

DIER

Report for West Tamar Highway,
Near Brady's Lookout

Submission to Parliamentary
Standing Committee on Public
Works

October 2011

Contents

1.	Introduction	1
1.1	Background	1
1.2	Project Location	1
1.3	Project Objectives	1
1.4	Project Justification	2
2.	The Existing Situation	4
2.1	The Road	4
2.2	Traffic Conditions	4
2.3	Crashes	4
2.4	The Road Side	5
3.	The Project	6
3.1	Proposed Works	6
3.2	Road Cross Section	6
3.3	Specific Design Issues	7
4.	Construction Program and Costs	11
4.1	Construction Program	11
4.2	Costs	11
5.	Environmental and Social Implications	12
5.1	Environmental Issues	12
5.2	Public Consultation	12
5.3	Service Authorities	14
6.	Conclusions and Recommendations	16

Table Index

Table 1	Traffic Data	4
Table 2	Base Estimate	11
Table A1	Crash History 2005 - 2010	18
Table A2	Crash Types	19

1. Introduction

1.1 Background

In October 2004 the draft West Tamar Corridor Study identified over \$150 million of potential works in this area which included a suite of projects subsequently undertaken to improve safety amounting to over \$16 million work. These projects included: an \$8 million duplication of the highway north of Riverside; \$3 million to replace the Supply River Bridges; and more than \$5 million on road widening, shoulder sealing in two projects between Legana and south of Beaconsfield and the current (2010/11) Flowery Gully junction improvements.

The site of the project is on the West Tamar Highway in the vicinity of the Bradys Lookout. It is referenced by the Department of Infrastructure, Energy and Resources' (DIER) Link Map 45, Chainage 0.5 to 3.38km.

The initial brief was simply for the installation of a tensioned wire rope safety barrier (TWRSB) and associated widening, but it became soon apparent that considerable work had to be done to improve the existing vertical and horizontal alignment, in part to address the initial cause of the accidents, and to enable the barrier to be installed in accordance with manufacturers' recommendations.

In developing the concept it was found that the pavement of the West Tamar Highway is showing considerable signs of deformation and failure through much of the project site. Approval was granted to undertake a pavement design based on a granular overlay allowing for improvement to the alignment geometry and superelevation, and full depth pavement construction for the additional pavement widening. Following further discussions with DIER's Project Manager and Manager Project Services the option to improve the insitu subgrade across the full carriageway width was adopted.

1.2 Project Location

This section of the West Tamar Highway links Launceston to the West Tamar communities north of Rosevears.

The project site is part of DIER Road Link 41, which runs between the junctions of Craythorne Road to the south, and Frankford Main Road to the north. The length of the link is 6.94km. The project extents incorporate the existing northbound and southbound overtaking lanes on either approach to Brady's Lookout. This is an overall length of 2.88km and is the most geometrically deficient part of this section of Highway. The project extents are shown in Figure 1.

1.3 Project Objectives

The project seeks to improve road safety by preventing head-on crashes and reducing the severity of loss of control crashes.

1.4.1 Safety Benefits

The proposed project incorporates major improvements and design elements that will address existing road safety issues. These include:

- Provision of painted median and tensioned wire rope safety barrier separating opposed traffic lanes to prevent head-on crashes;
- Provision of roadside safety barriers to reduce the severity of crashes where vehicles leave the road;
- Provision of sealed shoulders to provide additional recovery space for drivers where vehicle control is lost;
- Provision of a more consistent speed environment through the project site so that drivers are not caught unawares by isolated road elements of a lower standard;
- Provision of right turn lanes at Bradys Lookout Access and Bradys Lookout Road so that turning drivers do not impede traffic in the adjacent through lane;
- Provision of a left turn lane at Bradys Lookout Access so that turning drivers, particularly tourists, do not impede traffic in the adjacent through lanes;
- Provision of increased sight distance at the junctions;
- Restricting the allowed turning movements at Masons Road junction where adequate sight distance cannot be provided;
- Improvements to the road alignment to provide better ride and increase sight distance;
- Widening of highway lanes so that drivers, especially of large vehicles, can more easily stay in the correct lane; and
- Inclusion of audible lines on the median.

1.4.2 Maintenance Cost Savings

Reconstruction of this section of highway will significantly reduce the frequency and cost of road maintenance in comparison to the current road.

The number of call outs by maintenance staff to site will also be significantly reduced as there is expected to be substantially reduced need for guidepost replacement and cleaning; pavement and road edge repairs; and maintenance of drainage structures and channels.

However, the extensive use of safety barrier through the project site may induce some additional maintenance costs, particularly when it is first installed and drivers adjust to its presence.

1.4.3 Road User Benefit

In addition to the road safety benefits, road users will derive benefits from the following:

- Reduced fuel consumption and vehicle wear due to the more consistent speed environment;
- Reduced vehicle pollution due to the more consistent speed environment;
- Reduced road noise due to more uniform road seal conditions; and
- Wider sealed shoulders will provide more space for cyclists.

2.4 **The Road Side**

The abutting land consists of a mixture of cleared pasture land with areas of wood land. There are pockets of rural residential development with access generally provided from abutting local roads.

Through the project site the Highway is generally benched into the side of the Bradys Lookout hill with the western side of the road in cutting and the eastern side falling away down fairly steep embankments.

A significant part of the project site is located within an area subject to landslip, including an active landslip site.

