. RF-2031)
SB-FS	TYPE F SINGLE SIDED SAFETY BARRIER (SHEET NO. RF-2031)
SB-FD	TYPE F DOUBLE SIDED (SHEET NO. RF-2031)
SB-FF	TYPE F SINGLE SIDED BARRIER WITH FAUNA FENCE (SHEET NO. RF-2031)

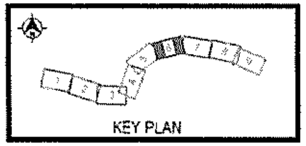
ACCEPTED FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

DESIGN MODEL FILE	RD-2016.dwg
PLOT DATE / TIME	22-11-2018 3:53:38 PM
PLOTTED BY	Scarlett McNally
REV	A — ISSUED FOR CONSTRUCTION
SCALE	0 2 4 6 8
COORDINATE SYSTEM	MGA ZONE 56
HEIGHT DATUM	AHD
DRAWING / DESIGN PREPARED BY	aurecon (www.aurecongroup.com)
NAME	[redacted]
CLIENT	NSW Transport Roads & Maritime Services
PREPARED FOR	PROJECT DELIVERY GREATER SYDNEY
	NORTHERN BEACHES COUNCIL AREA
	MR162 - A3 MONA VALE ROAD UPGRADE
	BETWEEN MANOR ROAD AND FOLEY STREET
	ROAD ALIGNMENT AND DETAILS
	TYPICAL SECTIONS MCA0
SHEET	07 OF 13
SIZE	A3
RMS REGISTRATION No.	DS2016/000911
PART	1
ISSUE STATUS	FOR CONSTRUCTION
SHEET No.	RD-2016
ISSUE	A

Document 6





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PLOT DATE / TIME: 22-11-2018 3:56:33 PM
PLOTTED BY: Scarlett McNally

DRAWN / DRG CHECK / DESIGN / DESIGN CHECK / DESIGN MANAGER / PROJECT MANAGER: [redacted]

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Transport Roads & Maritime Services
NSW GOVERNMENT

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

COORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

NORTHERN BEACHES COUNCIL AREA
MR162 - A3 MONA VALE ROAD UPGRADE
BETWEEN MANOR ROAD
AND FOLEY STREET
ROAD ALIGNMENT AND DETAILS
DETAILED ROAD PLAN
SHEET 06 OF 09

