

**PLANNING PROPOSAL TO PERMIT
SERVICE STATION DEVELOPMENT**

61 – 73 CHRISTIE STREET, ST MARYS

***Assessment of Traffic and
Parking Implications***

September 2015
(Rev B)

Reference 15187 (B)

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1. INTRODUCTION

This report has been prepared to accompany a Planning Proposal to Penrith City Council for a “change to permitted uses” to allow service station development on a site with frontage to Christie Street at St Marys (Figure 1).

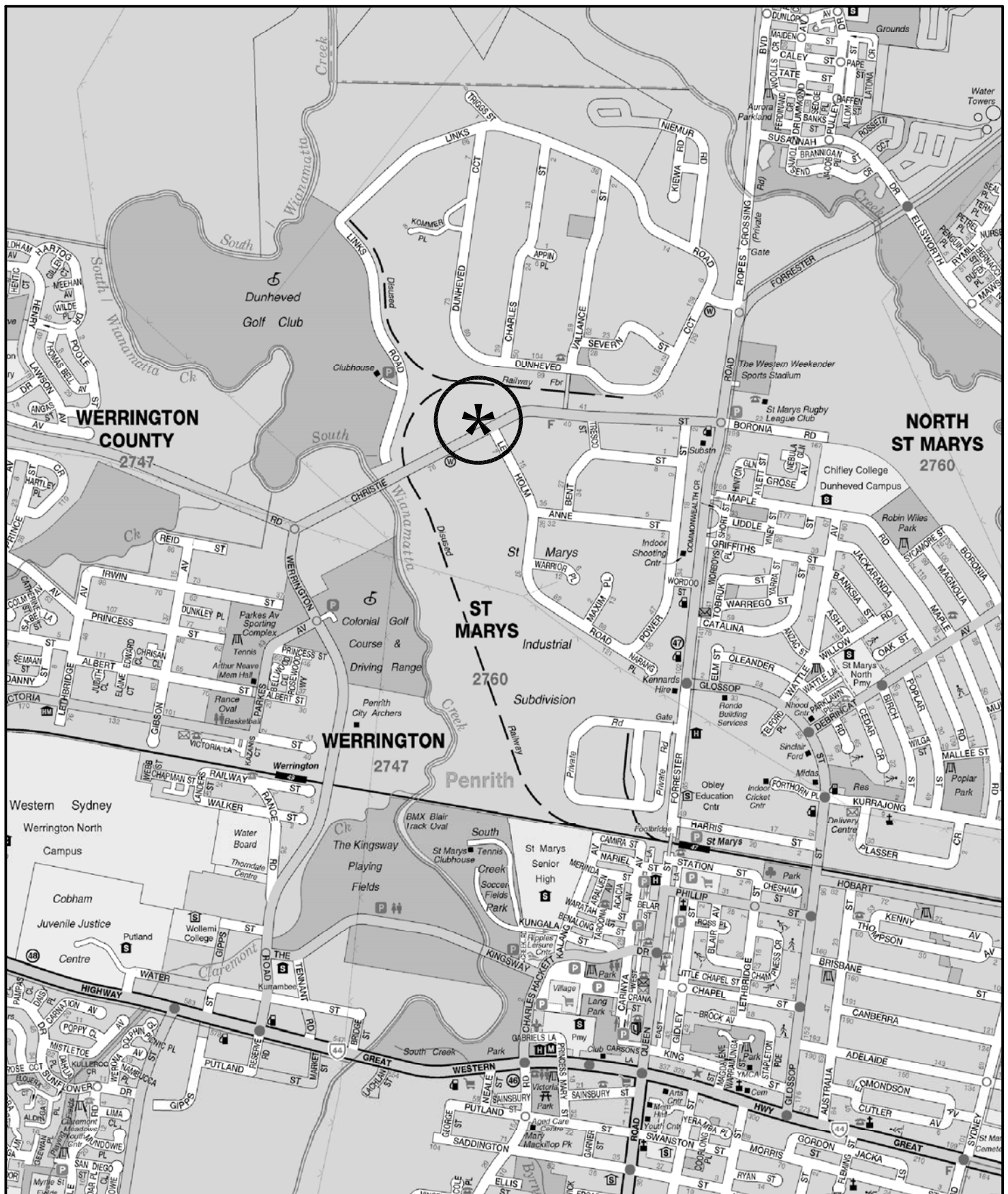
Service Stations accommodate motorists needs and are preferably located where the provision for those needs can be achieved while avoiding unnecessary circulation or movements away from motorist desire lines. The subject site is located within an IN1 – General Industrial zone and it is proposed to include an additional permitted use (service station) in Schedule 1 of Penrith LEP 2010 for the site.

The envisaged service station development comprises:

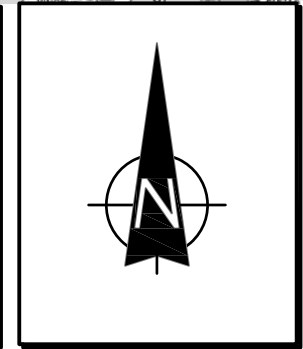
- a service station building incorporating a convenience store and amenities
- separate car and truck fuel dispensers
- access driveways on the Christie Street frontage (and in the future on the proposed new road frontage when constructed)

The purpose of this report is to:

- * describe the site, its context and the envisaged development
- * describe the road network serving the site and traffic conditions on that network as well as the proposed future circumstances
- * assess the envisaged vehicle access and servicing provisions
- * assess the potential traffic implications of the envisaged development
- * assess the adequacy of the envisaged parking provision



LEGEND



LOCATION

FIG 1

2. PLANNING PROPOSAL

2.1 SITE, CONTEXT AND EXISTING USE

The site (Figure 2) is a subdivided part of Lot 4 in DP70187 which has frontage of some 56m to Christie Street, located midway between Werrington Road and Forrester Street which occupies an irregular shaped site which is impacted by proposed roadworks involving:

- a new road connecting between Christie Street and Links Road excising a strip along the eastern side of the site
- a left turn slip lane on Christie Street excising a strip along the southern side of the site

The surrounding uses comprise:

- * the industrial uses extending along Christie Street
- * the Dunheved Industrial Area extending to the north
- * the St Marys Centre and railway station to the south
- * the service stations just to the east along Forrester Street

The total Lot 4 site along with the adjoining Lot 3 is currently occupied by the Better Springs industrial complex which contains a number of older style industrial and office buildings with vehicle accesses located on the extensive frontage to Christie Street. It is envisaged that the site formed by Lot 3 and the residue of Lot 4 will be redeveloped for a “self storage” facility.



LEGEND



SITE

FIG 2



1 DEMOLITION PLAN
1 : 250

**FOR DEVELOPMENT
APPROVAL**

A	1806/2015	ISSUED FOR DEVELOPMENT APPROVAL			M/S
No	Date	Description			By



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Project
ST MARYS SELF STORAGE

61-63 & 69-73 CHRISTIE STREET, ST MARYS

Drawing Title
DEMOLITION PLAN



A1 Scale	A3 Scale	Date	Drawn
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1 : 250 HALF A1 SCALE 11/05/15 MS

Drawing No	Revision
15-008 DA04	A

2.2 ENVISAGED DEVELOPMENT

The existing buildings would be demolished and minor earthworks undertaken to install fuel tanks and to provide level platforms for building and hardstand areas. The service station/convenience store building would be constructed on the northern part of the site with a fuel canopy and multi product fuel dispensers for cars in the centre of the site and for trucks on the western part.

