PROPOSED SHOP TOP HOUSING DEVELOPMENT

3 GONDOLA ROAD, NORTH NARRABEEN

TRAFFIC AND PARKING ASSESSMENT REPORT

26TH MAY 2022

REF 22016

Prepared by

Terraffic Pty Ltd
Traffic and Parking Consultants

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TABLE OF CONTENTS

APPENDICES

LIST OF ILLUSTRATIONS

1. INTRODUCTION

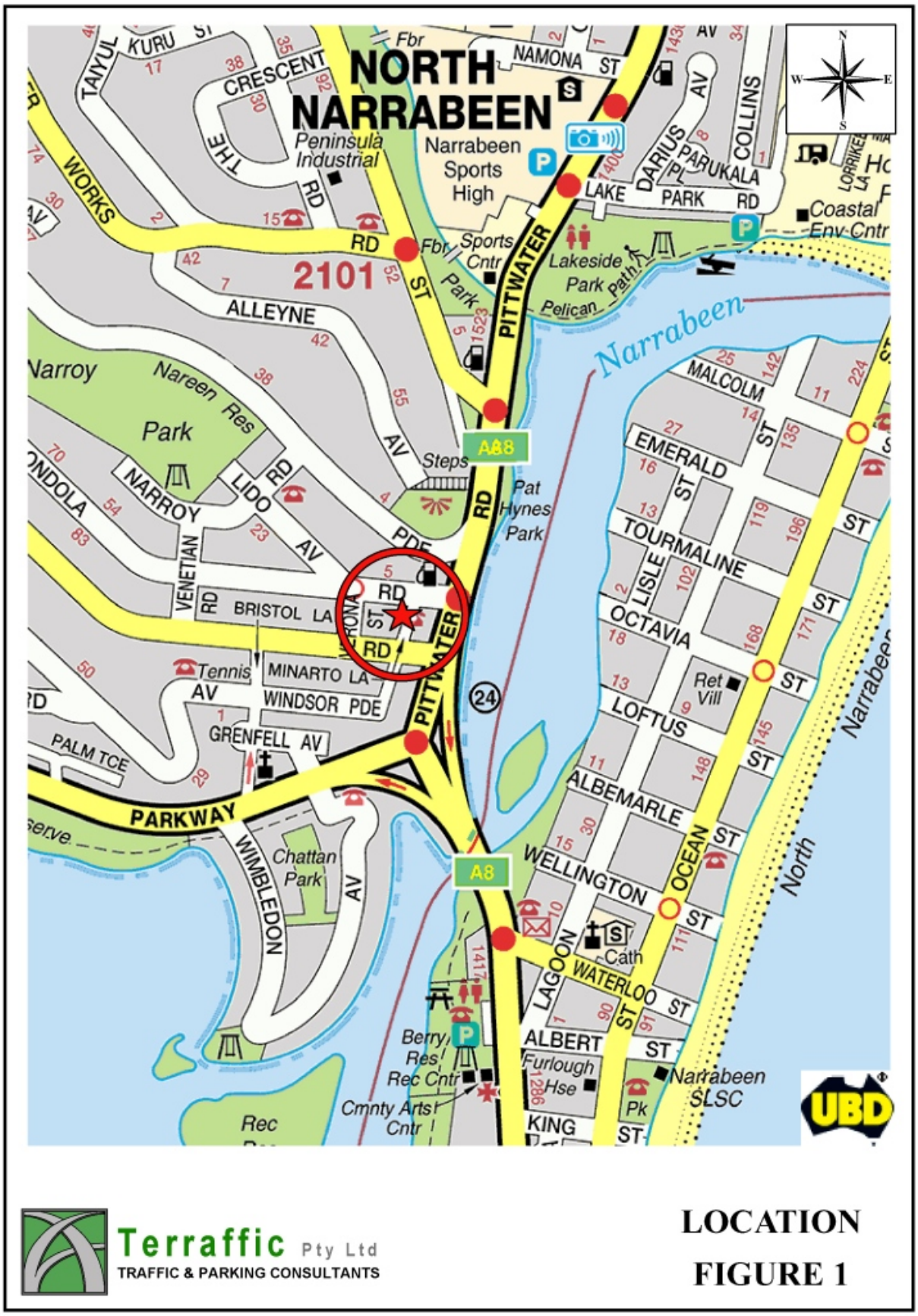
This report has been prepared to accompany a Development Application (DA) to Northern Beaches Council for a proposed shop top housing development at 3 Gondola Road, North Narrabeen (Figures 1 and 2).

The development site is located on the southern side of Gondola Road approximately 70m west of Pittwater Road. The site has an area of 638.7m^2 with a frontage of 18.29m to Gondola Road. The subject site is zoned B2 Local Centre under the controls of the Pittwater Local Environmental Plan 2014.

Existing Site Development

The existing site development comprises a 2 level commercial building with a floor area of approximately 555m^2. The existing building is served by 12 off-street parking spaces that gain vehicular access to Gondola Road via a 3.1m wide combined entry/exit driveway. As can be seen in the photograph below, the driveway widens internally to provide separate ramps to a ground level carpark and rooftop parking area.

