

Additional documents - Mangalore - DA2017-16

Please note the following documents are available in electronic or hard copy if requested. Summaries are provided in the planning report.

- Hydraulic/Drainage Assessment (Pitt & Sherry)
- Flora and Fauna Survey (North Barker Ecosystem Services)
- Historic Heritages Assessment and Historic Plantings Heritage Assessments (Austral)
- Contaminated Land Assessment (GHD)

Department of State Growth

STATE ROADS DIVISION

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Your Ref Our Ref



Mr Tim Kirkwood
General Manager
Southern Midlands Council
PO Box 21
Oatlands TAS 7120

Dear Mr Arnold

**MIDLAND HIGHWAY SAFETY UPGRADES
MANGALORE TO BAGDAD (STAGE 2 – MANGALORE)
CONSENT TO THE MAKING OF A DEVELOPMENT APPLICATION PURSUANT TO SECTION
52(1B) OF THE *LAND USE PLANNING AND APPROVALS ACT 1993***

Pursuant to Section 52(1B) of the *Land Use Planning and Approvals Act 1993*, I hereby give permission to the making of the above development application affecting land that forms part of the road reservation of the Midland Highway at Mangalore that is held under authority or ownership of the Department of State Growth.

I am authorised to provide such consent under delegation of the Minister for Infrastructure.

Yours sincerely

Shane Gregory

GENERAL MANAGER STATE ROADS

20 January 2017



APPLICATION FOR PLANNING PERMIT – USE AND DEVELOPMENT
Commercial, Industrial, Forestry and other Non- Residential development

Use this form to apply for planning approval in accordance with section 57 and 58 of the *Land Use Planning and Approvals Act 1993*

Applicant / Owner Details:

Owner / s Name

Postal Address **Phone No:**

Fax No:

Email address

Applicant Name
 (if not owner)

Postal Address **Phone No:**

Fax No:

Email address:

Description of proposed use and/or development:

Address of new use and development:

Certificate of Title No **Volume No** **Lot No:**

Description of Use

Development on site

current use of land and building

Refer Definitions in Clause 8.2 of the Southern Midlands Planning Scheme 2015
 Attach additional information if required.
 E.g. Are there any existing buildings on this title?
 If yes, what is the main building used as?

Is the property Heritage Listed Please tick ✓ answer

Yes No

Signage Please tick ✓ answer

Yes No

Business Details	Existing hours of operation				Proposed hours of new operation			
	Hours	am	to	pm	Hours	am	to	pm
	Weekdays				Weekdays			
	Sat				Sat			
	Sun				Sun			

Number of existing employees: Number of proposed new employees:

Traffic Movements	Number of commercial vehicles servicing the site at present		Approximate number of commercial vehicles servicing the site in the future	
Number of Car Parking Spaces	How many car spaces are currently provided		How many new car spaces are proposed	

Is the development to be staged: Please tick ✓ answer

Yes No

Is the development to be staged, If yes

Described proposed stages		Described period of proposed stages	
---------------------------	--	-------------------------------------	--

Proposed Material Types

What are the proposed external wall colours		What is the proposed roof colour	
What is the proposed external wall materials		What is the proposed roof materials	
What is the proposed new floor area m ²		What is the estimated value of all the new work proposed	\$17.55 M.

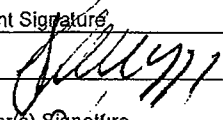
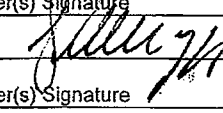
If yes attach details: size, colours, fonts, location

Please attach any additional information that may be required by Part 8.1 Application Requirements of the Planning Scheme.

Signed Declaration [Redacted]

I/we hereby apply for a planning approval to carry out the use or development described in this application and in the accompanying plans and documents, accordingly I declare that:

- The information given is a true and accurate representation of the proposed development. I understand that the information and materials provided with this development application may be made available to the public. I understand that the Council may make such copies of the information and materials as, in its opinion, are necessary to facilitate a thorough consideration of the Development Application. I have obtained the relevant permission of the copyright owner for the communication and reproduction of the plans accompanying the development application, for the purposes of assessment of that application. I indemnify the Southern Midlands Council for any claim or action taken against it in respect of breach of copyright in respect of any of the information or material provided.
- I am the applicant for the planning permit and I have notified the owner/s of the land in writing of the intention to make this application in accordance with Section 52(1) of the *Land Use Planning Approvals Act 1993* (or the land owner has signed this form in the box below in "Land Owner(s) signature");

Applicant Signature 	Applicant Name (print) Shane Gregory, General Manager State Roads	Date 19/1/17
Land Owner(s) Signature 	Land Owners Name (please print) Shane Gregory, General Manager State Roads	Date 19/1/17
Land Owner(s) Signature	Land Owners Name (please print)	Date

Address all correspondence to:
The General Manager, PO Box 21, Oatlands, Tasmania 7120
Or by Email Address: mail@southernmidlands.tas.gov.au 'in single PDF file format'
Phone (03) 62593011

DEVELOPMENT – Information & Checklist sheet

Use this check list for submitting your application

Submitting your application ✓

1. All plans and information required per Part 8.1 Application Requirements of the Planning Scheme
2. Copy of the current Certificate of Title, Schedule of Easements and Title Plan (Available from Service Tasmania Offices)
3. Any reports, certificates or written statements to accompany the Application (if applicable) required by the relevant zone or code.
4. Prescribed fees payable to Council

Information

If you provide an email address in this form then the Southern Midlands Council ("the Council") will treat the provision of the email address as consent to the Council, pursuant to Section 6 of the Electronic Transactions Act 2000, to using that email address for the purposes of assessing the Application under the Land Use Planning and Approvals Act 1993 ("the Act").

If you provide an email address, the Council will not provide hard copy documentation unless specifically requested.

It is your responsibility to provide the Council with the correct email address and to check your email for communications from the Council.

If you do not wish for the Council to use your email address as the method of contact and for the giving of information, please tick ✓ the box

Heritage Tasmania

If the Property is listed on the Tasmanian Heritage Register then the Application will be referred to Heritage Tasmania unless an Exemption Certificate has been provided with this Application. (Phone 1300 850 332 (local call cost) or email enquires@heritage.tas.gov.au)

TasWater

Depending on the works proposed Council may be required to refer the Application to TasWater for assessment (Phone 136992)

PRIVACY STATEMENT

The Southern Midlands Council abides by the Personal Information Protection Act 2004 and views the protection of your privacy as an integral part of its commitment towards complete accountability and integrity in all its activities and programs.

Collection of Personal Information: The personal information being collected from you for the purposes of the Personal Information Protection Act, 2004 and will be used solely by Council in accordance with its Privacy Policy. Council is collecting this information from you in order to process your application.

Disclosure of Personal Information: Council will take all necessary measures to prevent unauthorised access to or disclosure of your personal information. External organisations to whom this personal information will be disclosed as required under the Building Act 2000. This information will not be disclosed to any other external agencies unless required or authorised by law.

Correction of Personal Information: If you wish to alter any personal information you have supplied to Council please telephone the Southern Midlands Council on (03) 6259 3011. Please contact the Council's Privacy Officer on (03) 6254 5000 if you have any other enquires concerning Council's privacy procedures.

Address all correspondence to:
The General Manager, PO Box 21, Oatlands, Tasmania 7120
Or by Email Address: mail@southernmidlands.tas.gov.au 'in single PDF file format'
Phone (03) 62593011

Midland Highway Safety Upgrades Mangalore to Bagdad Stage 2

Report Supporting Development Application

February 2017

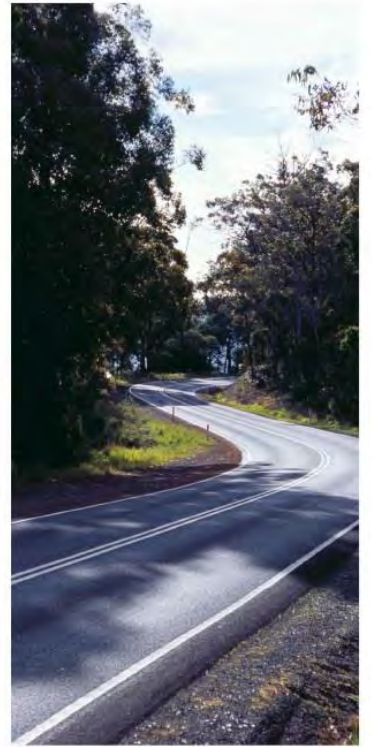
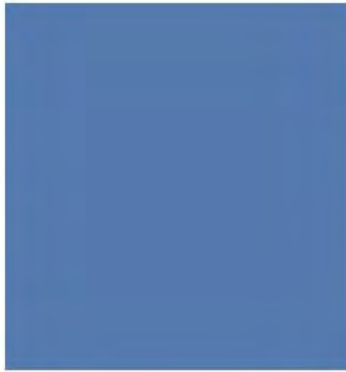


Table of Contents

1.	INTRODUCTION	1
2.	STRATEGIC RATIONALE.....	1
3.	PROPOSAL	2
3.1	GENERAL	2
3.2	WIDENING WORKS AND LAND ACQUISITION.....	3
3.3	TURNING FACILITIES.....	3
3.4	SIDE ROAD CONNECTIONS.....	3
3.5	STORMWATER CULVERTS	4
3.6	TEMPORARY WORKS.....	7
3.7	CONSTRUCTION.....	7
4.	SITE DESCRIPTION	8
4.1	LOCATION	8
4.2	FLORA AND FAUNA	9
4.3	HISTORIC HERITAGE	11
4.4	INDIGENOUS HERITAGE.....	13
4.5	LAND CAPABILITY	14
4.6	UTILITIES	14
4.7	CONSTRUCTION MANAGEMENT	14
4.8	NOISE	15
5.	SITE PHOTOGRAPHS	16
6.	TITLES	20
7.	STAKEHOLDER ENGAGEMENT	22
8.	PLANNING SCHEME	23
8.1	PLANNING SCHEME.....	23
8.2	EXEMPTIONS	23
8.3	USE DEFINITION.....	23
8.4	ZONING	23
8.5	USE TABLES AND LEVEL OF ASSESSMENT.....	24
8.6	PROVISIONS WITHIN THE RURAL LIVING ZONE	26
8.7	PROVISIONS WITHIN THE RURAL RESOURCE ZONE	29
8.8	PROVISIONS WITHIN THE SIGNIFICANT AGRICULTURAL ZONE	31
8.9	PROVISIONS WITHIN THE UTILITIES ZONE	33
8.10	DEMOLITION OF DWELLING AT 1192 MIDLAND HIGHWAY	36
8.11	OVERLAYS.....	36
8.12	CODES.....	37
8.13	SPECIFIC AREA PLANS.....	44
9.	OTHER PLANNING PROVISIONS	45
9.1	STATE POLICIES.....	45
10.	CONCLUSION	46
APPENDIX A.....	47	
HYDRAULIC ASSESSMENT.....	47	
APPENDIX B.....	48	
EXEMPTIONS FROM TASMANIAN HERITAGE COUNCIL.....	48	
APPENDIX C.....	49	
HISTORIC HERITAGE ASSESSMENTS AND HISTORIC PLANTINGS HERITAGE ASSESSMENTS	49	

APPENDIX D.....	50
CONTAMINATED LAND ASSESSMENT METHODOLOGY.....	50
APPENDIX E.	51
TRAFFIC IMPACT ASSESSMENT.....	51

List of Figures

Figure 1 Typical cross section	3
Figure 2: Subject Site Location	8
Figure 3 Location of THC listed properties	12
Figure 4: Northern end looking south from Eddington Rd.....	16
Figure 5: School Rd (northern end)	16
Figure 6: School Rd (southern end)	17
Figure 7: Sayes Court viewed from the southern end of School Rd	17
Figure 8: Recently constructed entry feature to Cornelian Hill	18
Figure 9: Between Shene road and Ballyhooly road	18
Figure 10: South of Black Brush Road looking north	19
Figure 11: South of Shene Road looking north.....	19
Figure 12: Zone extract	24
Figure 13: Planning scheme Overlay map.....	36

List of Tables

Table 1 Culverts under highway with capacity less than required for a 1 in 100 year rainfall event.....	4
Table 2 Culverts where overflow would result in water overtopping highway in a 1 in 100 year rainfall event.....	5
Table 3 catchment characteristics	6
Table 4 Threatened flora species recorded within the survey area	9
Table 5 Fauna species with moderate to high potential to occur	10
Table 6 Pioneer Trees to be impacted by the proposed works.....	13
Table 7: List of titles affected by aquisition.....	20
Table 8: Level of assessment in each zone.....	24

1. Introduction

The Mangalore to Bagdad Safety Upgrades Project is a component of the Midland Highway Upgrade Program, a 10 year plan with a total commitment of \$500 million from the Australian and State Governments to make safety improvements along the Midland Highway.

This project aims to improve safety over a 7km section of the Midland Highway from the Pontville Roundabout to Eddington Road. The following typical cross section forms the basis for the development of the design and is contingent upon the introduction of an 80 km/h speed limit across this section of the Highway:

- 3.5m wide lanes
- a central 3.0 m wide central turning lane
- 2.0m sealed shoulders, and
- 0.5m unsealed verges widened where road safety barrier is required.

This report supports a development application for the works from the Pontville Roundabout to Eddington Road, Stage 2 of the Mangalore to Bagdad project.

2. Strategic Rationale

The Mangalore to Bagdad section is a key section of the Midland Highway, Tasmania's major north-south transport corridor and a key link in Tasmania's State Road network. The Highway is both a critical freight connection facilitating access from the southern region to the State's northern ports, and the major transport link for passengers travelling between the northern and southern regions. This section of the highway acts as both a State significant arterial corridor and as a local collector road linking rural activities and commuters. There is a relatively high density of property accesses along this section of the highway which presents additional design considerations.

Currently a 100 km/h speed limit applies for the majority of the highway between Mangalore and Bagdad with a transition to 60 km/h (south bound) at the Pontville Roundabout and a corresponding north bound increase from 60 – 100 km/h. The transition to the Bagdad township 80 km/h zone commences approximately 20 m north of Eddington Rd.

Vehicle movements were recorded south of Ballyhooly Rd and south of Roberts Rd in April 2016. 9,042 vehicle movements were recorded south of Ballyhooly Rd with 11% of these being heavy vehicles. 7,836 vehicles per day were recorded south of Roberts Rd, 12% of which are heavy vehicles.

There were 43 accidents on this particular section of the highway in the last 10 years, including 3 fatalities and 5 serious crashes. The majority of crashes were rear end crashes or involved vehicles running off the road. It is noted that head on-crashes were prevalent along this section of road, with a total of 6 head-on crashes with 3 of these being fatal crashes. Examination of crash data found no commonality in the location or likely cause of these accidents. The proposed improvements are intended to reduce the incidence of head on collision and other accidents.

3. Proposal

3.1 General

The existing highway generally consists of a single traffic lane in each direction. Each lane is approximately 3.7 m wide with sealed shoulders approximately 1.0 m wide and gravel verges approximately 1.0 m wide. The existing alignment consists of a series of straights and large radius curves and has relatively flat grades. The existing horizontal and vertical alignment is appropriate for the current operating speed of the highway.

The safety upgrade works will include:

- Widening of the highway to incorporate a 3.0 m wide central turning lane
- Incorporation of dedicated turn lanes at side road intersections as necessary
- Widening of the sealed shoulders and installation of roadside safety barriers to minimise the potential for crashes as a result of vehicles running off road - where a safety barrier is proposed the verges will be widened to 1.0 m
- Treatment of road side hazards through removal or protection with safety barrier where applicable
- Incorporation of pedestrian refuges at intersections and along the highway as appropriate
- Regrading and sealing of property accesses within the road reservation to suit the new pavement levels .

Other works associated with the project include:

- Demolition of the existing dwelling at 1192 Midland Highway (on the north eastern corner of the intersection with Ballyhooly Rd)
- Planting of replacement trees near where Pioneer Avenue trees have been removed, subject to landowner consent. Replacement of other vegetation removed will be considered on a case by case basis, noting that it is intended that those large trees removed north of Wilsons Rd and between School Road (north) and Eddington Road will be replaced on private land, subject to landowner consent .

The existing path between Eddington Road and Roberts Road will be reinstated at a new location adjacent the widened road. The potential construction of an unsealed, 1.2m wide gravel path between Roberts Road and Black Brush Road is currently under consideration. The Department will continue to consult with Council in regards to the best outcomes for their community and in light of the funds available. If this path is constructed the Department of State Growth will request Council to maintain the footpath prior to the commencement of works. It is proposed that the management of roadside drainage along this section of the Highway will remain a State Government responsibility, regardless of the presence of a footpath or otherwise.

A full set of design drawings is attached to this application. A typical cross section of the proposed upgrade works is shown in Figure 1.

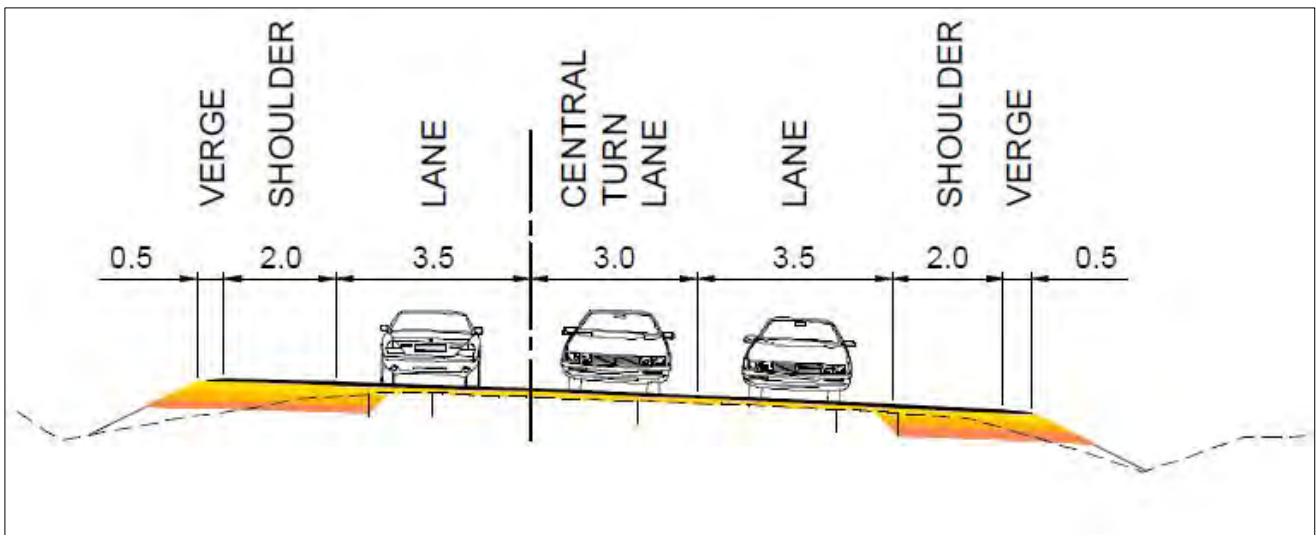


FIGURE 1 TYPICAL CROSS SECTION

3.2 Widening Works and Land Acquisition

The highway will be widened to accommodate the central turning lane (left and right turn) and the standardisation of verge and shoulder widths. The widening will generally be on the eastern side of the highway. Additional land is to be acquired to accommodate widening, batter construction and some intersection widenings. Land acquisition will include sufficient land for future extension of the footpath on the eastern side of the highway. The potential construction of an unsealed, 1.2m wide gravel footpath between Roberts Road and Black Brush Road is under consideration. The Department will continue to consult with Council in regards to the best outcomes for their community and in light of the funds available.

3.3 Turning Facilities

A central turn median lane is proposed for much of the length of the upgrade and no major turning facilities (e.g. U-turn bays) are proposed. As no central safety barrier is proposed, there is no requirement to install turning facilities. These are installed for residents who would no longer have been unable to directly access properties and needed to travel to a break in the barrier, turn then and travel back. The centre lane will allow motorists to decelerate out of the main traffic lane and wait for a safe gap in the approaching traffic to turn.

3.4 Side Road Connections

The following side roads connect to the Midland Highway along the length of the project:

- Shene Road
- Ballyhooly Road
- Blackbrush Road
- Goodwins Road
- Roberts Road
- Quarry Town Road (three connections – south, middle and north)
- Wilsons Road
- De Camera Road
- School Road (two connections – south and north)
- Eddington Road

Currently, channelised right turn treatments are provided at Ballyhooly Road and School Road (south) for northbound traffic and at Black Brush Road for southbound traffic. Channelised left turn treatments are provided at Ballyhooly Road and School Road (north) for southbound traffic and at Black Brush Road for northbound traffic. It is intended that these dedicated turn lanes are reinstated with the addition of a new dedicated right turn lane at Quarry Town Road (north) for southbound traffic.

Quarry Town Road (south) will be disconnected from the highway and a new cul de sac constructed. This will avoid the potential for conflicting turns between southbound traffic turning right into Quarry Town Road (south) and northbound traffic turning right into Wilsons Road.

All side road connections that do not carry sufficient traffic volumes to warrant the installation of dedicated right turn lanes will benefit from the provision of the central turn median which will allow right turning vehicles to prop clear of the through traffic.

As the treatment being implemented through Bagdad has not been previously implemented on the State Road Network, State Growth intends to monitor the operation of the highway through Bagdad and if necessary will refine the signs and linemarking arrangement adopted on Stage 2 during the detailed design.

3.5 Stormwater Culverts

There are 19 culverts under the highway and 99 culverts under side roads and property accesses. Three of the culverts under the highway are box culverts with the remainder reinforced concrete pipes.

A hydraulic assessment of the existing culverts has been undertaken. The capacity of culverts under the highway or where culvert overflow would result in water overtopping the highway were checked for a 1 in 100 year rainfall event and culverts under side roads and property accesses were checked for a 1 in 20 year rainfall event. The assessment indicated that there are three culverts under the highway which do not have sufficient capacity for a 1 in 100 year rainfall event and five road side culverts where a 1 in 100 year rainfall event would result in water overtopping the highway. The location of the culverts under the highway, their current size and the culvert size required to provide sufficient capacity for a 1 in 100 year rainfall event is indicated in Table 1. The same information for the roadside culverts is provided in Table 2. As the culverts under the highway only have marginally less capacity than required for a 1 in 100 year rainfall event, and to State Growth's knowledge there is no previous history of the culverts causing water to impact on the operation of the highway, it is intended to retain these existing culverts and extend them as required to suit the new highway cross section width. The roadside culverts where overflow would result in water overtopping the highway will be replaced with culverts of sufficient capacity as part of the upgrade works.

TABLE 1 CULVERTS UNDER HIGHWAY WITH CAPACITY LESS THAN REQUIRED FOR A 1 IN 100 YEAR RAINFALL EVENT

Chainage	Flow Rate for 1 in 100 year rainfall event (m ³ /s)	Existing Culvert Size	Size Required for 1 in 100 year rainfall event
2750	1.38	Twin DN600s	Twin DN750s
4980	0.13	DN300	DN375
5580	8.16	1800 x 900 box	1800 x 1200

TABLE 2 CULVERTS WHERE OVERFLOW WOULD RESULT IN WATER OVERTOPPING HIGHWAY IN A 1 IN 100 YEAR RAINFALL EVENT

Chainage	Flow Rate for 1 in 100 year rainfall event (m ³ /s)	Existing Culvert Size	Size Required for 1 in 100 year rainfall event
140	0.255	DN300	Twin DN450s
200	0.21	DN225	Twin DN300
340	0.45	DN300	Triple DN450s
2380	0.25	DN300	Twin DN300s
3600 - 3700	0.22	DN300	DN375

Assessment of the 99 culverts under side roads and property accesses indicated that 21 culverts have less capacity than required for a 1 in 20 year rainfall event. As upgrading of the highway predominantly involves widening of the pavement on the eastern side, many of the existing culverts under property accesses on the eastern side of the highway will need to be replaced to suit the alignment of new roadside drains. Where these existing culverts are replaced, culverts with sufficient capacity for a 1 in 20 year rainfall event will be installed.

To protect the highway pavement from water ingress, new open drains will be established where the invert of the existing open drains is less than 150mm below the bottom of the pavement. Where new open drains are required to be constructed and as a consequence culverts under accesses or side roads require replacement to match the new drain invert levels, these culverts will also be replaced with culverts of sufficient capacity for a 1 in 20 year rainfall event.

The combination of the highway widening and the establishment of new roadside drainage to protect the pavement will result in the majority of existing roadside culverts being replaced.

A copy of the Hydraulic Assessment is included in Appendix A.

In addition to assessing the capacity of existing culverts, each drainage catchment which crosses the highway has been assessed to determine the impact of the increased impervious area created through upgrading of the highway. Table 3 indicates:

- The chainage at which each catchment crosses the highway
- The total area of each catchment
- The area of the total catchment that is impervious accounting for implementation of the highway upgrade works
- The percentage of the catchment that is impervious accounting for implementation of the highway upgrade works
- The percentage increase in impervious area as a result of upgrading the highway
- The design flow rate based on upgrading of the highway, and
- The percentage increase in flow rate as a result of upgrading the highway.

The catchment assessment indicates that there will be minimal increase in flow as a result of upgrading the highway. Accordingly, upgrading of the highway will have negligible impact downstream of the highway due to the size of the catchments relative to the impervious area associated with the highway. Further review of the catchments and the capacity of open drains and channels downstream of the highway will be undertaken during detailed design.

TABLE 3 CATCHMENT CHARACTERISTICS

Chainage	Total Catchment Area (ha)	Impervious Area based on Design (ha)	Impervious Area based on Design (%)	Increase in impervious area relative to existing (%)	Design flow for 1 in 100 year rainfall event (m³/s)	Increase in flow rate relative to existing for a 1 in 100 year rainfall event (%)
130	12	0.46	3.83	1.00	0.59	0.7
315	15	0.46	3.07	0.89	1.01	0.9
515	27	0.31	1.14	0.33	1.09	1.0
885	17	0.87	5.05	0.19	0.98	0.4
1245	88	0.14	0.16	0.01	2.99	0.3
1580	70	1.83	2.61	0.04	3.78	0.0
1985	44	2.01	4.58	0.34	1.63	0.6
2560	62	1.74	2.81	0.23	2.50	0.8
2750	51	0.84	1.64	0.32	2.26	0.7
3440	55	0.65	1.17	0.10	2.64	0.3
4320	117	1.15	0.98	0.18	5.41	1.3
4880	120	0.83	0.69	0.13	5.59	0.2
4980	0.6	0.30	50.25	2.58	0.10	2.0
5320	8	0.98	12.25	1.38	0.74	1.9
5580	225	1.23	0.54	0.07	7.14	0.0
5910	4	0.17	4.32	0.52	0.43	0.2
6110	35	0.43	1.23	0.00	2.13	0.0
6330	0.4	0.11	27.50	0.00	0.07	0.0
6465	25	1.21	4.83	0.87	1.79	1.7

3.6 Temporary Works

No temporary road works are required in order to complete the proposed works.

3.7 Construction

Construction of the project is expected to commence in late 2017. At this stage construction completion is forecast to be easily achievable within 18 months.

The construction contract will require the contractor to nominate excess fill disposal sites to the relevant Local Government Council and obtain any relevant regulatory permits prior to site use. It will also require the contractor to assess and document the condition of any Local Government Council road that will be subject to the cartage of excess fill from this project, a minimum of one month prior to the commencement of that activity on that Council road. The Contractor will be contractually expected to repair any damage to that Council road that is clearly attributable to the cartage of excess fill, at the conclusion of construction.

4. Site Description

4.1 Location

The project area extends from the Pontville Roundabout to Eddington Road, between Mangalore and Bagdad on the Midland Highway. The general locality is shown in Figure 2. Land along the alignment is generally cleared for agricultural uses and residential development leading in to the north western approach to the outer suburbs of Hobart. The Bagdad Rivulet generally runs parallel to the highway on the eastern side. There are several tributaries of the Bagdad Rivulet that pass under the highway.

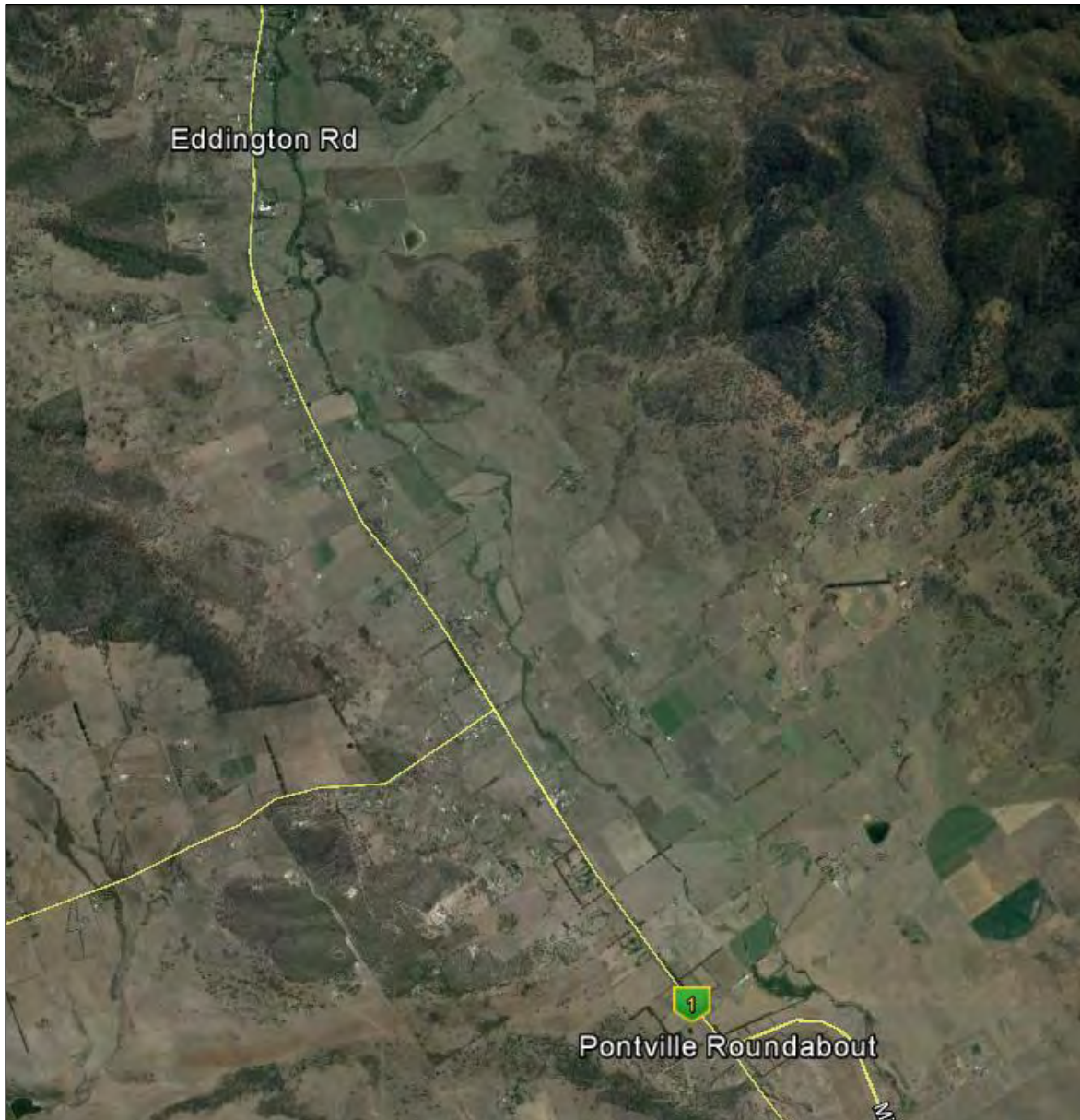


FIGURE 2: SUBJECT SITE LOCATION

4.2 Flora and Fauna

North Barker Ecosystem Services undertook a field survey along the alignment in November 2014. This survey followed a desktop analysis which identified flora and fauna species potentially occurring within the upgrade area. Land immediately adjoining the road was surveyed for a distance of 25 m either side of the centre line. Native vegetation, any potential flora and fauna habitat areas and all native species were recorded. Weeds species, including environmental weeds, were recorded. No targeted fauna surveys were undertaken.

4.2.1 Flora

The site is predominantly agricultural land and urban areas. Three threatened flora species listed under the Tasmanian *Threatened Species Protection Act 1995* (TSP Act) were recorded within the project area and these are listed in Table 4. No species currently listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded. These were predominantly observed on the western side of the highway where limited works are proposed.

TABLE 4 THREATENED FLORA SPECIES RECORDED WITHIN THE SURVEY AREA¹

Species	TSP Act Status	EPBC Act Status	Comment
<i>Austrostipa scabra</i> rough speargrass	Rare	-	Recorded at a number of roadside locations. One occurrence of 75 plants was recorded south of Ballyhooly Road and although within the alignment area is avoided by the proposed works. 13 plants located opposite Ballyhooly Rd will be disturbed by the works. A patch of 50 plants will be disturbed at Chainage 6070. Patches of 20 – 25 plants at Chainage 3850 and 6220 appear to be located on the outer edge of the works and will likely be disturbed by construction.
<i>Calocephalus citreus</i> lemon beautyheads	Rare	-	Previously known from the road reserve and adjoining private land south of Ballyhooly Road. One plant was recorded in this locality and although within the alignment area is not within the area to be disturbed by the proposed works.
<i>Vittadinia muelleri</i> narrowleaf new-holland daisy	Rare	-	20 plants were identified on the road side south of Roberts Rd (Chainage 4090) and will be disturbed by the works. A patch of 1500 plants was recorded east of the highway near the northern entrance to School Rd. This appears to be located in the vegetation between the school and the existing highway and is unlikely to be impacted. A larger occurrence of this species on the western side of the highway in this location contained an estimated 3000 plants. This patch will be disturbed by the proposed works.

The North Barker report assessed those species previously recorded within 5 km which have a moderate to high potential to occur in the area. Only one species, *Haloragis heterophylla* (variable raspwort) was considered to have any potential to occur. This species has a moderate potential to occur and is unlikely to have been overlooked during survey unless in small numbers. Habitat is present within the study area and can occur in the moist depressions amongst grasses.

While the impacts on the overall populations of each of these is not considered significant, final impact numbers will be required to determine permit and offset requirements from DPIPWE.

¹Note that *Carex tasmanica* curly sedge and *Austrostipa nodosa* knotty speargrass were included in the report however has subsequently been de-listed. *Rytidosperma popinensis* was reported but was revised to *Rytidosperma fulvum* wallaby grass which is not listed.

4.2.2 Fauna

No targeted fauna surveys were conducted however habitats within the area were assessed for suitability for use by fauna species. One threatened fauna species, the swift parrot (*Lathamus discolor*) listed under the EPBC Act and the TSP Act was recorded within the project area. This species was recorded in non-endemic eucalypts during the survey and nesting and foraging opportunities are present within the survey area. A row of planted *Eucalyptus ovata* (blue gum) was recorded south of Ballyhooly Road which could provide foraging habitat. These trees will not be impacted by the proposed works.

Based on the availability of habitats and records of occurrence within the locality, the species listed in Table 5 are also considered to have the potential to occur within the project area.

TABLE 5 FAUNA SPECIES WITH MODERATE TO HIGH POTENTIAL TO OCCUR

Species	TSP Act Status	EPBC Act Status	Comment
<i>Aquila audax fleayi</i> wedge-tailed eagle	Endangered	Endangered	High potential for foraging habitat. The study areas are likely to intersect with the territory of at least one pair of eagles. The nearest known nest is no closer than 3.1km north east near Barren Rock Falls, well beyond the range of likely disturbance.
<i>Dasyurus maculatus maculatus</i> spotted-tailed quoll	Rare	Vulnerable	Moderate potential for foraging habitat. There are 2 records within 5 km of the study area.
<i>Perameles gunnii</i> Eastern-barred bandicoot	-	Vulnerable	There are numerous records from the vicinity of the study area.
<i>Sarcophilus harrisii</i> Tasmanian devil	Endangered	Endangered	Moderate potential for foraging habitat. There are 5 road kill records within the study area.
<i>Tyto novaehollandiae castanops</i> Tasmanian masked owl	Endangered	-	Moderate potential for foraging habitat. Requires for nesting. There are no outstanding nesting trees along the roadside although birds are likely to forage in the vicinity of the study areas.

The wedge-tailed eagle, spotted-tailed quoll and Tasmanian devil all exploit the roadside food resource of animal carcasses, putting themselves at risk of vehicle collision. This is an existing situation that will not worsen as a result of the proposed road works. There are no breeding habitats present for any of these species that will be impacted.

The Eastern-barred bandicoot is likely to be present across the locality favouring the borders of pastures and riparian vegetation. Riparian and other edge vegetation is limited within the upgrade area which is dominated by farmland and residential development. There is a history of road kills along this section of the highway which could potentially improve through the proposed upgrades due to the reduction in speed limit to 80km/h.

The Eastern quoll was listed as endangered under the EPBC Act on 19 November 2015 however there is no suitable den habitat within the upgrade area and there appears to be no recent occurrence.

4.2.3 Weeds

Nine weed species listed as 'declared weeds' on the *Weed Management Act 1999* were recorded from the study area as well as two uncommon introduced species of note. Prior to the construction phase, State Growth will require the construction contractor to prepare and implement a Weed Management Plan for the full extent of the project, this must:

- Be undertaken by a suitably qualified and experienced weed contractor
- Provide for the effective management of Declared weeds from site construction completion through until the end of the Defects Liability period.
- Include project specific washdown procedure and a site plan that indicates the location, inspection and maintenance of washdown facilities. Each washdown event is to be recorded, as are vehicles, plant and equipment assessed and classed 'clean'.
- For Willow management – approved Willow management procedures shall be adopted.

4.3 Historic Heritage

Historic Heritage Assessments and a separate Historic Plantings Heritage Assessment (Appendix C) were prepared by Austral Tasmania to assess the significance of buildings and plantings along the highway and to determine likely impacts of the project. The dwelling at 11 Eddington Court is included in the reports prepared for the Stage 1 works and these reports are also included in Appendix C. The outcomes of these assessments are discussed in Section 8.12 E13 Historic Heritage Code.

4.3.1 Heritage buildings

A number of heritage listed buildings are located along the alignment with four of these comprising the Heritage Mile Cultural Landscape Precinct. The significance of this precinct relates to three intact and highly prominent homesteads of the early to mid-nineteenth century (Oakwood, Marlbrook & Woodburn) and a large Federation Queen Anne homestead (Wybra Hall), with their associated rural outbuildings. The properties retain their original land grants as reflected by fencing and road side properties, and the patterns of land use and remnant vegetation are reflective of the original land uses. No works are proposed along that side of the alignment so as to avoid impacts on this precinct.

There are a number of additional properties individually listed on the Tasmanian Heritage Register and by the Southern Midlands Council. The only properties impacted, and these impacts relate to acquisition of small areas of land at the highway frontage, are:

- 1546 Midland Highway, Sayes Court – this is a large property comprised of two lots. There is a dwelling and a barn on the property however these are located 140 m and 225 m respectively from the current highway boundary and will not be affected by the acquisition or works.
- 11 Eddington Rd – this is a timber dwelling located approximately 100 m from the current highway boundary. The dwelling will not be affected by the acquisition or works.

These are located at the northern end of the upgrade area and are shown in Figure 3.

In both instances the area to be acquired is located at the highway frontage of the site, well removed from the listed buildings, and is unlikely to impact on the heritage values of the site. The works have been granted an exemption by the Tasmanian Heritage Council (THC) as they satisfy the requirements of the Tasmanian Heritage Council: Works Guidelines 2015. A copy of these exemptions is provided in Appendix B.

A relatively recent sandstone entry feature built at the frontage of the heritage listed Cornelian Hill at 1358 Midland Highway is located partly within the road reserve and is required to be relocated to the correct property boundary to allow the upgrade works. This has also been granted an exemption by the THC.

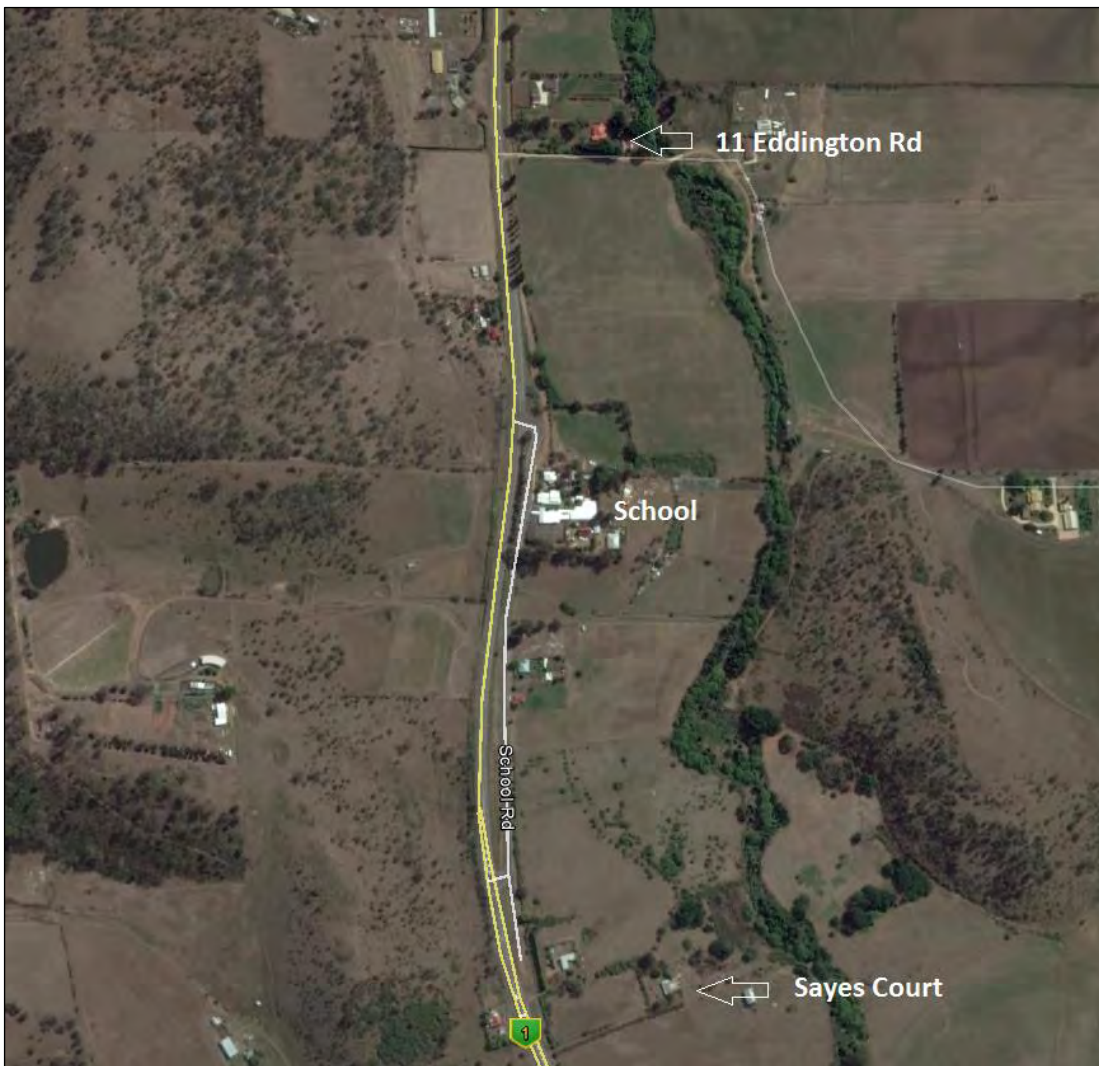


FIGURE 3 LOCATION OF THC LISTED PROPERTIES

4.3.2 Heritage plantings

There are also a number of plantings along the highway associated with individual properties and the Pioneer Memorial Avenue. The Pioneer Avenue is a series of roadside plantings that began in the 1930s, extending between Launceston and Hobart. It was originally intended to be a memorial to early pioneers of Tasmania, and evolved into a carefully planned series of plantings along the Midland Highway to beautify the countryside and encourage tourism. The Pioneer Avenue has been nominated for inclusion on the THR, and this nomination is still being assessed by the Tasmanian Heritage Council (THC)..

The Historic Plantings Heritage Assessments by Austral determined there are 38 likely Pioneer plantings within the entire Mangalore safety upgrade project area. The area covered by the current proposal (which extends slightly into the Stage 1 study area), includes 23 of these. The assessment determined that the survival rate of trees is considered to be low (likely less than 10%) and that this section compares poorly with other sections of highway recently surveyed. The majority of the surviving trees date to the 1950's replanting works. Although this section of the highway was not considered to be a significant Pioneer Avenue landscape, the assessment recommends the surviving plantings should be conserved wherever possible and accounted for in any future highway upgrade works.

A review of the alignment against the location of pioneer plantings indicates that 3 of the 23 remaining trees will be removed or trimmed to accommodate the works. These are outlined in Table 6.

TABLE 6 PIONEER TREES TO BE IMPACTED BY THE PROPOSED WORKS

Reference	Detail	Impact
2.01	Golden <i>Cupressus macrocarpa</i> , possible Pioneer Avenue replacement planting	To be trimmed or removed to allow for new fence construction
5.04	<i>Cupressus arizonica</i> (Arizona Cypress), possible Pioneer Avenue replacement planting	To be removed for path construction
5.05	<i>Cupressus arizonica</i> (Arizona Cypress), possible Pioneer Avenue replacement planting	To be removed for path construction

State Growth recognises the significance of the Pioneer Avenue, and is committed to retaining the Pioneer Avenue into the future. Some of the original Pioneer Avenue plantings will be impacted by the footprint of Midland Highway upgrade works. Removal of hazards, including trees, from the road reserve, where possible is an important part of the safety upgrade to reduce the severity of road crashes.

State Growth has developed a strategy for Pioneer Avenue plantings. The strategy is based on the following principles:

- Maintain the Pioneer Avenue where practicable and aim for no net loss of trees.
- Consult with relevant local Councils, Heritage Tasmania and affected landowners about appropriate replanting's to retain intent of the Pioneer Avenue.
- Replanting to occur outside the road reservation to maintain the safety of the Midland Highway.
- Establishment and management of new plantings must be cost-effective, meet community expectations and maintain the integrity of the Pioneer Avenue.
- The Historic Plantings Heritage Assessments also considered the significance of plantings on heritage properties within the project area. For the two heritage listed properties affected by acquisition, the following comments were made: 1546 Midland Highway, Sayes Court – potential impacts relate primarily to the hawthorn hedgerow along the southern side of the entrance drive to the dwelling. Replanting was recommended if possible.
- 11 Eddington Road – the eucalypts on the highway frontage are relatively recent plantings and while not of particular heritage significance they do provide screening for the dwelling. If these are to be removed the assessment recommended replanting. These will be replaced within the new property boundary.

Cornelian Hill will be impacted only by the relocation of the entry feature and the area surrounding the current location is generally cleared. No impacts on any vegetation of heritage significance are likely.

4.4 Indigenous Heritage

Aboriginal Heritage Tasmania (AHT) undertook a search of the Aboriginal Heritage Register over the project area and it was determined that there is a number of Aboriginal heritage sites recorded within or close to the proposed works. The majority of recorded sites are artefact scatters and an Aboriginal heritage investigation was required to be carried out. The purpose of this investigation was to determine whether the proposed works will impact on any Aboriginal heritage and to offer mitigation advice. No artefacts were observed during the field survey however there are two known records near the Black Brush Road intersection.

The investigation was undertaken and it was concluded that site and artefact densities within the road corridor study area are likely to be low. It was further concluded that any undetected sites present within the study area will have been subject to high levels of disturbance associated with past land clearing activity and prior road infrastructure construction. The area of the proposed works was assessed as

being of low archaeological sensitivity. Only one recorded site is located near the alignment and that is in a residential yard opposite the Black Brush Rd intersection. The site will not be impacted by the proposed works.

This area will be protected during construction with site preservation fencing (to be installed by the contractor). As part of a Construction Management Plan, the contractor will be required to implement an Unanticipated Discovery Plan (UDP) should any unexpected finds be encountered during construction.

4.5 Land Capability

The land adjacent the highway is predominantly Class 4 Agricultural land which is land well suited to grazing but which is limited to occasional or restricted cropping. A small area on the low hill containing the Bagdad School is Class 5 land which is unsuitable for cropping. There is no Prime Agricultural Land (Class 1, 2 or 3 land as defined by the Tasmanian State Policy on the Protection of Agricultural Land 2009) in the road corridor or immediately adjacent to it, so road works within the corridor will have no effect on Prime Agricultural Land.

4.6 Utilities

The following public utilities are located within the highway reservation:

- Overhead electricity, owned by TasNetworks
- Underground telecommunication cables, owned by Telstra, and
- Water mains, owned by TasWater.

To determine the extent of underground public utilities that require relocation or protection to facilitate the highway upgrade works, State Growth is undertaking a detailed investigation process which involves surface detection and survey of underground public utilities followed by targeted potholing where utilities have potential to be impacted. Following completion of these investigations State Growth will liaise with the relevant utility owners to agree on the necessary works and develop the required design documentation.

Overhead electricity modifications and street lighting augmentation and additions will be coordinated with TasNetworks.

4.7 Construction Management

The Department of State Growth requires all contractors to submit a Construction Environmental Management Plan (CEMP) that demonstrates compliance with best practice guidelines and relevant legislation and regulation. The CEMP must be compliant with the State Growth's Road Construction Specifications. CEMPs are reviewed and approved by State Growth prior to commencement of works to ensure the contractor has effectively identified and attributed construction related environmental risks, and has the systems and processes in place to effectively mitigate risk and respond to and report environmental incidents and emergency scenarios. In addition, all construction contractors working for State Growth must have ISO 14001 certification. State Growth also requires that the contractor's construction methodology and management of potential environmental impacts be guided by the following documents:

- DPIPWE Wetlands and Waterways Works Manual;
- A Soil and Water Management Plan
- The requirements covering Dangerous Goods / Bulk Hydrocarbon Storage adjacent to natural water courses; and
- A Site Rehabilitation Plan (that the contractor must submit for Department approval within three months of commencement of construction).

4.8 Noise

State Growth uses the Tasmanian State Road Traffic Noise Management Guidelines to manage traffic noise on State Roads. The Guidelines have been endorsed by the Environment Protection Authority (Tasmania) and are available at:

http://www.transport.tas.gov.au/__data/assets/pdf_file/0017/111527/DSG_Traffic_Noise_Guidelines_20151029.PDF

State Growth has applied the Guidelines to determine whether this project is eligible for noise mitigation. In this case, it has been determined that the project is not an 'eligible scenario' for noise mitigation. The reasoning for this is that the predominant scenario for the proposed works is a safety upgrade of an existing road. Therefore, this project is not eligible for noise mitigation under State Growth's Guidelines.

There will be short term noise associated with construction generated by machinery and safety requirements (reverse beepers) and this will be managed carefully to minimise impacts to local residents.

5. Site Photographs



FIGURE 4: NORTHERN END LOOKING SOUTH FROM EDDINGTON RD



FIGURE 5: SCHOOL RD (NORTHERN END)



FIGURE 6: SCHOOL RD (SOUTHERN END)



FIGURE 7: SAYES COURT VIEWED FROM THE SOUTHERN END OF SCHOOL RD



FIGURE 8: RECENTLY CONSTRUCTED ENTRY FEATURE TO CORNELIAN HILL



FIGURE 9: BETWEEN SHENE ROAD AND BALLYHOOLY ROAD



FIGURE 10: SOUTH OF BLACK BRUSH ROAD LOOKING NORTH



FIGURE 11: SOUTH OF SHENE ROAD LOOKING NORTH

6. Titles

The following titles (Table 7) are affected by the acquisition to facilitate the proposed works and a copy of these, and all other titles, is attached to this application. All other works are predominantly within the highway reservation with the exception of works on a small number of property accesses where grade improvements will be undertaken. Land is required to be acquired to facilitate the works, predominantly related to the widening of the pavement, proposed and future path construction and associated batters.

TABLE 7: LIST OF TITLES AFFECTED BY AQUISITION

Title Reference	Address	Owner
261/79/10	30 Shene Road PONTVILLE TAS 7030	Tasmanian Pistol and Revolver Club Inc
43426/7	7 Shene Road MANGALORE TAS 7030	Maurice John & Joyce Marie Steen
43426/8	11 Shene Road PONTVILLE TAS 7030	Kerry Ann Crlk & Paul Anthony Steen
11335/4	1044 Midland Highway PONTVILLE TAS 7030	Anthony Richard & Coral Elaine Gray
107429/2	1056 Midland Highway PONTVILLE TAS 7030	Leonnie Gayle Wilson
11335/1	Midland Highway MANGALORE TAS 7030	A L Fehlberg Pty Ltd
23961/8	Bundaleah 1140 Midland Highway MANGALORE TAS 7030	Mark Anthony & Elizabeth Anne Downward
39848/2	Midland Highway MANGALORE TAS 7030	Betty Ethel Knight
112712/1	1172 Midland Highway MAGALORE TAS 7030	Duncan Cameron McPherson
222184/1	1192 Midland Highway MANGALORE TAS 7030	Philip Geoffrey Clayton & Peta Maree O'Brien
53849/1	7 Ballyhooly Road MANGALORE TAS 7030	Robert James Dilger & Rebecca Michelle Oakley
21213/3	1244 Midland Highway MANGALORE TAS 7030	Rodney Neville & Rodney John Campbell
5523/2	1 Goodwins Road MANGALORE TAS 7030	Gregory James & Carla Jane Brown
103253/3	1328 Midland Highway MANGALORE TAS 7030	Merle Isabell Jones
160517/2	2 Wilsons Road BAGDAD TAS 7030	Steven William Baldwin
160517/1	3 Wilsons Road BAGDAD TAS 7030	Steven William Baldwin

Title Reference	Address	Owner
112755/1	1516 Midland Highway BAGDAD TAS 7030	Rhona Fay Bantick
101987/1	5 De Camera Road BAGDAD TAS 7030	Anthony Brian Jacobs
106393/1	1552 Midland Highway BAGDAD TAS 7030	Hazel Joan & Christopher Keith Chalmers
149490/1	Sayes Court 1546 Midland Highway BAGDAD TAS 7030	Gordon Keith Chalmers
134943/1	Springvale 49 Quarrytown Road BAGDAD TAS 7030	Raymond Stuart & Brenda Joy Saltmarsh
114549/1	Lot 1 Midland Highway BAGDAD TAS 7030	Geoffrey Keith Chalmers
31405/1	Lot 1 Midland Highway BAGDAD TAS 7030	Raymond Henry Millington
30802/5	Lot 5 Midland Highway BAGDAD TAS 7030	Kevin William Jacobson
52519/1	11 Eddington Road BAGDAD TAS 7030	Michael John & Tracey Anne Freeman
10438/1	1660 Midland Highway BAGDAD TAS 7030	Graham Frederick & Cynthia Anne Saunders

7. Stakeholder Engagement

Department of State Growth has undertaken significant engagement with affected stakeholders. State Growth representatives have met with the majority of landowners adjacent to this section of the Midland Highway and explained the project objectives and the impacts on their properties. The remaining adjacent landowners will be consulted in person during February thru April 2017, well before scheduled construction. Landowners are provided the opportunity to communicate information regarding the use of their property. Design drawings are presented to landowners to assist discussions and describe the impacts on roadside vegetation and to existing accesses.

To date, the key concerns raised by landowners primarily relate to access which the Department of State Growth has addressed through the decision to incorporate the 3.0 m central turn median. This treatment facilitates left and right turn movements both in and out of properties whilst achieving the safety improvement objectives of the project. Concerns relating to impacts on heritage values within the Heritage Mile Cultural Landscape Precinct resulted in the works being generally contained on the eastern side of the current highway.

An initial public display explaining one option to address road safety was presented to the community in March 2016. Community feedback from that activity has helped to develop the design plans.

A second public display of the design plans was held on 25 November 2016 at the Pontville Community Hall. A public notice advertising the public display was placed in the Mercury and Examiner newspapers, which included an address for the State Growth road project webpage <http://www.transport.tas.gov.au/road/projects> where the plans can be viewed online. A flyer explaining the project and advertising the public display was provided to most adjacent landowners and businesses. The flyer includes the webpage address and an 1800 phone number is on the website. This enables the public to contact the Department throughout the life of the project. A number of adjacent landowners were inadvertently missed in the public display invitation mail-out. A letter was sent to these landowners describing the design and bringing their attention to the webpage and phone contact details.

8. Planning Scheme

8.1 Planning Scheme

The proposed works are located within the Southern Midlands Council municipality and are subject to the provisions of the Southern Midlands Interim Planning Scheme 2015 (the Planning Scheme).

8.2 Exemptions

The Scheme contains a number of general and limited exemptions for certain developments. Maintenance and repair of roads is exempt from requiring approval. Minor upgrades by or on behalf of the State government, a Council, or a statutory authority do not require approval. This includes infrastructure works such as roads, rail lines, footpaths, cycle paths, drains, sewers, power lines and pipelines including:

- minor widening or narrowing of existing carriageways; or
- making, placing or upgrading kerbs, gutters, footpaths, roadsides, traffic control devices and markings, street lighting and landscaping.

Council has confirmed that the proposed works do not fall within either of these exemptions.

8.3 Use Definition

Within the Planning Scheme there are a series of definitions which must be applied to uses and development.

Utilities are defined in the planning scheme as the use of land for utilities and infrastructure which includes item (d) transport networks. Examples of utilities provided in the scheme include roads.

Given the scope of the works previously described the “best fit” definition is **utilities**.

Qualifications exist for certain uses to distinguish between consent requirements. In the case of utilities these relate to the location and scale of the utility and to works considered to be minor utilities. These include:

“use of land for utilities for local distribution or reticulation of services and associated infrastructure such as a footpath, cycle path, stormwater channel, water pipes, retarding basin, telecommunication lines or electricity substation and power lines up to but not exceeding 110Kv”.

The works are not considered to be minor utilities.

8.4 Zoning

The subject land is largely zoned Utilities under the Scheme as shown Figure 12. Land to the east of the existing highway is zoned Particular Purpose (PPZ2 Future Road) for the Bagdad Bypass. Land either side of the current highway alignment is included in a number of zones including:

- Rural Living Zone
- Rural Resources Zone
- Significant Agricultural Zone.

At various points along the alignment works will extend into these zones.



FIGURE 12: ZONE EXTRACT

8.5 Use Tables and level of assessment

The level of assessment within each of the zones affecting the proposed works is outlined in Table 8.

TABLE 8: LEVEL OF ASSESSMENT IN EACH ZONE

Zone	Works	Status
Rural Living	Utilities - if minor utilities	No permit required
	Utilities – except if no permit required	Discretionary use
Rural Resource	Utilities - if minor utilities	No permit required
	Utilities – except if no permit required	Discretionary use
Significant Agricultural	Utilities - if minor utilities	No permit required
	Utilities – except if no permit required	Discretionary use
Utilities	Utilities - if minor utilities	No permit required
	Utilities – except if no permit required	Permitted use

The level of assessment required for the proposed works is discretionary and the proposal is required to be assessed under the provisions of all zones.

Section 9.4 of the Planning Scheme relates to demolition and provides that:

“Unless approved as part of another development or prohibited by another provision, an application for demolition may be approved at the discretion of the planning authority having regard to:

- (a) the purpose of the applicable zone;
- (b) any relevant local area objective or desired future character statement of the applicable zone;
- (c) the purpose of any applicable code; and
- (d) the purpose of any applicable specific area plan.”

Whether a standalone application or part of this proposal the demolition of the house at 1192 Midland Highway is discretionary.

None of the subdivision standards apply to the use and development as the land is to be acquired under the *Land Acquisition Act 1993*, under section 102 of the *Local Government (Building & Miscellaneous Provisions) Act 1993*.

Development involving heritage listed properties usually requires a discretionary application and referral to THC. Exemptions are available however which may avoid the need for a discretionary permit on this basis. The *Tasmanian Heritage Council: Works Guidelines 2015* list those works eligible for a certificate of exemption from the THC. These include:

5.2 Subdivision or boundary adjustment which includes:

- A subdivision or boundary adjustment that is outside of the setting of historic elements.
- A subdivision or boundary adjustment that:
 - does not impact on the setting of the place; or
 - will not disconnect related heritage elements such as a house and its outbuildings; or
 - does not affect the historic lot curtilage of the place.

Note: All of the areas affected by the subdivision will remain entered in the Tasmanian Heritage Register as part of the original entry for the site, and works to the new lots will require approval from the Tasmanian Heritage Council.

It is considered that the exemption provisions apply to the proposed boundary adjustments for the acquisitions avoiding the need for THC approval.

8.6 Provisions within the Rural Living zone

Zone Purpose

13.1.1 Zone purpose statements

The purpose statements of the Rural Living zone are:

- 13.1.1.1 To provide for residential use or development on large lots in a rural setting where services are limited.
- 13.1.1.2 To provide for compatible use and development that does not adversely impact on residential amenity.
- 13.1.1.3 To provide for agricultural uses that do not adversely impact on residential amenity.
- 13.1.1.4 To facilitate passive recreational uses that enhance pedestrian, cycling and horse trail linkages.
- 13.1.1.5 To avoid land use conflict with adjacent Rural Resource or Significant Agriculture zoned land by providing for adequate buffer areas

The proposed highway upgrade is consistent with the purpose of the zone. It will facilitate the continuation of rural activities and residential uses, and ensure safe and suitable access is available for new developments in the area.

13.1.2 Local Area Objectives

There are no local area objectives applicable to the Rural Living zone.

13.1.3 Desired Future Character Statements

There are no future character statements applicable to the Rural Living zone.

Use Standards

The following use standards are applicable to the proposed upgrade. Note that the use of the works will be as a highway which is consistent with the current use. Impacts will not alter however the proximity to some dwellings will be increased.

13.3.1 Non-residential use

Objective	
To ensure that non-residential use does not unreasonably impact residential amenity.	
Acceptable Solutions	Comment
<p>A1 Hours of operation must be within: (a) 8.00 am to 6.00 pm Mondays to Fridays inclusive; (b) 9.00 am to 12.00 noon Saturdays; (c) nil Sundays and Public Holidays; except for office and administrative tasks or visitor accommodation. Use of the highway is continual. The proposal relies on performance criteria. P1 Hours of operation must not have an unreasonable impact upon the residential amenity through commercial vehicle movements, noise or other</p>	<p>Satisfies the performance criteria The resultant use of the highway will be no more intensive than currently occurs. There will be minimal detectable increase in noise or emissions due to the reduced setback from adjacent dwellings. The hours of construction will be 7am to 6pm Monday to Saturday and 10am to 6pm on Sundays, unless required under special circumstances.</p>

Objective	
To ensure that non-residential use does not unreasonably impact residential amenity.	
Acceptable Solutions	Comment
emissions that are unreasonable in their timing, duration or extent.	
<p>A2</p> <p>Noise emissions measured at the boundary of the site must not exceed the following:</p> <p>(a) 55 dB(A) (LAeq) between the hours of 8.00 am to 6.00 pm;</p> <p>(b) 5dB(A) above the background (LA90) level or 40dB(A) (LAeq), whichever is the lower, between the hours of 6.00 pm to 8.00 am;</p> <p>(c) 65dB(A) (LAMax) at any time.</p> <p>Relies on performance criteria:</p> <p>P2</p> <p>Noise emissions measured at the boundary of the site must not cause environmental harm</p>	<p>Satisfies performance criteria</p> <p>The proposed works involve a safety upgrade and while there will be an initial period of construction activity, the ongoing use will be consistent with current impacts. Residents currently experience noise as a result of the use however the acceptable solution and performance criteria do not make allowance for this scenario. To facilitate projects such as this, The Environmental Management and Pollution Control Act 1994 (EMPCA) provides for development of Environmental Protection Policies (EPP) to inform the management of noise emissions from specific development types such as roads. In line with the EPP, State Growth has developed a State Road Noise Strategy supported by the Tasmanian Traffic Noise Management Guidelines to manage traffic noise on State roads. The project will comply with these Guidelines.</p> <p>The Traffic Noise Management Guidelines provides guidance regarding traffic noise mitigation decisions by firstly defining 'eligible scenarios' which are scenarios where noise mitigation will be considered and then defines 'eligible buildings' which are buildings within a scenario for which mitigation will be considered. The Guidelines can be found on Department of State Growth's website: www.transport.tas.gov.au.</p> <p>The Midland Highway Safety Upgrades Mangalore to Bagdad Stage 2 project is defined as a 'safety upgrade' project under the Guidelines. The Guide indicates that safety upgrades are not required to provide noise mitigation.</p> <p>Although the project is not an eligible scenario for noise mitigation, there is a section of the highway from chainage 0 to 2770 which has asphalt surfacing. The asphalt surfacing along this section of the highway will be reinstated where required to ensure noise levels at adjacent eligible buildings immediately following construction do not increase relative to existing levels.</p>
<p>A3</p> <p>External lighting must comply with all of the following:</p> <p>(a) be turned off between 6:00 pm and 8:00 am, except for security lighting;</p> <p>(b) security lighting must be baffled to ensure they do not cause emission of light into adjoining private land.</p>	<p>Complies</p> <p>There is existing street lighting along the length of the highway, primarily at side road junctions. The purpose of the street lighting is to minimise the potential for crashes during hours of darkness or poor visibility. For this reason it is necessary for the street lights to operate between 6:00pm and 8:00am. Where widening of the highway will impact on an existing street light, the light pole will be relocated clear of the highway. New street lights may be installed as part of the highway upgrade works to ensure that appropriate illumination is provided. Where these street lights are located in close proximity to residential dwellings, baffles will be</p>

Objective	
To ensure that non-residential use does not unreasonably impact residential amenity.	
Acceptable Solutions	Comment
	provided to ensure compliance with Australian Standard AS1158.

Development Standards

The only relevant development standards for utilities or roads within this zone relate to location and cut and fill. There are standards applicable to subdivision however these are not applicable to subdivision for utilities.

13.4.3 Design

Objective	
To ensure that the location and appearance of buildings and works minimises adverse impact on the landscape.	
Acceptable Solutions	Comment
<p>A1</p> <p>The location of buildings and works must comply with any of the following:</p> <p>(a) be located within a building area, if provided on the title;</p> <p>(b) be an addition or alteration to an existing building.</p>	<p>Complies</p> <p>Neither of the qualifications in A1 apply. The location of the works is determined by the alignment of the current highway.</p>
<p>A4</p> <p>Fill and excavation must comply with all of the following:</p> <p>(a) height of fill and depth of excavation is no more than 1 m from natural ground level, except where required for building foundations;</p> <p>(b) extent is limited to the area required for the construction of buildings and vehicular access.</p> <p>Fill will exceed 1 m in height at some locations and the proposal relies on performance criteria:</p> <p>P4</p> <p>Fill and excavation must satisfy all of the following:</p> <p>(a) does not detract from the landscape character of the area;</p> <p>(b) does not unreasonably impact upon the privacy for adjoining properties;</p> <p>(c) does not affect land stability on the lot or adjoining land.</p>	<p>Satisfies performance criteria</p> <p>Fill levels will result from extension of the existing road formation and upgrading of intersections and will be required to ensure new surfaces are consistent with existing road levels. Appropriate batters will be installed to ensure stability of fill.</p> <p>All embankment batters will be hydromulched and ultimately have grass cover. This will not have a negative impact on privacy or landscape values and will be consistent with the current appearance.</p> <p>Rockier substrates will be assessed during construction and will be either left in a natural state or treated as above.</p>

8.7 Provisions within the Rural Resource zone

Zone Purpose

26.1.1 Zone purpose statements

The purpose statements of the Rural Resource zone are:

- 26.1.1.1 To provide for the sustainable use or development of resources for agriculture, aquaculture, forestry, mining and other primary industries, including opportunities for resource processing.
- 26.1.1.2 To provide for other use or development that does not constrain or conflict with resource development uses.
- 26.1.1.3 To provide for non-agricultural use or development, such as recreation, conservation, tourism and retailing, where it supports existing agriculture, aquaculture, forestry, mining and other primary industries.
- 26.1.1.4 To allow for residential and other uses not necessary to support agriculture, aquaculture and other primary industries provided that such uses do not:
 - a) fetter existing or potential rural resource use and development on other land;
 - b) add to the need to provide services or infrastructure or to upgrade existing infrastructure;
 - c) contribute to the incremental loss of productive rural resources.
- 26.1.1.5 To provide for protection of rural land so future resource development opportunities are not lost.
- 26.1.1.6 To provide for economic development that is compatible with agricultural and other rural resource activities.

The proposed highway upgrade is consistent with the purpose of the zone. It will facilitate the continuation of rural activities and ensure safe and suitable access is available for residents in the area. Provision of safe access between northern and southern regions of the state is a key part of the continued success of tourism, recreation and other industries.

26.1.2 Local Area Objectives

There are no local area objectives applicable to the Rural Resource zone.

26.1.3 Desired Future Character Statements

There are no future character statements applicable to the Rural Resource zone.

Use Standards

The following use standards are applicable to the use of the highway.

26.3.3 Discretionary Uses if not a single dwelling

Objective To ensure that discretionary non-agricultural uses do not unreasonably confine or restrain the agricultural use of agricultural land	
Acceptable Solutions	Comment
A1 No acceptable solution – relies on performance criteria P1 A discretionary non-agricultural use must not conflict with or fetter agricultural use on the site or adjoining land having regard to all of the following:	The proposed upgrade works will not impact on any agricultural uses. Only minor areas of land are involved in addition to the highway reservation and these are required to improve access and provide for future path construction between Black Brush Rd and the Pontville roundabout.

Objective To ensure that discretionary non-agricultural uses do not unreasonably confine or restrain the agricultural use of agricultural land	
Acceptable Solutions	Comment
(a) the characteristics of the proposed non-agricultural use; (b) the characteristics of the existing or likely agricultural use; (c) setback to site boundaries and separation distance between the proposed non-agricultural use and existing or likely agricultural use; (d) any characteristics of the site and adjoining land that would buffer the proposed non-agricultural use from the adverse impacts on amenity from existing or likely agricultural use.	No separation or buffers between uses is required – this is an existing highway with improvements proposed. Fences will be replaced where acquisition occurs and land uses will continue un-impeded by the road.

Development Standards

The only relevant development standards for utilities or roads within this zone relate to location and cut and fill.

26.4.3 Design

Objective To ensure that the location and appearance of buildings and works minimises adverse impact on the landscape.	
Acceptable Solutions	Comment
A1 The location of buildings and works must comply with any of the following: (a) be located within a building area, if provided on the title; (b) be an addition or alteration to an existing building (c) be located in an area not requiring the clearing of native vegetation and not on a skyline or ridgeline.	Relies on performance criteria. The location of the works is determined by the alignment of the current highway. The highway is not located on a visually prominent location or on any ridgelines. Side roads will run parallel to the highway and behind existing houses in most cases so will not be visible when viewed from the highway or obtrusive when viewed from surrounding areas.
A3 The depth of any fill or excavation must be no more than 2 m from natural ground level, except where required for building foundations. Fill in excess of 2m will be required in some locations and the proposal relies on performance criteria: P3 The depth of any fill or excavation must be kept to a minimum so that the development satisfies all of the following: (a) does not have significant impact on the rural landscape of the area; (b) does not unreasonably impact upon the privacy of adjoining properties; (c) does not affect land stability on the lot or adjoining areas.	Satisfies performance criteria Fill levels will result from extension of the existing road formation and upgrading of intersections and will be required to ensure new surfaces are consistent with existing road levels. Appropriate batters will be installed to ensure stability of fill. All embankment batters will be hydromulched and ultimately have grass cover. This will not have a negative impact on privacy or landscape values and will be consistent with the current appearance. Rockier substrates will be assessed during construction and will be either left in a natural state or treated as above.

