BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

PLANNING
PROJECT MANAGEMENT
ENGINEERING
CERTIFICATION

Albany Investments Pty Ltd

Traffic & Parking Impact Assessment

Residential Flat Building

7-11 Bent Street, Gosford

May 2019

barkerryanstewart.com.au

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

PLANNING
PROJECT MANAGEMENT
ENGINEERING
CERTIFICATION

Project No.	CC150124R03
Author	AS
Checked	GB
Approved	GB

Rev No.	Status	Date	Comments
1	DA submission	11/03/15	
2	DA submission	19/04/17	Number of units revised
3	DA submission	25/10/17	Client amendments
4	DA submission	07/12/17	
5	DA submission	21/12/18	Amended Plans
6	DA submission	10/05/19	Amended Plans

SYDNEY
Suite 603, Level 6, 12 Century Circuit
Norwest Business Park NSW 2153
P (02) 9659 0005 **F** (02) 9659 0006
E sydney@barkerryanstewart.com.au

CENTRAL COAST
Studio 5, 78 York Street
East Gosford NSW 2250
P (02) 4325 5255
E coast@barkerryanstewart.com.au

HUNTER
Unit 1, 17 Babilla Close
Beresfield NSW 2322
P (02) 4966 8388 **F** (02) 4966 1399
E hunter@barkerryanstewart.com.au

barkerryanstewart.com.au

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

PLANNING
PROJECT MANAGEMENT
ENGINEERING
CERTIFICATION

TABLE OF CONTENTS

SYDNEY
Suite 603, Level 6, 12 Century Circuit
Norwest Business Park NSW 2153
P (02) 9659 0005 F (02) 9659 0006
E sydney@barkerryanstewart.com.au

CENTRAL COAST
Studio 5, 78 York Street
East Gosford NSW 2250
P (02) 4325 5255
E coast@barkerryanstewart.com.au

HUNTER
Unit 1, 17 Babilla Close
Beresfield NSW 2322
P (02) 4966 8388 F (02) 4966 1399
E hunter@barkerryanstewart.com.au

barkerryanstewart.com.au

1 Introduction

Barker Ryan Stewart have been engaged by Albany Investments Pty Ltd to prepare a Traffic and Parking Impact Assessment in accordance with the requirements of Central Coast Council's Gosford DCP 2013 (DCP) and LEP 2014 (LEP) and the Road and Maritime Services (RMS) *'Guide to Traffic Generating Developments'* to accompany a Development Application for a 101-unit residential flat building at 7-11 Bent Street, Gosford. A Site Plan is provided at **Appendix A.**

The purpose of this report is to assess and address traffic, access, car parking and pedestrian impacts generated by the proposed development. This can be briefly outlined as follows:

- The expected traffic generation to/from the proposed development.
- The impact of the proposed development on the road network.
- Intersection analysis based on traffic counts.
- Vehicle parking provisions.
- Access design requirements.
- Delivery and Waste Collection.
- Provision for pedestrians.
- Availability of public transport.

This Traffic and Parking Impact Assessment Report concludes that the subject site is suitable for the proposed development in relation to traffic impact, car parking provision, vehicle and pedestrian access and safety considerations.

2 Existing Conditions

2.1 Site Location

The site is located at the northern end of the Gosford CBD. The address is 7-11 Bent Street, Gosford and comprises:

- Lot 26 DP 1591
- Lot 1 DP 436706
- Lot B DP 357731

The site is bound by Bent Street to the north, Henry Parry Drive to the east and residential units and houses to the south and west.

Figure 2.1: Site Location (NSW Land & Property Information SIX Maps 2013)

The subject site has an area of approximately 1,721m² and grades from an approximate RL 40m AHD at the eastern edge of the site down to an approximate RL 38m AHD adjacent at the south-western corner.

2.2 Existing Development

The site is currently developed with a unit complex at 9-11 Bent Street comprising 4 units and a single dwelling at 7 Bent Street.

According to the Gosford DCP 2013 a total of 6 car parking spaces would be required to be provided for the existing use of the site. The 6 existing car parking spaces provided represents the existing development meets the requirements of the DCP.

USE	GOSFORD DCP 2013	TOTAL EXISTING PARKING
Dwelling	1 space / Dwellings less than 125sqm	1
Multi Dwelling Housing (4 units)	1 space / unit 0.2 spaces / unit	5
Total	6	6

Figure 2.3: Existing site use – Gosford DCP 2013 car park requirement & existing parking

2.3 Existing Road Conditions

Bent Street is a 100m long no through road used for local access to residents. The speed limit in the vicinity of the site is 50km/h.

There is no formal footpath paving for the entire length of Bent Street on either side of the road. There is a T-intersection at the end of Bent Street with Watt Street. In order to access the site drivers of vehicles will need to enter Bent Street from the north off Watt Street as this intersection has a left in/left out operation.

Bent Street

Bent Street has a sealed carriageway width of 9m with unformed table drains on both sides in the footpath area. Bent Street has one eastbound lane and one westbound lane and no parking restrictions for on-street parking. Bent Street provides access to local residents. Bent Street is left out only with right turns not permitted onto Watt Street.

Watt Street

Watt Street has a sealed carriageway width of 10m with kerb and gutter on either side of the road. The portion of Watt Street adjacent to Bent Street has one northbound lane and one southbound lane with restricted 1 hour on street parking on the western side and no on-street parking on the eastern side. The right turn movement is prohibited from Watt Street into Bent Street.

Watt Street provides a linkage through the Gosford City Centre and continues to North Gosford.

2.4 Traffic Flows and Volumes

2.4.1 Daily Traffic Data

Roads and Maritime Services (RMS) collects traffic volume information from roadside traffic collection devices across the NSW Road Network.

The website states, *'Traffic volume information is collected via permanent and sample roadside traffic collection devices.*

Roads and Maritime Services has approximately 600 permanent roadside collection device stations which continuously collect traffic information 365 days per year. There are also numerous sample

roadside collection device stations across NSW, which collect information on a short-term basis usually over a two-week period.'

From RMS average daily traffic volume map the nearest traffic counting station is Station ID 05796 Narara located approximately 4.5km north of the subject site on the Pacific Highway.

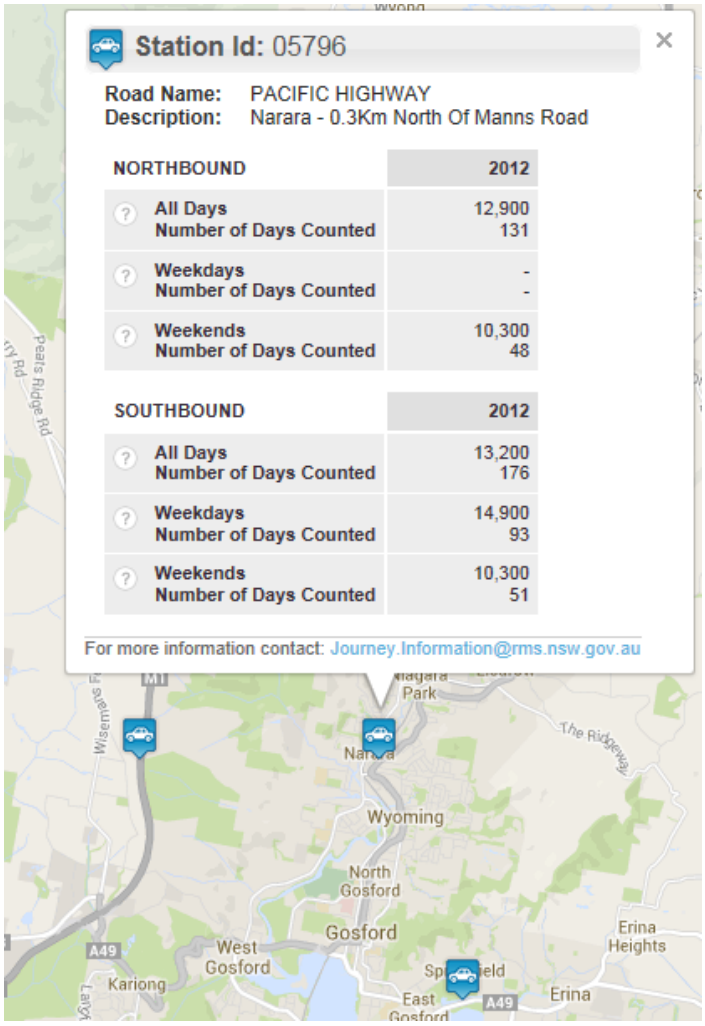


Figure 2.4: RMS's average daily traffic volume map

From the counts undertaken at Station ID 05796 in 2012 all days total of 12,900 northbound and 13,200 southbound vehicles were counted on average per day. Note that weekdays northbound were not provided therefore the weekday figures are not available.

Note that a large portion of the vehicles counted on these days would have dispersed into the road network and not driven passed the development site via Bent Street and therefore cannot be relied upon as an estimate of the traffic passing the site in Bent Street.

2.4.2 Existing Road Service Level

The RMS's '*Guide to Traffic Generating Development*' states, '*An important consideration in determining the impact of a development proposal on the road system is to assess the effect on traffic efficiency, the objective of which is to maintain the existing level of service. Adverse effects must be identified and corrective measures designed. The level of service is used as the performance standard. This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom to manoeuvre.*'

The capacity of the urban road is generally determined by the capacity of intersections. Tables 4.3 and 4.4 of the RMS' Guide to Traffic Generating Developments provide guidance on mid-block capacities for urban roads and likely levels of service. The tables are reproduced below.

Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Figure 2.5: Mid-block lane capacity and level of service

Watt Street

Based on the observed traffic count and roadside environment (with adjacent parking lane northbound and clearway conditions southbound), it is considered that Watt Street operates within the mid-block capacity for an urban road with interrupted flow. Watt Street is currently functioning at a level of service B in the south bound lane and A in the northbound lane in peak hour conditions.

Bent Street

Based on the observed traffic count and roadside environment (with adjacent parking lane), it is considered that Bent Street operates within the mid-block capacity for an urban road with interrupted flow. Bent Street is currently functioning at a level of service A in peak hour conditions.