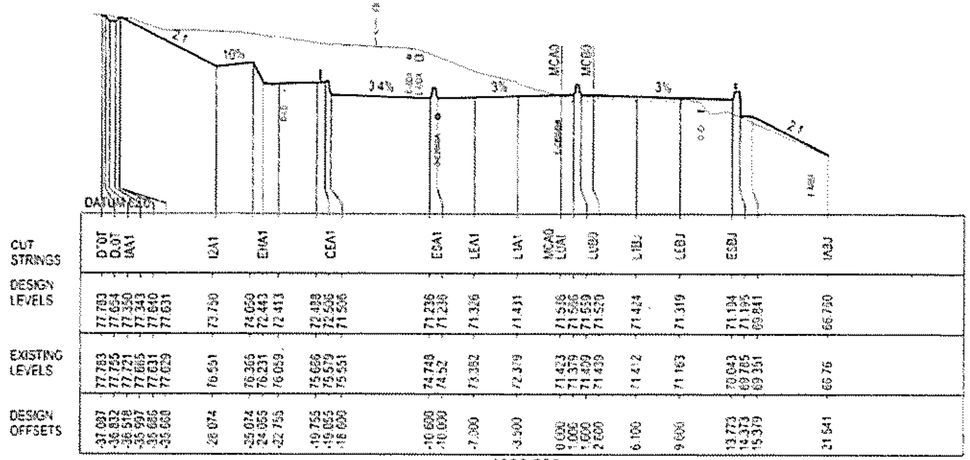
A3

DS2016/000911

FOR CONSTRUCTION

RD-2095 A

Document 6



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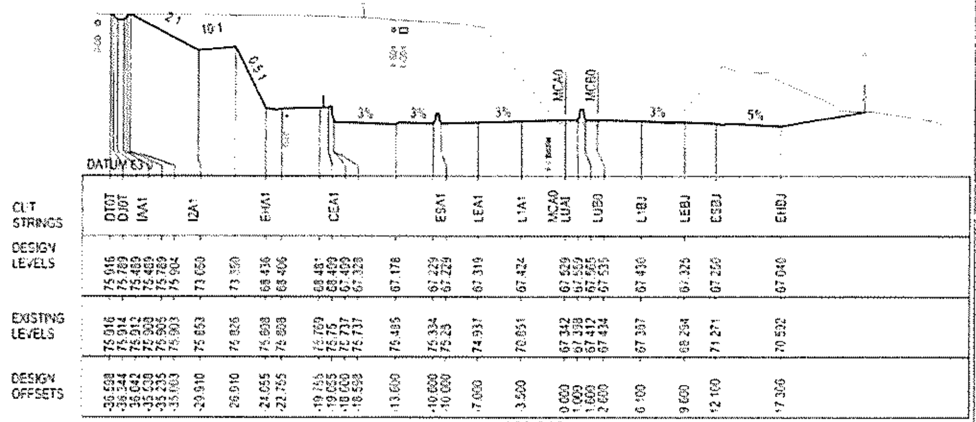

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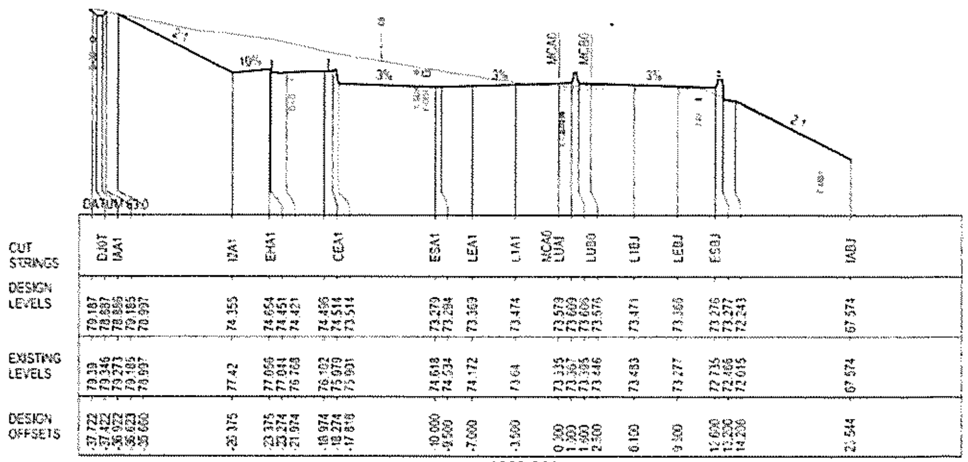

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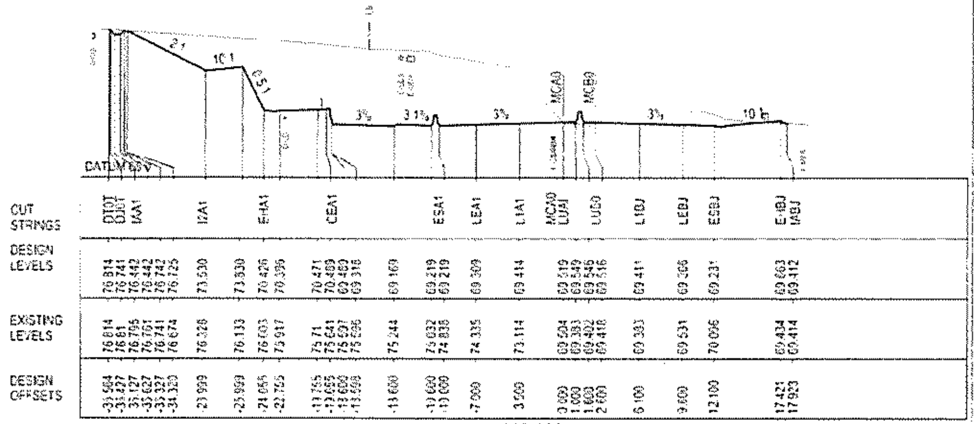

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RC-2045.dwg

23/10/2018 9:43:29 AM   Alex Caba

[redacted]

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NSW Transport Roads & Maritime Services

NORTHERN BEACHES COUNCIL AREA
MR162 - A3 MONA VALE ROAD UPGRADE WEST EARLY WORKS
BETWEEN MANOR ROAD
AND FOLEY STREET
ROAD CROSS SECTIONS
MC40 - MONA VALE ROAD

