Bialowas & Assoc. Pty Ltd Chartered Architects

Statement of Heritage Impact

Statement of Heritage Impact for:

Proposed New Service Station & Food Outlet
147 Bridge Street Muswellbrook NSW

On a vacant corner site within the Bridge Street Conservation Area

August 2018

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This Statement of Heritage Impact has been compiled in reference to the Guidelines issued by the State Heritage Department's Heritage Manual, specifically, the Statements of Heritage Impact

The SOHI has also referenced the Muswellbrook Development Control Plan Section 15 Heritage Conservation in Particular the four questions:

1 What makes for the Heritage Significance of the place?
2 How will the proposed development affect this heritage significance?
3 Will there be benefits for the place which outweigh any loss of heritage of heritage significance?
4 Might there be alternatives which would have lesser adverse effects on heritage significance?

The Statement of Heritage Impact addresses:

- Why the item is of heritage significance
- What impact the proposed works will have on that significance
- What measure are proposed to mitigate negative impacts
- Why more sympathetic solutions are not viable.

As well as Section 5.10 of Muswellbrook's Conservation Policy

5.10 Heritage conservation

(1) Objectives
The objectives of this clause are as follows:

(a) To conserve the environmental heritage of Muswellbrook,
(b) To conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,
(c) To conserve archaeological sites,
(d) To conserve Aboriginal objects and Aboriginal places of heritage significance.

In respect to other parts of Muswellbrook's Conservation Policy, it can be clearly stated that:

1. As the site is a vacant lot, there will be no demolition
2. The site does not involve any heritage item
3. The proposed development would not have any significant adverse effect on the amenity of the surrounding area

Description & References

The subject land, which has been a vacant site for several years, is zoned B2 Local Centre, as part of the current Local Environmental Plan of the Muswellbrook Shire Council.

The land has been amalgamated from several adjoining Lots which had previously been the site of a vehicle workshop and The Sales office of The Cross City Ford Sales Dealership.

The site has therefore been directly and quite recently, associated with the Motor Vehicle industry and the building types that are commonly associated with that industry.

The current proposal is also directly related to the motor vehicle Industry and aims to provide a new service station and a food outlet, which to a large extent is what many motorists and most tourists have come to expect.

The Site

The site on the corner of Bridge and St. Heliers Streets abuts on the northern and east sides, a residential area and is otherwise surrounded by commercial premises. A funeral Director's Premises are directly opposite in St Heliers Street and on the corner next to the Funeral Director is a relatively new Hungry Jack's and car park. Further along Bridge Street is the RSL Club and opposite on Bridge Street is also a historical residential area interspersed with Commerce like Betta Electrical and the Eaton Hotel.

Approaching the site from the North
A residential area with a wide variety of building types set among established trees on a rising hillside and heavily terraced with masonry retaining walls

This site is on the northern edge of the main commercial precinct of what appears to be a growing and thriving community.

The present site, with some 40m frontage to Bridge Street and approximately 94m along St Heliers Street, slopes up from Bridge Street to the east. The site is almost devoid of trees with just one small but established tree on the eastern most edge in Flanders Street.

Bridge Street looking north

In the recent past, the site has contained a variety of utilitarian sheds which were clad with galvanised iron and of partially masonry construction. The front had been modified to a more modern appearance as a showroom for the Ford Dealership. Those buildings no longer exist on the subject land and the site has since been vacant.

Relatively new brick residence opposite the site at the top laneway

The vacant site from the Bridge Street corner, with remnants of retaining walls and conc. paving

The current proposal therefore does not involve any demolition of existing buildings or heritage items.

Similarly, the proposal does not call for a radical change of use. The site is and will remain commercial in keeping with its traditional use as related to the motor vehicle industry. The proposal aims to adopt current best practice in service stations and the attendant foods premises.

The proposed design shows a food outlet of some 310 sq.m on the corner of Bridge Street and St Heliers Street with the proposed service station set well back on the site on the north eastern boundary. The site is to be excavated for easier vehicle access and as a result will be set lower than the adjacent residential buildings. This is in contrast to the usually dominating presence of many service stations.

Views of typical service stations within Muswellbrook

The existing Hungry Jack's Development directly opposite the proposed food outlet

New Development adjacent to a Heritage item

The proposed design of the service station has minimised its impact on the area by being recessed into the site and set back well off the road.

The food outlet, Oliver's is set closer to the road similar to the Hungry Jack's outlet adjacent. The colour scheme is relatively subdued with soft greys and the dark green. The frontage below the awning is to be largely glazed.

In keeping with the Heritage Council's advice on matters of form and finishes, it is not intended to slavishly copy earlier forms that have existed on the site but to use current technology and design, similar to that of the existing service stations and food premises evident in the Town of Muswellbrook. As such, this will be in keeping with the history of the streetscape for this area.

The former buildings arguably may not have had intrinsic Heritage Significance but simply complied with the pragmatic needs of the town as it grew to provide the services and needs of the community. Nor did they blend in with the surrounding residential character in either form, mass, colour or materials.

To replace those buildings in a similar manner would not in any way destroy or diminish the heritage value of this precinct as it previously existed.

The impact on this site of the proposed development would be one of enhancement or reinforcing of what was existing and what has traditionally been there as part of Muswellbrook's ongoing commercial history. The proposed scheme however, will in our view, considerably improve on the aesthetics of the former premises.

It is understood that the Client has adopted the corporate colour scheme required by the Mobil Company and the need to quickly and safely identify that brand to passing motorists. The site is to be excavated for easier access and will therefore recede and be less impactful on the surrounding residential area.

Oliver's, the proposed food outlet is to be set on the corner and will have green as its dominant corporate colour. We note that the adjacent residence also has a green coloured roof.

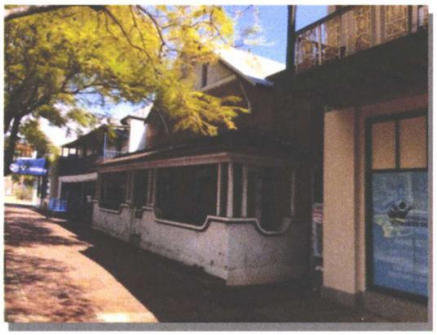
Again, it is hard to envisage any adverse impact that such colours or forms may have on this area as there are extant examples of far greater visual impact on nearby commercial premises.

A less than ideal example of trying to adapt or accommodate heritage

We understand that the client has chosen colours and materials for the retaining walls which will be sympathetic to the residential nature of the site and that considerably more planting will be included to soften and to enhance the amenity of the food outlet and the service station.

It is also understood that a suitable landscape plan will be part of the overall submission. It is proposed that trees of a suitable scale and type be planted along the St. Heliers street frontage and that shrubs and smaller plants be used where possible and some suitable greenery to be part of the retaining walls.

The proposed development is not adjacent an item of Heritage significance. There is however, a strong group of significant heritage buildings diagonally opposite the site. These will not be adversely affected as the proposal does not impede views towards this group from either the north or south approaches on Bridge Street.



The charming cottages that flank the Eaton's Hotel have a strong visual presence, human scale with varying details and colour schemes.

The most significant item in this group is Eaton's Hotel. This Heritage listed two storey building with a very unusual veranda with its double set of columns dominates.

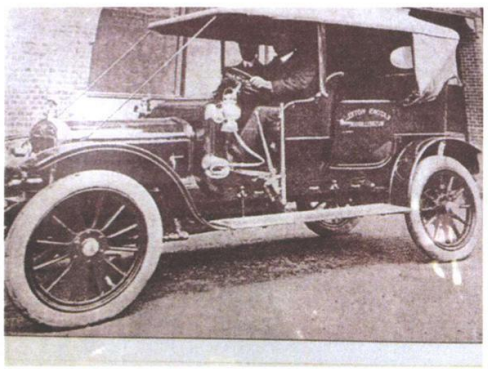
It has in recent years been transformed at the back, mercifully leaving the façade intact, and much of the front interiors. It was in its day, the premier hotel in the region, boasting a silver service for diners.

It has been described as the 'oldest and most striking pubs in the Hunter, Eaton's Hotel, is instantly recognisable by its round headed French windows and enormous veranda featuring cast-iron columns and decorative lacework'.

Formally the White Hart Inn, the hotel was built in 1850 and was part of the Cobb and Co. route between Scone and Singleton.

The coach way to the former stables still exists and forms a delightful aperture in the streetscape.

The hotel also had a close association with the motor industry. Mr Flanders one time owner of the hotel owned the first car in Muswellbrook.



The hotel was also a favourite of the motor cycling fraternity. In short, the hotel owes its existence and ongoing survival to the travel industry. The initial Cobb and Co. Coaches that brought visitors were replaced by motorised vehicles of all descriptions. It is therefore not surprising that service stations have become part and parcel of the travel industry that supports such buildings and townships.

Conclusion

1 What makes for the Heritage Significance of the place?

The heritage may reside in the adjoining neighbourhood as part of a residential conservation area, with some historical commercial intrusions; in particular, the group of cottages in Bridge Street and the Eaton's Hotel. As such they are not adversely affected by the proposal.

2 How will the proposed development affect this heritage significance?

As there is no significant change in the use and only improvement on what was previously on the site, we see no adverse effect. Similarly, it does not adversely affect the heritage group of buildings diagonally opposite in Bridge Street.

3 Will there be benefits for the place which outweigh any loss of heritage of heritage significance?

In our view there will be no loss of heritage significance; there will however be an improvement in the general aesthetic and amenity the proposal will provide to local residents and visitors alike.

4 Might there be alternatives which would have lesser adverse effects on heritage significance?

The proposal has no adverse effect on the heritage of the surrounding area and is an improvement on the recent past of the site itself and the ongoing history of the site.

It is our view that the above matters have been duly considered and that the proposal is consistent with the history of the precinct and sympathetic to its essentially commercial nature. It therefore complies with the Conservation policies of the NSW Heritage Assessment Criteria as well as Muswellbrook Council's Heritage Polices and in our view has no detrimental heritage impact on this site.

Henry Bialowas RAIA
Chartered Architect
ARB 5673

Traffic Solutions Pty Ltd

PROPOSED SERVICE STATION AND FOOD OUTLET, CORNER OF BRIDGE AND ST HELIERS STREETS, MUSWELLBROOK

TRAFFIC AND PARKING ASSESSMENT

30 August 2018

Ref: 18.19.008

P.O Box 9161 Bathurst NSW 2795 Phone: (02) 6331 0467 Email: craig@trafficsolutions.com.au

PROPOSED SERVICE STATION AND FOOD OUTLET, CORNER OF BRIDGE AND ST HELIERS STREETS, MUSWELLBROOK, TRAFFIC AND PARKING ASSESSMENT

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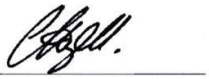

For: Mr. Stuart Pennells
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Report No.: 18.19.008

Date: 22 August 2018

Issue: FINAL

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FIGURES

1. INTRODUCTION

This report has been prepared to accompany a Development Application to Muswellbrook Shire Council for a proposed service station with convenience store and a food outlet. The development is proposed on the north-east corner of Bridge and St Heliers Streets, Muswellbrook. (Figure 1).

This report examines the traffic implications of the proposed development and will assess the:

- Proposed access arrangements.
- Adequacy and suitability of the off-street parking provision.
- Adequacy of the loading areas and fuel tanker filling points.
- Estimated traffic generation of the proposal.
- Impacts of the estimated traffic generation on the existing road network.

LOCATION
Fig 1

2. PROPOSED DEVELOPMENT

SITE

The site is located on the north-eastern corner of Bridge Street (New England Highway) and St Heliers Street and is currently vacant.

DEVELOPMENT PROPOSAL

The proposed development involves a new service station with a convenience store (207m^2 total area with 80m^2 of customer area), and a separate food outlet (314m^2 total indoors area with and 203m^2 of seating area indoors and outdoors).

The site will include 4 x 6 hose fuel dispensing bowsers and 2 x 3 three hose fuel dispensing bowsers facing Bridge Street. Parking for thirty-seven (37) vehicles including a dedicated disabled car space are proposed over the total site.

Access to the site is proposed via a 10m wide entry driveway off Bridge Street and separate entry and exit driveways to St Heliers Street (Entry 9m wide at boundary widening to 13.4m at kerb. Exit is 6m wide widening to 10.4 at the kerb).

The proposal is fully detailed on plans prepared by Calare Civil accompanying the development application, Project No. 18.0045, issue C, dated 30 July 2018 with the following drawing No's:

A101	COVER SHEET
A201	SITE PLAN
A202	BUILDING LAYOUT - OLIVERS
A203	ROOF PLAN - OLIVERS
A204	BUILDING LAYOUT - SERVICE STATION & CANOPY
A205	ROOF PLAN - SERVICE STATION & CANOPY
A206	TRAFFIC PLAN
A301	ELEVATIONS & SECTION - OLIVERS
A302	ELEVATIONS - SERVICE STATION & CANOPY
A303	SECTION - SERVICE STATION & CANOPY
A304	STREETSCAPE ELEVATIONS

A reduced copy of the site plan is attached as Appendix A.

3. EXISTING CONDITIONS

The subject site has frontage to Bridge Street which is a State Road under the care and control of the Roads and Maritimes Services (RMS) and St Heliers Street which is a local road under the control of Muswellbrook Shire Council.

Bridge Street in this location provides two line marked lanes in each direction with parking permitted on the western side only. The principle features of the traffic controls in the vicinity of the site are:

- 50 km/h speed limit.
- A painted median in St Heliers Road at Bridge Street.
- Give Way restriction in St Heliers Road at Bridge Street.

An indication of the existing traffic volumes along Bridge Street (New England Highway) in the vicinity of the subject site are provided on the RMS website which has a permanent counting station (No. 6157) located 60m north of Burton Lane, which is approximately 2.5 km north of St Heliers Street.

This station provides the following Annual Average Daily Traffic (AADT) volumes for this location. The following table indicates the recorded volumes and percentage heavy vehicles along The New England highway since 2015.

Table 3.1 – AADT at Permanent counting station 6157, New England Highway, 60m north of Burton Lane

Year	AADT	Heavy Vehicle percentage
2015	10161	15.21%
2016	n/a	n/a
2017	10336	18.02%
2018	9947	18.7%

Table 3.1 indicates that the average daily traffic volumes along the New England Highway are remaining stable in recent years.

Further review of the RMS data reveals that during 2017 the peak Average Weekday Total occurs on a Friday. The peak hour traffic volume during 2017 occurred between 3.00pm and 4.00pm on Friday 15th December 2017 with 977 vehicles (489 northbound and 488 southbound).

The RMS site indicates that the New England Highway carries a high level of heavy vehicles at 18.7%.

Copy of the data extracted from the RMS website is attached as Appendix B.

4. KEY ISSUES

ACCESS AND PARKING

Vehicular entry to the development will be via a 10m wide entry driveway off Bridge Street and separate entry and exit driveways to St Heliers Street (Entry 9m wide at boundary widening to 13.4m at kerb. Exit is 6m wide widening to 10.4 at the kerb).

The driveway locations provide very good sight lines in both directions along the respective street frontage which exceeds the desirable 69m requirement for sight distance in AS/NZS 2890.1 – 2004 *'Off Street Carparking'* and AS 2890.2:2002 *'Off Street Parking for heavy vehicles'* and for the posted speed limit of 50 km/h.

The geometric design requirements for car park layouts such as, aisle widths and parking bay dimensions are specified in the '*Australian/New Zealand Standard, Parking Facilities Part 1; Off Street Car Parking (AS/NZS 2890.1) 2004*. The standard classifies this development as a Class 3A off-street car parking facility and the following table provides information on the key requirements of AS/NZS 2890.1 - 2004.

TABLE 4.1 – AUSTRALIAN STANDARD COMPLIANCE

FEATURE	AS/NZS 2890.1 REQUIREMENT	PROPOSED	CONFORMS TO AS/NZS 2890.1
Parking Space dimensions	5.4m x 2.6m Standard plus an additional 300mm on each side adjacent to a wall.	5.4m x 2.6m Standard no spaces adjacent a wall	YES
	5.4m x 2.4m plus 2.4m shared area for disabled spaces	5.4m x 2.4m plus 5.4m x 2.4m shared area for disabled space	YES
Aisle widths	6.6m	9.9m min	YES
Driveway width	Combined entry/exit driveways width between 6.0m – 9.0m Note: Driveways are normally combined, but if separate, both entry and exit widths should be 3.0m min.	Bridge Street Driveway 10m	YES
		St Heliers St west driveway 9m	YES
		St Heliers St east driveway 6m	YES

Accordingly, this development proposal adheres to the above Australian Standard requirements.

In addition to the standards for off street car parking the Australian Standards, AS 2890.2:2002 provides the design requirements for varying size heavy vehicles. In this regard, the maximum vehicle to be catered for on site is the 19m articulated vehicle. The following table provides a comparison on the key requirements of AS 2890.2 applicable to the proposal.

TABLE 4.2 – AUSTRALIAN STANDARD COMPLIANCE			
FEATURE	**AS 2890.2 REQUIREMENT**	**PROPOSED**	**CONFORMS TO AS 2890.2**
Driveway width	Articulated Vehicle = 10m	Bridge Street truck driveway 10m entry widening to 11.4m at kerb Bridge Street truck exit driveway 9m widening to 13m at the kerb	**YES** **YES**
Loading area	Articulated Vehicle 19m x 3.5m Small Rigid vehicle (Oliver's) 6.4m x 3.5m	Tanker fill point > 19m x >3.5m Oliver's 7.4m x >3.5m	**YES** **YES**
Driveway/ramp grades	1 in 6.5 (15.4%) max	Max grade 1 in 16 (6.25%)	**YES**
Head clearance	4.5m min for articulated vehicles.	4.5m	**YES**

Accordingly, this development proposal adheres to the above Australian Standard requirements.

Council's Development Control Plan (*Development Control Plan Section 16 Car Parking and Access*) specifies the following car parking requirements applicable to this proposal:

Restaurants:

- 1 space per 7m^2 GFA available for dining.

Service Stations:

- 1 space per 20m^2 of GFA convenience store; plus
- 1 space per 6.5m^2 of GFA

Accordingly, the car parking required for this development proposal calculates as:

Restaurant indoor plus outdoor seating area 203m^2 @ 1 space/7m^2	=	29 spaces.
Convenience store 60m^2 @ 1 space/20m^2	=	3 spaces.
Remaining service station gross floor area 20m^2 @ 1 space/6.5m^2 GFA	=	3 spaces.
TOTAL	=	35 spaces.

Consequently, the proposed development satisfies Council's parking requirements with the provision of 37 off-street parking spaces.

HEAVY VEHICLE ACCESS

Bridge Street (New England Highway) is an approved 26m long B-double Route, However, St Heliers Street is not. Therefore, with the proposed entry/exit driveway arrangements, the maximum vehicle that would be permitted on site would be a 19m articulated vehicle.

The Roads and Maritime Services guidelines provide the following additional requirements for the internal roads, driveways and parking area design of a service station:

- Separate driveways are recommended, with width or 12m off a main road.
- Minimum spacing between a pair of driveways - 10 metres.
- There must not be more than two driveways on any one street frontage.
- Petrol pumps must not be closer than 4 metres to the property alignment of any public street.
- Inlets to bulk storage tanks must be situated so that when tankers are discharging fuel, they will stand completely on the site and not obstruct the safe and convenient entry to the site by other vehicles.

The proposal exceeds all the requirements with the exception of the Bridge Street driveway width. However, application of the Australian Standard 19m articulated vehicle swept turning paths reveals that the driveway as proposed is satisfactory.

The proposed fuel fill point is located to the west of the convenience store car parking adjacent the northern boundary. At this location, the roadway is over 7.2m wide which permits a vehicle to access the fuel filling point or pass a tanker unloading fuel to the filling points.