The RMS guide states that service level A is '*the top level …a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.*'

A level of service B, '*is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the level of Service A.*'

2.4.3 Traffic Counts

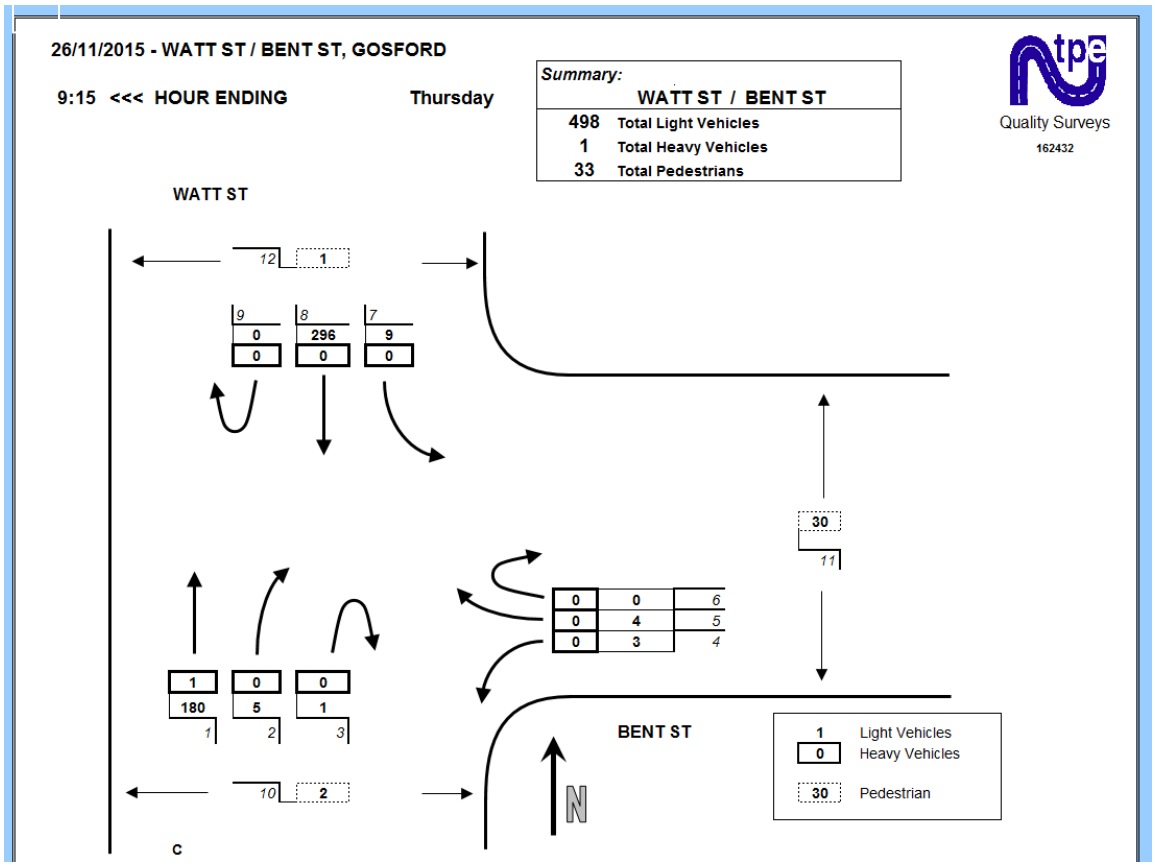
Traffic counts were undertaken during the morning and afternoon peak periods to gauge the performance of the current road system.

Barker Ryan Stewart engaged Northern Transport Planning & Engineering to undertake traffic counts at the intersection of Bent Street and Watt Street on Thursday 26th November 2015 in the morning between 7.30am and 9.30am and in the evening between 3.30pm and 5.30pm.

The full results of the traffic counts are shown in **Appendix B.**

Bent Street and Watt Street

The results of the traffic counts at the intersection of Bent Street and Watt Street during the morning peak 8.15am to 9.15am and evening peak 4.30pm to 5.30pm are shown in **Figure 2.6** below.



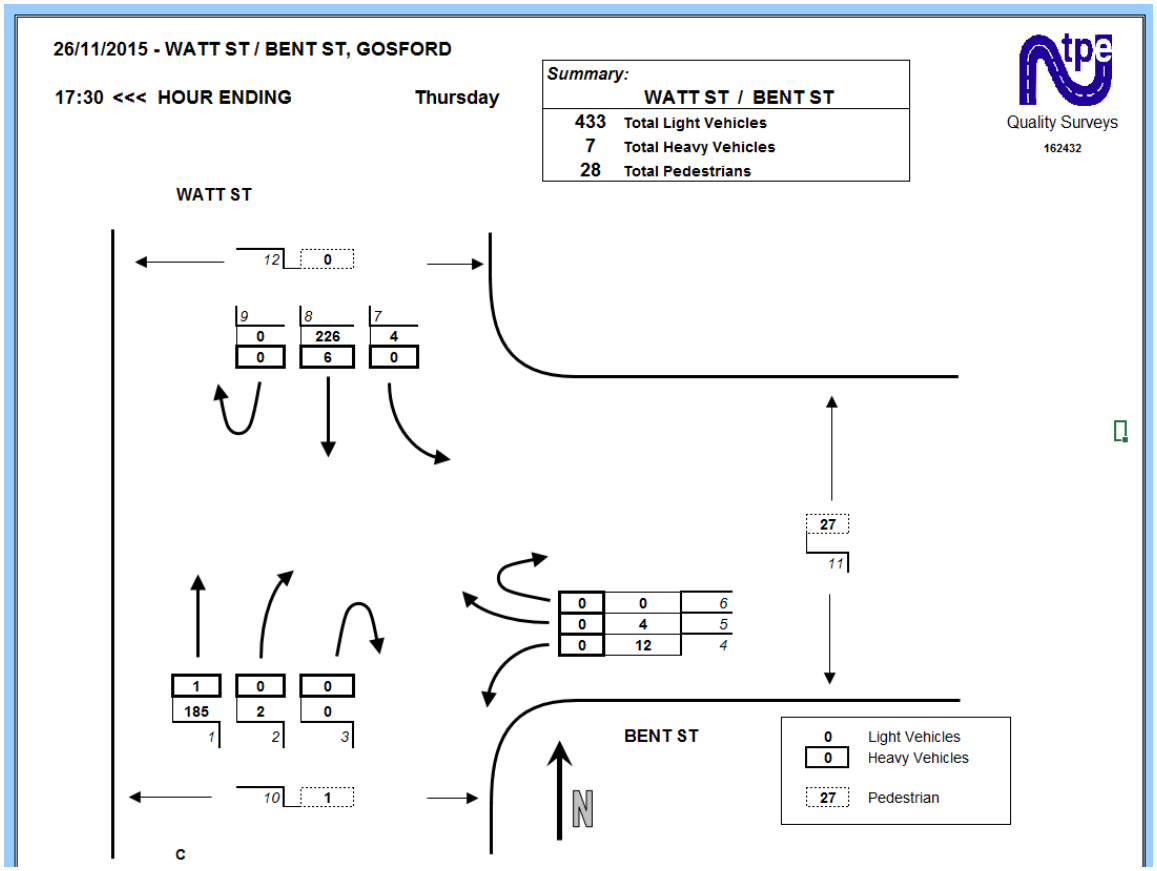


Figure 2.6: Intersection of Bent Street and Watt Street traffic counts

2.5 Public Transport, Pedestrians and Cyclists

The area is well connected to public transport, with rail, ferry and bus connections located in close proximity to the site.

The site is located along a number of bus routes with a bus stop located adjacent to the intersection of Watt Street and Beane Street, approximately 180m to the north of the subject site. The bus services link the area with Gosford North and beyond, Gosford East and beyond and to the Central Coast highway to the west. A bus route map is attached at **Appendix C.**

Gosford railway station is located a short distance (450m) to the west, with the railway line linking with Newcastle and beyond to the north and to Sydney and beyond to the south.

Charter Ferry services are available from Starship Cruises located approximately 1.4km to the south and links with suburbs located on Brisbane Waters.

Being located in the Gosford CBD, pedestrian footpaths allow easy access to other buildings within the CBD, including Gosford City Centre Car Park which is only approximately 750m south along Baker Street.

The site is linked with a number of existing and proposed future cycle paths as shown on the Gosford City Cycleways Map attached at **Appendix D**.

The site is very well located to all forms of public transport. This would minimise the need for residents, visitors and staff of the proposed development to drive their own vehicles to and from their various activities.

3 Proposed Development

3.1 Development Description

The proposal is for 101-unit residential development and associated car parking for 120 vehicles (including 19 Adaptable / Accessible spaces), 9 motorcycle spaces, 43 bicycle parking spaces and associated facilities provided in 4 basement levels.

The waste and loading bay is located at ground level and accessed by a new service lane to be constructed along the eastern boundary of the subject site.

Note that a Demolition and Site Remediation Traffic Management Plan and Construction Management Plan would be required to be prepared at the Construction Certificate Stage. This should be required as conditions of development consent and would generally be addressed by the main builder/contractor engaged to undertake the building works.

3.2 Access

The proposed entry/exit for the basement car parking will be located in Bent Street. The loading bay / waste collection area will be accessed via a 6 metre wide service road that will be constructed within the existing road reserve along the eastern boundary of the site. See **Appendix E** for details. This service road will also provide access for Rural Fire Service vehicles to the highly vegetated area between the subject site and Henry Parry Drive.

The entry/exit driveways comply with *AS/NZS 2890.1-2004 Parking Facilities – Off Street Car Parking, AS 2890.2-2002 Parking Facilities – Off Street Commercial Vehicle Facilities* and Council's DCP requirements.

The access to/from the basement parking is 6 metres wide and complies with the access width requirement for a Category 2 driveway fronting a local road and providing access for 101 to 300 parking spaces (6 to 9 metres wide).

Waste collection / large delivery vehicles will access the service road that will be constructed along the eastern boundary of the site by driving forward into the turning head provided at the eastern end of Bent Street then reversing into the service road. These vehicles will then exit the service road in a forward direction and turn left into Bent Street. The swept turning path demonstrating these manoeuvres is provided at **Appendix F.**

The proposed driveway locations comply with *Figure 3.3 – Minimum Sight Distance for Pedestrian Safety AS/NZS 2890.1* and the proposed driveway gradients comply with *AS/NZS 2890.1*. The access driveway from Bent Street to the basement parking has been designed with a gradient of in 50 (2%) which is much less than the specified maximum grade of 1 in 20 (5%) for an access driveway from the frontage road to 6 metres within the carpark.

3.3 Parking

As outlined above it is proposed to provide a total 120 car parking spaces (including 19 Adaptable / Accessible spaces).

The development also incorporates 43 secure bicycle spaces and 9 motorcycle spaces in accordance with the requirements of Gosford's DCP 2013.

The proposed parking facilities have been designed in accordance with the requirements *AS/NZS 2890.1, AS 2890.2* and *AS/NZS 2890.6 – Off-street Parking for People with Disabilities.*

3.4 Circulation

The proposed ramps and circulation roadways have been designed in accordance with the requirements *AS/NZS 2890.*1. The carpark ramps are 15 metres long and have been designed at a grade of 1 in 4 (25%) which complies with the specified maximum grade for straight ramps up to 20 metres long.

A swept path assessment in accordance with *AS/NZS 2890.1* was undertaken through the car park using a B99 and B85 vehicle and the proposed car park arrangement was found to be satisfactory. At the access and internal circulation ramps the swept paths of the B85 and B99 vehicles can by-pass each other simultaneously. Swept turning paths are provided at **Appendix F**.

3.5 Service Vehicles

Residential waste will be collected by Council's waste contractor from the waste collection/loading bay area on the ground floor via the new service lane to be constructed along the eastern boundary of the subject site.

Waste and recycling bins will be stored in designated refuse areas on the ground floor level.

The waste collection area and loading bay have been designed so that they can be serviced by a 10 metre Gosford Waste Vehicle. These vehicles can access the site in a reverse direction along the new service road by using the new turning head that will be provided at the end of Bent street to manoeuvre as shown in **Appendix F.**

A Waste and Loading Bay Management Plan should be prepared as a requirement of the consent, outlining the safe operation of the waste collection / loading bay area.

3.6 Public Transport, Pedestrians and Cyclists

As stated above, ample bicycle storage is provided to encourage alternative modes of transport to be utilised by residents.

All other public transport services, as discussed in 2.5 above, will be available to the proposed development. It is considered that the additional residents in the area will not have a significant effect on the capacity of the public transport infrastructure, rather it would add to the viability of these services.

4 Car Parking Assessment

4.1 Parking requirements

The proposed access and car parking provision has been assessed against Gosford's DCP 2013 Chapter 4.1 Gosford City Centre 4.1.4 Access and Parking and Servicing, Part 7 Chapter 7.1 Car Park, and the RMS Guide to Traffic Generating Developments.

