Traffic & Parking Assessment Report

16 Macpherson Street, Warriewood

Proposed Subdivision & Low Density Residential Development

Ref 22131

11th May 2023

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1. Introduction

1.1 Project Summary

CJP has been engaged by Warrimac Pty Ltd to prepare a Traffic & Parking Assessment Report (TPAR) in support of a Development Application (DA) to Northern Beaches Council, involving the subdivision of 16 Macpherson Street, Warriewood.

In summary, the DA involves the demolition of the existing dwelling house and plant nursery on the site, the subdivision of the site into 28 low density community title residential allotments, the construction of a mix of townhouses and free-standing houses, as well as associated infrastructure works including drainage and road construction. In this regard, Brands Lane is to be realigned and extended towards the far north-eastern end of the site where it will link into a new access lane within the site.

The proposed works also includes the construction of new dwelling houses on the 28 proposed allotments, in accordance with Council's Pittwater Local Environmental Plan 2014 (PLEP 2014) requirements. Off-street parking is proposed for 2 cars per allotment, in accordance with Council's Pittwater 21 Development Control Plan (P21 DCP) requirements, to be provided on each individual allotment.

Vehicular access to the site and the individual allotments is to be provided via two new intersections off Brands Lane which connect with each other by way of an internal access lane through the site.

A subdivision plan of the proposed development has been prepared by Craig & Rhodes and is reproduced in Appendix A, whilst the architectural plans have been prepared by PBD Architects and are reproduced in Appendix B.

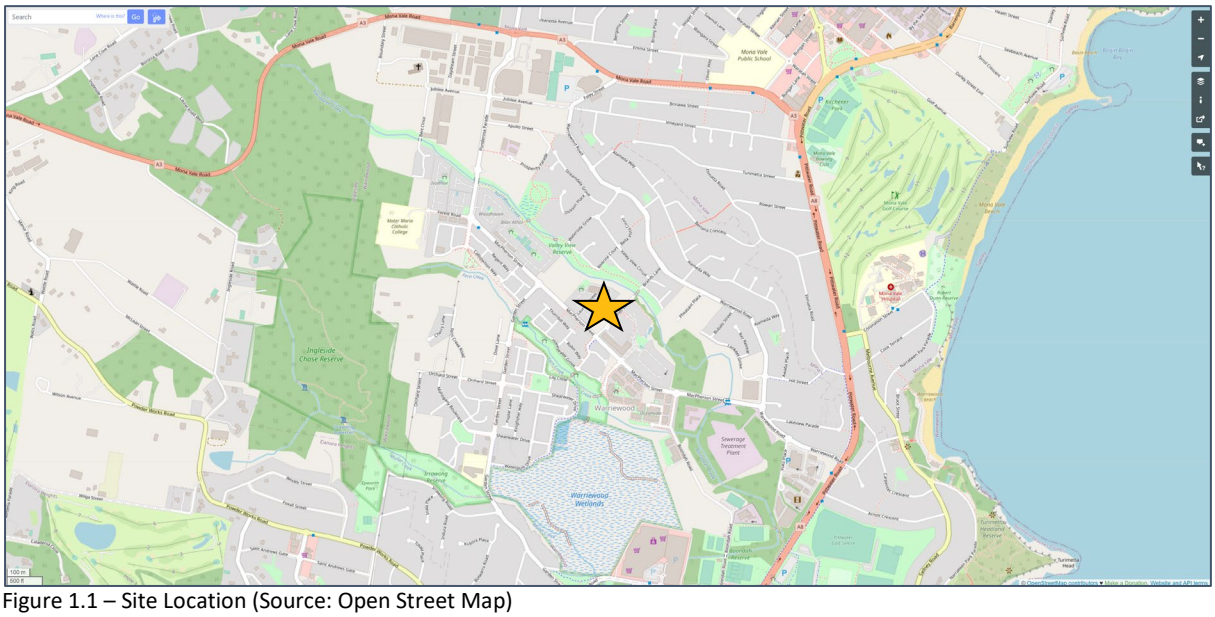


Figure 1.1 – Site Location (Source: Open Street Map)

Based on State Environmental Policy (Transport & Infrastructure) 2021, Schedule 3 – Traffic Generating Development, referral to Transport for NSW is not required.

1.2 Assessment Tasks

The purpose of this TPAR is to assess the traffic, parking, access, transport and servicing characteristics of the DA, and the associated impacts of the proposal on the surrounding road network, parking and transport environment. This can be briefly summarised below:

- Description of the existing site and its location
- Consistency with the Growth Centre Indicative Layout Plan
- Existing traffic conditions
- Public and active transport infrastructure
- Traffic generation potential of the proposal and its impacts on the surrounding road network
- Off-street parking/loading/access requirements and provisions
- Design of access driveway and parking area layout

1.3 Relevant Planning Controls

The site lies within the Northern Beaches Council (Council) Local Government Area (LGA), such that the relevant Council planning controls and strategies referenced in this TPAR include:

- Pittwater Local Environmental Plan 2014 (PLEP 2014)
- Pittwater 21 Development Control Plan (P21 DCP)
- Warriewood Valley Roads Masterplan 2018
- Warriewood Valley Landscape Masterplan and Design Guidelines (Public Domain) 2018

1.4 Traffic, Transport & Parking Guidelines & Standards

In preparing this TPAR, references are also made to the following site access, traffic and parking guidelines:

- Roads & Maritime Service's Guide to Traffic Generating Developments 2002 (RMS Guide)
- Roads & Maritime Service's Technical Direction Updated Traffic Surveys 2013 (TDT)
- State Environmental Planning Policy (Transport & Infrastructure) 2021
- Australian Standards 2890.1:2004 – Off-Street Car Parking (AS2890.1)
- Australian Standards 2890.2:2018 – Off-Street Commercial Vehicle Facilities (AS2890.2)
- NSW Government's Planning Guidelines for Walking & Cycling (December 2004)

In addition, reference is also made to comments received from Council following a pre-lodgement meeting held on 1 December 2022 (PLM2022/0211). The proposed design has therefore taken into consideration Council's comments, where applicable.