3.3 Specific Design Issues

3.3.1 Speed Environment

As noted in Section 2.1, the posted speed limit through the project site is 100km/h but the design speed of existing alignment components varies considerably but is clearly less than the posted speed limit. This discrepancy is undesirable; however, preliminary investigations confirmed that a road designed for a 100km/h operating speed was not feasible along the existing Highway corridor even with frontage acquisition from adjacent properties.

As provision of a new Highway corridor was beyond the scope of this project, GHD conferred with DIER's Traffic Management Branch (TMB) and it was agreed that the preferred approach was to develop a more consistent speed environment with individual alignment elements designed for 80km/h. This has been achieved.

It should be noted that the innate conservatism of the design criteria, usually means that in fine conditions drivers feel comfortable driving at a speed somewhat higher than design speed. In fact the Australian Standard ball-bank survey method generally used in speed limit determination does not directly co-relate to the process used during design.

It is understood that TMB will review speed zoning in the area after construction.

3.3.2 Slope Stability

As noted in Section 2.4, part of the project site is through terrain that is subject to landslip. The area has been the subject of a number of reports since the winter of 1975, when about 270m of the West Tamar Highway to the south of Bradys Lookout was affected by a reactivated landslip. DIER provided an extract of a Pitt & Sherry report (circa 2002) that reviewed available data regarding the landslip and recommended a course of field investigations to improve understanding of the nature and causes of the Highway deformation and allow development of future treatment options. It is understood that the additional investigations were not subsequently commissioned by DIER at that time.

For this project geotechnical engineering advice was sought on appropriate batter slopes to use in this terrain. One recommendation arising out of the geotechnical investigation was to use a maximum cut batter slope of 3H:1V, which is approximately twice as flat as the cut batters historically used on most projects throughout Tasmania.

Due to the local topography a 3H:1V cut batter slope is not practical to use through the whole length of the site that may be prone to landslip. In particular, near the road crest adjacent to Bradys Lookout and adjacent to the Masons Road junction use of this batter slope would have required very large excavations and, in the latter case, would have required Masons Road to be relocated.

It has therefore been necessary to specify the use of retaining walls and kerb and gutter through these areas. Where these retaining walls exceed 2.5m in height additional geotechnical investigation will be required to enable them to be appropriately designed.

Retaining walls have also been specified at some locations to prevent new fill embankments having to be chased down the existing embankment slope.

3.3.3 Ride Quality

As noted in Section 2.1, the ride quality through this section of the Highway, particularly to the south of Bradys Lookout, is poor. A number of factors potentially contribute to this, including:

- ▶ Inconsistent speed environment;
- ▶ Road subsidence due to effects of landslip;
- ▶ Uneven vertical alignment;

3.3.5 Termination of Overtaking Lanes

Generally the termination of an overtaking lane should only be at a point where there is sufficient sight distance for the overtaking driver to decide whether to complete or abandon the overtaking manoeuvre and it is desirable for the termination point to be on a straight to give drivers a better visual appreciation of the approaching merge.

Unfortunately, the curved alignment and proximity of the junction to access Bradys Lookout to the crest make these requirements impractical to meet. Extensive consideration was given to whether relocating the termination points of either the northbound or southbound overtaking lane would be beneficial. However, it became apparent that there was not an alternative location that met all the fundamental criteria. Therefore, both overtaking lanes will terminate essentially where they do presently, although the merges themselves have been lengthened to meet current standards.

3.3.6 Impacts on Masons Road Access

Masons Road and Bradys Lookout Road are approximately 250m apart. This is too close for standard junction treatments to have been installed at both without them interfering with each other.

The Masons Road junction is located approximately 70m south of an existing crest in the West Tamar Highway that significantly impedes sight distance. This crest is shown in Figure 3.

Figure 3 Crest North of Masons Road



The project includes some trimming of this crest to provide Stopping Sight Distance (SSD) along the West Tamar Highway. This has necessitated the extensive use of retaining walls immediately north of Masons Road.

Safe Intersection Sight Distance (SISD) is the minimum required at junctions and is significantly more onerous than SSD. Whilst it can be provided to the south of Masons Road, providing it to the north would require the West Tamar Highway to be lowered significantly, including at Masons Road which

4. Construction Program and Costs

4.1 Construction Program

The Capital Investment Program included in the 2011/12 Budget Papers indicated that only minor works would be undertaken prior to 2013/14.

However, given the progress made on the design it is proposed to reschedule the project so that construction can commence in 2011/12 with the works to be completed by around April 2013.

4.2 Costs

The cost of the works has been estimated based on historical rates for similar works delivered by DIER recently. The main components of the base estimate are shown in Table 2.

Table 2 Base Estimate

Item	Estimated Cost
Project Specific (eg walls, traffic counter)	\$723,425
Earthworks	\$965,460
Drainage	\$514,054
Pavement	\$1,974,465
Bitumen Surfacing	\$351,384
Traffic Facilities	\$790,082
Landscaping	\$152,208
Miscellaneous (eg service alterations, testing, traffic & environmental management)	\$160,500
SUB-TOTAL	\$5,631,577
Additional Items (eg acquisition)	\$317,000
Professional Fees	\$520,000
DIER Internal Overheads and Fees	\$475,237
DIER Supplied Materials and Services	\$337,000
TOTAL BASE ESTIMATE	\$7,280,814
P50 Estimate	\$7,594,146
P90 Estimate	\$8,211,744

The base estimate has subsequently been probabilistically modelled and P50 and P90 estimates obtained. The P50 estimate notionally represents the project budget that will not be exceeded 50% of the time and the P90 estimate similarly represents the project budget that will not be exceeded 90% of the time.