8.8 Provisions within the Significant Agricultural zone

Zone Purpose

27.1.1 Zone purpose statements

The purpose statements of the Significant Agricultural zone are:

- 27.1.1.1 To provide for the use or development of land for higher productivity value agriculture dependent on soil as a growth medium.
- 27.1.1.2 To protect the most productive agricultural land and ensure that non-agricultural use or development does not adversely affect the use or development of that land for agriculture.
- 27.1.1.3 To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.
- 27.1.1.4 To provide for limited non-agricultural uses that support the continued use of the land for agricultural use.
- 27.1.1.5 To protect regionally significant areas of significant agricultural land identified in the Regional Land Use Strategy, including areas subject to existing or proposed irrigation schemes, from conversion to non-agricultural use.
- 27.1.1.6 To protect areas used for reuse water irrigation.
- 27.1.1.7 To ensure that new residential use is only established where necessary to facilitate the management of the land for agricultural purposes and does not fetter existing or potential agricultural use on other land.

The land adjacent the highway is not prime agricultural land being generally Class 4 land primarily used for grazing. The proposed road safety improvements will have minimal impacts on the use of the land for agricultural purposes. The improvement of the highway and its intersections will improve safety and allow continued use of the highway and local road network by agricultural producers.

27.1.2 Local Area Objectives

There are no local area objectives applicable to the Significant Agricultural zone.

27.1.3 Desired Future Character Statements

There are no future character statements applicable to the Significant Agricultural zone.

Use Standards

The following use standards are applicable to the proposal.

27.3.1 Discretionary Uses

Objective To ensure that discretionary non-agricultural uses do not unreasonably confine or restrain the agricultural use of agricultural land	
Acceptable Solutions	Comment
A1 No acceptable solution – relies on performance criteria P1 A discretionary non-agricultural use must not conflict with or fetter agricultural use on the site or adjoining land having regard to all of the following: (a) the characteristics of the proposed non-agricultural use;	Satisfies Performance Criteria The proposed road works will not impact on any agricultural uses. Only minor areas of land are involved in addition to the highway reservation and these are required to accommodate construction batters and to improve intersection functioning. Works are located adjacent the existing road and generally a narrow strip of land will be required. The

Objective To ensure that discretionary non-agricultural uses do not unreasonably confine or restrain the agricultural use of agricultural land	
Acceptable Solutions	Comment
(b) the characteristics of the existing or likely agricultural use; (c) setback to site boundaries and separation distance between the proposed non-agricultural use and existing or likely agricultural use; (d) any characteristics of the site and adjoining land that would buffer the proposed non-agricultural use from the adverse impacts on amenity from existing or likely agricultural use.	finished highway will be consistent in nature and impacts to the existing highway and will not result in any conflict with adjoining rural land uses. No separation or buffers between uses is required – this is an existing highway with improvements proposed. Fences will be replaced where acquisition occurs and land uses will continue un-impeded by the road.

Development Standards

The only relevant development standards for utilities or roads within this zone relate to location and cut and fill.

Objective To ensure that the location and appearance of buildings and works minimises adverse impact on the landscape.	
Acceptable Solutions	Comment
A1 The location of buildings and works must comply with any of the following: (a) be located in an area not requiring the clearing of native vegetation and not on a skyline or ridgeline; (b) be located within a building area, if provided on the title; (c) be an addition or alteration to an existing building.	Complies The location of the works is determined by the alignment of the current highway. The highway is not located on a visually prominent location or on any ridgelines. Side roads will run parallel to the highway and behind existing houses in most cases so will not be visible when viewed from the highway or obtrusive when viewed from surrounding areas.
A3 The depth of any fill or excavation must be no more than 2 m from natural ground level, except where required for building foundations. Fill in excess of 2m will be required in some locations and the proposal relies on performance criteria: P3 The depth of any fill or excavation must be kept to a minimum so that the development satisfies all of the following: (a) does not have significant impact on the rural landscape of the area; (b) does not unreasonably impact upon the privacy of adjoining properties; (c) does not affect land stability on the lot or adjoining areas.	Satisfies performance criteria Fill levels will result from extension of the existing road formation and turning paths and will be required to ensure new surfaces are consistent with existing road levels. Appropriate batters will be installed to ensure stability of fill. All embankment batters will be hydromulched and ultimately have grass cover. This will not have a negative impact on privacy or landscape values and will be consistent with the current appearance. Rockier substrates will be assessed during construction and will be either left in a natural state or treated as above.

8.9 Provisions within the Utilities zone

Zone purpose

28.1.1 Zone purpose statements

The purpose statements of the Utilities zone are:

- 28.1.1.1 To provide land for major utilities installations and corridors.
- 28.1.1.2 To provide for other compatible uses where they do not adversely impact on the utility.

The Utilities zone in this instance contains the Midland Highway reservation and is intended to allow for the functioning and upgrade of the highway as required. The proposed works are consistent with the purpose of the zone.

28.1.2 Local Area Objectives

There are no desired local area objectives.

28.1.3 Desired Future Character Statements

There are no desired future character statements.

Use Standards

The following use standards apply as the works in part are adjacent the Rural Living zone, a large lot residential zone.

28.3.1 Hours of Operation

Objective	
To ensure that hours of operation do not have unreasonable impact on residential amenity on land within a residential zone	
Acceptable Solutions	Comment
A1 Hours of operation of a use within 50 m of a residential zone must be within 7.00 am to 7.00 pm, except if: (i) for office and administrative tasks; or (ii) a Utilities use. Use is continual and relies on performance criteria: P1 Hours of operation of a use within 50 m of a residential zone must not have an unreasonable impact upon the residential amenity of land in a residential zone through commercial vehicle movements, noise or other emissions that are unreasonable in their timing, duration or extent.	Satisfies the performance criteria The resultant use of the highway will be no more intensive than currently occurs. There will be minimal detectable increase in noise or emissions due to the reduced setback from adjacent dwellings. The hours of construction will be 7am to 6pm Monday to Saturday and 10am to 6pm on Sundays, unless required in special circumstances.

28.3.2 Noise

Objective	
To ensure that noise emissions do not cause environmental harm and do not have unreasonable impact on residential amenity on land within a residential zone	
Acceptable Solutions	Comment
<p>A1</p> <p>Noise emissions measured at the boundary of a residential zone must not exceed the following:</p> <p>(a) 55 dB(A) (LAeq) between the hours of 7.00 am to 7.00 pm;</p> <p>(b) 5dB(A) above the background (LA90) level or 40dB(A) (LAeq), whichever is the lower, between the hours of 7.00 pm to 7.00 am;</p> <p>(c) 65dB(A) (LAm_{ax}) at any time.</p> <p>Measurement of noise levels must be in accordance with the methods in the Tasmanian Noise Measurement Procedures Manual, issued by the Director of Environmental Management, including adjustment of noise levels for tonality and impulsiveness.</p> <p>Noise levels are to be averaged over a 15 minute time interval.</p> <p>Relies on performance criteria:</p> <p>P1</p> <p>Noise emissions measured at the boundary of a residential zone must not cause environmental harm within the residential zone.</p>	<p>Satisfies performance criteria</p> <p>The proposed works involve a safety upgrade and while there will be an initial period of construction activity, the ongoing use will be consistent with current impacts. Residents currently experience noise as a result of the use however the acceptable solution and performance criteria do not make allowance for this scenario. To facilitate projects such as this, The Environmental Management and Pollution Control Act 1994 (EMPCA) provides for development of Environmental Protection Policies (EPP) to inform the management of noise emissions from specific development types such as roads. In line with the EPP, State Growth has developed a State Road Noise Strategy supported by the Tasmanian Traffic Noise Management Guidelines to manage traffic noise on State roads. The project will comply with these Guidelines.</p> <p>The Traffic Noise Management Guidelines provides guidance regarding traffic noise mitigation decisions by firstly defining 'eligible scenarios' which are scenarios where noise mitigation will be considered and then defines 'eligible buildings' which are buildings within a scenario for which mitigation will be considered. The Guidelines can be found on Department of State Growth's website: www.transport.tas.gov.au.</p> <p>The Midland Highway Safety Upgrades Mangalore to Bagdad Stage 2 project is defined as a 'safety upgrade' project under the Guidelines. The Guide indicates that safety upgrades are not required to provide noise mitigation.</p> <p>Although the project is not an eligible scenario for noise mitigation, there is a section of the highway from chainage 0 to 2770 which has asphalt surfacing. The asphalt surfacing along this section of the highway will be reinstated where required to ensure noise levels at adjacent eligible buildings immediately following construction do not increase relative to existing levels.</p>

28.3.3 External Lighting

Objective	
To ensure that external lighting (not including street lighting) does not have unreasonable impact on residential amenity on land within a residential zone.	
Acceptable Solutions	Comment
<p>A1</p> <p>External lighting (not including street lighting) within 50 m of a residential zone must comply with all of the following:</p> <p>(a) be turned off between 10:00 pm and 6:00 am, except for security lighting;</p> <p>(b) security lighting must be baffled to ensure they do not cause emission of light outside the zone.</p>	<p>Complies</p> <p>There is existing street lighting along the length of the highway, primarily at side road junctions. The purpose of the street lighting is to minimise the potential for crashes during hours of darkness or poor visibility. For this reason it is necessary for the street lights to operate between 6:00pm and 8:00am. Where widening of the highway will impact on an existing street light, the light pole will be relocated clear of the highway. New street lights may be installed as part of the highway upgrade works to ensure that appropriate illumination is provided. Where these street lights are located in close proximity to residential dwellings, baffles will be provided to ensure compliance with Australian Standard AS1158.</p>

28.3.5 Discretionary use

Objective	
To ensure that uses not directly associated with a utility do not compromise the use of that land for utility purposes	
Acceptable Solutions	Comment
<p>A1 No acceptable solution</p> <p>Relies on performance criteria:</p> <p>P1</p> <p>Discretionary use must not compromise or reduce the operational efficiency of an existing or intended utility having regard to all of the following:</p> <p>(a) the compatibility of the utility and the proposed use;</p> <p>(b) the location of the proposed use in relation to the utility;</p> <p>(c) any required buffers or setbacks;</p> <p>(d) access requirements.</p>	<p>Satisfies performance criteria</p> <p>The use is directly associated with the utility and will not compromise its operation.</p>

Development Standards

There are no development standards relevant to the current proposal.

8.10 Demolition of dwelling at 1192 Midland Highway

Demolition of this dwelling and associated buildings is assessed against the following:

- a) the purpose of the applicable zone;
- b) any relevant local area objective or desired future character statement of the applicable zone;
- c) the purpose of any applicable code; and
- d) the purpose of any applicable specific area plan.”

The dwelling is located within the Rural Resource zone. The proposed highway upgrade is consistent with the purpose of the zone as demonstrated in Section 8.7 of this report. It will facilitate the continuation of rural activities and ensure safe and suitable access is available for residents in the area. The demolition of this dwelling is essential for widening of the Highway to incorporate the 3.0 m central turn median and 2.0 m wide sealed shoulders. The land is already isolated from, and incapable of, any potential agricultural use. There are no relevant local area objectives, desired future character statements or specific area plans. The site was previously used for mechanical repairs and the potential for contamination from this use and asbestos will be assessed prior to demolition (refer to Section 8.12).

The proposed demolition is consistent with the requirements of the scheme and subject to assessment of potential contamination hazard can be undertaken with no unreasonable environmental risk.

8.11 Overlays

The highway alignment is affected by the Waterway and Coastal Areas overlay and adjoins land within a heritage precinct as shown in Figure 13. The northern section of the highway is located close to areas identified as Landslip Hazard Area.

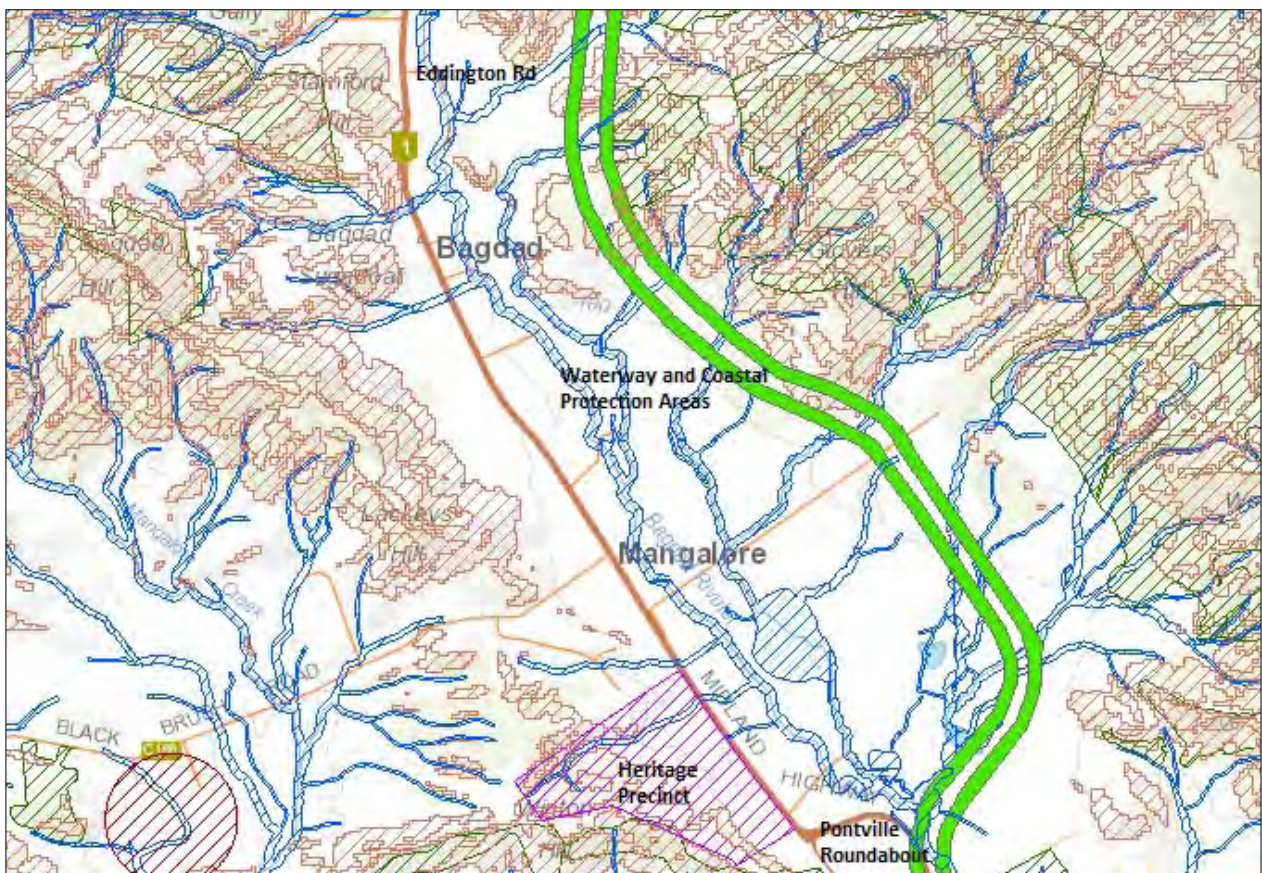


FIGURE 13: PLANNING SCHEME OVERLAY MAP

8.12 Codes

Within the Planning Scheme, there are a number of codes which relate to the proposed works and use and the applicable overlays. Only those which may have some application to the proposal are considered. These are addressed below and comments provided where applicable.

Code	Comment
E1 Bushfire Hazard Code	Not applicable – the development and use proposed is not a hazardous or sensitive use.
E2 Potentially Contaminated Land Code	See below
E3 Landslide Code	See below
E5 Road and Railway Assets Code	See below
E6 Parking and Access Code	See below
E7 Stormwater Management Code	See below
E8 Electricity Transmission Infrastructure Protection Code	Not applicable
E9 Attenuation Code	Not applicable
E10 Biodiversity Code	Not applicable - see below
E11 Waterway and Coastal Protection Code	See below
E13 Heritage Code	See below
E14 Scenic Landscapes Code	Not applicable – the land is not within a Scenic Landscape Area or Scenic Landscape Corridor
E15 Inundation Prone Areas Code	Not applicable
E17 Signs Code	Not applicable
E18 Wind and Solar Energy Code	Not applicable
E19 Telecommunications Code	Not applicable
E20 Acid Sulfate Soils Code	Not applicable
E21 Dispersive Soils Code	Not applicable

E2 Potentially Contaminated Land Code

Two sites within the project area have the potential for contamination. These are the former service station at 1172 Midland Highway and the dwelling and associated buildings at 1192 Midland Highway which is alleged to have historically been used for mechanical repairs. A narrow strip of land, 3m wide along the frontage of the service station site will be impacted by the works. The dwelling at 1192 Midland Highway is to be demolished to allow intersection widening and upgrade and to ensure road side safety.

This code applies to:

- (b) development on potentially contaminated land

Given the history of these two sites the provisions of the code are applicable. The following use standard applies.

Objective	
To ensure that potentially contaminated land is suitable for the intended use.	
Acceptable Solutions	Comment
<p>A1</p> <p>The Director, or a person approved by the Director for the purpose of this Code:</p> <p>(a) certifies that the land is suitable for the intended use; or</p> <p>(b) approves a plan to manage contamination and associated risk to human health or the environment that will ensure the land is suitable for the intended use.</p> <p>No assessment or plan has been approved and the proposal relies on performance criteria:</p> <p>P1</p> <p>Land is suitable for the intended use, having regard to:</p> <p>(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or</p> <p>(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or</p> <p>(c) a plan to manage contamination and associated risk to human health or the environment that includes:</p> <p>(i) an environmental site assessment;</p> <p>(ii) any specific remediation and protection measures required to be implemented before any use commences; and</p> <p>(iii) a statement that the land is suitable for the intended use.</p>	<p>Satisfies performance criteria</p> <p>The level of disturbance at the service station site (1172 Midland Highway) is relatively minor and the extent of contamination cannot be readily determined due to the location of the concrete apron on site.</p> <p>Similarly the nature or extent of contamination at 1192 Midland Highway has not been quantified.</p> <p>Given the nature of the proposed use (as road) and the limited potential for risk, it is considered that an assessment and management plan approach is appropriate in this instance. This will ensure all hazards are assessed prior to construction beginning to reduce the potential risks to workers.</p> <p>A methodology for assessing the potential for contamination and the management of potentially contaminated land during construction has been developed and is attached to this report in Appendix D.</p>

The following development standard is applicable to the proposed works.

Objective	
To ensure that works involving excavation of potentially contaminated land does not adversely impact on human health or the environment.	
Acceptable Solutions	Comment
<p>A1</p> <p>There is no acceptable solution and the proposal relies on performance criteria:</p> <p>P1</p> <p>Excavation does not adversely impact on health and the environment, having regard to:</p> <p>(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or</p> <p>(b) a plan to manage contamination and associated risk to human health and the environment that includes:</p> <p>(i) an environmental site assessment;</p>	<p>Satisfies performance criteria</p> <p>A plan to manage contamination and associated risk to human health and the environment will be developed prior to the commencement of works.</p> <p>The proposed methodology for these assessments is attached to this report in Appendix D.</p>

Objective	
To ensure that works involving excavation of potentially contaminated land does not adversely impact on human health or the environment.	
(ii) any specific remediation and protection measures required to be implemented before excavation commences; and	
(iii) a statement that the excavation does not adversely impact on human health or the environment.	

E3 Landslide Code

The only works impacted by this code are the junction improvement works near the Bagdad post office where widening of Quarry Town Road is required to improve turning paths for vehicles. In this area approximately 80m³ of excavation is required to establish a new roadside drain approximately 0.5m deep and the total area of soil disturbance, allowing for topsoil stripping to provide a suitable foundation upon which to construct new granular pavement, is 998m².

This area is mapped as a Low Class hazard area and the code allows for works such as buildings and two lot subdivisions within this area as an exemption to the code. The code defines major works as:

- a) excavation of 100 m³ or more in cut volume;
- b) excavation or soil disturbance of an area of 1,000 m² or more;
- c) clearance of vegetation involving an area of more than 1,000 m²;
- d) water storages or swimming pools with a volume of 45,000 litres or more

The works proposed in this case are not considered to be major works as defined in the code. No use standards apply as no sensitive or hazardous use is proposed. The following development standard applies.

E3.7.1 Buildings and Works, other than Minor Extensions

Objective	
To ensure that landslide risk associated with buildings and works for buildings and works, other than minor extensions, in Landslide Hazard Areas, is:	
(a) acceptable risk; or	
(b) tolerable risk, having regard to the feasibility and effectiveness of measures required to manage the landslide hazard.	
Acceptable Solutions	Comment
A1 No acceptable solution – proposal relies on performance criteria: P1 Buildings and works must satisfy all of the following: (a) no part of the buildings and works is in a High Landslide Hazard Area; (b) the landslide risk associated with the buildings and works is either: (i) acceptable risk; or (ii) capable of feasible and effective treatment through hazard management measures, so as to be tolerable risk.	Satisfies performance criteria No part of the works are located within a High hazard area. The works proposed are relatively minor and will be appropriately battered and stabilized to ensure the potential for landslip is minimised.

E5 Road and Railway Assets Code

This code applies to all use and development and aims to protect the safety and efficiency of the road network and reduce the potential for conflict with sensitive uses. The code does not specifically apply to upgrades of the highway itself, however such works are not excluded.

The code requires the provision of a traffic impact assessment (TIA) which must be considered by Council and the relevant authority when assessing applications relying on performance criteria. There are no applicable development standards (as the application does not propose any uses requiring access to the highway) and no reliance on performance criteria. A TIA is attached to this report at Appendix E.

It is considered that the purpose of the zone is met by the proposed works.

E6 Parking and Access Code

This code applies to all use and development. There are no standards set for utilities and all works will be constructed in accordance with State Growth Design Guidelines to Austroads standards.

All employees associated with the works will be required to park their vehicles in designated areas in accordance with site safety and management requirements.

E7 Stormwater Management Code

This code applies to development requiring management of stormwater and does not apply to use.

The purpose of this code is to ensure that stormwater disposal is managed in a way that furthers the objectives of the State Stormwater Strategy.

E7.7 Development Standards

E7.7.1 Stormwater Drainage and Disposal

Objective	
To ensure that stormwater quality and quantity is managed appropriately	
Acceptable Solutions	Comment
<p>A1</p> <p>Stormwater from new impervious surfaces must be disposed of by gravity to public stormwater infrastructure.</p> <p>Does not comply – relies on performance criteria</p>	<p>Run off from the additional impervious area generated through widening of the highway will be directed into existing drainage lines which connect into the Bagdad Rivulet. As indicated in Section 3.5, due to the size of the existing drainage catchments along the highway, the increase in impervious area is expected to have negligible impact on the performance on the existing drainage system downstream of the highway.</p>
<p>A2</p> <p>A stormwater system for a new <u>development</u> must incorporate water sensitive urban design principles ^{R1} for the treatment and disposal of stormwater if any of the following apply:</p> <p>(a) the size of new impervious area is more than 600 m²;</p> <p>(b) new car parking is provided for more than 6 cars;</p>	<p>The increase in impervious area generated by the highway upgrade is expected to have minimal impact on water quality. Detailed analysis will be undertaken during the detailed design to confirm compliance with the State Stormwater Strategy 2010.</p>

Objective	
To ensure that stormwater quality and quantity is managed appropriately	
Acceptable Solutions	Comment
<p>(c) a <u>subdivision</u> is for more than 5 lots.</p> <p>Does not comply – relies on performance criteria</p>	
<p>A3</p> <p>A <u>minor stormwater drainage system</u> must be designed to comply with all of the following:</p> <p>(a) be able to accommodate a storm with an <u>ARI</u> of 20 years in the case of non-industrial zoned land and an <u>ARI</u> of 50 years in the case of industrial zoned land, when the land serviced by the system is fully developed;</p> <p>(b) stormwater runoff will be no greater than pre-existing runoff or any increase can be accommodated within existing or upgraded public stormwater infrastructure.</p>	Complies – refer Section 3.5.
<p>A4</p> <p>A <u>major stormwater drainage system</u> must be designed to accommodate a storm with an <u>ARI</u> of 100 years.</p>	Complies – no new major transverse drainage systems will be installed as part of the upgrade works. Existing major drainage systems will be upgraded as outlined in Section 3.5.

E10 Biodiversity Code

The purpose of this code is to conserve threatened flora and fauna and their habitats and protect other biodiversity values identified by local, state and Commonwealth agencies.

E10.2.1 of the Planning Scheme states that this code applies to development involving clearance and conversion or disturbance of native vegetation within a Biodiversity Protection Area. No mapped Biodiversity Protection Areas are present with the area impacted by the works. The potential for impacts on flora, fauna and other conservation values is assessed in Section 4.2 of this report. The alignment generally avoids habitat and known records of threatened plants. The location and numbers of threatened plants is outlined in Section 4.2.1 and shown on the attached plans. A permit will be required to take any threatened plants and final numbers will need to be determined in the field when final alignments are approved.

E11 Waterway and Coastal Protection Code

This code applies to development within the Waterway and Coastal Protection Area as indicated on the overlay map extract in Figure 13. Five east-west flowing tributaries or drainage lines are within the area of works and ultimately drain towards the Bagdad Rivulet. Only the most northerly of these contains any significant vegetation and flows into what could be the original or natural drainage line. The others are sparsely vegetated and have largely been modified into straight channels, connecting with more natural drainage lines on the western side of the highway. The most southern area of the overlay, which terminates at the highway, passes over what appears to be a dwelling and outbuildings.

The purpose of this provision is to manage vegetation and soil disturbance in the vicinity of wetlands, watercourses and the coastline in order to:

- a) minimise impact on water quality, natural values including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands and lakes;
- b) minimise impact on coastal and foreshore values, native littoral vegetation, natural coastal processes and the natural ecological function of the coast;
- c) Not applicable.
- d) Not applicable.

The following development standards are relevant to the proposal:

E11.7.1 Buildings and works

Objective	
To ensure that buildings and works in proximity to a waterway, the coast, identified climate change refugia and potable water supply areas will not have an unnecessary or unacceptable impact on natural values	
Acceptable Solutions	Comment
<p>A1 Building and works within a Waterway and Coastal Protection Area must be within a building area on a plan of subdivision approved under this planning scheme.</p> <p>No building area is applicable and the proposal relies on performance criteria: P1 Building and works within a Waterway and Coastal Protection Area must satisfy all of the following:</p> <ul style="list-style-type: none"> (a) avoid or mitigate impact on natural values; (b) mitigate and manage adverse erosion, sedimentation and runoff impacts on natural values; (c) avoid or mitigate impacts on riparian or littoral vegetation; (d) maintain natural streambank and streambed condition, (where it exists); (e) maintain in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation; (f) avoid significantly impeding natural flow and drainage; (g) maintain fish passage (where applicable); (h) avoid landfilling of wetlands; (i) works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided. 	<p>Complies with performance criteria</p> <p>No building area is applicable to the proposed works which are located relative to the existing highway. No significant riparian vegetation is present within the areas mapped in this overlay and any clearing will be limited to that required for the works and appropriate safety clearances. No riparian vegetation or habitat values were identified in the flora and fauna assessment. All existing pipes or culverts will be maintained or extended as required. No impediment to fish passage or natural flows will be introduced as a consequence of earthworks, fill placement or site discharges.</p> <p>State Growth requires that the contractors' construction methodology and management of potential environmental impacts be guided by the following documents:</p> <ul style="list-style-type: none"> • DPIPWE Wetlands and Waterways Works Manual; • A Soil and Water Management Plan • A Site Rehabilitation Plan (that the contractor must submit for Department approval within three months of commencement of construction). <p>This ensures compliance with this performance criteria.</p>
<p>A4 Development must involve no new stormwater point discharge into a watercourse, wetland or lake.</p>	<p>Complies with performance criteria. No new discharge points are proposed.</p>

E13 Local Historic Heritage Code

The purpose of this overlay is to recognise and protect significant cultural heritage by regulating development that may impact on heritage values, features and characteristics. The wider locality includes a heritage precinct and a number of individually listed properties, however only two properties are impacted by the proposal. These are:

- 1546 Midland Highway, Sayes Court
- 11 Eddington Rd, a timber dwelling.

Both of these properties are subject to the acquisition of a narrow strip of land at the highway frontage. No impacts to the buildings are proposed and exemptions have been granted by THC.

Cornelian Hill at 1358 Midlands Highway has a sandstone entrance feature which is currently located partly within the road reservation and will have to be relocated. The Austral report states “a new entrance was created at the southern end of the property, running parallel and to the east of the current highway. Sandstone gates of fairly recent construction mark the current entrance”. This feature is not original and as such is not considered to be part of the protected heritage values on site. Notwithstanding this the relocation of the structure will involve the Cornelian Hill site and an exemption has been granted for the works.

The relevant development standards are discussed in the following sections.

E13.7 Development Standards for Heritage Places

E13.7.2 Buildings and works other than demolition

Objective	
<p>To ensure that development at a heritage place is:</p> <p>(a) undertaken in a sympathetic manner which does not cause loss of historic cultural heritage significance; and</p> <p>(b) designed to be subservient to the historic cultural heritage values of the place and responsive to its dominant characteristics</p>	
Acceptable Solutions	Comment
<p>A1 No acceptable solution provided – relies on performance criteria</p> <p>P1 Development must not result in any of the following: (a) loss of historic cultural heritage significance to the place through incompatible design, including in height, scale, bulk, form, fenestration, siting, materials, colours and finishes; (b) substantial diminution of the historic cultural heritage significance of the place through loss of significant streetscape elements including plants, trees, fences, walls, paths, outbuildings and other items that contribute to the significance of the place.</p>	<p>The proposed works require the acquisition of land at the western frontage of two listed properties. The area affected in both cases is located a considerable distance from the significant buildings on site. A third property, Cornelian Hill, has a recently built feature which will be relocated from the road reserve to the inside of the property. As discussed in this report, none of the works involving heritage listed properties will impact on the significance of those sites.</p> <p>With regard to landscape elements, the heritage assessment determined that potential impacts at Sayes Court relate primarily to the hawthorn hedgerow along the southern side of the entrance drive to the dwelling. Replanting was recommended if possible. At 11 Eddington Road the row of eucalypts on the highway frontage are relatively recent plantings and while not of particular heritage significance they do provide screening for the dwelling. These are required to be removed and replacement planting will be undertaken. The area of the entry feature at Cornelian Hill is largely cleared of vegetation and will not impact landscape features at this site.</p>
A2 – A4	Not applicable – no development or buildings proposed

<p>Objective</p> <p>To ensure that development at a heritage place is:</p> <p>(a) undertaken in a sympathetic manner which does not cause loss of historic cultural heritage significance; and</p> <p>(b) designed to be subservient to the historic cultural heritage values of the place and responsive to its dominant characteristics</p>	
Acceptable Solutions	Comment
No acceptable solution provided – relies on performance criteria	
<p>A5</p> <p>New front fences and gates must accord with original design, based on photographic, archaeological or other historical evidence</p>	<p>No significant gates or fence features will be impacted by the works. All fences and gates will be reinstated in a form consistent with the current structures. The entry at Cornelian Hill is not original and can be relocated without any impacts on the heritage significance of the site.</p>

8.13 Specific Area Plans

No specific area plans are relevant to the proposed works.

9. Other Planning Provisions

9.1 State Policies

State policies have been prepared in relation to coastal protection, protection of agricultural land and water quality management. The site of the works is not within a coastal location and is not located on prime agricultural land. The policies related to the coast and agricultural land are not applicable.

The purpose of the State Policy on Water Quality Management is to achieve the sustainable management of Tasmania's surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of Tasmania's Resource Management and Planning System. No use of groundwater or point source water discharges are proposed. The proposed road works have limited potential for any impacts on surface or ground waters. Drainage patterns will be maintained and enhanced through the provision of appropriate discharge systems. State Growth contractors are required to prepare Construction and Environmental Management Plans, including erosion and control plans, which is considered to be consistent with the purpose of the policy.

10. Conclusion

The Midland Highway Mangalore to Bagdad Safety Upgrades Project (Stage 2) is a component of the Midland Highway Upgrade Program.

The project is located predominantly within the Utilities zone with minor extensions into the Rural Resources, Rural Living and Significant Agricultural zones. The development is classed as Utilities, which is a Permitted use class within the Utilities zone but a discretionary use in the other impacted zones. The proposed works comply with the intent and standards applicable to each zone as outlined in Part D of the scheme.

Three overlays impact the area of works, relating to landslide hazard, and the protection of waterways and heritage areas. The ecological values within the upgrade area have been assessed and it is considered that there will be no significant impact to riparian vegetation or aquatic values as a consequence of the works. The adoption of best practice soil and erosion management techniques will ensure water quality is not detrimentally impacted during construction.

Heritage assessments were prepared in relation to heritage listed places and precincts as well as tree plantings of heritage value. The only impacts to heritage listed properties is the acquisition of a narrow strip of land along the highway frontage. This will not impact on the heritage values of the listed properties.

In addition to codes related to overlays, the proposed works have been assessed against other relevant codes within the scheme. The proposed works comply with all relevant code requirements.

This report includes specialist studies as attachments to provide an environmental and heritage context for Council.

It is considered that the proposed road works meet the relevant provisions of the Scheme as discussed and are recommended for approval.

Appendix A.

Hydraulic Assessment

Appendix B.

Exemptions from Tasmanian Heritage Council

Appendix C.

Historic Heritage Assessments and Historic Plantings Heritage Assessments

(Stage 2 reports cover whole alignment; Stage 1 reports include section from School Rd to Eddington Rd)

Appendix D.

Contaminated land assessment methodology

Appendix E.

Traffic Impact Assessment



Department of State Growth

GPO Box 536

Hobart TAS 7001 Australia

Phone: 1800 030 688

Email: info@stategrowth.tas.gov.au

Web: www.stategrowth.tas.gov.au



MIDLAND HIGHWAY (A0087)

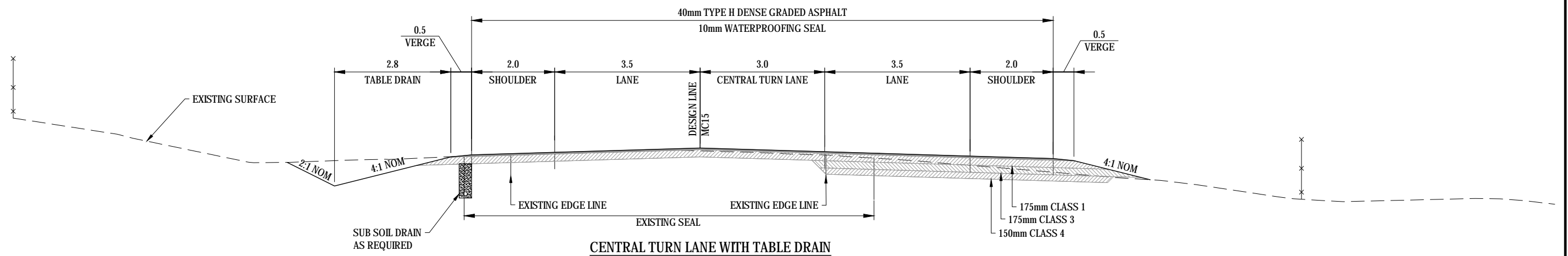
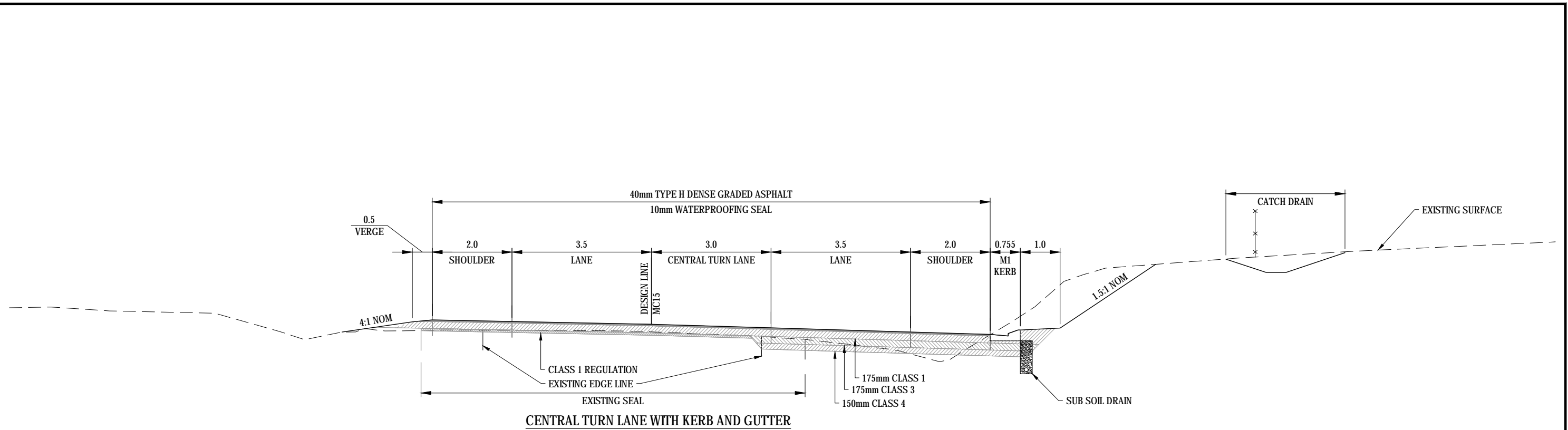
MANGALORE TO BAGDAD SAFETY UPGRADES

STAGE 2

DESIGN



SETOUT REVIEW NAME SIGNED DATE	DESIGNED NAME SIGNED DATE	<small>THESE DRAWINGS HAVE BEEN CHECKED, TAKEN TO SITE AND VERIFIED THAT THEY ARE APPROPRIATE FOR SITE CONDITIONS AND CONSTRAINTS. THE DRAWINGS ARE RECOMMENDED FOR ACCEPTANCE.</small>	<small>I CERTIFY THESE DRAWINGS HAVE BEEN PREPARED IN ACCORDANCE WITH THE BRIEF AND AS DETAILED IN THE FINAL DESIGN REPORT.</small>	Department of State Growth		<small>CONTRACT No.</small> 	<small>DRAWING</small> HB15050-C300	<small>PRINTED DATE</small> 24-Feb-17, 2:34 PM	<small>No. of SHEETS</small> -
STRUCTURAL REVIEW NAME SIGNED DATE	DESIGN REVIEW NAME SIGNED DATE	<small>DESIGN MANAGER (DESIGN ORGANISATION)</small> SIGNED DATE	<small>PRINCIPAL (DESIGN ORGANISATION)</small> SIGNED DATE	<small>THESE DRAWINGS HAVE BEEN PREPARED IN ACCORDANCE WITH THE DESIGN BRIEF AND PROJECT SCOPE. THE DRAWINGS ARE RECOMMENDED FOR ACCEPTANCE.</small>		<small>REGISTRATION NUMBER</small> A0087.001			<small>SHEET No.</small> 300
				<small>PROJECT MANAGER</small> SIGNED DATE	<small>ACCEPTED</small> MANAGER SIGNED DATE	<small>ROAD LINK No.</small> START: 15/0.85 - 15/6.72 FINISH: 15/6.72 - 20/1.75			<small>REVISION</small> -



No.	Amendment Description	Initials	Date
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Height Datum: A.H.D.

DESIGNED

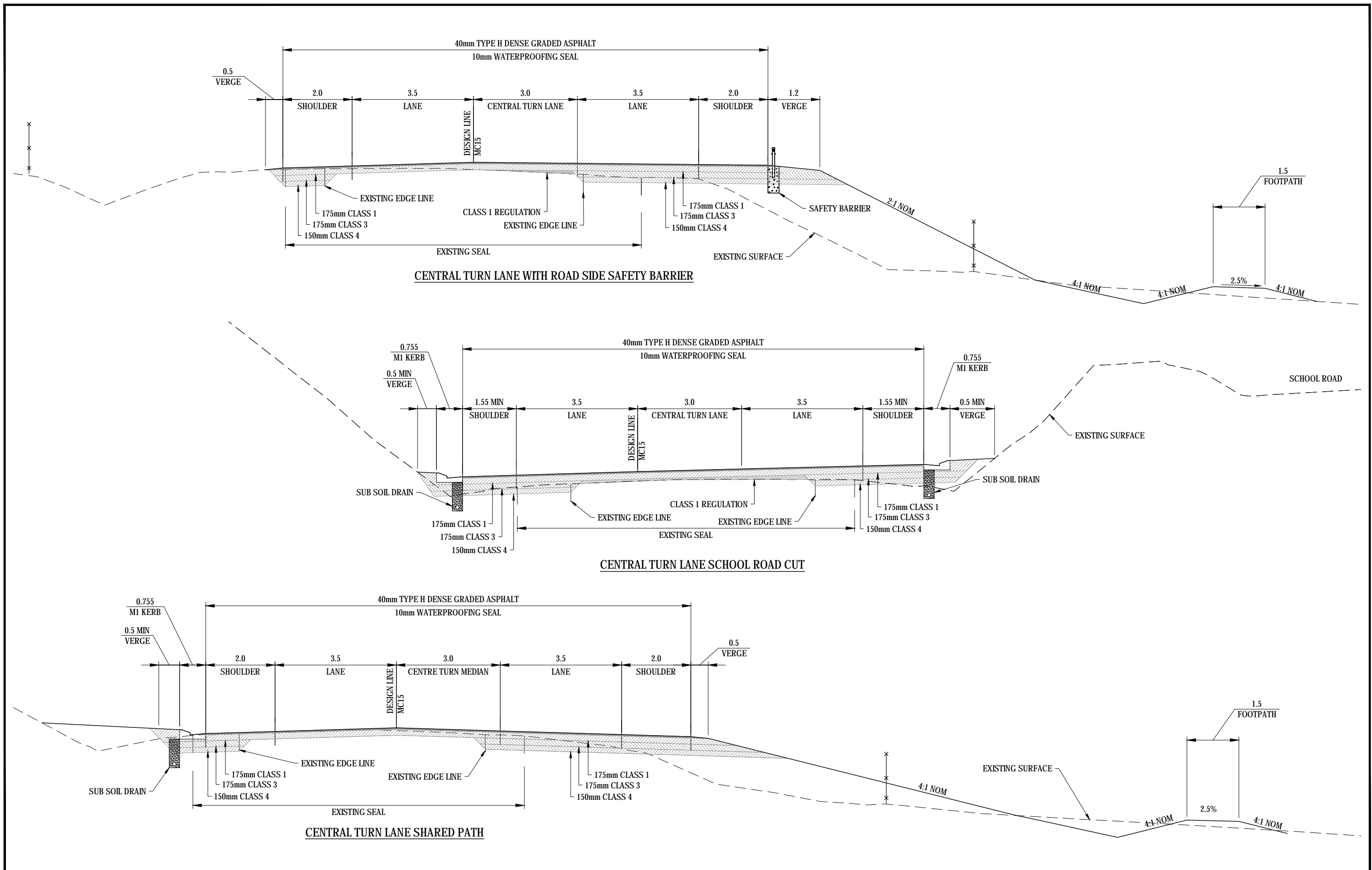
REVIEWED

Department of State Growth

MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

TYPICAL CROSS SECTIONS

CONTRACT No.	DRAWING HB15050-C301	PRINTED DATE 24-Feb-17, 2:34 PM	SHEET No. 301
REGISTRATION NUMBER A0087.030			REVISION



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 DESIGNED
 REVIEWED

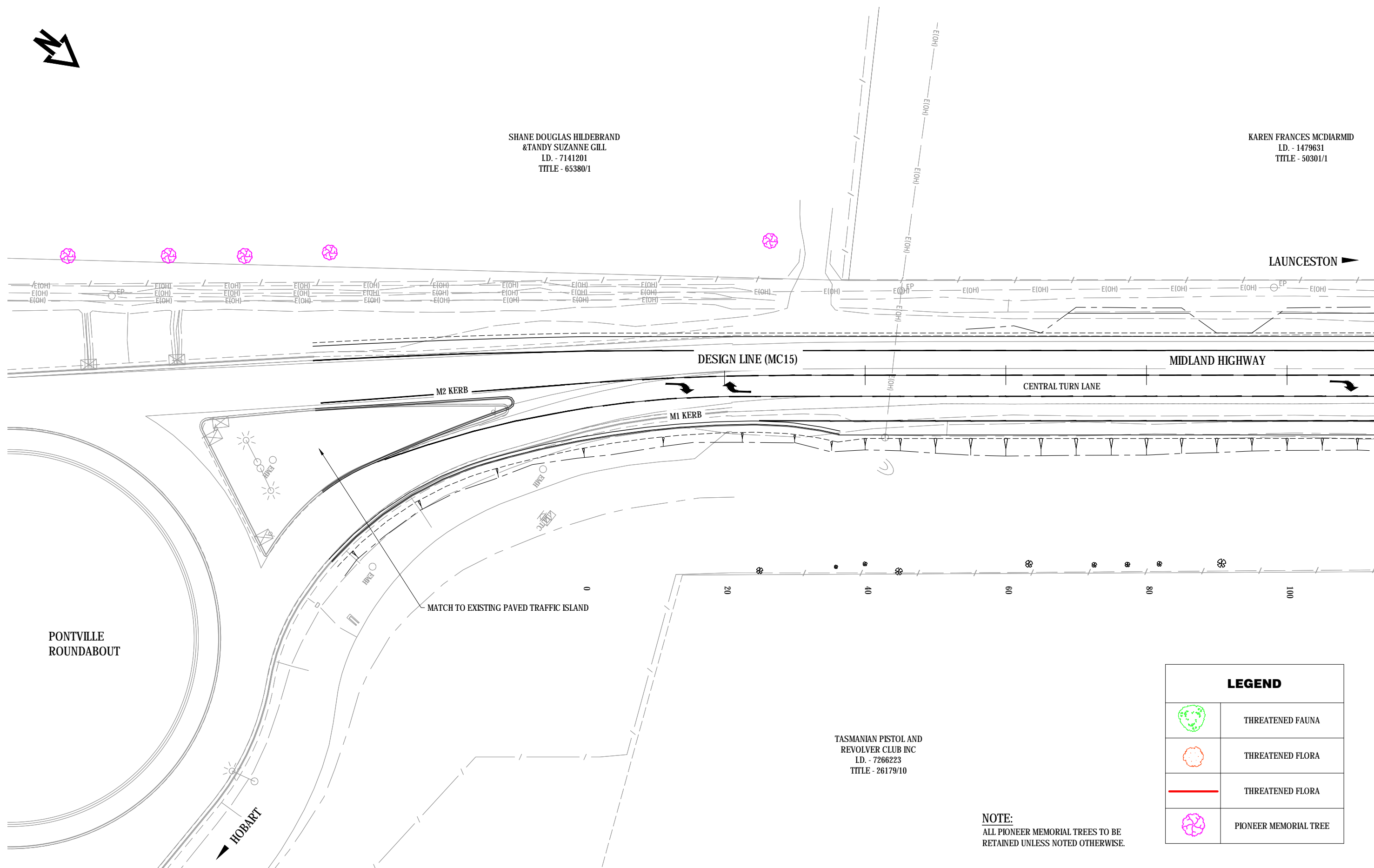
Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 TYPICAL CROSS SECTIONS

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REGISTRATION NUMBER A0087.030			REVISION



SHANE DOUGLAS HILDEBRAND
& TANDY SUZANNE GILL
LD. - 7141201
TITLE - 65380/1

KAREN FRANCES MCDIARMID
LD. - 1479631
TITLE - 50301/1



JOINS - SHEET 312

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

NOTE:
ALL PIONEER MEMORIAL TREES TO BE
RETAINED UNLESS NOTED OTHERWISE.

TASMANIAN PISTOL AND
REVOLVER CLUB INC
LD. - 7266223
TITLE - 26179/10

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

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Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 1 OF 40

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REGISTRATION NUMBER A0087.001			REVISION -



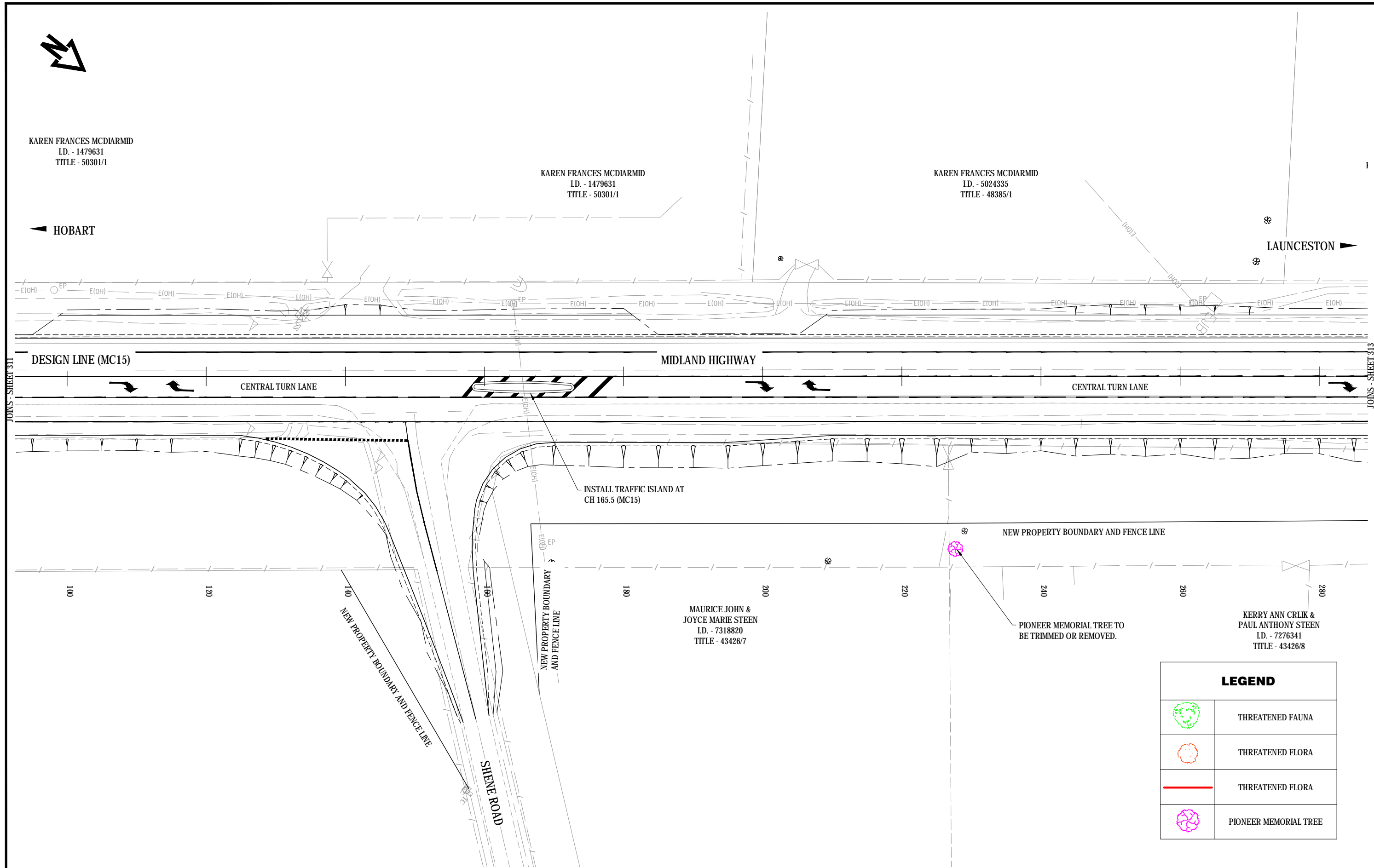
KAREN FRANCES MCDIARMID
 LD. - 1479631
 TITLE - 50301/1

HOBBART

KAREN FRANCES MCDIARMID
 LD. - 1479631
 TITLE - 50301/1

KAREN FRANCES MCDIARMID
 LD. - 5024335
 TITLE - 48385/1

LAUNCESTON



JOINS - SHEET 311

JOINS - SHEET 313

DESIGN LINE (MC15)

MIDLAND HIGHWAY

CENTRAL TURN LANE

CENTRAL TURN LANE

INSTALL TRAFFIC ISLAND AT
 CH 165.5 (MC15)

NEW PROPERTY BOUNDARY AND FENCE LINE

100

120

140

160

180

200

220

240

260

280

NEW PROPERTY BOUNDARY AND FENCE LINE

NEW PROPERTY BOUNDARY AND FENCE LINE

SHENE ROAD

MAURICE JOHN &
 JOYCE MARIE STEEN
 LD. - 7318820
 TITLE - 43426/7

PIONEER MEMORIAL TREE TO
 BE TRIMMED OR REMOVED.

KERRY ANN CRLIK &
 PAUL ANTHONY STEEN
 LD. - 7276341
 TITLE - 43426/8

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

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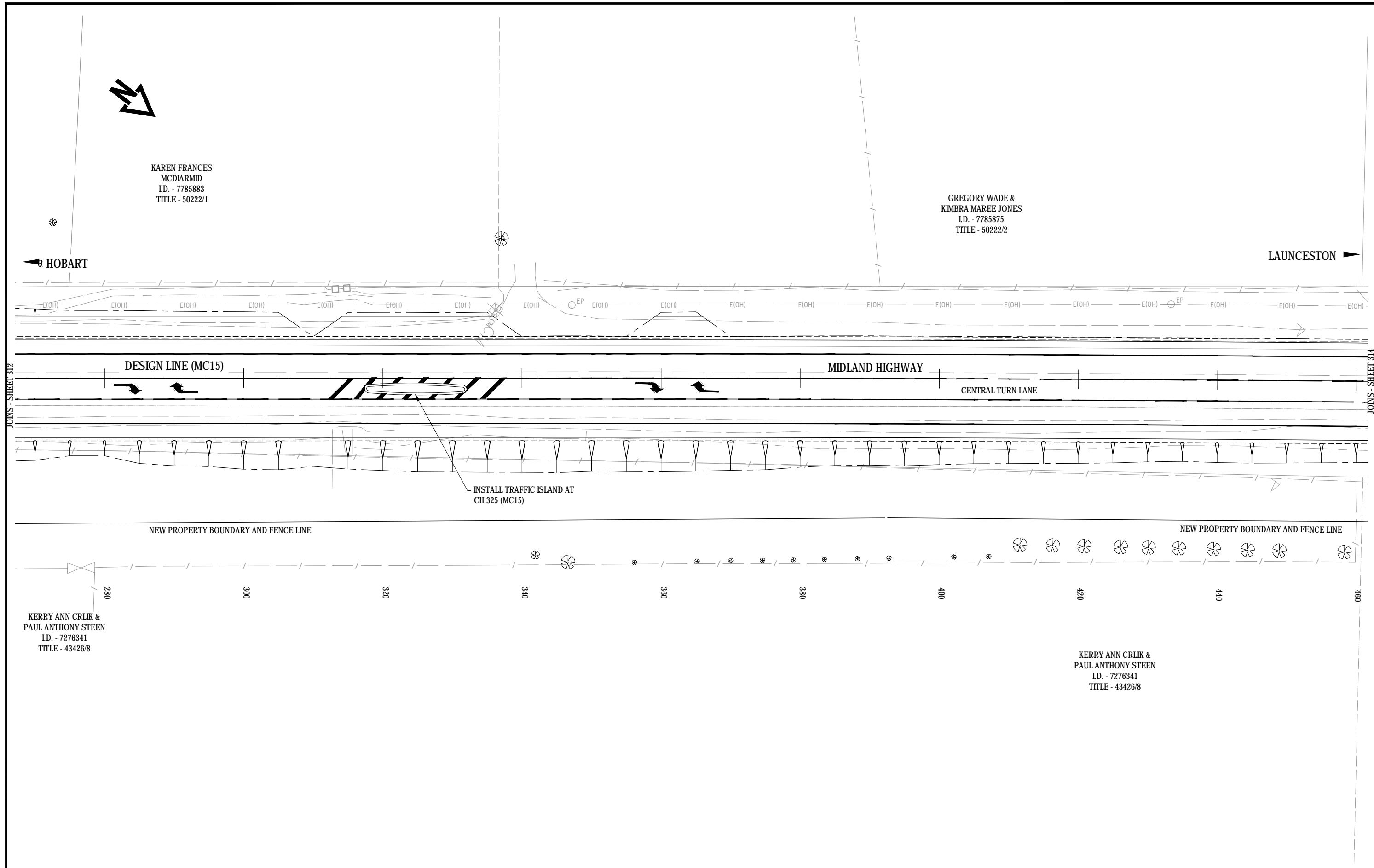
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DESIGNED: F. SHADWICK
 REVIEWED: R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 2 OF 40

CONTRACT No.	DRAWING HB15050-C312	PRINTED DATE 24-Feb-17, 2:35 PM	SHEET No. 312
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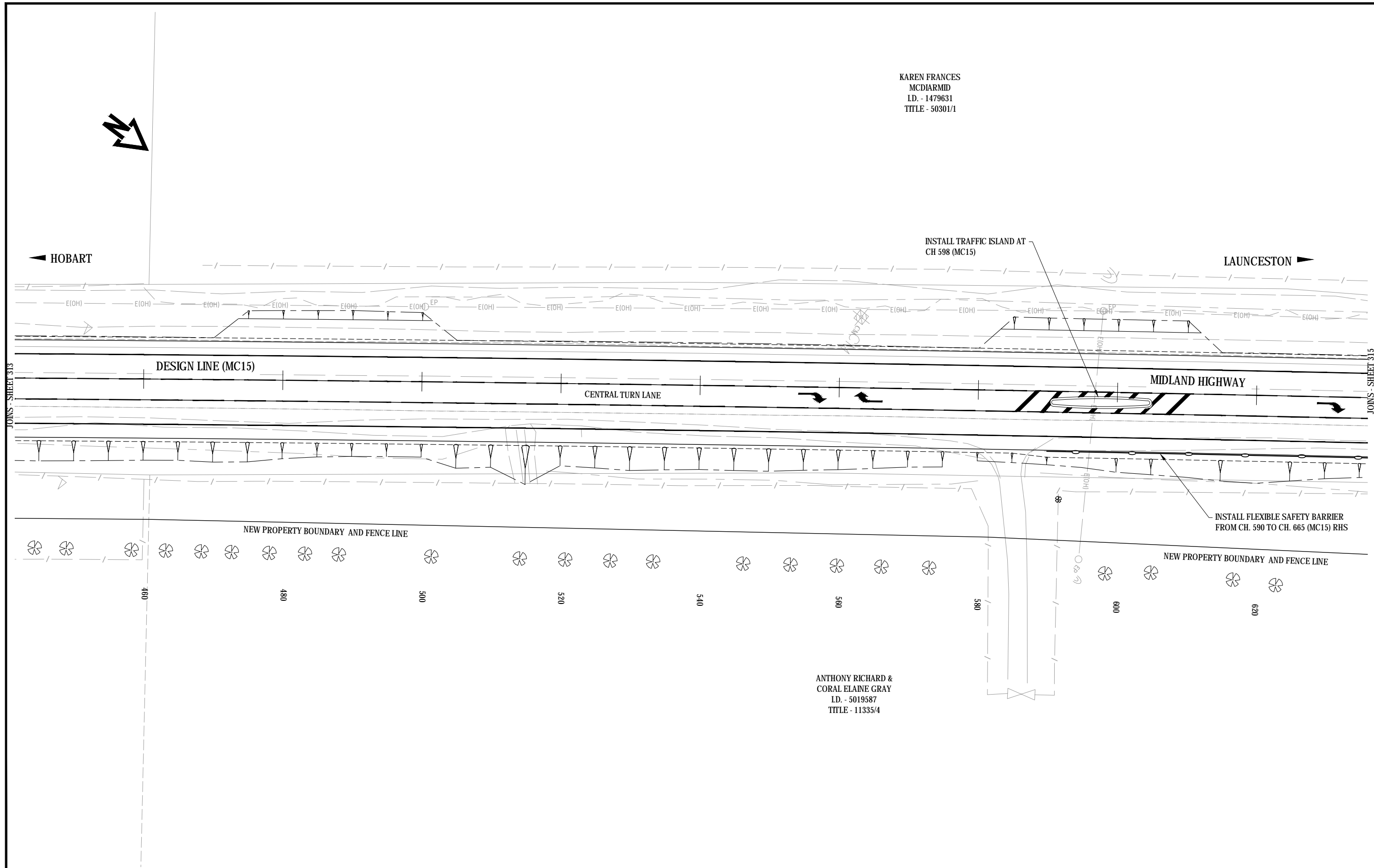
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DESIGNED: F. SHADWICK
 REVIEWED: R. MANNERING

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 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 3 OF 40

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KAREN FRANCES
 MCDIARMID
 LD. - 1479631
 TITLE - 50301/1



ANTHONY RICHARD &
 CORAL ELAINE GRAY
 LD. - 5019587
 TITLE - 11335/4

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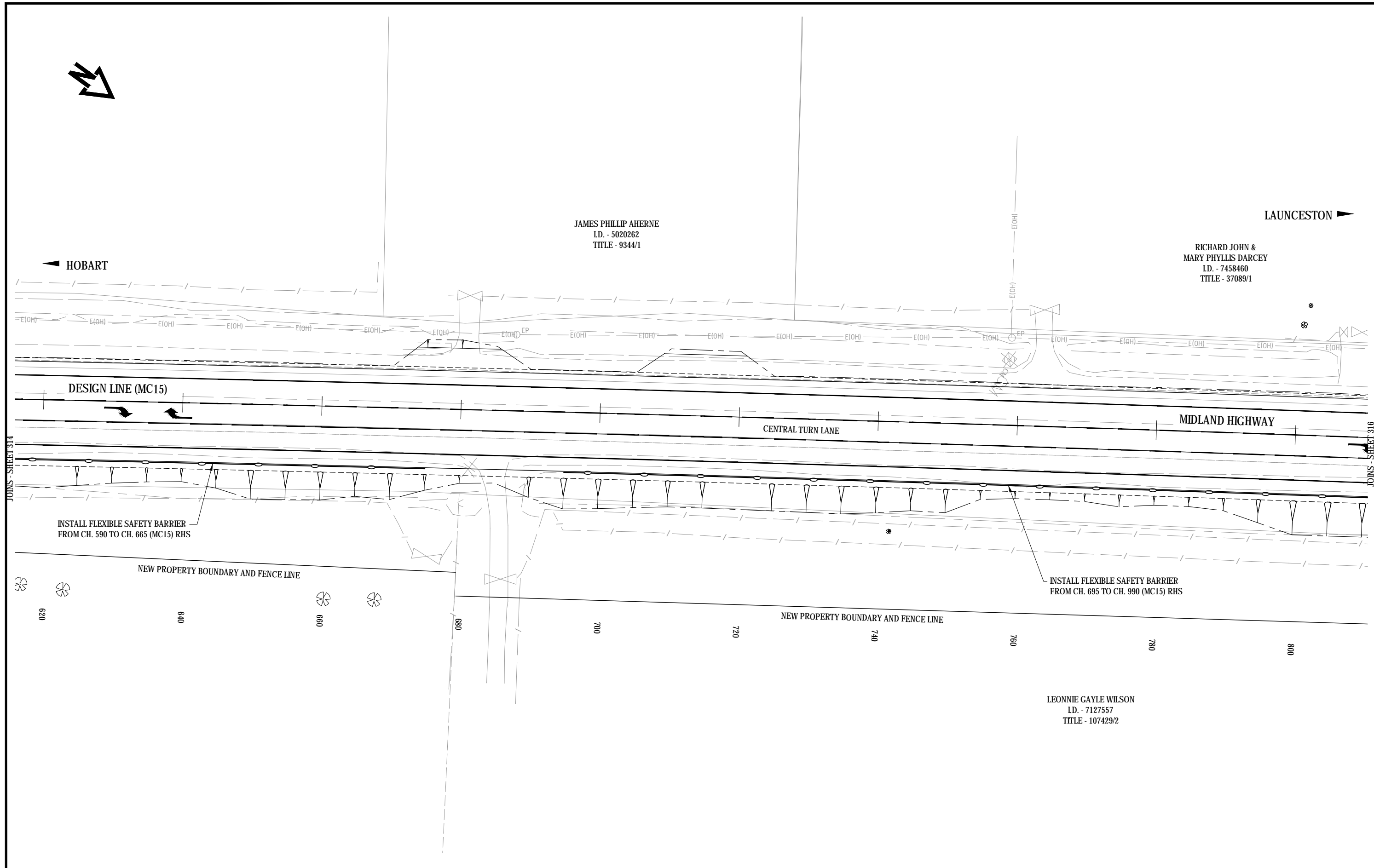
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 Height Datum: A.H.D.

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 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2

GENERAL ARRANGEMENT - DRG 4 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
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REGISTRATION NUMBER			REVISION -
A0087.001			



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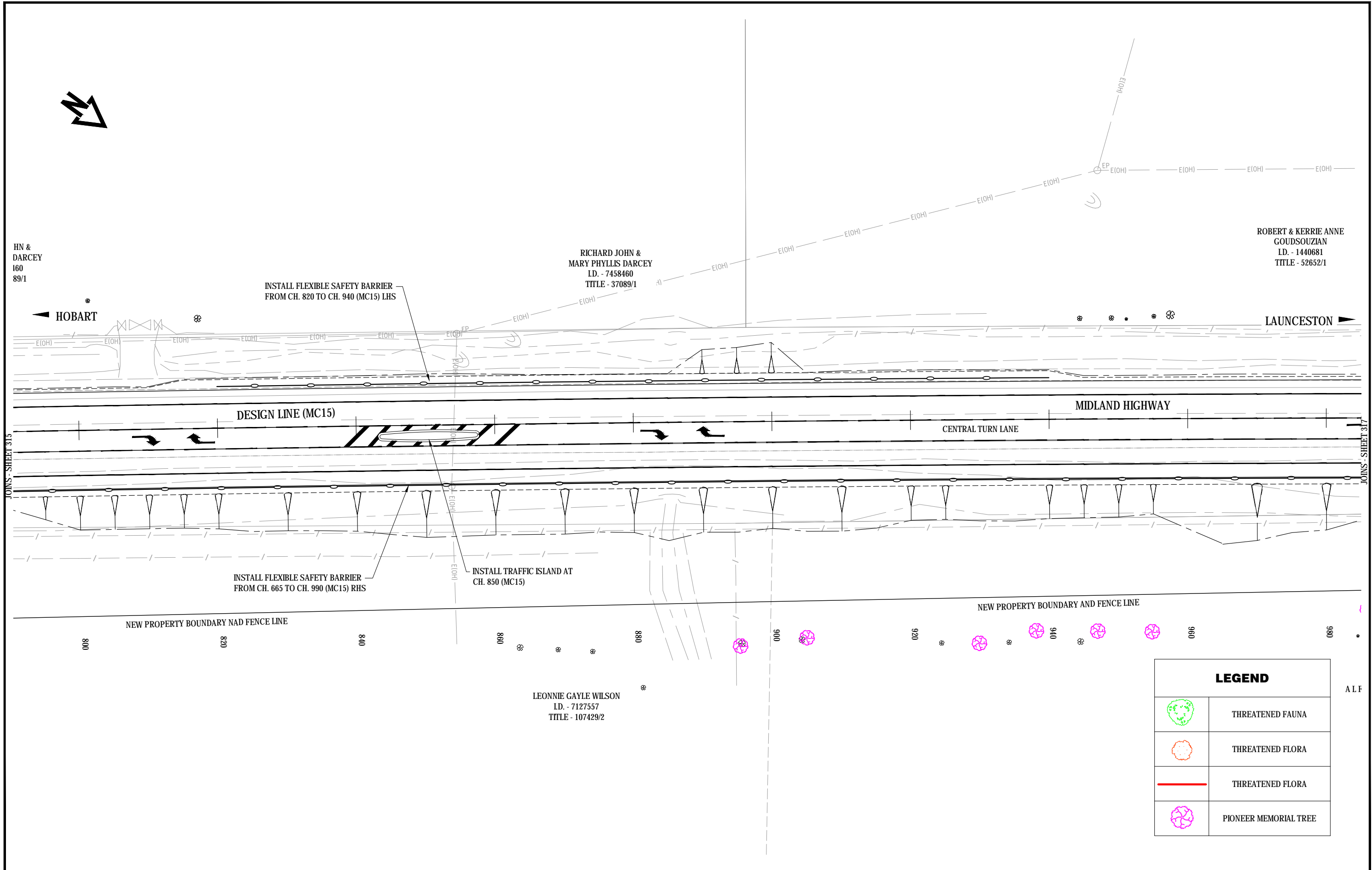
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 Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
 REVIEWED R. MANNERING

Department of State Growth
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 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 5 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	HB15050-C315	24-Feb-17, 2:35 PM	315
REGISTRATION NUMBER			REVISION -
A0087.001			



LEGEND	
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	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
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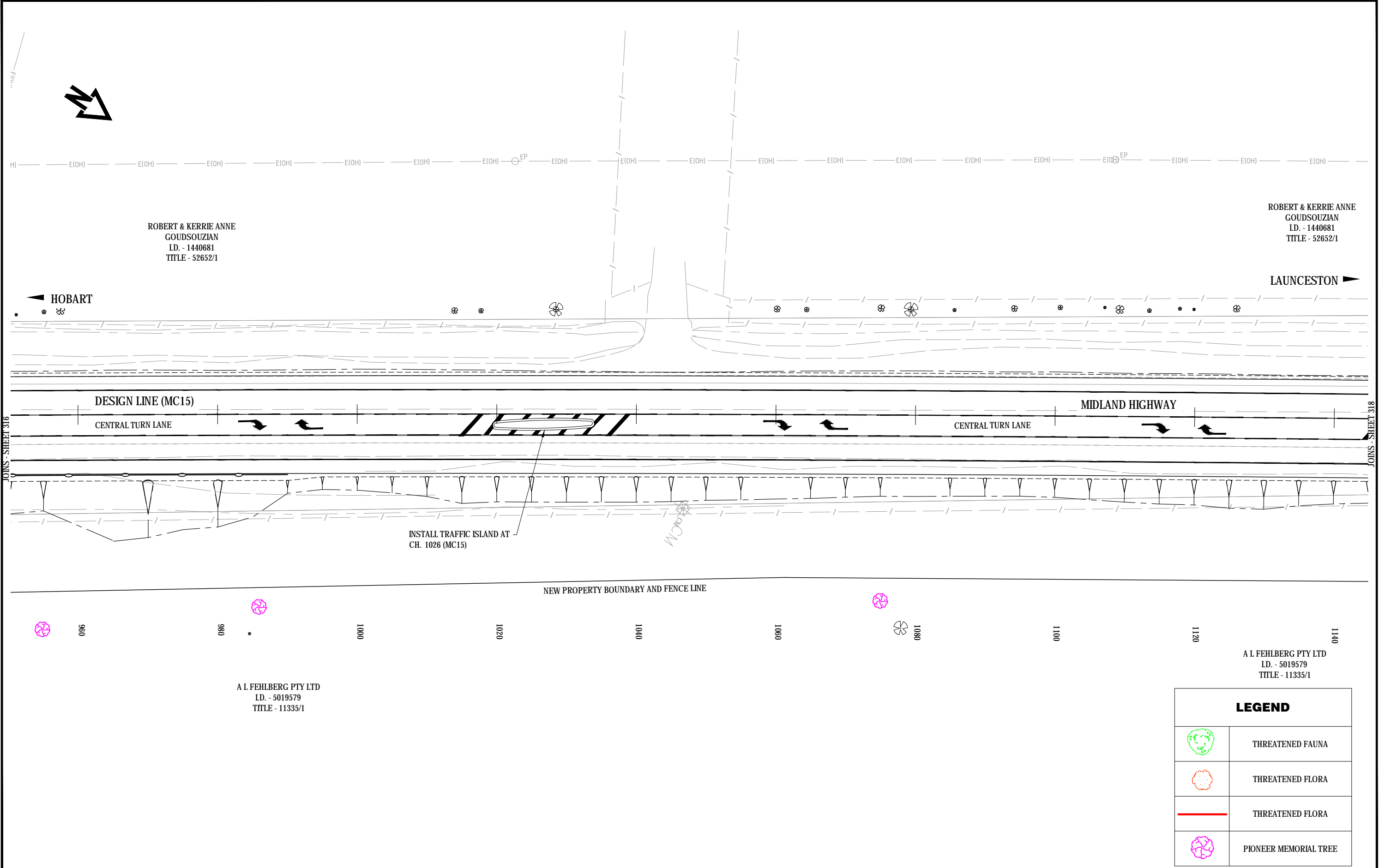
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Co-ordinate System: MGA ZONE 55 **Height Datum:** A.H.D.

