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25 January 2021

P00598B Adelaide Street Land Fill Raymond Terrace

Raymond Terrace Parklands
PO Box 342
Earlwood NSW 2206

Attn: Adam Liw

Dear Adam,

Proposed Bulk Earthworks for Rehabilitation of Disused Quarry, 251 Adelaide Street, Raymond Terrace, NSW.

Further to your recent email regarding the proposed bulk earthworks programme at 251 Adelaide Street Raymond Terrace we have now completed our site work and review of the documentation provided in relation to these works. It is understood that these works shall require the importation of a large quantity of excavated natural material and we provide the following assessment and advice in relation to traffic and access to support the EIS for this project.

This assessment has been prepared in accordance with the Austroads Guidelines and with consideration to the RMS Guide to Traffic Generating Developments and the Port Stephen Development Control Plan 2014 to meet the requirements of the SEARS issued for the project **(Attachment A).**

Site Location & Context

The subject site is located at 251 Adelaide Street with frontage to Adelaide Street only as shown in Figure 1. The site is vacant being a disused sand mine now filled with water.

The surrounding land use comprises mostly residential land to the north with the sewer works to the east and Windeyers Creek to the south and west.

Access to the site is provided by the existing unsealed driveway off Adelaide Street that was previously used by the old sand quarry.

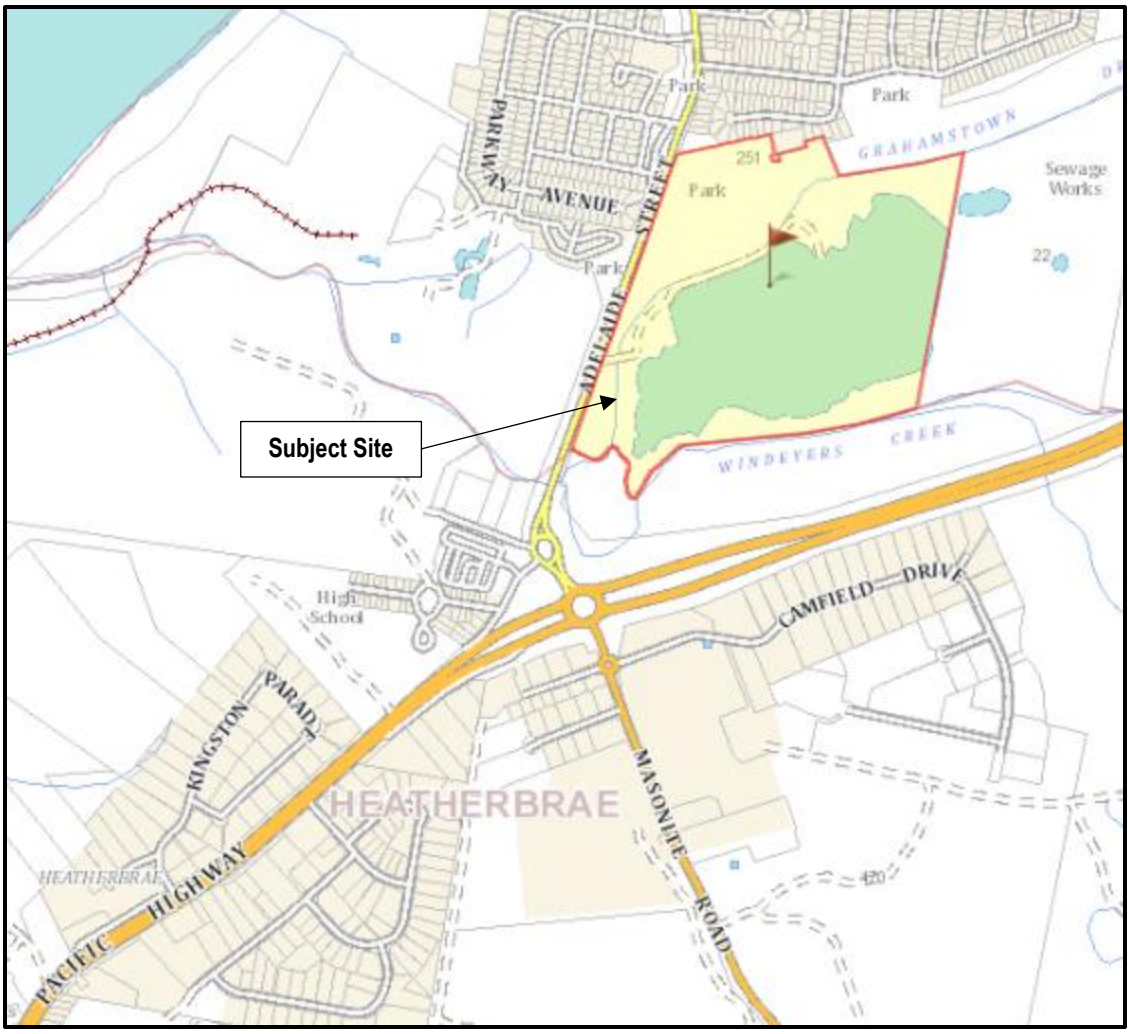

Figure 1 - Location of the subject site in the context of the surrounding road network.

Road Hierarchy

The main road through the locality is **Adelaide Street** which provides an important connection between Raymond Terrace and the Pacific Highway to the north and south. Previously functioning as part of the Pacific Highway it now carries local traffic as well as some minor regional traffic from the various towns and villages to the north west of Raymond Terrace. North of William Bailey Street, Adelaide Street forms part of the state road network carrying a wide range of vehicles up to and including B-double combinations. South of William Bailey Street, and in the locality of the subject site, Adelaide Street functions as a local collector road. Port Stephens Council is the road authority.

Adjacent to the subject site, Adelaide Street provides a generally north-south orientation with a straight alignment and a single lane of travel in each direction. It has a width of approximately 7.2 metres with sealed 2 metres shoulders to each side and grass verges. The posted speed limit along Adelaide Street is 70km/hr adjacent to the site. There is no street lighting.

There is an off-road shared pathway along the western side of Adelaide Street that cater for pedestrian and cyclist movements in this location.

Adelaide Street connects with the broader regional road network **(Pacific Highway)** via a two lane circulating roundabout approximately 550 metres to the south. In the vicinity of the subject site, the Pacific Highway forms a dual lane divided carriageway comprising two through lanes in each direction separated by a central median. The Pacific Highway has a posted speed limit of 100km/hr, increasing to 110km/hr to the north of the Adelaide Street roundabout. This state classified road provides a major road corridor along the eastern seaboard between Sydney and Brisbane.

Roadworks & Traffic Management Works

No roadworks or traffic management works are currently occurring in the immediate locality of the site and there are no works currently proposed.

To the south of the area there is a proposal to extend the M1 Pacific Motorway to Raymond Terrace to bypass Hexham and Tomago.

Existing Traffic Volumes and Road Operation

As part of the project work, a traffic survey was completed at the site entry on Adelaide Street to observe the current operation and determine the existing traffic volumes. This survey was completed during a typical weekday morning (7:00am to 9:00am) and afternoon (3.00pm – 5.00pm) on Tuesday 15th December 2020 with the results summarised below.

Table 1 Two way peak traffic flows on Adelaide Street

	Northbound	Southbound	Two-Way
AM Peak 8am-9am	592	617	1209
PM Peak 3.00pm-4.00pm	827	568	1395

As shown above, the current two-way traffic flows on Adelaide Street were 1209 vehicles per hour (vph) during the morning peak, which were reasonably balance in both directions and 1395 vph during the afternoon peak with a more pronounced flow northbound. In the morning peak, there is a slight bias in traffic travelling southbound towards the M1 Pacific Motorway whilst northbound traffic has a destination towards local shopping and commercial elements within the Raymond Terrace town centre. The opposite applies in the afternoon. Peak hour flows typically represent 8-12% of daily traffic flows, and as such daily flows on Adelaide Street could be in the order of 13,000 vehicles per day (vpd). Daily traffic flows would be reasonably balanced over the day.

Allowing the mid-block flow per lane of an undivided urban road to be 900 vph in the peak hour Adelaide Street is operating well within its current capacity. The peak hour flows per direction for a Level of Service (LoS) C is 600 vehicles with LoS D at 900 vehicles per hour. Thus, Adelaide Street is currently operating at Level of Service D during the peak directional flows (southbound in the AM/northbound in the PM) and the upper limit of LoS C for the alternate flow. Observations on site during the critical peak periods show that there are regular gaps in the traffic to assist with turning movements to and from adjoining properties and roads.

The roundabout controlled intersection of the Pacific Highway and Adelaide Street was observed during the peak periods. Generally, this roundabout operates well with low delays as drivers slow to negotiate the intersection. These delays can create some queuing due to the high volume of northbound traffic and significant queuing occurs in this location during holiday periods. Due to the high volume of through traffic northbound on the Pacific Highway queues can also occur on Adelaide Street. Right turning southbound traffic from the highway and through traffic provide some gaps in this northbound flow allowing for vehicle to exit Adelaide Street. Queues on Adelaide Street were observed and timed on site for the period 8am-8.45am and during this period most queues on Adelaide Street were 6 vehicles and cleared in less than 30 seconds. Longer queues occurred three times through the observation period with each of these taking 90 seconds for the back of queue to clear the roundabout. Similar queues occur in the afternoon and are also impacted by school pick up and drop off traffic (Hunter River High School) for the 20-30 minutes particularly in the afternoon.

Heavy Vehicle Flows

Observations on site indicate that there is a reasonable volume of heavy vehicle movements along Adelaide Street in the vicinity of the site (9% in the AM and 6% in the PM) with heavy vehicles flows primarily consisting of local deliveries and buses towards the Raymond Terrace town centre and construction trucks and similar medium sized trucks outbound towards the Pacific Highway.

Adelaide Street in this locality does not encourage through movements for heavy vehicles with the majority of heavy vehicles (outside of Raymond Terrace) travelling along the Pacific Highway or for destinations to the west via William Bailey Drive and Seaham Road.

Crash History & Traffic Safety

A review of crash statistics published online by Transport for New South Wales indicates that there were no accidents recorded on Adelaide Street in the immediate locality of the site over the 5 year period between 2015 and 2019. There have been a number of collisions at the roundabout intersection at the Pacific Highway reflecting the high traffic volumes in this location. The majority of these have been minor associated with either rear end or some off road collisions not uncommon at roundabouts.

Other Travel Modes

There is a shared pathway along the western side of Adelaide Street.

The area is serviced by public transport with regular bus services operating along Adelaide Street as well as Tathra Street and Phillip Road (Route 141 Town Service). Local buses provide services between Raymond Terrace and Newcastle, Newcastle Airport, Nelsons Bay and East Maitland. The majority of these services are provided by Hunter Valley Buses.

Bus routes servicing the site are:

- Route 135: Nelson Bay to Raymond Terrace (Twice Daily by Port Stephens Coaches)
- Route 140: Newcastle to Lakeside Shops
- Route 141: Raymond Terrace Town Service
-

Bus stops are located on Adelaide Street to the north of the site with a shelter provided on the eastern side of the road.

The nearest railway station is located at Hexham some 10km from the subject site. This station is serviced by the Hunter Line and provides regular services between Newcastle and Scone or Dungog.

Scope of Proposed Works

The proposal involves the dewatering and filling in of the onsite dam by disposing of approximately 3.5 million tonnes clean fill of ENM and VENM being importation, placement and grading of gravel, rock, clay and sand.

The proposed works include widening of the existing driveway linking the site with Adelaide Street, which is also to be compacted with gravel and clay.

It is anticipated that the site may operate over a 10 year period.

Review of Traffic

Traffic Generation

Up to 50 truck (tipper) and dogs shall access the site each day (50 inbound, 50 outbound) with these movements being spread throughout the day. The site is anticipated to operate over a 10 years period.

Truck movements would typically occur during normal construction hours (i.e. 7am-6pm Monday-Friday, 8am to 1pm Saturday) giving an average of 5 truck per hour entering and exiting the site (5 inbound and 5 outbound). There may be periods where additional heavy vehicles shall access the site however it is considered that these additional movements would be minimal and are offset by reduced truck movements at other times throughout the day.

Access Route

Excavated natural material shall be sourced from various projects located throughout the Hunter and Sydney with the majority of movements anticipated to the south of the site. All heavy vehicles shall travel to the site using the M1 Pacific Motorway to access Adelaide Street at the Heatherbrae exit and shall then return along the reverse route.

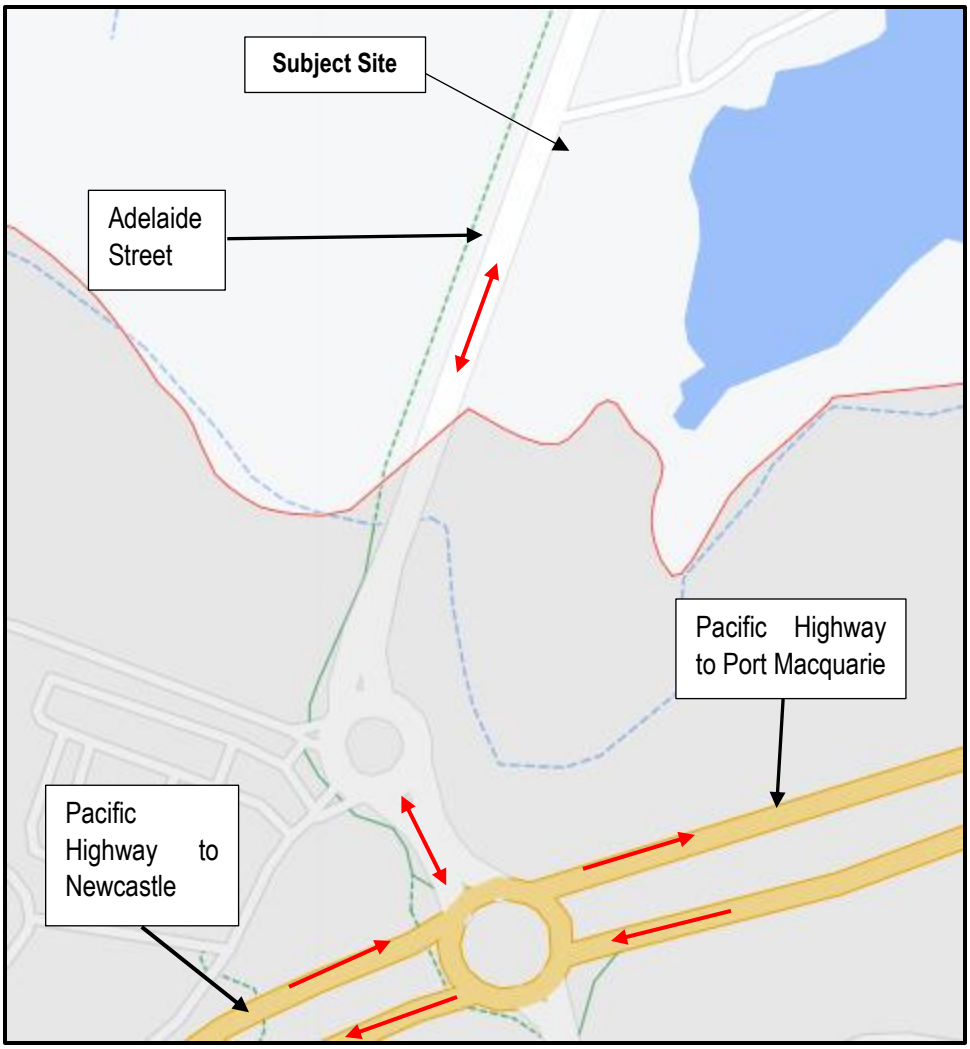

Figure 2 - Vehicle Movement Diagram showing Access Route(s)

Impact of Construction and Operation Traffic

There is minimal construction required for the site with the majority of traffic associated with the operation of the landfill site. There may be the need to bring in some earthmoving equipment prior to the commencement of operation however once on site this shall typically remain. The construction phase shall also allow for the widening of the access and sealing for the first 30 metres as well as fencing of the site. Overall, these traffic movements will be minimal and occur over a short period (< 2 months).

Allowing for the above access route, the proposed bulk earthworks could therefore see an average of 5 additional heavy vehicles (truck and dog combinations) travelling in each direction on Adelaide Street (south of the subject site) per hour with up to 50 heavy vehicle per hour (each way) throughout the day.

This represents a 7-8% increase over the existing traffic flows on Adelaide Street with one additional heavy vehicle on average every 10-15 minutes (each direction). Heavy vehicles flows over this 550m to the Pacific Highway will increase to between 12-15% of traffic volumes. Adelaide Street previously operated as part of the Pacific Highway and carried

high levels of heavy vehicles. Accordingly, it is considered that these additional vehicles will have a minimal impact upon the operation of this road which traverses non-residential land.

The impact of 50 additional trucks on the Pacific Highway will represent less than 0.2% of the either the northbound or southbound traffic volumes (2019 AADT) and so shall have a minimal impact on the operation of this highway.

The majority of these truck movements are anticipated to approach from the south and so turn left at the roundabout intersection of the Pacific Highway and Adelaide Street and return by turning right at this roundabout. Trucks approaching from the north will turn right at the roundabout and return by turning left. The left turn movement has little impact on the overall operation of this roundabout. The right turn from Adelaide Street to the Pacific Highway does not impact the northbound traffic however does require southbound traffic to give way. With an average of 5 trucks exiting per hour, or one every 10-15 minutes, the impact on this southbound traffic will be minimal.

As noted above, queues were observed at the roundabout of the Pacific Highway and Adelaide Street. As delays on the highway are primarily associated with vehicles slowing to negotiate the roundabout and Adelaide Street queues greater than 60 seconds are infrequent, the impact of 5 additional trucks and dog combinations across an hour will have a minimal and acceptable impact on this queue. Outside of the peak hours this intersection operates with minimal delays and significantly greater efficiency.

As the number of truck arrivals or departures will be on average one every 10-15 minutes there will be minimal queuing at the access point. The access shall be wide enough to allow two truck combinations to pass concurrently avoiding the need for an entering combination to need to wait for the access to clear. The Drivers Code of Conduct will require trucks to travel on the road network with suitable time gaps to avoid the need for more than one vehicle to arrive at the entry at any one point in time.

Light vehicle movements associated with the site will be minimal, associated with staff for operation and maintenance of earthmoving equipment.

Review of Access

Access to the site shall be provided via the existing unsealed access off Adelaide Street which historically provided access to the sand quarry operated by ROCLA. This driveway shall be widened to allow for the movement of truck and dog combinations. Due to the traffic demands for the project and the desire not to drive through the centre of Raymond Terrace, this access shall operate as a right in left out only for the heavy vehicles associated with the land fill operations whilst all movements shall be required for the low number of light vehicles associated with staff movements.

The Drivers Code of Conduct shall direct all drivers to approach the site from the south and depart to the south and not to travel to the north.

All vehicles shall enter and exit the site in a forward direction.

Signage shall be provided on the approach (Adelaide Street) to warn drivers of turning trucks.

Sight Distances

Australian Standard AS2890.2:2002 Parking Facilities (Off-Street Commercial Vehicle Facilities) specifies the minimum sight distance requirements for a commercial vehicle to find a safe gap in the oncoming traffic prior to exiting onto the frontage road. The values provided are based on the Minimum Gap Sight Distance (MGSD) described by the Austroads Guide to Road Design - Part 4A: Unsignalised and Signalised Intersections. For a frontage road speed of 70km/hr the distance along the frontage road is 97metres for a 5sec gap and 156 metres for an 8 sec gap.

Sight lines for drivers exiting the site extend to the right (north) to more than 380 metres and in the order of 275 metres to the left (south). As the access will allow for right in and left out only for the heavy vehicles the sight line to the north is critical. This distance exceeds the required sight distance for drivers exiting this access.

The Safe Intersection Sight Distance is the minimum which should be provided on the major road at any intersection and should be applied to the following cases to ensure that adequate visibility is provided between:

- vehicles approaching on the major road and vehicles turning right from the major road for basic right-turn (BAR) treatments (i.e. no right-turn lane provided)
- vehicles turning right from the major road and oncoming major road vehicles at all types of right-turn treatments, including those on divided roads.

The SISD for a 70km/hr road frontage is 141 metres minimum, 151 metres desirable. The sight distance approaching the access exceeds this in both directions.

Photo 1 - View looking south along Adelaide Street showing relatively straight and flat road alignment along its length.

Photo 2 - View looking right (north) from the site entry along Adelaide Street showing visibility exceeding 380 metres

Photo 3 - View looking left (south) from the site entry along Adelaide Street showing visibility exceeding 275 metres.

Requirement for Turn Treatments

Given the very low traffic volumes associated with the proposed landfill site (1 entering every 10-15 minutes) no turn treatments are proposed for the access. The intersection of Adelaide Street and the site access currently provides some informal widening on the access shoulder to allow for the swept paths of the truck and dog combination. The right turn into the site will be for laden trucks and the left turn out for unladen trucks.

The forward visibility for trucks approaching the site exceeds 350 metres with truck drivers able to adjust their speed on approach to select a suitable gap in approaching traffic to reduce delays in turning into the site. Should a truck need to prop to undertake this turn, vehicles behind will have in excess of 250 metres to adjust their speed or if necessary, stop while the truck completes its turn into the site.

Visibility for drivers turning out of the site access exceeds 350 metres which exceeds the requirement based on the posted speed limit of 70 km/h. Thus, the access can operate in a safe manner with unladen trucks able to select a suitable gap in the traffic flow to exit the site and accelerate to the road speed whilst vehicles approaching from the north will have adequate forward visibility to see a truck exiting the site and adjust their speed if necessary. The increase in the posted speed to 70km/hr from the urban 50km/hr speed occurs some 340 metres north of the site. Signage shall be provided on the approach to warn drivers of turning trucks.