The envisaged development comprises:

- * service station incorporating a convenience store (150m² GFA)
- * 12 parking spaces
- * Separate ingress and egress driveways on Christie Street (initially) with subsequent closure of the egress driveway and provision of a combined ingress and egress driveway on the new frontage road when constructed

Details of the envisaged development are provided on the plans prepared by MCHP Architects which accompany the Planning Proposal and are reproduced in part in Appendix A.

3. ROAD NETWORK AND TRAFFIC CONTROLS

3.1 ROAD NETWORK

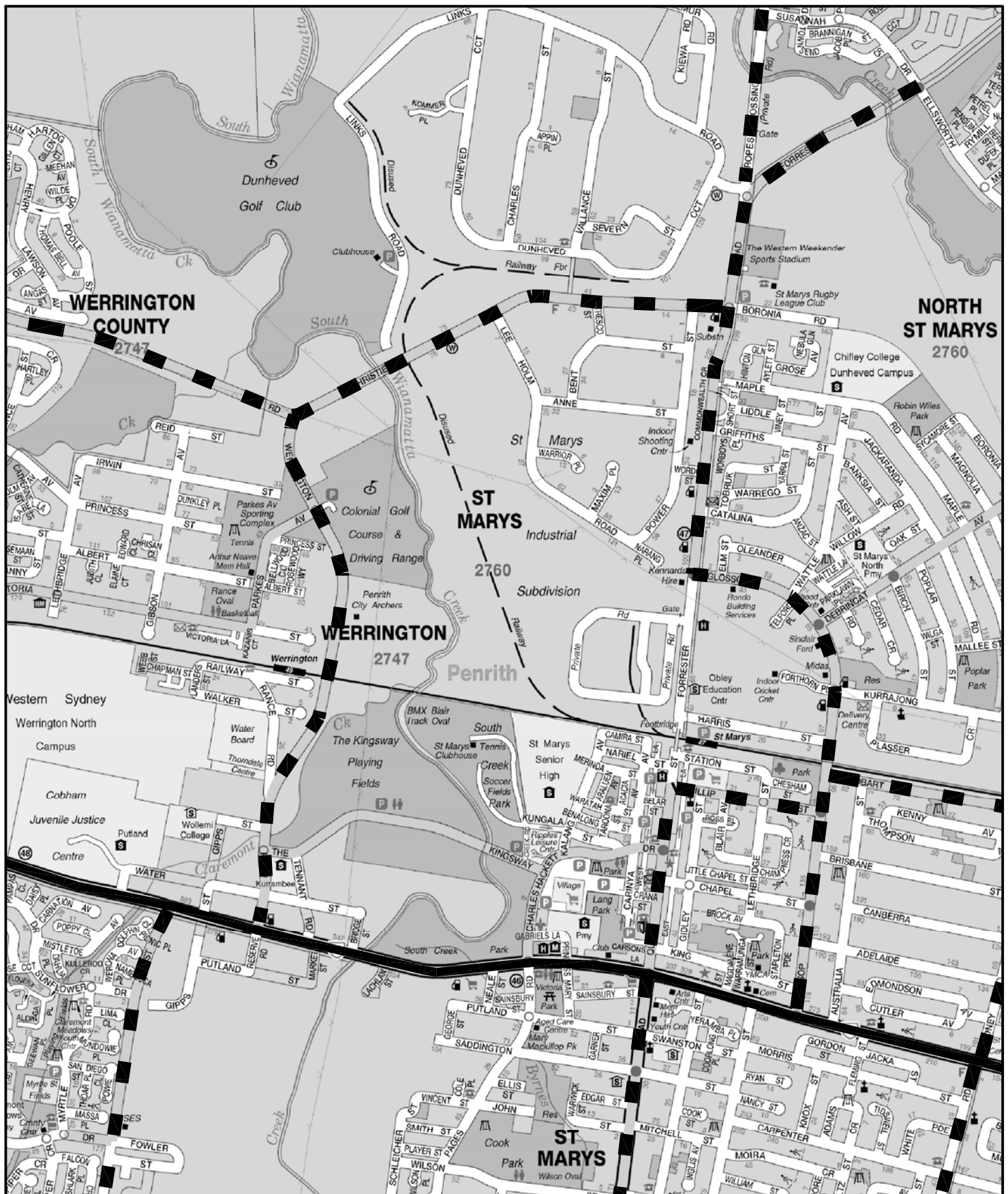
The road network serving the site (Figure 3) comprises:

- * *Great Western Highway* – a State Road and arterial route linking between Penrith and Parramatta
- * *Forrester Road/Glossop Street* – part of the major north-south collector road route through St Marys
- * *Christie Street/Dunheved Road* – part of a collector road route linking between The Northern Road and Forrester Road
- * *Werrington Road* – north-south collector road linking between Christie Street and the Great Western Highway
- * *Links Road/Dunheved Road* – a minor collector route provides access through to Dunheved Industrial area
- * *Links Road/Dunheved Circuit* – a minor collector route providing access through the Dunheved Industrial Area
- * *Lee Holm Road* – a local access road providing access to the St Marys Industrial area

Barriers to the road system are presented by the railway lines and South Wiannamatta and Ropes Creek waterways and as a result the Dunheved Industrial area only has one vehicle access point at the present time.

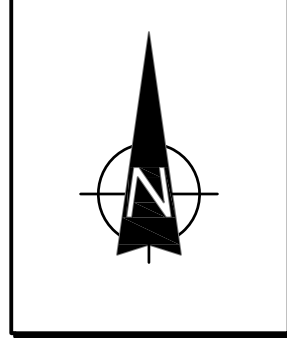
3.2 TRAFFIC CONTROLS

The existing traffic controls on the road system in the vicinity of the site (Figure 3) include:



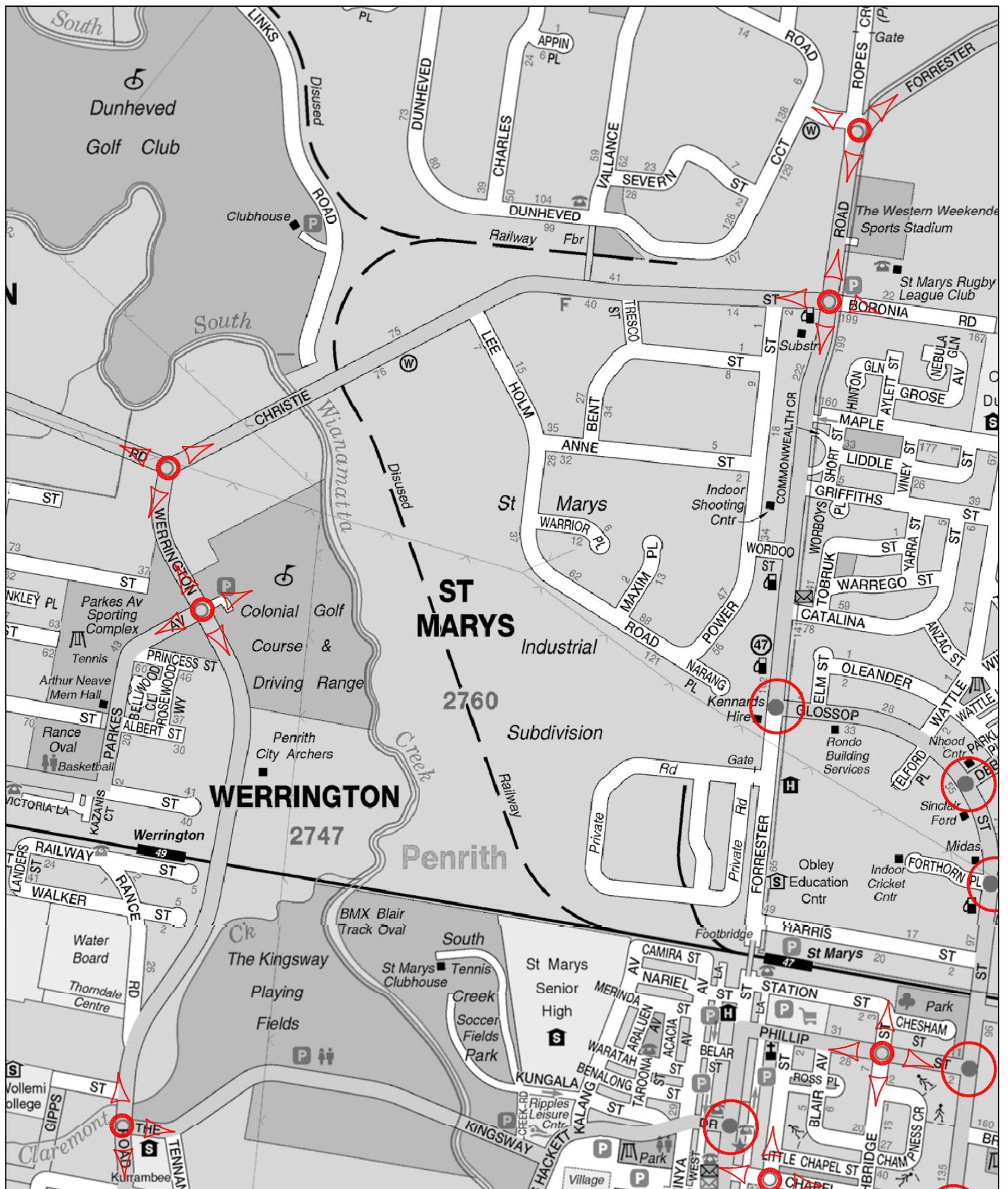
LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR



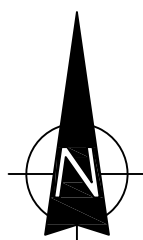
ROAD NETWORK

FIG 3



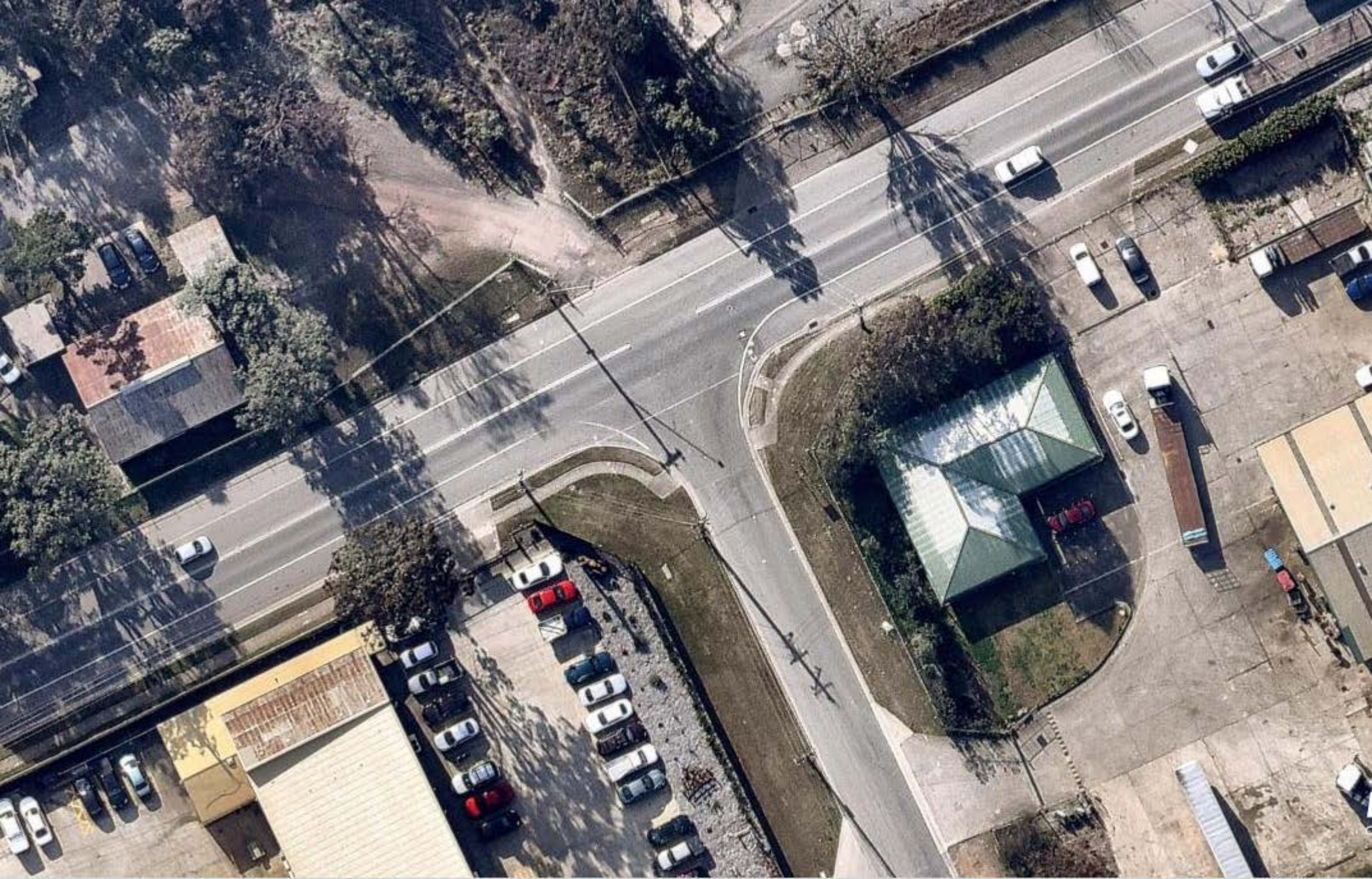
LEGEND

-  TRAFFIC SIGNAL CONTROL
-  ROUNDABOUT
-  RESTRICTED TURNING MOVEMENT



TRAFFIC CONTROLS

FIG 4



- * traffic control signals at the intersections along the Great Western Highway including Werrington Road and Gossop Street
- * roundabouts along Christie Street at the Werrington Road and Forrester Road/Boronia Road intersections
- * the 60 kmph speed restriction along Christie Street
- * the roundabout at the Forrester Road/Links Road/Ropes Crossing Road intersection
- * the linemarked parking lanes along Christie Street
- * the GIVEWAY control on Lee Holm Road at Christie Street (see details on image overleaf)

3.3 TRAFFIC CONDITIONS

An indication of the prevailing traffic conditions on the road system serving the site is provided by data provided by surveys undertaken as part of this study. The results of the morning and afternoon peak surveys at the Christie Street and Lee Holm Road intersection are provided in the following:

	AM	PM
Christie Street		
Eastbound	958	880
Right Turn	10	12
Westbound	722	1,178
Left Turn	28	10
Lee Holm Road		
Right Turn	10	18
Left Turn	38	116

The operational performance of this intersection under the existing circumstances has been modelled using SIDRA. The results of that assessment indicating a satisfactory performance are provided in Appendix B and summarised in the following while the criteria for interpreting SIDRA results is reproduced overleaf.