A3

PREPARED FOR PROJECT DELIVERY GREATER SYDNEY

DS2016/000911

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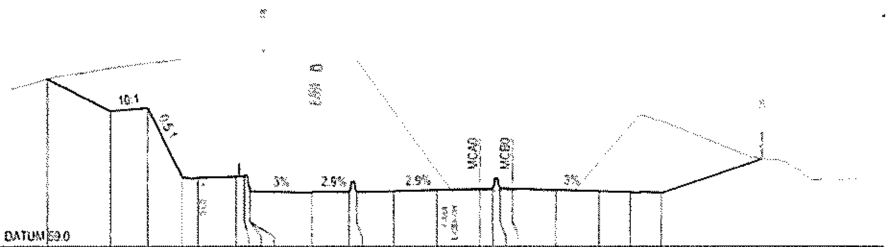
RC-2045 A

MGA ZONE 56

Document 6



CUT STRINGS	DESIGN LEVELS	EXISTING LEVELS	DESIGN OFFSETS
IAA1	72.396	72.787	
IZA1	69.810	73.113	-30.796
	70.110	73.529	-27.796
EHA1	64.547 64.517	73.999 74.162	-24.055 -22.755
CEA1	64.592 64.610 63.610 63.440	74.383 74.408 74.425 74.425	-19.755 -19.055 -18.600 -18.598
	63.290	74.309	-13.600
ESA1	63.341 63.341	74.208 73.914	-10.600 -10.000
LEA1	63.427	69.821	-7.000
L1A1	63.528	65.06	-3.500
MCA0 LUA1	63.628 63.657 63.672 63.642	63.524 63.507 63.496 63.479	0.000 1.000 1.600 2.600
LUB0			
L1BJ	63.537	63.284	6.100
LEBJ	63.432	65.692	9.600
ESBJ	63.357	68.58	12.100
EHBJ	63.282	68.991	14.600

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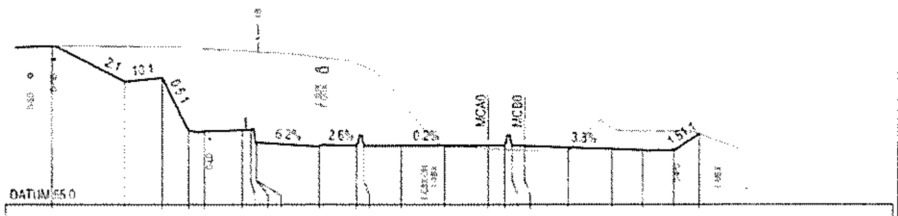
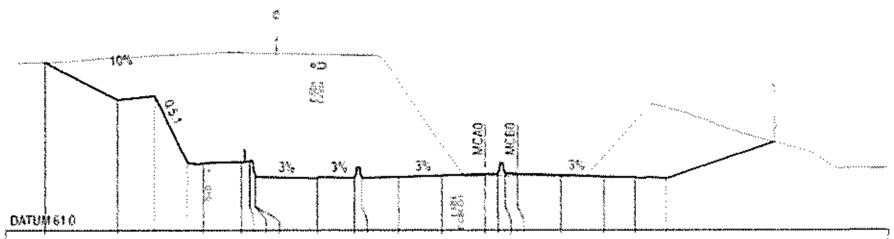


CUT STRINGS	DESIGN LEVELS	EXISTING LEVELS	DESIGN OFFSETS
	67.725	67.725	-35.055
IZA1	64.900	67.702	-29.911
	65.200	67.678	-26.911
EHA1	60.961 60.931	67.581 67.502	-24.055 -22.755
CEA1	61.006 61.023 59.862 60.023	67.313 67.269 67.24 67.24	-19.755 -19.055 -18.661 -18.600
	59.712	66.829	-13.603
ESA1	59.767 59.767	65.288 65.083	-10.600 -10.000
LEA1	59.773	63.511	-7.000
L1A1	59.781	59.711	-3.500
MCA0 LUA1	59.788 59.791 59.780 59.756	59.575 59.516 59.48 59.42	0.000 1.307 1.507 2.907
LUB0			
L1BJ	59.641	59.403	6.409
LEBJ	59.527	61.164	9.910
ESBJ	59.445	60.915	12.411
EHBJ	59.363	60.916	14.912
IABJ	60.712	63.707	16.945