It should be noted that as the base estimate is derived from historic rates, the P50 & P90 estimates by their nature already incorporate some allowance for risk and presume a stable market.

brochure has been prepared and has been distributed in the local area. There have also been newspaper advertisements and media releases.

To date briefings have been undertaken with the West Tamar Council, the West Tamar Highway Safety Committee and West Tamar Community Safety Group. All have been quite receptive and are keen to see the works commence.

A number of key stakeholders have already been consulted. These include Manion's Coaches, the Tamar Bike User Group (TBUG), the Truck Owners Association, the Motorcycle Riders Association of Tasmania and the Tasmanian Motorcycle Council.

5.2.1 Manion's Coaches

Manion's Coaches operate school bus services to Exeter and Launceston as well as a general daily bus service. From these discussions some minor improvements to current drop off areas are being considered.

5.2.2 Tamar Bike User Group

TBUG initially advised that most of their riders travel along Rosevears Drive and that they had no specific issues.

5.2.3 Truck Owners Association

The Truck Owners Association main concern was for cyclists on this section of the road, which differs in view from TBUG. However, provision has been made for a 2m wide sealed shoulder on the single lane side of the design and a 1m wide sealed shoulder on the two lane side.

5.2.4 Motorcycle Riders Association of Tasmania and the Tasmanian Motorcycle Council

A number of meetings have been held with the Motorcycle Riders Association and the Tasmanian Motorcycle Council, whose main concern is the installation of the TWRSB and its impacts on motorcycle riders. Currently consideration is being given to the installation of speed cushions through the tighter radii curves as a mitigation option.

5.2.5 Community Input

An open forum was held on the 5th of July at the West Tamar Council's Riverside offices. Representatives from both DIER and GHD attended the forum. The forum was advertised in the local media and letters sent to landowners directly impacted by the proposed works either by land acquisition or by the changed access arrangements to their properties due to the installation of the wire rope barrier within the median. Plans of the proposed works were displayed at the forum along with a computer generated visualisation of the proposed highway upgrade. It is noted that no one from the local community took the opportunity to attend the forum.

Public displays at the West Tamar Council, Legana Shopping Centre and Exeter Post Office have also been provided with feedback forms; the majority of comments noted the poor condition of this section of road and agree it is past time that the works are carried out.

5.2.6 Affected Property Owners

Significant property acquisition will be required to undertake the proposed works. The majority of property owners affected by acquisition can see the merits of the project as a number have had near misses attempting to turn right from the Highway

5.3.5 Waste Disposal

West Tamar Council operates garbage and recycling services through the project area. Verbal advice from Council staff suggests that the garbage truck routes run north and south along this part of the Highway and should not need to turn within the project site.

Appendix A

Crash Data

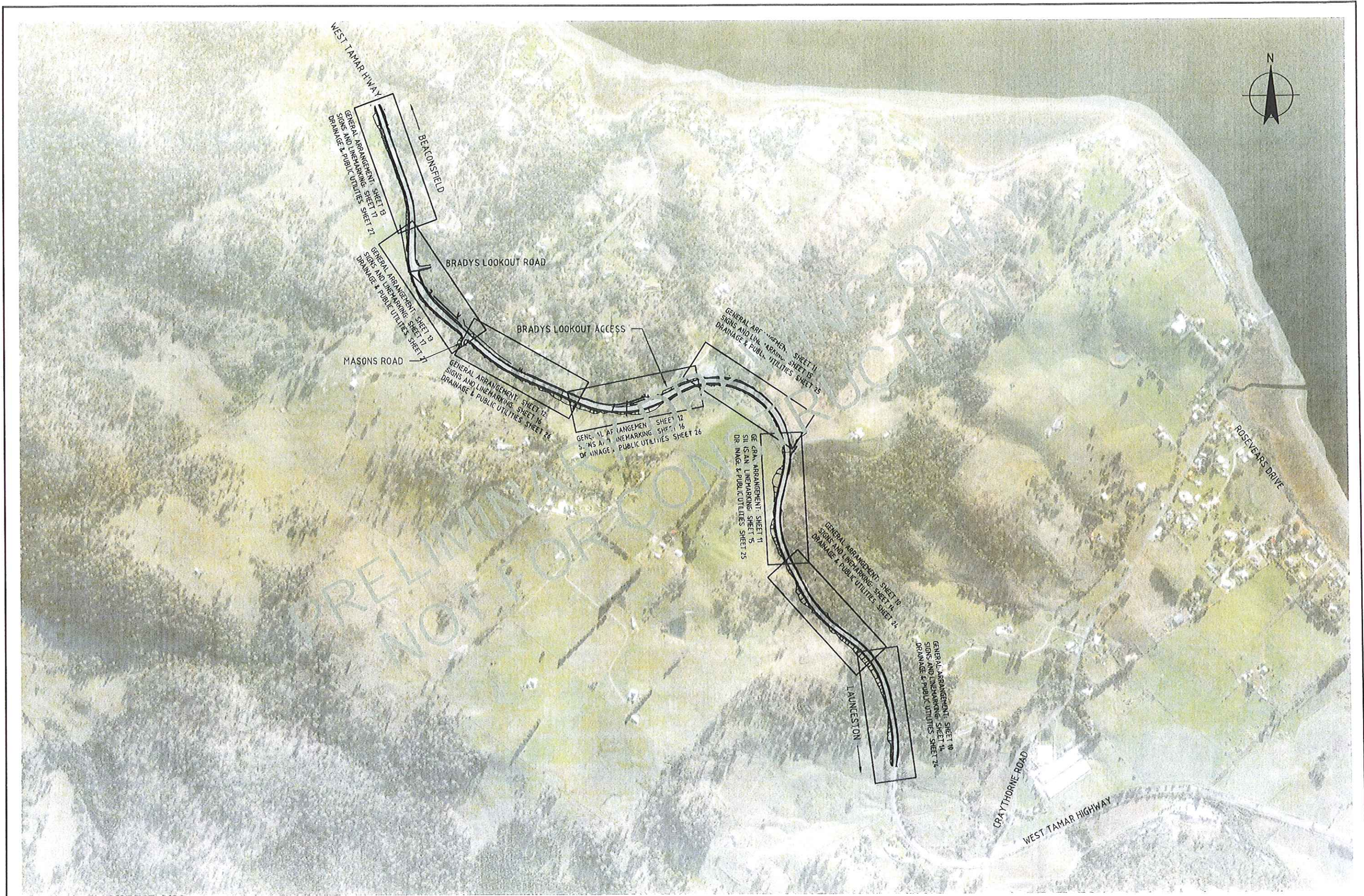
Date	Time	Severity	Type	Visibility	Wet/Dry	Unit
10/05/09	2006	Prop. Dam.	180	Light Rain	Wet	1 - Motorcycle
12/06/09	1705	Prop. Dam.	160	Not Known	Not Known	1 - Motorcycle