	AM	PM
LOS	A-D	A-F
DS	0.516	1.00
AVD	7.9	25.4

3.4 FUTURE CIRCUMSTANCES

Council has been concerned about the access difficulties for the Dunheved Industrial Area and have identified a scheme to provide a new (additional) access road connection. That proposed connection involves an extension of Links Road connecting into the existing Christie Street (at the Lee Holm Road intersection) from the north to create a 4-way intersection.

Design and traffic studies are currently being undertaken and a Voluntary Planning Agreement is being prepared by Council. It is envisaged that the 4-way intersection created with the new road will be controlled by traffic signals.

Concept details of the intersection scheme are provided on the diagrams prepared by J Wyndham Prince reproduced overleaf and in Appendix C.

Criteria for Interpreting Results of SIDRA Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and Accident Study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below, which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode

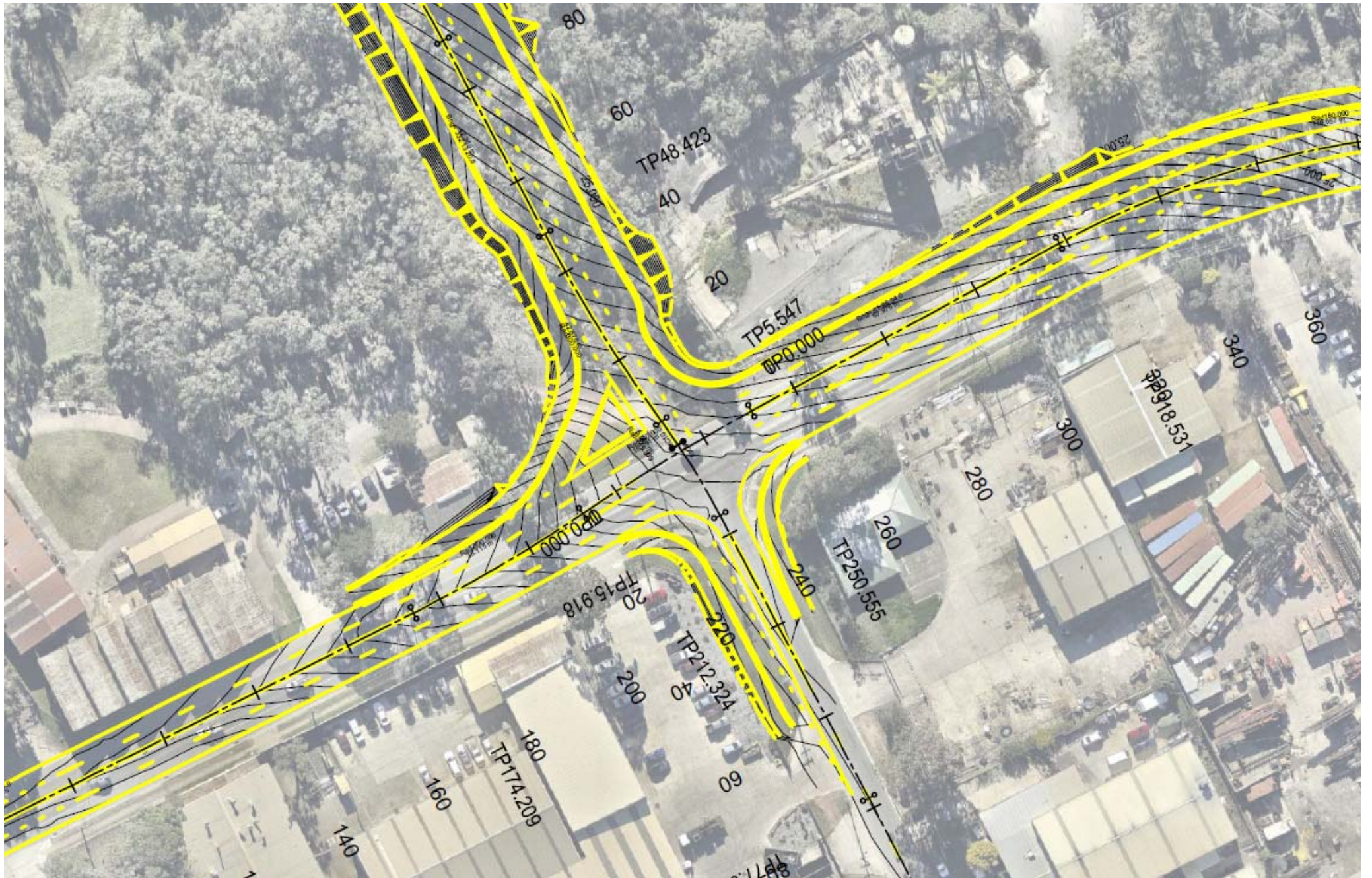
3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**¹ both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

¹ the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs



4. ACCESS AND TRAFFIC

ACCESS

The envisaged separate ingress and egress driveways are some 12m wide being located adjacent to the western and eastern boundaries respectively.

The envisaged driveways will:

- afford good sight distance provisions
- comply with the requirements of AS2890.1 and 2
- accommodate all vehicles requiring to access the site including fuel tankers

Subject to construction of the proposed new access road link to the Dunheved Industrial Area the driveway arrangement would be modified with:

- closure of the egress driveway
- construction of a combined ingress/egress driveway on the new access road frontage at the northern site boundary

TRAFFIC

The site is currently occupied by an office building and some other “outbuilding” with at-grade carparking and a vehicle access on Christie Street at the western boundary.

A very large proportion of vehicles which will access the proposed service station will be “drop in” trips (i.e. vehicles from the existing traffic flows past the site and the future flows to/from the Dunheved Industrial Area). As such the envisaged development will not generate any significant “additional” traffic movements having regard for the ‘discount’ attributable to the existing longstanding industrial use.

RMS Development Guidelines specify the peak afternoon/evening traffic generation of a service station/convenience store as $0.66 A (F)$ where $A (F)$ is the convenience store GFA. Application of this criteria indicates a generation of some 100 vtpd (150×0.66).

