acouras CONSULTANCY

Mosca Pserras Architects

194 Campbelltown Road, Denham Court

Acoustic DA Assessment

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1 Introduction

The following report has been prepared by Acouras Consultancy on behalf of Mosca Pserras Architects to assess the potential for noise impact associated with the proposed new service station at 194 Campbelltown Road, Denham Court. The site location is shown in Figure 1.

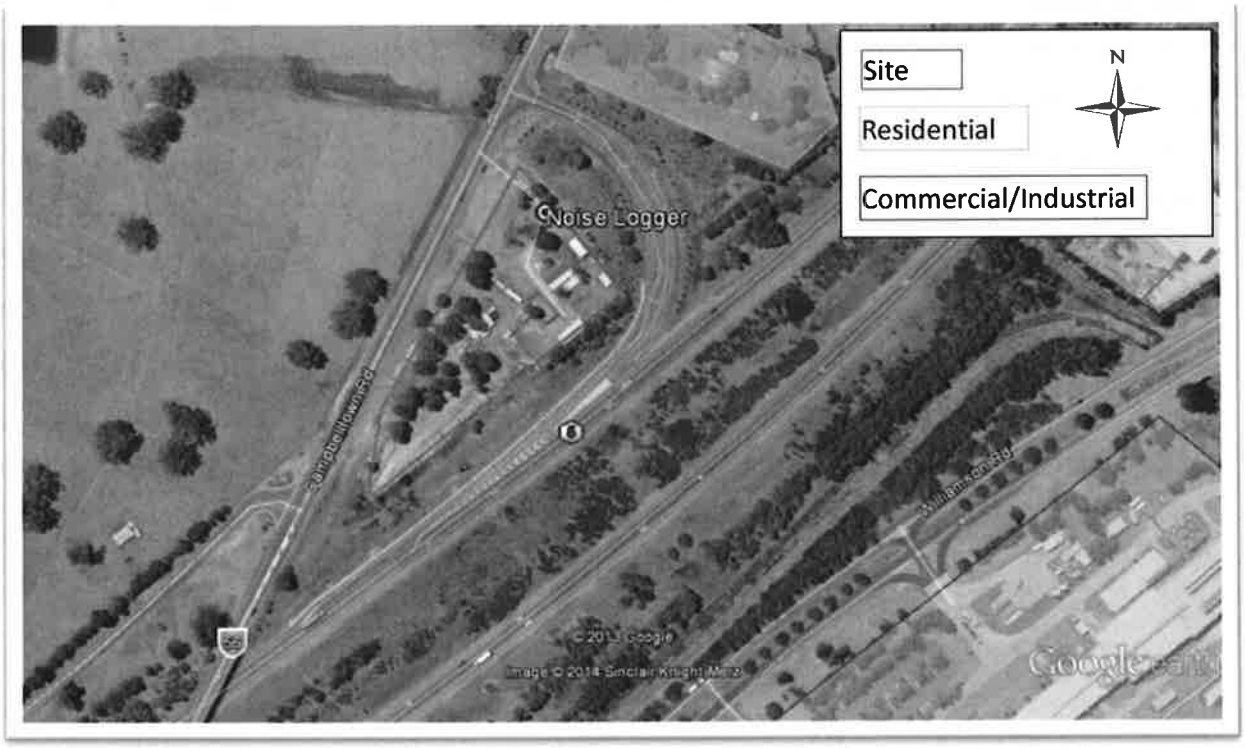


Figure 1 – Site Location, Nearest Residents and Noise Logger Position

2 Noise Criteria

The following standards and guidelines are applicable to this project:

- NSW EPA "Industrial Noise Policy" (INP).
- NSW EPA "Road Noise Policy" (RNP).
- Australian standard AS/NZS 2107-2000: Acoustics – Recommended design sound levels and reverberation times for building interiors.
- Australian standard AS 1055.1-1997: Acoustics – Description and measurement of environmental noise - General procedures.

2.1 Internal Noise Levels

For the commercial developments, the AS/NZS 2107–2000 outlines the acceptable internal noise levels such that a satisfactory acoustic environment within occupied spaces in new and existing buildings can be achieved. Table 1 presents the recommended internal design noise levels for retail buildings.

Table 1— Recommended Internal Design Noise Levels (AS/NZS 2107)

Type of occupancy/activity	Recommended design sound level, L_{eq} in dB(A)	
	Satisfactory	Maximum
Small retail store (small)	45	50

2.2 Noise Survey and Project Specific Limits

An unattended noise survey was carried out at the site to measure the background and ambient noise levels. Nose monitoring was conducted between Friday 17th to 23rd January 2014. The monitor was positioned in on the boundary at the northern end of the site. Location is shown in Figure 1. Measurements were conducted using the following equipment:

- SVAN 977 Type 1 Real time Analyser/Noise Logger. Serial No. 34135.
- SVAN SV30A Type 1 Sound Level Calibrator. Serial No. 31830.

Noise monitoring was conducted in general accordance with Australian standard AS 1055.1-1997: Acoustics-Description and measurement of environmental noise-General procedures.

The noise analyser was calibrated immediately before and after measurements were taken with no discernible differences between these two recorded levels. The sound analyser is Type 1 and comply with Australian standard AS1259.2: 1990.

Table 2 presents a summary of the measured ambient noise level and traffic noise impacting the development.

Table 2 – Measured Ambient and Traffic Noise and Levels, dBA

Location	Period	Average L_{eq}	Highest L_{eq} 1hr
194 Campbelltown Rd	Day (07:00-22:00)	62	65
	Night (22:00-07:00)	58	64

Table 3 presents a summary of the measured background noise level and the allowable intrusive noise limit for this project in accordance with the NSW Industrial Noise Policy guidelines.

Table 3—Noise Survey Summary and Project Limits, dBA

Location	Time Period	Existing Noise Levels		NSW Industrial Noise Policy	
		$L_{eq\ (period)}$	RBL	Amenity Criteria Recommended Noise Level (acceptable), L_{eq}	Project Specific Limit L_{eq}
1	Day	63	55	50	53
	Evening	60	51	45	50
	Night	58	43	40	48

During detailed design stage, the design and selection of the mechanical equipment required to service the proposed development will be required to achieve the NSW INP noise limits as presented in the table above.

During the monitoring period any adverse weather condition have been excluded. The noise logger results are presented in Appendix C.

2.3 Sleep Disturbance

The NSW INP does not specifically address sleep disturbance from high noise level events. The EPA, although not ideal continues to use the sleep criterion of an $L_{A1,\ (1\ minute)}$ not exceeding the $L_{A90,\ (15\ minute)}$ by more than 15 dB(A) as a guide to identify the likelihood of sleep disturbance.

The maximum noise level or $L_{A1,\ (1\ minute)}$, is th extent to which the maximum noise level exceeds the background level and the number of times this happens during the night-time period. Other factors that may be important in assessing the extent of impacts on sleep include:

- how often high noise events will occur.
- time of day (normally between 10pm and 7am).
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods).

The $L_{A1,\ (1\ minute)}$ descriptor is meant to represent a maximum noise level measured under 'fast' time response. The EPA will accept analysis based on either $L_{A1,\ (1\ minute)}$ or $L_{A,\ (Max)}$. Table 4 presents the limits for sleep disturbance.