Table A2 Crash Types

Code	Type
120	Wrong side / other head-on (not overtaking)
134	Vehicles in parallel lane / lane change right (not overtaking)
136	Vehicles in parallel lane / right turn sideswipe
160	Parked
167	Animal not ridden
180	Off carriageway right bend
181	Off right bend into object / parked vehicle
182	Off carriageway left bend
183	Off left bend into object / parked vehicle
191	Load or missile struck vehicle

Appendix B

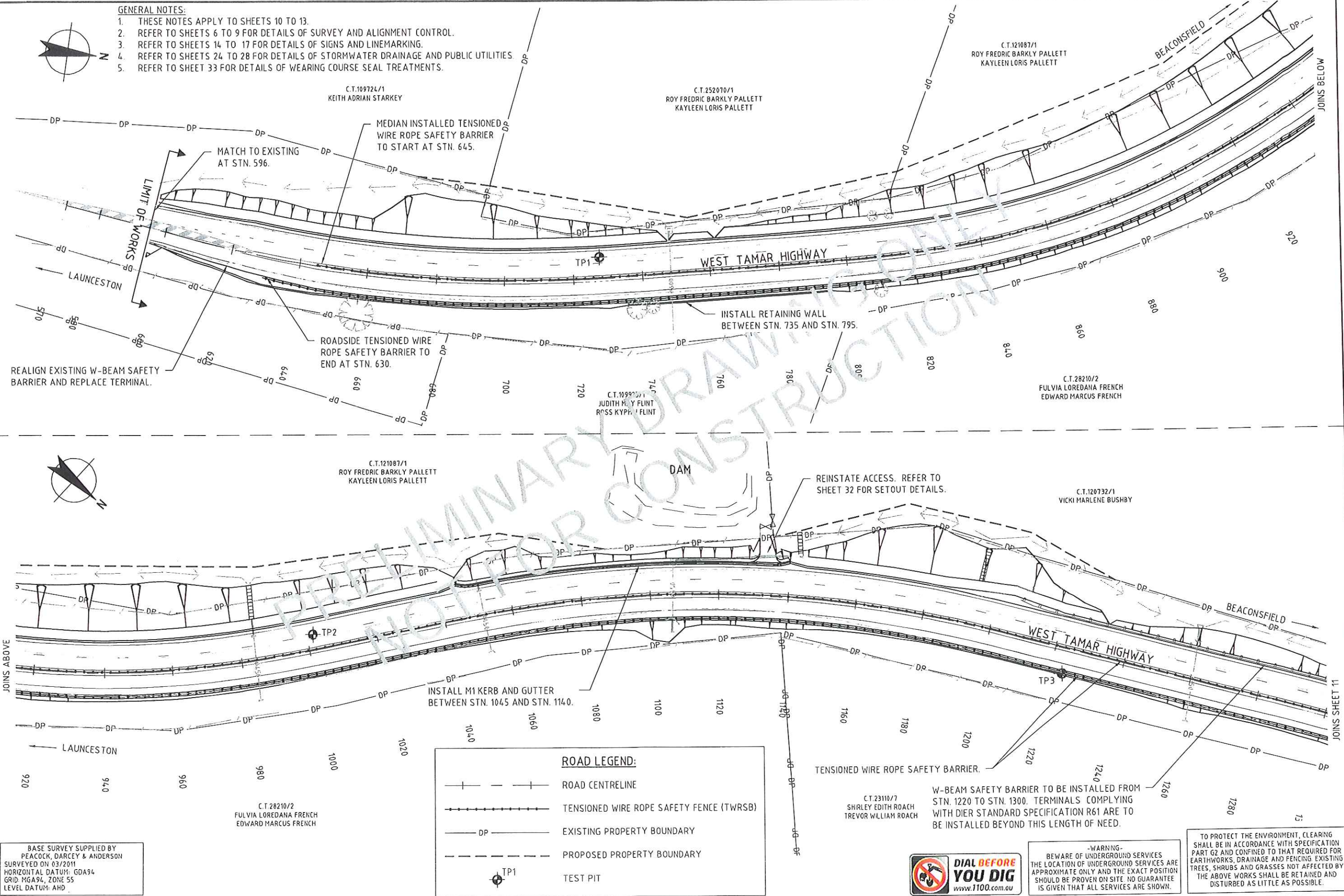
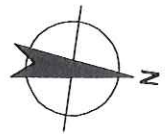
Drawings