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REVIEWED R. MANNERING

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 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 6 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
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REGISTRATION NUMBER			REVISION -
A0087.001			



ROBERT & KERRIE ANNE
GOUDSOUZIAN
I.D. - 1440681
TITLE - 52652/1

ROBERT & KERRIE ANNE
GOUDSOUZIAN
I.D. - 1440681
TITLE - 52652/1

HOBART

LAUNCESTON

DESIGN LINE (MC15)

MIDLAND HIGHWAY

CENTRAL TURN LANE

CENTRAL TURN LANE

INSTALL TRAFFIC ISLAND AT
CH. 1026 (MC15)

NEW PROPERTY BOUNDARY AND FENCE LINE

A L FEHLBERG PTY LTD
I.D. - 5019579
TITLE - 11335/1

A L FEHLBERG PTY LTD
I.D. - 5019579
TITLE - 11335/1

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

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SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

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REVIEWED R. MANNERING

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MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 7 OF 40

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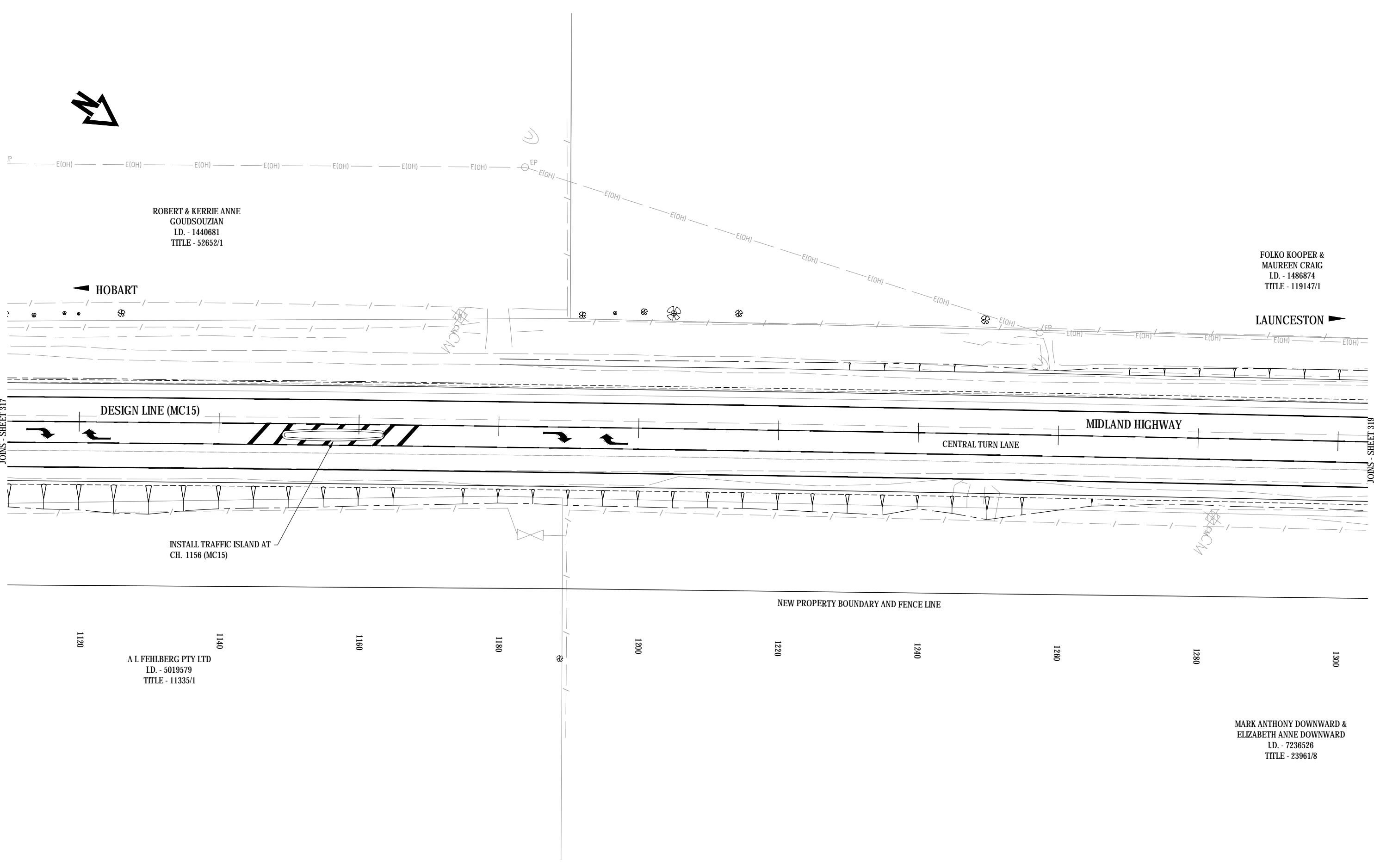


ROBERT & KERRIE ANNE
 GOUDSOUZIAN
 I.D. - 1440681
 TITLE - 52652/1

FOLKO KOOPER &
 MAUREEN CRAIG
 I.D. - 1486874
 TITLE - 119147/1

← HOBART

LAUNCESTON →



A L FEHLBERG PTY LTD
 I.D. - 5019579
 TITLE - 11335/1

MARK ANTHONY DOWNWARD &
 ELIZABETH ANNE DOWNWARD
 I.D. - 7236526
 TITLE - 23961/8

No.	Amendment Description	Initials	Date
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 SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

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 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 8 OF 40

CONTRACT No.	DRAWING HB15050-C318	PRINTED DATE 24-Feb-17, 2:35 PM	SHEET No. 318
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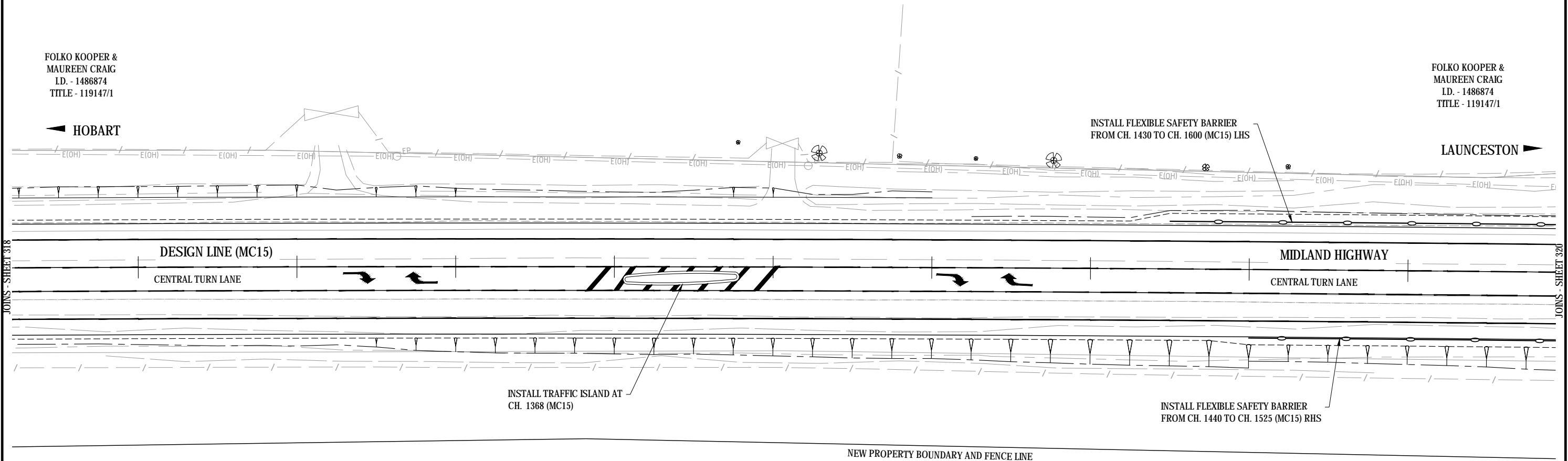


FOLKO KOOPER &
MAUREEN CRAIG
LD. - 1486874
TITLE - 119147/1

FOLKO KOOPER &
MAUREEN CRAIG
LD. - 1486874
TITLE - 119147/1

← HOBART

LAUNCESTON →



1300

1320

1340

1360

1380

1400

1420

1440

1460

MARK ANTHONY DOWNWARD &
ELIZABETH ANNE DOWNWARD
LD. - 7236526
TITLE - 23961/8

MARK ANTHONY DOWNWARD &
ELIZABETH ANNE DOWNWARD
LD. - 7236526
TITLE - 23961/8

JOINS - SHEET 318

JOINS - SHEET 320

No.	Amendment Description	Initials	Date
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SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

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REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 9 OF 40

CONTRACT No. HB15050-C319	DRAWING HB15050-C319	PRINTED DATE 24-Feb-17, 2:36 PM	SHEET No. 319
REGISTRATION NUMBER A0087.001			REVISION -



FOLKO KOOPER &
MAUREEN CRAIG
LD. - 1486874
TITLE - 119147/1

← HOBART

INSTALL FLEXIBLE SAFETY BARRIER
FROM CH. 1430 TO CH. 1600 (MC15) LHS

AUSTROSTIPA SCARBA (100 PLANTS)

JULIE ANNE MILLER
LD. - 7840547
TITLE - 103721/19

INSTALL TRAFFIC ISLAND AT
CH. 1612 (MC15)

AUSTROSTIPA SCARBA (30 PLANTS)

→ LAUNCESTON

DESIGN LINE (MC15)

CENTRAL TURN LANE

MIDLAND HIGHWAY

INSTALL FLEXIBLE SAFETY BARRIER
FROM CH. 1440 TO CH. 1525 (MC15) RHS

INSTALL FLEXIBLE SAFETY BARRIER
FROM CH. 1535 TO CH. 1815 (MC15) RHS

BETTY ETHEL KNIGHT
LD. - 7543315
TITLE - 232558/1

AUSTROSTIPA SCARBA (75 PLANTS)

NEW PROPERTY BOUNDARY AND FENCE LINE

NEW PROPERTY BOUNDARY AND FENCE LINE

1460 1480 1500 1520 1540 1560 1580 1600 1620

ARD &
/ARD

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

BETTY ETHEL KNIGHT
LD. - 7543315
TITLE - 39848/2

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 10 OF 40

CONTRACT No.	DRAWING HB15050-C320	PRINTED DATE 24-Feb-17, 2:36 PM	SHEET No. 320
REGISTRATION NUMBER A0087.001			REVISION -

MALCOLM CH
LD
TITI

SCOTT JOHN PLUMMER &
MICHELLE ANNE PLUMMER
LD. - 7840539
TITLE - 135882/1

LAUNCESTON

SCOTT JOHN PLUMMER &
MICHELLE ANNE PLUMMER
LD. - 7840539
TITLE - 135882/1

HOBART

AUSTROSTIPA SCABRA (30 PLANTS)

DESIGN LINE (MC15)

MIDLAND HIGHWAY

CENTRAL TURN LANE

NEW PROPERTY BOUNDARY AND FENCE LINE

AUSTROSTIPA SCABRA (75 PLANTS)

BETTY ETHEL KNIGHT
LD. - 7543315
TITLE - 232558/1

CALOCEPHALUS CITREUS (1 PLANT)

IAN GREGORY &
SYLVIA TINA BANOVICH
LD. - 5019552
TITLE - 85090/1

INSTALL FLEXIBLE SAFETY BARRIER
FROM CH. 1795 TO CH. 1985 (MC15) RHS

1640

1680

1680

1700

1720

1740





1760

1780

1800

18

LEGEND

	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

SCALES

1:500



Department of State Growth

MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

CONTRACT No.

DRAWING

PRINTED DATE

SHEET No.

HB15050-C321

24-Feb-17, 2:36 PM

321

REGISTRATION NUMBER
A0087.001

REVISION -

No.	Amendment Description	Initials	Date
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Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

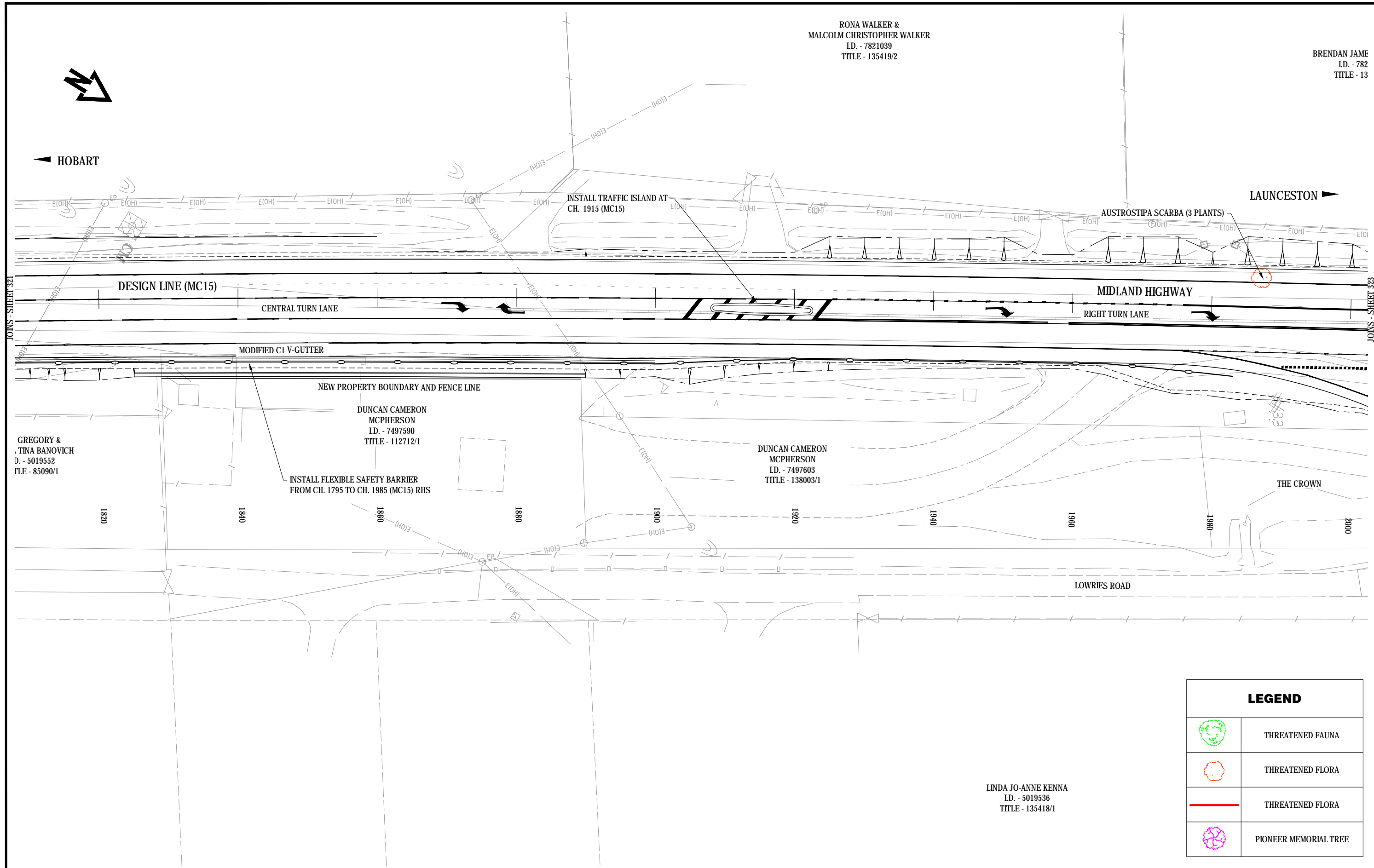
GENERAL ARRANGEMENT - DRG 11 OF 40

RONA WALKER &
MALCOLM CHRISTOPHER WALKER
LD. - 7821039
TITLE - 135419/2

BRENDAN JAME
LD. - 782
TITLE - 13

HOBBART

LAUNCESTON



GREGORY &
TINA BANOVICH
D. - 5019552
TLE - 85090/1

INSTALL FLEXIBLE SAFETY BARRIER
FROM CH. 1795 TO CH. 1985 (MC15) RHS

DUNCAN CAMERON
MCPHERSON
LD. - 7497590
TITLE - 112712/1

DUNCAN CAMERON
MCPHERSON
LD. - 7497603
TITLE - 138003/1

LINDA JO-ANNE KENNA
LD. - 5019536
TITLE - 135418/1

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55
Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 12 OF 40

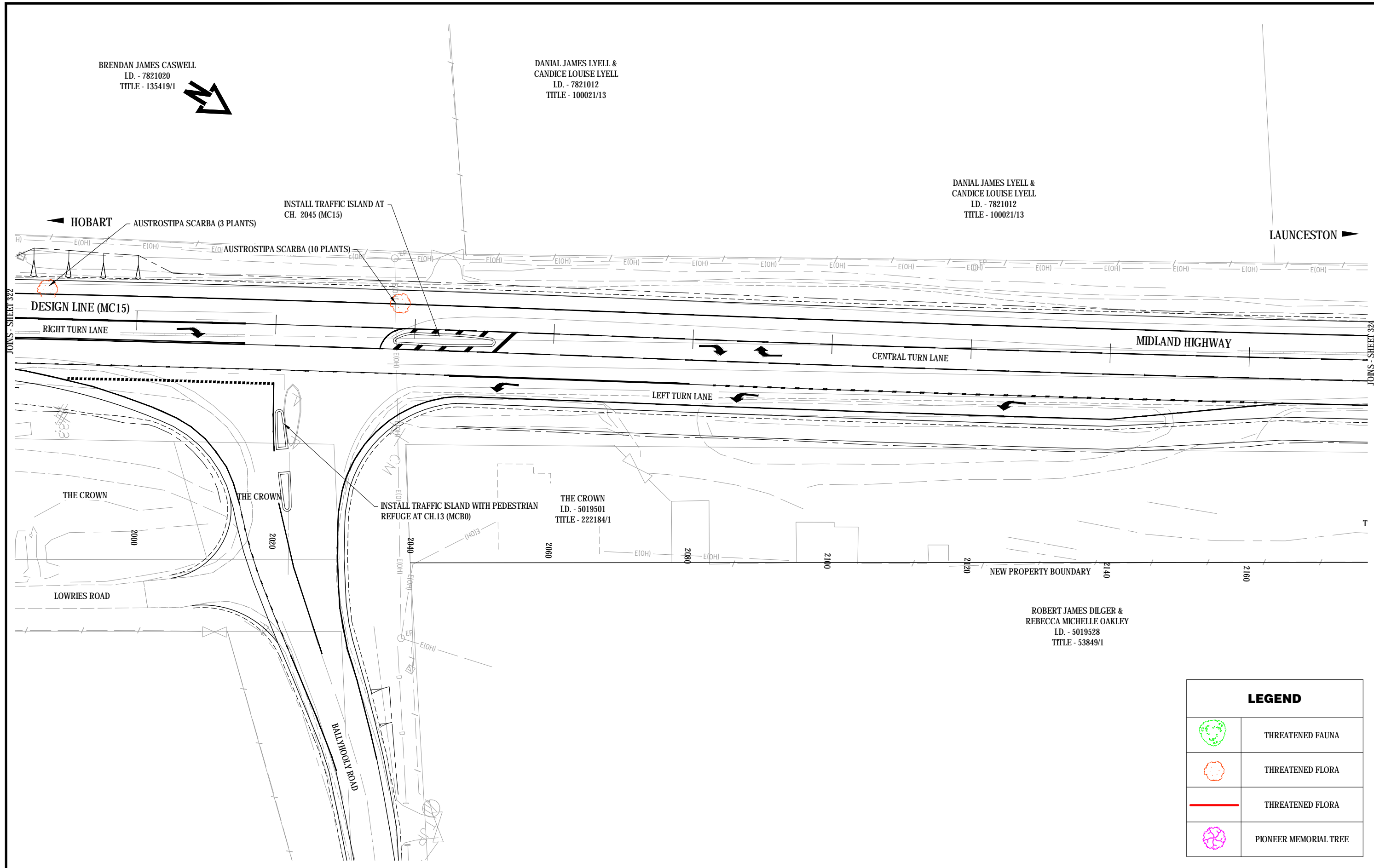
CONTRACT No.	DRAWING HB15050-C322	PRINTED DATE 24-Feb-17, 2:36 PM	SHEET No. 322
REGISTRATION NUMBER A0087.001			REVISION -

BRENDAN JAMES CASWELL
 LD. - 7821020
 TITLE - 135419/1



DANIAL JAMES LYELL &
 CANDICE LOUISE LYELL
 LD. - 7821012
 TITLE - 100021/13

DANIAL JAMES LYELL &
 CANDICE LOUISE LYELL
 LD. - 7821012
 TITLE - 100021/13



JOINS - SHEET 322

JOINS - SHEET 324

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date

SCALES
 1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
 REVIEWED R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2

GENERAL ARRANGEMENT - DRG 13 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	HB15050-C323	24-Feb-17, 2:36 PM	323
REGISTRATION NUMBER			REVISION -
A0087.001			

A3 original This sheet may be prepared using colour and may be incomplete if copied

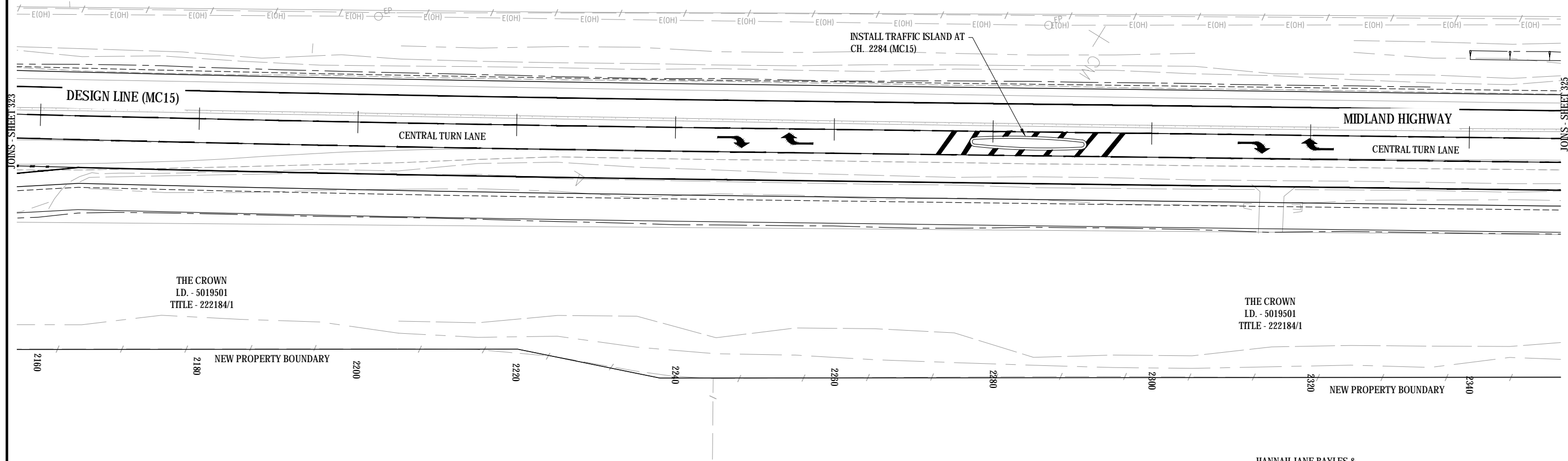


ANDREW MACGREGOR HUME &
TRACEY LEANNE HUME
LD. - 7821012
TITLE - 152936/2

ANDREW MACGREGOR HUME &
TRACEY LEANNE HUME
LD. - 7821012
TITLE - 152936/2

← HOBART

LAUNCESTON →



THE CROWN
LD. - 5019501
TITLE - 222184/1

THE CROWN
LD. - 5019501
TITLE - 222184/1

HANNAH JANE BAYLES &
JAMES JOSEPH THOMAS
LD. - 5019528
TITLE - 53849/1

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1:500

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

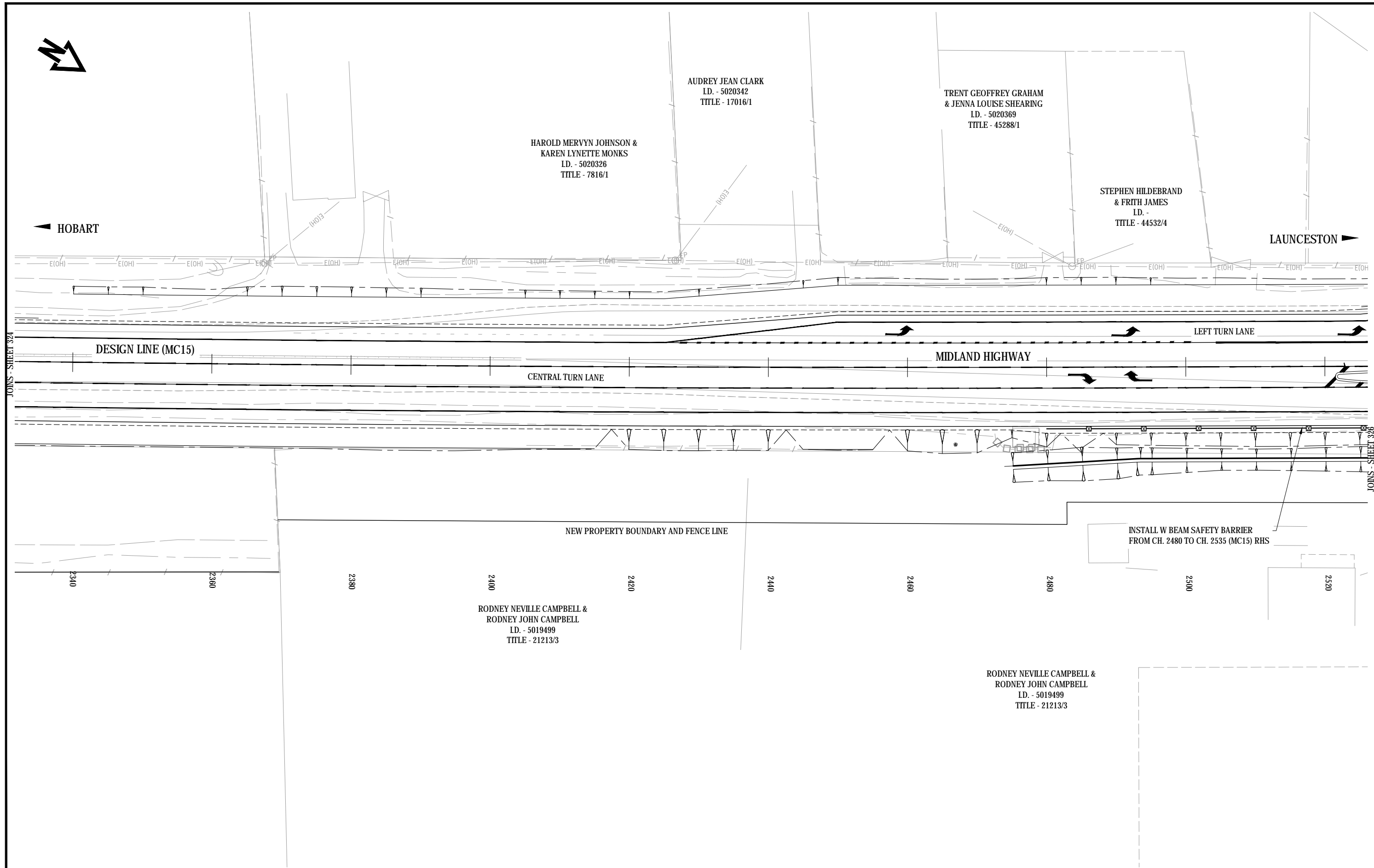
GENERAL ARRANGEMENT - DRG 14 OF 40

CONTRACT No. DRAWING HB15050-C324 PRINTED DATE 24-Feb-17, 2:36 PM

REGISTRATION NUMBER
A0087.001

SHEET No.
324

REVISION -



No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

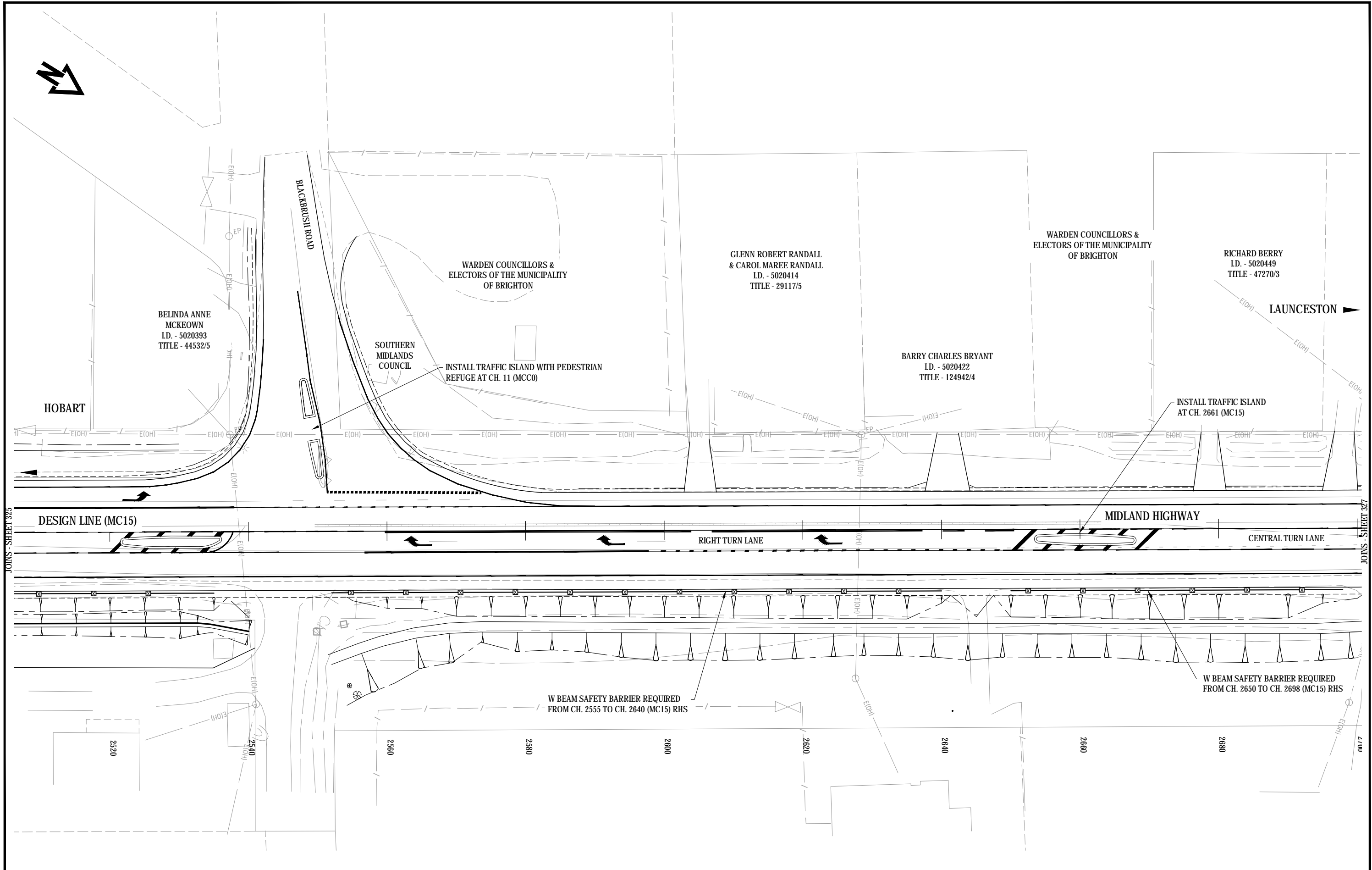
Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 15 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	HB15050-C325	24-Feb-17, 2:36 PM	325
REGISTRATION NUMBER			REVISION -
A0087.001			



No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
 1:500

 SCALE IN METRES - 1500
 Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
 REVIEWED R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 16 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	HB15050-C326	24-Feb-17, 2:36 PM	326
REGISTRATION NUMBER			REVISION -
A0087.001			



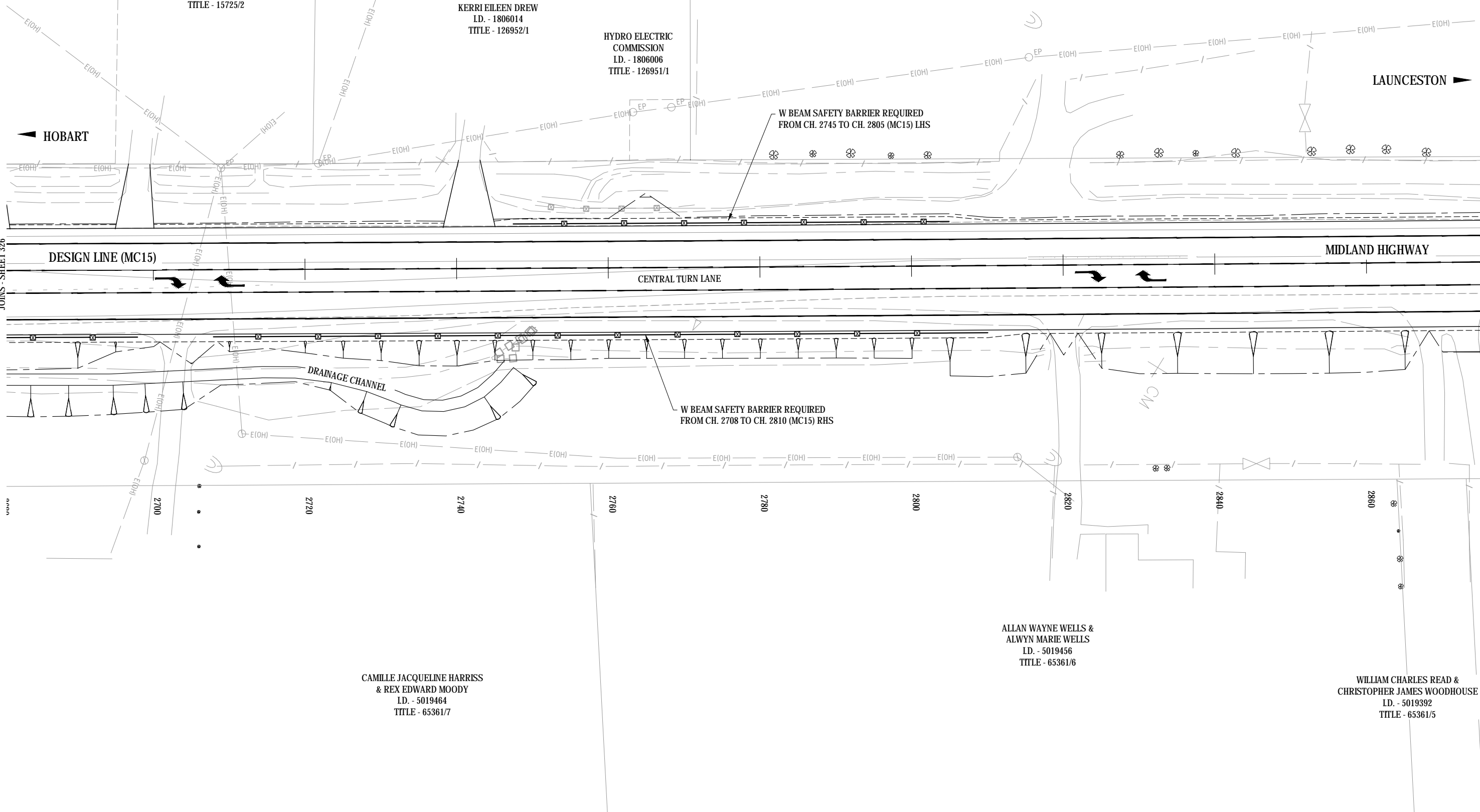
RICHARD BERRY
I.D. - 5020449
TITLE - 47270/3

ALAN JOHN ATCHISON
I.D. - 5020457
TITLE - 15725/2

BERNARD MARTIN DREW &
KERRI EILEEN DREW
I.D. - 1806014
TITLE - 126952/1

HYDRO ELECTRIC
COMMISSION
I.D. - 1806006
TITLE - 126951/1

WILLIAM PAUL ANDERSON &
JILLIAN NANCY ANDERSON
I.D. - 5020473
TITLE - 42470/1



HOBBART

LAUNCESTON

DESIGN LINE (MC15)

MIDLAND HIGHWAY

CENTRAL TURN LANE

DRAINAGE CHANNEL

W BEAM SAFETY BARRIER REQUIRED
FROM CH. 2708 TO CH. 2810 (MC15) RHS

W BEAM SAFETY BARRIER REQUIRED
FROM CH. 2745 TO CH. 2805 (MC15) LHS

2700

2720

2740

2760

2780

2800

2820

2840

2860

CAMILLE JACQUELINE HARRISS
& REX EDWARD MOODY
I.D. - 5019464
TITLE - 65361/7

ALLAN WAYNE WELLS &
ALWYN MARIE WELLS
I.D. - 5019456
TITLE - 65361/6

WILLIAM CHARLES READ &
CHRISTOPHER JAMES WOODHOUSE
I.D. - 5019392
TITLE - 65361/5

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

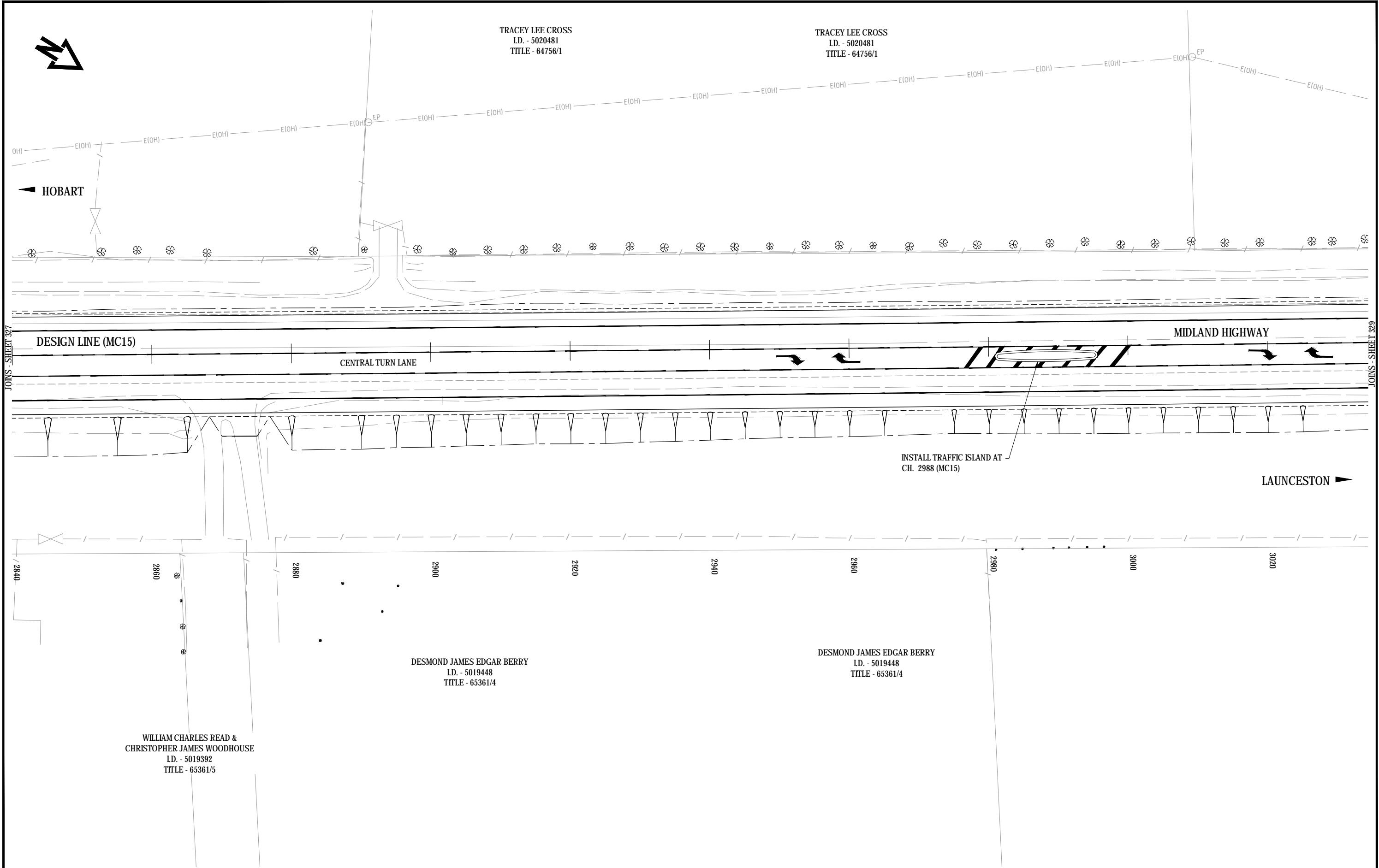
Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 17 OF 40

CONTRACT No.	DRAWING HB15050-C327	PRINTED DATE 24-Feb-17, 2:37 PM	SHEET No. 327
REGISTRATION NUMBER A0087.001			REVISION -



TRACEY LEE CROSS
LD. - 5020481
TITLE - 64756/1

TRACEY LEE CROSS
LD. - 5020481
TITLE - 64756/1

HOBART

MIDLAND HIGHWAY

DESIGN LINE (MC15)

CENTRAL TURN LANE

INSTALL TRAFFIC ISLAND AT
CH. 2988 (MC15)

LAUNCESTON

DESMOND JAMES EDGAR BERRY
LD. - 5019448
TITLE - 65361/4

DESMOND JAMES EDGAR BERRY
LD. - 5019448
TITLE - 65361/4

WILLIAM CHARLES READ &
CHRISTOPHER JAMES WOODHOUSE
LD. - 5019392
TITLE - 65361/5

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

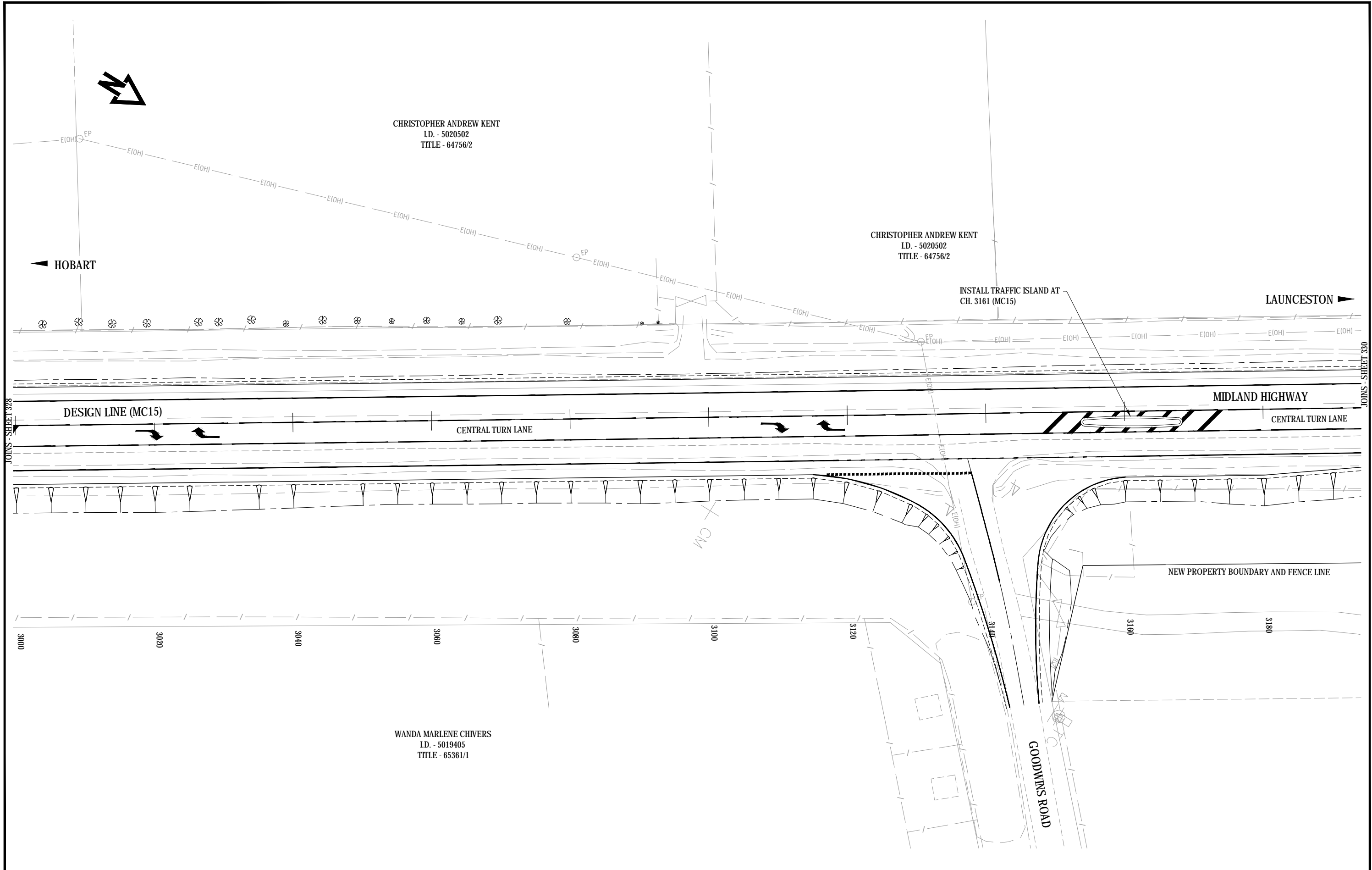
SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2
GENERAL ARRANGEMENT - DRG 18 OF 40

CONTRACT No.	DRAWING HB15050-C328	PRINTED DATE 24-Feb-17, 2:37 PM	SHEET No. 328
REGISTRATION NUMBER A0087.001			REVISION -



No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

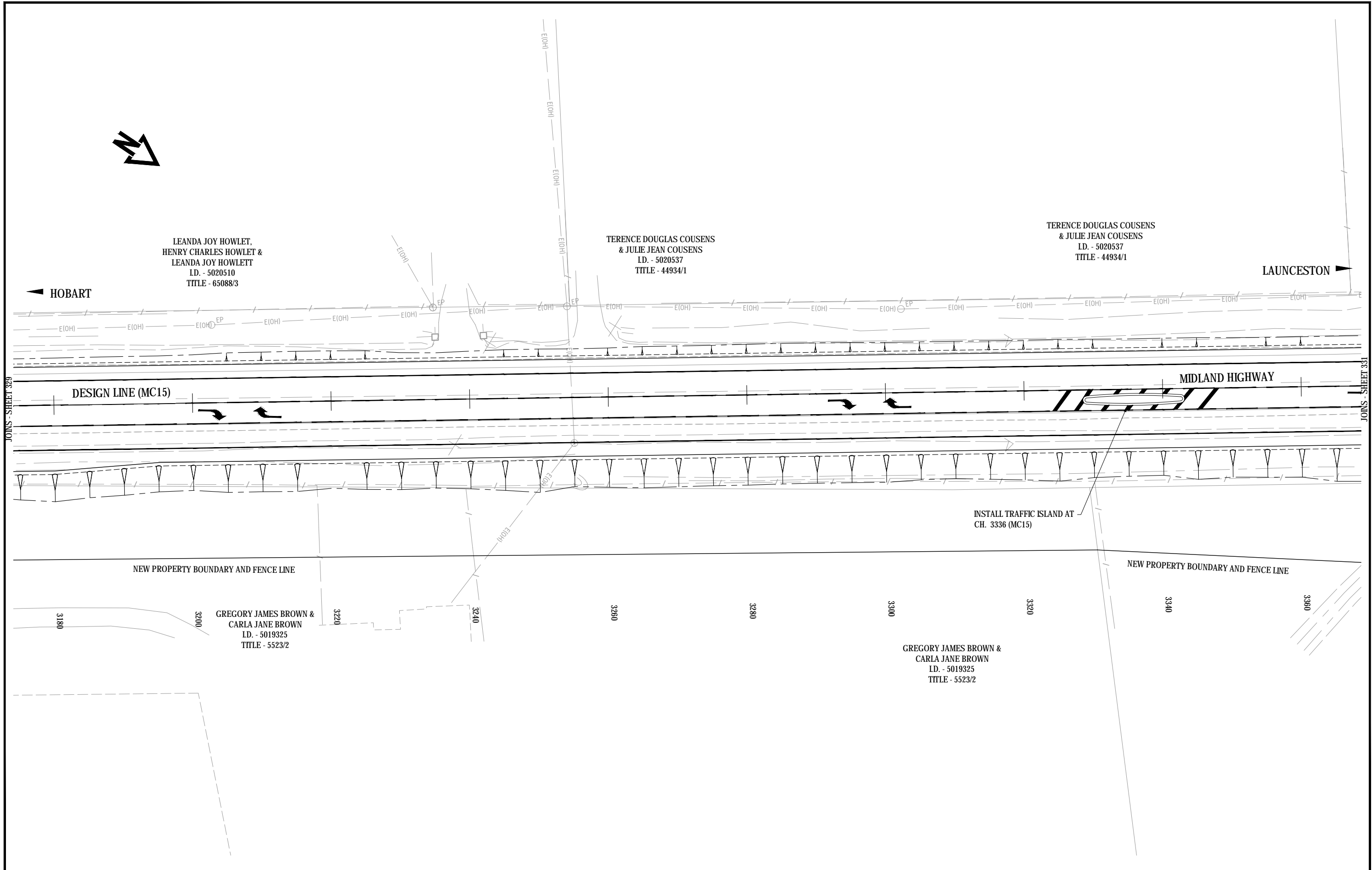
SCALES
 1:500

 SCALE IN METRES - 1500
 Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
 REVIEWED R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 19 OF 40

CONTRACT No.	DRAWING HB15050-C329	PRINTED DATE 24-Feb-17, 2:37 PM	SHEET No. 329
REGISTRATION NUMBER A0087.001			REVISION -



No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

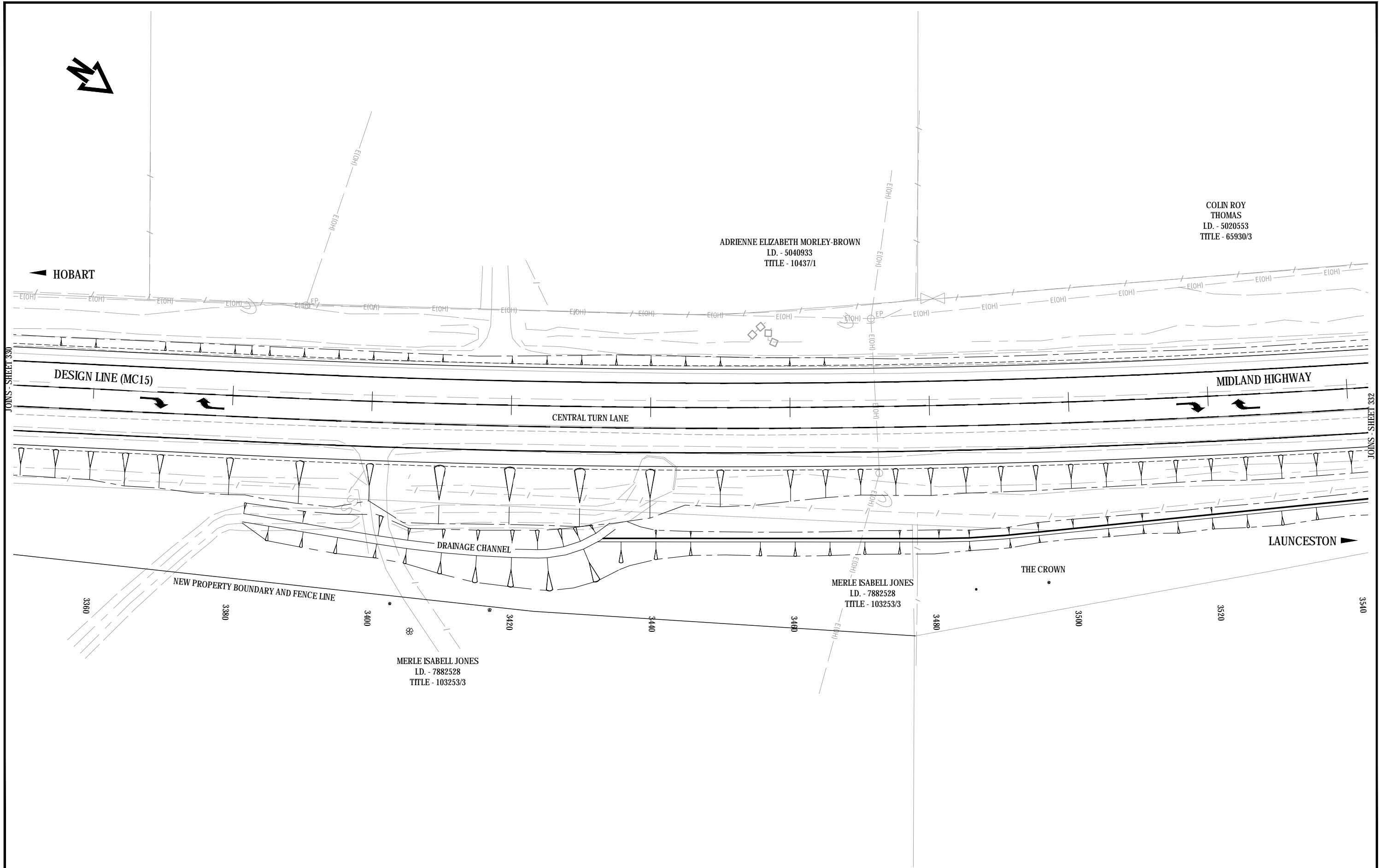
SCALES
 1:500

 SCALE IN METRES - 1:500
 Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
 REVIEWED R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 20 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	HB15050-C330	24-Feb-17, 2:37 PM	330
REGISTRATION NUMBER			REVISION -
A0087.001			



COLIN ROY
THOMAS
LD. - 5020553
TITLE - 65930/3

ADRIENNE ELIZABETH MORLEY-BROWN
LD. - 5040933
TITLE - 10437/1

MERLE ISABELL JONES
LD. - 7882528
TITLE - 103253/3

MERLE ISABELL JONES
LD. - 7882528
TITLE - 103253/3

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 21 OF 40

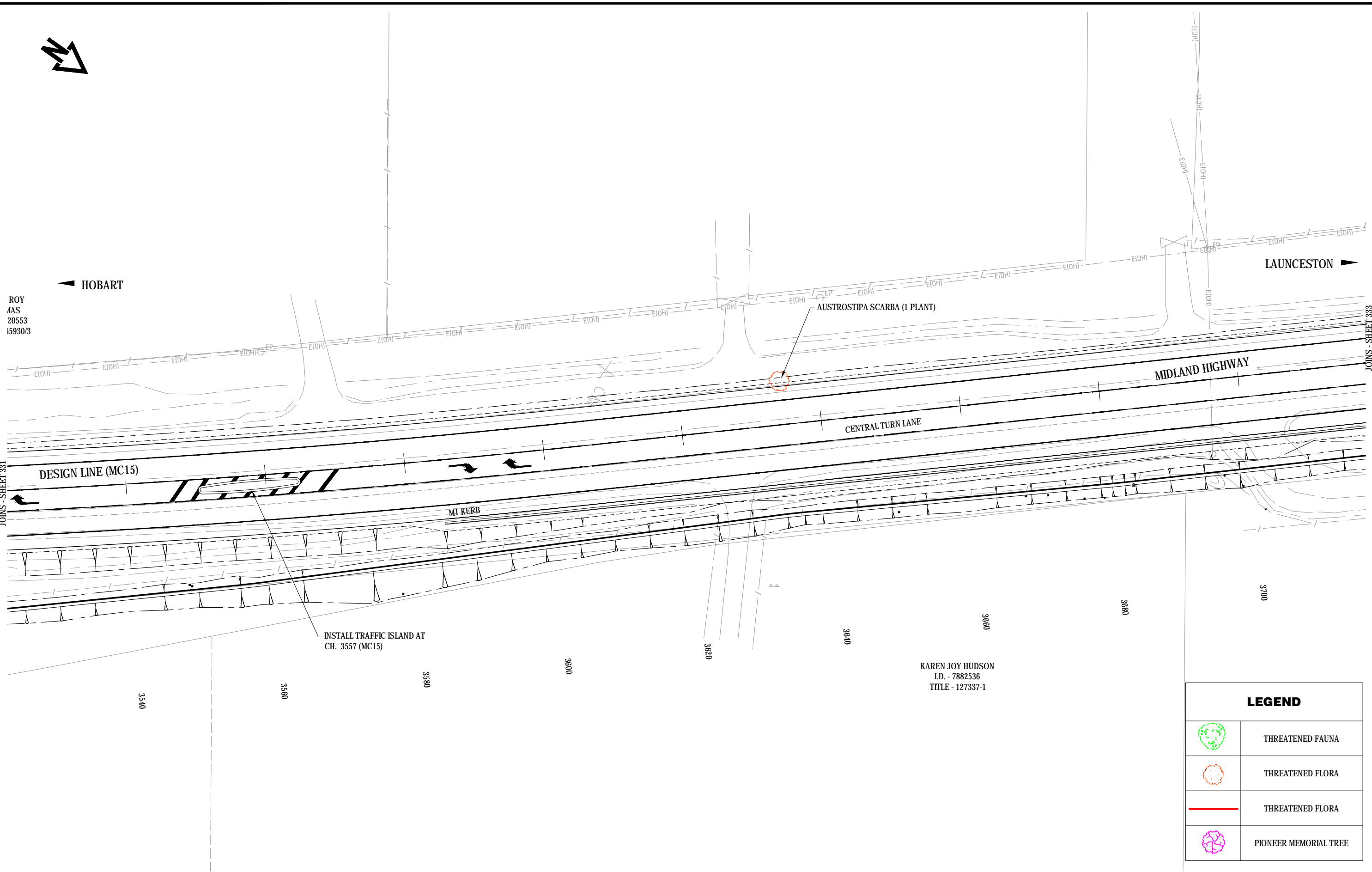
CONTRACT No.	DRAWING HB15050-C331	PRINTED DATE 24-Feb-17, 2:37 PM	SHEET No. 331
REGISTRATION NUMBER A0087.001			REVISION -



ROY
MAS
20553
15930/3

HOBBART

LAUNCESTON



JOINS - SHEET 331

JOINS - SHEET 333

KAREN JOY HUDSON
LD. - 7882536
TITLE - 127337-1

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 22 OF 40

CONTRACT No.	DRAWING HB15050-C332	PRINTED DATE 24-Feb-17, 2:37 PM	SHEET No. 332
REGISTRATION NUMBER A0087.001			REVISION -



JENNIFER ANNE
BURLEIGH
I.D. - 3194066
TITLE - 163807/1

LAUNCESTON

JENNIFER ANNE
BURLEIGH
I.D. - 3194066
TITLE - 163807/1

AUSTROSTIPA SCARBA (15 PLANTS)

INSTALL TRAFFIC ISLAND AT
CH. 3808 (MC15)

AUSTROSTIPA SCARBA (25 PLANTS)

HOBART

MIDLAND HIGHWAY

CENTRAL TURN LANE

DESIGN LINE (MC15)

CENTRAL TURN LANE

M1 KERB

JOINS - SHEET 332

JOINS - SHEET 334

CHRISTINE MARY KNIGHT
CRAIG RANDALL KNIGHT
I.D. - 7720959
TITLE - 50430/1

CHRISTINE MARY KNIGHT &
CRAIG RANDALL KNIGHT
I.D. - 7720959
TITLE - 50430/1

LEGEND

	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

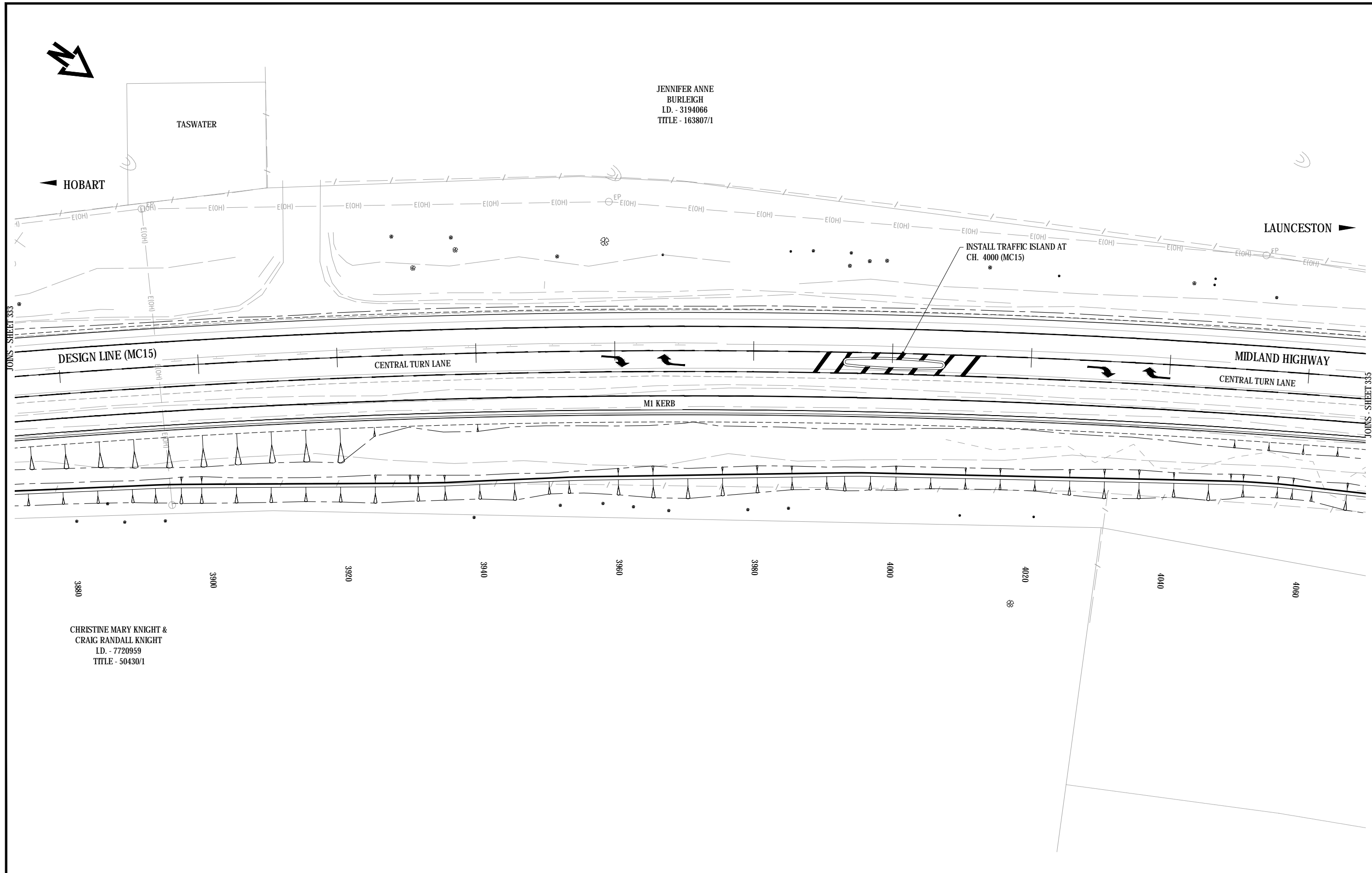
Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

DESIGNED: F. SHADWICK
REVIEWED: R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 23 OF 40

CONTRACT No.	DRAWING HB15050-C333	PRINTED DATE 24-Feb-17, 2:37 PM	SHEET No. 333
REGISTRATION NUMBER A0087.001			REVISION -



No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
 1:500

 SCALE IN METRES - 1500
 Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED: F. SHADWICK
 REVIEWED: R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 24 OF 40

CONTRACT No.	DRAWING HB15050-C334	PRINTED DATE 24-Feb-17, 2:37 PM	SHEET No. 334
REGISTRATION NUMBER A0087.001			REVISION -

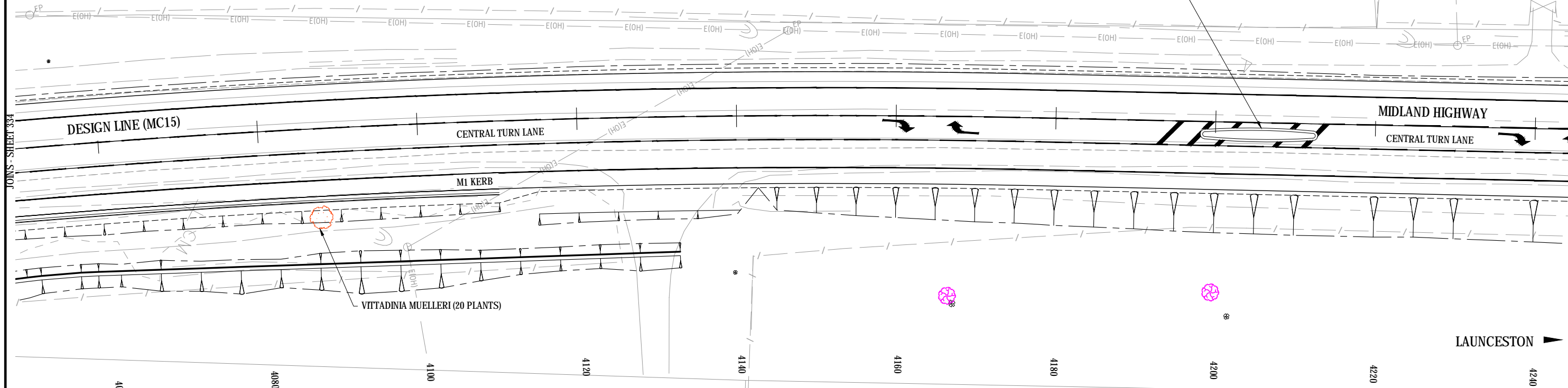


JAMIE MICHAEL HUGHES &
KERRYN LOUISE DOREEN PLUNKE
LD. - 5020596
TITLE - 157325/1

JENNIFER ANNE
BURLEIGH
LD. - 3194066
TITLE - 163807/1

HOBBART

INSTALL TRAFFIC ISLAND AT
CH. 4205 (MC15)



DAVID ALEXANDER JOHNSON
LD. - 5019288
TITLE - 9558/2

LEGEND

	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

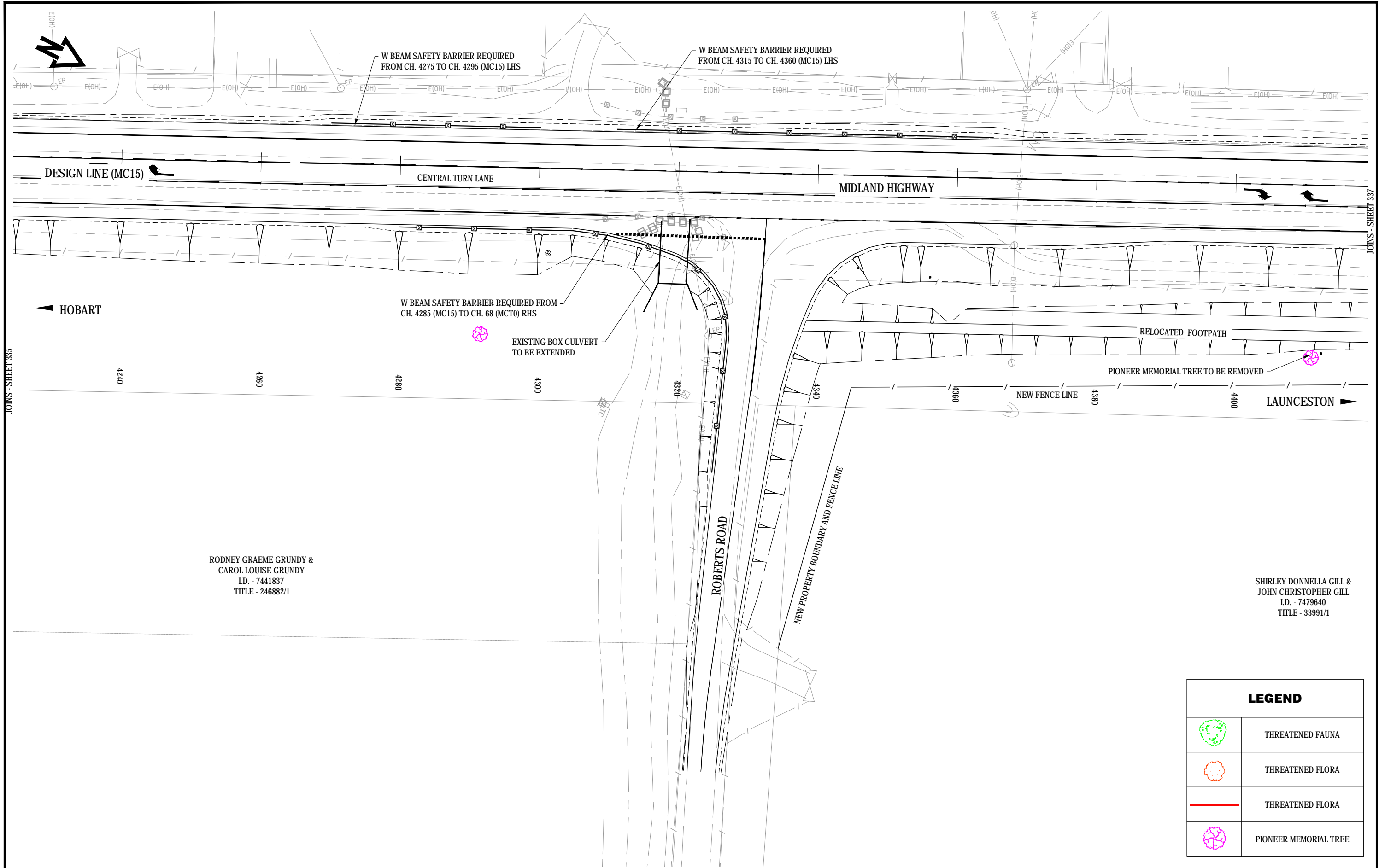
Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 25 OF 40

CONTRACT No.	DRAWING HB15050-C335	PRINTED DATE 24-Feb-17, 2:38 PM	SHEET No. 335
REGISTRATION NUMBER A0087.001			REVISION -



JOINS - SHEET 335

JOINS - SHEET 337

RODNEY GRAEME GRUNDY &
CAROL LOUISE GRUNDY
I.D. - 7441837
TITLE - 246882/1

SHIRLEY DONNELLA GILL &
JOHN CHRISTOPHER GILL
I.D. - 7479640
TITLE - 33991/1

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 26 OF 40

CONTRACT No.	DRAWING HB15050-C336	PRINTED DATE 24-Feb-17, 2:38 PM	SHEET No. 336
REGISTRATION NUMBER A0087.001			REVISION -

TREVOR WILLIAM NEWMAN
I.D. - 5020625
TITLE - 148178/1

ELVIE IRENE NEWMAN
I.D. - 5020633
TITLE - 132754/2

BARRY WAYNE NEWMAN
I.D. - 5020641
TITLE - 132754/1

JYE DANIEL DAVIS &
DANIELLE SUZANNE DAVIS
I.D. - 5020668
TITLE - 144676/1



HOBBART

LAUNCESTON

INSTALL TRAFFIC ISLAND AT
CH. 4448 (MC15)

DESIGN LINE (MC15)

CENTRAL TURN LANE

CENTRAL TURN LANE

MIDLAND HIGHWAY

RELOCATED FOOTPATH

NEW FENCE LINE

PIONEER MEMORIAL TREE TO BE REMOVED

SHIRLEY DONNELLA GILL &
JOHN CHRISTOPHER GILL
I.D. - 7479640
TITLE - 33991/1

RICKY PAUL STOCKS &
NICOLE LOUISE STOCKS
I.D. - 1826373
TITLE - 34774/2

LEGEND

	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

SCALES

1:500



SCALE IN METRES - 1:500



DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth

MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 27 OF 40

CONTRACT No.