2000.000



CUT STRINGS	DESIGN LEVELS	EXISTING LEVELS	DESIGN OFFSETS
IAA1	74.450	74.627	
IZA1	71.480	74.784	-30.908
	71.780	74.923	-27.908
EHA1	66.473 66.443	75.098 75.16	-24.055 -22.755
CEA1	66.518 66.535 65.535 65.365	75.234 75.195 75.178 75.178	-19.755 -19.055 -18.600 -18.598
	65.215	75.087	-13.600
ESA1	65.265 65.265	75.032 75.021	-10.600 -10.000
LEA1	65.355	72.913	-7.000
L1A1	65.460	67.835	-3.500
MCA0 LUA1	65.565 65.595 65.615 65.585	65.46 65.45 65.445 65.453	0.000 1.300 1.600 2.600
LUB0			
L1BJ	65.480	65.314	6.100
LEBJ	65.375	66.929	9.600
ESBJ	65.300	69.71	12.100
EHBJ	65.225	70.882	14.600

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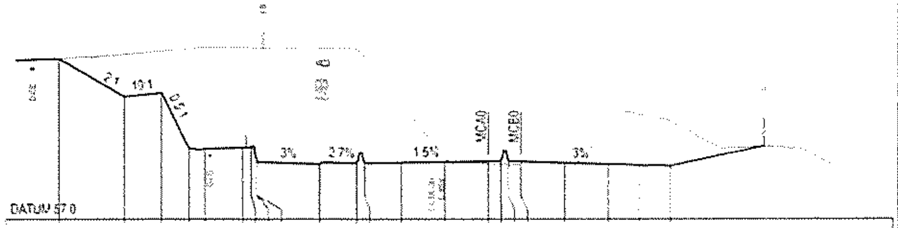

CUT STRINGS	DESIGN LEVELS	EXISTING LEVELS	DESIGN OFFSETS
	69.898	69.896	-34.546
IZA1	68.870	70.168	-30.127
	67.170	70.308	-27.127
EHA1	62.754 62.724	70.688 70.779	-24.055 -22.755
CEA1	62.799 62.816 61.816 61.651	70.764 70.759 70.756 70.756	-19.755 -19.055 -18.600 -18.598
	61.501	70.72	-13.600
ESA1	61.554 61.554	70.622 69.983	-10.600 -10.000
LEA1	61.600	66.245	-7.000
L1A1	61.654	62.038	-3.500
MCA0 LUA1	61.708 61.723 61.729 61.699	61.543 61.51 61.492 61.447	0.000 1.303 1.603 2.603
LUB0			
L1BJ	61.593	61.238	6.103
LEBJ	61.487	64.249	9.603
ESBJ	61.412	65.422	12.103
EHBJ	61.336	64.661	14.603

1980.000

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DRAWING FILE LOCATION / NAME | DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: RC-2046.dwg | PLOT DATE / TIME: 23/10/2018 9:49:58 AM | PLOT BY: Alex Saba

EXTERNAL REFERENCE FILES | REV | DATE | AMENDMENT / REVISION DESCRIPTION: ISSUED FOR CONSTRUCTION

SCALES ON A3 SIZE DRAWING: 0 5 10 15 SCALE 1:400 VERTICAL; 0 5 10 15 SCALE 1:400 HORIZONTAL

COORDINATE SYSTEM: MGA ZONE 56 | HEIGHT DATUM: AHD

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DRAWN / DESIGN CHECK / DESIGN: [redacted]

PREPARED BY: PROJECT DELIVERY GREATER SYDNEY

NSW Transport Roads & Maritime Services

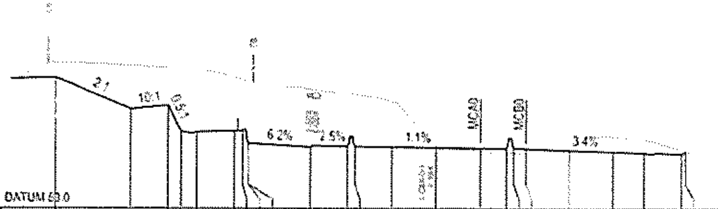
NORTHERN BEACHES COUNCIL AREA
MR162 - A3 MONA VALE ROAD UPGRADE WEST EARLY WORKS
BETWEEN MANOR ROAD
AND FOLEY STREET
ROAD CROSS SECTIONS
MCA0 - MONAVALE ROAD
SHEET 29 OF 43