				<p>SCALES</p> <p>0 100 200 300m</p> <p>SCALE 1:10,000 AT ORIGINAL SIZE</p>		<p>DESIGNED G.R.S.</p> <p>REVIEWED D.A.R.</p>		<p>Infrastructure Energy and Resources</p> <p>WEST TAMAR HIGHWAY (A0252)</p> <p>NEAR BRADYS LOOKOUT</p> <p>WIRE ROPE SAFETY FENCE AND</p> <p>PAINTED MEDIAN UPGRADE</p> <p>KEY PLAN</p>		<p>FILE No.</p>	<p>DRAWING</p> <p>32-15361-C009.dwg</p>	<p>PRINTED DATE</p> <p>06-Jun-11, 3:05 PM</p>	<p>SHEET No.</p> <p>5</p> <p>OF</p> <p>91</p> <p>VOLUME 1</p>
A	PRELIMINARY DESIGN	M.A.K.	11/03/11							<p>REGISTRATION NUMBER</p> <p>A0252.001</p>			
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.					

GENERAL NOTES:

1. THESE NOTES APPLY TO SHEETS 10 TO 13.
2. REFER TO SHEETS 6 TO 9 FOR DETAILS OF SURVEY AND ALIGNMENT CONTROL.
3. REFER TO SHEETS 14 TO 17 FOR DETAILS OF SIGNS AND LINEMARKING.
4. REFER TO SHEETS 24 TO 28 FOR DETAILS OF STORMWATER DRAINAGE AND PUBLIC UTILITIES.
5. REFER TO SHEET 33 FOR DETAILS OF WEARING COURSE SEAL TREATMENTS.



ROAD LEGEND:

- ROAD CENTRELINE
- TENSIONED WIRE ROPE SAFETY FENCE (TWRSB)
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- TEST PIT



-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

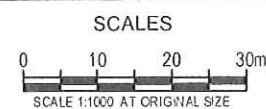
TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH SPECIFICATION PART 02 AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

BASE SURVEY SUPPLIED BY
PEACOCK, DARCEY & ANDERSON
SURVEYED ON 03/2011
HORIZONTAL DATUM: GDA94
GRID: MGA94, ZONE 55
LEVEL DATUM: AHD

C.T.28210/2
FULVIA LOREDANA FRENCH
EDWARD MARCUS FRENCH

C.T.23110/7
SHIRLEY EDITH ROACH
TREVOR WILLIAM ROACH

W-BEAM SAFETY BARRIER TO BE INSTALLED FROM STN. 1220 TO STN. 1300. TERMINALS COMPLYING WITH DIER STANDARD SPECIFICATION R61 ARE TO BE INSTALLED BEYOND THIS LENGTH OF NEED.