DRAWING
HB15050-C337

PRINTED DATE
24-Feb-17, 2:38 PM

SHEET No.

337

REGISTRATION NUMBER

A0087.001

REVISION -

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.



JYE DANIEL DAVIS &
DANIELLE SUZANNE DAVIS
I.D. - 5020668
TITLE - 144676/1

GARRY LOYAL HAYWOOD
I.D. - 5020676
TITLE - 64197/1

HORACE DOUGLAS GARLAND
I.D. - 5020684
TITLE - 14857/5

CRAIG ANDREW HUGHES &
LEANNE HUGHES
I.D. - 5020692
TITLE - 49014/1

LEANNE MAREE BROWN
I.D. - 5020705
TITLE - 241329/1

SYDNEY MUNTON &
SHIRLEY JOAN MUNTON
I.D. - 5020713
TITLE - 204573/1

HOBART

INSTALL TRAFFIC ISLAND AT
CH. 4599 (MC15)

LAUNCESTON

DESIGN LINE (MC15)

CENTRAL TURN LANE

MIDLAND HIGHWAY

CENTRAL TURN LANE

RELOCATED FOOTPATH

4540

4560

4580

4600

4620

4640

4660

4680

4700

4720

PIONEER MEMORIAL TREE TO BE REMOVED

JOHN KENNETH MEDHURST
I.D. - 1875415
TITLE - 246919/1

LEGEND



THREATENED FAUNA



THREATENED FLORA



THREATENED FLORA



PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 28 OF 40

CONTRACT No.	DRAWING HB15050-C338	PRINTED DATE 24-Feb-17, 2:38 PM	SHEET No. 338
REGISTRATION NUMBER A0087.001			REVISION -

EANNE MAREE BROWN
I.D. - 5020705
TITLE - 241329/1

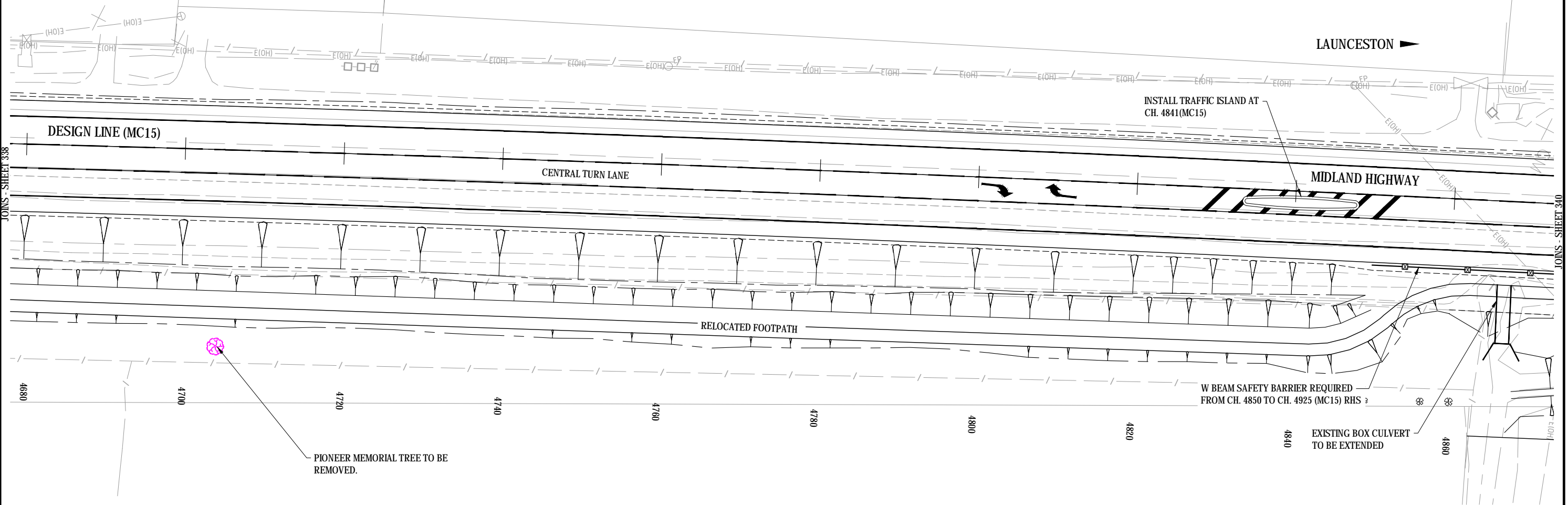


SYDNEY MUNTON &
SHIRLEY JOAN MUNTON
I.D. - 5020713
TITLE - 204573/1

JOHN KENNETH MEDHURST
I.D. - 1875415
TITLE - 246919/1

HOBBART

LAUNCESTON



JOHN KENNETH MEDHURST
I.D. - 1875415
TITLE - 246919/1

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1:500

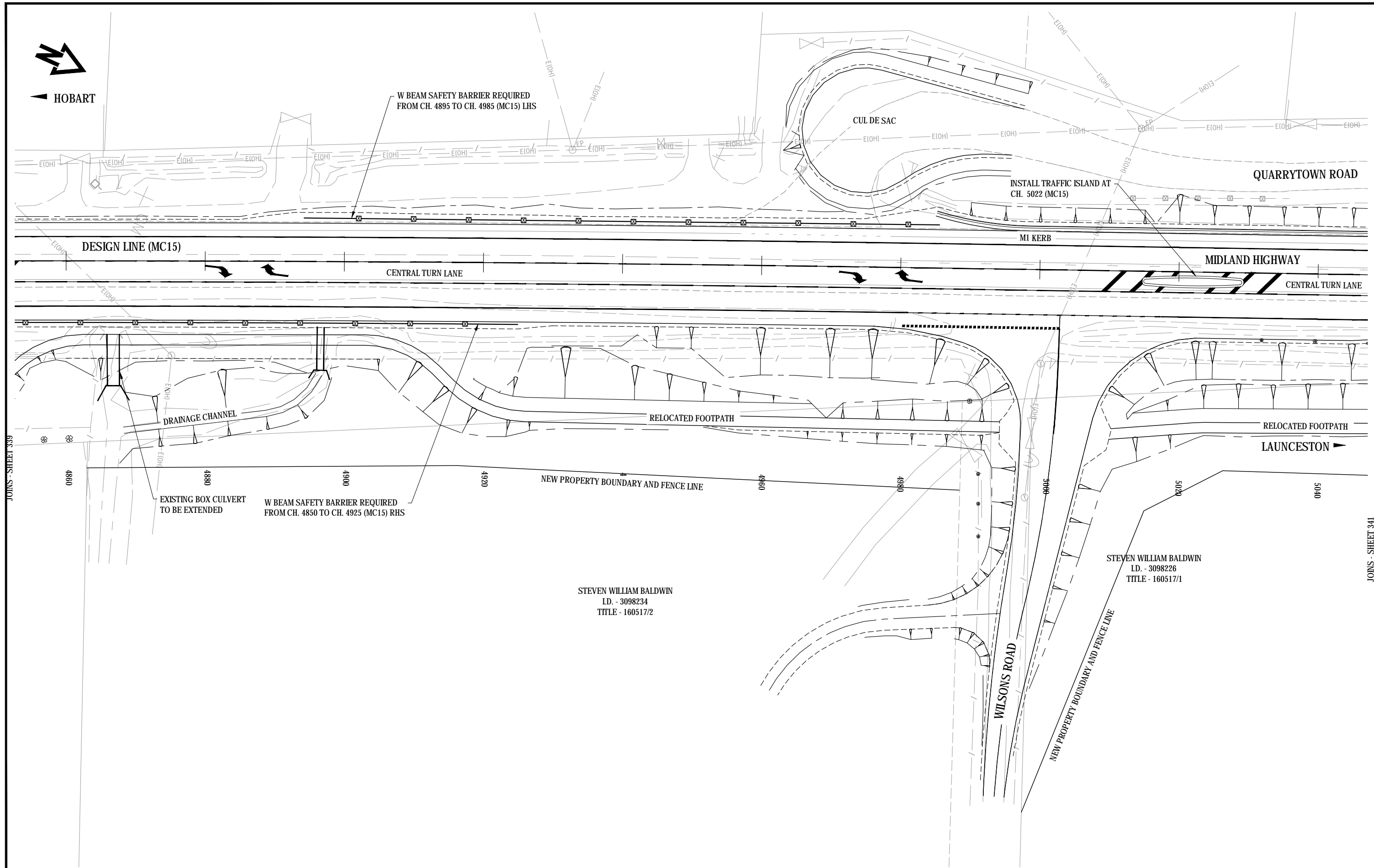
Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 29 OF 40

CONTRACT No.	DRAWING HB15050-C339	PRINTED DATE 24-Feb-17, 2:38 PM	SHEET No. 339
REGISTRATION NUMBER A0087.001			REVISION -



339 - SHEET - SNOOT

341 - SHEET - JOINS

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

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DESIGNED F. SHADWICK
 REVIEWED R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 30 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	HB15050-C340	24-Feb-17, 2:38 PM	340
REGISTRATION NUMBER			REVISION -
A0087.001			

ATHRYN SCOTT
- 7266207
E - 26951/1



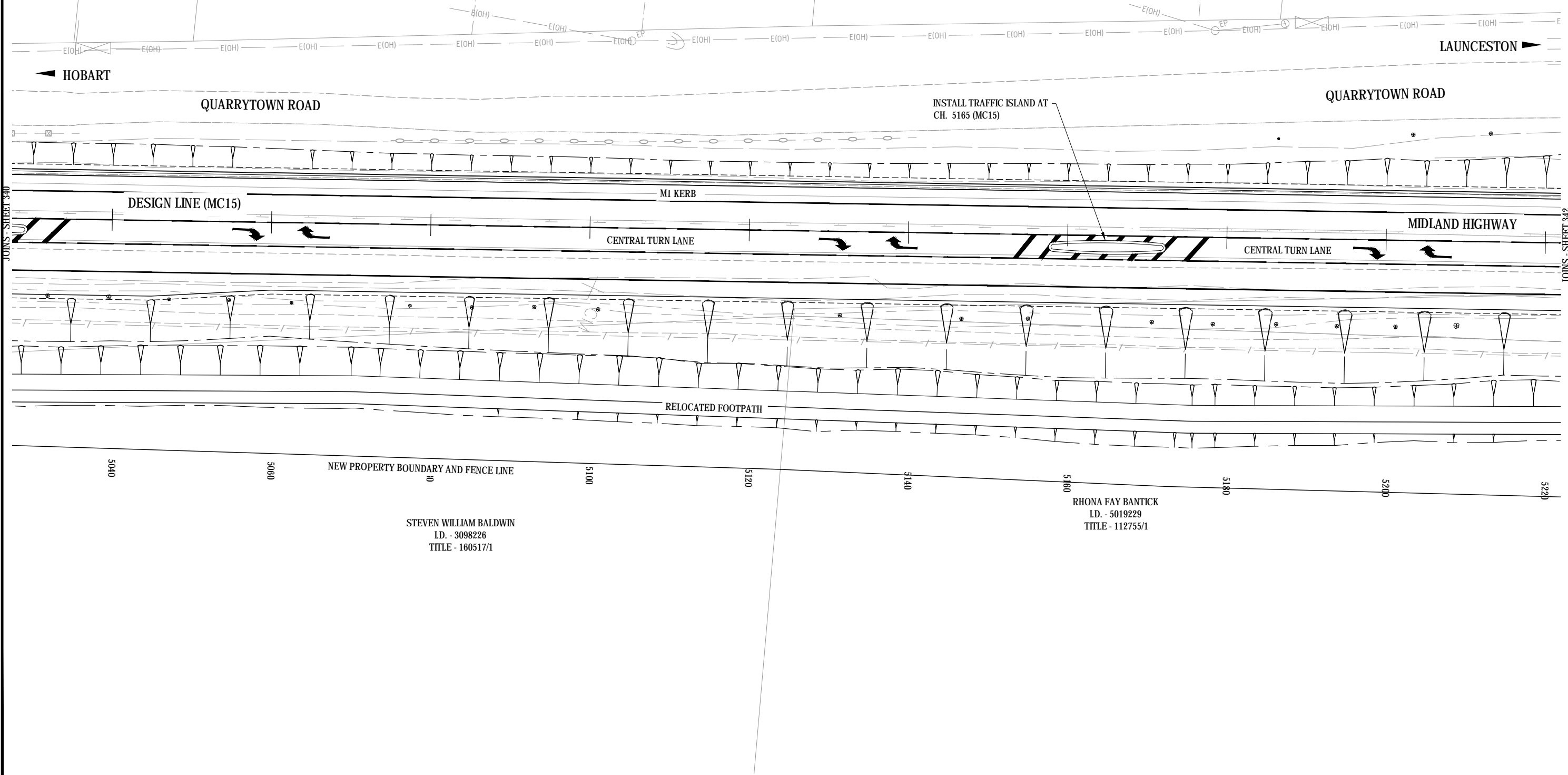
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KATHLEEN MARGARET
BOUTCHARD
LD. - 5020748
TITLE - 6765/1

ALISON MELISSA STOKES
LD. - 5020756
TITLE - 39340/1

SARAH LOUISE LANG
LD. - 5020764
TITLE - 39584/1

NERISE GAI BAKER &
STEPHEN JAMES MAXWELL
LD. - 5020780
TITLE - 36778/1

LEO CLARK
LD. - 1896443
TITLE - 131036/4



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Co-ordinate System: MGA ZONE 55 Height Datum: A.H.D.

DESIGNED: F. SHADWICK
REVIEWED: R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 31 OF 40

CONTRACT No. HB15050-C341	DRAWING HB15050-C341	PRINTED DATE 24-Feb-17, 2:38 PM	SHEET No. 341
REGISTRATION NUMBER A0087.001			REVISION -

LEO CLARK
LD. - 1896443
TITLE - 131036/4



STEWART REGINALD HARRY &
GAYBRIEL HARRY
LD. - 1896435
TITLE - 131036/3

MICHAEL JAMES HUGHES &
SHARON MAREE HUGHES
LD. - 1896427
TITLE - 131036/2

LIONEL JAMES HUGHES &
MONICA ESTELLE HUGHES
LD. - 1896419
TITLE - 131036/1

HOBBART

QUARRYTOWN ROAD

INSTALL TRAFFIC ISLAND AT
CH. 5308 (MC15)

NEW PROPERTY BOUNDARY AND FENCE LINE

LAUNCESTON

DESIGN LINE (MC15)

M1 KERB

LEFT TURN LANE

MIDLAND HIGHWAY

CENTRAL TURN LANE

CENTRAL TURN LANE

RELOCATED FOOTPATH

RELOCATED FOOTPATH

NEW PROPERTY BOUNDARY AND FENCE LINE

NEW PROPERTY BOUNDARY AND FENCE LINE

RHONA FAY BANTICK
LD. - 5019229
TITLE - 112755/1

INSTALL FLEXIBLE SAFETY BARRIER
FROM CH. 5305 TO CH. 5415 (MC15)

ANTHONY BRIAN JACOBS
LD. - 1517036
TITLE - 101987/1

DE CAMERA ROAD

SCALES

1:500



SCALE IN METRES - 1500



DESIGNED F. SHADWICK
REVIEWED R. MANNERING

Department of State Growth

MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 32 OF 40

CONTRACT No.

DRAWING
HB15050-C342

PRINTED DATE
24-Feb-17, 2:38 PM

SHEET No.

342

REGISTRATION NUMBER

A0087.001

REVISION -

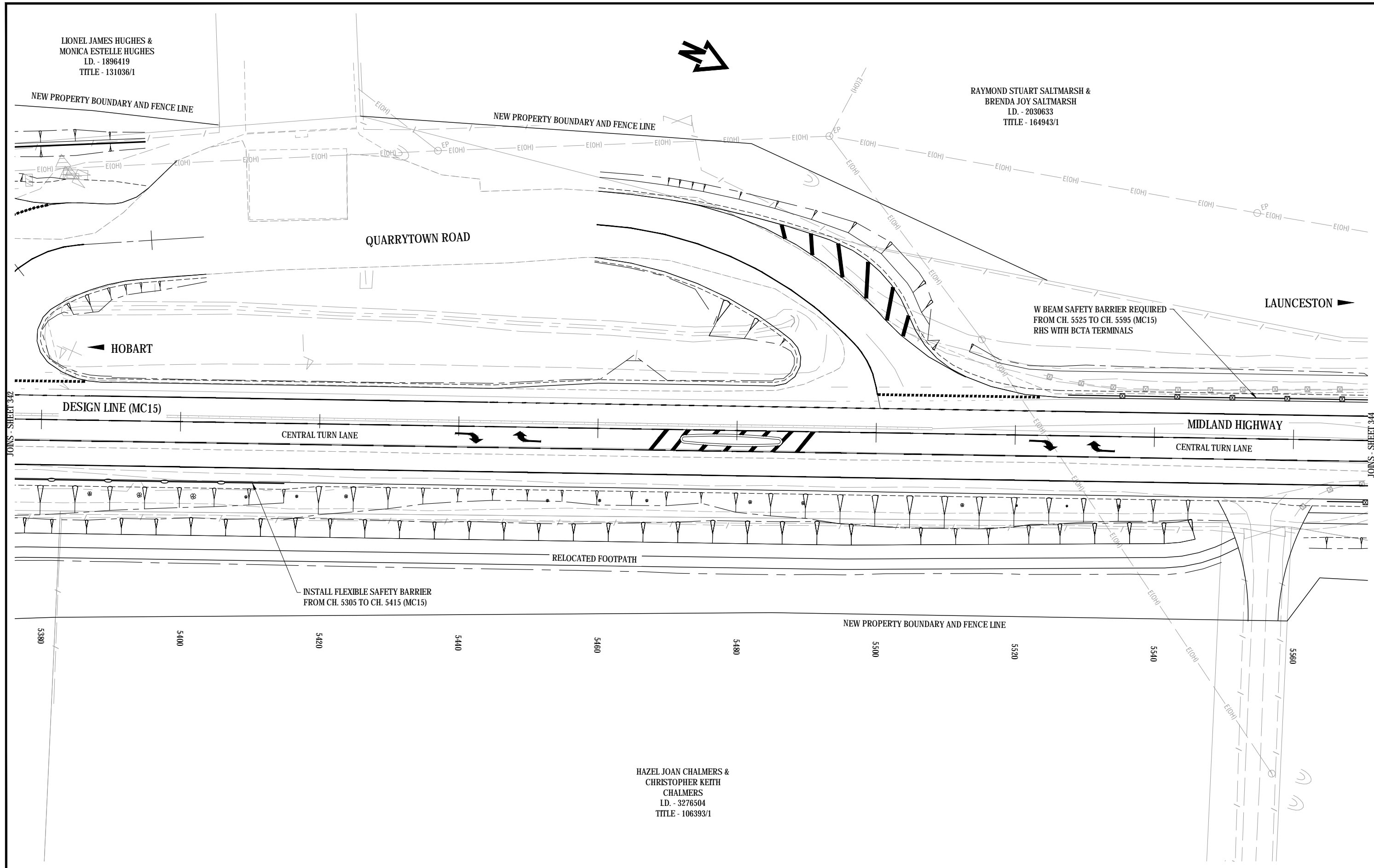
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LIONEL JAMES HUGHES &
MONICA ESTELLE HUGHES
I.D. - 1896419
TITLE - 131036/1

RAYMOND STUART SALTMARSH &
BRENDA JOY SALTMARSH
I.D. - 2030633
TITLE - 164943/1



JOINS - SHEET 342

JOINS - SHEET 344

HAZEL JOAN CHALMERS &
CHRISTOPHER KEITH
CHALMERS
I.D. - 3276504
TITLE - 106393/1

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Co-ordinate System: MGA ZONE 55
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MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

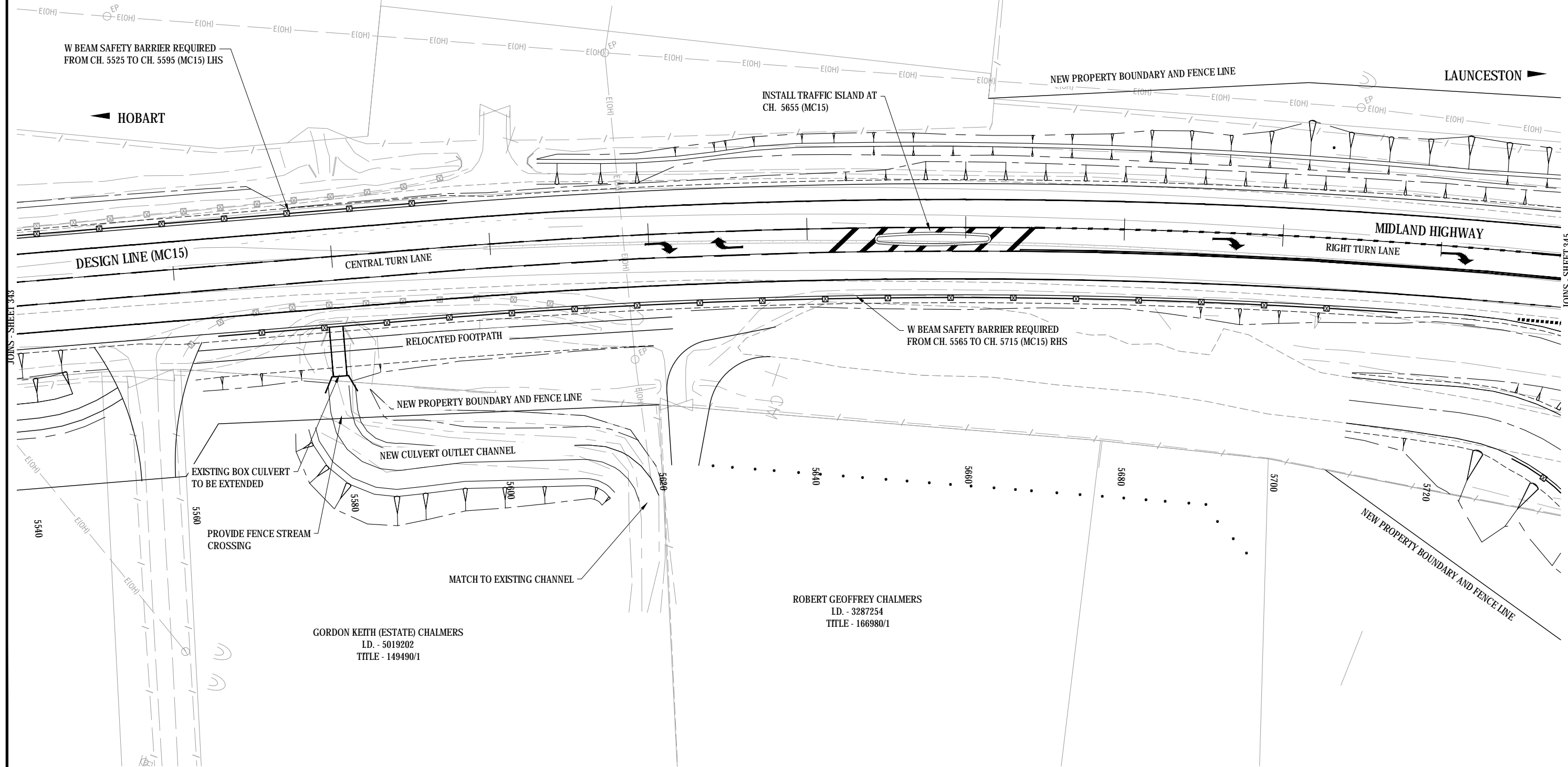
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REGISTRATION NUMBER			REVISION -
A0087.001			



RAYMOND STUART SALTMARSH &
 BRENDA JOY SALTMARSH
 LD. - 2030633
 TITLE - 164943/1

SONIA LOUISE KNIGHT &
 RICHARD GORDON
 KNIGHT
 LD. - 5020836
 TITLE - 46532/1



JOINS - SHEET 343

JOINS - SHEET 345

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SCALE IN METRES - 1:500

Co-ordinate System: MGA ZONE 55
 Height Datum: A.H.D.

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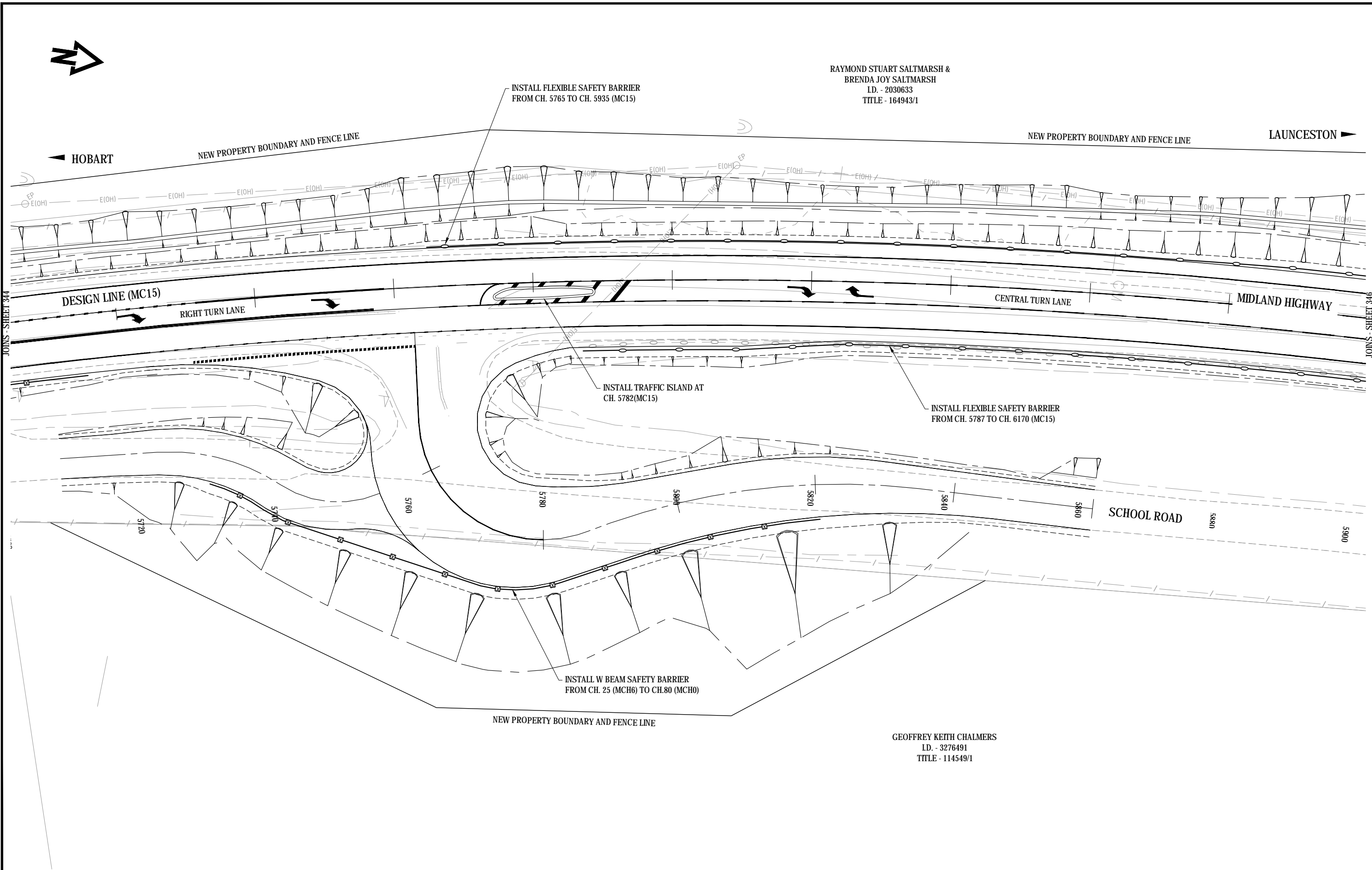
Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2

GENERAL ARRANGEMENT - DRG 34 OF 40

CONTRACT No.	DRAWING HB15050-C344	PRINTED DATE 24-Feb-17, 2:39 PM	SHEET No. 344
REGISTRATION NUMBER A0087.001			REVISION -



RAYMOND STUART SALTMARSH &
BRENDA JOY SALTMARSH
I.D. - 2030633
TITLE - 164943/1



GEOFFREY KEITH CHALMERS
I.D. - 3276491
TITLE - 114549/1

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1:500

Co-ordinate System: MGA ZONE 55
Height Datum: A.H.D.

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REVIEWED R. MANNERING

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MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

GENERAL ARRANGEMENT - DRG 35 OF 40

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REGISTRATION NUMBER A0087.001			REVISION -

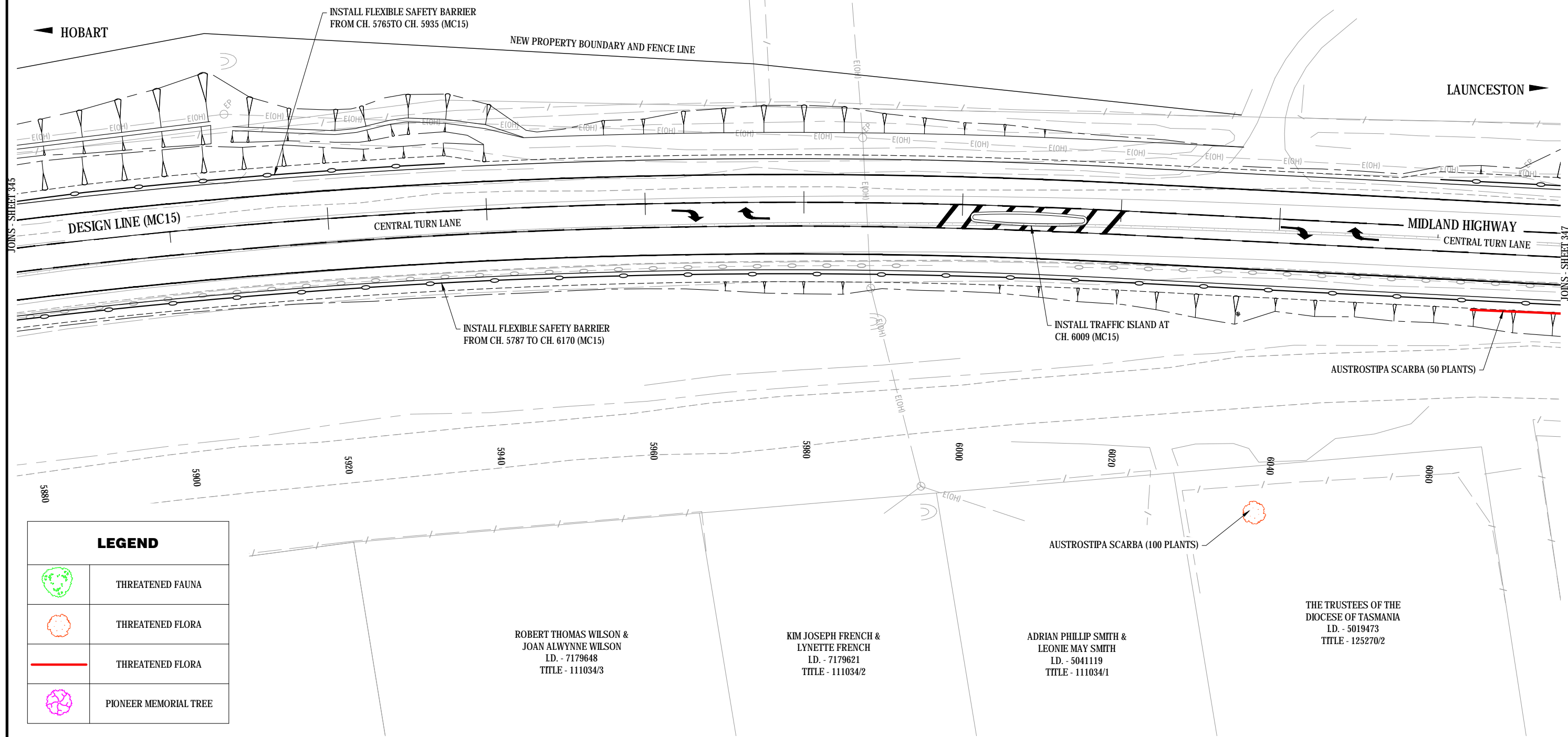


GRAEME VICTOR ROBERTS &
 PHILLIPA CLARE ROBERTS
 LD. - 2030625
 TITLE - 134942/1

RAYMOND STUART SALTMARSH &
 BRENDA JOY SALTMARSH
 LD. - 2030633
 TITLE - 164943/1

HOBBART

LAUNCESTON



LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

ROBERT THOMAS WILSON &
 JOAN ALWYNNE WILSON
 LD. - 7179648
 TITLE - 111034/3

KIM JOSEPH FRENCH &
 LYNETTE FRENCH
 LD. - 7179621
 TITLE - 111034/2

ADRIAN PHILLIP SMITH &
 LEONIE MAY SMITH
 LD. - 5041119
 TITLE - 111034/1

THE TRUSTEES OF THE
 DIOCESE OF TASMANIA
 LD. - 5019473
 TITLE - 125270/2

No.	Amendment Description	Initials	Date
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SCALES
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 SCALE IN METRES - 1:500

Co-ordinate System: MGA ZONE 55
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Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 36 OF 40

CONTRACT No. HB15050-C346	DRAWING HB15050-C346	PRINTED DATE 24-Feb-17, 2:39 PM	SHEET No. 346
REGISTRATION NUMBER A0087.001			REVISION -



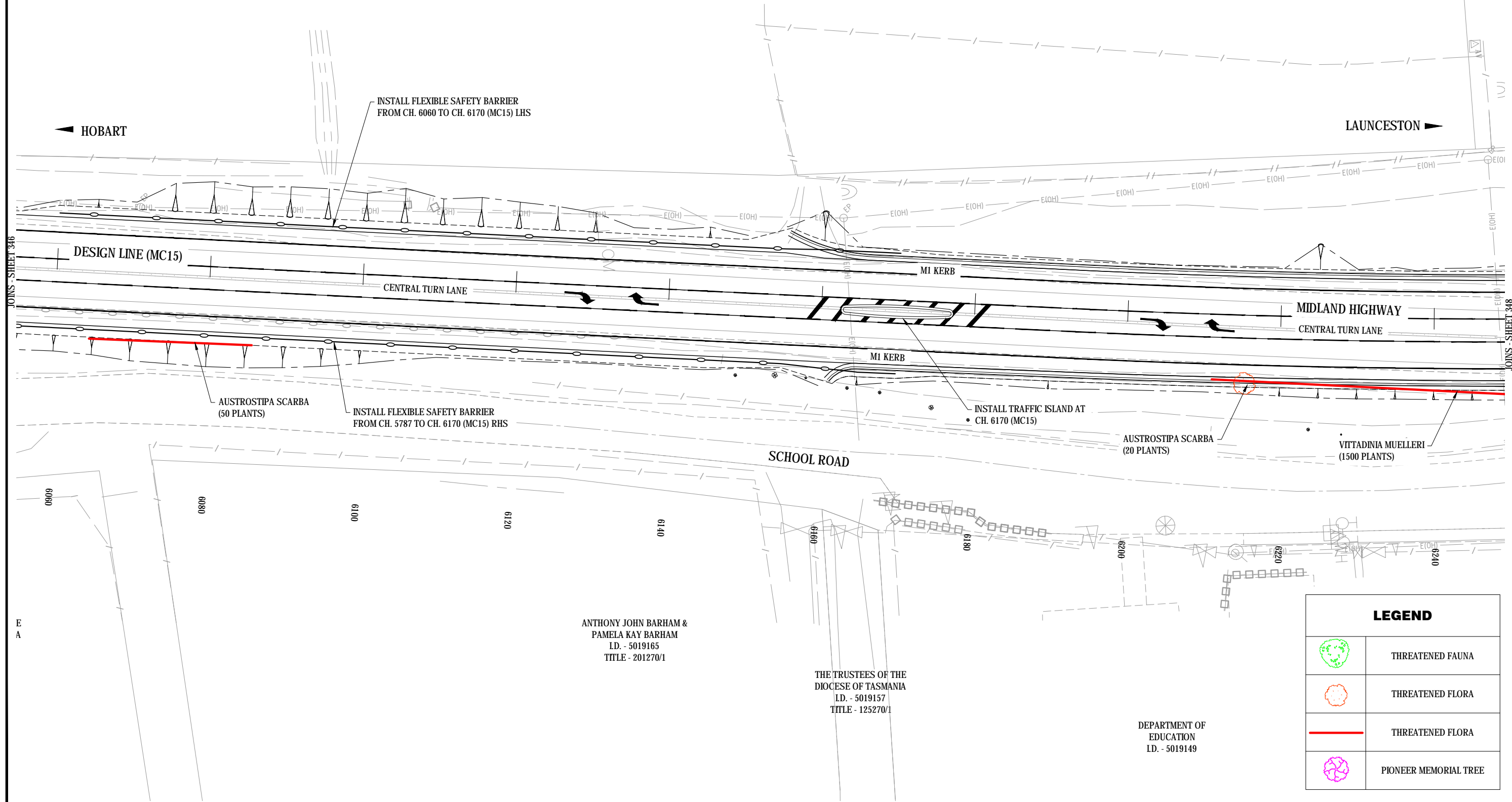
GRAEME VICTOR ROBERTS &
 PHILLIPA CLARE ROBERTS
 I.D. - 2030625
 TITLE - 134942/1

HOBERT

LAUNCESTON

JOINS - SHEET 346

JOINS - SHEET 348



ANTHONY JOHN BARHAM &
 PAMELA KAY BARHAM
 I.D. - 5019165
 TITLE - 201270/1

THE TRUSTEES OF THE
 DIOCESE OF TASMANIA
 I.D. - 5019157
 TITLE - 125270/1

DEPARTMENT OF
 EDUCATION
 I.D. - 5019149

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
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 SCALE IN METRES - 1500
 Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

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 REVIEWED R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 37 OF 40

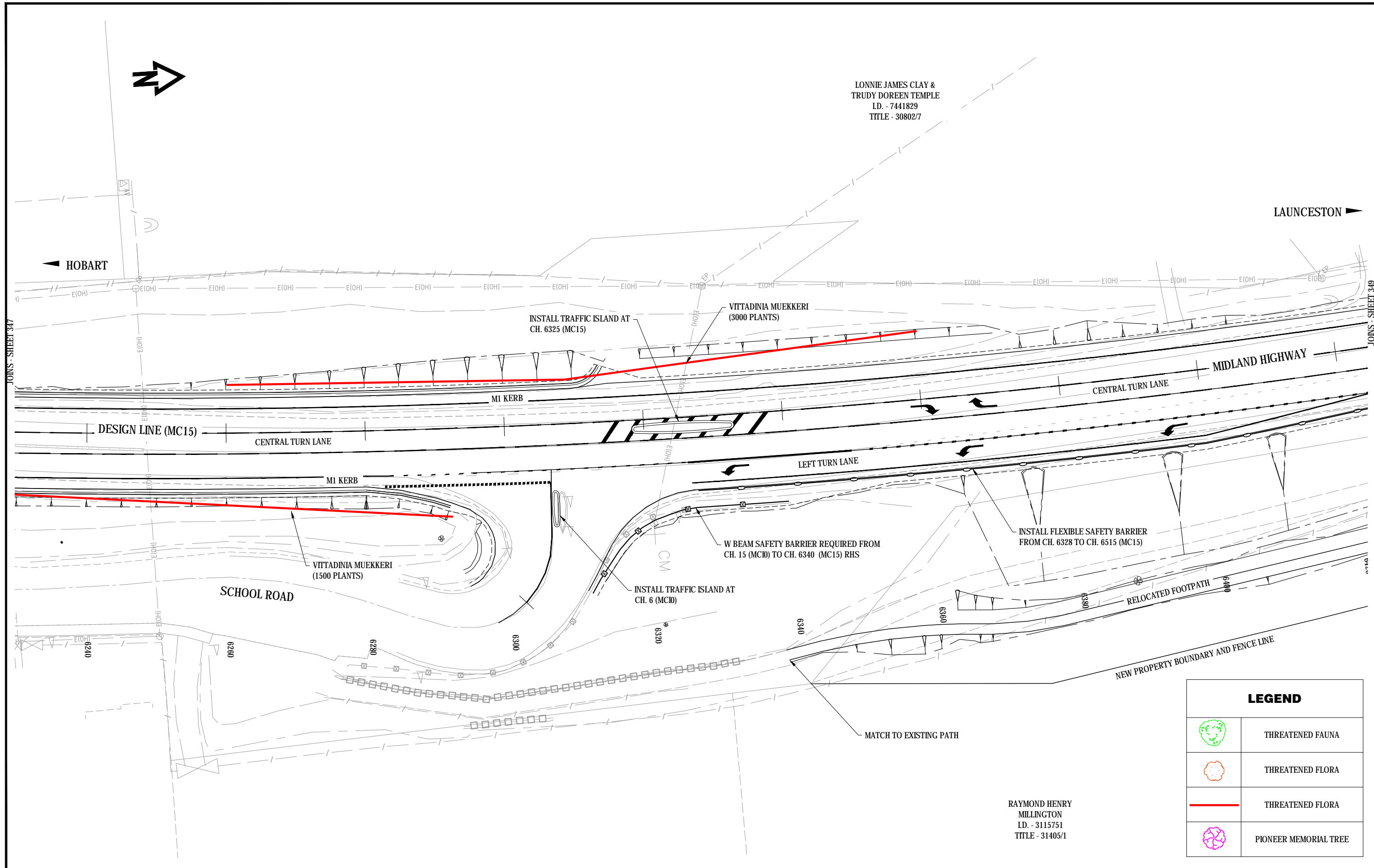
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REGISTRATION NUMBER A0087.001			REVISION -



LONNIE JAMES CLAY &
 TRUDY DOREEN TEMPLE
 LD. - 7441829
 TITLE - 30802/7

LAUNCESTON

HOBART



LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

RAYMOND HENRY
 MILLINGTON
 LD. - 3115751
 TITLE - 31405/1

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SCALES
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 SCALE IN METRES - 1500
 Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

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 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 38 OF 40

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	HB15050-C348	24-Feb-17, 2:39 PM	348
REGISTRATION NUMBER			REVISION -
A0087.001			



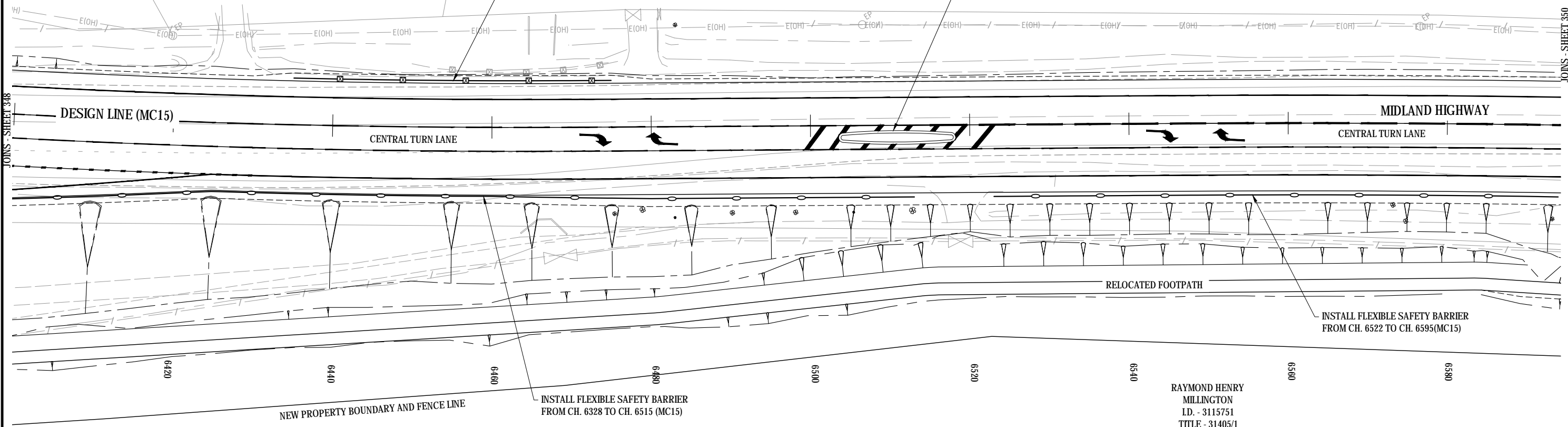
HOBART

KEVIN WILLIAM JACOBSON
I.D. - 3115743
TITLE - 30802/5

LAUNCESTON

W BEAM SAFETY BARRIER REQUIRED
FROM CH. 6435 TO CH. 6475 (MC15) LHS

INSTALL TRAFFIC ISLAND AT
CH. 6510 (MC15)



JOINS - SHEET 348

JOINS - SHEET 350

RAYMOND HENRY
MILLINGTON
I.D. - 3115751
TITLE - 31405/1

LEGEND	
	THREATENED FAUNA
	THREATENED FLORA
	THREATENED FLORA
	PIONEER MEMORIAL TREE

No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
1:500

SCALE IN METRES - 1500

Co-ordinate System: MGA ZONE 55 | Height Datum: A.H.D.

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REVIEWED R. MANNERING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD SAFETY UPGRADES
STAGE 2

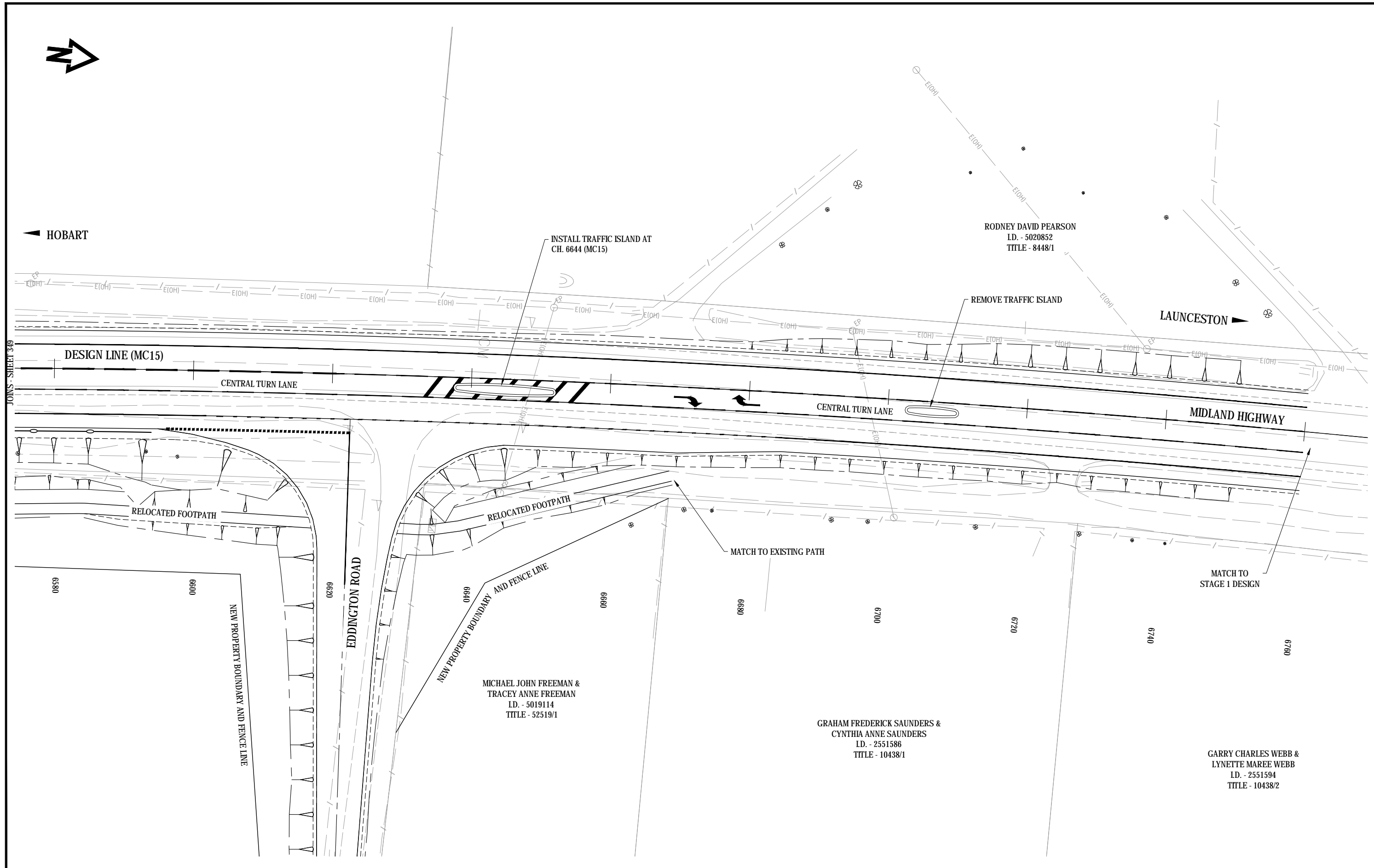
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CONTRACT No.	DRAWING HB15050-C349	PRINTED DATE 24-Feb-17, 2:39 PM	SHEET No. 349
REGISTRATION NUMBER A0087.001			REVISION -



HOBART

LAUNCESTON



JOINS SHEET 349

No.	Amendment Description	Initials	Date
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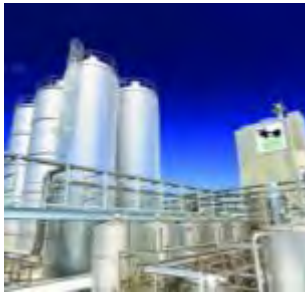
DESIGNED F. SHADWICK
 REVIEWED R. MANNERING

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 MANGALORE TO BAGDAD SAFETY UPGRADES
 STAGE 2
 GENERAL ARRANGEMENT - DRG 40 OF 40

CONTRACT No.	DRAWING HB15050-C350	PRINTED DATE 24-Feb-17, 2:39 PM	SHEET No. 350
REGISTRATION NUMBER A0087.001			REVISION -

Midland Highway Safety Upgrades Mangalore to Bagdad Stage 2 Traffic Impact Assessment

transport | community | mining | industrial | food & beverage | carbon & energy



Prepared for:

Department of State Growth

Client representative:

Simon Brown

Date:

8 February 2017

Rev 01

Table of Contents

1.	Introduction	1
2.	Site Location	1
3.	Development Proposal	2
4.	Existing Conditions	3
4.1	Midland Highway	3
4.2	Existing Traffic Operation.....	3
4.3	Crash History	4
5.	Road Safety	7
5.1	Safe Systems Assessment	7
5.2	Sight Distance.....	8
6.	Traffic Impacts.....	9
6.1	Travel Time.....	9
6.2	Intersection Operation.....	11
7.	Construction Impacts	13
7.1	Access.....	13
7.2	Parking	13
7.3	Traffic Generation	14
7.4	Turning Movements.....	15
7.5	Road Safety	15
8.	Summary	15

List of figures

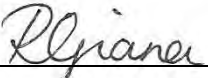
Figure 1: Locality Plan (Basemap source: www.thelist.tas.gov.au).....	1
Figure 2: Midland Highway Crash History	6
Figure 3: Travel Time Survey Results - Northbound Traffic.....	10
Figure 4: Travel Time Survey Results - Southbound Traffic.....	10

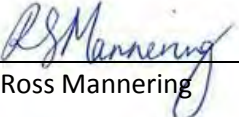
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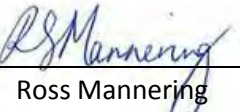
Table 1: Existing Midland Highway Traffic Volumes.....	3
Table 2: Existing Side Road Traffic Volumes.....	4
Table 3: Midland Highway Crash Severity	4
Table 4: Midland Highway Crash Types.....	5
Table 5: Safe Systems Assessment Summary	7
Table 6: Travel Times Summary.....	11
Table 7: Travel Speeds Summary.....	11
Table 8: SIDRA INTERSECTION Level of Service Criteria	12
Table 9: Existing Layout Operating Conditions.....	12
Table 10: Additional Traffic During Construction	14

Appendices

Appendix A:	Link Map
Appendix B:	Typical Median Details
Appendix C:	Safe Systems Assessment
Appendix D:	Travel Time Survey Results

Prepared by:  Date: 8 February 2017
 Rebekah Giana

Reviewed by:  Date: 8 February 2017
 Ross Mannering

Authorised by:  Date: 8 February 2017
 Ross Mannering

Revision History					
Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
00	Traffic Impact Assessment	R. Giana	R. Mannering	R. Mannering	24/01/2017
01	Traffic Impact Assessment	R. Giana	R. Mannering	R. Mannering	08/02/2017

1. Introduction

The Midland Highway Safety Upgrades Mangalore to Bagdad Stage 2 project is a component of the Midland Highway Upgrade Program, a 10 year plan with a total commitment of \$500 million from the Australian and State Governments to make safety improvements along the Midland Highway. The objective of the safety improvements is to increase the safety of the Highway to a minimum AUSRAP 3 rating.

The project involves upgrading a 7 kilometre section of the Midland Highway between the Pontville Roundabout and Eddington Road in Bagdad (Midland Highway Link 14, Chainage 11.68 to Link 16, Chainage 6.76). This upgrade is part of Stage 2 of the Mangalore to Bagdad project with Stage 1 through Bagdad currently under construction.

As the project is on a major highway, a Traffic Impact Assessment (TIA) required to ensure traffic volumes do not impact the operation of the Midland Highway and intersections with Council roads. The Department of State Growth has engaged **pitt&sherry** to undertake a TIA for the upgrade to accompany the Development Application for the Midland Highway Stage 2 upgrade from Mangalore to Bagdad.

This report has been prepared in accordance with the Department of State Growth's *Framework for Undertaking Traffic Impact Assessments* and details the findings of the traffic assessment undertaken for the proposed development.

2. Site Location

Figure 1 shows the extent of the project in the local context with the relevant Department of State Growth link maps attached in Appendix A.

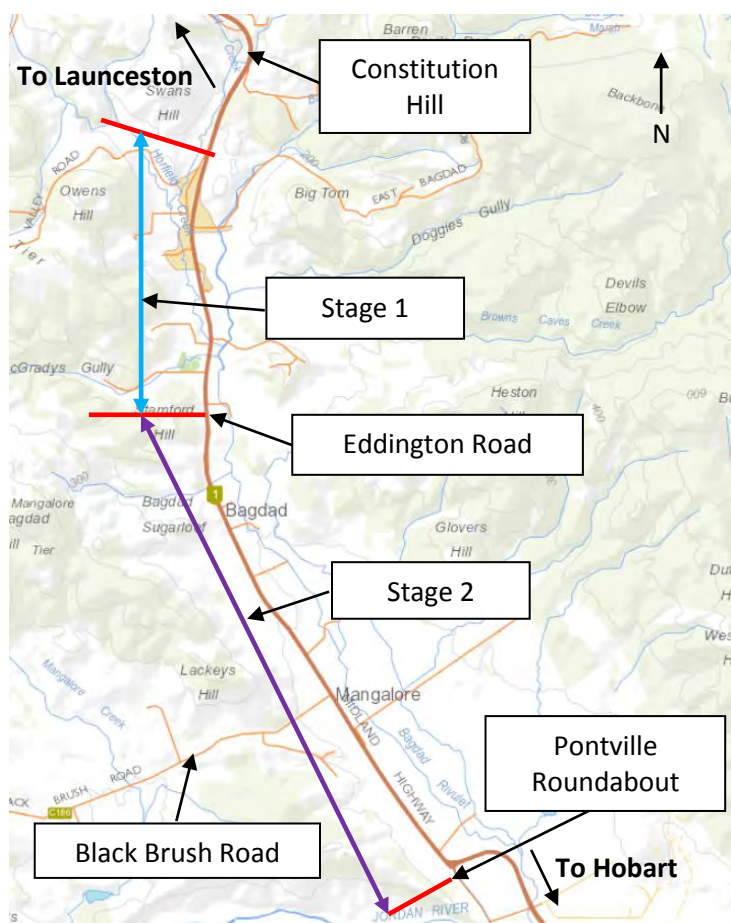


Figure 1: Locality Plan (Basemap source: www.thelist.tas.gov.au)

3. Development Proposal

The safety improvements will include the following:

- Separation of northbound and southbound lanes through provision of a 3.0m median which can also be used by right turning traffic
- Reduction of the speed limit to 80km/h
- Removal (or protection with safety barrier) of road side hazards such as steep side slopes and drains to provide a safer road environment
- Provision of 2.0m sealed shoulders and 0.5m unsealed verges widened where required to accommodate safety barriers
- Provision of 3.5m wide traffic lanes
- Construction of sealed accesses for all properties accessing the Highway including a nominal 5.0m of seal from the edge of the road shoulder.

These works will:

- Reduce the likelihood and severity of head-on collisions by separating opposing streams of traffic
- Reduce the likelihood of run-off road crashes by providing more width to regain control
- Reduce the severity of run-off road crashes by removing or protecting roadside hazards
- Provide a strengthened pavement with improved rideability.

This will result in widening of the existing sealed pavement (including shoulders) from 9.4m to 14.0m. Existing 1.0m wide sealed shoulders will be widened to 2.0m and property accesses will be sealed and provided with turning aprons that meet current design standards.

Where accesses are used by heavy vehicles, appropriate pavement widths will be provided and suitable setbacks will also be included so that vehicles that are required to stop at accesses are completely clear of the highway.

As discussed, the central median will allow full turning movements at all intersections and accesses and therefore turning facilities are not required.

There is an intention to implement central median markings similar to the arrangement used for Stage 1 through Bagdad. A drawing showing the typical median details from Stage 1 is included in Appendix B. Dedicated right turn lanes will be provided where required based on turning volumes and dedicated left turn lanes will be reinstated. As the treatment being implemented through Bagdad has not been previously implemented on the State Road Network, State Growth intends to monitor the operation of the highway through Bagdad and if necessary will refine the signs and linemarking arrangement adopted on Stage 2 during the detailed design.

The Quarrytown Road (south) connection to the Highway will be closed due to potential conflicting right turns with vehicles turning into Wilsons Road. Traffic from this approach can use the Quarrytown Road (middle) road.

Due to the installation of the central turning lane, it will be necessary to reduce the speed limit from the existing 100km/h to 80km/h as vehicles travelling in opposite directions will both be able to use the central turning lane.

Plans of the proposed upgrade works are included with the Development Application.

4. Existing Conditions

4.1 Midland Highway

The Midland Highway is a State Owned Category 1 Road under the Department of State Growth State Road Hierarchy. It is aligned in a north-south direction. The majority of the Mangalore to Bagdad Stage 2 road has a speed limit of 100km/h, however this is reduced to 60km/h on approach to and departure from the Pontville roundabout.

Within the extent of the project the Midland Highway has a single lane in each direction.

The flowing turning facilities currently exist within the extent of the project:

- Ballyhooly Road – Channelised Right Turn (CHR), auxiliary left turn lane (AUL)
- Black Brush Road – CHR, AUL
- Wilsons Road – CHR, BAL
- School Road (south) – CHR
- School Road (north) – AUL.

4.2 Existing Traffic Operation

Traffic data for the Midland Highway was requested from the Department of State Growth. Data was available for counts undertaken in April 2016 400m south of Ballyhooly Road and South of Roberts Road. A growth rate of 2% has been applied to the volumes to determine the 2017 volumes.

The calculated 2017 traffic volumes for the Midland Highway are summarised in Table 1.

Table 1: Existing Midland Highway Traffic Volumes

Location	2016 AADT (vpd)	AM Peak Hour (10:00-11:00)		PM Peak Hour (16:00-17:00)		% Heavy Vehicles
		Northbound	Southbound	Northbound	Southbound	
400m South of Ballyhooly Road	9,042	310	325	455	372	11%
South of Roberts Road	7,863	287	293	358	335	12%

In addition, turning movement counts were collected in May and June 2016 at Black Brush Road and School Road, which are the side roads with the highest turning volumes. The morning and afternoon turning volumes are shown in Table 2.

Table 2: Existing Side Road Traffic Volumes

Side Road	Peak	In		Out	
		Left Turn	Right Turn	Left Turn	Right Turn
Black Brush Road	AM	15 (2)	3 (1)	40 (0)	6 (2)
	PM	29 (4)	9 (1)	26 (4)	2 (0)
School Road (south)	AM	0 (0)	22 (1)	32 (2)	8 (0)
	PM	0 (0)	20 (1)	14 (1)	2 (0)
School Road (north)	AM	54 (2)	5 (0)	6 (0)	17 (1)
	PM	19 (1)	1 (0)	5 (0)	28 (2)

**Note volumes in brackets are heavy vehicles*

4.3 Crash History

The Department of State Growth has provided crash history information for the most recent 5 year period on the Midland Highway within the project extent.

A total of 43 crashes occurred within the project extent in the last 5 years. These crashes had varying levels of severity as shown in Table 3 and included many crash types as shown in

Table 4.

Table 3: Midland Highway Crash Severity

Severity	Number
Fatal	3
Serious	5
First aid	6
Minor	9
Property Damage Only	19
Unknown	1
Total	43

Table 4: Midland Highway Crash Types

DCA Code – Crash Type	Total Number	Severity		
		Fatal	Serious	Other
Run off Road	14	-	2	12
<i>171 – Left off carriageway into object or parked vehicle</i>	6	-	1	5
<i>173 – Right off carriageway into object or parked vehicle</i>	5	-	1	5
<i>179 – Other straight</i>	2	-	-	2
<i>170 – Off carriageway to left</i>	1	-	-	1
Vehicles in Same Direction	11	-	-	11
<i>130 – Rear end</i>	5	-	-	5
<i>132 – Right rear</i>	3	-	-	3
<i>131 – Left rear</i>	1	-	-	1
<i>133 – Side swipe</i>	1	-	-	1
<i>139 – Other Same Direction</i>	1	-	-	1
Head-On	6	3	-	3
<i>120 – Wrong side/ head on</i>	6	3	-	3
Turning Traffic	4	-	-	4
<i>112 – Left far</i>	1	-	-	1
<i>121 – Right through</i>	1	-	-	1
<i>140 – U-turn</i>	1	-	-	1
<i>152 – Pulling out</i>	1	-	-	1
Animals	3	-	-	3
<i>167 – Animal (not ridden)</i>	3	-	-	3
Pedestrians	2	-	2	-
<i>100 – Near side</i>	1	-	1	-
<i>109 – Other pedestrian</i>	1	-	1	-
Other	3	-	1	2
<i>162 – Accident or broken down</i>	1	-	-	1
<i>184 – Out of control on carriageway</i>	1	-	1	-
<i>191 – Load or missile struck vehicle</i>	1	-	-	1
TOTAL	43	3	4	36

The location of each of these crashes indicated by crash type is shown in Figure 2.

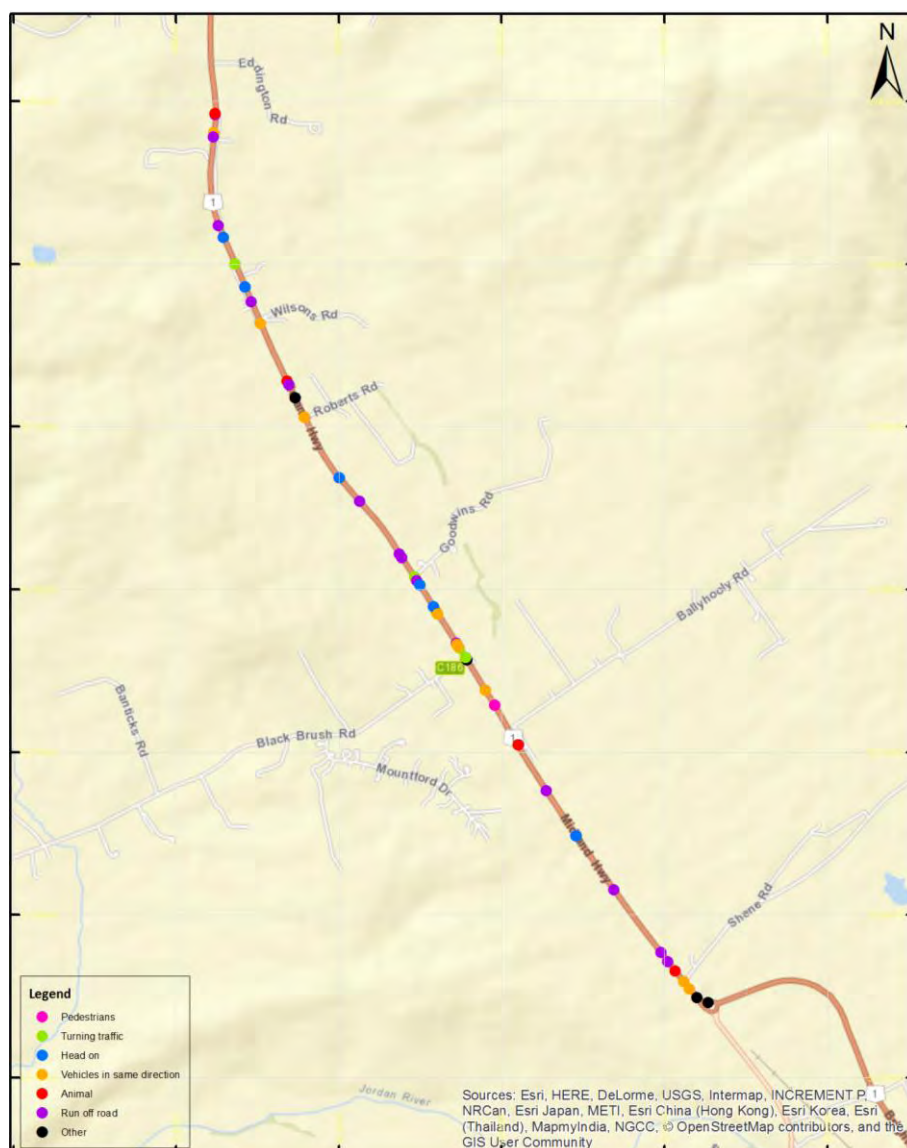


Figure 2: Midland Highway Crash History

There appears to be no significant correlation between the road condition at any particular point on the road and the recorded crash history. The crashes occurred at various times throughout the day and in different weather conditions along the length of the project length. The majority of crashes were rear end crashes or involved vehicles running off the road.

It is noted that head on-crashes were prevalent along this section of road, with a total of 6 head-on crashes with 3 of these being fatal crashes. It is expected that the safety upgrades to the Midland Highway will reduce the prevalence of head-on crashes through implementation of the median lane.

Serious injury crashes were predominantly off carriageway crashes into objects on the side of the road. It is expected the number of off-road crashes would be reduced by widening of the sealed shoulders and removal (or protection with safety barrier) of road side hazards.

Two serious injury involved pedestrians, it is expected that the introduction of traffic islands incorporating pedestrian refuges will allow pedestrians to cross the road in stages and reduction of the speed limit will allow pedestrians greater time to cross the road and will allow drivers greater reaction time, and therefore should reduce the prevalence of pedestrian crashes.

Several rear-end and right and left rear crashes occurred. It is expected that right-rear crashes would be reduced with implementation of the shared median as it allows right turning vehicles to prop clear of the through lane whilst waiting for a suitable gap in the approaching traffic.

Reduction in the prevalence and severity of all vehicle crashes including rear end crashes and turning traffic crashes is expected with the reduction of the speed limit to 80km/h. Whilst severity for vulnerable user crashes will still be high at 80km/h, the likelihood of crashes will be reduced through implementation of the proposed works.

5. Road Safety

5.1 Safe Systems Assessment

Austrroads has developed a Safe Systems assessment framework to assist road agencies to consider Safe System objectives for road infrastructure projects. The framework assists in assessing how close road design and operation align with Safe Systems objectives and clarifies elements which require modification to achieve a closer alignment with objectives.

The Safe Systems framework assesses different major crash types against the crash risk exposure, the likelihood of the crash occurring and the severity of the crash should it occur. The exposure, likelihood and severity for each crash type are scored out of 4, with 4 being the worst result, and multiplied together to give a score out of 64.

The Department of State Growth have completed a Safe Systems assessment for the Mangalore to Bagdad Stage 2 project. The assessment included scoring the existing road condition against the proposed condition.

The summary of the results of the Safe Systems assessment is shown in Table 5 with a copy of the full Safe Systems Assessment included in Appendix C.

Table 5: Safe Systems Assessment Summary

	Run-off-road	Head-on	Intersection	Property access	Pedestrian	Cyclist	Motorcyclist
EXISTING CONDITIONS							
Exposure	3/4	3/4	3/4	3/4	1/4	1/4	3/4
Likelihood	3/4	4/4	3/4	3/4	3/4	3/4	3/4
Severity	4/4	4/4	4/4	4/4	4/4	4/4	4/4
<i>Product</i>	<i>36/64</i>	<i>48/64</i>	<i>36/64</i>	<i>36/64</i>	<i>12/64</i>	<i>12/64</i>	<i>36/64</i>
TOTAL							216/448
PROPOSED CONDITIONS							
Exposure	3/4	3/4	3/4	3/4	1/4	1/4	3/4
Likelihood	1/4	2/4	2/4	1/4	2/4	2/4	1/4
Severity	2/4	3/4	3/4	3/4	4/4	4/4	3/4
<i>Product</i>	<i>6/64</i>	<i>18/64</i>	<i>18/64</i>	<i>9/64</i>	<i>8/64</i>	<i>8/64</i>	<i>9/64</i>
TOTAL							76/448

As shown in Table 5, the Safe Systems analysis clearly results in a lower total score for the proposed layout in comparison with existing conditions.

The exposure values have remained identical between the existing and proposed conditions as there will be no change in vehicles, pedestrian or bicycle volumes and the location of intersection and accesses will remain.

The likelihood of all crash types occurring has decreased with the proposed conditions. This is particularly significant for the following:

- Reduction in likelihood of run off road crashes due to the widening of the verges and removal (or protection with safety barrier) of road side hazards
- Reduction in likelihood of head-on crashes through implementation of the median turn lane
- Reduction in likelihood of intersection crashes due to the addition of or improvement of designated turning lanes, particularly right turn lanes
- Reduction in likelihood of crashes at property accesses by providing the median turn lane which removes right turners from the through traffic lane and providing wider shoulders to allow vehicles turning left to move onto the shoulder as they reach slower speeds on approach to accesses
- Reduction in likelihood of pedestrian crashes due to the implementation of pedestrian islands and lowering of the speed limit to 80km/h allowing more time for a pedestrian to cross the road
- Reduction in likelihood of cyclist crashes as cyclists would be able to ride on the sealed shoulders and an improved surface
- Reduction in likelihood of motorcycle crashes through wider sealed shoulders, the introduction of the central median, improved riding surface and improved delineation.

The severity of all crashes except for pedestrian and cyclist crashes is reduced due to the lowering of the speed limit to 80km/h.

5.2 Sight Distance

The Safe Intersection Sight Distance (SISD) has been assessed for vehicles at each intersection and access in the project length.

The SISD has been assessed against the *AUSTROADS Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections*.

As discussed, the speed limit on the Midland Highway will be 80km/h post construction. The SISD for an 80km/h road is 181m (with a reaction time of 2.0s). Based on the road design for this project, the SISD is expected to be well in excess of the AUSTROADS requirement in both directions at each all intersections and accesses.