A3

DS2016/000911

FOR CONSTRUCTION | RC-2046 | A | 1

Document 6



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DESIGN LEVELS	63.451	61.942	61.242 59.169 59.139	59.214 59.231 59.074 58.231	57.924	57.682 57.682	57.948	57.908	57.868	57.845 57.840 57.815	57.695	57.575	57.490	57.402 57.365
EXISTING LEVELS	64.613	64.452	64.242 64.107 63.998	63.427 63.272 63.169 63.168	62.555	62.177 62.152	61.556	58.023	57.672	57.521 57.48 57.412	57.688	58.702	58.467	57.736 57.603
DESIGN OFFSETS	-34.335	-28.826	-25.826 -24.265 -22.965	-19.965 -19.205 -18.755 -18.750	-13.757	-10.750 -10.150	-7.150	-3.575	0.000	2.054 2.654 3.655	7.158	10.662	13.164	16.167 16.511

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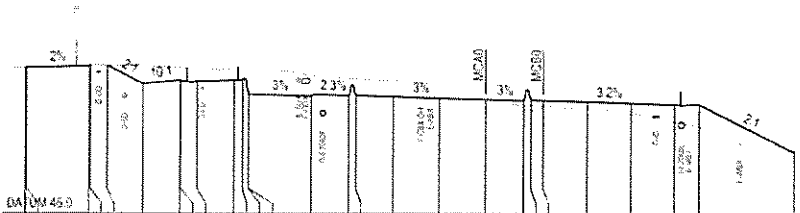

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DESIGN LEVELS	57.674 57.716	57.816 57.875 57.845	56.418	56.718 56.656 56.626	56.701 56.719 55.719 55.566	55.416	55.479 55.479	55.389	55.278	55.167	55.077 55.136 55.104	54.993	54.881	54.770	54.782	50.936
EXISTING LEVELS	57.683 57.684	57.853 57.852 57.846	57.866	57.669 57.567 57.582	57.498 57.479 57.467 57.467	57.077	55.844 55.813	55.657	55.659	54.962	54.742 54.7 54.63	54.36	54.067	53.428	52.995	51.084
DESIGN OFFSETS	-38.951 -36.865	-31.850 -31.729 -30.343	-27.486	-24.486 -24.455 -23.165	-20.155 -19.455 -19.000 -18.998	-14.000	-11.030 -10.400	-7.400	-3.700	0.000	3.022 3.622 4.622	8.139	11.655	15.157	17.141	24.816

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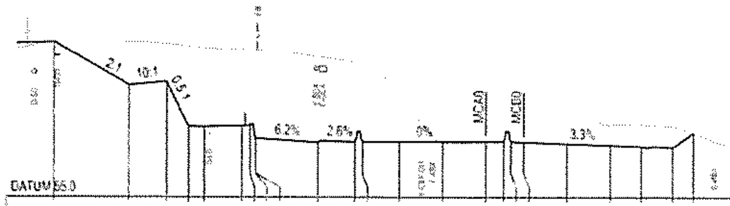

CUT STRINGS		I2A1	EHA1	CEA1		ESA1	LEA1	L1A1	MCA0 LUA1	LUB0	L1BJ	LEBJ	ESBJ	EHBJ	IABJ
DESIGN LEVELS	67.323	63.935	64.235 60.679 60.649	60.724 60.742 59.591 59.742	59.431	59.467 59.467	59.467	59.467	59.487	59.487 59.484 59.451	59.335	59.219	59.136	59.053	60.176
EXISTING LEVELS	67.346	67.363	67.235 66.98 66.813	66.708 66.683 66.668 66.667	66.179	65.88 65.47	63.082	59.431	59.281	59.195 59.159 59.098	59.22	60.775	60.801	60.639	60.133
DESIGN OFFSETS	-34.956	-29.736	-26.736 -24.055 -22.755	-9.755 -9.055 -8.668 -8.600	-13.610	-10.660 -10.060	-7.000	-3.500	0.000	1.400 2.000 3.000	6.502	10.004	12.505	15.007	15.731

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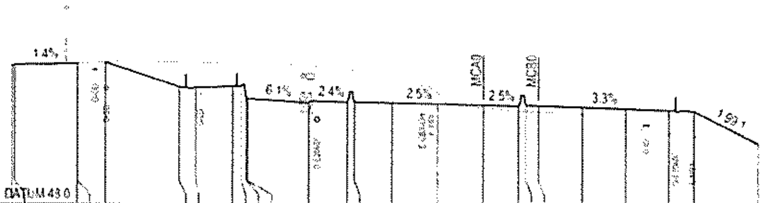

