TRAFFIC IMPACT ASSESSMENT

State Significant Development
The Boral Berrima Cement Works
SWDF Consumption Increase and New Access

Prepared for:

Boral Cement Limited

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BASIS OF REPORT

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Reference	Date	Prepared	Checked	Authorised
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EXECUTIVE SUMMARY

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Boral Cement Limited (Boral) to prepare a Traffic Impact Assessment (TIA) for the proposed development (MOD 14) at The Berrima Cement Works located on Taylor Avenue, New Berrima.

Boral has advised that they have set the most ambitious carbon emissions targets in the global construction materials industry and has joined the Science Based Targets initiative (SBTi) Business Ambition for 1.5°C and UNFCCC Race to Zero. The new carbon reduction targets mean Boral is committed to net zero carbon emissions by no later than 2050, aligned with the most ambitious aim of the Paris Agreement to limit global warming to 1.5°C.

In order to achieve the above climate targets, Boral is reducing their reliance on coal and increasing their consumption of SWDF materials. In order to increase the consumption of SWDF in their kilns, Boral is seeking modifications to their current approvals, which comprise:

- Increase the permissible delivery times;
- Increase the maximum permitted deliveries to site;
- Increase on-site storage capacity.

It is important to note that Boral does not seek a capacity increase at The Berrima Cement Works (facility) with this application.

Based on the plans prepared and information provided by Boral, a new haul road access to the facility is also proposed on Old Hume Highway, approximately 300m to the south of Old Hume Highway / Taylor Avenue / Medway Road roundabout.

It is therefore anticipated the proposed works will trigger the following regulatory clauses:

- Clause 104 of State Environmental Planning Policy Infrastructure (i-SEPP) 2007;
- Section 138 of the Roads Act 1993.

Based on the above, it is anticipated that Transport for New South Wales concurrence will also be required by way of referral, in addition to Council's standard review procedure.

Based on the analysis and discussion documented herein, the following is concluded:

- The proposed development will generate an additional 13 trucks per day, assumed to be two extra trucks during the peak hour;
- The proposed design for the new site access fronting Old Hume Highway as a result of the proposed development exceeds Austroads Guidelines;
- The operational assessment conducted herein demonstrates that the proposed development will not have any adverse impacts on the roundabout of Old Hume Highway / Taylor Avenue / Medway Road and will improve its operation by moving traffic away from Taylor Avenue;
- The proposed BAR and AUL(S) turn treatments are considered appropriate at the new haul road access and over and above the minimum requirements of Austroads Guidelines.

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1 Introduction

1.1 Context

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Boral Cement Limited (Boral) to prepare a Traffic Impact Assessment (TIA) for the proposed development (MOD 14) at the Berrima Cement Works located on Taylor Avenue, New Berrima. A new haul road access to the facility is also proposed on Old Hume Highway, approximately 300m to the south of Old Hume Highway / Taylor Avenue / Medway Road roundabout.

Plans for the development proposal have been prepared by Boral. A copy of the development plan layout is included at Appendix A.

1.2 Existing Approvals

The Berrima Cement Works operates under two development consents originally issued by the Department of Planning and Environment (DPE), now the Department of Planning, Industry, and Environment (DPIE), being DA 401-11-2002-i (Kiln 6) and DA 85-4-2005-i (Kiln 7). DA 401-11-2002-i for Kiln 6 has been modified thirteen times, as detailed in Table 1 below.

Table 1: Berrima Cement Works DA 401-11-2002-i Modification History

Reference	Description	Date Modified
MOD 2-1-2004-i	Non-Standard Fuels	26 September 2005
MOD 109-9-2006-i	Remove prohibition of hazardous wastes	22 September 2006
MOD 12-2-2007-i	Trial use of tyre chips	13 February 2007
MOD 4	Variation to usage rate of coke fines	24 April 2008
MOD 5	Coal deliveries by rail	31 August 2009
MOD 6	Coal stockpiling for sale	20 June 2012
MOD 7	GBFS processing	16 April 2012
MOD 8	Approval / EPL Consistency	5 August 2012
MOD 9	Use of Waste Derived Fuels	5 October 2016
MOD 10	Fuel storage shed amendments	11 April 2019
MOD 11	Use of Hi Cal 50	25 October 2019
MOD 12	Use of Isotainers and Site Wide Noise Limit	7 March 2020
MOD 13	Chloride Bypass System and Use of Woodchips	31 May 2021

1.3 Application

Boral has advised that they have set the most ambitious carbon emissions targets in the global construction materials industry and has joined the Science Based Targets initiative (SBTi) Business Ambition for 1.5°C and UNFCCC Race to Zero. The new carbon reduction targets mean Boral is committed to net zero carbon emissions by no later than 2050, aligned with the most ambitious aim of the Paris Agreement to limit global warming to 1.5°C.

Boral has defined the following five key levers that underpin its climate targets:

- Energy: by transitioning to 100 per cent renewable electricity, increasing the use of alternative fuels by 150% at its Berrima Cement kiln and improving energy efficiency;
- Cementitious intensity: by optimising the energy efficiency of its Berrima Cement kiln and accelerating adoption of its leading lower carbon concrete product range;
- Transport: by optimising supply chain logistics and routes, and exploring alternative fleet fuel options;
- Sourcing: by prioritising lower carbon intensity suppliers, and;
- by exploring and testing emerging carbon capture use and storage (CCUS) technologies.

It is important to note that Boral does not seek a capacity increase at The Berrima Cement Works (facility) with this application (MOD 14). Boral seeks to increase the consumption of SWDF (Solid Waste Derived Fuels) within the Kiln by 150%, reducing the plant's reliance on coal.

The delivery of SWDF is currently restricted to 6am – 6pm Monday to Friday and 7am – 1pm Saturday. Due to the lower relative energy properties of SWDF compared to coal increased truck movements are required over a 24-hour time period to ensure adequate fuel supply for efficient kiln operation.

Consequently, the modification seeks to allow unrestricted delivery times to facilitate the continual supply and increased consumption of SWDF in the kiln, removing the bottleneck experienced by a shortage of onsite storage capacity.

An alternate haul route, providing direct access to the Old Hume Highway is also proposed to help reduce environmental impacts on neighbouring sensitive receivers.

In short, to facilitate the increased use of SWDF in the kiln, modifications to the current approval are required to:

- Increase the permissible delivery times;
- Increase the maximum permitted deliveries to site;
- Increase on-site storage capacity.

It is anticipated that the proposed development will trigger the Section 138 of NSW Roads Act 1993 based on the following:

- Clause (a): Erect a structure or carry out a work in, on or over a public road;
- Clause (b): Dig up or disturb the surface of a public road.

It is also anticipated that Clause 104 of State Environmental Planning Policy Infrastructure (i-SEPP) 2007 will also be triggered and Transport for New South Wales concurrence will be required by way of referral.

1.4 Assessment Scope

This TIA report assesses the consistency of the development with Council and State planning and evaluates the impacts of the proposed development on the surrounding transport networks. Comments and requirements of the following agencies were considered as part of this proposal:

- Wingecarribbee Shire Council (WSC);
- Department of Planning, Industry and Environment (DPIE); and

- Transport for New South Wales (TfNSW).

This TIA also identifies the transport infrastructure required to support the proposed development and provides an assessment of the traffic- and transport-specific aspects of the development against the requirements of the following relevant standards and guidelines:

- Australian Standards AS2890.2:2018 Part 2: Off-Street Commercial Vehicle Facilities;
- Austroads Guidelines: Guide to Road Design Part 4a: Unsignalised and Signalised Intersections;
- RTA Guide to Traffic Generating Developments 2002;
- I-SEPP 2007 and NSW Roads Act 1993;
- RMS Traffic Modelling Guidelines 2013;
- WSC Engineering Standards: Engineering Design and Construction Specifications.

Comments provided by DPIE and TfNSW are tabulated in Table 2 and Table 3, respectively. It is understood that WSC has not provided comments to date on the proposed development application.

Table 2: DPIE Comments

	Comments / Requirements	SLR Response
1	A quantitative traffic impact assessment prepared in accordance with relevant Roads and Maritime Services and Austroads guidelines, that includes:	This report satisfies a TIA.
2	Details of all daily and peak traffic volumes likely to be generated during all key stages of construction and operation, including a description of key access / haul routes, vehicle types and potential queuing impacts.	Provided in Sections 3, 4, and 6 of this TIA.
3	An assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of crash history and cumulative traffic impacts at key intersections using SIDRA or similar traffic model.	Provided in Section 6 of this TIA.
4	Details of road upgrades, infrastructure works, or new roads or access points required for the development, including conceptual designs and swept path diagrams.	Provided in Sections 5 and 6 of this TIA.

Table 3: TfNSW Comments

	Comments / Requirements	SLR Response
1	Traffic Impact Study (TIS): A TIS is required to examine any potential transport related implications of the development. As a guide Table 2.1 of the RTA's Guide to Traffic Generating Developments outlines the key issues that should be considered in preparing a TIS. In addition, regard should be had for the Austroads publications, particularly the Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments and Part 3: Traffic Studies and Analysis Methods.	This report satisfies a TIA. Consideration was given to Austroads publications, in particular AGRD Part 4A, AGTM Part 12 and Part 3: Traffic Studies and Analysis Methods.

	Comments / Requirements	SLR Response
2	TfNSW considers that the traffic related issues relevant to the development should be considered and addressed in 2 distinct stages as follows: Construction phase: The transport of materials and equipment/components for the establishment of the facility (e.g., gravel, concrete, oversize over mass movements, etc) and ancillary infrastructure (overhead power/transmission line construction access points), the movement and parking of construction related vehicles including workers vehicles, etc; and Operational phase: The ongoing traffic generation due to the operation, maintenance, and servicing of the various elements of the project.	This report addresses the operational impacts of the proposed development.
3	Noting the above stages, the following will need to be addressed for each stage: - Details of all traffic types (both heavy and light vehicles) including a description of heavy vehicle types that will be used and the routes that will be taken to enable vehicles that are travelling from the north and south to gain access to the site as well as details on the routes that vehicles wishing to leave the site to go north and / or south will take; - For heavy vehicles, details are required on their size, their associated carrying capacity, etc for both the receipt of materials and the removal of waste products. This should also include details on the maximum number of vehicles per day and per annum that the proposed development will generate including how these numbers correlate to the daily and annual limits for which approval is being sought; - Details on traffic volumes that are likely to be generated by the proposed development. It should also include details on the distribution of the traffic generated that will come from and go to the north and south; and details on how maximum vehicle numbers will be monitored to ensure ongoing compliance.	Provided in Sections 3 and 4 of this TIA.
4	An assessment of the cumulative impact of traffic from this development and nearby developments that use the same access to and from the Hume Motorway/Highway.	Provided in Section 6 of this TIA.
5	An assessment of the suitability of the road connections with the classified road network at each access point as well as details on any works required. While TfNSW notes that the Old Hume Highway to which the new access is proposed to connect is a regional classified road managed by Council, any upgrade works should demonstrate compliance with the applicable requirements in Austroads Guide to Road Resign (2021). This including, but not limited to, an assessment for the treatment at the sites new access with the Old Hume Highway against the warrants for BA, AU and CH Turn Treatments outlined in Figure 3.25 of Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management and the provision of volume plots on Figure 3.25 to identify the appropriate turn treatments. The design speed to be used is posted speed +10km/h.	Provided in Section 5 of this TIA. This TIA suggests the construction of a new access road, with an AUL(S) and BAR arrangement.
6	Details of measures to mitigate and/or manage potential impacts including a schedule/timeframe for their provision.	Provided in Section 5 of this TIA.
7	Swept path diagrams to demonstrate the largest vehicles that will be using the classified road network can undertake all required manoeuvres to enable access to and from the development site.	This is not a new development application and no new vehicle types or connections to the classified road network are proposed.
8	An assessment of the crash history with the connections to be used with the Hume Motorway/state classified road (e.g., Medway Road and the Hume Motorway on-load and off-load ramps, Mereworth Road and the Hume Highway off-load ramp, etc) including details on what if any crashes have involved vehicles associated with the operations of the existing site.	Provided in Section 2.4 of this TIA, except Mereworth Road as SLR does not anticipate impacts to this intersection as part of the proposed works.

	Comments / Requirements	SLR Response
9	State Environmental Planning Policies: An assessment against the provisions of: State Environmental Planning Policy (Infrastructure) 2007. Specifically, Part 3, Division 15, Subdivision 2, Section 104 need to be addressed. If it is not applicable details shall be provided on why. State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007. Specifically, Part 3, Section 16 need to be addressed. If it is not applicable details shall be provided on why.	i-SEPP 2007 has been considered in this TIA however no references were made to SEPP Mining, Petroleum and Extractive Industries, given the proposal does not seek any changes to its current approval other than the following: 4% increase in the heavy vehicle volumes; Increased hours of operation and reduced peak hour traffic volumes.
10	Strategic / Concept Design: Noting the comments provided in Point 1 above, should it be identified as part of preparing the EIS or during the assessment of the application that mitigation measures are required that will impact a classified road then a concept design for the proposed works will need to be prepared and submitted (e.g., new access and associated turn treatments in the Old Hume Highway). This is needed to clarify the scope of works, demonstrate the works can be constructed within the road reserve and allow the consent authority to consider any environmental impacts of the works as part of their assessment. The concept design submitted must include, but not be limited to, legal property boundaries (including the existing road reserve boundaries based on a survey), existing and proposed lane configurations and lane widths at several locations along the length of the proposed works, etc. The design provided should be based on a design speed that is 10km/h over the posted speed limit and should demonstrate compliance with the applicable requirements in Austroads Guide to Road Design (2021) and the relevant TfNSW supplements.	Old Hume Highway is not part of the Classified Road Network. Notwithstanding, a concept civil design drawing has been provided for the New Haul Road Access, consistent with the requirements of TfNSW and WSC.
11	Consultation: TfNSW encourages further consultation, if required, during the preparation of the EIS to discuss issues/impacts on the state classified road and/or rail corridors.	No further consultation was undertaken other than the initial engagement with DPIE, TfNSW and WSC.

2 Existing Conditions Appraisal

2.1 Subject Site

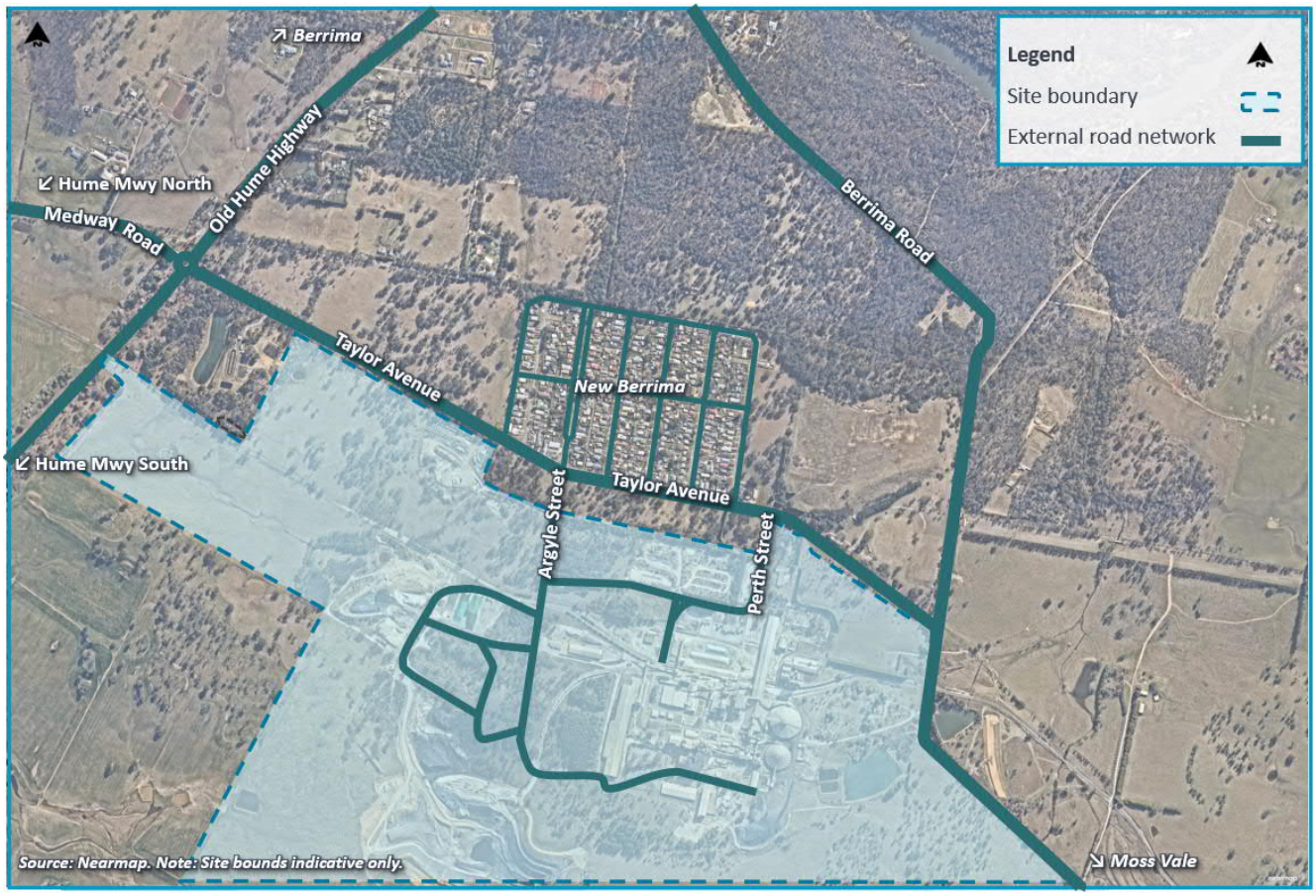
The Boral Cement Works is located south of New Berrima in the Southern Highlands, NSW in the Wingecarribee local government area (LGA). The site, identified as Lot 1 DP 582277, Lot 2 DP 774598, Lot 22 DP 582276, and Lot 100 DP 882139 is approximately 135 ha and is wholly owned by Boral.

The site is generally surrounded by undeveloped land, with the township of New Berrima located to the north of the site. The site currently has two accesses, as follows:

- Argyle Street: For employees, visitors, and services;
- Perth Street: For all other heavy vehicles.

The site location is shown in the context of the local area on Figure 1.

Figure 1: Site Location – Local Context



2.2 Surrounding Road Network

Details of the key roads surrounding the subject site are provided in Table 4.

Table 4: Key Roads

Road Name	Classification	Authority	Existing Form	Posted Speed
Old Hume Highway	Unclassified Regional Road	WSC	One traffic lane in each direction, undivided, rural cross-section.	80km/h
Taylor Avenue	Local Road	WSC	One traffic lane in each direction, undivided, rural cross-section.	80km/h 50km/h

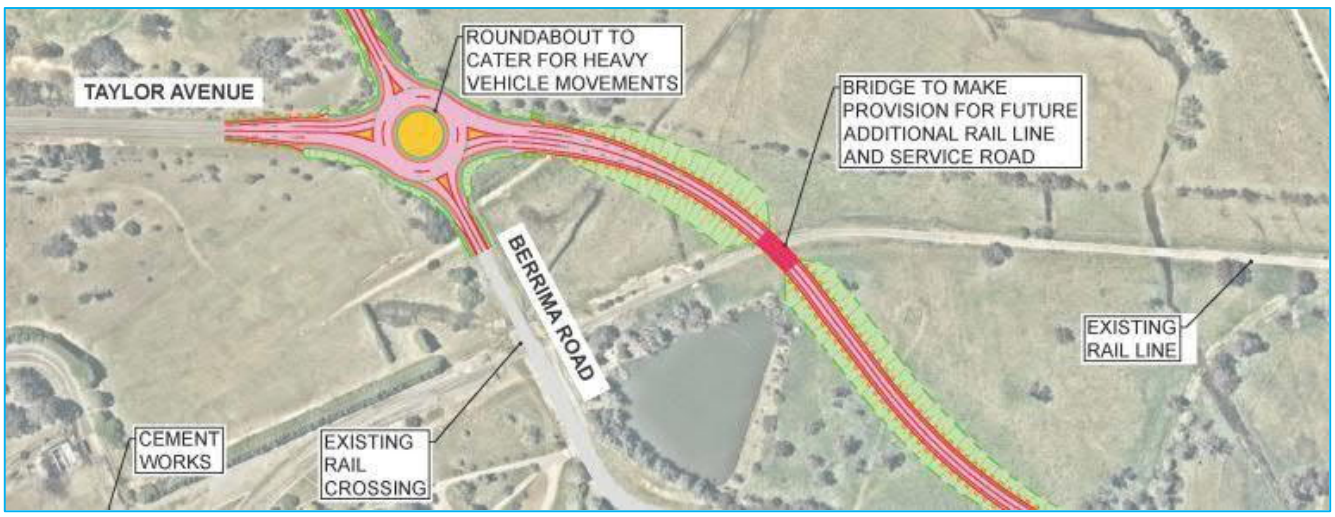
2.3 Road Network Planning

A review of the publicly available State-Level (TfNSW, DPIE) and Local-Level (WSC) documents has been undertaken to understand future road upgrades planned in the vicinity of the subject site.

No publicly available information was identified on the State Level however WSC website indicated that there are planned upgrades to the intersection of Berrima Road and Taylor Avenue. It is understood that detailed design and environmental studies have been completed and a portion of the works have also been delivered.

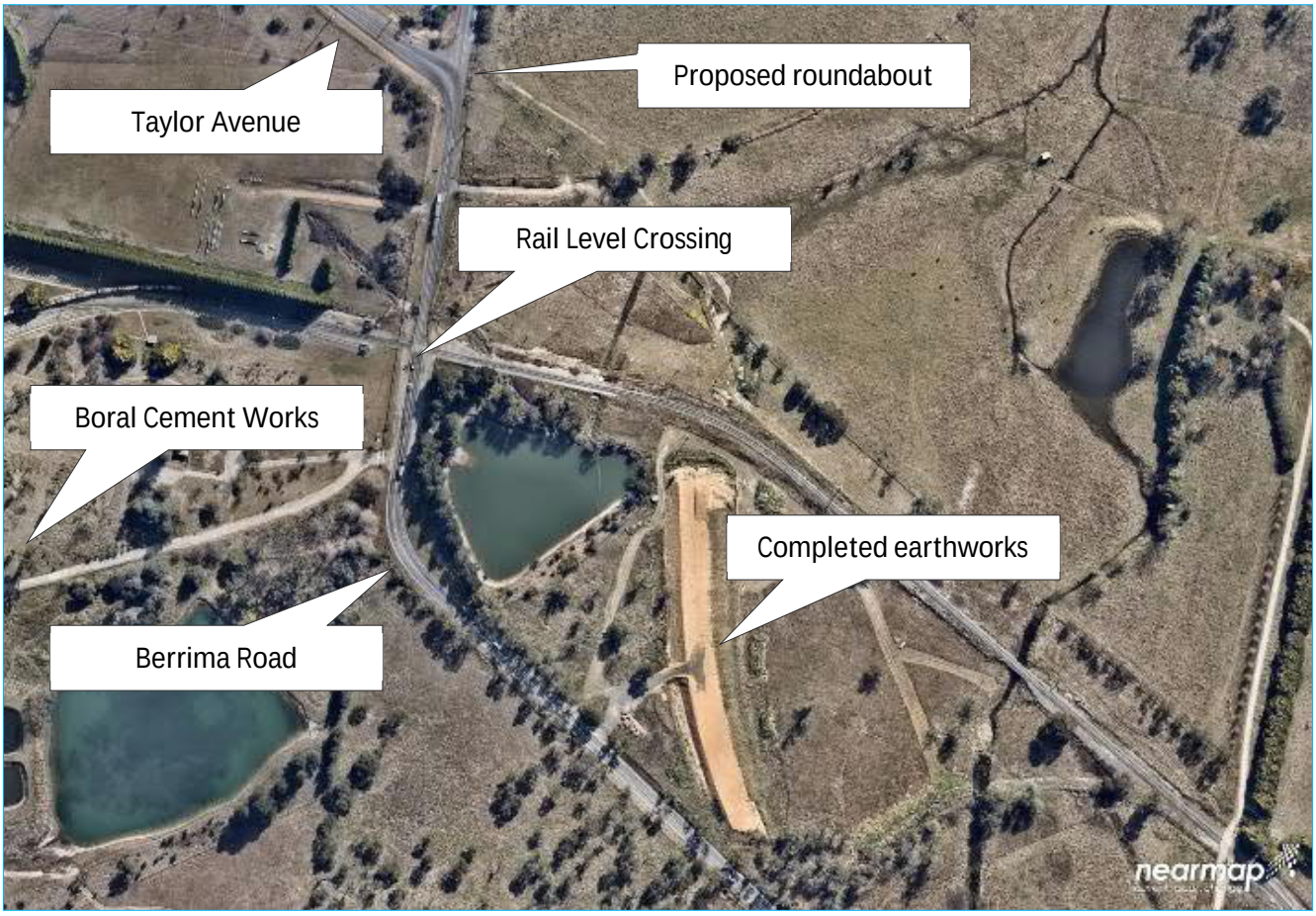
The project would involve construction of approx. 600m of new road, including a new roundabout with a capacity to accommodate B-Triple design vehicles at the intersection of Berrima Road and Taylor Avenue in New Berrima. In addition to realigning the road, the existing rail level crossing will also be replaced with a rail overbridge, providing safer and more efficient access to the Hume Highway. Figure 2 provides an overview of the scope of works and Appendix B provides the full-size concept design drawings.