The required parking provision for the proposed different uses of the site are outlined below:

- Multi Dwelling Housing – Gosford DCP
  - 1-bedroom dwelling – 1 space/dwelling
  - 2-bedroom dwelling – 1.2 space/dwelling
  - 3 of more bedroom dwelling – 1.5 space/dwelling
  - Visitors – 0.2 spaces/dwelling
  - Motorcycle 1 space/15 dwellings (or part thereof)
  - Bicycle (residents) – 1 space/3 dwellings
  - Bicycle (visitors) – 1 space/12 dwellings (or part thereof)

- High Density Residential Flat Buildings – RMS Guide to traffic generating development
  - 1-bedroom dwelling – 0.6 space/dwelling
  - 2-bedroom dwelling – 0.9 space/dwelling
  - 3 of more bedroom dwelling – 1.4 space/dwelling
  - Visitors – 1 space/ 5 units

- Disabled Parking (DCP)
  - Disability – Provide a minimum of 10% for the entire development

Figure 4.1 below outlines the number of car parking spaces required by Gosford DCP 2013 and LEP 2014 for the proposed development.

CAR PARKING REQUIREMENTS	GOSFORD DCP 2013	RMS GUIDE TO TRAFFIC GENERATING DEVELOPMENT	PROPOSED PARKING PROVISION
Multi Dwelling Housing			
1 Bedroom Apartments 29 units	1 space/dwelling **29**	0.6 spaces/dwelling **18**	**120 spaces including 19 adaptable / accessible spaces**
2 Bedroom Apartments 63 units	1.2 spaces/dwelling **76**	0.9 spaces/dwelling **57**	
3 Bedroom Apartments 9 units	1.5 spaces/dwelling **14**	1.4 spaces/dwelling **13**	
Visitor 101 total units	0.2 spaces/dwelling **20**	1 space/5 units **20**	
Disabled Spaces	10% of total spaces **139 x 10% = 14**	10% of total spaces **108 x 10% = 11**	
Total	**139**	**108**	

Figure 4.1: Car Parking requirement and provision

MOTORCYCLE AND BICYCLE REQUIREMENTS	GOSFORD DCP 2013	MOTORCYCLE	BICYCLE
Residential (101 units)	- Motorcycle 1 space/15 units - Bicycle 1 res./3 units & 1 visitor/12 units	**7**	34 + 9 = **43**
Total required		**7**	**43**
Proposed provision		**9**	**43**

Figure 4.2: Motorcycle and bicycle requirement and provision

4.2 Parking provision

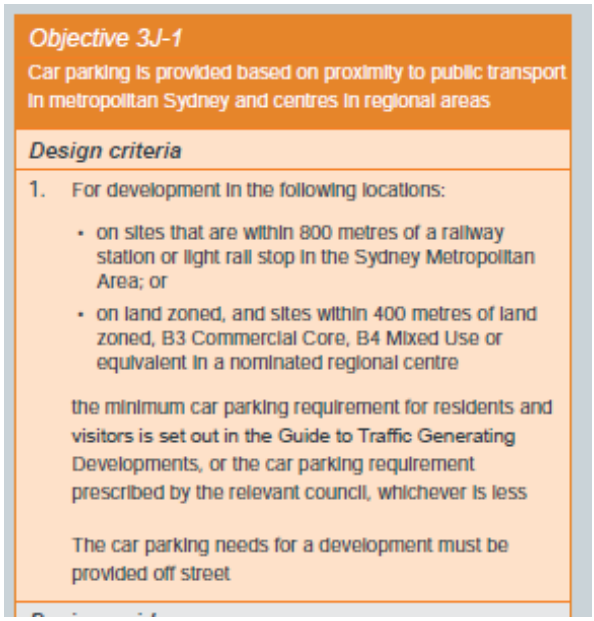
It is proposed to provide 120 car parking spaces for the entire development within 4 separate car parking areas. This represents a short fall of 19 spaces compared to the 139 spaces required in accordance with the Gosford DCP 2013. However, the proposed parking provision is more than the requirements of the RMS guidelines by 11 parking spaces.

Nineteen spaces are to be dedicated to adaptable /accessible parking, which generally represents 15.1% of the total spaces provided. This complies with the Gosford DCP 2013, 4.1 Gosford City Centre requirements.

A total of 9 motorcycle parking spaces are proposed to be provided. This meets the 7 spaces required by the Gosford DCP 2013.

It is proposed to provide bicycle parking for 43 bicycles. This meets the 43 spaces required by the Gosford DCP 2013.

The site meets the location requirements for a regional area in accordance with the Apartment Design Guide (see below) in which the design criteria provides for the minimum car parking requirement to be the lesser of the Council and RMS requirements. The proposed provision of 120 spaces exceeds the RMS requirement by 11 spaces and is thus considered to be acceptable.



Objective 3J-1

Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas

Design criteria

1. For development in the following locations:
   - on sites that are within 800 metres of a railway station or light rail stop in the Sydney Metropolitan Area; or
   - on land zoned, and sites within 400 metres of land zoned, B3 Commercial Core, B4 Mixed Use or equivalent in a nominated regional centre

   the minimum car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less

   The car parking needs for a development must be provided off street

5 Traffic Assessment

5.1 Traffic Generation

5.1.1 Existing Development

From the RMS's '*Guide to Traffic Generating Developments*', Section 3 – Land Use Traffic Generation the existing estimated traffic volumes generated by the existing educational and council building use described in Section 2.2 are outlined in Figure 5.1 below.

USE	PEAK HOUR VEHICLE TRIPS RATES	PEAK HOUR VEHICLE TRIPS
Dwelling houses 1	0.85/per dwelling	0.85
Medium Density Residential flat buildings 4 units	0.4-0.5/per unit	2
Total		**3**

Figure 5.1: Existing site use – traffic generation

5.1.2 Proposed Development

From the RMS's '*Guide to Traffic Generating Developments*', Section 3 – Land Use Traffic Generation the proposed estimated traffic volumes generated by the residential development are outlined in Figure 5.2 below.

USE	PEAK HOUR VEHICLE TRIPS RATES	PEAK HOUR VEHICLE TRIPS
High density residential flat building 101 units	0.29/unit	29.29
Total		**30**

Figure 5.2: Proposed development – traffic generation

5.2 Impact of Generated Traffic

From anticipated traffic generation rates calculated in Sections 5.1 above, it can be seen that there will be an estimated increase of 27 (30 minus 3) vehicle trip movements per hour in the peak hour for the proposed development when compared against the existing use.

The main traffic impacts of the development will occur in the AM and PM peak hour traffic periods.

In urban areas, the capacity of intersections generally constrains the capacity of the overall road network therefore the impact of the proposal on intersection performance on the local road network needs to be assessed. In this respect, the Bent Street and Watt Street intersection is most likely to be impacted by the development.

Intersection performance has been assessed using the SIDRA 6.1 modeling software which uses the level of service (delay) model adopted by the Roads and Maritime Services (RMS) in NSW to assess intersection performance. Average delay is used to determine the level of service (LOS) based on the following table sourced from the RMS' Guide to Traffic Generating Developments.

Table 4.2
Level of service criteria for intersections

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

Figure 5.3: RMS level of service criteria for intersections

For assessment purposes a LOS D or higher is considered satisfactory intersection operation. In predicting future traffic growth, a background traffic growth rate of 2 % per annum has been adopted.

As outlined in Section 2.6.3 traffic counts were undertaken at the intersection of Bent Street and Watt Street.

This intersection was modelled using SIDRA for the AM and PM peaks, pre and post development traffic generation rates and for 10-year Gosford CBD growth at 2% p.a.

The traffic modelling has been based on the following distribution:

- AM Peak
  - 100% of traffic leaving Bent street and turning left onto Watt Street (right turn not permitted out of Bent Street onto Watt Street)
- PM Peak
  - 50% of traffic leaving Bent street and turning left onto Watt Street (right turn not permitted out of Bent Street onto Watt Street)
  - 50% of traffic entering Bent Street turning left from Watt Street (right turn not permitted into Bent Street).

The results of the SIDRA analysis for each intersection are summarised below, with the full results attached at **Appendix G.**

It should be noted that the SIDRA model reflected a previous iteration of the DA plans, which had more units (161) and serviced apartments. This analysis is therefore considered to be a conservative model.

Bent Street and Watt Street (T-intersection)

The Bent Street and Watt Street Give Way T-intersection was modelled for the AM and PM peaks for the following scenarios:

1. Existing traffic generation
2. Existing traffic + development generated traffic
3. Existing traffic + development generated traffic + 10-year growth

In each circumstance the intersection was considered to operate at an optimum level of service A, *'Good operation'*.

It is considered that the traffic generated by the development, including 10-year growth projections would not have an adverse impact on this intersection.

5.3 State Environmental Planning Policy (Infrastructure)

The car park of the proposed development does not have direct access to a main road under the authority of RMS.

6 Conclusion/Recommendations

This Traffic and Parking Impact Assessment has been prepared in accordance with the requirements of the Gosford City Council's DCP 2013 and the Road and Maritime Services (RMS) *'Guide to Traffic Generating Developments'* to accompany a Development Application to Gosford City Council for the construction of a residential flat building development.

It is not considered that the proposed development will have a significant impact on the performance of the adjacent intersection (Bent/Watt Street). Overall it can be concluded that the development will not have an adverse impact on the efficiency of the existing local road network.

The proposed 120 car parking spaces provided for the 101 residential units is sufficient to meet the requirements of the RMS guide to traffic generating developments. Suitable motor cycle parking, bicycle parking and parking for disabled persons is generally meeting the requirements of Gosford DCP 2013 have also been provided within the development.

The proposed parking and loading facilities have been designed in accordance with the requirements of AS2890.1 – Off Street Car Parking, AS2890.2 – Off-Street Commercial Vehicle Facilities and AS 2890.6 – Off-street Parking for People with Disabilities. These facilities are also considered practical and safe ensuring that all traffic generated by the development can exit the site in a forward direction.

Residential waste will be collected by Council's Residential Waste Services via the service road that will be constructed along the eastern boundary of the site.

The Traffic and Parking Impact Assessment concludes that the subject site is suitable for the proposed development in relation to the impact of traffic, car parking provision, vehicle and pedestrian access and safety considerations.

7 References

Australian Standards, *'AS/NZS 2890.1:2004 Off-Street Car Parking'*.

Australian Standards, *'AS 2890.2:2002 Off-Street Commercial Vehicle Facilities'*.

Australian Standards, 'AS/NZS 2890.6:2002 Off-Street Parking for People with Disabilities'.

Roads and Maritime Services, *'Guide to Traffic Generating Developments'* Version 2.2 dated October 2002.

Roads and Maritime Services, *'Traffic Control at Work Sites'* Version 5.0 dated September 2018.

Roads and Maritime Services, *'Road Design Guide'*.