Infrastructure Energy and Resources

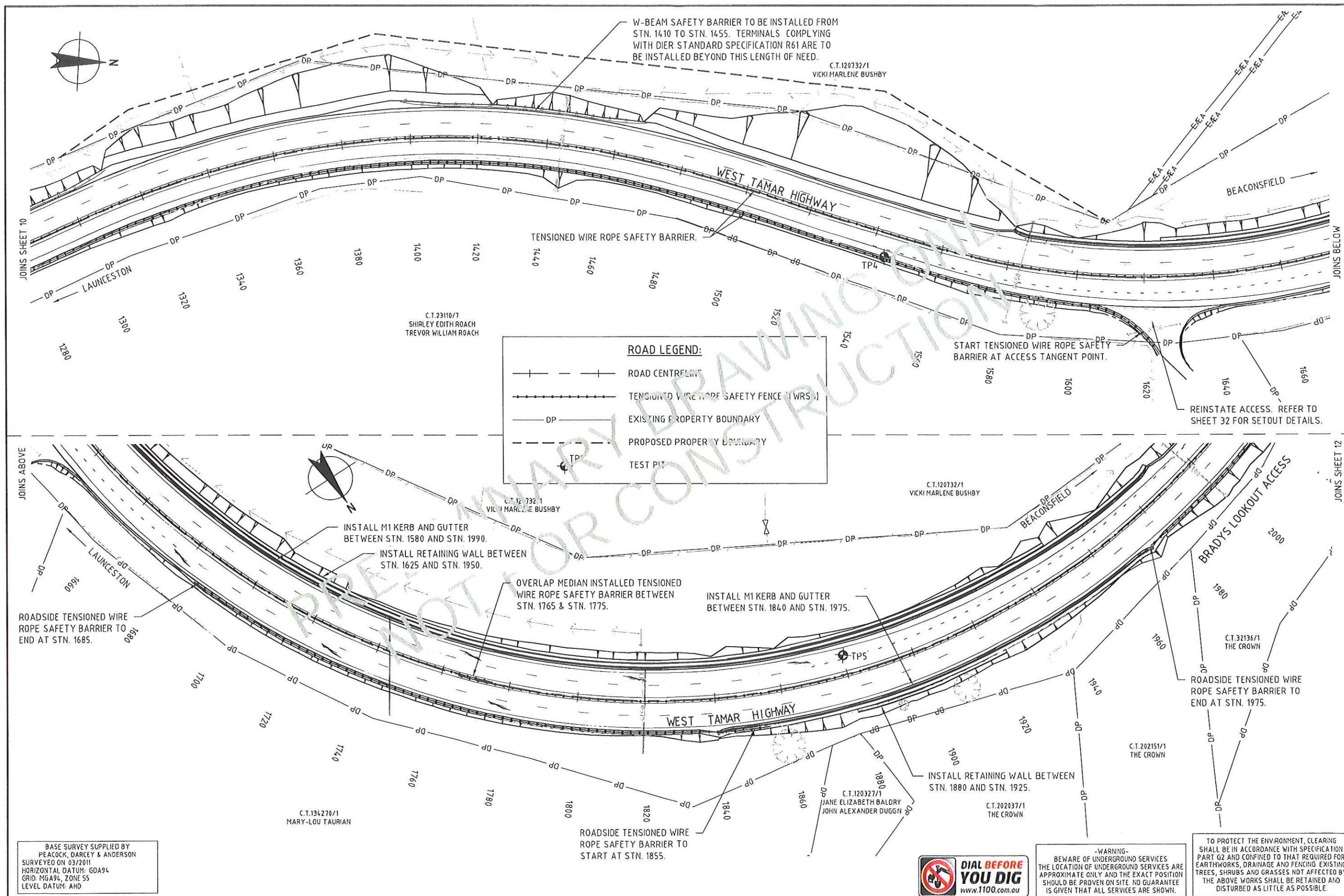
WEST TAMAR HIGHWAY (A0252)
NEAR BRADYS LOOKOUT
WIRE ROPE SAFETY FENCE AND
PAINTED MEDIAN UPGRADE
GENERAL ARRANGEMENT - SHEET 1 OF 4

FILE No.	DRAWING	PRINTED DATE	SHEET No.
	32-15361-C010_C013.dwg	06-Jun-11, 3:33 PM	10
REGISTRATION NUMBER			OF
A0252.001			91
			VOLUME 1