CUT STRINGS		IAA1	EHA1	CEA1		ESA1	LEA1	L1A1	MCA0 LUA1	LUB0	L1BJ	LEBJ	ESBJ	EHBJ	IABJ
DESIGN LEVELS	59.080 59.165	59.235 59.247 59.312	57.382 57.352	57.427 57.444 56.293 56.444	56.143	56.202 56.202	56.128	56.038	55.948	55.873 55.918 55.885	55.770	55.654	55.539	55.457	52.863
EXISTING LEVELS	59.127 59.13	59.205 59.256 59.312	59.307 59.283	59.234 59.229 59.228 59.228	59.012	58.748 58.626	57.528	56.909	55.742	55.537 55.495 55.429	55.235	54.294	53.698	53.461	52.845
DESIGN OFFSETS	-37.874 -37.655	-32.631 -32.606 -30.317	-24.383 -23.383	-20.083 -19.383 -18.992 -18.928	-13.994	-10.928 -10.328	-7.328	-3.664	0.000	2.327 3.128 4.428	7.330	11.431	14.933	16.934	27.094

2040.000

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MGA ZONE 56 AHD

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22.11.2016 2:31:52 PM Scarlett McNally

[redacted]

Transport Roads & Maritime Services

PROJECT DELIVERY GREATER SYDNEY

NORTHERN BEACHES COUNCIL AREA
MR132 - A3 MONA VALE ROAD UPGRADE WEST EARLY WORKS
BETWEEN MANOR ROAD
AND FOLEY STREET
ROAD CROSS SECTIONS
MCA0 - MONA VALE ROAD

SHEET 29 OF 43

A3

DS2016/000911

2

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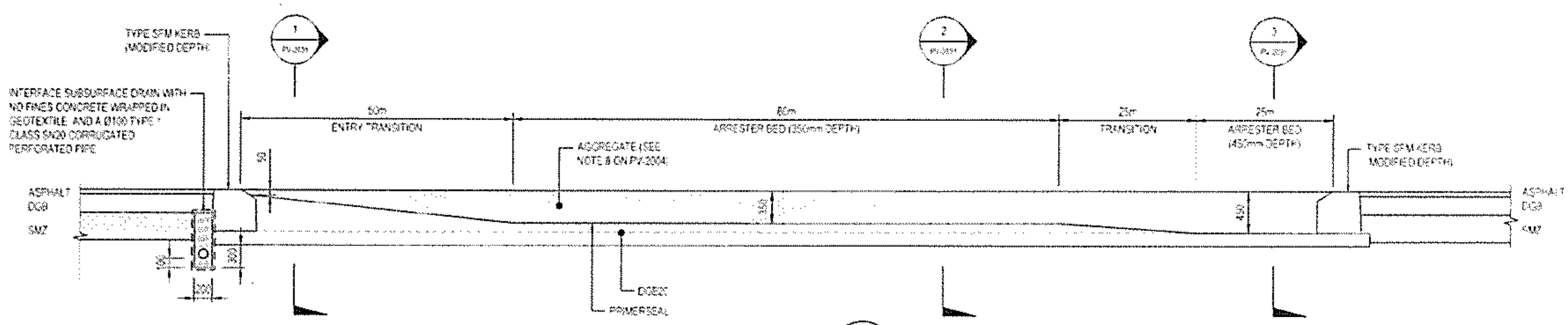
RC-2047

A

Document 6



ELEVATION 1

ELEVATION OF ARRESTER BED

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PLOT BY	Scarlett McNally
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COORDINATE SYSTEM	MGA ZONE 56
HEIGHT DATUM	AHD
DRAWN / DESIGN	[redacted]
PREPARED FOR	PROJECT DELIVERY GREATER SYDNEY
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NSW Government — Transport Roads & Maritime Services

NORTHERN BEACHES COUNCIL AREA
MR162 - A3 MONA VALE ROAD UPGRADE (STAGE 2)
BETWEEN MANOR ROAD
AND FOLEY STREET
PAVEMENT
ARRESTER BED DETAILS
SHEET 01 OF 02

