SSD 10291
St Luke's Grammar School, Dee Why

Proposed Senior School Campus & Sports Centre

TRAFFIC AND PARKING ASSESSMENT REPORT

9 June 2020

Ref 19090

VARGA TRAFFIC PLANNING Pty Ltd
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1.0 INTRODUCTION

This report has been prepared to accompany an Environmental Impact Statement to the *NSW Department of Planning* for the proposed staged expansion of the school facilities at the *St Luke's Grammar School, Dee Why* (Figures 1 and 2).

The existing *St Luke's Grammar School* comprises a pre-school and K-Year 12 co-educational school located at No. 210 Headland Road. It currently has a maximum enrolment of 1022 students, with approval to increase to 1092 students and 125 full-time equivalent staff (MOD 2018/0412, approved 26 June 2019).

1.1 Project Summary

St Luke's Grammar School proposes to expand its existing facilities to incorporate No. 224 Headland Road as a *sports centre*, and No. 800 Pittwater Road as a designated *senior campus* for Year 10-12 students only. The proposed expansion will involve *adaptive re-use* of the existing buildings on the sites.

The proposed development will result in a significantly *less intensive* use of the site in traffic terms when compared with the existing commercial uses of the site. Surveys indicate that daily traffic flows generated by the site will be reduced from more than 2931 vehicles per day to 740 vehicles per day after the senior school campus is fully developed.

Car parking on the *senior campus* site will also be reduced as the commercial tenants vacate the site, from 182 parking spaces at present, to 131 spaces whilst Office Works remains on the site, and then down to 91 spaces when the senior school campus is fully developed.

The *sports centre* proposed at 224 Headland Road will also result in a *less intensive* use of the site in traffic terms, with daily traffic flows expected to be reduced from 201 vehicles per day to 78 vehicles per day, with car parking on the site to be reduced from 45 parking spaces to 39 parking spaces.

1.2 Projected Enrolment

The proposed expansion of *St Luke's Grammar School* has been designed to accommodate future-focused principles of learning and to meet projected enrolment growth, recognising increasing demand in the local catchment area. The design has been developed through comprehensive consultation with the school.

The expanded school will ultimately have a capacity of 1600 students comprising:

- 1000 pre-school to Year 9 students, with 120 staff at 210 Headland Road, and
- 600 Year 10-12 students, with 60 staff at 800 Pittwater Road.

The *sports centre* proposed at No. 224 Headland Road will be shared by both school campuses.

The proposed development will be undertaken in three stages as follows:

- Stage 1: sports centre at 224 Headland Road commencing mid-2022
- Stage 2: senior school campus at 800 Pittwater Road commencing mid-2025
- Stage 3: senior school campus at 800 Pittwater Road commencing mid-2029.

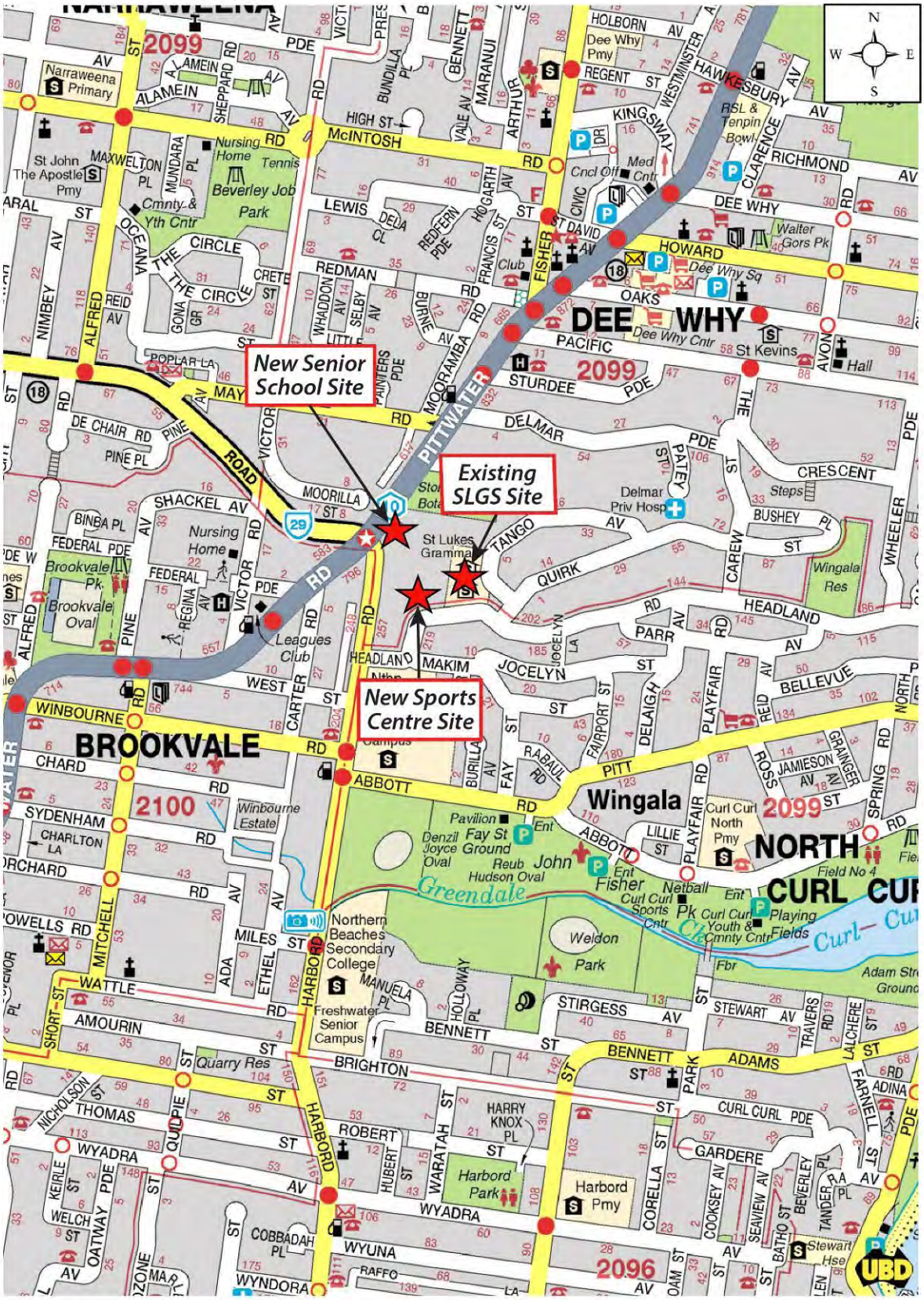
Enrolments at the new senior school campus are expected to increase incrementally as students progress through the school years towards Year 12, and to suit site availability.

1.3 Purpose of this Report

The purpose of this report is to assess the traffic and parking implications of the proposed development and to that end this report:

- describes the site and provides details of the development proposal

- reviews the road network in the vicinity of the site
- reviews the school bus and other public transport/bus services in the vicinity of the site
- reviews the results of traffic surveys conducted at the existing school, at the two commercial sites which are the subject of this application, and at the two nearby intersections nominated by TfNSW and the RMS
- estimates the traffic generation potential of the development proposal
- assesses the traffic implications of the development proposal in terms of road network capacity
- reviews the geometric design features of the proposed car parking facilities for compliance with the relevant codes and standards
- assesses the adequacy and suitability of the quantum of off-street car parking and loading provided on the site.



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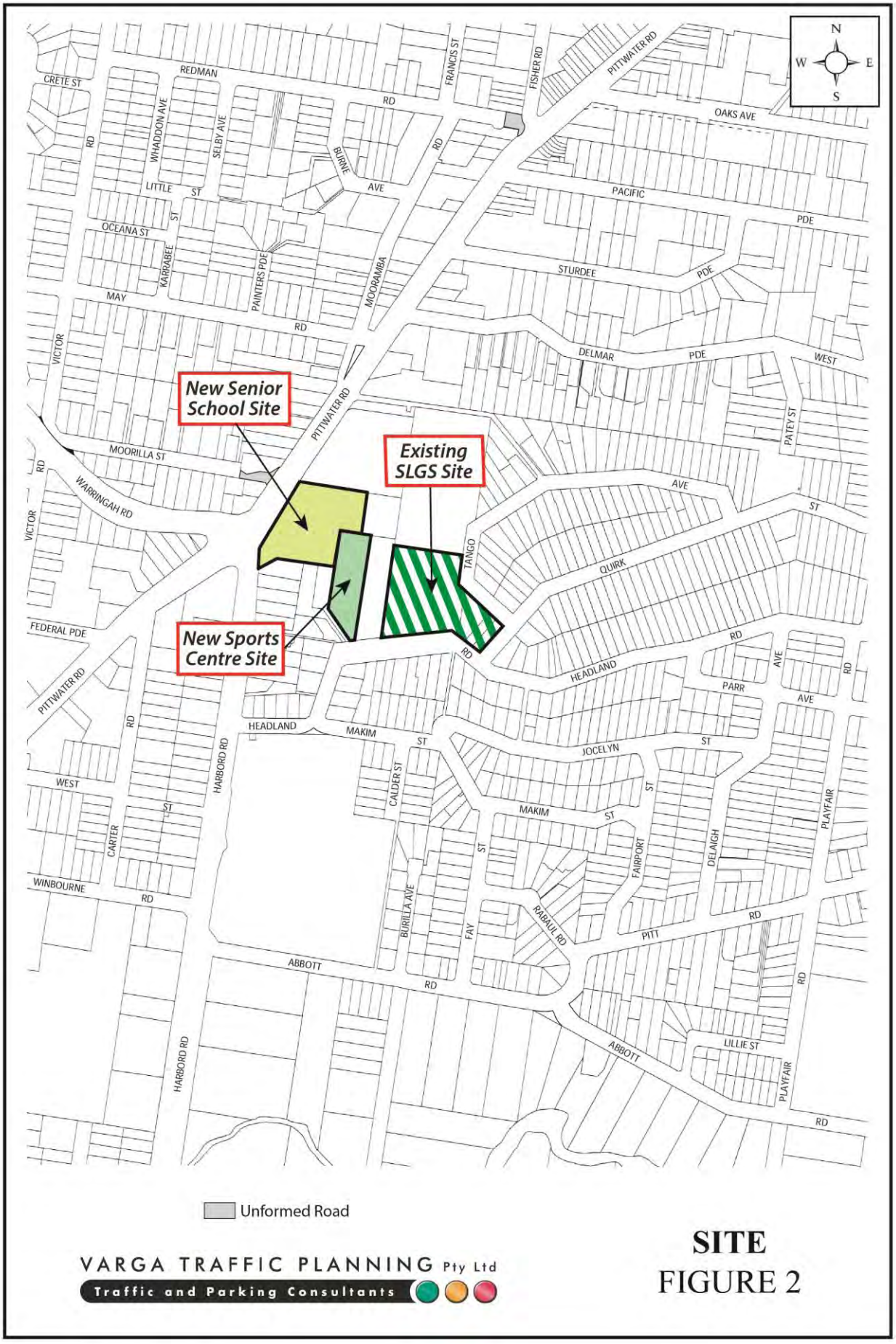
LOCATION
FIGURE 1


N
W
E
S
New Senior School Site
Existing SLGS Site
New Sports Centre Site
CRETE ST
REDMAN RD
FRANCIS ST
FISHER RD
PITTWATER RD
OAKS AVE
WHADDON AVE
SELBY AVE
BURNE AVE
LITTLE ST
PACIFIC PDE
OCEANA ST
KARRABEE ST
PAINTERS PDE
MOORAMBA RD
STURDEE PDE
MAY RD
VICTOR RD
DELMAR PDE
WEST
PATEY ST
MOORILLA ST
WARRINGAH RD
PITTWATER RD
TANGO AVE
QUIRK ST
FEDERAL PDE
HEADLAND RD
PARR AVE
MAKIM ST
JOCELYN ST
HARBORD RD
CALDER ST
WEST ST
CARTER ST
FAIRPORT ST
DELAIGH ST
PLAYFAIR RD
WINBOURNE RD
BURILLA AVE
FAY AVE
RABAUL RD
PITT RD
ABBOTT RD
LILLIE ST
Unformed Road
VARGA TRAFFIC PLANNING Pty Ltd
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SITE
FIGURE 2

2.0 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

2.1 SEARS

This report addresses the Secretary's Environmental Assessment Requirements (SEARs) for the State Significant Development (SSD), SSD 10291. Table 1 below details where the responses to each of the items raised in *Section 7: Transport and Accessibility* of the SEARs have been addressed in this report.

Table 1: Secretary's Environmental Assessment Requirements	
9. Transport & Accessibility	**Report Section**
Accurate details of the current daily and peak hour vehicle, existing and future public transport networks and pedestrian and cycle movement provided on the road network located adjacent to the proposed development	Chapter 2
Details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips based on surveys of the existing and similar schools within the local area	Chapter 6
The adequacy of existing public transport or any future public transport infrastructure to meet the likely future demand of the proposed development	Chapter 6
Measures to integrate the development with the existing/future public transport network	Chapters 5 & 6
The impact of trips generated by the development on nearby intersections	Chapter 6
The identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections, additional school bus routes along bus capable road, additional bus stops or bus bays	Chapters 5 & 6 See also Green Travel Plan
Details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace Travel Plan) and the provision of facilities to increase the non-car mode share for travel to and from the site	Chapters 5 & 6 See also Green Travel Plan
The proposed walking and cycling access arrangements and connections to public transport services	Chapter 5
The proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks	Chapters 5 & 6
Proposed bicycle parking provision, including end-of-trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance	Chapter 5

Proposed number of on-site car parking spaces for teaching staff and visitors and corresponding compliance with existing parking codes and justification for the level of car parking provided on-site	Chapters 5 & 7
An assessment of the cumulative on-street parking impacts of cars and bus pick-up/drop-off, staff parking and any other parking demands associated with the development	Chapter 7
An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures and personal safety in line with CPTED	Chapter 5
Emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements	Chapter 5
The preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic	See separate CTMP
Investigation of the possibility of removing vehicle access to Harbord Road by accessing the development via Headland Road	Chapter 5
Provision of safe and convenient pedestrian access between the existing and future campus for all users	Chapter 5
Pick-up and Drop-off areas designed to minimise impact of vehicle movements on the intersection of Pittwater Road with Harbord Road	Chapter 5
Vehicle access design that does not require the implementation of a school zone along Pittwater Road	Chapter 6
Investigations into potential internal pedestrian and vehicle connectivity between 224 Headland Road and 800 Pittwater Road	Chapter 5

2.2 RMS Requirements

Discussions were also held with officers of the Roads and Maritime Services at a pre-DA meeting held on 7 November 2019. The RMS raised a number of matters to be addressed. Table 2 below details where responses to each of the matters raised by the RMS have been addressed in this report.

Table 2: Roads and Maritime Services Requirements	
RMS Matters	**Report Section**
Applicant to investigate the possibility of removing all vehicular access from Harbour Road	Chapter 5
Roads and Maritime request that modelling is conducted to reflect the changes to the proposed development. Daily and peak traffic movements likely to be generated by the proposed development including the impact of nearby intersections and the need/associated funding for upgrading or road improvement works (if required). Key intersections to be examined and modelled include:	Chapter 6

• Pittwater Road/Harbord Road – Existing, Proposed with no 40 km/h school zone and • Proposed with 40 km/h School Zone on all four legs of the signalised intersection. Harbord Road/Headland Road – Existing and Proposed	
Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle widths, etc.) and relevant parking codes (if parking is to be changed)	Chapter 7
Details of service vehicle movements (including vehicle type and likely arrival and departure times)	Chapter 7
Roads and Maritime require justification for the large amount of onsite parking needed for St Luke's Grammar School and if car parking can be removed from 800 Pittwater Road, Dee Why	Chapters 5 & 7
Roads and Maritime require further clarification in relation to the mixed use of the site until 2026 with Office Works Dee Why. How is the school going to manage this and how it will operate?	Chapter 5
Roads and Maritime requires the environmental assessment report to assess the implications of the proposed development for non-car travel modes (including public transport use, walking and cycling); the potential for implementing a location-specific sustainable travel plan and the provision of facilities to increase the non-car mode share for travel to and from the site. This will entail an assessment of the accessibility of the development site by public transport.	Chapters 5 & 6
Further information in relation to school access points along Pittwater Road.	Chapter 5

2.3 Relevant Policies and Guidelines:

- Guide to Traffic Generating Developments (Roads and Maritime Services)
- EIS Guidelines – Road and Related Facilities (DoPI)
- Cycling Aspects of Austroads Guides
- NSW Planning Guidelines for Walking and Cycling
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
- Standards Australia AS2890.3 (Bicycle Parking Facilities)
- Warringah DCP 2011 – Appendix 1 – Car Parking Requirements

3.0 EXISTING SITE DEVELOPMENTS

3.1 Existing School Site

St Luke's Grammar School (SLGS) is located in Dee Why and North Curl Curl on Sydney's Northern Beaches.

The existing school is located at 210 Headland Road and comprises a number of school buildings, including a junior block, middle-school block and senior block, as well as a resource centre, multi-purpose hall, playing courts, a playing field and grassed areas.

The existing school site has frontages to Headland Road, Quirk Street, Tango Avenue and the Stony Range Regional Botanic Garden.

A recent aerial image of the existing SLGS and its surroundings is reproduced below, showing the locations of the proposed *sports centre* and *senior campus* in the context of the existing school and the surrounding local road network.

3.2 Existing Developments at No. 224 Headland Road

No. 224 Headland Road is currently occupied by an existing industrial/warehouse unit building comprising 7 tenancies. A number of those tenancies are already occupied by SLGS, to accommodate existing sporting facilities used by the school and the school uniform shop. Off-street car parking is currently provided for a total of 45 cars located in an outdoor at-grade parking area.

Vehicular access to the site is provided via a two-way entry/exit driveway crossover located on the Headland Road site frontage.

Pedestrian access to No. 224 Headland Road is provided via a separate pedestrian path which connects the public footpath in Headland Road, with a dedicated pedestrian pathway separate from the driveway (which is to be provided as part of a recently approved DA) within the site which traverses the entire length of the building.

3.3 Existing Developments at No. 800 Pittwater Road

No. 800 Pittwater Road is located opposite the intersection of Pittwater Road, Harbord Road and Warringah Road. The existing heritage-significant building is currently occupied by an *Office Works* retail outlet, a *Fitness First* gymnasium and swimming pool (including swim school), and an *I-ME*D radiology clinic.

Off-street parking is currently provided for 182 cars at various locations throughout the site, with the majority of the parking (i.e. 93 spaces) provided in a basement car parking area located beneath the existing building.

Vehicular access to the basement parking area is provided within the site via an entry-only ramp along the northern boundary of the site and an exit-only ramp located towards the south-western corner of the existing building.

Vehicular access to the site is provided via a two-way entry/exit driveway off the Harbord Road site frontage. The existing vehicular access driveway has been designed to accommodate 12.5m long HRV rigid trucks, and includes a splitter island inside the property

boundary which separates the entry and exit movements. A raised concrete central median island in Harbord Road restricts turning movements to Left-In/Left-Out (LILO) movements only.

Loading/servicing for the existing development is currently undertaken by a variety of trucks up to and including 12.5m long HRV rigid trucks. A dedicated loading dock is located in the south-eastern corner of the site.

Pedestrian access to the site is provided via a *pedestrian-only* gate located in the north-western corner of the site which connects with the public footpath that extends along the eastern side of Pittwater Road. There is a no other pedestrian access provided to the site at present.

3.4 Vehicular & Pedestrian Site Access Constraints – 800 Pittwater Road

It is pertinent to note that vehicular and pedestrian access to the 800 Pittwater Road site is *constrained* by the topographic features of the site. These features include:

- a concrete retaining wall constructed immediately behind the kerb in Pittwater Road which extends between Harbord Road and the car park entrance to the Stony Range Regional Botanic Gardens approximately 100m to the north of the site. The concrete retaining wall reaches a height of approximately 2m and is topped by a post and rail/wire mesh fence

- a second concrete retaining wall which generally follows the site boundary in Pittwater Road between the existing vehicular access driveway and the pedestrian gate located at the north-western corner of the site. The second concrete retaining wall is typically in the order of 1.5m in height and is topped by a steel guard rail along the site boundary. A second pedestrian safety/security fence is proposed along the entire Pittwater Rd site boundary to replace the existing guard rail.

Thus the public footpath along the eastern side of Pittwater Road along the site frontage is located *between* the two concrete retaining walls, each topped by a fence or guard rail, such that there is no pedestrian access between the *senior campus* site and traffic on the road

pavement on Pittwater Road except at the signalised pedestrian crossing at the Pittwater Road/Harbord Road intersection.

The rear of the 800 Pittwater Road site is separated from the 224 Headland Road site by a 20m high cliff. Stairs and a lift are proposed to connect the two sites as detailed later in this report.

Consideration has also been given to providing a vehicular link between the two sites at this location as required by the RMS, however the 20m difference in height between the two sites has proved to be insurmountable.

4.0 EXISTING SCHOOL OPERATIONAL CHARACTERISTICS

The existing *St Luke's Grammar School* comprises a pre-school and K-Year 12 co-educational school located at No. 210 Headland Road. It currently has a maximum enrolment of 1022 students, with approval to increase to 1092 students and 125 full-time equivalent staff.

4.1 Existing Off-Street Car Parking Facilities

The school provides a total of 133 off-street car parking spaces on the existing school site, including 112 spaces for staff plus 17 staff for students, as follows:

	Off-Street Car Parking
104 spaces:	multi-storey staff car park off Tango Avenue
8 spaces:	school hall undercroft staff car park off Headland Road
17 spaces:	student car parking off Headland Road
2 spaces:	disabled parking off Headland Road
1 space:	school visitors off Headland Road
1 space:	school deliveries off Headland Road
133 spaces:	**TOTAL**

Vehicular access to the multi-storey staff car park off Tango Avenue is provided via a single two-way driveway located at the northern-end of the Tango Avenue site frontage. Vehicular access to the remaining car parking facilities is provided via two separate two-way driveways located approximately midway along the Headland Road frontage of the site.

4.2 Existing Kerbside Drop-Off & Pick-Up Arrangements

There are a number of drop-off/pick-up areas and bus stops located around the perimeter of the existing SLGS site in Headland Road, Quirk Street and Tango Avenue. These comprise:

- an indented bus bay in Headland Road which has the capacity to accommodate 3 buses simultaneously

- a bus stop in Quirk Street which has the capacity to accommodate a further 2 buses, should the need ever arise

- a drop-off/pick-up zone in Headland Road which has the capacity to accommodate two cars, and

- an indented drop-off/pick-up bay in tango Avenue which has the capacity to accommodate up to 12 cars.

4.3 School Traffic Management Plan

The drop-off and pick-up operations at the school are intensively managed by school staff in accordance with the schools' *Traffic Management Plan* (Appendix 1). There are four staff rostered each morning to supervise drop-offs, and 12 staff are rostered each afternoon to supervise pick-ups.

Parents/carers using the Tango Avenue drop-off/pick-up bay are not permitted to exit their vehicle. Drivers must remain the driver's seat, and a member of St Lukes staff will open the passenger side doors and assist children to exit or enter the car. To assist this operation in the afternoon, parents/carers must place their family name *label* on the passenger side of the dashboard or suspended form the passenger side sunvisor so that it can be seen by St Lukes staff. Students await inside the school grounds until called to the kerb by staff before their parents' vehicle arrives at the pick-up point.

Five cars are loaded at any one time in the 12 spaces. The next 5 cars then move forward, by which time each student is waiting at their designated pick-up point. Staff will then assist children into their vehicle.

The successful operation of the *Traffic Management Plan* is further enhanced by the staggered operating hours of the school, as follows:

- Cottage Class Pre-School: 8:30am – 2:45pm (21 students)
- Kindergarten to Year 2 (Junior School): 8:30am – 2:55pm (138 students)
- Year 3 to Year 6 (Junior School): 8:30am – 3:05pm (205 students)

- Year 7 to Year 9 (Middle School): 8:30am – 3:20pm (355 students)
- Year 10 to Year 12 (Senior School): 8:30am – 3:20pm (303 students)

Peak traffic activity during the morning drop-off period typically occurs between 8:10am – 8:25am. Although this is a busy period, drop-offs are quick and efficient, there is no waiting and delays are minimal, if any.

Peak traffic activity in the afternoon typically occurs between 3:00pm and 3:15pm, and is associated with the junior school finishing times of 2:55pm (Kindergarten to Year-2), and 3:05pm (Years 3 to 6). There are typically no queues in Tango Avenue outside this 15-minute peak period in the afternoons, or at the high school finishing time of 3:20pm (Years 7 to 12).

The School Traffic Management Plan requires all school buses to use the indented bus bay in Headland Road, except for 1 bus which approaches from the east and turns right into Quirk Street from Headland Road. Occasionally a bus approaching the Headland Road indented bus bay from the west will be directed around the corner to the Quirk Street stop if the indented bus bay is fully occupied.

Students catching a bus in the afternoon must wait inside the school grounds, in the school courtyard, and are called forward when their bus arrives. Students board their buses under staff supervision.

If a bus is unable to be accommodated in the indented bus bay in Headland Road, staff will ensure that the bus moves around the corner to the Quirk Street bus stop. This issue will be resolved with the recently approved extension of the indented bus bay in Headland Road.

4.4 Existing School Traffic Generation

In order to gain an accurate appreciation of the traffic and parking demands generated by the existing school, surveys were undertaken during the school's *morning* drop-off and *afternoon* pick-up periods on 19th September, 2019. The surveys revealed that:

- during the *2-hour morning* drop-off period; between 7:00am and 9:00am:

- a total of 144 students travelled in 9 buses, including a total of 50 senior students (Years 10-12).

- a total of 373 students were dropped-off by 275 cars, including a total of 68 senior students (Years 10-12) dropped-off by 60 cars.

- during the *2-hour afternoon* pick-up period; between 2:30pm and 4:30pm there were:

  - a total of 271 students travelled in 10 buses, including a total of 50 senior students (Years 10-12).

  - a total of 208 students were picked up by 143 cars, including a total of 33 senior students (Years 10-12) picked-up by 30 cars.

In summary, the drop-off/pick-up surveys conducted at the existing SLGS revealed that the typical bus occupancy rate generated by the school was *18 students per bus* during the *morning* drop-off period and *27 students per bus* during the *afternoon* pick-up period.

The car occupancy rate generated by the school was approximately *1 vehicle per 1.55 students* during the *morning* drop-off period and approximately *1 vehicle per 1.45 students* during the *afternoon* pick-up periods.

Traffic activity generated by the school outside the 2 hours surveyed in both the morning and the afternoon is absolutely minimal, if any, apart from the late departure of some senior staff.

Accordingly, the cumulative daily traffic generation potential of the existing school including staff is in the order of 1,126 vehicles per day (vpd) comprising 563 vpd TO the school and 563 vpd FROM the school.

During the *1-hour* school peak period the surveys revealed that:

- during the 1-hour morning drop-off period:

  - a total of 294 K-Y9 students arrived in 196 cars, and

- a total of 60 Y10-Y12 students arrived in 52 cars

- during the *1-hour* afternoon pick-up period:

  - a total of 156 K-Y9 students were picked-up in 115 cars, and
  - a total of 28 Y10-Y12 students were picked-up in 26 cars.

The peak hour traffic generation characteristics of the existing school on a *per student* basis (i.e. excluding staff) is set out in the table below:

Existing School Traffic Generation (vehicles per hour/student)						
	AM Peak Hour			**PM Peak Hour**		
	IN	**OUT**	**TOTAL**	**IN**	**OUT**	**TOTAL**
K-Y9	0.273	0.273	**0.545**	0.160	0.160	**0.319**
Y10-Y12	0.172	0.172	**0.343**	0.086	0.086	**0.172**

The survey data confirms that the senior students in Years 10 to 12 generate substantially *less traffic* on a *per student* basis than younger students, and reinforces the conclusions reached in an independent traffic study[1] undertaken for the *Sydney North Planning Panel* prior to its approval of MOD 2018/0412 on 26 June 2019 that:

- the peak volumes at the site coincide with the junior school operating hours, and

- senior school drop-off/pick-up activities are relatively minor.

The survey results also confirm on-site observations that there are typically no queues in the drop-off/pick-up area at the high school finishing time of 3:20pm (Years 7 to 12).

1 The Transport Planning Partnership S*t Luke's Grammar School – Planning Panel Deferral Traffic and Parking Survey Results (7 May 2019)* undertaken for the *Sydney North Planning Panel*.

5.0 PROPOSED DEVELOPMENT

St Luke's Grammar School proposes to expand its existing Dee Why school campus to incorporate No. 224 Headland Road as a *sports centre* (for all Years) and No. 800 Pittwater Road as designated *senior campus* for up to 600 Year 10-12 school students.

The proposed development involves the internal alteration to the existing buildings located at both locations. Additional work is proposed at the rear of No. 800 Pittwater Road site to provide a passenger lift and stair access to the adjoining site at No. 224 Headland Road.

A staged redevelopment is proposed to accommodate the individual lease agreements for the current tenancies located within the two existing buildings. The first space to become available is the building at No.224 Headland Road.

Key features of the works proposed in each stage are detailed below.

5.1 Stage 1 – No.224 Headland Road (*Sports Centre*)

- Current lease agreement end date – 30 June 2022
- Conversion of existing teacher training room to school clothing store
- Remove existing internal wall partitions and mezzanine offices
- Basketball courts will also be used as a temporary Dance Studio space / Multi-Purpose Hall until the completion of the entire project
- At-grade car parking to be reconfigured and reduced from 45 spaces to 39 spaces for Year 12 students.

There will also be *no change* to the existing ground floor amenities, the half-basketball court and the vehicular access arrangements.

5.2 Stage 2 – No.800 Pittwater Road (*Senior Campus*)

- I-MED lease agreement end date – 31 August 2024
- Fitness First lease agreement end date – 30 June 2025
- Conversion of I-MED and Fitness First tenancies to school facilities

- Office Works Tenancy to remain operational on-site until Stage 3
- Car parking areas reconfigured, with parking reduced from 182 spaces to 131 spaces, including 60 spaces for staff, 15 spaces for students, 40 spaces for Office Works in accordance with DA Consent No. 97/59, with the remaining car parking to be allocated to the builders and visitors
- The 40 spaces for Office Works will be located in the at-grade car park at the front of the site. The remaining spaces in the at-grade car park will be allocated to the *senior campus*
- Reconfiguration of the at-grade car parking area in front of the building to provide a dedicated on-site drop-off/pick-up bay comprising 7 car spaces for the senior students only
- The reconfigured at-grade car parking area will have the capacity to accommodate 12.5m long large buses to cater for any school excursions when the drop-off/pick-up bay is *not* in use
- New passenger lift/stair access to connect the buildings at No. 224 Headland Road and at No. 800 Pittwater Road
- Construct a new pedestrian access to the *senior campus* off Harbord Road, directly opposite the signalised pedestrian crossing at the Pittwater Road/Harbord Road intersection
- Projected senior school campus of 360 students in 2026 with 36 staff, increasing to 480 Year 10-12 students with 48 staff in 2030.

5.3 Stage 3 – No.800 Pittwater Road (*Senior Campus*)

- Office Works lease agreement end date – 30 April 2029
- Conversion of existing commercial tenancy to school facilities
- New extension to the south-western side of existing building
- Temporary classroom spaces in Stage 2 reconfigured
- New entrance to basement car park, with the existing entrance to be closed
- Car parking area reconfigured, with parking reduced from 131 spaces in Stage 2 to 91 spaces, comprising 60 staff car parking spaces and 25 student parking spaces and 5 visitor car parking spaces

- Construct a new pedestrian access to the *senior campus* off Harbord Road, directly opposite the signalised pedestrian crossings at the Pittwater Road/Harbord Road intersection
- Projected senior school campus enrolments to increase to 600 students with 60 staff after completion of Stage 3.

5.4 Projected Enrolment

As noted above, the proposed expansion seeks approval to increase student enrolments from 1,022 students to 1,600 students (i.e. 578 *additional* students) and a total of 160 full-time equivalent staff as follows:

- the new *senior campus* will ultimately accommodate 600 Year 10-12 senior school students only
- the existing school campus at 210 Headland Road will accommodate 1,000 pre-school to Year 9 students, with 100 full-time equivalent staff.

It is anticipated that the increase in student enrolment and staff numbers will occur progressively over a period of many years, with the *maximum* enrolment of 1,600 students not expected to be achieved earlier than 2030.

5.5 Proposed New On-Site Drop-Off/Pick-Up Bay

A new dedicated on-site drop-off/pick-up bay is proposed on the senior school campus, initially with a capacity of 7 spaces whilst Office Works remains on the site in the Stage 2, then increasing to 12 spaces in the drop-off/pick-up bay upon completion of Stage 3.

Parents with children in *both* campuses will drop-off/pick-up their children at the Tango Road indented bay only, and the older sibling will then *walk* down to the lower campus.

The proposed on-site drop-off/pick-up zone has been designed to accommodate the swept turning path of large vehicles up to and including the 12.5m HRV trucks – i.e. similar to a large bus or tourist coach which may be used for school excursions, when the drop-off/pick-up bay is not in use.

Emergency service vehicles, such as an ambulance, will be also able to enter and exit the new senior school site in a forward direction at all times, utilising the proposed drop-off/pick-up zone.

A new bicycle parking facility is proposed adjacent to the new drop-off/pick-up facility for the use of senior students and staff. End-of-trip facilities are proposed adjacent to the reconstructed swimming pool, with separate showers/change rooms for students and staff.

5.6 Proposed Internal Pedestrian Link Between the Two Sites

A new internal pedestrian link comprising stairs and a lift is proposed between 800 Pittwater Rod (proposed *senior campus*) and 224 Headland Road (proposed *sports centre*) to facilitate the safe and direct movement of students and staff between the two sites. The proposed new internal pedestrian link will enable students and staff to move directly between the two sites in a safe and efficient manner.

The proposed pedestrian link comprising stairs and a lift will overcome the physical barrier between the two sites presented by the 20m high cliff which currently separates the two sites.

Consideration has also been given to providing a vehicular link between the two sites at this location as required by the RMS, however the 20m difference in height between the two sites has proved to be insurmountable.

5.7 Improved Pedestrian Access Between *Senior Campus* & Public Transport Services

The only pedestrian access to the senior school campus at present is provided via a gate located at the north-western corner of the site. A new pedestrian entrance is therefore proposed at the south-western corner of the site, directly opposite the signalised pedestrian crossings at the Pittwater Road/Harbord Road intersection to better integrate the *senior campus* with public transport services on Pittwater Road, and to encourage active forms of transport such as walking to school.

The new pedestrian entrance will be constructed as an interim arrangement in Stage 2, and will then be upgraded in Stage 3. It will provide the safest and shortest possible route between the *senior campus* and the existing bi-directional bus stops located in Pittwater Road immediately to the south of the Harbord Road intersection.

The existing pedestrian gate located at the north-western corner of the site will be retained and will provide the shortest possible walking route between the *senior campus* and the B-Line service bus stops located further to the north in Pittwater Road, near Howard Street. It should be noted that this *pedestrian-only* gate is separated from road traffic on Pittwater Road by a 2m high concrete embankment topped by a pedestrian fence which extends along the kerb line in front of the site and further to the north beyond the site to the car park entrance to the *Stony Range Regional Botanic Gardens.*

Improved pedestrian accessibility to both the regular route bus services and also to the new B-Line Services will considerably enhance the sustainable public transport options available to the *senior campus* students and staff. The new *senior campus* will provide significantly improved pedestrian access to regular route bus services and the new B-Line services for Year 10-12 students and staff.

5.8 After School Hours uses of the Development

The school proposes to make available for *community uses* the swimming pool on the *senior campus* site, and the basketball courts on the *sports centre* site, on an after-school hours basis.

It is anticipated that 3 swim school classes and squad training sessions with 50 children may be held in the pool between 4pm-7pm.

The basketball courts may be used by up to 20 people with 2 training sessions anticipated between 4pm-7pm.

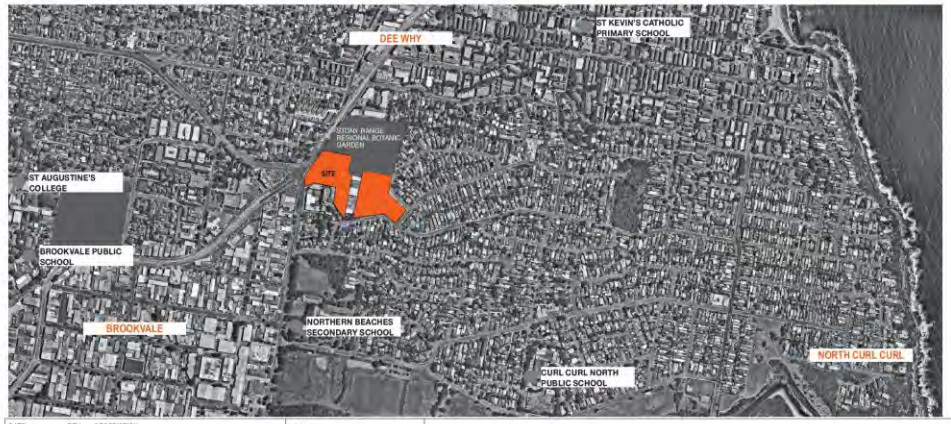
5.9 Plans of the Development Proposal

Plans of the proposed development have been prepared by *Tonkin Zulaikha Greer Architects* and are reproduced in the following pages.

Swept turning path diagrams which have been prepared in accordance with the requirements of *AS2890.1* and *AS2890.2* have been prepared using the *Autodesk Vehicle Tracking 2020* program are also reproduced in the following pages, confirming that all vehicles will be able to enter and exit the *senior campus* site whilst travelling in a forward direction at all times.

On some occasions it may be necessary to transport students from the junior school to the *sports centre* or the *senior campus*. This will be undertaken using a minibus such as a Toyota Coaster or similar sized community bus. Swept turning path analysis confirms that these minibuses can be accommodated at both sites, such that they will be able to enter and exit both sites while travelling in a forward direction at all times.

ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
224 HEADLAND RD AND 800 PITTWATER RD DEE WHY



DRAWING LIST

		Scale @ A1
A 000 GENERAL INFORMATION		
A-000	COVER PAGE	1:1000
A-001	LEGEND	1:0.67
A-002	SITE PLAN	1:500
A-003	STAGING OVERVIEW	1:500
A-004	SIGNAGE PLAN	1:500, 1:200
A 010 EXISITNG PLANS + ELEVATIONS - 224 HEADLAND RD		
A-010	LEVEL 0 EXISTING PLAN_224	1:200
A-011	LEVEL 1 EXISTING PLAN_224	1:200
A-012	EXISTING ROOF PLAN_224	1:200
A-013	EXISTING ELEVATIONS_224	1:200
A 020 EXISTING PLANS + ELEVATIONS - 800 PITTWATER RD		
A-020	LEVEL 0 EXISTING PLAN_800	1:200
A-021	LEVEL 1 EXISTING PLAN_800	1:200
A-022	LEVEL 2 EXISTING PLAN_800	1:200
A-023	LEVEL 3 EXISTING PLAN_800	1:200
A-024	LEVEL 4 EXISTING PLAN_800	1:200
A-025	EXISTING ELEVATIONS 1_800	1:200
A-026	EXISTING ELEVATIONS 2_800	1:200
A 030 DEMOLITION PLANS + ELEVATIONS - 800 PITTWATER RD		
A-030	LEVEL 0 DEMOLITION PLAN_800	1:200
A-031	LEVEL 1 DEMOLITION PLAN_800	1:200
A-032	LEVEL 2 DEMOLITION PLAN_800	1:200
A-033	LEVEL 3 DEMOLITION PLAN_800	1:200
A-034	LEVEL 4 DEMOLITION PLAN_800	1:200
A-035	WEST + NORTH DEMOLITION ELEVATIONS_800	1:200
A-036	EAST + SOUTH DEMOLITION ELEVATIONS_800	1:200
A 040 DEMOLITION PLANS + ELEVATIONS - 224 HEADLAND RD		
A-040	LEVEL 0 DEMOLITION PLAN_224	1:200
A-041	LEVEL 1 DEMOLITION PLAN_224	1:200
A-042	ROOF DEMOLITION PLAN_224	1:200
A-043	DEMOLITON ELEVATIONS - 224 HEADLAND ROAD	1:200
A 100 GENERAL ARRANGEMENT PLANS - 224 HEADLAND RD		
A-100	LEVEL 0 PLAN_224	1:200
A-101	LEVEL 1 PLAN_224	1:200
A-102	ROOF PLAN_224	1:200
A 110 GENERAL ARRANGEMENT PLANS - 800 PITTWATER RD		
A-110	LEVEL 0 PLAN - STAGE 2_800	1:200
A-111	LEVEL 1 PLAN - STAGE 2_800	1:200
A-112	LEVEL 2 PLAN - STAGE 2_800	1:200
A-113	LEVEL 3 PLAN - STAGE 2_800	1:200
A-114	LEVEL 4 PLAN - STAGE 2_800	1:200
A-115	LEVEL 5 PLAN - STAGE 2_800	1:200
A-116	LEVEL 0 PLAN - STAGE 3_800	1:200
A-117	LEVEL 1 PLAN - STAGE 3_800	1:200
A-118	LEVEL 2 PLAN - STAGE 3_800	1:200
A-119	LEVEL 3 PLAN - STAGE 3_800	1:200
A-120	LEVEL 4 PLAN - STAGE 3_800	1:200
A-121	LEVEL 5 PLAN - STAGE 3_800	1:200
A 200 ELEVATIONS - 224 HEADLAND RD		
A-200	ELEVATIONS_224	1:200
A 210 ELEVATIONS - 800 PITTWATER RD		
A-210	ELEVATIONS WEST + NORTH_800	1:200
A-211	ELEVATIONS EAST + SOUTH_800	1:200
A 300 SECTIONS - 224 HEADLAND RD		
A-300	SECTIONS 1_224	1:200
A 310 SECTIONS - 800 PITTWATER RD		
A-310	SECTIONS 1_800	1:200
A-311	SECTIONS 2_800	1:200
A-312	SECTIONS 3_800	1:200
A-313	TYPICAL WALL SECTIONS_800	1:50
A 400 SCHEDULES AND AREAS		
A-400	GFA +FSR CALCULATION_224	1:500
A-401	GFA +FSR CALCULATION_800	1:500
A-402	OPEN SPACE CALCULATION	1:500
A-403	ACCOMMODATION SCHEDULE_224	
A-404	ACCOMMODATION SCHEDULE - STAGE 2_800	
A-405	ACCOMMODATION SCHEDULE - STAGE 3_800	
A-406	CAR PARKING SCHEDULE	
A 500 SHADOW DIAGRAMS		
A-500	SHADOW DIAGRAMS - 21 JUNE	1:500
A-501	SHADOW DIAGRAMS - 21 JUNE	1:500
A-502	SHADOW DIAGRAMS - NEIGHBOURS	
A 600 VISUALIZATION		
A-600	MATERIALS SCHEDULE	
A-601	EXTERIOR PERSPECTIVE	
A-602	INTERIOR PERSPECTIVE	
A-603	AERIAL PERSPCTIVE	

DATE	REV	DESCRIPTION
12.03.2020	A	ISSUE FOR SSDA

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PROJECT :
ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
800 Pittwater Road Dee Why NSW 2099 | 224 Headland Road North Curl Curl NSW 2099
PROJECT NO : 18032

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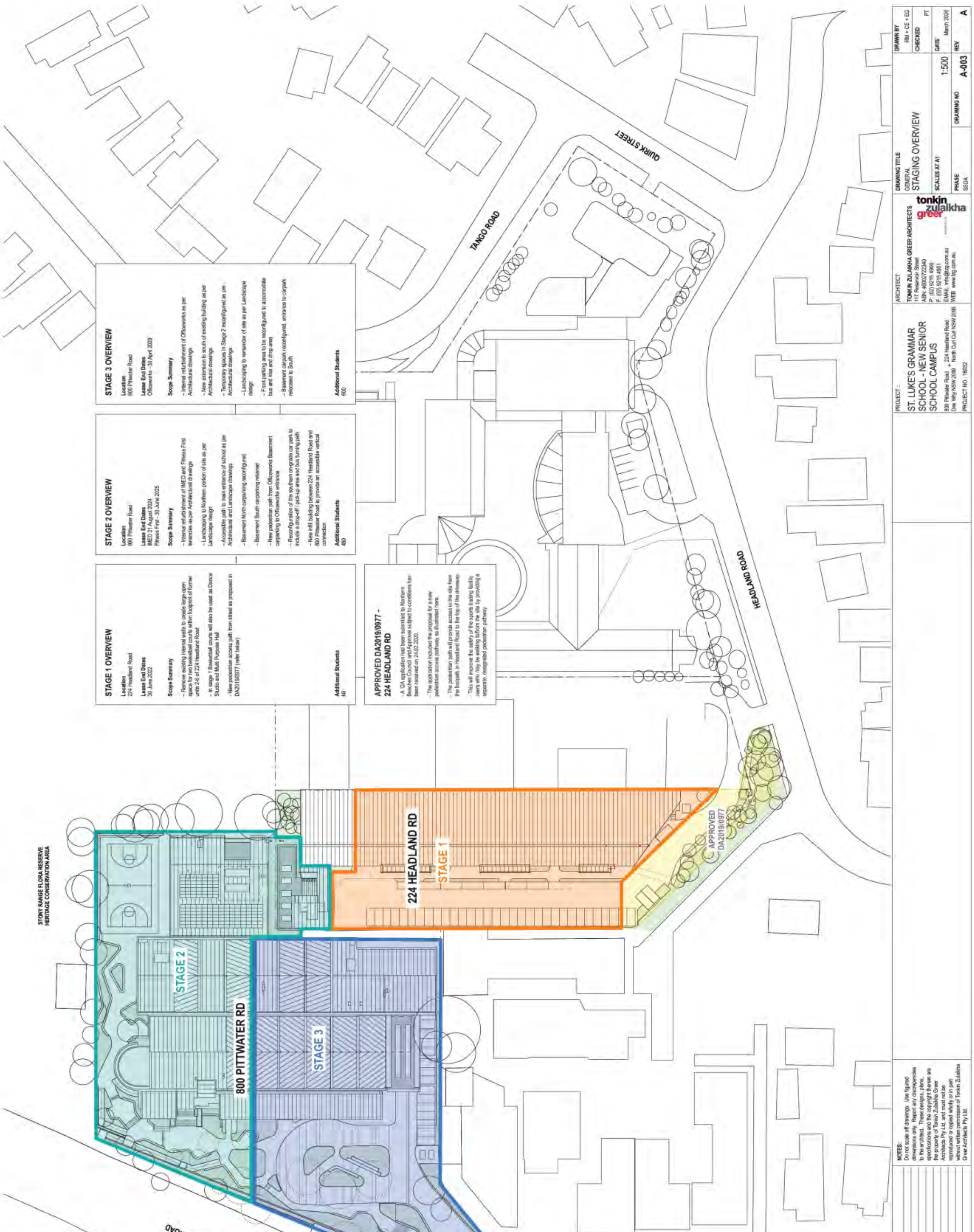
PHASE: SSDA
DRAWING NO: A-000
DRAWN BY: RM + CE + EG
CHECKED: PT
DATE: March 2020
REV: A


STAGE 3 OVERVIEW
STAGE 2 OVERVIEW
STAGE 1 OVERVIEW
APPROVED DA2019/0977 - 224 HEADLAND RD
TANGO ROAD
QUIRK STREET
HEADLAND ROAD
STONY RANGE FLORA RESERVE HERITAGE CONSERVATION AREA
224 HEADLAND RD
STAGE 1
APPROVED DA2019/0977
STAGE 2
800 PITTWATER RD
STAGE 3
PITTWATER ROAD
HARBORD ROAD
ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
tonkin zulaikha greer
STAGING OVERVIEW
1:500
A-003
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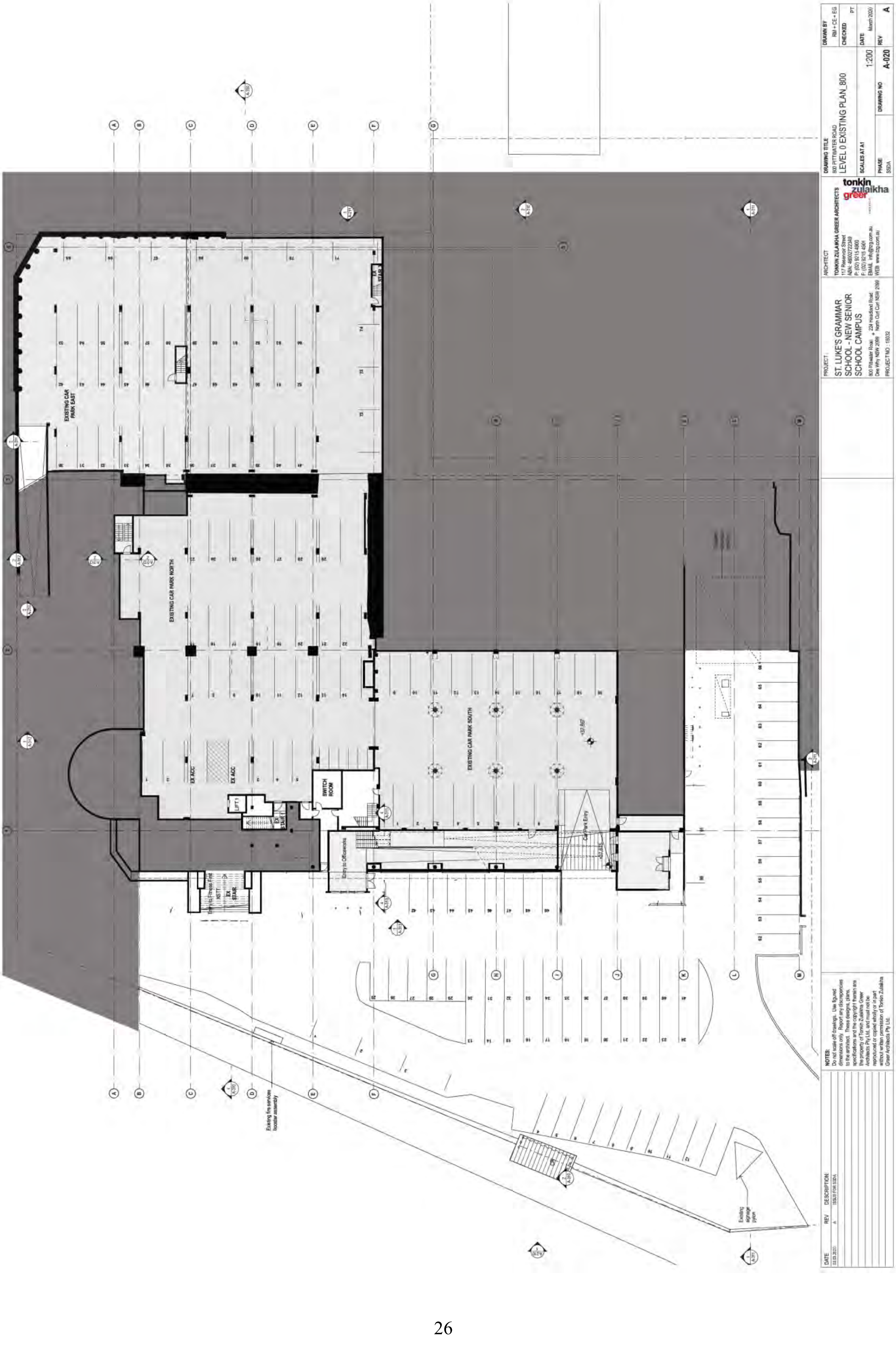
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LEVEL 0 EXISTING PLAN_800
1:200
A-020
tonkin zulaikha greer
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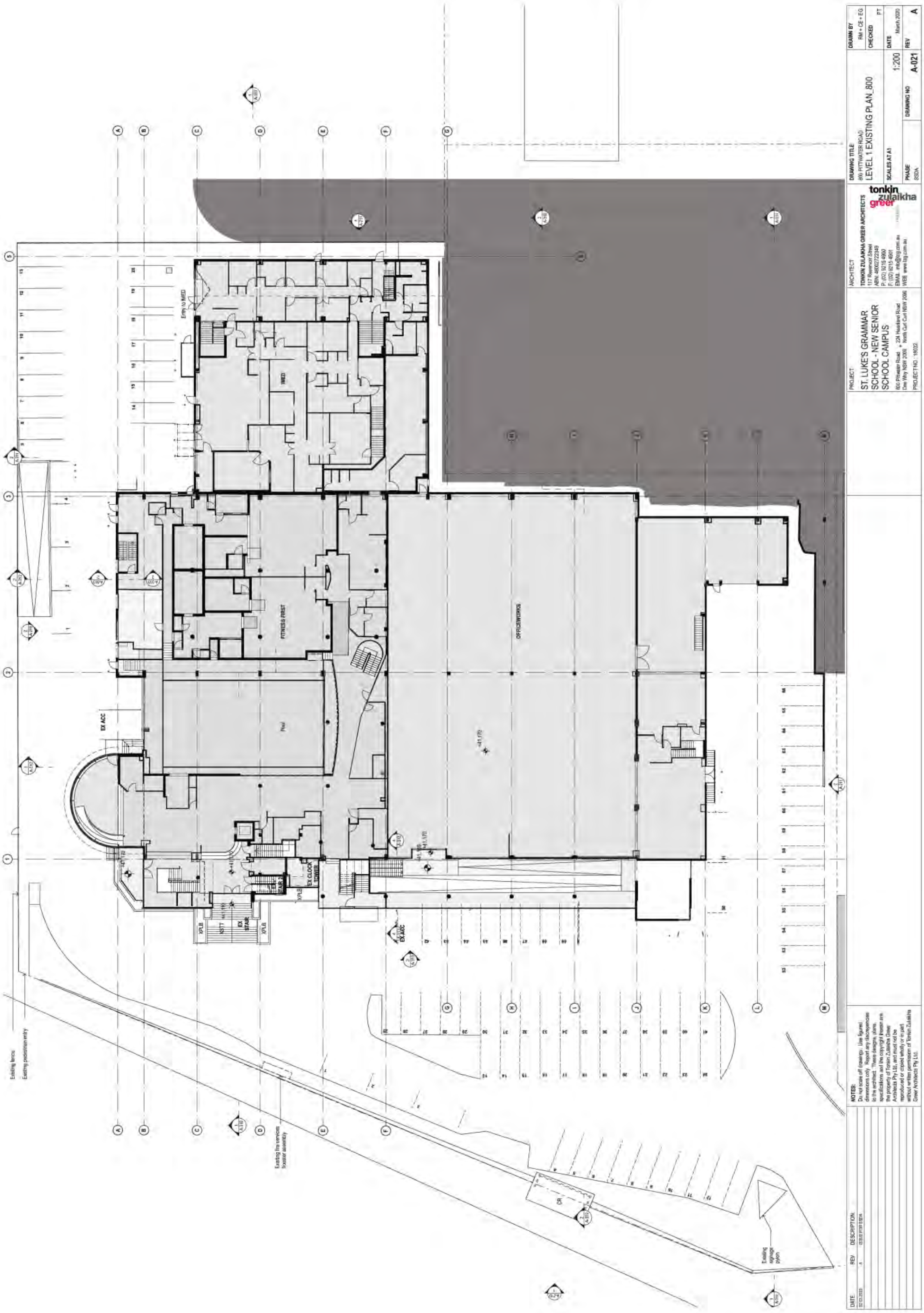
EXISTING CAR PARK NORTH
EXISTING CAR PARK SOUTH
SWITCH ROOM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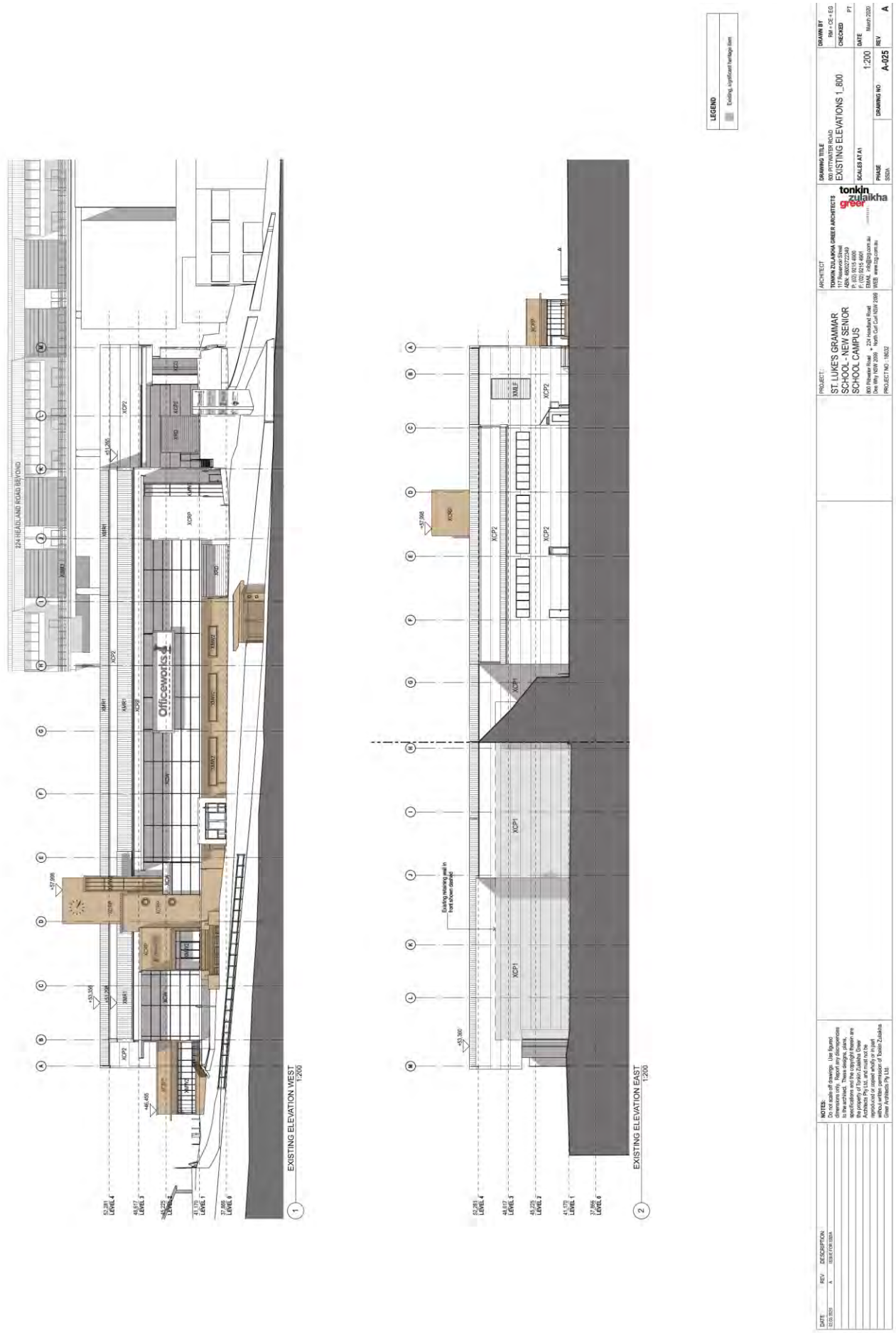
LEVEL 1 EXISTING PLAN_800
TONKIN ZULAIKHA GREER ARCHITECTS
tonkin zulaikha greer
1:200
A-021
OFFICEWORKS
FITNESS FIRST
Pool
EX ACC
EX CLOCK TOWER
EX STAIR


LEGEND
Existing, significant heritage item
224 HEADLAND ROAD BEYOND
Officeworks
EXISTING ELEVATION WEST
1:200
EXISTING ELEVATION EAST
1:200
Existing retaining wall in hard wood panels
PROJECT:
ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
800 Pittwater Road, Dee Why NSW 2099 + 224 Headland Road, North Curl Curl NSW 2099
PROJECT NO - 18032
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tonkin zulaikha greer
DRAWING TITLE
EXISTING ELEVATIONS 1_800
SCALED AT A1
1:200
DRAWN BY
CHECKED
DATE
March 2020
PHASE
SSDA
DRAWING NO
A-025
REV
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NOTES:
DESCRIPTION:
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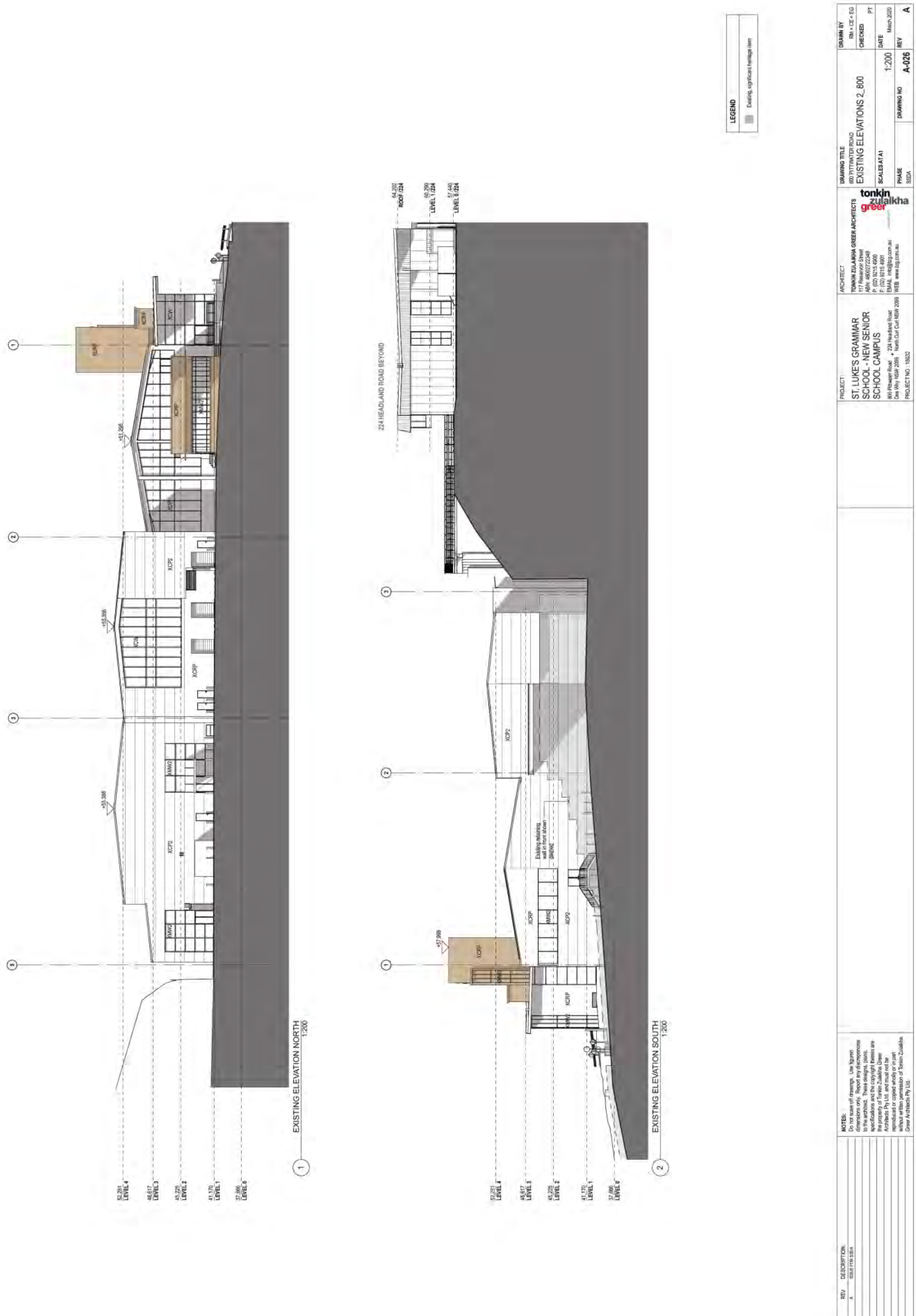
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1:200
EXISTING ELEVATION SOUTH
1:200
224 HEADLAND ROAD BEYOND
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EXISTING ELEVATIONS 2_800
1:200
A-026
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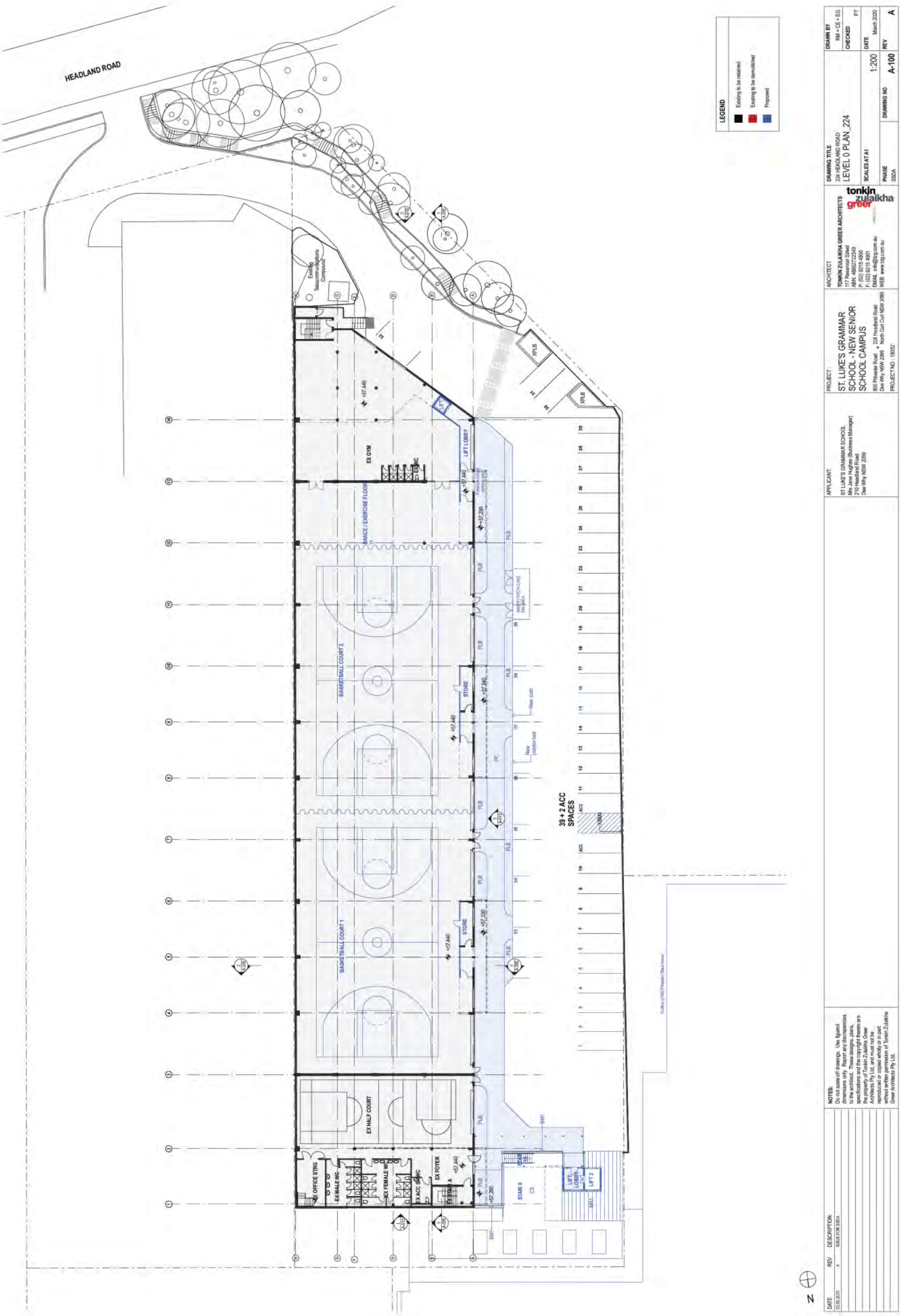
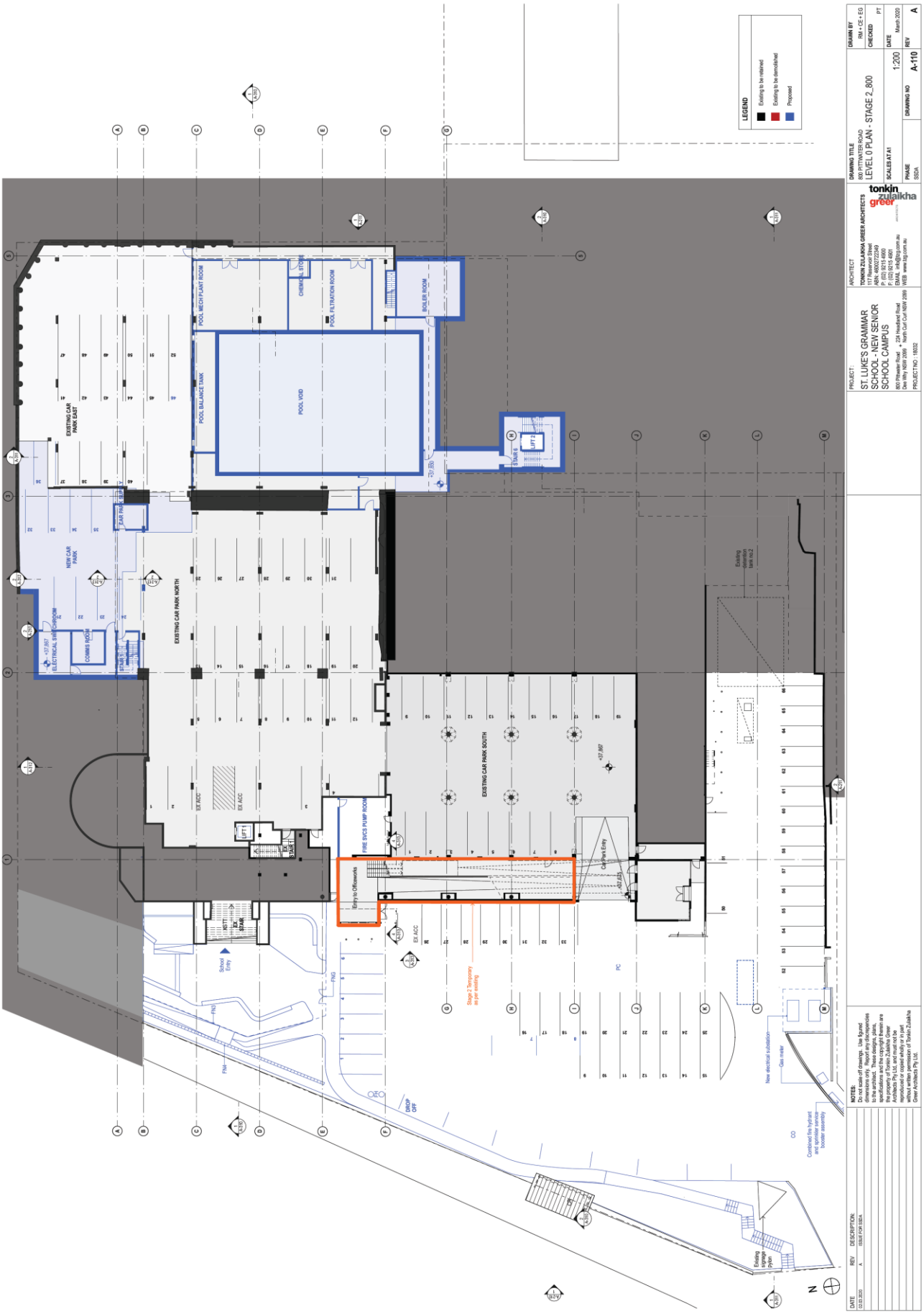

HEADLAND ROAD
LEGEND
Existing to be retained
Existing to be demolished
Proposed
LIFT LOBBY
EX GYM
DANCE / EXERCISE FLOOR
BASKETBALL COURT 2
BASKETBALL COURT 1
EX HALF COURT
STORE
39 + 2 ACC SPACES
ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
224 HEADLAND ROAD
LEVEL 0 PLAN_224
1:200
A-100
tonkin zulaikha greer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Existing to be demolished
Proposed
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800 PITTWATER ROAD
LEVEL 0 PLAN - STAGE 2_800
SCALE@ A1
1:200
DRAWING NO
A-110
DATE
March 2020
REV
A
DRAWN BY
RM + CE + EG
CHECKED
PT
PHASE
SSDA
ARCHITECT
tonkin zulaikha greer
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PROJECT
ST. LUKES GRAMMAR
SCHOOL - NEW SENIOR
SCHOOL CAMPUS
800 Pittwater Road + 224 Headland Road
Dee Why NSW
PROJECT NO - 18032
NOTES:
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DATE
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DESCRIPTION
02.03.2020
A
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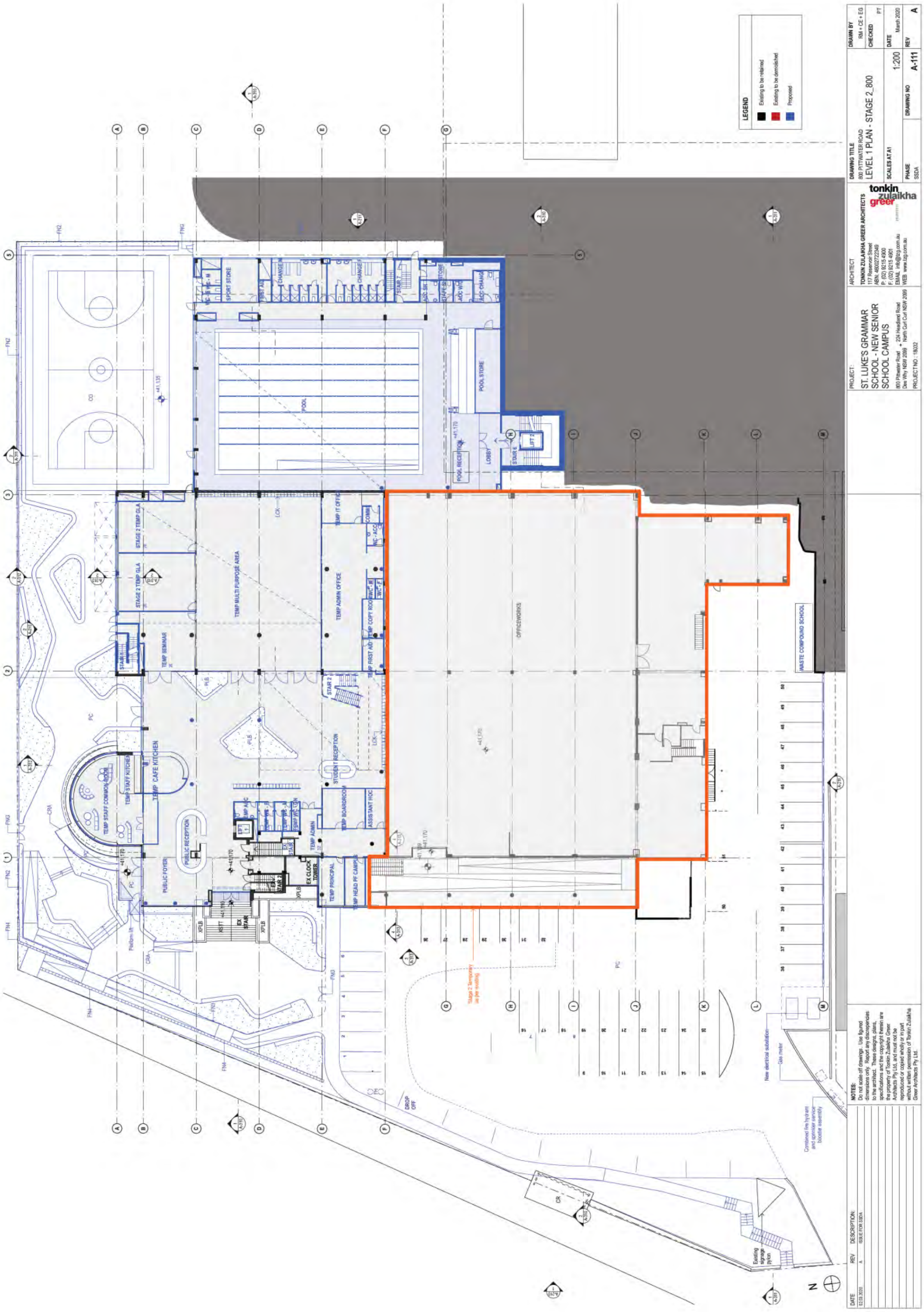
POOL MECH PLANT ROOM
CHEMICAL STORE
POOL FILTRATION ROOM
BOILER ROOM
POOL BALANCE TANK
POOL VOID
LIFT 2
STAIR 8
EXISTING CAR PARK EAST
CARPARK ACCESS
NEW CAR PARK
ELECTRICAL SWITCHROOM
COMMS ROOM
EXISTING CAR PARK NORTH
EXISTING CAR PARK SOUTH
EX ACC
LIFT 1
EX STAIR
FIRE SVCS PUMP ROOM
Entry to Officeworks
Service Entry
School Entry
Stage 2 Temporary as per existing
PC
DROP OFF
New electrical substation
Gas meter
Combined fire hydrant and sprinkler service booster assembly
Existing transmission Pylon
N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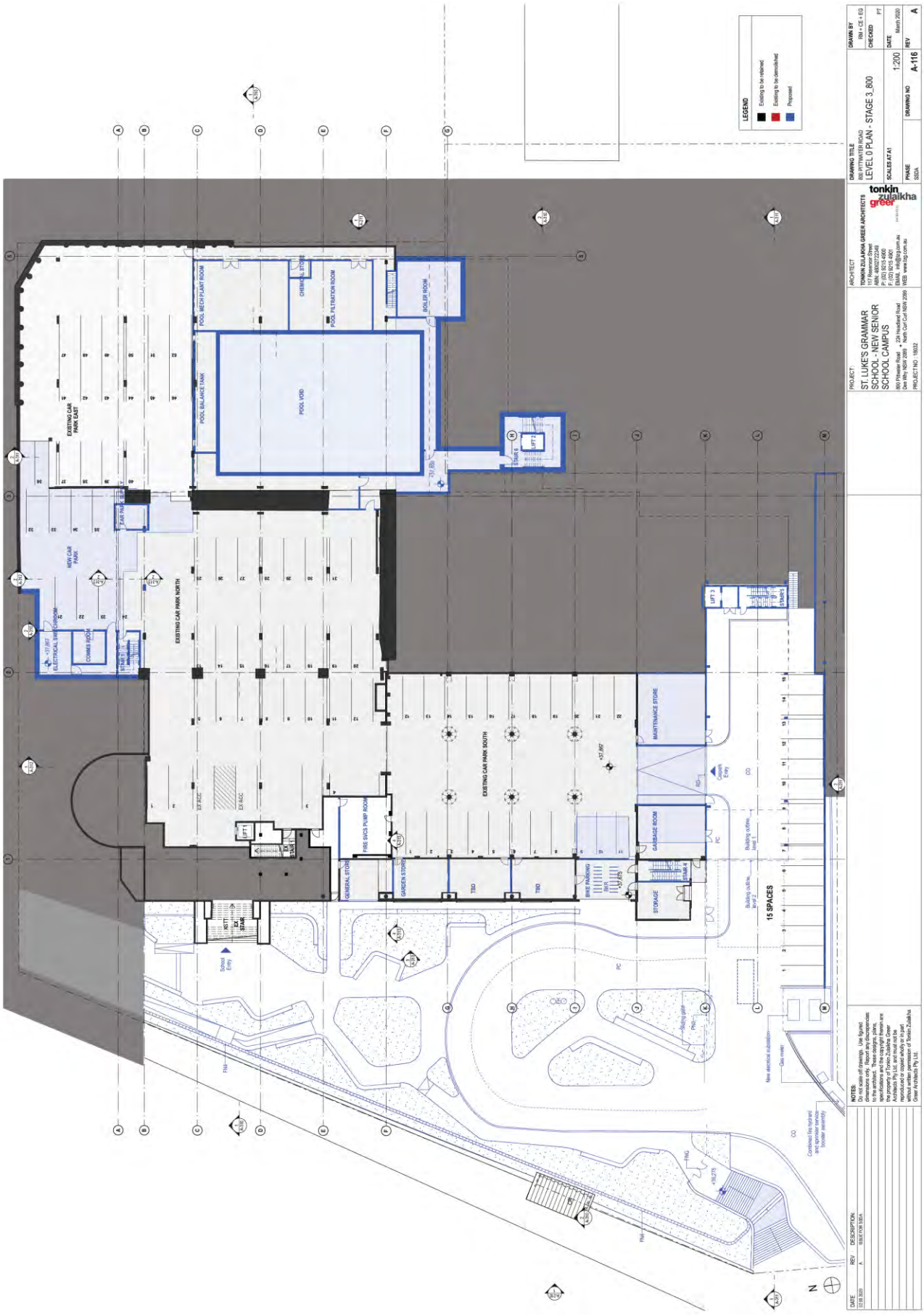
Existing to be demolished
Proposed
ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
LEVEL 1 PLAN - STAGE 2_800
1:200
A-111
tonkin zulaikha greer
POOL
POOL STORE
TEMP MULTI PURPOSE AREA
TEMP ADMIN OFFICE
OFFICEWORKS
WASTE COMPOUND SCHOOL
PUBLIC RECEPTION
PUBLIC FOYER
TEMP CAFE KITCHEN
DROP OFF