Articulated vehicle access to and egress from the site in a forward direction has been assessed using AutoCAD Vehicle Tracking software using a 19m long vehicle. Attached as appendix C is a swept turning path indicating that a 19m articulated vehicle is able to access the site in a forward direction from Bridge Street, travel to the fuel fill points and egress in a forward direction onto St Heliers Street to return to Bridge Street (New England Highway). This plan indicates that the proposed driveways are adequate to enable this vehicle to enter and leave the service station in a forward direction.

TRAFFIC

An estimation of the traffic generation of the proposed development can be calculated by reference to the Roads and Traffic Authority's *'Guide to Traffic Generating Developments, Section 3 - Landuse Traffic Generation'* of October 2002. The guide specifies the following week day peak period traffic generation potential for service stations with convenience stores and restaurants:

Service station with convenience store:

Evening peak hour vehicle trips (pvt) = 0.04 A(S) + 0.3 A(F)

or.

Evening peak hour vehicle trips = 0.66 A(F)
Average vehicle trips (9 pm-12 midnight) = 0.6 A(F).

where A(S) = area of site (m^2)
A(F) = GFA of convenience store (m^2)

Restaurants

Evening peak hour vehicle trips = 5 per 100 m^2 gross floor area.

Therefore, the evening peak hour traffic generation for this development is estimated to be:

Service station/convenience store	=	0.66(80m^2)
	=	52.8 trips
Plus restaurant	=	314m^2 @ 5 per 100m^2
	=	15.7
Total	=	68.5

The proportion of fuel trips to store trips can vary substantially depending upon the location of the service station and the time of day. Convenience stores surveyed in 1990 for the (then) Roads and Traffic Authority, indicated that the average percentage of total trips between 3.00pm and 6.00pm for fuel, was 46% (whether goods were purchased as well or not). Between 9.00 pm and 12.00 am the equivalent figure was 29%.

It should be noted that it is unlikely that the peak use of the service station, restaurants and New England Highway will occur simultaneously. However, for the purposes of this assessment the combined traffic generation of each component of the development this will be modelled during the existing New England Highway evening peak hour, which is a worst case scenario.

The estimated peak traffic generation of each of the uses of the site has been modelled during the Friday afternoon peak of the Highway which occurs between 3.00pm and 4.00pm on Friday 15th December 2017 with 977 vehicles (489 northbound and 488 southbound).

The RMS site indicates that the New England Highway carries a high level of heavy vehicles at 18.7%. recorded at station 6157 which has been included in the modelling.

It will also be assumed that the proportion of entering and exiting vehicles will be the same at 50/50.

The estimated additional peak hour approach and departure vehicle trips have been assigned proportionally to the road system on the basis of existing recorded flows along the highway. Figure 3 depicts the modelled Friday afternoon peak hour traffic volumes

modelled.

Using SIDRA intersection 6.0 PLUS, a software programme developed for the purpose of analysing signalised, roundabout and sign controlled intersections, the effect of the estimated traffic generation of this development on the intersection of the New England Highway with St Helliers Street and the service station vehicle access road has been modelled to determine their expected operation. The results of that analysis for the post development circumstances are provided in Table 4.4 and 4.5. The criteria for assessing the SIDRA results are provided overleaf and a copy of the summary output files are attached as appendix D.

TABLE 4.4
OPERATIONAL PERFORMANCE OF INTERSECTION OF NEW ENGLAND HIGHWAY AND ST HILLERS ROAD. SIGN CONTROL. FRIDAY AFTERNOON PEAK HOUR 3.00PM – 4.00PM. (SEE NOTE)

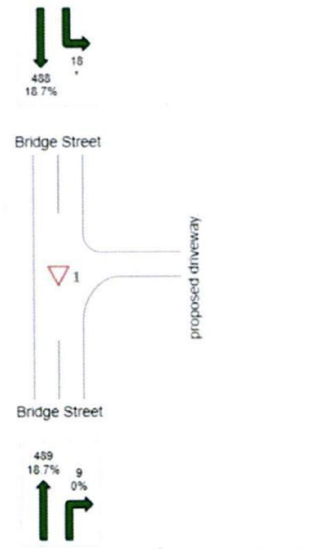
Performance Measure	Forecast Potential PM peak PM
Level of Service	A
Degree of Saturation	0.230
Total Average Delay (sec/veh)	2.3s
Total Average delay (sec/veh) for worst movement.	25.1s (LOS B) for right turn from site St Heliers Street

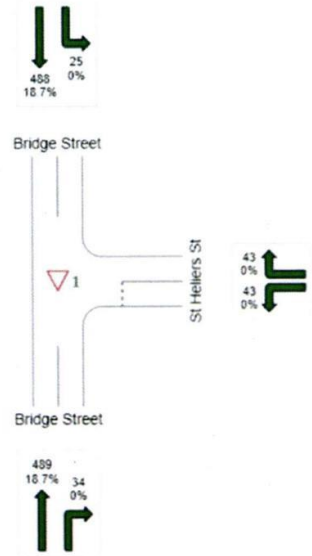
Note: To simulate existing vehicle turning volumes to/from St Heliers Street 25 vehicle per hour have been assumed for each turning movement in the peak hour (considered to be a worst case scenario).

TABLE 4.5
OPERATIONAL PERFORMANCE OF INTERSECTION OF NEW ENGLAND HIGHWAY AND THE VEHICLE ACCESS DRIVEWAY TO THE PROPOSAL. SIGN CONTROL. POTENTIAL FRIDAY AFTERNOON PEAK HOUR 3.00PM – 4.00PM.

Performance Measure	Potential PM Peak
Level of Service	A
Degree of Saturation	0.154
Total Average Delay (sec/veh)	1.0s
Total Average delay (sec/veh) for worst movement.	8.9 (LOS A) for right turn into site driveway

The results of the SIDRA analysis reveal that the existing intersection of New England Highway and St Heliers Road and the proposed intersection with the new access driveway Highway will operate at a good Level of Service and minimal delays with the estimated traffic volumes of the proposal.





Modelled Potential Friday Evening Peak Hour Flows
Fig 2

EVALUATION OF THE RESULTS OF SIDRA

LEVEL OF SERVICE

THE LEVEL OF SERVICE FOR TRAFFIC SIGNALS, ROUNDABOUTS AND SIGN CONTROL INTERSECTIONS IS SHOWN BELOW, THIS IS BASED ON THE AVERAGE DELAY IN SECONDS PER VEHICLE:

AVERAGE DELAY PER VEHICLE	LEVEL OF SERVICE	TRAFFIC SIGNALS & ROUNDABOUTS	SIGN CONTROL
< 14	A	GOOD	GOOD
15 - 28	B	GOOD WITH MINIMAL DELAYS AND SPARE CAPACITY	ACCEPTABLE DELAYS AND SPARE CAPACITY
29 - 42	C	SATISFACTORY WITH SPARE CAPACITY	SATISFACTORY BUT ACCIDENT STUDY REQUIRED
43 - 56	D	SATISFACTORY BUT OPERATING NEAR CAPACITY	NEAR CAPACITYAND ACCIDENT STUDY REQUIRED
57 - 70	E	**AT CAPACITY**: AT SIGNALS INCIDENTS WILL CAUSE EXCESSIVE DELAYS, ROUNDABOUTS REQUIRE ANOTHER CONTROL MODE	AT CAPACITY AND REQUIRES ANOTHER CONTROL MODE
> 70	F	UNSATISFACTORY	UNSATISFACTORY

DEGREE OF SATURATION

THE DEGREE OF SATURATION IS ANOTHER MEASURE OF THE OPERATIONAL PERFORMANCE OF INDIVIDUAL INTERSECTIONS.

FOR TRAFFIC SIGNAL CONTROLLED INTERSECTIONS BOTH QUEUE LENGTH AND DELAY INCREASE RAPIDLY AS THE DEGREE OF SATURATION APPROACHES 1.0, AND IT IS USUALLY ATTEMPTED TO KEEP IT BELOW 0.9.

FOR ROUNDABOUTS OR SIGN CONTROLLED INTERSECTIONS, OVERSATURATION IS INDICATED BY A VALUE IN EXCESS OF 0.8.

AVERAGE VEHICLE DELAY

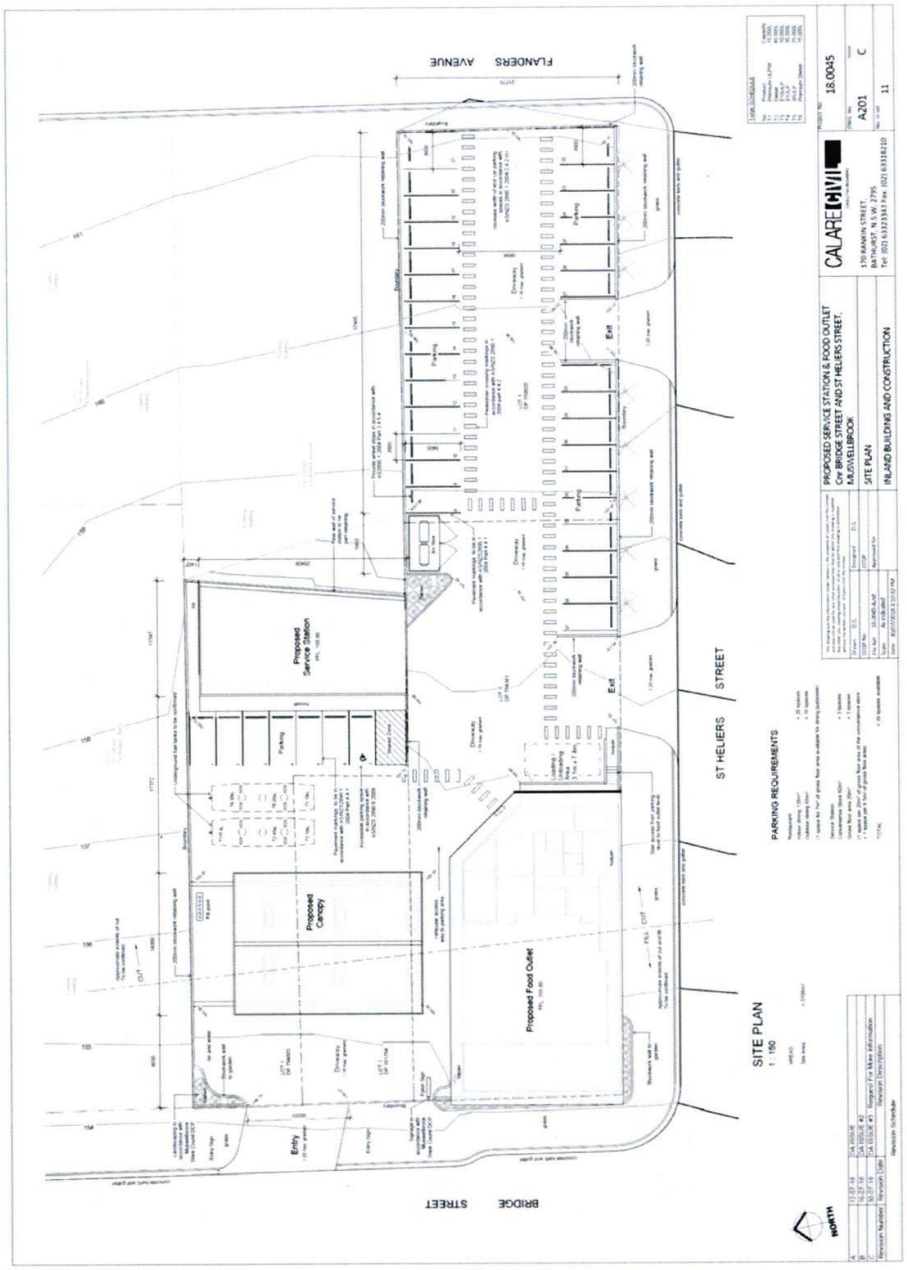
THE AVERAGE VEHICLE DELAY PROVIDES A MEASURE OF THE OPERATIONAL PERFORMANCE OF AN INTERSECTION AS INDICATED IN THE ABOVE TABLE . THE AVERAGE VEHICLE DELAYS IN THE TABLE SHOULD BE USED AS A GUIDE ONLY AS LONGER DELAYS COULD BE TOLERATED IN SOME LOCATIONS.

5. CONCLUSIONS

The preceding analysis has revealed that:

- The proposed vehicle access driveways are suitably located and will provide good sight distance along New England Highway and St Heliers Road frontages of the site.
- The proposed development satisfies the related geometric design specifications contained in the Australian Standards for off - street parking and vehicular access for cars and trucks.
- The 37 off-street parking spaces provided in the proposed development exceeds Council's development control plan requirements.
- The vehicle access road widths, diesel dispensers and proposed fuel fill point can be access by vehicles up to the 19m articulated vehicles in a forward direction entering and exiting the site.
- The subject proposal is estimated to potentially generate approximately 69 vehicle trips in the evening peak hour.
- The results of the SIDRA analysis reveal that the existing intersection of New England Highway and St Heliers Road and the proposed intersection with the new access driveway will operate at a good Level of Service and minimal delays with the estimated traffic volumes of the proposal.

APPENDIX A ARCHITECTURAL SITE PLAN


FLANDERS AVENUE
ST HELIERS STREET
BRIDGE STREET
Proposed Service Station
Proposed Canopy
Proposed Food Outlet
Entry
Exit
Exit
SITE PLAN
1:150
PARKING REQUIREMENTS
PROPOSED SERVICE STATION & FOOD OUTLET
Cnr BRIDGE STREET AND ST HELIERS STREET,
MUSWELLBROOK
SITE PLAN
INLAND BUILDING AND CONSTRUCTION
CALARE CIVIL
18.0045
A201
C
11

APPENDIX B RMS TRAFFIC VOLUME DATA

year	date	cardinal_direction_seq	classification_seq	hour_00	hour_01	hour_02	hour_03	hour_04	hour_05	hour_06	hour_07	hour_08	hour_09	hour_10	hour_11	hour_12	hour_13	hour_14	hour_15	hour_16	hour_17	hour_18	hour_19	hour_20	hour_21	hour_22	hour_23
2017	15/12/2017	Northbound	Light Vehicles	23	6	10	15	48	77	145	217	302	230	291	334	302	326	402	420	442	420	325	213	145	116	94	60
2017	15/12/2017	Northbound	Heavy Vehicles	12	10	21	19	31	41	84	83	74	54	63	85	80	72	82	69	66	72	52	54	30	17	30	13
2017	15/12/2017	Southbound	Heavy Vehicles	17	24	16	17	23	52	57	72	88	71	85	66	74	97	77	88	69	60	37	36	13	15	25	14
2017	15/12/2017	Northbound	All Vehicles	35	16	31	34	79	118	229	300	376	284	354	419	382	398	484	489	508	492	377	267	175	133	124	73
2017	15/12/2017	Southbound	All Vehicles	31	31	27	32	64	287	305	302	456	423	430	393	420	424	462	488	426	451	343	233	115	134	116	59
2017	15/12/2017	Southbound	Light Vehicles	14	7	11	15	41	235	248	230	368	352	345	327	346	327	385	400	357	391	306	197	102	119	91	45

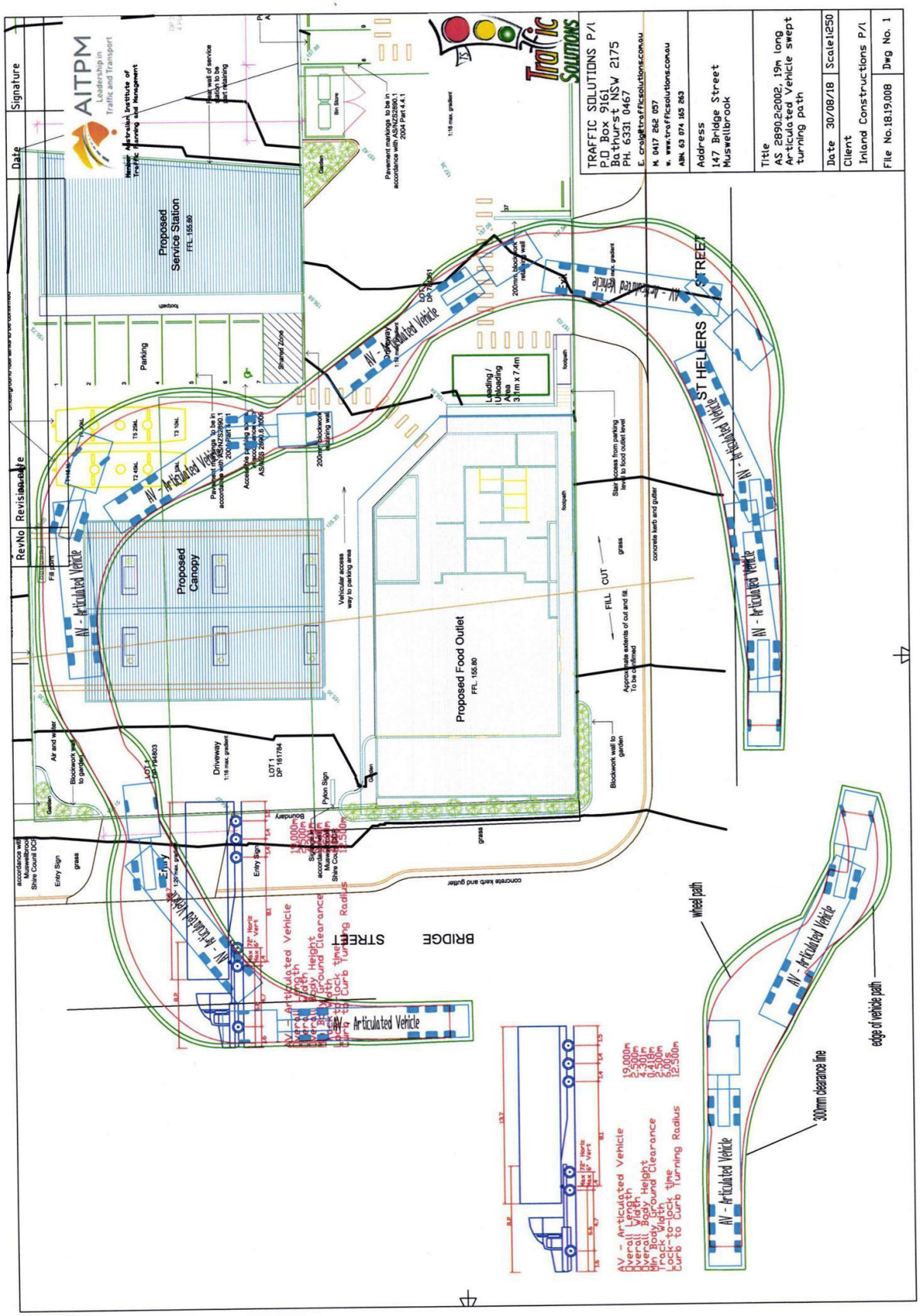
Week	Beginning	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Weekly Total
1	30/03/2015			11231	6516	5570	7160	3616	34093
2	6/04/2015	9826	10340	10179	10587	11837	8371	8337	69477
3	13/04/2015	10047	9552	10416	9902	12353	8992	8867	70129
4	20/04/2015	10329		8566	10121	11688		7915	48619
5	27/04/2015	10215	10141	10599	11182	12030	8081	7936	70184
6	4/05/2015	10277	9916	10270	11136	12292	9337	9075	72303
7	11/05/2015	10187	10282	10270	11296	12957	9206	8691	72889
8	18/05/2015	11062	10130	10077	10931				42200
9	25/05/2015	9942	9960	10156	10673	11300	8761	7797	68589
10	1/06/2015	9837	9707	10087	10957	13420	8532	7089	69629
11	8/06/2015	5735	10799	8895	10804	11345	7785	7853	63216
12	15/06/2015	10259	10200	10017	10640	11993	8213	7987	69309
13	22/06/2015	10311	10193	10241	10919	12603	9802	8793	72862
14	29/06/2015	10252	10059	10019	10771	11689	9795	8918	71503
15	6/07/2015	10052	9657	10164	10471	11325	8816	9415	69900
16	13/07/2015	10468	10212	9974	10917	10410	8842	8470	69293
17	20/07/2015	10249	9873	10121	10536	11221	7929	8000	67929
18	27/07/2015	9790	10115	10136	10694	12057	8068	8135	68995
19	3/08/2015	9840	9651	10192	10517	11675	8707	8757	69339
20	10/08/2015	10107	9754	10086	10619	11966	8531	9054	70117
21	17/08/2015	11109	11019	11167	12157	12431	9029	8221	75133
22	24/08/2015	9899	9769	10456	10456	11936	8626	8245	69387
23	31/08/2015	10027	9910	10239	10594	11644	8472	9066	69952
24	7/09/2015	10312	9948	10142	10982	11937	8262	8713	70296
25	14/09/2015	10663	10378	10421	11278	12553	8712	9100	73105
26	21/09/2015	10380	10149	10294	11218	12298	8371	9004	71714
27	28/09/2015	10436	10091	10512	11363	13561	9720	7660	73343
28	5/10/2015	10856	10924	10699	11002	12069	8083	8159	71792
29	12/10/2015	10430	10310	10379	11119	11948	7879	8291	70356
30	19/10/2015	10261	10137	10092	10700	12444	8820	8807	71261
31	26/10/2015	10024	10528	10507	10899	11875	7638	8307	69778
32	2/11/2015	10170	9195	10265	10645	11883	7951	8673	68782
33	9/11/2015	10915	10456	10522	11113	12370	8502	8539	72417
34	16/11/2015	10941	10074	10465	11028	12150	8434	8625	71717
35	23/11/2015	10478	10361	10600	10759	12247	8323	8818	71586
36	30/11/2015	10568	10263	10756	11525	12501	8808	8422	72843
37	7/12/2015	10650	10558	10767	11200	12267	8628	8426	72496
38	14/12/2015	10792	10947	10897	11466	12192	9123	8669	74086
39	21/12/2015	11161	11165	12575	12084		8053	9508	64546
40	28/12/2015	9106	9493	10088	9167		4384	4110	46348
41	4/01/2016	4514	4469	4455	4843	5262	3877	3891	31311
42	11/01/2016	4575	4687	4926	5171	5274	3957	4305	32895
43	18/01/2016	4943	4960	5106	5533	5711	4463		30716
44	25/01/2016	5822	3805	5330	5354	5800	3747	3676	33534
45	1/02/2016	4742	4951	5215	5376	5936	3842	4055	34117
46	8/02/2016	4720	4983	5141	5377	6110	4043	4236	34610
47	15/02/2016	4765	5024	5130	5703	6355	3932	4333	35242
48	22/02/2016	4995	5168	5249	5879	6427	3955	4216	35889
49	29/02/2016	5001	4894	5130	5356	5958	3988	4616	34943
50	7/03/2016	4951	5153	5261	5560	6309	4438	5141	36813
51	14/03/2016	5317	5064			6057	3843	4609	24890