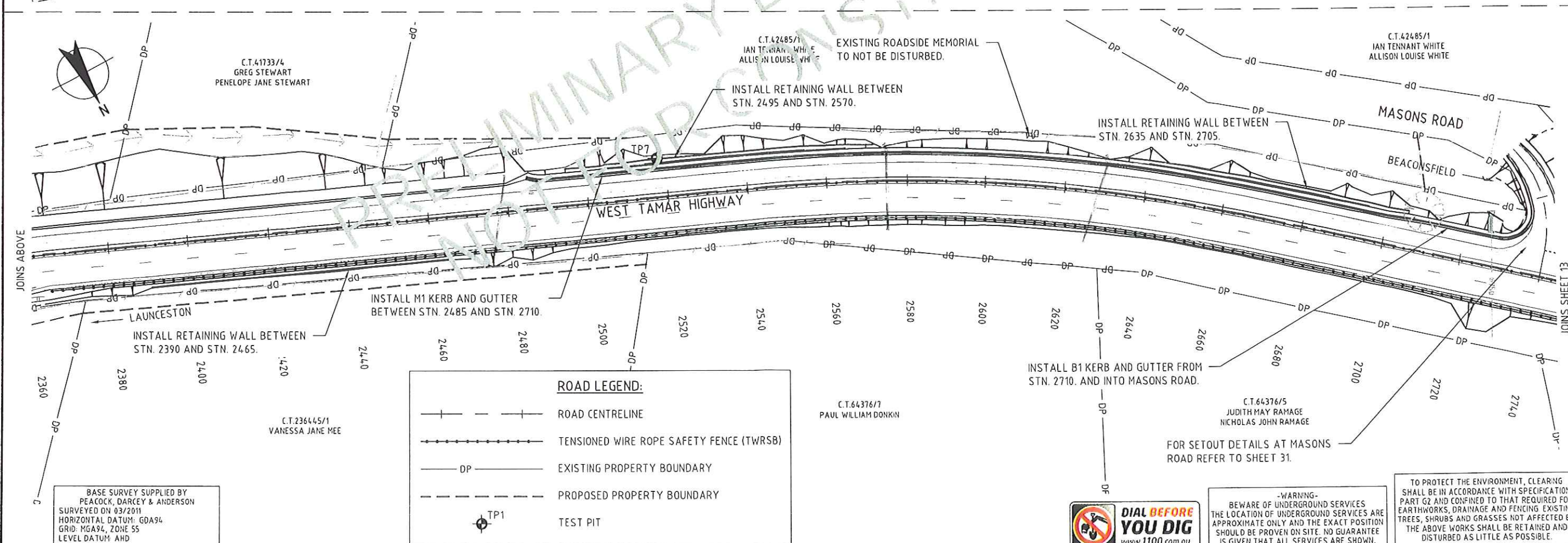
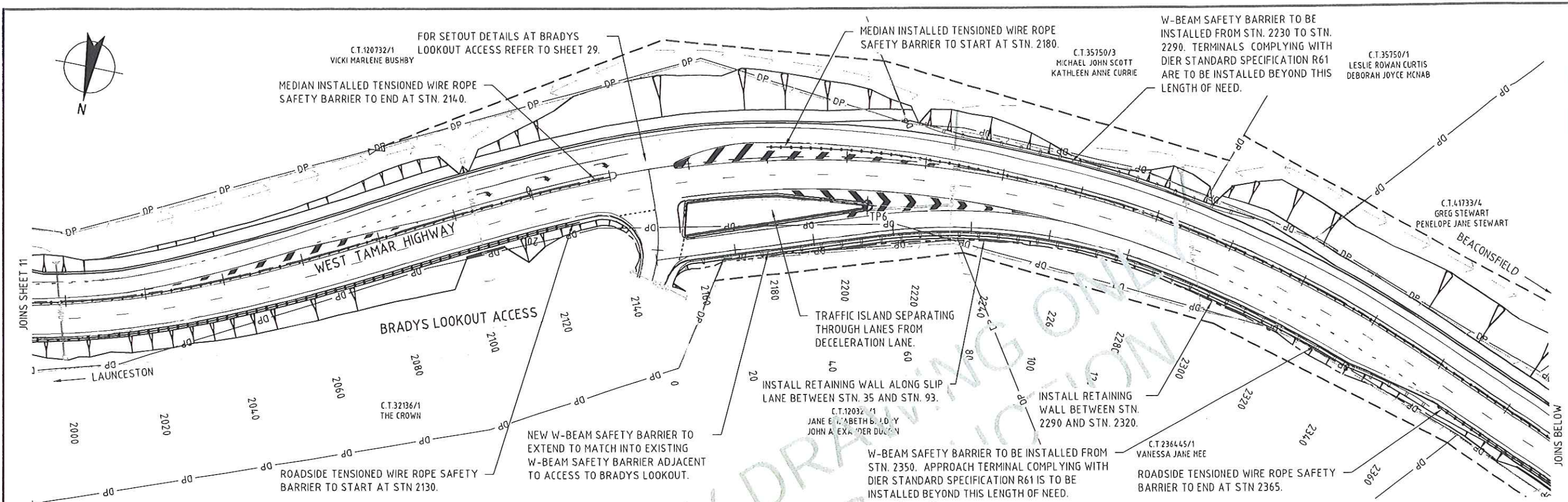
A	PRELIMINARY DESIGN	M.A.K.	11/03/11
No.	Amendment Description	Initials	Date
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

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

DESIGNED G.R.S.
REVIEWED D.R.A.R.



<p>BASE SURVEY SUPPLIED BY PEACOCK, DARCEY & ANDERSON SURVEYED ON 03/2011 HORIZONTAL DATUM: GDA94 GRID: MGA94, ZONE 55 LEVEL DATUM: AHD</p>				<p>SCALES</p> <p>0 10 20 30m</p> <p>SCALE 1:1000 AT ORIGINAL SIZE</p>		<p>DESIGNED G.R.S.</p> <p>REVIEWED D.R.A.R.</p>		<p>Infrastructure Energy and Resources</p> <p>WEST TAMAR HIGHWAY (A0252)</p> <p>NEAR BRADYS LOOKOUT</p> <p>WIRE ROPE SAFETY FENCE AND PAINTED MEDIAN UPGRADE</p> <p>GENERAL ARRANGEMENT - SHEET 2 OF 4</p>		<p>FILE No.</p> <p>32-15361-C010_C013.dwg</p>	<p>DRAWING</p> <p>32-15361-C010_C013.dwg</p>	<p>PRINTED DATE</p> <p>06-Jun-11, 3:34 PM</p>	<p>SHEET No.</p> <p>11 OF 91</p> <p>VOLUME 1</p>
<p>A PRELIMINARY DESIGN M.A.K. 11/03/11</p>				<p>Co-ordinate System: MGA Zone 55</p> <p>Height Datum: A.H.D.</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>	
<p>A3 original This sheet may be prepared using colour and may be incomplete if copied</p>				<p>Co-ordinate System: MGA Zone 55</p> <p>Height Datum: A.H.D.</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>		<p>REGISTRATION NUMBER</p> <p>A0252.001</p>	





ROAD LEGEND:

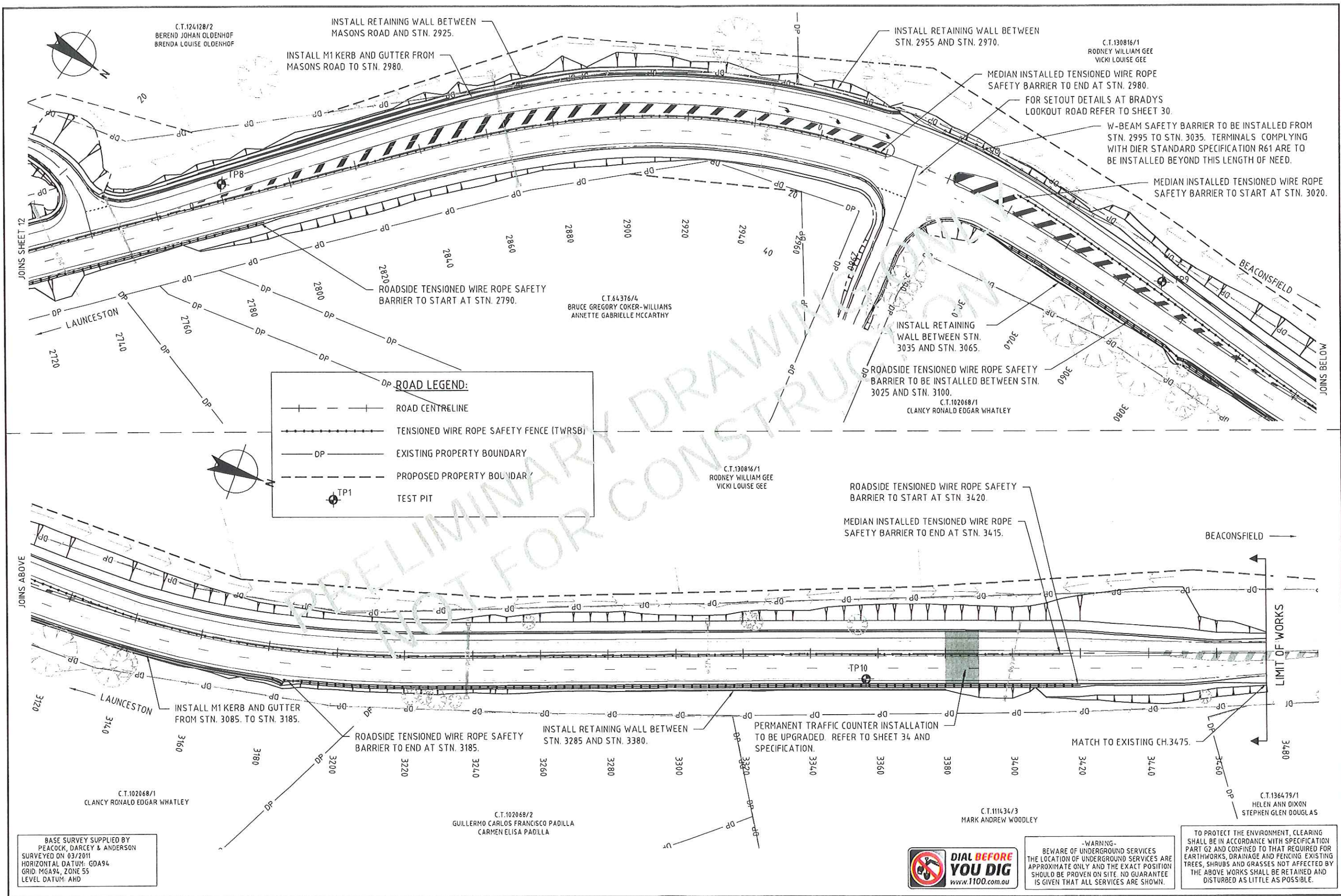
- ROAD CENTRELINE
- TENSIONED WIRE ROPE SAFETY FENCE (TWRSB)
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- TEST PIT



-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THE EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

TO PROTECT THE ENVIRONMENT, CLEARING SHALL BE IN ACCORDANCE WITH SPECIFICATION PART G2 AND CONFINED TO THAT REQUIRED FOR EARTHWORKS, DRAINAGE AND FENCING. EXISTING TREES, SHRUBS AND GRASSES NOT AFFECTED BY THE ABOVE WORKS SHALL BE RETAINED AND DISTURBED AS LITTLE AS POSSIBLE.

				<div>SCALES</div> <div><div>0102030m</div><div>SCALE 1:1000 AT ORIGINAL SIZE</div></div>		<div><div></div><div></div></div>	Infrastructure Energy and Resources		FILE No.	DRAWING	PRINTED DATE	SHEET No.
							WEST TAMAR HIGHWAY (A0252) NEAR BRADYS LOOKOUT WIRE ROPE SAFETY FENCE AND PAINTED MEDIAN UPGRADE GENERAL ARRANGEMENT - SHEET 3 OF 4		32-15361-C010_C013.dwg	06-Jun-11, 3:34 PM	12 OF 91	
A	PRELIMINARY DESIGN	M.A.K.	11/03/11			DESIGNED	G.R.S.		REGISTRATION NUMBER			
No.	Amendment Description	Initials	Date			REVIEWED	D.R.A.R.		A0252.001			
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.						VOLUME 1



-WARNING-
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE
APPROXIMATE ONLY AND THE EXACT POSITION
SHOULD BE PROVEN ON SITE. NO GUARANTEE
IS GIVEN THAT ALL SERVICES ARE SHOWN.

TO PROTECT THE ENVIRONMENT, CLEARING
SHALL BE IN ACCORDANCE WITH SPECIFICATION
PART G2 AND CONFINED TO THAT REQUIRED FOR
EARTHWORKS, DRAINAGE AND FENCING. EXISTING
TREES, SHRUBS AND GRASSES NOT AFFECTED BY
THE ABOVE WORKS SHALL BE RETAINED AND
DISTURBED AS LITTLE AS POSSIBLE.