LEGEND
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800 PITTWATER ROAD
LEVEL 0 PLAN - STAGE 3_800
SCALES AT A1
1:200
DRAWING NO
A-116
REV
A
DATE
March 2020
DRAWN BY
CHECKED
PROJECT
ST LUKE'S GRAMMAR
SCHOOL - NEW SENIOR
SCHOOL CAMPUS
ARCHITECT
tonkin zulaikha greer
POOL MECH PLANT ROOM
POOL FILTRATION ROOM
BOILER ROOM
POOL BALANCE TANK
POOL VOID
EXISTING CAR PARK EAST
EXISTING CAR PARK NORTH
EXISTING CAR PARK SOUTH
NEW CAR PARK
ELECTRICAL SWITCHROOM
COMMS ROOM
FIRE BPCS PUMP ROOM
GENERAL STORE
GARDEN STORE
MAINTENANCE STORE
GARBAGE ROOM
STORAGE
BIKE PARKING
15 SPACES
TBD
LIFT 1
LIFT 2
LIFT 3
STAIR 1
STAIR 2
STAIR 3
STAIR 4
STAIR 5
STAIR 6
NOTES
DESCRIPTION
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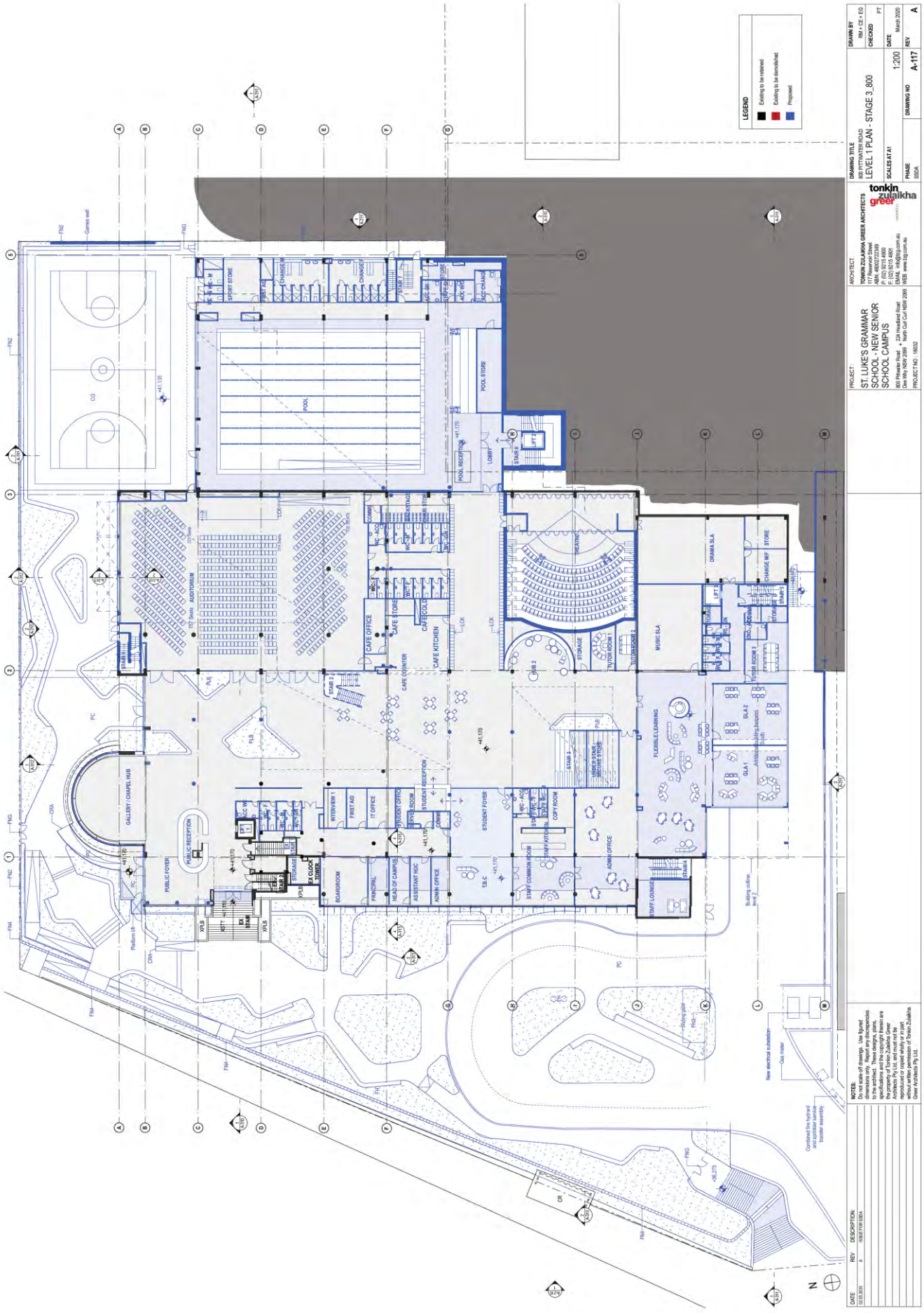
LEGEND
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Existing to be demolished
Proposed
PROJECT:
ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
DRAWING TITLE
LEVEL 1 PLAN - STAGE 3_800
SCALES AT A1
1:200
DRAWING NO
A-117
REV
A
DATE
March 2020
DRAWN BY
RM + CE + EG
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PT
PHASE
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Dee Why NSW 2099 North Curl Curl NSW 2099
PROJECT NO : 18032
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DATE
REV
DESCRIPTION
02.03.2020
A
ISSUE FOR SSDA
AUDITORIUM
707 Seats
POOL
POOL RECEPTION
LOBBY
CAFE OFFICE
CAFE STORE
CAFE COOLER
CAFE KITCHEN
CAFE COUNTER
THEATRE
TUTORROOM 2
TUTOR ROOM 3
MUSIC SLA
DRAMA SLA
FLEXIBLE LEARNING
GLA 1
GLA 2
GALLERY / CHAPEL HUB
PUBLIC RECEPTION
PUBLIC FOYER
BOARDROOM
PRINCIPAL
HEAD OF CAMPUS
ASSISTANT HOC
ADMIN OFFICE
STUDENT RECEPTION
STUDENT FOYER
STAFF COMMON ROOM
STAFF KITCHEN
COPY ROOM
ADMIN OFFICE
STAFF LOUNGE
INTERVIEW 1
FIRST AID
IT OFFICE
STUDENT OFFICE
STORE ROOM
T.S.I.C
UNDER STAIR WATER TANK
EX CLOCK TOWER
STORAGE
CHANGE M
CHANGE F
SPORT STORE
POOL STORE
LIFT 1
LIFT 2
LIFT 3
STAIR 1
STAIR 2
STAIR 3
STAIR 4
STAIR 5
STAIR 6
New electrical substation
Gas meter
Sliding gate
Building outline level 2
Combined fire hydrant and sprinkler service booster assembly
N


LEGEND
Existing to be retained
Existing to be demolished
Proposed
Existing, significant heritage item
224 HEADLAND ROAD BEYOND
ELEVATION WEST
1:200
ELEVATION NORTH
1:200
LEVEL 4
LEVEL 3
LEVEL 2
LEVEL 1
LEVEL 0
DRAWING TITLE
800 PITTWATER ROAD
ELEVATIONS WEST + NORTH_800
SCALE@A1
1:200
DRAWING NO
A-210
REV
A
DRAWN BY
RM + CE + EG
CHECKED
PT
DATE
March 2020
PHASE
SSDA
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PROJECT
ST LUKE'S GRAMMAR
SCHOOL - NEW SENIOR
SCHOOL CAMPUS
800 Pittwater Road + 224 Headland Road
Dee Why NSW 2099 North Cnr North 2099
PROJECT NO 18032
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DESCRIPTION
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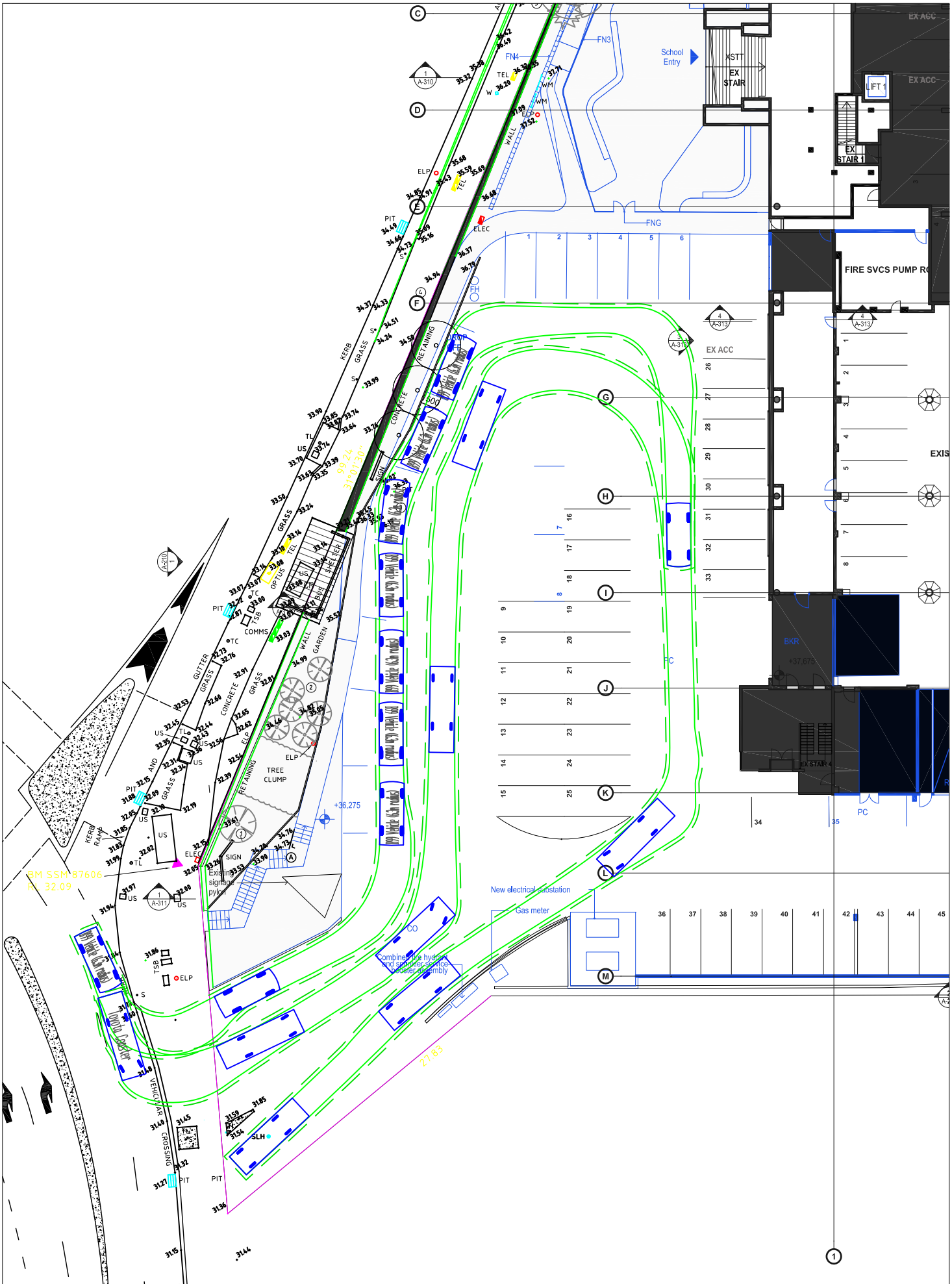
ISSUE FOR SSDA


LEGEND
Existing to be retained
Existing to be demolished
Proposed
Existing, significant heritage item
224 HEADLAND ROAD BEYOND
ELEVATION EAST
1:200
ELEVATION SOUTH
1:200
ST. LUKE'S GRAMMAR SCHOOL - NEW SENIOR SCHOOL CAMPUS
ELEVATIONS EAST + SOUTH_800
1:200
A-211
tonkin zulaikha greer



VARGA TRAFFIC PLANNING Pty Ltd
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20 Young Street
Neutral Bay, NSW 2089

Phone +61 2 9904 3224
PO Box 1868
Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
ST LUKES DEVELOPMENT

N

DRAWING TITLE
STAGE 2 DROP-OFF & PICK-UP AREA
B99 VEHICLE & TOYOTA COASTER

1:400 @ A4

ADDRESS
No.800 Pittwater Road,
Dee Why

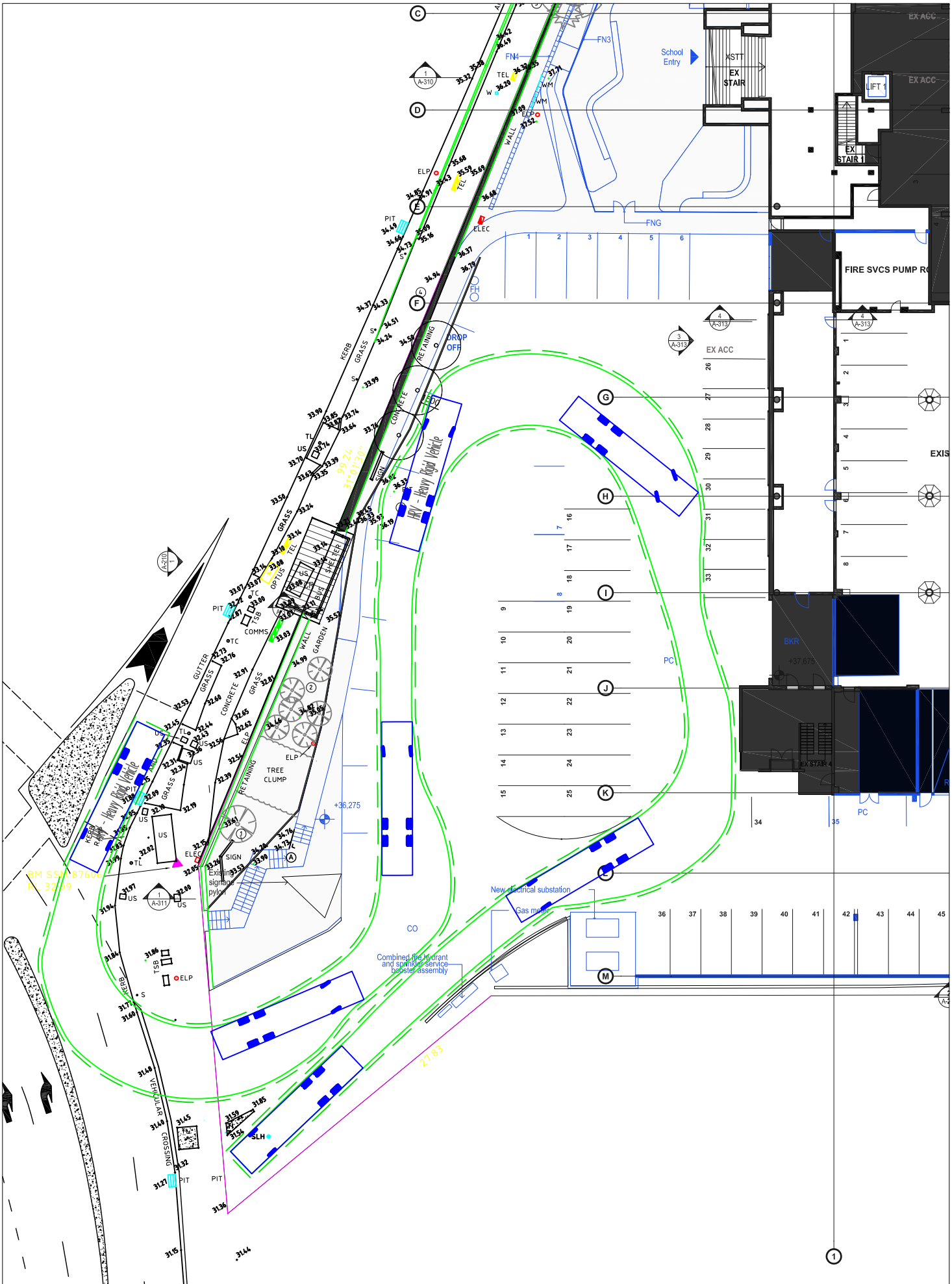
PROJECT NO.
19090

DATE DRAWN
2020-3-19

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants



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Phone +61 2 9904 3224
PO Box 1868
Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
ST LUKES DEVELOPMENT

N

DRAWING TITLE
Stage 2
12.5M HRV TRUCK (BUS) TURNING PATH

1:400 @ A4

ADDRESS
No.800 Pittwater Road,
Dee Why

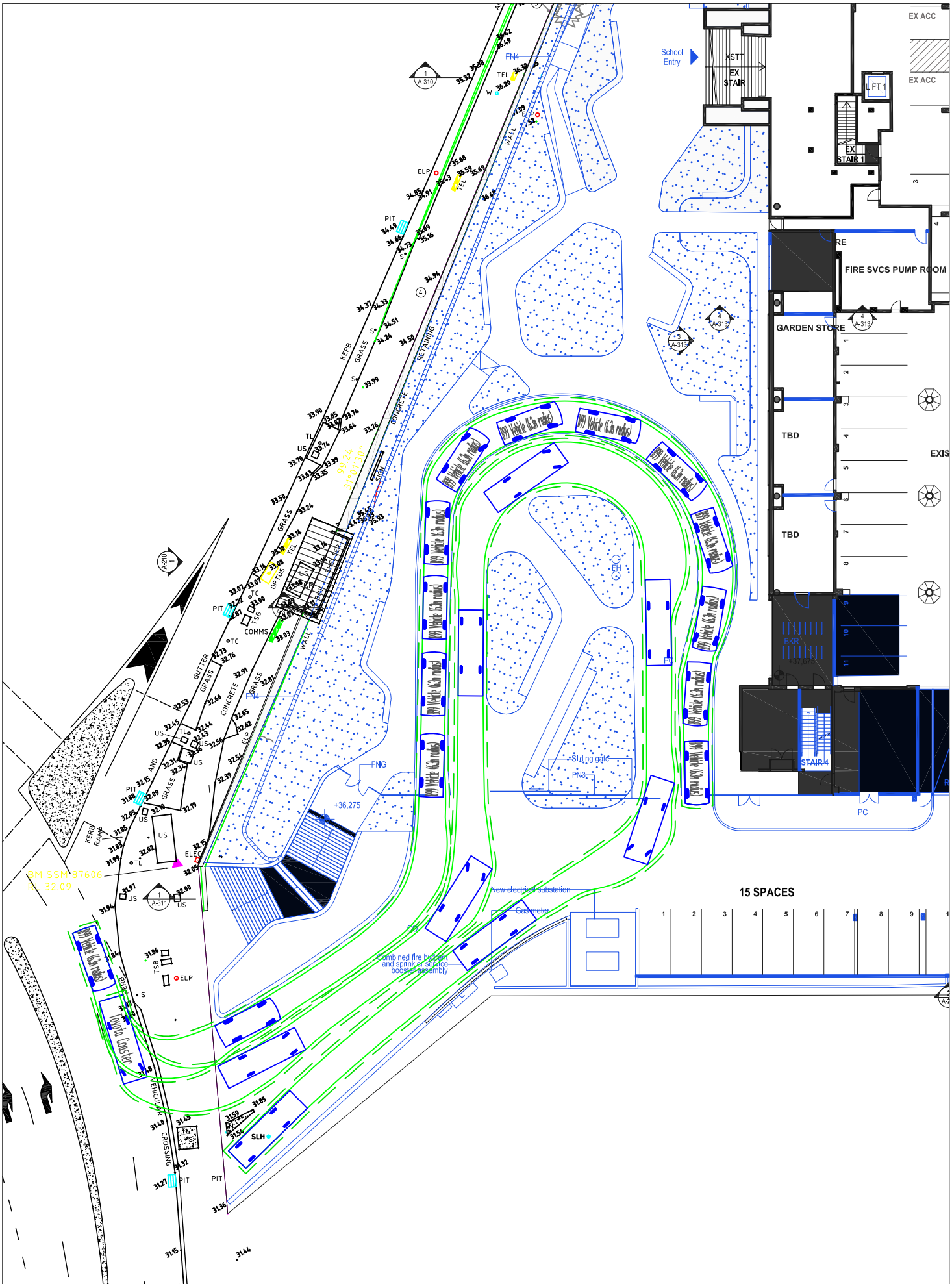
PROJECT NO.
19090

DATE DRAWN
2020-3-19

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants



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Phone +61 2 9904 3224
PO Box 1868
Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
ST LUKES DEVELOPMENT

N

DRAWING TITLE
STAGE 3 DROP-OFF & PICK-UP AREA
B99 VEHICLE & TOYOTA COASTER

1:400 @ A4

ADDRESS
No.800 Pittwater Road,
Dee Why

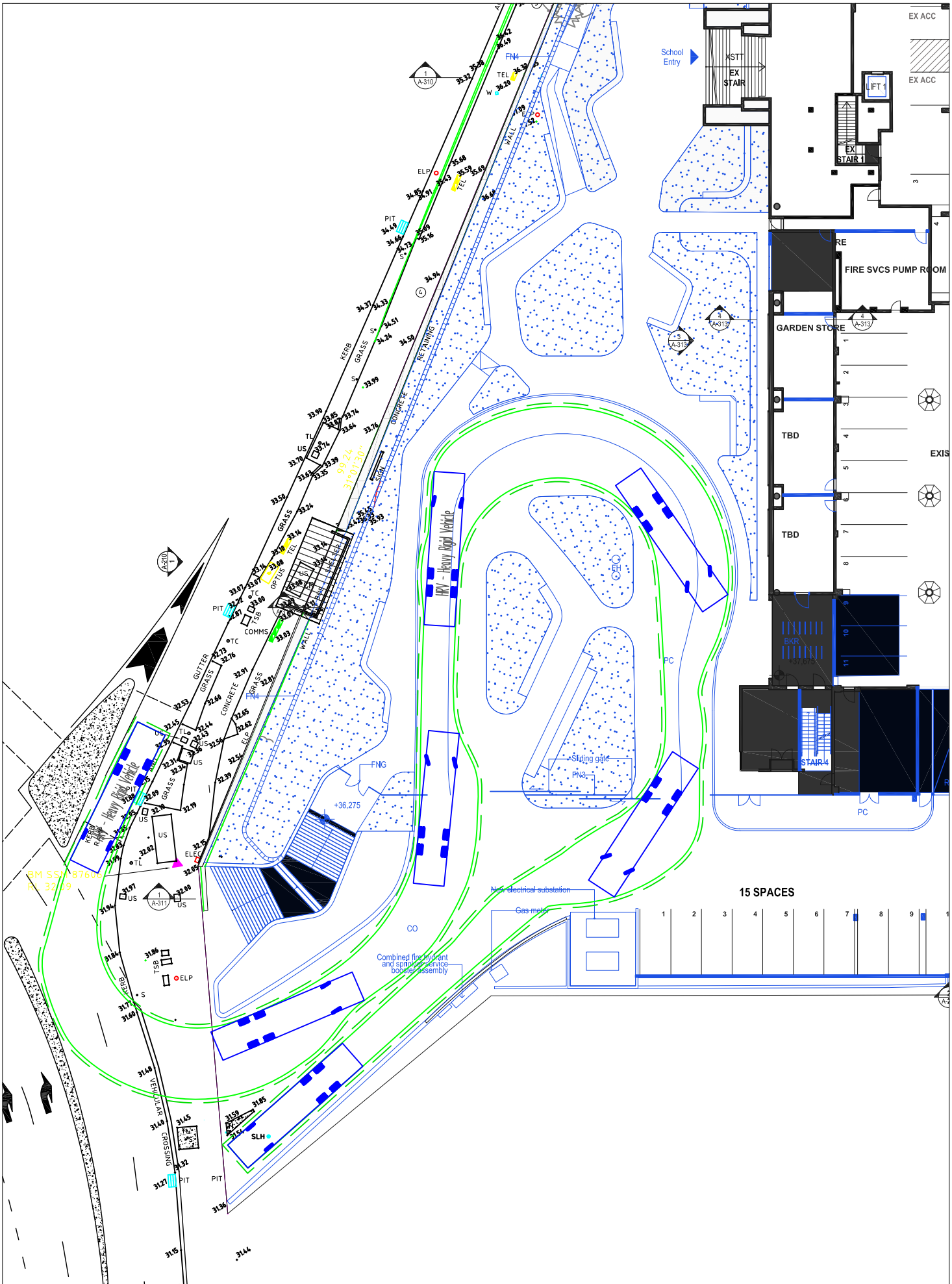
PROJECT NO.
19090

DATE DRAWN
2020-3-19

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants



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Neutral Bay, NSW 2089

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PO Box 1868
Neutral Bay, NSW 2089
www.vargatraffic.com.au
Sydney, Australia

PROJECT
ST LUKES DEVELOPMENT

DRAWING TITLE
Stage 3
12.5M HRV TRUCK (BUS) TURNING PATH

1:400 @ A4

ADDRESS
No.800 Pittwater Road,
Dee Why

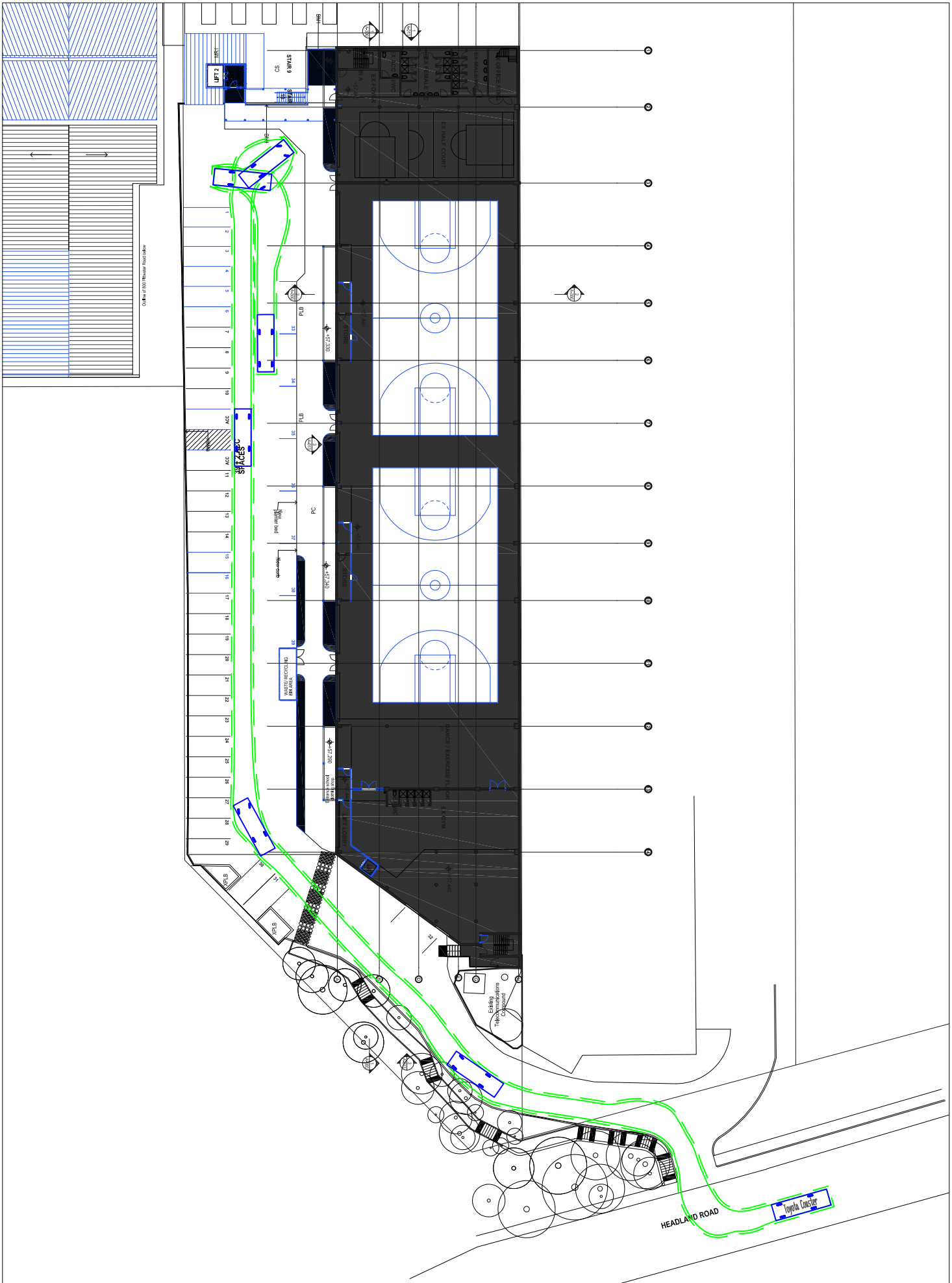
PROJECT NO.
19090

DATE DRAWN
2020-3-19

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants



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Sydney, Australia

PROJECT
ST LUKES DEVELOPMENT

N

DRAWING TITLE
7M TOYOTA COASTER TURNING PATH
U-Turning out of Site

1:600 @ A4

ADDRESS
No.800 Pittwater Road,
Dee Why

PROJECT NO.
19090

DATE DRAWN
2020-4-6

REVIEWED
ROBERT VARGA

PREPARED
DONALD LEE

VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants

6.0 TRAFFIC ASSESSMENT

6.1 Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the Roads and Maritime Authority is illustrated on Figure 3.

Pittwater Road is classified by the RMS as a *State Road* and provides the key north-south road link in the area, linking North Manly to Church Point. It typically carries two traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a central median island. Additional bus dedicated lanes are also located along both sides of Pittwater Road. Kerbside parking is generally permitted on both sides of the road outside of commuter peak periods.

Harbord Road is classified by the RMS as a *Regional Road* and follows a north-south alignment between Harbord and Brookvale. It typically carries two traffic lanes in each direction in the vicinity of the site, with kerbside parking permitted at selected locations.

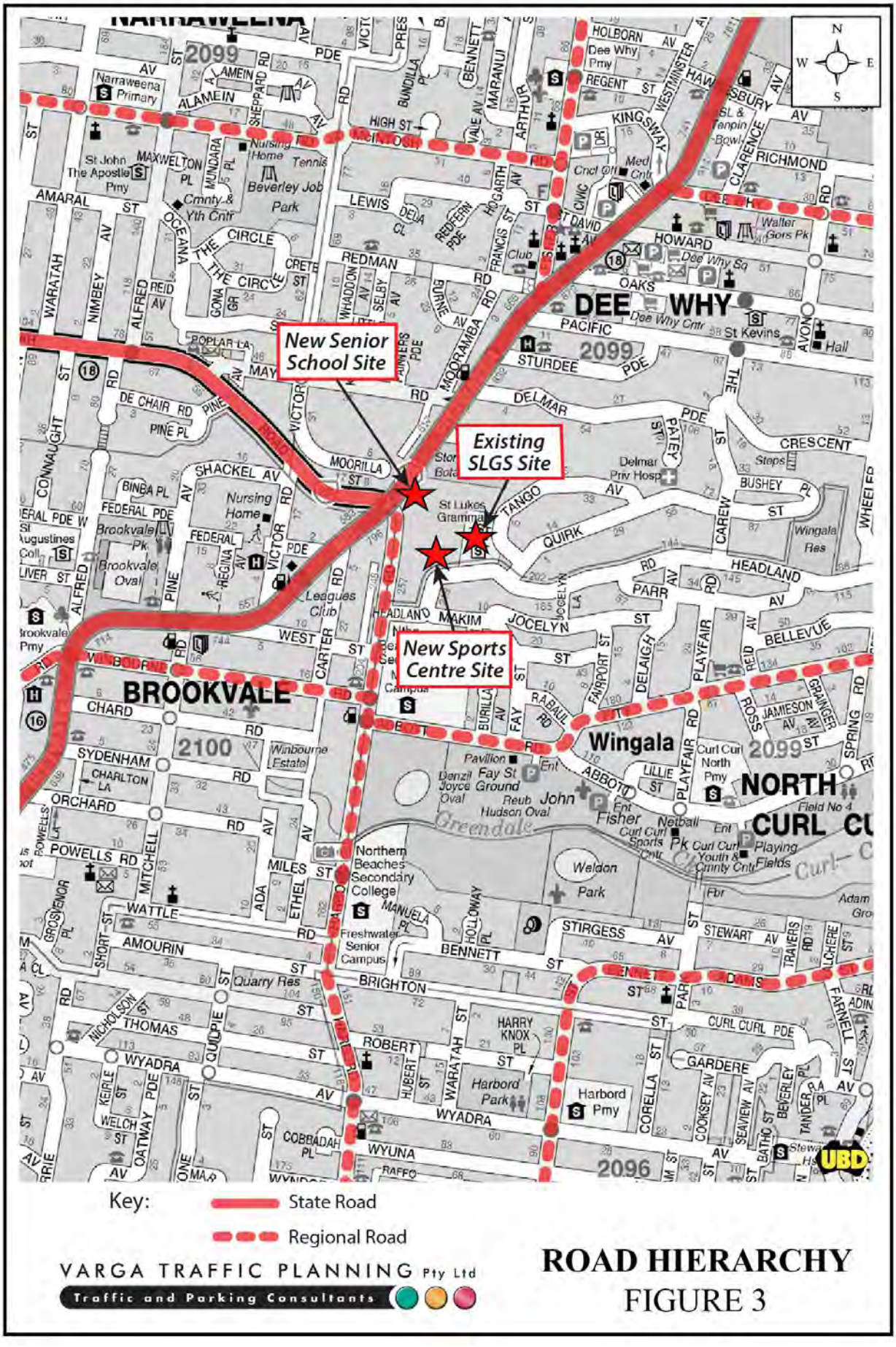
Headland Road, Quirk Street and Tango Avenue are local, unclassified roads which are primarily used to provide vehicular and pedestrian access to frontage properties. Kerbside parking is generally permitted on both sides of all three roads. Headland Road performs the function of a *collector road*, connecting the local residential area to the *higher-order* classified RMS road network.

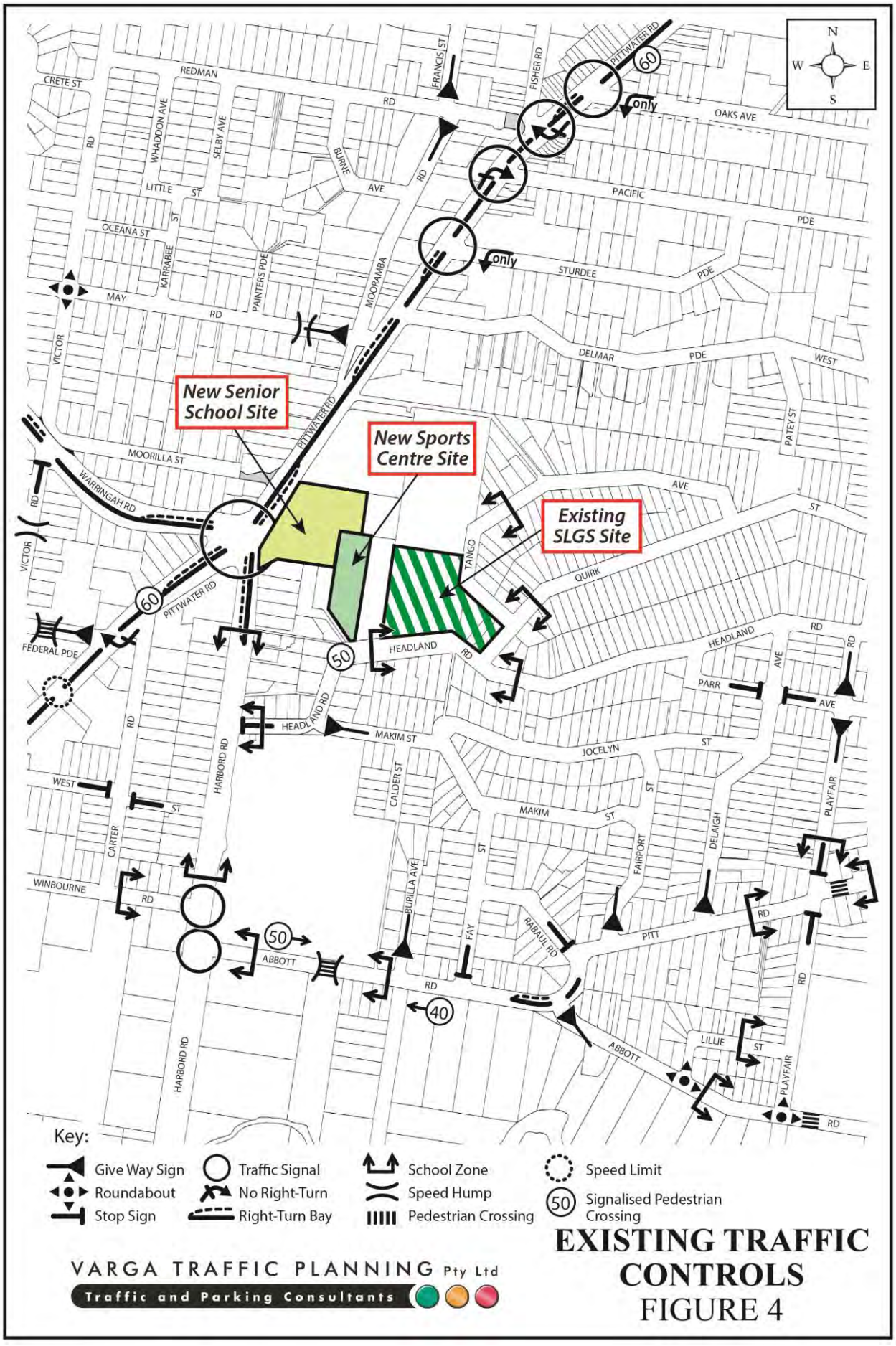
6.2 Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:

- a 60 km/h SPEED LIMIT which applies to Pittwater Road and Harbord Road

- a 50 km/h SPEED LIMIT which applies to Headland Road, Quirk Street, Tango Avenue and all other local roads in the area


New Senior School Site
Existing SLGS Site
New Sports Centre Site
DEE WHY
BROOKVALE
Wingala
NORTH CURL CU
Key:
State Road
Regional Road
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
ROAD HIERARCHY
FIGURE 3


N
W
E
S
New Senior School Site
New Sports Centre Site
Existing SLGS Site
PITTWATER RD
REDMAN RD
CRETE ST
WHADDON AVE
SELBY AVE
FRANCIS ST
FISHER RD
OAKS AVE
PACIFIC PDE
LITTLE ST
OCEANA ST
BURNE AVE
KARRABEE ST
PAINTERS PDE
MOORAMBA RD
STURDEE PDE
MAY RD
VICTOR RD
DELMAR PDE
WEST
PATEY ST
MOORILLA ST
WARRINGAH RD
TANGO AVE
QUIRK ST
FEDERAL PDE
HEADLAND RD
PARR AVE
MAKIM ST
JOCELYN ST
HARBORD RD
CALDER ST
WEST ST
CARTER RD
MAKIM ST
FAIRPORT ST
DELAIGH ST
PLAYFAIR RD
WINBOURNE RD
BURILLA AVE
FAY ST
RABAUL RD
PITT RD
ABBOTT RD
LILLIE ST
60
50
40
only
Key:
Give Way Sign
Roundabout
Stop Sign
Traffic Signal
No Right-Turn
Right-Turn Bay
School Zone
Speed Hump
Pedestrian Crossing
Speed Limit
Signalised Pedestrian Crossing
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
EXISTING TRAFFIC CONTROLS
FIGURE 4

- a 40 km/h SCHOOL ZONE SPEED LIMIT which applies to Harbord Road, Headland Road, Quirk Street and Tango Avenue in the vicinity of the *St Luke's Grammar School* and the *Northern Beaches Secondary College*

- a CENTRAL MEDIAN ISLAND in Pittwater Road which precludes right-turn movements into and out of the site

- TRAFFIC SIGNALS in Pittwater Road where it intersects with Warringah Road/Harbord Road

- RIGHT TURN HOLDING BAYS for all directions along the Pittwater Road and Warringah Road/Harbord Road intersection

- a STOP SIGN restriction in Headland Road where it intersects with Harbord Road.

6.3 Existing Public Transport Services

There are currently 13 bus routes which operate along Pittwater Road as illustrated on Figure 5.

The nearest bi-directional bus stops for these bus routes on Pittwater Road are located to the south of the Harbord Road intersection, approximately 100m walking distance from the proposed senior school campus.

The 132 bus service (Warringah Mall to Manly via North Balgowlah) is also located within easy walking distance, with the closest bus stop located along Harbord Road.

The typical service frequencies for services along Pittwater Road during morning/afternoon school times are summarised in Table 3.1 below.

In addition to the abovementioned regular bus route services, the new B-Line service also operates along Pittwater Road. The nearest B-Line bus stops are located near Howard Avenue approximately 700m to the north of the *pedestrian-only* gate located at the north-western corner of the *senior campus* site.