52	21/03/2016	4841	5443	5485	6589		3586	4620	30564
53	28/03/2016		5639	5321	5424	5894	4643	4366	31287
54	4/04/2016	4887	5121	5378	5468	6244	4623	4781	36502
55	11/04/2016	4942	4973	5195	5545	6160	4323	4779	35917
56	18/04/2016	4938	4989	5288	5670	6206	4228	4159	35478
57	25/04/2016	4268	5423	5436	5750	6406	4442	4135	35860
58	2/05/2016	4949	4945	5106	5670	6136	4637	4737	36180
59	9/05/2016	4980	5056	5182	5626	6207	4765	5098	36914
60	16/05/2016	5001	5062	5220	5654	6101	4374	4354	35766
61	23/05/2016	4786	4970	5296	5512	6096	4298	4438	35396
62	30/05/2016	4954	5066	5258	5405	6155	3640	3301	33779
63	6/06/2016	4760	4947	5152	5419				20278
64	13/06/2016	5882	5457	5106	5627	5924	4268	3739	36003
65	20/06/2016	4644	4954	5053	5330	6084	4439	4159	34663
66	27/06/2016	4823	4943	5297	5515	6073	5278	4353	36282
67	4/07/2016	4810	4992	5137		5901	4486	5026	30352
68	11/07/2016	5331	5178	5181	5491	6071	4546	4669	36467
69	18/07/2016	4978	4908	5041	5435	5717	4354	4060	34493
70	25/07/2016	4820	4988	5236	5572	5899	4197	4203	34915
71	1/08/2016	4905	4973	4945	5354	5969	4130	4166	34442
72	8/08/2016	4759	4856	5046	5533	5890	4321	4477	34882
73	15/08/2016	4900	4883	5503	6309	6812	4381	4914	37702
74	22/08/2016	5167	5084	5230	5838	6152	4664	4378	36513
75	29/08/2016	4880	4964	5133	5418	5852	4109	4000	34356
76	5/09/2016	4838	4993	5103	5628	6182	4074	4599	35417
77	12/09/2016	5072	5237	5341	5582	6091	4151	4169	35643
78	19/09/2016	4964	5086	5295	5665	6299	4340	4512	36161
79	26/09/2016	5093	5301	5559	5877	6377	4246	4290	36743
80	3/10/2016	6132	5623	5355	5519	6175	4390	4635	37829
81	10/10/2016	5143	5215	5356	6021	6483	4130	4212	36560
82	17/10/2016	5062	5270	5272	5725	6507	4132	4576	36544
83	24/10/2016	5031	5169	5386	5924	6035	4004	4428	35977
84	31/10/2016	4866	4758	5028	5696	6169	4191	4894	35602
85	7/11/2016	5283	5155	5231	5492	6028	4270	4486	35945
86	14/11/2016	4936	5105	5336	5760	6318	4487	4580	36522
87	21/11/2016	5215	5379	5435	6043	6648	4159	4371	37250
88	28/11/2016	5108	5226				4396	4244	18974
89	5/12/2016	5160	5233	5384	5938	6305	4226	4282	36528
90	12/12/2016	5099	5016			6199	4442	4376	25132
91	19/12/2016	5454	5528	5618	6210	6317	4760		33887
92	26/12/2016	3938	4989	5100	5221	5535	4013	3248	32044
93	2/01/2017	8591	9721	9540	9970	10567	8074	8074	64537
94	9/01/2017	9944	9861	9817	10275	10769	8069	7817	66552
95	16/01/2017	9841	9878	9842	10737	11756	8485	8682	69221
96	23/01/2017	10564	10600	5910	4573	11498	8827	3896	55868
97	30/01/2017	9584	10432	10587	10920	12285	7738	7956	69502
98	6/02/2017	10753	10363	10307	11046	11613	7641	7738	69461
99	13/02/2017	10706	10722	10843	10801	11873	8248	8288	71481
100	20/02/2017	10432	10267	10383	11332	12231	8080	8341	71066
101	27/02/2017	10205	10010	10178	10811	12105	8072	9460	70841
102	6/03/2017	10324	10147	10162	10943	12342	8390	8991	71299
103	13/03/2017	9992	10062	10238	11097	11734	7947	8741	69811
104	20/03/2017	10215	10404	10149	11207	12115	8029	9031	71150

105	27/03/2017	10640	10432	10083	11084	12432	10364	9018	74053
106	3/04/2017	10993	10727	11197	11786	13116	9763	9113	76695
107	10/04/2017	10601	10481	11309	6279	6235	7602	7773	60280
108	17/04/2017	4511	11138	10832	10825	12141	8906	8614	66967
109	24/04/2017	10352		10626	11044	11697	8592	9136	61447
110	1/05/2017	10569	10055	10140	11203	12418	9443	8885	72713
111	8/05/2017	10420	10366	10428	11579	12880	9757	9691	75121
112	15/05/2017	10466	10455	10556	10946	11785	8129	8467	70804
113	22/05/2017	10103	10113	9004	10916	11684	8825	8691	69336
114	29/05/2017	9924	9671	9879	10561	11425	8589	7986	68035
115	5/06/2017	9909	10088	9927	10937	5443	8812	7348	62464
116	12/06/2017	10515	11065	10582	11105	11619	8323	8500	71709
117	19/06/2017	10400	10487	10531	11224	12035	9337	8778	72792
118	26/06/2017	10600	10078	10352	11032	12102	5382	8922	68468
119	3/07/2017	10707	10468	10247	11054	12404	8650	9637	73167
120	10/07/2017	10745	10395	10509	11105	12198	8804	9012	72768
121	17/07/2017	10509	10229	10325	11044	11956	9304	8380	71747
122	24/07/2017	10433	10178	10271	11064	11961	8244	8259	70410
123	31/07/2017	9869	10164	10185	10469	11608	8654	8553	69502
124	7/08/2017	10150	10274	10318	10814	12285	8246	8844	70931
125	14/08/2017	10714	10663		11350	12660	9095	9458	63940
126	21/08/2017	11202	11221	11704	12135	12977	9285	9092	77616
127	28/08/2017	10389	10309	10203	10827	11947	9001	8423	71099
128	4/09/2017	10251	10288	10336	11511	12266	8346	9017	72015
129	11/09/2017	10474	10384	10520	11146	12278	8097	8753	71652
130	18/09/2017	10874	10609	10648	11485	12744	9266	8876	74502
131	25/09/2017	10651	10410	10912	11650	13493	9710	8071	74897
132	2/10/2017	10548	11165	10774	11254	11738	8643	8565	72687
133	9/10/2017	10864	10650	10476	11509	12394	8478	8643	73014
134	16/10/2017	10556	10610	10418	11388	11978	8636	8915	72501
135	23/10/2017	10687	10518	10498	11289	12605	8508	9301	73406
136	30/10/2017	10596	10632	10549	11237	12295	7997	8454	71760
137	6/11/2017	10397	9718	10475	11046	12317	8607	9492	72052
138	13/11/2017	10742	10434	10876	11677	12698	8898	9214	74539
139	20/11/2017	11062		10993	11800	12869	8557	8824	64105
140	27/11/2017	11082	10594	10599	11456	12248	8635	8876	73490
141	4/12/2017	11118	11195	10987	11533	12454	9161	8722	75170
142	11/12/2017	11007	11096	11603	11718	12629	8918	8750	75721
143	18/12/2017	11147	11489	11283	11980	12961	5487	8699	73046
144	25/12/2017		9231	11284	10153	10295	8778	3594	53335
145	1/01/2018		9926	9536	9847	10447	7954	3837	51547
146	8/01/2018	9646	9445	9650	10041	10728	7465	3922	60897
147	15/01/2018	9853	9821	10175	10896	12069	8370	8623	69807
148	22/01/2018	10537	10651	11433	6342	4731	7970	3996	55660
149	29/01/2018	5357	10132	10064	10487	11246	8003	8186	63475
150	5/02/2018	10274	10075	10371	10881	11658			53259
151	12/02/2018	9994	10572	10550	11013	11836	8085	8401	70451
152	19/02/2018	10559	10283	10749	11212	12585	7926	8330	71644
153	26/02/2018	10233	10064	10341	10806		7912	8313	57669
154	5/03/2018	10344	10162	10274	11160		8034	8777	58751
155	12/03/2018	10599	10314	10721	11355		8707	9102	60798
156	19/03/2018	10661	10578	10349	11182		8274	10718	61762
157	26/03/2018	10627	11025	11387	6519			7709	47267

158	2/04/2018	11071	11358	10863	10021	10502	7551	9078	70444
159	9/04/2018	11109	10792	10436	11532		9566	9018	62453
160	16/04/2018	10605	10020	10154	10992				41771
161	23/04/2018								
162	30/04/2018		10368		10851	12290	8589	9310	51408
163	7/05/2018	10802	10427		11655	12609	9525	9288	64306
164	14/05/2018	10855	10470		10975	11974	8754	9289	62317
165	21/05/2018	10460			10667	11652	9020	8855	50654
166	28/05/2018	10217	10251		10864	11547	8387	7675	58941
167	4/06/2018	10254	10006	10349	11267	13642	8960	7368	71846

APPENDIX C AUTOCAD VEHICLE TRACKING 19M ARTICULATED SWEPT TURNING PATH

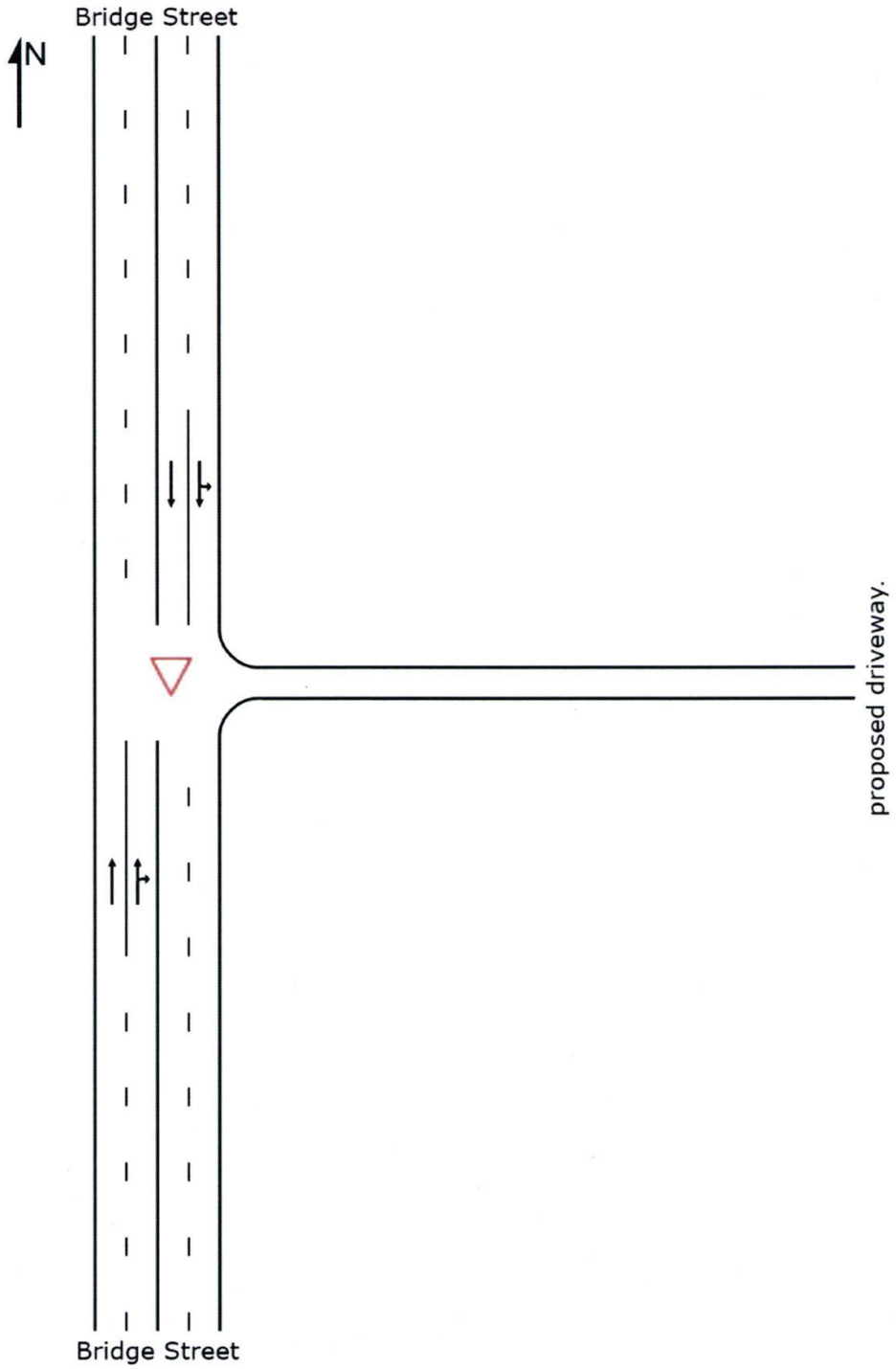

TRAFFIC SOLUTIONS P/L
P.O Box 9161
Bathurst NSW 2175
PH. 6331 0467
M. 0417 262 057
ABN. 63 074 165 263
Address
147 Bridge Street
Muswellbrook
Title
AS 2890.2:2002, 19m long Articulated Vehicle swept turning path
Date 30/08/18
Scale 1:250
Client
Inland Constructions P/L
File No. 18.19.008
Dwg No. 1
Proposed Service Station
FFL 155.80
Proposed Canopy
Proposed Food Outlet
FFL 155.80
Parking
Shared Zone
Loading / Unloading Area 31m x 7.4m
Driveway
Pylon Sign
Entry Sign
Vehicular access way to parking area
Start access from parking level to food outlet level
Approximate extents of cut and fill. To be confirmed
FILL
CUT
ST HELIERS STREET
BRIDGE STREET
AV - Articulated Vehicle
AV - Articulated Vehicle Length
Overall Width
Overall Body Height
Ground Clearance
Track Width
Lock-to-lock time
Curb to Curb Turning Radius
19.000m
2.500m
4.418m
0.410m
2.500m
6.00s
12.500m
wheel path
edge of vehicle path
300mm clearance line

APPENDIX D SIDRA SUMMARY OUTPUT FILES

SITE LAYOUT

Site: Proposed Friday PM peak dw

Bridge St and proposed driveway
Giveway / Yield (Two-Way)



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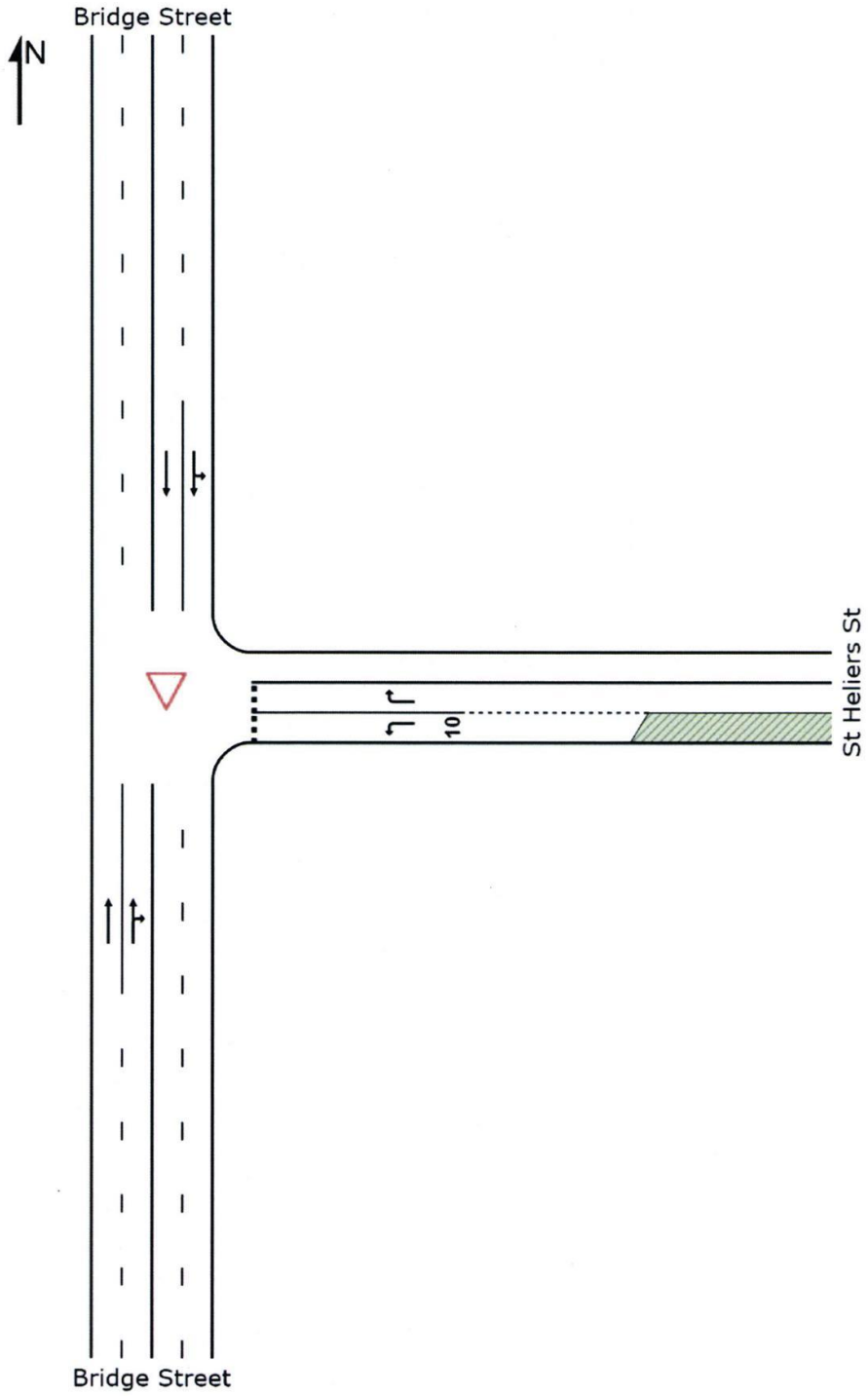
SIDRA INTERSECTION 6.0.24.4877
Project: T:\20182019\008\sidra\muswellbrook.sip6
8000870, 6016543, TRAFFIC SOLUTIONS PTY LTD, PLUS / 1PC