Austroads *'Guide to Traffic Management – Part 3 Traffic Studies and Analysis'*

Austroads *'Guide to Road Design – Part 4A Unsignalised and Signalised Intersections'*

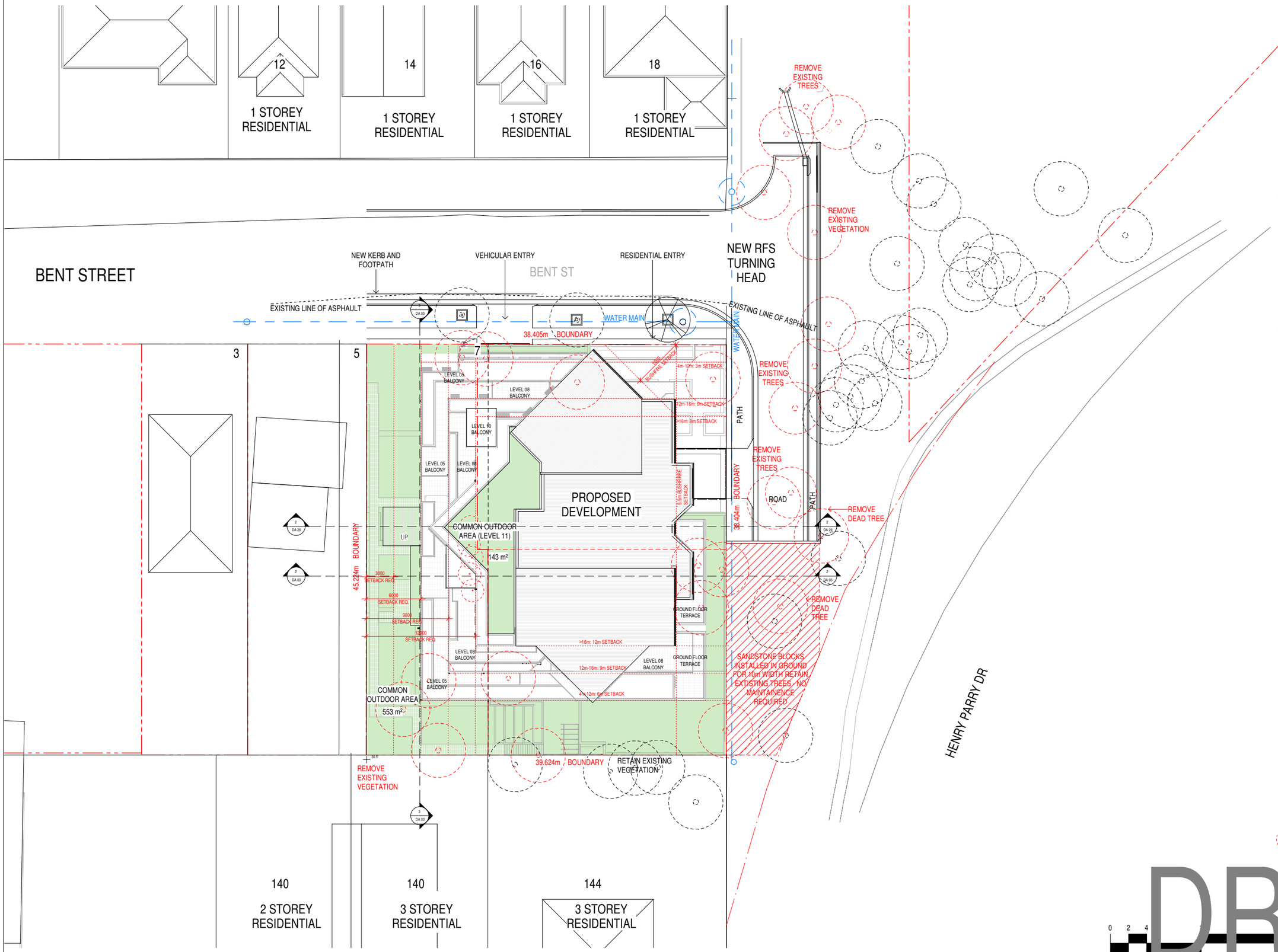
NSW Department of Planning, *'SEPP (Infrastructure) 2007'*

NSW Department of Planning, *'Apartment Design Guide'*

Central Coast Council's Gosford DCP 2013

Gosford City Centre, *'Transport Management and Accessibility Plan'* prepared by AECOM Australia.

APPENDIX A
Site Plan



1 DA 03 SITE PLAN 1 : 200

SCHEDULE OF AREAS

SITE AREA	1793.5 m²	
SITE COVERAGE PROPOSED (50% MAX . SITE COVER PERMITTED UNDER GOSFORD DCP CLAUSE 4.1.2.7)	1464.9 m²	82%
DEEP SOIL ZONE (7% MIN . DEEP SOIL ZONE UNDER THE APARTMENT DESIGN GUIDE)	209 m²	11.6%
COMMON OUTDOOR AREA (25% MIN . UNDER THE APARTMENT DESIGN GUIDE)	696 m²	38.8%

FSR CALCULATION

TO RFDC DEFINITION

LEVEL B1 FLOOR	143.693 m²
LOWER GROUND FLOOR	272.936 m²
GROUND FLOOR PLAN	639.565 m²
LEVEL 01 FLOOR	744.481 m²
LEVEL 02 FLOOR	748.725 m²
LEVEL 03 FLOOR	757.369 m²
LEVEL 04 FLOOR	759.951 m²
LEVEL 05 PLAN	587.823 m²
LEVEL 06 PLAN	580.439 m²
LEVEL 07 PLAN	581.140 m²
LEVEL 08 PLAN	494.604 m²
LEVEL 09 FLOOR	494.383 m²
LEVEL 10 FLOOR	494.724 m²
LEVEL 11 FLOOR	315.298 m²
Grand total: 104	7615.131 m²

FSR **4.25:1**

MAXIMUM FSR 6.175:1 (4.75 + 30% BONUS)

1 BED	22
1 BED + STUDY	7
2 BED	63
3 BED	9

WASTE CALCULATIONS

101 UNITS X 120L= 12120L (AS PER GOSFORD DCP REQUIREMENT) + 4 x 240L GREEN WASTE BINS — 7x1.1m³ +0.66m³ BINS

(TWICE WEEKLY COLLECTION - THE SAME AMOUNT OF BINS FOR RECYCLING AND WASTE HAVE BEEN PROVIDED)

TOTAL UNITS: 101

SCHEDULE OF BASIX REQUIREMENTS

REFER TO BASIX REPORT FOR FULL LIST OF REQUIREMENTS, THES INCLUDE:
WATER COMMITMENTS:
- TOILETS 4 STAR
- TAPS 4 STAR
- DISHWASHER 4 STAR
- CENTRAL RAINWATER TANK
- SWIMMING POOL NOT TO EXCEED 65kL

BASIX ENERGY COMMITMENTS:
- 5 STAR INSTANTANEOUS GAS HOT WATER
- AIR CONDITIONING 1 PHASE 2 STAR TO LIVING ROOMS
- COOK GAS TOP AND ELECTRIC OVEN
- DISHWASHER 3 STAR
- DRYER 1.5 STAR
- POOL UNHEATED

LEGEND

EXISTING TREES TO BE REMOVED

COMMON OUTDOOR AREA

NOTE:
TYPICAL DIMENSIONS FOR LEVEL 1-4 ARE SHOWN ON DA 10
TYPICAL DIMENSIONS FOR LEVEL 6-7 ARE SHOWN ON DA 15
TYPICAL DIMENSIONS FOR LEVEL 8-11 ARE SHOWN ON DA 18

0 2 4 20 40

Issue	Description	Date	Chk Auth
12	RFI UPDATE	30.04.19	SO AK
11	RFS UPDATE	09.11.18	SO AK
10	RFI UPDATE	11.10.18	SO AK
9	UPDATE	02.07.18	SO AK

Member Australian Institute of Architects

ADG architects
Suite 3.04, Level 3, 107-109 Mann St Gosford 2250
ph: 02 4340 2088 fax: 02 4340 2098 e:info@adgarchitects.com.au

Project: PROPOSED RESIDENTIAL FLAT DEVELOPMENT (DIAMOND APARTMENTS)

Client: KDC GROUP

Location: 7-11 BENT ST GOSFORD N.S.W.

Drawing: SITE PLAN

N

PRELIMINARY
NOT TO BE USED DURING CONSTRUCTION

Project Number 15026 | Drawing Number DA 02 | Issue 12

Scale As indicated @ A1 | Date Printed 30/04/2019 17:17:21

File Name \\Adgserver01\adg\15_026 Bent St\2-DA\BENT ST_DA revised.rvt

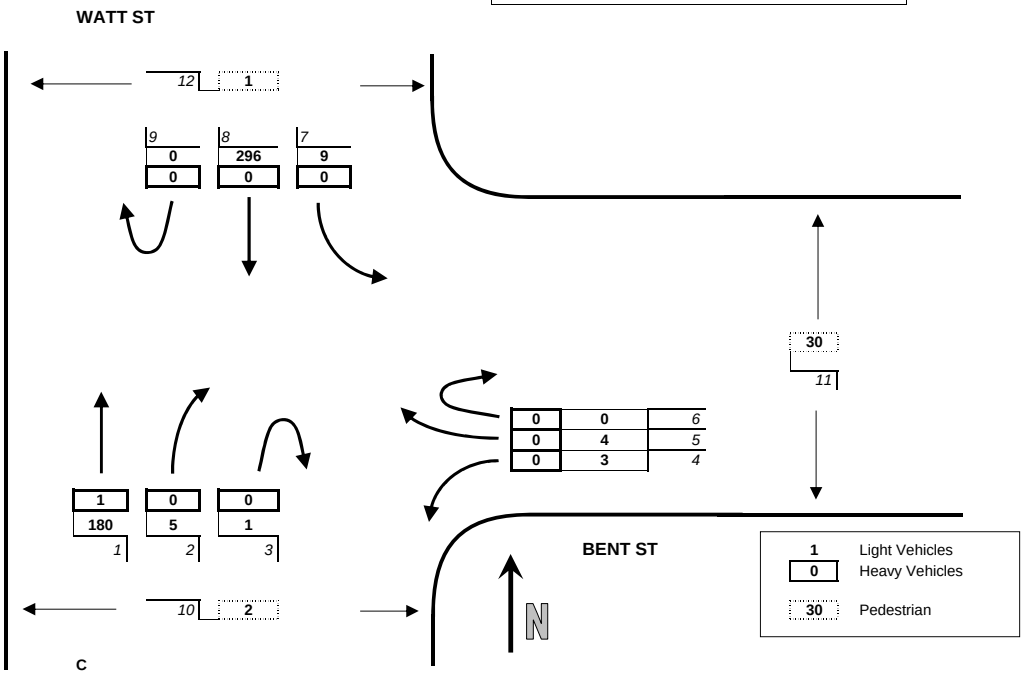
APPENDIX B
Traffic Counts

26/11/2015 - WATT ST / BENT ST, GOSFORD

9:15 <<< HOUR ENDING **Thursday**

Summary: WATT ST / BENT ST	
498	Total Light Vehicles
1	Total Heavy Vehicles
33	Total Pedestrians

Quality Surveys
162432



26/11/2015 - WATT ST / BENT ST, GOSFORD

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN HOUR		Pedestrians 10	11	12
07:45	34	0	0	2	0	0	3	26	0	65		0	5	2
08:00	58	0	0	1	0	0	2	54	0	115		1	2	0
08:15	27	2	0	2	1	0	4	51	0	87		1	5	0
08:30	43	0	0	0 <	2	0	5 <	61	0	111	378	0 <	14	0 <
08:45	54 <	3	0	1	1	0	0	85	0	144	457	0 <	5	1
09:00	42	1	1 <	1	1 <	0	3	88	0	137	479	1 <	6 <	0
09:15	41	1	0 <	1	0	0	1	62 <	0	106	498 <	1 <	5 <	0
09:30	30	2 <	0 <	2 <	0	0	0	45	0	79	466	0 <	7	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN HOUR	
07:45	0	0	0	0	0	0	0	1	0	1	
08:00	0	0	0	0	0	0	0	0	0	0	
08:15	0	0	0	0	0	0	0	0	0	0	
08:30	0	0	0	0	0	0	0	0 <	0	0	1 <
08:45	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0
09:15	1 <	0	0	0	0	0	0	0	0	1	1 <
09:30	0 <	0	0	0	0	0	0	0	0	0	1 <

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN HOUR	
07:45	34	0	0	2	0	0	3	27	0	66	
08:00	58	0	0	1	0	0	2	54	0	115	
08:15	27	2	0	2	1	0	4	51	0	87	
08:30	43	0	0	0 <	2	0	5 <	61	0	111	379
08:45	54 <	3	0	1	1	0	0	85	0	144	457
09:00	42	1	1 <	1	1 <	0	3	88	0	137	479
09:15	42	1	0 <	1	0	0	1	62 <	0	107	499 <
09:30	30	2 <	0 <	2 <	0	0	0	45	0	79	467