6. Traffic Impacts

6.1 Travel Time

6.1.1 Travel Time Surveys

Travel time surveys have been completed between the north departure from the Midland Highway/ Brighton Road roundabout at Pontville and the southern end of School Road in Bagdad to determine the impacts of reducing the speed limit from 100km/h to 80km/h. The travel time surveys were undertaken using the floating car method, which involves driving a vehicle along the Midland Highway in the traffic flow and recording the travel time between two fixed points.

The travel time surveys were taken between the north approach of the Midland Highway/ Brighton Road roundabout at Pontville and the southern end of School Road in Bagdad. The travel time surveys included approximately 300m at a 60km/h speed limit at the southern end of the survey. The speed limit on the remaining 5500m of the survey length was 100km/h.

Initially **pitt&sherry** staff undertook travel time surveys at the site on Thursday 27 October 2016 at 7:45am to 10:15am and 2:30pm to 6:00pm which included the AM and PM peak hours.

It is of note that between 2:30pm and 5:00pm on the 27 October there were tree trimming works taking place on the Highway which included lowered speed limits.

Additional surveys were completed between 11:00am and 4:00pm on Tuesday 1 November 2016 which included the off-peak and a repeat of the times when tree trimming was taking place on the first survey day.

Between the two collection days 45 travel time surveys were taken in each direction. The data for each run was collected on a GPS tracker program installed on a mobile phone. The tracker collected GPS location data as well as the time taken to complete the run and the distance travelled.

While undertaking the travel time surveys it was observed that the majority of vehicles travel at just under the 100km/h speed limit and that travel speeds were always affected by the presence of any slow moving vehicle along the road section.

6.1.2 Results and Findings

A summary of the travel time survey results are shown in Figure 3 and Figure 4. Full results showing the data collected and the time of each travel time survey is included in Appendix D. The results in the figures and Appendix D exclude the data collected during the tree trimming works as the works increased the travel time significantly.

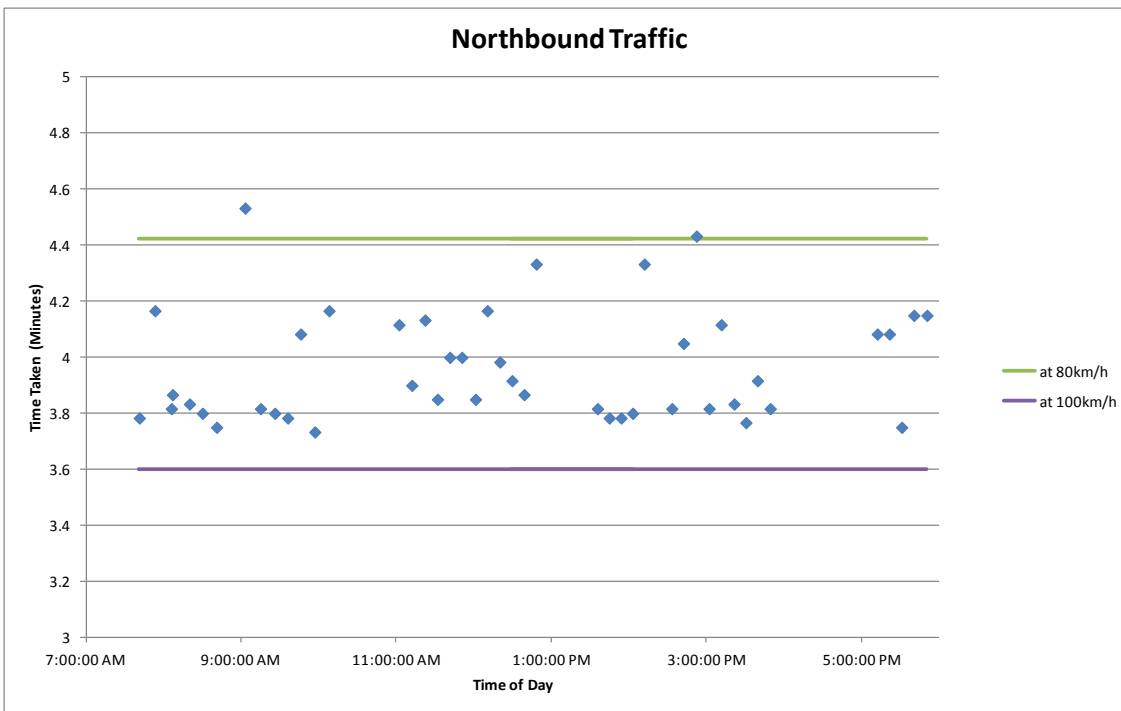


Figure 3: Travel Time Survey Results - Northbound Traffic

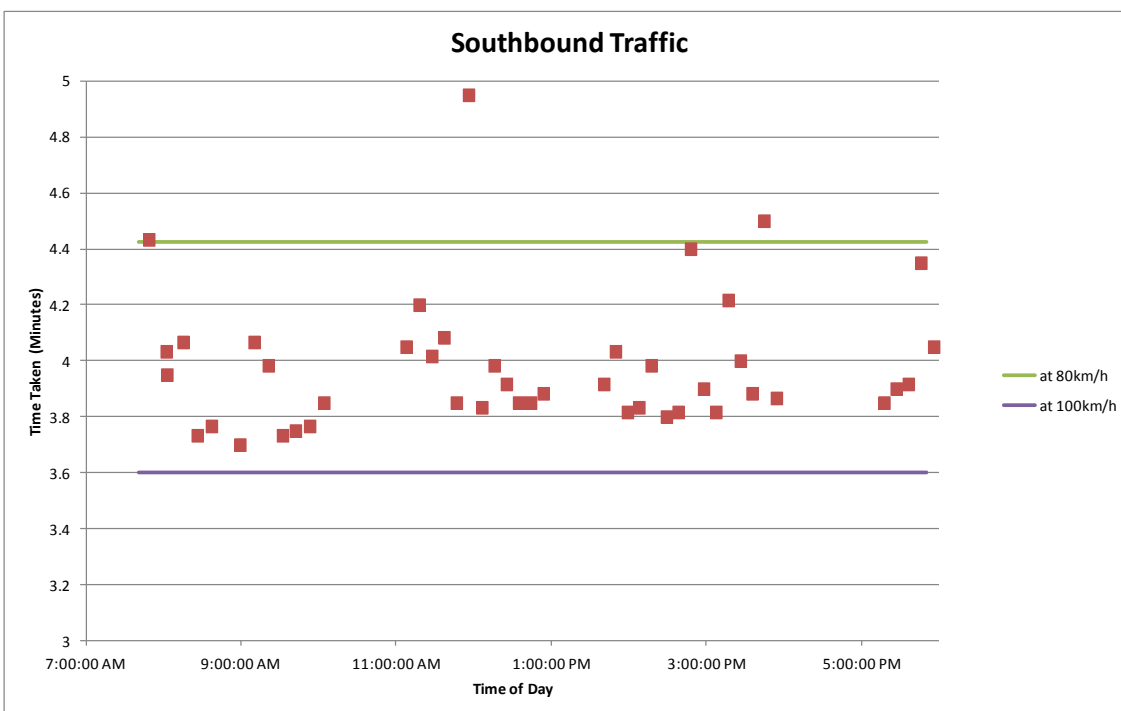


Figure 4: Travel Time Survey Results - Southbound Traffic

The results above show that the majority of trips are completed at a speed between 80km/h and 100km/h with some trips lower than 80km/h. It is noted that the posted 60km/h section was taken into account in the calculation of the 80km/h and 100km/h timings.

Based on the results above, there appears to be no significant correlation between the time of day of the travel time survey and time taken to complete the survey. Therefore, the greatest impact on travel speeds is expected to be due to slow moving vehicles.

6.1.3 Travel Times

The maximum speed limit travel times and the mean, median and longest and shortest times to complete the travel time survey are shown in Table 6.

Table 6: Travel Times Summary

	Northbound	Southbound
Speed limit 100km/h	3 mins, 36 secs	
Speed limit 80km/h	4 mins, 26 secs	
Mean time	3 mins, 58 secs	3 mins, 59 secs
Median time	3 mins, 52 secs	3 mins, 55 secs
Longest time	4 mins, 32 secs	4 mins 57 secs
Shortest time	3 mins, 44 secs	3 mins, 42 secs

Based on the above, the trip between the north departure from the Midland Highway/ Brighton Road roundabout at Pontville and the southern end of School Road in Bagdad would be expected to take approximately 30 seconds longer in each direction if the speed limit is reduced to 80km/h.

6.1.4 Speeds

The calculated mean and median speed through the 100km/h speed limited section are shown in Table 7. These speeds have been based on the average and median travel times.

Table 7: Travel Speeds Summary

	Northbound	Southbound
Mean speed	88km/h	87km/h
Median speed	90km/h	89km/h

Based on the results above, the mean and median speeds in the 100km/h speed limited section are approximately 90km/h. Therefore a reduction in the speed limit to 80km/h would result an effective speed reduction of 10km/h for the mean and median vehicle for travel within the time period of the survey work.

6.2 Intersection Operation

The change in traffic volumes on the road network post development is expected to be negligible as full turning movements will remain for all major traffic generating properties and roads.

The operation of the Black Brush Road, School Road (south) and School Road (north) post development have been assessed using SIDRA INTERSECTION. The intersection performance is based on the vehicle delay and the corresponding Level of Service (LOS). It is generally accepted that an intersection operates well if it is at LOS D or higher. Table 8 shows the criteria that SIDRA intersection adopts in assessing the LOS.

Table 8: SIDRA INTERSECTION Level of Service Criteria

LOS	Delay per Vehicle (secs)		
	Signals	Roundabout	Sign Control
A	10 or less	10 or less	10 or less
B	10 to 20	10 to 20	10 to 15
C	20 to 35	20 to 35	15 to 25
D	35 to 55	35 to 50	25 to 35
E	55 to 80	50 to 70	35 to 50
F	Greater than 80	Greater than 70	Greater than 50

As a conservative approach, the full Midland Highway traffic volumes south of Ballyhooly Road were used for the Black Brush Road modelling and the full Midland Highway volumes south of Roberts Road were used for the School Road modelling.

Table 9 presents a summary of the existing operation of side road intersections with the Midland Highway.

Table 9: Existing Layout Operating Conditions

Side Road	Peak	Leg	Degree of Saturation (DOS)	Average Delay (secs)	95 th Percentile Queue (m)	LOS
Black Brush Road	AM	South	0.18	0	0	NA
		North	0.19	0	0	NA
		West	0.05	8	1	A
		TOTAL	0.19	1	1	NA
	PM	South	0.26	1	0	NA
		North	0.11	0	0	NA
		West	0.04	9	1	A
		TOTAL	0.26	1	1	NA
School Road (south)	AM	South	0.17	1	1	NA
		East	0.04	8	1	A
		North	0.17	0	0	NA
		TOTAL	0.17	1	1	NA
	PM	South	0.21	0	1	NA
		East	0.02	8	0	A
		North	0.20	0	0	NA
		TOTAL	0.21	0	1	NA

Side Road	Peak	Leg	Degree of Saturation (DOS)	Average Delay (secs)	95 th Percentile Queue (m)	LOS
School Road (north)	AM	South	0.16	0	0	NA
		East	0.05	11	1	B
		North	0.17	1	0	NA
		TOTAL	0.17	1	1	NA
	PM	South	0.21	0	0	NA
		East	0.10	14	2	B
		North	0.20	0	0	NA
		TOTAL	0.21	1	2	NA

On the basis of this assessment, it is clear that the most heavily used intersections in the project area will continue to operate with minimal queuing and delays on all approaches. For this reason, all other intersections are expected to operate with satisfactory Levels of Service.

7. Construction Impacts

7.1 Access

Access to the site will be via the existing Midland Highway. The works will be controlled by a comprehensive traffic management plan that must be prepared by the Contractor undertaking the works. The traffic management plan must comply with Department of State Growth Specification requirements that include limits on delay times.

7.2 Parking

Parking for construction workers' vehicles will be provided at a site compound on property adjacent to the highway. Several light vehicles will need to park near work activities and the Contractor's Traffic Management Plan will outline these parking arrangements and the safety procedures with respect to parking clear of highway traffic.

7.3 Traffic Generation

Based on preliminary information, the traffic movements that are expected to be generated from the construction of the highway upgrade are shown in Table 10.

Table 10: Additional Traffic During Construction

Activity	Number of trips
Mobilisation	Up to 20 truck trips per day – 2 to 4 weeks duration
Construction workers	20 trips per day in light vehicles – duration of project, approximately 18 months
Earthworks	Up to 150 truck trips per day generally operating on new formation or clear of traffic lanes - duration approximately 8 months
Pavement materials	Up to 60 truck trips per day. Expected to be sourced from major quarries and delivered via the Midland Highway – duration approximately 10 months
Delivery of general construction materials	Up to 10 truck trips per day – duration approximately 18 months
Demobilisation	Up to 20 truck trips – 1 to 2 weeks duration

The information in Table 10 shows that traffic volumes on the Midland Highway are expected to increase by approximately 180 vehicles per day or 20 vehicles per hour and these additional traffic movements will predominately be heavy vehicles. These figures above represent an increase of approximately 2.5% on current daily traffic volumes

The site will be under the control of the Contractor and will operate under a reduced speed limit during working hours and may at times operate under reduced speed limits outside working times.

The predominant impact on traffic operations on the Midland Highway will be delays due to construction activity as distinct from delays due to the increased traffic generated from material deliveries and workers travelling to and from the site.

As indicated, the Department of State Growth impose strict performance requirements with respect to traffic control and delays on its worksites that include:

- Maximum delay of 8 minutes without prior notice to the travelling public
- Maximum delay of 15 minutes where prior notice is given to the travelling public
- Restrictions on lane closures
- Minimum standards for side tracks and detours
- Daily surveillance of Contractors activities and monitoring of traffic operation.

Construction activity will inevitably result in some reduction on level of service on the Midland Highway for the expected 18 month duration of the works; however, the measures indicated above will ensure that any reduction is within tolerable levels.

The impact on the local road network controlled by the Southern Midlands Council is expected to be negligible as almost all additional traffic generated as a result of the works will travel on the Midland Highway.

The design provides an approximate balance between cut and fill thereby minimising the need for excess materials to be transported over local roads for disposal. The Department of State Growth will incorporate appropriate requirements into the construction contract for the upgrade works to ensure the contractor minimises the transport of materials over local roads, and should this occur any unreasonable damage is repaired.

7.4 Turning Movements

The site will be controlled by appropriate signing in Accordance with AS1742.3 *Manual of uniform traffic control devices - Traffic control for works on roads*. In addition, where required, traffic controllers will assist trucks to turn into or out of designated work areas.

7.5 Road Safety

The Traffic Management Plan prepared by the Contractor will describe the traffic management measures that will be implemented by the Contractor to ensure the safety of both the travelling public and construction workers. This Traffic Management Plan will be monitored on a daily basis and will also be the subject of audits to ensure its effectiveness.

The Department of State Growth will ensure that School Road is not used to detour Midland Highway traffic during construction.

8. Summary

An assessment of the traffic impacts associated with the construction of the Mangalore to Badgad Stage 2 of the Midland Highway Safety Upgrades has been undertaken in accordance with Department of State Growth's *Framework for Undertaking Traffic Impact Assessments*. This assessment includes examination of construction impacts, safe intersection sight distances, traffic operations and road safety. The analysis and discussions presented in the report can be summarised as follows:

- A Safe Systems assessment has been completed and shows that the likelihood and severity of most crashes will be reduced as a result of the proposed upgrade works
- The available sight distances at the side roads and accesses meet the AUSTRROADS requirements for a speed limit of 80km/h
- Analysis of travel times has concluded that the reduction of the posted speed limit would result in an additional travel time of approximately 30 seconds in each direction and an effective drop in travel speeds of 10km/h, typically for daytime travel on any day of the week
- The additional traffic volumes generated by the construction of the facility are expected to have some impact on the level of service on the highway, however the implementation of required traffic control measures will ensure that this impact is kept within tolerable limits
- There would be a negligible traffic impact post development as the highway upgrade will not generate a permanent increase in traffic
- A total of 43 reported crashes have occurred on this section of the Midland Highway over the most recent 5 year period. There appears to be no significant correlation between the road condition and the recorded crash history. Implementation of the proposed upgrade works could be expected to improve the safety performance of this section of the Midland Highway.

Appendix A

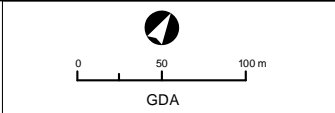
Link Maps



MIDLAND HWY A0087 PONTVILLE ROUNDABOUT

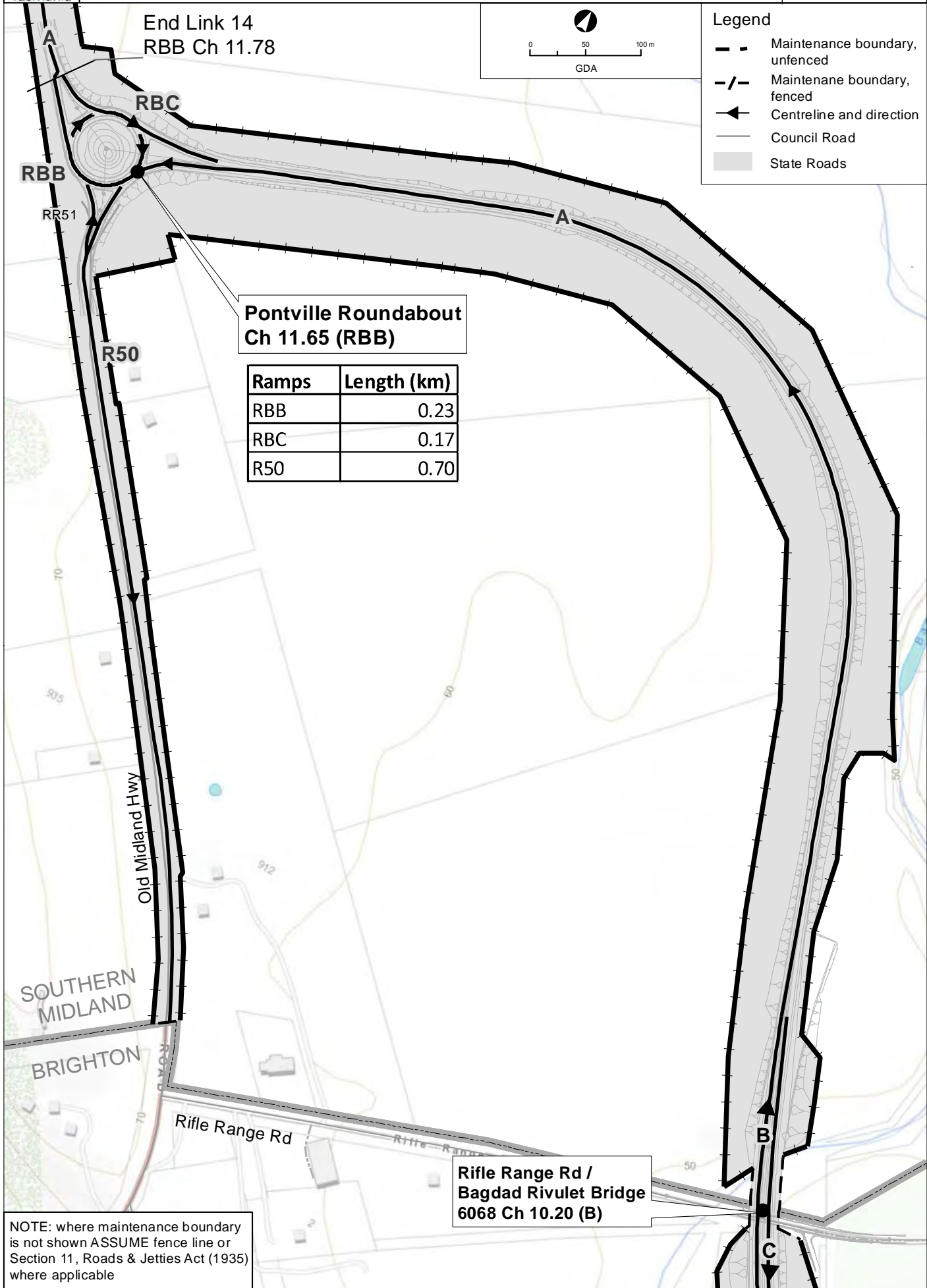
Region S

Link 14
Ch 11.65



Legend

- - - Maintenance boundary, unfenced
- / - Maintenance boundary, fenced
- ← Centreline and direction
- Council Road
- State Roads



**Pontville Roundabout
Ch 11.65 (RBB)**


Ramps	Length (km)
RBB	0.23
RBC	0.17
R50	0.70

NOTE: where maintenance boundary is not shown ASSUME fence line or Section 11, Roads & Jetties Act (1935) where applicable

**Rifle Range Rd /
Bagdad Rivulet Bridge
6068 Ch 10.20 (B)**

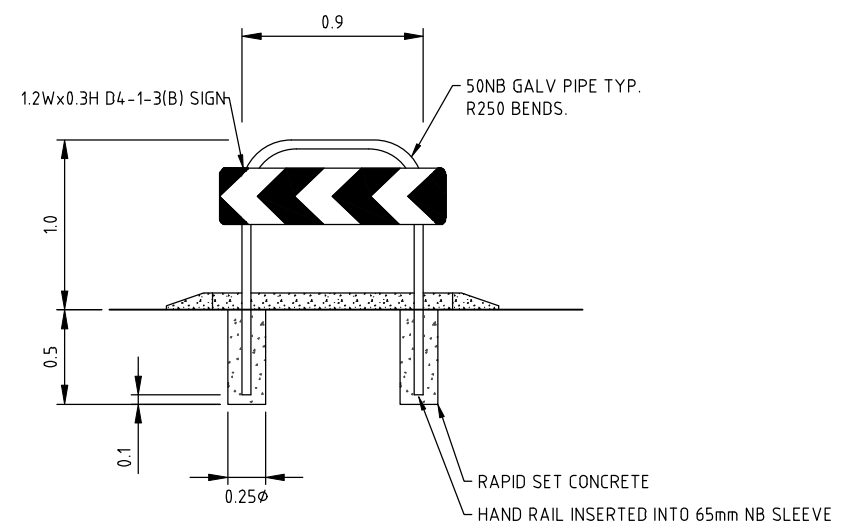
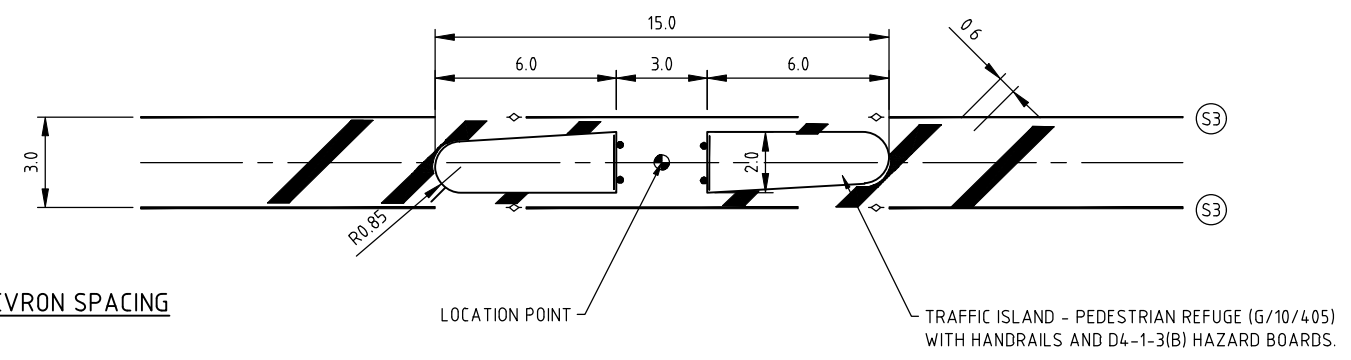
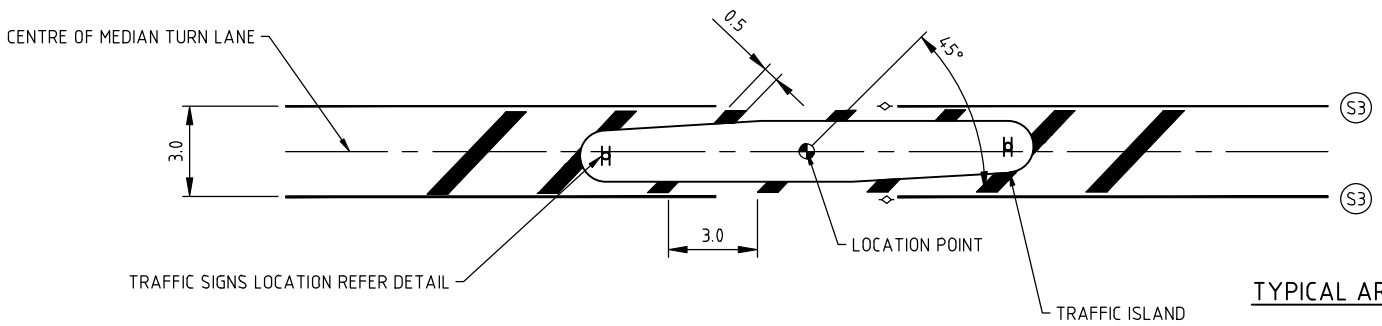
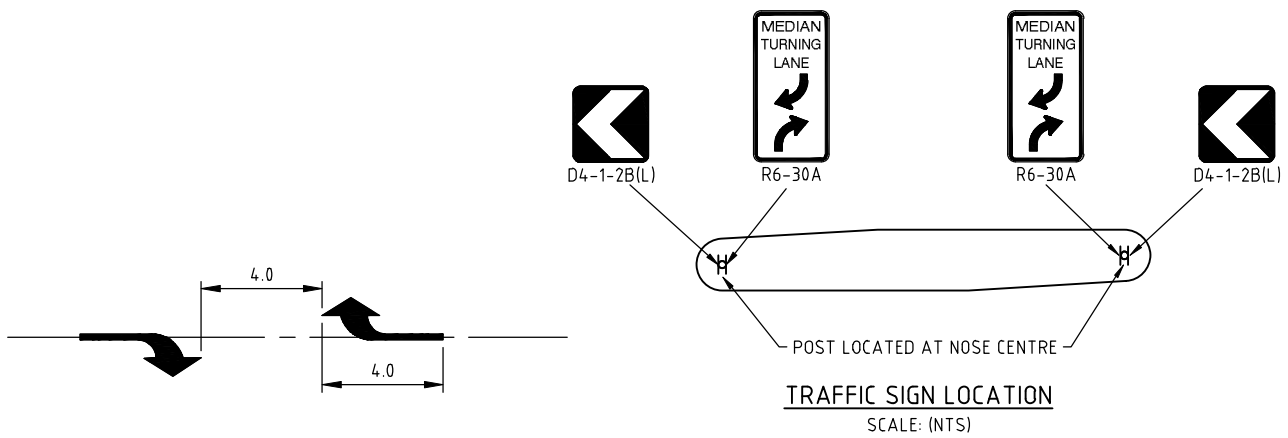
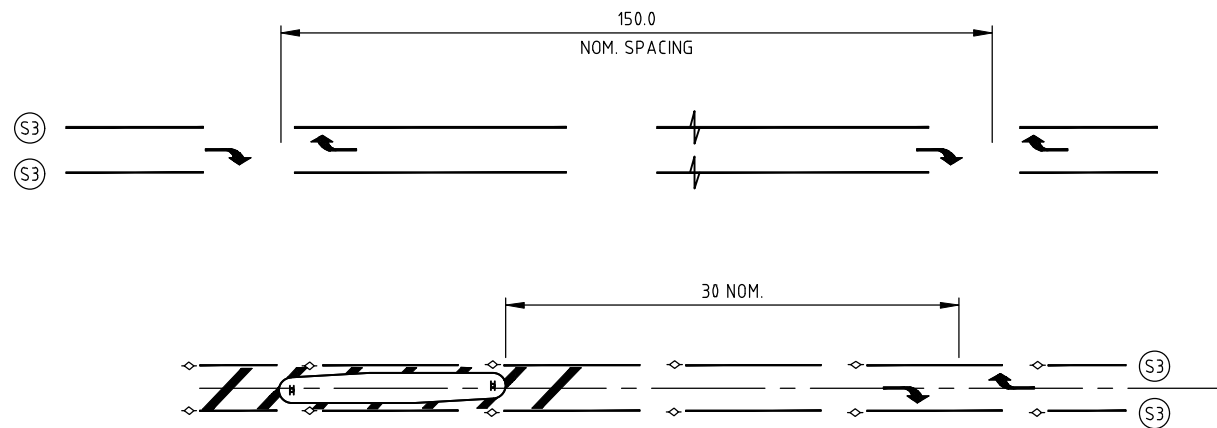
MIDLAND HIGHWAY

A0087

SCALE 1:50 000 	DESCRIPTION	FEAT. No.	DIST. km.	LINK No. 20 16 14
				SURVEY 1287
				REVISED 02/13
8.12	CHAUNCY VALE ROAD	L1186	8.12	
	WINSTEAD ROAD	L1539	7.50	
	HORFIELD CREEK BRIDGE	821	7.45	
7.43	GANGELLS LANE	L0297	7.43	
	HALL LANE	L1173	7.06	
6.60	EDDINGTON ROAD	L1047	6.64	
	SCHOOL ROAD BAGDAD	L1429	6.34	
	SCHOOL ROAD BAGDAD	L1429	5.79	
	CULVERT	138	5.61	
5.36	WILSONS ROAD	L1351	5.01	
	CULVERT	142	4.89	
	ROBERTS ROAD	L1403	4.36	
	CULVERT	1572	4.35	
3.66	GOODWINS ROAD	L1199	3.16	
	BLACK BRUSH ROAD	L1092	2.58	
2.38	BALLYHOOLY ROAD	L1128	2.04	
	LOWREYS ROAD	L1348	1.80	
1.03				
	SHENES ROAD	L1131	0.15	
0.00	ROUNDAABOUT (BULLNOSE)		0.00	
	BRIGHTON / SOUTHERN MIDLANDS		-0.92	

Appendix B

Typical Median Details



TYPICAL HOLDING RAIL DETAIL
(IN TRAFFIC ISLAND)
NTS

0	FOR TENDER	R.M.	20/11/2015
No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

SCALES
N.T.S.

Co-ordinate System: MGA ZONE 55
Height Datum: A.H.D.

DESIGNED D.GREGS
REVIEWED R.MANNING

Department of State Growth
MIDLAND HIGHWAY (A0087)
MANGALORE TO BAGDAD
ROAD IMPROVEMENTS (STAGE 1)
SIGNS & LINEMARKING DETAILS - DRG 1 OF 1

CONTRACT No. 2303
DRAWING HB15050-C2451
PRINTED DATE 18-Nov-15, 5:07 PM
REGISTRATION NUMBER
A0087.030

SHEET No. **2451**
REVISION 0

Appendix C

Safe Systems Assessment

Midland Highway safety upgrade through Managlore - Safe System Assessment

Existing conditions

Crash Type	Run-off-road	Head-on	Intersection	Property Access	Pedestrian	Cyclist	Motorcyclists	Total
Exposure	9,000 Vpd Moderate traffic volume 3/4	9,000 Moderate traffic volume 3/4	Low volume of turning traffic 3/4	Low volume of turning traffic 3/4	Low pedestrian activity 1/4	Low volume of cyclists 1/4	Reasonable number of motorcyclists 3/4	
Likelihood	Narrow shoulders Moderate clear zone Limited protection to roadside hazards 3/4	No separation-apart from centreline 4/4	Reasonable sight distance Limited protection of right turners into accesses Moderate level of turning facilities 3/4	Reasonable sight distance No protection of right turners into accesses Gravel access to properties 3/4	No crossing facilities No formal footpaths 3/4	good sight distance narrow shoulders reasonably wide traffic lanes 3/4	good sight distance narrow shoulders reasonably wide traffic lanes patchy road surface 3/4	
Severity	High speed 100 km/h Limited barriers 4/4	High speed 4/4	High speed 4/4	High speed 4/4	High speed 4/4	High speed 4/4	High speed 4/4	
Product	36/64	48/64	36/64	36/64	12/64	12/64	36/64	216/448

Proposed conditions

Crash Type	Run-off-road	Head-on	Intersection	Property Access	Pedestrian	Cyclist	Motorcyclists	Total
Exposure	9,000 Vpd Moderate traffic volume 3/4	9,000 Moderate traffic volume 3/4	Low volume of turning raffic 3/4	Low volume of turning raffic 3/4	Low pedestrian activity 1/4	Low volume of cyclists 1/4	Reasonable number of motorcyclists 3/4	
Likelihood	Wider shoulders Clear zones Protection to roadside hazards 1/4	Separation by 3 metres painted median supported with solid islands every 200m to prevent overtaking 2/4	Reasonable sight distance Improved formal turning facilities 2/4	Reasonable sight distance Turning lane provides protection for right turners Sealed property access provides better traction Left in and left out easier with wider shoulder 1/4	Reasonable sight distance Solid islands scattered along the route in conjunction with 3 metre central turn lane 2/4	Good sight distance Wider sealed shoulders 3.5m wide traffic lanes 2/4	Wider sealed shoulders Central median - separation to opposing traffic Improved road riding surface Improved delineation 1/4	
Severity	Reduced speed limit to 80 km/h Barriers protecting hazards 2/4	Reduced speed limit to 80 km/h 3/4	Reduced speed limit to 80 km/h 3/4	Reduced speed limit to 80 km/h 3/4	Reduced speed limit to 80 km/h 4/4	Reduced speed limit to 80 km/h 4/4	Reduced speed limit to 80 km/h 3/4	
Product	6/64	18/64	18/64	9/64	8/64	8/64	9/64	76/448

Appendix D

Travel Time Survey Results

NORTHBOUND SURVEY

Date	Time	Travel Time
27/10/2016	7:41:11 AM	0:03:47
27/10/2016	7:53:17 AM	0:04:10
27/10/2016	8:06:00 AM	03:48.6
27/10/2016	8:06:51 AM	0:03:52
27/10/2016	8:20:00 AM	03:49.8
27/10/2016	8:30:00 AM	03:47.5
27/10/2016	8:41:00 AM	03:45.3
27/10/2016	9:03:00 AM	04:31.6
27/10/2016	9:15:00 AM	03:48.5
27/10/2016	9:26:00 AM	03:48.0
27/10/2016	9:36:00 AM	03:47.2
27/10/2016	9:46:00 AM	04:05.2
27/10/2016	9:57:00 AM	03:43.6
27/10/2016	10:08:00 AM	04:09.8
1/11/2016	11:02:07 AM	0:04:07
1/11/2016	11:12:05 AM	0:03:54
1/11/2016	11:22:16 AM	0:04:08
1/11/2016	11:31:57 AM	0:03:51
1/11/2016	11:41:27 AM	0:04:00
1/11/2016	11:50:47 AM	0:04:00
1/11/2016	12:01:20 PM	0:03:51
1/11/2016	12:10:30 PM	0:04:10
1/11/2016	12:20:12 PM	0:03:59
1/11/2016	12:29:38 PM	0:03:55
1/11/2016	12:38:59 PM	0:03:52
1/11/2016	12:48:22 PM	0:04:20
1/11/2016	1:35:48 PM	0:03:49
1/11/2016	1:44:54 PM	0:03:47
1/11/2016	1:54:04 PM	0:03:47
1/11/2016	2:03:01 PM	0:03:48
1/11/2016	2:12:00 PM	0:04:20
1/11/2016	2:33:20 PM	0:03:49
1/11/2016	2:42:21 PM	0:04:03
1/11/2016	2:52:23 PM	0:04:26
1/11/2016	3:02:11 PM	0:03:49
1/11/2016	3:11:34 PM	0:04:07
1/11/2016	3:21:30 PM	0:03:50
1/11/2016	3:30:40 PM	0:03:46
1/11/2016	3:39:38 PM	0:03:55
1/11/2016	3:49:29 PM	0:03:49
27/10/2016	5:12:20 PM	0:04:05
27/10/2016	5:21:46 PM	0:04:05
27/10/2016	5:31:15 PM	0:03:45
27/10/2016	5:40:40 PM	0:04:09
27/10/2016	5:50:48 PM	0:04:09

SOUTHBOUND SURVEY

Date	Time	Travel Time
27/10/2016	7:48:29 AM	0:04:26
27/10/2016	8:02:00 AM	04:01.6
27/10/2016	8:02:31 AM	0:03:57
27/10/2016	8:15:00 AM	04:04.4
27/10/2016	8:26:00 AM	03:43.8
27/10/2016	8:37:00 AM	03:46.0
27/10/2016	8:59:00 AM	03:41.5
27/10/2016	9:10:00 AM	04:04.3
27/10/2016	9:21:00 AM	03:59.3
27/10/2016	9:32:00 AM	03:44.1
27/10/2016	9:42:00 AM	03:45.1
27/10/2016	9:53:00 AM	03:46.4
27/10/2016	10:04:00 AM	03:51.0
1/11/2016	11:07:40 AM	0:04:03
1/11/2016	11:17:43 AM	0:04:12
1/11/2016	11:27:33 AM	0:04:01
1/11/2016	11:36:58 AM	0:04:05
1/11/2016	11:46:33 AM	0:03:51
1/11/2016	11:55:58 AM	0:04:57
1/11/2016	12:06:18 PM	0:03:50
1/11/2016	12:15:50 PM	0:03:59
1/11/2016	12:25:18 PM	0:03:55
1/11/2016	12:34:42 PM	0:03:51
1/11/2016	12:44:02 PM	0:03:51
1/11/2016	12:53:49 PM	0:03:53
1/11/2016	1:40:40 PM	0:03:55
1/11/2016	1:49:43 PM	0:04:02
1/11/2016	1:58:58 PM	0:03:49
1/11/2016	2:07:51 PM	0:03:50
1/11/2016	2:17:22 PM	0:03:59
1/11/2016	2:29:10 PM	0:03:48
1/11/2016	2:38:13 PM	0:03:49
1/11/2016	2:47:50 PM	0:04:24
1/11/2016	2:57:55 PM	0:03:54
1/11/2016	3:07:25 PM	0:03:49
1/11/2016	3:16:57 PM	0:04:13
1/11/2016	3:26:23 PM	0:04:00
1/11/2016	3:35:25 PM	0:03:53
1/11/2016	3:44:39 PM	0:04:30
1/11/2016	3:54:18 PM	0:03:52
27/10/2016	5:17:32 PM	0:03:51
27/10/2016	5:27:00 PM	0:03:54
27/10/2016	5:36:24 PM	0:03:55
27/10/2016	5:46:06 PM	0:04:21
27/10/2016	5:56:01 PM	0:04:03

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Additional documents – St Peters Pass to Tunbridge - DA2017-10

Please note the following documents are available in electronic or hard copy if requested. Summaries are provided in the planning report.

- Hydraulic Assessment (Jacobs)
- Landslide Risk Assessment and Management Report (Jacobs)
- Flora and Fauna Survey and Addendum (North Barker Ecosystem Services)
- Historic Heritage Assessment and Historic Plantings Heritage Assessment (Austral and Landscape Plan)
- Heritage Impact Assessment (Dr Sophie Collins, Cultural Heritage Management Australia)

Midland Highway Safety Upgrades

St Peters Pass to South of Tunbridge

Development Application Supporting Report

February 2017



Table of Contents

1. INTRODUCTION	4
2. STRATEGIC RATIONALE	4
3. PROJECT OBJECTIVES	4
4. SITE DESCRIPTION	5
4.1 LOCATION.....	5
4.2 TITLES.....	5
4.3 EXISTING ROAD AND ROADSIDE ENVIRONMENT	6
5. PROPOSAL	9
5.1 DESIGN	9
5.2 OVERTAKING LANES.....	10
5.3 BRIDGE STRUCTURES	10
5.4 LOCAL ROADS	11
5.5 PRIVATE ACCESSES	12
5.6 DESIGN OPTIONS FOR SIGNIFICANT PROPERTY ACCESSES	14
5.7 STORMWATER.....	15
5.8 SERVICE RELOCATIONS	16
5.9 LANDSCAPING	16
5.10 LIGHTING	17
5.11 LAND ACQUISITION	17
5.12 GEOLOGY	18
5.13 FLORA & FAUNA.....	18
5.14 NOISE.....	19
5.15 LAND CAPABILITY.....	19
5.16 HISTORIC HERITAGE.....	19
5.17 ABORIGINAL HERITAGE	22
5.18 CONSTRUCTION	22
6. STAKEHOLDER ENGAGEMENT	23
7. SITE PHOTOGRAPHS	24
8. PLANNING SCHEME	25
8.1 DETERMINING APPLICATIONS	25
8.2 PLANNING SCHEME OBJECTIVES.....	26
8.3 USE CATEGORISATION.....	27
8.4 PART C ZONES.....	28
8.5 PART D CODES	35
8.6 PART F SPECIFIC AREA PLANS.....	52
9. TASMANIAN HERITAGE REGISTER	52
10. STATE POLICIES	53
11. CONCLUSION	54

1. Introduction

This report supports a development application by the Department of State Growth (State Growth) to the Southern Midlands Council (Council) for the widening and upgrading of the existing Midland Highway to provide a “2 + 1” arrangement between St Peters Pass and South of Tunbridge.

The St Peters Pass to South of Tunbridge upgrade project is part of the Greater Midland Highway Upgrades Program. The program has the objective of making safety improvements to the Midland Highway in order to achieve a minimum 3-star AusRAP rating along the entire length of the highway. This will be achieved through the provision of alternating lengths of “2+1” lane arrangements, as well as targeted vertical and horizontal alignment improvements and junction upgrades.

The project is located on the Midland Highway approximately 95 km north of Hobart. The project extends from 3.6 km south of the Sorell Springs Road junction to south of Tunbridge, with a total length of 10.7 km.

The purpose of this report, supporting plans and technical reports is to address the Southern Midlands Interim Planning Scheme 2015 (the Scheme). The proposal is assessed to comply with the relevant requirements of the Scheme.

2. Strategic Rationale

The upgrade of the Midland Highway from St Peters Pass to South of Tunbridge is a component of the Midland Highway Action Plan, a 10 year commitment by the Australian and Tasmanian Governments of \$500 million made in May 2014. The key objectives of the Plan are to improve safety to a minimum 3 Star AusRAP¹ rating, integrated with additional safe overtaking facilities, and a staged approach to capacity improvements. More information on the Midland Highway Action Plan is available at <http://www.midlandhighway.tas.gov.au/>.

3. Project Objectives

The objectives of the project are to:

- Upgrade the road to a minimum 3-Star AusRAP rating
- Improve safety and reduce head-on collisions by providing a flexible safety barrier in the central median
- Consolidate breaks in the central median barrier
- Provide additional safe overtaking opportunities through a “2+1” lane arrangement
- Maintain a 110km/h speed environment, consistent with the Tasmanian Guidelines for Category One Roads
- Upgrade junctions
- Improve horizontal and vertical alignment of the road, where necessary and cost effective

¹ The Australian Road Assessment Program (AusRAP) has examined 21,921 kilometres of national highway with a speed limit of 90km per hour or above, awarding Star Ratings based on their level of safety. Sections of road are rated on a scale of 1 to 5-stars, with 1-star being the least safe and 5-star being the safest. – Australian Automobile Association (2013) *Star Rating Australia's National Network of Highways 2013*

4. Site Description

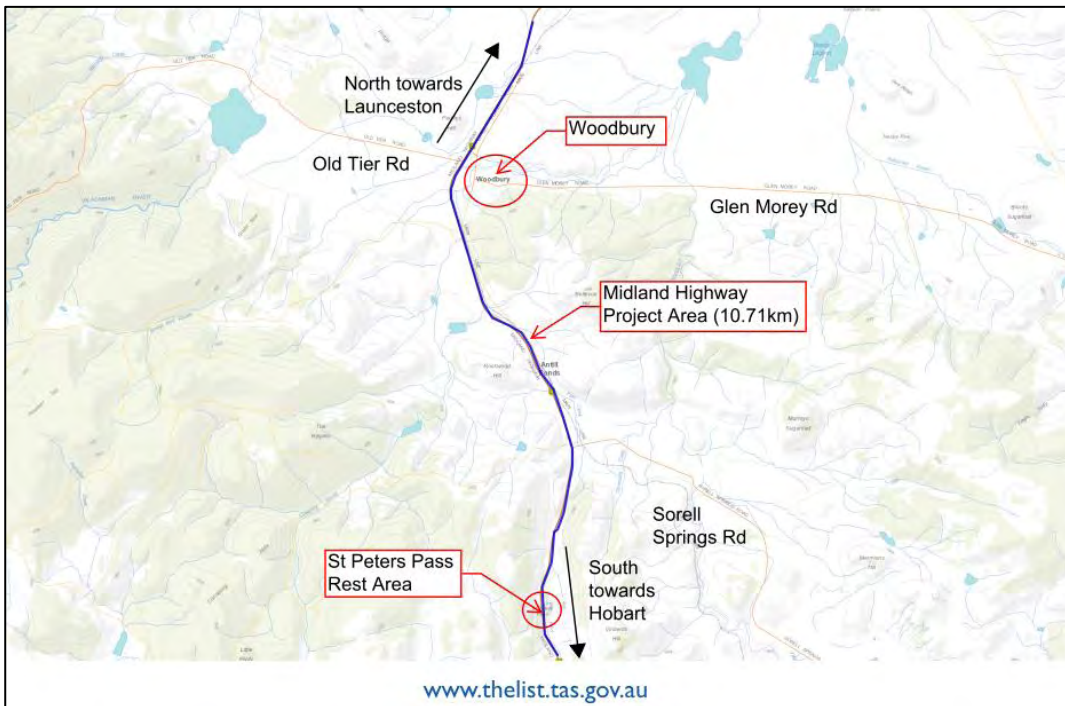
4.1 Location

The project is located on the Midland Highway approximately 95 km north of Hobart. The project extends from 3.6 km south of the Sorell Springs Road junction to south of Tunbridge, with a total length of 10.7 km. The project location is shown in Figure 4-1.

The surrounding land is used for farming. South of Woodbury the surrounding land is zoned rural resource, while north of Woodbury the surrounding land is zoned significant agricultural.

The north / south rail line runs adjacent to the highway on the eastern side.

FIGURE 4-1 PROJECT LOCATION



4.2 Titles

The following titles shown in Table 4-1 are adjacent to the project site and are affected by the proposed works. Land titles for properties with works proposed to be undertaken either for the upgrade or to accesses, in addition to State Growth titles, are attached.

TABLE 4-1 LIST OF TITLES AFFECTED BY PROPOSED DEVELOPMENT

Name	Landowner	Property Address	Titles Affected
Daryl Hazlewood	The Plains Company Pty Ltd	"The Plains" 8299 Midland Hwy Tunbridge TAS 7120	33523/1
William A & Richard W Webster	Private land owner	"Warringa" 7999 Midland Hwy Woodbury TAS 7120	136507/5

Name	Landowner	Property Address	Titles Affected
Phillip And Jan Burbury	Kuranda Pty Ltd	"Kuranda" 388 Glen Morey Rd Woodbury TAS 7120	113917/3 113916/2
Allen W & Linda M Cooper	Private land owner	"Woodbury House" 7489 Midland Highway Woodbury Tas 7120	162120/1
Gavin Nicholas	Brooklands Pty Ltd	109 Sorell Springs Rd Antill Ponds TAS 7120	47150/1 168928/1 129719/1 103934/1 232311/1 47645/1
Darryl Hindle	Private land owner	"Rockwood Cottage" 7661 Midland Hwy Antill Ponds TAS 7120	168532/1
Askin And Catherine Morrison	St Peter's Pass Pty Ltd	"St Peters Pass" 6820 Midland Highway Oatlands 7120	104898/17 104898/16 104898/15 135459/1 113351/1 168533/1 240828/1
Anselina J Methorst	Private land owner	"Weona" 7482 Midland Hwy Antill Ponds TAS 7120	46435/1
Richard J & Thomas M Le Souef	Private land owner	Woodbury Rd, Woodbury TAS 7120	145079/1
Shaun P Haney	Private land owner	44 Woodbury Road, Woodbury TAS 7120	213529/1
Beryl K Powell	Powell Agri Business Pty Ltd	120 Main Rd Tunbridge TAS 7120	113365/1
Dale A Powell	Powell Agri Business Pty Ltd	13 Ballochmyle Rd Tunbridge TAS 7120	113363/1 168611/1
Robert D Curtis	Private land owner	Antill Ponds Rd Antill Ponds TAS 7120	51052/1 51052/2
Ada N., Robert W., David R., Mary A. And Diana L. Scott	Private land owner	54 Woodbury Rd Woodbury TAS 7120	115474/1
Mark Cornelius	Private land owner	Midland Highway Woodbury TAS 7120	197695/1
-	Rockwood Pty Ltd	-	18967/1

4.3 Existing Road and Roadside Environment

4.3.1 Existing Road

The Tasmania State Road Hierarchy identifies the Midland Highway as a Category 1 Road. Category 1 roads are the primary freight and passenger roads connecting Tasmania. They carry large numbers

of heavy freight and passenger vehicles and are the key links supporting future economic development in Tasmania. The Midland Highway is a gazetted high productivity vehicle (HPV) route.

The Midland Highway between St Peters Pass and south of Tunbridge contains two lengths of undivided overtaking lanes in each direction. One is located approximately 900m north of the St Peters Pass rest area for a length of 1.3 km and the other approximately 800m north of Glen Morey Road for a length of 1.3 km. The remaining project area generally consists of a two lane carriageway. The posted speed limit is 110 km/h.

For the existing “1+1” carriageway, the seal is typically 9.0m in width, generally consisting of 3.5m wide lanes, 1.0m sealed shoulders and no central median. For the existing “2+2” carriageway, the seal is 18.0 m with 3.5 m wide lanes, 2.0 m sealed shoulders and no central median.

Intersections within the project site include:

- St Peters Pass Rest Area
- Sorell Springs Road
- Antill Ponds Road
- Old Tier Road
- Glen Morey Road
- Melrose Road

4.3.2 Traffic Data

The Midland Highway between St Peters Pass and Tunbridge carries in the order of 5,000 vehicles per day (vpd). Recent surveyed traffic volume data is provided in Table 4-2.

TABLE 4-2 TRAFFIC VOLUME DATA

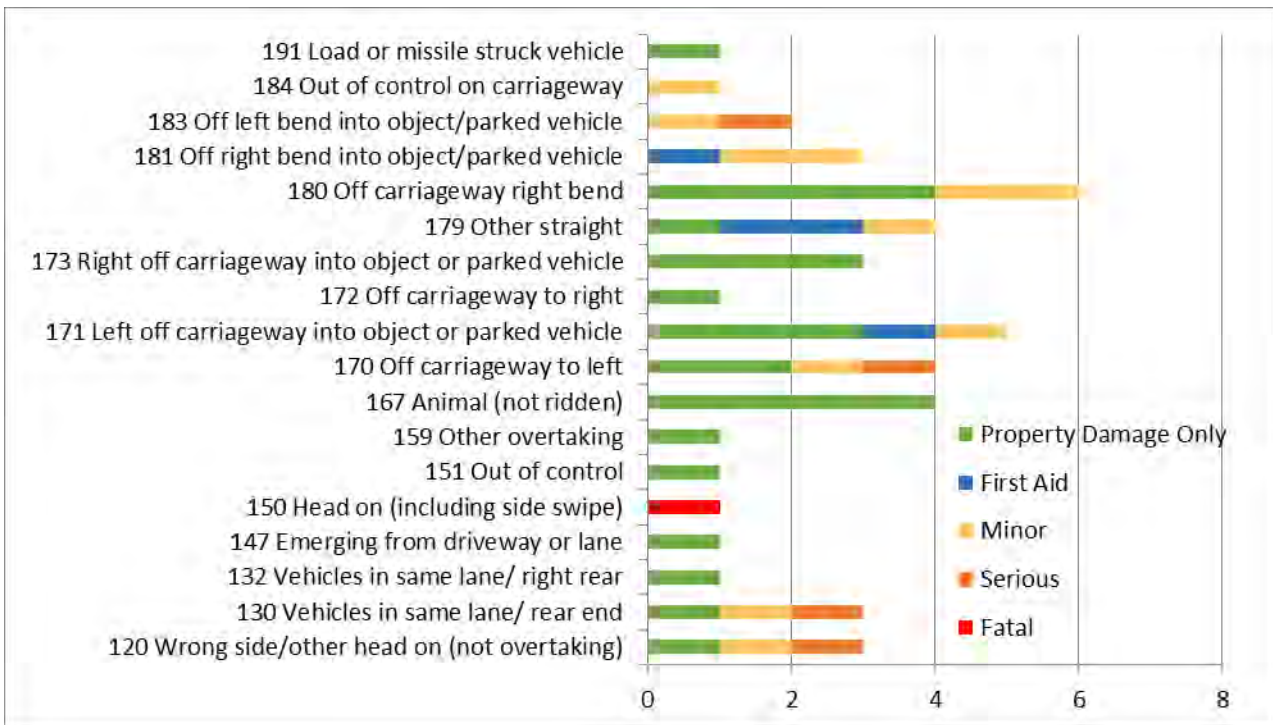
Location	AADT	% Commercial	Year
1.19km North of York Plains Road (Link 43 Ch. 8.30)	4,485	17.5	2011

Crash data was obtained for the 10 year period between 2006 and 2015. The crash data is summarised as follows:

- A total of 45 crashes were recorded within the project site during this period
- The most common crash type was ‘off carriageway’ with 29 crashes. Of these crashes, 17 occurred on straight sections and 12 occurred on curves.
- 11 crashes involved ‘asleep/ fatigue’ as a crash factor. These were all ‘off carriageway’ crashes. Nine crashes involved ‘excessive speed’ as a crash factor. These crashes were ‘off carriageway’ crashes and ‘head on’ collisions.
- More than half (56%) of crashes were property damage only. One crash involved a fatality, four crashes involved serious injury, 11 involved minor injury and four required first aid.
- The fatality involved a head on collision which occurred just north of Currajong Bridge.

A summary of the crash data is provided in Table 4-3.

TABLE 4-3 CRASH PROFILE



4.3.3 Public Transport

There are five locations that buses are known to pull over within the project site:

- St Peters Pass rest area
- Near Sorell Springs Road
- Near Antill Ponds Road
- Woodbury
- Old Tier Road

Buses will be able to utilise the turn facilities at Sorell Springs Road, Antill Ponds Road and Old Tier Road once the construction works are completed.

4.3.4 Pedestrian and Cyclist Movements

The project involves a high speed road environment in a rural area. Pedestrian movements are not appropriate on the highway and are rare (e.g. breakdowns). Cyclist movements are infrequent. The increased shoulder width of 2 m will improve safety for the infrequent cyclist and pedestrian movements.

4.3.5 Private Accesses

There are currently approximately 20 private property accesses within the project site, some of which are unlicensed. Table 5-3 describes the proposed access treatments within the project site.

5. Proposal

5.1 Design

5.1.1 Overview

The objectives of the project are to:

- Upgrade the road to a minimum 3-Star AusRAP rating
- Improve safety and reduce head-on collisions by providing a flexible safety barrier in the central median
- Consolidate breaks in the central median barrier
- Provide additional safe overtaking opportunities through a “2+1” lane arrangement
- Maintain a 110km/h speed environment, consistent with the Tasmanian Guidelines for Category One Roads
- Upgrade junctions
- Improve horizontal and vertical alignments of the road, where necessary and cost effective

The proposed design includes three northbound and two southbound overtaking lanes. Public turn facilities include a G-turn on Sorell Springs Road, a P-turn for northbound traffic on the Midland Highway, just south of the existing Antill Ponds junction, and a P-turn on Old Tier Road.

The design was developed in accordance with the guidelines and standards listed below:

- Project Brief No. 2220-1-34
- Department of State Growth Standard Brief for Services
- VicRoads (and Department of State Growth) Specifications
- Austroads Guidelines
- Australian Standards

5.1.2 Design Speed

The highway is currently signposted at 110 km/h. The horizontal design speed adopted for the safety upgrades is 120 km/h, i.e. 10 km/h higher than the posted limit. The vertical alignment is designed for 110 km/h. There are some locations where a lower design speed has been adopted where value for money and safety benefits can be better achieved through the provision of a lower design speed.

5.1.3 Design Vehicle

The Design Vehicle for the highway upgrades is a PBS L3A vehicle.

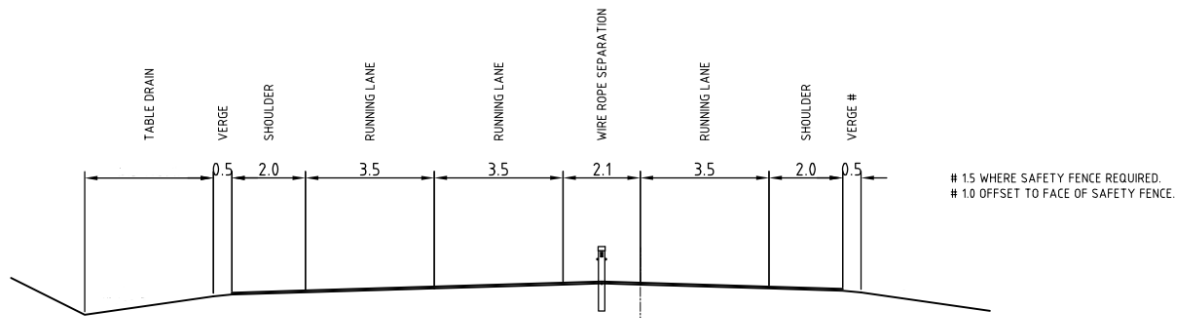
5.1.4 Typical Cross Sections

The upgrade adopts the following cross section:

- 3.5m traffic lanes with alternating overtaking opportunities
- 2.0m sealed shoulders
- 2.1m central median incorporating flexible safety barrier
- 0.5m unsealed verges (1.5m verge where flexible safety barrier is provided - sealed to base of barrier)

A typical “2+1” lane arrangement is shown in Figure 5-1.

FIGURE 5-1 DEPARTMENT OF STATE GROWTH'S TYPICAL "2+1" CROSS SECTION



5.2 Overtaking lanes

The project includes three northbound overtaking lanes and two southbound overtaking lanes. The overtaking lane locations proposed in the preliminary design are shown in Table 5-1. Adjustments to the final locations of the overtaking lanes may be required during the Detailed Design process.

TABLE 5-1 OVERTAKING LANES

Direction	Start Ch. (m)	End Ch. (m)	Length (m) - excluding tapers	Length (m) - Including Tapers
Northbound	10420	11540	1120	1420
Southbound	11830	12820	990	1290
Northbound	15090	16280	1190	1490
Southbound	16150	17400	1250	1550
Northbound	18780	20430	1650	1950

5.3 Bridge Structures

There are six existing reinforced concrete box culvert structures within the limit of works. The structures are all of segmentally cast, in situ construction with wing walls cast integral with the structure. There is also a circular stock underpass structure constructed from approximately 2m diameter reinforced concrete pipe. Details of these structures are provided in Table 5-2. The existing structures will be extended or replaced as required.

TABLE 5-2 EXISTING STRUCTURES

Structure Number	Project Chainage	Year of Construction	No. of Cells	Cell Dimensions (span x height)	Skew (deg)	Length (m)
B5367	18430	1970	3	1.8 x 1.2	0	17.7
B5436	18175	1970	1	2.4 x 1.5	0	16.1
B5437	17596	1970	2	2.3 x 1.5	0	16.7
B5441	17044	1970	1	3.0 x 1.5	45	21.1
B5442	15737	1970	2	2.3 x 2.4	45	21.8
B5555	10171	1973	1	3.0 x 1.5	0	15.1
Circular Stock Underpass	18190	Unknown	1	~ 2m DIA	0	14.9

A structural assessment of the existing box culvert structures was undertaken in order to determine the capacity of these structures to carry modern heavy vehicles. The results indicate that all of the assessed structures are capable of carrying the required heavy vehicles and thus are suitable to be retained and / or extended for the upgraded highway.

5.4 Local Roads

5.4.1 St Peters Pass Rest Area

The Department of State Growth previously investigated options to improve visibility at this intersection, which included lowering the crest or raising the dip north of the junction to improve sight distance for traffic turning right into the rest area. Investigations also concluded that provision of a right turn lane was required and extension of the taper of the existing left turn lane to ensure it was visible for a vehicle turning left was also recommended.

The proposed design involves raising the vertical alignment of the highway in order improve sight distance at the intersection. The design also includes the provision of Channelized Right Turn (CHR) and Auxiliary Left Turn (AUL) facilities. Tree clearing will also be undertaken to improve sight distance.

5.4.2 Sorell Springs Road

The existing Sorell Springs Road junction has deficient sight distance and turn facilities for the junction are inadequate with only a Basic Right Turn (BAR) and an AUL treatment currently present. The proposed design includes an upgrade to this intersection with compliant AUL and CHR facilities provided. Excavation of the cut batter will be undertaken to improve sight distance.

5.4.3 Antill Ponds

The proposed design relocates the existing Antill Ponds Road intersection approximately 300m south and provides a CHR treatment and a P-turn manoeuvre for northbound traffic (access to Antill Ponds Road is off the back of the P-turn). The relocated intersection achieves safe intersection sight distance (SISD), improving safety and functionality. The existing intersection will be closed.

5.4.4 Glen Morey Road / Old Tier Road / Melrose Road

The proposed design for the Old Tier Road, Glen Morey Road and Melrose Road intersections include:

- Relocating the Glen Morey Road intersection to opposite Melrose Road (Ch.18650) to provide adequate space for CHR and AUL treatments into both Old Tier Road and Glen Morey Road. Right turn movements out of new Glen Morey Road intersection are restricted for heavy / long vehicles (light vehicles accepted).
- Providing a short acceleration lane for southbound vehicles turning out of new Glen Morey Road intersection
- Providing a P-turn facility on Old Tier Road
- Allowing the Melrose Road access to remain open. Right turn movements into Melrose Road will not be permitted.
- Closing an existing access on western side of Highway between Old Tier Road and Melrose Road

The proposed design for Glen Morey Road intersection restricts long vehicles from turning right onto the highway, and requires that they detour and use the nearby turn facility on Old Tier Road, to avoid potential conflicts with the rail crossing. Light vehicles will be permitted to turn right out of Glen Morey Road.

Providing a G-turn on Glen Morey Road (rather than Old Tier Road) was investigated early in the project but was dismissed as it would increase the number of vehicles using this junction and increase the risk of conflict with the rail crossing. The proposed design does not increase the number of vehicles using the rail crossing. Further details regarding the rail crossing are provided in the attached Traffic Impact Assessment.

The benefits of the proposed design are summarised below:

- The separation of Glen Morey Road intersection and Old Tier Road allows adequate space for left and right turn treatments
- Heavy / long vehicles that wish to make a U-turn on the highway will not have to cross over the rail line, and will not risk being over the rail line while waiting to make a right turn movement (as would have been the case if a U-turn facility was designed on Glen Morey Road)
- Heavy / long vehicles travelling south from the relocated Glen Morey Road will be able to move off the rail line and utilise the acceleration lane / holding lane provided
- Heavy / long vehicles from Glen Morey Road that wish to go north will only have to travel 400m south to Old Tier Road in order to use the public turning facility
- Right turn movements out of Melrose Road access are allowed

5.5 Private Accesses

There are currently approximately 20 private property accesses within the project site, some of which are unlicensed. Details of the access treatments are provided in Table 5-3. Due to the central flexible safety barrier, a number of accesses will become left turn in and left turn out only. Where right turns are restricted, turn facilities will need to be utilised to access properties. Table 5-3 includes details of additional travel distances required at these accesses due to the restriction of right turns.

TABLE 5-3 ACCESS TREATMENTS

Access Number	Ch. (km)	Side	Proposed Treatment	CT Reference & Owner	Proposed Access Treatment	Closest turn facilities	Max. Additional travel distance
1	10.30	RHS	St Peters Pass Rest Area	N/A	As per Section 5.5.	NA	NA
2	11.08	LHS	Farm gate gravel access	CT135459/1 St Peters Pass P/L	Access to be closed – unlicensed access	NA	NA
3	11.08	RHS	Farm gate gravel access	CT135459/1 St Peters Pass P/L	Access to be closed – unlicensed access	NA	NA
4	11.41	LHS	Farm gate gravel access	CT135459/1 St Peters Pass P/L	Retained as left in/left out	South: York Plains Road* North: Sorrel Springs Road G-turn	Right in: 8,620m Right out: 3,300m
5	11.41	RHS	Farm gate triple sealed access	CT 104898/15 & /16 & /17 St Peters Pass P/L	Retained as left in/left out	South: York Plains Road* North: Sorrel Springs Road G-turn	Right out: 8,620m Right in: 3,300m
6	12.96	RHS	Sorell Springs Road		As per Section 5.5.	NA	NA
7	13.14	LHS	Middle Park homestead gravel access	CT 113351/1 Middle Park P/L	Retained as left in/left out – access upgraded to suit B-double	South: Sorrel Springs Road G-turn North: Antill Ponds P-turn	Right in: 560m Right out: 1,920

Access Number	Ch. (km)	Side	Proposed Treatment	CT Reference & Owner	Proposed Access Treatment	Closest turn facilities	Max. Additional travel distance
8	13.28	RHS	Farm gate gravel access	CT 113351/1 Middle Park P/L	Retained as left in/left out	South: Sorrel Springs Road G-turn North: Antill Ponds P-turn	Right out: 840m Right in: 1,640m
9	13.31	LHS	Multiple sealed farmhouse access	CT 113351/1 Middle Park P/L	Retained as left in/left out – access upgraded to suit B-double	South: Sorrel Springs Road G-turn North: Antill Ponds P-turn	Right in: 900m Right out: 1,580m
10	13.43	RHS	Farmhouse access Gravel	CT46435/1 Anselina Methorst	Retained as left in/left out	South: Sorrel Springs Road G-turn North: Antill Ponds P-turn	Right out: 1,140m Right in: 1,340m
11	14.22	LHS	Farm gate - double dirt access	CT 113351/1 Middle Park P/L	Access to be closed – unlicensed access	NA	NA
12	14.22	RHS	Farm gate gravel access	CT 113351/1 Middle Park P/L	Access to be closed – unlicensed access	NA	NA
13	14.37	RHS	Antill Ponds Road	N/A	As per Section 5.5.	NA	NA
13	15.22	LHS	House access gravel	CT168852/1 Daryl Hindle	Access to be closed – unlicensed access. Access provided through internal track from Ch. 15.45 access	NA	NA
14	15.45	RHS	Old access	CT168852/1 Daryl Hindle	Access to be closed – unlicensed access	NA	NA
15	15.45	LHS	New paddock access sealed (poorly)	CT 168533/1 Askin & Catherine Morrison	Retained as left in/left out – access upgraded to suit farm vehicles	South: Sorell Springs Road North: Old Tier Road P-turn	Right in: 5,180m (max.) Right out: 6,300m
16	16.93	LHS	Woodbury House access gravel	CT162120/1 A & L Cooper	Retained as left in/left out – design to match in to existing access	South: Sorell Springs Road North: Old Tier Road P-turn	Right in: 8,140m (max.) Right out: 3,340m
17	17.09	LHS	Gravel access fenced off (Access #14 alternative)	CT162120/1 A & L Cooper	Access not reinstated	NA	NA
18	17.4	LHS	Paddock gate No formation	CT162120/1 A & L Cooper	Access closed	NA	NA
19	18.03	LHS	Paddock gate no formation	CT113917/3 A & T Burbury	Retained as left in/left out – access upgraded to suit farm vehicles	South: Sorell Springs Road North: Old Tier Road P-turn	Right in**: 10,340m Right out: 1,140m
20	18.30	LHS	Old Tier Rd	-	As per Section 5.5.	NA	NA
21	18.51	LHS	Farmhouse access Gravel	CT136507/5 W, R & W Webster	Access to be closed (appears unlicensed) – access provided from Ch. 18.69 access	NA	NA
22	18.51	RHS	Glen Morey Rd	-	As per Section 5.5.	NA	NA
23	18.69	LHS	Melrose Rd Gravel access	CT136507/5 W, R & W Webster	Retained as left in/right out – access upgraded to suit semi-trailers	South: Old Tier Road	Right in: 1,380m

* Assumed location of turning facility. Section of Highway south of St Peters Pass is being designed separately to this project.

**A gate will be provided off Old Tier Road allowing access to this property

5.6 Design Options for Significant Property Accesses

A number of design options were investigated for the Woodbury access located at Ch. 16900, and the Middle Park access near Ch. 13300, which are proposed to be left in / left out, as per the Midland Highway upgrade strategy.

The design options investigated included reducing or relocating the overtaking lanes to allow right turn movements, relocating public turning facilities, and also the construction of access tracks. The relocation of public turning facilities and the construction of access tracks were not feasible due to significantly large amounts of excavation works required, or due to the impacts on surrounding properties.

In order to assess the requirement for a full channelized right turn treatment at the Woodbury House and Middle Park accesses, the vehicles making a right turn movement from the highway were estimated from landowner information and also published guidelines.

Based on information provided by landowners, the Middle Park access caters for approximately 10 vehicle movements per day. Vehicles using the access include B-Doubles for stock movement.

The owners of Woodbury House are undertaking renovations to convert the property to a bed and breakfast style accommodation. Based on landowner discussions, the planned Woodbury House accommodation may have up to 11 units when constructed. The RTA Guide to Traffic Generating Developments 2002 provides an estimate for the traffic generated by accommodation facilities of three trips per day for each unit. Therefore based on the RTA guide there could be up to 33 trips per day into and out of the property. Assuming a 50/50 split of vehicles into and out of the property and a 50/50 directional split, it is estimated that eight vehicles per day would turn right into the Woodbury House property for accommodation purposes.

The landowners that access the farm paddocks behind Woodbury House have estimated that they currently make a right turn manoeuvre into and out of the Woodbury access on a daily basis in light vehicles (e.g. a "ute"), and approximately once a week in a tractor (this can vary depending on the time of year).

It is also possible that in about eight years' time approximately 500 Ha of forest plantations accessed via the Woodbury House access will be ready for harvest. According to the plantation owner, approximately 130,000 tonnes of wood could be transported out of the Woodbury House access over a three to four year period, which equates to an average of about four to five trucks turning right into the access per day (assuming 260 days per year of transport, and a 30 tonne truck capacity).

Based on the RTA Guidelines, as well as information provided by landowners, it is estimated that the peak daily traffic that would use a right turn facility at the Middle Park access is 10 vehicles per day, and at the Woodbury House access 15-20 vehicles per day (8-10 vehicles associated with the Woodbury House property and eventual accommodation facilities, 2-5 vehicles for the farm and 4-5 vehicles for the eventual logging activities).

The Austroads Guide to Road Design Part 4A provides criteria for inclusion of channelized turn treatments for a major road with an operating speed of 100 km/h or more. The estimated hourly traffic volume for the Midland Highway within the project site is 300 vehicles per hour, therefore based on the guidelines a short channelized right turn treatment is warranted when the turning volume is between 10-50 vehicles per hour, and a full length channelized right turn treatment is warranted when turning volume is greater than 50 vehicles per hour. The estimated peak right turn movements into the Middle Park and Woodbury accesses are only 10-20 vehicles per day, i.e. an average of one to three vehicles per hour.

Based on the warrants for turn treatments from the design guidelines, dedicated right turn lanes at the Middle Park and Woodbury accesses are not required due to the low traffic volumes. Any reduction in the overtaking lane configuration to allow for right turn movements would result in a material reduction

in overtaking opportunities, and require additional breaks in the central median barrier increasing cross-over movements on the highway.