SIDRA INTERSECTION 6

SITE LAYOUT

Site: Proposed Friday PM peak

Bridge and St Heliers Streets
Giveway / Yield (Two-Way)



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8000870, 6016543, TRAFFIC SOLUTIONS PTY LTD, PLUS / 1PC

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

▽ Site: Proposed Friday PM peak dw

Bridge St and proposed driveway
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Street											
2	T1	515	18.7	0.154	1.7	LOS A	1.4	11.2	0.28	0.02	58.3
3	R2	9	0.0	0.154	8.9	LOS A	1.4	11.2	0.58	0.03	54.7
Approach		524	18.4	0.154	1.8	NA	1.4	11.2	0.29	0.02	58.2
North: Bridge Street											
7	L2	19	0.0	0.153	5.6	LOS A	0.0	0.0	0.00	0.04	57.9
8	T1	514	18.7	0.153	0.0	LOS A	0.0	0.0	0.00	0.02	59.7
Approach		533	18.0	0.153	0.2	NA	0.0	0.0	0.00	0.02	59.7
All Vehicles		1057	18.2	0.154	1.0	NA	1.4	11.2	0.14	0.02	58.9

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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Proposed Friday PM peak

Bridge and St Heliers Streets
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Street											
2	T1	515	18.7	0.170	1.5	LOS A	1.4	11.2	0.25	0.05	58.1
3	R2	36	0.0	0.170	9.1	LOS A	1.4	11.2	0.60	0.13	54.4
Approach		551	17.5	0.170	2.0	NA	1.4	11.2	0.28	0.06	57.9
East: St Heliers St											
4	L2	45	0.0	0.044	6.6	LOS A	0.2	1.1	0.34	0.60	52.6
6	R2	45	0.0	0.230	25.1	LOS B	0.8	5.5	0.85	0.96	41.5
Approach		91	0.0	0.230	15.9	LOS B	0.8	5.5	0.60	0.78	46.4
North: Bridge Street											
7	L2	26	0.0	0.155	5.6	LOS A	0.0	0.0	0.00	0.06	57.7
8	T1	514	18.7	0.155	0.0	LOS A	0.0	0.0	0.00	0.03	59.7
Approach		540	17.8	0.155	0.3	NA	0.0	0.0	0.00	0.03	59.6
All Vehicles		1181	16.3	0.230	2.3	NA	1.4	11.2	0.17	0.10	57.5

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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

TRAFFIC SOLUTIONS PTY LTD

Reference No: 18.19.008
15 February 2019

The General Manager
Muswellbrook Shire Council
P.O Box 122
Muswellbrook NSW 2333

Attention: Mr Hamish McTaggart

Dear Hamish,

Supplementary Traffic Statement - proposed service station, convenience store and food outlet, corner of Bridge and St Heliers Streets, Muswellbrook.. DA 78/2018

This statement is to address the traffic related issues raised by the Roads and Maritime Services (RMS) letter of 11th January 2019.

RMS concern relates to the traffic volume data used in the Traffic Report submitted with the development application and requested an intersection count be undertaken and remodelling of the intersection of Bridge Street and St Heliers Street.

Accordingly, data on the traffic movements have been collected by surveys undertaken by R.O.A.R. Data Pty Ltd on behalf of this firm from 3.00 pm – 6.00 pm on Friday, 8 February 2019 at the intersection of Bridge and St Heliers Streets, Muswellbrook. Conditions on this day were described as cloudy with no unusual circumstances encountered.

The peak hour at the intersection in evening was found to be between 3.30pm – 4.30pm. Detailed results of the survey are attached.

The estimated traffic generation calculated in the report submitted with the DA was 69 vehicle trips in the evening peak hour. It should be noted that it is unlikely that the peak use of the service station, restaurants and Bridge Street will occur simultaneously. However, for the purposes of this assessment the combined traffic generation of each component of the development will be modelled during the existing Bridge Street evening peak hour, which is a worst case scenario.

To assess the impact of the development on the intersection, the estimated evening peak hour approach and departure vehicle trips have been assigned proportionally to this intersection on the basis of existing flows past the site along Bridge Street. It will also be assumed that the proportion of entering and exiting vehicles will be the same. I.e. 35 entering and 34 exiting.

Traffic Solutions Pty Ltd, PO Box 9161, Bathurst NSW 2795
Ph: 02 6331 0467 ▪ Email: craig@trafficsolutions.com.au
ABN 63 074 165 263

It is recognised that some of the traffic generated by the development may approach and depart the site via St Heliers Street east, however, by concentrating all of the potential traffic generated by this development to this intersection a higher impact upon this intersection (and therefore a worst case scenario) is modelled.

Using SIDRA intersection 6.0 plus, a software program developed for the purpose of analysing signalised, roundabout and controlled intersections, the effect of the estimated traffic generation of this development on the adjacent road system has been assessed.

A comparison of intersection performance between the existing and projected traffic demands during the evening peak hour upon the intersection has been modelled. Tabled below are the results of the intersection modelling and a copy of the SIDRA modelled volumes and summary output files are attached for Council and the RMS review.

Intersection Operational Indicators	**Operational performance of intersection of Bridge Street and St Heliers Street. Sign Control. Friday Afternoon Peak hour 3.30pm – 4.30pm.**	
	Existing	**Potential**
	PM	**PM**
Level of Service	A	Choose an item.
Degree of Saturation	0.209	0.221
Total Average Delay (sec/veh)	1.6s	2.1s
Total Average delay (sec/veh) for right turn from St Heliers St	24.9s (Los B)	26.9 (Los B)

The results of the SIDRA analysis reveal:

- The Level of Service at the intersection will not change with the estimated additional traffic generation of the proposed development.

- The additional traffic demand on the intersection as a consequence of the proposed development will only alter the Degree of Saturation and Total Average Delays minutely.

I trust this additional information is suitable to continue assessment of the application. Should you require any additional information or clarification of the contents of this letter please contact me on the numbers provided.

Yours sincerely

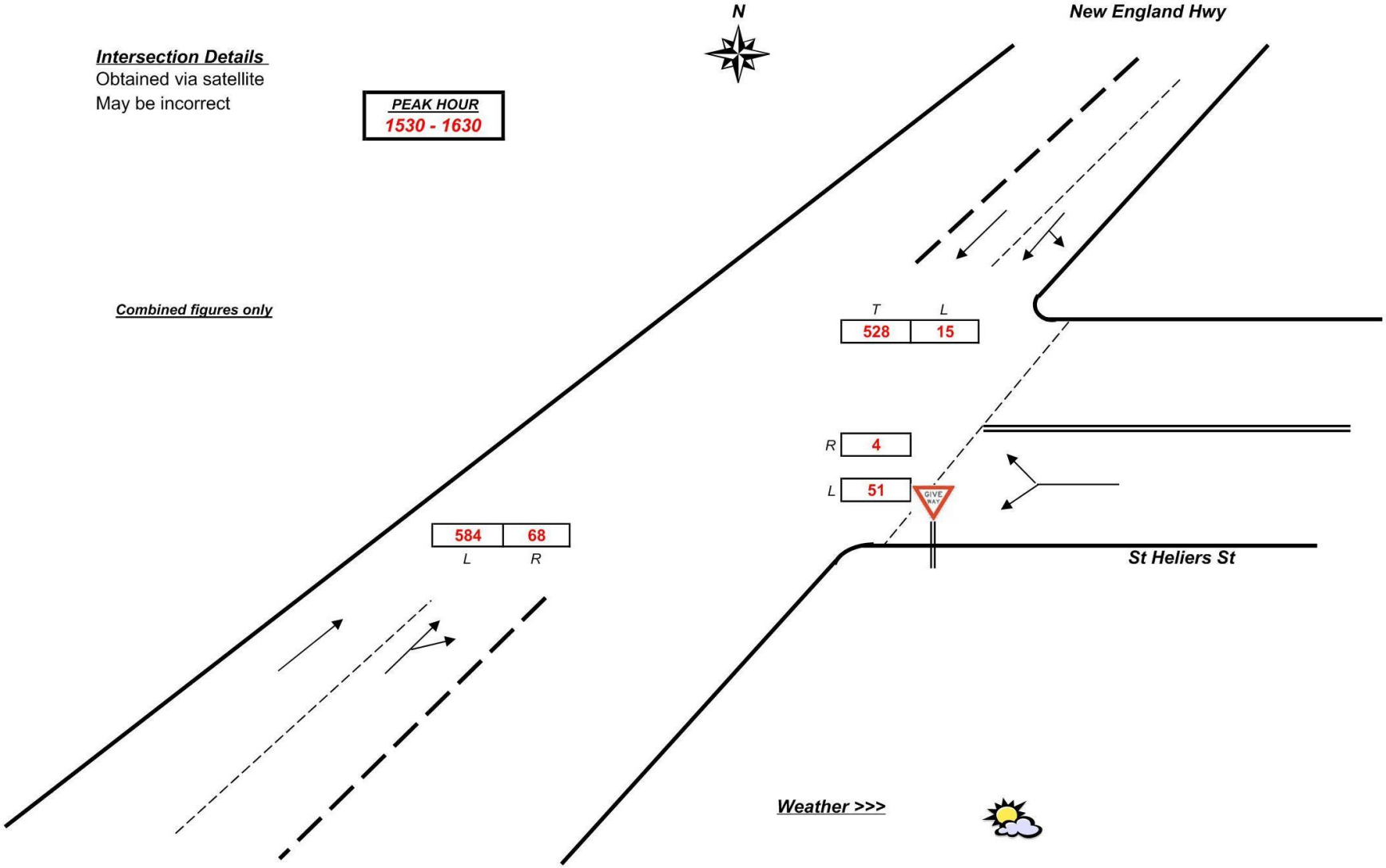
Craig Hazell
Director

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : Traffic Solutions Pty. Ltd.
Job No/Name : 7007 MUSWELLBROOK St Heliers Rd
Day/Date : Friday 8th February 2019

Intersection Details
Obtained via satellite
May be incorrect

PEAK HOUR
1530 - 1630



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Client : Traffic Solutions Pty. Ltd.
Job No/Name : 7007 MUSWELLBROOK St Heliers Rd
Day/Date : Friday 8th February 2019

PEDS	NORTH	EAST	SOUTH	
Time Per	New England	St Heliers St	New England	TOT
1500 - 1515	0	4	0	4
1515 - 1530	0	2	0	2
1530 - 1545	0	0	0	0
1545 - 1600	0	3	0	3
1600 - 1615	0	1	1	2
1615 - 1630	0	2	0	2
1630 - 1645	0	1	0	1
1645 - 1700	0	0	0	0
1700 - 1715	0	0	0	0
1715 - 1730	0	1	3	4
1730 - 1745	0	3	1	4
1745 - 1800	0	0	0	0
Per End	0	17	5	22

PEDS	NORTH	EAST	SOUTH	
Peak Per	New England	St Heliers St	New England	TOT
1500 - 1600	0	9	0	9
1515 - 1615	0	6	1	7
1530 - 1630	0	6	1	7
1545 - 1645	0	7	1	8
1600 - 1700	0	4	1	5
1615 - 1715	0	3	0	3
1630 - 1730	0	2	3	5
1645 - 1745	0	4	4	8
1700 - 1800	0	4	4	8
PEAK HR	0	6	1	7

Lights	NORTH		EAST		SOUTH		
	New England Hwy		St Heliers St		New England Hwy		
Time Per	T	L	R	L	R	T	TOT
1500 - 1515	112	1	1	13	23	121	271
1515 - 1530	126	4	5	8	16	116	275
1530 - 1545	133	4	1	21	18	140	317
1545 - 1600	133	5	1	8	17	137	301
1600 - 1615	104	3	2	16	17	144	286
1615 - 1630	123	3	0	6	16	133	281
1630 - 1645	120	7	1	12	14	131	285
1645 - 1700	125	6	5	7	14	148	305
1700 - 1715	118	5	3	6	22	119	273
1715 - 1730	124	4	2	8	12	130	280
1730 - 1745	132	4	6	1	12	151	306
1745 - 1800	122	4	2	4	11	119	262
Per End	1472	50	29	110	192	1589	3442

Heavies	NORTH		EAST		SOUTH		
	New England Hwy		St Heliers St		New England Hwy		
Time Per	T	L	R	L	R	T	TOT
1500 - 1515	4	0	0	3	0	12	19
1515 - 1530	6	0	0	0	1	7	14
1530 - 1545	12	0	0	0	0	6	18
1545 - 1600	10	0	0	0	0	10	20
1600 - 1615	6	0	0	0	0	6	12
1615 - 1630	7	0	0	0	0	8	15
1630 - 1645	10	0	0	0	0	10	20
1645 - 1700	7	0	0	0	0	6	13
1700 - 1715	8	0	0	0	0	7	15
1715 - 1730	4	0	0	0	0	2	6
1730 - 1745	5	0	0	0	0	5	10
1745 - 1800	6	0	0	0	0	4	10
Per End	85	0	0	3	1	83	172

Combined	NORTH		EAST		SOUTH		
	New England Hwy		St Heliers St		New England Hwy		
Time Per	T	L	R	L	R	T	TOT
1500 - 1515	116	1	1	16	23	133	290
1515 - 1530	132	4	5	8	17	123	289
1530 - 1545	145	4	1	21	18	146	335
1545 - 1600	143	5	1	8	17	147	321
1600 - 1615	110	3	2	16	17	150	298
1615 - 1630	130	3	0	6	16	141	296
1630 - 1645	130	7	1	12	14	141	305
1645 - 1700	132	6	5	7	14	154	318
1700 - 1715	126	5	3	6	22	126	288
1715 - 1730	128	4	2	8	12	132	286
1730 - 1745	137	4	6	1	12	156	316
1745 - 1800	128	4	2	4	11	123	272
Per End	1557	50	29	113	193	1672	3614

Lights	NORTH		EAST		SOUTH		
	New England Hwy		St Heliers St		New England Hwy		
Peak Per	T	L	R	L	R	T	TOT
1500 - 1600	504	14	8	50	74	514	1164
1515 - 1615	496	16	9	53	68	537	1179
1530 - 1630	493	15	4	51	68	554	1185
1545 - 1645	480	18	4	42	64	545	1153
1600 - 1700	472	19	8	41	61	556	1157
1615 - 1715	486	21	9	31	66	531	1144
1630 - 1730	487	22	11	33	62	528	1143
1645 - 1745	499	19	16	22	60	548	1164
1700 - 1800	496	17	13	19	57	519	1121
PEAK HR	493	15	4	51	68	554	1185

Heavies	NORTH		EAST		SOUTH		
	New England Hwy		St Heliers St		New England Hwy		
Peak Per	T	L	R	L	R	T	TOT
1500 - 1600	32	0	0	3	1	35	71
1515 - 1615	34	0	0	0	1	29	64
1530 - 1630	35	0	0	0	0	30	65
1545 - 1645	33	0	0	0	0	34	67
1600 - 1700	30	0	0	0	0	30	60
1615 - 1715	32	0	0	0	0	31	63
1630 - 1730	29	0	0	0	0	25	54
1645 - 1745	24	0	0	0	0	20	44
1700 - 1800	23	0	0	0	0	18	41
PEAK HR	35	0	0	0	0	30	65

Combined	NORTH		EAST		SOUTH		
	New England Hwy		St Heliers St		New England Hwy		
Peak Per	T	L	R	L	R	T	TOT
1500 - 1600	536	14	8	53	75	549	1235
1515 - 1615	530	16	9	53	69	566	1243
1530 - 1630	528	15	4	51	68	584	1250
1545 - 1645	513	18	4	42	64	579	1220
1600 - 1700	502	19	8	41	61	586	1217
1615 - 1715	518	21	9	31	66	562	1207
1630 - 1730	516	22	11	33	62	553	1197
1645 - 1745	523	19	16	22	60	568	1208
1700 - 1800	519	17	13	19	57	537	1162
PEAK HR	528	15	4	51	68	584	1250

R.O.A.R. DATA

Reliable, Original & Authentic Results

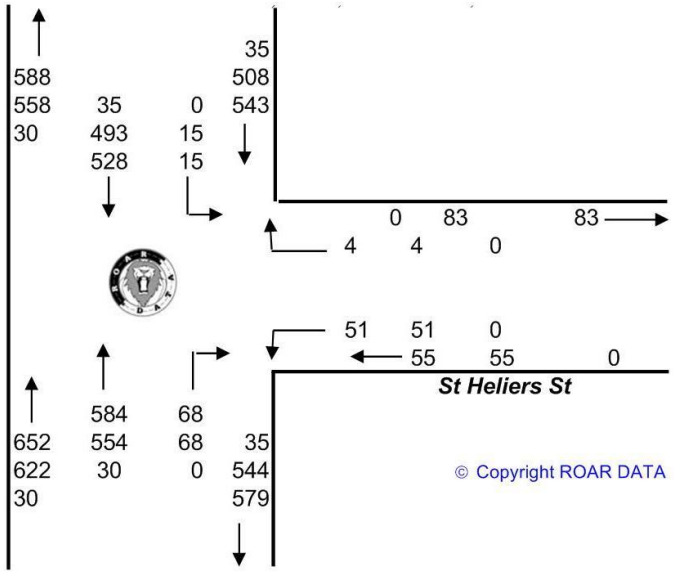
Ph.88196847, Mob.0418-239019

Client : Traffic Solutions Pty. Ltd.
Job No/Name : 7007 MUSWELLBROOK St Heliers Rd
Day/Date : Friday 8th February 2019