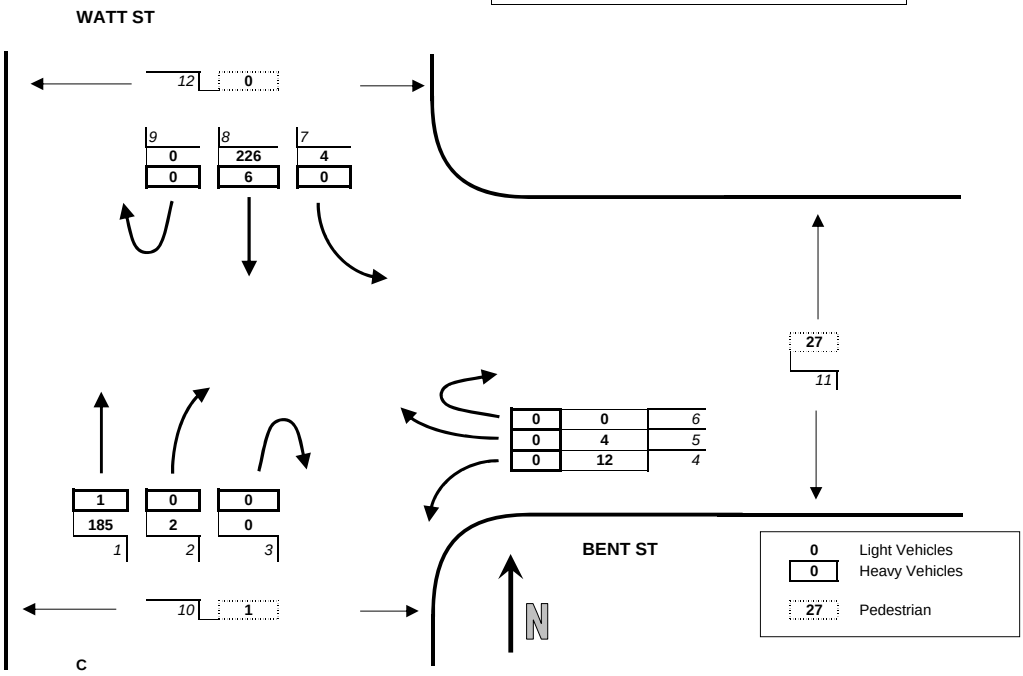
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

26/11/2015 - WATT ST / BENT ST, GOSFORD

17:30 <<< HOUR ENDING **Thursday**

Summary: WATT ST / BENT ST	
433	Total Light Vehicles
7	Total Heavy Vehicles
28	Total Pedestrians

Quality Surveys
162432



26/11/2015 - WATT ST / BENT ST, GOSFORD

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN HOUR		Pedestrians 10	11	12
15:45	41	0	0	0	2	0	1	54	0	98		0	8	0
16:00	52	1	1	1	1	0	2	45	0	103		1	4	0
16:15	54	1	0	0	3	0	3	48	0	109		1	8	0
16:30	40	0	1 <	2	2	0	2	37	0	84	394	1 <	4	0
16:45	47 <	1 <	0 <	3	3 <	0	3 <	55	0	112	408	0 <	8	0
17:00	44	0	0	3	0	0	0	58	0	105	410	1 <	2	0
17:15	55	1	0	4 <	0	0	1	47	0	108	409	0	9	0
17:30	39	0	0	2 <	1	0	0	66 <	0	108	433 <	0	8 <	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN HOUR	
15:45	1	0	0	0	0	0	0	0	0	1	
16:00	0	0	0	0	0	0	0	0	0	0	
16:15	0	0	0	0	0	0	0	1	0	1	
16:30	0 <	0	0	0	0	0	0	1	0	1	3
16:45	0	0	0	0	0	0	0	1	0	1	3
17:00	0	0	0	0	0	0	0	1	0	1	4
17:15	0	0	0	0	0	0	0	3 <	0	3	6
17:30	1 <	0	0	0	0	0	0	1 <	0	2	7 <

All Vehicles

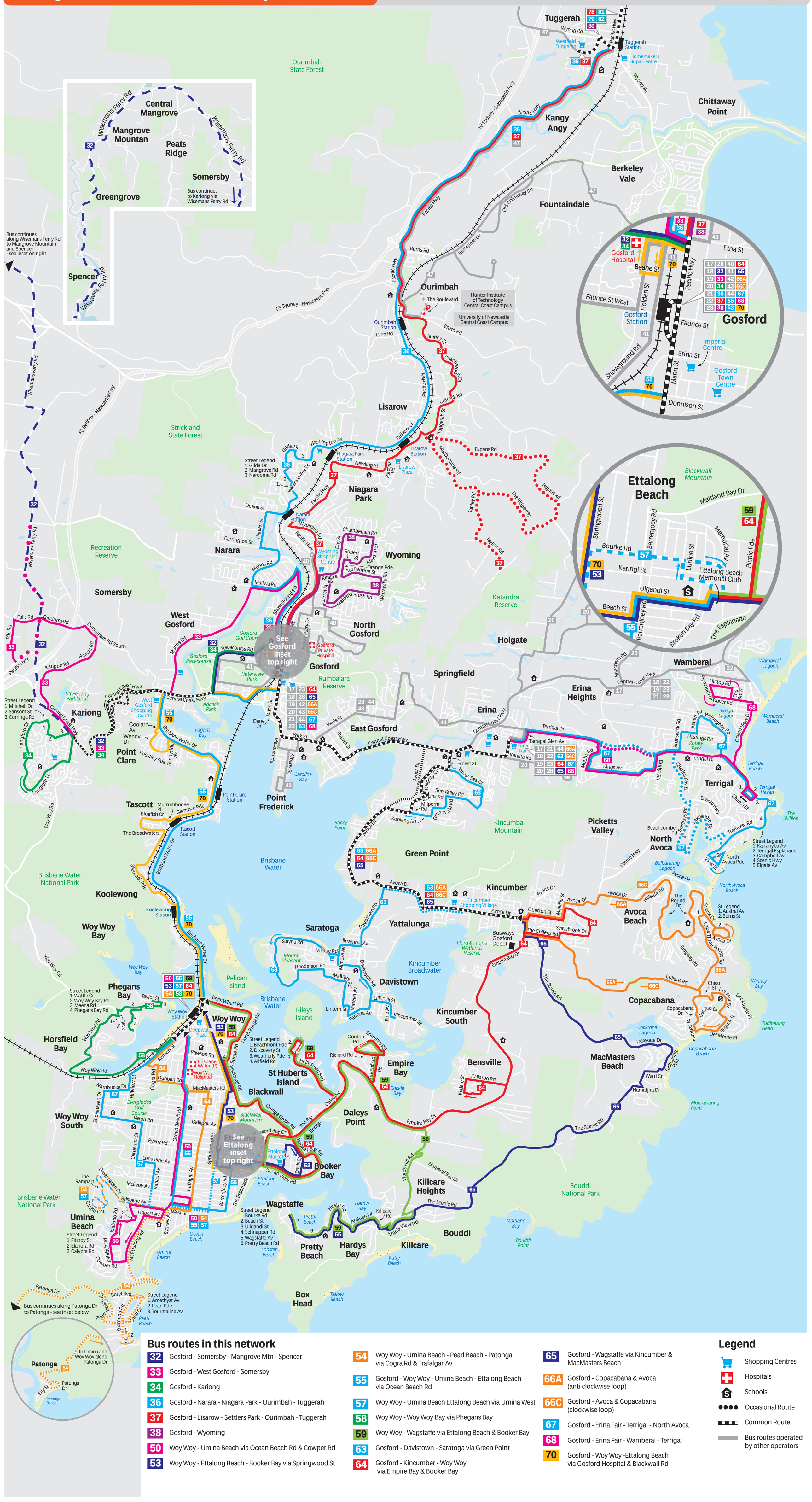
	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN HOUR	
15:45	42	0	0	0	2	0	1	54	0	99	
16:00	52	1	1	1	1	0	2	45	0	103	
16:15	54	1	0	0	3	0	3	49	0	110	
16:30	40	0	1 <	2	2	0	2	38	0	85	397
16:45	47 <	1 <	0 <	3	3 <	0	3 <	56	0	113	411
17:00	44	0	0	3	0	0	0	59	0	106	414
17:15	55	1	0	4 <	0	0	1	50	0	111	415
17:30	40	0	0	2 <	1	0	0	67 <	0	110	440 <

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

APPENDIX C
Bus Route Map

Region 6 Gosford Network Map Effective 8/11/2010

busways



Bus routes in this network

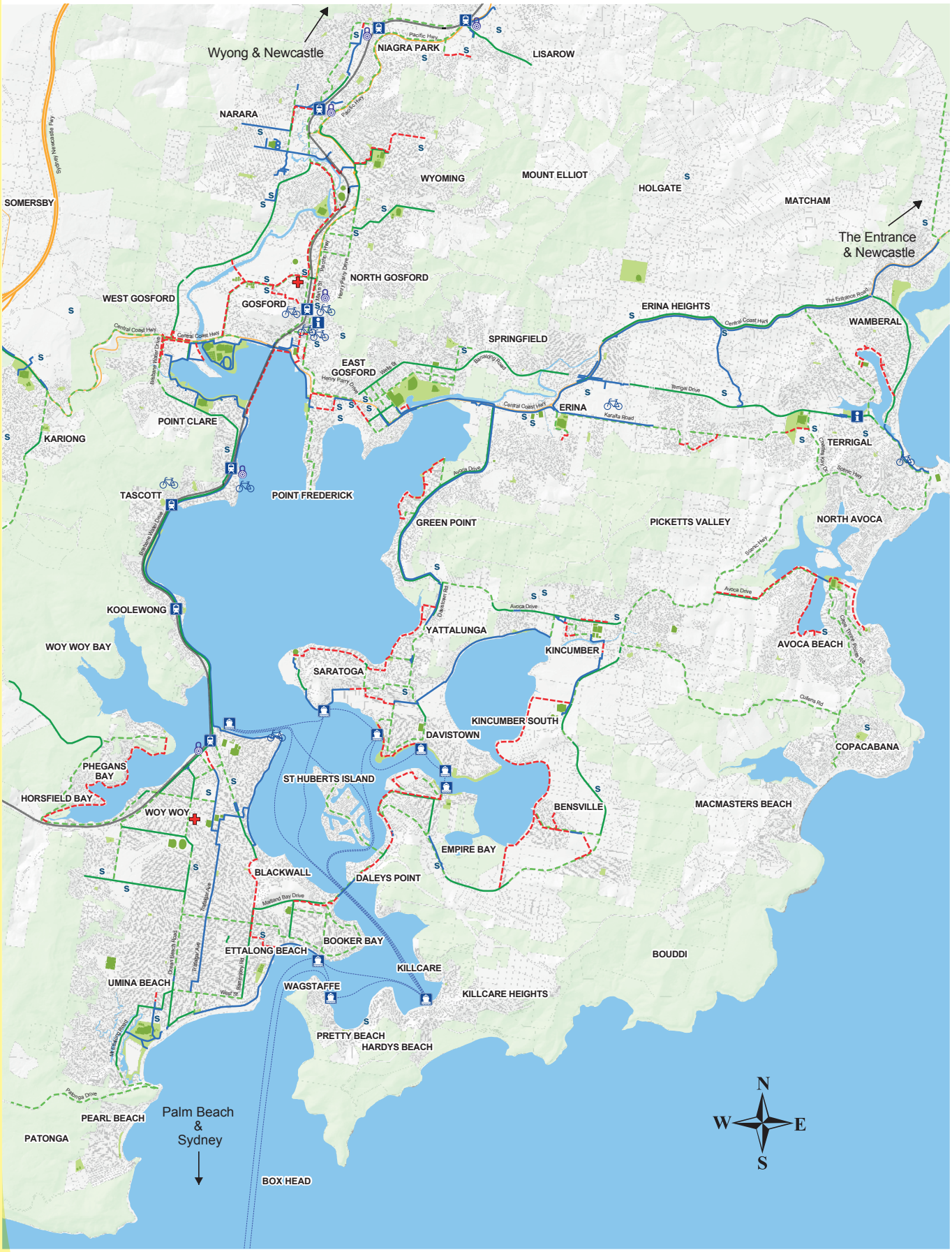
- **32** Gosford - Somersby - Mangrove Mtn - Spencer
- **33** Gosford - West Gosford - Somersby
- **34** Gosford - Kariong
- **36** Gosford - Narara - Niagara Park - Ourimbah - Tuggerah
- **37** Gosford - Lisarow - Settlers Park - Ourimbah - Tuggerah
- **38** Gosford - Wyoming
- **50** Woy Woy - Umina Beach via Ocean Beach Rd & Cowper Rd
- **53** Woy Woy - Ettalong Beach - Booker Bay via Springwood St
- **54** Woy Woy - Umina Beach - Pearl Beach - Patonga via Cogra Rd & Trafalgar Av
- **55** Gosford - Woy Woy - Umina Beach - Ettalong Beach via Ocean Beach Rd
- **57** Woy Woy - Umina Beach Ettalong Beach via Umina West
- **58** Woy Woy - Woy Woy Bay via Phegans Bay
- **59** Woy Woy - Wagstaffe via Ettalong Beach & Booker Bay
- **63** Gosford - Davistown - Saratoga via Green Point
- **64** Gosford - Kincumber - Woy Woy via Empire Bay & Booker Bay
- **65** Gosford - Wagstaffe via Kincumber & MacMasters Beach
- **66A** Gosford - Copacabana & Avoca (anti clockwise loop)
- **66C** Gosford - Avoca & Copacabana (clockwise loop)
- **67** Gosford - Erina Fair - Terrigal - North Avoca
- **68** Gosford - Erina Fair - Wamberal - Terrigal
- **70** Gosford - Woy Woy -Ettalong Beach via Gosford Hospital & Blackwall Rd

Legend

- Shopping Centres
- Hospitals
- Schools
- Occasional Route
- Common Route
- Bus routes operated by other operators

APPENDIX D
Gosford City Cycleways Map

Gosford City Cycleways Map



Kilometres

0 0.5 1 2 3 4

1:55,000

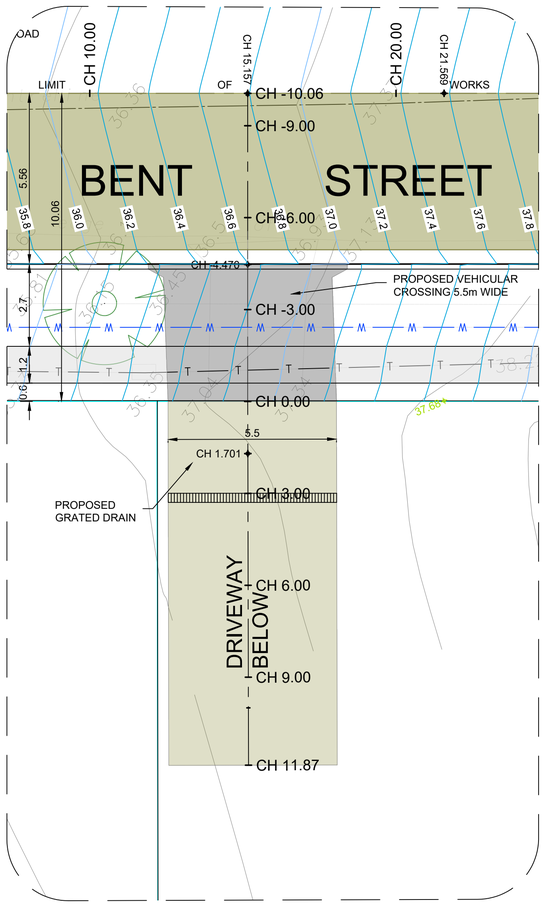
Legend

- Off Road - As Built
- Off Road - Proposed
- On Road - As Built
- On Road - Proposed
- Schools
- Highways
- Ferry Wharfs
- Railway Stations
- Information Centres
- Bike Lockers
- Bike Racks
- Hospital
- Railway Lines

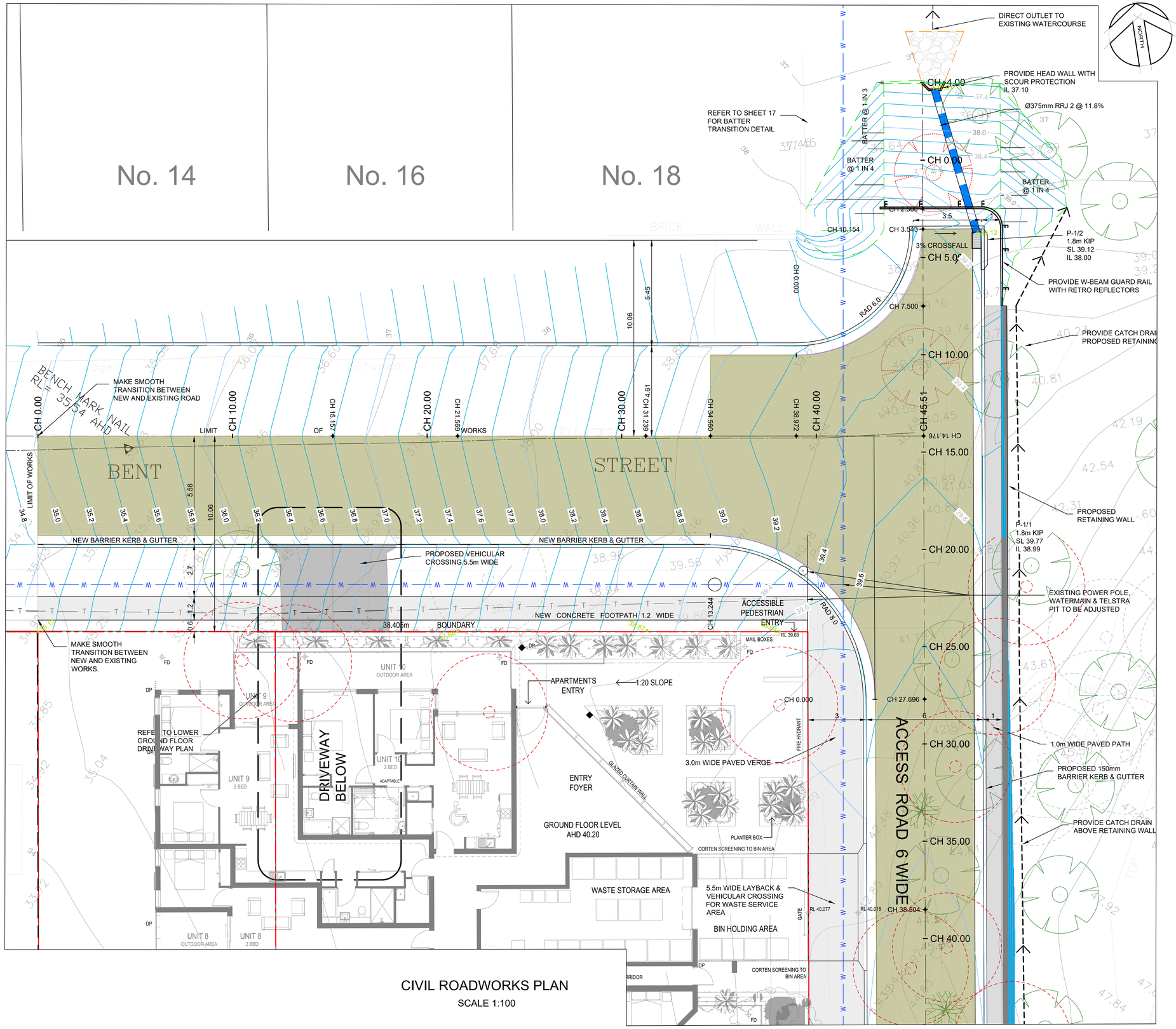
APPENDIX E
Service Road

A1

CONCEPT DESIGN ONLY
SUBJECT TO FINAL DESIGN
NOT TO BE USED FOR CONSTRUCTION



LOWER GROUND FLOOR DRIVEWAY PLAN
SCALE 1:100



CIVIL ROADWORKS PLAN
SCALE 1:100

DIAL BEFORE YOU DIG
www.1100.com.au

2 0 2 4 6 8 10
METRES
1:100

No	DATE	AMENDMENT
G	2/04/2019	BASEMENT PARKING RECONFIGURED
F	28/11/2018	CLIENT AMENDMENTS
E	13/08/2018	CLIENT AMENDMENTS
D	06/12/2017	CLIENT AMENDMENTS
C	25/10/2017	COUNCIL AMENDMENTS

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
PLANNING - PROJECT MANAGEMENT - ENGINEERING - CERTIFICATION

SYDNEY
P: 02 9659 0005
CENTRAL COAST
P: 02 4325 5255
HUNTER
P: 02 4966 8388
ABN: 26 134 067 842
brs.com.au
mail@brs.com.au

Client:
KDC GROUP

7-11 BENT STREET
GOSFORD
PROPOSED MIX USE DEVELOPMENT
BENT STREET & GERTRUDE STREET ROADWORKS

Designed: AD/NZ
Drawn: MB/NZ
Checked: AD

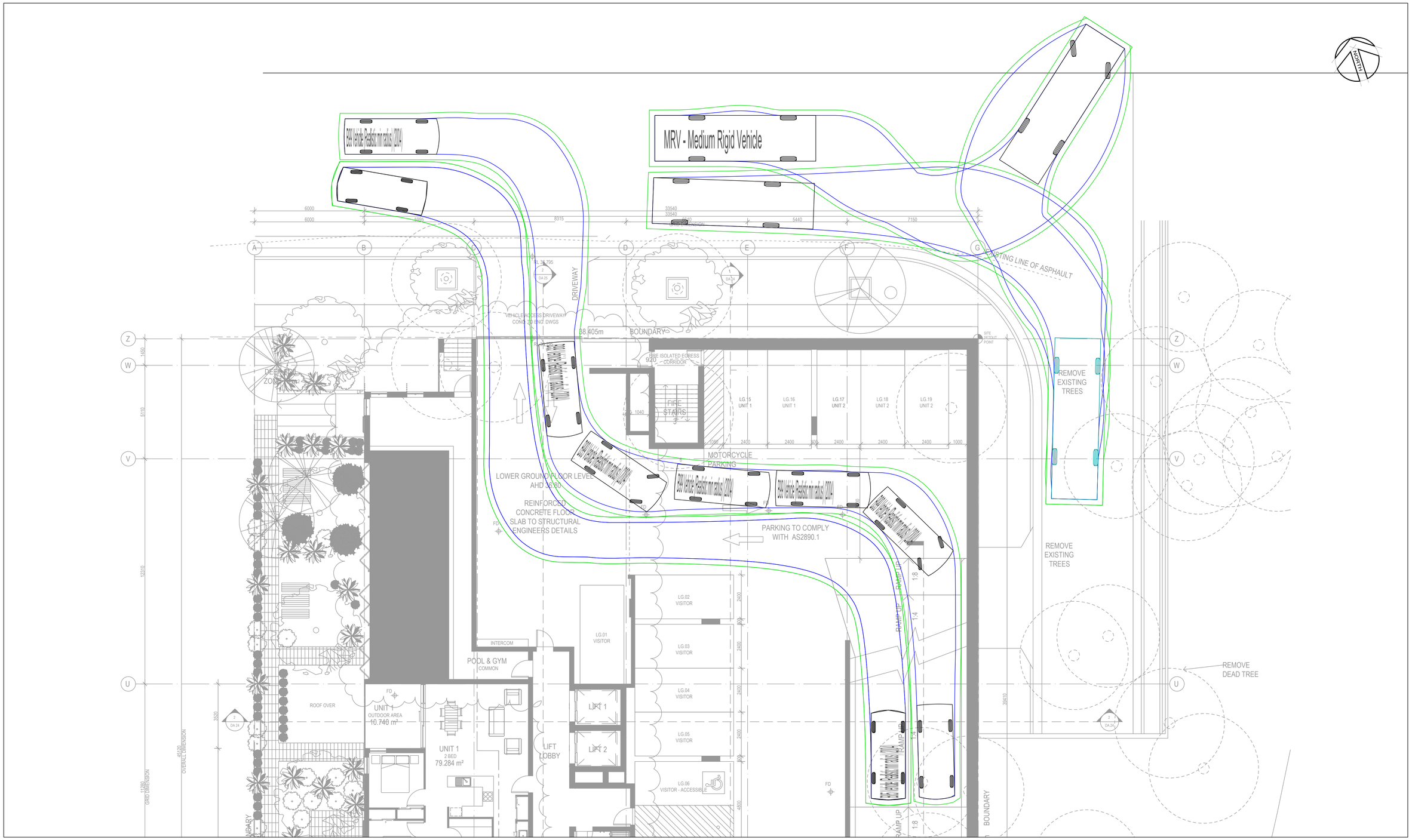
Scales: Plan 1:100
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No.
150124E1.03
File Ref.
CC150124E2-F.dwg
REV.
G
SHEET 3 OF 19 SHEETS