Public turning facilities are proposed at Sorell Springs Road, Antill Ponds Road and Old Tier Road. The Antill Ponds Road turning facility will be accessible for all vehicle types from a northbound direction, as well as light vehicles from a southbound direction.

It is envisaged that the vehicles using the Middle Park access will benefit from the proposed new northbound P-turn at Antill Ponds Road. The turn facility at Antill Ponds Road will significantly reduce the travel time required for the landowners who utilise the accesses at both Ch. 13100 and 13300 (west) and wish to travel south, who would otherwise be forced to travel to Old Tier Road to make a U-turn manoeuvre. Similarly, it benefits the landowners who use the access at Ch. 13400 (east), as it will reduce the time to get to their property when travelling from the south.

The P-turn facility at Antill Ponds Road will also benefit light vehicles travelling south from the Woodbury House access as it reduces the distance to the nearest turning facility from 4km (at Sorell Springs Road) to 2.8km.

5.7 Stormwater

The intent for the drainage design was to maintain existing catchment characteristics and drainage flow paths as much as possible. There are a number of significant creek crossings within the project extents, and locations where waterways flow closely adjacent to the existing highway. These natural crossings have been maintained, and impacts to adjacent waterways have been minimised where possible. In accordance with Table 8.1 of *Department of State Growth Professional Services Specification T8 - Drainage*, a 100 year Average Recurrence Interval (ARI) was adopted for analysis of peak flows for Category One roads.

Predominately, existing culverts within the project site were found to have sufficient hydraulic capacity to convey catchment flows under the highway for both minor (20 year ARI) and major (100 year ARI) flood events. However, two culverts have been preliminarily identified for upgrading;

- A 1200 Dia RCP culvert near the heritage-listed Woodbury House property was found to be inadequate to cope with a 100 year ARI flood event. Whilst inundation in large rainfall events is partially attributable to the low-lying topography in this area, it is proposed to upgrade the existing drainage infrastructure by laying a secondary 1200 Dia RCP pipe alongside the existing culvert to comply with Department of State Growth requirements and alleviate flooding on the property.
- Just south of Old Tier Road at the northern end of the project, a 2400 x 1500 RCBC captures flows from the large Stringy Bark Rivulet catchment. A 78" diameter RCP just downstream of this RCBC is used as a stock underpass. During large rainfall events, this underpass is known to flow full since the invert of the pipe is lower than the invert of the RCBC. Hydraulic modelling has indicated that the combined capacity of the box culvert and stock underpass is inadequate for a 100 year ARI flood event. It is proposed to remove and replace the current RCBC and stock underpass arrangement with twin RCBC units, similar to the arrangement at Currajong Creek. The floor level on one side of the underpass will be raised so that stock can be transported through one side of the culvert in everyday rainfall events. In heavy rainfall events (when stock movements would not be plausible), both RCBC units will flow full.

All other existing transverse culverts are to be retained, with extensions undertaken where new earthworks extend beyond the existing headwall.

A hydraulic report is attached which contains further detail of the drainage assessment.

5.8 Service Relocations

Telstra

Underground Telstra cables are present along the majority of the route, with an optic fibre line running through paddocks along the western side of the highway (well clear of the road reserve), and what appears to be copper lines running along the eastern side. There are also a number of Telstra cable road crossings within the project site.

Based on the Preliminary Design, it is anticipated that approximately 1500m of Telstra cable and 10 pits will need to be relocated. Telstra cables have been accurately located and surveyed so that the relocation designs can be completed during the detailed design,

TasNetworks

Overhead power lines are present along the length of the route, predominantly following the old highway alignment and are generally clear of any proposed works. The power lines cross over from the western side of the highway just north of the St Peters Pass Rest Area and follow the old formation on the eastern side. North of Sorell Springs Road for 700m the poles are located within the works area or the clear zone on the eastern side of the road.

There are 14 TasNetworks power poles that are directly impacted by the highway upgrades. During the detailed design, TasNetworks will be engaged to undertake the design of the pole relocations.

TasWater

No TasWater assets have been identified within the extent of works.

TasGas

There is a TasGas High-Pressure Pipeline located west of the road reserve which is not impacted by the proposed works.

Tasmanian Irrigation

A Tasmanian Irrigation pipeline is present within the project site, crossing under the Midland Highway approximately 100m south of Old Tier Road at Woodbury. The pipe crossing is 1.5m deep (minimum) and thus should not be impacted by the works.

The power lines that cross the highway at the location of the pipe crossing are also owned by Tasmanian Irrigation. It is expected that up to five Tasmanian Irrigation power poles will be impacted by the proposed designs and will need to be relocated. Tasmanian Irrigation has been contacted regarding the required pole relocations.

Private Irrigation

There are two pivot irrigators located on the western side of the highway. A full pivot is located at Chainage 13900 and a half pivot at Chainage 19100. The irrigators will not be impacted by the works.

A number of irrigation pipelines are present under the road and within existing culverts. The provision of dedicated conduits for these irrigation lines will be determined in the detailed design stage.

There are several farm dams located within the vicinity of the proposed highway upgrades however there is not anticipated to be any impact upon these from the works.

5.9 Landscaping

The Midland Highway between Oatlands and Tunbridge is generally characterised by exotic tree planting along the current and former road alignments with a background of native forest. The

adjacent landscape is predominantly pastoral with views to historic rural / agricultural buildings and surrounding hills.

The road upgrade will impact on the landscape character. A comprehensive landscape assessment has been undertaken that considers the significant heritage and scenic values within the project area. A concept landscaping plan has then been developed in order to mitigate the impact on the landscape. Consultation on the landscape assessment and plan methodology has been undertaken Southern Midlands Council, Heritage Tasmania, affected landowners, and the broader community through a public display process. The landscaping assessment and plan are attached.

The following principles were used to inform the landscape design:

- Respect the existing landscape character and where possible integrate the proposed road upgrades into its setting
- Provide a low maintenance and safe road corridor
- Protect and retain Pioneer Avenue trees where possible and provide suitable infill planting to enhance the avenue
- Removal / control of suckers and invasive species in strategic locations to open up views to historic Pioneer Avenue trees or other landscape features.
- Suckering trees can contribute to the overall landscape experience and in some locations may be retained, provided they do not obscure views to historic plantings and other significant landscape features
- Potential identification of former road alignment and heritage sites with selected tree planting
- Tree species selection will be informed by the Pioneer Avenue concept, including a review of the best performing species, local site conditions and environmental values
- Proposed tree planting will generally be within freehold land and not within the road reserve
- Plant hardy, low growing native vegetation on embankments to provide soil erosion and weed control
- Willow and other declared weeds must be removed / controlled

5.10 Lighting

There is existing lighting at the Glen Morey Road intersection due to the rail crossing on Glen Morey Road in close proximity to the highway. This lighting will be reinstated at the relocated Glen Morey Road intersection. No other lighting is proposed.

5.11 Land Acquisition

Design of the upgrades has been limited to the existing road reserve where possible, however acquisition will be required from some properties. The acquisition based on the Preliminary Design is detailed in Table 5-4.

TABLE 5-4 EXPECTED LAND ACQUISITION

Name	Company (If applicable)	Property Address	Titles Affected	Approximate Acquisition (m2)
Daryl Hazlewood	The Plains Company Pty Ltd	"The Plains" 8299 Midland Hwy Tunbridge TAS 7120	33523/1	4,070
William A & Richard W Webster	-	"Warringa" 7999 Midland Hwy Woodbury TAS 7120	136507/5	8,880
Phillip And Jan Burbury	Kuranda Pty Ltd	"Kuranda" 388 Glen Morey Rd Woodbury TAS 7120	113917/3	3,460

Name	Company (If applicable)	Property Address	Titles Affected	Approximate Acquisition (m2)
Gavin Nicholas	Brooklands Pty Ltd	109 Sorell Springs Rd Antill Ponds TAS 7120	168928/1 47645/1	11,010
Darryl Hindle	-	"Rockwood Cottage" 7661 Midland Hwy Antill Ponds TAS 7120	168532/1	1,100
Askin And Catherine Morrison	St Peter's Pass Pty Ltd	"St Peters Pass" 6820 Midland Highway Oatlands 7120	104898/17 104898/16 105392/1 135459/1 113351/1 168533/1	23,190

5.12 Geology

A geotechnical investigation was undertaken along the length of the route between the 1st August 2016 and 9th August 2016. The investigation consisted of the excavation of 15 test pits (to a nominal depth of 1.8 m or refusal below existing ground level) and excavation of 21 pavement dipping test locations to subgrade level (to a maximum depth of 1.5 m below existing ground level or refusal). The test pits were generally positioned along the widening areas and the pavement dipping test locations were generally positioned near the outer wheel path of the traffic lane and road shoulder.

The subsurface profiles of the test pit locations generally consisted of a topsoil layer up to 200 mm thick, overlying fill or alluvial soils up to a maximum thickness of 1.3m. Residual soils and weathered bedrock was encountered below the fill and alluvial profiles to depths greater than 1.8 m.

The subsurface profile of the pavement dipping test locations generally consisted of a bituminous spray seal up to 90 mm thick, generally overlying Sandy Gravel/Gravelly Sand or Clayey Gravel subbase, between 140 – 1420 mm thick. The pavement material was underlain by alluvium, residual soil and in places extremely weathered rock.

Parts of the proposed road works are within the Low Hazard Landslip band on the planning scheme maps. A Landslide Risk Report has been prepared and is attached.

5.13 Flora & Fauna

5.13.1 Threatened flora

The Department of State Growth commissioned environmental investigations along the Midland Highway between St Peters Pass and Woodbury in 2015 and 2016.

This survey found a number of threatened flora species in the existing roadside environment through the project site are listed on the Tasmanian *Threatened Species Protection Act 1995* (TSPA).

Five TSPA flora species are located in the project site:

- *Austrostipa scabra* (rough speargrass) - rare
- *Scleranthus fasciculatus* (spreading knawel) - vulnerable
- *Vittadinia burbidgeau* (smooth New Holland daisy) - rare
- *Vittadinia cuneate* subsp. *cuneata* (fuzzy New Holland daisy) - rare
- *Vittadinia gracilis* (woolly New Holland daisy) – rare

Haloragis heterophylla (rare) was also considered to be highly likely to be present.

No flora species currently listed under the (Commonwealth) *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) were found in the project area. Some areas of the lowland *Poa labillardieri* grassland were recorded near the project area. This community is listed as critically endangered under the EPBCA.

A targeted fauna survey for ptunarra brown butterfly (*Oreixenica ptunarra*) was undertaken in early April 2016. This survey recorded one single ptunarra brown butterfly within *Poa labillardieri* grassland on the top slopes near the Midland Highway at St Peters Pass.

Consistent with the EPBCA assessment guidelines, a significant impact assessment was undertaken for the ptunarra brown butterfly and lowland *Poa labillardieri* grassland. The planned road upgrades were determined not to have a significant impact on either, therefore no referral under the EPBCA is required.

In accordance with Regulation 4 of the *Threatened Species Protection Regulations 2006*, a permit to take will be sought from Department of Primary Industries, Parks, Water and Environment for the TSPA-listed threatened species, prior to construction. The level of impact on this species from the proposed works is relatively minor. Once obtained, the permit to take can be provided to Council for information purposes.

Ten species of declared weeds listed under the Tasmanian *Weed Management Act 1999* occur within the study area, including:

- African boxthorn
- Blackberry
- Californian thistle
- Eragostis / love grass
- Fennel
- Gorse
- Hoary cress / white weed
- Slender thistle

The construction contractor will be required to develop and implement a weed management plan, as part of their overall construction plan, to eradicate these species from the project area (as far as practicable) and manage their works in a manner that minimises the spread of weeds.

5.14 Noise

The proposed works are not expected to generate any significant increases in levels of road noise. Given the existing traffic noise on the highway, and the nature of the works (i.e. safety upgrades), the noise levels post construction are not expected to change from current levels.

5.15 Land Capability

The Land Information Services Tasmania identifies the land within the project site as a land capability classification of class 5 or 6. There is no Prime Agricultural Land (as defined by the Tasmanian State Policy on the Protection of Agricultural Land 2009) in the road corridor or immediately adjacent to it.

5.16 Historic Heritage

Austral Tasmania Pty Ltd conducted a field survey in November 2015 to record and assess the potential heritage values for both properties and plantings within the study area and surrounds. The survey extended from St Peters Pass, north along the highway to South of Tunbridge. A number of historical features were observed during the survey including Pioneer Avenue trees, historic plantings and built heritage. Two separate reports were produced containing an historic heritage assessment and historic plantings assessment.

Extensive work has been undertaken during the design process to minimise impacts on important historic features and plantings. A landscape assessment comprehensively reviewed the findings of the heritage investigations and considered them in the assessment. The concept landscaping plan was developed based on the findings of the assessment.

A Heritage Impact Statement was undertaken to review the design and assess the nature and types of heritage impacts that may occur as a result of the development footprint.

5.16.1 Pioneer Avenue Plantings

The Pioneer Avenue is a series of roadside plantings that began in the 1930s, extending between Launceston and Hobart. It was originally intended to be a memorial to early pioneers of Tasmania, and evolved into a carefully planned series of plantings along the Midland Highway to beautify the countryside and encourage tourism. The Pioneer Avenue has been nominated for inclusion on the THR, and this nomination is still being assessed by the Tasmanian Heritage Council (THC).

State Growth recognises the significance of the Pioneer Avenue, and is committed to retaining the Pioneer Avenue into the future. Some of the original Pioneer Avenue plantings will be impacted by the footprint of Midland Highway upgrade works. Removal of hazards, including trees, from the road reserve, where possible is an important part of the safety upgrade to reduce the severity of road crashes.

State Growth has developed a strategy for Pioneer Avenue plantings. The strategy is based on the following principles:

- Maintain the Pioneer Avenue where practicable and aim for no net loss of trees.
- Consult with relevant local Councils, Heritage Tasmania and affected landowners about appropriate replanting's to retain intent of the Pioneer Avenue.
- Re-plantings to occur outside the road reservation to maintain the safety of the Midland Highway.
- Establishment and management of new plantings must be cost-effective, meet community expectations and maintain the integrity of the Pioneer Avenue.

296 Pioneer Avenue trees are located within the project extents formed from 31 separate avenues or plantations. The Pioneer Avenue is Tasmania's largest designed landscape and the St Peters Pass plantings form a key component of the overall scheme.

It is anticipated that two Pioneer Avenue trees will need to be removed as part of the works. A concept landscaping plan has been developed and is attached. This includes a replacement plan for trees impacted by the design.

5.16.2 Historic plantings

A total of 36 general historic plantings were identified, including 4 lines of hawthorn hedgerows and 32 individual trees planted for landscaping purposes at the St Peters Pass rest area. These plantings have been assessed as having local level significance.

Up to 9 of the individual trees at St Peter Pass Rest Area will need to be removed as part of the works. The hawthorn hedgerow located just north of the St Peters Pass Rest Area at Ch. 10560-10680 is highly likely to be impacted by the works due to the close proximity to the edge of the existing pavement. The attached concept landscaping plan includes a replacement plan for plantings impacted by the design.

5.16.3 Topiaries

There are 17 examples of topiary formed from hawthorn plants in the project site. These topiaries were established during the 1960s by an Oatlands Council patrolman Jack Cashion. Over the years, 100 topiary figures were cut from hawthorn bushes along the Midland Highway between Oatlands and Tunbridge. Most of the identified topiaries are located within the rest area itself, although some continue to exist along the highway. These plantings have been assessed in the St Peters Pass, Midland Highway Historic Plantings Heritage Assessment as having local level significance.

There is not anticipated to be any impact to the topiaries from the works. There is one topiary at the southern limit of works that will need to be fenced off and protected during construction.

5.16.4 Built heritage

There are a number of significant built heritage features in the project area. A pioneer memorial cairn is located at the rest area, and there is a section of dry-stone embankment used as a retaining wall on an early and bypassed section of the highway. The cairn has been assessed as having local level significance. The dry-stone embankment has not been assessed but has been identified as having potential historic, aesthetic or other values. Neither of these features is impacted by the works.

North of St Peters Pass, there are two properties listed on the Tasmanian Heritage Register and in the Historic Heritage Code of the Southern Midlands Interim Planning Scheme (Rockwood and Woodbury House). The James Pillinger Grave is listed in the Historic Heritage Code of the Southern Midlands Interim Planning Scheme.

A list of the built heritage sites (both listed and unlisted) along the proposed highway upgrade is provided in Table 5-5.

TABLE 5-5 IMPACTS ON HERITAGE FEATURES

Heritage Feature	Impact
<p>The Woodbury property (CT 162120/1). This includes an 1880's weatherboard workers cottage, a 1930's weatherboard cottage, 1930's shearer's quarters, late-1820's convict barracks (providing housing for the convict workers building the main road), an 1830's stable/coach house, a second 1830's stable block, and 1930's garage. The study area also includes archaeological sites from a number of former buildings including a blacksmith's shop, possibly a former dairy, a granary, cottage sites, a well and historic road formations.</p> <p>The Woodbury property also has additional built heritage features which include chock-and-log timber fencing and remnants of a drystone wall.</p>	<p>No impact aside from clearing vegetation (suckered elms) in the table drains within the road reserve.</p>
<p>Archaeological surface evidence of the once substantial 1900's Rockwood building complex.</p> <p>On the eastern side of the highway from the Rockwood house are substantial sandstone abutments and piers of a bridge crossing over St Peters Pass Creek.</p>	<p>A small amount of acquisition of the title but no impact to the building itself.</p>
<p>Grave, corner of Midland Highway and Old Tier Road, The grave is located west of the highway and within the study area at approximately 532019/5330497. It marks the burial of James Pillinger who died in 1845. The grave site will need to be avoided due to the complexities associated with the disturbance of burial places. The Heritage report did not identify any additional grave sites.</p>	<p>A small amount of acquisition of the grave property but not to the grave site itself.</p>
<p>Nineteenth century drystone walling. This acts as an embankment for a section of the old road above St Peters Pass Creek.</p>	<p>No impact</p>
<p>A modified culvert/bridge on Sorell Springs Road including nineteenth century sandstone abutments and modern deck.</p>	<p>No impact</p>
<p>An early-mid twentieth century shearing shed at 7453 Midland Highway.</p>	<p>No impact</p>

Heritage Feature	Impact
A cottage at 109 Sorell Springs Road.	No impact
A nineteenth century cottage at 7482 Midland Highway - possibly a former railway workers cottage. Macrocarpa plantings along the entrance drive and nearby windbreak.	No impact to property. Impact to macrocarpa to be minimised.
A late nineteenth, early twentieth century farm house at 7999 Midland Highway.	No impact
A roadside memorial to Mark Whayman who was killed at the site in a vehicle accident in 1999 (approx. 533697/5326386, Ch. 13550).	No impact – to be protected during construction.
Antill Ponds Railway siding. This area has been substantially disturbed / destroyed during the late twentieth century and further management is not considered warranted, except if unanticipated discoveries are found during works.	No impact
An archaeological site (former cottage) located within the road reserve opposite Woodbury. The site is located outside of the listed boundaries of Woodbury.	No impact

5.17 Aboriginal Heritage

An Aboriginal Heritage Assessment for the St Peters Pass to South of Tunbridge section of the Midland Highway was undertaken in June 2015 by Cultural Heritage Management Australia (CHMA), covering an area 25 m either side of the road centre line. As part of this assessment, a search was carried out of the Aboriginal Heritage Register (AHR) to determine the extent of sites within the general vicinity of the highway followed by a field assessment.

The search of the register showed that there were a number of Aboriginal sites located within a 5 km radius of the road corridor study area.

In the course of the field assessment, a total of 9 Aboriginal sites were identified.

A permit will be required if the works impact on any Aboriginal sites. Other Aboriginal sites will be protected during construction with site preservation fencing installed by contractor. An Unanticipated Discovery Plan will be a requirement of the contractor should any unexpected finds be encountered during construction.

5.18 Construction

Construction of the project is planned to commence in late 2017, with an 18 month construction period expected. State Growth requires all contractors to submit a Construction Environmental Management Plan (CEMP) that demonstrates compliance with best practice guidelines and relevant legislation and regulation. The CEMP must be compliant with the Department's G10 Environmental Specification. CEMPs are reviewed and approved by the Department's Environmental Officers who are certified Environmental Management System (EMS) Auditors, prior to site award to ensure the contractor has effectively identified and attributed construction related environmental risks, and has the systems and processes in place to effectively mitigate risk and respond to and report environmental incidents and emergency scenarios. All construction contractors must have ISO 14001 certification. A copy of the State Growth-approved CEMP and final Weed and Hygiene Management Plan can be provided to Council during construction for information purposes if required.

6. Stakeholder Engagement

State Growth has undertaken active engagement with stakeholders, including the Southern Midlands Council, TasRail, Heritage Tasmania, and property owners.

In the initial stage of the project, a Stakeholder Engagement Plan (SEP) was developed which identified stakeholders and categorised their level of interest in or influence over the project. Action Plans were developed for each key stakeholder identifying at which stage of the project to contact the stakeholder and the best means of engagement.

State Growth has undertaken significant engagement with affected stakeholders. State Growth representatives have met with landowners adjacent to this section of the Midland Highway and explained the project objectives and the impacts on their properties. Landowners were provided the opportunity to explain current farm operations and communicate definite and potential future farm ideas. Preliminary design drawings were presented to landowners to assist discussions and describe the impacts on existing accesses due to the need to minimise gaps in the central flexible safety barrier. The concept landscaping plan has been provided to adjacent landowners that are affected by vegetation removal that requires replacement plantings on private properties. Consultation on the landscaping assessment and plan methodology has been undertaken with Southern Midlands Council and Heritage Tasmania who were supportive of the approach in addressing historic and scenic landscape issue simultaneously.

A public display of the design plans was held on 09 February 2017 at the Oatlands Community Hall, Oatlands. A public notice advertising the public display was placed in the Mercury and Examiner newspapers on Saturday 4 February 2017 and Wednesday 8 February 2017 which included an address for the State Growth road project webpage where the plans can be viewed online. A letter advising public display has been sent to adjacent and affected landowners. A poster explaining the project and advertising the public display was placed in high profile places in Oatlands. The poster includes the webpage address and an 1800 phone number is on the website. This enables the public to contact the Department throughout the life of the project.

7. Site Photographs



Sorell Springs Road Junction



Rail line crossing on Glen Moree Road



Currajong Creek



Currajong Creek Culvert



Middle Park Homestead Access Ch. 13280



Farm Access Ch. 11410

8. Planning Scheme

The project is located within the Southern Midlands Local Government Area. The applicable Planning Scheme is the Southern Midlands Council Interim Planning Scheme 2015 (the Scheme) and the relevant Planning Authority is the Southern Midlands Council.

8.1 Determining Applications

In accordance with Clause 6.2.4 of the Scheme, minor upgrades by the State Government of roads, including minor widening of existing carriageways, are exempt from requiring a permit under the scheme, unless it involves:

- (a) a code in this planning scheme which lists a heritage place or precinct and requires a permit for the use or development that is to be undertaken; or
- (b) the removal of any threatened vegetation.

The proposed works will require a varied level of widening and works, with a significant amount of the upgrade requiring an additional lane. As such, it is considered that the proposal does not constitute minor upgrades for the purpose of Clause 6.2.4. Accordingly, this application has been lodged for the planning authority's consideration.

In determining a permit application Council must have regard to the requirements of Clause 8.10.1:

- (a) all applicable standards and requirements in this planning scheme; and
- (b) any representations received pursuant to and in conformity with ss57(5) of the Act

An assessment in accordance with subclause 8.10.1(a) is provided in Section 8 of this report. In determining any discretionary aspects of the proposal Council must in addition to 8.10.1, have regard to 8.10.2:

- (a) the purpose of the applicable zone;
- (b) any relevant local area objective or desired future character statement for the applicable zone;
- (c) the purpose of any applicable code; and
- (d) the purpose of any applicable specific area plan;

but only insofar as each such purpose, local area objects or desired future character statement is relevant to the particular discretion being exercised.

The existing Midland Highway is within the Utilities Zone. Land adjoining the project area is generally zoned as Rural Resource with areas of Significant Agricultural Zone north of Woodbury. The proposal is permitted within the Utilities Zone. The proposal requires discretion within the following zones in relation to use (Utilities) and development:

- 26.0 Rural Resource Zone
- 27.0 Significant Agricultural Zone

The proposal also requires discretion under the following applicable codes within the planning scheme:

- E3.0 Landslide Code
- E5.0 Road & Railway Assets Code.
- E6.0 Parking and Access Code
- E7.0 Stormwater Management Code
- E10.0 Biodiversity Code
- E11.0 Waterway and Coastal Protection Code
- E13.0 Historic Heritage Code
- E14.0 Scenic Landscapes Code

- E15.0 Inundation Prone Areas Code

An assessment in accordance with Clause 8.10.2 of the Scheme is provided in Section 8 of this report.

Any land subject to new use and development outside the Utilities Zone is to be compulsorily acquired under the *Land Acquisition Act 1993* and is not subject to the subdivision standards of the Scheme.

8.2 Planning Scheme Objectives

Clause 3.0.1 identifies the regional and local objectives for infrastructure under the Scheme.

It is the **Regional Objective** “to adopt a more integrated approach to planning and infrastructure” with the desired outcomes and ways of achieving these outcomes outlined as follows:

Desired Outcomes	Outcomes to be achieved by:
(a) The efficiency of existing physical infrastructure is maximized.	(a) Facilitating developer charges for off-site infrastructure provision which send the correct price signals to ensure the most efficient use of infrastructure overall.
(b) Physical infrastructure and servicing is planned, coordinated and delivered in a timely manner to support the regional settlement pattern and specific growth management strategies.	(b) Protecting the function and safety of transport infrastructure through road and rail assets code.
(c) An integrated transport and land use planning system that supports economic growth, accessibility and modal choice in an efficient, safe and sustainable manner is developed and maintained.	(c) Recognising and protecting major utilities through the use of the Utilities Zone.
	(d) Protecting land identified for future major roads from inappropriate or premature development by applying the Particular Purpose Zone 2 – Future Road Corridor.

Of note is an overall expectation to maximise the efficiency of existing infrastructure in response to regional growth in a safe and sustainable manner. The St Peters Pass to South of Tunbridge Project is part of the regional Greater Midland Highway Upgrades Program with the key objective of making safety improvements to the entire length of the highway to achieve a minimum 3-star AusRAP rating.

The **Local Objectives** for infrastructure under the Scheme include:

- To maintain, improve and maximize the community benefit from existing and future infrastructure.
- To ensure infrastructure is appropriate to support development, is used efficiently and is expanded as necessary in an orderly and integrated manner.

Desired Outcomes	Outcomes to be achieved by:
(a) Adequate public infrastructure exists, or will be provided, to support land use envisaged by this Planning Scheme.	(a) Ensuring land zoned for residential, business and industrial use is, or can be, adequately serviced to provide for its intended use.
(b) Infrastructure is utilized efficiently.	(b) Maximize densities within settlements, where appropriate, through appropriate zoning and development standards.

Desired Outcomes	Outcomes to be achieved by:
(c) Infrastructure is designed to an appropriate standard under 'affordable best practice'.	(c) Ensuring infrastructure necessary to service new development is provided as part of that development and that any off-site impact is mitigated.
(d) Key infrastructure with potential for amenity impacts is protected from encroachment and fettering by sensitive use or other incompatible use.	(d) Applying the Utilities Zone to major utilities, facilities and corridors including major roads, the Particular Purpose Zone 2 – Future Road Corridor Zone to the route of the future Midland Highway Bagdad Bypass and using the Electricity Transmission Infrastructure Protection Code to protect major electricity transmission assets.
(e) Council's strategic land use planning is integrated with its asset management programs and long-term financial and capital works planning.	(e) Ensuring the zoning of the land is cognisant of future implications for asset management and new capital works planning.
(f) Development of un-serviced land is compatible with the capacity of the land and does not create demand for unplanned public infrastructure.	(f) Applying a suite of zones that is commensurate with the capacity of the land avoids a demand for unplanned public infrastructure.
(g) New and expanded irrigation schemes are facilitated.	(g) Ensuring new development does not increase stormwater discharge above pre-existing conditions unless downstream capacity exists or will be provided.
(h) Improved access to modern communications infrastructure is facilitated.	(h) Ensuring irrigation infrastructure and associated agricultural use and value-adding activities and support industries are allowable within rural areas.

Of relevance to this project are the objectives to use infrastructure efficiently, to design it to meet appropriate standards that support 'best practice', and to protect it from amenity impacts associated with encroachment and fettering by sensitive use.

8.3 Use Categorisation

The use classification for the proposed works is 'Utilities' which is defined in Table 8.2 of the Scheme as follows:

Use of land for utilities and infrastructure including:

- a) telecommunications;
- b) electricity generation;
- c) transmitting or distributing gas, oil or power;
- d) transport networks;**
- e) collecting, treating, transmitting, storing or distributing water; or
- f) collecting, treating, or disposing of storm or floodwater, sewage or sullage.

Examples include an electrical sub-station or power line, gas, water or sewerage main, optic fibre main or distribution hub, pumping station, railway line, retarding basin, **road**, sewage treatment plant, storm or flood water drain, water storage dam and weir."

Any extension to use and development of the existing roadway will also be classified as 'Utilities' in accordance with this definition.

A use that is associated with and a subservient part of another use on the same site will be categorised in the same use class. For example, vegetation clearing as part of a road project will be classified as Utilities.

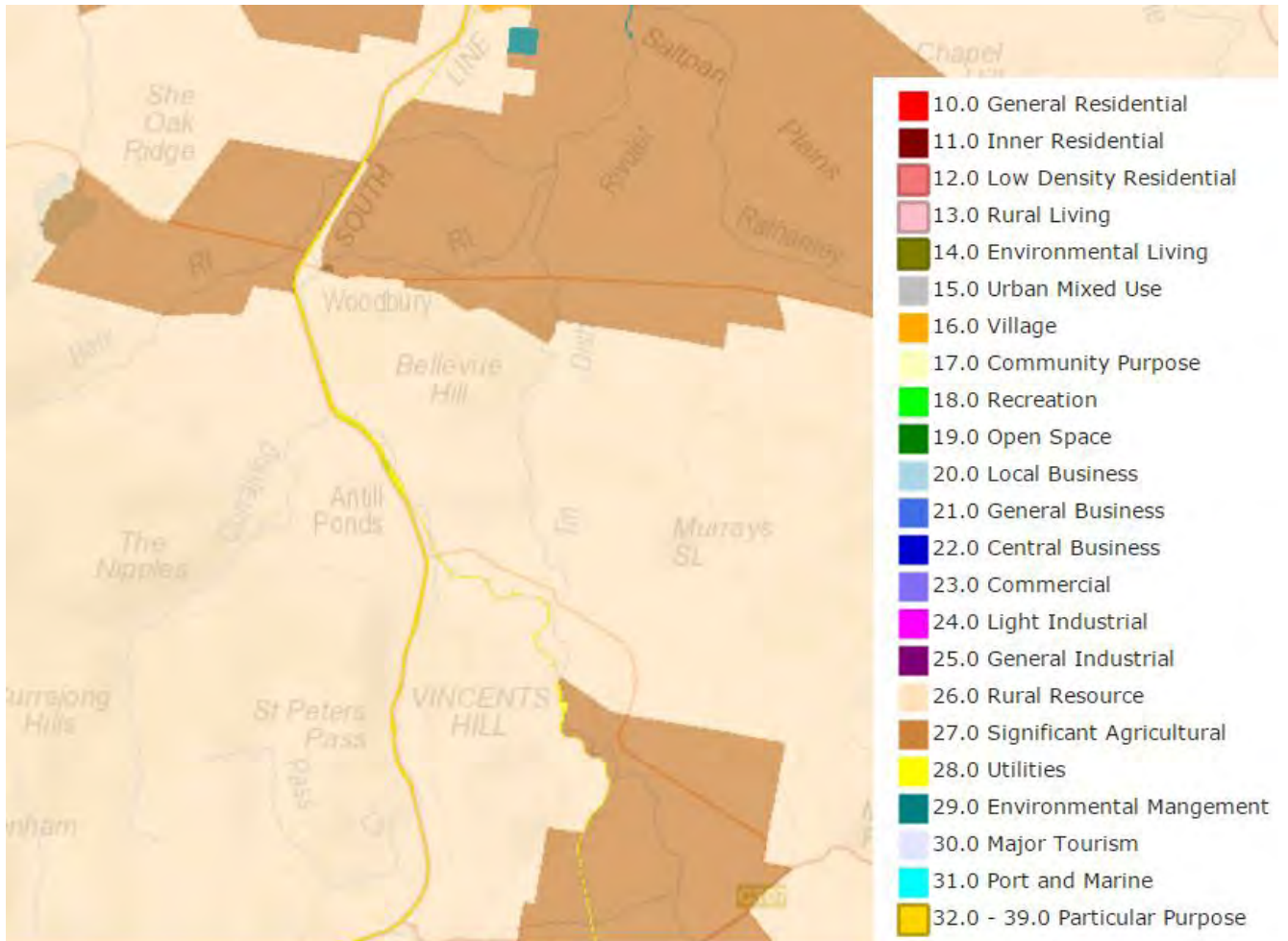
8.4 Part C Zones

The existing Midland Highway is zoned Utilities. The surrounding land is zoned Rural Resources south of Woodbury and Significant Agricultural north of Woodbury. Zoning is illustrated in Figure 8-1.

The proposed Utilities Use Class has the following use status in the zones:

- Zone: 26 Rural Resource – discretionary
- Zone: 27 Significant Agriculture – discretionary
- Zone: 28 Utilities – permitted

FIGURE 8-1 ZONING MAP



Source: The List Tasmania

8.4.1 28.0 Utilities Zone

28.1 Zone Purposes, Local Area Objective and Desired Future Character Statement

The Utilities Zone purpose is:

- 28.1.1.1 To provide land for major utilities installations and corridors.
- 28.1.1.2 To provide for other compatible uses where they do not adversely impact on the utility.

There are no desired local area objectives or Desired Future Character Statements.

The proposal is for significant upgrade works of the Midland Highway which is considered a significant state / regional infrastructure utility. The project is consistent with the intentions of Clause 28.1.

28.2 Use Table

Under the Use Table in Clause 28.2, Utilities are classified as Permitted. This means that the use or development must be granted a permit if under Clause 8.7:

- (a) the use is within a class specified in the applicable use Table as being a use which is permitted;
- (b) the use or development complies with each applicable standard and does not rely on a performance criterion to do so; and
- (c) the use or development is not discretionary or prohibited under any other provision of the planning scheme.

The proposal within the Utilities Zone is a permitted use and assessment below illustrates compliance with each applicable standard of the zone. Use or development is not discretionary or prohibited under the planning scheme.

28.3 Use Standards

Acceptable Solution/ Performance Criteria	Compliance Statement
<p>28.3.1 Hours of Operation</p> <p>A1. Hours of operation of a use within 50 m of a residential zone must be within 7.00 am to 7.00 pm, except if:</p> <p>(i) for office and administrative tasks; or</p> <p>(ii) a Utilities use.</p>	<p>A1 compliant as the use is Utilities and the subject land is not within 50m of a residential zone.</p>
<p>28.3.2 Noise</p> <p>A1. Noise emissions measured at the boundary of a residential zone must not exceed the following:</p> <p>(a) 55dB(A) (LAeq) between the hours of 7.00 am to 7.00 pm;</p> <p>(b) 5dB(A) above the background (LA90) level or 40dB(A) (LAeq), whichever is the lower, between the hours of 7.00om and 7.00 am;</p> <p>(c) 65dB(A) (LAm_{ax}) at any time.</p>	<p>A1 compliant as the use is not within the vicinity of a residential zone. The proposed works will not add to the current noise levels on the highway.</p>
<p>28.3.3 External Lighting</p>	<p>This section is not applicable as all lighting can be classed as street lighting which is exempt from assessment.</p>
<p>28.3.4 Commercial Vehicle Movements</p>	<p>This section is not applicable as the works are not within 50m of a residential zone.</p>
<p>28.3.5 Discretionary Use</p>	<p>This section is not applicable as the use has Permitted status.</p>

28.4 Development Standards

Acceptable Solution / Performance Criteria	Compliance Statement
28.4.1 Building Height 28.4.2 Setback (buildings) 28.4.3 Landscaping 28.4.4 Outdoor storage areas	None of the listed development standards apply. There are no buildings to consider in terms of height and setback. The subject land does not abut a residential zone in terms of landscaping. No outdoor storage will result from this development. Works camps during construction will be temporary uses and outside the scope of the Planning Scheme.
28.4.5 Fencing Fencing must comply with all of the following: (a) fences and gates of greater height than 2.1 m must not be erected within 10 m of the frontage; (b) fences along a frontage must be 50% transparent above a height of 1.2 m; (c) height of fences along a common boundary with land in a residential zone must be no more than 2.1 m and must not contain barbed wire.	A1 compliant in that any new fencing will be reinstated agricultural type wire fences to define the boundary of farming properties.
28.5 Subdivision Standards	No subdivision is proposed, the additional land required for the works is being acquired, pursuant to the Land Acquisition Act and is not considered subdivision for the purposes of the <i>Local Government, Building and Miscellaneous Provisions Act</i> .

8.4.2 26.0 Rural Resource Zone

Small areas of land acquisition will be required within the rural resource zone in order to facilitate widening, junction / access upgrades and provision of turning facilities. Details of the required land acquisition are provided in Section 5.11

26.1 Zone Purpose

The Rural Resource Zone purpose is:

- 26.1.1.1 To provide for the sustainable use or development of resources for agriculture, aquaculture, forestry, mining and other primary industries, including opportunities for resource processing.
- 26.1.1.2 To provide for use and development that does not constrain or conflict with resource development uses.
- 26.1.1.3 To provide for non-agricultural use or development, such a recreation, conservation, tourism and retailing, where it supports existing agriculture, forestry, mining and other primary industries.
- 26.1.1.4 To allow for residential and other uses not necessary to support agriculture, aquaculture and other primary industries provided that such uses do not:
 - (a) Fetter existing or potential rural resource use and development on other land;
 - (b) Add to the need to provide services or infrastructure or to upgrade existing infrastructure.

- (c) Contribute to the incremental loss of productive rural resources.
- 26.1.1.5 To provide for the protection of rural land so future resource development opportunities are not lost.
- 26.1.1.6 To provide for economic development that is compatible with agricultural and other rural resource activities.

There are no desired local area objectives or Desired Future Character Statements within this zone.

The works on land within this zone are minor in footprint and do not extend within the rural land holdings to the extent that would restrict or obstruct the current and future rural resource activities. The project is therefore considered consistent with the intentions of Clause 26.1 and is expected to allow for improvements to the general operations of rural resource activities within the area of this section of the highway.

26.2 Use Table

Under the Use Table of Clause 28.2, Utilities (not considered as minor) are classified as discretionary. This means that under Clause 8.8 the planning authority has the discretion to refuse or permit the use or development if:

- (a) the use is within a use class specified in the applicable Use Table as being a use which is discretionary;
- (b) the use or development complies with each applicable standard but relies upon a performance criterion to do so; or;
- (c) it is discretionary under any other provisions of the planning scheme.
- (d) the use or development is not prohibited under any other provision of the planning scheme.

An assessment of the proposed use and development under this zone against the use and development performance standards for discretionary use and development is provided below.

26.3.3 Discretionary Use

It is the objective of the standards within this clause to ensure that discretionary non-agricultural uses do not unreasonably confine or restrain the agricultural use of agricultural land.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>No acceptable solutions provided.</p> <p>P1.</p> <p>A discretionary non-agricultural use must not conflict with or fetter agricultural use on the site or adjoining land having regard to all of the following:</p> <ul style="list-style-type: none"> (a) the characteristics of the proposed non-agricultural use; (b) the characteristics of the existing or likely agricultural use; (c) setbacks to site boundaries and separation distance between the proposed non-agricultural use and existing or likely agricultural use; (d) any characteristics of the site and adjoining land that would buffer the proposed non-agricultural use from the adverse impacts from existing or likely agricultural use. 	<p>P1 compliant.</p> <p>The proposed area affected by the works on rural resource land will be limited to small areas on the boundary with the Utility Zone and will not affect the characteristics of the existing agricultural land use. This land will be acquired for utility purposes as part of the project.</p>

26.4 Development Standards

Acceptable Solution / Performance Criteria	Compliance Statement
26.4.1 Building Height	Not applicable.
26.4.2 Setback	Not applicable.
<p>26.4.3 Design</p> <p>P1. The location of buildings and works must satisfy all of the following:</p> <p>(a) be located on a skyline or ridgeline only if:</p> <p>(i) there are no sites clear of native vegetation and clear of other significant site constraints such as access difficulties or excessive slope, or the location is necessary for the functional requirements of infrastructure;</p> <p>(ii) significant impacts on the rural landscape are minimised through the height of the structure, landscaping and use of colours with a light reflectance value not greater than 40 percent for all exterior building surfaces;</p> <p>(b) be consistent with any Desired Future Character Statements provided for the area;</p> <p>(c) be located in an area requiring the clearing of native vegetation only if:</p> <p>(i) there are no sites clear of native vegetation and clear of other significant site constraints such as access difficulties or excessive slope, or the location is necessary for the functional requirements of infrastructure;</p> <p>(ii) the extent of clearing is the minimum necessary to provide for buildings, associated works and associated bushfire protection measures;</p> <p>A2. Exterior building surfaces must be coloured using colours with a light reflectance value not greater than 40 percent.</p> <p>P3 The depth of any fill or excavation must be kept to a minimum so that the development satisfies all of the following:</p> <p>(a) does not have significant impact on the rural landscape of the area;</p> <p>(b) does not unreasonably impact upon the privacy of adjoining properties;</p> <p>(c) does not affect land stability on the lot or adjoining areas.</p>	<p>P1 compliant</p> <p>The proposed works are not located on a skyline or ridgeline.</p> <p>No Desired Future Character Statements are provided for this zone.</p> <p>Some vegetation clearing is required within the rural resource zone in order to facilitate widening, junction / access upgrades and provision of turning facilities. Removal of vegetation has been minimised. A concept landscaping plan has been developed based on a landscape assessment of the project area and is attached. This includes a replacement plan for vegetation impacted by the design.</p> <p>A2 not applicable as no building surfaces form part of the works.</p> <p>P3 compliant.</p> <p>The works will be visible from the existing road however they have been designed to minimise visual impact by reducing height and bulk through balancing cut and fill.</p> <p>The proposed concept landscaping plan developed as part of the project aims to maintain significant view corridors visible from the road that lead to prominent natural and historic features.</p> <p>Adjoining properties are setback from the highway and the works will not impact on the privacy of these properties.</p> <p>A Landslide Risk Assessment (LRA) Report has been prepared and is attached. Mitigation measures will be implemented to ensure the upgrade does not affect land</p>

Acceptable Solution / Performance Criteria	Compliance Statement
	stability on the lot or adjoining areas.
26.4.4 Plantation Forestry	Not applicable

8.4.3 27.0 Significant Agriculture Zone

Small areas of land acquisition will be required within the significant agriculture zone at the northern end of the project in order to facilitate upgrades to the Old Tier Road and Glen Morey Road intersections and to provide a turn facility on Old Tier Road. A small amount of acquisition will also be required to facilitate widening on the western side of the highway north of Glen Morey Road. Details of the required land acquisition are provided in Section 5.11

27.1 Zone Purposes

The Significant Agriculture Zone purpose is:

- 27.1.1.1 To provide for the use or development of land for higher productivity value agriculture dependent on soil as a growth medium.
- 27.1.1.2 To protect the most productive agricultural land and ensure that non-agricultural use or development does not adversely affect the use or development of that land for agriculture.
- 27.1.1.3 To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provisions.
- 27.1.1.4 To provide for limited non-agricultural uses that supports the continued use of the land for agricultural use.
- 27.1.1.5 To protect regionally significant areas of significant agricultural land identified in the Regional Land Use Strategy, including areas subject to existing or proposed irrigation schemes, from conversion to non-agricultural use.
- 27.1.1.6 To ensure that new residential use is only established where necessary to facilitate the management of the land for agricultural purposes and does not fetter existing or potential agricultural use on other land.

There are no desired local area objectives or Desired Future Character Statements within this zone.

The works on land within this zone are minor in footprint and do not extend within the rural land holdings to the extent that would restrict or obstruct the current and future significance of the rural land parcels. The project is therefore considered consistent with the intentions of Clause 27.1 and is expected to allow for improvements to the general operations of agricultural activities on the properties which have access from this section of the highway.

27.2 Use Table

Under the Use Table at Clause 28.2, Utilities (not considered as minor) are classified as discretionary. This means that under Clause 8.8 the planning authority has the discretion to refuse or permit the use or development if:

- (a) the use is within a use class specified in the applicable Use Table as being a use which is discretionary;
- (b) the use or development complies with each applicable standard but relies upon a performance criterion to do so; or;
- (c) it is discretionary under any other provisions of the planning scheme.
- (d) the use or development is not prohibited under any other provision of the planning scheme.

An assessment of the proposed use and development under this zone against the use and development performance standards for discretionary use and development is provided below.

27.3.3 Discretionary Use

It is the objective of the standards within this clause to ensure that discretionary non-agricultural uses do not unreasonably confine or restrain the agricultural use of agricultural land.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>No acceptable solutions provided.</p> <p>P1.</p> <p>A discretionary non-agricultural use must not conflict with or fetter agricultural use on the site or adjoining land having regard to all of the following:</p> <ul style="list-style-type: none"> (a) the characteristics of the proposed non-agricultural use; (b) the characteristics of the existing or likely agricultural use; (c) setbacks to site boundaries and separation distance between the proposed non-agricultural use and existing or likely agricultural use; (d) any characteristics of the site and adjoining land that would buffer the proposed non-agricultural use from the adverse impacts from existing or likely agricultural use. 	<p>P1 compliant.</p> <p>The proposed area affected by the works on significant agricultural land will be limited to small areas and will not affect the characteristics of the existing agricultural land use. This land will be acquired for utility purposes as part of the project.</p> <p>The design has considered impacts on irrigation activities in order to minimise impacts on significant agricultural land.</p>

27.4 Development Standards

Acceptable Solution / Performance Criteria	Compliance Statement
<p>27.4.1 Building Height</p>	<p>Not applicable.</p>
<p>27.4.2 Setback</p>	<p>Not applicable.</p>
<p>27.4.3 Design</p> <p>P1.</p> <p>The location of buildings and works must satisfy all of the following:</p> <ul style="list-style-type: none"> (a) be located in an area requiring the clearing of native vegetation only if: <ul style="list-style-type: none"> i. there are no sites clear of native vegetation and clear of other significant site constraints such as access difficulties or excessive slope, or the location is necessary for the functional requirements of infrastructure ii. the extent of clearing is the minimum necessary to provide for buildings, associated works and associated bushfire protection measures; (b) be located on a skyline or ridgeline only if: <ul style="list-style-type: none"> i. there are no sites clear of native vegetation and clear of other significant site constraints such as access difficulties or excessive slope, or the location is necessary for the functional requirements of infrastructure ii. significant impact on the rural landscape is minimized through the height of the structure, landscaping and 	<p>P1 compliant.</p> <p>A small amount of vegetation clearing is required in order to provide safety improvements to the existing junctions within this zone. Removal of vegetation will be minimised. A concept landscaping plan based on a landscape assessment has been developed and is attached. This includes a replacement plan for vegetation impacted by the design.</p> <p>The proposed works are not located on a skyline or ridgeline.</p> <p>No Desired Future Character Statements are provided for this zone.</p>

Acceptable Solution / Performance Criteria	Compliance Statement
<p>use of colours with a light reflectance value not greater than 40 percent for all exterior building surfaces;</p> <p>(c) be consistent with any Desired Future Character Statements provided for the area.</p> <p>A2. Exterior building surfaces must be coloured using colours with a light reflectance value not greater than 40 percent.</p> <p>A3. The depth of any fill or excavation must be no more than 2m from natural ground level, except where required for building foundations.</p>	<p>A2 not applicable as no building surfaces form part of the works.</p> <p>A3 compliant. Small amounts of cut and fill are required on the western side the highway within the significant agriculture zone, in order to facilitate widening and junction improvements. No cut or fill depths of more than 2m are required, therefore Acceptable Solution A3 is achieved.</p>
27.4.4 Plantation Forestry	Not applicable

8.5 Part D Codes

Clause 7.3 of the planning scheme specifies the need to consider codes that apply to land under overlay control as well as specific provisions that identify planning issues requiring compliance. Clause 7.3.4 states where there is a conflict between a provision in a code and a provision in a zone, the code provision prevails.

This section provides an assessment of the proposal against the requirements of the following planning scheme codes triggered by the works:

- E3.0 Landslide Code
- E5.0 Road and Railway Assets Code
- E6.0 Parking and Access Code
- E7.0 Stormwater Management Code
- E10.0 Biodiversity Code
- E11.0 Waterway and Coastal Protection Code
- E13.0 Historic Heritage Code
- E14.0 Scenic Landscapes Code
- E15.0 Inundation Prone Areas Code

Signage is part of the project however this is all signs associated with traffic control (statutory signs) which are exempt from the requirements of the E17.0 Signs Code.

8.5.1 E3.0 Landslide Code

The purpose of this code is to ensure that use and development is appropriately designed, located, serviced, constructed or managed to reduce to within tolerable limits the risk to human life and property and the cost to the community, caused by landslides.

E3.2 Application

The code applies to:

- (a) Development for buildings and works or subdivision on land within a Landslide Hazard Area
- (b) Use of land for vulnerable use or hazardous use within a Landslide Hazard Area

Only a small proportion of the proposed works are located within a Landslide Hazard Overlay with the classification of Low hazard.

E3.7 Development Standards for Buildings and Works

The upgrades are classified as major works. Under the Planning Scheme, major works means any of the following:

- (a) excavation of 100 m³ or more in cut volume;
- (b) excavation or soil disturbance of an area of 1,000 m² or more;
- (c) clearance of vegetation involving an area of more than 1,000 m²;
- (d) water storages or swimming pools with a volume of 45,000 litres or more.

The project involves excavation of more than 100m³ in cut volume.

E3.7.3 Major Works

The objective of E3.7.3 is to ensure that landslide risk associated with major works in Landslide Hazard Areas, is:

- (a) acceptable risk; or
- (b) tolerable risk, having regard to the feasibility and effectiveness of any measures required to manage the landslide hazard.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1</p> <p>Major works must satisfy all of the following:</p> <ul style="list-style-type: none"> (a) no part of the works is in a High Landslide Hazard Area; (b) the landslide risk associated with the works is either: <ul style="list-style-type: none"> (i) acceptable risk; or (ii) capable of feasible and effective treatment through hazard management measures, so as to be tolerable risk. 	<p>P1 compliant.</p> <p>A Landslide Risk Assessment (LRA) Report has been prepared and is attached.</p> <p>No part of the proposed work is within High Landslide Risk Area. Parts of the proposed road works are within the Low Hazard Landslip band on the planning scheme maps.</p> <p>Section E3.3 of the Planning Scheme defines a tolerable risk as either being “moderate” based on a qualitative assessment using the Australian Geomechanic Society (AGS) guidelines for landslide risk assessment, or as having risk of loss of life at most 1x10⁻⁴ (for existing slopes) using a quantitative assessment.</p> <p>The landslide risk assessment undertaken uses the RMS Guide to Slope Risk Analysis, which was developed to be consistent with the AGS guidelines for landslip risk assessment, however was tailored specifically for the geotechnical risk of roads and highways (and in fact, both procedures were published by AGS).</p> <p>The assessment rated the existing batter geometry against identified hazards, including:</p> <ul style="list-style-type: none"> • Small rotational failure – ALR3 • Large rotation failure (Ch. 10620 to Ch. 10950) – ALR3 • Rock fall – ALR3 <p>ALR3 risk levels (i.e. “medium / moderate”), have a middle value annual probability of death at 1x10⁻⁵ (refer table 6.1 in the LRA report).</p> <p>The assessment also rated the proposed Preliminary Design batter geometry against identified hazards, including:</p>

Acceptable Solution / Performance Criteria	Compliance Statement
	<ul style="list-style-type: none"> • Small rotational failure – ALR3 • Large rotation failure (Ch. 10620 to Ch. 10950) – ALR2 • Rock fall – ALR3 <p>Based on the definitions provided in the Scheme, the designs proposed will meet the required performance criteria for the risk associated with small rotational failures and rock falls.</p> <p>The highway geometry will be modified during the Detailed Design phase to ensure the slopes on the western side of the highway from Ch. 10620 to Ch. 10950 are not disturbed and the problem areas are avoided. Therefore the assessed risk level for a large rotational failure will revert to ALR3 (i.e. as per the existing situation). This mitigation measure will mean the highway upgrades will meet the required performance criteria for the risk associated with large rotational failures.</p> <p>In addition, new batter slopes within the project will be redesigned at 2H:1V during the Detailed Design phase to further reduce the risk of land slide hazards. It should also be noted that the new highway cross section increases the travel distance for rock falls by increasing the shoulder width from 1m to 2m.</p>

8.5.2 E5.0 Road & Railway Assets Code

The purpose of this Code is to protect the safety and efficiency of road and railway networks and reduce the conflict between sensitive uses and major roads and the rail network.

The Code is not intended to apply to road upgrade works undertaken by the road authority, however a Traffic Impact Assessment associated with this project has been undertaken in accordance with Department of State Growth's Framework for Undertaking Traffic Impact Assessments, and is attached.

E5.5 Use Standards

E5.5.1 Existing Road Accesses and Junctions

The objective of E5.5.1 is to ensure that the safety and efficiency of roads is not reduced by increased use of existing accesses and junctions.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>A1</p> <p>The annual average daily traffic (AADT) of vehicle movements, to and from a site, onto a category 1 or category 2 road, in an area subject to a speed limit of more than 60km/h, must not increase by more than 10% or 10 vehicle movements per day, whichever is the greater.</p>	<p>A1 compliant.</p> <p>The upgrade to the Midland Highway will not generate additional traffic.</p>
<p>P2</p> <p>Any increase in vehicle traffic at an existing access or junction in an area subject to a speed limit of more than 60km/h must be safe and not unreasonably impact on the efficiency of the road, having regard to:</p> <ul style="list-style-type: none"> (a) the increase in traffic caused by the use; (b) the nature of the traffic generated by the use; (c) the nature and efficiency of the access or the junction; (d) the nature and category of the road; (e) the speed limit and traffic flow of the road; (f) any alternative access to a road; (g) the need for the use; (h) any traffic impact assessment; and (i) any written advice received from the road authority. 	<p>P2 compliant.</p> <p>Due to the location of turning facilities on Sorell Springs Road and Old Tier Road, there will be increased use of these junctions. The increased traffic volume is expected to be in the order of 40-50 turning movements per day. Both junctions will be upgraded with compliant AUL and CHR facilities provided. The upgraded junctions will be able to safely and efficiently cater for this small increase in traffic volumes.</p>

E5.6 Development Standards

E5.6.1 Development adjacent to roads and railways

The objective of E5.6.1 is to ensure that development adjacent to category 1 or category 2 roads or the rail network:

- (a) ensures the safe and efficient operation of roads and the rail network;
- (b) allows for future road and rail widening, realignment and upgrading; and
- (c) is located to minimise adverse effects of noise, vibration, light and air emissions from roads and the rail network.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1</p> <p>The location of development, from the rail network, or a category 1 road or category 2 road in an area subject to a speed limit of more than 60km/h, must be safe and not unreasonably impact on the efficiency of the road or amenity of sensitive uses, having regard to:</p> <ul style="list-style-type: none"> (a) the proposed setback; (b) the existing setback of buildings on the site; (c) the frequency of use of the rail network; (d) the speed limit and traffic volume of the road; (e) any noise, vibration, light and air emissions from the rail network or road; (f) the nature of the road; (g) the nature of the development; (h) the need for the development; (i) any traffic impact assessment; (j) any recommendations from a suitably qualified person for mitigation of noise, if for a habitable building for a sensitive use; and (k) any written advice received from the rail or road authority. 	<p>P1 compliant.</p> <p>The upgrade will involve widening the Midland Highway to improve safety and efficiency.</p> <p>In a number of areas within the project site the existing highway is within 50m of the rail line. Widening on the eastern side (toward the rail line) has been limited and will not unreasonably impact the use of the rail line.</p>

E5.6.2 Road Accesses and Junctions

The objective of E5.6.2 is to ensure that the safety and efficiency of roads are not reduced by the creation of new accesses and junctions.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1</p> <p>For roads in an area subject to a speed limit of more than 60km/h, accesses and junctions must be safe and not unreasonably impact on the efficiency of the road, having regard to:</p> <ul style="list-style-type: none"> (a) the nature and frequency of the traffic generated by the use; (b) the nature of the road; (c) the speed limit and traffic flow of the road; (d) any alternative access; (e) the need for the access or junction; (f) any traffic impact assessment; and (g) any written advice received from the road authority. 	<p>P1 compliant.</p> <p>Two junctions within the project site, Glen Morey Road and Antill Ponds Road, will be relocated as part of works. The junctions have been relocated in order to improve safety. Providing a greater separation between Old Tier Road and Glen Morey Road allows compliant CHR treatments to be provided at both junctions. The new Antill Ponds junction will have greater sight distance than the existing location which has deficient sight distance. A CHR treatment will also improve safety at the relocated Antill Ponds junction. The new junction incorporates a turn facility, which will improve efficiency for highway traffic.</p> <p>Private accesses within the project site will generally become left in/ left out only and number of accesses will be closed which will also improve safety on the highway.</p>

E5.6.3 New level Crossings

The objective of E5.6.3 is to ensure that the safety and the efficiency of the rail network are not reduced by access across part of the rail network.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1</p> <p>Level crossings must be safe and not unreasonably impact on the efficiency of the rail network, having regard to:</p> <p>(a) the nature and frequency of the traffic generated by the use;</p> <p>(b) the frequency of use of the rail network;</p> <p>(c) the location of the level crossing;</p> <p>(d) any alternative access;</p> <p>(e) the need for the level crossing;</p> <p>(f) any traffic impact assessment;</p> <p>(g) any measures to prevent access to the rail network; and</p> <p>(h) any written advice received from the rail authority.</p>	<p>P1 compliant.</p> <p>Consistent with the existing situation, a level crossing will be provided on the relocated Glen Morey Road near the Midland Highway. The upgrade will not increase the number of vehicles using the level crossing. Both traffic and rail volumes at the level crossing are low.</p> <p>The design improves the safety of the level crossing on Glen Morey Road through:</p> <ul style="list-style-type: none"> • Provision of CHR and AUL treatments at the Glen Morey Road intersection • Restriction of right turn movements out of Glen Morey Road for long heavy vehicles (detour via Old Tier Road) • Provision of a left turn slip lane for vehicles turning out of Glen Morey Road

E5.6.4 Sight distance at accesses, junctions and level crossings

The objective of E5.6.4 is to ensure that accesses, junctions and level crossings provide sufficient sight distance between vehicles and trains to enable safe movement of traffic.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>A1</p> <p>Sight distances at:</p> <p>(a) an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1; and</p> <p>(b) rail level crossings must comply with AS1742.7 Manual of uniform traffic control devices - Railway crossings, Standards Association of Australia.</p> <p>P1</p> <p>The design, layout and location of an access, junction or rail level crossing must provide adequate sight distances to ensure the safe movement of vehicles, having regard to:</p> <p>(a) the nature and frequency of the traffic generated by the use;</p> <p>(b) the frequency of use of the road or rail network;</p> <p>(c) any alternative access;</p> <p>(d) the need for the access, junction or level crossing;</p>	<p>P1 compliant.</p> <p>Safe Intersection Sight Distance (SISD) checks have been undertaken at all accesses, junctions and turn facilities based on Austroads Guidelines.</p> <p>All junctions have been assessed based on the desirable value of 325 m for a design speed of 120 km/h which is greater than the requirements of Table E5.1 in the Scheme (290 m for an 85th percentile speed of 110 km/h). All junctions achieve the desirable value of 325 m.</p> <p>Accesses have been assessed against the EDD requirements of approximately 240m (adjusted for grade). All accesses achieve the EDD requirements. The EDD requirements are considered appropriate as it is difficult to achieve higher SISD at existing accesses. The design does not include any new private accesses.</p> <p>Based on AS1742.7 the required sight distance for vehicles stopped at the hold line is 220m (based on a B-Double). This sight distance is achieved. Some vegetation clearing will be required in the vicinity of</p>

Acceptable Solution / Performance Criteria	Compliance Statement
(e) any traffic impact assessment; (f) any measures to improve or maintain sight distance; and (g) any written advice received from the road or rail authority.	the level crossing.

8.5.3 E6.0 Parking and Access Code

The purpose of this code is to:

- (a) ensure safe and efficient access to the road network for all users, including drivers, passengers, pedestrians and cyclists;
- (b) ensure enough parking is provided for a use or development to meet the reasonable requirements of users, including people with disabilities;
- (c) ensure sufficient parking is provided on site to minimise on-street parking and maximise the efficiency of the road network;
- (d) ensure parking areas are designed and located in conformity with recognised standards to enable safe, easy and efficient use and contribute to the creation of vibrant and liveable places;
- (e) ensure access and parking areas are designed and located to be safe for users by minimising the potential for conflicts involving pedestrians, cyclists and vehicles; and by reducing opportunities for crime or anti-social behaviour;
- (f) ensure that vehicle access and parking areas do not adversely impact on amenity, site characteristics or hazards;
- (g) recognise the complementary use and benefit of public transport and non-motorised modes of transport such as bicycles and walking;
- (h) provide for safe servicing of use or development by commercial vehicles.

E6.6 Use Standards

Based on the Scheme there are no requirements to provide car, motorbike or cyclist parking for a road upgrade (classified as utilities).

E6.7 Development Standards

E6.7.1 Number of Vehicular Accesses

The objective of E6.7.1 is to ensure that:

- (a) safe and efficient access is provided to all road network users, including, but not limited to: drivers, passengers, pedestrians, and cyclists, by minimising:
 - (i) the number of vehicle access points; and
 - (ii) loss of on-street car parking spaces;
- (b) vehicle access points do not unreasonably detract from the amenity of adjoining land uses;
- (c) vehicle access points do not have a dominating impact on local streetscape and character.

Acceptable Solution / Performance Criteria	Compliance Statement
A1 The number of vehicle access points provided for each road frontage must be no more than 1 or the existing number of vehicle access points, whichever is the greater.	A1 compliant. No new accesses will be provided within the project site. A number of accesses will be closed, reducing the number of accesses on the Midland Highway.

E6.7.2 Design of Vehicular Accesses

The objective of E6.7.1 is to ensure safe and efficient access for all users, including drivers, passengers, pedestrians and cyclists by locating, designing and constructing vehicle access points safely relative to the road network.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1</p> <p>Design of vehicle access points must be safe, efficient and convenient, having regard to all of the following:</p> <p>(a) avoidance of conflicts between users including vehicles, cyclists and pedestrians;</p> <p>(b) avoidance of unreasonable interference with the flow of traffic on adjoining roads;</p> <p>(c) suitability for the type and volume of traffic likely to be generated by the use or development;</p> <p>(d) ease of accessibility and recognition for users.</p>	<p>P1 compliant.</p> <p>Existing accesses impacted by the works which are to be retained will be upgraded as part of the project.</p> <p>Accesses have been designed based on the current vehicles using the access. All accesses meet the EDD requirements for safe intersection sight distance. Further information is provided in the attached TIA.</p>

8.5.4 E7.0 Stormwater Management Code

The purpose of this provision is to ensure that stormwater disposal is managed in a way that furthers the objectives of the State Stormwater Strategy.

E7.2 Application

This Code is applicable as it applies to development requiring management of stormwater. A stormwater hydraulics report from a suitably qualified person is attached advising of the suitability of the stormwater system for the proposed use and development.

E7.7 Development Standards

E7.7.1 Stormwater Drainage and Disposal

The objective of E7.7.1 is to ensure that stormwater quality and quantity is managed appropriately.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>A1</p> <p>Stormwater from new impervious surfaces must be disposed of by gravity to public stormwater infrastructure.</p>	<p>A1 compliant.</p> <p>All runoff generated as a result of the increased area of impervious surfaces will discharge by gravity into roadside table drains running parallel to the highway, and be conveyed under the roadway by a network of adequately sized cross-drainage infrastructure.</p>
<p>P2</p> <p>A stormwater system for a new development must incorporate a stormwater drainage system of a size and design sufficient to achieve the stormwater quality and quantity targets in accordance with the State Stormwater Strategy 2010, as detailed in Table E7.1 unless it is not feasible to do so.</p>	<p>P2 compliant.</p> <p>Impervious area along the highway between St Peters Pass and south of Tunbridge will increase by 55,585 m². WSUD principles have been considered by modelling the roadside network of grass-lined table drains as swales to determine the effect on runoff stormwater quality (and inevitable discharge into natural waterways).</p> <p>Based on Figures 7.4 – 7.6 in ‘WSUD: Engineering procedures for stormwater management in Tasmania, 2012,’ it is estimated that the following can be achieved;</p> <ul style="list-style-type: none"> • 90% reduction in Total Suspended Solids (TSS) • 65% reduction in Total Phosphorus (TP) • 40% reduction in Total Nitrogen (TN)

Acceptable Solution / Performance Criteria	Compliance Statement
	It is considered that these reductions sufficiently meet the requirements of Performance Criteria P2.
<p>A3</p> <p>A minor stormwater drainage system must be designed to comply with all of the following:</p> <p>(a) be able to accommodate a storm with an ARI of 20 years in the case of non-industrial zoned land and an ARI of 50 years in the case of industrial zoned land, when the land serviced by the system is fully developed;</p> <p>(b) stormwater runoff will be no greater than pre-existing runoff or any increase can be accommodated within existing or upgraded public stormwater infrastructure.</p>	<p>A3 compliant.</p> <p>The volume of runoff generated as part of these upgrades has not increased. All culverts have been assessed for adequacy and have been upgraded as required where they were found to be inadequate for a minor storm event.</p>
<p>A4</p> <p>A major stormwater drainage system must be designed to accommodate a storm with an ARI of 100 years.</p>	<p>A4 compliant.</p> <p>All culverts have been assessed for adequacy and have been upgraded as required where they were found to be inadequate for a major storm event.</p>

8.5.5 E10.0 Biodiversity Code

The purpose of this provision is to:

- a) minimise loss of identified threatened native vegetation communities and flora species
- b) conserve identified threatened fauna species by minimising clearance of important habitat and managing environmental impact
- c) minimise loss of other biodiversity values that are recognised as locally significant by the Planning Authority.

E10.2 Application

The code applies to development involving clearance and conversion or disturbance of native vegetation within a Biodiversity Protection Area.

The Biodiversity Protection Area overlay occurs over part of the road upgrade area.

Under the Definition of Terms section (E10.3), Priority Biodiversity values are specified in Table E10.1.

The vegetation community, Lowland *Poa labillardierei* grassland (GPL) is present within the road upgrade area. This is classified as 'High Priority Biodiversity Values' as per Table E.10.1.

The vegetation community *Eucalyptus viminalis* grassy forest and woodland (DVG) has also been mapped within the Biodiversity Overlay. This is classified as 'Low Priority Biodiversity Values' as it is listed as 'other native vegetation communities' as per Table E.10.1. DVG is not a threatened vegetation community under any state or federal legislation.

The Biodiversity Protection Area overlay occurs over part of the mapped GPL and DVG vegetation and will be impacted as part of the road upgrades. Hence the Biodiversity Code applies in these situations.

FIGURE 8-2 BIODIVERSITY CODE OVERLAY WITHIN PROJECT AREA



E10.4 Development Exempt from this Code

Vegetation clearing is exempt where it involves works within 2 m of existing infrastructure including roads, tracks, footpaths, cycle paths, drains, sewers, pipelines and telecommunications facilities for the maintenance, repair, upgrading or replacement of such infrastructure.

The extent of works does not meet the Code exemptions in Clause E10.4. As such E10.7 Development Standards applies.

E10.5 Application Requirements

State Growth commissioned North Barker Ecosystem Services to undertake natural values investigations within the project area in October 2015. The report titled *Midland Highway – St Peters Pass Rest Area to Woodbury, Flora and Fauna Habitat Survey, October 2015* is provided as an attachment.

E10.7.1 Building and Works

The objective of E10.7.1 is to ensure that development for buildings and works that involves clearance and conversion or disturbance within a Biodiversity Protection Area does not result in unnecessary or unacceptable loss of priority biodiversity values.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>A1 Clearance and conversion or disturbance must comply with one of the following: a) Be within a Building Area on a plan if</p>	<p>None of the acceptable solutions listed under A1 are met for the proposed roadworks. Therefore Performance Criteria P1 applies.</p>

Acceptable Solution / Performance Criteria	Compliance Statement
<p>subdivision approved under this planning scheme</p> <p>b) The development is for a single dwelling on an existing lot within the Low Density Residential Zone, Rural Living Zone or Environmental Living Zone and:</p> <ul style="list-style-type: none"> i) Clearance and conversion or disturbance is confined to Low Priority Biodiversity Values; ii) The area of clearance and conversion is no more than 3,000m² iii) The area of disturbance is no more than 6,000m² <p>c) The development is other than for a single dwelling on an existing lot within the Low Density Residential Zone, Rural Living Zone, or Environmental Living Zone and;</p> <ul style="list-style-type: none"> i) Clearance and conversion or disturbance is confined to Low Priority Biodiversity Values; ii) The area of clearance and conversion is no more than 1,500m²; iii) The area of disturbance is no more than 3,000m²; 	
<p>P1</p> <p>a) If low priority values:</p> <ul style="list-style-type: none"> i) Development is designed and located to minimise impacts, having regard to constraints such as topography or land hazard and the particular requirements of the development; ii) Impacts resulting from bushfire hazard management measures and minimised as far as reasonably practical through siting and fire-resistant design of habitable buildings 	<p>P1 (a) (i) compliant.</p> <p>The project area contains <i>Eucalyptus viminalis</i> grassy forest and woodland (DVG) which is classified as a 'low priority value' as per table E10.1. DVG is not listed as a threatened community under any state or federal legislation. Therefore Performance Criteria P1 a) applies.</p> <p>The Department of State Growth commissioned North Barker Ecosystem Services to undertake natural values investigations within the project area in October 2015. The report titled <i>Midland Highway – St Peters Pass Rest Area to Woodbury, Flora and Fauna Habitat Survey, October 2015</i> mapped DVG in the proposed works area. The survey results were incorporated into final design to minimise impacts to this vegetation community. The proposed works are an upgrade to an existing highway, therefore the development must be designed and located on the existing road alignment. All practical measures have been undertaken in development of the design to minimise impacts to vegetation while ensuring that the objectives of the safety upgrade are achieved.</p> <p>Up to 0.76 ha of DVG will be affected by the road upgrade with the impact restricted to generally less than 12 m of the edge of the mapped community. An estimated 23,300 ha remains with the Southern Midlands Council area and less than 0.003 % will be impacted as part of this project. Therefore the impacts to DVG are minimal in the context of the broader municipality, and will not cause an unacceptable loss of priority biodiversity values.</p> <p>P1 (a) (ii) not applicable.</p>

Acceptable Solution / Performance Criteria	Compliance Statement
<p>b) If moderate priority biodiversity values:</p> <ul style="list-style-type: none"> i) development is designed and located to minimise impacts, having regard to constraints such topography or land hazard and the particular requirements of the development; ii) impacts resulting from bushfire hazard management measures are minimised as far as reasonably practicable through siting and fire-resistant design of habitable buildings; iii) remaining moderate priority biodiversity values on the site are retained and improved through implementation of current best practice mitigation strategies and ongoing management measures designed to protect the integrity of these values; 	<p>P1 (b) not applicable.</p> <p>There are no 'moderate priority biodiversity values' contained within the project area. As such b) is not applicable.</p>
<p>c) If high priority biodiversity values:</p> <ul style="list-style-type: none"> i) Development is designed and located to minimise impacts, having regard to constraints such as topography or land hazard and the particular requirements of the development; ii) Impacts resulting from bushfire hazard management measures are minimised as far as reasonably practicable through siting and fire-resistant design of habitable buildings; iii) Remaining high priority biodiversity values on the site are retained and improved through implementation of current best practice mitigation strategies and ongoing management measures designed to protect the integrity of these values; iv) special circumstances exist; 	<p>P1 (c) (i) compliant.</p> <p>The project area contains <i>Lowland Poa labillardierei grassland</i> (GPL) which is classified as a 'high priority value' as per table E10.1. Therefore Performance Criteria P1 c) applies.</p> <p>The findings from North Barker's 2015 report (Appendix A) mapped approximately 3.59 ha within the wider project area. The survey data was incorporated into the final design to ensure impacts were minimised. The proposed works are an upgrade to an existing highway, therefore the development must be designed and located on the existing road alignment. All practical measures have been undertaken during development of the design to minimise impacts to vegetation while ensuring that the objectives of the safety upgrade are achieved.</p> <p>Up to 0.24 ha of GPL will be impacted by the road upgrades, with the impact restricted to generally less than 11 m of the edge of the community. An estimated 2,400 ha remains within the Southern Midlands Council and less than 0.01% will be impacted. Therefore the impacts to GPL are minimal in the context of the broader municipality, and will not cause an unacceptable loss of priority biodiversity values.</p> <p>P1 (c) (ii) not applicable.</p> <p>P1 (c) (iii) compliant.</p> <p>During construction, areas of GPL not directly impacted will be designated "no-go" zones to ensure that impact beyond the works footprint is avoided. GPL that is impacted by the project occurs generally on the edge of the areas which are more disturbed. In addition to the measures outlined in i) to retain GPL where reasonably practical, a Significant impact assessment was undertaken by North Barker Ecosystem Services to determine whether the impacts to the GPL within the project area are likely to have a significant impact on matters of national environmental significance (as required under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>). The assessment</p>

Acceptable Solution / Performance Criteria	Compliance Statement
	<p>concluded that the impacts to the community is not significant and therefore does not require referral to the (C'wealth) Department of the Environment and Energy.</p> <p>P1 (c) (iv) not applicable.</p>

E10.8 Subdivision Standards

E10.8 is not applicable as land acquisition occurs under the *Land Acquisition Act 1993*.