PM PEAK
1530 - 1630

TOTAL VOLUMES FOR COUNT PERIOD

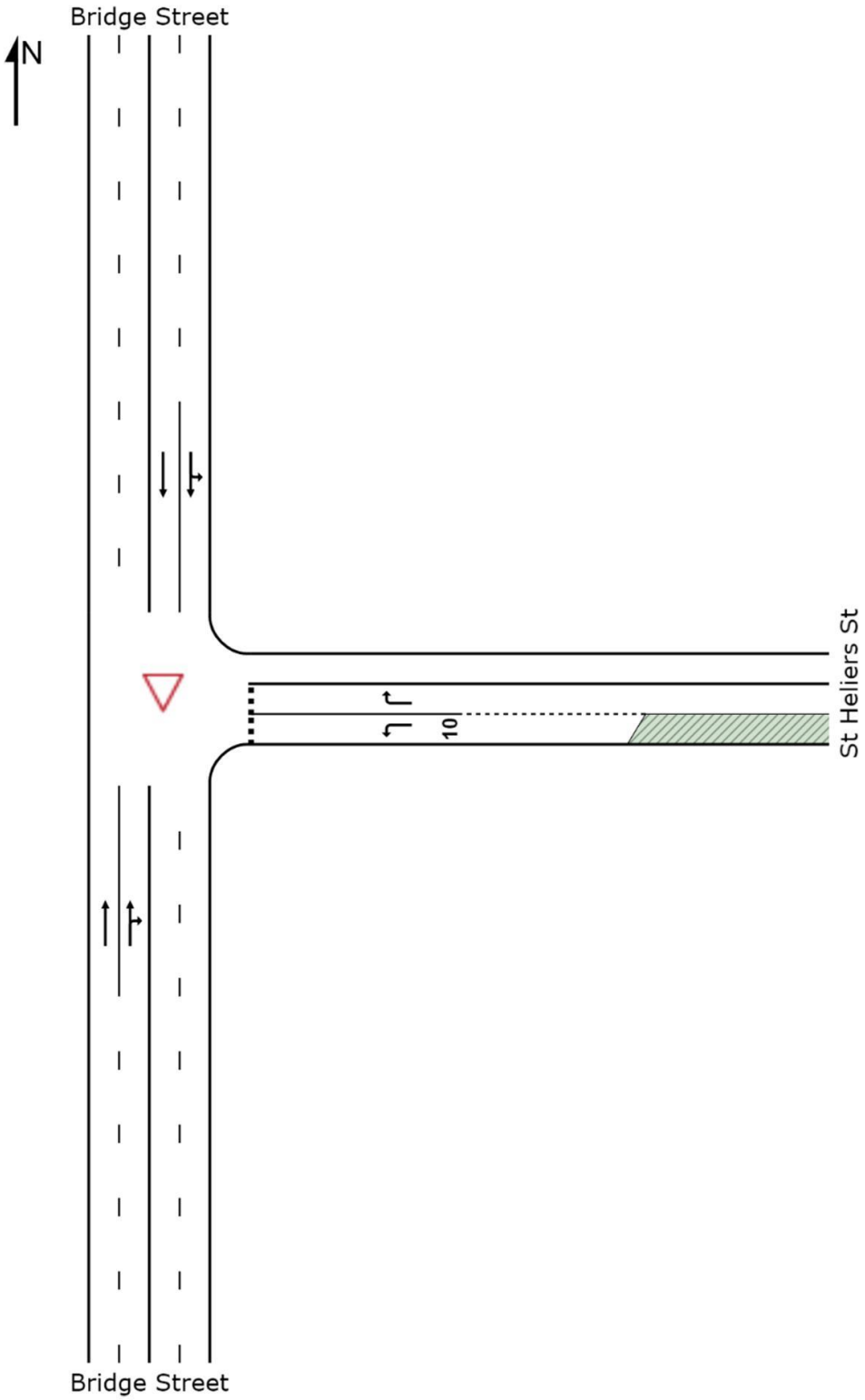
N



SITE LAYOUT

▽ Site: Proposed Friday PM peak

Bridge and St Heliers Streets
Giveway / Yield (Two-Way)



INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: Existing Friday PM peak

Bridge and St Heliers Streets
Giveway / Yield (Two-Way)

Volume Display Method: Total and Veh

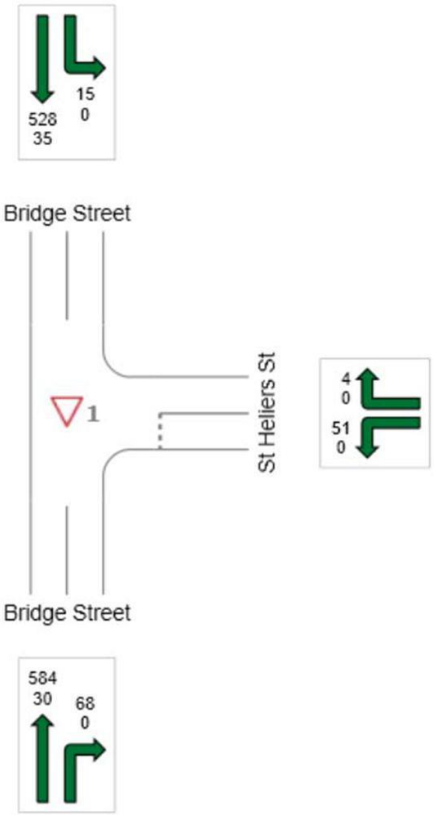
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 1250

Light Vehicles (LV): 1185

Heavy Vehicles (HV): 65



INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

▽ Site: Potential Friday PM peak

Bridge and St Heliers Streets
Giveway / Yield (Two-Way)

Volume Display Method: Total and Veh

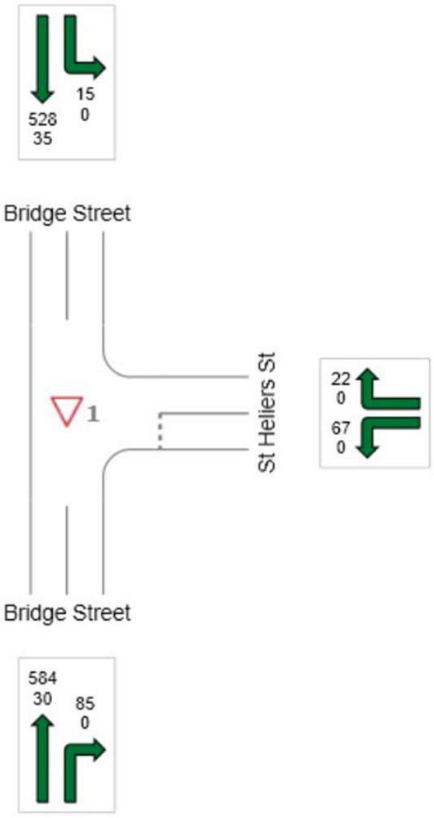
Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

Total Intersection Volumes (veh)

All Movement Classes: 1301

Light Vehicles (LV): 1236

Heavy Vehicles (HV): 65



MOVEMENT SUMMARY

▽ Site: Existing Friday PM peak

Bridge and St Heliers Streets
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Street											
2	T1	615	5.1	0.209	1.4	LOS A	1.5	11.2	0.21	0.07	58.1
3	R2	72	0.0	0.209	9.4	LOS A	1.5	11.2	0.58	0.20	53.5
Approach		686	4.6	0.209	2.2	NA	1.5	11.2	0.25	0.09	57.6
East: St Heliers St											
4	L2	54	0.0	0.053	6.7	LOS A	0.2	1.3	0.35	0.60	52.1
6	R2	4	0.0	0.024	24.9	LOS B	0.1	0.5	0.84	0.94	41.6
Approach		58	0.0	0.053	8.0	LOS A	0.2	1.3	0.38	0.63	51.1
North: Bridge Street											
7	L2	16	0.0	0.153	5.6	LOS A	0.0	0.0	0.00	0.03	58.0
8	T1	556	6.6	0.153	0.0	LOS A	0.0	0.0	0.00	0.02	59.8
Approach		572	6.4	0.153	0.2	NA	0.0	0.0	0.00	0.02	59.8
All Vehicles		1316	5.2	0.209	1.6	NA	1.5	11.2	0.15	0.08	58.2

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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Potential Friday PM peak

Bridge and St Heliers Streets
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Street											
2	T1	615	5.1	0.221	1.3	LOS A	1.5	11.1	0.19	0.08	58.1
3	R2	89	0.0	0.221	9.4	LOS A	1.5	11.1	0.59	0.26	53.2
Approach		704	4.5	0.221	2.3	NA	1.5	11.1	0.24	0.11	57.5
East: St Heliers St											
4	L2	71	0.0	0.069	6.7	LOS A	0.2	1.7	0.35	0.61	52.1
6	R2	23	0.0	0.138	26.9	LOS B	0.4	3.1	0.87	0.94	40.7
Approach		94	0.0	0.138	11.7	LOS A	0.4	3.1	0.48	0.69	48.6
North: Bridge Street											
7	L2	16	0.0	0.153	5.6	LOS A	0.0	0.0	0.00	0.03	58.0
8	T1	556	6.6	0.153	0.0	LOS A	0.0	0.0	0.00	0.02	59.8
Approach		572	6.4	0.153	0.2	NA	0.0	0.0	0.00	0.02	59.8
All Vehicles		1369	5.0	0.221	2.1	NA	1.5	11.1	0.16	0.11	57.6

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 is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

OPERATIONAL NOISE IMPACT ASSESSMENT

24-Hr Service Station, Muswellbrook, NSW

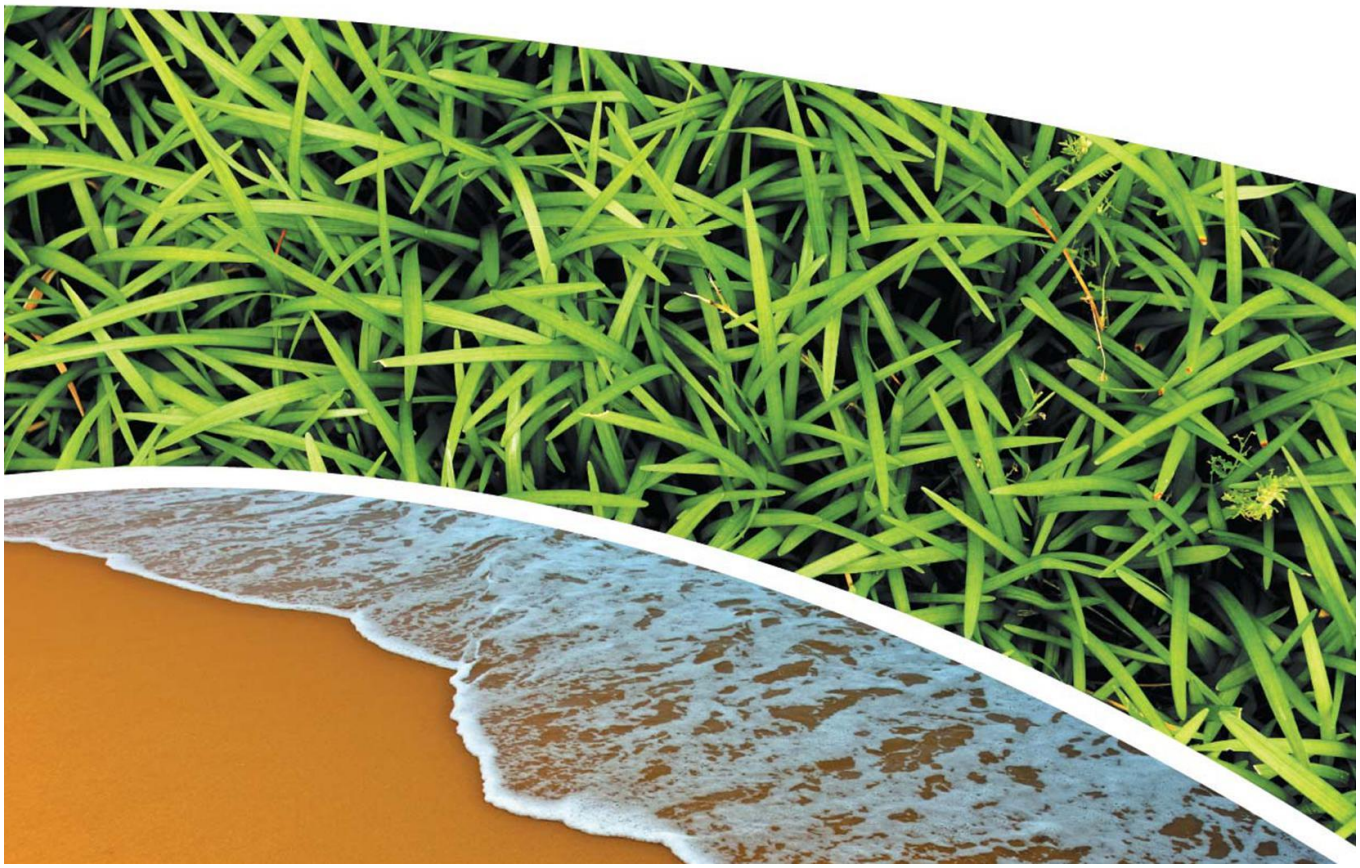
Prepared for Inland Building and Construction Pty Ltd

Prepared by RCA Australia

RCA ref 13852-601/1

December 2018

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL



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DOCUMENT STATUS						
Rev No	Comment	Author	Reviewer	Approved for Issue (Project Manager)		
				Name	Signature	Date
/0	Draft	Alex Rees	Natasha Pegler	AR		06.12.18
/1	Final	Alex Rees	Natasha Pegler	AR	A. Rees	10.12.18

DOCUMENT DISTRIBUTION				
Rev No	Copies	Format	Issued to	Date
/0	1	Electronic (email)	Inland Building Construction Pty Ltd	06.12.18
/0	1	Electronic report	RCA – job archive	06.12.18
/1	1	Electronic (email)	Inland Building Construction Pty Ltd	10.12.18
/1	1	Electronic report	RCA – job archive	10.12.18

Contents

RCA ref 13852-601/1

10 December 2018

Inland Building Construction Pty Ltd
PO Box 1864
BATHURST NSW 2795

OPERATIONAL NOISE IMPACT ASSESSMENT FOR 24-HR SERVICE STATION
147 – 151 BRIDGE STREET, MUSWELLBROOK

1 INTRODUCTION

RCA Acoustics (RCA) has been engaged by Inland Building Construction Pty Ltd to prepare an operational noise impact assessment to support a development application to operate a 24-hour Service Station and food outlet (Olivers) at the corner of St Helliers and Bridge Street, Muswellbrook, NSW. The purpose of this report is to assess the potential noise impacts to nearby sensitive receivers from the proposed operations of the site.

1.1 EXISTING SITE DESCRIPTION

The site is located at the corner of St Helliers and Bridge Street, Muswellbrook. The site is bounded by residential receivers to the North and East, St Helliers Street (a local road) on the South and Bridge Street / New England Highway (arterial road) to the West. There are commercial premises directly South and South-West of the proposed site. The proposed site is currently vacant.

1.2 PROPOSAL DESCRIPTION

A Development Application has been lodged with Muswellbrook Shire Council to operate a 24-hour Service Station with an attached food outlet (Olivers).

Robert Carr & Associates Pty Ltd
T/A RCA Acoustics ABN 53 063 515 711
92 Hill St, PO Box 175 Carrington NSW 2294
Ph 02 **4902 9200 Fax** 02 **4902 9299**
Email administrator@rca.com.au
Web www.rca.com.au

2 EXISTING ACOUSTIC ENVIRONMENT

The following noise sensitive receivers have been identified from aerial imagery.

Receiver ID	Receiver type	Distance and direction from site boundary
R01	Residential	40 m NW
R02	Residential	40 m NE
R03	Residential	32 m NW
R04	Residential	30 m W
R05	Commercial	Adjacent N
R06	Residential	7 m NE
R07	Residential	31 m W
R08-1	Residential	Adjacent E
R08-2	Residential	Adjacent N
R09	Commercial	32 m W
R10	Commercial	31 m W
R11	Residential	9 m E
R12	Residential	31 m WSW
R13	Commercial	20 m S
R14	Commercial	37 m SW
R15	Residential	21 m SE

Figure 1 Site ( ), measurement location ( ) and identified noise sensitive receivers ( )

2.1 NOISE MONITORING

Noise monitoring was undertaken at the proposed site to quantify the existing ambient acoustic environment. A noise logger was deployed between 19 October – 2 November 2018, and continuously recorded statistical noise data over 15-minute integration periods. The calibration of the noise logger was checked before and after the monitoring period, and was found to be within 0.5 dB tolerance of 94 dB. Additional notes regarding each noise logger are provided in **Table 2-1**.

Table 2-1 *Equipment details*

Make/Model	Serial Number	Settings
SVAN / 971	55582	**'A' weighted** **'Fast' time response**

The rating background levels (RBLs) were calculated in accordance with the Noise Policy for Industry (NPI) (EPA, 2017). A summary of the day / evening / night RBLs and overall L_{eq}'s are provided in **Table 2-2**.

Table 2-2 *Unattended noise monitoring summary*

	Day	Evening	Night
RBL	45	42	32
Overall L_{Aeq}	55	54	52

Attended noise measurements were conducted at each site to assist in identifying the local noise sources for each area. Additional information is provided in **Table 2-3**.

Table 2-3 *Attended 15-minute measurements and observations*

Date and time of measurement	$L_{A90,\ 15\ min}$	$L_{Aeq,\ 15\ min}$	Observations and instantaneous sound pressure levels
2/11/2018 11:56	46	55	Wind speed between 1 – 3 m/s
2/11/2018 12:11	46	54	Road traffic noise from New England Highway was dominant and constant noise source, typically between 43 – 68 dBA Occasional road traffic noise from St Helliers Street 46 – 62 dBA.

3 ASSESSMENT CRITERIA

3.1 OPERATIONAL NOISE

In 2017 the EPA released the NPI to supersede the Industrial Noise Policy. Assessment criteria has been determined for this project in accordance with the NPI. The NPI provides guidance on setting noise criteria and includes consideration of two types of criterion: amenity noise criteria and intrusive noise criteria.

The purpose of the amenity noise criteria is to set reasonable cumulative industrial noise levels for an area based on the receiver land use. Table 2.2 of the NPI provides noise amenity criteria. The NPI states that to ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise, where the project amenity level is 5 dB less than the recommended amenity level. Relevant levels for this assessment are reproduced below in **Table 3-1**. The 'Suburban' noise amenity level has been adopted for all residential receivers based on the measured background levels and advice given in the NPI.

Table 3-1 *Amenity noise levels from the NPI*

Receiver	Noise amenity level	Time of day	Amenity noise level, L_{Aeq}, dB	Project amenity noise level, L_{Aeq}, dB
Residential	Suburban	Day	55	50
		Evening	45	40
		Night	40	35
Commercial premises	All	When in use	65	60

Note 1: The NPI determines the 'day' to be between 7 am and 6 pm, the 'evening' to be between 6 pm and 10 pm' and the 'night' to be between 10 pm and 7 am.

The NPI also provides advice on adjusting the project amenity level in areas of high traffic noise. While traffic noise was found to be a dominant noise source for both areas, the traffic noise was not high enough to warrant adjusting the amenity noise level. No adjustment to the project amenity levels have been made on that basis.

The purpose of the intrusiveness criteria is to limit the degree of change a new noise source introduces to an existing environment, by limiting the $L_{Aeq,\ 15\ min}$ of the new noise source to 5 dB above the measured rating background level (RBL). The relevant intrusiveness criteria has been determined by adding 5 dB to the RBLs provided in **Table 2-2**, but not allowing the evening criteria to be higher than the day, and not allowing the night criteria to be higher than the evening, as advised by the NPI. The intrusiveness criteria only apply to residential receivers and are provided in **Table 3-2**.

Table 3-2 *Intrusiveness noise criteria*

Receiver	Intrusiveness criteria, $L_{Aeq,15\ min}$, dB		
	Day	Evening	Night
All identified residential receivers	50	47	37

The project specific criteria at each receiver location then becomes the minimum of the amenity and intrusiveness criteria for day, evening and night periods. Note that the amenity criteria are applied over the full day, evening or night period, while the intrusiveness criteria apply to the worst case 15 minutes of operation. Section 2.2 of the NPI advises increasing the amenity criteria by 3 dB when assessing against $L_{Aeq,15min}$ noise, and is included in this assessment.

In addition to the intrusiveness and amenity criteria, the NPI provides guidance on maximum noise levels which may trigger the need for a sleep disturbance assessment. This is the greater of 52 dB or the night time RBL plus 15 dB.

The project specific criteria are presented in **Table 3-3**.

Table 3-3 *Project specific criteria*

Receiver	Project specific criteria, $L_{Aeq,\ 15\ minute}$ dB			Sleep Disturbance, L_{AMax}
	Day	Evening	Night	
Residential	50	43	37	52
Commercial premises	60	60	60	N/A

3.2 ROAD NOISE IMPACTS

The proposal has the potential to cause road noise impacts due to an increase in vehicles using public roads. The NSW Road Noise Policy (RNP) (DECC, 2011) provides non-mandatory assessment criteria to assist the process of planning approvals and to identify where mitigation measures may be required.

The relevant noise criteria from the RNP has been reproduced below in **Table 3-4**. These criteria apply to residences; the RNP does not specify road noise criteria for commercial premises.

Table 3-4 *RNP noise criteria for residential land uses*

Road category	Type of project	Assessment criteria, dB	
		Day	Night
Local roads (St Helliers)	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq,\ (1\ hour)}$ 55 (external)	$L_{Aeq,\ (1\ hour)}$ 50 (external)
Arterial Roads (Bridge St / New England Highway)	Existing residences affected by additional traffic on existing arterial roads generated by land use developments	$L_{Aeq,\ (15\ hour)}$ 60 (external)	$L_{Aeq,\ (9\ hour)}$ 55 (external)

Note: Day is defined as the period between 7 am – 10 pm, and night is defined as the periods between 10 pm – 7 am.

In addition to the criteria stated above, the RNP application notes state that where the existing road noise exceeds, or is within 2 dB of the relevant noise criterion, the total road noise after the development should be limited to an increase of 2 dB. If it can be shown that the total road noise will increase due to the new development by 2 dB or less, it follows that the RNP objectives have been met.

4 OPERATIONAL NOISE ASSESSMENT

An operational noise assessment has been conducted by modelling scenarios representing typical operation of the site using computer software CadnaA (version 2017). The ISO 9613-2 algorithm was implemented, which incorporates the equivalent of a 2 m/s source to receiver wind in all directions or a moderate temperature inversion. The result is that the modelled predictions are made under 'noise enhancing' meteorological conditions. This provides some conservatism in the predictions made. The model uses a general ground coefficient of 0.5 to represent the mixture of surfaces, including water and vegetated ground.

4.1 NOISE MODELLING SCENARIOS

The following scenarios were considered for typical operation:

- Day/evening operation, including peak traffic numbers for both service station and restaurant and HVAC plant for both buildings;
- Night operation, including traffic numbers representative of 9 pm – midnight at the service station and HVAC plant for both buildings
- Night sleep disturbance assessment, including HVAC plant for both buildings and maximum noise levels from a single car door slam at the service station.

The number of vehicles used in the scenarios was determined from the traffic & parking assessment (Traffic Solutions, report no. 18.19.008). These numbers, along with other assumptions used in developing the noise model, are laid out in **Table 4-1**.

Table 4-1 *Model input assumptions*

Peak vehicle numbers, service station	6.6 vehicles/15min
Peak vehicle numbers, restaurant	2 vehicles/15min
Night (9 pm – midnight) vehicle numbers, service station	6 vehicles/15min
SWL of moving vehicle on site	84 dB(A)
Speed of moving vehicle on site	10 km/h
SWL of car door slam	92 dB(A)
No. door slams, peak	17
No. door slams, night	12
SWL of HVAC plant	81 dB(A)
Applied Mitigation – Service Station	2 m barrier around North, East and South sides of HVAC plant
Applied Mitigation – Service Station	2 m barrier around North and East sides of HVAC plant

The positions of noise sources are shown in **Appendix B**, **Appendix C**, and **Appendix D**.

4.2 MODEL RESULTS

A summary of the modelling results is presented below in **Table 4-2**. Noise contours for each scenario are presented in **Appendix B**, **Appendix C**, and **Appendix D**.

Table 4-2 *Model results*

Receiver	Project specific criteria, dB				Day / Evening results	Night results	Night LMax results
	Day	Evening	Night	LMax			
R01	50	40	35	52	36	35	48
R02	50	40	35	52	34	33	46
R03	50	40	35	52	37	36	50
R04	50	40	35	52	38	37	50
R05	60	60	60	N/A	46	45	59
R06	50	40	35	52	35	34	41
R07	50	40	35	52	37	36	51
R08-1	50	40	35	52	39	36	38
R08-2	50	40	35	52	37	36	51
R09	60	60	60	N/A	42	36	38
R10	60	60	60	N/A	36	35	50
R11	50	40	35	52	35	31	38
R12	50	40	35	52	35	35	49
R13	60	60	60	N/A	40	40	43
R14	60	60	60	N/A	35	34	42
R15	50	40	35	52	37	34	46

No receivers are found to exceed the project specific criteria.

4.3 ROAD NOISE IMPACTS

Currently, road noise is the dominant noise source for all identified receivers. Residences that may be affected by additional road noise from the traffic generated by the development are:

- R01, R03, R04, R07, R12 along Bridge St
- R15 along St Helliers Rd

Receivers along Bridge St are exposed to the high traffic volumes travelling along the New England Hwy. The number of additional vehicles generated from this assessment is small compared to the existing traffic volumes (less than 10% additional vehicles). The increase in traffic noise along Bridge St will be much less than 2 dB and so complies with the road noise criteria.

Receiver R15 is situated east of all entries/exits to the site and its only exposure to additional traffic noise will be from vehicles travelling east along St Helliers Rd. This will be a small proportion of vehicles accessing the site, as most will arrive and leave via Bridge St. Eastbound traffic on St Helliers Rd will generally be residents accessing the local area, and would be travelling along St Helliers Rd even without the presence of the proposed development. The expected increase to road traffic noise is therefore expected to be less than 2 dB and will comply with the road noise criteria.

4.4 RECOMMENDATIONS

The modelling has shown that HVAC plant located on the roof of the two buildings is likely to be the most significant noise source. Full specifications of the proposed plant and location are not currently known and RCA have endeavoured to model a scenario that is representative of actual site operation.

RCA recommend that a qualified acoustic engineer should be consulted when selecting HVAC plant, positions, and potential enclosures. This will ensure that the noise criteria are met in the final design.

This assessment has not included noise from a tire air pump. While the noise level generated from the pump would be low, tonal beeping noises have the potential to cause annoyance and introduce tonality adjustments under the NPI. The position of the pump should also be approved by a qualified acoustic engineer.

5 CONCLUSION

RCA was engaged by Inland Building Construction to undertake an Operational Noise Impact Assessment to assess the potential noise impacts of a proposed development in Muswellbrook. The proposed development consists of a 24-hr service station and a restaurant.

RCA has modelled operational scenarios representing typical operation during the evening and night periods. The predicted noise levels were found to comply with the project-specific criteria. Full details of some noise sources on the site were not available at the time of assessment and RCA recommend that these plant items should be individually assessed when the final design is ready to ensure they will comply with the criteria.

Yours faithfully,

Natasha Pegler
Acoustic Consultant

Appendix A

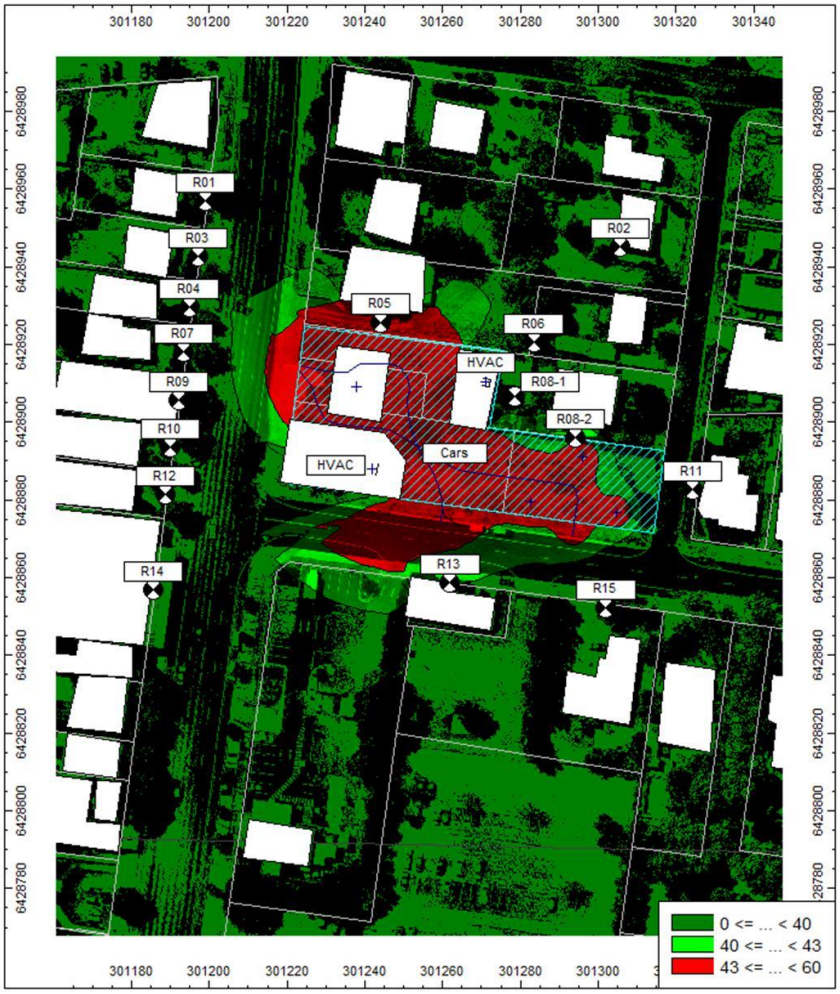
Terms and Definitions

TERMS AND DEFINITIONS

dB(A)	Unit of sound pressure level, modified by the A-weighting network to represent the sensitivity of the human ear.
SPL	The incremental variation of sound pressure from the reference pressure level expressed in decibels.
SWL (L_W)	Sound Power Level of a noise sources per unit time expressed in decibels from reference level $W_{O.}$
L_X	Statistical noise descriptor. Where (x) represents the percentage of the time for which the specified noise level is exceeded.
L_{eq}	Equivalent continuous noise level averaged over time on an equivalent energy basis.
L_1	Average Peak Noise Level in a measurement period.
L_{10}	Average Maximum Noise Level in a measurement period.
L_{90}	Average Minimum Noise Level in a measurement period.
L_{max}	Maximum Noise Level in a measurement period.
Background Noise Level	Noise level determined for planning purposes as the one tenth percentile of the ambient L_{A90} noise levels.
PO	Reference Sound Pressure for the calculation of SPL in decibels.
WO	Reference Sound Power for the calculation of SWL in decibels.

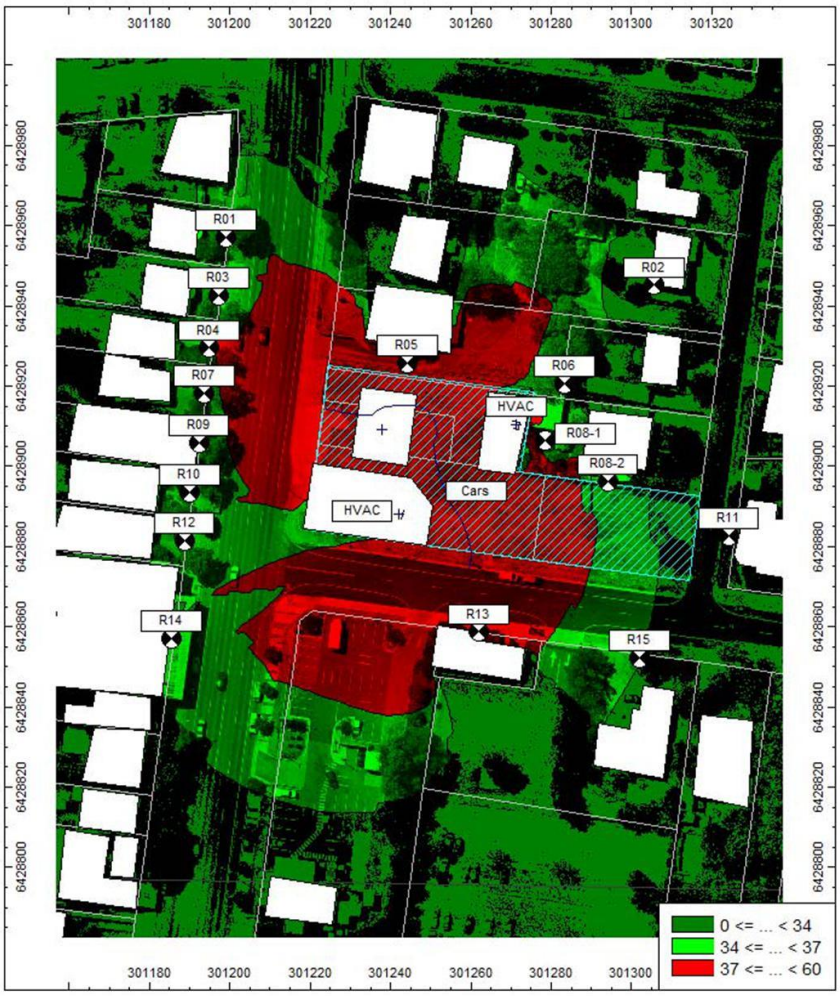
Appendix B

LAeq, 15 minute Noise Contours – Day/Evening (1.5 m above ground using ISO9613)



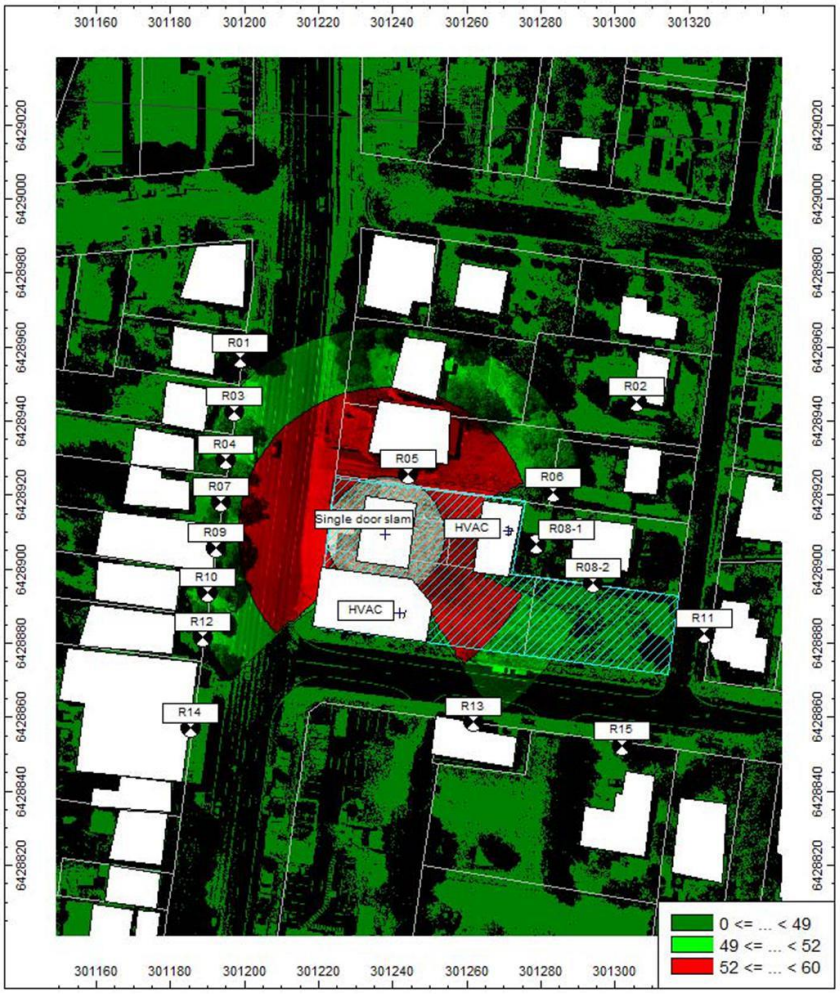
Appendix C

LAeq, 15 minute Noise Contours – Night (1.5 m above ground using ISO9613)



Appendix D

LAmax Noise Contours (1.5 m above ground using ISO9613)



Data Review of Previous Environmental Reports for 147-153 Bridge Street Muswellbrook NSW 2333

Inland Building & Construction

March 2019

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Statement of Limitations

This document has been prepared in response to specific instructions from Inland Building & Construction to whom the report has been addressed. The work has been undertaken with the usual care and thoroughness of the consulting profession. The work is based on generally accepted standards, practices of the time the work was undertaken. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The report has been prepared for the use by Inland Building & Construction and the use of this report by other parties may lead to misinterpretation of the issues contained in this report. To avoid misuse of this report, Prensa advise that the report should only be relied upon by Inland Building & Construction and those parties expressly referred to in the introduction of the report. The report should not be separated or reproduced in part and Prensa should be retained to assist other professionals who may be affected by the issues addressed in this report to ensure the report is not misused in any way.

Prensa is not a professional quantity surveyor (QS) organisation. Any areas, volumes, tonnages or any other quantities noted in this report are indicative estimates only. The services of a professional QS organisation should be engaged if quantities are to be relied upon.

Sampling Risks

Prensa acknowledges that any scientifically designed sampling program cannot guarantee all sub-surface contamination will be detected. Sampling programs are designed based on known or suspected site conditions and the extent and nature of the sampling and analytical programs will be designed to achieve a level of confidence in the detection of known or suspected subsurface contamination. The sampling and analytical programs adopted will be those that maximises the probability of identifying contaminants. Inland Building & Construction must therefore accept a level of risk associated with the possible failure to detect certain sub-surface contamination where the sampling and analytical program misses such contamination. Prensa will detail the nature and extent of the sampling and analytical program used in the investigation in the investigation report provided.

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Soil contamination can be expected to be non-homogeneous across the stratified soils where present on site, and the concentrations of contaminants may vary significantly within areas where contamination has occurred. In addition, the migration of contaminants through groundwater and soils may follow preferential pathways, such as areas of higher permeability, which may not be intersected by sampling events. Subsurface conditions including contaminant concentrations can also change over time. For this reason, the results should be regarded as representative only.

Inland Building & Construction recognises that sampling of subsurface conditions may result in some cross contamination. All care will be taken and the industry standards used to minimise the risk of such cross contamination occurring, however, Inland Building & Construction recognises this risk and waives any claims against Prensa and agrees to defend, indemnify and hold Prensa harmless from any claims or liability for injury or loss which may arise as a result of alleged cross contamination caused by sampling.

Reliance on Information Provided by Others

Prensa notes that where information has been provided by other parties in order for the works to be undertaken, Prensa cannot guarantee the accuracy or completeness of this information. Inland Building & Construction therefore waives any claim against the company and agrees to indemnify Prensa for any loss, claim or liability arising from inaccuracies or omissions in information provided to Prensa by third parties. No indications were found during our investigations that information contained in this report, as provided to Prensa, is false.

Recommendations for Further Study

The industry recognised methods used in undertaking the works may dictate a staged approach to specific investigations. The findings therefore of this report may represent preliminary findings in accordance with these industry recognised methodologies. In accordance with these methodologies, recommendations contained in this report may include a need for further investigation or analytical analysis. The decision to accept these recommendations and incur additional costs in doing so will be at the sole discretion of Inland Building & Construction and Prensa recognises that that Inland Building & Construction will consider their specific needs and the business risks involved. Prensa does not accept any liability for losses incurred as a result of Inland Building & Construction not accepting the recommendations made within this report.

prensa

Table of Contents

1 Introduction

Prensa Pty Ltd (Prensa) was requested by Inland Building & Construction (IBC) to complete a data review of previous environmental reports prepared by Prensa for the previous owner of the Site (AI Group) in 2012 and 2014 for the property located at 147-153 Bridge St, Muswellbrook NSW ("the Site").

The Site is described as Lot 1 in Deposited Plans (DPs) 784361, 159620, 161784 and 794803.

The total area of the Site is approximately 3,000 m^2. The Site area and location is shown in **Figure 1** and **Figure 2** in the **Figures** section of this report.

2 Background

It is understood that IBC proposes to redevelop the Site for use as a petrol station. The Site historically operated as a commercial car dealership and prior to that, a car service centre (including a service station and mechanics workshop). At the time of this review, the Site was non-operational and comprised vacant land, surrounded by temporary construction fencing. It is understood that previous environmental works, including remediation, validation and waste classification of soils were undertaken at the Site in 2012 and 2014. As part of the development application (DA) IBC requested Prensa to undertake a data review of the previous environmental reports prepared for the Site, as well as to complete an inspection of the Site. The intent of the review and inspection was to compare the current condition of the Site with the previous condition of the Site as outlined in the following previous environmental reports, which were provided by IBC:

- *Environmental Site Assessment and Geotechnical Investigation, 147-151 Bridge Street, Muswellbrook NSW, September 2012,* prepared by Prensa Pty Ltd (Prensa, 2012);
- *Soil Validation Assessment of Underground Petroleum Storage System, 147-151 Bridge Street, Muswellbrook NSW, February 2014,* prepared by Prensa Pty Ltd (Prensa, 2014a); and
- *Soil Validation Assessment of Former Oil Storage Area at 147-151 Bridge Street, Muswellbrook NSW, March 2014,* prepared by Prensa Pty Ltd (Prensa, 2014b).

The review and inspection aimed to assess whether any significant changes were likely to have occurred in relation to the contamination status of the Site since the completion of the previous reports in 2012 and 2014 that may prompt the requirement for additional investigation works to be undertaken as part of the DA process.

3 Objectives

The objectives of the data review and site inspection were to provide:

- An indication of contamination status of the Site, based on the information provided within the previously prepared environmental assessment reports, and whether this would potentially impact upon the proposed development of the Site as a service station; and
- Comment on the potential for the contamination status to have changed since the completion of the previous environmental assessment, based on the findings of the site inspection, which may warrant the completion of further site investigations.

4 Scope of Works

In order to address the objectives, Prensa undertook the following scope of works:

- Review of the three (3) previous environmental reports prepared in 2012 and 2014 by Prensa [Prensa (2012), Prensa (2014a) and Prensa (2014b)] that were applicable to the Site;
- A site inspection on 7 March 2019, paying particular attention to any potentially contaminating features, i.e. stockpiles, underground storage tanks (USTs) and associated infrastructure and any site features that differed from those described in the previous reports;
- Collection of photographs for comparison to previous Site inspections; and
- Preparation of this report detailing the findings of the data review and inspection.

5 Technical Framework

In completing the above tasks, Prensa undertook works in general accordance with the following:

- NSW Work Health and Safety Act 2011;
- NSW Work Health and Safety Regulation 2017;
- Protection of the Environment Operations (POEO) Act 1997 (POEO Act 1997);
- Contaminated Land Management (CLM) Act, 1997 (CLM Act 1997);
- CLM Amendment Act, 2008 (CLM Act 2008);
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPM 2013;
- NSW Environment Protection Authority (EPA) State Environmental Planning Policy 55 – Remediation of Land (SEPP55), 1998;
- NSW Environment Protection Authority (EPA) *Waste Classification Guidelines: Part 1 – Classifying Waste*, 2014 (EPA 2014); and
- NSW Office of Environment and Heritage, *Contaminated Sites Guidelines for Consultants Reporting on Contaminated Sites*, 2011 (OEH 2011).

6 Methodology

A data review was undertaken for the Muswellbrook Environmental Site Assessment (ESA) and Validation reports. In order to summarise the environmental condition of the site and evaluate whether contamination exists the reports were reviewed for the following information:

- Background information relating to who the report was intended, purpose of the investigation, and proposed development of the land;
- Investigation details relating to what investigation was undertaken, scope of works, and what Contaminants of Potential Concern (CoPC) was selected for investigation;
- Field observations during the investigation;
- Relevant adopted site criteria for the investigation of each report;
- Analytical findings of each report; and
- Discussion and conclusions of each report.

7 Findings

7.1 Data Review

A review of the Prensa (2012) ESA report and the Prensa (2014a) and Prensa (2014b) validation reports was undertaken to fulfil the objectives of this report.

7.1.1 Review of Prensa (2012) ESA Report

Prensa previously undertook an Environmental Site Assessment (ESA) and supervised a Geotechnical Investigation of the Site in behalf of a previous owner of the Site (reference *11468 ESA Muswellbrook*, September 2012). The ESA was undertaken to satisfy the NSW State Environment Planning Policy (SEPP) No. 55, *Remediation of Land*, 1998.

The objective of the ESA was "*to assess the potential for contamination to exist at the Site as a result of current and/or historical activities that could represent a potential risk to future users of the Site, in light of the proposed commercial redevelopment*."

As part of the historical documentation review completed for the ESA, aerial photographs and titles for the Site were reviewed. These indicated that the Site historically operated as a service station from 1958 until 2000, in addition to a motor mechanic workshop which was constructed in 1979 and was operational until 2011, where mechanical operations ceased due to the property being damaged by fire. Also as part of the historical documentation review, a dangerous goods search was undertaken for the Site. The dangerous goods search identified that in 1971 Ampol applied for a permit to install three (3) underground storage tanks (USTs). The plans from 1975 indicated that the USTs were located in the south western corner of the Site. The plans also indicated that the three (3) smaller USTs were to be replaced by one (1) larger UST.

The site inspection undertaken during the ESA identified redundant infrastructure from the previous activities at the Site, which included a 21,000 L UST and associated bowser in the south west corner, a triple interceptor trap (TIT) in the wash bay area located central to the southern boundary, an above-ground storage tank (AST) located central to the northern boundary and a bunded oil storage area located at the centre of the Site.

Five (5) gridded and six (6) targeted boreholes were established at the Site, in addition to three (3) groundwater monitoring wells. Four (4) of the targeted boreholes were established surrounding the UST in the south west corner of the Site.

The soil analytical results identified elevated concentrations of Total Recoverable Hydrocarbons (TRH) in the vicinity of the bunded oil storage area located at the centre of the Site. A single TRH (C_6-C_{10}) concentration exceeded the adopted health screen level (HSL) for direct contact, but not for vapour intrusion. The TRH (C_6-C_{10}) exceedance was encountered at a depth of 0.2 metres below ground level (mBGL). It was concluded that "*the elevated TRH (C_6-C_{10}) concentration did not pose a significant health risk to future users of the Site, given that the soil would either be removed off-site during the bulk soil removal and development of the proposed basement/ground floor car park; or if soil was to remain in-situ, a permanent barrier would be installed to prevent direct contact with the impacted soil.*"

Laboratory analysis of samples collected in the vicinity of the fuel handling infrastructure did not indicate the presence of significant contamination.

The installation of the groundwater wells identified the presence of groundwater at a depth of approximately 4.5 mBGL. Analytical results for groundwater samples collected from the three (3)

monitoring wells installed on Site displayed detectable concentrations of TRH at monitoring well MW1 (adjacent to the UST) where a hydrocarbon odour was observed during fieldworks. However, the concentration was less than the criteria adopted for the proposed commercial use of the Site.

Based on the findings of the investigation, it was concluded that "*in accordance with the former NSW Department of Urban Affairs and Planning (now NSW Department of Planning and Infrastructure) EPA SEPP 55 Planning Guidelines for Managing Land Contamination, no further investigation or remediation of the Site was considered necessary in order to render the soil and groundwater at the Site suitable for the stated intended use.*"

7.1.2 Review of Prensa (2014a) Validation Report

Prensa was engaged in February 2014 to undertake soil validation sampling of the area surrounding the former location of the underground petroleum storage system (UPSS) at the Site as identified in the Muswellbrook ESA (September 2012).

At the time of the February 2014 validation sampling, the UST had already been removed from site. Inspection of the walls and base of the tank pit indicated that soils within the tank pit did not display visual or olfactory evidence of hydrocarbon contamination, with no odours or staining observed. It is understood that the former UST was of steel construction with a capacity of approximately 21,000 L, and was previously used to store unleaded petrol (ULP)

Prensa collected ten (10) validation soil samples (denoted V01 to V10 in the Prensa (2014a) report), including eight (8) from the walls and base of the UST excavation pit, one (1) from beneath the former fuel line and one (1) from beneath the former fuel dispenser. The validation samples reported contaminant concentrations less than adopted ecological and health investigation/screening levels for a commercial land use. Therefore, based on the results of the validation sampling undertaken in February 2014, it is considered that the remaining soil within the former UST excavation and beneath the former fuel infrastructure is unlikely to pose a health or ecological risk to future users of the Site, construction workers or nearby receptors based on the proposed future land use of the Site (at the time of this report it was understood to be mixed commercial).

Approximately 58 m^3 of soil was excavated from the UST pit and stockpiled east and north east of the UST pit. Analysis of four (4) soil samples collected from the stockpile (SP01) indicated that the soil was classified as General Solid Waste (non-putrescible) for off-site disposal. The results were also compared to the adopted investigation/screening levels (commercial/industrial) as detailed in NEPM 2013. Based on the stockpile sampling data the soil was considered acceptable to be reused as backfill in the UST pit, although no detail was provided regarding whether the stockpiled soil was in fact used to backfill the UST pit.

7.1.3 Review of Prensa (2014b) Oil Storage Validation Report

Prensa was engaged in late February 2014 to undertake excavation and validation works associated with the oil storage area, located in the central region of the Site. Approximately 250 m^3 of fill material and natural soil associated with the oil storage area was excavated using a mechanical excavator, then stockpiled immediately north of the excavation prior to off-site disposal. It was noted that at the time of the validation assessment, the former buildings located at the Site were reported to have been demolished.

Prensa collected sixteen (16) gridded validation soil samples from the excavation pit ('VA01' to 'VA16', one (1) sample per five (5) linear metres along the boundary and one (1) sample per twenty-five (25) metres cubed), including:

- Seven (7) from the excavation walls (maximum depth of 0.8 mBGL); and
- Nine (9) from the base of the excavation pit (maximum depth of 2.0 mBGL).

The walls and base of the excavation were observed to comprise natural soil, which consisted of brown, gravelly clay with medium plasticity. No odours or staining were present at the validation sampling locations (VA01 to VA16). This was supported by the low PID readings (ranging from 0.1 to 7.1 parts per million (ppm)) recorded for the soil samples.

The stockpiled soil comprised similar natural soil with brown, gravelly clay observed. Oil staining was observed in sampled material on a number of samples collected from the stockpile.

The results of the validation sampling undertaken at the Site were reviewed in relation to their potential risk to the proposed land use (commercial/industrial use). The results for the soil samples analysed (VA01 to VA16) indicated that the contaminant concentrations were less than NEPM 'D' Health Investigation Levels (HILs) and Health Screening Levels (HSLs) adopted for the proposed commercial use of the Site. The TRH concentrations were also less than the TRH management limits for fine soil based on a commercial/industrial land use.

The soil contaminant concentrations reported for the validation samples were less than the adopted HILs and HSLs and it was concluded that these concentrations "*would therefore not preclude the use of the Site for the proposed commercial land use.*"

7.2 Site Inspection

The Site was located at 147-151 Bridge Street, Muswellbrook NSW and is approximately 110 km north west of the Newcastle CBD. The Site was surrounded by the following:

- **North:** Residential properties and commercial properties including the previous Phillippe Brasserie (now closed) and Brooks Outdoors, with agricultural land approximately 1 km north of the Site;
- **East:** Flanders Avenue, residential properties, Victoria Park located approximately 650 m east of the Site followed by more residential properties and Weeraman Sporting fields located approximately 1.6 km east of the Site;
- **South:** St Hellers Street, commercial properties which include Hungry Jacks, Muswellbrook RSL Club and Visitors Centre, Comfort Inn, a service station approximately 220 m south of the Site, Muswellbrook Marketplace and Muswellbrook Regional Arts Centre. Muscle Creek, Muswellbrook Golf Course, Muswellbrook Train Station and Fitzgerald Park were observed approximately 900 m south of the Site and Olympic Park was located approximately 1.2 km south east of the Site; and
- **West:** Bridge Street (New England Highway), commercial properties including Betta Electrical and Total Health & Education Centre, residential properties and the Hunter River and Rutherford Park located approximately 500 m west of the Site.

The closest sensitive receptors were identified as the residential properties surrounding the Site and the Hunter River, located approximately 300 m west of the Site.

7.2.1 Site Features

At the time of the inspection, the Site comprised vacant land with the Site boundaries clearly identified by temporary construction fencing. The Site comprised sporadic vegetation cover and building rubble and debris including concrete pieces, glass fragments, metal, PVC and terracotta pipework, corrugated roofing sheets, ceramic tile fragments, chicken wire netting, wood sheets and insulated electrical wiring. It was also noted that the western boundary line of the Site comprised hardstand that operated as the driveway entry to the Site from Bridge Street. A suspected TIT was observed to be present at this entry point to the Site.

Additionally, the Site inspection identified fragments of suspected asbestos-containing materials (ACM) which were submitted to the National Association of Testing Authorities (NATA) accredited Prensa Laboratory for bulk sample analysis (BSA) for the confirmation of the presence of asbestos.

7.2.2 Topography

The Site was observed to have a gentle overall slope towards the west and Bridge Street. However, it was also noted that the Site was uneven and hummocky moving from the north boundary to the south boundary. This hummocky topography of depressions and mounds across the Site is considered to have been generated as a result of demolition and excavation works associated with the previously identified, removed and validated UPSS System and Oil Storage System.

8 Discussion

The original ESA undertaken in 2012 by Prensa identified potential sources of contamination associated with its historical operation as a service station, mechanics workshop and car dealership, with the main contaminants of concern being hydrocarbons, heavy metals and asbestos.

A review of historical documentation identified the presence of three (3) USTs that were proposed to be replaced by one (1) 21,000 L UST. At the time of the site inspection undertaken during the 2012 ESA, only the 21,000 L UST was identified on Site, in addition to a triple interceptor trap (TIT), an AST and a bunded oil storage area. However, the investigations undertaken, which included both a gridded and targeted soil assessment as well as the installation of three (3) groundwater wells surrounding each of these potential contaminating sources, identified limited contamination present that would preclude the redevelopment of the Site for the intended commercial/industrial use or pose a potential health or environmental risk to workers and the environment during redevelopment works.

Two years following the submission of the Prensa (2012) ESA report, a validation report (Prensa, 2014a) was submitted outlining the results of validation sampling following the excavation and off-site disposal of the disused 21,000 L UST. The Prensa (2014a) report indicated that contaminant concentrations for all validation samples were less than adopted ecological and health investigation/screening levels for a commercial/industrial land use. Therefore, it was considered that the remaining soil within the former UST excavation and beneath the former fuel infrastructure was unlikely to pose a health or ecological risk to future users of the Site, construction workers or nearby receptors based on the proposed future land use of the Site (at the time of the report was understood to be mixed commercial).

Prensa also undertook excavation and validation works associated with the bunded oil storage area in the central portion of the Site (Prensa, 2014b). The results of the validation sampling undertaken at the Site were reviewed in relation to their potential risk to the proposed land use (based on commercial/industrial use). The results of the soil samples analysed (VA01 to VA16) indicated that the contaminant concentrations were less than NEPM 'D' HILs and HSLs adopted for the proposed commercial use of the Site, and were less than the adopted TRH management limits for fine soil based on a commercial/industrial land use.

As the hydrocarbon and heavy metal soil contaminant concentrations from the validation samples of the UST and oil storage area were less than the adopted HILs and HSLs for a commercial land use, it was considered that the soils remaining on Site would not preclude the use of the Site for the proposed service station development to be undertaken by IBC.

It is noted however, that in addition to chemical analysis undertaken as part of the previous ESA and validation works, suspected ACM fragments were identified during these works. As the validation works were focussed on contaminants associated with the UST and oil storage areas (i.e. hydrocarbons and heavy metals), the suspected asbestos contamination on-site was not addressed at the time of the 2014 validation works.

At the time of the Site inspection undertaken by Prensa on 7 March 2019, the Site comprised vacant land with the Site boundaries clearly identified by temporary construction fencing. The construction fencing that ran along the western edge of the Site was noted to be present over the previous hardstand driveway entrance used to enter the Site from Bridge Street. Within this hardstand was a suspected TIT, however it was unclear as to when this TIT was installed and its association with previous operations at the Site. The majority of the Site surface comprised sporadic vegetation cover and building rubble and debris, including concrete pieces, glass fragments, metal, PVC and terracotta pipework, corrugated roofing sheets, ceramic tile fragments, chicken wire netting, wood sheets and insulated electrical wiring. Fragments of suspected ACM were identified on the surface during the inspection, which were submitted to the Prensa NATA accredited Laboratory for bulk sample analysis for asbestos. The results of this analysis identified the presence of chrysotile, amosite and crocidolite asbestos fibres within the ACM fragments collected from the surface soils of the Site (Prensa Ref: 59930-001-001 BSA 11032019, provided in Appendix A).

9 Conclusion and Recommendations

Based on the review of the Prensa (2012) ESA, Prensa (2014a) UST Validation and Prensa (2014b) Oil Storage Validation reports produced for the Site, the previous investigations undertaken revealed minimal contamination associated with the historical activities including the motor mechanic workshop, car sales and servicing and a fuel station. Associated infrastructure including the UST and oil storage area, previously located on the Site, was removed and validated in 2014, with the validation samples reporting contaminant concentrations less than the adopted health and ecological investigation and screening levels for the proposed commercial use of the Site (i.e. a service station).

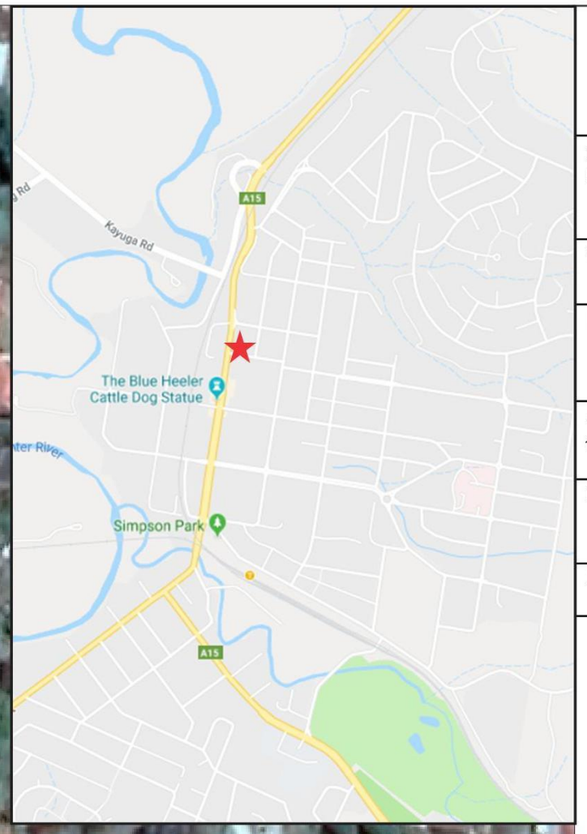
However, fibre-cement fragments suspected to contain asbestos were identified on the surface soils at the Site during the UST and oil storage area validation works. As these previous works were focussed on contaminants arising from these sources (i.e. hydrocarbons and heavy metals), the suspected asbestos contamination on-site was not addressed at the time of 2014 remediation and validation works.

Due to the presence of confirmed ACM fragments identified during the Site inspection completed by Prensa on 8 March 2019, as well as the previously identified fragments of this material referred to in the environmental reports reviewed, it is considered that the Site is potentially impacted by asbestos contamination (particularly on the surface). Therefore, it is recommended that additional assessment be undertaken at the Site to delineate the vertical and lateral extent of asbestos contamination across the Site. This will aid in determining the most practicable approach to managing or remediating the asbestos contamination present on Site. Additionally, the presence of a suspected TIT which is located within the hardstand at the entry to the Site from Bridge Street may require additional assessment to determine its role in previous activities undertaken at the Site and the potential use or requirement for remediation based on proposed future works and use of the Site.