APPENDIX F
Swept Paths

A1



DIAL BEFORE YOU DIG www.1100.com.au

2 0 2 4 6 8 10 METRES 1:100

No	DATE	AMENDMENT
A	9/05/20129	FIRST ISSUE

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
ENGINEERING | PLANNING | PROJECT MANAGEMENT | SURVEYING | CERTIFICATION

SYDNEY P: 02 9659 0005
CENTRAL COAST P: 02 4325 5255
HUNTER P: 02 4966 8388
ABN: 26 134 067 842
www.brs.com.au
mail@brs.com.au

Client: ADG ARCHITECTS

7-11 BENT STREET, GOSFORD
PROPOSED RESIDENTIAL DEVELOPMENT

LOWER GROUND FLOOR - B99 / B85 & MRV

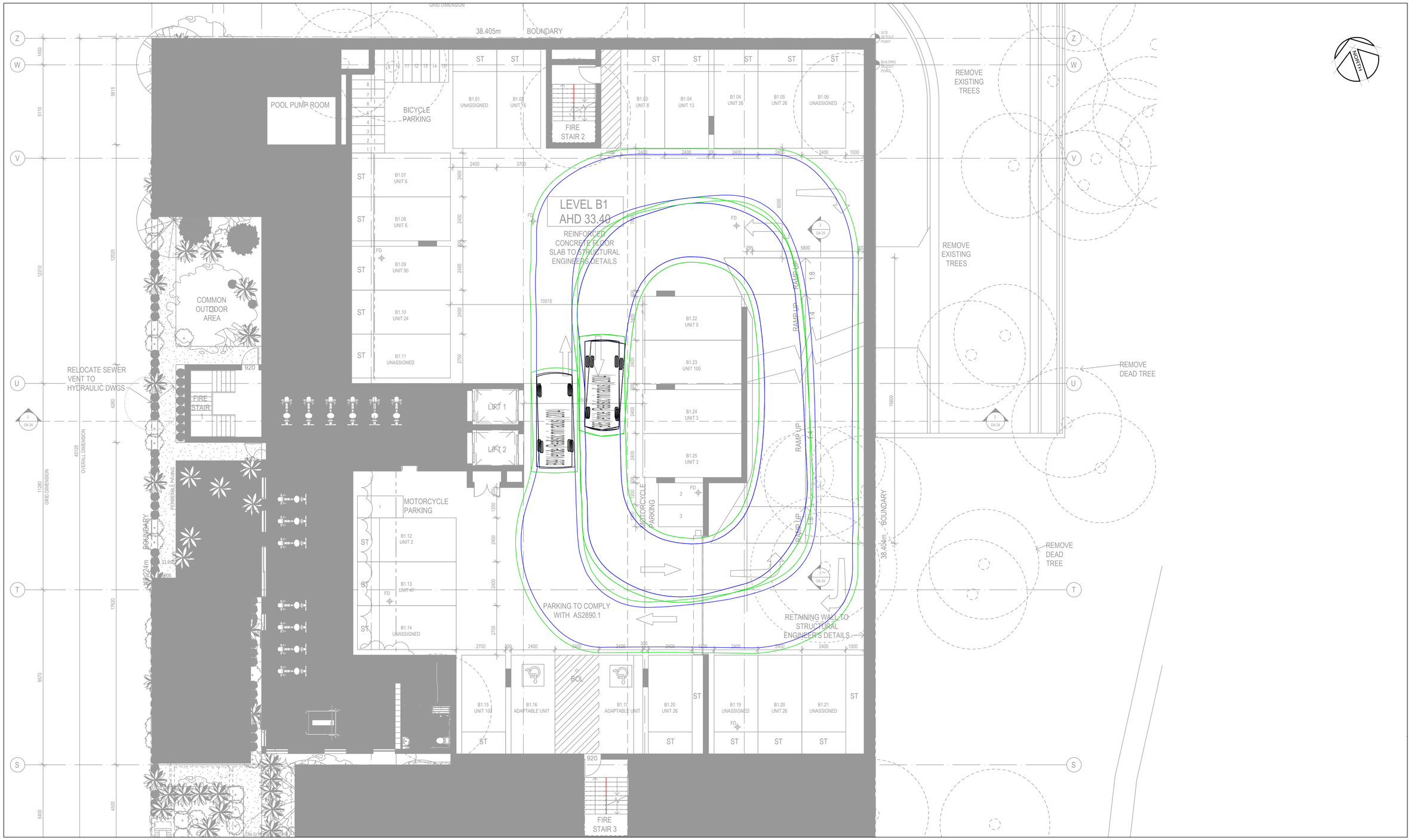
Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No. CC150124TR01
File Ref. CC150124-D01A
REV. A
SHEET 1 OF 4 SHEETS

A1



DIAL BEFORE YOU DIG www.1100.com.au

2 0 2 4 6 8 10 METRES 1:100

No	DATE	AMENDMENT
A	9/05/20129	FIRST ISSUE

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
ENGINEERING | PLANNING | PROJECT MANAGEMENT | SURVEYING | CERTIFICATION

SYDNEY
P: 02 9659 0005
CENTRAL COAST
P: 02 4325 5255
HUNTER
P: 02 4966 8388
ABN: 26 134 067 842
www.brs.com.au
mail@brs.com.au

Client: ADG ARCHITECTS

7-11 BENT STREET, GOSFORD
PROPOSED RESIDENTIAL DEVELOPMENT

BASEMENT 1 PLAN - B99 / B85

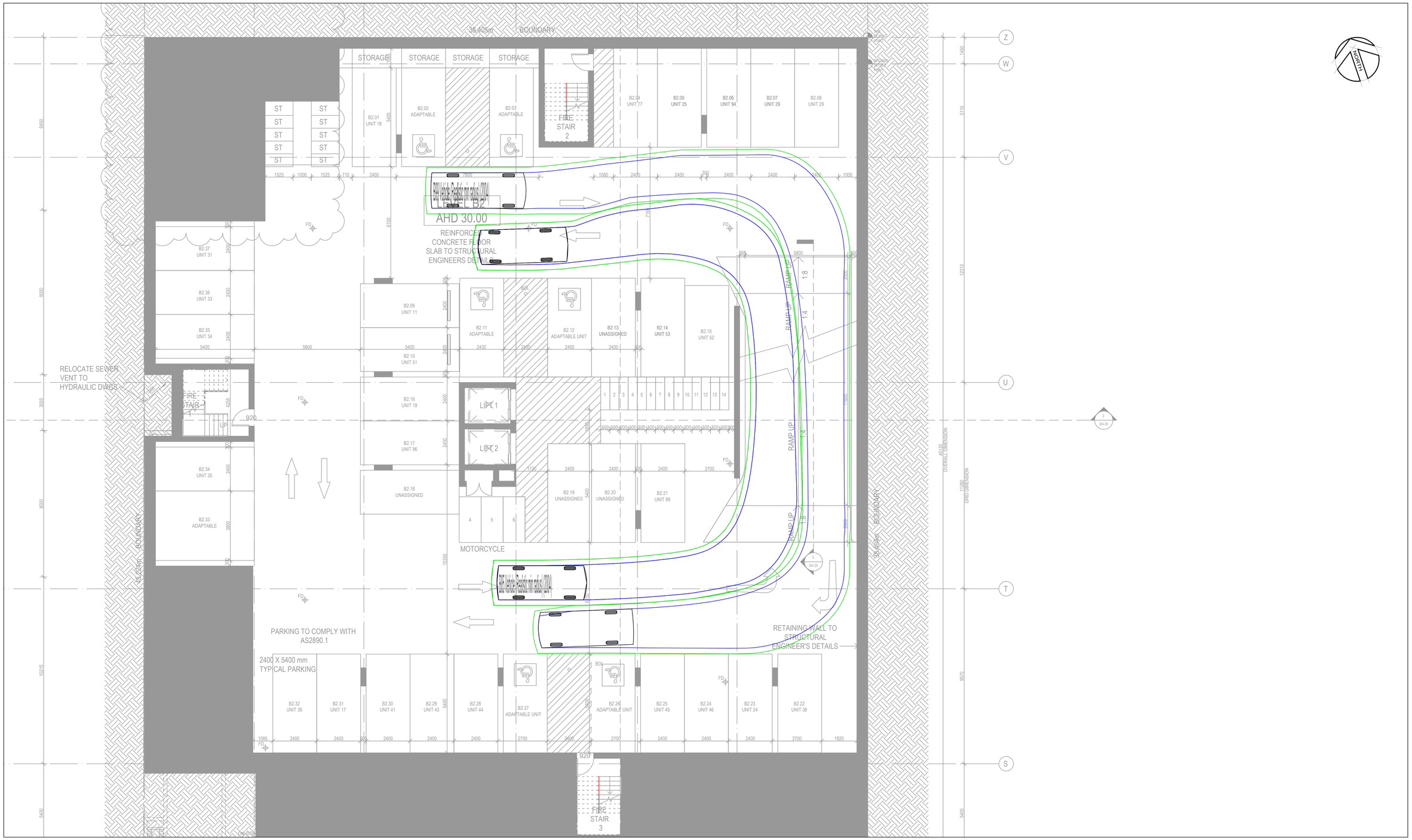
Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No.
CC150124TR02
File Ref. CC150124-D01A
REV. A
SHEET 2 OF 4 SHEETS

A1



DIAL BEFORE YOU DIG www.1100.com.au

2 0 2 4 6 8 10 METRES 1:100

No	DATE	AMENDMENT
A	9/05/20129	FIRST ISSUE

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
ENGINEERING | PLANNING | PROJECT MANAGEMENT | SURVEYING | CERTIFICATION

SYDNEY
P: 02 9659 0005
CENTRAL COAST
P: 02 4325 5255
HUNTER
P: 02 4966 8388
ABN: 26 134 067 842
www.brs.com.au
mail@brs.com.au