8.5.6 E11.0 Waterway and Coastal Protection Zone

The purpose of this provision is to manage vegetation and soil disturbance in the vicinity of wetlands, watercourses and the coastline in order to:

- a) minimise impact on water quality, natural values including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands and lakes
- b) minimise impact on coastal and foreshore values, native littoral vegetation, natural coastal processes and the natural ecological function of the coast
- c) protect vulnerable coastal areas to enable natural processes to continue to occur, including the landward transgression of sand dunes, wetlands, saltmarshes and other sensitive coastal habitats due to sea-level rise
- d) minimise impact on water quality in potable water supply catchment areas

E11.2 Application of the Code

The code applies to development within:

- a) Waterway and Coastal Protection Areas
- b) Future Coastal Refugia Areas
- c) Potable Water Supply Areas

The code does not apply to use.

An area of the highway is subject to a Waterway and Coastal Protection Area associated with the Currajong River system identified on the planning scheme overlay map. The Waterway and Coastal Protection Area code applies to works within this area of the project.

E11.7 Development Standards

E11.7.1 Building and Works

The objective of E11.7.1 is to ensure that buildings and works in proximity to a waterway, the coast, identified climate change refugia and potable water supply areas will not have an unnecessary or unacceptable impact on natural values.

Acceptable Solution/ Performance Criteria	Compliance Statement
<p>P1</p> <p>Building and works within a Waterway and Coastal Protection Area must satisfy all of the following:</p> <p>(a) avoid or mitigate impact on natural values;</p> <p>(b) mitigate and manage adverse erosion, sedimentation and runoff impacts on natural values;</p>	<p>P1 compliant.</p> <p>Proposed works for new road, intersections and accesses will occur within the Waterway and Coastal Protection Area. The proposed works will be within an area of current land disturbance for farming purposes and will require construction over existing watercourses.</p>

Acceptable Solution/ Performance Criteria	Compliance Statement
<p>(c) avoid or mitigate impacts on riparian or littoral vegetation;</p> <p>(d) maintain natural streambank and streambed condition, (where it exists);</p> <p>(e) maintain in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation;</p> <p>(f) avoid significantly impeding natural flow and drainage;</p> <p>(g) maintain fish passage (where applicable);</p> <p>(h) avoid landfilling of wetlands;</p> <p>(i) works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.</p>	<p>Disturbance to the immediate surrounds of rivers and wetlands will be kept to a minimum and controlled with the adoption of appropriate management measures.</p> <p>The existing road intervenes with the existing waterways. New road works will occur at the following waterway locations:</p> <ul style="list-style-type: none"> • Currajong Rivulet. • Pass Creek • Stringybark Rivulet • Numerous subsidiaries of the above watercourses <p>The State Policy on Water Quality Management provides a framework for the protection of these waterway features, in particular ensuring management and regulation of sources of emissions to surface waters. The following aspects of the project will ensure consistency with the requirements of the state policy:</p> <ul style="list-style-type: none"> • The proposal will not result in a new point source discharge into a waterway, and will not increase the existing point source discharges into existing water courses crossing the highway by more than 10%. • Stormwater from the road will be directed to table drains. • Culverts will be extended where necessary. There will be no change in location of existing flow regimes across the highway. • Construction of the road will be carried out in accordance with an environmental management plan consistent with the relevant State Growth specifications to prevent erosion and the pollution of streams and waterways by runoff from construction activities. <p>The construction management plan will be developed in accordance with the Wetlands and Waterways Works Manual (DPIWE, 2003).</p> <p>Use of heavy machinery and other activities within areas of the river and wetland systems will be controlled during the course of construction so as to minimise disturbance.</p> <p>It is considered that the proposed works will not detrimentally impact on the area subject to this code.</p>

8.5.7 E13.0 Historic Heritage Code

The purpose of this code is to recognise and protect the historic cultural heritage significance of places, precincts, landscapes and areas of archaeological potential by regulating development that may impact on their values, features and characteristics.

E13.2 Application of the Code

This code applies to development involving land defined in this code as any of the following:

- a) a Heritage Place
- b) a Heritage Precinct
- c) a Cultural Landscape Precinct
- d) a Place of Archaeological Potential

This code does not apply to use, unless a Heritage Place is listed because its use or history of use is a key criterion in its listing. This code does not apply to signs.

Along with survey reports for historic heritage and plantings, a Heritage Impact Statement by a suitably qualified person has been undertaken to address impacts of the proposed design on heritage properties and vegetation.

The concept landscaping plan based on the landscape assessment is provided to address impacts on heritage plantings.

E13.7 Development Standards

E13.7.2 Buildings and Works other than Demolition

The objective of E13.7.2 is to ensure that development at a heritage place is:

- (a) undertaken in a sympathetic manner which does not cause loss of historic cultural heritage significance; and
- (b) designed to be subservient to the historic cultural heritage values of the place and responsive to its dominant characteristics.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1</p> <p>Development must not result in any of the following:</p> <ul style="list-style-type: none">(a) loss of historic cultural heritage significance to the place through incompatible design, including in height, scale, bulk, form, fenestration, siting, materials, colours and finishes;(b) substantial diminution of the historic cultural heritage significance of the place through loss of significant streetscape elements including plants, trees, fences, walls, paths, outbuildings and other items that contribute to the significance of the place.	<p>P1 compliant.</p> <p>The Heritage Impact Statement confirms that the development will not result in a loss of historical cultural heritage significance through impacts on valuable historic elements of listed properties or through loss of significant vegetation, provided the recommendations in the statement are complied with. The landscape assessment comprehensively reviewed the findings of the original heritage reports and the concept landscaping plan (based on the assessment) incorporates the recommendations of the Heritage Impact Statement.</p>

8.5.8 E14.0 Scenic Landscapes Code

The purpose of Scenic Landscapes Code is to recognise and protect landscapes that are important for their scenic values.

E14.2 Application

This code applies to development on land defined within this Code as either of the following:

- a) A Scenic Landscape Area

b) A Scenic Landscape Corridor

The Code is applicable as the works are located within a Scenic Landscape Corridor.

The Midland Highway between Oatlands and Tunbridge is generally characterised by exotic tree planting along the current and former road alignments with a background of native forest. The adjacent landscape is predominantly pastoral with views to historic rural / agricultural buildings and surrounding hills.

The road upgrade will impact on the landscape character. A comprehensive landscape assessment has been undertaken that considers the significant heritage and scenic values within the project area. A concept landscaping plan has been developed in order to mitigate the impact on the landscape values that were identified as part of the assessment. The landscaping assessment and plan are attached.

The following principles were used to inform the landscape design:

- Respect the existing landscape character and where possible integrate the proposed road upgrades into its setting
- Provide a low maintenance and safe road corridor
- Protect and retain Pioneer Avenue trees where possible and provide suitable infill planting to enhance the avenue
- Removal / control of suckers and invasive species in strategic locations to open up views to historic Pioneer Avenue trees or other landscape features.
- Suckering trees can contribute to the overall landscape experience and in some locations may be retained, provided they do not obscure views to historic plantings and other significant landscape features
- Potential identification of former road alignment and heritage sites with selected tree planting
- Tree species selection will be informed by the Pioneer Avenue concept, including a review of the best performing species, local site conditions and environmental values
- Proposed tree planting will generally be within freehold land and not within the road reserve
- Plant hardy, low growing native vegetation on embankments to provide soil erosion and weed control
- Willow and other declared weeds must be removed / controlled

E14.7 Development Standards

E14.7.3 Removal of Bushland and Exotic Vegetation within Scenic Landscape Corridors

The Objective of E14.7.3 is to ensure that removal or disturbance of bushland and exotic vegetation does not cause an unreasonable change to, or have an unreasonable adverse effect on, the scenic landscape value of Scenic Landscape Corridors.

Acceptable Solution / Performance Criteria	Compliance Statement
P1 Removal or disturbance of bushland, exotic trees with a height more than 10 m or hedgerows must be minimised and must result in only minor change to scenic landscape value.	P1 compliant. The stretch of the Midland Highway subject to this proposal is generally characterised by exotic tree plantings along the road alignments with a background of native forests. The surrounding landscape is predominantly rural pasture with views to undulating hills as a backdrop. The Pioneer Avenue was planted along the highway during the 1930's, some of which are set back from the new alignment of the highway. As part of the design process and concept landscaping plan development the removal of vegetation (native and exotic) is avoided and minimised where possible. The works will obviously be visible from the road and will initially have a visual impact on the landscape character of the area.

Acceptable Solution / Performance Criteria	Compliance Statement
	However with the approach of minimising tree removal to only what is entirely necessary, as well as adopting a comprehensive landscaping plan that involves the planting of species that contribute to the landscape values of the area and the removal of weeds, it is expected that longer term the impact on landscape will be minimal, and may even be enhanced.

E14.7.4 Appearance of Buildings and Works within Scenic Landscape Corridors

The objective of E14.7.4 is to ensure that buildings and works do not cause an unreasonable change to, or have an unreasonable adverse effect on, the scenic landscape value of Scenic Landscape Corridors.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1 Buildings and works visible from the pertinent road must maintain scenic landscape value through satisfying one or more of the following, as necessary;</p> <ul style="list-style-type: none"> (a) be set back from the pertinent road as far as reasonably practical; (b) be externally coloured using colours commonly applied to buildings within the local rural landscape; (c) be designed to: <ul style="list-style-type: none"> (i) minimise visual impact due to height and bulk; (ii) minimise cut and fill; (d) be located to maintain significant view corridors from the pertinent major road to prominent natural features; (e) be located to take advantage of any existing native or exotic vegetation, or new vegetation, for visual screening purposes; (f) fences are post & wire or other design of a similarly transparent appearance. 	<p>P1 compliant. The works will be visible from the existing road however they have been designed to minimise visual impact by reducing height and bulk through balancing cut and fill.</p> <p>The proposed landscaping plan developed as part of the project aims to maintain significant view corridors visible from the road that lead to prominent natural and historic features.</p>

8.5.9 E15.0 Inundation Prone Areas Code

The purpose of this code includes managing development in areas at risk from periodic or permanent inundation.

E15.2 Application

This code applies as parts of the works are located within the Riverine Inundation Hazard Area on the Planning Scheme maps.

E15.7 Development Standards for Buildings and Works

E15.7.5 Riverine, Coastal Investigation Area, Low, Medium, High Inundation Hazard Areas

The objective of E15.7.5 is:

- (a) To ensure that landfill and mitigation works do not unreasonably increase the risk from riverine, watercourse and inland flooding, and risk from coastal inundation.
- (b) To ensure that the risk to waste water management from riverine, watercourse and inland flooding, and risk from coastal inundation is appropriately managed.

Acceptable Solution / Performance Criteria	Compliance Statement
<p>P1</p> <p>Landfill, or solid walls greater than 5 m in length and 0.5 m in height, must satisfy all of the following:</p> <p>(a) no adverse effect on flood flow over other property through displacement of overland flows;</p> <p>(b) the rate of stormwater discharge from the property must not increase;</p> <p>(c) stormwater quality must not be reduced from pre-development levels.</p>	<p>P1 compliant.</p> <p>The Riverine Inundation Hazard Area intervenes with the existing road embankment formation on the eastern side of the Highway in the vicinity of Ch 13760 and Ch 13920.</p> <p>The new works in this location consist of widening of the road formation predominantly on the western side. The embankment construction on the eastern side is minimal and will have no detrimental effect on the inundation hazard area.</p>

8.6 Part F Specific Area Plans

No Specific Area Plans apply to the proposed works.

9. Tasmanian Heritage Register

An historic heritage assessment and historic plantings assessment incorporating a desktop review and field survey conducted in November 2015 were undertaken to record and assess potential heritage values within the study area and surrounds. The survey extended from St Peters Pass Rest Area along the highway to south of Tunbridge. A number of historical features were observed during the survey including Pioneer Avenue trees, historic plantings and built heritage.

Five properties within the project area are listed on the Tasmanian Heritage Register (THR):

- Woodbury
- Rockwood
- Kenmore Arms

Land acquisition is only required from Rockwood and Kenmore Arms, although for Kenmore Arms the land acquisition will not impact on the THR-listed 'area of interest'. Extensive work has been undertaken during the design process to minimise impacts on important historic features and plantings.

A Heritage Impact Statement was undertaken to assess the nature and types of heritage impacts that may occur as a result of the development footprint. The Statement found that provided management measures were implemented for the THR-listed properties, Rockwood and Woodbury (indirect impacts) that the proposal will not result in the loss of historic cultural significance of these places. For historic plantings including Pioneer Avenue trees, the removal of trees and replanting to the extent possible with same (or similar) tree species in accordance principles defined in the Heritage Tasmania Practice Notes, will result in minimal impacts on their cultural significance. A landscape assessment comprehensively reviewed the findings of the heritage investigations and the concept landscaping plan was developed based on the findings of the assessment. The concept

landscaping plan based on the assessment incorporates the recommendations of the Statement, including that it be based on the principles in the Practice Notes. Heritage Tasmania were consulted through the development of the landscape assessment and plan, and were supportive of the approach to addressing impacts on historic heritage plantings.

The heritage investigations reports, Heritage Impact Statement, landscape assessment and concept landscaping plan are attached.

10. State Policies

10.1.1 State Policy on the Protection of Agricultural Land 2009

The State Policy on the Protection of Agricultural Land provides a framework for planning decisions involving agricultural land. Its purpose is to conserve and protect agricultural land so that it remains available for the sustainable development of agriculture, recognising the particular importance of prime agricultural land. Its provisions are reflected in the Scheme; however they are also addressed below.

The existing adjacent agricultural land use comprises grazing and cropping. Principle 3 of the Policy relevantly states in relation to the development of utilities, such as roads, that:

“The development of utilities, extractive industries and controlled environment agriculture on prime agricultural land may be allowed, having regard to criteria, including the following:

- (a) minimising the amount of land alienated;
- (b) minimising negative impacts on the surrounding environment; and
- (c) ensuring the particular location is reasonably required for operational efficiency”.

The proposal is assessed to be consistent with the above requirements in that the proposed works are designed to minimise the amount of the land acquired to that necessary to accommodate the necessary road design.

Further, the proposed works are required to ensure the safety and operational efficiency of this section of the Midland Highway as part of the National Highway network.

10.1.2 State Policy on Water Quality Management 1997

The State Policy on Water Quality Management provides a framework for the development of ambient water quality objectives and the management and regulation of sources of emissions to surface waters (including coastal waters) and groundwater. In terms of water quality, investigations have identified that:

- The proposal will not result in a new point source discharge into a waterway, and will not increase the existing point source discharges into existing water courses crossing the highway by more than 10%.
- Stormwater from the road will be directed to table drains.
- Culverts will be extended where necessary. There will be no change in location of existing flow regimes across the highway.
- Construction of the road will be carried out in accordance with an environmental management plan consistent with the relevant State Growth specifications to prevent erosion and the pollution of streams and waterways by runoff from construction activities.

The proposal is therefore assessed to be consistent with the State Policy.

11. Conclusion

This report supports a development application by the Department of State Growth to the Southern Midlands Council for the widening and upgrading of the existing Midland Highway to provide a “2 + 1” arrangement between St Peters Pass and South of Tunbridge.

The project is a component of the Midland Highway Upgrade Program, which aims to improve safety to a minimum 3 Star AusRAP² rating.

The purpose of this report is to address the Southern Midlands Council Interim Planning Scheme 2015. This report includes specialist assessments as attachments to provide additional context for Council.

This report has identified the proposed road works are a permitted use within the Utilities Zone and a discretionary use in the Rural Resource and Significant Agriculture Zones. Discretion is required in relation to the following codes:

- E3.0 Landslide Code
- E5.0 Road and Railway Assets Code
- E6.0 Parking and Access Code
- E7.0 Stormwater Management Code
- E10.0 Biodiversity Code
- E11.0 Waterway and Coastal Protection Code
- E13.0 Historic Heritage Code
- E14.0 Scenic Landscapes Code
- E15.0 Inundation Prone Areas Code

The proposal is assessed to comply with the relevant acceptable solutions and performance criteria under these zones and codes. The proposal is therefore assessed to comply with the requirements of the Scheme and State heritage matters, and should be approved.

² The Australian Road Assessment Program (AusRAP) has examined 21,921 kilometres of national highway with a speed limit of 90km per hour or above, awarding Star Ratings based on their level of safety. Sections of road are rated on a scale of 1 to 5-stars, with 1-star being the least safe and 5-star being the safest. – Australian Automobile Association (2013) *Star Rating Australia's National Network of Highways 2013*



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MIDLAND HIGHWAY (A0087)

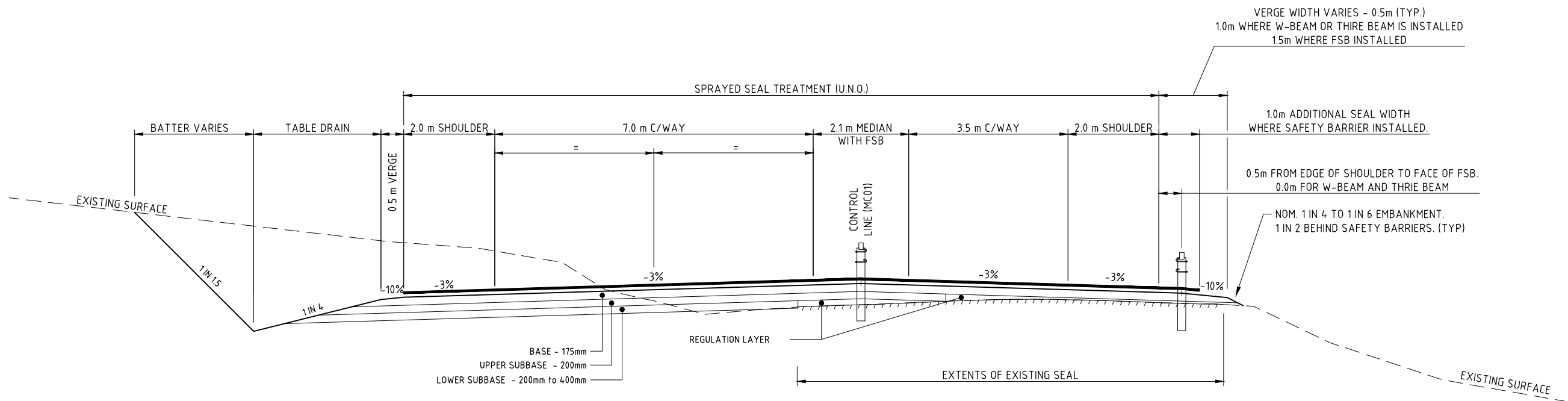
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PRELIMINARY DESIGN



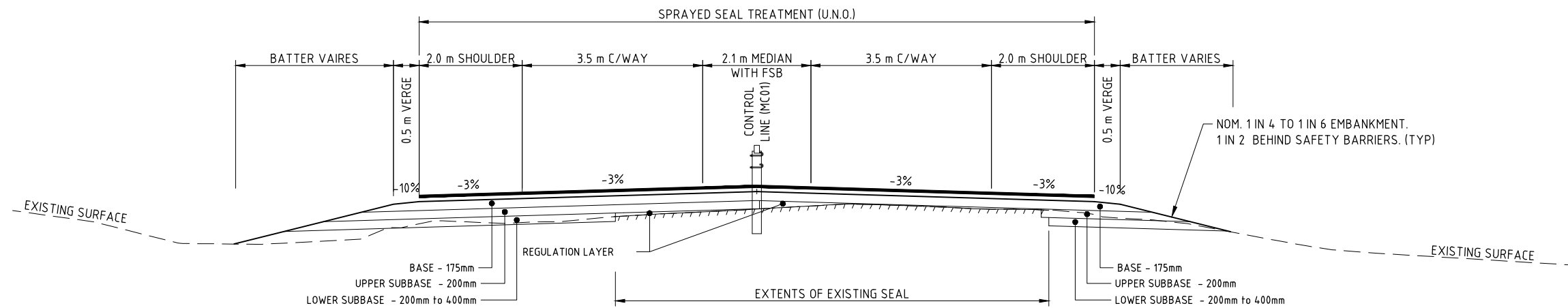
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 Jacobs Group (Australia) Pty Ltd
 Ground Floor, 100 Melville Street
 HOBART, TAS 7000
 AUSTRALIA
 Tel: +61 3 6221 3711
 Fax: +61 3 6224 2325
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SETOUT REVIEW NAME: #### SIGNED: #### DATE: ####		DESIGNED NAME: #### SIGNED: #### DATE: ####		THESE DRAWINGS HAVE BEEN CHECKED, TAKEN TO SITE AND VERIFIED THAT THEY ARE APPROPRIATE FOR SITE CONDITIONS AND CONSTRAINTS. THE DRAWINGS ARE RECOMMENDED FOR ACCEPTANCE.		I CERTIFY THESE DRAWINGS HAVE BEEN PREPARED IN ACCORDANCE WITH THE BRIEF AND AS DETAILED IN THE FINAL DESIGN REPORT.		Department of State Growth THESE DRAWINGS HAVE BEEN PREPARED IN ACCORDANCE WITH THE DESIGN BRIEF AND PROJECT SCOPE. THE DRAWINGS ARE RECOMMENDED FOR ACCEPTANCE.		CONTRACT No. IS163600-0009-CR-DRG-1001.dwg	DRAWING IS163600-0009-CR-DRG-1001.dwg	PRINTED DATE 08-Feb-17, 4:01 PM	No. of SHEETS -	
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										ROAD LINK No. START: LINK 43 A0087 CH 9.94 FINISH: LINK 49 A0087 CH 7.82		REVISION P1		



2+1 LANE TYPICAL CROSS SECTION

SCALE N.T.S.



1+1 LANE TYPICAL CROSS SECTION

SCALE N.T.S.

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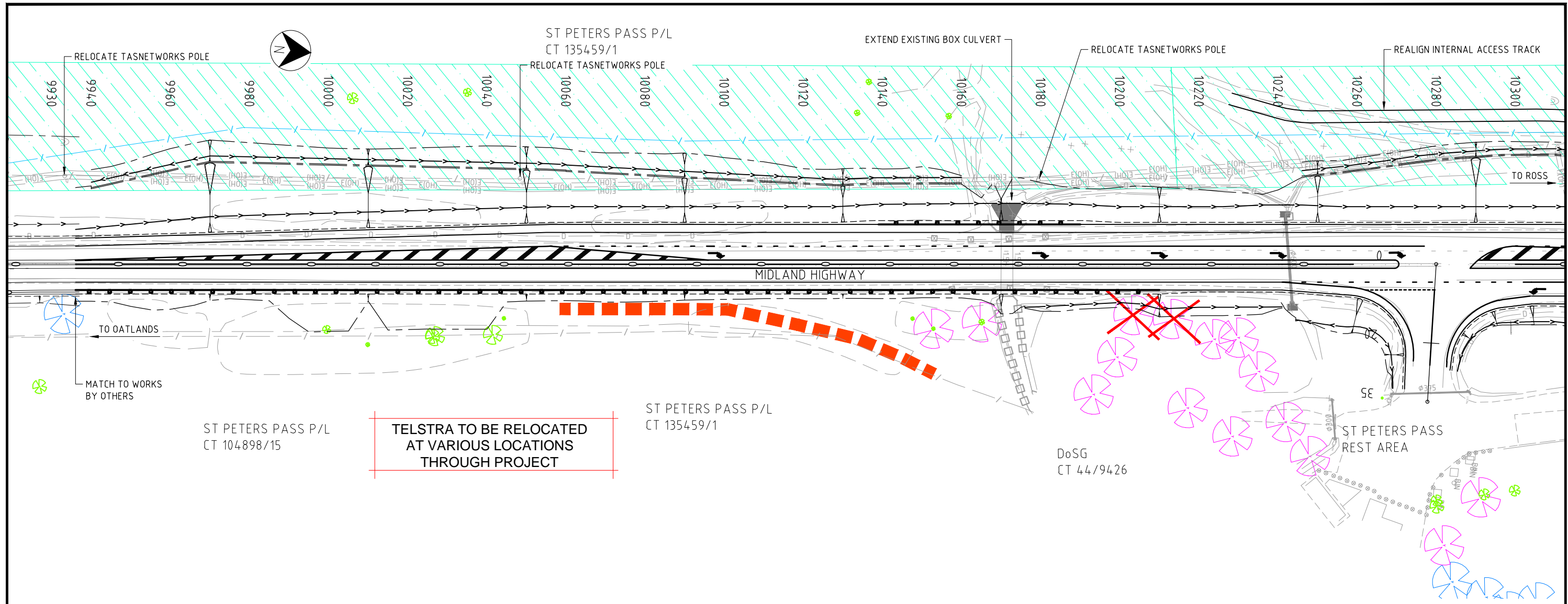
Tasmanian Government

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REVIEWED R. SYKES

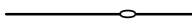


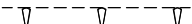







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MIDLAND HIGHWAY (A0087)
ST PETERS PASS TO SOUTH OF TUNBRIDGE
DEVELOPMENT APPLICATION
TYPICAL CROSS SECTIONS

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REGISTRATION NUMBER A0087.000X			REVISION P1



LEGEND:

-  PROPOSED FLEXIBLE SAFETY BARRIER
-  PROPOSED THRIE BEAM / W-BEAM SAFETY BARRIER
-  PROPOSED PROPERTY FENCE LINES
-  PROPOSED EARTHWORKS
-  EXISTING TREES
-  EXISTING TREES - TOPIARY
-  EXISTING TREES - HISTORIC
-  EXISTING TREES - PIONEER AVENUE
-  TREES TO BE REMOVED
-  EXISTING HEDGEROW - HAWTHORN
-  EXISTING VEGETATION AREA - ENVIRONMENTAL (EUCALYPTUS, LOWLAND POA AND BURSARIA-ACACIA)

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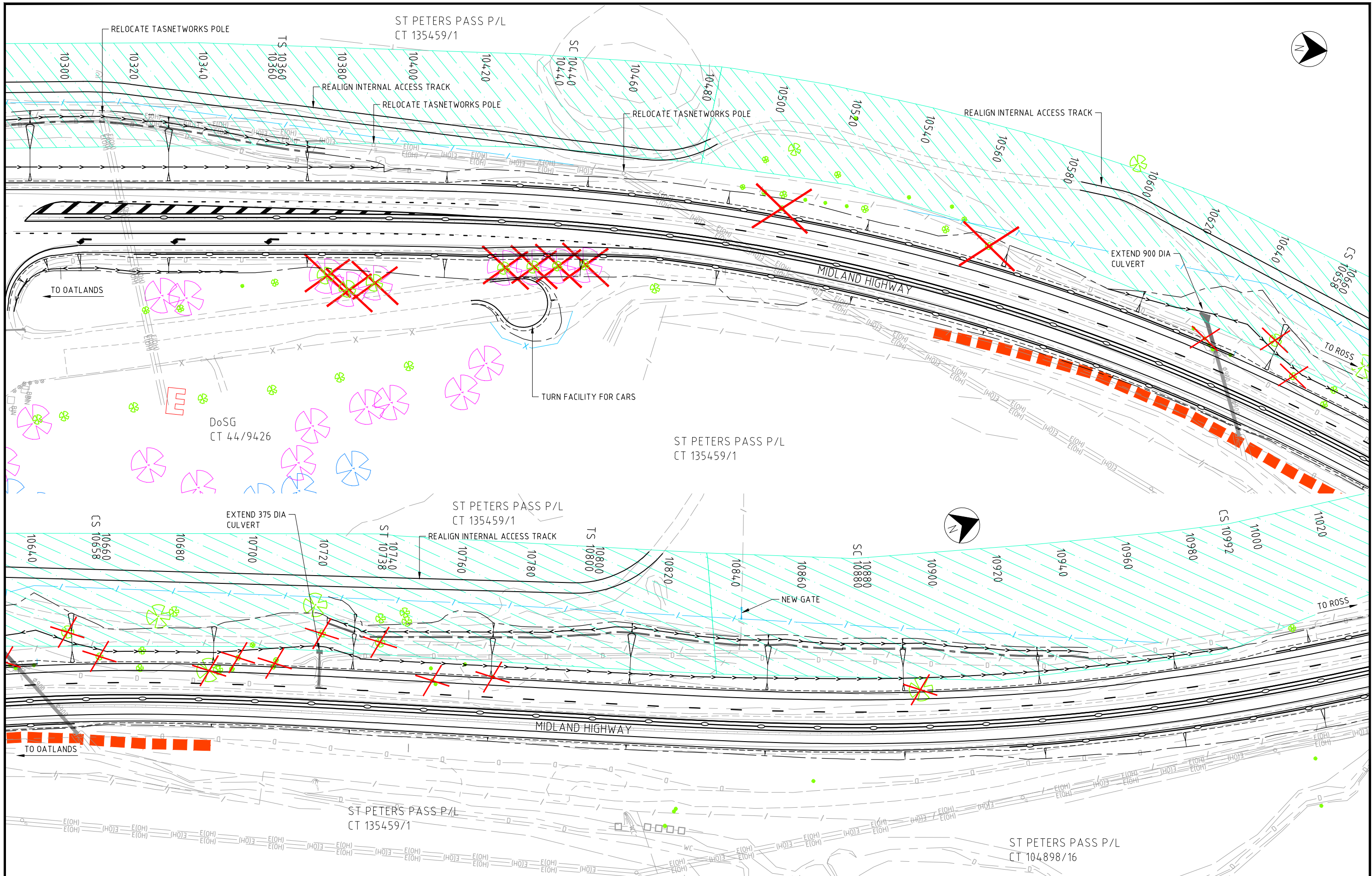
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MIDLAND HIGHWAY (A0087)
ST PETERS PASS TO SOUTH OF TUNBRIDGE
DEVELOPMENT APPLICATION
LAYOUT PLAN

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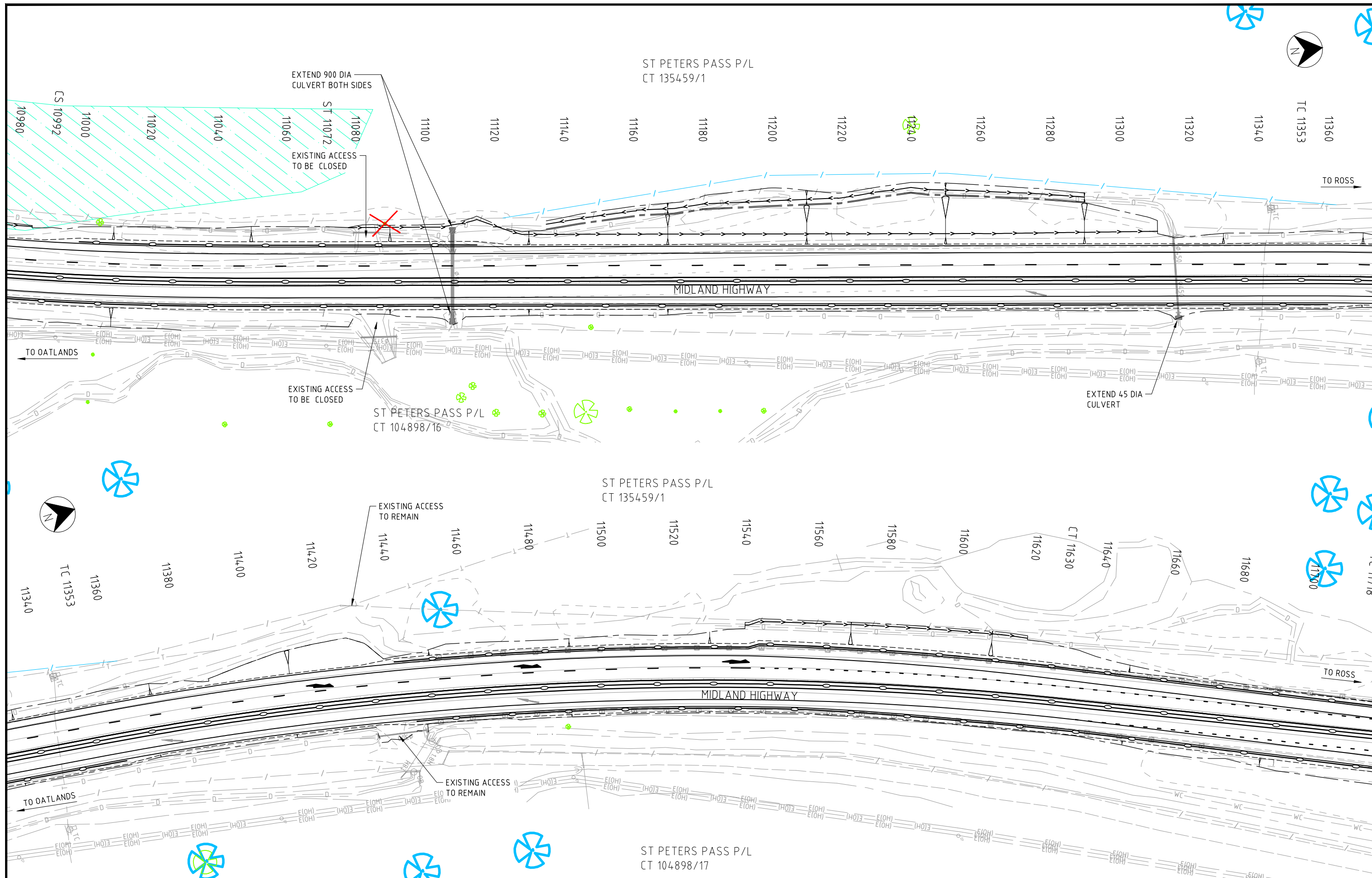
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 MIDLAND HIGHWAY (A0087)
 ST PETERS PASS TO SOUTH OF TUNBRIDGE
 DEVELOPMENT APPLICATION
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Co-ordinate System: GDA/MGA 55 Height Datum: AHD 83

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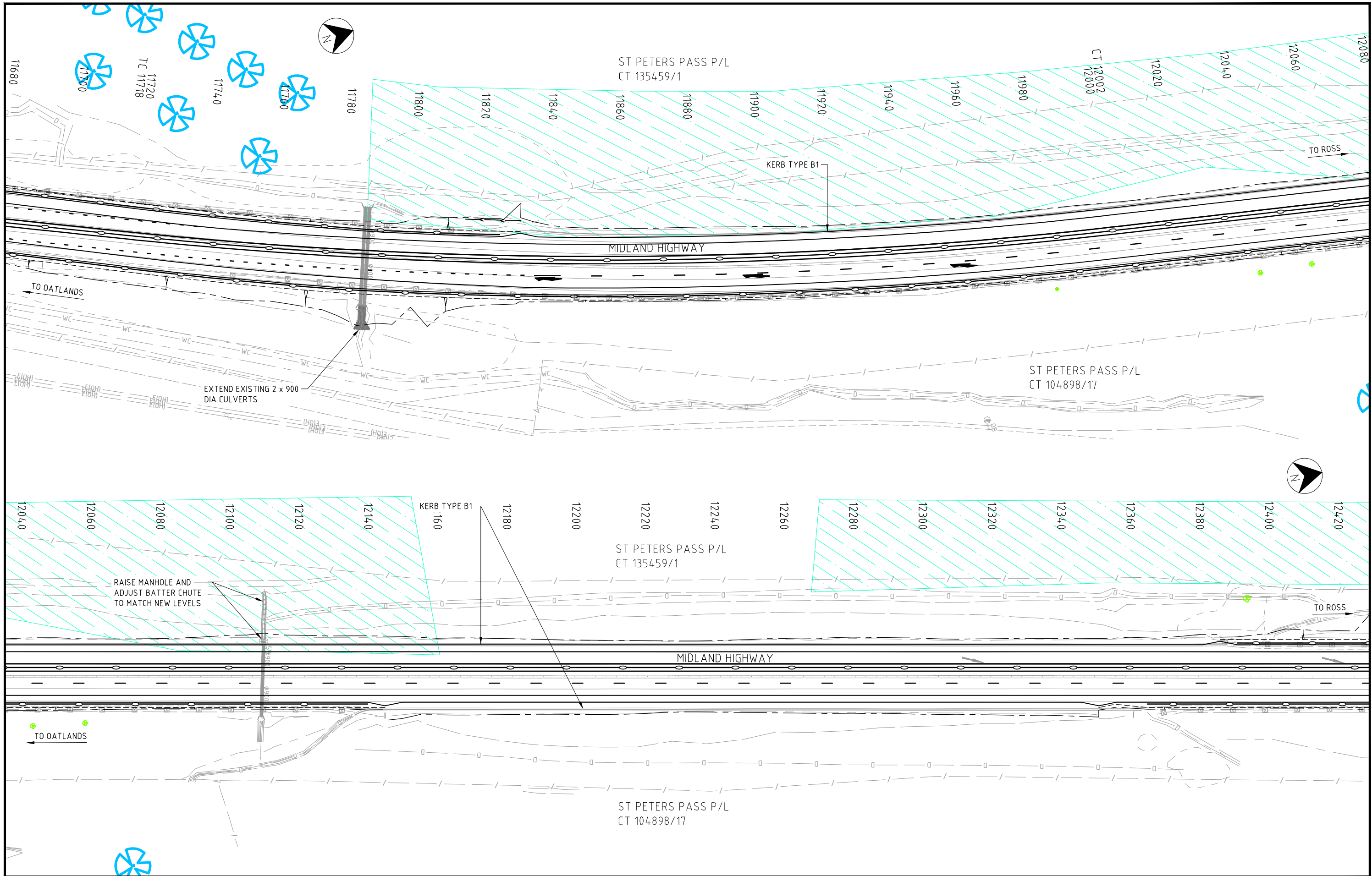
MIDLAND HIGHWAY (A0087)

ST PETERS PASS TO SOUTH OF TUNBRIDGE

DEVELOPMENT APPLICATION

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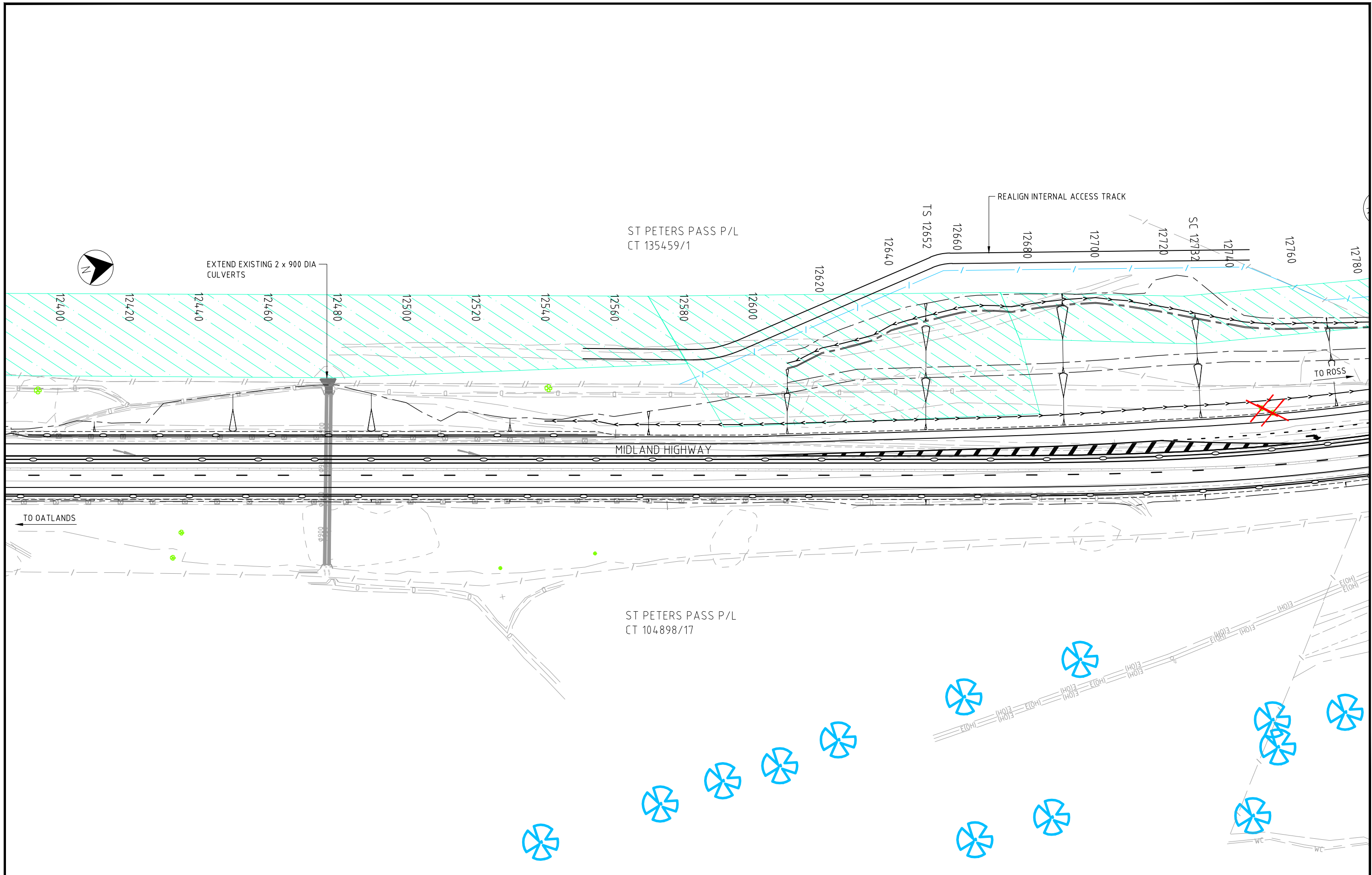
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ST PETERS PASS TO SOUTH OF TUNBRIDGE
DEVELOPMENT APPLICATION
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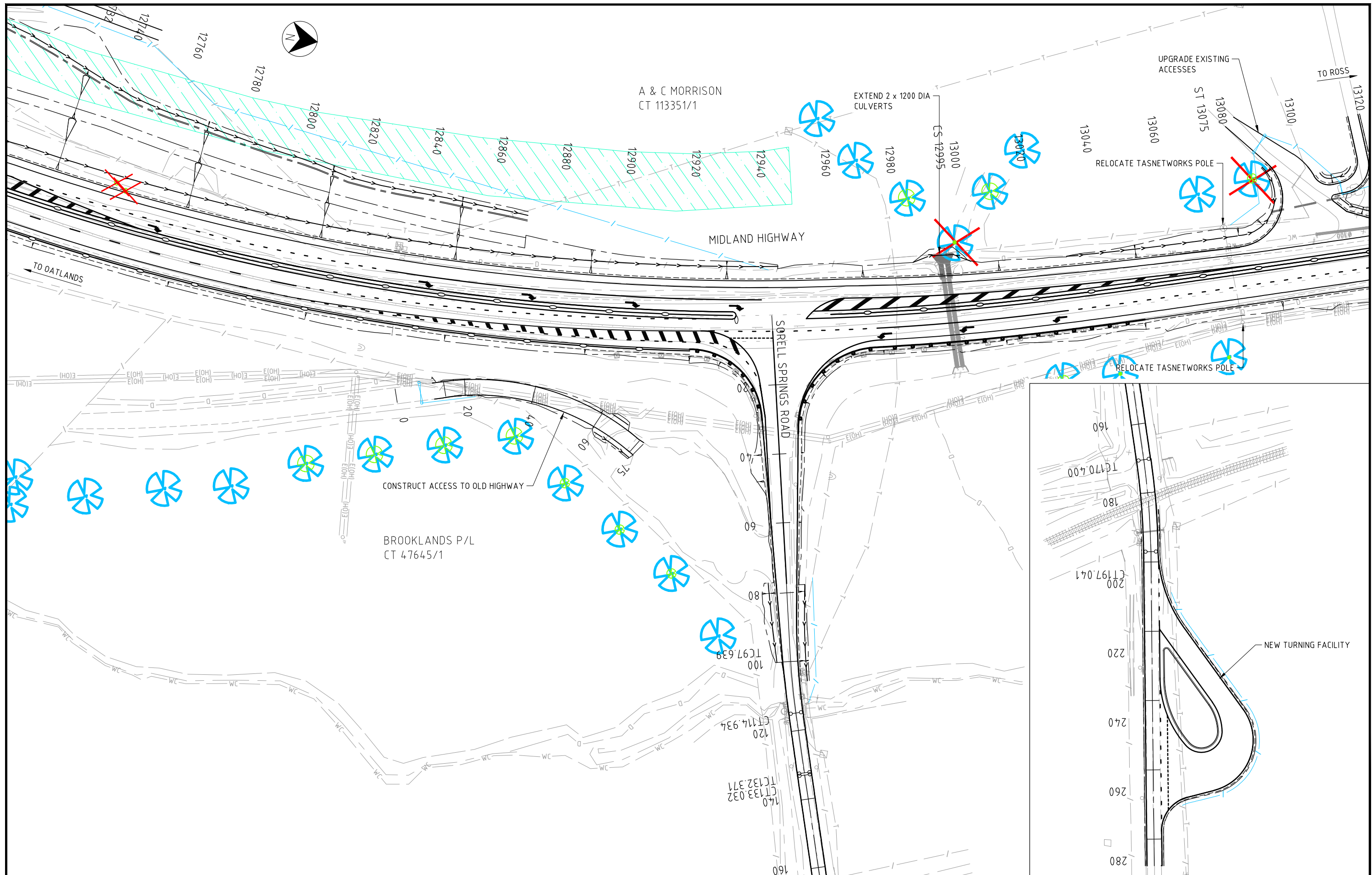
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 ST PETERS PASS TO SOUTH OF TUNBRIDGE
 DEVELOPMENT APPLICATION
 LAYOUT PLAN

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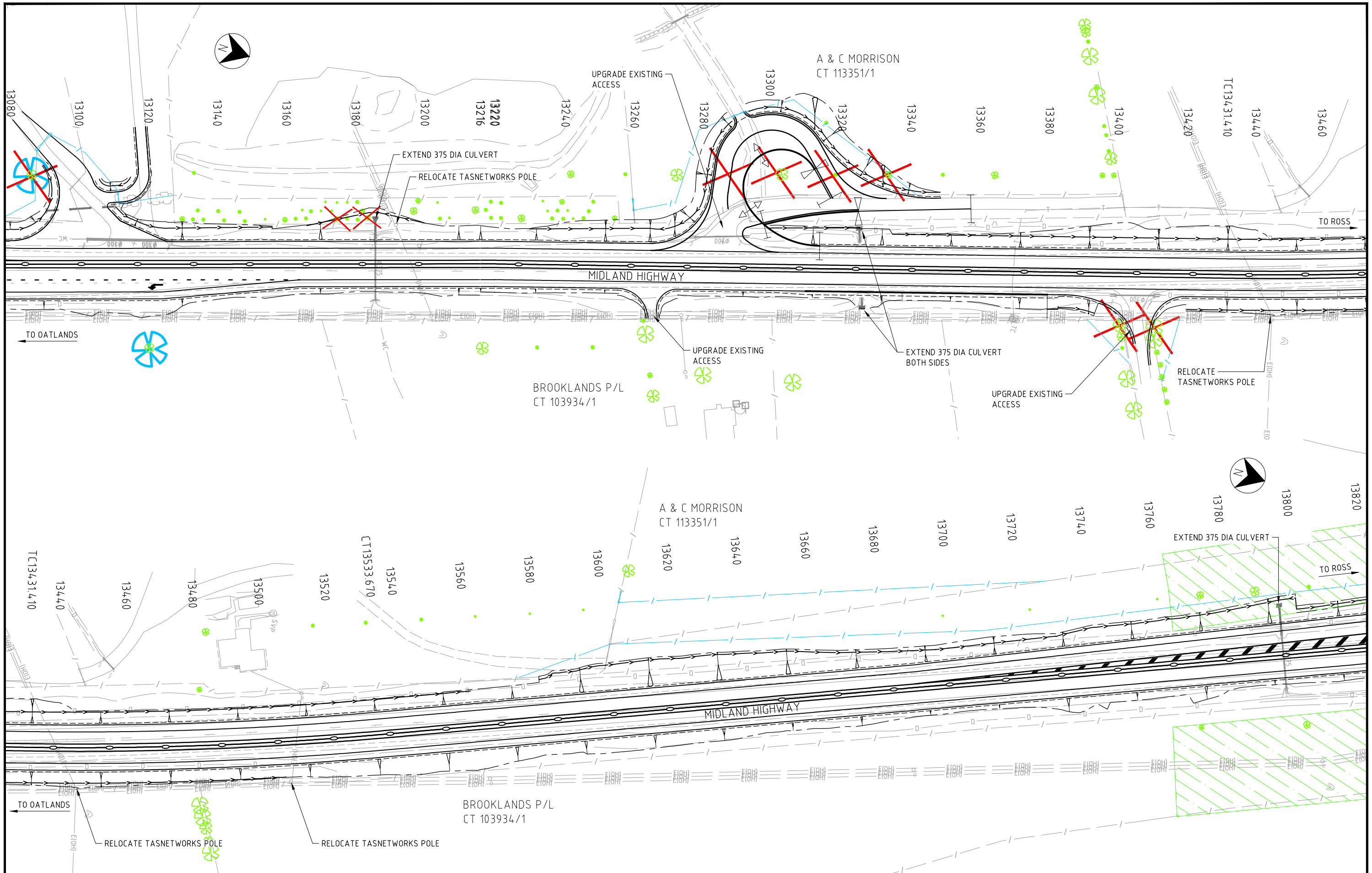
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 DEVELOPMENT APPLICATION
 LAYOUT PLAN

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Co-ordinate System: GDA/MGA 55 Height Datum: AHD 83

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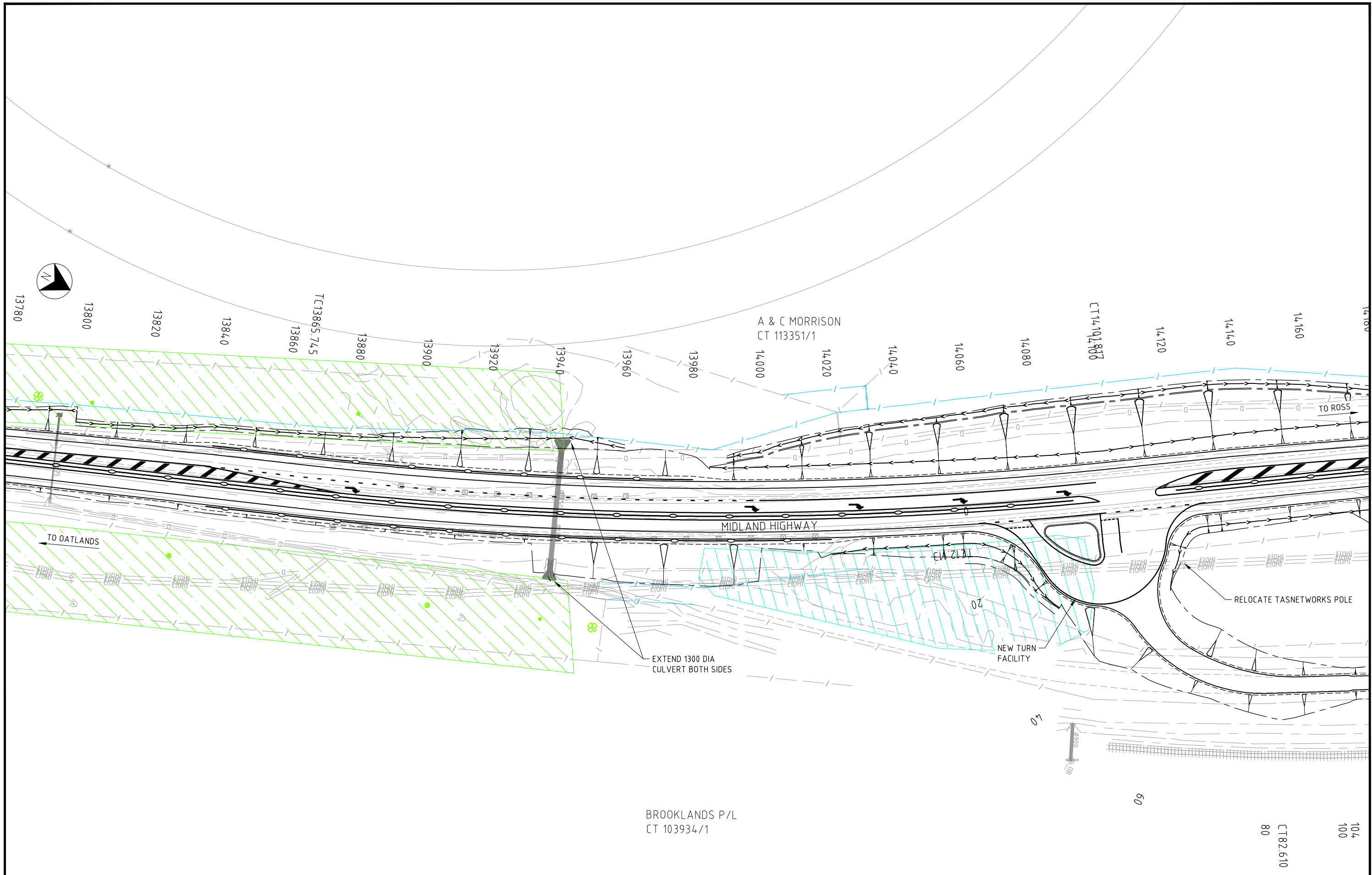
MIDLAND HIGHWAY (A0087)

ST PETERS PASS TO SOUTH OF TUNBRIDGE

DEVELOPMENT APPLICATION

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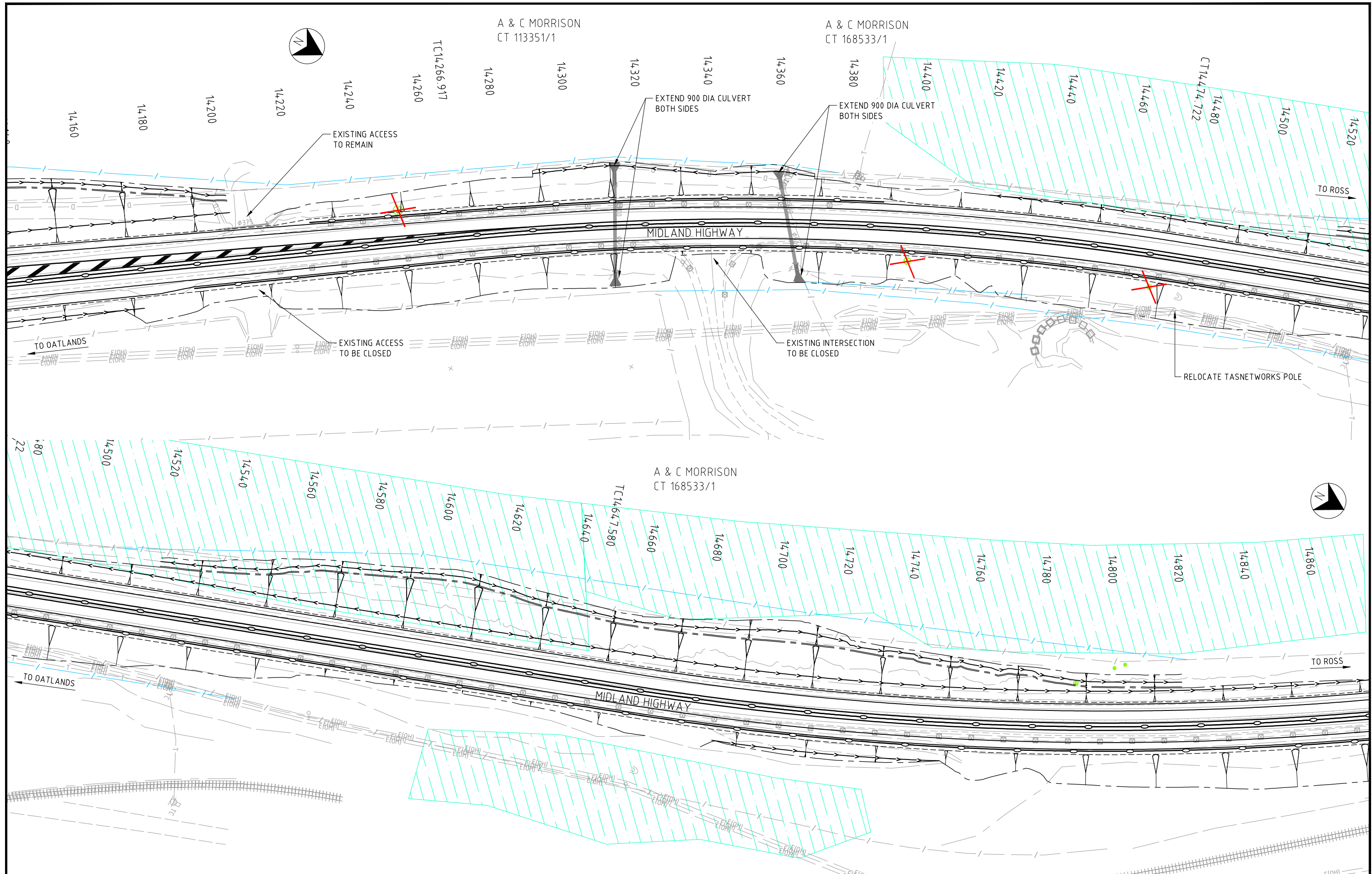
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 ST PETERS PASS TO SOUTH OF TUNBRIDGE
 DEVELOPMENT APPLICATION
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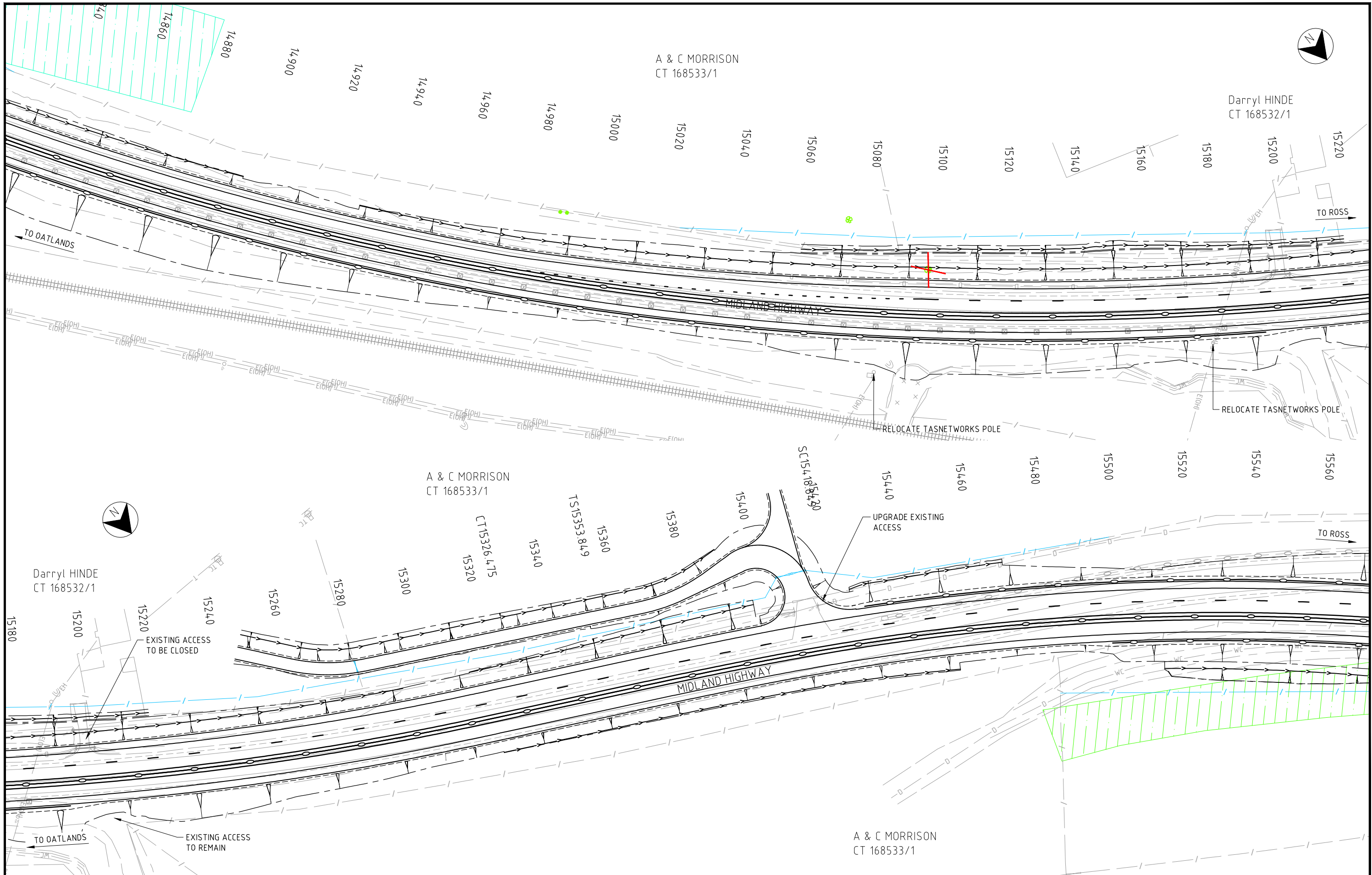
MIDLAND HIGHWAY (A0087)

ST PETERS PASS TO SOUTH OF TUNBRIDGE

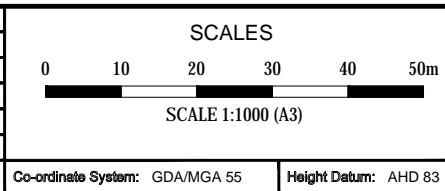
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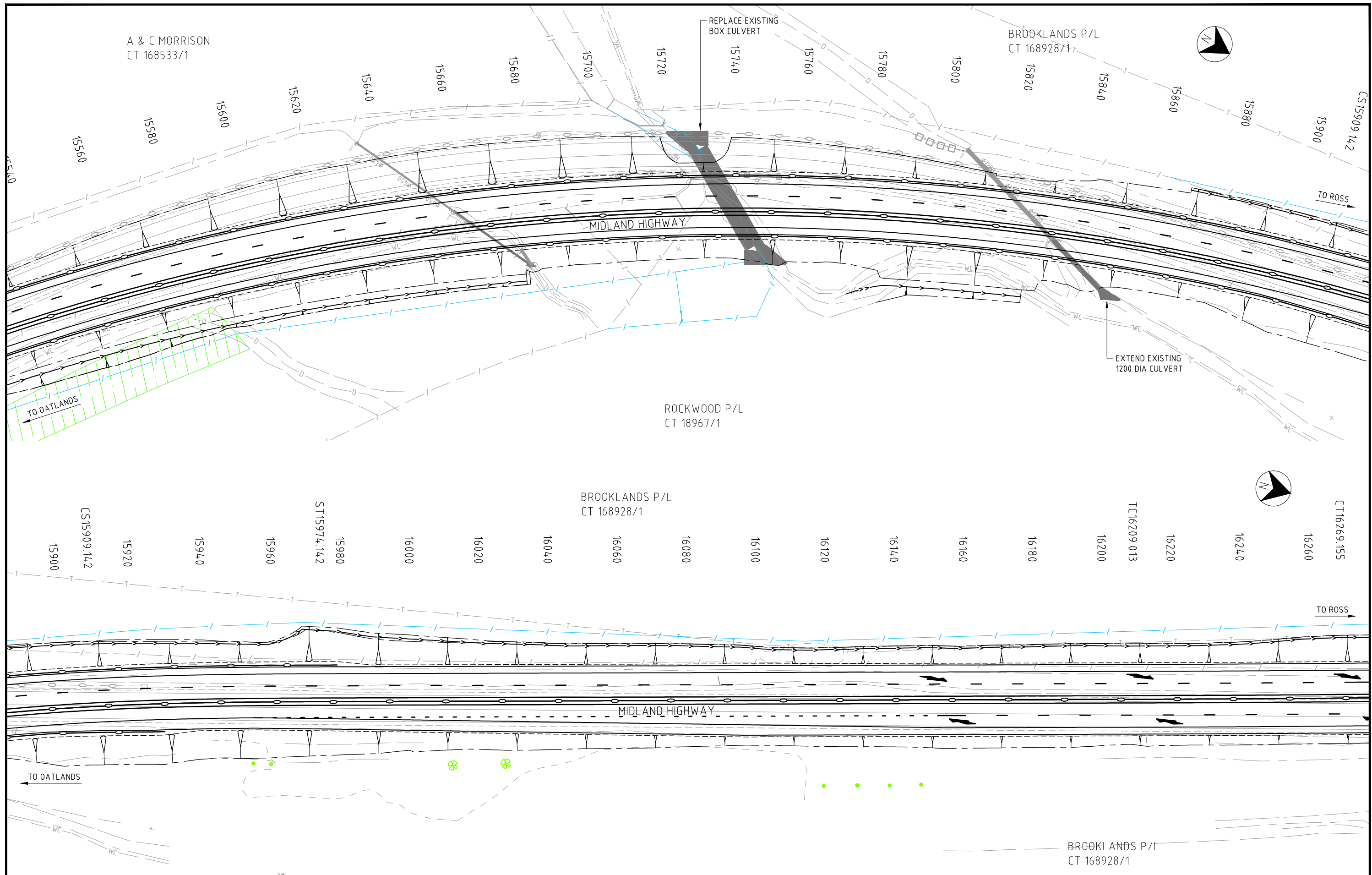


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ST PETERS PASS TO SOUTH OF TUNBRIDGE
DEVELOPMENT APPLICATION
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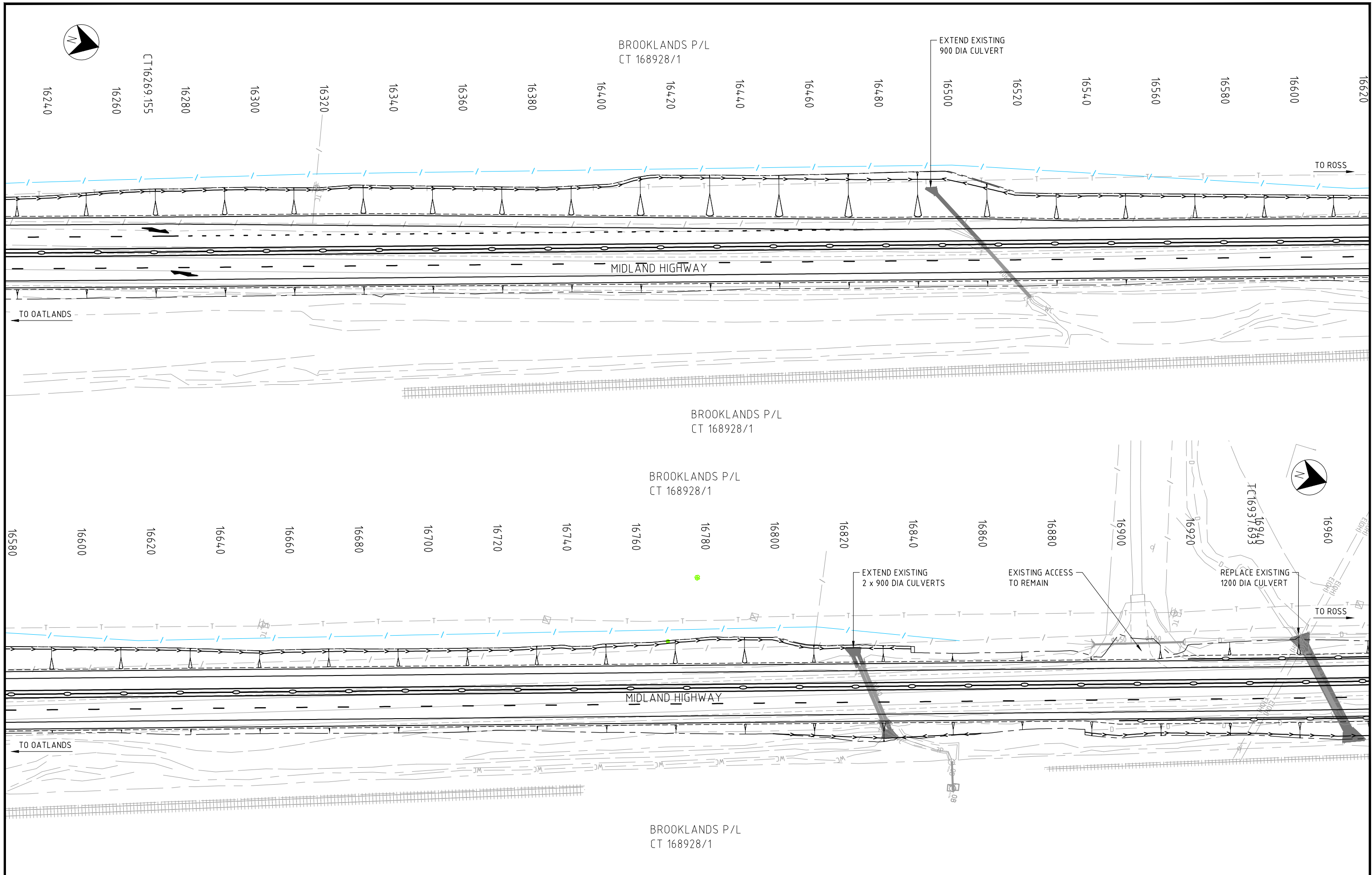
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 MIDLAND HIGHWAY (A0087)
 ST PETERS PASS TO SOUTH OF TUNBRIDGE
 DEVELOPMENT APPLICATION
 LAYOUT PLAN