There are a number of existing nearby service stations in the area which will present competition while surveys have been undertaken by TTPA at a number of comparable existing service station/convenience stores and the aggregated results of those surveys in terms of peak vtpd in the morning, afternoon and weekend periods are provided in the following:

AM	PM	WEMD
100 vtpd	130 vtpd	60 vtpd

The great majority of access movements will be left turn IN/OUT movements occurring along Christie Street (and the future access road) for vehicles travelling past the envisaged service station. Because the great majority of trips will be “drop in” there will not be any perceptible affectation to the Christie Street traffic circumstances or at nearby intersections.

Details are not available/resolved in relation to the future intersection, however the same traffic circumstances would pertain in that the encouraged development will not result in an significant increase to the future vehicle movements at the intersection.

Based on the above it is apparent that the envisaged development will not have any adverse traffic implications.

5. PARKING

Penrith Council's carparking DCP specifies a parking provision in relation to service station/convenience store of:

- 1 space per 20m² GFA for convenience store

Application of these criteria to the envisaged convenience store indicates the following:

150 m² @ 1 per 20 m² - 8 spaces

It is envisaged to provide a total of 12 parking spaces including 1 disabled driver space as well as 6 car spaces at the pumps and this will be compliant with Council's requirements and will accommodate potential peak demands.

6. INTERNAL CIRCULATION AND SERVICING

INTERNAL CIRCULATION

The carpark area will be designed to accord to the design requirements of AS2890.1, 2 and 6 with generous parking bay and manoeuvring provisions. Refuelling will be provided for truck and semi-trailer vehicles and swept path details of these vehicles accessing the envisaged service station are provided in Appendix D.

SERVICING

Deliveries for the convenience store and refuse removal will be undertaken utilising a loading bay adjacent to the service station building. Fuel deliveries will be made using a semitrailer ingressing and egressing as shown in the swept path diagrams in Appendix D. As is normal with service stations, deliveries will be programmed to occur outside of peak trading periods.

7. CONCLUSION

The envisaged service station/convenience store development at St Marys will involve a site which will provide convenient access for the surrounding industrial/employment uses. This assessment has concluded that the design of the development in terms of vehicle access, circulation, parking and servicing is appropriate and that there will not be any adverse traffic impacts on the road system serving the site.

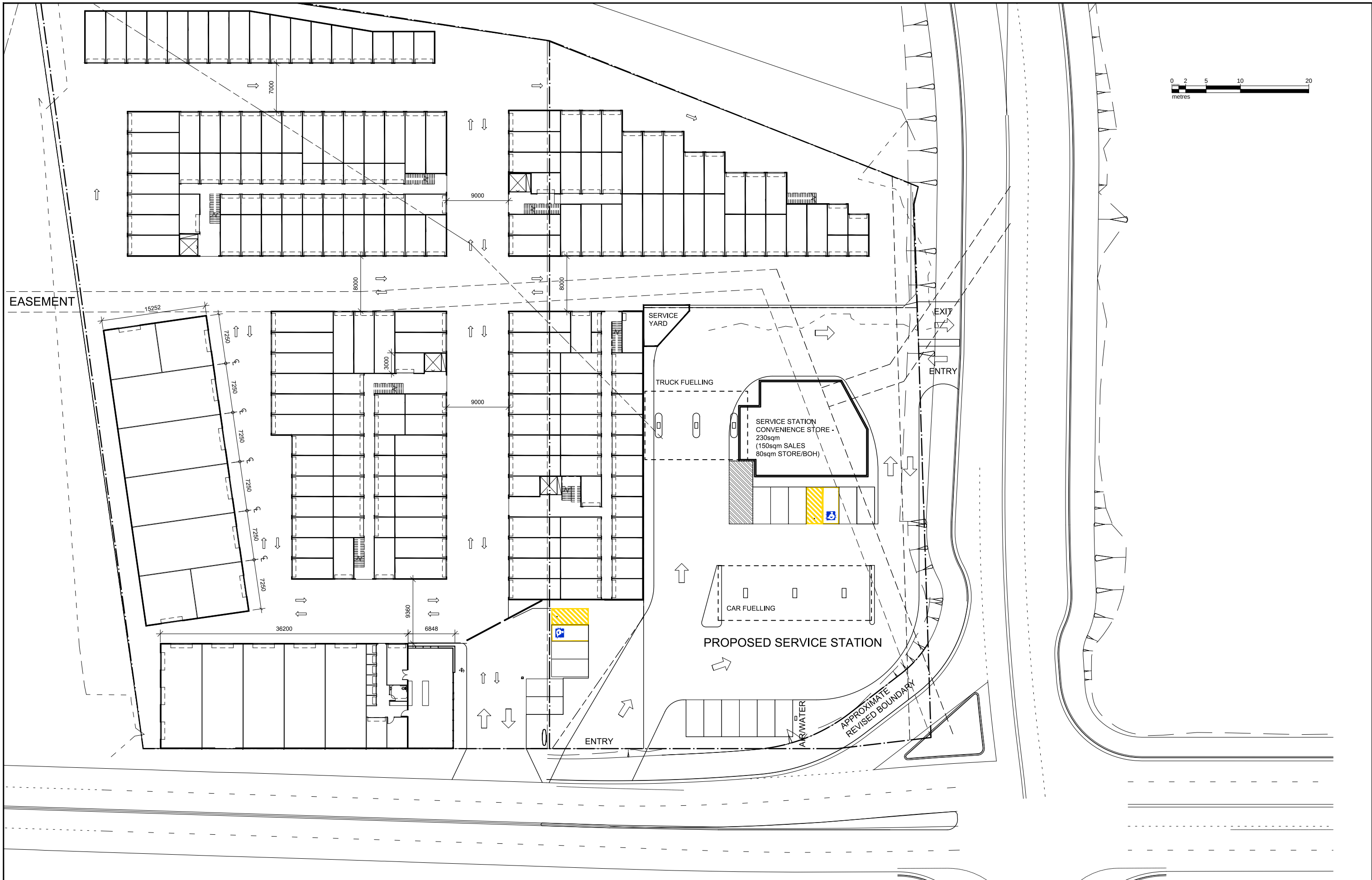
Appendix A

PLANS OF ENVISAGED DEVELOPMENT

C	02.09.2015	ENTRIES TO SELF STORAGE AND SERVICE STATION FURTHER SEPARATED		H
B	01.09.2015	ENTRIES OFF CHRISTIE STREET SEPARATED, MINOR LAYOUT ADJUSTMENTS		H
A	31.08.2015	COMBINED DRIVEWAY TO SERVICE STATION AND SELF STORAGE		H
	Date	Amendment		B



Drawing Title			
CONCEPT DESIGN - SITE - SERVICE STATION			
A1 Scale 1:250	A3 Scale HALF A1 SCALE	Date 31.08.2015	Drawn HS
Drawing No 15-008-SK02			Revision C



PRELIMINARY

No	Date	Amendment	By
C	02.09.2015	ENTRIES TO SELF STORAGE AND SERVICE STATION FURTHER SEPARATED	HS
B	01.09.2015	ENTRIES OFF CHRISTIE STREET SEPARATED, MINOR LAYOUT ADJUSTMENTS	HS
A	31.08.2015	COMBINED DRIVEWAY TO SERVICE STATION AND SELF STORAGE	HS



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Client
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Project
**PRELIMINARY SITE CONCEPT
KSS ST MARYS
61-63 69-73 CHRISTIE STREET
ST MARYS**

Drawing Title			
CONCEPT DESIGN - SITE - SERVICE STATION			
A1 Scale 1:250	A3 Scale HALF A1 SCALE	Date 31.08.2015	Drawn HS
Drawing No 15-008-SK03			Revision C

Appendix B

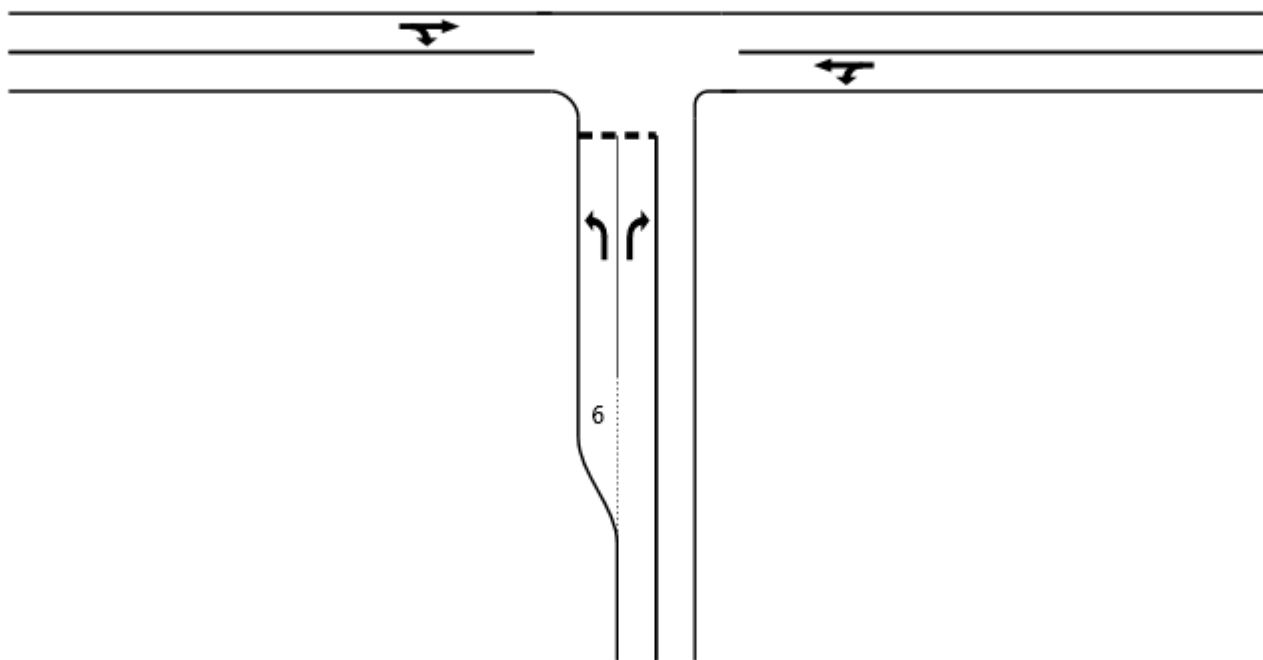
SIDRA RESULTS



CHRISTIE

CHRISTIE

LEE HOLM



MOVEMENT SUMMARY

Site: CHRISTIE & LEE HOLM RD
AM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: LEEHOLM											
1	L	38	2.0	0.164	14.9	LOS B	0.3	2.0	0.66	0.89	42.6
3	R	10	2.0	0.133	53.3	LOS D	0.4	2.6	0.95	0.98	24.2
Approach		48	2.0	0.164	22.9	LOS B	0.4	2.6	0.72	0.91	36.8
East: CHRISTIE											
4	L	28	2.0	0.390	8.3	LOS A	0.0	0.0	0.00	1.07	49.0
5	T	722	2.0	0.390	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		750	2.0	0.390	0.3	NA	0.0	0.0	0.00	0.04	59.5
West: CHRISTIE											
11	T	958	2.0	0.516	13.0	LOS A	12.7	90.4	1.00	0.00	41.2
12	R	10	2.0	0.516	21.4	LOS B	12.7	90.4	1.00	1.22	41.0
Approach		968	2.0	0.516	13.1	NA	12.7	90.4	1.00	0.01	41.2
All Vehicles		1766	2.0	0.516	7.9	NA	12.7	90.4	0.57	0.05	47.2

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

Processed: Monday, 24 August 2015 9:25:52 AM
SIDRA INTERSECTION 5.1.13.2093

Project: F:\WORK15\15187 - 61-73 CHRISTIE STREET, ST MARYS\MODELLING\CHRISTIE LEEHOLM.sip
8000272, TRANSPORT & TRAFFIC PLANNING ASSOCIATES, SINGLE

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: CHRISTIE & LEE HOLM RD
PM

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: LEEHOLM											
1	L	91	2.0	1.000 ³	37.1	LOS C	2.1	14.9	0.97	0.99	29.7
3	R	43	2.0	1.000 ⁴	299.6	LOS F	6.9	48.9	1.00	1.22	6.4
Approach		134	2.0	1.000	121.0	LOS F	6.9	48.9	0.98	1.06	13.8
East: CHRISTIE											
4	L	10	2.0	0.617	8.3	LOS A	0.0	0.0	0.00	1.09	49.0
5	T	1178	2.0	0.617	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1188	2.0	0.617	0.1	NA	0.0	0.0	0.00	0.01	59.9
West: CHRISTIE											
11	T	880	2.0	0.520	44.6	LOS D	20.8	147.9	1.00	0.00	25.8
12	R	12	2.0	0.520	53.0	LOS D	20.8	147.9	1.00	1.23	25.7
Approach		892	2.0	0.520	44.7	NA	20.8	147.9	1.00	0.02	25.8
All Vehicles		2214	2.0	1.000	25.4	NA	20.8	147.9	0.46	0.08	34.6

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

³ x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

⁴ x = 1.00 due to minimum capacity

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SIDRA INTERSECTION 5.1.13.2093

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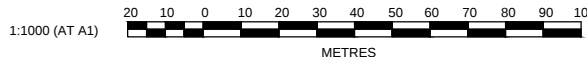
SIDRA
INTERSECTION

Appendix C

PLANS OF PROPOSED ROAD



DRAFT ISSUE ONLY
THESE PLANS HAVE NOT COMPLETED J. WYNDHAM PRINCE'S QUALITY REVIEW, CHECKING AND APPROVAL PROCESS AND ARE SUBJECT TO CHANGE



B	WATER QUALITY DEVICES UPDATED	DP	DP	AM	RO	01/04/15			
A	ISSUE FOR DA APPROVAL	DP	TG	AM	RO	28/07/14			
	AMENDMENT	DES	DRN	CKD	APR	DATE			