New Senior School Site
Existing SLGS Site
New Sports Centre Site
Collaroy Plateau
Cromer
Narraweena
Dee Why
Dee Why Beach
Wingala
North Curl Curl
Curl Curl
South Curl Curl
North Manly
Freshwater
Queenscliff
Fairlight
Broo
eacon Hill
gah Mall
Pittwater Road Services
151 180 E85 L90
E54 E80 188 199
158 E83 E88
E60 185 E89
B1 B-Line
Route 139
Street Legend
1. Bridge Rd
2. Pavilion St
3. Greycliffe St
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
PUBLIC TRANSPORT SERVICES
FIGURE 5

Table 3.1: Existing Bus Services along Pittwater Road

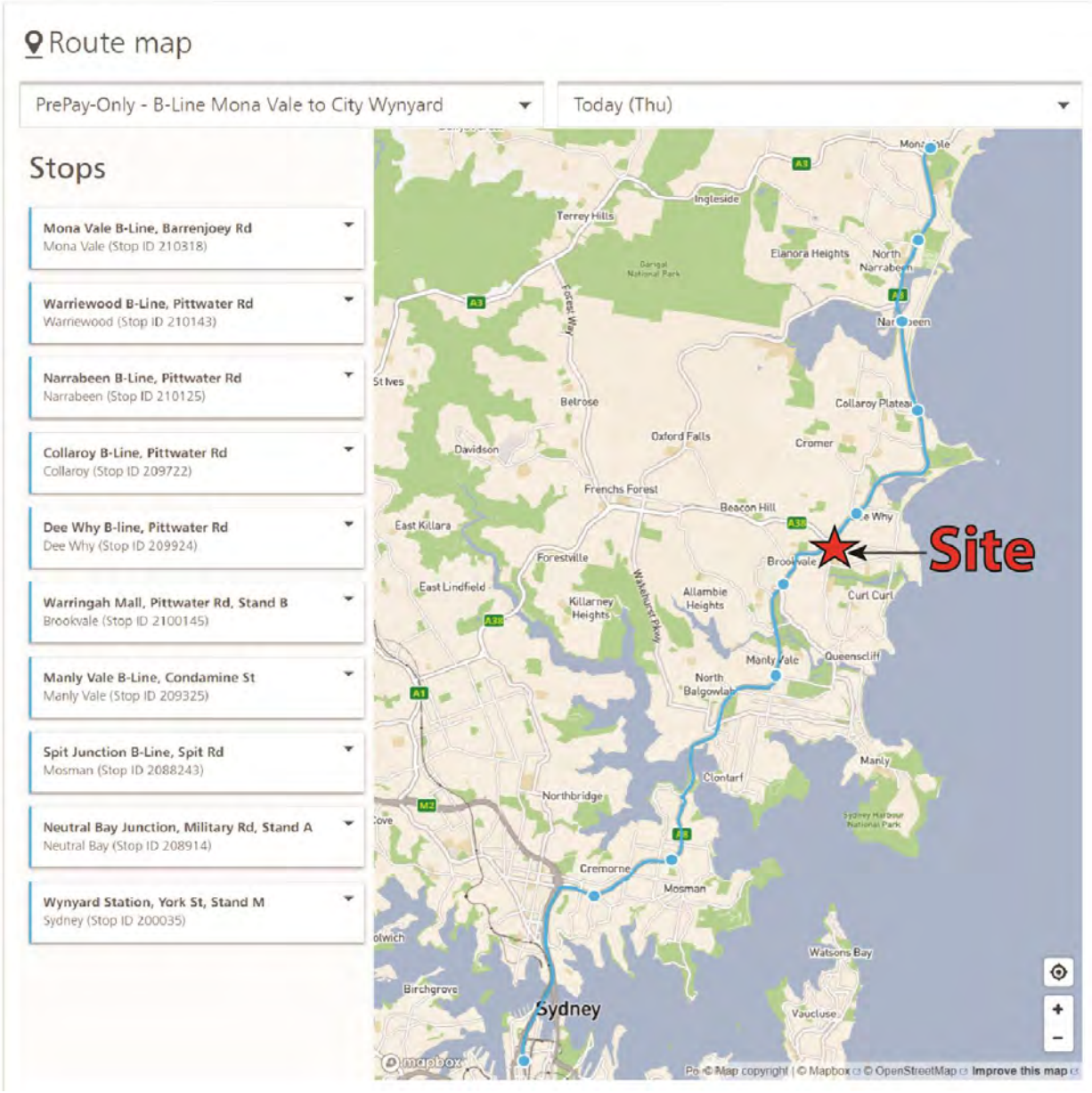
Route Number	Bus Route Description	Typical Service Frequency		
		Weekday	Saturday	Sunday
146	Wheeler Heights to Manly	30min	30min	30min
151	Mona Vale to City QVB	30min	30min	30min
158	Cromer to Manly	1 service[1]	N/A	N/A
169	Manly to City Wynyard via Narraweena	30min	30min	60min
178	City Wynyard to Cromer Heights	30min	30min	30min
180	Collaroy Plateau to City Wynyard	30min	30min	30min
185	Mona Vale to Warringah Mall via Warriewood	30min	30min	30min
188	Mona Vale to City Wynyard	20min	30min	30-60min
193	Warringah Mall to Austlink via Frenchs Forest	30min	30min	30-60min
199	Palm Beach to Manly	15min	30min	30min
E69	Manly to City Wynyard via Narraweena (EXPRESS)	5-10min	N/A	N/A
E78	Cromer Heights to City Wynyard (EXPRESS)	15-20min	N/A	N/A
E79	Wheeler Heights to City Wynyard (EXPRESS)	15-20min	N/A	N/A

[1]**Morning Service at approx. 7am and Afternoon Service at approx. 4pm**

The new B-Line service will primarily benefit *senior campus* students who can independently access the B-Line bus stops in Pittwater Road near Howard Street using the *pedestrian-only* gate located on the north-western corner of the site.

It should be noted that this *pedestrian-only* gate is separated from road traffic on Pittwater Road by a 2m high concrete embankment topped by a pedestrian fence which extends along the site frontage and northerly to the car park entrance to the Stony Range Regional Botanic Gardens, approximately 100m to the north of the site. The B-Line route is illustrated on Figure 5.1 below.

Figure 5.1 – B-Line Route



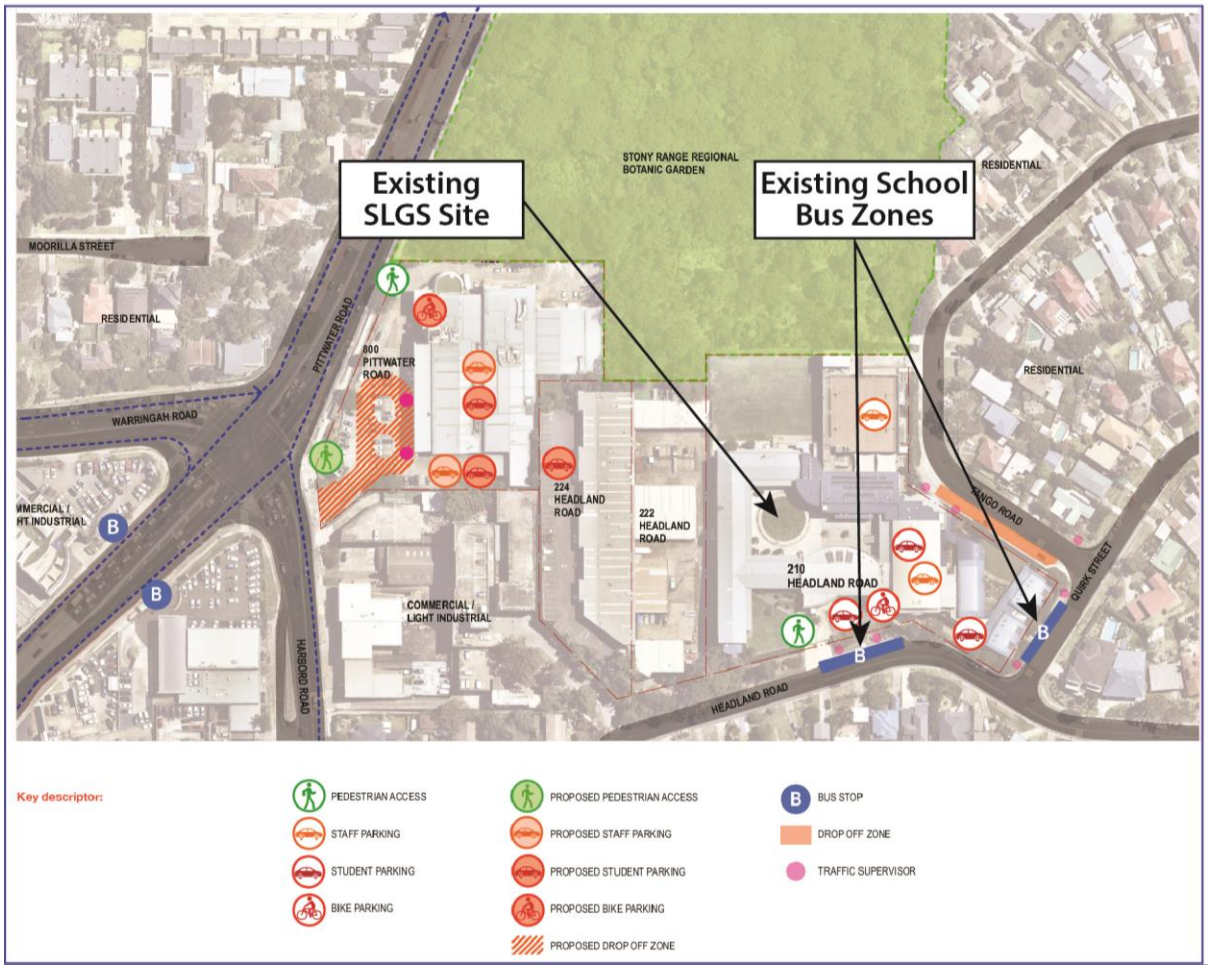
In addition to the abovementioned regular bus routes & B-Line services, there are also dedicated *school bus* services which stop directly outside the existing *St Luke's Grammar School* in Headland Road or in Quirk Street.

The school buses serving the existing St Luke's Grammar School Campus are provided by the NSW State Government and are listed on the Transport for NSW website as detailed below, with service timetables detailed in Appendix B.

- 668N – St Luke's Dee Why to Balgowlah Heights
- 669N – St Luke's Dee Why to Manly Wharf
- 670N – St Luke's Dee Why to Bantry Bay
- 671N – St Luke's Dee Why to Skyline Shops
- 672N – St Luke's Dee Why to Collaroy Plateau
- 677N – St Luke's Dee Why to Warriewood Square
- 678N – St Luke's Dee Why to Newport
- 684N – Collaroy Plateau to Balgowlah Boys' High
- 702N – Frenchs Forest to St Pauls
- 732N – Allambie & Rodborough Roads to Manly High School
- 759N – North Curl Curl to North Curl Curl Public School
- 784N – St Luke's to Frenchs Forest
- 787N – St Luke's Grammar to Avalon

The location of the bus stops in the vicinity of the site are illustrated on Figure 5.2 below and are also shown on the Transport Access Guide which forms part of the *Green Travel Plan*.

Figure 5.2 Access and Movement Analysis of existing/proposed SLGS site, extracted from Tonkin Zulaikha Greer's *Architectural Design Report (October 2019)*



6.4 Existing Traffic Conditions

In order to gain an accurate appreciation of the existing traffic conditions on the road network in the vicinity of the site, peak period traffic surveys were undertaken at the Pittwater Road/Harbord Road and also the Harbord Road/Headland Road intersections on 19th September 2019. The surveys revealed that:

- the road network peak in the morning occurred between 7:30am and 8:30am which coincides with the morning *school peak*

- The road network peak in the afternoon occurred between 4:00pm and 5:00pm, after the afternoon *school peak* which occurs at 3:00pm and 4:00pm

- one-way southbound traffic flows in Pittwater Road along the site frontage are typically in the order of 2,400 vehicles per hour (vph) during the morning *school peak* period, and approximately 1,800 vph during the afternoon *school peak* period

- one-way northbound traffic flows in Pittwater Road in the vicinity of the Warringah Road/Harbord Road intersection are typically in the order of 1,350 vehicles per hour (vph) during the morning *school peak* period, and approximately 2,000 vph during the afternoon *school peak* period

- one-way southbound traffic flow in Harbord Road along the site frontage are typically in the order of 1,100 vehicles per hour (vph) during the morning *school peak* period, decreasing to approximately 900 vph during the afternoon *school peak* period

- southbound traffic flows in Harbord Road in the vicinity of the Headland Road intersection are typically in the order of 1,000 vph during the *school peak* periods

- two-way traffic flows in Headland Road in the vicinity of the Harbord Road intersection are typically in the order of 550 vehicles per hour (vph) during the morning *school peak* period, and approximately 450 vph during the afternoon *school peak* period.

The results of the traffic surveys are reproduced in full in Appendix C, and the traffic flows during school peak periods are summarised on Figures 6a and 6b, revealing that:

Traffic surveys were also undertaken at the site access driveways of No.800 Pittwater Road and also No.224 Headland Road to identify the traffic flows generated by the existing uses of those sites.

The results of the traffic surveys at the site access driveways are reproduced in full in Appendix C and are summarised on Figures 7a and 7b, revealing that:

No. 800 Pittwater Road

- two-way traffic flows using the existing site access driveway during the *morning* school peak period (7:30-8:30am) were 170 vph (i.e. 92 vph IN and 72 vph OUT)

- during the *afternoon* school peak period (3:00pm-4:00pm) the two-way traffic flows using the existing driveway was 244 vph (131 vph IN and 113 vph OUT)

- the total volume of traffic generated by the existing uses of the site throughout the 12-hour duration of the surveys (6am-6pm) was 2,931 vehicle movements including 17 heavy vehicle truck movements.

No. 224 Headland Road

- there were 23 vehicle movements in and out of the existing site during the school peak period in the *morning* (i.e. 14 vph IN and 9 vph OUT)

- there were 16 vehicle movements in and out of the existing site (i.e. 6 trips IN and 10 trips OUT) during the school peak period in the *afternoon*

- there were a total of 201 vehicle movements (two-way) generated by the existing uses of the site throughout the 12-hour duration of the surveys between 6am-6pm.

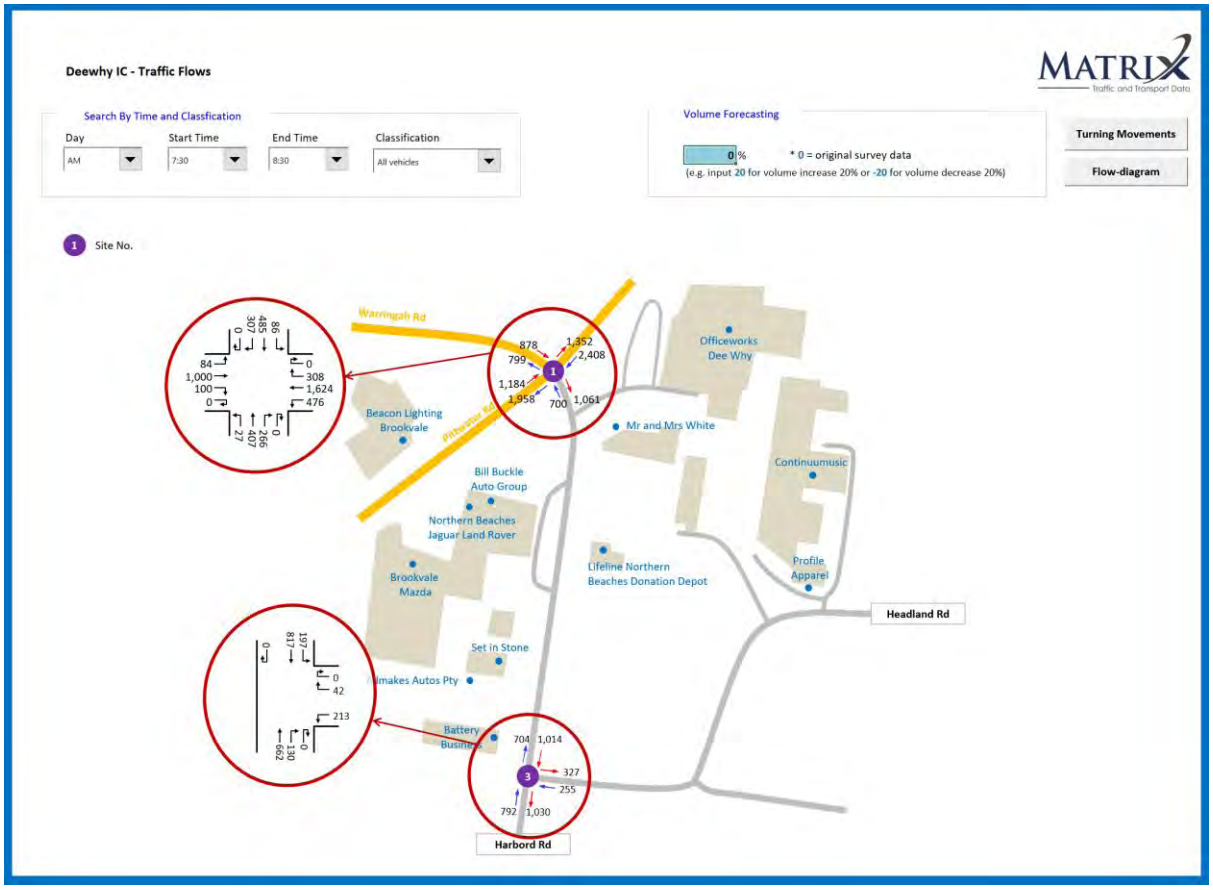


Figure 6a – Existing Traffic Flow Traffic Assignment during *morning* school peak (7:30am-8:30am)

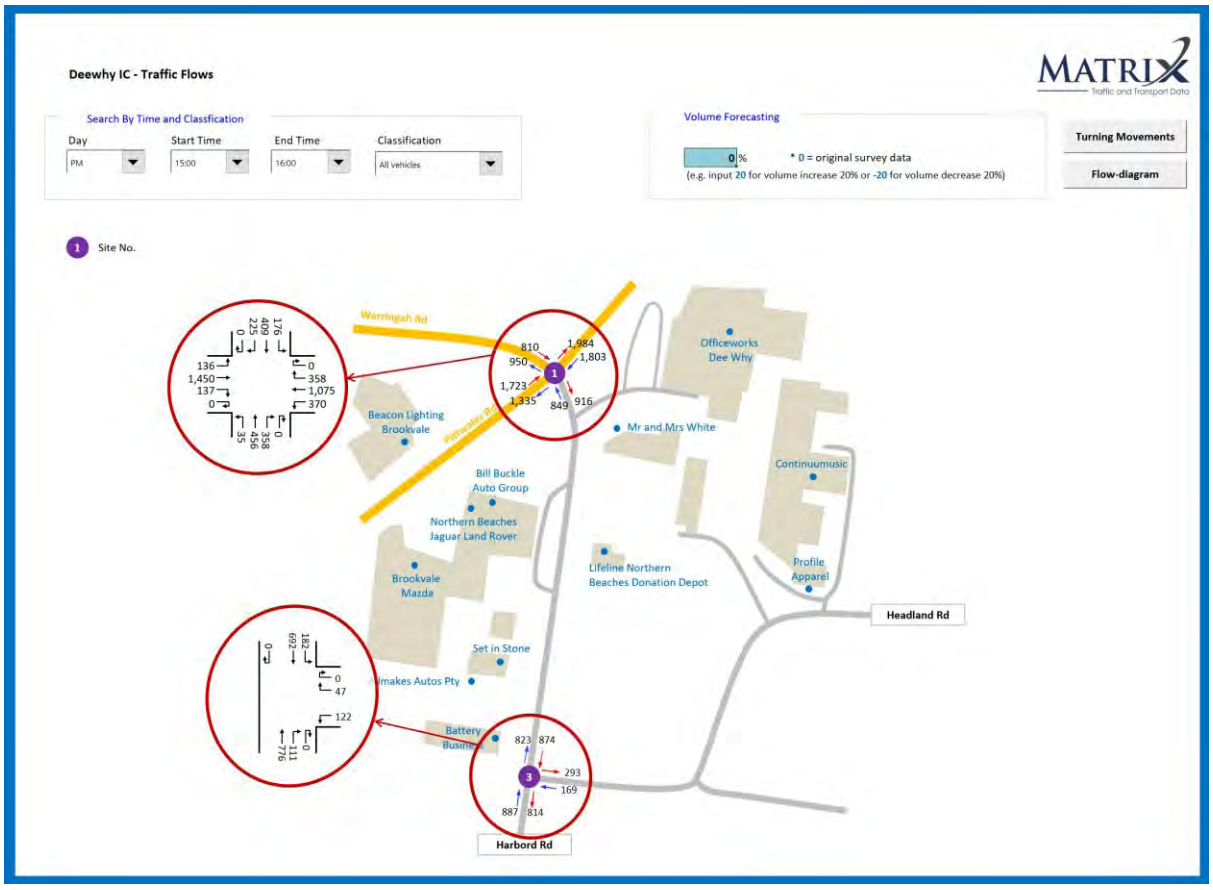


Figure 6b – Existing Traffic Flow Traffic Assignment during *afternoon* school peak (3:00pm-4:00pm)

Figure 7a – Existing Traffic Flow Traffic Assignment along the site access driveways of 800 Pittwater Road and 224 Headland Road during *morning* school peak (7:30am-8:30am)

Figure 7b – Existing Traffic Flow Traffic Assignment along the site access driveways of 800 Pittwater Road and 224 Headland Road during *afternoon* school peak (3:00pm-4:00pm)

6.5 Projected Future Traffic Generation Potential

The traffic implications of a development proposal primarily concern the effects of the additional traffic flows generated as a result of a development and its impact on the operational performance of the adjacent road network.

An indication of the traffic generation potential at most types of developments is usually provided by reference to Roads and Maritime Services Publication *Guide to Traffic Generating Developments (2002)*. However, the RMS *guidelines* do not nominate the traffic generation rate for schools. A number of surveys were therefore undertaken at SLGS to identify the level of traffic activity generated by the existing student numbers, as detailed in Chapter 4 of this report.

Based on a "per student" basis the survey results identified the following traffic generation rates:

Existing School Traffic Generation Rates (vehicles per hour/student)						
	AM Peak Hour			**PM Peak Hour**		
	IN	**OUT**	**TOTAL**	**IN**	**OUT**	**TOTAL**
K-Y9	0.273	0.273	**0.545**	0.160	0.160	**0.319**
Y10-Y12	0.172	0.172	**0.343**	0.086	0.086	**0.172**

The survey data confirms that senior students in Years 10 to 12 generate substantially l*ess traffic* on a per student basis than younger students, and reinforces the conclusions reached in an independent traffic study[2] prior to its approval of MOD 2018/0412 on 26 June 2019. It also confirms on-site observations. There are typically no queues at the high school finishing time of 3:20pm (Years 7 to 12).

Proposed *Senior Campus* - No. 800 Pittwater Road

Application of the above traffic generation rates to the 600 students proposed on the senior school campus at 800 Pittwater Road yields a total of 103 drop-offs during the morning *school peak* hour, and a total of 52 pick-ups during the afternoon *school peak* hour. In

2 The Transport Planning Partnership S*t Luke's Grammar School – Planning Panel Deferral Traffic and Parking Survey Results 7 May 2019* undertaken for the *Sydney North Planning Panel*.

addition, there will be 15 students and 75% of staff parking on-site who will also arrive and depart during the same *school peak* hour.

A comparison of existing and projected traffic flows during the 1-hour *school peak* period at the existing site access driveway in Harbor Road is set out in the table below, revealing that:

- traffic flows during the morning *school peak* hour will increase by 96 vph when compared with the existing uses of the site, and

- traffic flows during the afternoon *school peak* hour will decrease by 80 vph when compared with the existing uses of the site.

No. 800 Pittwater Road Comparison of Existing and Projected Future Traffic Flows During the 1-Hour *School Peak* Period (vehicles per hour)				
	Existing Traffic Flows		**Projected Future Traffic Flows**	
	AM	**PM**	**AM**	**PM**
IN	92 vph	131 vph	163 vph	52 vph
OUT	78 vph	113 vph	103 vph	112 vph
TOTAL	**170 vph**	**244 vph**	**266 vph**	**164 vph**

As noted in the foregoing, the school proposes to make available for *community uses* the swimming pool on the *senior campus* site, and the basketball courts on the *sports centre* site on an after-school hours basis. Parking for both community uses will be allocated on the *service campus* site.

It is anticipated that 3 swim school classes and squad training sessions may be held in the pool. Assuming a vehicle occupancy of 1.2 swim/squad students per vehicle, the swim school/squad training could be expected to generate approximately 85 vehicles per hour (in and out combined) between 4pm-7pm. It is noted that the *existing* uses of the site at those times typically generate more than 300 vph (in and out combined) and the proposed community uses therefore represent a substantially *less intensive* use of the site in traffic terms than those existing uses.

The *community use* of the basketball courts on an after-school hours basis is expected to be used by 10 persons per court. With a vehicle occupancy of 1.2 persons per vehicle the basketball courts are expected to generate approximately 33 vph between 4pm-7pm.

The *daily* traffic generation potential of the proposed senior school campus upon completion of Stage 3 is expected to be 508 vehicles per day (including student and staff parking) plus a further 232 vehicles per day associated with the *community uses* of the swimming pool and basketball courts, yielding a cumulative *daily* traffic generation potential of 740 vehicles per day.

This compares with the existing *daily* traffic flows of 2,931 vehicles per day generated by the existing uses of the site as identified by surveys conducted between 6am-6pm[3]. The proposed senior school campus development is therefore expected to result in a very substantial reduction in the *daily* traffic generation potential of the site of at least 2,191 vehicles per day (vpd) as set out in the table below:

No. 800 Pittwater Road **Comparison of Existing and Projected Future Daily Traffic Flows (6am-6pm)**	
Existing Traffic Generation:	2,931 vpd
Projected Traffic Generation:	740 vpd
Nett Change:	**-2,191 vpd**

Proposed *Sports Centre* - No. 224 Headland Road

The *sports centre* proposed at 224 Headland Road includes 39 car parking spaces for Year 12 students who will arrive in the morning and depart in the afternoon. There will not be any other traffic generated by the *sports centre* usage, with all students to walk to the site from the adjacent school campus.

A comparison of existing and projected future traffic flows during the 1-hour *school peak* period is set out in the table below, revealing that:

- traffic flows during the morning *school peak* hour will increase slightly by 18 vph, and

3 It is acknowledged that the existing uses of the site generates additional traffic *before* 6am and *after* 6pm associated with the Fitness First gymnasium and swimming pool.

- traffic flows during the afternoon *school peak* hour will increase slightly by 25 vph.

No. 224 Headland Road Comparison of Existing and Projected Future Traffic Flows During the 1-Hour *School Peak* Period (vehicles per hour)				
	Existing Traffic Flows		**Projected Future Traffic Flows**	
	AM	**PM**	**AM**	**PM**
IN	14 vph	6 vph	39 vph	-
OUT	9 vph	10 vph	-	39 vph
TOTAL	**23 vph**	**16 vph**	**39 vph**	**39 vph**

The *daily* traffic generation potential of the proposed *sports centre* upon completion of Stage 1 is expected to be 78 vehicles per day. This compares with the *daily* traffic flows of 201 vehicles per day generated by the existing uses of the site as identified by surveys conducted between 6am-6pm. The proposed *sports centre* component of the development is therefore expected to result in a substantial reduction in the *daily* traffic generation potential of the site of approximately 123 vehicles per day (vpd) as set out in the table below:

No. 224 Headland Road Comparison of Existing and Projected Future Daily Traffic Flows (6am-6pm)	
Existing Traffic Generation:	201 vpd
Projected Traffic Generation:	78 vpd
Nett Change:	**-123 vpd**

Existing School Campus - No. 210 Headland Road

Application of the above traffic generation rates to the 1,000 students proposed on the existing school campus at 210 Headland Road indicates that there will be nett increase of 25 drop-offs during the morning *school peak* hour, and a nett increase of 22 pick-ups during the afternoon *school peak* hour, as set out in the table below.

Existing School Campus - No. 210 Headland Road Comparison of Existing and Projected Future Traffic Flows During the 1-Hour *School Peak* Period (vehicles per hour)				
	Existing Traffic Flows		**Projected Future Traffic Flows**	
	AM	**PM**	**AM**	**PM**
IN	297 vph	115 vph	322 vph	137 vph
OUT	196 vph	216 vph	221 vph	238 vph
TOTAL	**493 vph**	**331 vph**	**543 vph**	**375 vph**

The *daily* traffic generation potential of the existing school campus upon completion of Stage 3 is expected to be 1,215 vehicles per day taking account the change in student mix proposed at the existing school campus. This compares with the *daily* traffic flows of 1,126 vehicles per day generated by the existing uses of the existing school campus. The change in student mix proposed at the existing school campus is therefore expected to result in an increase in the *daily* traffic generation potential of the site of 89 vpd as set out in the table below.

No. 210 Headland Road **Comparison of Existing and Projected Future Daily Traffic Flows (6am-6pm)**	
Existing Traffic Generation: Projected Traffic Generation:	1,126 vpd 1,215 vpd
Nett Change:	**+89 vpd**

6.6 Traffic Implications - Road Network Capacity

The traffic implications of development proposals primarily concern the effects that any changes in traffic flows may have on the operational performance of the nearby road network during school peak periods.

Those effects can be assessed using the SIDRA program which is widely used by the RMS and many LGA's for this purpose. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

The result of the SIDRA analysis of the two main intersections located around the perimeter of *St Luke's Grammar School* are summarised in the Tables 3.1, 3.2 & 3.3 below, revealing that:

<u>Pittwater Road/Harbord Road Intersection</u>

- the Pittwater Road/Harbord Road intersection currently operates at *Level of Service "D"* under the existing traffic demands with total average vehicle delays in the order of 49 seconds/vehicle

- under the projected future traffic demands expected to be generated by the development proposal, the Pittwater Road/Harbord Road intersection will continue to

operate at *Level of Service "D"* during the *morning* school peak and *afternoon* school peak period, with total average vehicle delays in the order of 50 second/vehicle.

The SIDRA capacity analysis of the Pittwater Road/Harbord Road intersection was then repeated, assuming a 40 km/h School Zone speed limit applied to all four approaches to the intersection. The results of that analysis are summarised in Table 3.2 below, revealing that the intersection will continue to operate at Level of Service "D" with total average vehicle delays in the order of 52 seconds/vehicle.

In essence, the analysis shows that, *if* a 40 km/h School Zone speed limit was applied, it would have little practical effect on the operating performance of the intersection.

It is noted in this regard that repeated observations of the intersection operation throughout the *school peak* periods that vehicle speeds traversing the intersection are in the order of approximately 40 km/h in any event, and thus the application of a 40 km/h School Zone speed limit is unlikely to have any practical or appreciable effects on intersection performance.

Harbord Road/Headland Road Intersection

- the Harbord Road/Headland Road intersection currently operates at *Level of Service "A"* during the *morning* and *afternoon* school peak period, under the existing traffic demands with total average vehicle delays in the order of 10.6 and 5.9 seconds/vehicle respectively.

- under the projected future traffic demands expected to be generated by the development proposal, the Harbord Road/Headland Road intersection will continue to operate at *Level of Service "A",* with increases in average vehicle delays of between *0 and 2* second/vehicle.

The detailed SIDRA movement summaries are reproduced in Appendix D. The results indicate that the surrounding intersections are expected to continue to operate at current *Levels of Service*, with minimal change in total average vehicle delays.

In summary therefore, the capacity analysis confirms that the proposed expansion of St Luke's Grammar School will not have any unacceptable traffic implications in terms of road network capacity. Accordingly, there will not be any road upgrades or intersection improvements required as a consequence of the development proposal.

6.7 The Need for 40/h School Zone Speed Limits

The RMS requirements for 40 km/h School Zone speed limits on multi-lane roads and high-speed roads are specified in *Technical Direction No. TD2003/RS02*. The *Technical Direction* specifies the following:

- *multi-lane roads* are defined as roads with 2 or more lanes for traffic movement in the same direction of travel

- access points are defined as any point by which students can currently enter or exit a school site on foot, bicycle, wheel recreational device or wheeled toy. They include gates, driveways and delivery access points

- where access points exist on multi-lane roads and high-speed roads, every effort should be undertaken to negotiate with the school to relocate and/or close-off an access point, rather than install a 40 km/h school zone. If this is not possible, it may be necessary to consider other treatments in addition to the school zone, so that a safer environment is created for the students of the school in question

- school zone installations on multi-lane roads of 70 km/h or less should be a minimum (length) of 200m

A 40 km/h school speed limit already exists around the perimeter of the existing SLGS site in Headland Road, Quirk Street and in Tango Avenue. It is anticipated that the 40 km/h school zone speed limit in Headland Road would be extended towards the west to incorporate the entrance to the vehicular and pedestrian entrances to the *sports centre* proposed at 224 Headland Road.

Another school zone speed limit exists in Harbord Road from 100m south of Pittwater Road to Brighton Street for Freshwater Secondary College.

The *senior campus* which is the subject of this application will have pedestrian entrances located at the north-western and south-western corners of the site, in addition to the vehicle entrance (left-in/left-out) also located at the south-western corner of the site.

The proposed *senior campus* does not have any other street frontage other than Pittwater Road and a short section of Harbord Road where the existing vehicular access driveway is located.

The two pedestrian entrances are a key component of the *senior campus* proposals to enable it to be integrated with the existing public transport services on Pittwater Road, because each pedestrian entrance provides the shortest and most direct walking route to:

- the B-Line bus stops to the north, and

- the regular bus route service stops to the south of the site in Pittwater Road.

It is noted in this regard that the *pedestrian-only* gate located at the north-western corner of the site is separated from road traffic on Pittwater Road by a 2m high concrete retaining wall topped by a pedestrian safety fence along the kerb line which extends along the majority of the site frontage and further to the north across the frontage of the adjacent Stony Range Regional Botanic Garden.

The location of the existing *pedestrian-only* gate at the north-western corner of the site is illustrated on Figure 7c below. It is pertinent to note that another retaining wall is located on the opposite (i.e. western) side of Pittwater Road, such that all pedestrian access to this section of Pittwater Road is impossible.

Figure 7c – Existing *Pedestrian-Only* Gate at North-Western Corner of the *Senior Campus* Site

The pedestrian entrance proposed near the south-western corner of the *senior campus* site is to be located directly opposite the signalised pedestrian crossings which provide direct pedestrian access to the bi-directional bus stops located in Pittwater Road immediately to the south of the intersection.

The location of the pedestrian access proposed at the south-western corner of the *senior campus* site is illustrated on Figure 7d below. The proposed pedestrian access will be located directly opposite the signalised pedestrian crossings and will provide the shortest possible walking route to the bi-directional bus stops located immediately to the south of the intersection.

Figure 7c – Existing *Pedestrian-Only* Gate at North-Western Corner of the *Senior Campus* Site

The provision of direct pedestrian access along the shortest possible routes to both the regular bus route stops and the B-Line bus stops form a key component of the school's proposal to integrate the *senior campus* with the existing public transport network, and is ideally suited to the needs of senior students who will be able to access these external bus stops in a safe and efficient manner.

The proposed pedestrian entrances will also extend the "range" of the *senior campus* for active transport users (i.e. walking and cycling) for students and staff travelling to/from the *senior campus* on foot or bicycle.

Strict application of *Technical Direction TDT2003/RS02* suggests that a 40 km/h School Zone speed limit would be required on all four approaches to the Pittwater Road/Harbor Road intersection.

However the need to implement a 40 km/h School Zone speed limit could be mitigated by the following factors:

- the *pedestrian-only* gate located at the north-western corner of the site frontage provides pedestrian access to the public footpath ***only***. It is *not possible* for pedestrians on the footpath to access the road pavement due to the 2m high concrete retaining wall which is topped by a pedestrian fence

- the pedestrian entrance proposed on the south-western corner of the site in Harbord Road will be located directly opposite the signalised pedestrian crossings at the Pittwater Road/Harbord Road intersection which provide access to the bi-directional bus stops for regular bus services on Pittwater Road.

TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF PITTWATER ROAD & WARRINGAH ROAD/HARBORD ROAD

Key Indicators		Existing Traffic Demand		Projected Development Traffic Demand	
		AM	**PM**	**AM**	**PM**
Level of Service		D	D	D	D
Degree of Saturation		0.804	0.808	0.872	0.808
Average Vehicle Delay (secs/veh)					
Harbord Road (S)	L	85.6	77.7	84.4	78.1
	T	78.0	73.1	75.1	73.2
	R	72.1	76.8	75.0	75.4
Pittwater Road (NE)	L	19.2	17.0	23.6	17.7
	T	35.5	38.1	47.4	40.0
	R	67.6	77.3	78.4	77.3
Warringah Road (W)	L	37.7	44.6	41.4	44.6
	T	73.8	69.6	78.4	71.0
	R	80.8	86.8	89.5	86.8
Pittwater Road (SW)	L	7.2	7.2	7.2	7.2
	T	36.8	35.6	31.3	36.8
	R	87.9	48.8	86.9	49.1
TOTAL AVERAGE VEHICLE DELAY		**48.5**	**49.0**	**53.4**	**49.9**
		PIT_HARX		PIT_HARP	

TABLE 3.2 - RESULTS OF SIDRA ANALYSIS OF PITTWATER ROAD & WARRINGAH ROAD/HARBORD ROAD WITH 40 KM/H SPEED LIMIT

Key Indicators		Existing Traffic Demand		Projected Development Traffic Demand	
		AM	**PM**	**AM**	**PM**
Level of Service		D	D	D	D
Degree of Saturation		0.804	0.808	0.872	0.808
Average Vehicle Delay (secs/veh)					
Harbord Road (S)	L	82.7	74.8	81.5	75.2
	T	75.5	70.6	72.6	70.8
	R	69.7	74.4	72.6	73.0
Pittwater Road (NE)	L	17.0	14.8	21.4	15.5
	T	35.5	38.1	47.4	40.0
	R	64.7	74.4	75.4	74.4
Warringah Road (W)	L	35.2	42.2	38.9	42.2
	T	71.4	67.2	75.9	68.5
	R	78.2	84.1	86.8	84.1
Pittwater Road (SW)	L	3.8	3.8	3.8	3.8
	T	36.8	35.6	31.3	36.8
	R	85.4	46.3	84.4	46.6
TOTAL AVERAGE VEHICLE DELAY		**47.3**	**47.7**	**52.1**	**48.5**
		PIT_HARX		PIT_HARP	

TABLE 3.3 - RESULTS OF SIDRA ANALYSIS OF HARBORD ROAD & HEADLAND ROAD

Key Indicators		Existing Traffic Demand		Projected Development Traffic Demand	
		AM	**PM**	**AM**	**PM**
Level of Service		A	A	A	A
Degree of Saturation		0.905	0.742	0.930	0.851
Average Vehicle Delay (secs/veh)					
Harbord Road (S)	T	1.1	1.2	1.1	1.4
	R	11.9	9.7	12.2	10.8
Headland Road (E)	L	61.9	40.1	71.0	65.6
	R	137.6	103.0	149.2	138.9
Harbord Road (N)	L	3.5	3.5	3.5	3.5
	T	0.0	0.0	0.0	0.0
TOTAL AVERAGE VEHICLE DELAY		**10.6**	**5.9**	**11.7**	**7.9**
		HAR_HEAX		HAR_HEAP	

Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals[4] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

4 *The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.*

7.0 PARKING IMPLICATIONS

7.1 Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 8 and comprise:

- CLEARWAY and full-time NO STOPPING/NO PARKING restrictions along the entire Pittwater Road frontage of the proposed senior school campus site

- BUS LANE and NO STOPPING/NO PARKING restrictions along the western side of Pittwater Road, opposite the senior school campus site

- NO PARKING restrictions on the eastern side of Harbord Road in the vicinity of the senior school campus site

- a short section of UNRESTRICTED kerbside parking further to the south on the eastern side of Harbord Road

- NO STOPPING/NO PARKING restrictions along the western side of Harbord Road

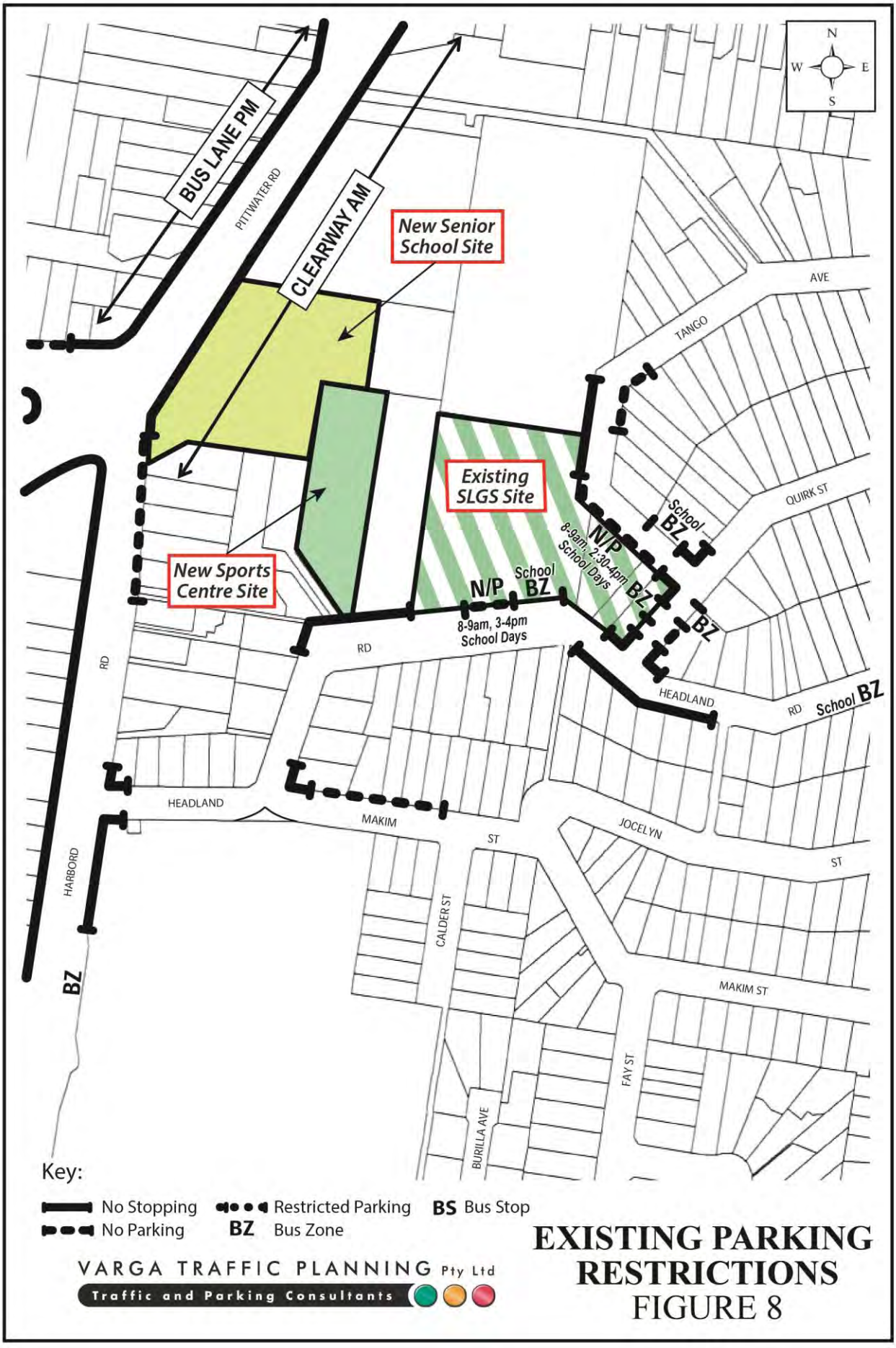
- NO STOPPING restrictions along the northern side of Headland Road in the vicinity of the proposed *sports centre* site

- SCHOOL BUS ZONES on the northern side of Headland Road and the western side of Quirk Street adjacent to the existing school campus site

- NO PARKING restrictions in the drop-off bay located on the southern side of Tango Avenue adjacent to the existing school campus site.

7.2 Off-Street Parking Provisions

The off-street parking requirements applicable to the development proposal are specified in Warringah Council's *DCP 2011 – Appendix 1 – Car Parking Requirements* document in the following terms:


N
W
E
S
BUS LANE PM
PITTWATER RD
CLEARWAY AM
New Senior School Site
Existing SLGS Site
New Sports Centre Site
TANGO
AVE
QUIRK ST
School BZ
N/P
8-9am, 2:30-4pm School Days
BZ
N/P
School BZ
8-9am, 3-4pm School Days
RD
HEADLAND
RD
School BZ
HEADLAND
MAKIM
ST
JOCELYN
ST
HARBORD
RD
BZ
CALDER ST
MAKIM ST
FAY ST
BURILLA AVE
Key:
No Stopping
No Parking
Restricted Parking
BZ Bus Zone
BS Bus Stop
VARGA TRAFFIC PLANNING Pty Ltd
Traffic and Parking Consultants
EXISTING PARKING RESTRICTIONS
FIGURE 8

Educational Establishment

1 car space per staff member in attendance *plus* as relevant,
adequate pick-up/set-down area on-site *plus*
adequate provision of bicycle racks *plus*
adequate provision for student parking *plus*
provision of bus standing and turning area

Application of the above parking requirements to the 60 staff proposed at the new senior school campus site yields a staff car parking requirement of 60 parking spaces.

That staff car parking requirement is satisfied by the proposed provision of 60 car parking spaces in a reconfiguration of the existing basement car parking area.

In addition, a further 25 car parking spaces are proposed on the senior school campus site for the use of Year 12 students only.

A further 40 car parking spaces for Office Works will be provided on the senior school campus site in Stage 2, in accordance with DA Consent Number 97/59.

Additional student car parking comprising 39 spaces is proposed for Year 12 students on the *sports centre* site. The total Year 12 student parking to be provided at both sites is therefore 64 spaces.

In addition to the above car parking facilities, a new drop-off/pick-up bay is also proposed within the senior school campus site. The existing 90^0 angle parking spaces in the outdoor car parking area along the site frontage are to be removed to create the dedicated drop-off/pick-up area, initially for 7 spaces in Stage 2, increasing to 12 spaces in Stage 3. Queueing for a further 5 cars can be accommodated on the driveway approaching the drop-off/pick-up bay in both stages should the need ever arise:

- without impeding other traffic entering the site, and
- without extending beyond the property boundary.

The proposed new drop-off/pick-up bay on the *senior campus* site will have the same capacity as the existing drop-off/pick-up bay in Tango Avenue, but will cater for

approximately half the number of students. In addition, survey data confirms that senior students in Years 10 to 12 generate substantially *less traffic* on a *per student* basis than younger students.

In particular, the surveys and observations undertaken in the existing drop-off/pick-up bay in Tango Avenue have revealed that:

- peak traffic activity during the morning drop-off period typically occurs between 8:10am-8:25am. Although this is a busy period, drop-offs are quick and efficient, and delays are minimal if any

- peak traffic activity in the afternoon typically occurs between 3:00pm-3:15pm, and is associated with the *junior school* finishing times of 2:55pm (for Kindergarten to Year 2) and 3:05pm (Years 3 to 6). There are typically no queues in Tango Avenue outside this 15 minute peak period in the afternoons

- the *high school* Years 7 to 12 (currently 658 students) finishes at 3:20pm but does not generate any delays or queues, with typically only 3 to 5 cars recorded in the Tango Avenue drop-off/pick-up bay at 3:25pm, then only 1 car after that time. On a pro-rata basis during the afternoon pick-up this equates to:

    - 2 to 4 cars waiting in Stage 2 (480 students), when a drop-off/pick-up capacity of 7 cars will be provided (plus a further 5 cars on the driveway), and

    - 3 to 5 cars waiting in Stage 3 (600 students) when a drop-off/pick-up capacity of 12 cars will be provided (plus a further 5 cars on the driveway).

Thus the drop-off/pick-up bays proposed on the *senior campus* site in Stages 2 and 3 will substantially exceed projected future demands at all times.

7.3 Loading/Servicing Provisions

Loading/servicing of the new senior school site is expected to be undertaken by a variety of light commercial vehicles and small to medium sized rigid trucks such as garbage trucks.

The servicing needs of the proposed senior school campus are expected to be minimal, and will primarily comprise light commercial vehicles such as stationary deliveries.

All deliveries will be undertaken outside drop-off and pick-up times, as currently occurs at the existing school campus at 210 Headland Road.

The largest truck expected to access the site will be a medium sized rigid truck for garbage collection, and will access the site on an after-hours basis only when the school is closed, consistent with the existing garbage collection arrangements at the existing school campus.

Deliveries to the senior school campus will be undertaken using the drop-off/pick-up bay in Stage 2 (at times when the bay is not in use), and will revert to the existing loading area when it is vacated by Office Works in Stage 3.

It is pertinent to note that all vehicular access and circulation arrangements proposed on the senior school campus site have been designed to accommodate the swept turning path/manoeuvring requirements of large 12.5m long HRV rigid trucks, consistent with the servicing arrangements for the existing uses of the site.

The geometric design layout of the proposed drop-off/pick-up and loading facilities will also ultimately be designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 2 - Off-Street Commercial Vehicle Facilities AS2890.2* in respect of loading dock dimensions and service area requirements for HRV trucks.

8.0 CONCLUSION

St Luke's Grammar School at Dee Why proposes to expand its existing educational facilities to provide a new *sports centre* at No. 224 Headland Road (Stage 1) and a new senior school campus at No. 800 Pittwater Road which will cater for senior Year 10-12 students only, initially for 480 students (Stage 2) and increasing to 600 students in Stage 3.

The foregoing analysis has found that:

No. 800 Pittwater Road

- the existing uses of the site by Office Works, I-MED Imaging and Fitness First Gymnasium/Swimming Pool generates a *daily* traffic flow of 2,931 vehicles per day (between 6am-6pm)

- the proposed senior school campus development will result in a substantial reduction in the *daily* traffic generation potential of the site to approximately 740 vehicles per day

- traffic flows during the morning *school peak* hour will increase by 96 vph (two-way) when compared with the existing uses of the site, and

- traffic flows during the afternoon *school peak* hour will decrease by 80 vph (two-way) when compared with the existing uses of the site.

No. 224 Headland Road

- the existing uses of the site by the industrial/warehouse tenants as well as existing school sports facilities generate *daily* traffic flows of 201 vehicles per day (between 6am-6pm). The proposed school's *sports centre* will reduce the *daily* traffic generation potential of the site to approximately 78 vehicles per day

- traffic flows during the morning *school peak* hour will increase slightly by 18 vph (two-way), and

- traffic flows during the afternoon *school peak* hour will increase slightly by 25 vph (two-way).

Traffic Assessment

- before/after SIDRA capacity analysis of the Pittwater Road/Harbord Road/Warringah Road and Harbord Road/Headland Road intersections has found that both intersections will continue to operate at current *Levels of Service*, with minimal increases in total average delays

- further analysis has found that the Pittwater Road/Harbord Road/Warringah Road intersection would *also* continue to operate at current *Levels of Service* and with minimal delays, *if* a 40 km/h School Zone speed limit was implemented on all four approaches to the intersection

- SIDRA capacity analysis of the proposed site access driveways has confirmed that both driveways will operate at *Level of Service "A"* and with minimal delays during the *school peak* hours.

Proposed Car Parking Facilities

- Consistent with RMS requests, car parking on the *senior campus* site will be reduced from 182 spaces at present, to 131 spaces whilst Office Works remains on the site, then down to 91 spaces upon completion of the *senior campus.*

- Similarly, car parking on the *sports centre* site will also be reduced, from 45 spaces to 39 spaces.

- Car parking on the *senior campus* site and the *sports centre* site is proposed in accordance with the minimum parking requirements specified in Warringah Council's *DPCP 2011* as follows:

    - 60 spaces will be provided for staff in accordance with DCP 2011 requirements

    - 5 spaces for visitors

- 25 spaces for Year 12 students on the *senior campus* site plus a further 39 spaces for Year 12 students on the *sports centre* site

- The proposed car parking represents a balance between the RMS request to reduce car parking on the *senior campus* site and the need to achieve compliance with Council's DCP parking requirements which seek to minimise the impacts of overflow car parking in the surrounding residential streets.

- It is noted in this regard that the amount of car parking on the 2 sites will be reduced from 227 spaces to 130 spaces whilst achieving *compliance* with Council's DCP parking requirements. Most of that reduction of 97 spaces was removed from the *senior campus* site.

Proposed On-Site Drop-off/Pick-Up Facility

- Analysis of the survey data indicates that a drop-off/pick-up capacity of 2 to 4 cars will be required in Stage 2, increasing to 3 to 5 cars in Stage 3.

- The drop-off/pick-up facility proposed on the *senior campus* will have a capacity of 7 spaces in Stage 2, increasing to 12 spaces in Stage 3.

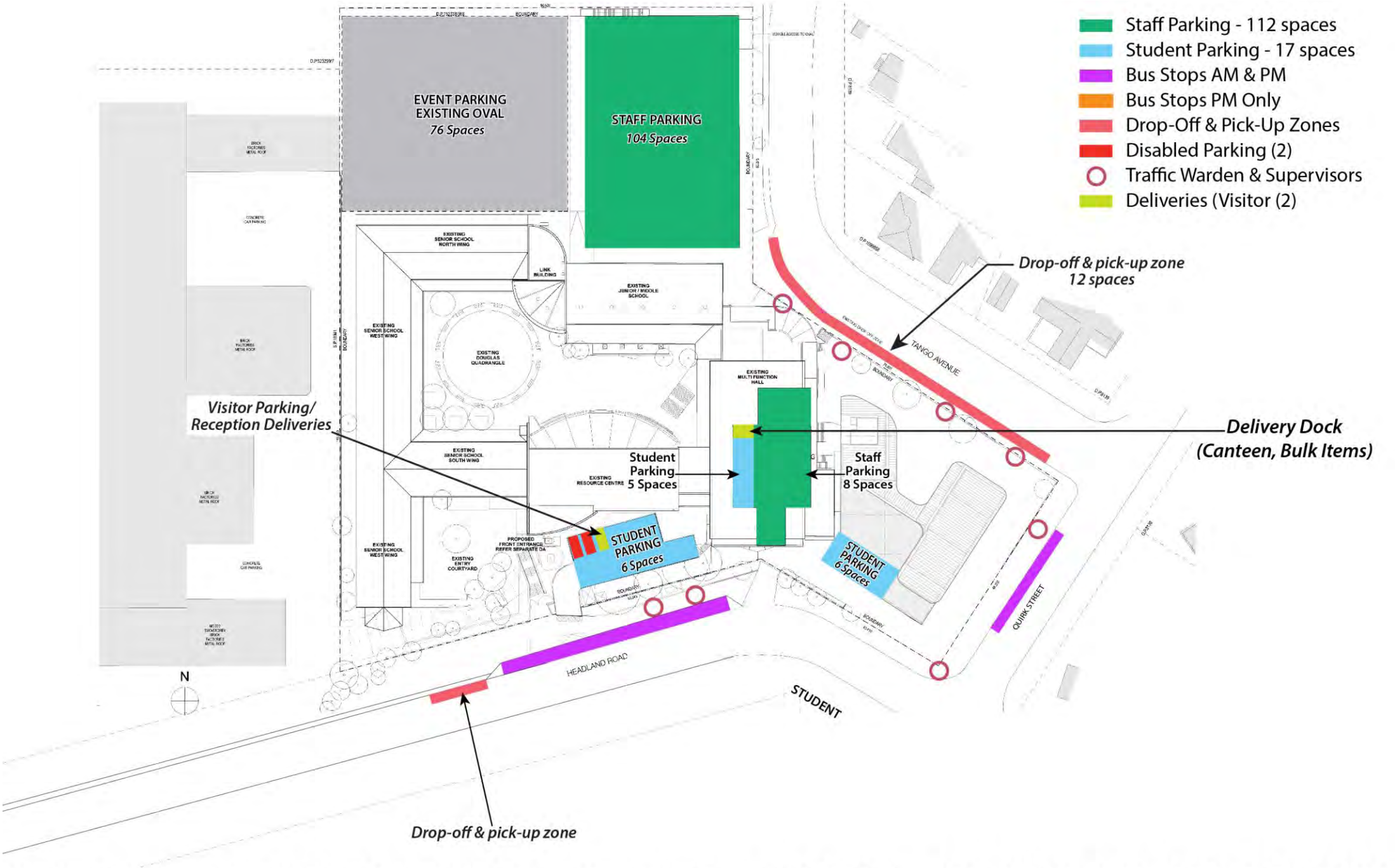
- Queueing for *a further 5 cars* is provided on the driveway approaching the drop-off/pick-up bay in both stages *without* impeding other traffic flows entering the site, and *without* extending beyond the property boundary.

- Thus the drop-off/pick-up bay proposed on the *senior campus* site in Stages 2 and 3 will substantially exceed projected future demands at all times.

- It is pertinent to note in this regard that the proposed new drop-off/pick-up facility will have the *same capacity* as the existing drop-off/pick-up bay in Tango Avenue, but will cater for *half the number of students*, noting also that the senior students in Years 10 to 12 generate substantially *less traffic* on a *per student* basis than younger students.

APPENDIX A

SCHOOL TRAFFIC MANAGEMENT PLAN



This plan reflects changes to be undertaken in Headland Road and Tango Avenue in accordance with DA Modification Application 2018/0412 approved by Sydney North Planning Panel on 26 June 2019. The school intends to have the additional works in Council's road reserve finalised before commencement of Term 1 2020

ST LUKES GRAMMAR SCHOOL TRAFFIC MANAGEMENT PLAN

APPENDIX B

SCHOOL BUS TIMETABLE

SCHOOL BUS Timetable

ST LUKE'S GRAMMAR SCHOOL

CHRIST OUR LIGHT

Effective 12 February 2019

All students wait to be called on the Bennett Quad

TANGO AVENUE

QUIRK STREET

HEADLAND ROAD

Quirk Street Stop

669 Manly Wharf (3.34 pm)

Headland Road Stop

668 Seaforth Shops / The Buff (3.37 pm)
670 North Balgowlah / Bantry Bay (3.36 pm)
671 Skyline Shops (3.35 pm)
678 Newport (3.26 pm)
672 Collaroy Plateau (3.32 pm)
677 Narrabeen (3.40 pm)
784 Frenchs Forest (3.33 pm)
787 Avalon / Clareville (3.25 pm)

Morning Buses

631	8.05 am	Manly Wharf (Gilbert Park)	FROM MANLY Dep. Stand F Gilbert Park Via Belgrave, Pittwater, Collingwood Route 136, Harbord, Abbott, Pitt, Playfair, Parr, Headland, Quirk
	8:11 am	Stella Maris Manly	
	8:20 am	NBSC Manly Campusl	
	8:24 am	St Luke's Grammar School	

668	7:42 am	Balgowlah Heights [Ernest Street]	FROM BALGOWLAH HEIGHTS
	7:51 am	Panorama & Ponsonby Pdes	
	7:59 am	Seaforth - Dudley St	
	8:02 am	Balgowlah Shops	
	8:07 am	Manly Vale Shops	
	8:11 am	Warringah Mall - Pittwater Rd	
	8:16 am	NBSC Manly Campus	
	8:19 am	St Luke's Grammar School	

675	7:37 am	Balgowlah Heights [Ernest Street]	FROM BALGOWLAH HEIGHTS Via Woodland, Abbott, Lewis, Ernest, Beatrice, Seaview, Upper Beach, Maretimo, Violet, Wanganella, Sydney, Condamine, Pittwater, Mitchell, Winbourne, Harbord, Headland
	7:49 am	Balgowlah Shops	
	7:54 am	Manly Vale Shops	
	7:58 am	Warringah Mall [Pittwater Rd]	
	8:04 am	NBSC Manly Campus	
	8:08 am	St Luke's Grammar School	

702	7:45 am	Rabbett St & Forest Way	FROM FRENCHS FOREST Via Rabbett, Warringah, Wakehurst Parkway, F. Forest East (Skyline Shops), Warringah, Harbord, Headland Quirk, Tango
	7:52 am	Skyline Shops	
	7:56 am	Warringah & Willandra Roads	
	8:01 am	Moorilla St at Victor Rd, Dee Why	
	8:06 am	St Luke's Grammar School	

673 Express from Mona Vale	7:33 am	Pittwater High	FROM MONA VALE Via Mona, Bassett, Barrenjoey, Route 190, Harbord, Headland Rd
	7:38 am	Mona Vale Junction	
	7:46 am	Narrabeen [Pittwater Rd]	
	7:51 am	Collaroy	
	7:58 am	Dee Why [Howard Ave]	
	8:02 am	St Luke's Grammar School	

673n All Stops from Avalon	7:29 am	Careel Head Road	FROM AVALON Via Barrenjoey, Route 190, Harbord, Headland
	7:34 am	Avalon	
	7:39 am	Newport [Neptune Road]	
	7:44 am	Newport Hotel	
	7:51 am	Mona Vale Junction	
	7:57 am	Narrabeen [Pittwater Road]	
	8:01 am	Collaroy	
	8:07 am	Dee Why [Howard Ave]	
	8:10 am	St Luke's Grammar School	

677	7:55 am	Warriewood Square	FROM WARRIEWOOD Via Jacksons, Pittwater Harbord, Headland
	8:01 am	Narrabeen [Pittwater Road]	
	8:04 am	Collaroy	
	8:10 am	Dee Why [Howard Ave]	
	8:15 am	St Luke's Grammar School	

684	7:35 am	Collaroy Plateau	FROM COLLAROY PLATEAU Via Hall, Veterans, Rose, Kirkstone, Heather, Ambleside, Sth Creek, Toronto, Route 173 to Cromer Heights, Route 173 to Carawa, Fisher Road North, Lynwood, Fisher, McIntosh, 180 degree turn at Victor Road roundabout, McIntosh, Fisher, St Davids, Pittwater, Harbord, Headland
	7:45 am	Cromer Heights	
	7:51 am	Carawa & Carcoola Roads	
	8:02 am	Dee Why [Howard Ave]	
	8:05 am	Cnr Headland & Harbord	
	8:07 am	St Luke's Grammar School	

Afternoon Buses

669	3:34 pm	Departs **Quirk St** Stand	TO MANLY Via Quirk, Tango, Quirk, Headland, Harbord, Brighton, Bennett, Oliver, Lawrence, Dowling
	3:37 pm	NBSC Manly Campus	
	3:47 pm	Crown & Dowling [Queenscliff]	
	3:51 pm	Queenscliff Bridge	
	3:58 pm	Manly Wharf	

668	3:37 pm	Departs **Headland Rd** Stand	TO SEAFORTH (via Manly Wharf) Via Tango, Quirk Headland, Harbord, Windborne, Pittwater, Belgrave, West Esplanade, Commonwealth, Lauderdale, White, Woodland, Lower Beach, Bungaloe, New, Curban, Ernest, Woodland, Abbott, Lewis, Ernest, Beatrice, Seaview, Upper Beach, Maretimo, Sydney, Ross, Panorama, Ponsby, Palmerston, Alan, Salisbury, Ponsonby, Seaforth, Princes
	3:41 pm	NBSC Manly Campus	
	3:46 pm	Brookvale Shops	
	3:47 pm	Brookvale Depot	
	3:53 pm	Manly Lagoon [P'water & E'bin Ave]	
	3:59 pm	Manly Wharf	
	4:03 pm	Condamine St & White St	
	4:11 pm	Balgowlah Heights [Ernest St]	
	4:18 pm	Seaforth Shops	
	4:23 pm	The Bluff	

670	3:36 pm	Departs **Headland Rd** Stand	TO SEAFORTH Via Quirk, Headland, Harbord, Miles, Ada, Orchard, Pittwater, Condamine, Route 132, Woodbine, Hunter, St Paul's, Bangaroo, Brook, Frenchs Forest, Wakehurst Parkway/Judith
	3:39 pm	NBSC Manly Campus	
	3:46 pm	Warringah Mall	
	3:56 pm	Kitchener Road & Wanganella St	
	4:00 pm	North Balgowlah	
	4:09 pm	Seaforth Oval [Wakehurst & Judith]	

671	3:35 pm	Departs **Headland Rd** Stand	TO FRENCHS FOREST (End Skyline Shops via Allambie Heights) Via Winbourne Road, Pittwater Road, Old Pittwater Road, Kentwell Road, Allambie Road, Aquatic Dive
	3:40 pm	NBSC Manly Campus	
	3:44 pm	St Augustines Brookvale	
	3:49 pm	Brookvale Depot	
	3:54 pm	Condamine St & Kentwell Road	
	4:00 pm	Allambie Heights Shops	
	4:05 pm	Warringah Aquatic Centre	
	4:08 pm	Skyline Shops	

784	3:33 pm	Departs **Headland Rd** Stand	TO FRENCHS FOREST (End Forest Way Shops) Via Quirk, Carew, Headland, Wheeler, The Crescent, Pacific, Pittwater, Warringah, French Forest Rd East (Skyline Shops), Wakehurst Parkway, Warringah, Forest Way, Naree, Rabbett
	3:49 pm	Warringah & Willandra Roads	
	3:54 pm	Skyline Shops, Frenchs Forest	
	4:01 pm	Frenchs Forest	
	4:06 pm	Forest Way & Rabbett St	

Afternoon Buses

672	3:32 pm	Departs **Headland Rd** Stand	TO COLLAROY PLATEAU Via Headland, Griffin, The Strand, Howard, St Davids, Fisher, McIntosh, Alfred, Route 173, House, McNamara, Badcoe, Truman, Toronto, South Creek, Ambleside, Rose, Veterans, Telopea, Fuller, Hall
	3:40 pm	Dee Why [Howard Ave]	
	3:45 pm	Narraweena [McIntosh & Alfred]	
	3:50 pm	Carawa & Carcoola Roads	
	3:55 pm	Cromer Heights	
	4:04 pm	Collaroy Plateau	
677	3:40 pm	Departs **Headland Rd** Stand	TO NARRABEEN Via Headland Road, The Strand, Howard Avenue, Pittwater Road, Waterloo Narrabeen
	3:48 pm	Dee Why [Howard Avenue]	
	3:57 pm	Collaroy	
	4:03 pm	Narrabeen [Waterloo Street]	
678	3:26 pm	Departs **Headland Rd** Stand	TO NEWPORT First set down Mona Vale. Via Headland, Harbord, Wheeler, The Crescent, Pacific, Avon, Howard, Pittwater, Route 187 Via Newport Hotel Loop
	3:52 pm	Mona Vale Junction	
	4:01 pm	Newport Hotel	
	4:07 pm	Newport [Neptune Road] First set down Mona Vale	
787	3:26 pm	Departs **Headland Rd** Stand	TO AVALON Via Headland Road, Harbord, Abbott, Pitt, Playfair, Parr, Headland, Wheeler, The Crescent, Pacific, Avon, Howard, Pittwater, Barrenjoey, Beaconsfield, Kalinya, Gladstone, Barrenjoey, Plateau, Bilwara, Lower Plateau, Wandeen, Hudson, Avalon
	3:33 pm	NBSC Manly Campus	
	3:35 pm	Freshwater Senior Campus	
	3:48 pm	Dee Why [Howard Ave]	
	3:55 pm	Collaroy	
	3:59 pm	Narrabeen [Pittwater Road]	
	4:09 pm	Mona Vale Junction	
	4:15 pm	Newport Hotel	
	4:20 pm	Newport [Neptune Road]	
	4:24 pm	Plateau and Barrenjoey Roads	
	4:27 pm	Bilgola Plateau Shops	
	4:31 pm	Taylors Point	
	4:34 pm	Clareville [Hudson and Hilltop]	
	4:39 pm	Avalon	

BUS TIMETABLES ONLINE:
www.sydneybuses.info/schools/school-services
www.transport.info
www.b-line.transport.nsw.gov.au

Locate "ST LUKE'S GRAMMAR SCHOOL" in the "Select School" option and identify the routes available.

Timetable Correct as of ***12 February 2019***

APPENDIX C

TRAFFIC SURVEY DATA

Client	Varga Traffic Engineering
Location	St Lukes Dee Why
Date	Thu, 19th September 2019
Survey Time	07:30 - 09:30 & 14:30 - 16:30 (4hrs)
Description	St Lukes Dee Why Pick Up & Drop Off Surveys

MATRIX Traffic and Transport Data

N

[Location]
St Lukes Dee Why

Bus Stop 1 - Headland Rd(North Side)
Bus Stop 2 - Quirk St(West Side)
Car Drop Off 1 - Headland Rd(North Side)
Car Drop Off 2 - Tango Ave(South Side)
Car Drop Off 3 - Tango Ave(West Side)
Car Drop Off 4 - Tango Ave(East Side)

Client	Varga Traffic Engineering
Location	Bus Stop 1 - Headland Rd(North Side)
Date	Thu, 19th September 2019
Survey Time	07:30 - 09:30 & 14:30 - 16:30 (4hrs)
Description	St Lukes Dee Why Pick Up & Drop Off Surveys

MATRIX Traffic and Transport Data

Arrival Time	Departure Time	Duration of Stay	Class	Pick Up			Drop Off		
				Grade 10-12	Others	Total	Grade 10-12	Others	Total
7:48:20	7:49:57	0:01:37	Bus	0	0	0	4	17	21
7:51:56	7:53:32	0:01:36	Bus	0	0	0	16	17	33
7:53:44	7:54:09	0:00:25	Bus	0	1	1	1	3	4
8:01:14	8:01:41	0:00:27	Bus	0	0	0	6	8	14
8:03:14	8:04:34	0:01:20	Bus	0	0	0	4	4	8
8:03:20	8:04:10	0:00:50	Bus	0	0	0	9	17	26
8:08:36	8:09:18	0:00:42	Bus	0	0	0	2	6	8
15:15:09	15:16:09	0:01:00	Car	0	1	1	0	0	0
15:37:55	15:43:35	0:05:40	Bus	6	35	41	0	0	0
15:40:35	15:43:39	0:03:04	Bus	9	23	32	0	0	0
15:47:15	15:48:57	0:01:42	Bus	6	19	25	0	0	0
15:49:44	15:51:41	0:01:57	Bus	3	6	9	0	0	0
15:47:54	15:52:16	0:04:22	Bus	4	41	45	0	0	0
15:52:33	15:54:18	0:01:45	Bus	6	20	26	0	0	0
15:55:31	15:56:35	0:01:04	Bus	1	17	18	0	0	0
15:57:43	15:59:35	0:01:52	Bus	2	23	25	0	0	0
16:01:07	16:02:40	0:01:33	Bus	5	14	19	0	0	0

[15mins interval]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 7:15	0	0	0	0	0	0	0
7:15 - 7:30	0	0	0	0	0	0	0
7:30 - 7:45	0	0	0	0	0	0	**0**
7:45 - 8:00	0	1	1	21	37	58	**59**
8:00 - 8:15	0	0	0	21	35	56	**56**
8:15 - 8:30	0	0	0	0	0	0	**0**
8:30 - 8:45	0	0	0	0	0	0	**0**
8:45 - 9:00	0	0	0	0	0	0	**0**
9:00 - 9:15	0	0	0	0	0	0	**0**
9:15 - 9:30	0	0	0	0	0	0	**0**
AM Total	**0**	**1**	**1**	**42**	**72**	**114**	115
14:30 - 14:45	0	0	0	0	0	0	**0**
14:45 - 15:00	0	0	0	0	0	0	**0**
15:00 - 15:15	0	0	0	0	0	0	**0**
15:15 - 15:30	0	1	1	0	0	0	**1**
15:30 - 15:45	15	58	73	0	0	0	**73**
15:45 - 16:00	22	126	148	0	0	0	**148**
16:00 - 16:15	5	14	19	0	0	0	**19**
16:15 - 16:30	0	0	0	0	0	0	**0**
PM Total	**42**	**199**	**241**	**0**	**0**	**0**	241

[Peak Hr Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:15 - 8:15	0	1	1	42	72	114	**115**
15:15 - 16:15	42	199	241	0	0	0	**241**

[Hourly Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 8:00	0	1	1	21	37	58	**59**
7:15 - 8:15	0	1	1	42	72	114	**115**
7:30 - 8:30	0	1	1	42	72	114	**115**
7:45 - 8:45	0	1	1	42	72	114	**115**
8:00 - 9:00	0	0	0	21	35	56	**56**
8:15 - 9:15	0	0	0	0	0	0	**0**
8:30 - 9:30	0	0	0	0	0	0	**0**
AM Total	**0**	**1**	**1**	**42**	**72**	**114**	115
14:30 - 15:30	0	1	1	0	0	0	**1**
14:45 - 15:45	15	59	74	0	0	0	**74**
15:00 - 16:00	37	185	222	0	0	0	**222**
15:15 - 16:15	42	199	241	0	0	0	**241**
15:30 - 16:30	42	198	240	0	0	0	**240**
PM Total	**42**	**199**	**241**	**0**	**0**	**0**	241

Client	Varga Traffic Engineering
Location	Bus Stop 2 - Quirk St(West Side)
Date	Thu, 19th September 2019
Survey Time	07:30 - 09:30 & 14:30 - 16:30 (4hrs)
Description	St Lukes Dee Why Pick Up & Drop Off Surveys

Arrival Time	Departure Time	Duration of Stay	Class	Pick Up			Drop Off		
				Grade 10-12	Others	Total	Grade 10-12	Others	Total
8:04:55	8:05:16	0:00:21	Car	0	0	0	0	1	1
8:05:04	8:05:14	0:00:10	Car	0	0	0	0	3	3
8:11:35	8:12:32	0:00:57	Bus	0	0	0	8	18	26
15:36:19	15:36:43	0:00:24	Car	0	1	1	0	0	0
15:38:22	15:38:55	0:00:33	Car	0	1	1	0	5	5
15:45:09	15:48:10	0:03:01	Bus	8	23	31	0	2	2
15:59:18	16:00:37	0:01:19	Bus	0	0	0	0	4	4
16:20:52	16:21:10	0:00:18	Car	0	1	1	0	0	0
16:24:35	16:30:00	0:05:25	Car	0	0	0	0	1	1

[15mins interval]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 7:15	0	0	0	0	0	0	0
7:15 - 7:30	0	0	0	0	0	0	0
7:30 - 7:45	0	0	0	0	0	0	0
7:45 - 8:00	0	0	0	0	0	0	0
8:00 - 8:15	0	0	0	8	22	30	30
8:15 - 8:30	0	0	0	0	0	0	0
8:30 - 8:45	0	0	0	0	0	0	0
8:45 - 9:00	0	0	0	0	0	0	0
9:00 - 9:15	0	0	0	0	0	0	0
9:15 - 9:30	0	0	0	0	0	0	0
AM Total	**0**	**0**	**0**	**8**	**22**	**30**	30
14:30 - 14:45	0	0	0	0	0	0	0
14:45 - 15:00	0	0	0	0	0	0	0
15:00 - 15:15	0	0	0	0	0	0	0
15:15 - 15:30	0	0	0	0	0	0	0
15:30 - 15:45	0	2	2	0	5	5	7
15:45 - 16:00	8	23	31	0	6	6	37
16:00 - 16:15	0	0	0	0	0	0	0
16:15 - 16:30	0	1	1	0	1	1	2
PM Total	**8**	**26**	**34**	**0**	**12**	**12**	46

[Peak Hr Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:15 - 8:15	0	0	0	8	22	30	30
15:30 - 16:30	8	26	34	0	12	12	46

[Hourly Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 8:00	0	0	0	0	0	0	0
7:15 - 8:15	0	0	0	8	22	30	30
7:30 - 8:30	0	0	0	8	22	30	30
7:45 - 8:45	0	0	0	8	22	30	30
8:00 - 9:00	0	0	0	8	22	30	30
8:15 - 9:15	0	0	0	0	0	0	0
8:30 - 9:30	0	0	0	0	0	0	0
AM Total	**0**	**0**	**0**	**8**	**22**	**30**	30
14:30 - 15:30	0	0	0	0	0	0	0
14:45 - 15:45	0	2	2	0	5	5	7
15:00 - 16:00	8	25	33	0	11	11	44
15:15 - 16:15	8	25	33	0	11	11	44
15:30 - 16:30	8	26	34	0	12	12	46
PM Total	**8**	**26**	**34**	**0**	**12**	**12**	46

Client	Varga Traffic Engineering
Location	Car Drop Off 1 - Headland Rd(North Side)
Date	Thu, 19th September 2019
Survey Time	07:30 - 09:30 & 14:30 - 16:30 (4hrs)
Description	St Lukes Dee Why Pick Up & Drop Off Surveys

MATRIX Traffic and Transport Data

Arrival Time	Departure Time	Duration of Stay	Class	Pick Up			Drop Off		
				Grade 10-12	Others	Total	Grade 10-12	Others	Total
6:58:35	7:00:48	0:02:13	Car	0	0	0	2	0	2
7:00:00	7:27:30	0:27:30	Car	0	1	1	0	0	0
7:18:09	7:18:22	0:00:13	Car	0	0	0	0	1	1
7:24:57	7:25:27	0:00:30	Car	0	0	0	0	1	1
7:37:25	7:37:38	0:00:13	Car	0	0	0	1	1	2
7:38:18	7:38:32	0:00:14	Car	0	0	0	0	1	1
7:44:39	7:44:49	0:00:10	Car	0	0	0	1	0	1
7:46:45	7:47:01	0:00:16	Car	0	0	0	2	0	2
8:00:41	8:00:55	0:00:14	Car	0	0	0	0	2	2
8:02:23	8:02:38	0:00:15	Car	0	0	0	0	2	2
8:04:00	8:04:05	0:00:05	Car	0	0	0	0	1	1
8:04:46	8:05:16	0:00:30	Car	0	1	1	1	11	12
8:07:28	8:07:35	0:00:07	Car	0	0	0	0	1	1
8:08:27	8:08:51	0:00:24	Car	0	0	0	0	3	3
8:19:54	8:20:09	0:00:15	Car	0	0	0	0	1	1
8:32:52	8:33:11	0:00:19	Car	0	0	0	0	1	1
8:53:49	8:54:31	0:00:42	Car	0	0	0	0	1	1
14:30:01	14:32:00	0:01:59	Car	0	1	1	0	0	0
14:33:40	14:40:13	0:06:33	Car	0	1	1	0	0	0
14:40:42	14:54:45	0:14:03	Car	0	2	2	0	0	0

[15mins interval]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 7:15	0	1	1	2	0	2	**3**
7:15 - 7:30	0	0	0	0	2	2	**2**
7:30 - 7:45	0	0	0	2	2	4	**4**
7:45 - 8:00	0	0	0	2	0	2	**2**
8:00 - 8:15	0	1	1	1	20	21	**22**
8:15 - 8:30	0	0	0	0	1	1	**1**
8:30 - 8:45	0	0	0	0	1	1	**1**
8:45 - 9:00	0	0	0	0	1	1	**1**
9:00 - 9:15	0	0	0	0	0	0	**0**
9:15 - 9:30	0	0	0	0	0	0	**0**
AM Total	**0**	**2**	**2**	**7**	**27**	**34**	**31**
14:30 - 14:45	0	4	4	0	0	0	**4**
14:45 - 15:00	0	0	0	0	0	0	**0**
15:00 - 15:15	0	0	0	0	0	0	**0**
15:15 - 15:30	0	0	0	0	0	0	**0**
15:30 - 15:45	0	0	0	0	0	0	**0**
15:45 - 16:00	0	0	0	0	0	0	**0**
16:00 - 16:15	0	0	0	0	0	0	**0**
16:15 - 16:30	0	0	0	0	0	0	**0**
PM Total	**0**	**4**	**4**	**0**	**0**	**0**	**4**

[Peak Hr Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:30 - 8:30	0	1	1	5	23	28	**29**
15:00 - 16:00	0	0	0	0	0	0	**0**

[Hourly Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 8:00	0	1	1	6	4	10	**11**
7:15 - 8:15	0	1	1	5	24	29	**30**
7:30 - 8:30	0	1	1	5	23	28	**29**
7:45 - 8:45	0	1	1	3	22	25	**26**
8:00 - 9:00	0	1	1	1	23	24	**25**
8:15 - 9:15	0	0	0	0	3	3	**3**
8:30 - 9:30	0	0	0	0	2	2	**2**
AM Total	**0**	**2**	**2**	**7**	**27**	**34**	**31**
14:30 - 15:30	0	4	4	0	0	0	**4**
14:45 - 15:45	0	0	0	0	0	0	**0**
15:00 - 16:00	0	0	0	0	0	0	**0**
15:15 - 16:15	0	0	0	0	0	0	**0**
15:30 - 16:30	0	0	0	0	0	0	**0**
PM Total	**0**	**4**	**4**	**0**	**0**	**0**	**4**

Client	Varga Traffic Engineering
Location	Car Drop Off 2 - Tango Ave(South Side)
Date	Thu, 19th September 2019
Survey Time	07:30 - 09:30 & 14:30 - 16:30 (4hrs)
Description	St Lukes Dee Why Pick Up & Drop Off Surveys

MATRIX Traffic and Transport Data

[15mins interval]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 7:15	0	0	0	2	3	5	5
7:15 - 7:30	0	0	0	4	13	17	17
7:30 - 7:45	0	0	0	8	20	28	28
7:45 - 8:00	0	0	0	24	57	81	81
8:00 - 8:15	0	0	0	14	132	146	146
8:15 - 8:30	0	0	0	9	51	60	60
8:30 - 8:45	0	0	0	0	2	2	2
8:45 - 9:00	0	0	0	0	0	0	0
9:00 - 9:15	0	0	0	0	0	0	0
9:15 - 9:30	0	0	0	0	0	0	0
AM Total	**0**	**0**	**0**	**61**	**278**	**339**	317
14:30 - 14:45	0	0	0	0	1	1	1
14:45 - 15:00	0	3	3	0	2	2	5
15:00 - 15:15	0	19	19	0	0	0	19
15:15 - 15:30	11	106	117	0	0	0	117
15:30 - 15:45	16	24	40	0	0	0	40
15:45 - 16:00	1	1	2	0	2	2	4
16:00 - 16:15	2	3	5	0	0	0	5
16:15 - 16:30	3	1	4	0	0	0	4
PM Total	**33**	**157**	**190**	**0**	**5**	**5**	195

[Peak Hr Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:30 - 8:30	0	0	0	55	260	315	315
15:00 - 16:00	28	150	178	0	2	2	181

[Hourly Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 8:00	0	0	0	38	93	131	131
7:15 - 8:15	0	0	0	50	222	272	272
7:30 - 8:30	0	0	0	55	260	315	315
7:45 - 8:45	0	0	0	47	242	289	289
8:00 - 9:00	0	0	0	23	185	208	208
8:15 - 9:15	0	0	0	9	53	62	62
8:30 - 9:30	0	0	0	0	2	2	2
AM Total	**0**	**0**	**0**	**61**	**278**	**339**	317
14:30 - 15:30	11	128	139	0	3	3	142
14:45 - 15:45	27	152	179	0	2	2	181
15:00 - 16:00	28	150	178	0	2	2	180
15:15 - 16:15	30	134	164	0	2	2	166
15:30 - 16:30	22	29	51	0	2	2	53
PM Total	**33**	**157**	**190**	**0**	**5**	**5**	195

Client	Varga Traffic Engineering
Location	Car Drop Off 3 - Tango Ave(West Side)
Date	Thu, 19th September 2019
Survey Time	07:30 - 09:30 & 14:30 - 16:30 (4hrs)
Description	St Lukes Dee Why Pick Up & Drop Off Surveys

MATRIX Traffic and Transport Data

Arrival Time	Departure Time	Duration of Stay	Class	Pick Up			Drop Off		
				Grade 10-12	Others	Total	Grade 10-12	Others	Total
7:00:00	7:07:57	0:07:57	Car	0	1	1	0	0	0
7:41:32	9:00:00	1:18:28	Car	0	0	0	0	1	1
7:57:48	8:09:14	0:11:26	Car	0	0	0	0	1	1
7:57:56	7:58:22	0:00:26	Car	0	1	1	0	0	0
8:04:27	8:23:36	0:19:09	Car	0	0	0	0	1	1
8:06:29	8:07:04	0:00:35	Car	0	0	0	0	1	1
8:17:00	9:00:00	0:43:00	Car	0	0	0	0	1	1
8:21:39	9:00:00	0:38:21	Car	0	0	0	0	1	1
14:30:00	15:16:42	0:46:42	Car	0	2	2	0	0	0
14:30:00	15:31:04	1:01:04	Car	0	1	1	0	0	0
14:30:00	16:30:00	2:00:00	Car	0	1	1	0	0	0
14:30:00	16:28:29	1:58:29	Car	0	1	1	0	0	0
14:56:02	15:15:00	0:18:58	Car	0	2	2	0	0	0
15:08:41	15:28:08	0:19:27	Car	0	2	2	0	0	0
15:17:04	15:32:53	0:15:49	Car	0	1	1	0	0	0
15:26:20	15:37:32	0:11:12	Car	0	1	1	0	0	0
15:31:42	15:46:03	0:14:21	Car	0	1	1	0	0	0
15:34:08	15:44:34	0:10:26	Car	0	1	1	0	0	0

[15mins interval]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 7:15	0	1	1	0	0	0	1
7:15 - 7:30	0	0	0	0	0	0	0
7:30 - 7:45	0	0	0	0	1	1	1
7:45 - 8:00	0	1	1	0	1	1	2
8:00 - 8:15	0	0	0	0	2	2	2
8:15 - 8:30	0	0	0	0	2	2	2
8:30 - 8:45	0	0	0	0	0	0	0
8:45 - 9:00	0	0	0	0	0	0	0
9:00 - 9:15	0	0	0	0	0	0	0
9:15 - 9:30	0	0	0	0	0	0	0
AM Total	**0**	**2**	**2**	**0**	**6**	**6**	7
14:30 - 14:45	0	5	5	0	0	0	5
14:45 - 15:00	0	2	2	0	0	0	2
15:00 - 15:15	0	2	2	0	0	0	2
15:15 - 15:30	0	2	2	0	0	0	2
15:30 - 15:45	0	2	2	0	0	0	2
15:45 - 16:00	0	0	0	0	0	0	0
16:00 - 16:15	0	0	0	0	0	0	0
16:15 - 16:30	0	0	0	0	0	0	0
PM Total	**0**	**13**	**13**	**0**	**0**	**0**	13

[Peak Hr Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:30 - 8:30	0	1	1	0	6	6	7
14:45 - 15:45	0	8	8	0	0	0	8

[Hourly Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 8:00	0	2	2	0	2	2	4
7:15 - 8:15	0	1	1	0	4	4	5
7:30 - 8:30	0	1	1	0	6	6	7
7:45 - 8:45	0	1	1	0	5	5	6
8:00 - 9:00	0	0	0	0	4	4	4
8:15 - 9:15	0	0	0	0	2	2	2
8:30 - 9:30	0	0	0	0	0	0	0
AM Total	**0**	**2**	**2**	**0**	**6**	**6**	7
14:30 - 15:30	0	11	11	0	0	0	11
14:45 - 15:45	0	8	8	0	0	0	8
15:00 - 16:00	0	6	6	0	0	0	6
15:15 - 16:15	0	4	4	0	0	0	4
15:30 - 16:30	0	2	2	0	0	0	2
PM Total	**0**	**13**	**13**	**0**	**0**	**0**	13

Client	Varga Traffic Engineering
Location	Car Drop Off 4 - Tango Ave(East Side)
Date	Thu, 19th September 2019
Survey Time	07:30 - 09:30 & 14:30 - 16:30 (4hrs)
Description	St Lukes Dee Why Pick Up & Drop Off Surveys

Arrival Time	Departure Time	Duration of Stay	Class	Pick Up			Drop Off		
				Grade 10-12	Others	Total	Grade 10-12	Others	Total
7:00:00	7:12:23	0:12:23	Car	0	1	1	0	0	0
7:00:00	7:40:16	0:40:16	Car	0	1	1	0	0	0
7:56:29	9:00:00	1:03:31	Car	0	0	0	0	2	2
7:56:36	9:00:00	1:03:24	Car	0	0	0	0	3	3
14:30:00	16:14:14	1:44:14	Car	0	5	5	0	0	0

[Peak Hr Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:30 - 8:30	0	0	0	0	5	5	**5**
14:45 - 15:45	0	0	0	0	0	0	**0**

[15mins interval]

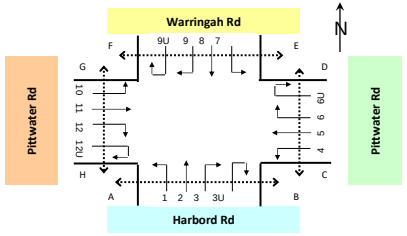
Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 7:15	0	2	2	0	0	0	**2**
7:15 - 7:30	0	0	0	0	0	0	**0**
7:30 - 7:45	0	0	0	0	0	0	**0**
7:45 - 8:00	0	0	0	0	5	5	**5**
8:00 - 8:15	0	0	0	0	0	0	**0**
8:15 - 8:30	0	0	0	0	0	0	**0**
8:30 - 8:45	0	0	0	0	0	0	**0**
8:45 - 9:00	0	0	0	0	0	0	**0**
9:00 - 9:15	0	0	0	0	0	0	**0**
9:15 - 9:30	0	0	0	0	0	0	**0**
AM Total	**0**	**2**	**2**	**0**	**5**	**5**	**5**
14:30 - 14:45	0	5	5	0	0	0	**5**
14:45 - 15:00	0	0	0	0	0	0	**0**
15:00 - 15:15	0	0	0	0	0	0	**0**
15:15 - 15:30	0	0	0	0	0	0	**0**
15:30 - 15:45	0	0	0	0	0	0	**0**
15:45 - 16:00	0	0	0	0	0	0	**0**
16:00 - 16:15	0	0	0	0	0	0	**0**
16:15 - 16:30	0	0	0	0	0	0	**0**
PM Total	**0**	**5**	**5**	**0**	**0**	**0**	**5**

[Hourly Summary]

Approach	Pick Up			Drop Off			Grand Total
	Grade 10-12	Others	Total	Grade 10-12	Others	Total	
7:00 - 8:00	0	2	2	0	5	5	**7**
7:15 - 8:15	0	0	0	0	5	5	**5**
7:30 - 8:30	0	0	0	0	5	5	**5**
7:45 - 8:45	0	0	0	0	5	5	**5**
8:00 - 9:00	0	0	0	0	0	0	**0**
8:15 - 9:15	0	0	0	0	0	0	**0**
8:30 - 9:30	0	0	0	0	0	0	**0**
AM Total	**0**	**2**	**2**	**0**	**5**	**5**	**5**
14:30 - 15:30	0	5	5	0	0	0	**5**
14:45 - 15:45	0	0	0	0	0	0	**0**
15:00 - 16:00	0	0	0	0	0	0	**0**
15:15 - 16:15	0	0	0	0	0	0	**0**
15:30 - 16:30	0	0	0	0	0	0	**0**
PM Total	**0**	**5**	**5**	**0**	**0**	**0**	**5**

Job No.	: N5401
Client	: Varga Traffic Planning
Suburb	: Dee Why
Location	: 1. Warringah Rd / Pittwater Rd / Harbord Rd
Day/Date	: Tue, 29th October 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies



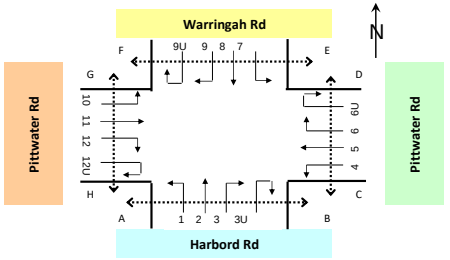
MATRIX Traffic and Transport Data

Approach	**Harbord Rd**												**Pittwater Rd**											
Direction	**Direction 1 (Left Turn)**			**Direction 2 (Through)**			**Direction 3 (Right Turn)**			**Direction 3U (U Turn)**			**Direction 4 (Left Turn)**			**Direction 5 (Through)**			**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
7:00 to 7:15	2	1	**3**	74	6	**80**	60	5	**65**	0	0	**0**	93	2	**95**	318	29	**347**	76	0	**76**	0	0	**0**
7:15 to 7:30	3	1	**4**	88	9	**97**	58	6	**64**	0	0	**0**	127	7	**134**	369	27	**396**	99	6	**105**	0	0	**0**
7:30 to 7:45	4	0	**4**	109	3	**112**	69	5	**74**	0	0	**0**	116	6	**122**	374	27	**401**	94	0	**94**	0	0	**0**
7:45 to 8:00	7	2	**9**	81	8	**89**	71	4	**75**	0	0	**0**	123	1	**124**	368	30	**398**	82	1	**83**	0	0	**0**
8:00 to 8:15	7	2	**9**	102	4	**106**	58	4	**62**	0	0	**0**	122	6	**128**	370	36	**406**	65	1	**66**	0	0	**0**
8:15 to 8:30	4	1	**5**	94	6	**100**	52	3	**55**	0	0	**0**	98	4	**102**	400	19	**419**	64	1	**65**	0	0	**0**
8:30 to 8:45	13	1	**14**	96	5	**101**	86	5	**91**	0	0	**0**	93	2	**95**	353	28	**381**	82	2	**84**	0	0	**0**
8:45 to 9:00	14	1	**15**	94	10	**104**	74	2	**76**	0	0	**0**	118	8	**126**	338	22	**360**	66	2	**68**	0	0	**0**
AM Totals	**54**	**9**	**63**	**738**	**51**	**789**	**528**	**34**	**562**	**0**	**0**	**0**	**890**	**36**	**926**	**2,890**	**218**	**3,108**	**628**	**13**	**641**	**0**	**0**	**0**
15:00 to 15:15	8	0	**8**	104	3	**107**	71	7	**78**	0	0	**0**	78	5	**83**	265	29	**294**	85	5	**90**	0	0	**0**
15:15 to 15:30	5	1	**6**	107	4	**111**	99	4	**103**	0	0	**0**	95	6	**101**	245	15	**260**	100	1	**101**	0	0	**0**
15:30 to 15:45	7	0	**7**	120	4	**124**	82	3	**85**	0	0	**0**	84	4	**88**	219	21	**240**	95	1	**96**	0	0	**0**
15:45 to 16:00	13	1	**14**	111	3	**114**	89	3	**92**	0	0	**0**	94	4	**98**	261	20	**281**	66	5	**71**	0	0	**0**
16:00 to 16:15	8	1	**9**	117	4	**121**	84	1	**85**	0	0	**0**	85	5	**90**	220	22	**242**	79	2	**81**	0	0	**0**
16:15 to 16:30	10	0	**10**	107	4	**111**	87	3	**90**	0	0	**0**	112	2	**114**	263	25	**288**	65	5	**70**	0	0	**0**
16:30 to 16:45	13	0	**13**	112	4	**116**	102	1	**103**	0	0	**0**	97	2	**99**	182	13	**195**	74	3	**77**	0	0	**0**
16:45 to 17:00	10	1	**11**	123	4	**127**	81	2	**83**	0	0	**0**	110	0	**110**	259	29	**288**	53	2	**55**	0	0	**0**
PM Totals	**74**	**4**	**78**	**901**	**30**	**931**	**695**	**24**	**719**	**0**	**0**	**0**	**755**	**28**	**783**	**1,914**	**174**	**2,088**	**617**	**24**	**641**	**0**	**0**	**0**

Approach	**Warringah Rd**												**Pittwater Rd**												**Crossing Pedestrians**								
Direction	**Direction 7 (Left Turn)**			**Direction 8 (Through)**			**Direction 9 (Right Turn)**			**Direction 9U (U Turn)**			**Direction 10 (Left Turn)**			**Direction 11 (Through)**			**Direction 12 (Right Turn)**			**Direction 12U (U Turn)**											
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**B to A**	**A to B**	**D to C**	**C to D**	**F to E**	**E to F**	**H to G**	**G to H**	**Total**
7:00 to 7:15	25	1	**26**	96	5	**101**	67	4	**71**	0	0	**0**	5	7	**12**	152	29	**181**	32	0	**32**	0	0	**0**	0	6	1	4	3	2	0	0	**16**
7:15 to 7:30	9	1	**10**	97	3	**100**	78	6	**84**	0	0	**0**	4	7	**11**	169	27	**196**	19	2	**21**	0	0	**0**	3	6	3	4	3	8	3	1	**31**
7:30 to 7:45	27	0	**27**	118	3	**121**	71	6	**77**	0	0	**0**	9	9	**18**	198	26	**224**	26	0	**26**	0	0	**0**	1	5	2	3	6	6	4	0	**27**
7:45 to 8:00	17	1	**18**	123	2	**125**	99	4	**103**	0	0	**0**	7	8	**15**	242	29	**271**	22	3	**25**	0	0	**0**	4	16	2	8	11	6	7	6	**60**
8:00 to 8:15	18	3	**21**	111	3	**114**	67	6	**73**	0	0	**0**	15	6	**21**	240	21	**261**	21	2	**23**	0	0	**0**	2	6	2	8	4	14	1	4	**41**
8:15 to 8:30	17	3	**20**	116	9	**125**	49	5	**54**	0	0	**0**	20	10	**30**	227	17	**244**	24	2	**26**	0	0	**0**	6	10	2	3	16	3	9	0	**49**
8:30 to 8:45	28	5	**33**	141	7	**148**	59	12	**71**	0	0	**0**	10	8	**18**	188	19	**207**	35	0	**35**	0	0	**0**	2	2	1	7	5	5	4	1	**27**
8:45 to 9:00	21	4	**25**	115	5	**120**	86	8	**94**	0	0	**0**	18	8	**26**	212	14	**226**	46	1	**47**	0	0	**0**	1	1	2	2	6	6	3	0	**21**
AM Totals	**162**	**18**	**180**	**917**	**37**	**954**	**576**	**51**	**627**	**0**	**0**	**0**	**88**	**63**	**151**	**1,628**	**182**	**1,810**	**225**	**10**	**235**	**0**	**0**	**0**	**19**	**52**	**15**	**39**	**54**	**50**	**31**	**12**	**272**
15:00 to 15:15	34	1	**35**	101	2	**103**	39	6	**45**	0	0	**0**	21	14	**35**	369	14	**383**	43	1	**44**	0	0	**0**	7	1	2	1	3	3	1	0	**18**
15:15 to 15:30	35	3	**38**	101	4	**105**	50	7	**57**	0	0	**0**	19	9	**28**	317	17	**334**	32	4	**36**	0	0	**0**	5	14	11	2	13	7	3	2	**57**
15:30 to 15:45	49	3	**52**	83	3	**86**	55	7	**62**	0	0	**0**	17	18	**35**	359	16	**375**	26	1	**27**	0	0	**0**	7	4	9	2	10	7	4	1	**44**
15:45 to 16:00	50	1	**51**	106	9	**115**	52	9	**61**	0	0	**0**	26	12	**38**	328	30	**358**	29	1	**30**	0	0	**0**	5	2	4	7	1	8	2	1	**30**
16:00 to 16:15	51	1	**52**	92	2	**94**	42	5	**47**	0	0	**0**	22	5	**27**	405	17	**422**	15	2	**17**	0	0	**0**	10	4	3	11	5	7	3	5	**48**
16:15 to 16:30	47	4	**51**	114	4	**118**	35	6	**41**	0	0	**0**	28	3	**31**	400	24	**424**	35	2	**37**	0	0	**0**	4	1	2	6	6	12	0	2	**33**
16:30 to 16:45	62	2	**64**	132	5	**137**	55	2	**57**	0	0	**0**	29	8	**37**	379	22	**401**	32	0	**32**	0	0	**0**	7	5	5	3	5	9	5	4	**43**
16:45 to 17:00	46	6	**52**	128	2	**130**	56	2	**58**	0	0	**0**	22	3	**25**	385	18	**403**	35	1	**36**	0	0	**0**	3	5	2	0	4	5	0	5	**24**
PM Totals	**374**	**21**	**395**	**857**	**31**	**888**	**384**	**44**	**428**	**0**	**0**	**0**	**184**	**72**	**256**	**2,942**	**158**	**3,100**	**247**	**12**	**259**	**0**	**0**	**0**	**48**	**36**	**38**	**32**	**47**	**58**	**18**	**20**	**297**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 1. Warringah Rd / Pittwater Rd / Harbord Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



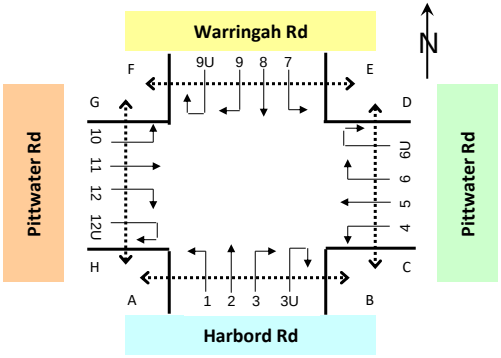
MATRIX Traffic and Transport Data

Approach	Harbord Rd												Pittwater Rd											
Direction	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00	16	4	**20**	352	26	**378**	258	20	**278**	0	0	**0**	459	16	**475**	1,429	113	**1,542**	351	7	**358**	0	0	**0**
7:15 to 8:15	21	5	**26**	380	24	**404**	256	19	**275**	0	0	**0**	488	20	**508**	1,481	120	**1,601**	340	8	**348**	0	0	**0**
7:30 to 8:30	22	5	**27**	386	21	**407**	250	16	**266**	0	0	**0**	459	17	**476**	1,512	112	**1,624**	305	3	**308**	0	0	**0**
7:45 to 8:45	31	6	**37**	373	23	**396**	267	16	**283**	0	0	**0**	436	13	**449**	1,491	113	**1,604**	293	5	**298**	0	0	**0**
8:00 to 9:00	38	5	**43**	386	25	**411**	270	14	**284**	0	0	**0**	431	20	**451**	1,461	105	**1,566**	277	6	**283**	0	0	**0**
AM Totals	**54**	**9**	**63**	**738**	**51**	**789**	**528**	**34**	**562**	**0**	**0**	**0**	**890**	**36**	**926**	**2,890**	**218**	**3,108**	**628**	**13**	**641**	**0**	**0**	**0**
15:00 to 16:00	33	2	**35**	442	14	**456**	341	17	**358**	0	0	**0**	351	19	**370**	990	85	**1,075**	346	12	**358**	0	0	**0**
15:15 to 16:15	33	3	**36**	455	15	**470**	354	11	**365**	0	0	**0**	358	19	**377**	945	78	**1,023**	340	9	**349**	0	0	**0**
15:30 to 16:30	38	2	**40**	455	15	**470**	342	10	**352**	0	0	**0**	375	15	**390**	963	88	**1,051**	305	13	**318**	0	0	**0**
15:45 to 16:45	44	2	**46**	447	15	**462**	362	8	**370**	0	0	**0**	388	13	**401**	926	80	**1,006**	284	15	**299**	0	0	**0**
16:00 to 17:00	41	2	**43**	459	16	**475**	354	7	**361**	0	0	**0**	404	9	**413**	924	89	**1,013**	271	12	**283**	0	0	**0**
PM Totals	**74**	**4**	**78**	**901**	**30**	**931**	**695**	**24**	**719**	**0**	**0**	**0**	**755**	**28**	**783**	**1,914**	**174**	**2,088**	**617**	**24**	**641**	**0**	**0**	**0**

Approach	Warringah Rd												Pittwater Rd												Crossing Pedestrians								
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)											
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	B to A	A to B	D to C	C to D	F to E	E to F	H to G	G to H	Total
7:00 to 8:00	78	3	**81**	434	13	**447**	315	20	**335**	0	0	**0**	25	31	**56**	761	111	**872**	99	5	**104**	0	0	**0**	8	33	8	19	23	22	14	7	**134**
7:15 to 8:15	71	5	**76**	449	11	**460**	315	22	**337**	0	0	**0**	35	30	**65**	849	103	**952**	88	7	**95**	0	0	**0**	10	33	9	23	24	34	15	11	**159**
7:30 to 8:30	79	7	**86**	468	17	**485**	286	21	**307**	0	0	**0**	51	33	**84**	907	93	**1,000**	93	7	**100**	0	0	**0**	13	37	8	22	37	29	21	10	**177**
7:45 to 8:45	80	12	**92**	491	21	**512**	274	27	**301**	0	0	**0**	52	32	**84**	897	86	**983**	102	7	**109**	0	0	**0**	14	34	7	26	36	28	21	11	**177**
8:00 to 9:00	84	15	**99**	483	24	**507**	261	31	**292**	0	0	**0**	63	32	**95**	867	71	**938**	126	5	**131**	0	0	**0**	11	19	7	20	31	28	17	5	**138**
AM Totals	**162**	**18**	**180**	**917**	**37**	**954**	**576**	**51**	**627**	**0**	**0**	**0**	**88**	**63**	**151**	**1,628**	**182**	**1,810**	**225**	**10**	**235**	**0**	**0**	**0**	**19**	**52**	**15**	**39**	**54**	**50**	**31**	**12**	**272**
15:00 to 16:00	168	8	**176**	391	18	**409**	196	29	**225**	0	0	**0**	83	53	**136**	1,373	77	**1,450**	130	7	**137**	0	0	**0**	24	21	26	12	27	25	10	4	**149**
15:15 to 16:15	185	8	**193**	382	18	**400**	199	28	**227**	0	0	**0**	84	44	**128**	1,409	80	**1,489**	102	8	**110**	0	0	**0**	27	24	27	22	29	29	12	9	**179**
15:30 to 16:30	197	9	**206**	395	18	**413**	184	27	**211**	0	0	**0**	93	38	**131**	1,492	87	**1,579**	105	6	**111**	0	0	**0**	26	11	18	26	22	34	9	9	**155**
15:45 to 16:45	210	8	**218**	444	20	**464**	184	22	**206**	0	0	**0**	105	28	**133**	1,512	93	**1,605**	111	5	**116**	0	0	**0**	26	12	14	27	17	36	10	12	**154**
16:00 to 17:00	206	13	**219**	466	13	**479**	188	15	**203**	0	0	**0**	101	19	**120**	1,569	81	**1,650**	117	5	**122**	0	0	**0**	24	15	12	20	20	33	8	16	**148**
PM Totals	**374**	**21**	**395**	**857**	**31**	**888**	**384**	**44**	**428**	**0**	**0**	**0**	**184**	**72**	**256**	**2,942**	**158**	**3,100**	**247**	**12**	**259**	**0**	**0**	**0**	**48**	**36**	**38**	**32**	**47**	**58**	**18**	**20**	**297**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 1. Warringah Rd / Pittwater Rd / Harbord Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

	Approach	Harbord Rd			Pittwater Rd			Warringah Rd			Pittwater Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:30 to 8:30	658	42	**700**	2,276	132	**2,408**	833	45	**878**	1,051	133	**1,184**	**5,170**
PM	16:00 to 17:00	854	25	**879**	1,599	110	**1,709**	860	41	**901**	1,787	105	**1,892**	**5,381**

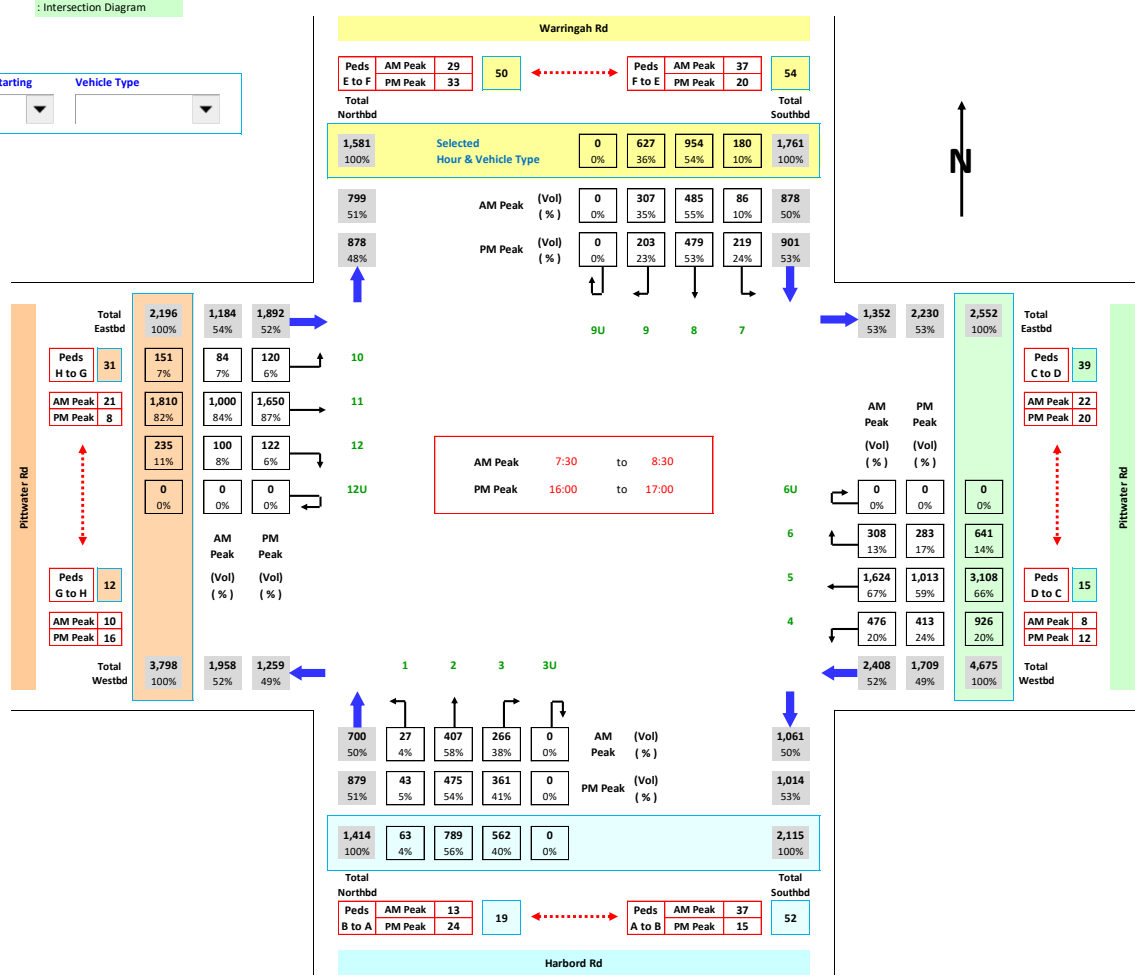
Approach	Harbord Rd			Pittwater Rd			Warringah Rd			Pittwater Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00 to 8:00	626	50	**676**	2,239	136	**2,375**	827	36	**863**	885	147	**1,032**	**4,946**
7:15 to 8:15	657	48	**705**	2,309	148	**2,457**	835	38	**873**	972	140	**1,112**	**5,147**
7:30 to 8:30	658	42	**700**	2,276	132	**2,408**	833	45	**878**	1,051	133	**1,184**	**5,170**
7:45 to 8:45	671	45	**716**	2,220	131	**2,351**	845	60	**905**	1,051	125	**1,176**	**5,148**
8:00 to 9:00	694	44	**738**	2,169	131	**2,300**	828	70	**898**	1,056	108	**1,164**	**5,100**
AM Totals	**1,320**	**94**	**1,414**	**4,408**	**267**	**4,675**	**1,655**	**106**	**1,761**	**1,941**	**255**	**2,196**	**10,046**
15:00 to 16:00	816	33	**849**	1,687	116	**1,803**	755	55	**810**	1,586	137	**1,723**	**5,185**
15:15 to 16:15	842	29	**871**	1,643	106	**1,749**	766	54	**820**	1,595	132	**1,727**	**5,167**
15:30 to 16:30	835	27	**862**	1,643	116	**1,759**	776	54	**830**	1,690	131	**1,821**	**5,272**
15:45 to 16:45	853	25	**878**	1,598	108	**1,706**	838	50	**888**	1,728	126	**1,854**	**5,326**
16:00 to 17:00	854	25	**879**	1,599	110	**1,709**	860	41	**901**	1,787	105	**1,892**	**5,381**
PM Totals	**1,670**	**58**	**1,728**	**3,286**	**226**	**3,512**	**1,615**	**96**	**1,711**	**3,373**	**242**	**3,615**	**10,566**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 1. Warringah Rd / Pittwater Rd / Harbord Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

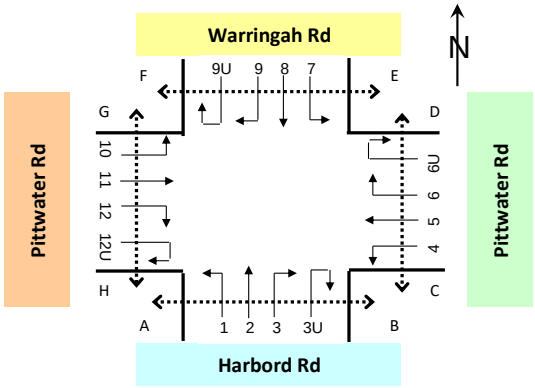
MATRIX Traffic and Transport Data

Hour Starting | Vehicle Type



Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 1. Warringah Rd / Pittwater Rd / Harbord Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Classified Intersection Count
: Pedestrian Data

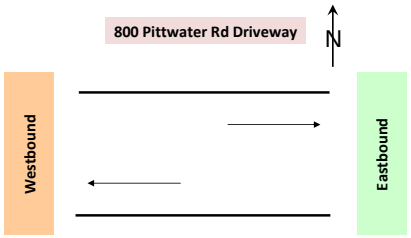


MATRIX Traffic and Transport Data

Direction	Pedestrians							
Time Period	B to A	A to B	D to C	C to D	F to E	E to F	H to G	G to H
7:00 to 7:15	0	6	1	4	3	2	0	0
7:15 to 7:30	3	6	3	4	3	8	3	1
7:30 to 7:45	1	5	2	3	6	6	4	0
7:45 to 8:00	4	16	2	8	11	6	7	6
8:00 to 8:15	2	6	2	8	4	14	1	4
8:15 to 8:30	6	10	2	3	16	3	9	0
8:30 to 8:45	2	2	1	7	5	5	4	1
8:45 to 9:00	1	1	2	2	6	6	3	0
AM Totals	**19**	**52**	**15**	**39**	**54**	**50**	**31**	**12**
15:00 to 15:15	7	1	2	1	3	3	1	0
15:15 to 15:30	5	14	11	2	13	7	3	2
15:30 to 15:45	7	4	9	2	10	7	4	1
15:45 to 16:00	5	2	4	7	1	8	2	1
16:00 to 16:15	10	4	3	11	5	7	3	5
16:15 to 16:30	4	1	2	6	6	12	0	2
16:30 to 16:45	7	5	5	3	5	9	5	4
16:45 to 17:00	3	5	2	0	4	5	0	5
PM Totals	**48**	**36**	**38**	**32**	**47**	**58**	**18**	**20**

Job No.	: N5401
Client	: Varga Traffic Planning
Suburb	: Dee Why
Location	: 2. 800 Pittwater Rd Driveway / Harbord Rd
Day/Date	: Tue, 29th October 2019
Weather	: Fine
Description	: Mid Block Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies

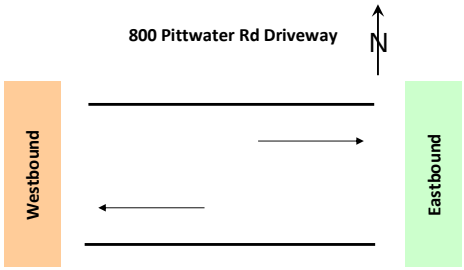


MATRIX Traffic and Transport Data

Approach	**800 Pittwater Rd Driveway**					
Direction	**Westbound**			**Eastbound**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
6:00 to 6:15	14	0	**14**	18	2	**20**
6:15 to 6:30	21	2	**23**	14	0	**14**
6:30 to 6:45	24	0	**24**	19	0	**19**
6:45 to 7:00	50	0	**50**	15	0	**15**
7:00 to 7:15	26	0	**26**	17	0	**17**
7:15 to 7:30	25	0	**25**	17	0	**17**
7:30 to 7:45	18	0	**18**	24	0	**24**
7:45 to 8:00	22	0	**22**	26	0	**26**
8:00 to 8:15	18	0	**18**	23	0	**23**
8:15 to 8:30	20	0	**20**	19	0	**19**
8:30 to 8:45	18	0	**18**	34	0	**34**
8:45 to 9:00	22	0	**22**	58	0	**58**
9:00 to 9:15	30	0	**30**	38	0	**38**
9:15 to 9:30	29	0	**29**	53	0	**53**
9:30 to 9:45	36	0	**36**	28	0	**28**
9:45 to 10:00	35	0	**35**	32	0	**32**
10:00 to 10:15	29	0	**29**	45	0	**45**
10:15 to 10:30	55	0	**55**	46	1	**47**
10:30 to 10:45	44	0	**44**	26	0	**26**
10:45 to 11:00	35	0	**35**	25	0	**25**
11:00 to 11:15	41	1	**42**	30	1	**31**
11:15 to 11:30	36	0	**36**	27	0	**27**
11:30 to 11:45	35	0	**35**	20	0	**20**
11:45 to 12:00	35	0	**35**	31	0	**31**
12:00 to 12:15	39	0	**39**	27	0	**27**
12:15 to 12:30	30	0	**30**	27	1	**28**
12:30 to 12:45	33	0	**33**	31	0	**31**
12:45 to 13:00	34	1	**35**	27	0	**27**
13:00 to 13:15	29	1	**30**	18	2	**20**
13:15 to 13:30	27	1	**28**	39	0	**39**
13:30 to 13:45	36	0	**36**	23	0	**23**
13:45 to 14:00	18	0	**18**	20	0	**20**
14:00 to 14:15	27	0	**27**	21	0	**21**
14:15 to 14:30	20	0	**20**	25	0	**25**
14:30 to 14:45	19	0	**19**	29	0	**29**
14:45 to 15:00	32	0	**32**	31	0	**31**
15:00 to 15:15	24	0	**24**	39	0	**39**
15:15 to 15:30	32	0	**32**	31	0	**31**
15:30 to 15:45	30	0	**30**	33	1	**34**
15:45 to 16:00	27	0	**27**	27	0	**27**
16:00 to 16:15	24	0	**24**	43	0	**43**
16:15 to 16:30	42	0	**42**	50	0	**50**
16:30 to 16:45	38	0	**38**	46	0	**46**
16:45 to 17:00	38	0	**38**	35	1	**36**
17:00 to 17:15	32	2	**34**	54	0	**54**
17:15 to 17:30	20	0	**20**	47	0	**47**
17:30 to 17:45	33	0	**33**	47	0	**47**
17:45 to 18:00	32	0	**32**	33	0	**33**
12hr Totals	**1,434**	**8**	**1,442**	**1,488**	**9**	**1,497**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 2. 800 Pittwater Rd Driveway / Harbord Rd

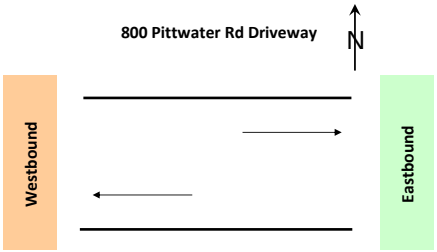
Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Hourly Summary



Approach	800 Pittwater Rd Driveway					
Direction	Westbound			Eastbound		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total
6:00 to 7:00	109	2	**111**	66	2	**68**
6:15 to 7:15	121	2	**123**	65	0	**65**
6:30 to 7:30	125	0	**125**	68	0	**68**
6:45 to 7:45	119	0	**119**	73	0	**73**
7:00 to 8:00	91	0	**91**	84	0	**84**
7:15 to 8:15	83	0	**83**	90	0	**90**
7:30 to 8:30	78	0	**78**	92	0	**92**
7:45 to 8:45	78	0	**78**	102	0	**102**
8:00 to 9:00	78	0	**78**	134	0	**134**
8:15 to 9:15	90	0	**90**	149	0	**149**
8:30 to 9:30	99	0	**99**	183	0	**183**
8:45 to 9:45	117	0	**117**	177	0	**177**
9:00 to 10:00	130	0	**130**	151	0	**151**
9:15 to 10:15	129	0	**129**	158	0	**158**
9:30 to 10:30	155	0	**155**	151	1	**152**
9:45 to 10:45	163	0	**163**	149	1	**150**
10:00 to 11:00	163	0	**163**	142	1	**143**
10:15 to 11:15	175	1	**176**	127	2	**129**
10:30 to 11:30	156	1	**157**	108	1	**109**
10:45 to 11:45	147	1	**148**	102	1	**103**
11:00 to 12:00	147	1	**148**	108	1	**109**
11:15 to 12:15	145	0	**145**	105	0	**105**
11:30 to 12:30	139	0	**139**	105	1	**106**
11:45 to 12:45	137	0	**137**	116	1	**117**
12:00 to 13:00	136	1	**137**	112	1	**113**
12:15 to 13:15	126	2	**128**	103	3	**106**
12:30 to 13:30	123	3	**126**	115	2	**117**
12:45 to 13:45	126	3	**129**	107	2	**109**
13:00 to 14:00	110	2	**112**	100	2	**102**
13:15 to 14:15	108	1	**109**	103	0	**103**
13:30 to 14:30	101	0	**101**	89	0	**89**
13:45 to 14:45	84	0	**84**	95	0	**95**
14:00 to 15:00	98	0	**98**	106	0	**106**
14:15 to 15:15	95	0	**95**	124	0	**124**
14:30 to 15:30	107	0	**107**	130	0	**130**
14:45 to 15:45	118	0	**118**	134	1	**135**
15:00 to 16:00	113	0	**113**	130	1	**131**
15:15 to 16:15	113	0	**113**	134	1	**135**
15:30 to 16:30	123	0	**123**	153	1	**154**
15:45 to 16:45	131	0	**131**	166	0	**166**
16:00 to 17:00	142	0	**142**	174	1	**175**
16:15 to 17:15	150	2	**152**	185	1	**186**
16:30 to 17:30	128	2	**130**	182	1	**183**
16:45 to 17:45	123	2	**125**	183	1	**184**
17:00 to 18:00	117	2	**119**	181	0	**181**
12hr Totals	**1,434**	**8**	**1,442**	**1,488**	**9**	**1,497**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 2. 800 Pittwater Rd Driveway / Harbord Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

	Approach	Westbound			Eastbound			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	
AM	9:45 to 10:45	163	0	**163**	149	1	**150**	**313**
PM	16:15 to 17:15	150	2	**152**	185	1	**186**	**338**

Approach	Westbound			Eastbound			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	109	2	**111**	66	2	**68**	**179**
6:15 to 7:15	121	2	**123**	65	0	**65**	**188**
6:30 to 7:30	125	0	**125**	68	0	**68**	**193**
6:45 to 7:45	119	0	**119**	73	0	**73**	**192**
7:00 to 8:00	91	0	**91**	84	0	**84**	**175**
7:15 to 8:15	83	0	**83**	90	0	**90**	**173**
7:30 to 8:30	78	0	**78**	92	0	**92**	**170**
7:45 to 8:45	78	0	**78**	102	0	**102**	**180**
8:00 to 9:00	78	0	**78**	134	0	**134**	**212**
8:15 to 9:15	90	0	**90**	149	0	**149**	**239**
8:30 to 9:30	99	0	**99**	183	0	**183**	**282**
8:45 to 9:45	117	0	**117**	177	0	**177**	**294**
9:00 to 10:00	130	0	**130**	151	0	**151**	**281**
9:15 to 10:15	129	0	**129**	158	0	**158**	**287**
9:30 to 10:30	155	0	**155**	151	1	**152**	**307**
9:45 to 10:45	163	0	**163**	149	1	**150**	**313**
10:00 to 11:00	163	0	**163**	142	1	**143**	**306**
10:15 to 11:15	175	1	**176**	127	2	**129**	**305**
10:30 to 11:30	156	1	**157**	108	1	**109**	**266**
10:45 to 11:45	147	1	**148**	102	1	**103**	**251**
11:00 to 12:00	147	1	**148**	108	1	**109**	**257**
11:15 to 12:15	145	0	**145**	105	0	**105**	**250**
11:30 to 12:30	139	0	**139**	105	1	**106**	**245**
11:45 to 12:45	137	0	**137**	116	1	**117**	**254**
12:00 to 13:00	136	1	**137**	112	1	**113**	**250**
12:15 to 13:15	126	2	**128**	103	3	**106**	**234**
12:30 to 13:30	123	3	**126**	115	2	**117**	**243**
12:45 to 13:45	126	3	**129**	107	2	**109**	**238**
13:00 to 14:00	110	2	**112**	100	2	**102**	**214**
13:15 to 14:15	108	1	**109**	103	0	**103**	**212**
13:30 to 14:30	101	0	**101**	89	0	**89**	**190**
13:45 to 14:45	84	0	**84**	95	0	**95**	**179**
14:00 to 15:00	98	0	**98**	106	0	**106**	**204**
14:15 to 15:15	95	0	**95**	124	0	**124**	**219**
14:30 to 15:30	107	0	**107**	130	0	**130**	**237**
14:45 to 15:45	118	0	**118**	134	1	**135**	**253**
15:00 to 16:00	113	0	**113**	130	1	**131**	**244**
15:15 to 16:15	113	0	**113**	134	1	**135**	**248**
15:30 to 16:30	123	0	**123**	153	1	**154**	**277**
15:45 to 16:45	131	0	**131**	166	0	**166**	**297**
16:00 to 17:00	142	0	**142**	174	1	**175**	**317**
16:15 to 17:15	150	2	**152**	185	1	**186**	**338**
16:30 to 17:30	128	2	**130**	182	1	**183**	**313**
16:45 to 17:45	123	2	**125**	183	1	**184**	**309**
17:00 to 18:00	117	2	**119**	181	0	**181**	**300**
12hr Totals	**1,434**	**8**	**1,442**	**1,488**	**9**	**1,497**	**2,939**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 2. 800 Pittwater Rd Driveway / Harbord Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Intersection Diagram

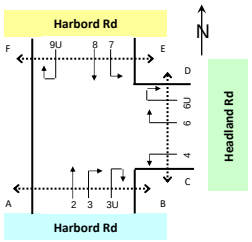
Hour Starting **Vehicle Type**

800 Pittwater Rd Driveway

AM Peak	9:45	to	10:45
PM Peak	16:15	to	17:15

Job No.	: N5401
Client	: Varga Traffic Planning
Suburb	: Dee Why
Location	: 3. Harbord Rd / Headland Rd
Day/Date	: Tue, 29th October 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies



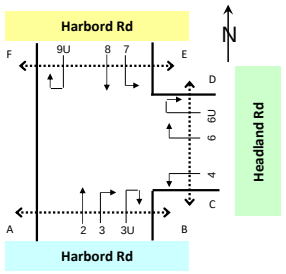
MATRIX Traffic and Transport Data

Approach	**Harbord Rd**									**Headland Rd**									
Direction		**Direction 2 (Through)**			**Direction 3 (Right Turn)**			**Direction 3U (U Turn)**			**Direction 4 (Left Turn)**				**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period		**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**		**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
7:00 to 7:15		119	13	**132**	34	0	**34**	0	0	**0**	43	0	**43**		13	0	**13**	0	0	**0**
7:15 to 7:30		138	11	**149**	27	0	**27**	0	0	**0**	52	0	**52**		18	0	**18**	0	0	**0**
7:30 to 7:45		132	8	**140**	31	1	**32**	0	0	**0**	37	1	**38**		15	0	**15**	0	0	**0**
7:45 to 8:00		165	9	**174**	25	0	**25**	0	0	**0**	46	1	**47**		7	1	**8**	0	0	**0**
8:00 to 8:15		169	13	**182**	33	0	**33**	0	0	**0**	55	0	**55**		9	0	**9**	0	0	**0**
8:15 to 8:30		156	10	**166**	38	2	**40**	0	0	**0**	73	0	**73**		9	1	**10**	0	0	**0**
8:30 to 8:45		145	9	**154**	13	0	**13**	0	0	**0**	42	0	**42**		8	0	**8**	0	0	**0**
8:45 to 9:00		148	14	**162**	12	0	**12**	0	0	**0**	35	1	**36**		7	0	**7**	0	0	**0**
AM Totals		**1,172**	**87**	**1,259**	**213**	**3**	**216**	**0**	**0**	**0**	**383**	**3**	**386**		**86**	**2**	**88**	**0**	**0**	**0**
15:00 to 15:15		189	10	**199**	44	1	**45**	0	0	**0**	40	0	**40**		11	0	**11**	0	0	**0**
15:15 to 15:30		195	7	**202**	19	0	**19**	0	0	**0**	30	1	**31**		12	1	**13**	0	0	**0**
15:30 to 15:45		183	8	**191**	22	1	**23**	0	0	**0**	19	7	**26**		10	1	**11**	0	0	**0**
15:45 to 16:00		174	10	**184**	24	0	**24**	0	0	**0**	23	2	**25**		11	1	**12**	0	0	**0**
16:00 to 16:15		204	4	**208**	29	0	**29**	0	0	**0**	24	0	**24**		6	0	**6**	0	0	**0**
16:15 to 16:30		196	6	**202**	25	0	**25**	0	0	**0**	29	0	**29**		11	1	**12**	0	0	**0**
16:30 to 16:45		199	2	**201**	31	0	**31**	0	0	**0**	35	0	**35**		7	1	**8**	0	0	**0**
16:45 to 17:00		163	4	**167**	36	0	**36**	0	0	**0**	35	0	**35**		12	0	**12**	0	0	**0**
PM Totals		**1,503**	**51**	**1,554**	**230**	**2**	**232**	**0**	**0**	**0**	**235**	**10**	**245**		**80**	**5**	**85**	**0**	**0**	**0**

Approach	**Harbord Rd**									**Crossing Pedestrians**						
Direction	**Direction 7 (Left Turn)**			**Direction 8 (Through)**				**Direction 9U (U Turn)**										
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**		**Lights**	**Heavies**	**Total**	**B to A**	**A to B**	**D to C**	**C to D**	**F to E**	**E to F**		**Total**
7:00 to 7:15	56	2	**58**	158	5	**163**		0	0	**0**	0	0	0	2	0	0		**2**
7:15 to 7:30	36	3	**39**	197	10	**207**		0	0	**0**	0	0	7	0	0	0		**7**
7:30 to 7:45	44	3	**47**	200	9	**209**		0	0	**0**	0	0	3	3	0	0		**6**
7:45 to 8:00	42	2	**44**	208	4	**212**		0	0	**0**	0	1	8	3	0	0		**12**
8:00 to 8:15	49	6	**55**	195	5	**200**		0	0	**0**	0	0	10	2	0	0		**12**
8:15 to 8:30	49	2	**51**	183	13	**196**		0	0	**0**	0	1	5	2	0	0		**8**
8:30 to 8:45	40	1	**41**	195	9	**204**		0	0	**0**	0	0	9	1	0	0		**10**
8:45 to 9:00	46	0	**46**	168	14	**182**		0	0	**0**	0	0	22	2	0	0		**24**
AM Totals	**362**	**19**	**381**	**1,504**	**69**	**1,573**		**0**	**0**	**0**	**0**	**2**	**64**	**15**	**0**	**0**		**81**
15:00 to 15:15	57	3	**60**	152	7	**159**		0	0	**0**	0	0	0	0	0	0		**0**
15:15 to 15:30	43	4	**47**	170	10	**180**		0	0	**0**	0	0	13	0	0	0		**13**
15:30 to 15:45	34	3	**37**	149	5	**154**		0	0	**0**	0	0	3	3	0	0		**6**
15:45 to 16:00	36	2	**38**	185	14	**199**		0	0	**0**	0	0	0	5	0	0		**5**
16:00 to 16:15	28	0	**28**	153	7	**160**		0	0	**0**	0	0	1	2	0	0		**3**
16:15 to 16:30	42	1	**43**	207	5	**212**		0	0	**0**	0	0	2	3	0	0		**5**
16:30 to 16:45	53	0	**53**	198	8	**206**		0	0	**0**	0	0	0	4	0	0		**4**
16:45 to 17:00	51	0	**51**	225	3	**228**		0	0	**0**	0	0	2	6	0	0		**8**
PM Totals	**344**	**13**	**357**	**1,439**	**59**	**1,498**		**0**	**0**	**0**	**0**	**0**	**21**	**23**	**0**	**0**		**44**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 3. Harbord Rd / Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



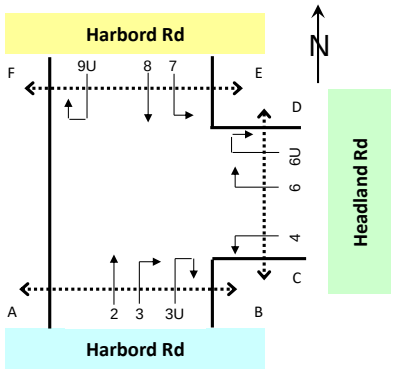
MATRIX Traffic and Transport Data

Approach	Harbord Rd									Headland Rd								
Direction		Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)				Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00		554	41	**595**	117	1	**118**	0	0	**0**	178	2	**180**		53	1	**54**	0	0	**0**
7:15 to 8:15		604	41	**645**	116	1	**117**	0	0	**0**	190	2	**192**		49	1	**50**	0	0	**0**
7:30 to 8:30		622	40	**662**	127	3	**130**	0	0	**0**	211	2	**213**		40	2	**42**	0	0	**0**
7:45 to 8:45		635	41	**676**	109	2	**111**	0	0	**0**	216	1	**217**		33	2	**35**	0	0	**0**
8:00 to 9:00		618	46	**664**	96	2	**98**	0	0	**0**	205	1	**206**		33	1	**34**	0	0	**0**
AM Totals		**1,172**	**87**	**1,259**	**213**	**3**	**216**	**0**	**0**	**0**	**383**	**3**	**386**		**86**	**2**	**88**	**0**	**0**	**0**
15:00 to 16:00		741	35	**776**	109	2	**111**	0	0	**0**	112	10	**122**		44	3	**47**	0	0	**0**
15:15 to 16:15		756	29	**785**	94	1	**95**	0	0	**0**	96	10	**106**		39	3	**42**	0	0	**0**
15:30 to 16:30		757	28	**785**	100	1	**101**	0	0	**0**	95	9	**104**		38	3	**41**	0	0	**0**
15:45 to 16:45		773	22	**795**	109	0	**109**	0	0	**0**	111	2	**113**		35	3	**38**	0	0	**0**
16:00 to 17:00		762	16	**778**	121	0	**121**	0	0	**0**	123	0	**123**		36	2	**38**	0	0	**0**
PM Totals		**1,503**	**51**	**1,554**	**230**	**2**	**232**	**0**	**0**	**0**	**235**	**10**	**245**		**80**	**5**	**85**	**0**	**0**	**0**

Approach	Harbord Rd									Crossing Pedestrians						
Direction	Direction 7 (Left Turn)			Direction 8 (Through)				Direction 9U (U Turn)								
Time Period	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	B to A	A to B	D to C	C to D	F to E	E to F	Total
7:00 to 8:00	178	10	**188**	763	28	**791**		0	0	**0**	0	1	18	8	0	0	**27**
7:15 to 8:15	171	14	**185**	800	28	**828**		0	0	**0**	0	1	28	8	0	0	**37**
7:30 to 8:30	184	13	**197**	786	31	**817**		0	0	**0**	0	2	26	10	0	0	**38**
7:45 to 8:45	180	11	**191**	781	31	**812**		0	0	**0**	0	2	32	8	0	0	**42**
8:00 to 9:00	184	9	**193**	741	41	**782**		0	0	**0**	0	1	46	7	0	0	**54**
AM Totals	**362**	**19**	**381**	**1,504**	**69**	**1,573**		**0**	**0**	**0**	**0**	**2**	**64**	**15**	**0**	**0**	**81**
15:00 to 16:00	170	12	**182**	656	36	**692**		0	0	**0**	0	0	16	8	0	0	**24**
15:15 to 16:15	141	9	**150**	657	36	**693**		0	0	**0**	0	0	17	10	0	0	**27**
15:30 to 16:30	140	6	**146**	694	31	**725**		0	0	**0**	0	0	6	13	0	0	**19**
15:45 to 16:45	159	3	**162**	743	34	**777**		0	0	**0**	0	0	3	14	0	0	**17**
16:00 to 17:00	174	1	**175**	783	23	**806**		0	0	**0**	0	0	5	15	0	0	**20**
PM Totals	**344**	**13**	**357**	**1,439**	**59**	**1,498**		**0**	**0**	**0**	**0**	**0**	**21**	**23**	**0**	**0**	**44**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 3. Harbord Rd / Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

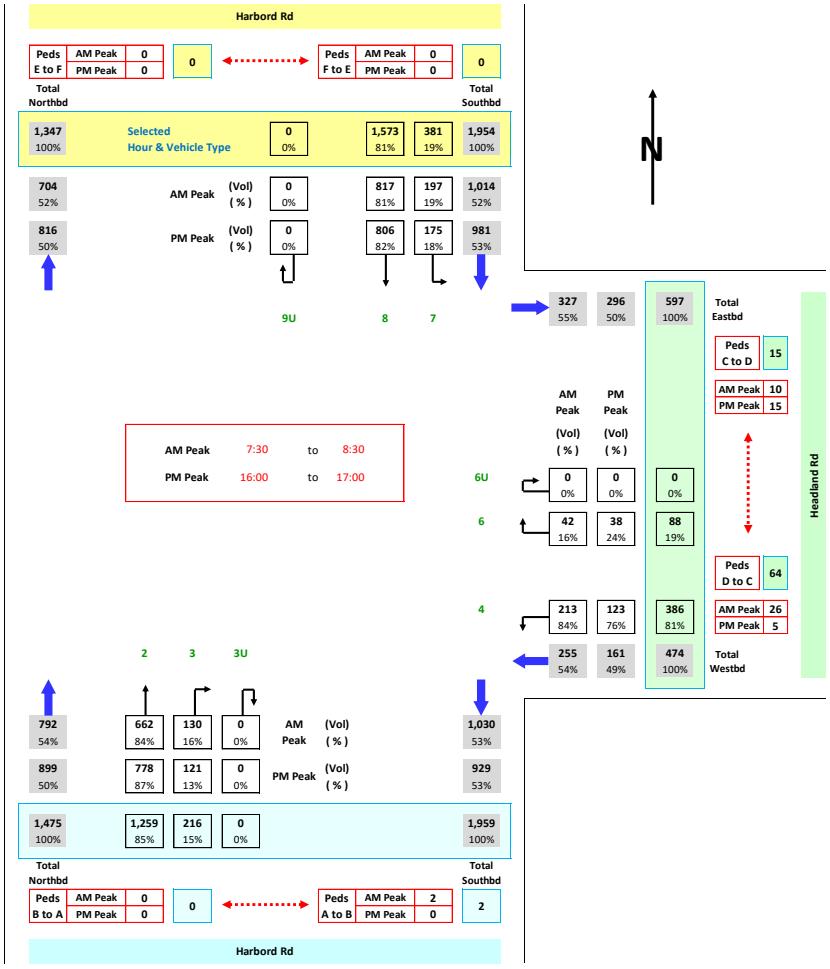
	Approach	Harbord Rd			Headland Rd			Harbord Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:30 to 8:30	749	43	**792**	251	4	**255**	970	44	**1,014**	**2,061**
PM	16:00 to 17:00	883	16	**899**	159	2	**161**	957	24	**981**	**2,041**

Approach	Harbord Rd			Headland Rd			Harbord Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00 to 8:00	671	42	**713**	231	3	**234**	941	38	**979**	**1,926**
7:15 to 8:15	720	42	**762**	239	3	**242**	971	42	**1,013**	**2,017**
7:30 to 8:30	749	43	**792**	251	4	**255**	970	44	**1,014**	**2,061**
7:45 to 8:45	744	43	**787**	249	3	**252**	961	42	**1,003**	**2,042**
8:00 to 9:00	714	48	**762**	238	2	**240**	925	50	**975**	**1,977**
AM Totals	**1,385**	**90**	**1,475**	**469**	**5**	**474**	**1,866**	**88**	**1,954**	**3,903**
15:00 to 16:00	850	37	**887**	156	13	**169**	826	48	**874**	**1,930**
15:15 to 16:15	850	30	**880**	135	13	**148**	798	45	**843**	**1,871**
15:30 to 16:30	857	29	**886**	133	12	**145**	834	37	**871**	**1,902**
15:45 to 16:45	882	22	**904**	146	5	**151**	902	37	**939**	**1,994**
16:00 to 17:00	883	16	**899**	159	2	**161**	957	24	**981**	**2,041**
PM Totals	**1,733**	**53**	**1,786**	**315**	**15**	**330**	**1,783**	**72**	**1,855**	**3,971**

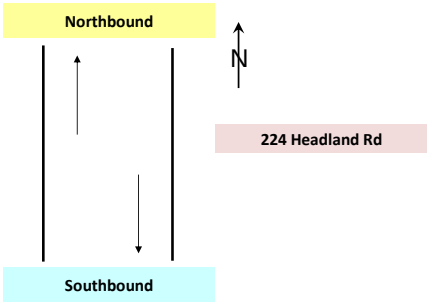
Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 3. Harbord Rd / Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

Hour Starting	Vehicle Type
AM Totals	All Vehicles



Job No.	: N5401
Client	: Varga Traffic Planning
Suburb	: Dee Why
Location	: 4. 224 Headland Rd
Day/Date	: Tue, 29th October 2019
Weather	: Fine
Description	: Mid Block Count
	: 15 mins Data



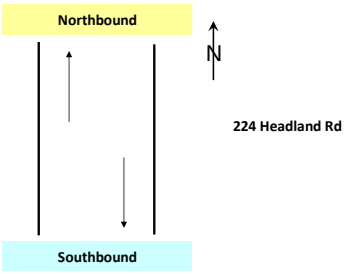
	Class 1	Class 2
Classifications	Lights	Heavies

MATRIX Traffic and Transport Data

Approach	**224 Headland Rd**					
Direction	**Northbound**			**Southbound**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
6:00 to 6:15	1	0	**1**	0	0	**0**
6:15 to 6:30	0	1	**1**	0	0	**0**
6:30 to 6:45	0	1	**1**	0	1	**1**
6:45 to 7:00	7	0	**7**	3	1	**4**
7:00 to 7:15	14	0	**14**	14	0	**14**
7:15 to 7:30	4	0	**4**	5	0	**5**
7:30 to 7:45	1	0	**1**	2	0	**2**
7:45 to 8:00	4	0	**4**	1	0	**1**
8:00 to 8:15	4	0	**4**	2	0	**2**
8:15 to 8:30	5	0	**5**	4	0	**4**
8:30 to 8:45	3	0	**3**	4	0	**4**
8:45 to 9:00	3	0	**3**	1	0	**1**
9:00 to 9:15	3	0	**3**	0	0	**0**
9:15 to 9:30	4	0	**4**	1	0	**1**
9:30 to 9:45	2	0	**2**	1	0	**1**
9:45 to 10:00	3	0	**3**	2	0	**2**
10:00 to 10:15	1	0	**1**	1	0	**1**
10:15 to 10:30	1	0	**1**	3	0	**3**
10:30 to 10:45	1	0	**1**	2	0	**2**
10:45 to 11:00	2	0	**2**	1	0	**1**
11:00 to 11:15	2	0	**2**	1	0	**1**
11:15 to 11:30	3	0	**3**	2	0	**2**
11:30 to 11:45	0	0	**0**	2	0	**2**
11:45 to 12:00	0	0	**0**	0	0	**0**
12:00 to 12:15	2	0	**2**	2	0	**2**
12:15 to 12:30	1	0	**1**	0	0	**0**
12:30 to 12:45	0	0	**0**	2	0	**2**
12:45 to 13:00	1	0	**1**	3	0	**3**
13:00 to 13:15	2	0	**2**	2	0	**2**
13:15 to 13:30	1	0	**1**	2	0	**2**
13:30 to 13:45	1	0	**1**	1	0	**1**
13:45 to 14:00	3	0	**3**	1	0	**1**
14:00 to 14:15	4	0	**4**	0	0	**0**
14:15 to 14:30	4	0	**4**	1	0	**1**
14:30 to 14:45	1	0	**1**	2	0	**2**
14:45 to 15:00	1	0	**1**	5	0	**5**
15:00 to 15:15	3	0	**3**	3	0	**3**
15:15 to 15:30	2	0	**2**	6	0	**6**
15:30 to 15:45	0	0	**0**	0	0	**0**
15:45 to 16:00	1	0	**1**	1	0	**1**
16:00 to 16:15	0	1	**1**	1	0	**1**
16:15 to 16:30	2	0	**2**	1	1	**2**
16:30 to 16:45	0	0	**0**	1	0	**1**
16:45 to 17:00	0	0	**0**	3	0	**3**
17:00 to 17:15	1	0	**1**	4	0	**4**
17:15 to 17:30	0	0	**0**	0	0	**0**
17:30 to 17:45	1	0	**1**	2	0	**2**
17:45 to 18:00	1	0	**1**	0	0	**0**
12hr Totals	**100**	**3**	**103**	**95**	**3**	**98**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 4. 224 Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Hourly Summary

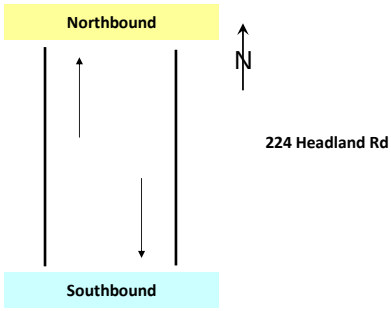


MATRIX Traffic and Transport Data

Approach	224 Headland Rd					
Direction	Northbound			Southbound		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total
6:00 to 7:00	8	2	**10**	3	2	**5**
6:15 to 7:15	21	2	**23**	17	2	**19**
6:30 to 7:30	25	1	**26**	22	2	**24**
6:45 to 7:45	26	0	**26**	24	1	**25**
7:00 to 8:00	23	0	**23**	22	0	**22**
7:15 to 8:15	13	0	**13**	10	0	**10**
7:30 to 8:30	14	0	**14**	9	0	**9**
7:45 to 8:45	16	0	**16**	11	0	**11**
8:00 to 9:00	15	0	**15**	11	0	**11**
8:15 to 9:15	14	0	**14**	9	0	**9**
8:30 to 9:30	13	0	**13**	6	0	**6**
8:45 to 9:45	12	0	**12**	3	0	**3**
9:00 to 10:00	12	0	**12**	4	0	**4**
9:15 to 10:15	10	0	**10**	5	0	**5**
9:30 to 10:30	7	0	**7**	7	0	**7**
9:45 to 10:45	6	0	**6**	8	0	**8**
10:00 to 11:00	5	0	**5**	7	0	**7**
10:15 to 11:15	6	0	**6**	7	0	**7**
10:30 to 11:30	8	0	**8**	6	0	**6**
10:45 to 11:45	7	0	**7**	6	0	**6**
11:00 to 12:00	5	0	**5**	5	0	**5**
11:15 to 12:15	5	0	**5**	6	0	**6**
11:30 to 12:30	3	0	**3**	4	0	**4**
11:45 to 12:45	3	0	**3**	4	0	**4**
12:00 to 13:00	4	0	**4**	7	0	**7**
12:15 to 13:15	4	0	**4**	7	0	**7**
12:30 to 13:30	4	0	**4**	9	0	**9**
12:45 to 13:45	5	0	**5**	8	0	**8**
13:00 to 14:00	7	0	**7**	6	0	**6**
13:15 to 14:15	9	0	**9**	4	0	**4**
13:30 to 14:30	12	0	**12**	3	0	**3**
13:45 to 14:45	12	0	**12**	4	0	**4**
14:00 to 15:00	10	0	**10**	8	0	**8**
14:15 to 15:15	9	0	**9**	11	0	**11**
14:30 to 15:30	7	0	**7**	16	0	**16**
14:45 to 15:45	6	0	**6**	14	0	**14**
15:00 to 16:00	6	0	**6**	10	0	**10**
15:15 to 16:15	3	1	**4**	8	0	**8**
15:30 to 16:30	3	1	**4**	3	1	**4**
15:45 to 16:45	3	1	**4**	4	1	**5**
16:00 to 17:00	2	1	**3**	6	1	**7**
16:15 to 17:15	3	0	**3**	9	1	**10**
16:30 to 17:30	1	0	**1**	8	0	**8**
16:45 to 17:45	2	0	**2**	9	0	**9**
17:00 to 18:00	3	0	**3**	6	0	**6**
12hr Totals	**100**	**3**	**103**	**95**	**3**	**98**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 4. 224 Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Peak Hour Summary



	Approach	Northbound			Southbound			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	
AM	6:45 to 7:45	26	0	**26**	24	1	**25**	**51**
PM	14:30 to 15:30	7	0	**7**	16	0	**16**	**23**

MATRIX Traffic and Transport Data

Approach	Northbound			Southbound			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	8	2	**10**	3	2	**5**	**15**
6:15 to 7:15	21	2	**23**	17	2	**19**	**42**
6:30 to 7:30	25	1	**26**	22	2	**24**	**50**
6:45 to 7:45	26	0	**26**	24	1	**25**	**51**
7:00 to 8:00	23	0	**23**	22	0	**22**	**45**
7:15 to 8:15	13	0	**13**	10	0	**10**	**23**
7:30 to 8:30	14	0	**14**	9	0	**9**	**23**
7:45 to 8:45	16	0	**16**	11	0	**11**	**27**
8:00 to 9:00	15	0	**15**	11	0	**11**	**26**
8:15 to 9:15	14	0	**14**	9	0	**9**	**23**
8:30 to 9:30	13	0	**13**	6	0	**6**	**19**
8:45 to 9:45	12	0	**12**	3	0	**3**	**15**
9:00 to 10:00	12	0	**12**	4	0	**4**	**16**
9:15 to 10:15	10	0	**10**	5	0	**5**	**15**
9:30 to 10:30	7	0	**7**	7	0	**7**	**14**
9:45 to 10:45	6	0	**6**	8	0	**8**	**14**
10:00 to 11:00	5	0	**5**	7	0	**7**	**12**
10:15 to 11:15	6	0	**6**	7	0	**7**	**13**
10:30 to 11:30	8	0	**8**	6	0	**6**	**14**
10:45 to 11:45	7	0	**7**	6	0	**6**	**13**
11:00 to 12:00	5	0	**5**	5	0	**5**	**10**
11:15 to 12:15	5	0	**5**	6	0	**6**	**11**
11:30 to 12:30	3	0	**3**	4	0	**4**	**7**
11:45 to 12:45	3	0	**3**	4	0	**4**	**7**
12:00 to 13:00	4	0	**4**	7	0	**7**	**11**
12:15 to 13:15	4	0	**4**	7	0	**7**	**11**
12:30 to 13:30	4	0	**4**	9	0	**9**	**13**
12:45 to 13:45	5	0	**5**	8	0	**8**	**13**
13:00 to 14:00	7	0	**7**	6	0	**6**	**13**
13:15 to 14:15	9	0	**9**	4	0	**4**	**13**
13:30 to 14:30	12	0	**12**	3	0	**3**	**15**
13:45 to 14:45	12	0	**12**	4	0	**4**	**16**
14:00 to 15:00	10	0	**10**	8	0	**8**	**18**
14:15 to 15:15	9	0	**9**	11	0	**11**	**20**
14:30 to 15:30	7	0	**7**	16	0	**16**	**23**
14:45 to 15:45	6	0	**6**	14	0	**14**	**20**
15:00 to 16:00	6	0	**6**	10	0	**10**	**16**
15:15 to 16:15	3	1	**4**	8	0	**8**	**12**
15:30 to 16:30	3	1	**4**	3	1	**4**	**8**
15:45 to 16:45	3	1	**4**	4	1	**5**	**9**
16:00 to 17:00	2	1	**3**	6	1	**7**	**10**
16:15 to 17:15	3	0	**3**	9	1	**10**	**13**
16:30 to 17:30	1	0	**1**	8	0	**8**	**9**
16:45 to 17:45	2	0	**2**	9	0	**9**	**11**
17:00 to 18:00	3	0	**3**	6	0	**6**	**9**
12hr Totals	**100**	**3**	**103**	**95**	**3**	**98**	**201**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 4. 224 Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting	Vehicle Type
12hr Totals	All Vehicles

Northbound

103
100%

26 37%	**AM Peak**	**(Vol) (%)**
7 21%	**PM Peak**	**(Vol) (%)**

NB

SB

AM Peak	**(Vol) (%)**	**25** 46%
PM Peak	**(Vol) (%)**	**16** 36%

98
100%

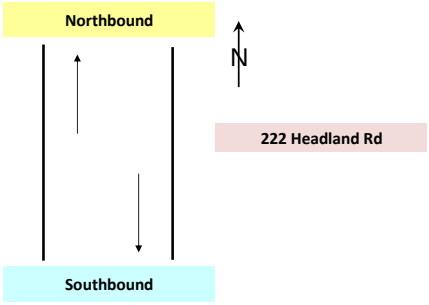
Southbound

N

224 Headland Rd

AM Peak	6:45	to	7:45
PM Peak	14:30	to	15:30

Job No.	: N5401
Client	: Varga Traffic Planning
Suburb	: Dee Why
Location	: 5. 222 Headland Rd
Day/Date	: Tue, 29th October 2019
Weather	: Fine
Description	: Mid Block Count
	: 15 mins Data



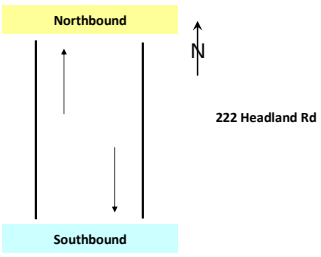
	Class 1	Class 2
Classifications	Lights	Heavies

MATRIX Traffic and Transport Data

Approach	**222 Headland Rd**					
Direction	**Northbound**			**Southbound**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
6:00 to 6:15	2	0	**2**	0	0	**0**
6:15 to 6:30	0	0	**0**	0	0	**0**
6:30 to 6:45	0	0	**0**	1	0	**1**
6:45 to 7:00	1	0	**1**	3	0	**3**
7:00 to 7:15	2	0	**2**	0	0	**0**
7:15 to 7:30	1	0	**1**	2	0	**2**
7:30 to 7:45	1	0	**1**	0	0	**0**
7:45 to 8:00	4	0	**4**	2	0	**2**
8:00 to 8:15	3	0	**3**	2	0	**2**
8:15 to 8:30	2	0	**2**	0	0	**0**
8:30 to 8:45	3	0	**3**	1	0	**1**
8:45 to 9:00	0	0	**0**	1	0	**1**
9:00 to 9:15	1	0	**1**	0	0	**0**
9:15 to 9:30	3	0	**3**	1	0	**1**
9:30 to 9:45	0	0	**0**	0	0	**0**
9:45 to 10:00	3	0	**3**	0	0	**0**
10:00 to 10:15	1	0	**1**	5	0	**5**
10:15 to 10:30	0	0	**0**	0	0	**0**
10:30 to 10:45	1	0	**1**	2	0	**2**
10:45 to 11:00	4	0	**4**	2	0	**2**
11:00 to 11:15	2	0	**2**	2	0	**2**
11:15 to 11:30	0	0	**0**	2	0	**2**
11:30 to 11:45	2	0	**2**	3	0	**3**
11:45 to 12:00	2	1	**3**	0	0	**0**
12:00 to 12:15	2	0	**2**	2	1	**3**
12:15 to 12:30	3	0	**3**	2	0	**2**
12:30 to 12:45	1	0	**1**	3	0	**3**
12:45 to 13:00	1	0	**1**	2	0	**2**
13:00 to 13:15	2	0	**2**	1	0	**1**
13:15 to 13:30	1	0	**1**	1	0	**1**
13:30 to 13:45	1	0	**1**	1	0	**1**
13:45 to 14:00	2	0	**2**	0	0	**0**
14:00 to 14:15	2	1	**3**	1	0	**1**
14:15 to 14:30	0	1	**1**	1	2	**3**
14:30 to 14:45	2	0	**2**	1	0	**1**
14:45 to 15:00	2	0	**2**	1	0	**1**
15:00 to 15:15	0	0	**0**	2	0	**2**
15:15 to 15:30	3	0	**3**	2	0	**2**
15:30 to 15:45	1	0	**1**	3	0	**3**
15:45 to 16:00	2	0	**2**	1	0	**1**
16:00 to 16:15	0	0	**0**	4	0	**4**
16:15 to 16:30	0	0	**0**	1	0	**1**
16:30 to 16:45	1	0	**1**	0	0	**0**
16:45 to 17:00	2	0	**2**	0	0	**0**
17:00 to 17:15	3	0	**3**	4	0	**4**
17:15 to 17:30	1	0	**1**	2	0	**2**
17:30 to 17:45	3	0	**3**	3	0	**3**
17:45 to 18:00	2	0	**2**	1	0	**1**
12hr Totals	**75**	**3**	**78**	**68**	**3**	**71**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 5. 222 Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Hourly Summary

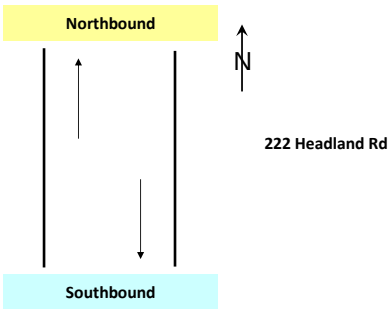


MATRIX Traffic and Transport Data

Approach	222 Headland Rd					
Direction	Northbound			Southbound		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total
6:00 to 7:00	3	0	**3**	4	0	**4**
6:15 to 7:15	3	0	**3**	4	0	**4**
6:30 to 7:30	4	0	**4**	6	0	**6**
6:45 to 7:45	5	0	**5**	5	0	**5**
7:00 to 8:00	8	0	**8**	4	0	**4**
7:15 to 8:15	9	0	**9**	6	0	**6**
7:30 to 8:30	10	0	**10**	4	0	**4**
7:45 to 8:45	12	0	**12**	5	0	**5**
8:00 to 9:00	8	0	**8**	4	0	**4**
8:15 to 9:15	6	0	**6**	2	0	**2**
8:30 to 9:30	7	0	**7**	3	0	**3**
8:45 to 9:45	4	0	**4**	2	0	**2**
9:00 to 10:00	7	0	**7**	1	0	**1**
9:15 to 10:15	7	0	**7**	6	0	**6**
9:30 to 10:30	4	0	**4**	5	0	**5**
9:45 to 10:45	5	0	**5**	7	0	**7**
10:00 to 11:00	6	0	**6**	9	0	**9**
10:15 to 11:15	7	0	**7**	6	0	**6**
10:30 to 11:30	7	0	**7**	8	0	**8**
10:45 to 11:45	8	0	**8**	9	0	**9**
11:00 to 12:00	6	1	**7**	7	0	**7**
11:15 to 12:15	6	1	**7**	7	1	**8**
11:30 to 12:30	9	1	**10**	7	1	**8**
11:45 to 12:45	8	1	**9**	7	1	**8**
12:00 to 13:00	7	0	**7**	9	1	**10**
12:15 to 13:15	7	0	**7**	8	0	**8**
12:30 to 13:30	5	0	**5**	7	0	**7**
12:45 to 13:45	5	0	**5**	5	0	**5**
13:00 to 14:00	6	0	**6**	3	0	**3**
13:15 to 14:15	6	1	**7**	3	0	**3**
13:30 to 14:30	5	2	**7**	3	2	**5**
13:45 to 14:45	6	2	**8**	3	2	**5**
14:00 to 15:00	6	2	**8**	4	2	**6**
14:15 to 15:15	4	1	**5**	5	2	**7**
14:30 to 15:30	7	0	**7**	6	0	**6**
14:45 to 15:45	6	0	**6**	8	0	**8**
15:00 to 16:00	6	0	**6**	8	0	**8**
15:15 to 16:15	6	0	**6**	10	0	**10**
15:30 to 16:30	3	0	**3**	9	0	**9**
15:45 to 16:45	3	0	**3**	6	0	**6**
16:00 to 17:00	3	0	**3**	5	0	**5**
16:15 to 17:15	6	0	**6**	5	0	**5**
16:30 to 17:30	7	0	**7**	6	0	**6**
16:45 to 17:45	9	0	**9**	9	0	**9**
17:00 to 18:00	9	0	**9**	10	0	**10**
12hr Totals	**75**	**3**	**78**	**68**	**3**	**71**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 5. 222 Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Peak Hour Summary



	Approach	Northbound			Southbound			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:45 to 8:45	12	0	**12**	5	0	**5**	**17**
PM	17:00 to 18:00	9	0	**9**	10	0	**10**	**19**

Approach	Northbound			Southbound			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	3	0	**3**	4	0	**4**	**7**
6:15 to 7:15	3	0	**3**	4	0	**4**	**7**
6:30 to 7:30	4	0	**4**	6	0	**6**	**10**
6:45 to 7:45	5	0	**5**	5	0	**5**	**10**
7:00 to 8:00	8	0	**8**	4	0	**4**	**12**
7:15 to 8:15	9	0	**9**	6	0	**6**	**15**
7:30 to 8:30	10	0	**10**	4	0	**4**	**14**
7:45 to 8:45	12	0	**12**	5	0	**5**	**17**
8:00 to 9:00	8	0	**8**	4	0	**4**	**12**
8:15 to 9:15	6	0	**6**	2	0	**2**	**8**
8:30 to 9:30	7	0	**7**	3	0	**3**	**10**
8:45 to 9:45	4	0	**4**	2	0	**2**	**6**
9:00 to 10:00	7	0	**7**	1	0	**1**	**8**
9:15 to 10:15	7	0	**7**	6	0	**6**	**13**
9:30 to 10:30	4	0	**4**	5	0	**5**	**9**
9:45 to 10:45	5	0	**5**	7	0	**7**	**12**
10:00 to 11:00	6	0	**6**	9	0	**9**	**15**
10:15 to 11:15	7	0	**7**	6	0	**6**	**13**
10:30 to 11:30	7	0	**7**	8	0	**8**	**15**
10:45 to 11:45	8	0	**8**	9	0	**9**	**17**
11:00 to 12:00	6	1	**7**	7	0	**7**	**14**
11:15 to 12:15	6	1	**7**	7	1	**8**	**15**
11:30 to 12:30	9	1	**10**	7	1	**8**	**18**
11:45 to 12:45	8	1	**9**	7	1	**8**	**17**
12:00 to 13:00	7	0	**7**	9	1	**10**	**17**
12:15 to 13:15	7	0	**7**	8	0	**8**	**15**
12:30 to 13:30	5	0	**5**	7	0	**7**	**12**
12:45 to 13:45	5	0	**5**	5	0	**5**	**10**
13:00 to 14:00	6	0	**6**	3	0	**3**	**9**
13:15 to 14:15	6	1	**7**	3	0	**3**	**10**
13:30 to 14:30	5	2	**7**	3	2	**5**	**12**
13:45 to 14:45	6	2	**8**	3	2	**5**	**13**
14:00 to 15:00	6	2	**8**	4	2	**6**	**14**
14:15 to 15:15	4	1	**5**	5	2	**7**	**12**
14:30 to 15:30	7	0	**7**	6	0	**6**	**13**
14:45 to 15:45	6	0	**6**	8	0	**8**	**14**
15:00 to 16:00	6	0	**6**	8	0	**8**	**14**
15:15 to 16:15	6	0	**6**	10	0	**10**	**16**
15:30 to 16:30	3	0	**3**	9	0	**9**	**12**
15:45 to 16:45	3	0	**3**	6	0	**6**	**9**
16:00 to 17:00	3	0	**3**	5	0	**5**	**8**
16:15 to 17:15	6	0	**6**	5	0	**5**	**11**
16:30 to 17:30	7	0	**7**	6	0	**6**	**13**
16:45 to 17:45	9	0	**9**	9	0	**9**	**18**
17:00 to 18:00	9	0	**9**	10	0	**10**	**19**
12hr Totals	**75**	**3**	**78**	**68**	**3**	**71**	**149**

Job No. : N5401
Client : Varga Traffic Planning
Suburb : Dee Why
Location : 5. 222 Headland Rd

Day/Date : Tue, 29th October 2019
Weather : Fine
Description : Mid Block Count
: Intersection Diagram

Hour Starting	Vehicle Type
12hr Totals	All Vehicles

Northbound

78 100%

12 31%	**AM Peak**	**(Vol) (%)**
9 23%	**PM Peak**	**(Vol) (%)**

NB

SB

AM Peak	**(Vol) (%)**	**5** 17%
PM Peak	**(Vol) (%)**	**10** 24%

71 100%

Southbound

N

222 Headland Rd

AM Peak	7:45	to	8:45
PM Peak	17:00	to	18:00

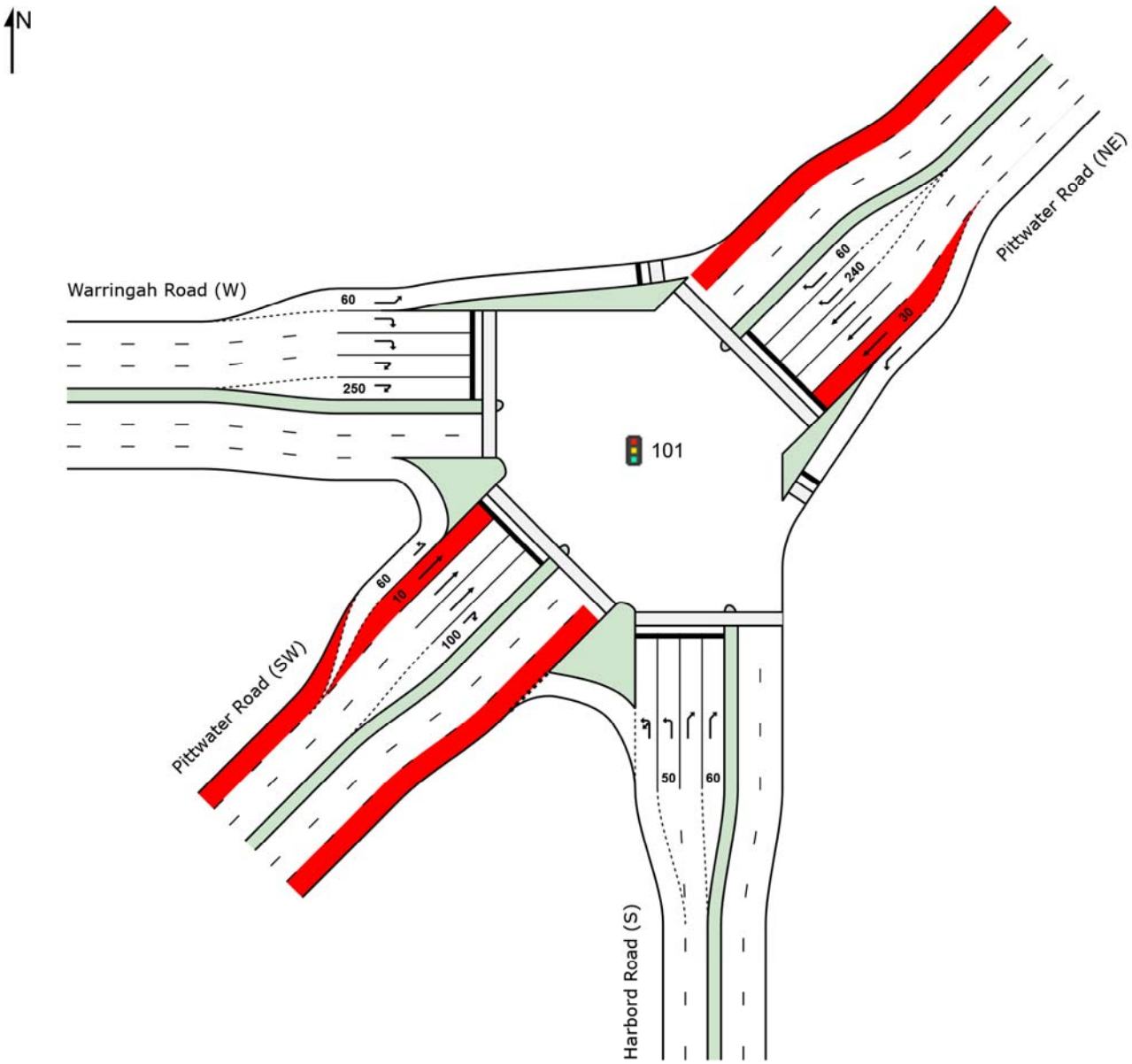
APPENDIX D

SIDRA CAPACITY ANALYSIS RESULTS

SITE LAYOUT

Site: 101 [Existing AM]

PIT_HARX
Site Category: (None)
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: 101 [Existing AM]

PIT_HARX
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	27	18.5	0.761	85.6	LOS F	16.8	124.4	1.00	0.92	1.54	25.1
1	L2	407	5.2	0.761	78.0	LOS F	16.8	124.4	0.99	0.89	1.31	26.2
3a	R1	266	6.0	0.572	72.1	LOS F	9.4	68.9	0.99	0.80	0.99	27.4
Approach		700	6.0	0.761	76.0	LOS F	16.8	124.4	0.99	0.86	1.20	26.6
NorthEast: Pittwater Road (NE)												
24a	L1	476	3.6	0.613	19.2	LOS B	17.0	122.9	0.54	0.72	0.54	44.8
25	T1	1625	7.0	0.803	35.5	LOS C	42.5	315.4	0.85	0.78	0.87	38.0
26a	R1	308	1.0	0.529	67.6	LOS E	10.5	74.2	0.97	0.80	0.97	28.9
Approach		2409	5.5	0.803	36.4	LOS C	42.5	315.4	0.81	0.77	0.82	37.6
West: Warringah Road (W)												
10a	L1	86	8.1	0.130	37.7	LOS C	4.1	30.8	0.70	0.70	0.70	36.9
12	R2	485	3.5	0.793	73.8	LOS F	18.4	132.9	1.00	0.89	1.11	27.1
12b	R3	307	6.8	0.779	80.8	LOS F	11.7	86.5	1.00	0.88	1.15	25.8
Approach		878	5.1	0.793	72.7	LOS F	18.4	132.9	0.97	0.87	1.08	27.3
SouthWest: Pittwater Road (SW)												
30b	L3	84	39.3	0.065	7.2	LOS A	0.0	0.0	0.00	0.55	0.00	53.4
31	T1	1001	9.4	0.516	36.8	LOS C	20.3	153.4	0.81	0.70	0.81	37.5
32b	R3	100	7.0	0.804	87.9	LOS F	7.9	58.6	1.00	0.89	1.24	24.5
Approach		1185	11.3	0.804	39.0	LOS C	20.3	153.4	0.77	0.71	0.79	36.6
All Vehicles		5172	6.8	0.804	48.5	LOS D	42.5	315.4	0.85	0.78	0.91	33.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	69.3	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

MOVEMENT SUMMARY

Site: 101 [Existing PM]

PIT_HARX
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	36	8.3	0.788	77.7	LOS F	20.4	147.9	1.00	0.93	1.44	26.6
1	L2	470	3.2	0.788	73.1	LOS F	20.4	147.9	0.98	0.90	1.27	27.2
3a	R1	365	3.0	0.770	76.8	LOS F	13.6	97.8	1.00	0.88	1.11	26.5
Approach		871	3.3	0.788	74.8	LOS F	20.4	147.9	0.99	0.89	1.21	26.9
NorthEast: Pittwater Road (NE)												
24a	L1	377	5.0	0.379	17.0	LOS B	11.2	81.5	0.62	0.73	0.62	46.0
25	T1	1024	7.7	0.743	38.1	LOS C	34.9	260.3	0.88	0.78	0.88	37.0
26a	R1	349	2.6	0.774	77.3	LOS F	13.1	93.7	1.00	0.89	1.12	26.8
Approach		1750	6.1	0.774	41.4	LOS C	34.9	260.3	0.85	0.79	0.87	35.8
West: Warringah Road (W)												
10a	L1	193	4.1	0.318	44.6	LOS D	10.5	76.0	0.80	0.76	0.80	34.5
12	R2	400	4.5	0.667	69.6	LOS E	13.9	101.2	0.99	0.83	0.99	27.9
12b	R3	227	12.3	0.808	86.8	LOS F	8.9	69.2	1.00	0.90	1.23	24.8
Approach		820	6.6	0.808	68.5	LOS E	13.9	101.2	0.95	0.83	1.01	28.2
SouthWest: Pittwater Road (SW)												
30b	L3	128	34.4	0.096	7.2	LOS A	0.0	0.0	0.00	0.55	0.00	53.6
31	T1	1490	5.4	0.759	35.6	LOS C	31.2	228.4	0.84	0.75	0.84	37.9
32b	R3	110	7.3	0.760	48.8	LOS D	4.9	36.2	1.00	0.85	1.16	33.1
Approach		1728	7.7	0.760	34.4	LOS C	31.2	228.4	0.79	0.74	0.80	38.4
All Vehicles		5169	6.2	0.808	49.0	LOS D	34.9	260.3	0.87	0.80	0.93	33.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	32.1	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	63.1	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

MOVEMENT SUMMARY

Site: 101 [Proposed AM]

PIT_HARP
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	30	16.7	0.696	84.4	LOS F	16.0	118.0	0.99	0.89	1.52	25.3
1	L2	412	5.1	0.696	75.1	LOS F	16.0	118.0	0.98	0.86	1.25	26.8
3a	R1	271	5.9	0.651	75.0	LOS F	9.8	72.0	1.00	0.82	1.02	26.8
Approach		713	5.9	0.696	75.5	LOS F	16.0	118.0	0.99	0.85	1.18	26.7
NorthEast: Pittwater Road (NE)												
24a	L1	554	3.1	0.732	23.6	LOS B	23.3	167.2	0.63	0.76	0.63	42.5
25	T1	1625	7.0	0.872	47.4	LOS D	50.1	371.2	0.90	0.89	1.01	33.8
26a	R1	308	1.0	0.760	78.4	LOS F	11.6	81.7	1.00	0.87	1.12	26.7
Approach		2487	5.3	0.872	46.0	LOS D	50.1	371.2	0.86	0.86	0.94	34.2
West: Warringah Road (W)												
10a	L1	86	8.1	0.143	41.4	LOS C	4.3	32.5	0.74	0.71	0.74	35.6
12	R2	563	3.0	0.863	78.4	LOS F	22.9	164.5	1.00	0.94	1.19	26.2
12b	R3	307	6.8	0.871	89.5	LOS F	12.5	92.5	1.00	0.95	1.31	24.4
Approach		956	4.7	0.871	78.6	LOS F	22.9	164.5	0.98	0.92	1.19	26.2
SouthWest: Pittwater Road (SW)												
30b	L3	84	39.3	0.065	7.2	LOS A	0.0	0.0	0.00	0.55	0.00	53.4
31	T1	1001	9.4	0.459	31.3	LOS C	18.7	141.0	0.75	0.65	0.75	39.7
32b	R3	141	5.0	0.840	86.9	LOS F	11.2	81.8	1.00	0.92	1.26	24.7
Approach		1226	10.9	0.840	36.1	LOS C	18.7	141.0	0.72	0.67	0.75	37.7
All Vehicles		5382	6.6	0.872	53.4	LOS D	50.1	371.2	0.86	0.83	0.97	32.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	69.3	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

MOVEMENT SUMMARY

Site: 101 [Proposed PM]

PIT_HARP
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	43	7.0	0.799	78.1	LOS F	21.5	155.4	1.00	0.94	1.46	26.5
1	L2	482	3.1	0.799	73.2	LOS F	21.5	155.4	0.98	0.91	1.29	27.2
3a	R1	378	2.9	0.757	75.4	LOS F	14.0	100.2	1.00	0.87	1.09	26.7
Approach		903	3.2	0.799	74.4	LOS F	21.5	155.4	0.99	0.90	1.21	27.0
NorthEast: Pittwater Road (NE)												
24a	L1	403	4.7	0.409	17.7	LOS B	12.4	90.3	0.64	0.74	0.64	45.6
25	T1	1024	7.7	0.766	40.0	LOS C	35.7	265.9	0.90	0.80	0.90	36.3
26a	R1	349	2.6	0.774	77.3	LOS F	13.1	93.7	1.00	0.89	1.12	26.8
Approach		1776	6.0	0.774	42.3	LOS C	35.7	265.9	0.86	0.81	0.88	35.4
West: Warringah Road (W)												
10a	L1	193	4.1	0.318	44.6	LOS D	10.5	76.0	0.80	0.76	0.80	34.5
12	R2	425	4.2	0.713	71.0	LOS F	15.2	110.4	1.00	0.85	1.03	27.6
12b	R3	227	12.3	0.808	86.8	LOS F	8.9	69.2	1.00	0.90	1.23	24.8
Approach		845	6.4	0.808	69.2	LOS E	15.2	110.4	0.95	0.84	1.03	28.0
SouthWest: Pittwater Road (SW)												
30b	L3	128	34.4	0.096	7.2	LOS A	0.0	0.0	0.00	0.55	0.00	53.6
31	T1	1490	5.4	0.775	36.8	LOS C	31.3	229.3	0.85	0.76	0.85	37.5
32b	R3	122	6.6	0.783	49.1	LOS D	5.4	39.8	1.00	0.86	1.18	33.0
Approach		1740	7.6	0.783	35.4	LOS C	31.3	229.3	0.80	0.75	0.81	38.0
All Vehicles		5264	6.1	0.808	49.9	LOS D	35.7	265.9	0.88	0.81	0.94	33.0

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

Movement Performance - Pedestrians

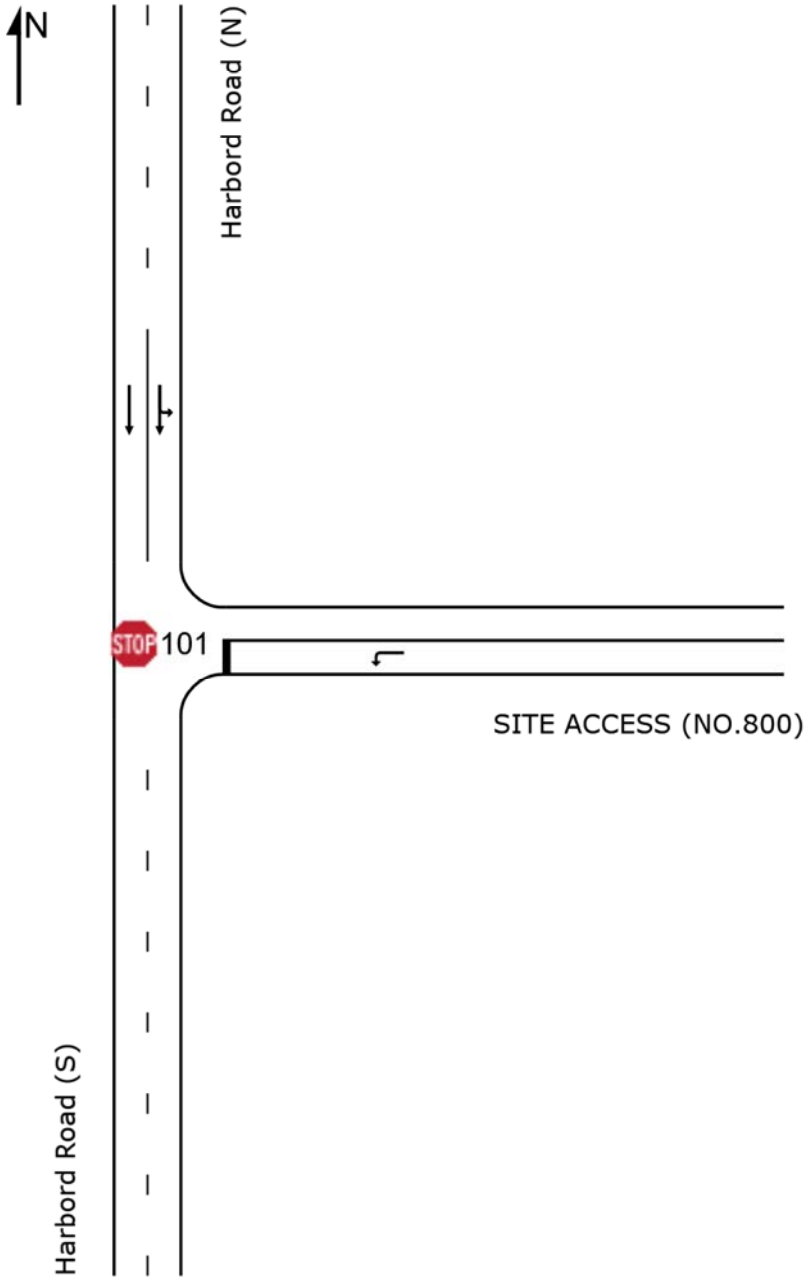
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	32.0	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	63.1	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

SITE LAYOUT

Site: 101 [Existing AM]

HAR_SITE
Site Category: (None)
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 101 [Existing AM]

HAR_SITE
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SITE ACCESS (NO.800)												
4	L2	78	0.0	0.092	10.5	LOS A	0.4	2.5	0.50	0.92	0.50	50.7
Approach		78	0.0	0.092	10.5	LOS A	0.4	2.5	0.50	0.92	0.50	50.7
North: Harbord Road (N)												
7	L2	92	0.0	0.297	3.9	LOS A	0.0	0.0	0.00	0.09	0.00	56.1
8	T1	1061	0.0	0.297	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.4
Approach		1153	0.0	0.297	0.3	NA	0.0	0.0	0.00	0.05	0.00	59.1
All Vehicles		1231	0.0	0.297	1.0	NA	0.4	2.5	0.03	0.10	0.03	58.1

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

MOVEMENT SUMMARY

Site: 101 [Existing PM]

HAR_SITE
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SITE ACCESS (NO.800)												
4	L2	113	0.0	0.118	9.9	LOS A	0.5	3.3	0.46	0.90	0.46	51.1
Approach		113	0.0	0.118	9.9	LOS A	0.5	3.3	0.46	0.90	0.46	51.1
North: Harbord Road (N)												
7	L2	131	0.0	0.270	3.9	LOS A	0.0	0.0	0.00	0.15	0.00	55.5
8	T1	916	0.0	0.270	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.2
Approach		1047	0.0	0.270	0.5	NA	0.0	0.0	0.00	0.07	0.00	58.7
All Vehicles		1160	0.0	0.270	1.4	NA	0.5	3.3	0.04	0.15	0.04	57.3

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

MOVEMENT SUMMARY

Site: 101 [Proposed AM]

HAR_SITE
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SITE ACCESS (NO.800)												
4	L2	181	0.0	0.191	10.1	LOS A	0.8	5.6	0.48	0.92	0.48	51.0
Approach		181	0.0	0.191	10.1	LOS A	0.8	5.6	0.48	0.92	0.48	51.0
North: Harbord Road (N)												
7	L2	255	0.0	0.341	3.9	LOS A	0.0	0.0	0.00	0.22	0.00	54.7
8	T1	1061	0.0	0.341	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.9
Approach		1316	0.0	0.341	0.8	NA	0.0	0.0	0.00	0.11	0.00	58.0
All Vehicles		1497	0.0	0.341	1.9	NA	0.8	5.6	0.06	0.21	0.06	56.5

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

MOVEMENT SUMMARY

Site: 101 [Proposed PM]

HAR_SITE
Site Category: (None)
Stop (Two-Way)

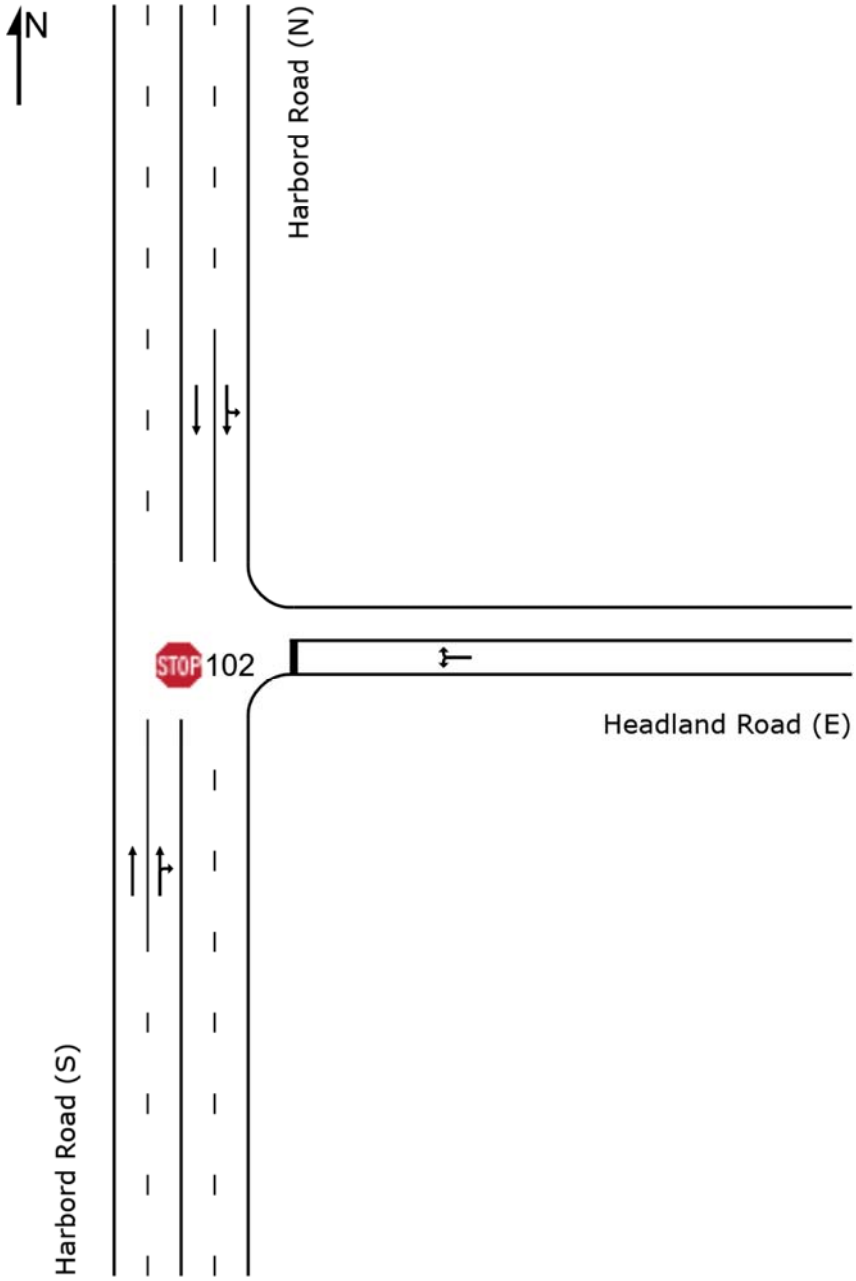
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SITE ACCESS (NO.800)												
4	L2	225	0.0	0.228	9.9	LOS A	1.0	6.9	0.47	0.91	0.47	51.1
Approach		225	0.0	0.228	9.9	LOS A	1.0	6.9	0.47	0.91	0.47	51.1
North: Harbord Road (N)												
7	L2	183	0.0	0.284	3.9	LOS A	0.0	0.0	0.00	0.19	0.00	55.0
8	T1	916	0.0	0.284	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.0
Approach		1099	0.0	0.284	0.7	NA	0.0	0.0	0.00	0.10	0.00	58.3
All Vehicles		1324	0.0	0.284	2.2	NA	1.0	6.9	0.08	0.23	0.08	56.2

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

SITE LAYOUT

Site: 102 [Existing AM]

HAR_HEAX
Site Category: (None)
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 102 [Existing AM]

HAR_HEAX
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
2	T1	662	6.0	0.306	1.1	LOS A	1.8	12.8	0.10	0.07	0.12	38.8
3	R2	130	2.3	0.306	11.9	LOS A	1.8	12.8	0.75	0.56	0.89	34.6
Approach		792	5.4	0.306	2.9	NA	1.8	12.8	0.21	0.15	0.25	37.7
East: Headland Road (E)												
4	L2	213	0.9	0.905	61.9	LOS E	14.5	102.9	0.75	2.31	3.39	19.2
6	R2	42	4.8	0.905	137.6	LOS F	14.5	102.9	0.75	2.31	3.39	19.4
Approach		255	1.6	0.905	74.4	LOS F	14.5	102.9	0.75	2.31	3.39	19.3
North: Harbord Road (N)												
7	L2	197	6.6	0.270	3.5	LOS A	0.0	0.0	0.00	0.18	0.00	39.4
8	T1	817	3.8	0.270	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	39.5
Approach		1014	4.3	0.270	0.7	NA	0.0	0.0	0.00	0.09	0.00	39.5
All Vehicles		2061	4.4	0.905	10.6	NA	14.5	102.9	0.17	0.39	0.51	33.2

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

MOVEMENT SUMMARY

Site: 102 [Existing PM]

HAR_HEAX
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
2	T1	785	3.7	0.284	1.2	LOS A	1.7	12.3	0.16	0.07	0.18	38.5
3	R2	95	1.1	0.284	9.7	LOS A	1.7	12.3	0.51	0.22	0.59	36.9
Approach		880	3.4	0.284	2.1	NA	1.7	12.3	0.20	0.09	0.23	38.2
East: Headland Road (E)												
4	L2	106	9.4	0.742	40.1	LOS C	5.7	42.7	0.72	1.49	1.89	21.8
6	R2	42	7.1	0.742	103.0	LOS F	5.7	42.7	0.72	1.49	1.89	22.0
Approach		148	8.8	0.742	57.9	LOS E	5.7	42.7	0.72	1.49	1.89	21.9
North: Harbord Road (N)												
7	L2	150	6.0	0.226	3.5	LOS A	0.0	0.0	0.00	0.17	0.00	39.4
8	T1	693	5.2	0.226	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.6
Approach		843	5.3	0.226	0.6	NA	0.0	0.0	0.00	0.08	0.00	39.5
All Vehicles		1871	4.7	0.742	5.9	NA	5.7	42.7	0.15	0.20	0.26	35.8

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

MOVEMENT SUMMARY

Site: 102 [Proposed AM]

HAR_HEAP
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
2	T1	662	6.0	0.343	0.3	LOS A	1.6	11.2	0.02	0.02	0.03	39.6
3	R2	143	2.1	0.343	14.3	LOS A	1.6	11.2	0.81	0.86	0.99	33.1
Approach		805	5.3	0.343	2.8	NA	1.6	11.2	0.16	0.17	0.20	37.8
East: Headland Road (E)												
4	L2	218	0.9	1.381	392.1	LOS F	59.2	419.8	1.00	6.06	10.97	5.6
6	R2	55	3.6	1.381	479.2	LOS F	59.2	419.8	1.00	6.06	10.97	5.7
Approach		273	1.5	1.381	409.7	LOS F	59.2	419.8	1.00	6.06	10.97	5.6
North: Harbord Road (N)												
7	L2	231	5.6	0.306	3.5	LOS A	0.0	0.0	0.00	0.19	0.00	39.4
8	T1	920	3.4	0.306	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	39.5
Approach		1151	3.8	0.306	0.7	NA	0.0	0.0	0.00	0.09	0.00	39.5
All Vehicles		2229	4.1	1.381	51.6	NA	59.2	419.8	0.18	0.85	1.42	19.8

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

MOVEMENT SUMMARY

Site: 102 [Proposed PM]

HAR_HEAP
Site Category: (None)
Stop (Two-Way)

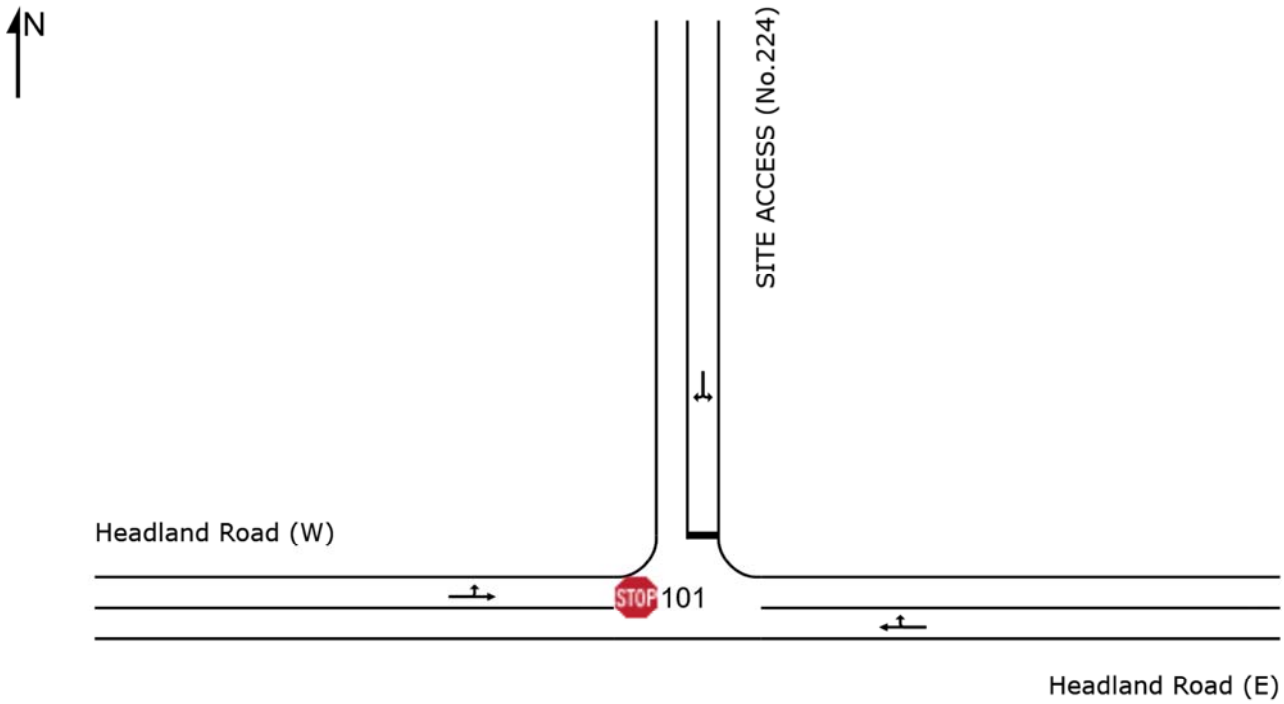
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
2	T1	785	3.7	0.298	1.5	LOS A	2.0	14.5	0.17	0.07	0.20	38.2
3	R2	99	1.0	0.298	11.3	LOS A	2.0	14.5	0.62	0.27	0.73	36.0
Approach		884	3.4	0.298	2.6	NA	2.0	14.5	0.22	0.10	0.26	37.8
East: Headland Road (E)												
4	L2	118	8.5	1.431	442.2	LOS F	45.0	333.6	1.00	4.92	9.55	5.0
6	R2	74	4.1	1.431	502.8	LOS F	45.0	333.6	1.00	4.92	9.55	5.1
Approach		192	6.8	1.431	465.5	LOS F	45.0	333.6	1.00	4.92	9.55	5.0
North: Harbord Road (N)												
7	L2	161	5.6	0.257	3.5	LOS A	0.0	0.0	0.00	0.16	0.00	39.5
8	T1	805	4.5	0.257	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.6
Approach		966	4.7	0.257	0.6	NA	0.0	0.0	0.00	0.08	0.00	39.6
All Vehicles		2042	4.3	1.431	45.2	NA	45.0	333.6	0.19	0.54	1.01	20.7

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

SITE LAYOUT

Site: 101 [Existing AM]

HEA_SITE (No.224)
Site Category: (None)
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 101 [Existing AM]

HEA_SITE (No.224)
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Headland Road (E)												
5	T1	14	0.0	0.011	0.0	LOS A	0.0	0.2	0.04	0.16	0.04	39.2
6	R2	7	0.0	0.011	3.6	LOS A	0.0	0.2	0.04	0.16	0.04	39.2
Approach		21	0.0	0.011	1.2	NA	0.0	0.2	0.04	0.16	0.04	39.2
North: SITE ACCESS (No.224)												
7	L2	7	0.0	0.007	6.7	LOS A	0.0	0.2	0.04	0.96	0.04	37.4
9	R2	2	0.0	0.007	6.4	LOS A	0.0	0.2	0.04	0.96	0.04	36.3
Approach		9	0.0	0.007	6.6	LOS A	0.0	0.2	0.04	0.96	0.04	37.2
West: Headland Road (W)												
10	L2	7	0.0	0.008	3.4	LOS A	0.0	0.0	0.00	0.20	0.00	39.3
11	T1	9	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	39.1
Approach		16	0.0	0.008	1.5	NA	0.0	0.0	0.00	0.20	0.00	39.2
All Vehicles		46	0.0	0.011	2.4	NA	0.0	0.2	0.03	0.33	0.03	38.8

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

MOVEMENT SUMMARY

Site: 101 [Existing PM]

HEA_SITE (No.224)
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Headland Road (E)												
5	T1	6	0.0	0.005	0.0	LOS A	0.0	0.1	0.04	0.16	0.04	39.2
6	R2	3	0.0	0.005	3.6	LOS A	0.0	0.1	0.04	0.16	0.04	39.2
Approach		9	0.0	0.005	1.2	NA	0.0	0.1	0.04	0.16	0.04	39.2
North: SITE ACCESS (No.224)												
7	L2	6	0.0	0.008	6.7	LOS A	0.0	0.2	0.05	0.96	0.05	37.5
9	R2	4	0.0	0.008	6.4	LOS A	0.0	0.2	0.05	0.96	0.05	36.3
Approach		10	0.0	0.008	6.6	LOS A	0.0	0.2	0.05	0.96	0.05	37.1
West: Headland Road (W)												
10	L2	3	0.0	0.007	3.4	LOS A	0.0	0.0	0.00	0.11	0.00	39.7
11	T1	10	0.0	0.007	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	39.5
Approach		13	0.0	0.007	0.8	NA	0.0	0.0	0.00	0.11	0.00	39.6
All Vehicles		32	0.0	0.008	2.7	NA	0.0	0.2	0.03	0.39	0.03	38.6

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

MOVEMENT SUMMARY

Site: 101 [Proposed AM]

HEA_SITE (No.224)
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Headland Road (E)												
5	T1	32	0.0	0.028	0.1	LOS A	0.1	0.7	0.11	0.18	0.11	39.0
6	R2	19	0.0	0.028	3.7	LOS A	0.1	0.7	0.11	0.18	0.11	39.1
Approach		51	0.0	0.028	1.4	NA	0.1	0.7	0.11	0.18	0.11	39.0
North: SITE ACCESS (No.224)												
7	L2	7	0.0	0.007	6.8	LOS A	0.0	0.2	0.09	0.93	0.09	37.4
9	R2	2	0.0	0.007	6.6	LOS A	0.0	0.2	0.09	0.93	0.09	36.3
Approach		9	0.0	0.007	6.7	LOS A	0.0	0.2	0.09	0.93	0.09	37.2
West: Headland Road (W)												
10	L2	36	0.0	0.033	3.4	LOS A	0.0	0.0	0.00	0.26	0.00	39.1
11	T1	27	0.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.26	0.00	38.9
Approach		63	0.0	0.033	1.9	NA	0.0	0.0	0.00	0.26	0.00	39.0
All Vehicles		123	0.0	0.033	2.1	NA	0.1	0.7	0.05	0.28	0.05	38.9

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

MOVEMENT SUMMARY

Site: 101 [Proposed PM]

HEA_SITE (No.224)
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Headland Road (E)												
5	T1	21	0.0	0.020	0.0	LOS A	0.1	0.5	0.07	0.20	0.07	39.0
6	R2	15	0.0	0.020	3.6	LOS A	0.1	0.5	0.07	0.20	0.07	39.1
Approach		36	0.0	0.020	1.5	NA	0.1	0.5	0.07	0.20	0.07	39.0
North: SITE ACCESS (No.224)												
7	L2	18	0.0	0.043	6.8	LOS A	0.1	1.0	0.10	0.93	0.10	37.5
9	R2	33	0.0	0.043	6.5	LOS A	0.1	1.0	0.10	0.93	0.10	36.4
Approach		51	0.0	0.043	6.6	LOS A	0.1	1.0	0.10	0.93	0.10	36.8
West: Headland Road (W)												
10	L2	3	0.0	0.014	3.4	LOS A	0.0	0.0	0.00	0.05	0.00	40.0
11	T1	25	0.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.8
Approach		28	0.0	0.014	0.4	NA	0.0	0.0	0.00	0.05	0.00	39.8
All Vehicles		115	0.0	0.043	3.5	NA	0.1	1.0	0.07	0.49	0.07	38.2

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

MOVEMENT SUMMARY

Site: 101 [Existing AM]

PIT_HARX
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	27	18.5	0.761	82.7	LOS F	16.8	124.4	1.00	0.95	1.54	21.5
1	L2	407	5.2	0.761	75.5	LOS F	16.8	124.4	0.99	0.92	1.31	22.2
3a	R1	266	6.0	0.572	69.7	LOS E	9.4	68.9	0.99	0.80	0.99	22.9
Approach		700	6.0	0.761	73.6	LOS F	16.8	124.4	0.99	0.87	1.20	22.4
NorthEast: Pittwater Road (NE)												
24a	L1	476	3.6	0.613	17.0	LOS B	17.0	122.9	0.54	0.64	0.54	33.9
25	T1	1625	7.0	0.803	35.5	LOS C	42.5	315.4	0.85	0.78	0.87	28.9
26a	R1	308	1.0	0.529	64.7	LOS E	10.5	74.2	0.97	0.79	0.97	24.0
Approach		2409	5.5	0.803	35.6	LOS C	42.5	315.4	0.81	0.75	0.82	29.0
West: Warringah Road (W)												
10a	L1	86	8.1	0.130	35.2	LOS C	4.1	30.8	0.70	0.64	0.70	29.3
12	R2	485	3.5	0.793	71.4	LOS F	18.4	132.9	1.00	0.91	1.11	22.7
12b	R3	307	6.8	0.779	78.2	LOS F	11.7	86.5	1.00	0.91	1.15	21.9
Approach		878	5.1	0.793	70.2	LOS E	18.4	132.9	0.97	0.88	1.08	22.9
SouthWest: Pittwater Road (SW)												
30b	L3	84	39.3	0.065	3.8	LOS A	0.0	0.0	0.00	0.39	0.00	40.0
31	T1	1001	9.4	0.516	36.8	LOS C	20.3	153.4	0.81	0.70	0.81	28.6
32b	R3	100	7.0	0.804	85.4	LOS F	7.9	58.6	1.00	0.93	1.24	21.0
Approach		1185	11.3	0.804	38.6	LOS C	20.3	153.4	0.77	0.70	0.79	28.3
All Vehicles		5172	6.8	0.804	47.3	LOS D	42.5	315.4	0.85	0.78	0.91	26.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	69.3	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

MOVEMENT SUMMARY

Site: 101 [Existing PM]

PIT_HARX
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	36	8.3	0.788	74.8	LOS F	20.4	147.9	1.00	0.95	1.44	22.5
1	L2	470	3.2	0.788	70.6	LOS F	20.4	147.9	0.98	0.93	1.27	22.8
3a	R1	365	3.0	0.770	74.4	LOS F	13.6	97.8	1.00	0.90	1.11	22.3
Approach		871	3.3	0.788	72.4	LOS F	20.4	147.9	0.99	0.92	1.21	22.6
NorthEast: Pittwater Road (NE)												
24a	L1	377	5.0	0.379	14.8	LOS B	11.2	81.5	0.62	0.67	0.62	34.6
25	T1	1024	7.7	0.743	38.1	LOS C	34.9	260.3	0.88	0.78	0.88	28.3
26a	R1	349	2.6	0.774	74.4	LOS F	13.1	93.7	1.00	0.92	1.12	22.6
Approach		1750	6.1	0.774	40.3	LOS C	34.9	260.3	0.85	0.79	0.87	28.0
West: Warringah Road (W)												
10a	L1	193	4.1	0.318	42.2	LOS C	10.5	76.0	0.80	0.72	0.80	27.7
12	R2	400	4.5	0.667	67.2	LOS E	13.9	101.2	0.99	0.83	0.99	23.3
12b	R3	227	12.3	0.808	84.1	LOS F	8.9	69.2	1.00	0.94	1.23	21.2
Approach		820	6.6	0.808	66.0	LOS E	13.9	101.2	0.95	0.83	1.01	23.5
SouthWest: Pittwater Road (SW)												
30b	L3	128	34.4	0.096	3.8	LOS A	0.0	0.0	0.00	0.39	0.00	40.0
31	T1	1490	5.4	0.759	35.6	LOS C	31.2	228.4	0.84	0.75	0.84	28.8
32b	R3	110	7.3	0.760	46.3	LOS D	4.9	36.2	1.00	0.87	1.16	26.9
Approach		1728	7.7	0.760	34.0	LOS C	31.2	228.4	0.79	0.73	0.80	29.3
All Vehicles		5169	6.2	0.808	47.7	LOS D	34.9	260.3	0.87	0.80	0.93	26.5

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	32.1	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	63.1	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

MOVEMENT SUMMARY

Site: 101 [Proposed AM]

PIT_HARP
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	30	16.7	0.696	81.5	LOS F	16.0	118.0	0.99	0.91	1.52	21.6
1	L2	412	5.1	0.696	72.6	LOS F	16.0	118.0	0.98	0.87	1.25	22.6
3a	R1	271	5.9	0.651	72.6	LOS F	9.8	72.0	1.00	0.82	1.02	22.5
Approach		713	5.9	0.696	73.0	LOS F	16.0	118.0	0.99	0.86	1.18	22.5
NorthEast: Pittwater Road (NE)												
24a	L1	554	3.1	0.732	21.4	LOS B	23.3	167.2	0.63	0.70	0.63	32.6
25	T1	1625	7.0	0.872	47.4	LOS D	50.1	371.2	0.90	0.89	1.01	26.4
26a	R1	308	1.0	0.760	75.4	LOS F	11.6	81.7	1.00	0.90	1.12	22.5
Approach		2487	5.3	0.872	45.1	LOS D	50.1	371.2	0.86	0.85	0.94	26.9
West: Warringah Road (W)												
10a	L1	86	8.1	0.143	38.9	LOS C	4.3	32.5	0.74	0.66	0.74	28.4
12	R2	563	3.0	0.863	75.9	LOS F	22.9	164.5	1.00	0.97	1.19	22.1
12b	R3	307	6.8	0.871	86.8	LOS F	12.5	92.5	1.00	1.00	1.31	20.9
Approach		956	4.7	0.871	76.1	LOS F	22.9	164.5	0.98	0.95	1.19	22.1
SouthWest: Pittwater Road (SW)												
30b	L3	84	39.3	0.065	3.8	LOS A	0.0	0.0	0.00	0.39	0.00	40.0
31	T1	1001	9.4	0.459	31.3	LOS C	18.7	141.0	0.75	0.65	0.75	29.8
32b	R3	141	5.0	0.840	84.4	LOS F	11.2	81.8	1.00	0.96	1.26	21.1
Approach		1226	10.9	0.840	35.5	LOS C	18.7	141.0	0.72	0.67	0.75	29.0
All Vehicles		5382	6.6	0.872	52.1	LOS D	50.1	371.2	0.86	0.83	0.97	25.7

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	69.3	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

MOVEMENT SUMMARY

Site: 101 [Proposed PM]

PIT_HARP
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road (S)												
1b	L3	43	7.0	0.799	75.2	LOS F	21.5	155.4	1.00	0.97	1.46	22.4
1	L2	482	3.1	0.799	70.8	LOS F	21.5	155.4	0.98	0.94	1.29	22.8
3a	R1	378	2.9	0.757	73.0	LOS F	14.0	100.2	1.00	0.89	1.09	22.5
Approach		903	3.2	0.799	71.9	LOS F	21.5	155.4	0.99	0.92	1.21	22.6
NorthEast: Pittwater Road (NE)												
24a	L1	403	4.7	0.409	15.5	LOS B	12.4	90.3	0.64	0.69	0.64	34.4
25	T1	1024	7.7	0.766	40.0	LOS C	35.7	265.9	0.90	0.80	0.90	27.9
26a	R1	349	2.6	0.774	74.4	LOS F	13.1	93.7	1.00	0.92	1.12	22.6
Approach		1776	6.0	0.774	41.2	LOS C	35.7	265.9	0.86	0.80	0.88	27.8
West: Warringah Road (W)												
10a	L1	193	4.1	0.318	42.2	LOS C	10.5	76.0	0.80	0.72	0.80	27.7
12	R2	425	4.2	0.713	68.5	LOS E	15.2	110.4	1.00	0.85	1.03	23.1
12b	R3	227	12.3	0.808	84.1	LOS F	8.9	69.2	1.00	0.94	1.23	21.2
Approach		845	6.4	0.808	66.7	LOS E	15.2	110.4	0.95	0.85	1.03	23.4
SouthWest: Pittwater Road (SW)												
30b	L3	128	34.4	0.096	3.8	LOS A	0.0	0.0	0.00	0.39	0.00	40.0
31	T1	1490	5.4	0.775	36.8	LOS C	31.3	229.3	0.85	0.76	0.85	28.6
32b	R3	122	6.6	0.783	46.6	LOS D	5.4	39.8	1.00	0.89	1.18	26.9
Approach		1740	7.6	0.783	35.0	LOS C	31.3	229.3	0.80	0.74	0.81	29.1
All Vehicles		5264	6.1	0.808	48.5	LOS D	35.7	265.9	0.88	0.81	0.94	26.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6	NorthEast Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P6B	NorthEast Slip/Bypass Lane Crossing	53	32.0	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P4B	West Slip/Bypass Lane Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P8	SouthWest Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		316	63.1	LOS F			0.96	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)