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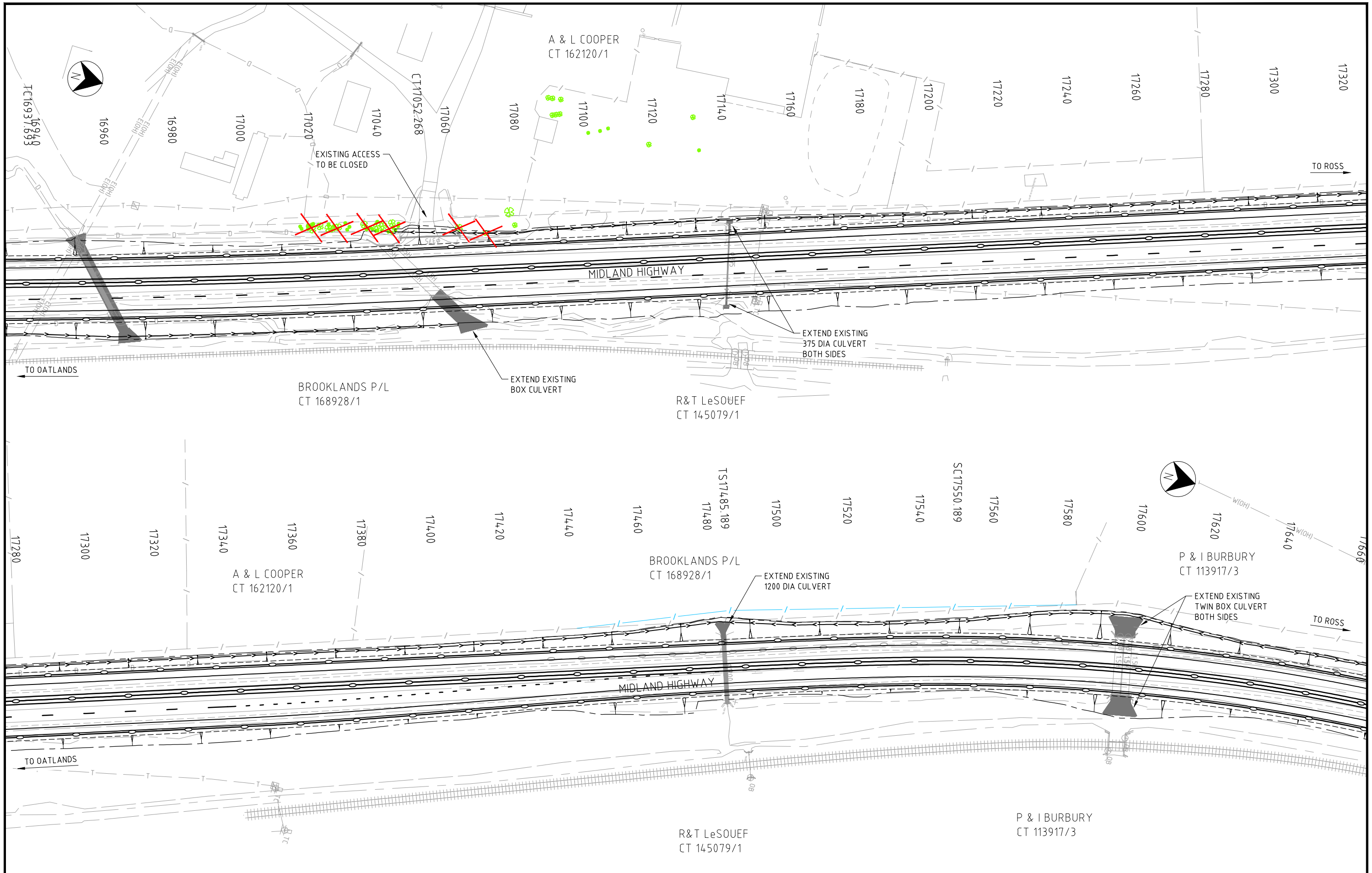
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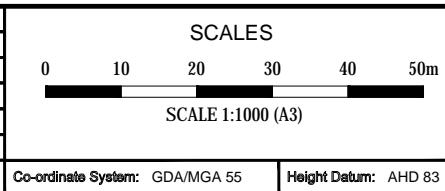
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 MIDLAND HIGHWAY (A0087)
 ST PETERS PASS TO SOUTH OF TUNBRIDGE
 DEVELOPMENT APPLICATION
 LAYOUT PLAN

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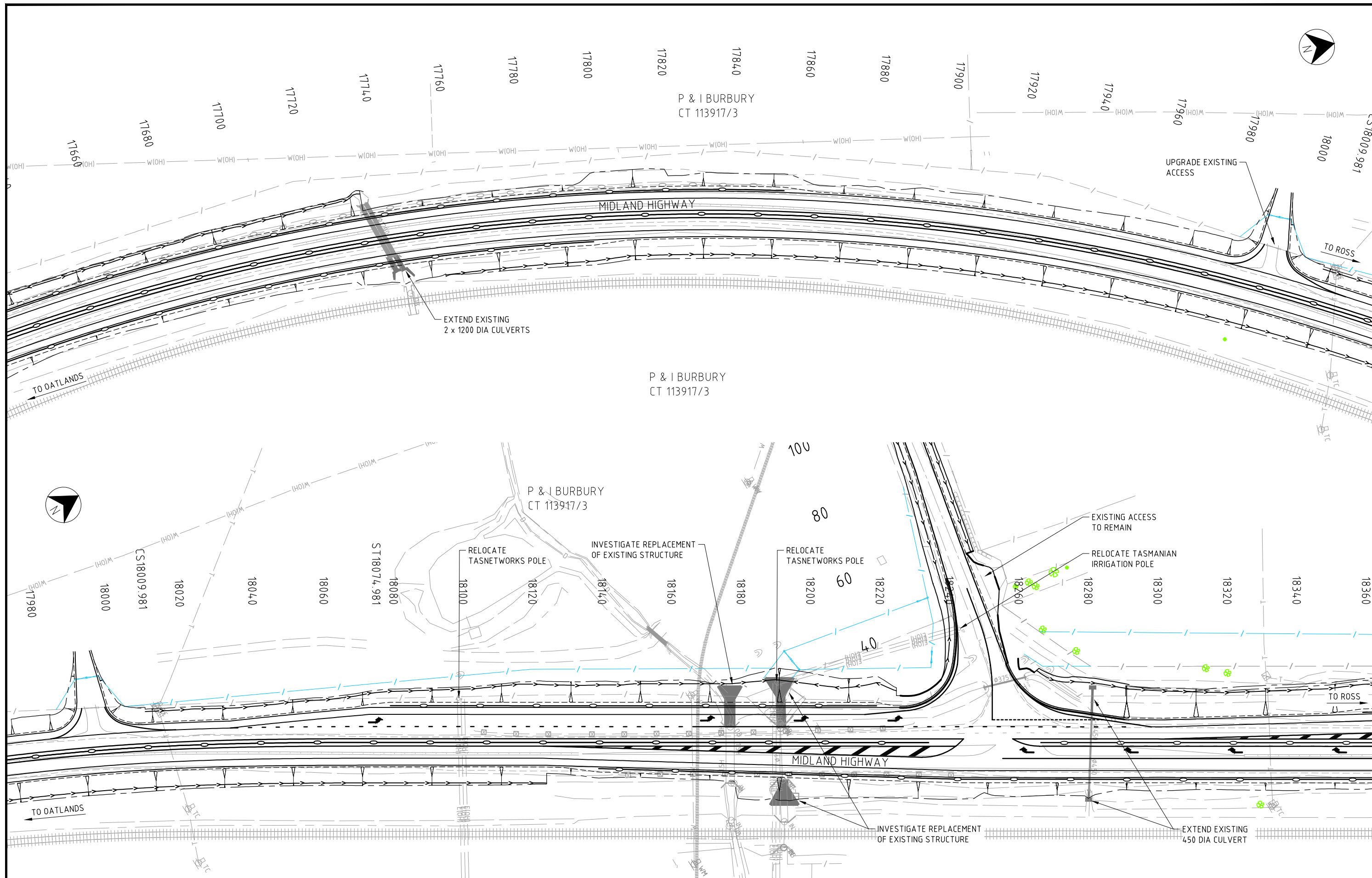


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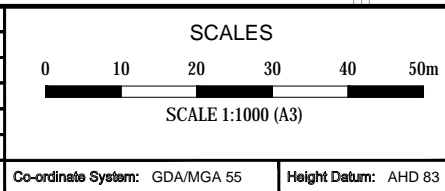
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Department of State Growth
MIDLAND HIGHWAY (A0087)
ST PETERS PASS TO SOUTH OF TUNBRIDGE
DEVELOPMENT APPLICATION
LAYOUT PLAN

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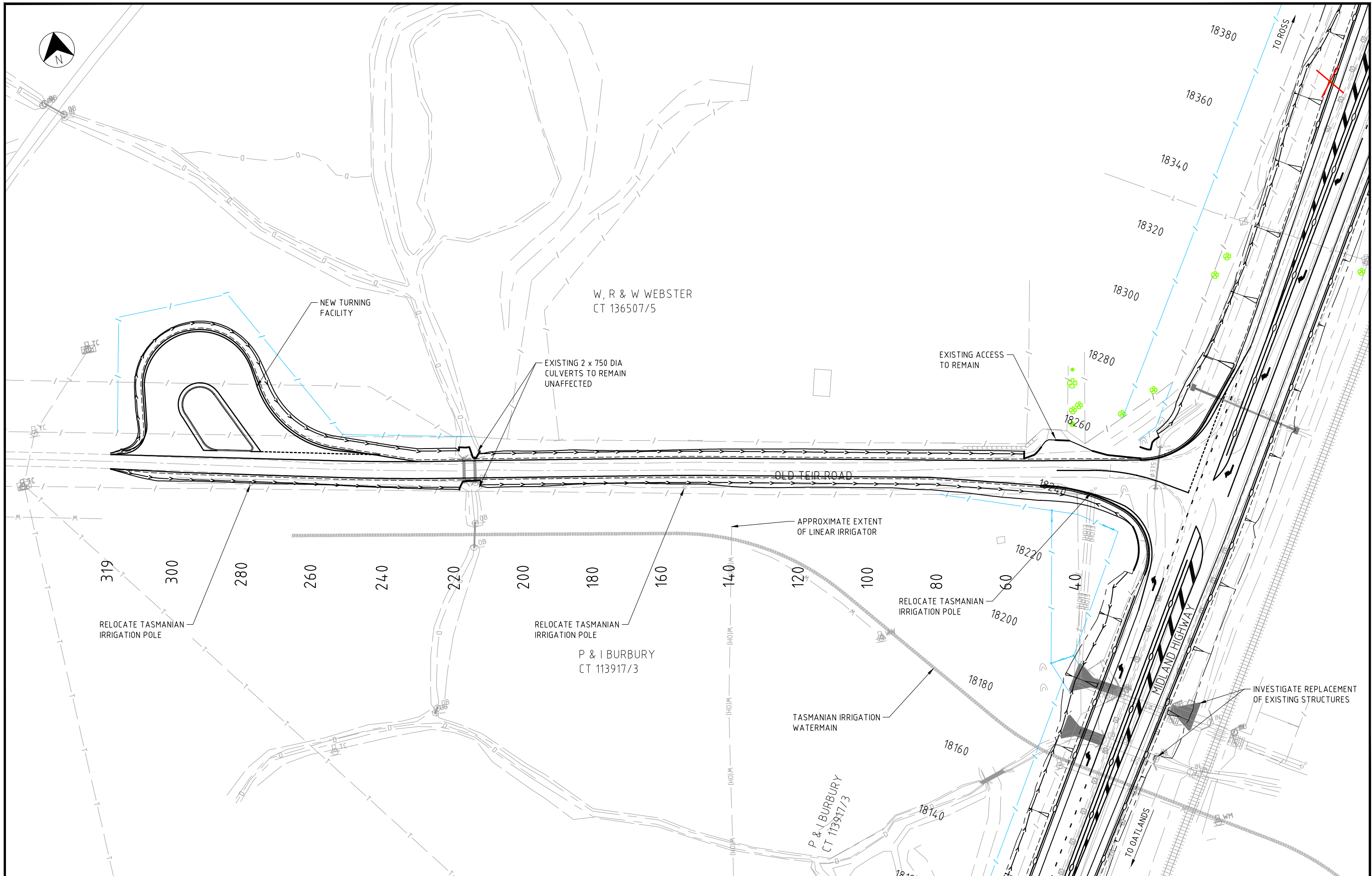


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Department of State Growth
MIDLAND HIGHWAY (A0087)
ST PETERS PASS TO SOUTH OF TUNBRIDGE
DEVELOPMENT APPLICATION
LAYOUT PLAN

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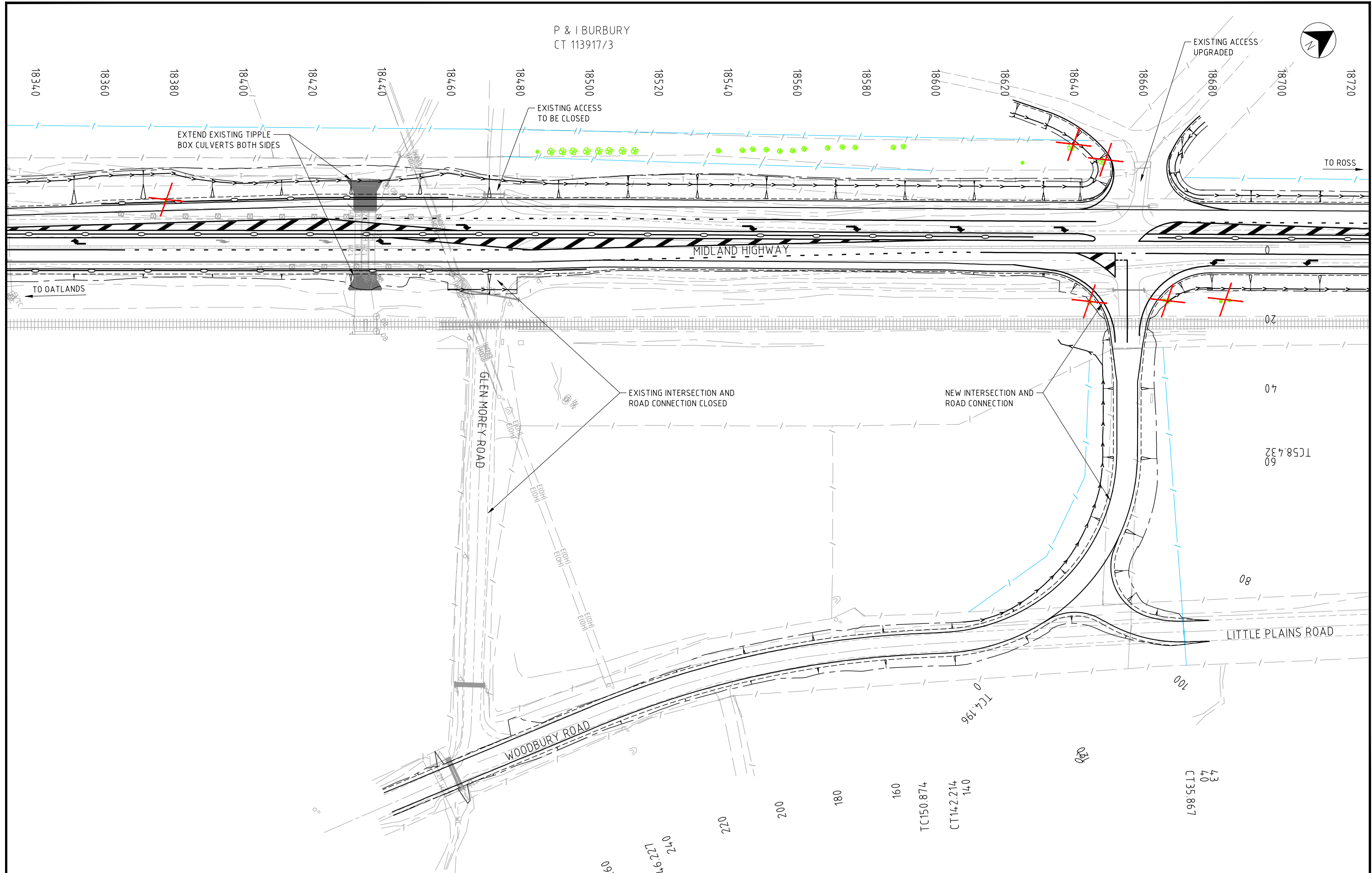
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Department of State Growth
 MIDLAND HIGHWAY (A0087)
 ST PETERS PASS TO SOUTH OF TUNBRIDGE
 DEVELOPMENT APPLICATION
 LAYOUT PLAN

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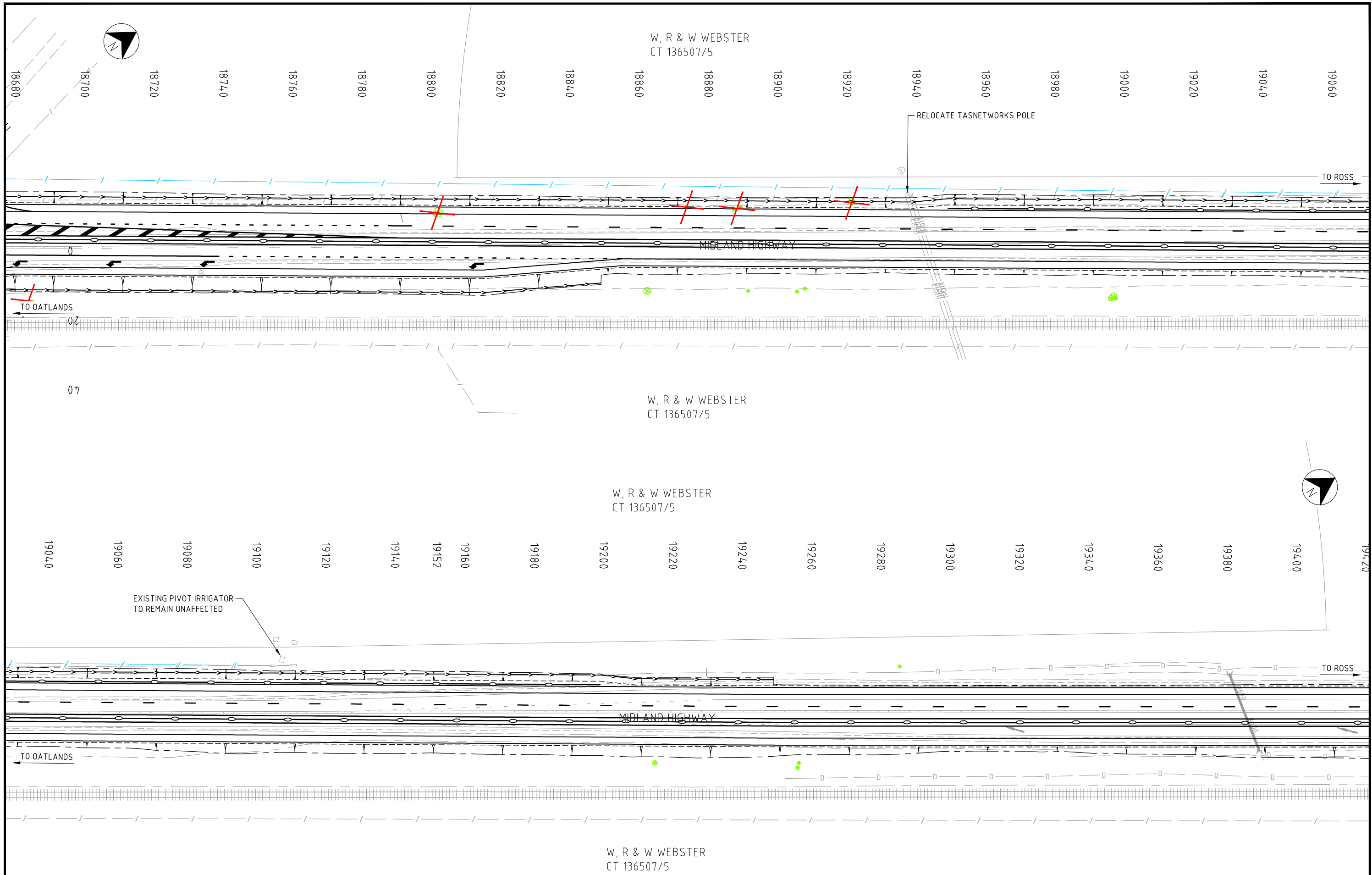
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 Co-ordinate System: GDA/MGA 55 Height Datum: AHD 83

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 REVIEWED R. SYKES

Department of State Growth
 MIDLAND HIGHWAY (A0087)
 ST PETERS PASS TO SOUTH OF TUNBRIDGE
 DEVELOPMENT APPLICATION
 LAYOUT PLAN

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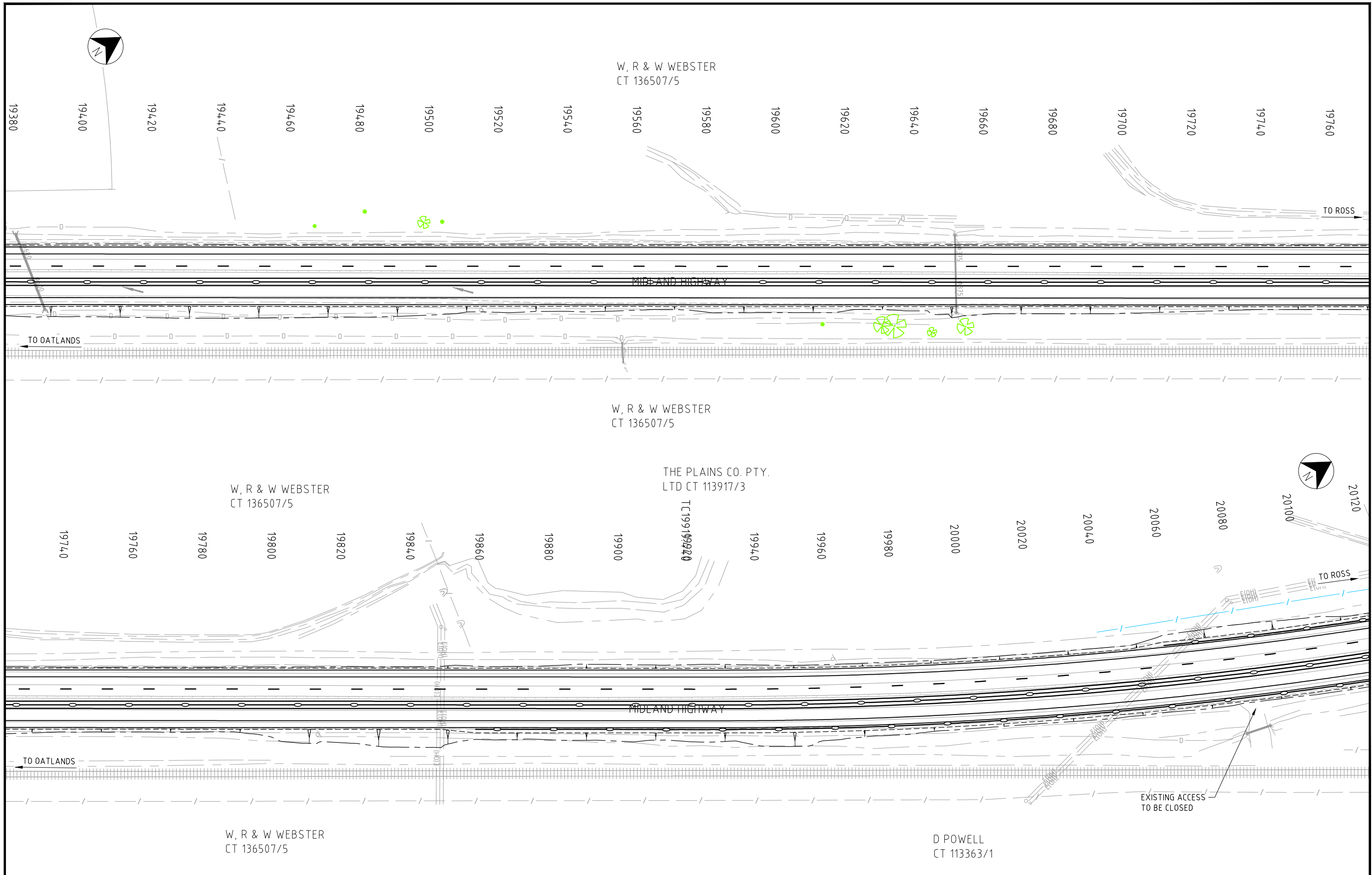
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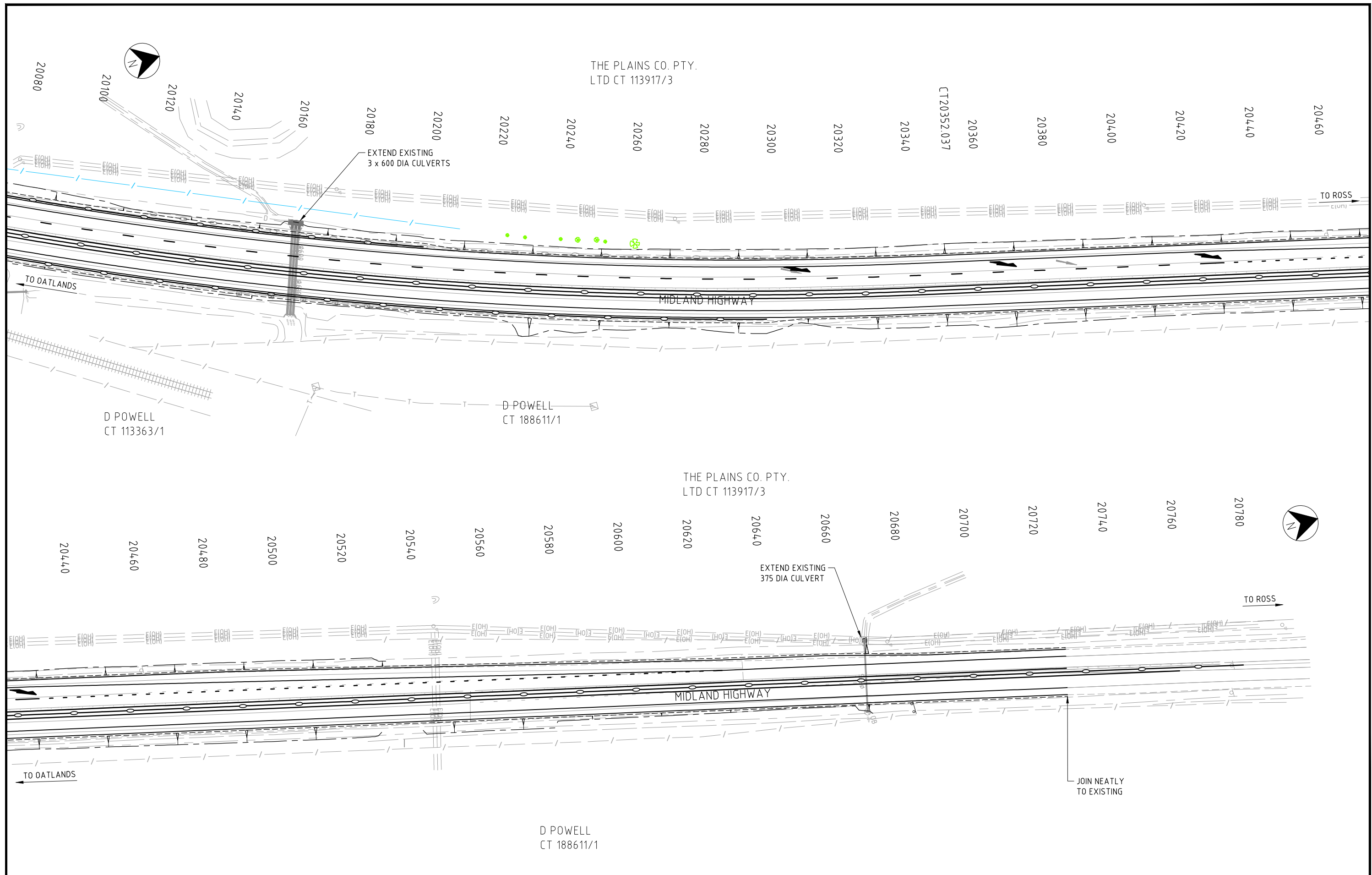
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SCALES
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St Peters Pass to South of Tunbridge

Department of State Growth

Traffic Impact Assessment

Rev 1

February 2017



St Peters Pass to South of Tunbridge

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Contents

1. Introduction4

1.1 Background.....4

1.2 Traffic Impact Assessment4

2. Existing Conditions.....5

2.1 Transport Network.....5

2.2 Road Safety Performance5

3. Proposed Upgrade7

3.1 Overview.....7

3.2 Geometry.....7

3.3 Clear Zones8

3.4 Overtaking Lanes8

3.5 Junctions8

3.5.1 St Peters Pass Rest Area.....8

3.5.2 Sorell Springs Road8

3.5.3 Antill Ponds.....8

3.5.4 Glen Morey Road / Old Tier Road / Melrose Road8

3.6 Glen Morey Road Level Crossing9

3.7 Private Accesses9

4. Traffic Impacts12

4.1 Traffic Generation12

4.2 Transport Efficiency12

4.2.1 Overtaking Opportunities.....12

4.2.2 Accesses and Turn Facilities.....13

4.3 Road Safety Impacts.....13

4.4 Junction Impacts13

4.5 Rail Crossing13

4.6 Sight Distance.....14

4.6.1 Stopping Sight Distance14

4.6.2 Intersection Sight Distance.....15

4.6.3 Access Sight Distance.....15

4.7 Pedestrian / Cyclists.....15

5. Planning Scheme Requirements16

5.1 Schedule E5.0 Road and Railway Assets Code16

E5.5 Use Standards.....16

5.2 Parking and Access Code19

6. Conclusions21

Important note about your report

The sole purpose of this report and the associated services performed by Jacobs is to conduct a traffic impact assessment for the upgrades to the Midland Highway between St Peters Pass and south of Tunbridge, in accordance with the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

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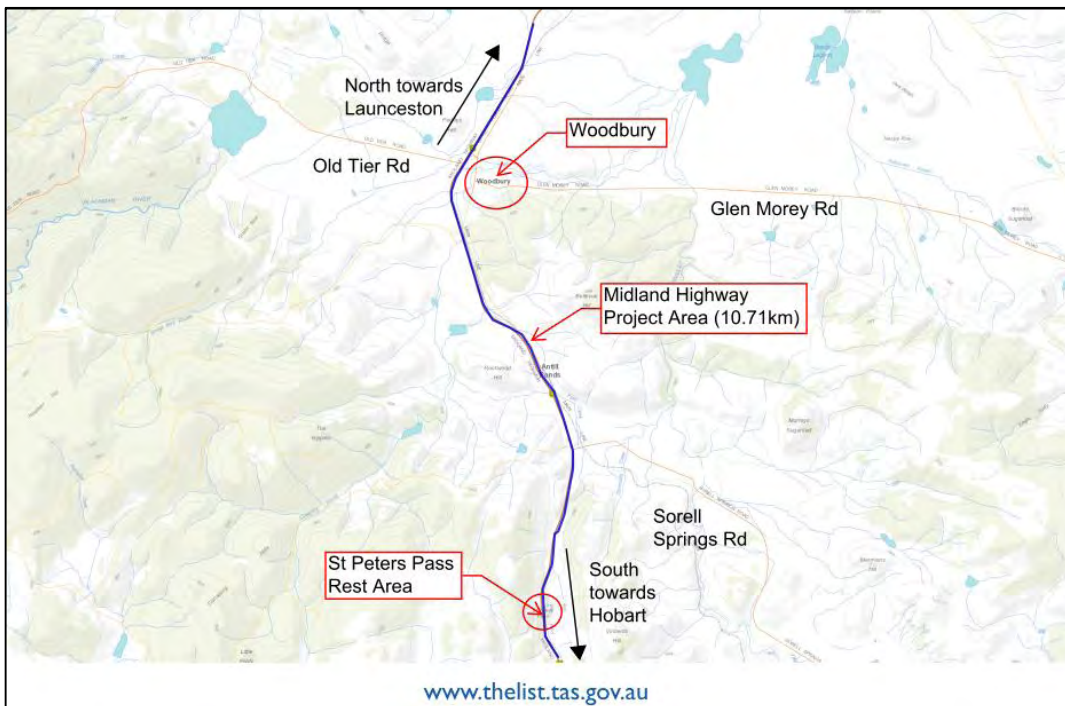
1. Introduction

1.1 Background

The St Peters Pass to South of Tunbridge upgrade project is part of the Greater Midland Highway Upgrades Program. The program has the objective of making safety improvements to the Midland Highway in order to achieve a minimum 3-star AusRAP rating along the entire length of the highway. This will be achieved through the provision of alternating lengths of “2+1” lane arrangements, as well as targeted vertical and horizontal alignment improvements and junction upgrades.

The St Peters Pass to South of Tunbridge project is located on the Midland Highway (A0087) approximately 95km north of Hobart. The project extends from 3.6km south of the Sorell Springs Road junction (Link 43/10.00) to south of Tunbridge (Link 49/7.77), with a total length of 10.71km. The project location is shown in Figure 1.1

Figure 1.1 : Project Location



1.2 Traffic Impact Assessment

This Traffic Impact Assessment (TIA) has been prepared in accordance with the Department of State Growth (DSG) publication, *A Framework for Undertaking Traffic Impact Assessments*, September 2007. This TIA has also been prepared with reference to the Austroads publication, *Guide to Traffic Management, Part 12: Traffic Impacts of Development*, 2009.

2. Existing Conditions

2.1 Transport Network

The Tasmania State Road Hierarchy identifies the Midland Highway as a Category 1 Road. Category 1 roads are the primary freight and passenger roads connecting Tasmania. They carry large numbers of heavy freight and passenger vehicles and are the key links supporting future economic development in Tasmania.

The Midland Highway is a gazetted high productivity vehicle (HPV) route. The Midland Highway between St Peters Pass and Tunbridge carries in the order of 5,000 vehicles per day (vpd). Recent traffic volume data is provided in Table 2.1. The highway is currently signposted at 110 km/h.

Table 2.1 : Traffic volume data

Location	AADT	% Commercial	Year
1.19km North of York Plains Road (Link 43 Ch 8.30)	4,485	17.5	2011

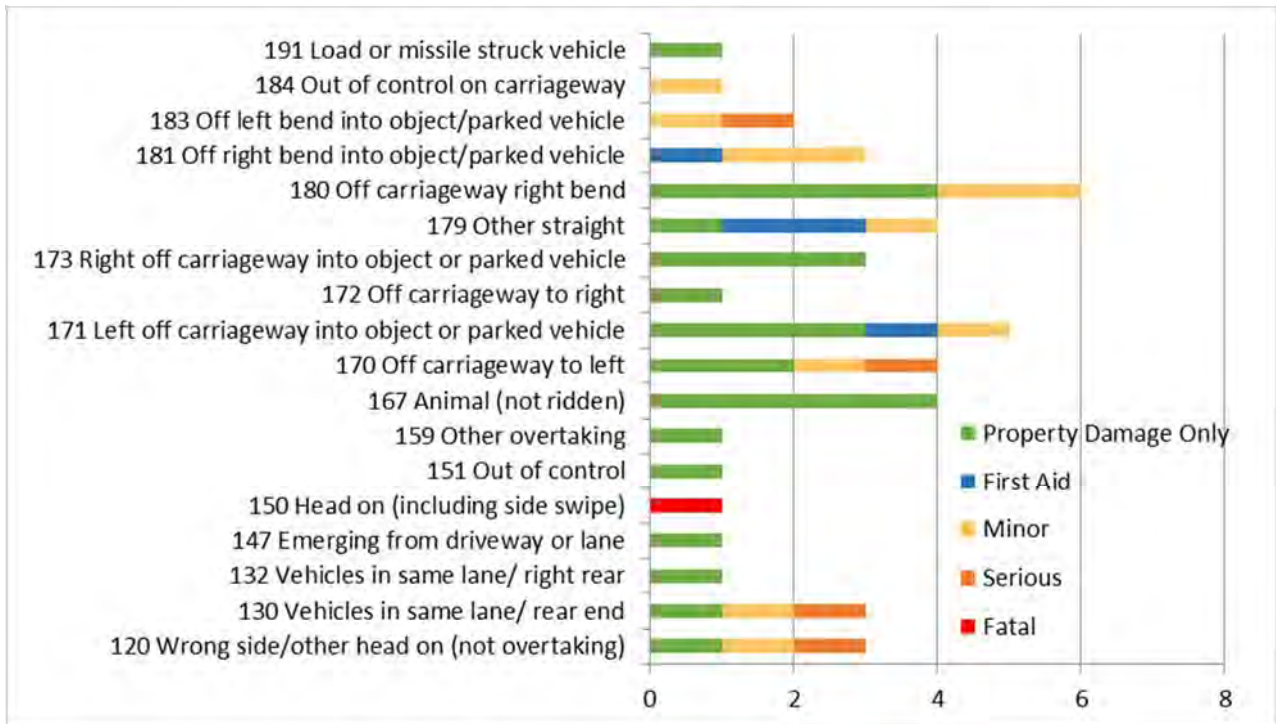
2.2 Road Safety Performance

Crash data was obtained for the 10 year period between 2006 and 2015. The crash data is summarised as follows:

- A total of 45 crashes were recorded within the project site during this period
- The most common crash type was 'off carriageway' with 29 crashes. Of these crashes, 17 occurred on straight sections and 12 occurred on curves.
- 11 crashes involved 'asleep/ fatigue' as a crash factor. These were all 'off carriageway' crashes. Nine crashes involved 'excessive speed' as a crash factor. These crashes were 'off carriageway' crashes and 'head on' collisions.
- More than half (56%) of crashes were property damage only. One crash involved a fatality, four crashes involved serious injury, 11 involved minor injury and four required first aid.
- The fatality involved a head on collision which occurred just north of Currajong Bridge.

A summary of the crash data is provided in Figure 2.1.

Figure 2.1 : Crash Profile



3. Proposed Upgrade

3.1 Overview

The St Peters Pass to South of Tunbridge upgrade project is part of the Greater Midland Highway Upgrades Program. The program has the objective of making safety improvements to the Midland Highway in order to achieve a minimum 3-star AusRAP rating along the entire length of the highway.

The objectives of the project are to:

- Upgrade the road to a minimum 3-Star AusRAP rating
- Improve safety and reduce head-on collisions by providing a flexible safety barrier in the central median
- Consolidate breaks in the central median barrier
- Provide additional safe overtaking opportunities through a “2+1” lane arrangement
- Maintain a 110km/h speed environment, consistent with the Tasmanian Guidelines for Category One Roads
- Upgrade junctions
- Improve horizontal and vertical alignment of the road, where necessary and cost effective

The proposed design includes three northbound and two southbound overtaking lanes. Public turn facilities include a G-turn on Sorell Springs Road, a P-turn for northbound traffic on the Midland Highway just south of the existing Antill Ponds junction, and a P-turn on Old Tier Road.

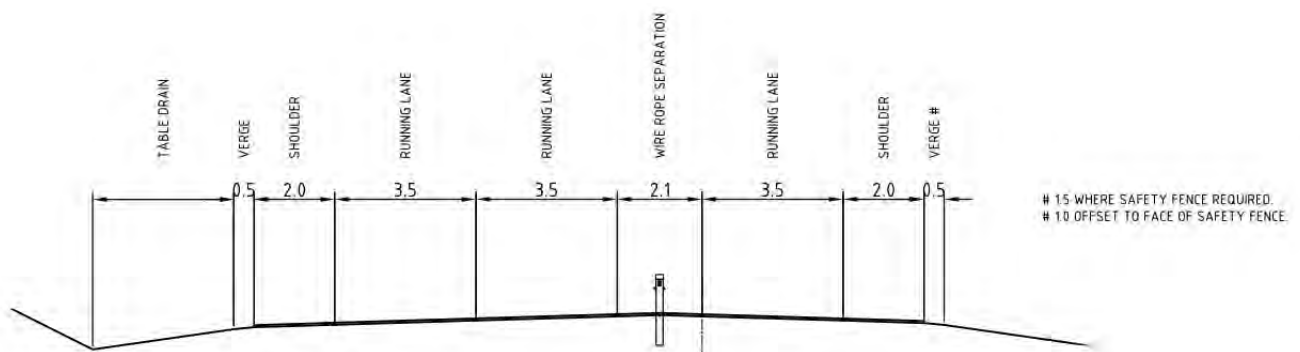
3.2 Geometry

A typical cross-section of the “2+1” lane arrangement is shown in Figure 3.1. The lane arrangement provides lane widths of 3.5 m, 2.0 m wide sealed shoulders, a 2.1 m median with a centrally located flexible safety barrier and 0.5 m verges.

The horizontal design speed adopted for the safety upgrades is 120 km/h, i.e. 10 km/h higher than the posted limit, except where value for money and safety benefits can be better achieved through the provision of a lower design speed. In two locations in this project the curve radius has been designed for 110 km/h. Both curves will be widened as part of the project which will improve safety by providing more manoeuvring room.

The vertical alignment is designed for 110 km/h. There are multiple locations where the vertical geometry does not meet the minimum design speed requirements. The majority of these locations are between chainages 12180 and 14636 and include both sag and crest curves. The minimum sag design speed is 100 km/h and the minimum crest design speed is 90 km/h. In most cases it would require significant cut or fill to improve these deficient areas which is not considered value for money in relation to the safety benefits provided.

Figure 3.1 : Cross section



3.3 Clear Zones

A nominal clear zone width of 9 m applies to the majority of the design. Curve and embankment slope adjustments have been applied where required, which varies the clear zone width from 9 m to 14 m.

3.4 Overtaking Lanes

The project includes three northbound overtaking lanes and two southbound overtaking lanes as shown in Table 3.1.

Table 3.1 : Overtaking lanes

Direction	Start Ch (m)	End Ch (m)	Length (m) - excluding tapers
Northbound	10420	11540	1120
Southbound	11830	12820	970
Northbound	15090	16280	1180
Southbound	16150	17400	1245
Northbound	18780	20430	1640

3.5 Junctions

3.5.1 St Peters Pass Rest Area

Safety upgrades will be undertaken at the St Peters Pass Rest Area junction. The proposed design involves raising the vertical alignment of the highway in order to improve sight distance at the intersection. The design also includes the provision of Channelised Right Turn (CHR) and Auxiliary Left Turn (AUL) facilities. Tree clearing will be undertaken to improve sight distance.

3.5.2 Sorell Springs Road

The existing Sorell Springs Road junction has deficient sight distance and turn facilities for the junction are inadequate with only a Basic Right Turn (BAR) and an AUL treatment currently present.

The proposed design includes an upgrade to this intersection with compliant AUL and CHR facilities provided. Excavation on cut batters approaching the intersection will be undertaken to improve sight distance.

3.5.3 Antill Ponds

The proposed design relocates the existing Antill Ponds Road intersection approximately 300m south and provides a CHR treatment and a P-turn manoeuvre for northbound traffic (access to Antill Ponds Road is off the back of the P-turn). The relocated intersection achieves safe intersection sight distance (SISD), improving safety and functionality. The existing intersection will be closed.

3.5.4 Glen Morey Road / Old Tier Road / Melrose Road

The proposed design for the Old Tier Road, Glen Morey Road and Melrose Road intersections include:

- Relocating the Glen Morey Road intersection to opposite Melrose Road (Ch.18650) to provide adequate space for CHR and AUL treatments into both Old Tier Road and Glen Morey Road. Right turn movements out of new Glen Morey Road intersection are restricted for heavy / long vehicles (light vehicles are exempted).

- Providing a slip lane for southbound vehicles turning out of the new Glen Morey Road intersection
- Providing a P-turn facility on Old Tier Road
- Allowing the Melrose Road access to remain open. Right turn movements into Melrose Road will not be permitted.
- Closing an existing access on western side of the highway between Old Tier Road and Melrose Road

3.6 Glen Morey Road Level Crossing

As discussed above, Glen Morey Road will be relocated to opposite Melrose Road. Consistent with the existing situation, a level crossing will be located on Glen Morey Road near the Midland Highway. The existing level crossing on Glen Morey Road is shown in Figure 3.2

Figure 3.2 : Glen Morey Road Level Crossing



3.7 Private Accesses

There are currently approximately 20 private property accesses within the project site, some of which are unlicensed. A number of unlicensed accesses will be closed. Due to the central flexible safety barrier, a number of accesses will become left turn in and left turn out only. Turning facilities coupled with breaks in the median barrier have been designed in consultation with the landowners to facilitate safe turning movements into these accesses. Proposed access treatments and additional travel distances required are shown in Table 3.2.

Table 3.2 : Accesses

Access Number	Ch (km)	Side	Proposed Treatment	CT Reference & Owner	Proposed Treatment & Design Vehicle	Closest turn facilities	Additional travel distance
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Access Number	Ch (km)	Side	Proposed Treatment	CT Reference & Owner	Proposed Treatment & Design Vehicle	Closest turn facilities	Additional travel distance
1	10.3	RHS	St Peters Pass Rest Area		Refer Section 3.5	NA	NA
2	11.41	LHS	Farm gate gravel access	CT135459/1 St Peters Pass P/L	Retained as left in/left out – design to match in to existing access	South: York Plains Road* North: Sorrel Springs Road G-turn	Right in: 8,620m Right out: 3,300m
3	11.41	RHS	Farm gate triple sealed access	CT 104898/15 & /16 & /17 St Peters Pass P/L	Retained as left in/left out – design to match in to existing access	South: York Plains Road* North: Sorrel Springs Road G-turn	Right out: 8,620m Right in: 3,300m
4	12.96	RHS	Sorell Springs Road		Refer Section 3.5	NA	NA
7	13.14	LHS	Middle Park homestead gravel access	CT 113351/1 Middle Park P/L	Retained as left in/left out – access upgraded to suit B-double	South: Sorrel Springs Road G-turn North: Antil Ponds P-turn	Right in: 560m Right out: 1,920
8	13.28	RHS	Farm gate gravel access	CT103934/1	Retained as left in/left out – design to match in to existing access	South: Sorrel Springs Road G-turn North: Antil Ponds P-turn	Right out: 840m Right in: 1,640m
9	13.31	LHS	Multiple sealed farmhouse access	CT 113351/1	Retained as left in/left out – access upgraded to suit B-double	South: Sorrel Springs Road G-turn North: Antil Ponds P-turn	Right in: 900m Right out: 1,580m
10	13.43	RHS	Farmhouse access Gravel	CT46435/1 Anseling Methhorst	Retained as left in/left out – access upgraded to suit B-double	South: Sorrel Springs Road G-turn North: Antil Ponds P-turn	Right out: 1,140m Right in: 1,340m
11	14.22	LHS	Farm gate - double dirt access	CT 113351/1 Middle Park P/L	Access closed – unlicensed access	NA	NA
12	14.37	RHS	Antill Ponds Road		Refer Section 3.5	NA	NA
13	15.22	LHS	House access gravel	CT168852/1	Access closed – unlicensed access. Access provided through internal track from Ch 15.45 access	NA	NA
14	15.45	LHS	New paddock access sealed (poorly)	CT 168533/1 Adam Burbury	Retained as left in/left out – access upgraded to suit B-double	South: Sorell Springs Road North: Old Tier Road P-turn	Right in: 5,180m Right out: 6,300m

Access Number	Ch (km)	Side	Proposed Treatment	CT Reference & Owner	Proposed Treatment & Design Vehicle	Closest turn facilities	Additional travel distance
15	15.45	RHS	Old Disused access	CT 168533/1 Adam Burbury	Access closed	NA	NA
16	16.93	LHS	Woodbury House access gravel	CT162120/1 A & L Cooper	Retained as left in/left out – design to match in to existing access	South: Sorell Springs Road North: Old Tier Road P-turn	Right in: 8,140 Right out: 3,340m
17	17.09	LHS	Gravel access fenced off (Access #14 alternative)	CT162120/1 A & L Cooper	Access not reinstated	NA	NA
18	17.4	LHS	Paddock gate No formation	CT162120/1 A & L Cooper	Access closed	NA	NA
19	18.03	LHS	Paddock gate no formation	CT113917/3 A & T Burbury	Retained as left in/left out – access upgraded to suit B-double	South: Sorell Springs Road North: Old Tier Road P-turn	Right in**: 10,340m Right out: 1,140m
20	18.3	LHS	Old Tier Rd	-	Refer Section 3.5	NA	NA
21	18.51	LHS	Farmhouse access Gravel	CT136507/5 W, R & W Webster	Access closed – access provided from Ch 18.69 access	NA	NA
22	18.51	RHS	Glen Morey Rd	-	Refer Section 3.5	NA	NA
23	18.69	LHS	Melrose Rd Gravel access	CT136507/5 W, R & W Webster	Retained, right turns in not permitted– access upgraded to suit B-double	South: Old Tier Road	Right in: 1,380m

* Assumed location of turning facility. Section of Highway south of St Peters Pass is being designed separately to this project.

**A gate will be provided off Old Tier Road allowing access to this property

4. Traffic Impacts

4.1 Traffic Generation

The upgrade will provide safety improvements but will not generate additional traffic. There will be increased use of some junctions in order to access turn facilities. This is discussed in more detail in Section 4.4.

4.2 Transport Efficiency

4.2.1 Overtaking Opportunities

The upgrade will provide transport efficiency improvements by providing evenly spaced formal overtaking opportunities through the “2+1” arrangement. The “2+1” arrangement will replace the existing “2+2” sections of highway north of St Peters Pass and north of Old Tier Road.

A comparison of the total existing overtaking lane length and the total proposed overtaking lane length in each direction is provided in Table 4.1. The length of overtaking lane within the limit of works will remain similar for southbound traffic, while the northbound overtaking lane length will be increased by 1.7 km. An additional southbound overtaking lane is already provided in a recently upgraded section of the highway, north of the limit of works.

Table 4.1 : Existing and proposed overtaking lane length

	Total overtaking lane length Existing (m)	Total overtaking lane length- Design (m)
Northbound	3,100	4,890
Southbound	3,160	2,800

It is noted that informal overtaking opportunities will be eliminated (sections of two lane carriageway where overtaking is permitted) due to the provision of the central flexible safety barrier. Safer overtaking opportunities will be provided through regular formal overtaking lanes.

Travel time savings have been estimated by modelling the existing and proposed road geometries in the software package TRARR (version 6.09). TRARR uses the horizontal and vertical road alignments, the available overtaking opportunities and sight distances, and traffic volumes to estimate travel speeds, travel times and overtaking opportunities.

Modelling was undertaken for various traffic volumes, ranging from 90 vehicles per hour (vph) to 450 vph in each direction. Existing peak hour volumes are expected to be in the order of 200-250 vph in each direction.

Travel time savings are expected for northbound traffic due to the increased length of overtaking lanes in the design compared to the existing road. Estimated travel time savings for northbound traffic ranged from 2 seconds per vehicle to 15 seconds per vehicle. Travel time savings predicted by the model are within the project site only and further benefits are expected in adjacent sections of highway due to the reduced vehicle bunching.

For southbound traffic there is a slight decrease in total overtaking lane length for the design. The modelling showed a slight increase in travel times within the project site for southbound traffic ranging from 2 seconds per vehicle to 6 seconds per vehicle. It is noted an additional southbound overtaking lane is already provided in a recently upgraded section of the highway, north of the limit of works, which will improve efficiency for southbound traffic.

Modelling of the existing road showed that as traffic volumes increase, informal overtaking opportunities are reduced with overtaking movements largely undertaken within formal overtaking lanes at higher hourly traffic volumes.

4.2.2 Accesses and Turn Facilities

The provision of the central flexible safety barrier will mean that a number of accesses become left turn in and left turn out only. This will result in some increased travel time for landowners who will need to travel further to utilise a turn facility and access the property with a left turn. Turning facilities coupled with breaks in the median barrier have been designed in consultation with landowners to facilitate safe turning movements into these accesses. Proposed access treatments and additional travel distances required are shown in Table 3.2.

The median barrier also impacts the number of available U-turn opportunities, however the frequency of turning facilities has been designed to meet the requirements for emergency service vehicles.

4.3 Road Safety Impacts

The upgrades aim to improve safety to a minimum 3 Star AusRAP rating through provision of an alternating "2+1" arrangement, with a central flexible safety barrier. The project will improve safety by significantly reducing head on crashes and the likelihood and severity of other casualty crashes. The one fatality that occurred within the project site in the last ten years was caused by a head on collision.

Localised improvements to geometry and sight distances will also improve safety. Provision of a wider 2 m sealed shoulder will reduce run off road crashes which are the most common crash type occurring within the project site.

It is preferable to minimise accesses on Category 1 roads. Safety will be improved by decommissioning a number of existing accesses on the Midland Highway and making a number of accesses left turn in and left turn out only.

Significant safety improvements will be made to junctions within the project site, including providing AUL and CHR treatments and improving sight distances.

4.4 Junction Impacts

Due to the location of turning facilities on Sorell Springs Road and Old Tier Road, there will be increased use of these junctions. The increased traffic volume is expected to be in the order of 40-50 turning movements per day. Both junctions will be upgraded with compliant AUL and CHR facilities provided. The junctions will be able to cater for this small increase in traffic volumes.

4.5 Rail Crossing

Consistent with the existing situation, a level crossing will be provided on the relocated Glen Morey Road near the Midland Highway. An existing safety issue is noted at the current Glen Morey Road level crossing due to the proximity of the rail line and highway. Large heavy vehicles waiting to turn right onto the highway have the back of the vehicle hanging over the rail line. This creates the potential for a collision between heavy vehicles and a train. In addition, vehicles turning into Glen Morey Road from the highway may not see a train, particularly when travelling in the same direction as the train. There is not enough room between the highway and the rail line to store a long heavy vehicle.

Glen Morey Road is a public road and cannot be closed. Due to the location of the rail line, a level crossing in close proximity to the highway cannot be avoided in this area.

AS1742.7 and Austroads provide measures to be taken to mitigate short stacking (long vehicles occupying the rail crossing whilst waiting to enter a road intersection). These include:

- Establishing a detour and regulatory sign posting for long vehicles

- Providing appropriate emergency escape, refuge areas or slip lanes for long vehicles

The proposed design for Glen Morey Road intersection restricts long vehicles from turning right, removing the issue of short-stacking. Long vehicles are able to detour and use the nearby turn facility on Old Tier Road. While the restriction of right turns will be sign-posted, it is noted some drivers may ignore this signage. The right turn movement has been designed to cater for long vehicles.

The design also includes a left turn slip lane for vehicles entering the highway from Glen Morey Road. This allows long vehicles to make the left turn without over hanging the rail line. It also acts as an escape area for vehicles entering Glen Morey Road from the highway and any long vehicles ignoring the signage restricting right turns.

Even though a slip lane is provided, it is considered preferable to restrict right turn movements for long vehicles. Vehicles waiting at the intersection for a gap in highway traffic (while overhanging the rail line), would need to look back over their shoulder to view a train approaching and react in time to utilise the escape area. It is considered safer to detour long vehicles via Old Tier Road.

As with the existing situation, there is enough room to store a car between the rail line and the road, but not a long heavy vehicle. The provision of CHR and AUL treatments at the Glen Morey Road junction as well as the escape area will improve safety and reduce the risk of collision between a vehicle entering Glen Morey Road and a train. Both rail and traffic volumes at the level crossing are low and the risk of collision is considered low.

Based on AS1742.7 the required sight distance for vehicles stopped at the hold line is 220m. This sight distance is achieved. Some vegetation clearing will required in the vicinity of the level crossing.

Signals are not considered appropriate for the crossing due to the proximity to the highway. TasRail has advised signals were previously installed at the current Glen Morey Road level crossing, but were removed as they interfered with highway traffic.

Providing a G-turn on Glen Morey Road (rather than Old Tier Road) was investigated early in the project but was dismissed as it would increase the number of vehicles using this junction and increase the risk of conflict with the level crossing. The proposed design does not increase the number of vehicles using the level crossing.

4.6 Sight Distance

4.6.1 Stopping Sight Distance

The Stopping Sight Distances (SSD) have been assessed along the length of the project. In accordance with the Design Guidelines for Category One Roads, an absolute minimum SSD value of 209m has been assessed.

At approximately 18 locations, deficient SSD's are observed due to the addition of flexible safety barrier in the median and the verges. The assessment has assumed the barrier to be a solid obstruction as the ability to see through the barriers to pavement level would be minimal (especially at oblique angles). It is not practical to change the road alignment such that all stopping sight distances are achieved as the horizontal curves would need to be of a sufficiently large radius or the pavement sufficiently wide such that the flexible safety barrier does not impede sight lines.

There are several locations where SSD is not achieved due to the vertical alignment. Those areas where the SSD deficiencies are due to vertical alignment are replicating the existing conditions where the sight distances were already insufficient for a 110km/h design speed. In most cases it would require significant cut or fill to improve these deficient areas which is not considered value for money in relation to the safety benefits provided.

The widened highway and shoulder will allow more manoeuvring room to for a vehicle to avoid an object, which will improve safety.

4.6.2 Intersection Sight Distance

Safe Intersection Sight Distance (SISD), Minimum Gap Sight Distance (MGSD) and Approach Sight Distance (ASD) checks have been undertaken at all accesses, intersections and turn facilities. SISD's have been assessed based on the desirable value of 325m SISD and utilising a driver eye height of 1.1m, an object height of 1.25m and an offset of 3.0m from the carriageway.

MGSD's have been assessed for a distance of 153m based on a 110km/h operating speed utilising a 1.1m driver eye height, 0.65m object height and an offset of 3.0m from the carriageway.

ASD's have been assessed based on a 60km/h design speed on side roads utilising a 1.1m driver eye height and 0.0m object height (i.e. line marking).

Generally all intersections meet the required sight distances with the exception of those detailed in Table 4.2. Those locations that do not meet the required MGSD distances do meet the Extended Design Domain (EDD) requirements and that philosophy has been adopted for this component. The EDD for MGSD uses an object height of 1.25m instead of 0.65m. This is considered appropriate given the other intersection sight distance requirements are met.

Table 4.2 : Locations which do not meet required intersection sight distance

Location	Direction	Criteria	Reason for Failure	Comment
St Peters Pass Rest Area	Southbound	MGSD	Median Flexible safety barrier	Meets EDD requirements
Sorell Springs Road	Southbound	MGSD	Median Flexible safety barrier	Meets EDD requirements
Antill Ponds P-turn	Southbound	MGSD	Median Flexible safety barrier	Meets EDD requirements
Old Tier Road	Northbound	MGSD	Median Flexible safety barrier	Meets EDD requirements
Glen Morey Road	Southbound	MGSD	Median Flexible safety barrier	Meets EDD requirements

4.6.3 Access Sight Distance

Access safe intersection sight distance has been assessed against the EDD requirements of approximately 240m (adjusted for grade). All accesses achieve the EDD requirements.

4.7 Pedestrian / Cyclists

The project involves a high speed road environment in a rural area. Pedestrian movements are not appropriate on the highway and are rare (eg breakdowns). Cyclist movements are infrequent. The increased shoulder width of 2m will improve safety for the infrequent cyclist and pedestrian movements.

5. Planning Scheme Requirements

The proposed upgrade has been assessed under the requirements of schedule E5.0 Road and Railway Asset Code and Schedule E6.0 Parking and Access Code of the Southern Midlands Interim Planning Scheme 2015 (the Scheme). The requirements of the codes relevant to the upgrade are outlined in the following sections.

5.1 Schedule E5.0 Road and Railway Assets Code

The purpose of this Code is to:

- a) Protect the safety and efficiency of the road and railway networks
- b) Reduce conflicts between sensitive uses and major roads and the rail network

E5.5 Use Standards

E5.5.1 Existing Road Accesses and Junctions

The objective of E5.5.1 is to ensure that the safety and efficiency of roads is not reduced by increased use of existing accesses and junctions.

Acceptable Solution / Performance Criteria	Compliance
<p>A1</p> <p>The annual average daily traffic (AADT) of vehicle movements, to and from a site, onto a category 1 or category 2 road, in an area subject to a speed limit of more than 60km/h, must not increase by more than 10% or 10 vehicle movements per day, whichever is the greater.</p>	<p>The upgrade to the Midland Highway will not generate additional traffic, therefore Acceptable Solution A1 is met.</p>
<p>P2</p> <p>Any increase in vehicle traffic at an existing access or junction in an area subject to a speed limit of more than 60km/h must be safe and not unreasonably impact on the efficiency of the road, having regard to:</p> <ul style="list-style-type: none"> (a) the increase in traffic caused by the use; (b) the nature of the traffic generated by the use; (c) the nature and efficiency of the access or the junction; (d) the nature and category of the road; (e) the speed limit and traffic flow of the road; (f) any alternative access to a road; (g) the need for the use; (h) any traffic impact assessment; and (i) any written advice received from the road authority. 	<p>Due to the location of turning facilities on Sorell Springs Road and Old Tier Road, there will be increased use of these junctions. The increased traffic volume is expected to be in the order of 40-50 turning movements per day. Both junctions will be upgraded with compliant AUL and CHR facilities provided. The upgraded junctions will be able to safely and efficiently cater for this small increase in traffic volumes. Performance Criteria P2 is therefore met.</p>

E5.6 Development Standards

E5.6.1 Development adjacent to roads and railways

The objective of E5.6.1 is to ensure that development adjacent to category 1 or category 2 roads or the rail network:

- (a) ensures the safe and efficient operation of roads and the rail network;
- (b) allows for future road and rail widening, realignment and upgrading; and
- (c) is located to minimise adverse effects of noise, vibration, light and air emissions from roads and the rail network.

Acceptable Solution / Performance Criteria	Compliance
<p>P1 The location of development, from the rail network, or a category 1 road or category 2 road in an area subject to a speed limit of more than 60km/h, must be safe and not unreasonably impact on the efficiency of the road or amenity of sensitive uses, having regard to:</p> <ul style="list-style-type: none"> (a) the proposed setback; (b) the existing setback of buildings on the site; (c) the frequency of use of the rail network; (d) the speed limit and traffic volume of the road; (e) any noise, vibration, light and air emissions from the rail network or road; (f) the nature of the road; (g) the nature of the development; (h) the need for the development; (i) any traffic impact assessment; (j) any recommendations from a suitably qualified person for mitigation of noise, if for a habitable building for a sensitive use; and (k) any written advice received from the rail or road authority. 	<p>The upgrade will involve widening the Midland Highway to improve safety and efficiency.</p> <p>In a number of areas within the project site the existing highway is within 50m of the rail line. Widening on the eastern side (toward the rail line) has been limited and will not unreasonably impact the use of the rail line. Performance Criteria P1 is therefore met.</p>

E5.6.2 Road Accesses and Junctions

The objective of E5.6.2 is to ensure that the safety and efficiency of roads are not reduced by the creation of new accesses and junctions.

Acceptable Solution / Performance Criteria	Compliance
<p>P1 For roads in an area subject to a speed limit of more than 60km/h, accesses and junctions must be safe and not unreasonably impact on the efficiency of the road, having regard to:</p> <ul style="list-style-type: none"> (a) the nature and frequency of the traffic generated by the use; (b) the nature of the road; (c) the speed limit and traffic flow of the road; 	<p>Two junctions within the project site, Glen Morey Road and Antill Ponds Road, will be relocated as part of works. The junctions have been relocated in order to improve safety. Providing a greater separation between Old Tier Road and Glen Morey Road allows compliant CHR treatments to be provided at both junctions. The new Antill Ponds junction will have greater sight distance than the existing location which has deficient sight distance. A CHR treatment will also improve safety at the relocated Antill Ponds junction.</p>

Acceptable Solution / Performance Criteria	Compliance
<p>(d) any alternative access; (e) the need for the access or junction; (f) any traffic impact assessment; and (g) any written advice received from the road authority.</p>	<p>The new junction incorporates a turn facility, which will improve efficiency for highway traffic.</p> <p>Private accesses within the project site will generally become left in/ left out only and number of accesses will be closed which will also improve safety on the highway.</p> <p>Performance Criteria P1 is therefore met.</p>

E5.6.3 New Level Crossings

The objective of E5.6.3 is to ensure that the safety and the efficiency of the rail network is not reduced by access across part of the rail network.

Acceptable Solution / Performance Criteria	Compliance
<p>P1 Level crossings must be safe and not unreasonably impact on the efficiency of the rail network, having regard to:</p> <p>(a) the nature and frequency of the traffic generated by the use; (b) the frequency of use of the rail network; (c) the location of the level crossing; (d) any alternative access; (e) the need for the level crossing; (f) any traffic impact assessment; (g) any measures to prevent access to the rail network; and (h) any written advice received from the rail authority.</p>	<p>Consistent with the existing situation, a level crossing will be provided on the relocated Glen Morey Road near the Midland Highway. The upgrade will not increase the number of vehicles using the level crossing. Both traffic and rail volumes at the level crossing are low.</p> <p>The design improves the safety of the level crossing on Glen Morey Road through:</p> <ul style="list-style-type: none"> • Provision of CHR and AUL treatments at the Glen Morey Road intersection • Restriction of right turn movements out of Glen Morey Road for long heavy vehicles (detour via Old Tier Road) • Provision of a left turn slip lane for vehicles turning out of Glen Morey Road <p>Performance Criteria P1 is therefore met.</p>

E5.6.4 Sight distance at accesses, junctions and level crossings

The objective of E5.6.4 is to ensure that accesses, junctions and level crossings provide sufficient sight distance between vehicles and trains to enable safe movement of traffic.

Acceptable Solution / Performance Criteria	Compliance
<p>A1 Sight distances at:</p> <p>(a) an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1; and (b) rail level crossings must comply with AS1742.7 Manual of uniform traffic control devices - Railway</p>	<p>Safe Intersection Sight Distance (SISD) checks have been undertaken at all accesses, junctions and turn facilities based on Austroads Guidelines.</p> <p>All junctions have been assessed based on the desirable value of 325 m for a design speed of 120</p>

Acceptable Solution / Performance Criteria	Compliance
<p>crossings, Standards Association of Australia.</p> <p>P1</p> <p>The design, layout and location of an access, junction or rail level crossing must provide adequate sight distances to ensure the safe movement of vehicles, having regard to:</p> <ul style="list-style-type: none"> (a) the nature and frequency of the traffic generated by the use; (b) the frequency of use of the road or rail network; (c) any alternative access; (d) the need for the access, junction or level crossing; (e) any traffic impact assessment; (f) any measures to improve or maintain sight distance; and (g) any written advice received from the road or rail authority. 	<p>km/h which is greater than the requirements of Table E5.1 in the Scheme (290 m for an 85th percentile speed of 110 km/h). All junctions achieve the desirable value of 325 m.</p> <p>Accesses have been assessed against the EDD requirements of approximately 240m (adjusted for grade). All accesses achieve the EDD requirements. The EDD requirements are considered appropriate as it is difficult to achieve higher SISD at existing accesses. The design does not include any new private accesses.</p> <p>Based on AS1742.7 the required sight distance for vehicles stopped at the hold line is 220m. This sight distance is achieved. Some vegetation clearing will be required in the vicinity of the level crossing.</p> <p>It is considered that Performance Criteria P1 is met.</p>

5.2 Parking and Access Code

The purpose of this code is to:

- (a) ensure safe and efficient access to the road network for all users, including drivers, passengers, pedestrians and cyclists;
- (b) ensure enough parking is provided for a use or development to meet the reasonable requirements of users, including people with disabilities;
- (c) ensure sufficient parking is provided on site to minimise on-street parking and maximise the efficiency of the road network;
- (d) ensure parking areas are designed and located in conformity with recognised standards to enable safe, easy and efficient use and contribute to the creation of vibrant and liveable places;
- (e) ensure access and parking areas are designed and located to be safe for users by minimising the potential for conflicts involving pedestrians, cyclists and vehicles; and by reducing opportunities for crime or anti-social behaviour;
- (f) ensure that vehicle access and parking areas do not adversely impact on amenity, site characteristics or hazards;
- (g) recognise the complementary use and benefit of public transport and non-motorised modes of transport such as bicycles and walking;
- (h) provide for safe servicing of use or development by commercial vehicles.

E6.6 Use Standards

Based on the Scheme there are no requirements to provide car, motorbike or cyclist parking for a road upgrade (classified as utilities).

E6.7 Development Standards

E6.7.1 Number of Vehicular Accesses

The objective of E6.7.1 is to ensure that:

- (a) safe and efficient access is provided to all road network users, including, but not limited to: drivers, passengers, pedestrians, and cyclists, by minimising:
 - (i) the number of vehicle access points; and
 - (ii) loss of on-street car parking spaces;
- (b) vehicle access points do not unreasonably detract from the amenity of adjoining land uses;
- (c) vehicle access points do not have a dominating impact on local streetscape and character.

Acceptable Solution / Performance Criteria	Compliance
<p>A1</p> <p>The number of vehicle access points provided for each road frontage must be no more than 1 or the existing number of vehicle access points, whichever is the greater.</p>	<p>No new accesses will be provided within the project site. A number of accesses will be closed, reducing the number of accesses on the Midland Highway. Therefore Acceptable Solution A1 is met.</p>

E6.7.2 Design of Vehicular Accesses

The objective of E6.7.1 is to ensure safe and efficient access for all users, including drivers, passengers, pedestrians and cyclists by locating, designing and constructing vehicle access points safely relative to the road network.

Acceptable Solution / Performance Criteria	Compliance
<p>P1</p> <p>Design of vehicle access points must be safe, efficient and convenient, having regard to all of the following:</p> <ul style="list-style-type: none"> (a) avoidance of conflicts between users including vehicles, cyclists and pedestrians; (b) avoidance of unreasonable interference with the flow of traffic on adjoining roads; (c) suitability for the type and volume of traffic likely to be generated by the use or development; (d) ease of accessibility and recognition for users. 	<p>Existing accesses impacted by the works which are to be retained will be upgraded as part of the project. Accesses have been designed based on the current vehicles using the access. All accesses meet the EDD requirements for safe intersection sight distance.</p> <p>Performance Criteria P1 is therefore met.</p>

6. Conclusions

The upgrades between St Peters Pass and south of Tunbridge will improve safety to a minimum 3 Star AusRAP rating through provision of an alternating “2+1” arrangement, with a central median flexible safety barrier.

The project will improve safety by significantly reducing head on crashes and reducing the likelihood and severity of other casualty crashes. Localised geometry improvements and provision of 2 m sealed shoulders will also improve safety.

Significant safety improvements will be made to junctions within the project site, including providing CHR and AUL treatments and improving sight distance. Safety will also be improved by decommissioning a number of existing accesses and making a number of accesses left in / left out only.

Transport efficiency will be improved by the provision of evenly spaced overtaking opportunities through the “2+1” arrangement.

The design achieves sufficient sight distance at all intersections, accesses and turn facilities. Significant sight distance improvements will be made to a number of junctions which currently have deficient sight distance including St Peters Pass rest area and Sorell Springs Road.

Consistent with the existing situation, a railway crossing will be provided on the relocated Glen Morey Road near the Midland Highway. The design improves the safety of the level crossing on Glen Morey Road through:

- Provision of CHR and AUL treatments at the Glen Morey Road intersection
- Restriction of right turn movements out of Glen Morey Road for long heavy vehicles (detour via Old Tier Road)
- Provision of a left turn slip lane for vehicles turning out of Glen Morey Road

Whilst the provision of a central flexible safety barrier will significantly improve overall safety for road users, the barrier will change access arrangements for a number of landowners with properties adjacent to the highway. Turning facilities coupled with breaks in the median barrier have been designed in consultation with the landowners to facilitate safe turning movements into these accesses.

The median barrier also impacts the number of available U-turn opportunities on the highway, however the frequency of turning facilities has been designed to meet the requirements for emergency service vehicles.

The proposed upgrade has been assessed under the requirements of schedule E5.0 Road and Rail Asset Code and schedule E6.0 Parking and Access Code of the Southern Midlands Interim Planning Scheme 2015 and has been assessed to meet the requirements of the Scheme.