Figure 2: WSC Planned Upgrades



A portion of the works were delivered in July 2018, including the sorting and processing 130,000 tonne of general fill for construction of two bridge approaches. Works included bulk earthworks, material handling / processing and storm water drainage. It is understood that project has been on halt since July 2018 and awaiting further grant funding. Figure 3 illustrates the location of the completed earthworks.

Figure 3: Aerial Image of the Vicinity of Proposed Works – Tuesday 17/08/2021



2.4 Crash History

In order to highlight any safety deficiencies in the surrounding road network in proximity to the subject site, crash data has been extracted from Transport for NSW Centre for Road Safety website[1]. Crashes are reported for the latest five-year period between 2016 and 2020.

The crash details are provided in Table 5 and crash locations are illustrated in Figure 4.

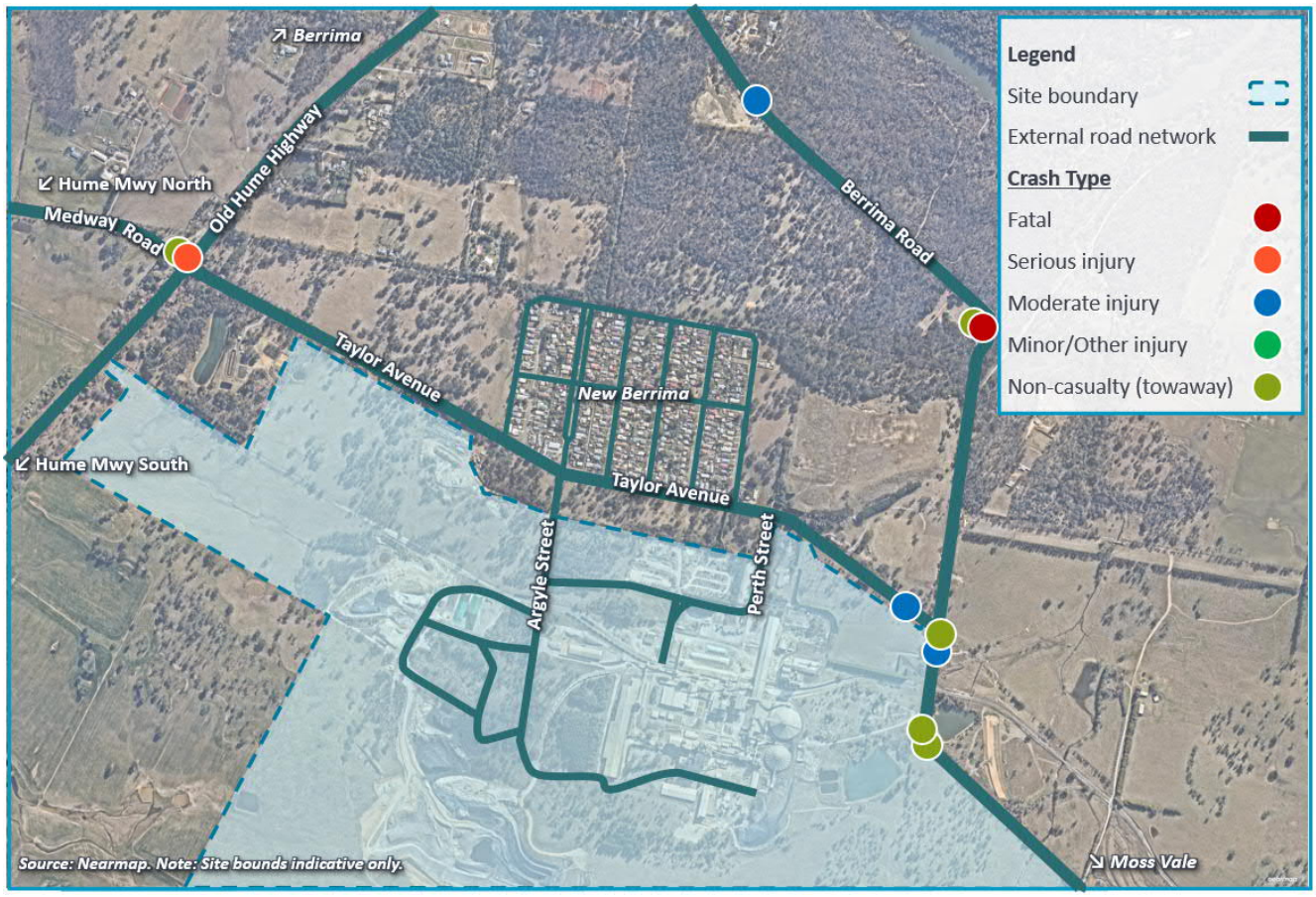
Table 5: Crash Data Details

Location	Crash ID	Year	Severity	Rum Code	Description
Berrima Rd	1126150	2016	Fatal	20	Head on (Not overtaking)
Berrima Rd	1226187	2020	Non-casualty towaway)	81	Off Carriageway Left on Right Bend into Object / Parked Vehicle
Taylor Ave / Berrima Rd	1164710	2018	Non-casualty towaway)	87	Off Carriageway Left on Left Bend into Object / Parked Vehicle
Berrima Rd	1180209	2018	Moderate Injury	87	Off Carriageway Left on Left Bend into Object / Parked Vehicle

[1] https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tablga=4

Location	Crash ID	Year	Severity	Rum Code	Description
Taylor Ave / Berrima Rd	1186834	2018	Moderate Injury	30	Rear end
Taylor Ave	1189621	2018	Moderate Injury	67	Struck animal
Old Hume Hwy / Medway Rd / Taylor Avenue	1193097	2018	Serious Injury	10	Cross traffic
Old Hume Hwy / Medway Rd / Taylor Avenue	1238999	2020	Non-casualty (towaway)	85	Off Carriageway Right on Left Bend into Object / Parked Vehicle
Berrima Rd	1205468	2019	Non-casualty (towaway)	86	Off Carriageway Left on Left Bend
Berrima Rd	1222893	2020	Non-casualty (towaway)	81	Off Carriageway Left on Right Bend into Object / Parked Vehicle

Figure 4: Crash Locations (Dataset queried on 15/10/2021)



As shown in Table 5, there were a total of ten reported crashes in the vicinity of the area within the five-year crash period. One crash resulted in fatality as a result of a head-on crash along Berrima Road and another crash resulted in serious injuries due to vehicles crossing the Medway Road / Old Hume Highway roundabout from adjacent directions. All other reported crashes resulted in moderate injuries or no injuries.

This dataset indicates that there is no recurring crash occurrence or theme in the immediate vicinity of the site that would preclude development or warrant mitigation to enable development, given that the proposed development is anticipated to reduce the cumulative traffic on Taylor Avenue and divert it to Old Hume Highway and away from the township of New Berrima.

3 Proposed Modification

To increase the consumption of SWDF within the kiln and reduce the plant's reliance on coal, Boral propose a modification (MOD 14) to the existing development consent DA 401-11-2002. The current consent contains the following operational parameters:

- A production capacity of 1.56 mt p.a. for Kiln 6;
- 24 hours per day, 7 days per week operations; and
- Restriction of SWDF delivery hours to 6am to 6pm, Monday to Friday and 7am to 1pm Saturday.

The kiln requires approximately 700 Gigajoules per hour of energy to maintain temperatures for optimised kiln performance and production of clinker. One truck load of coal (30 tonnes) provides 690 Gigajoules of energy, equating to approximately one hour of fuel. Conversely SWDF material provides approximately 450 Gigajoules of energy. Given SWDF is less energy dense than coal, providing only two thirds of the energy per truck compared to coal, additional truck movements are required to fuel the kiln with SWDF at the same level of efficiency. Consequently, additional truck movements that are spread over a longer timeframe are required.

To facilitate the increased SWDF throughput Boral propose to increase onsite storage and handling facilities, with an associated increase in truck movements and extended delivery hours. An alternate haul route, providing direct access to the Old Hume Highway is also proposed to help reduce not only environmental impacts on neighbouring sensitive receivers but also vehicular traffic on Taylor Avenue and surrounding road network.

3.1 Vehicular Impacts

To maintain the same production level at the facility, an increase in truck movements to / from the site will be required across a full 24-hour day. As such, the proposed development seeks an increase to the currently approved total truck movements, from 317 per day to 330 per day. However, it is important to note that peak hour volumes will decrease as the deliveries will be spread over a 24-hour period.

In addition, the development plans prepared by Boral proposes a new access haul road, providing direct access to the Old Hume Highway to help reduce environmental and traffic impacts on neighbouring sensitive receivers. Furthermore, the proposed development seeks to remove restrictions regarding the delivery times of SWDF to 24/7 via this new access haul road.

The proposed development with regards to haulage of energy source and total truck movements per day are described in Table 6 and Table 7, respectively.

Table 6: Haulage of Energy Sources (Per Day)

Source of Energy Haulage	Existing	Proposed*
SWDF	16	39
Coal	22	12

As identified in Table 6, it is understood that a decrease in 10 truckloads of coal will require 23 truckloads of SWDF material. This is due to the difference in energy densities of coal and SWDF.

Table 7: Total Heavy Vehicle Movements (Per Day)

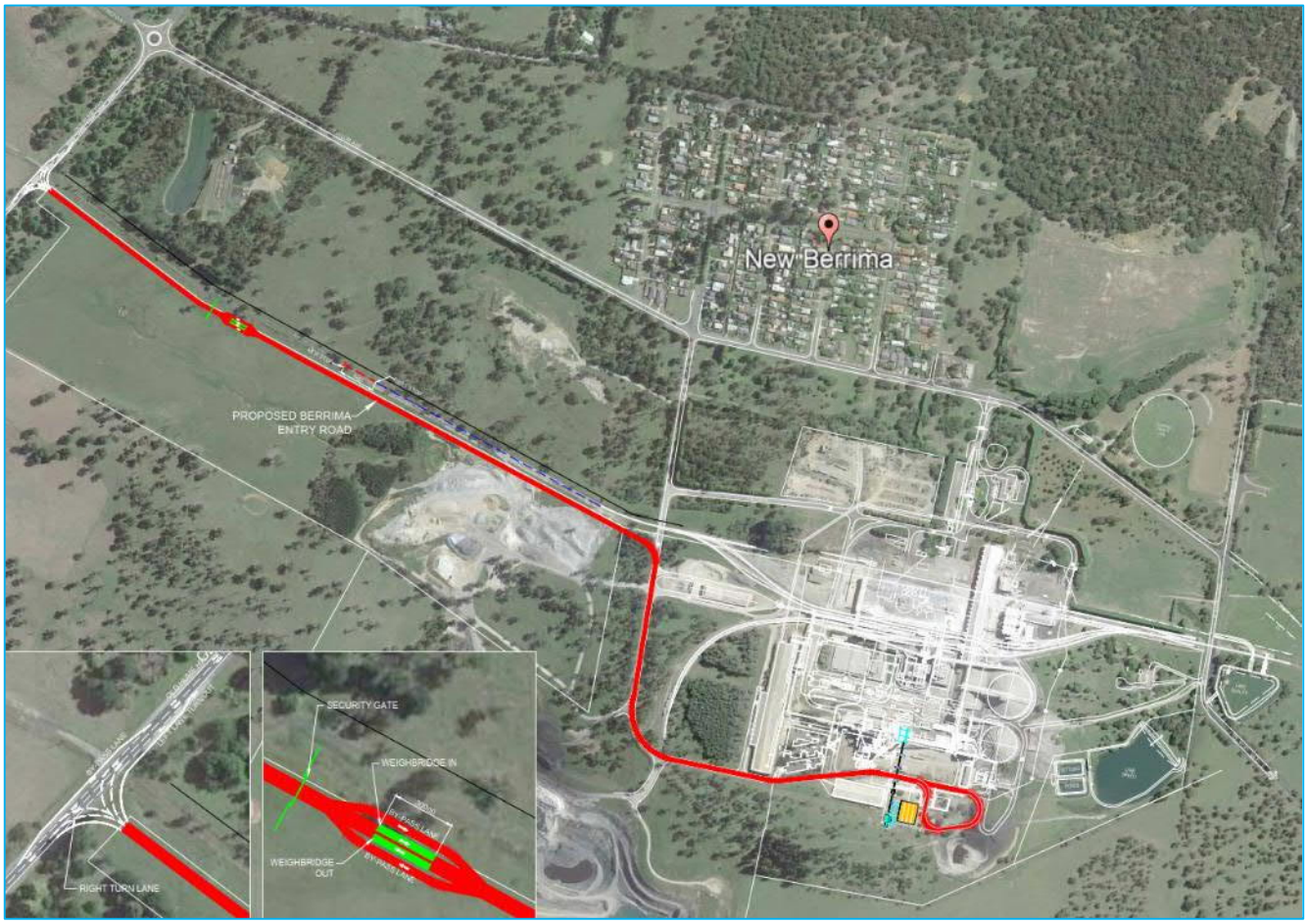
Material / Access	Existing	Proposed*
Total Vehicles at Taylor Avenue Access	317	128
Total Vehicles at Old Hume Highway Access	0	202
Total (Site)	317	330

*identified truck movements are subject to the availability of an alternative fuel source, with the requirement to maintain current consumption levels of coal should the full volume of the alternate supply not be available. From an impact modelling perspective, the worst-case scenario has been considered.

3.2 Site Access and New Haul Road

As part of the proposed modifications, a new site access will be established from the west, connecting directly to the Old Hume Highway. This access is illustrated in Figure 5.

Figure 5: The Proposed New Haul Road



The new haul road will reduce noise impacts for sensitive receivers along Taylor Avenue and therefore lifting the constraint to 24-hour operations. The new haul road will be constructed on existing Boral holdings with no proposed property acquisition undertaking. The new haul road will comprise a sealed two-lane carriageway (one way in each direction) that connects in with existing internal roads within the Cement Works. Details of the proposed new access road can be found in Section 5.

4 Assessed Traffic Demands

4.1 Study Intersections and Access Roads

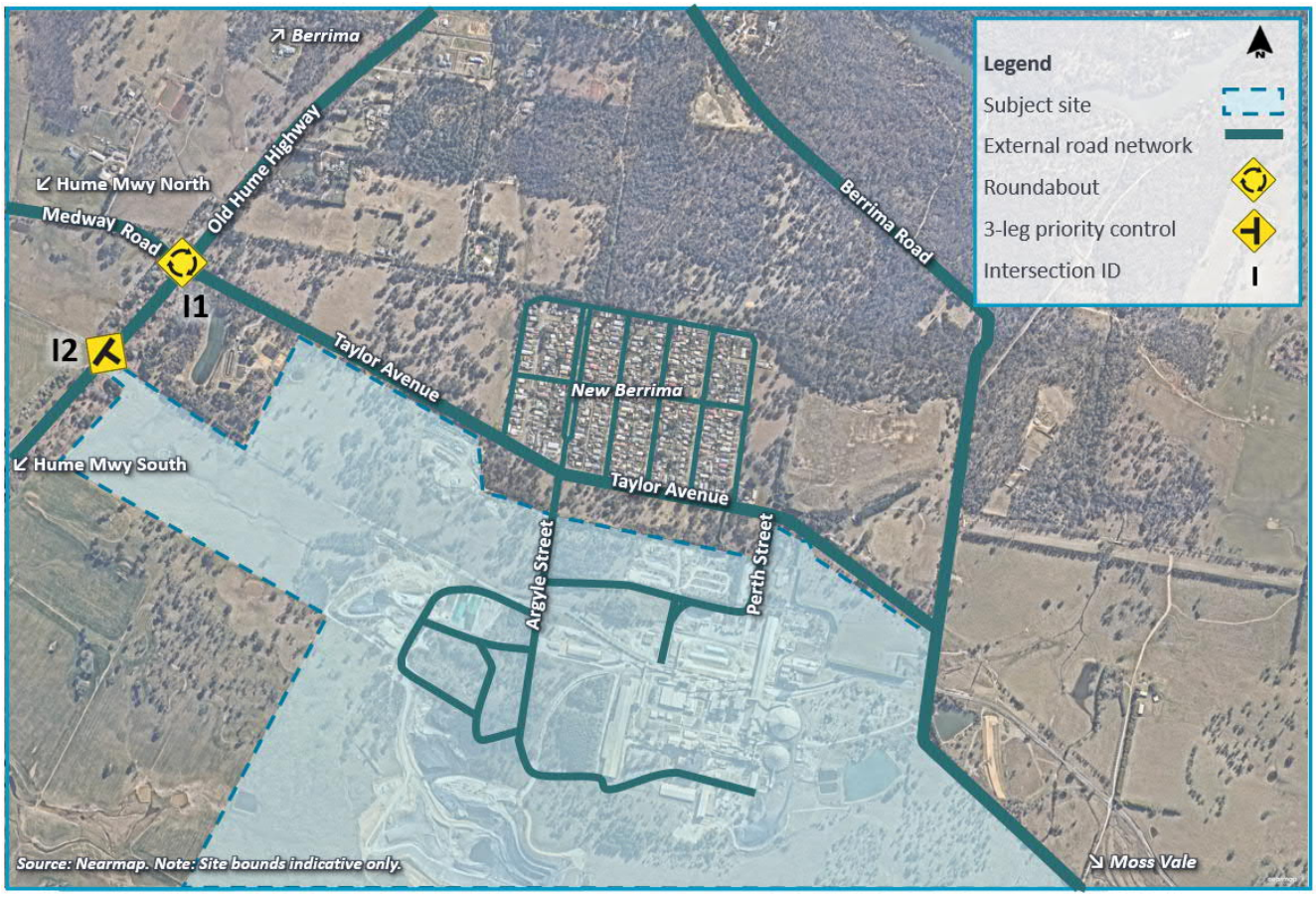
To investigate the potential traffic impacts of the development on the surrounding road network, intersections and access roads listed in Table 8 were considered for the analysis.

Table 8: Study Intersections

ID	Intersection	Form	Authority
I1	Old Hume Highway / Taylor Avenue / Medway Road (Existing)		WSC
I2	Old Hume Highway / New Haul Road Access (Future, Proposed)		WSC

Figure 6 illustrates the locations of the study intersections and access roads.

Figure 6: Study Intersections



4.2 Existing Traffic Demands

In order to determine the traffic impacts of the proposed development at the intersection of Old Hume Highway / Taylor Avenue / Medway Road, classified intersection count surveys were undertaken to create a baseline for the background traffic demands. Traffic surveys were commissioned to Trans Traffic Survey (TTS) to be undertaken at the following periods:

- Saturday 11 September 2021, 7:00am to 1:00pm;
- Tuesday 14 September 2021, 6:00am to 6:00pm.

The traffic count surveys identified the following peak periods:

- Saturday Peak Hour: 10:00am to 11:00am;
- Weekday Peak Hour (AM): 6:45am to 7:45am;
- Weekday Peak Hour (PM): 3:30pm to 4:30pm.

The assessed traffic volumes (traffic surveys results) are included at Appendix C.

In order to ascertain the existing traffic demands, speed environment and vehicle composition on the existing fronting section on Taylor Ave and the proposed fronting on Old Hume Highway, automated pneumatic tube counts (ATC) surveys were also undertaken by TTS for one full week, starting on Saturday the 11 September 2021 at the following locations:

- Taylor Ave between Melbourne St and Brisbane St;
- Old Hume Hwy, 290m south of Taylor Ave (adj. to power line easement).

ATC surveys identified Friday to be the busiest day at both locations. The peak hour volumes for this day are presented in Table 9 below.

Table 9: Peak Hour Volumes

Location	Peak	Time	Eastbound Volume (LV/HV)	Westbound Volume (LV/HV)	Total Volume
Taylor Avenue	AM	7:00 – 8:00	152 (105 / 47)	94 (56 / 38)	246 vph
	PM	3:00 – 4:00	107 (77 / 30)	160 (141 / 19)	267 vph
Location	**Peak**	**Time**	**Northbound Volume (LV/HV)**	**Southbound Volume (LV/HV)**	**Total Volume**
Old Hume Highway	AM	11:00-12:00	47 (32 / 15)	49 (34 / 15)	96 vph
	PM	2:00-3:00	53 (41 / 12)	57 (45 / 12)	110 vph

* LV = light vehicles, HV = heavy vehicles

These volumes have been adopted as the background traffic for analysis. The counts also identified that Class 10 vehicles are the largest vehicles (up to 26.0m) utilising the route with the exception of only 5 Class 11 vehicles across the surveyed week utilising the route.

It is also understood that the proposed modification will not result in any changes to the staff numbers and staff vehicles on-site. Based on this, no changes to the light vehicle volumes should be expected.

4.3 Development Traffic Demands

As discussed in Section 3.1 the proposed development will increase the total trucks using the site from 317 to 330 per day. However, the addition of the proposed site access fronting Old Hume Highway will divide heavy vehicle traffic generation between the two accesses.

In addition, the proposed development is seeking approval for 24/7 delivery times for SWDF. However, for a conservative estimate, a 12-hour delivery timeframe have been applied to determine peak hour volumes.

The adopted peak hour resultant traffic demand estimate for the proposed development is presented in Table 10.

Table 10: Proposed Development Peak Hour Traffic Demand

Access	Existing (trucks per day)	Existing (peak hour trucks)	Proposed (trucks per day)	Proposed (peak hour trucks)	Peak hour change
Taylor Ave Access	317	26.4 (26)	128	10.7 (11)	-15.7 (-16)
Old Hume Hwy Access	N/A	N/A	202	16.8 (17)	+16.8 (+17)
Total (Site)	317	26.4 (26)	330	27.5 (28)	+1.1 (1)

As outlined in Table 10, it is assumed that the proposed development will increase total truck numbers by a maximum of two in the peak hour, even with a very conservative assessment, as we adopted a 12-hour spread rather than the proposed 24-hour operation.

4.4 Trip Assignment

The trip assignment for truck movements as a result of the proposed development is assumed to be the same as existing, such that proposed traffic will follow a similar trip assignment as the existing intersection of Old Hume Hwy / Taylor Ave / Medway Rd.

Table 11 summarises the observed trip distributions which have been adopted for all development traffic demands, where the "In" movements are movements to Taylor Ave and "Out" movements are movements from Taylor Ave.

Table 11: Existing Heavy Vehicle Trip Assignments

Movement	Weekday AM Peak				Weekday PM Peak				Daily			
	In	Out	Total	Percentage	In	Out	Total	Percentage	In	Out	Total	Percentage
Old Hume Hwy (S)	7	5	12	31%	11	3	14	28%	79	83	162	28%
Medway Rd	12	10	22	56%	12	20	32	64%	178	160	338	59%
Old Hume Hwy (N)	1	4	5	13%	2	2	4	8%	39	36	75	13%
Total (Site)	20	19	39	100%	25	25	50	100%	296	279	575	100%

Note that the above table shows all heavy vehicle movements, not just those generated by the Berrima Cement Works.

Based on the above, the adopted trip assignment and resulting trucks using each road are as follows:

- 30% (8 trucks) will use Old Hume Highway (South);
- 60% (17 trucks) will use Medway Road;

- 10% (3 trucks) will use Old Hume Highway (North).

Note that for a conservative approach, no traffic has been assigned to the east of Taylor Ave (assume no vehicles are coming from or going to the east of the facility).

As such, Table 12 summarises the assumed trip generation of the proposed development.

Table 12: Post Development Trip Assignments

Access	Movement	Peak hour trucks	Total
Taylor Ave	Old Hume Hwy (S)	0	11
	Medway Rd	9	
	Old Hume Hwy (N)	2	
Old Hume Hwy (Proposed)	Old Hume Hwy (S)	8	17
	Medway Rd	8	
	Old Hume Hwy (N)	1	

It should be noted that the existing heavy vehicle volumes using Taylor Avenue at the intersection of Old Hume Highway / Taylor Ave / Medway Rd (e.g., 39 during AM peak, 50 during PM peak), are less than Boral's currently approved limit of an average of 26 heavy vehicles during a peak hour (i.e., 52 movements in total). As such, it is assumed that all existing heavy vehicle trips using Taylor Avenue at the subject intersection will be replaced by the post development generated trips, as summarised in Table 12.

5 Traffic Engineering Design Considerations

5.1 Sight Distance Assessment

The sight distance at the driveway crossover has been checked against guidance contained in Austroads Guide to Road Design Part 4A (AGRD04A-17) and is based on the Safe Intersection Sight Distance (SISD) requirement as described in Section 3.2.2 within this document.

Equation 2 in this guidance provides the formula for the SISD as follows:

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

The 85th percentile speeds, shortened as "V", are based on the weekday data captured from automatic traffic count surveys undertaken between Saturday the 11 September 2021 to Friday 18 September, where:

- Northbound speeds were 84.0 km/h; and
- Southbound speeds were 87.2 km/h.

The SISD input and resulting output is contained in Table 13 below.

Table 13: SISD Calculations

SISD Parameters	Northbound	Southbound
Observation Time (s)	3.0	3.0
Reaction Time (s)	2.5	2.5
Decision Time (D_T) (s)	5.0	5.0
Operating (85th percentile) speed (V) (km/h)	84	87.2
Coefficient of Deceleration (d)	0.29	0.29
Longitudinal Grade (a) (%)	2%	-3%
SISD (m)	206	236

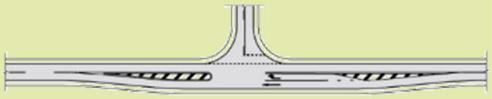
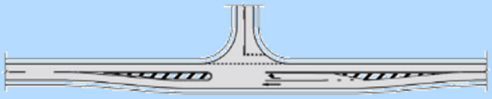
Based on a review of high-resolution aerial images and vertical profile information obtained from Google Earth Pro, it is concluded that the SISD can be achieved in both directions. Nevertheless, SISD is to be checked during detailed design stage to ensure accurate horizontal and vertical geometry and heights of drivers and objects are applied, and that the there are no "blind spots" or obstructions within the required SISD. Should there be sight obstructions, consideration is to be made whether a STOP sign is to be installed rather than a GIVE WAY sign.

5.2 Turn Warrant Assessment

Turn warrant assessments have been undertaken to establish the desirable form of the proposed Old Hume Highway / Site Access in accordance with the industry research summarised within the Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management (AGTM6-20).

The warrants provide guidance where turning lanes should be provided based on design traffic volumes. A pictorial description of the various turn treatments considered is provided in Table 14 and Figure 7 to assist with reader interpretation of this assessment.

Table 14: Turn Treatment Types

Acronym	Right Turn Treatment	Left Turn Treatment
BAR or BAL	 BAR (Basic Right Turn)	 BAL (Basic Left Turn)
CHR(S) or AUL(S)	 CHR(S) (Channelised Right Turn [Short])	 AUL(S) (Auxiliary Left Turn [Short])
CHR or AUL/CHL	 CHR (Channelised Right Turn)	 CHL (Channelised Left Turn)  AUL (Auxiliary Left Turn)

* Source: AGTM6-20

Figure 7: Turn Treatment Types and Volume Criteria

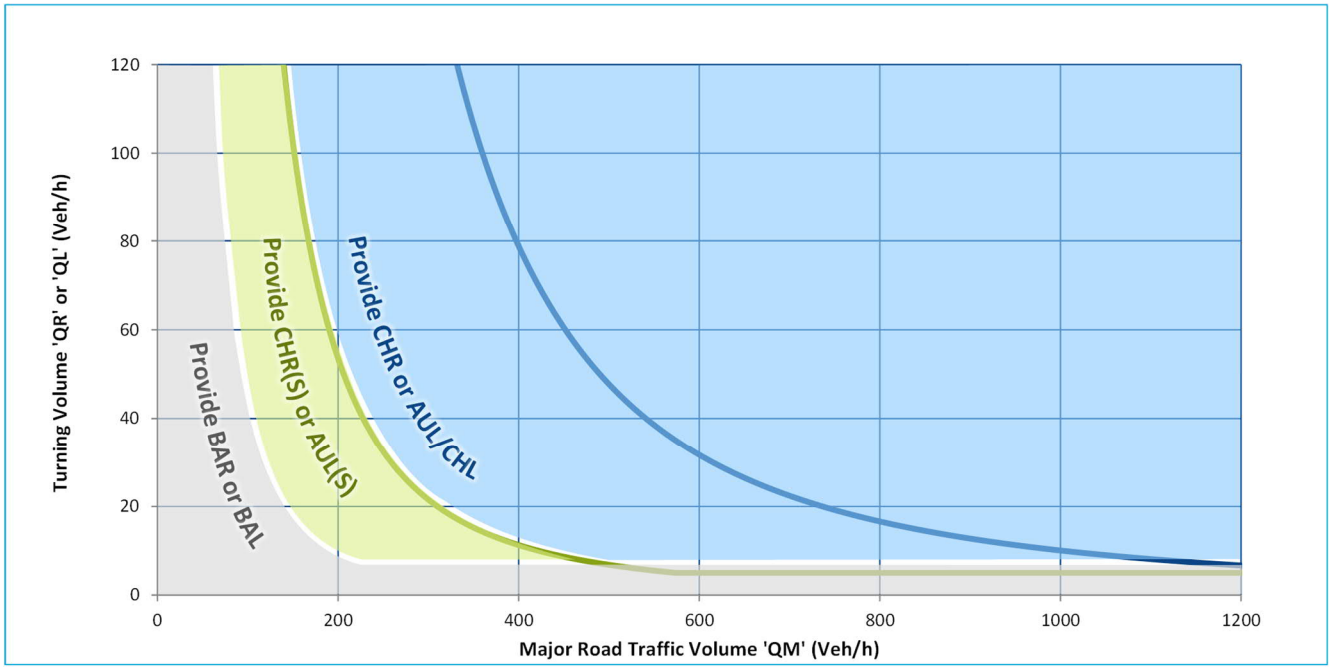


Figure 8 summarises the turn warrant assessments undertaken for the Old Hume Highway / New Haul Road Access during the worst peak period, i.e., Weekday PM peak hour. The assessment is based on the following criteria:

- Design Domain – Normal Design Domain;
- Road configuration – two-lane two-way;
- Design speed – between 70km/h and 100 km/h (based on posted speed limit); and
- Left turn splitter island – No.

Figure 8: Turn Warrant Assessment – Weekday PM Peak

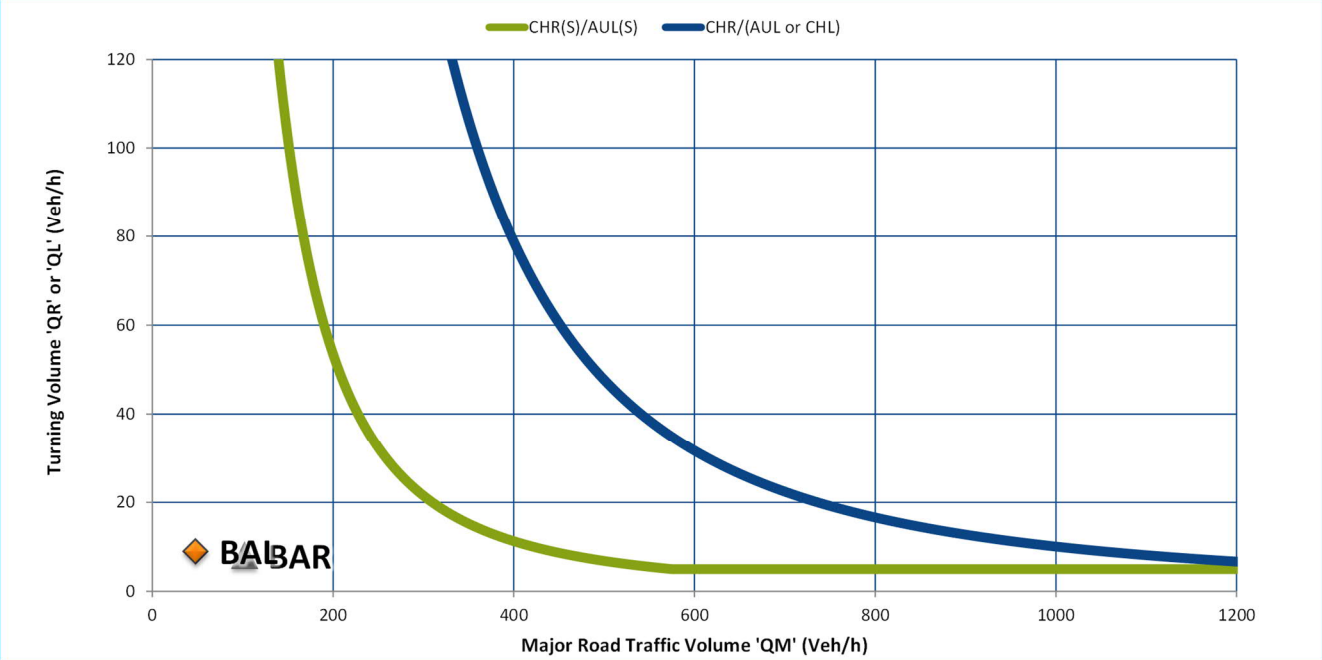


Figure 8 indicates that a Basic Right Turn [BAR] and Basic Left Turn [BAL] treatments are adequate on the major road (Old Hume Highway). Based on the 85% percentile speed of less than 90km/h, assumed design speed of 90km/h (posted speed limit of 80km/h + 10km/h).

Notwithstanding the turn warrant assessments above, the applicant proposes to construct the proposed New Haul Road Access with BAR and AUL(S) treatments. This is over and above the minimum requirements of Austroads Guidelines and considered appropriate by SLR. It is anticipated that this treatment would future proof the operation of the proposed new haul road access should capacity increases to occur in the future.

Concept civil design drawings of the proposed new haul road access, which would be subject to separate approvals if they were to occur, have been prepared by SLR and provided in Appendix F.

For the purposes of the SIDRA assessment shown in Figure 11, it was assumed that vehicles approaching a turning truck travelling in the same direction would not be able to go around the truck in order to present a highly conservative assessment.

6 Traffic Analysis

6.1 Adopted Performance Thresholds

The performance of the nominated study intersections was assessed using SIDRA Intersection 9.0 (SIDRA), a computer-based modelling software that determines intersection operation based on input parameters, including carriageway geometry and traffic volumes. Amongst other parameters, SIDRA provides an estimate of the intersection's Degree of Saturation (DOS), queues and delays.

The maximum DOS thresholds identified by the Austroads Guide to Traffic Management Part 12: Traffic Impacts of Developments (AGTM12-19) for each intersection type are reproduced in Table 15.

Table 15: Degree of Saturation Thresholds

Intersection Type	DOS Threshold
Signalised intersections	Less than or equal to 0.90
Roundabouts	Less than or equal to 0.85
Priority controlled intersections	Less than or equal to 0.80

TfNSW (formerly RMS and RTA) defines intersection performance based on vehicle delay. SIDRA calculates the average delay encountered by all vehicles that travel through the modelled intersection and determines a level of service per intersection, approach, and lane. Based on RMS Traffic Modelling Guidelines 2013, Table 16 indicates the criteria that is adopted by SIDRA in assessing the level of service.

Table 16: TFNSW SIDRA Level of Service Criteria

Level of Service (LOS)	Average Delay per Vehicle (seconds / vehicle)	Signalised Intersections and Roundabouts	Give Way & Stop Sign
A	0 to 14.5	Good operation	Good operation
B	14.5 to 28.5	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28.5 to 42.5	Satisfactory	Satisfactory, but accident study required
D	42.5 to 56.5	Operating near capacity	Near capacity, accident study required
E	56.5 to 70.5	At capacity; at signals, incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70.5	Extra capacity required	Extreme delay, major treatment required

Level of Service (LOS) values exceeding LOS E indicate that an intersection is nearing its practical capacity and upgrades works or other interventions may be required. At LOS F, road users are likely to experience significant delays and excessive queueing.

It should also be noted that for roundabouts and priority control intersections, the critical movement for LOS assessment should be that with the worst movement delay, however for signalised intersections, LOS should be reported based on the average delay.

6.2 Construction Traffic Assessment

6.2.1 Proposed Civil Works

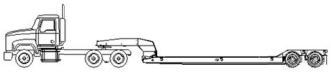
Boral proposes to undertake the following civil works:

- Construction of a new haul road to provide access from the west of the site, connecting directly to the Old Hume Highway. It is anticipated that this haul road will be approximately 1,400m in length and 8m in width subject to detailed design;
- Construction of a priority-controlled intersection at the new Old Hume Highway and New Access Road intersection. For the purposes of estimating the bill of quantities associated with the construction phase it has been assumed that this intersection and the nearby road works will be approximately 400m in length and 20m in width with the specific footprint of the works confirmed through the detailed design process;
- Construction of one shed to accommodate the greater volume of SWDF received. For the purposes of estimating the bill of quantities associated with the construction phase it has been assumed that the shed will be approximately 16m wide, 39m long and 12m high.

6.2.2 Construction Traffic Generation

The vehicle fleet anticipated to be associated with the development is shown in Table 17.

Table 17: Vehicle Fleet

Vehicle	Typical Vehicle Profile	Haulage Material
Private Vehicle		Supervision Workforce Conservatively assumed occupancy of 1 person per vehicle
Coaster Bus		Labour Workforce Conservatively assumed occupancy of 10 persons per vehicle
Concrete Truck		Concrete
Heavy Rigid Vehicle		Water deliveries
Six Axle Articulated Vehicle		40ft container deliveries
B-Double		Equipment deliveries
32t truck and dog		Aggregate
Flat deck		Equipment deliveries
Hook truck		Waste removal
Low Loader		Machinery deliveries

The construction traffic demands of the proposed works are expected to be associated with the workforce and the transportation of construction materials / equipment to the site:

- Table 18 summarises the machinery and materials that are anticipated to be required for site clearance and site establishment, these assumptions are nominal for the purposes of estimating the bill of quantities and will be confirmed through the detailed design process;
- Table 19 summarises the construction workforce assumptions.

Table 18: Site Clearance and Establishment

Element	Assumption	Delivery Method
Site Investigations	1 x Backhoe 1 x Excavator	Low Loader
Site Clearing & Earthworks	2 x Bulldozer 2 x Grader 4 x Excavator 2 x Compactor 1 x Scraper 2 x Water Cart 1 x Loader 2 x Moxy or Truck & Dogs 1 x Backhoe	Low Loader
Water for Dust Suppression	1 x Water Cart	HRV (Water Truck)
New Haul Road Engineering Material	1,400m long x 8m wide x 1.00m deep 21,280t @ 1.9t per m3	32t Truck & Dog
New Intersection Engineering Material	400m long x 20m wide x 1.00m deep 15,200t @ 1.9t per m3	32t Truck & Dog

Table 19 Construction Workforce

Element	Assumption
Workforce	55 persons maximum on-site 50 Labour 5 Supervisors
Roster	5 days on / 2 days off
Shift rotation	Up to 8 hours during daylight
Travel Arrangements	Labour via coaster bus Supervisors via private vehicle
Light vehicle occupancy	1 passenger per vehicle
Coaster bus occupancy	10 passengers per vehicle
Accommodation	In Bowral
Workforce Distribution	100% to/from Bowral (to/from the north of Old Hume Highway / Taylor Avenue intersection)
Haulage Distribution	100% to/from Sydney (to/from the west of Old Hume Highway / Taylor Avenue intersection)

6.2.3 Construction Traffic Volumes

The following assumptions were made to determine the construction traffic demands:

- All construction materials will arrive to site from Sydney and therefore will approach to the site via Medway Road;
- Entire workforce will reside in hotels to the north of the subject site (i.e., Bowral, Mittagong, Campbelltown) and therefore will approach to the site via Old Hume Highway (N);
- Delivery of engineering materials will be undertaken by Truck & Dog Trailer combinations with a nominal capacity of 32 tonnes;

- Water to suppress dust will be provided on-site by Boral and therefore no traffic impacts will occur;
- Machinery such as bulldozers, excavators, graders, compactors, scrapers, water carts, loaders will only be delivered once at the commencement of the project and taken away once at the completion of the project. Based on this, this machinery is not counted towards the peak construction traffic demand;
- Civil works will take a total of 30 business days (6 weeks) to complete (a conservative assumption to adopt high daily and hourly volumes;
- No construction activity will be undertaken on Saturdays and Sundays;
- Existing AM and PM peak hours will also experience a conservative 20% of daily total deliveries.

Based on the assumptions above, Table 20 and Table 21 provide a summary of anticipated leg-by-leg construction traffic demands at the intersection of Old Hume Highway / Taylor Avenue / Medway Road.

Table 20: Construction Trip Assignment - AM

Access	Approach from	Additional Peak Hour Volume	Total
Old Hume Hwy / Taylor Avenue / Medway Road roundabout	Old Hume Hwy (S)	0	18 vehicles IN
	Medway Rd	8 trucks turning right into Old Hume Highway	
	Old Hume Hwy (N)	5 light vehicles travelling through 5 coaster buses travelling through	

Table 21: Construction Trip Assignment - PM

Access	Approach from	Additional Peak Hour Volume	Total
Old Hume Hwy / Taylor Avenue / Medway Road roundabout	Old Hume Hwy (S)	8 trucks turning left into Medway Road 5 light vehicles traveling through 5 coaster buses traveling through	18 vehicles OUT
	Medway Rd	0	
	Old Hume Hwy (N)	0	

6.2.4 Assessment Scenarios

For the purposes of the construction traffic assessment conducted herein, it has been assumed that construction work will commence shortly subject to appropriate approvals being secured and therefore no background growth has been applied to the traffic volumes identified in September 2021. As such, the following scenario models were developed in SIDRA:

- Old Hume Highway / Taylor Avenue / Medway Road:
  - Existing 2021 Survey Counts: To determine a baseline of the current intersection performance;
  - Existing 'With Development': To determine the impacts of the construction traffic on the intersection performance.

6.2.5 SIDRA Assessment (Construction Traffic Assessment)

6.2.5.1.1 I1 – Old Hume Highway / Taylor Avenue / Medway Road

The Old Hume Highway / Taylor Avenue / Medway Road intersection is an existing roundabout with an internal radius of approximately 27m. The site layout extracted from the SIDRA model and the summary output from the SIDRA assessment are presented in Figure 9 and Table 22, with more detailed SIDRA output provided in Appendix E.

Figure 9: Old Hume Highway / Taylor Avenue / Medway Road – SIDRA Site Layout

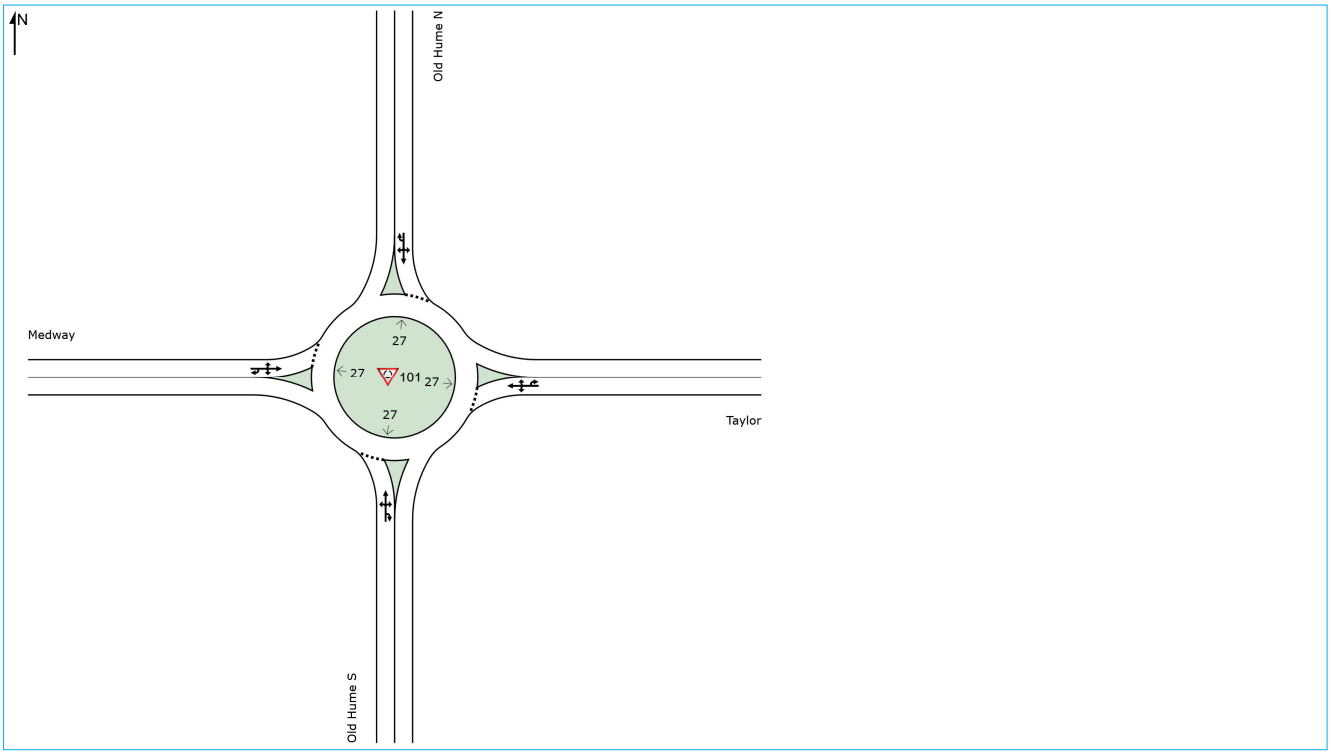


Table 22: Old Hume Highway / Taylor Avenue / Medway Road – SIDRA Summary Output (Construction)

Scenario	Level of Service (LOS)	DOS (%)	Critical Movement (Worst Delay - s)	Worst 95th %ile Queue (m)
Existing (Without Construction)				
Weekday AM Peak	A	0.121	12.0 (North)	4.6 (West)
Weekday PM Peak	A	0.139	12.1 (South)	5.8 (East)
With Construction				
Weekday AM Peak	A	0.130	12.1 (North)	5.2 (West)
Weekday PM Peak	A	0.139	12.1 (South)	5.8 (East)

Based on the SIDRA summary information provided in Table 22, the forecast construction traffic is not expected to have a noticeable impact on the roundabout operation. This is due to the low traffic demand that would be generated by the proposed civil works (approximately one vehicle in every 3.3 minutes in the AM or PM peak hours).

6.3 Operational Traffic Assessment

The traffic analysis has been undertaken using the volumes developed in a spreadsheet model making the assumptions outlined in Section 4.2 to Section 4.4.

Detailed traffic flow diagrams (desktop models) are provided in Appendix D.

6.3.1 Assessment Scenarios

For the purposes of the operational traffic assessment conducted herein, it has been assumed that the year of opening of the development will be 2021. As such, the following scenario models were developed in SIDRA:

- Old Hume Highway / Taylor Avenue / Medway Road:
  - Existing 2021 Survey Counts: To determine a baseline of the current intersection performance;
  - Existing 'With Development': To determine the impacts of the proposed development on the intersection performance.
- Old Hume Highway / Site Access:
  - Existing 'With Development': To determine the intersection performance of the proposed new intersection.

6.3.2 SIDRA Assessment (Operational Traffic Assessment)

6.3.2.1.1 I1 – Old Hume Highway / Taylor Avenue / Medway Road

The Old Hume Highway / Taylor Avenue / Medway Road intersection is an existing roundabout with an internal radius of approximately 27m. The site layout extracted from the SIDRA model and the summary output from the SIDRA assessment are presented in Figure 10 and Table 23, with more detailed SIDRA output provided in Appendix E.

Figure 10: Old Hume Highway / Taylor Avenue / Medway Road – SIDRA Site Layout

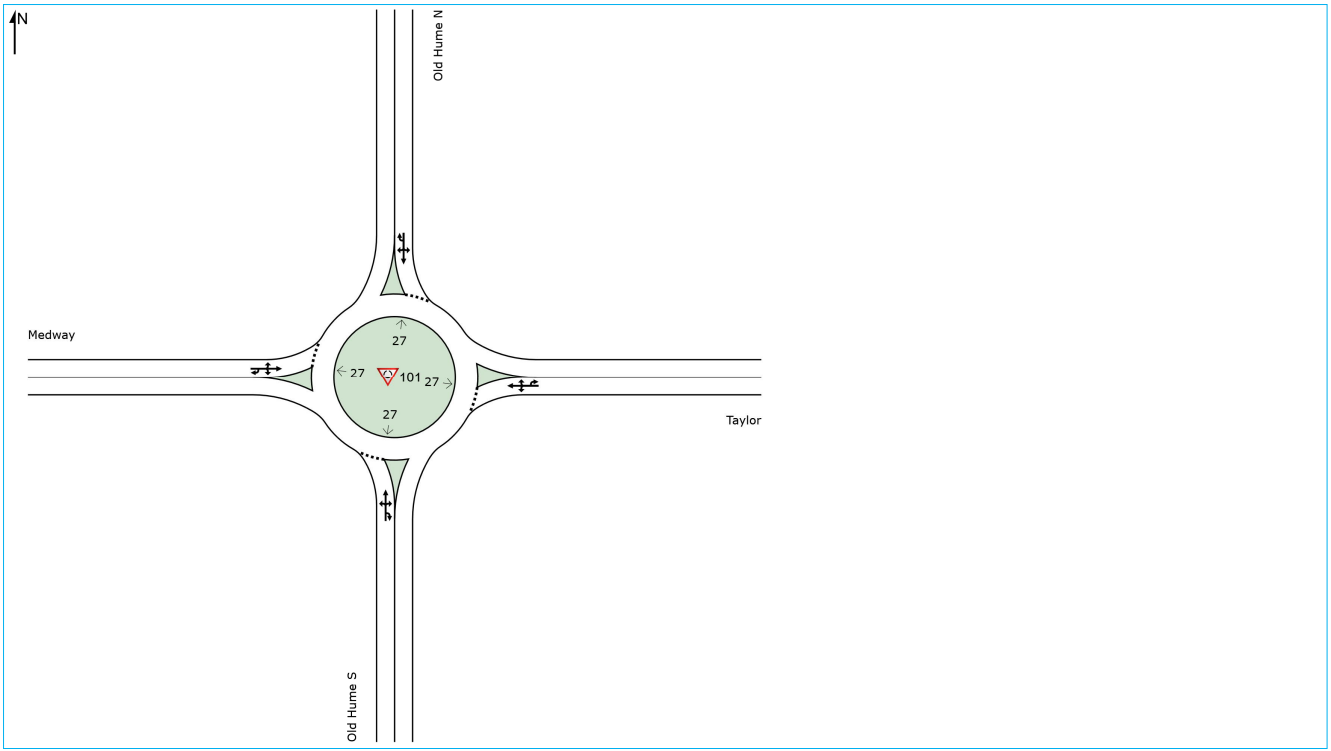


Table 23: Old Hume Highway / Taylor Avenue / Medway Road – SIDRA Summary Output (Operational)

Scenario	Level of Service (LOS)	DOS (%)	Critical Movement (Worst Delay - s)	Worst 95th %ile Queue (m)
Existing (Without Proposal)				
Weekday AM Peak	A	0.121	12.0 (North)	4.6 (West)
Weekday PM Peak	A	0.139	12.1 (South)	5.8 (East)
Saturday Peak	A	0.065	11.7 (South)	2.5 (East)
With Proposal				
Weekday AM Peak	A	0.115	12.0 (North)	4.3 (West)
Weekday PM Peak	A	0.124	12.0 (South)	4.8 (East)
Saturday Peak	A	0.065	11.7 (South)	2.5 (East)

The output from the operational assessment, as summarised in Table 23, indicates that the Old Hume Highway / Taylor Avenue / Medway Road intersection operates well within the maximum desired operational thresholds for all assessed scenarios, with the traffic demands associated with the proposed development.

It is also evident that the re-direction of heavy vehicles from Taylor Avenue to Old Hume Highway will result in the better operation of the roundabout across the weekdays.

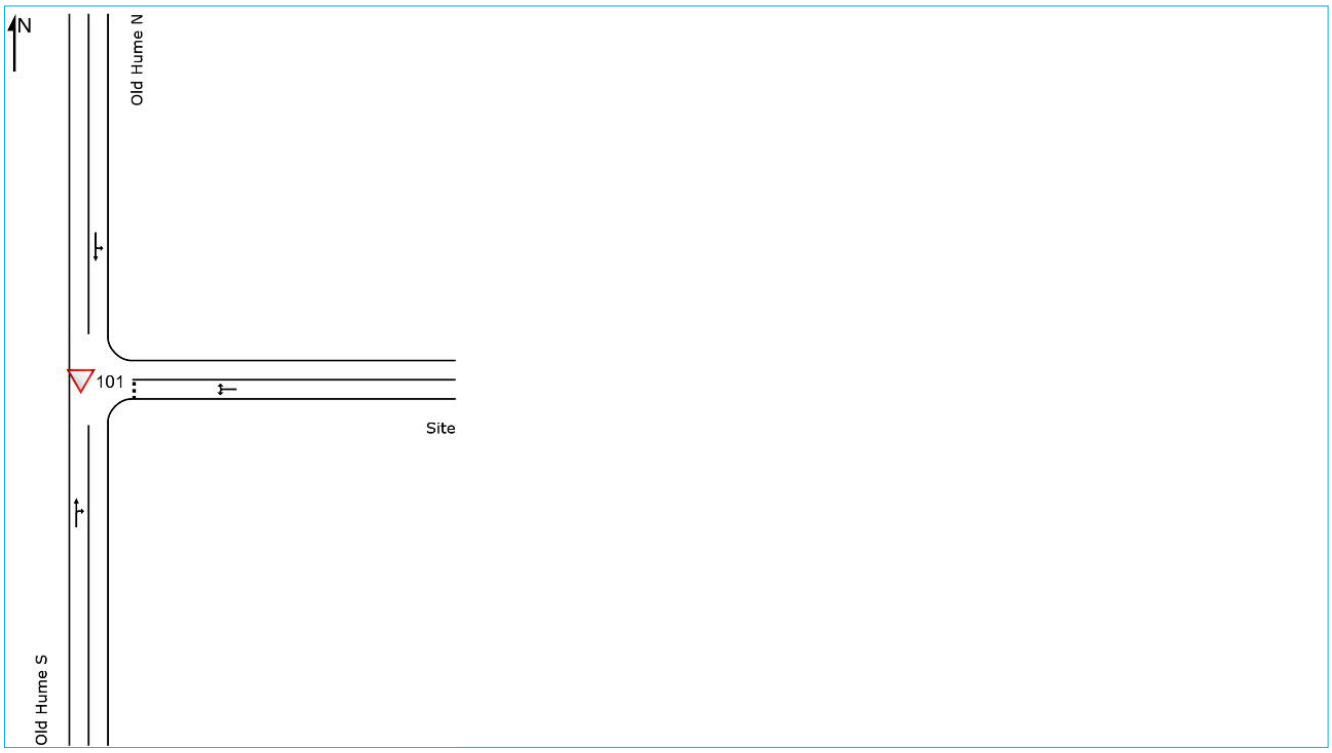
The greatest critical movement delay for any movement in the "with proposal" scenario is 12.0 seconds per vehicle, or LOS A. The 95th percentile queue associated with this movement is only 1.8m and, in SLR's traffic engineering view, the proposed changes do not pose risks to the operation of the intersection.

6.3.2.1.2 I2 – Old Hume Highway / New Haul Road Access

The proposed Old Hume Highway / New Haul Road Access will take the form of a priority-controlled 3-way intersection once constructed.

The site layout extracted from the SIDRA model and the summary output from the SIDRA assessment are presented in Figure 11 and Table 24, with more detailed SIDRA output provided in Appendix E.

Figure 11: Old Hume Highway / Site Access – SIDRA Site Layout



It should be noted that the proposed BAR and AUL(S) treatments at the proposed new haul road access were not incorporated into the design of the SIDRA model to present a highly conservative assessment.

Table 24: Old Hume Highway / Site Access – SIDRA Summary Output (Operational)

Scenario	Level of Service (LOS)	DOS (%)	Critical Movement (Worst Delay - s)	Worst 95th %ile Queue (m)
With Proposal				
Weekday AM Peak	A	0.034	9.0 (South)	0.9 (East)
Weekday PM Peak	A	0.036	9.0 (South)	1.0 (East)
Saturday Peak	A	0.035	9.0 (South)	0.9 (East)

The output from the operational assessment, as summarised in Table 24, indicates that the proposed Old Hume Highway / New Haul Road Access operates well within the maximum desired operational thresholds.

7 Summary and Conclusions

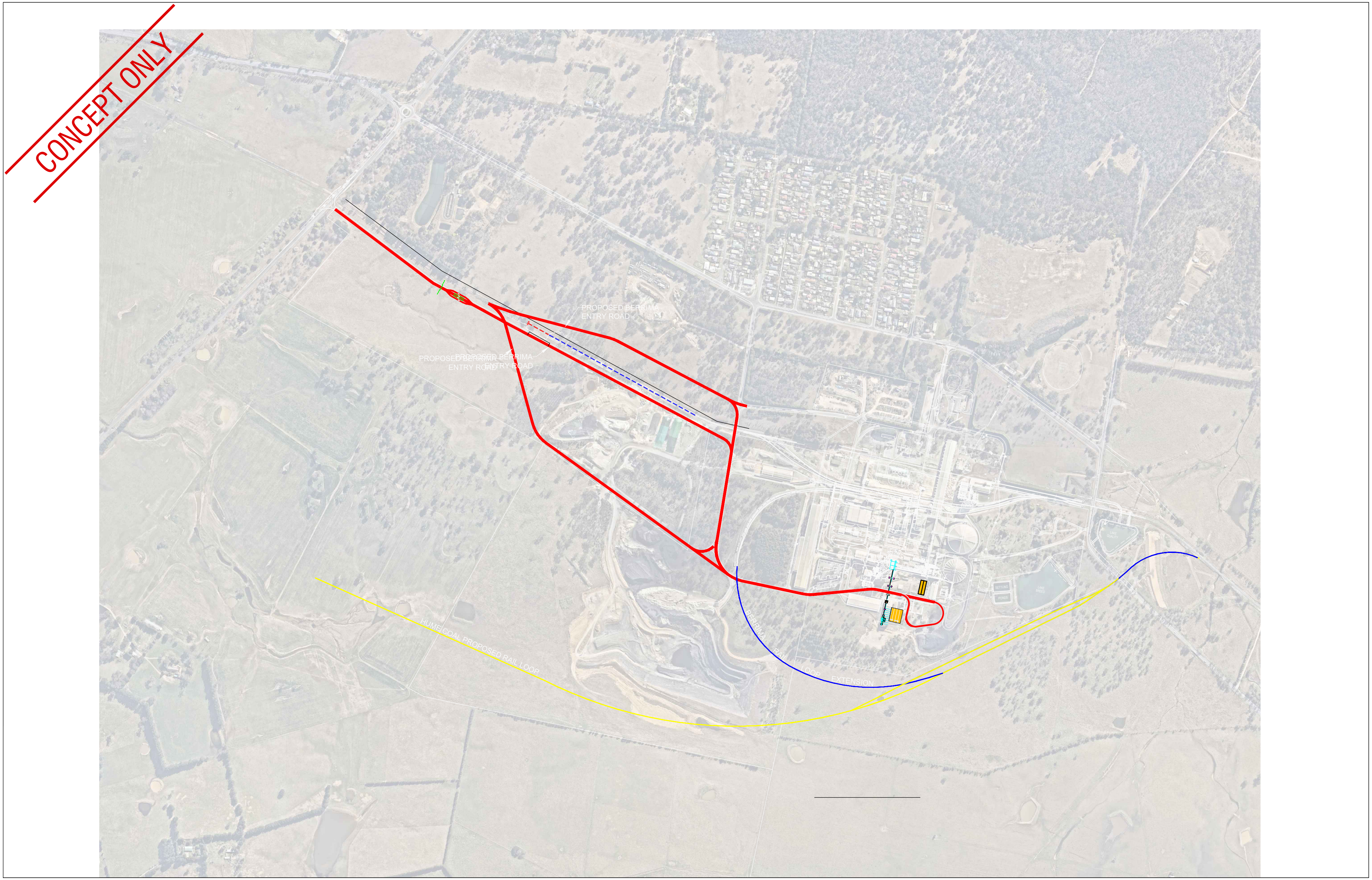
SLR Consulting Australia Pty Ltd (SLR) has been engaged by Boral Limited (Boral) to prepare a Traffic Impact Assessment (TIA) for a proposed development at Berrima Cement Works on Taylor Avenue, New Berrima. A plan for the development has been prepared by Boral and is included in Appendix A.

Based on the analysis and discussion documented herein, the following is concluded:

- The proposed development will generate additional 13 trucks per day, assumed to be two extra trucks during the peak hour;
- The proposed design of the new haul road access fronting Old Hume Highway as part of the proposed development exceeds Austroads Guidelines;
- The traffic assessments conducted herein for both the operational and construction scenarios demonstrate that the proposed development or the proposed civil works will not have any adverse impacts on the roundabout of Old Hume Highway / Taylor Avenue / Medway Road and will improve its operation by moving traffic away from Taylor Avenue once the development is completed; and
- The proposed BAR and AUL(S) turn treatments are considered appropriate at the new haul road access and over and above the minimum requirements of Austroads Guidelines.

APPENDIX A

Development Plan



SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels

N

0.0 100 200 300 400 METRES

SCALE 1:10000

SLR

15 ASTOR TERRACE
SPRING HILL 4000
AUSTRALIA
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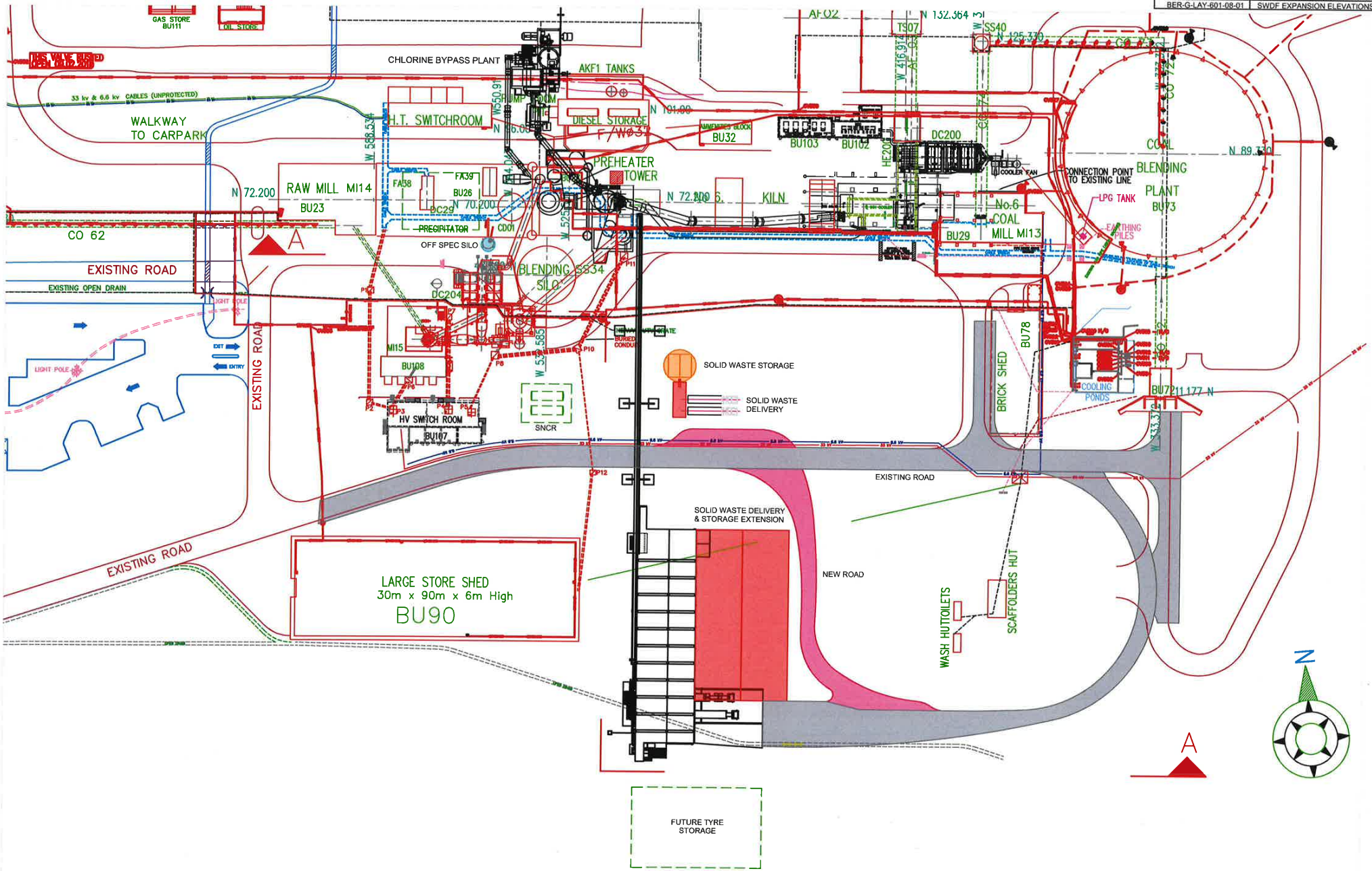
Project No:	660.30127
Date:	12/10/2021
Drawn by:	Charlie Seventekin
Scale:	AS SHOWN
Sheet Size:	A3
Projection:	-

BORAL

BORAL Berrima

Site Plan

FIGURE SK-01



SITE PLAN

REFERENCE DRAWINGS

DRAWING	DESCRIPTION
BER-G-LAY-601-08-01	SWDF EXPANSION ELEVATIONS

NO JOB IS SO IMPORTANT THAT IT CAN'T BE DONE SAFELY!

REV.	DATE	REV-BY	APPROVED	REVISION
A	22/10/2021	L.P.McIntosh		DRAWING ISSUED FOR COMMENT

REFERENCE DRAWINGS — REVISIONS

DRAWN: L.P.McIntosh DATE: 22/10/2021
CHECKED: DATE:
ENGINEER: DATE:
APPROVED: DATE:

Boral Cement
ABN 62 008 528 523
Engineering Services
Taylor Avenue New Berrima NSW 2577
Locked Bag 4 New Berrima NSW 2577
Phone: +61 2 4860 2325
Fax: +61 2 4860 2399
Email: drawing.office@boral.com.au

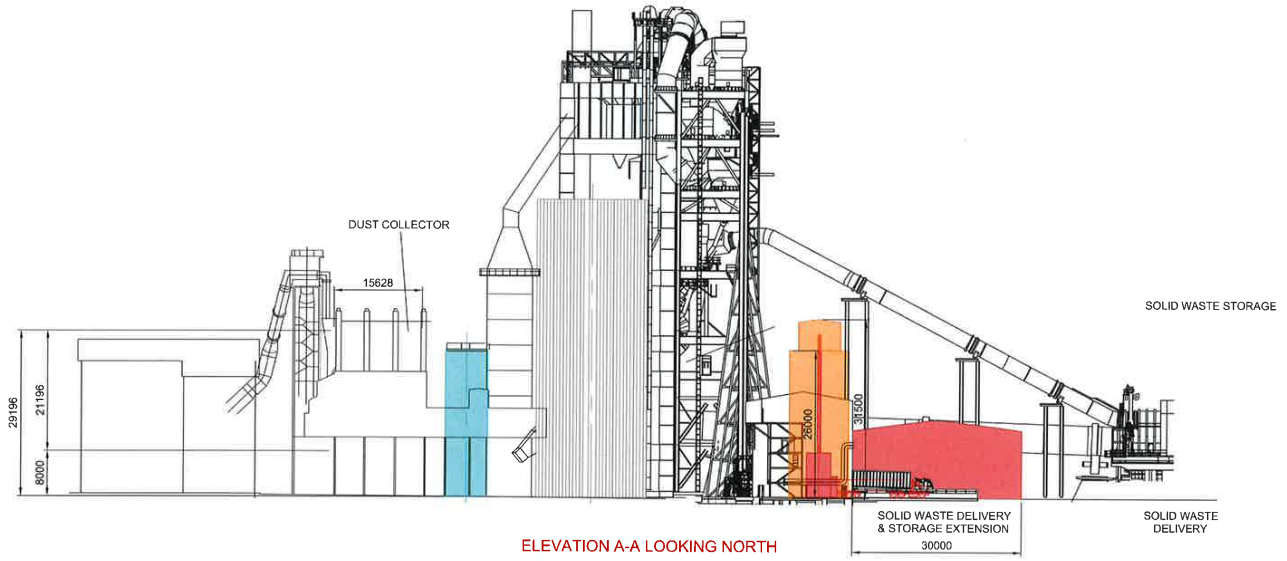
STATUS: PRELIMINARY

ALPHA NUMERIC:
STOCK NUMBER
BCES JOB No: GBM601
SHEET: B1
SCALE: 1:500

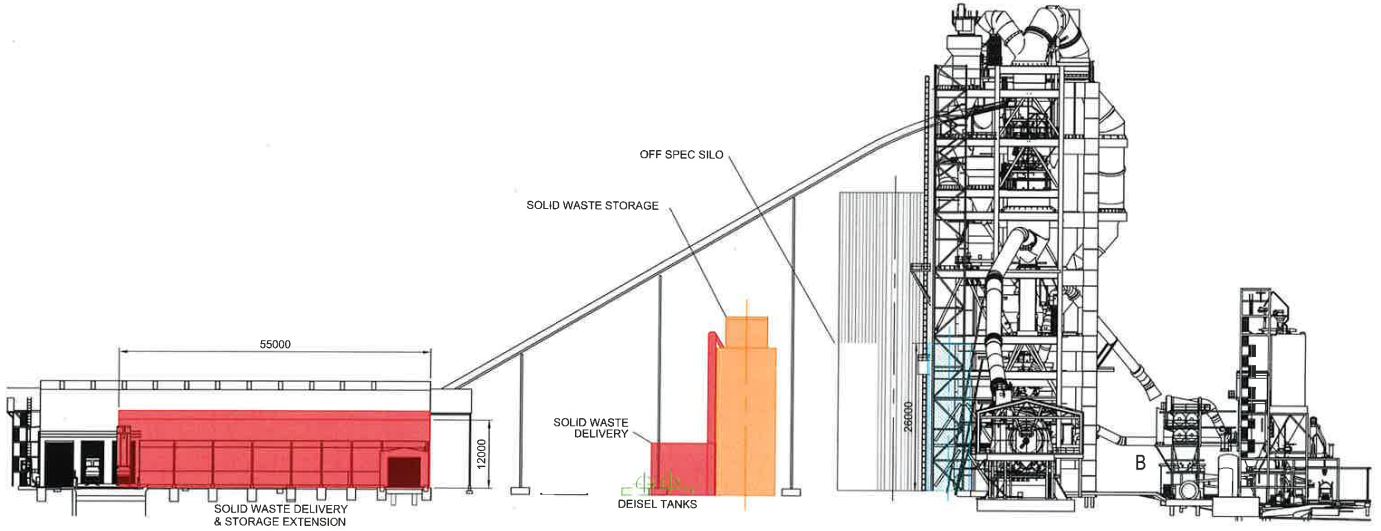
PLANT: BERRIMA
PROJECT: SWDF 200kt EXPANSION
SECTION: SITE
SUB SECTION:
TITLE: EXPANSION SITE PLAN LAYOUT
CLASSIFICATION:

DRAWING No: BER-G-LAY-601-09-01
WORKS No:
REV: A

REFERENCE DRAWINGS	
DRAWING	DESCRIPTION
BER-G-LAY-601-07-01	SWDF EXPANSION PLAN



ELEVATION A-A LOOKING NORTH



ELEVATION LOOKING WEST

NO JOB IS SO IMPORTANT THAT IT CAN'T BE DONE SAFELY!

DRAWING No	DESCRIPTION
	REFERENCE DRAWINGS

REV.	DATE	REV-BY	APPROVED	REVISION
A	22/10/2021	L.P.McIntosh		DRAWING ISSUED FOR COMMENT

REVISIONS

DRAWN: L.P.McIntosh DATE: 22/10/2021
CHECKED: DATE:
ENGINEER: DATE:
APPROVED: DATE:

Boral Cement
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Locked Bag 4 New Berrima NSW 2577
Email: drawing.office@boral.com.au
Phone: +61 2 4860 2325
Fax: +61 2 4860 2399

STATUS: PRELIMINARY

ALPHA NUMERIC:
STOCK NUMBER:
BCES JOB No: GBM601
SHEET: B1
SCALE: 1:500

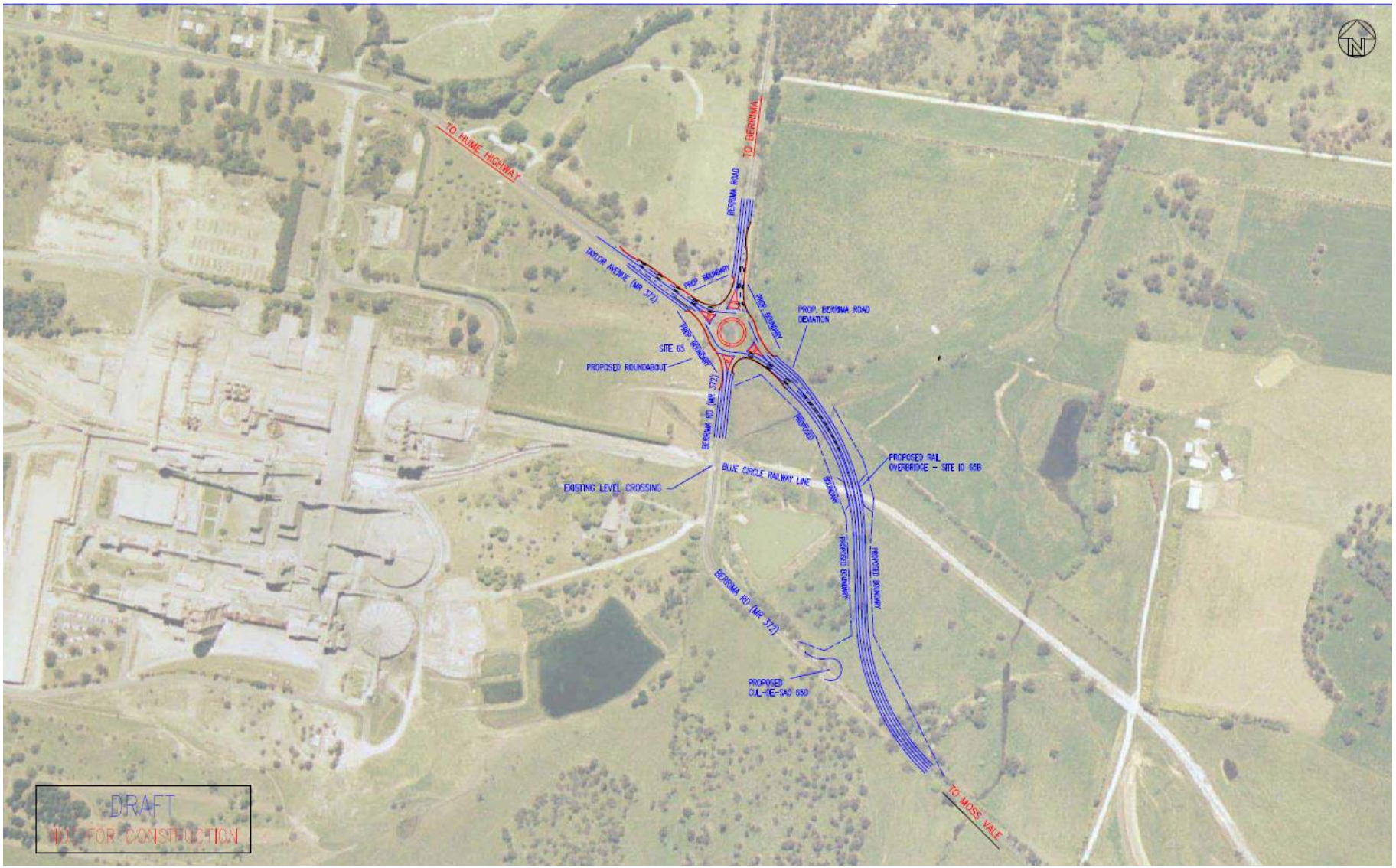
PLANT: BERRIMA
PROJECT: SWDF 200kt EXPANSION
SECTION: SITE
SUB SECTION:
TITLE: EXPANSION SITE ELEVATIONS
CLASSIFICATION: LAYOUT

DRAWING No: BER-G-LAY-601-10-01
WORKS No:
REV: A

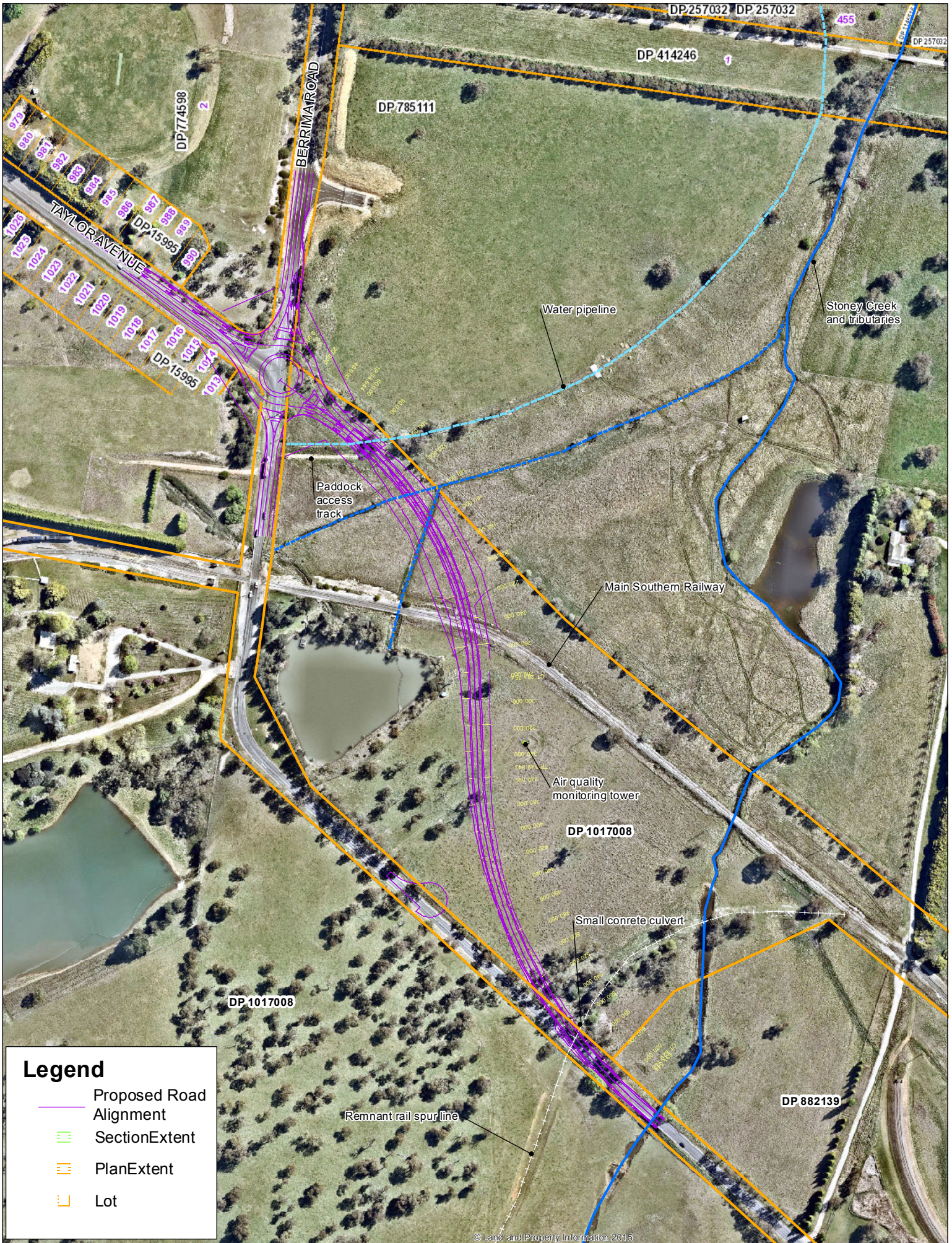
APPENDIX B

WSC Planned Upgrades – Taylor Avenue and Berrima Road Roundabout

Appendix A - Design Reference Documents



Proposed Concept Design for Project



Legend

- Proposed Road Alignment
- SectionExtent
- PlanExtent
- Lot

OPUS
Sydney Office, L13, Tower 2,
475 Victoria Avenue, Chatswood NSW 2067
Tel +61 2 9325 5600 www.opus.com.au

WINGECARRIBEE SHIRE COUNCIL

Proposed Berrima Road Deviation
Preliminary Environmental Investigation

Site Plan

N

Project No: T-C0234.00

Projection: Transverse Mercator
Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia Zone 56

Note: Aerial Photography: Nearmap

Scale Meters
0 20 40 80
1:2,500 @A3

Map No

Date 28/11/2016

Revision

Revision Date

APPENDIX C

Traffic Survey Results

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Taylor Ave and Old Hume Hwy, Berrima

GPS *-34.499696, 150.321700*

Date:	Sat 11-09-21
Weather:	Fair
Suburban:	Berrima
Customer:	SLR

North:	Old Hume Hwy
East:	Taylor Ave
South:	Old Hume Hwy
West:	Medway Rd

Survey Period	AM:	7:00 AM-12:00 PM
	PM:	12:00 PM-1:00 PM
Traffic Peak	AM:	10:00 AM-11:00 AM
	PM:	12:00 PM-1:00 PM

All Vehicles

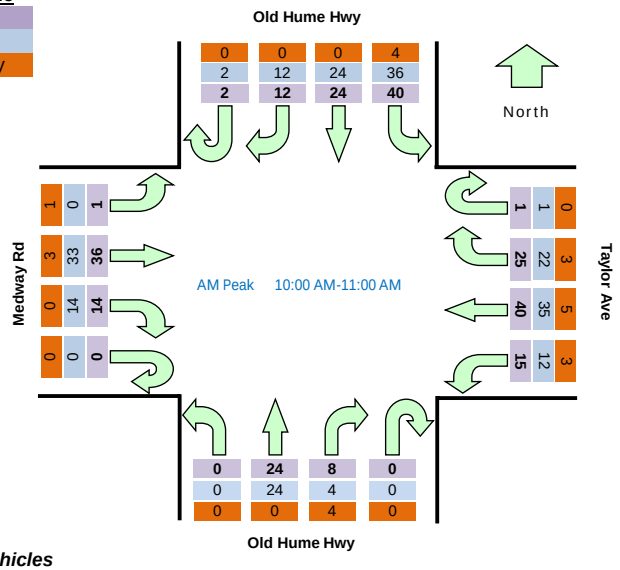
Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	0	2	2	0	1	6	0	0	1	3	1	0	0	12	0	99	
7:15	7:30	0	0	2	0	0	0	7	1	0	0	3	0	0	0	10	1	87	
7:30	7:45	0	0	1	1	0	1	3	1	0	2	3	0	0	0	12	1	84	
7:45	8:00	0	0	1	1	0	5	4	1	0	0	4	0	0	0	4	2	87	
8:00	8:15	0	0	4	2	0	1	2	0	0	0	1	0	0	0	5	1	109	
8:15	8:30	0	0	3	0	0	4	4	0	0	0	4	0	0	1	3	2	129	
8:30	8:45	0	4	3	2	0	4	5	0	0	0	1	0	0	0	8	1	154	
8:45	9:00	0	0	0	5	1	6	10	1	0	0	4	0	0	0	14	3	178	
9:00	9:15	1	1	2	2	0	6	11	3	0	1	5	1	0	0	3	0	183	
9:15	9:30	0	2	2	2	1	4	12	4	0	1	4	1	0	0	9	4	205	
9:30	9:45	0	2	2	2	0	6	7	3	0	1	6	2	0	1	11	9	215	
9:45	10:00	0	3	6	4	0	5	6	2	0	3	6	0	0	2	11	1	232	
10:00	10:15	2	1	2	7	0	6	14	5	0	1	8	0	0	5	7	0	242	Peak
10:15	10:30	0	0	13	11	1	5	5	3	0	2	5	0	0	2	9	0	238	
10:30	10:45	0	4	6	12	0	7	11	3	0	4	5	0	0	4	13	0	234	
10:45	11:00	0	7	3	10	0	7	10	4	0	1	6	0	0	3	7	1	207	
11:00	11:15	0	2	10	6	0	10	5	3	0	2	7	1	0	4	3	1	192	
11:15	11:30	1	1	6	7	0	8	9	1	0	3	3	3	0	3	7	0	185	
11:30	11:45	0	1	2	3	0	4	7	4	0	2	5	0	0	4	10	0	180	
11:45	12:00	1	2	2	1	0	6	13	0	0	2	8	0	0	2	6	1	187	
12:00	12:15	0	1	6	10	1	4	6	1	0	3	3	0	0	3	9	0	198	
12:15	12:30	0	3	6	8	0	6	6	3	0	0	5	0	0	4	6	0		
12:30	12:45	0	0	8	5	0	6	14	4	0	0	2	0	0	0	9	1		
12:45	13:00	0	4	2	5	0	6	15	2	0	3	3	0	0	4	11	0		

Peak Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
10:00	11:00	2	12	24	40	1	25	40	15	0	8	24	0	0	14	36	1	242
12:00	13:00	0	8	22	28	1	22	41	10	0	6	13	0	0	11	35	1	198

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	2	0	0	1	4	0	0	0	2	1	0	0	10	0
7:15	7:30	0	0	2	0	0	0	5	1	0	0	3	0	0	0	10	1
7:30	7:45	0	0	1	1	0	1	2	0	0	2	2	0	0	0	11	1
7:45	8:00	0	0	1	1	0	5	4	1	0	0	4	0	0	0	3	2
8:00	8:15	0	0	4	2	0	1	1	0	0	0	1	0	0	0	4	1
8:15	8:30	0	0	3	0	0	1	3	0	0	0	4	0	0	1	2	2
8:30	8:45	0	4	3	2	0	4	3	0	0	0	1	0	0	0	8	1
8:45	9:00	0	0	0	4	1	6	9	0	0	0	4	0	0	0	13	3
9:00	9:15	1	1	2	1	0	6	7	3	0	1	4	0	0	0	1	0
9:15	9:30	0	2	2	2	1	4	10	4	0	1	3	1	0	0	9	4
9:30	9:45	0	2	2	2	0	6	4	3	0	1	5	1	0	1	9	9
9:45	10:00	0	3	6	3	0	5	6	2	0	3	6	0	0	2	8	0
10:00	10:15	2	1	2	6	0	5	12	3	0	1	8	0	0	5	7	0
10:15	10:30	0	0	13	10	1	5	5	3	0	0	5	0	0	2	9	0
10:30	10:45	0	4	6	11	0	6	9	2	0	2	5	0	0	4	10	0
10:45	11:00	0	7	3	9	0	6	9	4	0	1	6	0	0	3	7	0
11:00	11:15	0	2	10	6	0	9	3	3	0	1	7	1	0	4	2	1
11:15	11:30	1	1	6	7	0	8	6	1	0	2	3	2	0	3	7	0
11:30	11:45	0	1	2	3	0	4	5	4	0	2	5	0	0	4	9	0

11:45	12:00	1	2	2	1	0	6	13	0	0	2	8	0	0	2	5	1
12:00	12:15	0	1	6	10	1	4	6	1	0	3	3	0	0	3	9	0
12:15	12:30	0	3	6	8	0	6	5	3	0	0	5	0	0	4	6	0
12:30	12:45	0	0	8	4	0	6	14	3	0	0	2	0	0	0	7	1
12:45	13:00	0	4	2	5	0	6	15	2	0	1	2	0	0	4	11	0

Peak Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
10:00	11:00	2	12	24	36	1	22	35	12	0	4	24	0	0	14	33	0	219
12:00	13:00	0	8	22	27	1	22	40	9	0	4	12	0	0	11	33	1	190

Heavy Vehicles

Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	2	0	0	2	0	0	1	1	0	0	0	2	0
7:15	7:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7:30	7:45	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	0
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00	8:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
8:15	8:30	0	0	0	0	0	3	1	0	0	0	0	0	0	0	1	0
8:30	8:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
8:45	9:00	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0
9:00	9:15	0	0	0	1	0	0	4	0	0	0	1	1	0	0	2	0
9:15	9:30	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0
9:30	9:45	0	0	0	0	0	0	3	0	0	0	1	1	0	0	2	0
9:45	10:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	1
10:00	10:15	0	0	0	1	0	1	2	2	0	0	0	0	0	0	0	0
10:15	10:30	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0
10:30	10:45	0	0	0	1	0	1	2	1	0	2	0	0	0	0	3	0
10:45	11:00	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	1
11:00	11:15	0	0	0	0	0	1	2	0	0	1	0	0	0	0	1	0
11:15	11:30	0	0	0	0	0	0	3	0	0	1	0	1	0	0	0	0
11:30	11:45	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
11:45	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:30	12:45	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	0
12:45	13:00	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0

Peak Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
10:00	11:00	0	0	0	4	0	3	5	3	0	4	0	0	0	0	3	1	23
12:00	13:00	0	0	0	1	0	0	1	1	0	2	1	0	0	0	2	0	8

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Taylor Ave and Old Hume Hwy, Berrima

GPS *-34.499696, 150.321700*

Date:	Tue 14-09-21
Weather:	Fair
Suburban:	Berrima
Customer:	SLR

North:	Old Hume Hwy
East:	Taylor Ave
South:	Old Hume Hwy
West:	Medway Rd

Survey Period	AM:	6:00 AM-12:00 PM
	PM:	12:00 PM-6:00 PM
Traffic Peak	AM:	6:45 AM-7:45 AM
	PM:	3:30 PM-4:30 PM

All Vehicles

Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:00	6:15	0	1	1	1	0	5	13	4	0	1	5	0	0	0	17	0	252	
6:15	6:30	0	0	1	1	0	3	13	3	0	3	5	0	0	0	20	1	276	
6:30	6:45	0	1	1	2	0	7	11	3	0	5	10	0	0	3	35	0	296	
6:45	7:00	0	0	2	1	0	2	13	4	0	2	9	0	0	3	39	1	300	Peak
7:00	7:15	0	1	3	1	0	4	15	5	0	4	3	0	0	2	34	0	299	
7:15	7:30	0	1	2	3	0	3	13	1	0	3	5	0	0	2	37	0	283	
7:30	7:45	0	1	3	3	0	7	12	3	0	7	8	0	0	2	34	2	289	
7:45	8:00	0	2	4	6	0	7	16	2	0	3	4	0	0	0	29	2	273	
8:00	8:15	0	0	2	3	0	6	7	2	0	2	5	0	0	2	27	0	267	
8:15	8:30	0	2	2	3	1	10	12	0	0	4	10	1	0	1	30	0	271	
8:30	8:45	0	0	2	4	0	7	12	5	0	3	11	1	0	1	20	0	272	
8:45	9:00	0	1	2	8	0	5	14	2	0	2	9	0	0	2	22	2	256	
9:00	9:15	0	1	3	6	0	4	12	5	0	5	7	0	0	2	14	1	244	
9:15	9:30	1	2	4	2	0	6	14	2	0	4	11	0	0	2	28	1	237	
9:30	9:45	1	2	2	1	0	9	13	3	0	2	9	0	0	2	6	0	217	
9:45	10:00	0	0	5	6	0	4	11	5	0	3	8	0	0	1	14	0	225	
10:00	10:15	0	0	5	7	0	3	11	2	0	0	8	0	0	2	14	1	227	
10:15	10:30	0	5	5	2	0	3	9	6	0	4	11	0	0	1	11	0	227	
10:30	10:45	0	1	4	6	0	7	11	4	0	2	6	0	0	1	15	1	229	
10:45	11:00	1	3	5	9	1	5	9	5	0	3	6	0	0	2	9	1	220	
11:00	11:15	1	2	3	5	0	5	8	6	1	5	2	0	0	2	13	0	217	
11:15	11:30	0	3	4	6	0	5	12	4	0	7	8	0	0	2	7	1		
11:30	11:45	0	1	4	6	0	3	8	5	0	3	4	1	0	1	13	0		
11:45	12:00	0	0	3	2	0	4	13	4	0	4	9	0	0	0	16	1		

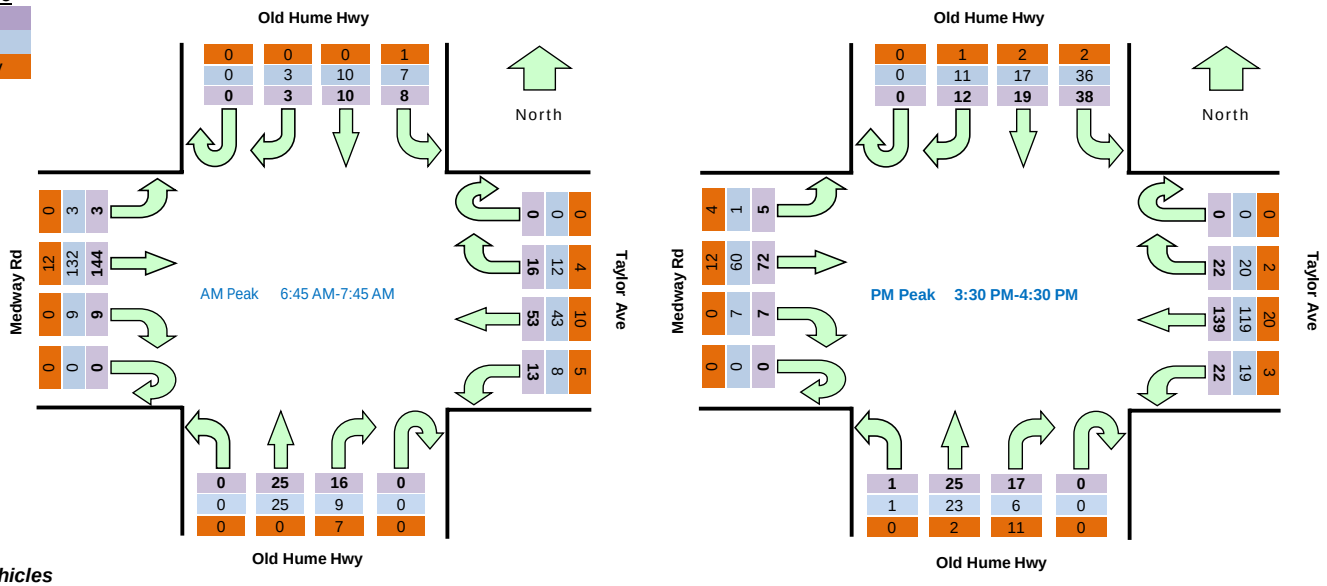
12:00	12:15	0	3	3	7	0	4	16	5	0	0	5	0	0	0	14	0	225	
12:15	12:30	0	2	4	3	0	9	12	1	0	4	5	0	0	3	17	1	216	
12:30	12:45	0	1	4	7	0	3	10	4	0	4	5	0	0	2	12	0	203	
12:45	13:00	0	4	2	7	0	2	14	4	0	1	6	0	0	1	14	0	218	
13:00	13:15	0	3	1	7	0	6	11	0	0	3	1	0	0	2	14	0	235	
13:15	13:30	0	0	6	3	1	7	10	4	0	4	7	0	0	1	5	0	254	
13:30	13:45	0	1	5	6	0	7	14	4	0	2	7	0	0	1	20	0	275	
13:45	14:00	0	2	8	2	0	8	22	6	0	7	5	0	0	1	10	1	302	
14:00	14:15	0	1	3	0	0	3	19	5	0	4	7	0	0	1	24	0	301	
14:15	14:30	1	4	6	7	0	5	26	3	0	3	3	0	0	1	10	0	334	
14:30	14:45	0	3	6	5	0	10	25	6	0	6	4	0	0	2	25	2	342	
14:45	15:00	0	4	10	9	0	5	16	5	0	2	2	1	0	1	16	0	338	
15:00	15:15	0	4	8	10	0	5	41	6	0	3	4	0	0	2	16	1	375	
15:15	15:30	0	3	7	5	1	4	21	4	0	8	6	0	0	3	15	0	364	
15:30	15:45	0	2	5	8	0	3	43	5	0	1	6	0	0	1	16	0	379	Peak
15:45	16:00	0	4	5	11	0	7	38	7	0	8	6	0	0	3	18	1	376	
16:00	16:15	0	4	6	10	0	6	32	4	0	5	5	0	0	2	14	1	348	
16:15	16:30	0	2	3	9	0	6	26	6	0	3	8	1	0	1	24	3	317	
16:30	16:45	0	3	9	3	0	4	34	6	0	2	2	2	1	2	19	0	275	
16:45	17:00	0	5	7	7	0	2	29	2	0	3	3	4	0	0	18	0	227	
17:00	17:15	0	12	11	6	0	4	6	0	0	0	7	0	0	2	8	2	174	
17:15	17:30	0	5	8	7	0	5	8	0	0	0	8	0	0	2	6	1		
17:30	17:45	0	3	10	3	0	0	2	0	1	0	7	1	0	1	9	2		
17:45	18:00	0	3	7	4	0	1	1	0	0	0	7	0	0	2	2	0		

Peak Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
6:45	7:45	0	3	10	8	0	16	53	13	0	16	25	0	0	9	144	3	300
15:30	16:30	0	12	19	38	0	22	139	22	0	17	25	1	0	7	72	5	379

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	1	1	1	0	4	12	1	0	1	5	0	0	0	13	0
6:15	6:30	0	0	1	1	0	1	11	0	0	3	5	0	0	0	18	1
6:30	6:45	0	1	1	2	0	7	11	2	0	4	8	0	0	3	32	0
6:45	7:00	0	0	2	1	0	2	9	3	0	2	9	0	0	3	38	1
7:00	7:15	0	1	3	1	0	2	11	2	0	2	3	0	0	2	29	0
7:15	7:30	0	1	2	3	0	2	12	0	0	1	5	0	0	2	33	0
7:30	7:45	0	1	3	2	0	6	11	3	0	4	8	0	0	2	32	2
7:45	8:00	0	2	4	4	0	7	11	0	0	1	4	0	0	0	21	1
8:00	8:15	0	0	2	1	0	5	7	1	0	1	5	0	0	2	22	0
8:15	8:30	0	2	1	2	1	9	10	0	0	2	9	1	0	1	27	0
8:30	8:45	0	0	2	3	0	7	5	1	0	1	11	1	0	1	15	0
8:45	9:00	0	1	2	6	0	5	11	0	0	2	8	0	0	2	18	0
9:00	9:15	0	1	3	4	0	4	6	2	0	2	7	0	0	2	10	0
9:15	9:30	1	2	3	2	0	4	11	1	0	1	11	0	0	2	20	0
9:30	9:45	1	2	2	1	0	9	7	2	0	1	8	0	0	2	5	0

9:45	10:00	0	0	5	4	0	4	7	1	0	1	8	0	0	1	9	0
10:00	10:15	0	0	5	7	0	3	6	1	0	0	6	0	0	2	9	1
10:15	10:30	0	3	4	2	0	3	4	2	0	1	10	0	0	1	7	0
10:30	10:45	0	1	4	6	0	7	8	2	0	0	6	0	0	1	10	0
10:45	11:00	1	3	5	5	1	5	5	2	0	2	6	0	0	2	6	0
11:00	11:15	1	2	3	3	0	5	8	1	0	3	2	0	0	2	8	0
11:15	11:30	0	3	3	6	0	3	8	1	0	3	6	0	0	2	5	0
11:30	11:45	0	1	4	5	0	3	6	2	0	2	4	1	0	1	11	0
11:45	12:00	0	0	2	2	0	2	8	2	0	2	9	0	0	0	10	1
12:00	12:15	0	3	3	7	0	4	10	2	0	0	5	0	0	0	7	0
12:15	12:30	0	2	4	3	0	2	12	1	0	0	4	0	0	3	14	0
12:30	12:45	0	1	4	6	0	2	7	1	0	0	4	0	0	2	8	0
12:45	13:00	0	2	2	4	0	1	12	2	0	1	5	0	0	1	10	0
13:00	13:15	0	3	1	7	0	5	8	0	0	0	1	0	0	2	11	0
13:15	13:30	0	0	6	2	1	7	7	1	0	1	5	0	0	1	3	0
13:30	13:45	0	0	5	6	0	7	10	3	0	2	2	0	0	1	12	0
13:45	14:00	0	1	7	2	0	8	18	3	0	2	4	0	0	1	8	0
14:00	14:15	0	1	3	0	0	3	13	1	0	4	7	0	0	1	19	0
14:15	14:30	1	4	4	5	0	5	17	2	0	1	3	0	0	1	6	0
14:30	14:45	0	3	5	4	0	8	21	5	0	3	4	0	0	2	19	1
14:45	15:00	0	3	9	8	0	3	15	2	0	1	2	1	0	1	11	0
15:00	15:15	0	2	8	9	0	3	36	4	0	2	4	0	0	2	11	0
15:15	15:30	0	3	7	5	1	3	17	3	0	6	6	0	0	3	11	0
15:30	15:45	0	1	4	7	0	2	37	5	0	0	6	0	0	1	12	0
15:45	16:00	0	4	4	11	0	7	34	5	0	3	6	0	0	3	15	0
16:00	16:15	0	4	6	10	0	6	25	4	0	0	5	0	0	2	12	1
16:15	16:30	0	2	3	8	0	5	23	5	0	3	6	1	0	1	21	0
16:30	16:45	0	2	9	3	0	4	31	6	0	1	2	2	1	2	17	0
16:45	17:00	0	5	7	7	0	2	27	2	0	3	3	4	0	0	15	0
17:00	17:15	0	11	8	4	0	3	3	0	0	0	5	0	0	2	6	2
17:15	17:30	0	5	7	6	0	4	7	0	0	0	8	0	0	2	5	1
17:30	17:45	0	3	9	1	0	0	2	0	0	0	6	1	0	1	9	2
17:45	18:00	0	2	7	2	0	1	1	0	0	0	5	0	0	1	2	0

Peak Time		**North Approach Old Hume Hwy**				**East Approach Taylor Ave**				**South Approach Old Hume Hwy**				**West Approach Medway Rd**				**Peak**
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
6:45	7:45	0	3	10	7	0	12	43	8	0	9	25	0	0	9	132	3	261
15:30	16:30	0	11	17	36	0	20	119	19	0	6	23	1	0	7	60	1	320

Heavy Vehicles

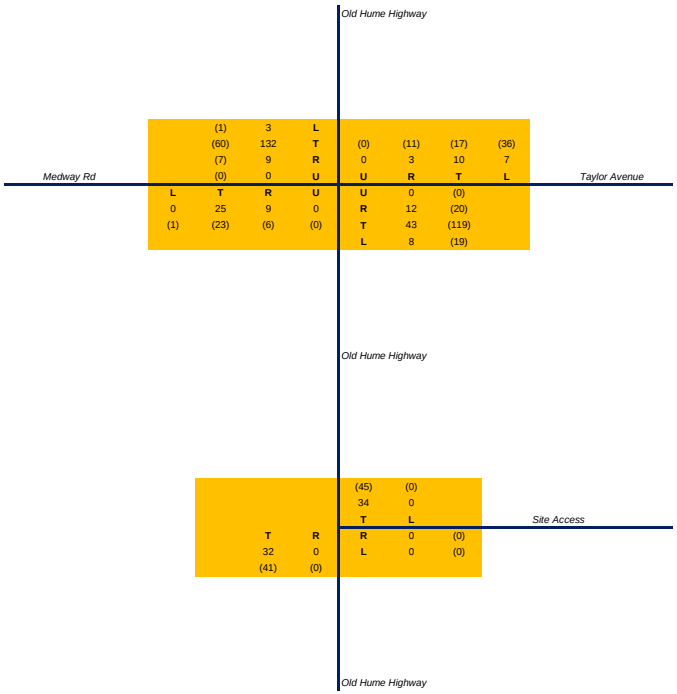
Time		North Approach Old Hume Hwy				East Approach Taylor Ave				South Approach Old Hume Hwy				West Approach Medway Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	0	0	0	0	1	1	3	0	0	0	0	0	0	4	0
6:15	6:30	0	0	0	0	0	2	2	3	0	0	0	0	0	0	2	0
6:30	6:45	0	0	0	0	0	0	0	1	0	1	2	0	0	0	3	0
6:45	7:00	0	0	0	0	0	0	4	1	0	0	0	0	0	0	1	0
7:00	7:15	0	0	0	0	0	2	4	3	0	2	0	0	0	0	5	0
7:15	7:30	0	0	0	0	0	1	1	1	0	2	0	0	0	0	4	0
7:30	7:45	0	0	0	1	0	1	1	0	0	3	0	0	0	0	2	0
7:45	8:00	0	0	0	2	0	0	5	2	0	2	0	0	0	0	8	1
8:00	8:15	0	0	0	2	0	1	0	1	0	1	0	0	0	0	5	0
8:15	8:30	0	0	1	1	0	1	2	0	0	2	1	0	0	0	3	0
8:30	8:45	0	0	0	1	0	0	7	4	0	2	0	0	0	0	5	0
8:45	9:00	0	0	0	2	0	0	3	2	0	0	1	0	0	0	4	2
9:00	9:15	0	0	0	2	0	0	6	3	0	3	0	0	0	0	4	1
9:15	9:30	0	0	1	0	0	2	3	1	0	3	0	0	0	0	8	1
9:30	9:45	0	0	0	0	0	0	6	1	0	1	1	0	0	0	1	0
9:45	10:00	0	0	0	2	0	0	4	4	0	2	0	0	0	0	5	0
10:00	10:15	0	0	0	0	0	0	5	1	0	0	2	0	0	0	5	0
10:15	10:30	0	2	1	0	0	0	5	4	0	3	1	0	0	0	4	0
10:30	10:45	0	0	0	0	0	0	3	2	0	2	0	0	0	0	5	1
10:45	11:00	0	0	0	4	0	0	4	3	0	1	0	0	0	0	3	1
11:00	11:15	0	0	0	2	0	0	0	5	1	2	0	0	0	0	5	0
11:15	11:30	0	0	1	0	0	2	4	3	0	4	2	0	0	0	2	1
11:30	11:45	0	0	0	1	0	0	2	3	0	1	0	0	0	0	2	0
11:45	12:00	0	0	1	0	0	2	5	2	0	2	0	0	0	0	6	0
12:00	12:15	0	0	0	0	0	0	6	3	0	0	0	0	0	0	7	0
12:15	12:30	0	0	0	0	0	7	0	0	0	4	1	0	0	0	3	1
12:30	12:45	0	0	0	1	0	1	3	3	0	4	1	0	0	0	4	0
12:45	13:00	0	2	0	3	0	1	2	2	0	0	1	0	0	0	4	0
13:00	13:15	0	0	0	0	0	1	3	0	0	3	0	0	0	0	3	0
13:15	13:30	0	0	0	1	0	0	3	3	0	3	2	0	0	0	2	0
13:30	13:45	0	1	0	0	0	0	4	1	0	0	5	0	0	0	8	0
13:45	14:00	0	1	1	0	0	0	4	3	0	5	1	0	0	0	2	1

14:00	14:15	0	0	0	0	0	0	6	4	0	0	0	0	0	0	5	0
14:15	14:30	0	0	2	2	0	0	9	1	0	2	0	0	0	0	4	0
14:30	14:45	0	0	1	1	0	2	4	1	0	3	0	0	0	0	6	1
14:45	15:00	0	1	1	1	0	2	1	3	0	1	0	0	0	0	5	0
15:00	15:15	0	2	0	1	0	2	5	2	0	1	0	0	0	0	5	1
15:15	15:30	0	0	0	0	0	1	4	1	0	2	0	0	0	0	4	0
15:30	15:45	0	1	1	1	0	1	6	0	0	1	0	0	0	0	4	0
15:45	16:00	0	0	1	0	0	0	4	2	0	5	0	0	0	0	3	1
16:00	16:15	0	0	0	0	0	0	7	0	0	5	0	0	0	0	2	0
16:15	16:30	0	0	0	1	0	1	3	1	0	0	2	0	0	0	3	3
16:30	16:45	0	1	0	0	0	0	3	0	0	1	0	0	0	0	2	0
16:45	17:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0
17:00	17:15	0	1	3	2	0	1	3	0	0	0	2	0	0	0	2	0
17:15	17:30	0	0	1	1	0	1	1	0	0	0	0	0	0	0	1	0
17:30	17:45	0	0	1	2	0	0	0	0	1	0	1	0	0	0	0	0
17:45	18:00	0	1	0	2	0	0	0	0	0	0	2	0	0	1	0	0

Peak Time		**North Approach Old Hume Hwy**				**East Approach Taylor Ave**				**South Approach Old Hume Hwy**				**West Approach Medway Rd**				**Peak**
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
6:45	7:45	0	0	0	1	0	4	10	5	0	7	0	0	0	0	12	0	39
15:30	16:30	0	1	2	2	0	2	20	3	0	11	2	0	0	0	12	4	59

APPENDIX D

Traffic Flow Diagrams (Desktop Models)



Legend

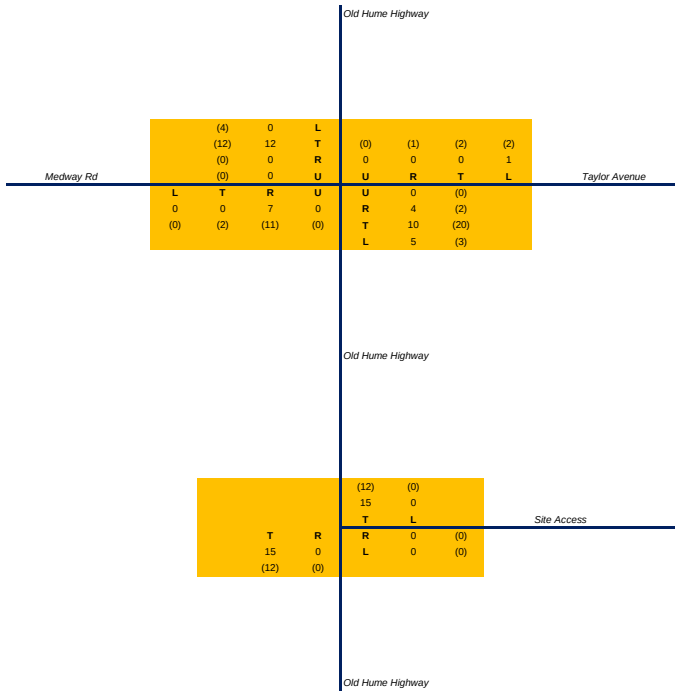
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

Existing Weekday Light Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



Legend

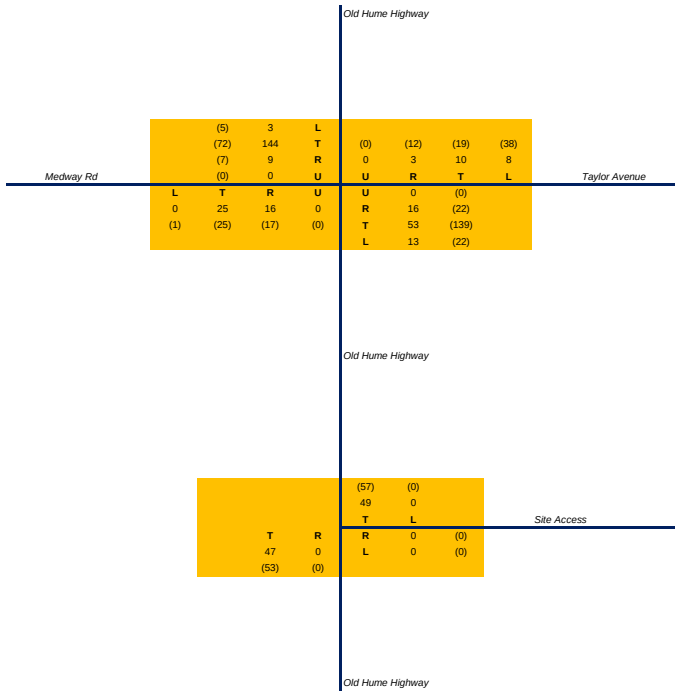
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

Existing Weekday Heavy Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



Legend

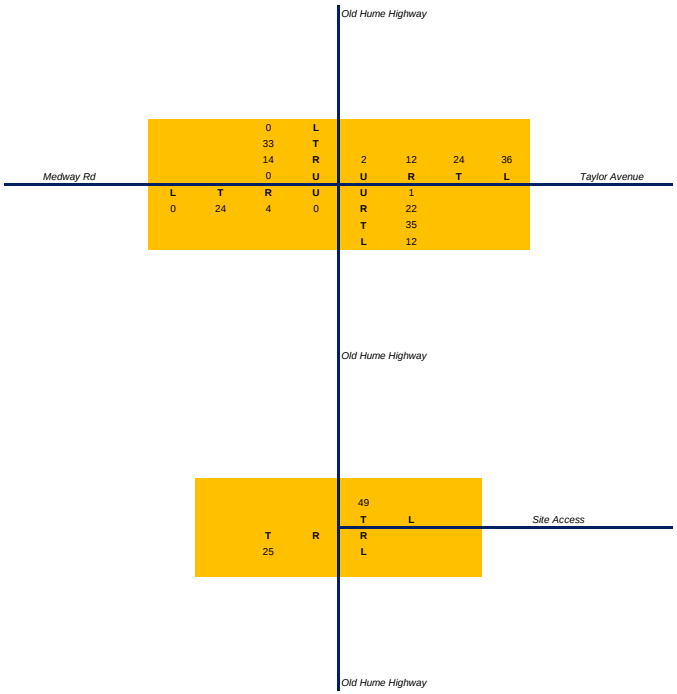
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

Existing Weekday Total Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



N

Legend

L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through		
R	Right turn		
U	U-turn		

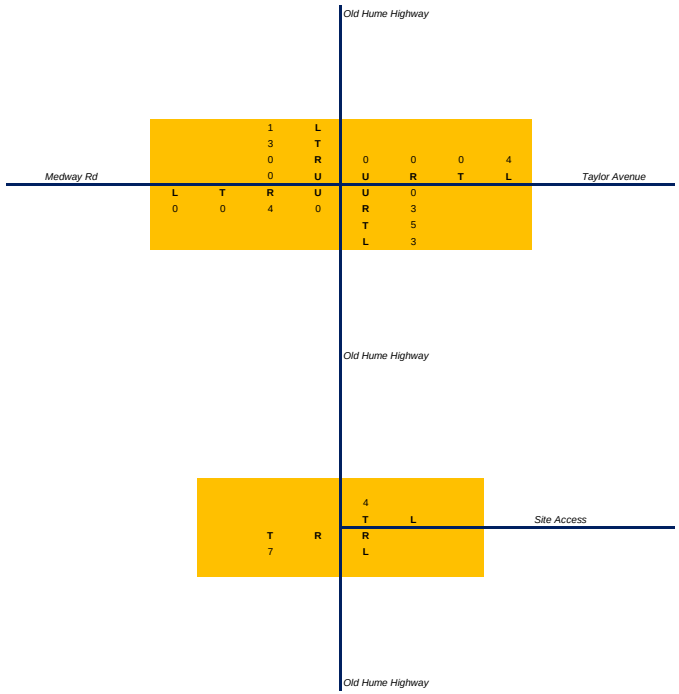
Existing Saturday Light Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021

SLR



Legend

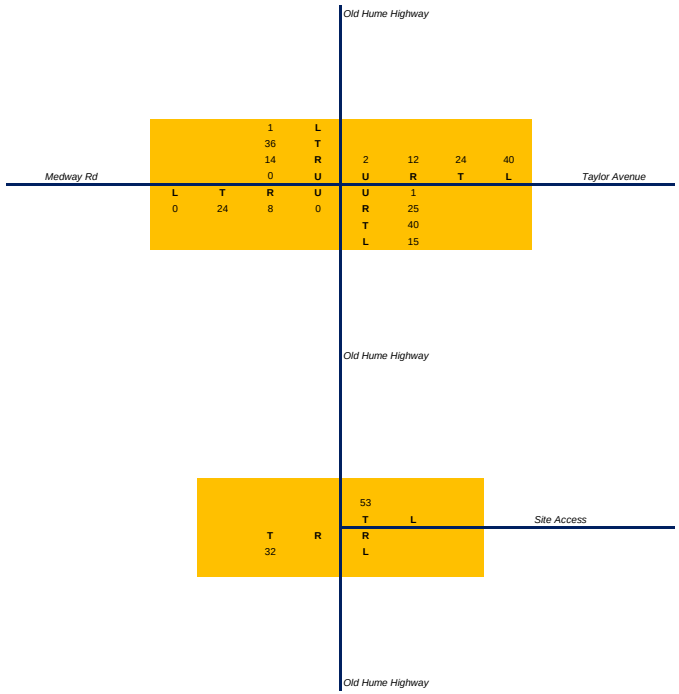
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through		
R	Right turn		
U	U-turn		

Existing Saturday Heavy Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



Legend

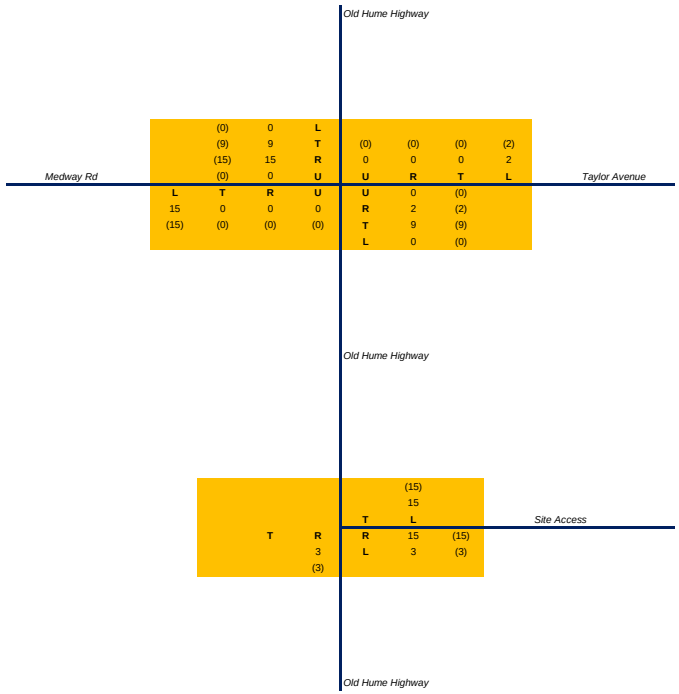
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through		
R	Right turn		
U	U-turn		

Existing Saturday Total Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



Legend

L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

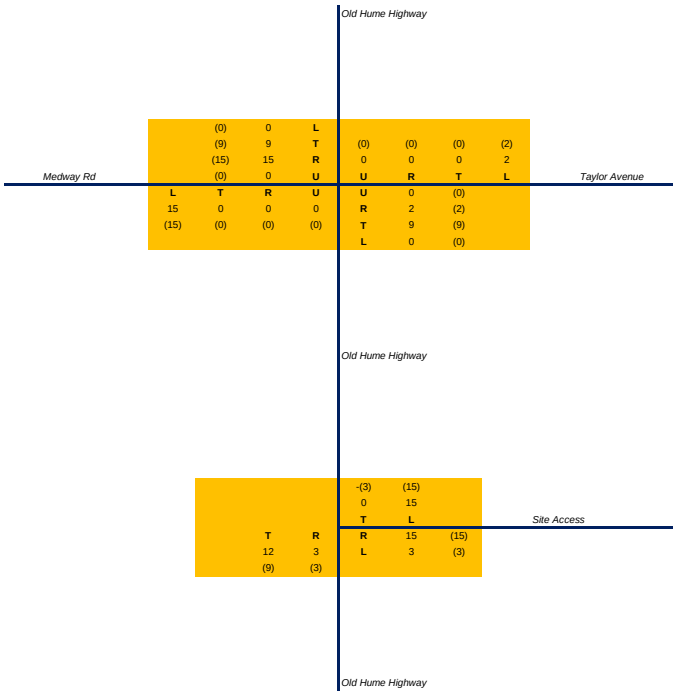
Development Weekday Heavy Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021

SLR



Legend

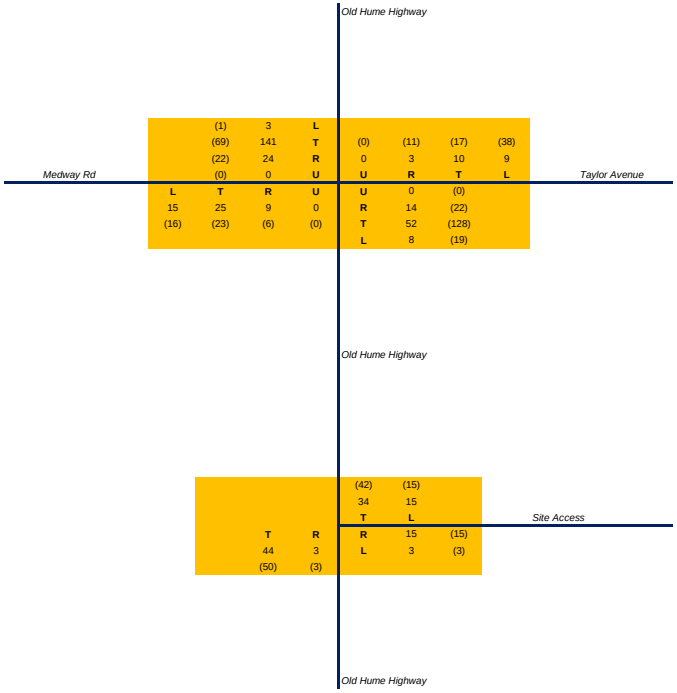
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

Post-Development Weekday Heavy Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



Legend

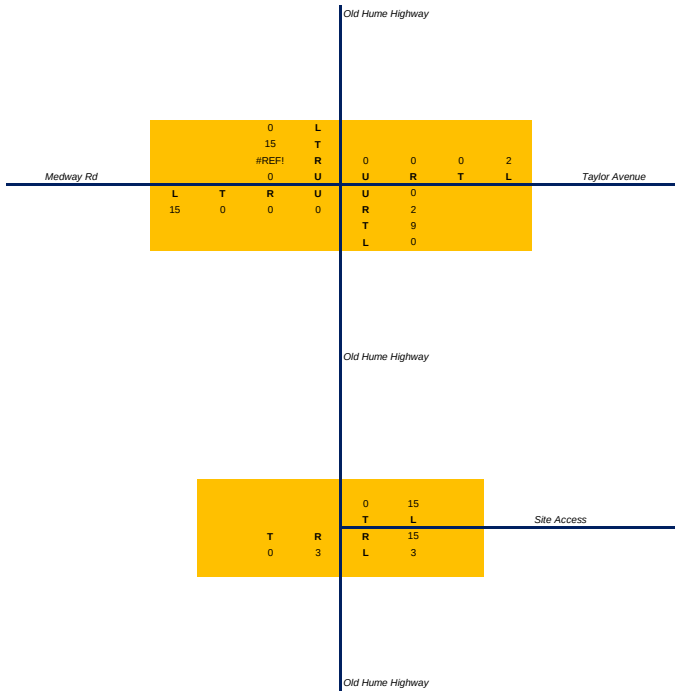
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

Post-Development Weekday Total Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



Legend

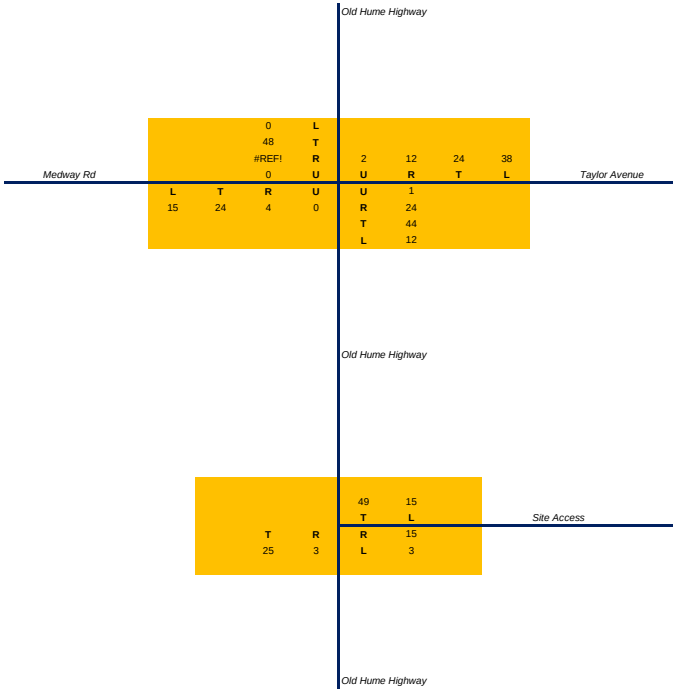
L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

Post-Development Saturday Heavy Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021



Legend

L	Left Turn	00	Weekday AM Peak Hour Volumes
T	Through	(00)	Weekday PM Peak Hour Volumes
R	Right turn		
U	U-turn		

Post-Development Saturday Total Vehicle Volumes

660.30127

Berrima Cement SSD

04-11-2021

APPENDIX E

SIDRA Outputs

USER REPORT FOR SITE

All Movement Classes

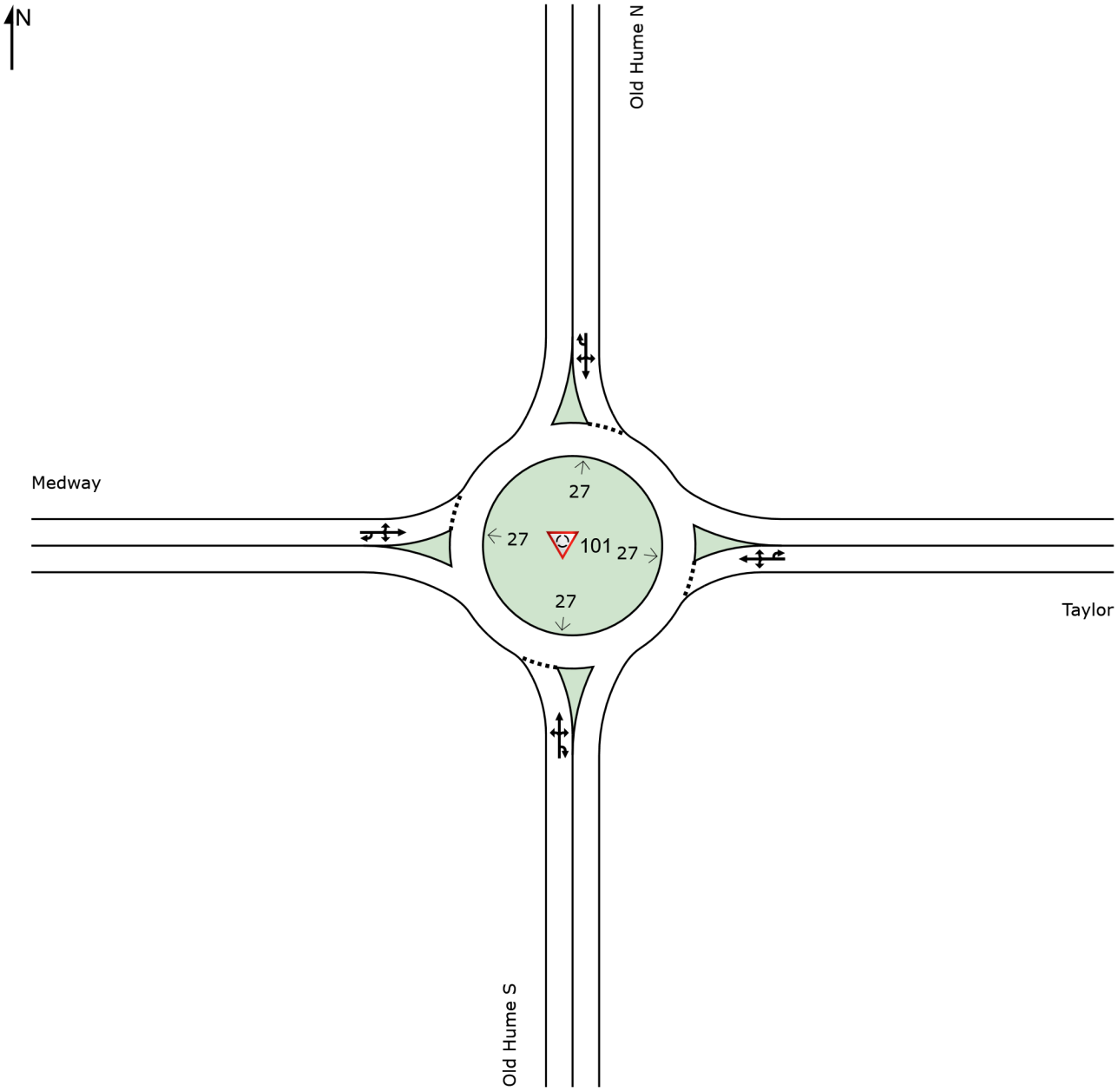
Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_1**

Site: 101 [Old Hume / Taylor / Medway - BG TUE - AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	1	0	1	0.0	0.036	3.9	LOS A	0.2	1.4	0.22	0.47	0.22	54.2
2	T1	25	0	26	0.0	0.036	4.0	LOS A	0.2	1.4	0.22	0.47	0.22	55.7
3	R2	16	7	17	43.8	0.036	10.0	LOS A	0.2	1.4	0.22	0.47	0.22	54.2
3u	U	1	0	1	0.0	0.036	11.7	LOS B	0.2	1.4	0.22	0.47	0.22	57.2
Approach		43	7	45	16.3	0.036	6.4	LOS A	0.2	1.4	0.22	0.47	0.22	55.1
East: Taylor														
4	L2	13	5	14	38.5	0.065	4.0	LOS A	0.3	2.7	0.12	0.43	0.12	53.9
5	T1	53	10	56	18.9	0.065	3.9	LOS A	0.3	2.7	0.12	0.43	0.12	56.1
6	R2	16	4	17	25.0	0.065	9.4	LOS A	0.3	2.7	0.12	0.43	0.12	55.7
6u	U	1	0	1	0.0	0.065	11.4	LOS B	0.3	2.7	0.12	0.43	0.12	58.1
Approach		83	19	87	22.9	0.065	5.1	LOS A	0.3	2.7	0.12	0.43	0.12	55.7
North: Old Hume N														
7	L2	8	1	8	12.5	0.019	4.5	LOS A	0.1	0.7	0.33	0.47	0.33	53.8
8	T1	10	0	11	0.0	0.019	4.4	LOS A	0.1	0.7	0.33	0.47	0.33	55.6
9	R2	3	0	3	0.0	0.019	9.8	LOS A	0.1	0.7	0.33	0.47	0.33	55.9
9u	U	1	0	1	0.0	0.019	12.0	LOS B	0.1	0.7	0.33	0.47	0.33	57.2
Approach		22	1	23	4.5	0.019	5.5	LOS A	0.1	0.7	0.33	0.47	0.33	55.0
West: Medway														
10	L2	3	0	3	0.0	0.121	3.8	LOS A	0.6	4.6	0.21	0.39	0.21	55.0
11	T1	144	12	152	8.3	0.121	4.0	LOS A	0.6	4.6	0.21	0.39	0.21	56.4
12	R2	9	0	9	0.0	0.121	9.3	LOS A	0.6	4.6	0.21	0.39	0.21	56.8
12u	U	1	0	1	0.0	0.121	11.6	LOS B	0.6	4.6	0.21	0.39	0.21	58.2
Approach		157	12	165	7.6	0.121	4.3	LOS A	0.6	4.6	0.21	0.39	0.21	56.4
All Vehicles		305	39	321	12.8	0.121	4.9	LOS A	0.6	4.6	0.19	0.42	0.19	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Taylor / Medway - BG TUE - PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	1	0	1	0.0	0.044	4.3	LOS A	0.2	1.8	0.36	0.51	0.36	53.7
2	T1	25	2	26	8.0	0.044	4.5	LOS A	0.2	1.8	0.36	0.51	0.36	55.1
3	R2	17	11	18	64.7	0.044	11.1	LOS B	0.2	1.8	0.36	0.51	0.36	53.1
3u	U	1	0	1	0.0	0.044	12.1	LOS B	0.2	1.8	0.36	0.51	0.36	56.8
Approach		44	13	46	29.5	0.044	7.2	LOS A	0.2	1.8	0.36	0.51	0.36	54.3
East: Taylor														
4	L2	22	3	23	13.6	0.139	3.9	LOS A	0.7	5.8	0.17	0.41	0.17	54.6
5	T1	139	20	146	14.4	0.139	3.9	LOS A	0.7	5.8	0.17	0.41	0.17	56.3
6	R2	22	2	23	9.1	0.139	9.3	LOS A	0.7	5.8	0.17	0.41	0.17	56.4
6u	U	1	0	1	0.0	0.139	11.5	LOS B	0.7	5.8	0.17	0.41	0.17	58.2
Approach		184	25	194	13.6	0.139	4.6	LOS A	0.7	5.8	0.17	0.41	0.17	56.1
North: Old Hume N														
7	L2	38	2	40	5.3	0.058	4.1	LOS A	0.3	2.1	0.26	0.47	0.26	54.4
8	T1	19	2	20	10.5	0.058	4.2	LOS A	0.3	2.1	0.26	0.47	0.26	55.9
9	R2	12	1	13	8.3	0.058	9.6	LOS A	0.3	2.1	0.26	0.47	0.26	56.0
9u	U	1	0	1	0.0	0.058	11.8	LOS B	0.3	2.1	0.26	0.47	0.26	57.7
Approach		70	5	74	7.1	0.058	5.2	LOS A	0.3	2.1	0.26	0.47	0.26	55.1
West: Medway														
10	L2	5	4	5	80.0	0.072	4.8	LOS A	0.4	2.9	0.22	0.41	0.22	52.7
11	T1	72	12	76	16.7	0.072	4.1	LOS A	0.4	2.9	0.22	0.41	0.22	56.0
12	R2	7	0	7	0.0	0.072	9.4	LOS A	0.4	2.9	0.22	0.41	0.22	56.5
12u	U	1	0	1	0.0	0.072	11.6	LOS B	0.4	2.9	0.22	0.41	0.22	57.9
Approach		85	16	89	18.8	0.072	4.7	LOS A	0.4	2.9	0.22	0.41	0.22	55.8
All Vehicles		383	59	403	15.4	0.139	5.0	LOS A	0.7	5.8	0.22	0.43	0.22	55.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Taylor / Medway - BG SAT (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	12	0	13	0.0	0.037	3.9	LOS A	0.2	1.3	0.22	0.44	0.22	54.8
2	T1	24	0	25	0.0	0.037	4.0	LOS A	0.2	1.3	0.22	0.44	0.22	56.4
3	R2	8	4	8	50.0	0.037	10.1	LOS B	0.2	1.3	0.22	0.44	0.22	54.6
3u	U	1	0	1	0.0	0.037	11.7	LOS B	0.2	1.3	0.22	0.44	0.22	58.0
Approach		45	4	47	8.9	0.037	5.2	LOS A	0.2	1.3	0.22	0.44	0.22	55.7
East: Taylor														
4	L2	15	3	16	20.0	0.065	4.0	LOS A	0.3	2.5	0.18	0.47	0.18	53.7
5	T1	40	5	42	12.5	0.065	4.0	LOS A	0.3	2.5	0.18	0.47	0.18	55.5
6	R2	25	3	26	12.0	0.065	9.4	LOS A	0.3	2.5	0.18	0.47	0.18	55.5
6u	U	1	0	1	0.0	0.065	11.5	LOS B	0.3	2.5	0.18	0.47	0.18	57.3
Approach		81	11	85	13.6	0.065	5.7	LOS A	0.3	2.5	0.18	0.47	0.18	55.2
North: Old Hume N														
7	L2	40	4	42	10.0	0.061	3.9	LOS A	0.3	2.2	0.19	0.46	0.19	54.5
8	T1	24	0	25	0.0	0.061	3.9	LOS A	0.3	2.2	0.19	0.46	0.19	56.3
9	R2	12	0	13	0.0	0.061	9.3	LOS A	0.3	2.2	0.19	0.46	0.19	56.5
9u	U	2	0	2	0.0	0.061	11.6	LOS B	0.3	2.2	0.19	0.46	0.19	57.9
Approach		78	4	82	5.1	0.061	4.9	LOS A	0.3	2.2	0.19	0.46	0.19	55.4
West: Medway														
10	L2	1	1	1	100.0	0.041	5.0	LOS A	0.2	1.5	0.19	0.46	0.19	51.7
11	T1	36	3	38	8.3	0.041	4.0	LOS A	0.2	1.5	0.19	0.46	0.19	55.6
12	R2	14	0	15	0.0	0.041	9.3	LOS A	0.2	1.5	0.19	0.46	0.19	55.9
12u	U	1	0	1	0.0	0.041	11.6	LOS B	0.2	1.5	0.19	0.46	0.19	57.3
Approach		52	4	55	7.7	0.041	5.6	LOS A	0.2	1.5	0.19	0.46	0.19	55.6
All Vehicles		256	23	269	9.0	0.065	5.4	LOS A	0.3	2.5	0.19	0.46	0.19	55.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Taylor / Medway - BG+CONS. TUE - AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	1	0	1	0.0	0.036	3.9	LOS A	0.2	1.4	0.22	0.47	0.22	54.1
2	T1	25	0	26	0.0	0.036	4.0	LOS A	0.2	1.4	0.22	0.47	0.22	55.7
3	R2	16	7	17	43.8	0.036	10.0	LOS A	0.2	1.4	0.22	0.47	0.22	54.2
3u	U	1	0	1	0.0	0.036	11.7	LOS B	0.2	1.4	0.22	0.47	0.22	57.2
Approach		43	7	45	16.3	0.036	6.4	LOS A	0.2	1.4	0.22	0.47	0.22	55.1
East: Taylor														
4	L2	13	5	14	38.5	0.069	4.2	LOS A	0.3	2.8	0.18	0.43	0.18	53.7
5	T1	53	10	56	18.9	0.069	4.0	LOS A	0.3	2.8	0.18	0.43	0.18	55.9
6	R2	16	4	17	25.0	0.069	9.6	LOS A	0.3	2.8	0.18	0.43	0.18	55.5
6u	U	1	0	1	0.0	0.069	11.5	LOS B	0.3	2.8	0.18	0.43	0.18	57.8
Approach		83	19	87	22.9	0.069	5.2	LOS A	0.3	2.8	0.18	0.43	0.18	55.5
North: Old Hume N														
7	L2	8	1	8	12.5	0.030	4.5	LOS A	0.1	1.2	0.35	0.47	0.35	53.8
8	T1	20	5	21	25.0	0.030	4.8	LOS A	0.1	1.2	0.35	0.47	0.35	55.2
9	R2	3	0	3	0.0	0.030	9.8	LOS A	0.1	1.2	0.35	0.47	0.35	55.9
9u	U	1	0	1	0.0	0.030	12.1	LOS B	0.1	1.2	0.35	0.47	0.35	57.2
Approach		32	6	34	18.8	0.030	5.4	LOS A	0.1	1.2	0.35	0.47	0.35	54.9
West: Medway														
10	L2	3	0	3	0.0	0.130	3.8	LOS A	0.7	5.2	0.21	0.40	0.21	55.0
11	T1	144	12	152	8.3	0.130	4.0	LOS A	0.7	5.2	0.21	0.40	0.21	56.4
12	R2	17	8	18	47.1	0.130	10.0	LOS A	0.7	5.2	0.21	0.40	0.21	55.0
12u	U	1	0	1	0.0	0.130	11.6	LOS B	0.7	5.2	0.21	0.40	0.21	58.2
Approach		165	20	174	12.1	0.130	4.7	LOS A	0.7	5.2	0.21	0.40	0.21	56.2
All Vehicles		323	52	340	16.1	0.130	5.1	LOS A	0.7	5.2	0.22	0.43	0.22	55.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Taylor / Medway - BG+CONS. TUE - PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	9	8	9	88.9	0.066	5.9	LOS A	0.3	3.0	0.37	0.50	0.37	51.6
2	T1	35	7	37	20.0	0.066	4.7	LOS A	0.3	3.0	0.37	0.50	0.37	54.9
3	R2	17	11	18	64.7	0.066	11.1	LOS B	0.3	3.0	0.37	0.50	0.37	53.1
3u	U	1	0	1	0.0	0.066	12.1	LOS B	0.3	3.0	0.37	0.50	0.37	56.8
Approach		62	26	65	41.9	0.066	6.8	LOS A	0.3	3.0	0.37	0.50	0.37	53.9
East: Taylor														
4	L2	22	3	23	13.6	0.139	3.9	LOS A	0.7	5.8	0.17	0.41	0.17	54.6
5	T1	139	20	146	14.4	0.139	3.9	LOS A	0.7	5.8	0.17	0.41	0.17	56.3
6	R2	22	2	23	9.1	0.139	9.3	LOS A	0.7	5.8	0.17	0.41	0.17	56.4
6u	U	1	0	1	0.0	0.139	11.5	LOS B	0.7	5.8	0.17	0.41	0.17	58.2
Approach		184	25	194	13.6	0.139	4.6	LOS A	0.7	5.8	0.17	0.41	0.17	56.1
North: Old Hume N														
7	L2	38	2	40	5.3	0.058	4.1	LOS A	0.3	2.1	0.26	0.47	0.26	54.4
8	T1	19	2	20	10.5	0.058	4.2	LOS A	0.3	2.1	0.26	0.47	0.26	55.9
9	R2	12	1	13	8.3	0.058	9.6	LOS A	0.3	2.1	0.26	0.47	0.26	56.0
9u	U	1	0	1	0.0	0.058	11.8	LOS B	0.3	2.1	0.26	0.47	0.26	57.7
Approach		70	5	74	7.1	0.058	5.2	LOS A	0.3	2.1	0.26	0.47	0.26	55.1
West: Medway														
10	L2	5	4	5	80.0	0.073	4.9	LOS A	0.4	3.0	0.25	0.41	0.25	52.6
11	T1	72	12	76	16.7	0.073	4.2	LOS A	0.4	3.0	0.25	0.41	0.25	55.9
12	R2	7	0	7	0.0	0.073	9.4	LOS A	0.4	3.0	0.25	0.41	0.25	56.4
12u	U	1	0	1	0.0	0.073	11.7	LOS B	0.4	3.0	0.25	0.41	0.25	57.8
Approach		85	16	89	18.8	0.073	4.7	LOS A	0.4	3.0	0.25	0.41	0.25	55.7
All Vehicles		401	72	422	18.0	0.139	5.1	LOS A	0.7	5.8	0.23	0.44	0.23	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Taylor / Medway - BG+DEV TUE - AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	8	8	8	100.0	0.038	5.1	LOS A	0.2	1.5	0.22	0.45	0.22	51.8
2	T1	26	1	27	3.8	0.038	4.0	LOS A	0.2	1.5	0.22	0.45	0.22	55.7
3	R2	9	0	9	0.0	0.038	9.4	LOS A	0.2	1.5	0.22	0.45	0.22	56.0
3u	U	1	0	1	0.0	0.038	11.6	LOS B	0.2	1.5	0.22	0.45	0.22	57.4
Approach		44	9	46	20.5	0.038	5.5	LOS A	0.2	1.5	0.22	0.45	0.22	55.0
East: Taylor														
4	L2	8	0	8	0.0	0.057	3.6	LOS A	0.3	2.2	0.11	0.43	0.11	54.9
5	T1	52	9	55	17.3	0.057	3.9	LOS A	0.3	2.2	0.11	0.43	0.11	56.2
6	R2	14	2	15	14.3	0.057	9.3	LOS A	0.3	2.2	0.11	0.43	0.11	56.2
6u	U	1	0	1	0.0	0.057	11.4	LOS B	0.3	2.2	0.11	0.43	0.11	58.1
Approach		75	11	79	14.7	0.057	4.9	LOS A	0.3	2.2	0.11	0.43	0.11	56.1
North: Old Hume N														
7	L2	9	2	9	22.2	0.020	4.5	LOS A	0.1	0.7	0.32	0.47	0.32	53.6
8	T1	10	0	11	0.0	0.020	4.3	LOS A	0.1	0.7	0.32	0.47	0.32	55.7
9	R2	3	0	3	0.0	0.020	9.7	LOS A	0.1	0.7	0.32	0.47	0.32	55.9
9u	U	1	0	1	0.0	0.020	12.0	LOS B	0.1	0.7	0.32	0.47	0.32	57.3
Approach		23	2	24	8.7	0.020	5.4	LOS A	0.1	0.7	0.32	0.47	0.32	54.9
West: Medway														
10	L2	3	0	3	0.0	0.115	3.8	LOS A	0.6	4.3	0.18	0.39	0.18	55.1
11	T1	141	9	148	6.4	0.115	3.9	LOS A	0.6	4.3	0.18	0.39	0.18	56.6
12	R2	9	0	9	0.0	0.115	9.3	LOS A	0.6	4.3	0.18	0.39	0.18	57.0
12u	U	1	0	1	0.0	0.115	11.5	LOS B	0.6	4.3	0.18	0.39	0.18	58.4
Approach		154	9	162	5.8	0.115	4.3	LOS A	0.6	4.3	0.18	0.39	0.18	56.6
All Vehicles		296	31	312	10.5	0.115	4.7	LOS A	0.6	4.3	0.18	0.41	0.18	56.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Taylor / Medway - BG+DEV TUE - PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	9	8	9	88.9	0.038	5.7	LOS A	0.2	1.5	0.34	0.47	0.34	51.7
2	T1	24	1	25	4.2	0.038	4.4	LOS A	0.2	1.5	0.34	0.47	0.34	55.3
3	R2	6	0	6	0.0	0.038	9.7	LOS A	0.2	1.5	0.34	0.47	0.34	55.6
3u	U	1	0	1	0.0	0.038	12.0	LOS B	0.2	1.5	0.34	0.47	0.34	56.9
Approach		40	9	42	22.5	0.038	5.7	LOS A	0.2	1.5	0.34	0.47	0.34	54.5
East: Taylor														
4	L2	19	0	20	0.0	0.124	3.7	LOS A	0.6	4.8	0.16	0.41	0.16	55.0
5	T1	128	9	135	7.0	0.124	3.9	LOS A	0.6	4.8	0.16	0.41	0.16	56.5
6	R2	22	2	23	9.1	0.124	9.3	LOS A	0.6	4.8	0.16	0.41	0.16	56.5
6u	U	1	0	1	0.0	0.124	11.5	LOS B	0.6	4.8	0.16	0.41	0.16	58.2
Approach		170	11	179	6.5	0.124	4.6	LOS A	0.6	4.8	0.16	0.41	0.16	56.3
North: Old Hume N														
7	L2	38	2	40	5.3	0.057	4.0	LOS A	0.3	2.1	0.23	0.46	0.23	54.5
8	T1	19	2	20	10.5	0.057	4.1	LOS A	0.3	2.1	0.23	0.46	0.23	56.0
9	R2	12	1	13	8.3	0.057	9.5	LOS A	0.3	2.1	0.23	0.46	0.23	56.1
9u	U	1	0	1	0.0	0.057	11.7	LOS B	0.3	2.1	0.23	0.46	0.23	57.8
Approach		70	5	74	7.1	0.057	5.1	LOS A	0.3	2.1	0.23	0.46	0.23	55.2
West: Medway														
10	L2	5	4	5	80.0	0.067	4.7	LOS A	0.3	2.6	0.19	0.40	0.19	52.9
11	T1	69	9	73	13.0	0.067	4.0	LOS A	0.3	2.6	0.19	0.40	0.19	56.2
12	R2	7	0	7	0.0	0.067	9.3	LOS A	0.3	2.6	0.19	0.40	0.19	56.7
12u	U	1	0	1	0.0	0.067	11.5	LOS B	0.3	2.6	0.19	0.40	0.19	58.1
Approach		82	13	86	15.9	0.067	4.6	LOS A	0.3	2.6	0.19	0.40	0.19	56.1
All Vehicles		362	38	381	10.5	0.124	4.8	LOS A	0.6	4.8	0.20	0.43	0.20	55.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Taylor / Medway - BG+DEV SAT (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
1	L2	8	8	8	100.0	0.034	5.2	LOS A	0.2	1.3	0.24	0.43	0.24	52.0
2	T1	25	1	26	4.0	0.034	4.0	LOS A	0.2	1.3	0.24	0.43	0.24	55.9
3	R2	4	0	4	0.0	0.034	9.4	LOS A	0.2	1.3	0.24	0.43	0.24	56.3
3u	U	1	0	1	0.0	0.034	11.7	LOS B	0.2	1.3	0.24	0.43	0.24	57.6
Approach		38	9	40	23.7	0.034	5.0	LOS A	0.2	1.3	0.24	0.43	0.24	55.1
East: Taylor														
4	L2	12	0	13	0.0	0.065	3.8	LOS A	0.3	2.5	0.18	0.47	0.18	54.2
5	T1	44	9	46	20.5	0.065	4.0	LOS A	0.3	2.5	0.18	0.47	0.18	55.4
6	R2	24	2	25	8.3	0.065	9.4	LOS A	0.3	2.5	0.18	0.47	0.18	55.6
6u	U	1	0	1	0.0	0.065	11.5	LOS B	0.3	2.5	0.18	0.47	0.18	57.3
Approach		81	11	85	13.6	0.065	5.7	LOS A	0.3	2.5	0.18	0.47	0.18	55.3
North: Old Hume N														
7	L2	38	2	40	5.3	0.059	3.9	LOS A	0.3	2.1	0.20	0.46	0.20	54.6
8	T1	24	0	25	0.0	0.059	3.9	LOS A	0.3	2.1	0.20	0.46	0.20	56.3
9	R2	12	0	13	0.0	0.059	9.3	LOS A	0.3	2.1	0.20	0.46	0.20	56.5
9u	U	2	0	2	0.0	0.059	11.6	LOS B	0.3	2.1	0.20	0.46	0.20	57.9
Approach		76	2	80	2.6	0.059	5.0	LOS A	0.3	2.1	0.20	0.46	0.20	55.5
West: Medway														
10	L2	1	1	1	100.0	0.048	4.9	LOS A	0.2	1.8	0.19	0.45	0.19	51.8
11	T1	42	9	44	21.4	0.048	4.1	LOS A	0.2	1.8	0.19	0.45	0.19	55.3
12	R2	14	0	15	0.0	0.048	9.3	LOS A	0.2	1.8	0.19	0.45	0.19	56.0
12u	U	1	0	1	0.0	0.048	11.6	LOS B	0.2	1.8	0.19	0.45	0.19	57.3
Approach		58	10	61	17.2	0.048	5.5	LOS A	0.2	1.8	0.19	0.45	0.19	55.4
All Vehicles		253	32	266	12.6	0.065	5.3	LOS A	0.3	2.5	0.20	0.45	0.20	55.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

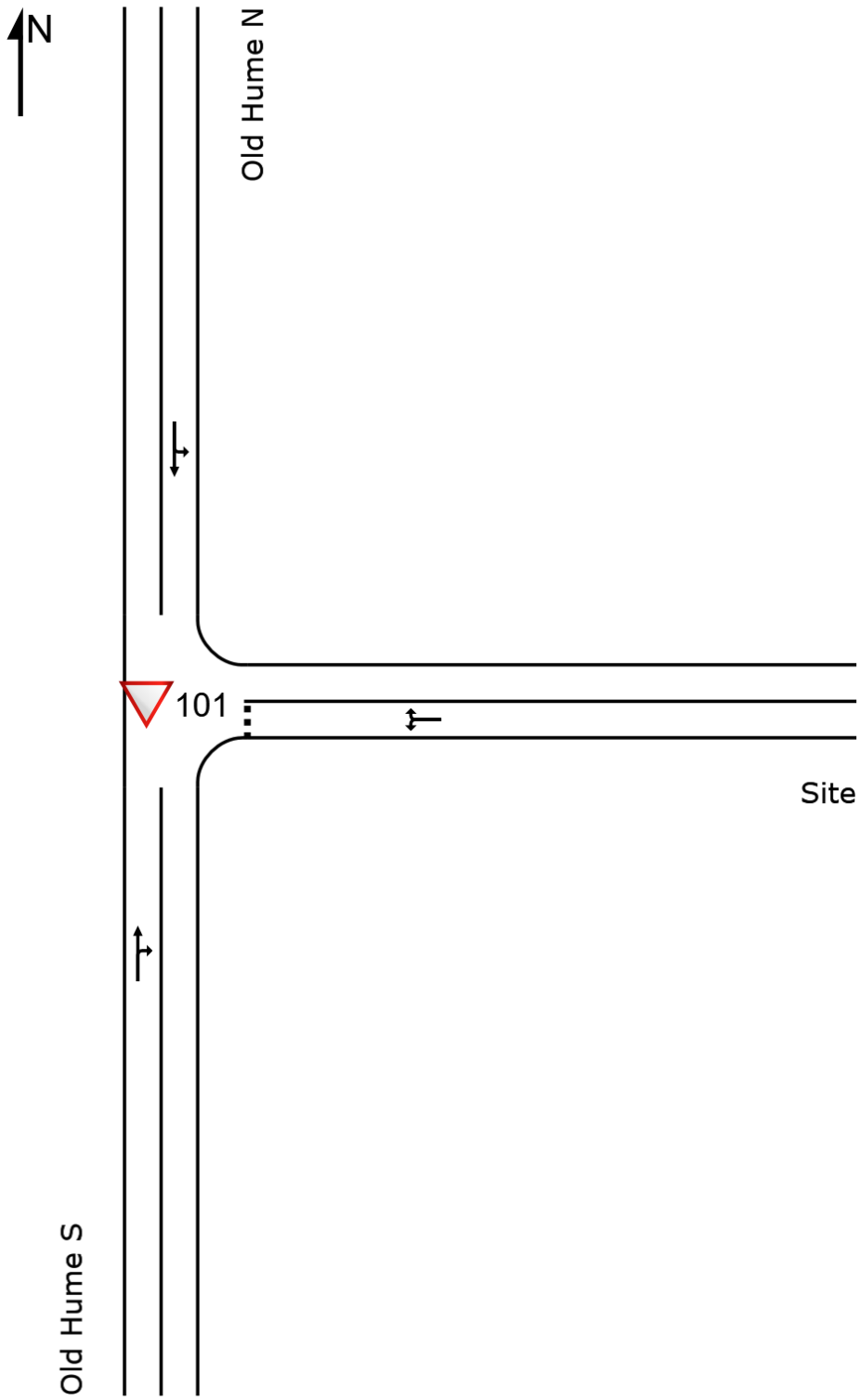
Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_1**

Site: 101 [Old Hume / Site - POST DEV FRI - AM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.


N
Old Hume N
101
Site
Old Hume S

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
2	T1	39	7	41	17.9	0.034	0.1	LOS A	0.1	0.7	0.08	0.11	0.08	76.5
3	R2	8	8	8	100.0	0.034	9.0	LOS A	0.1	0.7	0.08	0.11	0.08	50.8
Approach		47	15	49	31.9	0.034	1.6	NA	0.1	0.7	0.08	0.11	0.08	70.4
East: Site														
4	L2	8	8	8	100.0	0.021	4.3	LOS A	0.1	0.9	0.16	0.46	0.16	39.7
6	R2	9	9	9	100.0	0.021	5.0	LOS A	0.1	0.9	0.16	0.46	0.16	39.1
Approach		17	17	18	100.0	0.021	4.7	LOS A	0.1	0.9	0.16	0.46	0.16	39.4
North: Old Hume N														
7	L2	9	9	9	100.0	0.032	8.8	LOS A	0.0	0.0	0.00	0.12	0.00	41.3
8	T1	40	6	42	15.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	76.9
Approach		49	15	52	30.6	0.032	1.6	NA	0.0	0.0	0.00	0.12	0.00	66.4
All Vehicles		113	47	119	41.6	0.034	2.1	NA	0.1	0.9	0.06	0.16	0.06	61.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Site - POST DEV FRI - PM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
2	T1	45	4	47	8.9	0.036	0.1	LOS A	0.1	0.7	0.08	0.10	0.08	77.0
3	R2	8	8	8	100.0	0.036	9.0	LOS A	0.1	0.7	0.08	0.10	0.08	51.1
Approach		53	12	56	22.6	0.036	1.5	NA	0.1	0.7	0.08	0.10	0.08	71.5
East: Site														
4	L2	8	8	8	100.0	0.021	4.3	LOS A	0.1	1.0	0.18	0.46	0.18	39.7
6	R2	9	9	9	100.0	0.021	5.1	LOS A	0.1	1.0	0.18	0.46	0.18	39.0
Approach		17	17	18	100.0	0.021	4.7	LOS A	0.1	1.0	0.18	0.46	0.18	39.3
North: Old Hume N														
7	L2	9	9	9	100.0	0.036	8.8	LOS A	0.0	0.0	0.00	0.10	0.00	41.5
8	T1	48	3	51	6.3	0.036	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	77.5
Approach		57	12	60	21.1	0.036	1.4	NA	0.0	0.0	0.00	0.10	0.00	68.2
All Vehicles		127	41	134	32.3	0.036	1.9	NA	0.1	1.0	0.06	0.15	0.06	63.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 660.30127-SIDRA Analysis-2022 01 31 - CS - Construction **Template: SLR Template_3**

Site: 101 [Old Hume / Site - POST DEV SAT (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

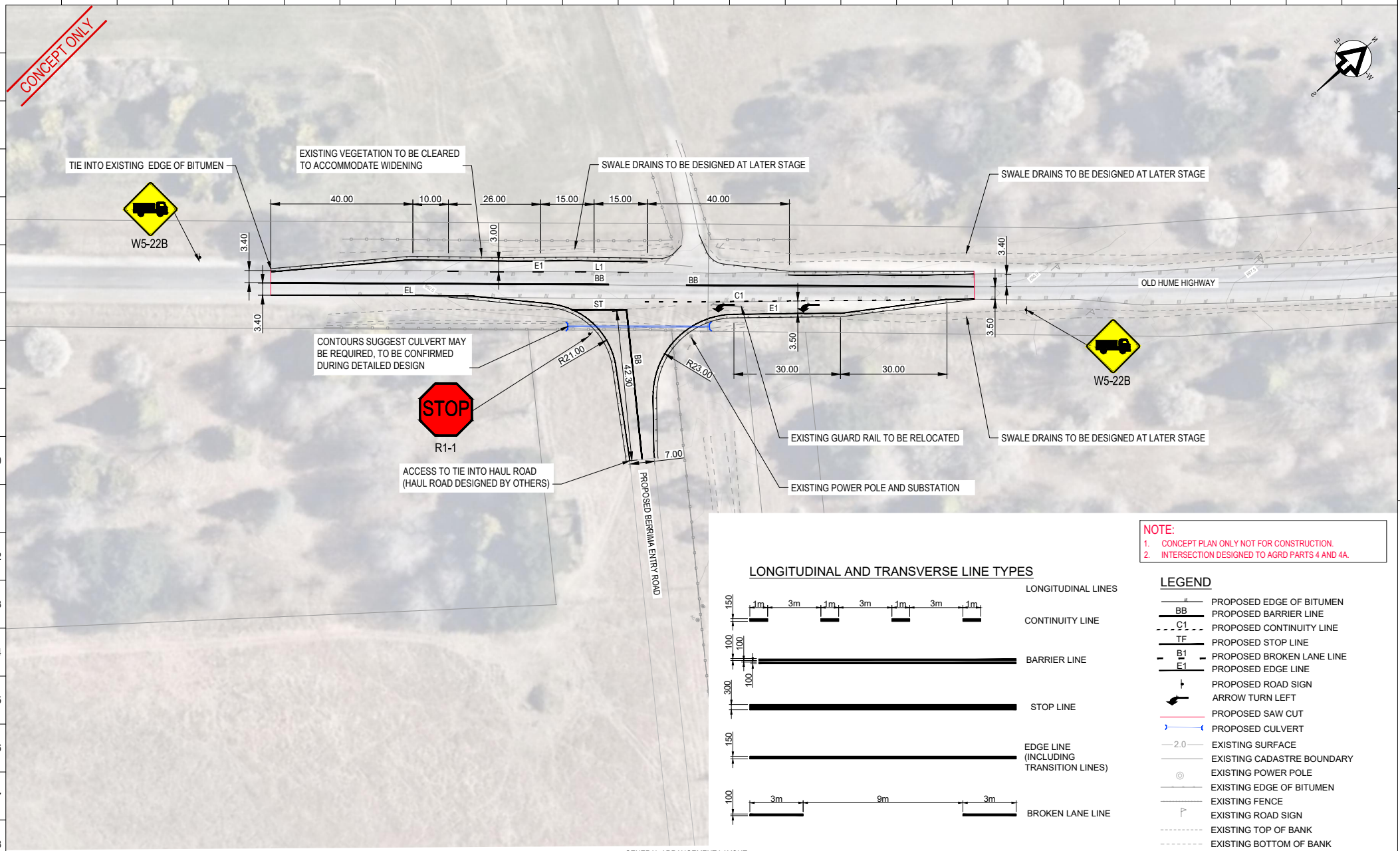
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Old Hume S														
2	T1	25	0	26	0.0	0.024	0.2	LOS A	0.1	0.7	0.11	0.15	0.11	75.6
3	R2	8	8	8	100.0	0.024	9.0	LOS A	0.1	0.7	0.11	0.15	0.11	50.5
Approach		33	8	35	24.2	0.024	2.3	NA	0.1	0.7	0.11	0.15	0.11	67.5
East: Site														
4	L2	8	8	8	100.0	0.021	4.3	LOS A	0.1	0.9	0.17	0.45	0.17	39.7
6	R2	9	9	9	100.0	0.021	4.9	LOS A	0.1	0.9	0.17	0.45	0.17	39.0
Approach		17	17	18	100.0	0.021	4.6	LOS A	0.1	0.9	0.17	0.45	0.17	39.4
North: Old Hume N														
7	L2	9	9	9	100.0	0.035	8.8	LOS A	0.0	0.0	0.00	0.10	0.00	41.6
8	T1	49	0	52	0.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	77.7
Approach		58	9	61	15.5	0.035	1.4	NA	0.0	0.0	0.00	0.10	0.00	68.4
All Vehicles		108	34	114	31.5	0.035	2.2	NA	0.1	0.9	0.06	0.17	0.06	61.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX F

Concept Civil Drawings of the New Haul Road Access

CONCEPT ONLY



GENERAL ARRANGEMENT LAYOUT
SCALE 1: 500

LONGITUDINAL AND TRANSVERSE LINE TYPES

NOTE:
1. CONCEPT PLAN ONLY NOT FOR CONSTRUCTION.
2. INTERSECTION DESIGNED TO AGRD PARTS 4 AND 4A.

LEGEND

- PROPOSED EDGE OF BITUMEN
- BB PROPOSED BARRIER LINE
- C1 PROPOSED CONTINUITY LINE
- TF PROPOSED STOP LINE
- B1 PROPOSED BROKEN LANE LINE
- E1 PROPOSED EDGE LINE
- PROPOSED ROAD SIGN
- ARROW TURN LEFT
- PROPOSED SAW CUT
- PROPOSED CULVERT
- 2.0 EXISTING SURFACE
- EXISTING CADASTRE BOUNDARY
- EXISTING POWER POLE
- EXISTING EDGE OF BITUMEN
- EXISTING FENCE
- EXISTING ROAD SIGN
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK

CONSULTANT PROJECT

FULL SIZE ON ORIGINAL 0 10 20 40 60 80 100 A1

PLOT DATE Fri Oct 29 12:44:35 2021

REVISIONS			
1	29.10.2021	PRELIMINARY ISSUE	WP
	DATE	DESCRIPTION	

Responsible Principal Signature | Date

DRAWN: WP	DATE: 20.10.2021
DESIGN: WP	DATE: 20.10.2021
DRG. CHECK: LG	DATE: 28.10.2021
DES. CHECK:	DATE:

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NSW 2500
AUSTRALIA
T: 61 2 4249 1000
www.slrconsulting.com

DIAL 1100 BEFORE YOU DIG

0.0 5.0 10 15 20 METRES
SCALE 1:500

FOR REVIEW

CLIENT: BORAL

PROJECT: PROPOSED BERRIMA ENTRY ROAD INTERSECTION

DRAWING TITLE: GENERAL ARRANGEMENT LAYOUT

A1	DO NOT SCALE THIS DRAWING IF IN DOUBT ASK	SCALE: 1:500	DRAWING NUMBER: 660.30143-CI-SK001	ISSUE: 1

\\au.slr.local\Corporate\Projects-SLR\660-Srv\WOL\660-WOL\660.30127.00000 Berrima Cement SSD\08 Transport Advisory\03 CAD\Civil\660.30127-CI-SK001.dwg

CONCEPT ONLY

VEHICLE SWEPT PATH ANALYSIS LAYOUT
SCALE 1: 500

NOTE:
1. CONCEPT PLAN ONLY NOT FOR CONSTRUCTION.

B-DOUBLE 26M

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

CONSULTANT PROJECT

FULL SIZE ON ORIGINAL 0 10 20 40 60 80 100 A1

PLOT DATE
Fri Oct 29 12:46:54 2021

	REVISIONS			
	1	29.10.2021	PRELIMINARY ISSUE	WP
		DATE	DESCRIPTION	

Responsible Principal Signature | Date

DRAWN:	WP	DATE: 20.10.2021
DESIGN:	WP	DATE: 20.10.2021
DRG. CHECK:	LG	DATE: 28.10.2021
DES. CHECK:		DATE:

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DIAL 1100 BEFORE YOU DIG

0.0 5.0 10 15 20 METRES
SCALE 1:500

FOR REVIEW

CLIENT: BORAL

PROJECT: PROPOSED BERRIMA ENTRY ROAD INTERSECTION

DRAWING TITLE: VEHICLE SWEPT PATH ANALYSIS LAYOUT SHEET 1

A1	DO NOT SCALE THIS DRAWING IF IN DOUBT ASK	SCALE: 1:500	DRAWING NUMBER: 660.30143-CI-SK002	ISSUE: 1

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CONCEPT ONLY

VEHICLE SWEPT PATH ANALYSIS LAYOUT
SCALE 1: 500

NOTE:
1. CONCEPT PLAN ONLY NOT FOR CONSTRUCTION.

B-DOUBLE 26M

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

CONSULTANT PROJECT

FULL SIZE ON ORIGINAL A1

PLOT DATE
Fri Oct 29 12:27:24 2021

	REVISIONS			
1	29.10.2021	PRELIMINARY ISSUE		WP
	DATE	DESCRIPTION		

Responsible Principal Signature | Date

DRAWN:	WP	DATE:	20.10.2021
DESIGN:	WP	DATE:	20.10.2021
DRG. CHECK:	LG	DATE:	28.10.2021
DES. CHECK:		DATE:	

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NSW 2500
AUSTRALIA
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www.slrconsulting.com

DIAL 1100 BEFORE YOU DIG

0.0 5.0 10 15 20 METRES
SCALE 1:500

FOR REVIEW

CLIENT: BORAL

PROJECT: PROPOSED BERRIMA ENTRY ROAD INTERSECTION

DRAWING TITLE: VEHICLE SWEPT PATH ANALYSIS LAYOUT SHEET 2

A1	DO NOT SCALE THIS DRAWING IF IN DOUBT ASK	SCALE: 1:500	DRAWING NUMBER: 660.30143-CI-SK003	ISSUE: 1

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