Client: ADG ARCHITECTS

7-11 BENT STREET, GOSFORD
PROPOSED RESIDENTIAL DEVELOPMENT

BASEMENT 2 PLAN - B99 / B85

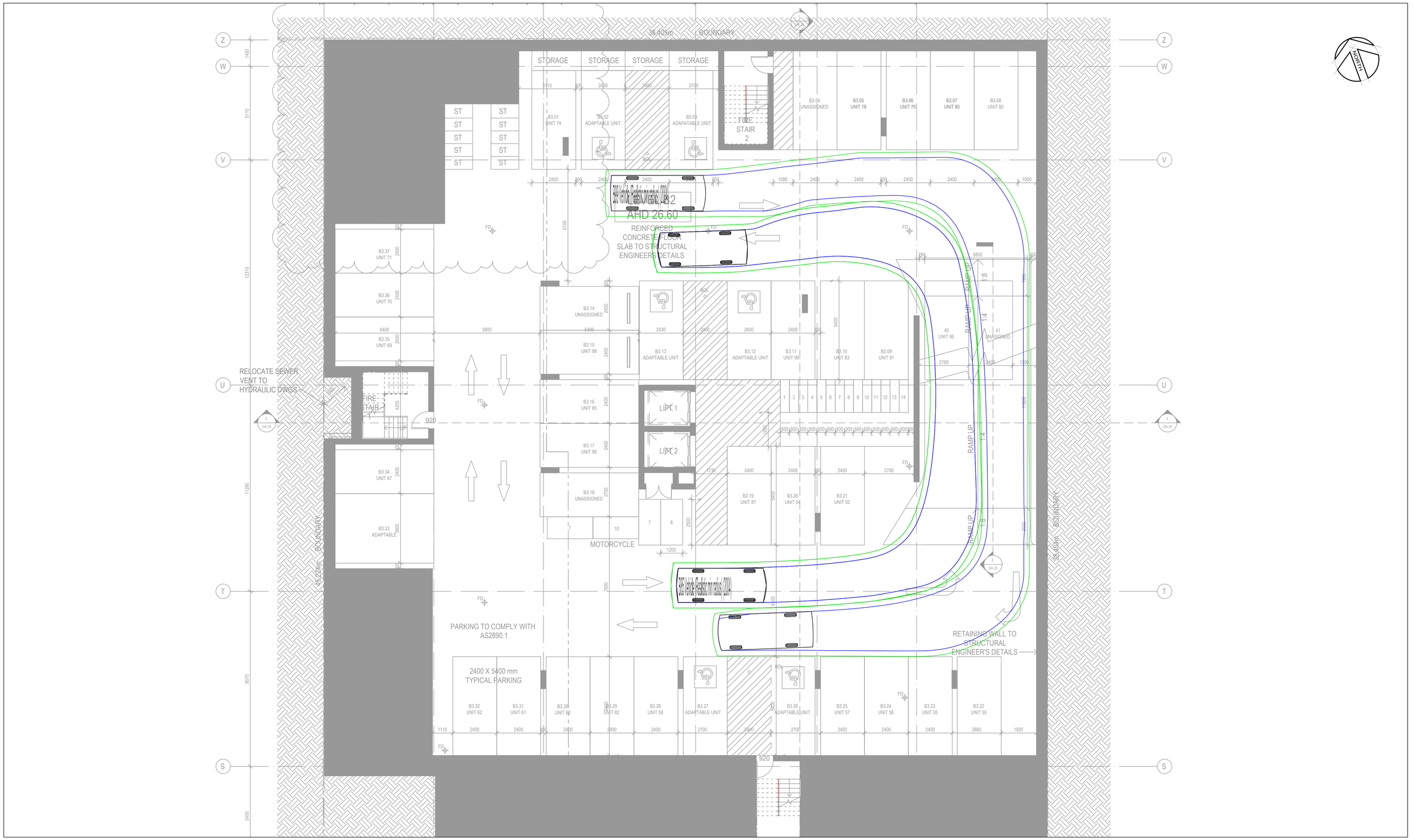
Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No.
CC150124TR03
File Ref. CC150124-D01A
REV. A
SHEET 3 OF 4 SHEETS

A1



DIAL BEFORE YOU DIG www.1100.com.au

2 0 2 4 6 8 10 METRES 1:100

No	DATE	AMENDMENT
A	9/05/20129	FIRST ISSUE

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
ENGINEERING | PLANNING | PROJECT MANAGEMENT | SURVEYING | CERTIFICATION

SYDNEY
P: 02 9659 0005
CENTRAL COAST
P: 02 4325 5255
HUNTER
P: 02 4966 8388
ABN: 26 134 067 842
www.brs.com.au
mail@brs.com.au

Client:

ADG ARCHITECTS

7-11 BENT STREET, GOSFORD
PROPOSED RESIDENTIAL DEVELOPMENT

BASEMENT 3 PLAN - B99 / B85

Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No.
CC150124TR04
File Ref. CC150124-D01A
REV. A
SHEET 4 OF 4 SHEETS

APPENDIX G
SIDRA Reports

MOVEMENT SUMMARY

Site: Bent Street / Watt Street intersection AM Peak

New Site
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Watt Street											
2	T1	181	0.6	0.097	0.0	LOS A	0.0	0.3	0.03	0.02	49.8
3	R2	5	0.0	0.097	5.7	LOS A	0.0	0.3	0.03	0.02	47.4
Approach		186	0.5	0.097	0.2	NA	0.0	0.3	0.03	0.02	49.7
East: Bent Street											
4	L2	7	0.0	0.006	5.5	LOS A	0.0	0.1	0.35	0.52	41.0
Approach		7	0.0	0.006	5.5	LOS A	0.0	0.1	0.35	0.52	41.0
North: Watt Street											
7	L2	9	0.0	0.157	4.6	LOS A	0.0	0.0	0.00	0.02	48.7
8	T1	296	0.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		305	0.0	0.157	0.1	NA	0.0	0.0	0.00	0.02	49.8
All Vehicles		498	0.2	0.157	0.2	NA	0.0	0.3	0.01	0.02	49.7

Level of Service (LOS) Method: Delay (RTA NSW).
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: Bent Street / Watt Street intersection AM Peak Post Dev

New Site
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Watt Street											
2	T1	181	0.6	0.097	0.0	LOS A	0.0	0.3	0.03	0.02	49.8
3	R2	5	0.0	0.097	5.7	LOS A	0.0	0.3	0.03	0.02	47.4
Approach		186	0.5	0.097	0.2	NA	0.0	0.3	0.03	0.02	49.7
East: Bent Street											
4	L2	62	0.0	0.050	5.5	LOS A	0.2	1.3	0.36	0.56	41.0
Approach		62	0.0	0.050	5.5	LOS A	0.2	1.3	0.36	0.56	41.0
North: Watt Street											
7	L2	9	0.0	0.157	4.6	LOS A	0.0	0.0	0.00	0.02	48.7
8	T1	296	0.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		305	0.0	0.157	0.1	NA	0.0	0.0	0.00	0.02	49.8
All Vehicles		553	0.2	0.157	0.8	NA	0.2	1.3	0.05	0.08	49.0

Level of Service (LOS) Method: Delay (RTA NSW).
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: Bent Street / Watt Street intersection AM Peak Post Dev 10 year growth

New Site
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Watt Street											
2	T1	217	0.6	0.117	0.1	LOS A	0.1	0.4	0.03	0.02	49.7
3	R2	6	0.0	0.117	6.0	LOS A	0.1	0.4	0.03	0.02	47.3
Approach		223	0.5	0.117	0.2	NA	0.1	0.4	0.03	0.02	49.7
East: Bent Street											
4	L2	74	0.0	0.063	5.8	LOS A	0.2	1.7	0.40	0.59	40.8
Approach		74	0.0	0.063	5.8	LOS A	0.2	1.7	0.40	0.59	40.8
North: Watt Street											
7	L2	11	0.0	0.188	4.6	LOS A	0.0	0.0	0.00	0.02	48.7
8	T1	355	0.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		366	0.0	0.188	0.1	NA	0.0	0.0	0.00	0.02	49.8
All Vehicles		664	0.2	0.188	0.8	NA	0.2	1.7	0.06	0.08	49.0

Level of Service (LOS) Method: Delay (RTA NSW).
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: Bent Street / Watt Street intersection PM Peak

New Site
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Watt Street											
2	T1	186	0.5	0.097	0.0	LOS A	0.0	0.1	0.01	0.01	49.9
3	R2	2	0.0	0.097	5.4	LOS A	0.0	0.1	0.01	0.01	47.6
Approach		188	0.5	0.097	0.1	NA	0.0	0.1	0.01	0.01	49.9
East: Bent Street											
4	L2	16	0.0	0.012	5.3	LOS A	0.0	0.3	0.30	0.52	41.2
Approach		16	0.0	0.012	5.3	LOS A	0.0	0.3	0.30	0.52	41.2
North: Watt Street											
7	L2	4	0.0	0.123	4.6	LOS A	0.0	0.0	0.00	0.01	48.8
8	T1	232	2.6	0.123	0.0	LOS A	0.0	0.0	0.00	0.01	49.9
Approach		236	2.5	0.123	0.1	NA	0.0	0.0	0.00	0.01	49.9
All Vehicles		440	1.6	0.123	0.3	NA	0.0	0.3	0.02	0.03	49.6

Level of Service (LOS) Method: Delay (RTA NSW).
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: Bent Street / Watt Street intersection PM Peak Post Dev

New Site
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Watt Street											
2	T1	186	0.5	0.097	0.0	LOS A	0.0	0.1	0.01	0.01	49.9
3	R2	2	0.0	0.097	5.5	LOS A	0.0	0.1	0.01	0.01	47.6
Approach		188	0.5	0.097	0.1	NA	0.0	0.1	0.01	0.01	49.9
East: Bent Street											
4	L2	44	0.0	0.033	5.3	LOS A	0.1	0.9	0.31	0.53	41.2
Approach		44	0.0	0.033	5.3	LOS A	0.1	0.9	0.31	0.53	41.2
North: Watt Street											
7	L2	30	0.0	0.137	4.6	LOS A	0.0	0.0	0.00	0.06	48.1
8	T1	232	2.6	0.137	0.0	LOS A	0.0	0.0	0.00	0.06	49.4
Approach		262	2.3	0.137	0.5	NA	0.0	0.0	0.00	0.06	49.3
All Vehicles		494	1.4	0.137	0.8	NA	0.1	0.9	0.03	0.08	49.0

Level of Service (LOS) Method: Delay (RTA NSW).
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: Bent Street / Watt Street intersection PM Peak Post Dev 10 year growth

New Site
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Watt Street											
2	T1	223	0.5	0.117	0.0	LOS A	0.0	0.1	0.01	0.01	49.9
3	R2	2	0.0	0.117	5.8	LOS A	0.0	0.1	0.01	0.01	47.6
Approach		226	0.5	0.117	0.1	NA	0.0	0.1	0.01	0.01	49.9
East: Bent Street											
4	L2	53	0.0	0.042	5.5	LOS A	0.2	1.1	0.35	0.55	41.0
Approach		53	0.0	0.042	5.5	LOS A	0.2	1.1	0.35	0.55	41.0
North: Watt Street											
7	L2	36	0.0	0.165	4.6	LOS A	0.0	0.0	0.00	0.06	48.1
8	T1	278	2.6	0.165	0.0	LOS A	0.0	0.0	0.00	0.06	49.4
Approach		314	2.3	0.165	0.5	NA	0.0	0.0	0.00	0.06	49.3
All Vehicles		593	1.4	0.165	0.8	NA	0.2	1.1	0.04	0.08	49.0

Level of Service (LOS) Method: Delay (RTA NSW).
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.