The initial approach to manage the residual contamination should be formalised in a Remediation Action Plan (RAP). The RAP should be prepared prior to redevelopment works commencing on site and be used to induct all personnel participating in soil management activities.

prensa

Figures



prensa

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www.prensa.com.au
admin@prensa.com.au

Client:
INLAND BUILDING & CONSTRUCTION

Project:
MUSWELLBROOK DATA REVIEW

Address:
147-153 Bridge Street, Muswellbrook NSW 2333

Drawing Title:
Site Location

Job Number: 59930 | Client Number: I0081

N

0 20 40
Metres

Legend

- Site location
- Temporary Construction Fence Boundary

Image Source: Google Earth
Viewed:13 March 2019

Drawn by:		Date:
MRK		14/03/2019
Checked by:		Date:
JXL		14/03/2019
File Name:	Figure No:	Revision:
59930_Site Figures	1	A

prensa

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Site Features

Job Number: 59930

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0 10 20
Metres

N

Legend

- Temporary Construction Fence Boundary
- Previous UST Location
- Previous TIT Location
- Previous Oil Storage Area
- Previous AST Location
- Current TIT Location

Image Source: Google Earth
Viewed:13 March 2019

Drawn by:	Date:
MRK	14/03/2019
Checked by:	**Date:**
JXL	14/03/2019

File Name:	Figure No:	Revision:
59930_Site Figures	2	A

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Appendix A: NATA Laboratory Certificates of Analysis

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ABN: 12 142 106 581

11 March 2019

I0081:MRK
59930-001-001 BSA.xlsm

Genevieve Braddon
Inland Building & Construction
PO Box 1864
Bathurst NSW 2792

Dear Genevieve,

Asbestos Bulk Sample Analysis Report

147-151 Bridge Street, Muswellbrook NSW 2333

Please find attached the asbestos bulk sample analysis results of the 1 sample collected by Melanie Kime of Prensa Pty Ltd for 147-151 Bridge Street, Muswellbrook NSW 2333 on 8 March 2019 and received at the Prensa Pty Ltd laboratory (Suite 102, Level 1, 71 Longueville Road, Lane Cove NSW 2066) on 11 March 2019. The sample was analysed on 11 March 2019 and the results are presented on the following page(s).

Prensa qualitatively analyses bulk samples for asbestos using polarising light microscopy and dispersion staining techniques in accordance with Prensa Test Method PRLAB2002 Asbestos Identification, and in accordance with Australian Standard (AS) 4964 – 2004, *Method for the qualitative identification of asbestos in bulk samples.*

If you require further information please contact the Prensa office on (02) 8968 2500.

Regards,

Jack Wearne
Approved Asbestos Fibre Identifier

Felicity Bouwmeester
Prensa Signatory

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing. Corporate Site Number 21837. This document shall not be reproduced except in full. Sampling is not covered by the scope of the NATA accreditation.

property > environment > safety >

prensa

Asbestos Bulk Sample Analysis Report

147-151 Bridge Street, Muswellbrook NSW 2333

Sample No	Sample Location / Description / Size	Result
59930 - 001 - 001	Surface soils of vacant site - Debris fragments Grey fibrous cement material 80 x 40 x 10 mm	***Chrysotile (white asbestos) detected*** ***Amosite (brown asbestos) detected*** ***Crocidolite (blue asbestos) detected***

Only the samples submitted for analysis have been considered in presenting these results.

Appendix B: Photographs

prensa

Photo 1. Site overview facing east.

Photo 2. Overview of western half of Site. Photo identifies hummocky topography that was evident across the Site

Photo 3. Old infrastructure associated with previous operations on site. Located along central southern boundary of site, adjacent previous oil-storage area.

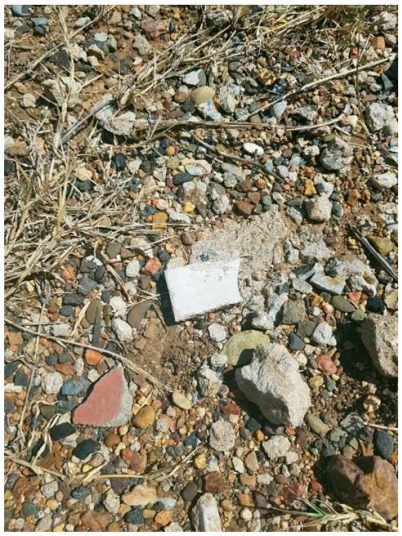


Photo 4. Positive ACM fibre-cement fragment found in the north-western portion of the Site.

Photo 5. Building debris and waste materials

Photo 6. Triple Interceptor Trap (TIT) at Site entry when entering from Bridge St.

Photo 7. General waste piled in north-eastern corner of Site.

Photo 8. Old electrical wiring located along central southern boundary of Site.

Proposed Mobil Service Station & Food Outlet

Response to CI Referral & Letter

DJP Corp Pty Ltd T/A

INLAND BUILDING & CONSTRUCTION

BUILDERS LIC: R86305 ABN: 29 138 778 033

COMMERCIAL | INDUSTRIAL

PO BOX 1864, BATHURST NSW 2795

PH: (02) 6331 3330 MOB: 0418 647 593

ibc@inlandbuilding.com.au

CONTENTS

1

1. Enforcement of RMS Requirements

TRAFFIC SOLUTIONS PTY LTD

Reference No: 18.19.008
19 May 2019

The General Manager
Muswellbrook Shire Council
PO Box 122
Muswellbrook NSW 2333

Attention: Mr Hamish McTaggart

Dear Sir,

Supplementary Traffic Statement - Proposed Service Station and Restaurant, Corner of Bridge and St Heliers Streets, Muswellbrook, DA 78/2018

Traffic Solutions Pty Ltd has been requested by Inland Building and Construction to provide a response to issues 1 and 5 of Council's letter dated 29th April 2019.

Issue 1 Enforcement of RMS requirements.

The RMS letter dated 13th March 2019 requires that all vehicle access from Bridge Street be left in only. The design of the driveway off Bridge Street is orientated such that right turn is restricted. The applicant raises no object to a condition requiring 'No Right Turn' restrictions/signposting to enforce this requirement similar to the adjacent Hungry Jacks site.

The RMS letter is unclear which heavy vehicles should be prohibited from refuelling on this site. Heavy vehicles are classified as any vehicle over 3 tonnes. This is considered unreasonable and excessive particularly when a 19m long fuel tanker has been shown to be able to enter and exit the site. It is unclear, how a condition or signposting can be imposed that prevents heavy vehicles from accessing the site when a 19 articulated vehicle is required/permitted to access the site to deliver fuels.

The applicant raises no objection to a condition that excludes 25/26m long B-doubles from accessing the site, as this proposal has not been designed for this size vehicle.

Issue 5 sight distances and vehicle safety.

I have calculated the sight distance from the proposed exit driveway onto St Heliers Street towards Bridge Street in accordance with the Australian Standards AS/NZS 2890.1:2004 – Off Street Parking. Austroads Part 3 is not considered to be applicable as this document is for Stopping Sight Distances for road intersections, not driveways.

The Australian Standard provides the minimum sight distances to/from an access driveway along a road frontage for varying road speeds. The speed limit along St Heliers Street is 50 km/h, however, a vehicle turning left from Bridge Street would be travelling at less speed which is the only driveway that has a restricted sight line.

Traffic Solutions Pty Ltd, PO Box 9161, Bathurst NSW 2795
Ph: 02 6331 0467 ▪ Email: craig@trafficsolutions.com.au
ABN 63 074 165 263

The results of this assessment are provided in the following table for 40 and 50 km/h approach speeds and attached is the requested sight distance plan for Council's review.

AS/NZS 2890.1:2004 minimum sight distance requirements for cars (drivers eye height 1.15m)			
Direction of sight distance measurement along a vehicle path	**Distance Required for 40 Km/h**	**Distance Required for 50 Km/h**	**Distance measured**
West towards Bridge Street	35m	45m	51.6m

Accordingly, my calculations reveal that the available sight distance exceeds the stopping distance required by the Australian Standard for the speed limit of 50 km/h.

Notwithstanding, that Austroads is not considered appropriate for driveway stopping sight distances, the minimum distance required for 50 km/h is 49m (reaction time of 2 seconds) which is also exceeded to the egress driveway of the proposal.

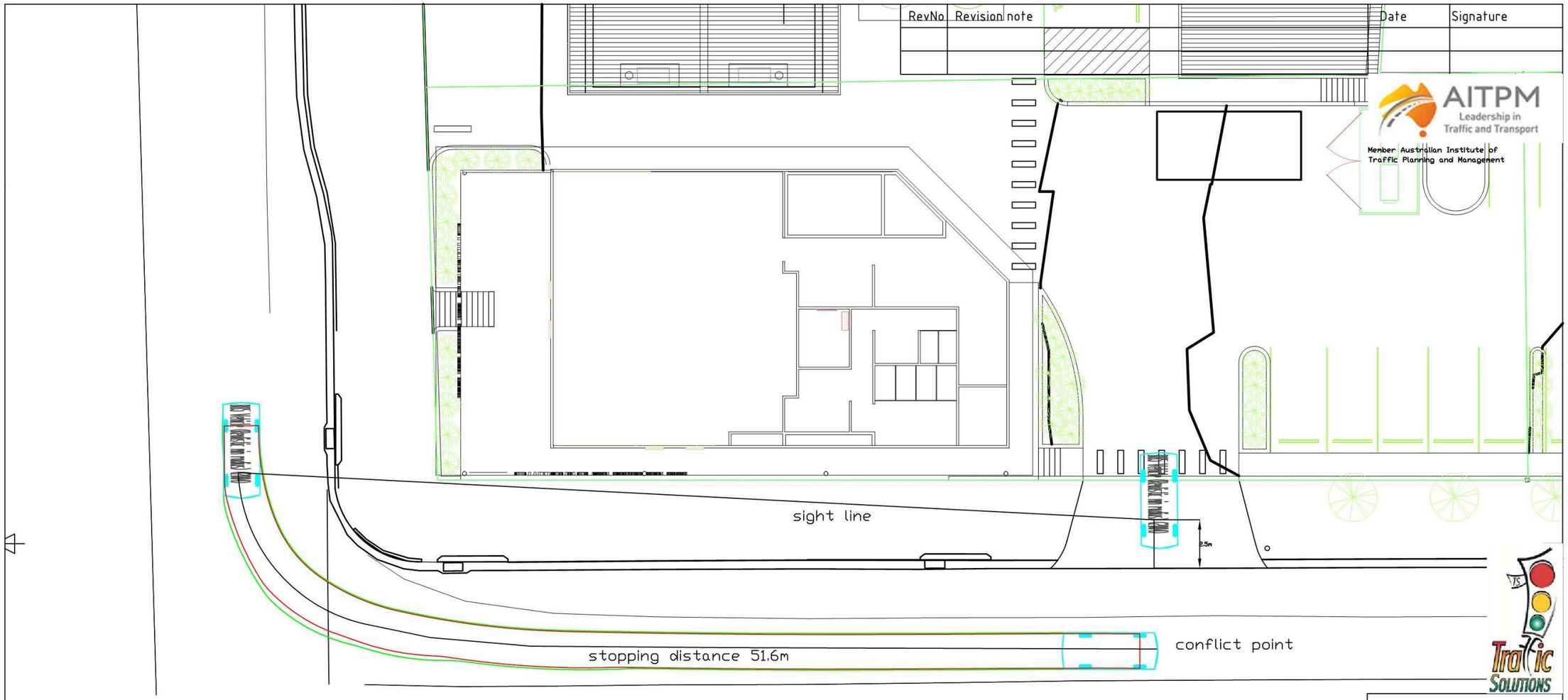
Should you require any additional information or clarification of the contents of this letter please contact me on the numbers provided.

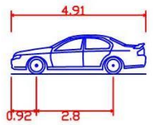
Yours sincerely

Craig Hazell
Director

RevNo	Revision note	Date	Signature

AITPM
Leadership in Traffic and Transport
Member Australian Institute of Traffic Planning and Management





B85 Vehicle (Realistic min radius) (2004)	
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m

TRAFFIC SOLUTIONS P/L
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ABN. 63 074 165 263

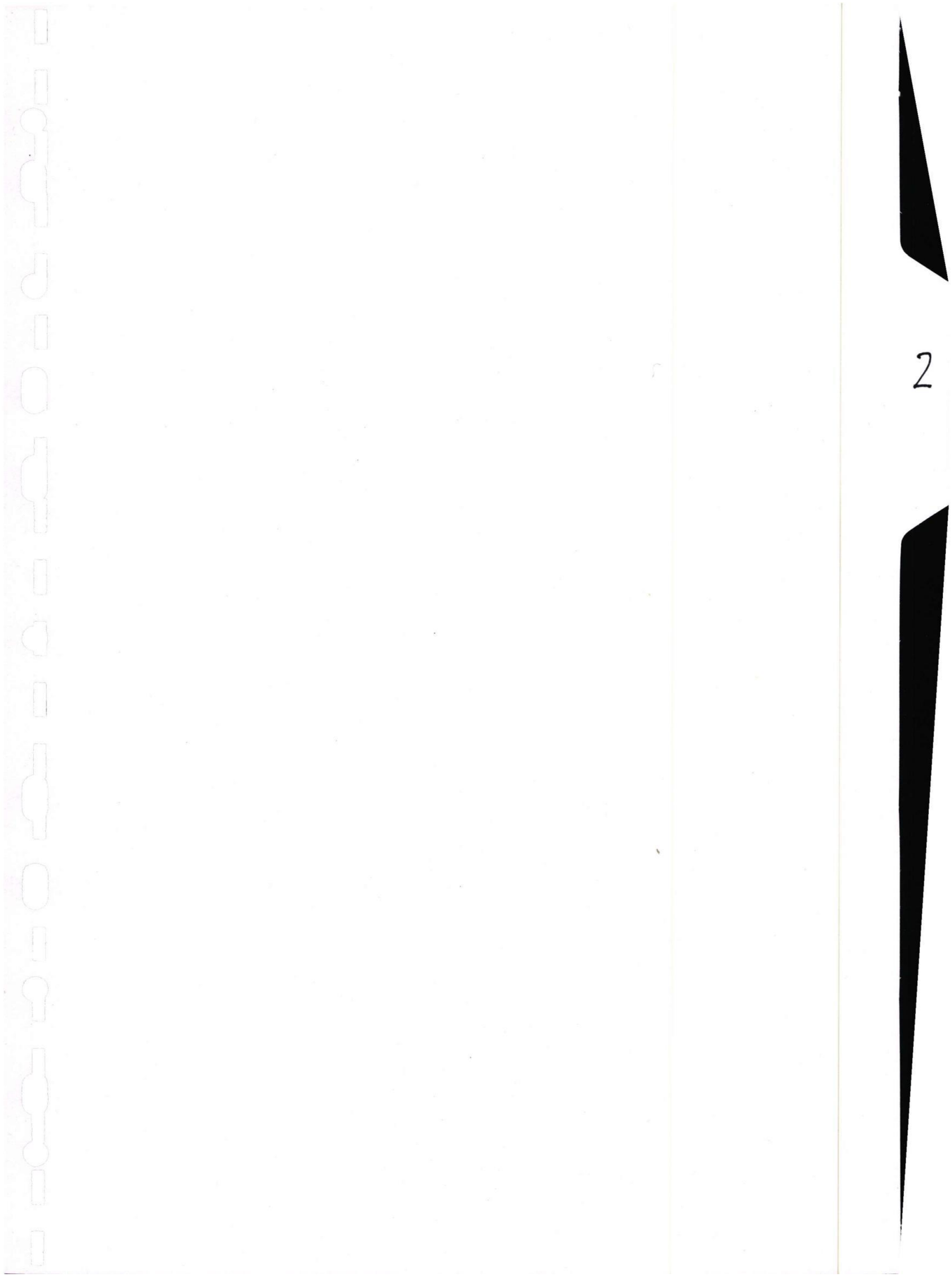
Address
corner of Bridge and St Heliers Sts Muswellbrook

Title
Sight line and stopping distance plan

Date 18/05/19 | Scale1:200@A3

Client
Inland Building and Construction

File No.18.19.008 | Dwg No. 1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2. Turning Circle Information

Please refer to architectural drawings

3

3. Development Within the Bridge Street Road Reserve

Please refer to architectural drawings


4

4. Pedestrian Access & Safety

Please refer to architectural drawings

5

5. Site Distances & Vehicle Safety

TRAFFIC SOLUTIONS PTY LTD

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19 May 2019

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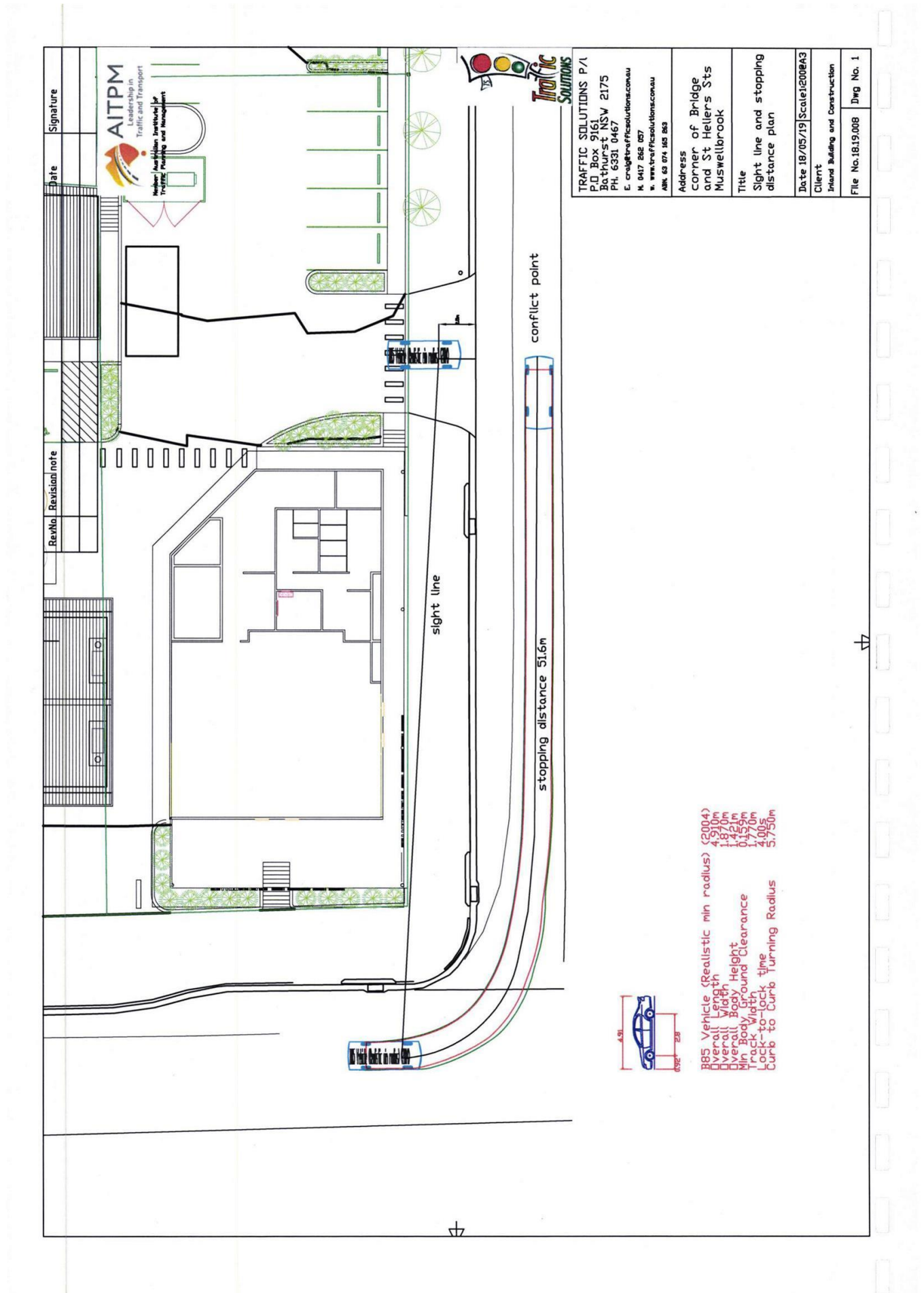
Director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ABN. 63 074 165 863
Address
corner of Bridge and St Hellers Sts Muswellbrook
Title
Sight line and stopping distance plan
Date 18/05/19
Scale1:200@A3
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Inland Building and Construction
File No.18.19.008
Dwg No. 1
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Overall Body Height 1.421m
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Track Width 1.770m
Lock-to-Lock time 4.00s
Curb to Curb Turning Radius 5.750m

6

6. Stormwater Design Detail