J. WYNDHAM PRINCE

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CHRISTIE STREET ST MARYS
INDUSTRIAL ESTATE AND LINK ROAD

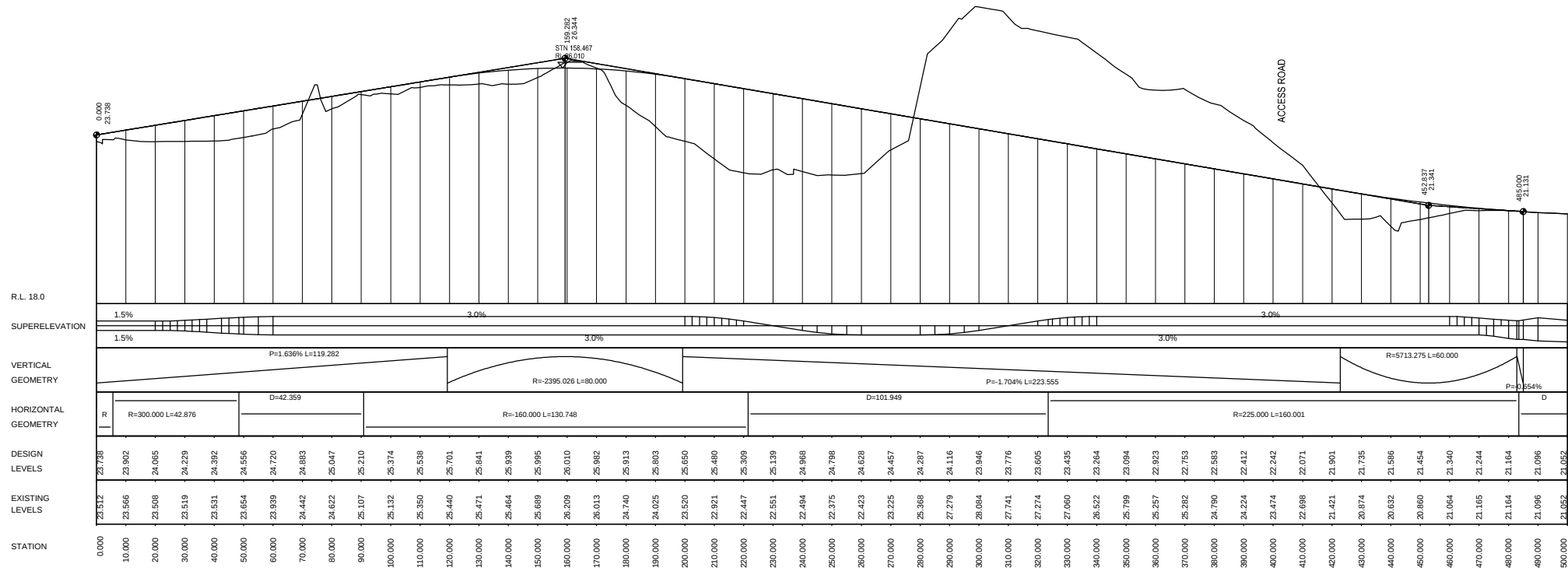
PLAN

PLAN No:
DAR-003

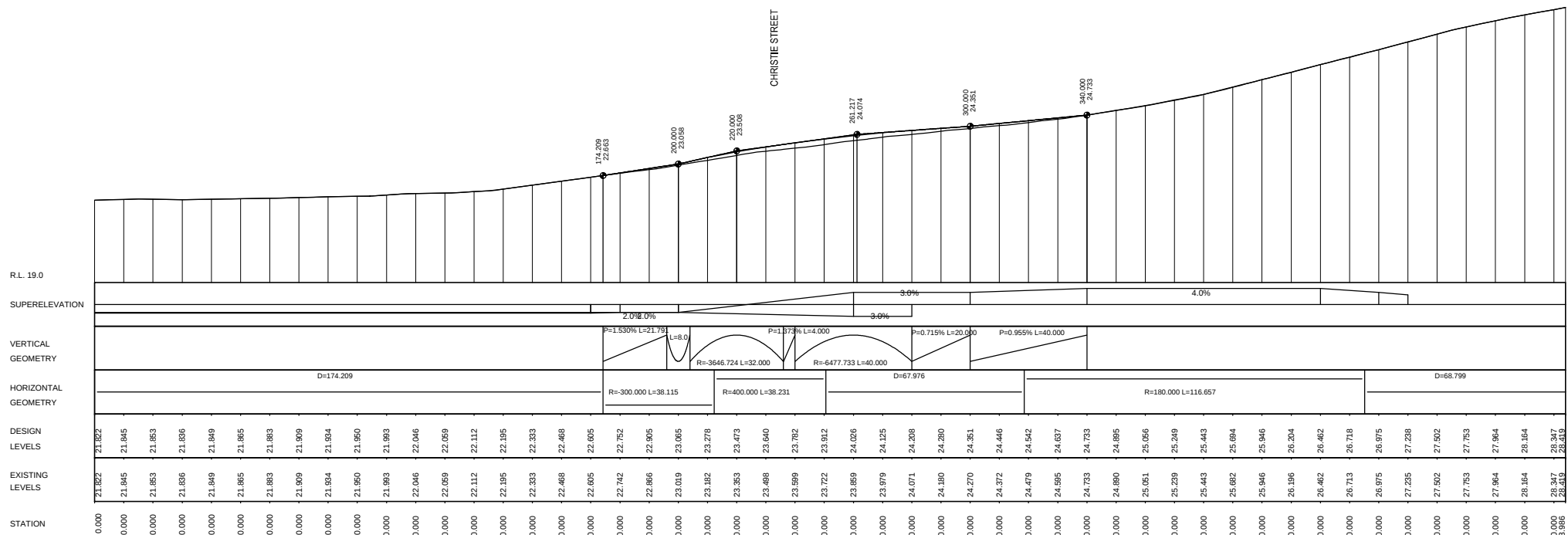
FILE No: 110069DAR-003

SHEET SIZE: A1 ORIGINAL

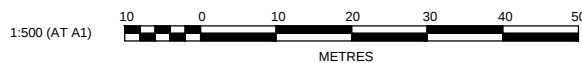
B



LONGITUDINAL SECTION - LINK ROAD - MC10



LONGITUDINAL SECTION - CHRISTIE STREET - MC00



A	ISSUE FOR DA APPROVAL	DP	TG	AM	RO
	AMENDMENT	DES	DRN	CKD	APR
					DATE

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CHRISTIE STREET ST MARYS INDUSTRIAL ESTATE AND LINK ROAD
LONGITUDINAL SECTIONS