Photograph of the site



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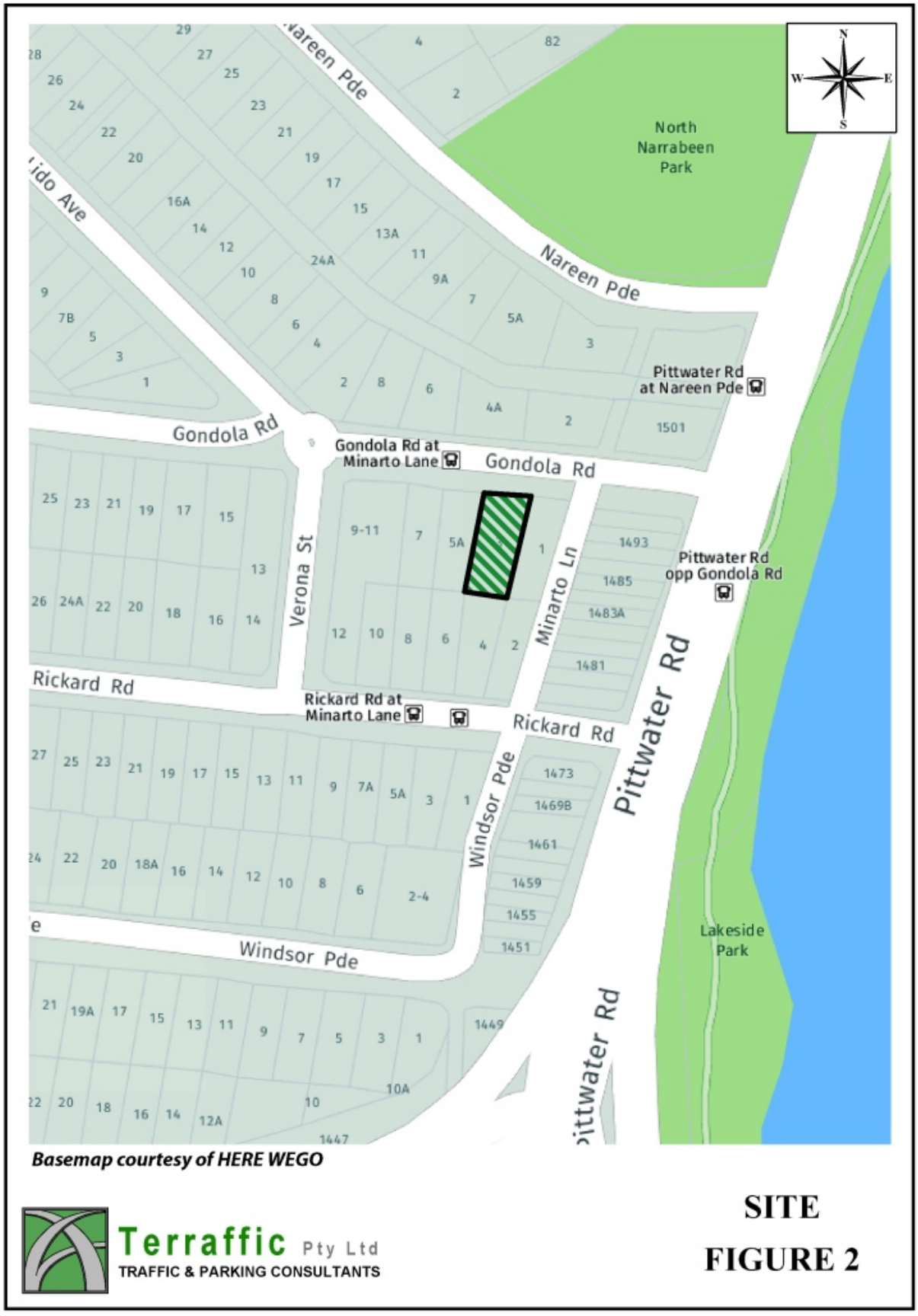
LOCATION

FIGURE 1


N
W
E
S
North Narrabeen Park
Nareen Pde
Pittwater Rd at Nareen Pde
Gondola Rd
Gondola Rd at Minarto Lane
Verona St
Minarto Ln
Pittwater Rd opp Gondola Rd
Pittwater Rd
Rickard Rd
Rickard Rd at Minarto Lane
Windsor Pde
Lakeside Park
Basemap courtesy of HERE WEGO
Terraffic Pty Ltd
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SITE
FIGURE 2

Development Proposal

The proposed development comprises the construction of a shop top housing building comprising 119.97m^2 of commercial floor space and 8 x 2 bedroom units (includes 2 accessible units).

The development proposal is served by a 2 level basement with 22 off-street parking spaces comprising 16 resident spaces, 3 visitor spaces and 3 commercial tenant spaces. The development will also be served by 7 bicycle racks located on the lower ground floor towards the front boundary.

Vehicular access to the site is via a 5.5m wide combined entry/exit driveway off Gondola Road. The driveway retains this width for 6m prior to reducing to a single lane ramp. The purpose of this 6m length is to accommodate a waiting car prior to entering.

A single lane ramp will connect the basement parking levels. A traffic signal arrangement comprising lights and waiting bays are proposed in order to control vehicle movements within the carpark. As is standard practice, entering traffic will be given priority over exiting traffic. The signal will only turn red on the ground level when an exiting vehicle triggers the signals by driving into the linemarked waiting bay.

Architectural plans of the development proposal prepared by Mackenzie Architects International are reproduced in Appendix A.

Public Transport Accessibility

The subject site has convenient access to the following bus service operated by Sydney Buses:

Route 182 Mona Vale to Narrabeen via Warriewood, North Narrabeen and Elanora Heights (operates daily)

Route 185 Mona Vale to Narrabeen via Warriewood and North Narrabeen (operates daily)

Route 190X Avalon to City Wynyard (Express Service) via Mona Vale, North Narrabeen, Narrabeen, Dee Why, Brookvale, Mosman, Neutral Bay and North Sydney Station (operates during weekday peaks)

Route 199 Palm Beach to Manly Wharf via Avalon, Newport, Mona Vale, North Narrabeen, Narrabeen, Dee Why and Brookvale (operates daily)

The bus stops for route 182 are located on Rickard Road while the bus stops for routes 185, 190X and 199 are located on Pittwater Road at Gondola Road. The bus stops for the B1 Line are located on Pittwater Road to the south of Waterloo Road in Narrabeen. This will represent a walk of approximately 720m between the development site and the B1 bus stop.

The purpose of this report is to assess the traffic and parking implications of the proposed development.

2. PARKING ASSESSMENT

Pittwater Council Off-Street Parking Requirements

Table 1 in Section B6.3 of the Pittwater 21 DCP (effective 14 November 2015) specifies the following parking requirements for Shop-Top Housing:

1 bedroom dwellings	1 space per dwelling
2 or more bedroom dwellings	2 spaces per dwelling
Visitor parking	1 space per 3 dwellings
Business and Office Premises	2.5 spaces per 100m^2 GLA

Application of this requirement to the proposed development yields a minimum parking provision of 22 spaces calculated as follows:

8 x 2 bedroom units @ 2 spaces per dwelling	16.0 resident spaces
8 units @ 1 space per 3 units for visitors	2.7 visitor spaces (say 3 spaces)
119.97m^2 commercial @ 2.5 spaces per 100m^2	3.0 tenant spaces
Total requirement	**21.7 spaces (rounded to 22 spaces)**

The proposed development satisfies the DCP with the provision of 22 off-street parking spaces comprising 16 resident spaces, 3 visitor spaces and 3 commercial tenant spaces.

RMS Guidelines Off-Street Parking Requirements

Section 5 of the Roads and Maritime Services *"Guide to Traffic Generating Developments"* (October 2002) specifies the following parking requirements for medium density residential and commercial office developments:

1 bedroom units	1 space per unit
2 bedroom units	1.2 spaces per unit
3 bedroom units	1.5 spaces per unit
Visitor parking	1 space per 5 dwellings
Office	1 space per 40m^2 GFA

Application of this requirement to the proposed development yields a minimum parking provision of 15 spaces calculated as follows:

8 x 2 bedroom units @ 1.2 spaces per unit	9.6 resident spaces (rounded to 10 spaces)
8 units @ 1 space per 5 units for visitors	1.6 visitor spaces (rounded to 2 spaces)
Total residential requirement	*11.2 spaces (rounded to 12 spaces)*
119m^2 commercial @ 1 space per 40m^2	3.0 tenant spaces
Total requirement	**14.4 spaces (rounded to 15 spaces)**

The proposed development clearly exceeds the RMS Guidelines with the provision of 22 off-street parking spaces comprising 16 resident spaces, 3 visitor spaces and 3 commercial tenant spaces.

Carpark Compliance

The proposed carpark and access has been designed to generally satisfy the following requirements of the Australian Standard AS/NZS2890.1:2004 – *"Off-street Car Parking":*

- Parking spaces have a minimum length of 5.4m and width of 2.4m
- An additional 0.3m has been provided for spaces adjacent to a wall or obstruction
- 1.0m wide blind aisle extension has been provided
- The access/manoeuvring aisle has a minimum width of 5.8m
- The dual width section of the access driveway has a minimum width of 6.1m comprising a 5.5m roadway and 2 x 300mm wide kerbs
- The single width sections of the accessway have a minimum width of 3.6m comprising a 3.0m roadway and 2 x 300mm wide kerbs
- The curved single lane ramps satisfy the dimensional requirements in Figure 2.9 of the Standard
- The maximum gradient of the access ramp does not exceed 25% (1 in 4)
- Ramp transitions do not exceed 12.5% (1 in 8) over 2.0m
- Ramp grades are measured along the inside kerb on the curved ramps
- Pavement cross-falls do not exceed 5% (1 in 20) in any direction
- Pedestrian sight lines in accordance with Figure 3.3 of the Standard have been provided

The disabled parking spaces have been designed to comply with the Australian Standard AS/NZS2890.6:2009 – *"Off-street parking for people with disabilities"* as follows:

- A 5.4m long x 2.4m wide dedicated (non-shared) parking space
- An adjacent shared area that is also 5.4m long x 2.4m wide
- A minimum headroom of 2.5m above the disabled spaces
- Pavement cross-falls in disabled spaces do not exceed 2.5% (1 in 40) in any direction

For drainage purposes, the access driveway rises from the boundary (RL2.0) to a crest at RL4.40. The first 6m of the access driveway from the boundary has an upgrade of 10% as per the requirements in Clause 3.3(a) of the Standard. Furthermore, the 10% grade satisfies the maximum grade specified in Clause 3.3(c) for queuing areas.

As noted in the foregoing, a comprehensive traffic signal design will be prepared as part of the Construction Certificate. The design will include the location of traffic signals, linemarked waiting bays, induction loops, convex mirrors, sensors, etc.

The ability of the Australian Standard AS/NZS2890.1:2004 B99 Vehicle to circulate in the basement carpark was tested using the Autodesk Vehicle Tracking software and found to be satisfactory with the required clearances to walls and structure. A linemarked WAITING BAY is proposed on the Lower Ground Floor (Upper basement level) to further facilitate passing manoeuvres if necessary.

The swept path of an entering B99 vehicle passing a waiting B85 vehicle on the Lower Ground Floor (Upper Basement) is reproduced in Appendix B. As can be seen, the entering vehicle can comfortably pass a departing vehicle stopped in the WAITING BAY.

Bicycle Parking

Section B6.3 of the Pittwater 21 DCP nominates that residential developments require secure bicycle storage at a rate of 1 bicycle rack per 3 dwellings. Application of this rate yields a minimum bicycle parking requirement of 3 bicycles calculated as follows:

8 units @ 1 bicycle space per 3 units	3 bike spaces

The DCP also notes that businesses require bicycle parking when the floor area is 200m^2 or more. As the proposed commercial space is only 119.97m^2, bicycle parking for the commercial component is not required. However, provision has been made on-site to park 7 bicycles which

clearly exceeds the DCP requirement and will provide parking for commercial tenants if necessary.

Motorcycle Parking

Section B6.3 of the Pittwater 21 DCP specifies that business/industrial development or additions, comprising of 200m² GFA or more, provision is to be made for motor cycle parking at a rate of 1 motor cycle parking space per 100 motor vehicle spaces.

As the proposed commercial space is only 119m^2, motorcycle parking for the commercial component is not required. To that end, the proposal does not provide any motorcycle parking spaces.

Queuing Analysis

This assessment has been carried out using Basic Queuing Theory to determine the length of queue on exit from the carpark. As can be appreciated, a queuing analysis for entering traffic will not be required as the traffic signal on the ground level will primarily be green to allow free flow of entering traffic. The signal will only turn red on ground level when a vehicle stops in the waiting bay located in the basement.

The 2 main factors in determining the queue is the “Arrival Rate” (how many vehicles are exiting the site in an hour) and the “Service Rate” (how many vehicles can depart the site along the single lane ramp).

As noted in Chapter 3 of this report, the proposal will generate up to 6 vehicle trips per hour during peak periods. Of those 6 vehicles, there will be 2 incoming commercial tenants and 4 outgoing residents during in the morning peak. The flows are reversed in the evening peak. For the purposes of providing a robust assessment, it will be assumed that all 6 vehicles will depart in the morning peak and return in the evening peak.

The arrival rate (r) for the purposes of this queuing analysis will be 6 vehicles.

To determine how many vehicles can depart the basement over an hour, the following aspects have been considered:

- There is a travel distance of 60m from the waiting bay on the upper basement to the passing bay at the entrance to the site
- Cars will travel at an average speed of 10km/h (2.78m/s)
- A headway of 1 minute between departing vehicles to take into account manoeuvring from the car space to the waiting bay and for the traffic signals to change from red to green

Based on the distance and average speed, it would take a car 22 seconds to travel from the waiting bay on the upper basement to the passing bay on ground level. When including the 1 minute headway, the total time per vehicle departure is 1 minute and 22 seconds (ie 88 seconds).

The service rate (s) would therefore be 41 vehicle departures per hour calculated as follows:

3600 seconds per hour / 88 seconds per vehicle 40.9 vehicles per hour

Based on these factors, the queuing theory assessment predicts that there will be 1.6% chance that the queue will exceed 1 vehicle in the morning peak as follows:

1. Arrival Rate (r) is 6 vehicles per hour

2. Service Rate (s) is 41 vehicles per hour

3. The Utilisation Factor (p) = r / s

   (p) = 6 / 41
   (p) = 0.146

4. The expected (mean) number of vehicles in the queue is calculated as follows:

   E(n) = r / (s – r)
   E(n) = 6 / (41-6)
   E(n) = 6 / 35 = 0.17 vehicles in queue

5. The probability that the queue will extend further than 1 vehicle can be calculated as follows:

$$P(n>1) = p^{1+1}$$
$$P(n>1) = 0.146^2 = 0.02 = 2\% \text{ chance}$$

Based on this equation, there will be a 2% chance of there being more than 1 vehicle in the queue. Therefore, it can be determined that the 98th percentile queue will not exceed 1 vehicle.

In the circumstances, it can be concluded that the proposed development has no unacceptable parking or queuing implications.

3. TRAFFIC ASSESSMENT

Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the Roads and Maritime Services (RMS) is illustrated on Figure 3 and comprises the following:

State Roads	**Regional Roads**
Pittwater Road	Garden Street – Powderworks Road
Wakehurst Parkway	

As can be seen, Pittwater Road is a classified *State Road* performing an arterial road function. It typically carries 6 traffic lanes with traffic separated by a raised median island.

Gondola Road is an unclassified local road performing a collector road function. It connects Pittwater Road to the residential areas of Elanora Heights and North Narrabeen. It has a pavement width of approximately 10m with one hour restricted parking on both sides of the roadway between the site and Pittwater Road.

The existing traffic controls on the road network in the vicinity of the site are illustrated on Figure 4.

Projected Traffic Generation

An indication of the traffic generation potential of the existing and proposed development is provided by reference to the Roads and Maritime Services (RMS) "*Guide to Traffic Generating Developments"* (October 2002).

The traffic generation rates specified in the Guidelines are based on extensive surveys of a wide range of land uses throughout Sydney and regional NSW and nominate the following traffic generation rates applicable to the existing and proposed development on the site:

Medium density residential flat buildings	0.5 trips per dwelling – smaller units (2 bedrooms)
	0.65 trips per dwelling – larger units (3+ bedrooms)

Commercial/office	2 trips per 100m^2

Application of the RMS traffic generation rate to the **existing development** yields a traffic generation potential of approximately 11vtph during peak periods as follows:

555m^2 commercial @ 2vtph per 100m^2	11vtph

Application of the RMS traffic generation rate to the **proposed development** yields a traffic generation potential of approximately 6vtph during peak periods as follows:

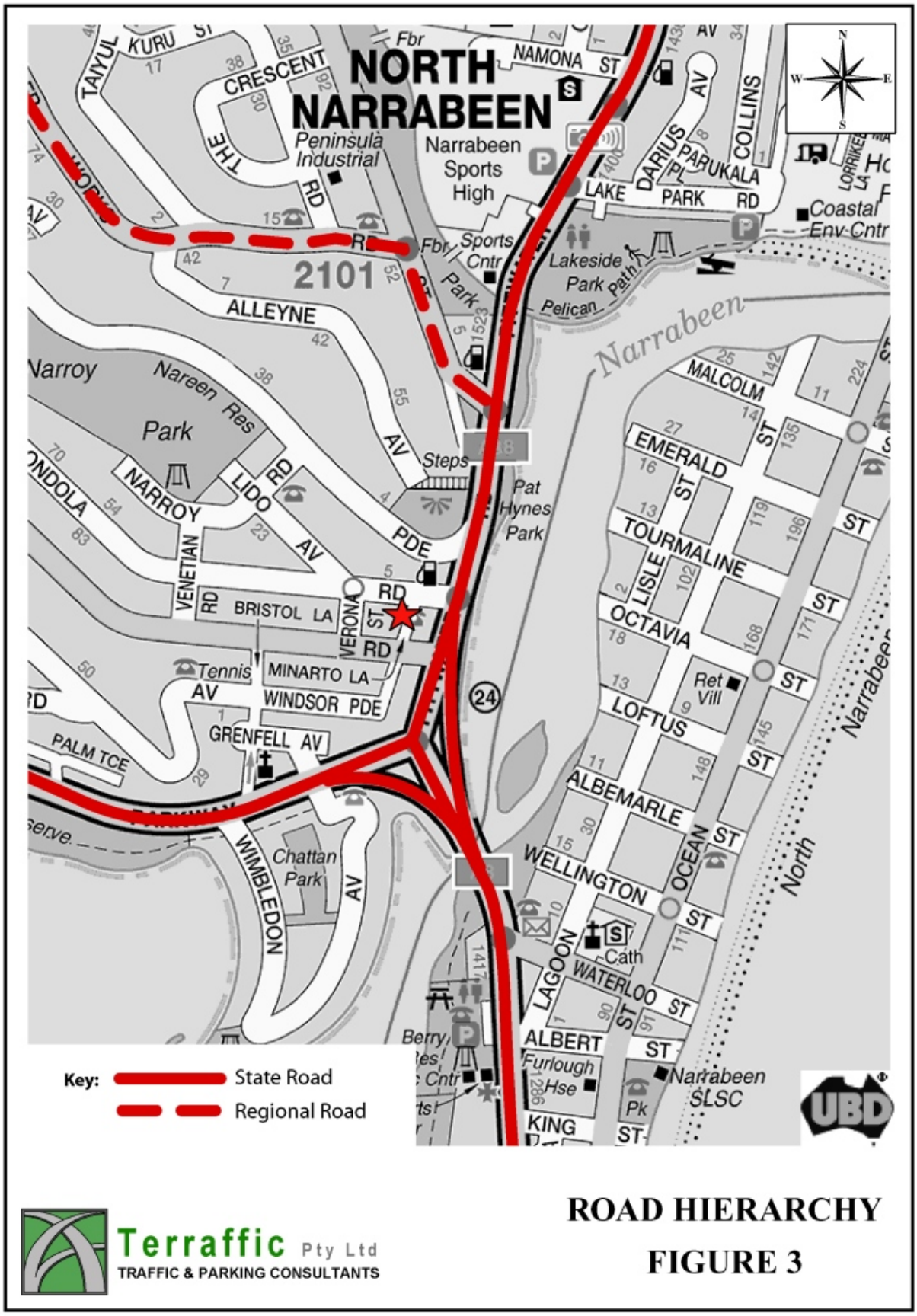
119.97m^2 commercial @ 2vtph per 100m^2	2vtph
8 x 1 and 2 bedroom units @ 0.5vtph per unit	4vtph
Total Development	**6vtph**

Based on the RMS Guidelines, the proposal will result in a net reduction of 5 vehicle trips per hour during peak periods as follows:

Existing commercial development	11vtph
Proposed shop top development	6vtph
Net reduction in traffic	**5vtph**

In instances where the existing site development has the potential to generate more traffic than the proposed development, it will be readily appreciated that the proposed development will not have any noticeable or unacceptable effect on the road network serving the site in terms of road network capacity or traffic-related environmental effect.

In the circumstances, it can be concluded that the proposed development has no unacceptable traffic implications.



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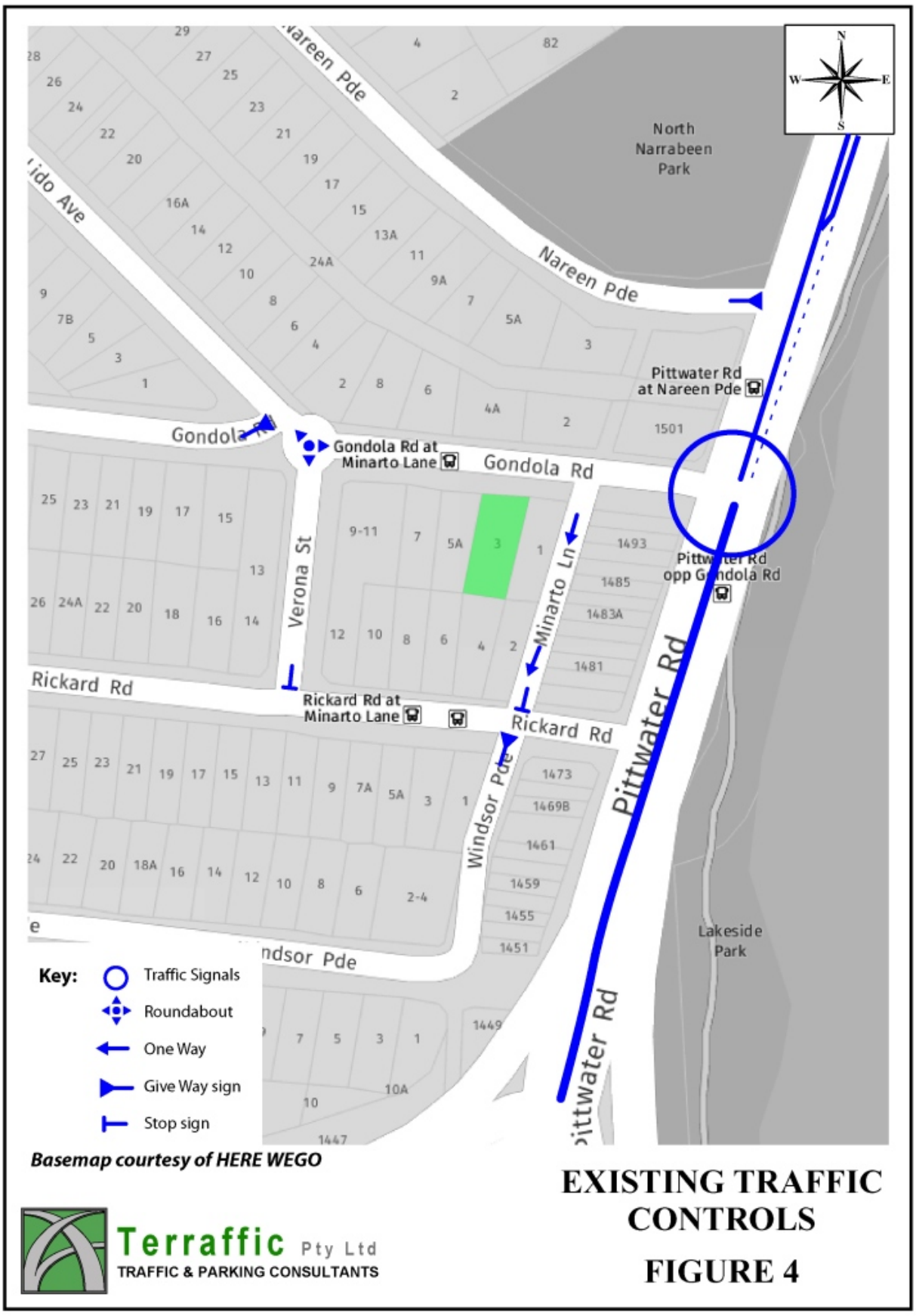
ROAD HIERARCHY

FIGURE 3


N
W
E
S
North Narrabeen Park
Nareen Pde
Pittwater Rd at Nareen Pde
Gondola Rd at Minarto Lane
Gondola Rd
Verona St
Minarto Ln
Pittwater Rd opp Gondola Rd
Rickard Rd
Rickard Rd at Minarto Lane
Windsor Pde
Pittwater Rd
Lakeside Park
Key:
Traffic Signals
Roundabout
One Way
Give Way sign
Stop sign
Basemap courtesy of HERE WEGO
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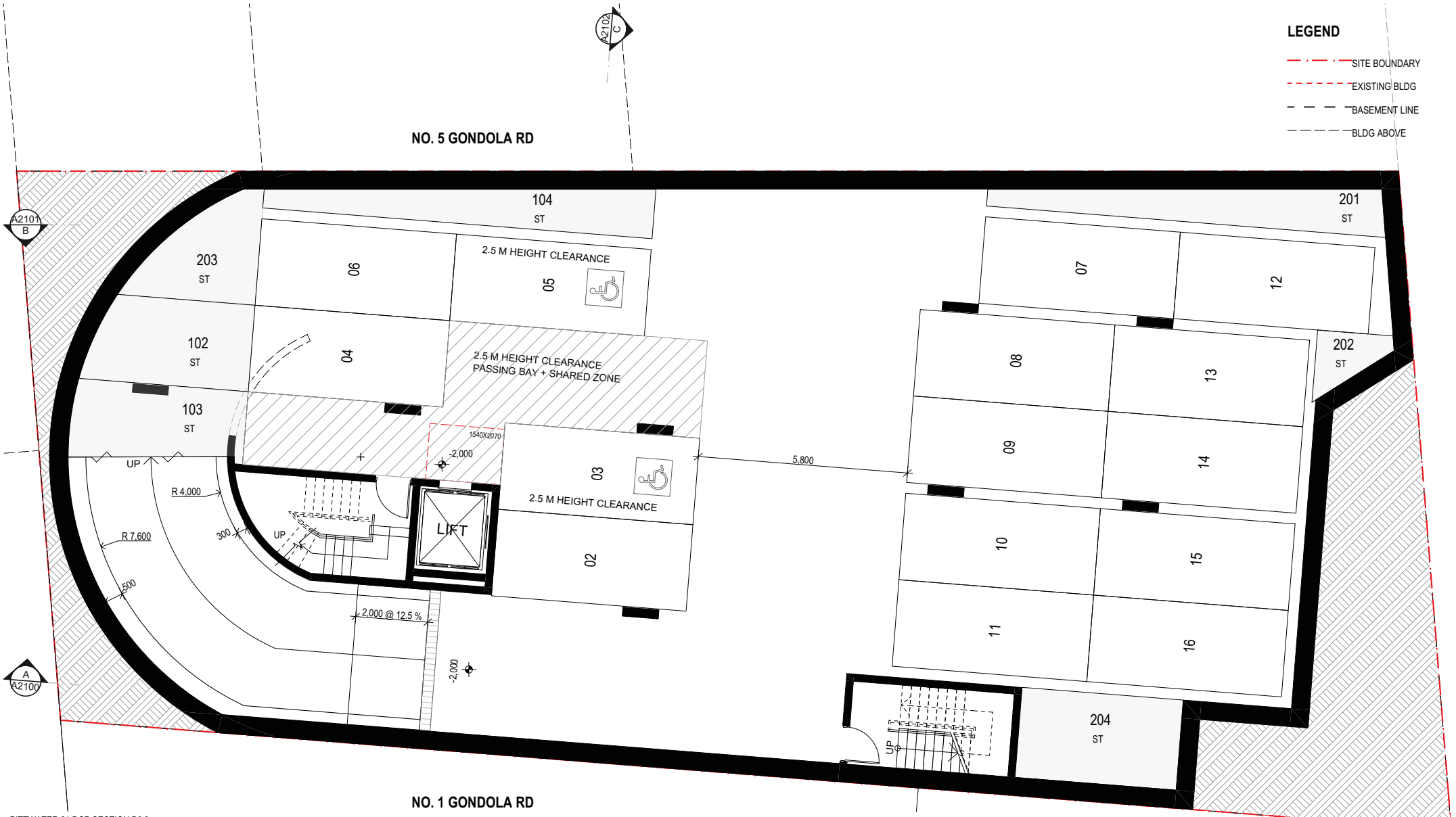
TRAFFIC & PARKING CONSULTANTS
EXISTING TRAFFIC CONTROLS
FIGURE 4

APPENDIX A

PLANS OF THE PROPOSED DEVELOPMENT



PITTWATER 21 DCP SECTION B6.3

SHOP TOP HOUSING	**Minimum Number of. Car Spaces** 1 bedroom dwellings — 1 space per dwelling 2 or more bedroom dwellings — 2 spaces per dwelling Adaptable Housing in accordance with control C1.9 of the Pittwater 21 Development Control Plan. — 1 space per dwelling in accordance with AS 4299-1995: Adaptable Housing. The provision of parking for people with disabilities must be provided at a rate of 3% of the required parking spaces, excluding parking required for Adaptable Housing. Separate visitor parking is to be provided at a rate of 1 space per 3 dwellings rounded up. Provision must be made for garbage collection, removalist vans and emergency vehicles.	1 BICYCLE RACK / 3 DWELLING
COMMERCIAL PREMISES	2.5 car parking spaces per 100m2 Gross Lettable Area (GLA) Provision of accessible parking spaces for people with disabilities must be at the rate of 3% of required car parking spaces and must be appropriately signposted. Where the Gross Floor Area (GFA) exceeds 400m², provision is to be made for: • Delivery vehicles at 1 space per 4000m² GFA or 1 space whichever is greater; • Courier parking at 1 space per 1000m² GFA or 1 space, whichever is greater.	>200 m² PREMISE MIN. 4 BICYCLE RACKS

RESI CAR SPACE CALCULATION	
6 UNITS @ 2 BEDROOM	12
2 ADAPTABLE UNITS @ 2 CARS	4
ACCESSIBLE SPACE	0.4
VISITOR SPACE	2.6
TOTAL RESIDENTIAL CAR	19
TOTAL BICYCLE RACK	2.7 ~ 3

COMM CAR CALCULATION	
119 m² (INCLD. ACCESSIBLE SPACE)	2.9 1
TOTAL COMM CAR	3.4 ~ 3
TOTAL BICYCLE RACK	4

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Nominated Architect No.6033
ABN 76 091 107 201
ACN 091107201

STATUS: #Project Status

LEGEND
DO NOT SCALE DRAWINGS
VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

AMENDMENTS

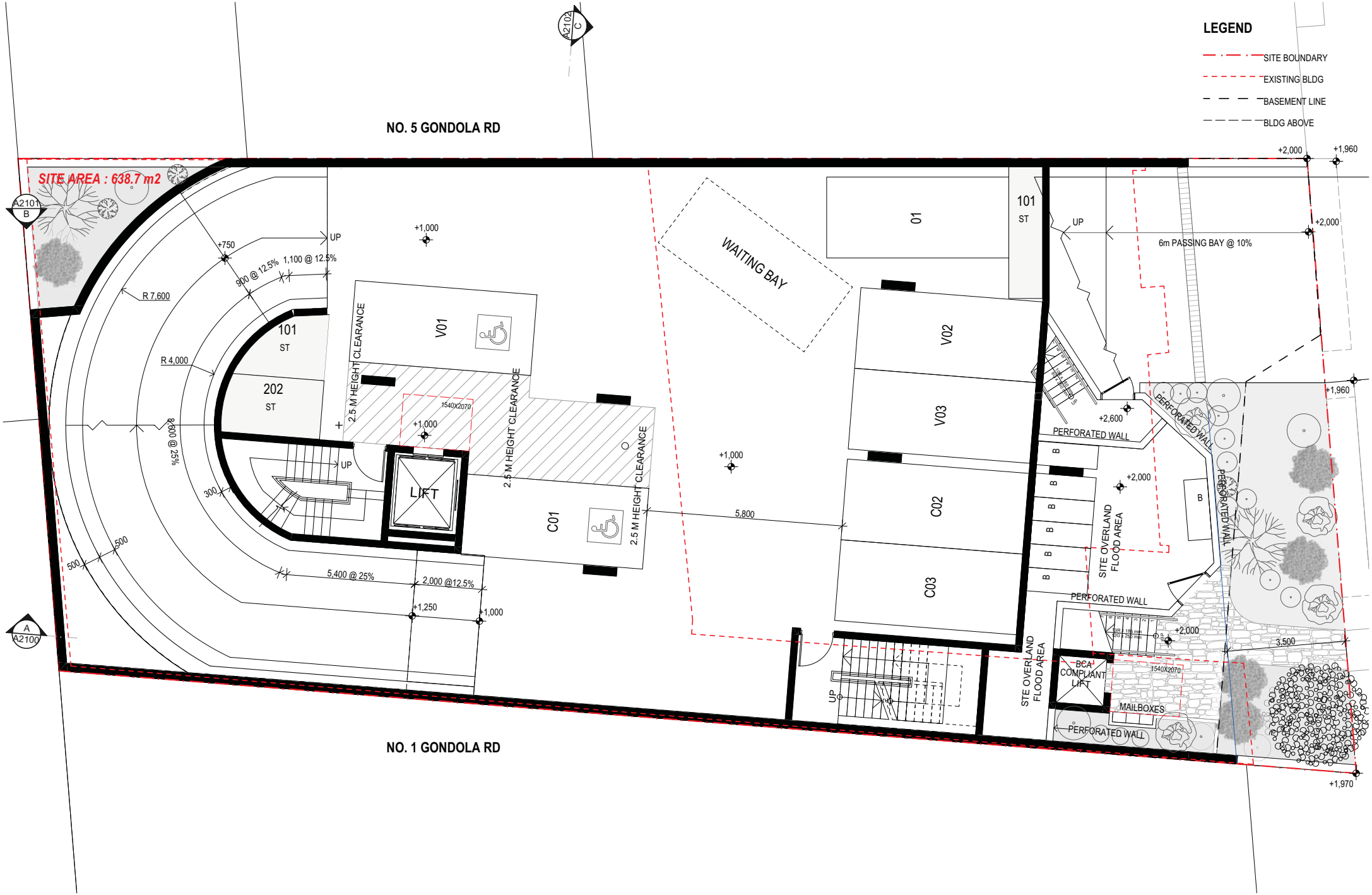
REV	STATUS	BY	DATE
A	DA	AM	18/05/2022

PROJECT NORTH

PROJECT
Development Application
3 GONDOLA RD
NORTH NARRABEEN
NSW 2101, AUSTRALIA

DRAWING:
BASEMENT 1

SCALE: 1:100@A3
DRAWING NO.: A1001
ISSUE: A



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Nominated Architect No.6033
ABN 76 091 107 201
ACN 091107201

STATUS: #Project Status

LEGEND
DO NOT SCALE DRAWINGS
VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

AMENDMENTS

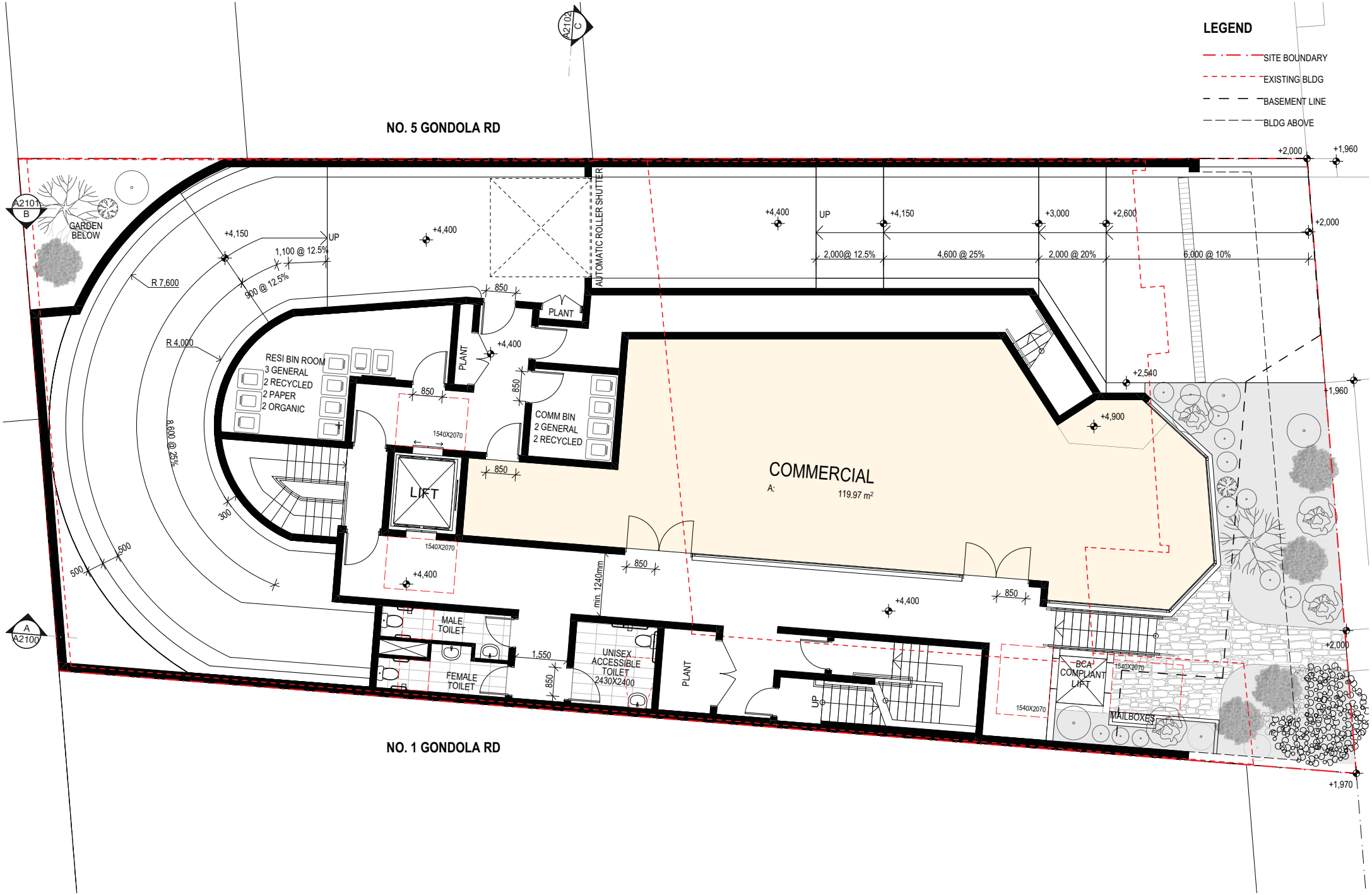
REV	STATUS	BY	DATE
A	DA	AM	18/05/2022

PROJECT NORTH

PROJECT
Development Application
3 GONDOLA RD
NORTH NARRABEEN
NSW 2101, AUSTRALIA

DRAWING:
LOWER GROUND FLOOR

SCALE: 1:100@A3
DRAWING NO.: A1002
ISSUE: A



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ACN 091107201

STATUS: #Project Status

LEGEND
DO NOT SCALE DRAWINGS
VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

AMENDMENTS

REV	STATUS	BY	DATE
A	DA	AM	18/05/2022

PROJECT NORTH

PROJECT
Development Application
3 GONDOLA RD
NORTH NARRABEEN
NSW 2101, AUSTRALIA

DRAWING:
UPPER GROUND FLOOR

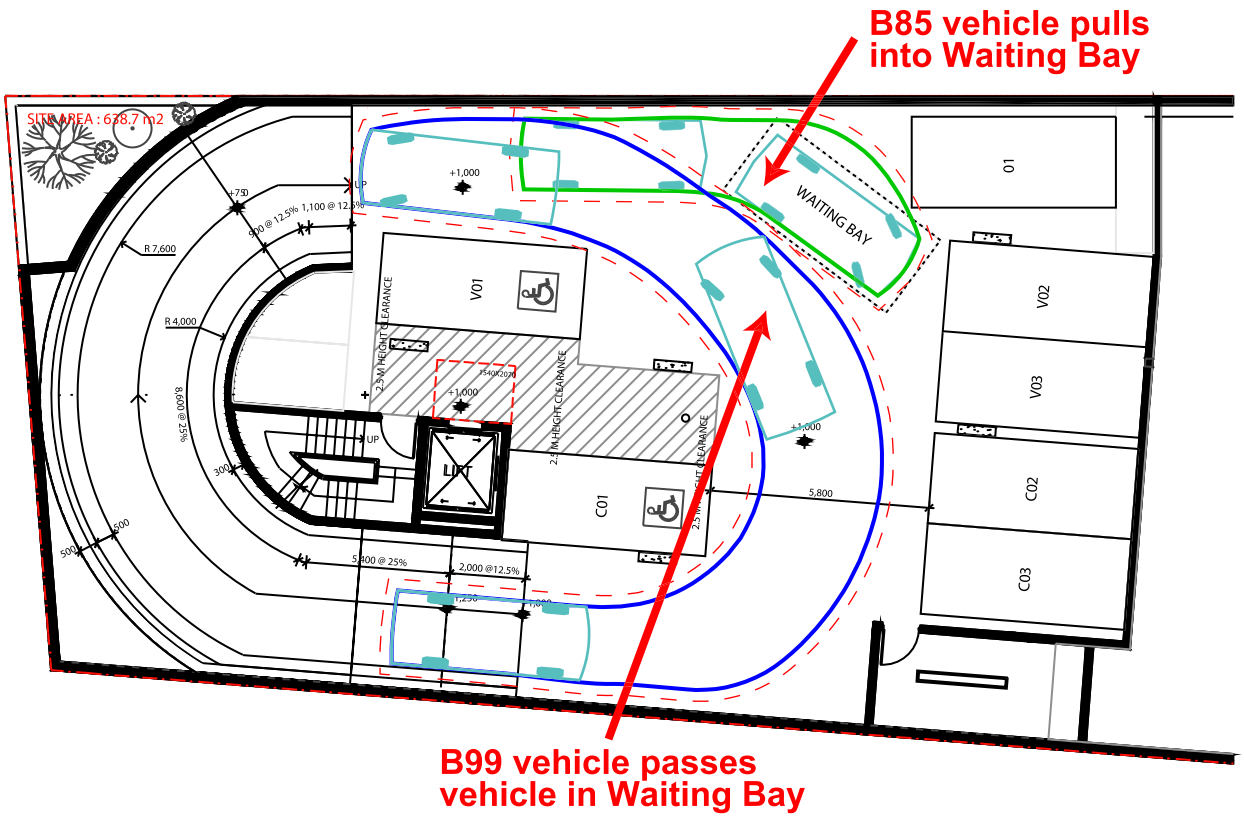
SCALE:	DRAWING NO.:	ISSUE:
1:100@A3	A1003	A

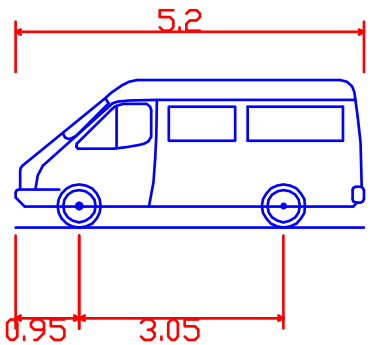
APPENDIX B

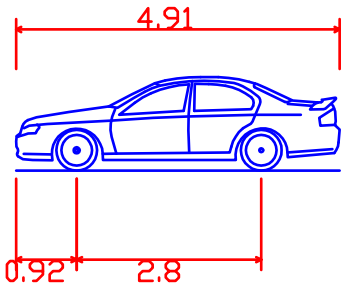
SWEPT PATH ANALYSIS

Path prepared using
Autodesk Vehicle Tracking

0 2 4 6 8 10 20
METRES
SCALE 1:200







B99 Vehicle (Realistic min radius) (2004)	
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00s
Curb to Curb Turning Radius	6.250m

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

B99 Vehicle Path
B85 Vehicle Path
300mm Clearance Path

Manoeuvring Path of Australian Standard AS/NZS2890.1:2004 B99 Vehicle Entering Basement and Passing a Waiting B85 Vehicle

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