Table 4 – Sleep Disturbance Limits, dBA

Period	Background Level, RBL	Sleep Disturbance Limits $L_{A1,\ (1min)}$
22:00 to 07:00	43	58

2.4 Traffic Noise Generation

The development of the service station facilities has the potential to generate increased traffic noise along Campbelltown Road will be assessed in accordance with the NSW EPA Road Noise Policy (RNP). Table 5 sets out the assessment criteria for residences to be applied to particular types of project, road category and land use.

Table 5— Road traffic noise assessment criteria for residential land uses

Road Category	Type of project/land use	Assessment Criteria - dBA	
		Day (7am-10pm)	Night (10pm-7am)
Freeway/ arterial/ sub-arterial road	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq, (15\ hour)}$ 60 (external)	$L_{Aeq, (9\ hour)}$ 55 (external)

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'.

3 Assessment and Recommendations

3.1 Operational Assessment

The proposed service station, is to be located in a rural environment with nearby commercial/industrial areas. The facility is bounded by the Campbelltown Road to the west and the M5 Motorway (Hume Highway) to the east. Traffic noise from the motorway dominates the ambient noise levels in the area.

The nearest noise sensitive receiver that may potentially be affected by the operation of the site is located to the north (refer to Figure 1).

As part of our assessment we have taken the following activities into consideration:

- Activities associated with patron vehicles entering/exiting the service station.
- Activates from truck refuelling.
- Operation of external mechanical plant associated with the convenience store. This includes exhaust ventilation fans and outdoor condensers.
- The service station and convenience store will operate between 05:00 to 21:00 seven days a week.

3.2 Vehicle Activity

The proposed service station and convenience store is expected to operate between 05:00 to 21:00 seven days a week. From on our understanding of the proposed operation:

- The facility is expected to cater for at least 200 passenger cars during the peak hour. This would be considered the worst case scenario and any other periods outside the peak hour would have a less impact.
- The facility is expected to cater for at least 15-20 trucks per day. Estimated rigid trucks and semi-trailers are at least 2 movements per hour.
- Cars and trucks using the facilities will be able to enter and exit the site in a forward direction without reversing.

Table 3 below provide sound pressure levels of typical vehicle noise that have been used for the calculations.

Table 6 – Typical Noise Level of Vehicles, L_{max} dBA

Type	Sound Pressure Level Range @ 0.5m, L_{max} dBA[1]
General passenger vehicle	67-88
3 to 6 tonne Truck (rigid)	84-90
Semi-trailer (eg, Western Star or Kenworth)	80-101

Based on the operation and above sound pressure levels, Table 3 details the predicted noise level at the nearest residential receiver to the north of the development site.

[1] Based on ADR83/00 external noise test.

Table 7 – Predicted Noise Level of Vehicles Activity, dBA

Type	Sound Pressure Level at Nearest Residential Receiver			
	$L_{eq(15min)}$ dBA	INP Noise Limit D/E/N	L_{max} dBA	Sleep Disturbance Limit
General passenger vehicle	43	53/50/48	40	58
Truck (rigid)	27	53/50/48	42	58
Semi-trailer	37	53/50/48	53	58
Cumulative	**45**	**53/50/48**	-	-

From the calculation above, the predicted noise level from operational activities is estimated to comply with the NSW INP for operational noise and for sleep disturbance noise limits.

Refuelling vehicles access the site generally can take approximately 40minutes to complete the operation. Refuelling operations not expected to cause an impact provided that all operations are conducted only during the day between 07:00 and 18:00.

3.3 Automatic Carwash

The automatic carwash and vacuum cleaner bays are located on southern end of the site which is over 200m from the residents. The use of the facilities is not expected to cause an impact provided that operation is restricted to day use only, ie between 07:00 and 18:00.

3.4 Mechanical Plant and Equipment

At this stage, the design and selection of the mechanical equipment required to service the proposed development has not been finalised therefore the possible to conduct a detailed assessment of the mechanical plant noise. However, the mechanical services consultant should consider the relevant requirements when designing and selecting such equipment.

- Selection of low noise equipment.
- Location of rooftop plant equipment, such as exhaust fans, condensers etc such that it is shielded from the noise sensitive.
- Consider the construction of acoustic enclosures for plant equipment, acoustic attenuators on exhaust systems and acoustic louvers at ventilation openings.

Following the approval of the proposed DA, at Construction Certificate stage, detailed assessment of mechanical plant and equipment noise and their ameliorative measures should be conducted to ensure compliance with the EPA INP requirements as given in Section 2.2 .

3.5 Façade Glazing Requirements

Acoustic glazing for the convenience store given in Table 8 is required to reduce noise impact on the internal occupants and should result in noise levels within such units in accordance with the AS/NZS 2107:2000.

Table 8 – Schedule of Window and Glazing (R_w)

Façade	Space	Glazing Thickness	Minimum R_w (Glazing+Frame)
All	Retail	6mm monolithic	28

3.6 Building Façade Construction

To provide sufficient acoustic attention of noise, the general external construction of the proposed building would need to be constructed as detailed in Table 9.

Table 9 – External Façade Construction (R_w)

Building Element	Proposed Construction	Minimum R_w
External Wall	TBA	TBA
Roof and ceiling	TBA	TBA

3.7 Assessment of Traffic Noise Generation

This section details a review of the expected increase in traffic noise generation from this development. Based on the report prepared by Colston Budd Hunt & Kafes Pty Ltd (ref: 8792) dated February 2014, Table 2.2 indicates the following expected net increase in traffic during the morning (AM) peak and afternoon (PM) peak.

Based on the current traffic flows along Campbelltown Road, the following Table 10 summaries the predicted change in traffic noise level.

Table 10: Predicted Change Traffic Noise Levels during Peak Periods

Period	Direction	Existing Peak Traffic Flow	Net Increase Peak Traffic Flow	Change in Traffic Noise, dBA
AM Peak	North of M5 Ramp	1,035	1,075	0.2
	South of M5 Ramp	1,365	1,405	0.1
PM Peak	North of M5 Ramp	865	905	0.2
	South of M5 Ramp	1,010	1,050	0.2

Based on the above calculations, increases in traffic noise levels are predicted to be less than 1dB and therefore comply with the EPA RNP guidelines.

4 Conclusion

An acoustic assessment of the proposed development has been carried out in accordance with the Industrial Noise Policy and Road Noise Policy of the EPA.

An environmental noise survey of the site has been conducted and the noise limiting criteria for mechanical plant/equipment noise emission has been determined based on the NSW INP. The limits are presented in Table 3.

The review the potential noise impact from the operational activities, mechanical noise a patron vehicle movements is detailed in Section 3 . Based on our predictions, the cumulative noise is expected to be less than $L_{eq(15min)}$ 48dBA (at nighttime) noise limit at the nearest residential.

Construction for glazing, external walls and the roof/ceiling systems have been provided to achieve the internal noise criteria and are detailed in Section 3.1 and Section 3.6 .

Providing the recommendations in this report are implemented, the noise from the proposed development is predicted to comply with acoustic requirements of the EPA noise limits and relevant Australian standards.

Appendix A – Acoustic Terminology

Decibel, dB: A dimensionless unit which denotes the ratio between two quantities that are proportional to power, energy or intensity. One of these quantities is a designated reference by which all other quantities of identical units are divided. The sound pressure level in decibels is equal to 10 times the logarithm (to the base 10) of the ratio between the pressure squared divided by the reference pressure squared. The reference pressure used in acoustics is 20 micro Pascals.

A-WEIGHTING: A measure of sound pressure level designed to reflect the response of the human ear, which does not respond equally to all frequencies. To describe sound in a manner representative of the human ear's response it is necessary to reduce the effects of the low and high frequencies with respect to medium frequencies. The resultant sound level is said to be A-weighted, and the units are in decibels (dBA). The A-weighted sound level is also called the noise level.

Sound Pressure Level, L p (dB), of a sound: 20 times the logarithm to the base 10 of the ratio of the r.m.s. sound pressure to the reference sound pressure of 20 micro Pascals. Sound pressure level is measured using a microphone and a sound level meter, and varies with distance from the source and the environment.

Ambient Noise/Sound: All noise level present in a given environment, usually being a composite of sounds from many sources far and near. Traffic, HVAC, masking sound or even low-level background music can contribute to ambient level of noise or sound.

Percentile Level - L 90 , L 10 , etc: A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, e.g. L 90 is the level which is exceeded for 90% of a measurement period. L 90 is commonly referred to as the "background" sound level.

Background Noise (L 90): The sum total of all unwanted residual noise generated from all direct and reflected sound sources in a space that can represent an interface to, or interfere with good listening and speech intelligibility.

Rating Background Level – RBL: Method for determining the existing background noise level which involves calculating the tenth percentile from the L A90 measurements. This value gives the Assessment Background Noise Level (ABL). Rating Background Level is the median of the overall ABL.

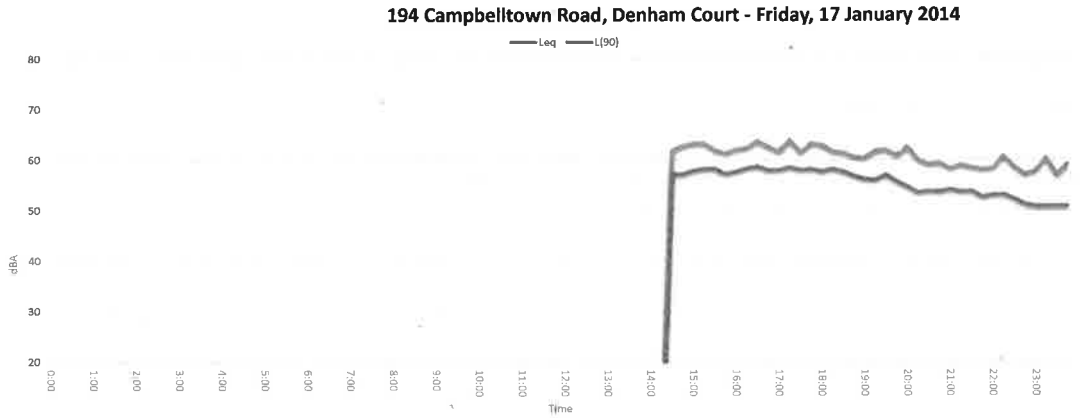
L AEQ,T : Equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.

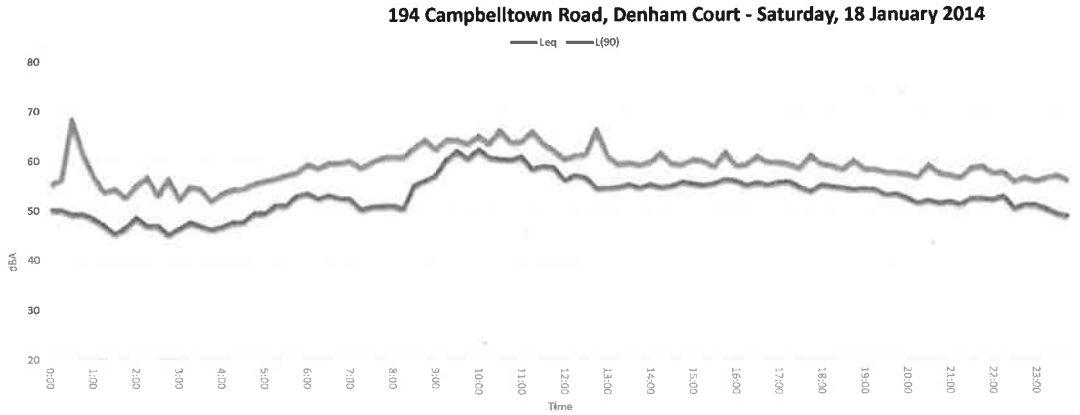
Appendix B – Architectural Drawings

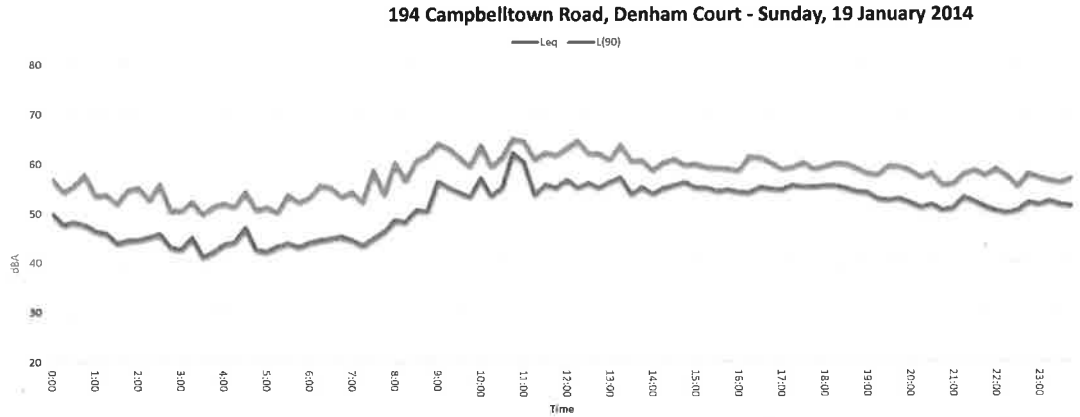
This assessment was based on the following architectural drawings provided by Mosca Pserras Architects.

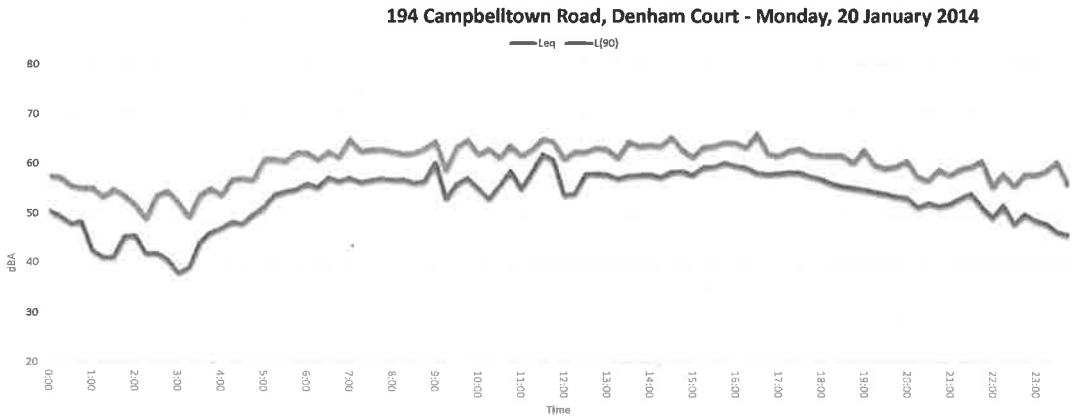
Drawing	Issue	Date	Description
AP01	D	03.09.13	Site Plan

Appendix C – Noise Logger Results





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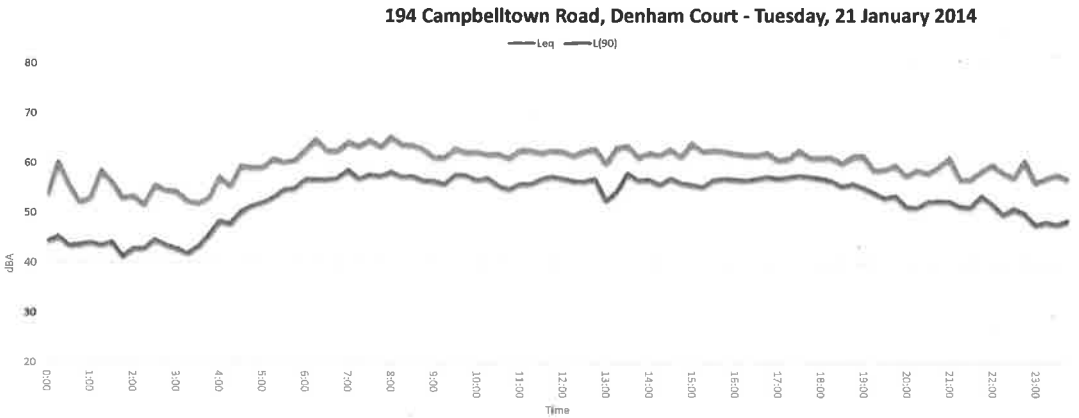
Leq
L(90)
dBA
Time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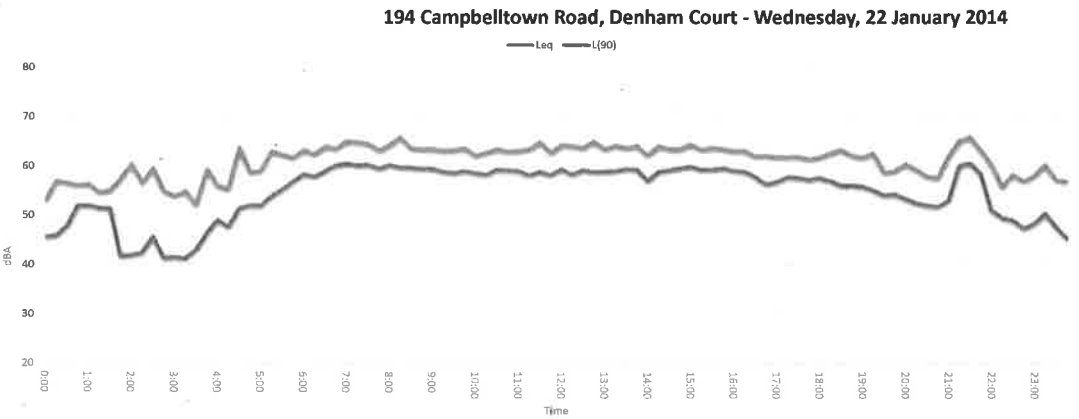
L(90)
dBA
Time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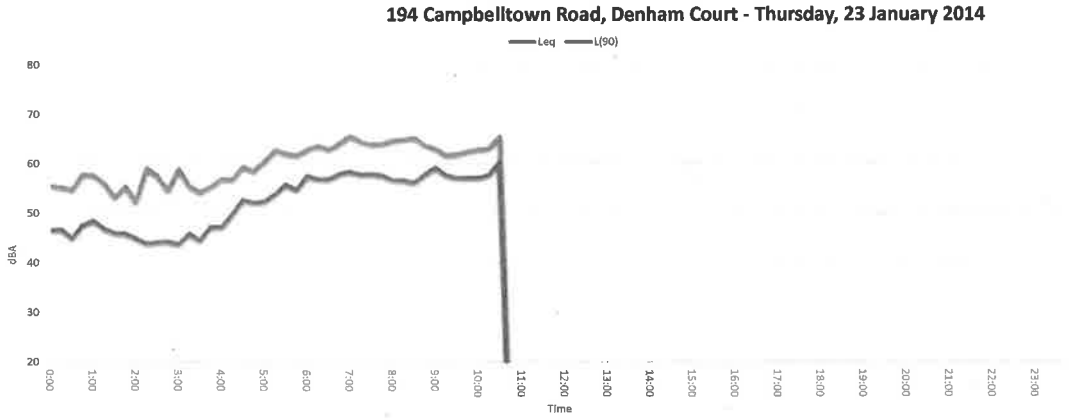
dBA
Time


194 Campbelltown Road, Denham Court - Thursday, 23 January 2014
Leq
L(90)
dBA
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70
60
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40
30
20
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7:00
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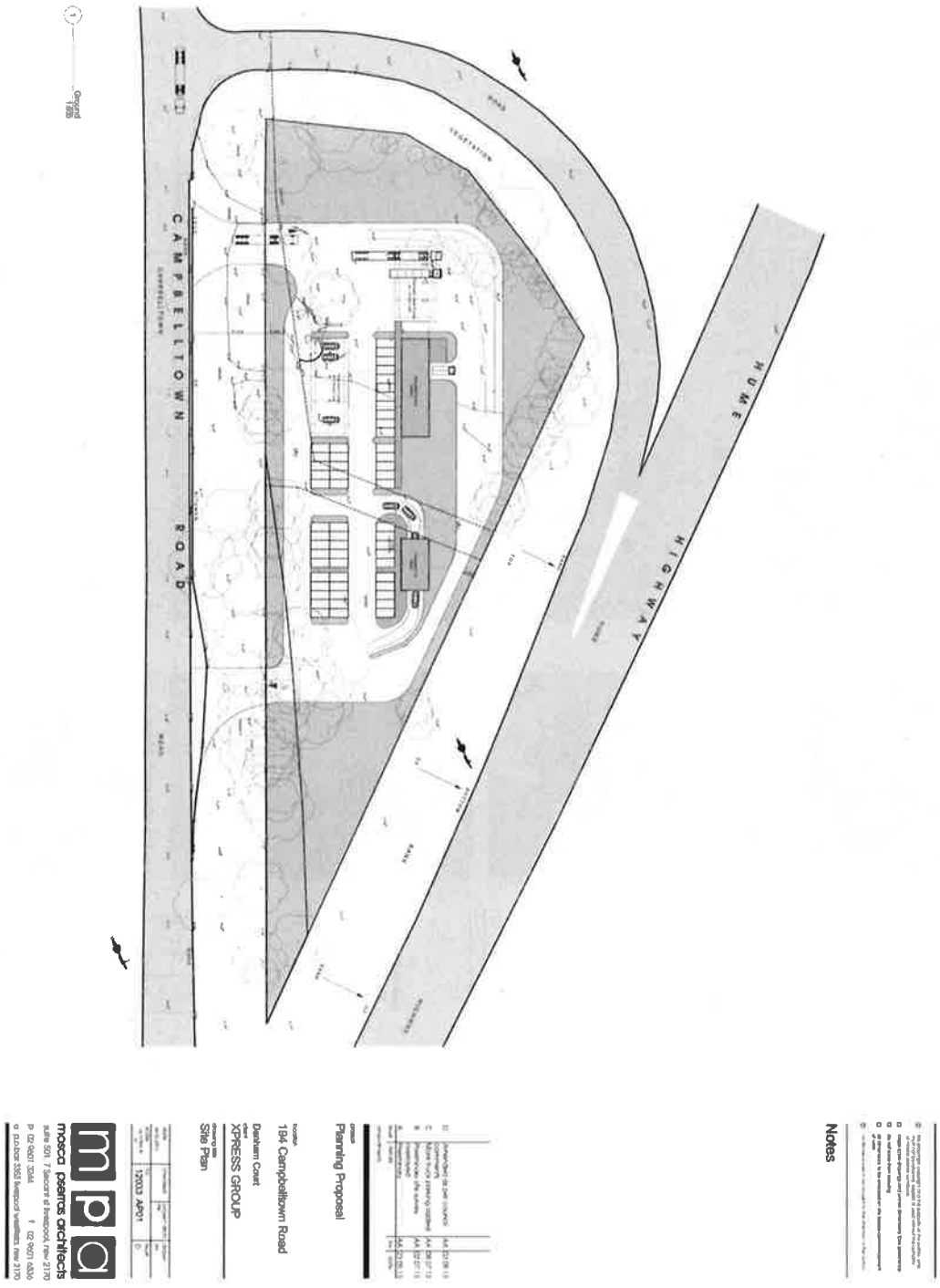
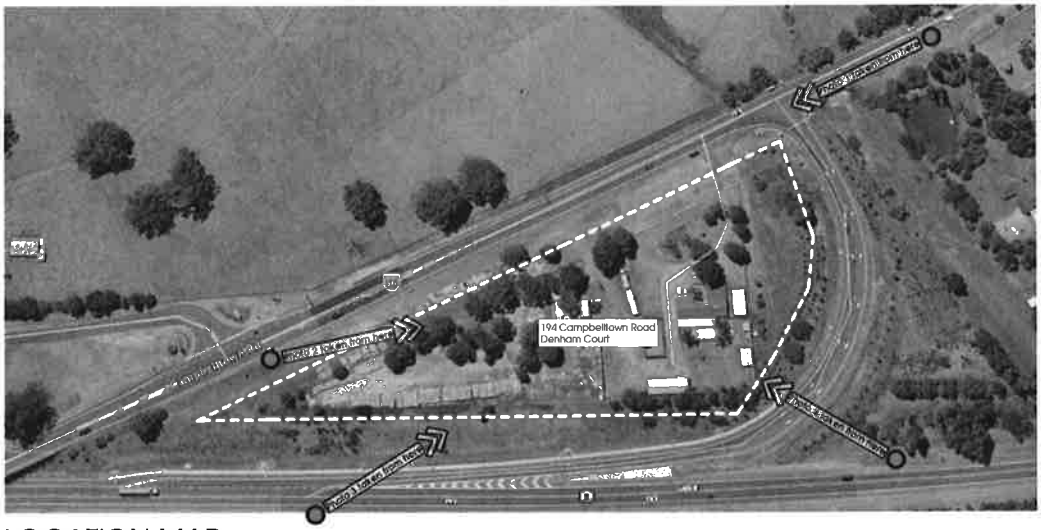
23:00
Time

Appendix D – Site Plan





LOCATION MAP

PHOTO 1:
Indicates the visual impact of the proposed building from the South-bound direction of Campbelltown Road Is minimal as it is hidden behind a series of existing trees

PHOTO 2:
Indicates the visual impact of the proposed building from the North-bound direction of Campbelltown Road. The proposed building/s are visible from this point however, the visual impact is minimal as the existing trees along the Campbelltown Road boundary of the site create a visual buffer zone.

PHOTO 3:
Indicates the visual impact of the proposed building from the North-bound direction of the M5 Motorway is minimal as it is hidden behind a large embankment with existing mature trees and proposed screen planting (See landscape plan)

PHOTO 4:
Indicates the visual impact of the proposed building from the South-bound direction of the M5 Motorway. The proposed building/s are visible from this point however, the visual impact is minimal as the existing trees within the site along the M5 Motorway boundary create a visual buffer zone.

PHOTO 1:

PHOTO 2:

PHOTO 3:

PHOTO 4:

Notes

project
Planning Proposal

location
194 Campbelltown Road
Denham Court

client
XPRESS GROUP

drawing title
Visual Impact Assessment

12033 AP02

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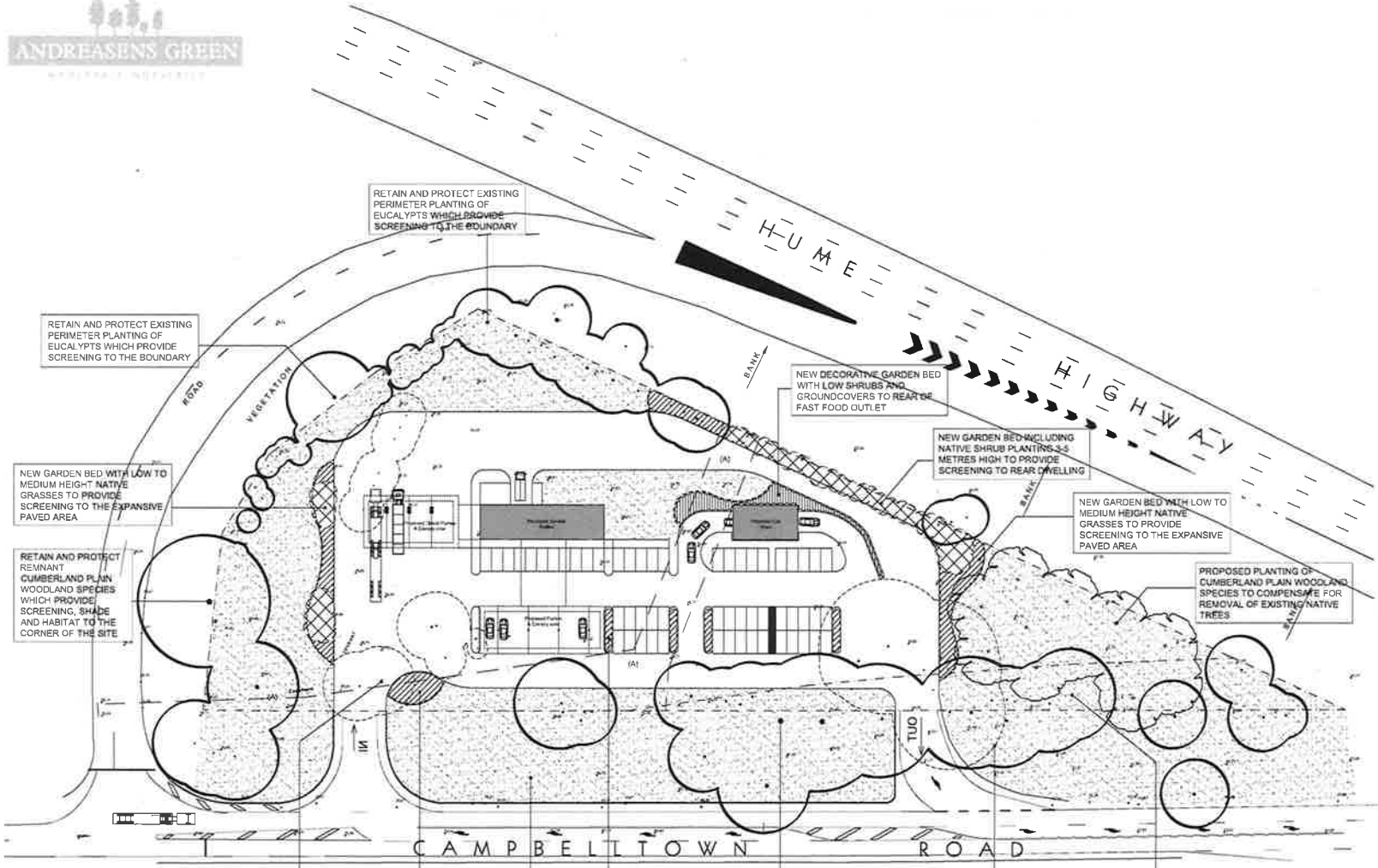
p o box 3353 liverpool westfield, nsw 2170



LANDSCAPE SKETCH PLAN 1 : 500

TYPICAL PLANT SPECIES LIST

Cumberland plain woodland trees

Eucalyptus moluccana (Grey box - 10m)
Eucalyptus tereticornis (Forest red gum - 15m)

Native screen planting (2-5 metres high)

Acmena smithii 'minor' (Lilly pilly - 3m)
Callistemon 'Captain Cook' (Bottlebrush - 2m)
Callistemon 'Endeavor' (Bottlebrush - 5m)
Melaleuca 'Claret Tops' (Paperbark - 12m)

Syzygium 'Aussie compact' (Lilly pilly - 3m)
Syzygium australe 'Resilience' (Lilly Pilly - 3m)
Syzygium 'Cascade' (Syzygium - 3.5m)

Native shrub, groundcover and native grass planting (less than 1200mm high)

Callistemon 'White Anzac' (White Bottlebrush - 1.5m)
Melaleuca thymifolia (Rock Myrtle - 1m)
Beaches virgata 'nana' (Dwarf beaches - 0.5m)
Syzygium 'Tiny Trev' (Dwarf lilly pilly - 0.75m)

Lomandra longifolia 'Tanika' (Fine leaf dwarf lomandra - 0.6m)
Poa poliformis 'Eskdale' (Poa grass - 0.6m)
Poa labillardieri 'Nellies clump poa grass - 1m)
Pennisetum alopecuroides (Swamp foxtail - 0.8m)

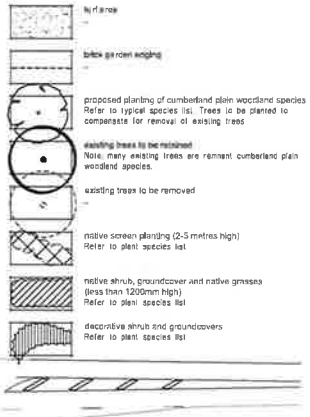
Pennisetum 'Nafray' (Foxtail - 0.8m)
Dianella 'Little jess' (Dianella - 0.4m)
Dianella 'Silver Streak' (Variegated Dianella - 0.6m)

Decorative shrub and groundcover

Raphiolepis 'Oriental Pearl' (Dwarf indian hawthorne - 1m)
Buxus microphylla japonica (Japanese Box - 2m)
Murraya paniculata (Orange Jessamine - 3m)
Duranta 'Sheenas gold' (Golden Duranta - 1m)

Liriope 'Evergreen Giant' (Giant liriope - 0.5m)
Trachelospermum triciolor (Variegated jasmine - 0.3m)
Trachelospermum jasminoides (Star jasmine - 0.3m)

LEGEND



DATE	AMENDMENT	ISSUE

RAY FUGGLE ASSOCIATES
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Project
PROPOSED SERVICE STATION

No.194 Campbelltown Road,
DENHAM COURT

Client
XPRESS GROUP

Drawing Title
LANDSCAPE PLAN

issue	DA	date 19/03/14	issue no. A
file name			drawing no. C\
drawn	HK	scale 1:500 @ A1	
checked	RF	project no. 3520b	L-01

EXPRESS GROUP PTY LTD

TRAFFIC REPORT FOR PLANNING PROPOSAL FOR PROPOSED SERVICE STATION, DENHAM COURT

MARCH 2014

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REF: 8792

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned by Express Group Pty Ltd to prepare a traffic report for the planning proposal to allow a service station on Campbelltown Road at Denham Court.

1.2 The site is occupied by a dwelling with vehicular access from Campbelltown Road. The proposed development is a service station with convenience store and car wash, with vehicular access from Campbelltown Road.

1.3 Council has requested the following in relation to the planning proposal:

"A detailed traffic study is required to be prepared as part of this proposal. The traffic study should as a minimum investigate the extent of traffic generated by the proposed service station as well as the following:

- *The appropriateness of the proposed right turn to and from Campbelltown Road, including road design;*
- *The impacts of vehicle movements to and from the site, including access to and from the F5;*
- *Impacts on traffic movements in the wider locality as a result of the proposed development."*

1.4 The traffic implications of the proposed development, including the above matters raised by Council, are addressed in the following chapter.

2. IMPLICATIONS OF PROPOSED DEVELOPMENT

2.1 The traffic implications of the proposed development are set down through the following sections:

- site location and road network;
- proposed development;
- access, servicing and internal layout;
- traffic generation and effects;
- matters raised by Council; and
- summary.

Site Location and Road Network

2.2 The site is located on the eastern side of Campbelltown Road at Denham Court, between McCormack Place to the north and Williamson Road to the south. The M5 Motorway is east of the site. There is a northbound off-ramp from the M5 adjacent to the site's eastern and northern boundaries. The off-ramp intersects Campbelltown Road at a signalised intersection adjacent to the site.

2.3 The site is occupied by a dwelling with vehicular access from Campbelltown Road. Adjacent to the site, Campbelltown Road provides for one traffic lane in each direction with sealed shoulders and a 70 kilometre per hour speed limit. It passes over the M5, south of the site. Further south it intersects Williamson Road, which provides access to the Ingleburn Industrial Estate. There is a roundabout at the Campbelltown Road/Williamson Road intersection. The fourth leg of the roundabout provides a southbound on-ramp to the M5.

2.4 There is a right turn bay for southbound traffic on Campbelltown Road, near the southern end of the site. It provides access to a horse riding ranch.

Proposed Development

2.5 The proposed development is a service station with convenience store and car wash, with vehicular access from Campbelltown Road.

2.6 On-site parking would be provided in accordance with appropriate Council and/or RMS controls in association with a future development application.

Access, Servicing and Internal Layout

2.7 Vehicular access to the site is proposed from Campbelltown Road. Driveways are proposed near the northern and southern ends of the site.

2.8 The northern driveway would provide for entering vehicles, including right turns into the site. A right turn bay would be provided in Campbelltown Road to facilitate this movement, as shown in drawings prepared by J. Wyndham Prince. The southern driveway would provide for exiting vehicles.

2.9 The site would provide for cars and trucks to enter, circulate and exit in a forward direction. Separate fill points would be designated for cars and heavy vehicles. A loading bay will be provided at the rear of the convenience store.

2.10 The layout will be designed to provide for appropriate circulation by semi trailers and b-doubles, in accordance with the Australian Standard for Parking Facilities (Part 2: Off-street commercial vehicle facilities), AS 2890.2 – 2002.

2.11 The car wash would provide a 'drive-through' arrangement, with vehicles entering at the northern end of the car wash building and exiting at the southern end. Separate vacuum bays would be provided adjacent to the car wash.

2.12 Overall, subject to detailed design, the proposed access, servicing, internal circulation and layout arrangements are considered appropriate.

Traffic Generation and Effects

2.13 Traffic generated by the proposed development would have its greatest effects during weekday morning and afternoon peak hours when it combines with commuter traffic on the surrounding road network. In order to gauge traffic conditions, counts were undertaken at these times at the intersection of Campbelltown Road with the M5 off-ramp.

2.14 The results of the surveys are shown in Figures 2 and 3, and summarized in Table 2.1.

Table 2.1: Existing two-way (sum of both directions) peak hour traffic flows

Road	Location	AM peak hour	PM peak hour
Campbelltown Road	North of M5 ramp	1,035	865
	South of M5 ramp	1,365	1,010
M5 ramp	East of Campbelltown Road	770	315

2.15 Table 2.1 shows that Campbelltown Road carried some 850 to 1,400 vehicles per hour two-way during the surveyed peak hours. Flows on the M5 off-ramp were lower at some 300 to 800 vehicles per hour two-way.

2.16 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The intersections shown in Figures 2 and 3 have been analysed using the SIDRA program.

2.17 SIDRA provides a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required

43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.18 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.19 The SIDRA analysis found that the signalised intersection of Campbelltown Road with the M5 off-ramp operates with average delays of less than 25 seconds per vehicle during weekday morning and afternoon peak periods. This represents level of service B, a good level of service.

2.20 The RMS "Guide to Traffic Generating Developments" indicates that service stations with convenience stores generate 0.66 A(F), where A(F) is area of the convenience store.

2.21 Based on a convenience store of 300m^2, the proposed service station would generate some 200 vehicles per hour two-way during peak times.

2.22 The majority of traffic would be passing trade, which is traffic driving past the development regardless of its visit to the development. Our assessment is based on 70 per cent passing trade.

2.23 The additional traffic has been assigned to the road network. Existing traffic flows plus the additional traffic from the proposed development are shown in Figures 2 and 3, and summarised in Table 2.2.

Table 2.2: Existing two-way (sum of both directions) peak hour traffic flows

Road	Location	AM peak hour		PM peak hour	
		Existing	Plus development	Existing	Plus development
Campbelltown Road	North of M5 ramp	1,035	+40	865	+40
	South of M5 ramp	1,365	+40	1,010	+40
M5 ramp	East of Campbelltown Road	770	-	315	-

2.24 Table 2.2 shows that traffic increases on Campbelltown Road would be some 40 vehicles per hour two-way at peak times.

2.25 The intersection of Campbelltown Road with the M5 ramp has been re-analysed with SIDRA for the additional development traffic flows shown in Figures 2 and 3. The analysis found that the intersection would continue to operate with average delays of less than 25 seconds per vehicle during weekday morning and afternoon peak periods. This represents level of service B, a good level of service.

2.26 Therefore, the road network will be able to cater for the additional traffic from the proposed development.

Matters Raised by Council

"A detailed traffic study is required to be prepared as part of this proposal. The traffic study should as a minimum investigate the extent of traffic generated by the proposed service station as well as the following:

- *The appropriateness of the proposed right turn to and from Campbelltown Road, including road design;*
- *The impacts of vehicle movements to and from the site, including access to and from the F5;*
- *Impacts on traffic movements in the wider locality as a result of the proposed development."*

2.27 With regards to the first bullet point, the proposed right turn bay into the site is shown in drawings prepared by J. Wyndham Prince. Campbelltown Road is straight in the vicinity of the site and there are good sight lines for northbound traffic turning into the site, as well as for traffic in both directions turning from the site. Vehicles will be able to readily turn into the site in gaps due to the modest southbound through traffic volumes on Campbelltown Road, and in gaps created by the upstream traffic signals. Analysis with SIDRA indicates that the site access will operate with average delays of less than 15 seconds per vehicle at peak times. This represents level of service A/B, a good level of service.

2.28 Therefore, with appropriate capacity to facilitate right turns to and from the site, and no unusual safety issues at the proposed site access location, right turns to and from the site are considered to be appropriate.

2.29 In relation to the second bullet point, no access is proposed from the M5 or the exit ramp to or from the site. It is therefore anticipated that most traffic arriving at the site will be passing traffic on Campbelltown Road or traffic already exiting the M5. It is not anticipated that a significant volume of through traffic on the M5 will exit the freeway to visit the site before re-joining the freeway (as a significant diversion would be required).

2.30 With regards to the third bullet point, as previously noted, the majority of traffic to and from the site is expected to be passing trade, i.e. traffic already using, Campbelltown Road and the M5 exit ramp. As previously discussed in paragraph 2.24, the additional traffic on Campbelltown Road north and south of the site would be small at some 40 vehicles per hour two-way. Such a low volume would not have noticeable effects on the signalised intersection adjacent to the site. Further from the site, traffic volumes would dissipate further and would not generally be noticeable.

Summary

2.31 In summary, the main points relating to the traffic implications of the planning proposal are as follows:

i) the planning proposal would provide for a service station with convenience store and car wash;

ii) vehicular access is proposed from Campbelltown Road, with driveways near the northern and southern ends of the site;

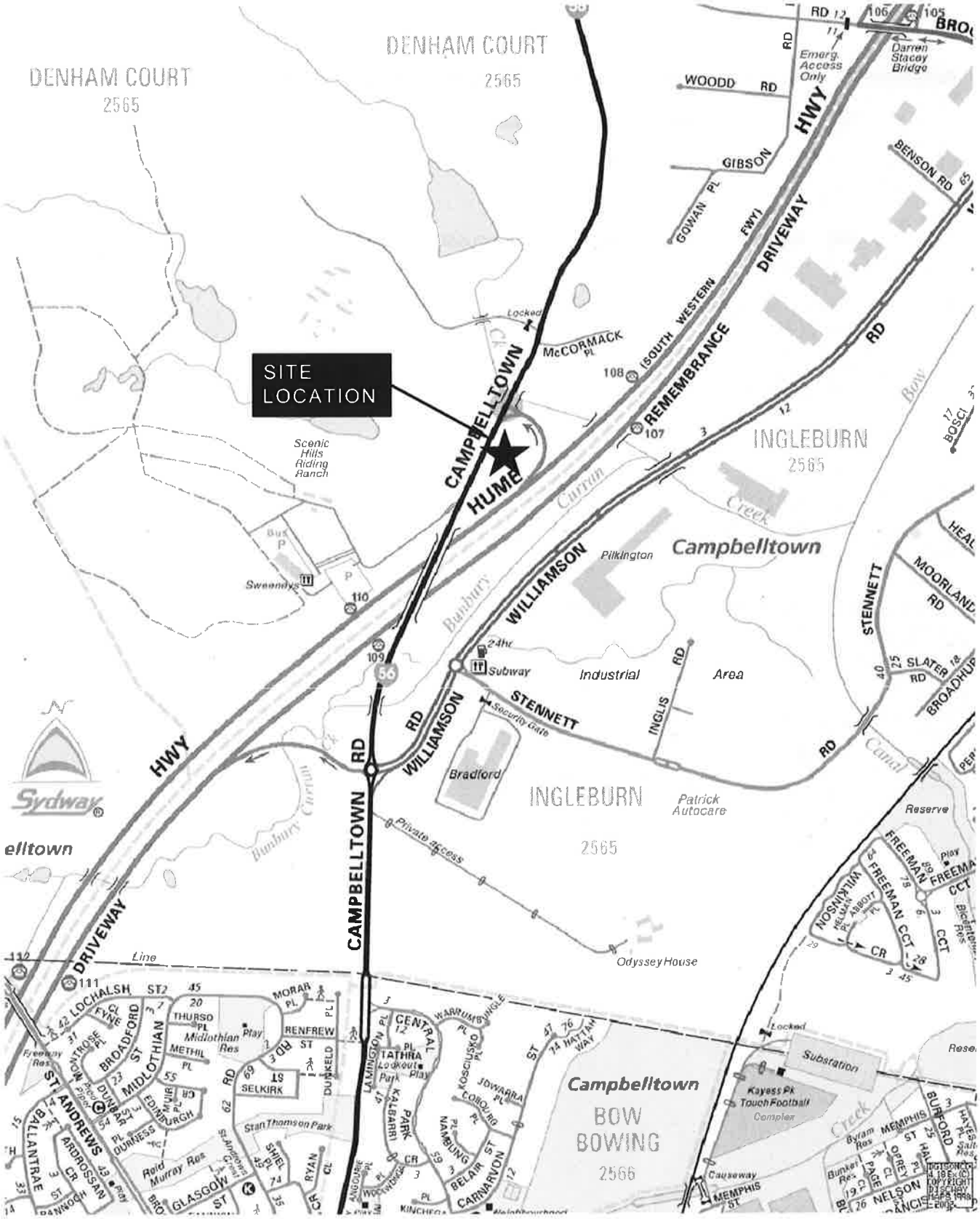
iii) a right turn bay is proposed in Campbelltown Road for access to the site;

iv) the proposed access arrangements will have appropriate capacity, and should operate with no unusual safety issues;

v) the internal circulation and layout will be appropriate for cars and trucks and should be designed in accordance with Australian Standards at the detailed design stage;

vi) the road network will be able to cater for the additional traffic from the proposed development; and

vii) matters raised by Council are discussed in paragraphs 2.27 to 2.30.



Location Plan

Colston Budd Hunt & Kafes Pty Ltd

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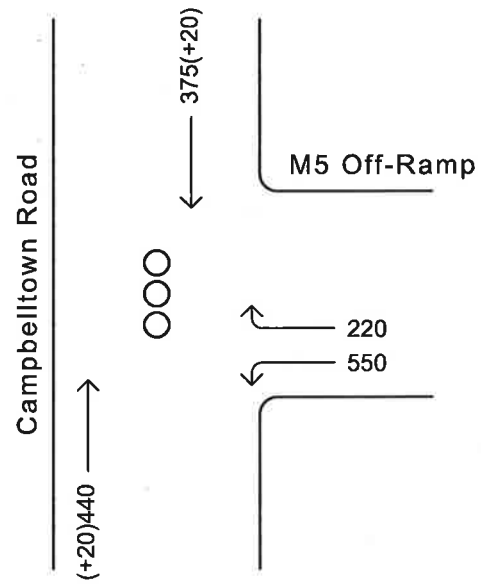
Figure 1



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals

Existing weekday morning peak hour traffic flows plus development traffic

Colston Budd Hunt & Kafes Pty Ltd

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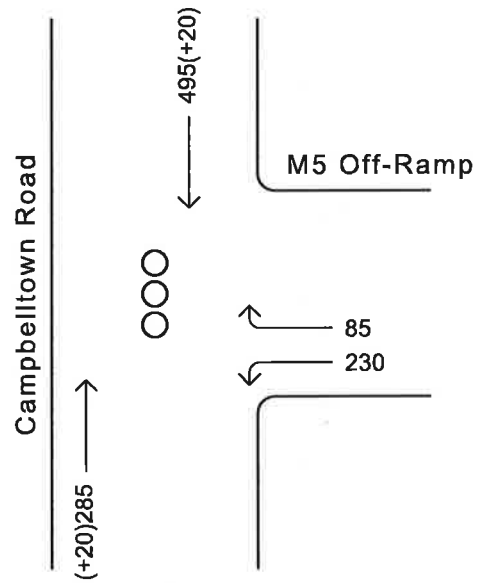
Figure 2



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals

Existing weekday afternoon peak hour traffic flows plus development traffic

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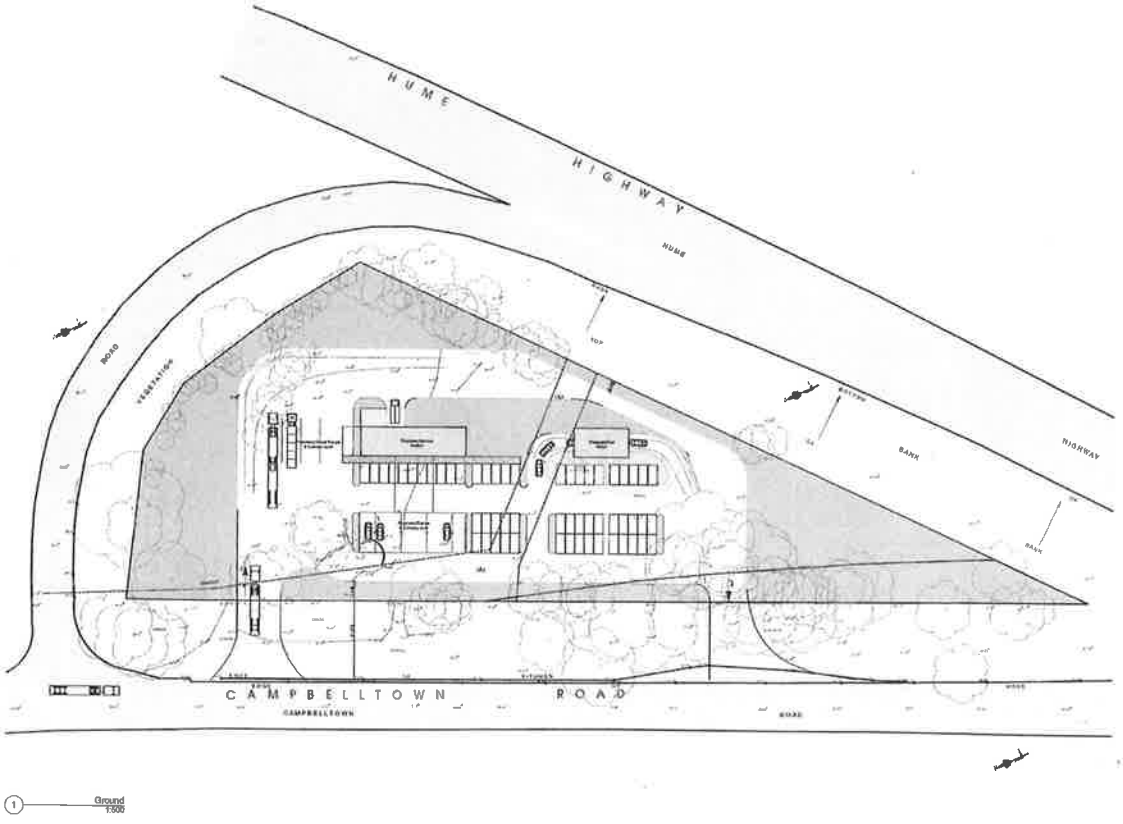
Figure 3



1 Ground 1:500

Notes

D	Amended as per council comments	AA	23.07.13
C	Move truck parking added	AA	08.07.13
B	Preliminary site survey overlayed	AA	02.07.13
A	Preliminary	AA	31.05.13
issue	details	by	date

amendments

project
Planning Proposal

location
194 Campbelltown Road
Denham Court

client
XPRESS GROUP

drawing title
Site Plan

date 04.06.2013	checked	project arch. no	drawn AA
scale on robot b A1		no 12033 AP01	issue D

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