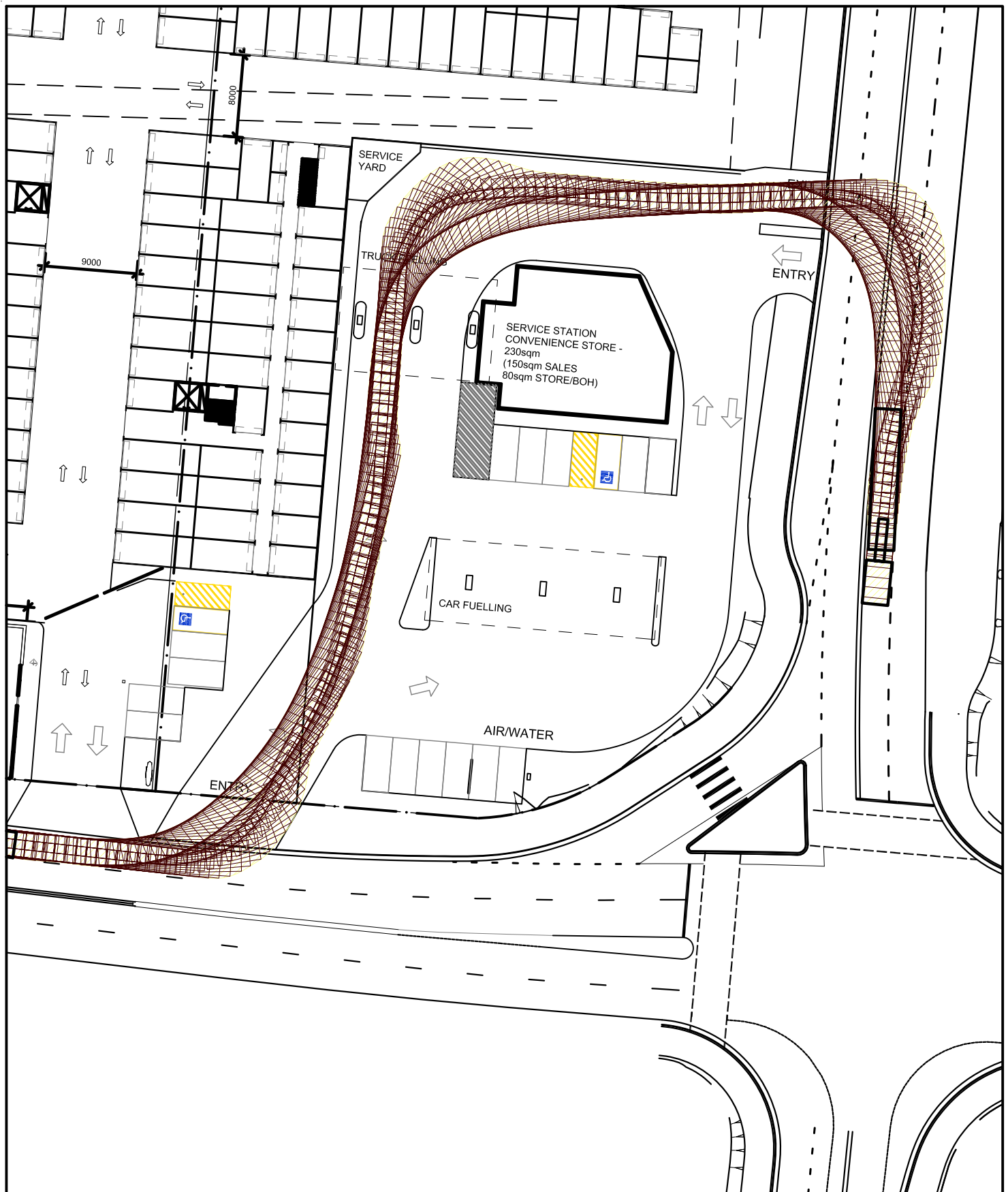
PLAN No: **DAR004**

FILE No: 110069DAR-004

SHEET SIZE: A1 ORIGINAL

Appendix D

TURNING PATH ASSESSMENT



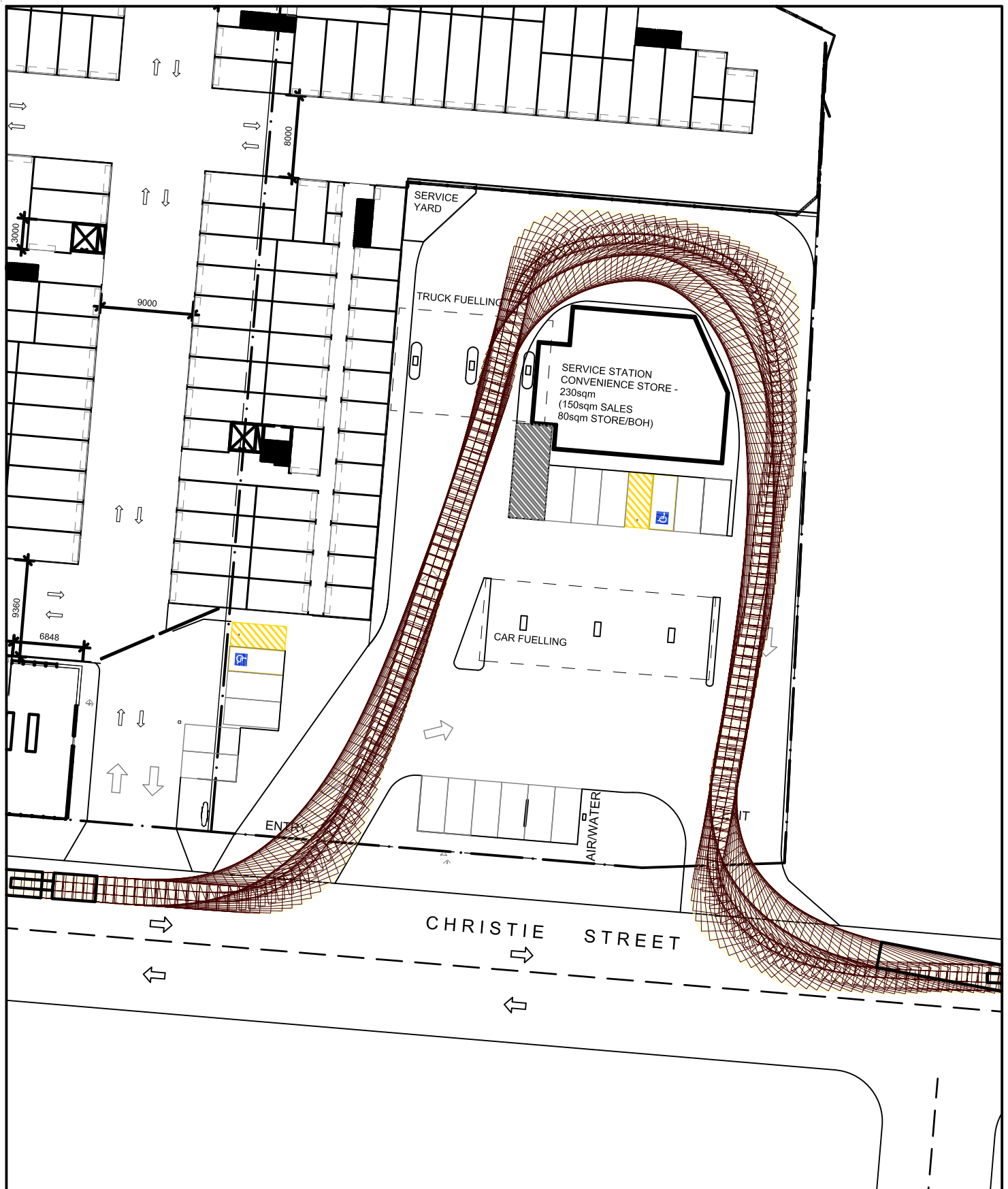
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
OF A 19m ARTICULATED
VEHICLE ENTERING AND
EXITING THE SITE**

SP 1



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
OF A 19m ARTICULATED
VEHICLE ENTERING AND
EXITING THE SITE**

SP 2