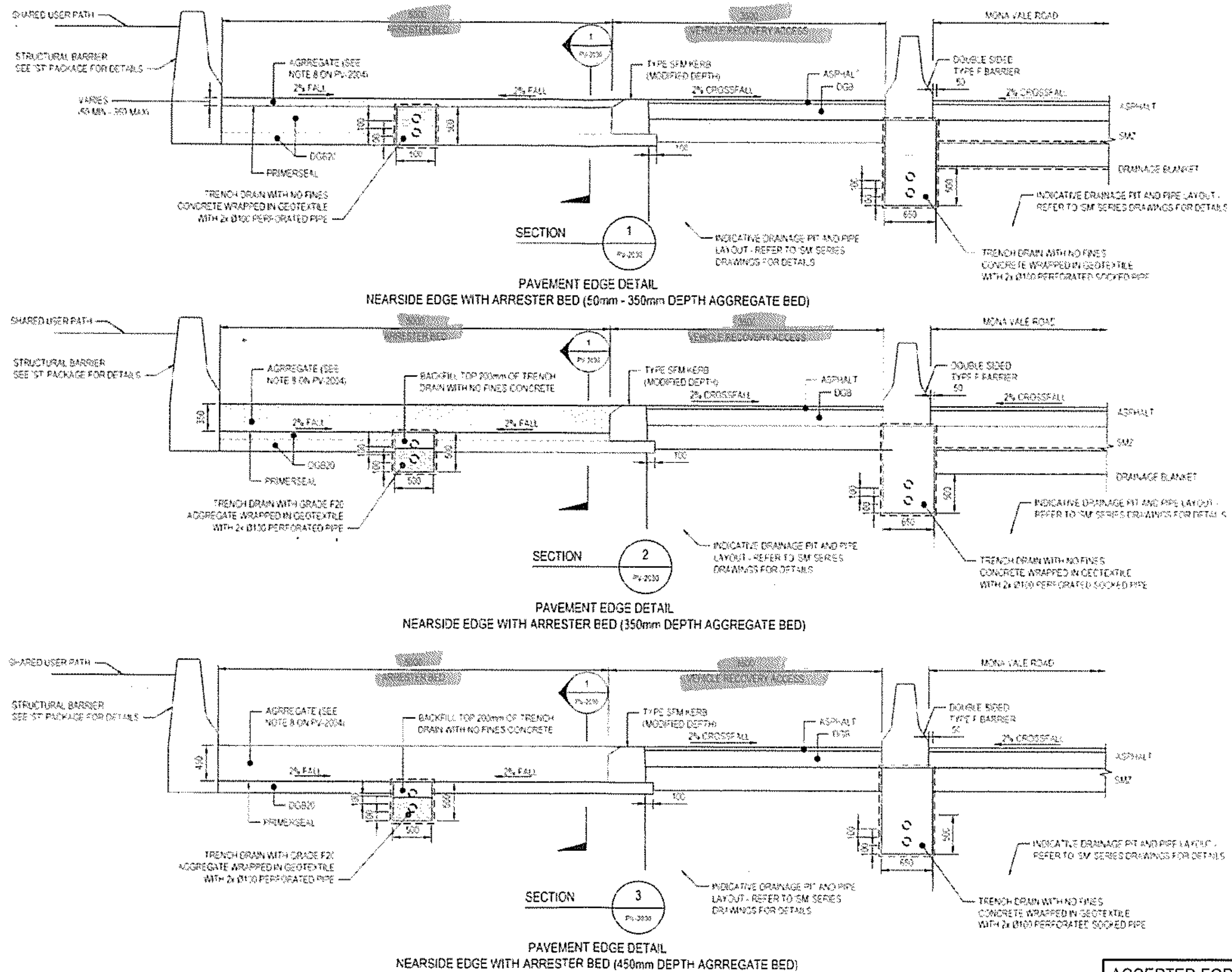
A3

DS2016/000911

FOR CONSTRUCTION

PV-2030 A

Document 6



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PV-2031.dwg

SCALE 1:50

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[redacted]

NSW Government — Transport Roads & Maritime Services

PREPARED FOR: PROJECT DELIVERY GREATER SYDNEY

NORTHERN BEACHES COUNCIL AREA
MR162 - A3 MONA VALE ROAD UPGRADE (STAGE 2)
BETWEEN MANOR ROAD AND FOLEY STREET
PAVEMENT
ARRESTER BED DETAILS

A3

DS2016/000911

ISSUE STATUS: FOR CONSTRUCTION

PV-2031 — A

COORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD