



1075 HEIDELBERG-KINGLAKE ROAD, HURSTBRIDGE

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Attachment 1 Revised Traffic Impact
Assessment

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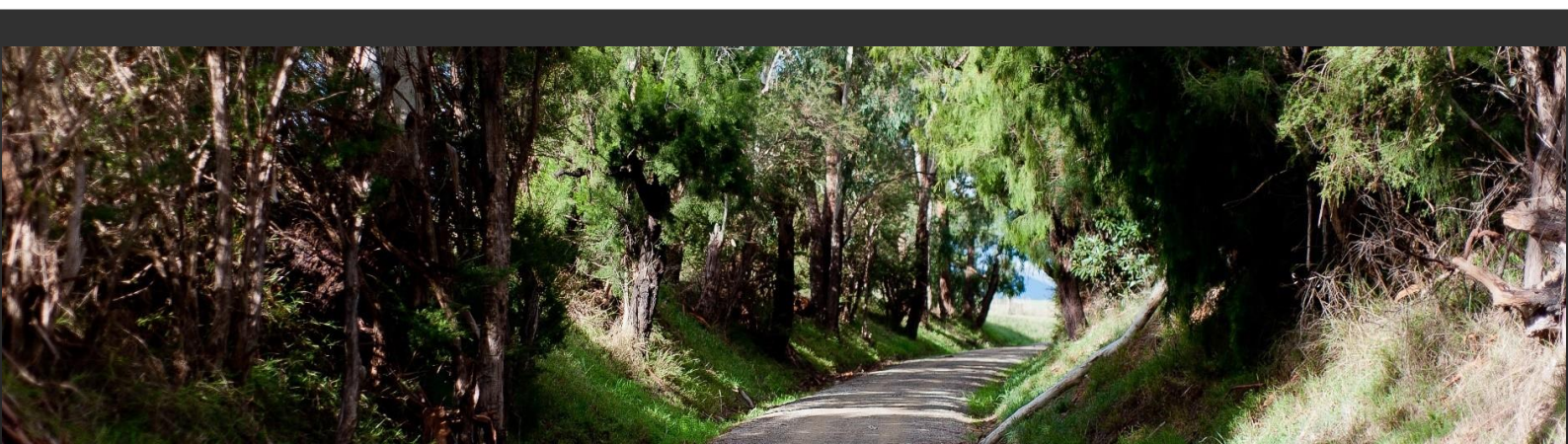
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1075 Heidelberg-Kinglake Road, Hurstbridge

Transport Impact Assessment



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12 November 2021

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DOCUMENT INFORMATION

Prepared for	Tract		
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Signature		Signature	

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1 INTRODUCTION

onemilegrid has been requested by Tract to undertake a Transport Impact Assessment of the proposed school at 1075 Heidelberg-Kinglake Road, Hurstbridge.

The subject site is currently operating with a number of uses on the site, including restaurant, function space and a nursery. The proposed school use will use portable buildings and existing buildings on the site for the operation, and there are no proposed changes to the existing car parking and vehicle access.

This assessment will review the additional parking and traffic impacts associated with the proposed additional use of the school on the site and continued operation of the existing uses.

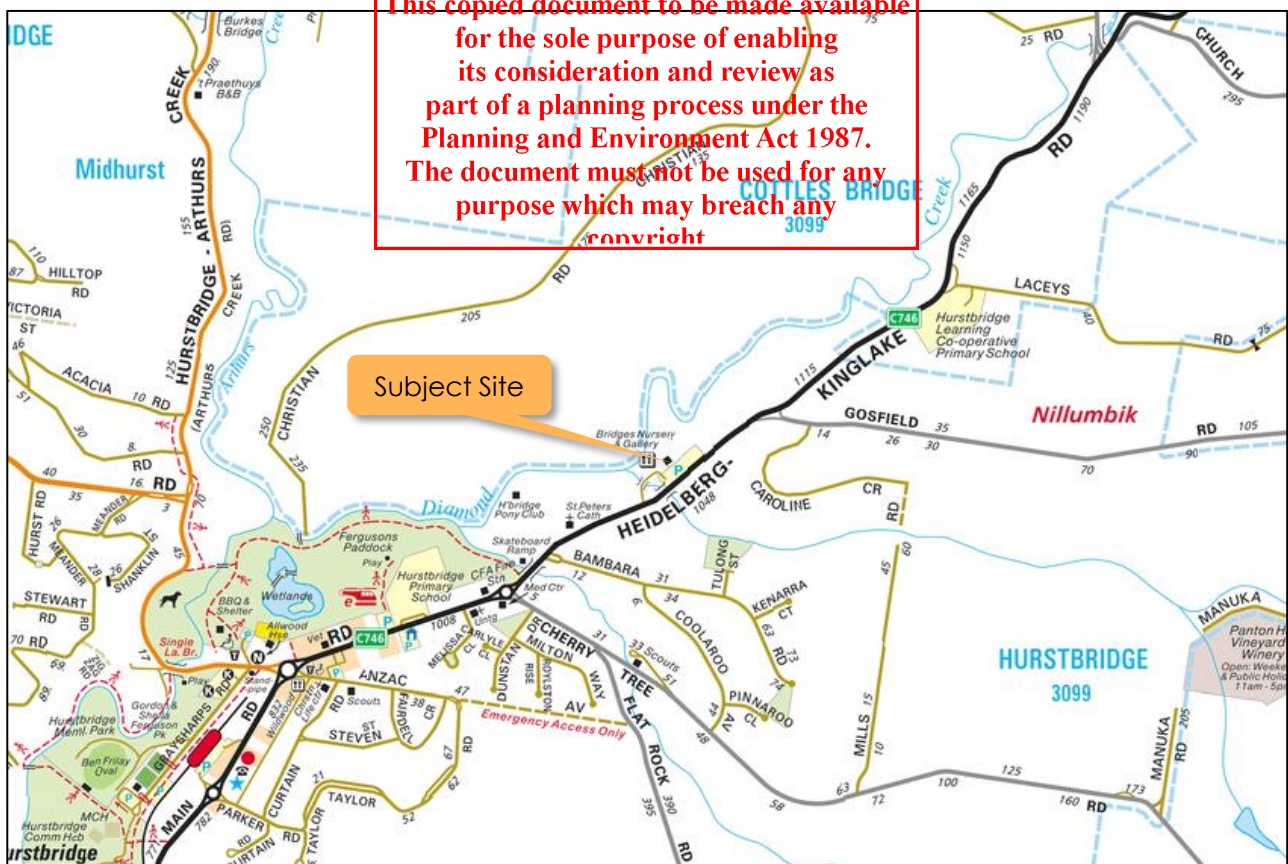
As part of this assessment the subject site has been inspected with due consideration of the development proposal, traffic data has been sourced and relevant background reports have been reviewed.

2 EXISTING CONDITIONS

2.1 Site Location

The subject site is located at 1075 Heidelberg-Kinglake Road, Hurstbridge, as shown in Figure 1.

Figure 1 Site Location



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The site is currently occupied by two dwellings and a restaurant/function centre and nursery operated by Bridges. The site is densely populated with trees, particularly along Diamond Creek at the north of the site.

The existing Bridges site, occupied by a nursery, restaurant, and function centre, operates during the following periods:

- Nursery: Tuesday to Sunday, between 9:00am-4:00pm
- Restaurant: Wednesday to Saturday between 9:00am-9:00pm and Sunday 9:00am-5:00pm
- Function Centre: As booked on Weekends

The restaurant and function centre operate with a maximum shared capacity of 150 patrons. The nursery operates with a total site area of approximately 1,200 m².

Bridges provides a car park with three pick-up / drop-off spaces, 14 line marked spaces, and approximately 47 unmarked spaces, equating to a total of 61 car parking spaces. Furthermore, overflow parking is available at the rear of the car park. Vehicle access to Bridges is provided via a two-way crossover to Heidelberg-Kinglake Road.

Land use in the immediate vicinity of the site is generally occupied by green wedge land, with some housing in the area. Diamond Creek runs along the north boundary of the site.

An aerial view of the subject site is provided in Figure 2.

Figure 2 Site Context (2 November 2020)



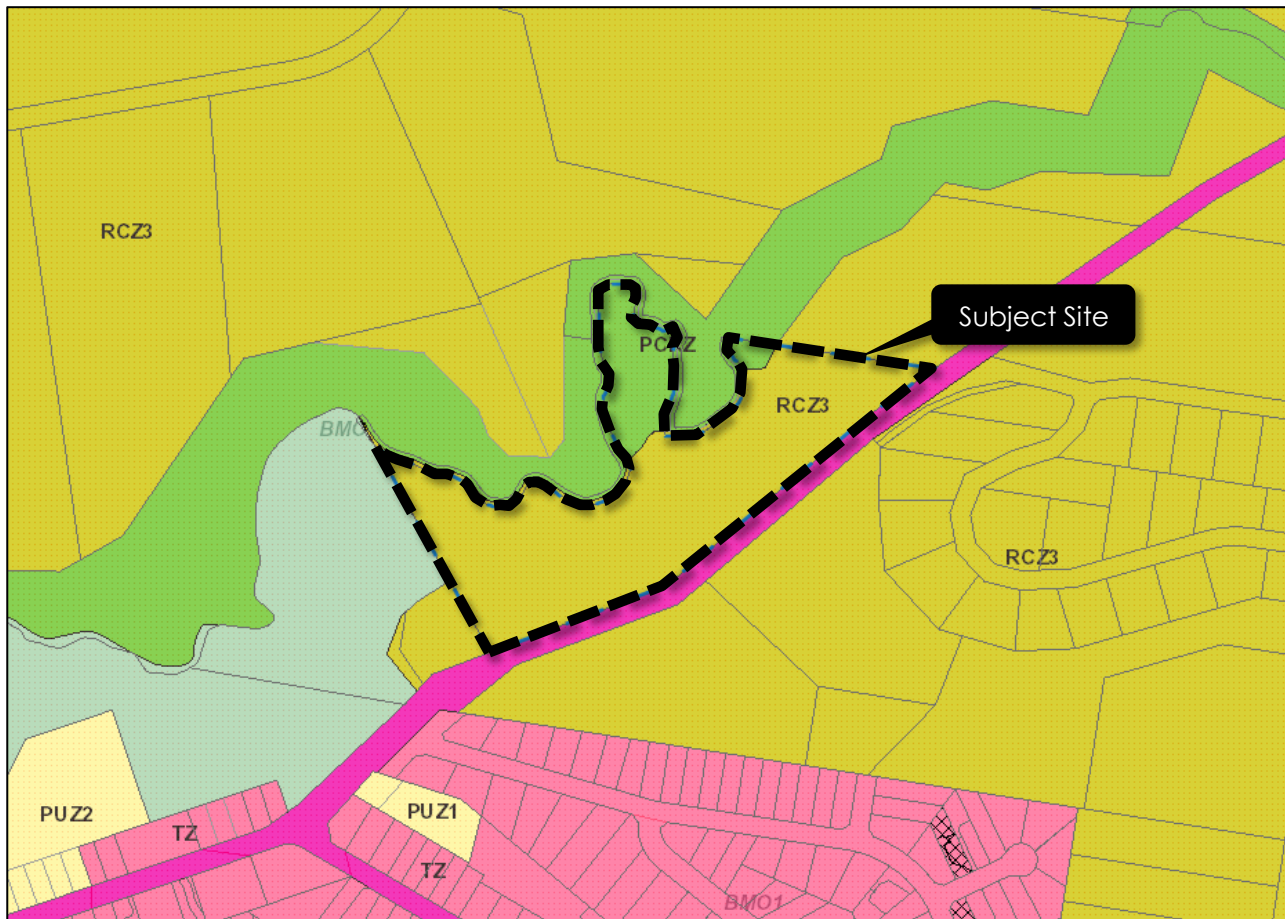
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2.2 Planning Zones and Overlays

It is shown in Figure 3 that the site is primarily located within a Rural Conservation Zone (RCZ), with a small portion at the north of the site located within a Public Conservation and Resource Zone (PCRZ). The site is subject to a Bushfire Management Overlay, an Environmental Significance Overlay, and a Land Subject to Inundation Overlay. Additionally, the site abuts Heidelberg-Kinglake Road, which is within a Road Zone (RDZ1).

Figure 3 Planning Scheme Zones



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2.3 Road Network

2.3.1 Heidelberg-Kinglake Road

Heidelberg-Kinglake Road is an arterial road generally aligned east-west in the vicinity of the site, running between Whittlesea-Kinglake Road and Healesville-Kinglake Road in the north, and Main Hurstbridge Road in the south. Heidelberg-Kinglake Road provides a single unshouldered traffic lane in each direction adjacent to the site, with a left turn deceleration lane provided for entry to the site.

An 80km/h speed limit applies to Heidelberg-Kinglake Road in the vicinity of the site.

2.4 Traffic Volumes

Traffic volume information for Heidelberg-Kinglake Road adjacent to the site was obtained via the Department of Transport (VicRoads) Traffic Profile Viewer. The data indicates that Heidelberg-Kinglake Road carries the following approximate traffic volumes between Cottles Bridge-Strathewen Road and Cherry Tree Road.

Table 1 Existing Traffic Volumes

<i>Direction</i>	<i>AM Peak (8:00am)</i>	<i>PM Peak (4:00pm)</i>
North-eastbound	84	225
South-westbound	223	130
Total	307	355

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2.5 Sustainable Transport

2.5.1 Bicycle Connections – Strava

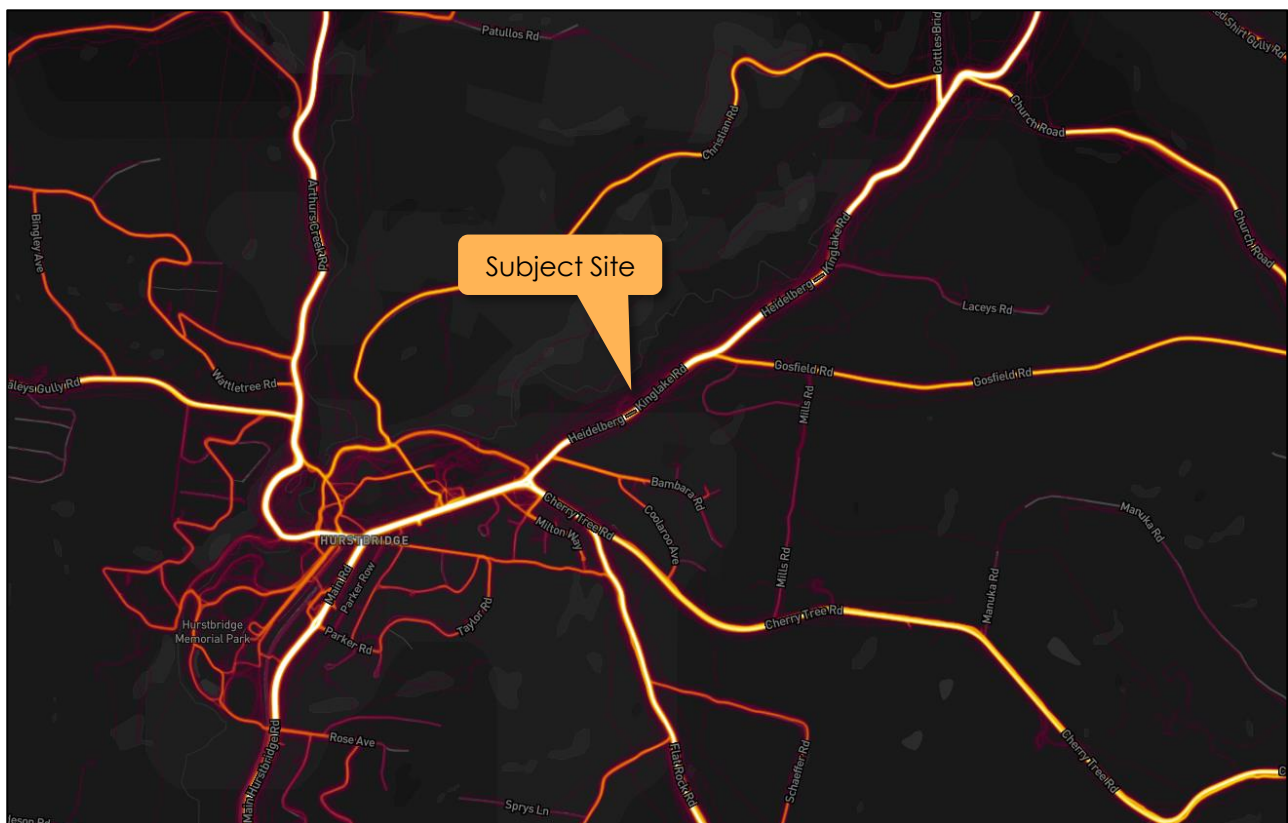
Strava is a social network and training tool for cyclists, runners and swimmers. Users record their physical activity using a dedicated GPS device or utilise the mobile app, and upload the file to their profile.

Strava anonymised this information and makes it available through their “Global Heatmap” tool, showing aggregated all public activities over the last two years across the world.

A view of the cycling heatmap in proximity to the study area is provided below in Figure 4. Routes of higher usage are brighter in colour.

As shown below, Heidelberg-Kinglake Road is heavily utilised by cyclists, providing a connection between the site and Hurstbridge Railway Station.

Figure 4 Strava Cycling Heatmap



It is noted that this information includes all cycling activities recorded on the platform, inclusive of weekend trips, and all trips throughout the day. Additionally, the data is skewed towards sports cyclists, given that the bulk of commuter and recreational cyclists will not be tracking their rides.

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2.5.2 Public Transport

Public transport in the vicinity of the site is limited to the Hurstbridge Line and the Route 343 bus which runs from Hurstbridge - Greensborough via Diamond Creek Station. The closest stops are located at Hurstbridge Station, approximately 1.3 km south-west of the site.

3 DEVELOPMENT PROPOSAL

3.1 General

It is proposed to change the use of the site for the purposes of a small independent school. The school is proposed to operate with core staff times between 8:30am and 4:00pm with no provision for before or after school care. Proposed student and staff numbers are shown in Table 2.

Table 2 Proposed Development

Component	No. Students	No. Staff
Junior School (Prep-6)	65	20
Senior School (7-12)	65	

No regular bus service is proposed for the school, however, it is expected that a bus may be required for infrequent use. Swept paths have been prepared and are attached within Appendix B demonstrating a 14.5 metre bus circulating the site, including turning around within the car park.

No changes are proposed to the existing access and car park design, with the exception of the removal of three spaces to provide for bicycle parking and the marking of parking spaces. The site will continue to operate with 58 at-grade car parking spaces, in addition to a pick-up / drop-off area. There is room for overflow parking east of the gravel car parking area.

It is noted that the accessible parking spaces have been updated to reflect the requirements of the Australian Standard for Off-Street Car Parking AS2890.1. Specifically, they are provided with a length of 5.4 metres, and a width of 2.4 metres, and an adjacent shared area of the same dimensions

A total of 16 bicycle parking spaces are proposed on-site in the gravel car parking area.

3.2 Waste Management

It is proposed to utilise a private contractor to manage the collection and disposal of all waste streams associated with the development. The waste collection vehicle will enter the car park and prop near the bin storage area for collection. The private contractor will collect the bins directly from the bin storage area, and immediately return them following collection.

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4 DESIGN ASSESSMENT

4.1 General

There are no major changes to the existing layout of the car parking areas, with the exception of line marking and installation of plastic caps to delineate parking spaces, and the introduction of the bicycle parking facilities. The perpendicular parking spaces include minimum dimensions of 2.6m wide, 4.9m long and aisle widths of 6.4m.

The angled parking spaces include similar appropriate dimensions.

There are no proposed changes to the surfaces of the parking areas, with the exception of the introduction of the line marking within the asphalt area and the plastic caps within the gravel area.

A Concept Layout Plan has been prepared detailing the existing parking facilities and proposed changes, which is included as Appendix A.

A Swept Path Assessment has also been undertaken to demonstrate vehicle access to the site, confirming that concurrent B99 design vehicles can enter and exit the site. The Swept Path Assessment is provided as Appendix B.

4.2 Clause 52.29 – Land Adjacent to a Road Zone, Category 1

The development proposal is subject to the requirements of Clause 52.29 of the Nillumbik Planning Scheme which applies to land adjacent to a Road Zone Category 1 (Heidelberg-Kinglake Road) and aims to ensure appropriate access is provided to identified roads.

Relevant to the proposed development, the Clause states that a permit is required to create or alter access to a road in a Road Zone Category 1, and that the proposal is to be referred to the relevant referral authority (in this case, the Department of Transport (VicRoads)).

Before deciding on the appropriateness or otherwise of an application to alter access to the Road Zone, the responsible authority must consider the following:

- The Municipal Planning Strategy and the Planning Policy Framework.
- The views of the relevant road authority.
- The effect of the proposal on the operation of the road and on public safety.
- Any policy made by the relevant road authority pursuant to Schedule 2, Clause 3 of the Road Management Act 2004 regarding access between a controlled access road and adjacent land.

The proposed development does not propose a physical alteration of the existing Heidelberg-Kinglake Road access, but rather a moderate intensification of use of the site.

The proposed school is expected to generate no more than 41 trips for any one movement during the peak hour period. This equates to approximately two trips every three minutes. Even when focussed into one access point, the traffic volumes generated by the proposed school are very low and are expected to be easily absorbed into the surrounding road network.

In light of the above, it is considered that the proposed development will satisfy the requirements of Clause 52.29.

4.3 Bicycle Parking

Bicycle parking spaces have been designed in accordance with the Australian Standards; specifically, they are provided with a width of 0.5 metres and a length of 1.8 metres, accessed via a 1.5m aisle.

The proposed bicycle parking location and layout is detailed in the Concept Layout Plan within Appendix A.

5 WASTE MANAGEMENT

5.1 Expected Waste Generation

Based on typical waste generation rates published by Sustainability Victoria, the proposed development is expected to generate garbage and recycling at rates of 1.5L per student per week, and 0.45L per student per week respectively. Furthermore, in May 2015, the EPA NSW published the results of a waste audit, which examined the composition of waste disposed of by commercial and industrial properties. Based on the findings, it is expected that 10% of garbage generated by the proposed development would comprise organic waste.

The expected waste generation is shown in Table 3.

Table 3 Expected Waste Generation

Waste Stream	Rate/Student/Week	No. Students	Expected Waste/Week
Garbage	1.35 litres	130	175 litres
Organics	0.15 litres		20 litres
Recycling	0.5 litres		65 litres

5.2 Bin Requirements

5.2.1 Bin Provision

Based on the above waste generation rates, two 240 litre bins will be required for weekly waste collection, including one each for garbage and recycling.

Further to the above, it is proposed to provide a composting system on-site, managed by the operator. Waste product from the compost system will then be used on garden areas.

5.2.2 Bin Storage

Bins will be stored in a storage area located between the two gravel car parking areas, which is capable of accommodating two x 240 litre bins. The proposed bin storage area is included on the Concept Layout Plan provided as Appendix A.

Furthermore, the bin storage area is located appropriately for access by staff, and is separated from the common areas. The bin storage room should be vermin proof, and have appropriate ventilation, lighting and drainage.

5.2.3 Bin Collection

On collection days, the private contractor will enter the site and prop near the bin storage area for collection. The bins will be collected directly from the bins storage area and replaced immediately after collection. Following collection, the waste vehicle will use the car park to turn around and exit the site in a forward direction.

Collection will occur outside of school operating hours via an 8.8 metre waste truck to ensure car spaces are available.

6 LOADING CONSIDERATIONS

Clause 65 (Decision Guidelines) of the Nillumbik Planning Scheme identifies that "Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate: The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts."

Considering the proposed use of the site as a school, it is not considered necessary to provide an on-site loading bay. It is expected that the majority of deliveries will occur via small vans and utility vehicles, which can utilise the existing on-site car park or drop-off / pick-up area.

The provision for loading is therefore considered appropriate for the proposed use.

7 BICYCLE PARKING CONSIDERATIONS

The bicycle parking requirements for the subject site are identified in Clause 52.34 of the Nillumbik Planning Scheme, which specifies the following requirements for the proposed school use.

Table 4 Clause 52.34 – Bicycle Parking Requirements

Component	No/Area	Requirement	Total
Primary school	10 staff	1 space per 20 employees	-
	19 students over year 4	1 space per 5 pupils (over year 4)	3
Secondary school	10 staff	1 space per 20 employees	-
	65 students	1 space per 5 pupils	13
Total			16

It is proposed to provide 16 bicycle parking spaces on-site, in accordance with the above requirements.

The provision for bicycle parking is therefore considered appropriate.

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8 CAR PARKING CONSIDERATION

8.1 Statutory Car Parking Requirements

The car parking requirements for the subject site are identified in Clause 52.06 of the Nillumbik Planning Scheme, which specifies the following requirements for the different components of the proposed development.

Table 5 Clause 52.06 – Car Parking Requirements

Use	No/Area	Rate	Car Parking Measure	Total
Primary school	10	1	to each employee that is part of the maximum number of employees on the site at any time	10
Secondary school	10	1.2	to each employee that is part of the maximum number of employees on the site at any time	12
Total				22

Based on the above calculations, a total of 22 parking spaces are required for the proposed development.

It is proposed to provide a total of 58 car parking spaces, in addition to a drop-off / pick-up area, to service the proposed development, which is in excess of the Planning Scheme requirements outlined above.

The provision of car parking is therefore considered to be appropriate to satisfy the parking demands generated by the development.

8.2 Accessible Car Parking

The Building Code of Australia (BCA) specifies the minimum requirements for provision of accessible car parking.

The proposed school, classified as a Class 9B building, requires provision of one accessible car spaces for every 100 car parking spaces or part thereof.

Noting the proposed provision of 58 car spaces on-site, the BCA requires at least one accessible car space on-site.

The proposed provision of two spaces thus satisfies the BCA requirements.

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9 TRAFFIC

9.1 Traffic Generation

The peak traffic generation periods for the proposed school use are expected to occur between 8:00am and 9:00am for the school drop off period, and between 3:00pm and 4:00pm for the school pick-up period.

The school use is proposed to operate with 130 students. With no school bus service provided, it is expected that 80% of students would travel to the school by car. Furthermore, considering the school is proposed to accommodate students between years prep to 12, it is expected that a number of siblings would attend the school. Therefore, it will be assumed that each vehicle carries an average of 1.8 students.

Based on the above, the site is expected to generate up to 116 vehicle movements during each of the peak hours, comprising 58 vehicles entering and exiting the site during each peak hour period.

The traffic generation for the site during the peak hour periods is shown below in Table 6.

Table 6 Traffic Generation

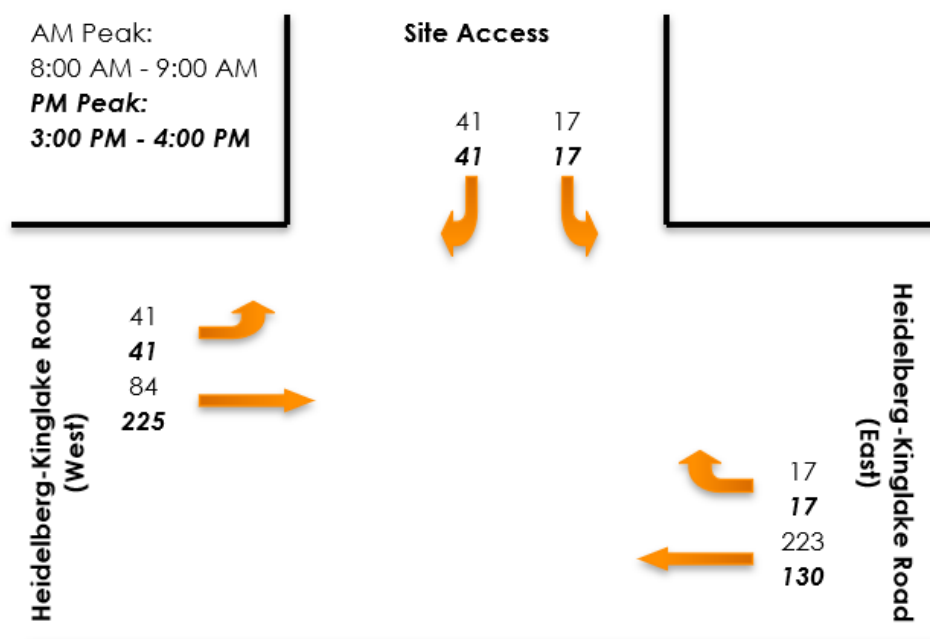
	Inbound	Outbound	Total
AM	58	58	116
PM	58	58	116

9.2 Traffic Distribution

Considering the location of the site, it is expected that 70% of traffic would travel to/from the site via the west, and 30% of traffic would travel to/from the site via the east.

Applying the expected traffic volumes generated by the proposed development to the existing traffic volumes provided on Heidelberg-Kinglake Road requires to the future site access traffic volumes detailed in Figure 5. To provide for a conservative assessment it has been assumed that the peak periods for the site align with the peak periods for Heidelberg-Kinglake Road.

Figure 5 Future Traffic Volumes



9.3 Traffic Impact

Reviewing the volumes above, it is noted that a maximum of 41 vehicle movements per hour are expected for any one movement, equivalent to approximately three trips every 2 minutes. Even focussed into one access point, the traffic volumes generated by the proposed development are low and are expected to be easily absorbed into the surrounding road network.

9.4 Pick-Up/Drop-Off

Pick-up and drop off is proposed to occur via the car park, and pick-up/drop-off area.

Vehicles dropping off students in the morning or picking up students in the afternoon will park in a space in the on-site car park, or prop in one of the pick-up/drop off area, while students enter or exit the cars. Following this, the vehicles will exit the site in a forward direction.

9.5 Austroads Turn Lane Warrants

A review of the post-development traffic volumes against the Austroads turn lane warrants suggests that a short auxiliary left-turn treatment and a short channelised right-turn treatment may be warranted. These warrants effectively balance the additional construction cost of higher-order treatments against the reduction in estimated crash costs.

Under existing conditions, a left turn deceleration lane of approximately 40 metres is provided.

Commentary within the associated Austroads Guide to Traffic Management Part 6 does however note that these warrants are based on the construction of intersections on new roads (i.e., greenfield sites), are not intended for direct application for property accesses and driveways. As the site is an existing access driveway, this does not strictly apply.

To further review the appropriateness of the existing access under future conditions, the traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

9.5.1 Intersection Capacity Assessment

The SIDRA Intersection software package has been developed to provide information on the capacity of an intersection with regard to a number of parameters. Those parameters considered relevant are, Degree of Saturation (DoS), 95th Percentile Queue, and Average Delay as described below.

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Table 7 SIDRA Intersection Parameters

Parameter	Description														
Degree of Saturation (DoS)	The DoS represents the ratio of the traffic volume making a particular movement compared to the maximum capacity for that particular movement. The value of the DoS has a corresponding rating depending on the ratio as shown below.														
	<table><tr><th>Degree of Saturation</th><th>Rating</th></tr><tr><td>Up to 0.60</td><td>Excellent</td></tr><tr><td>0.61 – 0.70</td><td>Very Good</td></tr><tr><td>0.71 – 0.80</td><td>Good</td></tr><tr><td>0.81 – 0.90</td><td>Fair</td></tr><tr><td>0.91 – 1.00</td><td>Poor</td></tr><tr><td>Above 1.00</td><td>Very Poor</td></tr></table>	Degree of Saturation	Rating	Up to 0.60	Excellent	0.61 – 0.70	Very Good	0.71 – 0.80	Good	0.81 – 0.90	Fair	0.91 – 1.00	Poor	Above 1.00	Very Poor
	Degree of Saturation	Rating													
	Up to 0.60	Excellent													
	0.61 – 0.70	Very Good													
	0.71 – 0.80	Good													
	0.81 – 0.90	Fair													
	0.91 – 1.00	Poor													
Above 1.00	Very Poor														
It is noted that whilst the range of 0.91 – 1.00 is rated as 'poor', it is acceptable for critical movements at an intersection to be operating within this range during high peak periods, reflecting actual conditions in a significant number of suburban signalised intersections.															
Average Delay (seconds)	Average delay is the time delay that can be expected for all vehicles undertaking a particular movement in seconds.														
95th Percentile (95%ile) Queue	95%ile queue represents the maximum queue length in metres that can be expected in 95% of observed queue lengths in the peak hour														

The results of the analysis are provided in Table 8.

Table 8 Heidelberg-Kinglake Road / Site Access Future Conditions

Approach	Movement	DoS	Avg. Delay (sec)	Queue (m)
AM Peak				
Heidelberg-Kinglake Road (East)	Through	0.135	2.1	1.0
	Right Turn	0.135	7.2	1.0
Site Access (North)	Left Turn	0.067	5.4	1.8
	Right Turn	0.067	7.4	1.8
Heidelberg-Kinglake Road (West)	Left Turn	0.023	6.9	0.0
	Through	0.045	2.0	0.0
PM Peak				
Heidelberg-Kinglake Road (East)	Through	0.087	2.3	1.2
	Right Turn	0.087	7.8	1.2
Site Access (North)	Left Turn	0.072	5.9	1.9
	Right Turn	0.072	7.8	1.9
Heidelberg-Kinglake Road (West)	Left Turn	0.023	6.9	0.0
	Through	0.121	2.0	0.0

As shown above the intersection is projected to operate under excellent conditions with minimal queues and delays experienced by motorists. Of note, the average delay for vehicles turning right from Heidelberg-Kinglake Road into the site is 7.8 seconds, which is very low and considered appropriate without the provision of a right-turn deceleration lane.

In view of the foregoing, it is considered that the existing access arrangement is satisfactory.

10 CONCLUSIONS

It is proposed to change the use of the site for the purposes of a school operating with 130 students and 20 staff.

Considering the analysis presented above, it is concluded that:

- The proposed car parking and access design will not be altered from the existing conditions, and is therefore considered appropriate
- The proposed provision of no formal bicycle parking is considered appropriate
- The proposed supply of car parking is appropriate for the proposed development
- The proposed development is expected to have a negligible impact on the surrounding road network when compared to the existing operation
- The existing access arrangement can comfortably accommodate the traffic expected to be generated by the site, and no access treatment is required

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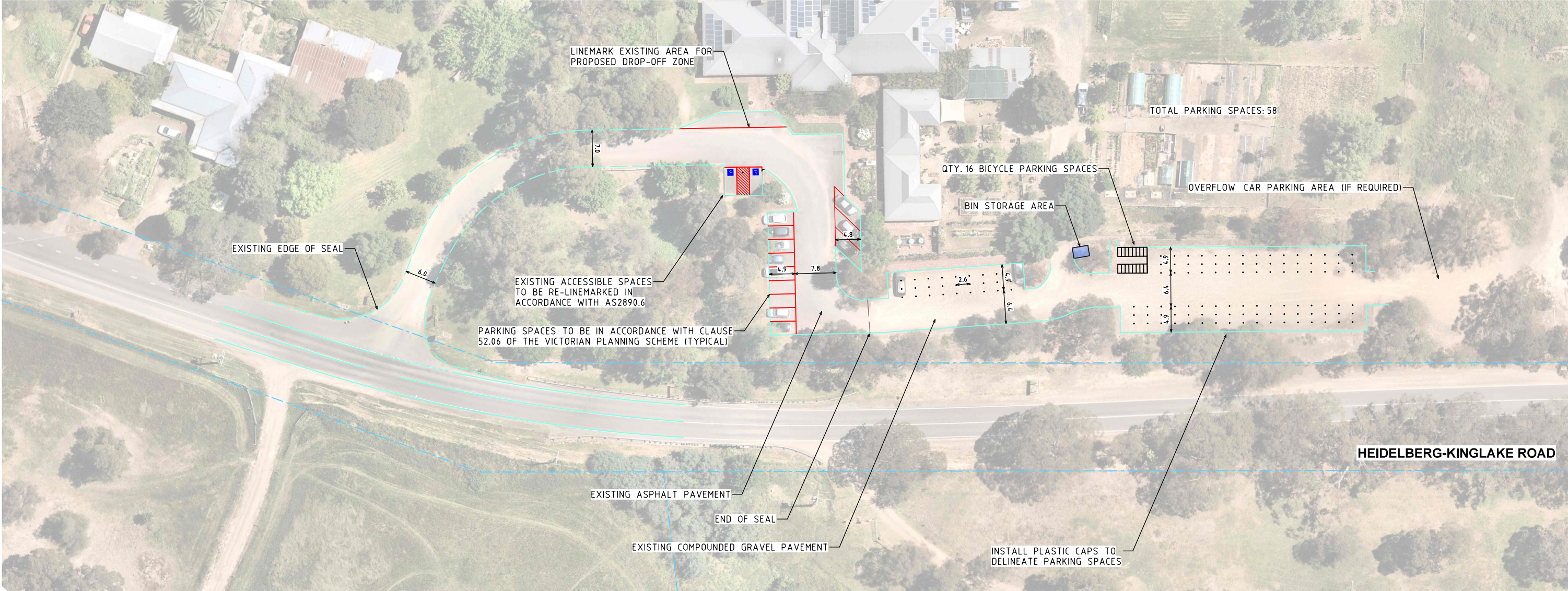
Appendix A *Concept Layout Plan*

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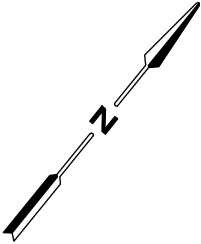
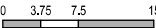
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GENERAL NOTES

1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL UNLESS NOTED.
2. SIGNS AND LINE MARKING TO BE INSTALLED IN ACCORDANCE WITH VICROADS SUPPLEMENT TO AS1742.2.
3. BICYCLE FACILITY SIGNS AND LINE MARKING TO BE INSTALLED IN ACCORDANCE WITH AS1742.9.
4. ADOPT VICROADS SUPPLEMENT TO AUSTRALIAN STANDARDS AS REQUIRED.
5. REMOVE ALL REDUNDANT SIGNS AND LINE MARKING.



Scale 1:750 @ A3



Drawing Title
1075 HEIDELBERG-KINGLAKE ROAD, JURSTBRIDGE
CAR PARKING LAYOUT AND ACCESS ROAD
CONCEPT LAYOUT PLAN

Designed DK	Approved JMS	Metway Ref 263 B7
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Project Number 210606	Drawing Number CLP103	Revision A
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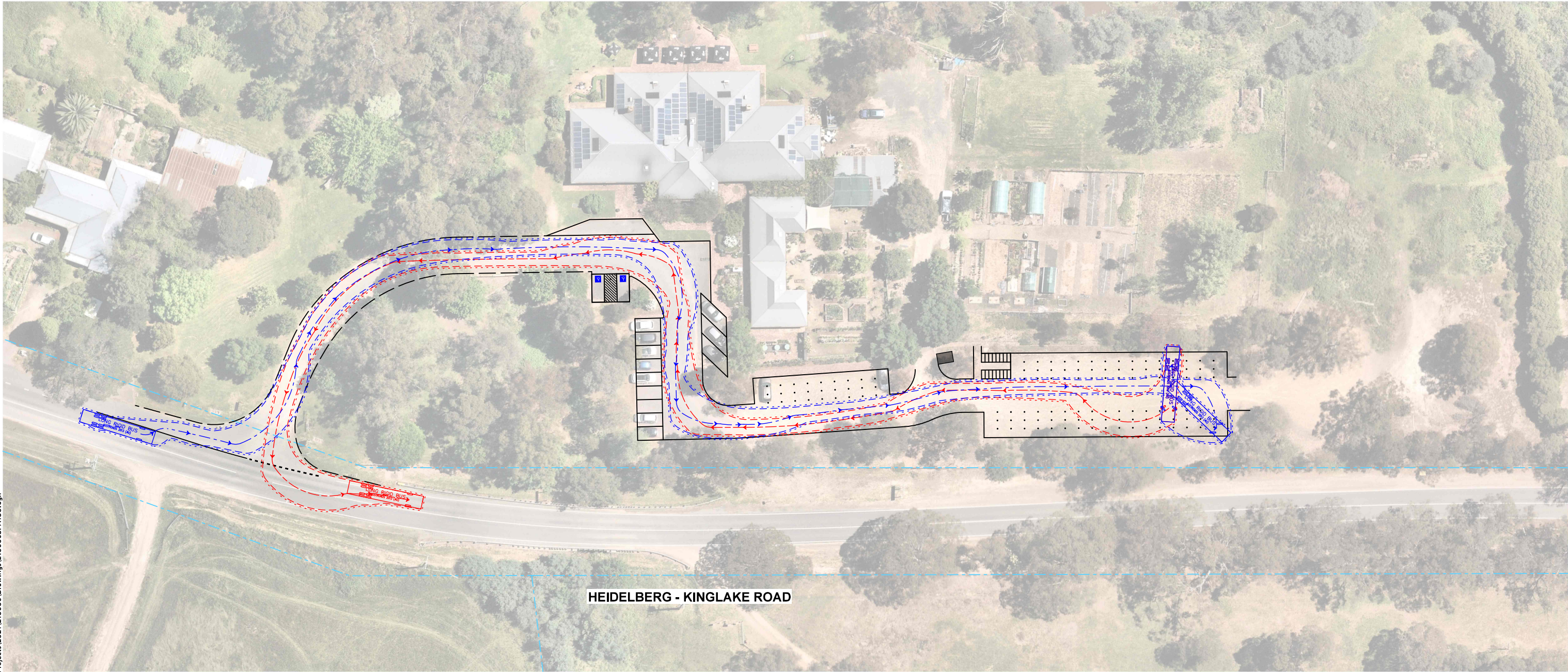
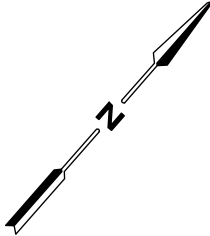
Appendix B *Swept Path Diagrams*

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**ADVERTISED
PLAN**

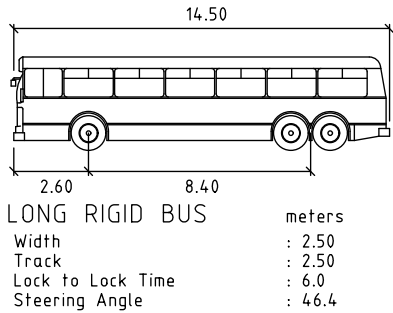


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HEIDELBERG - KINGLAKE ROAD

ADVERTISED PLAN



LONG RIGID BUS		metres
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	46.4

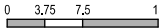
SWEPT PATH LEGEND

- DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED

Aerial Photography
Aerial photography provided by Nearmap



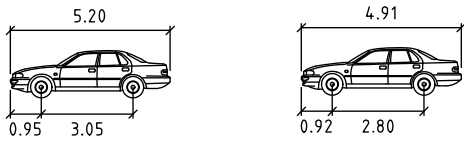
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Drawing Title
1075 HEIDELBERG-KINGLAKE ROAD, HURSTBRIDGE
SITE VEHICLE ACCESS
SWEPT PATH ANALYSIS

Designed	Approved	Metway Ref
DK	JMS	263 B7

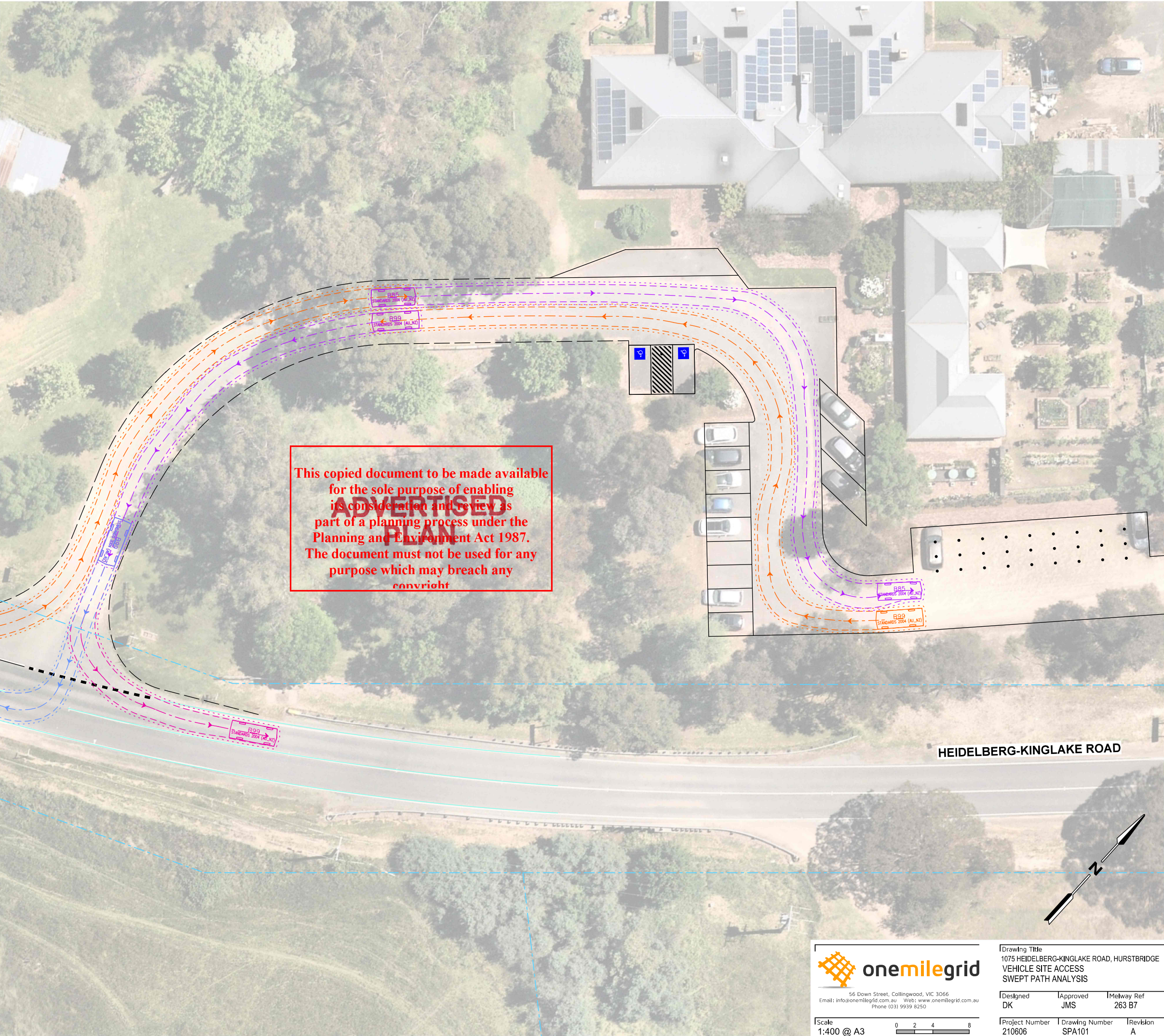
Project Number	Drawing Number	Revision
210606	SPA100	B



B99	meters	B85	meters
Width	: 1.94	Width	: 1.87
Track	: 1.84	Track	: 1.77
Lock to Lock Time	: 6.0	Lock to Lock Time	: 6.0
Steering Angle	: 33.9	Steering Angle	: 34.1

SWEPT PATH LEGEND

----- DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
..... 300mm CLEARANCE ENVELOPE SHOWN DOTTED



CAD File: N:\Projects\2021\210606\Drawings\210606SPA101.dgn

Date Plotted: 12-11-2021 12:05:07



Scale
1:400 @ A3

0 2 4 8

Drawing Title
1075 HEIDELBERG-KINGLAKE ROAD, HURSTBRIDGE
VEHICLE SITE ACCESS
SWEPT PATH ANALYSIS

Designed DK	Approved JMS	Metway Ref 263 B7
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Project Number 210606	Drawing Number SPA101	Revision A
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