It is therefore considered that the existing intersection of Adelaide Street and the site access is acceptable for the low volume of trucks accessing and exiting the site. Road safety can be enhanced with installation of “Trucks Turning Ahead “ signs for the duration of the landfill project. These signs would be provided in advance of the access for drivers travelling in both directions. Also, the regular trimming of vegetation at the site access and within the sight triangles can enable visibility to be maintained for all road users.

Site Access Layout

The existing unsealed access shall be widened to provide an appropriate width to ensure that Truck and Dog combinations can enter and exit the site in a forward direction. Details shall be provided to Council prior to the commencement of earthworks on site with this to be allowed for in the initial stage of construction.

Conclusion

Overall, the above assessment has demonstrated that the proposed bulk earthworks and importation of fill will have a minor and acceptable impact upon the surrounding road network, with traffic generated by these works being well within the capacity of Adelaide Street and the broader road network (Pacific Highway).

The key element of this project will be the provision of safe and suitable access for Truck and Dog combinations, which is proposed to occur via the existing unsealed access off Adelaide Street. Given the relatively low number of trucks required to access the site per day, no upgrades are proposed to Adelaide Street.

The bulk earthworks shall see up to 50 vehicles inbound and outbound a day however these shall be dependent upon market demand for the exporting of fill from various sites. The existing access layout at Adelaide Street is considered appropriate however should be enhanced with “Trucks Turning Ahead “signage and the maintenance of vegetation at the access for the duration of the landfill project.

The existing unsealed site access provides acceptable sight distances which satisfy the requirements for travel speeds of 70 km/hr along the site frontage.

Please do not hesitate to contact me on 4032 7979 should you have any queries or concerns.

Yours sincerely,

Sean Morgan
Director

Attachment A – SEARS

SEARS	
Details of road transport routes and access to the site	Pages 1,4,6 and 7
Road traffic predictions for the development during construction and operation	Page 4
An assessment of the impacts to the safety and function of the road network and the details of any road upgrades required for the development	Pages 5 and 6
Transport for NSW	
Transport recommends that the Environmental Impact Statement (EIS) should refer to the following guidelines with regard to the traffic and transport impacts of the proposed development:	
- Road and Related Facilities within the Department of Planning EIS Guidelines, and,	
- Section 2 Traffic Impact Studies of Transport for NSW's Guide to Traffic Generating Developments 2002.	-
Furthermore, a traffic and transport study shall be prepared in accordance with the Roads and Maritime Services NSW's Guide to Traffic Generating Developments 2002 and is to include (but not be limited to) the following:	
- Assessment of all relevant vehicular traffic routes and intersections for access to / from the subject properties.	Pages 2 and 3
- Current traffic counts for all of the traffic routes and intersections.	Page 3
- The anticipated additional vehicular traffic generated from both the construction and operational stages of the project.	Page 4
- The distribution on the road network of the trips generated by the proposed development. It is requested that the predicted traffic flows are shown diagrammatically to a level of detail sufficient for easy interpretation.	Pages 5 and 6
- Consideration of the traffic impacts on existing and proposed intersections, in particular, the intersection of Adelaide Street and the Pacific Highway, and the capacity of the local and classified road network to safely and efficiently cater for the additional vehicular traffic generated by the proposed development during both the construction and operational stages. The traffic impact shall also include the cumulative traffic impact of other proposed developments in the area.	Pages 5 and 6
- Identify the necessary road network infrastructure upgrades that are required to maintain existing levels of service on both the local and classified road network for the development. In this regard, preliminary concept drawings shall be submitted with the EIS for any identified road infrastructure upgrades. However, it should be noted that any identified road infrastructure upgrades will need to be to the satisfaction of Transport for NSW and Council.	Page 5 No upgrades required

- Traffic analysis of any major / relevant intersections impacted, using SIDRA or similar traffic model, including: o Current traffic counts and 10 year traffic growth projections o With and without development scenarios o 95th percentile back of queue lengths o Delays and level of service on all legs for the relevant intersections o Electronic data for Transport for NSW review.	Page 6 No SIDRA modelling required due to low hourly traffic flows generated by proposal. 10 additional trips per hour represent 0.2-0.5% increase in flows on the Pacific Highway
o Any other impacts on the regional and state road network including consideration of pedestrian, cyclist and public transport facilities and provision for service vehicles.	No impact