2. Existing Conditions

2.1 Site Location & Description

The development site is located on the northern corner of the Macpherson Street and Brands Lane intersection. The site has street frontages of approximately 43m in length to Macpherson Street, approximately 240m in length to Brands Lane, and occupies a total area of approximately 1.02ha.

A copy of the survey plan, prepared by LTS Lockley, is reproduced below and in Appendix C.

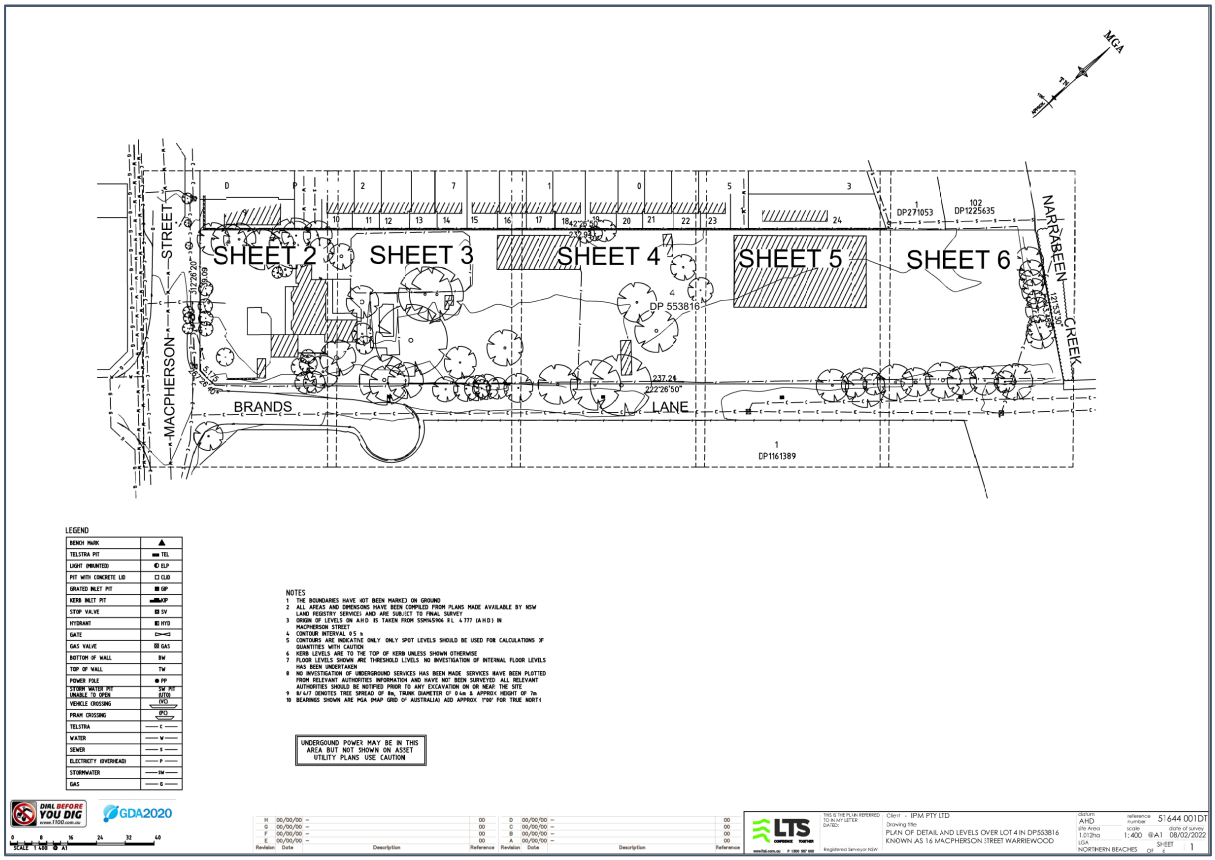


Figure 2.1 – Survey plan (Source: LTS Lockley)

The site is currently occupied by a single dwelling house as well as a number of sheds and greenhouses which operate as a plant nursery.

Off-street parking is currently provided at various locations throughout the site. Vehicular access to the plant nursery is provided via two driveways located of the Brands Lane frontage, whilst vehicular access to the dwelling house is provided via a driveway located off the Macpherson Street frontage.

A recent aerial image of the site and its surroundings is reproduced on the following page, along with a series of Streetview images.

Figure 2.2 – Aerial map (Source: Nearmap)

Figure 2.3 – Streetview image of Macpherson Street & Brands Ln intersection, looking north (Source: Google Maps)

Figure 2.4 – Streetview image of Brands Ln and existing roundabout, looking north-east (Source: Google Maps)

Figure 2.5 – Streetview image of Brands Ln, looking south-west (Source: Google Maps)

2.2 Planning Context

The site is zoned R3 Medium Density Residential, as indicated in the map below, whilst the maximum Height of Building is 10.5m. The proposed subdivision of the site is permissible in the zone, subject to development consent.

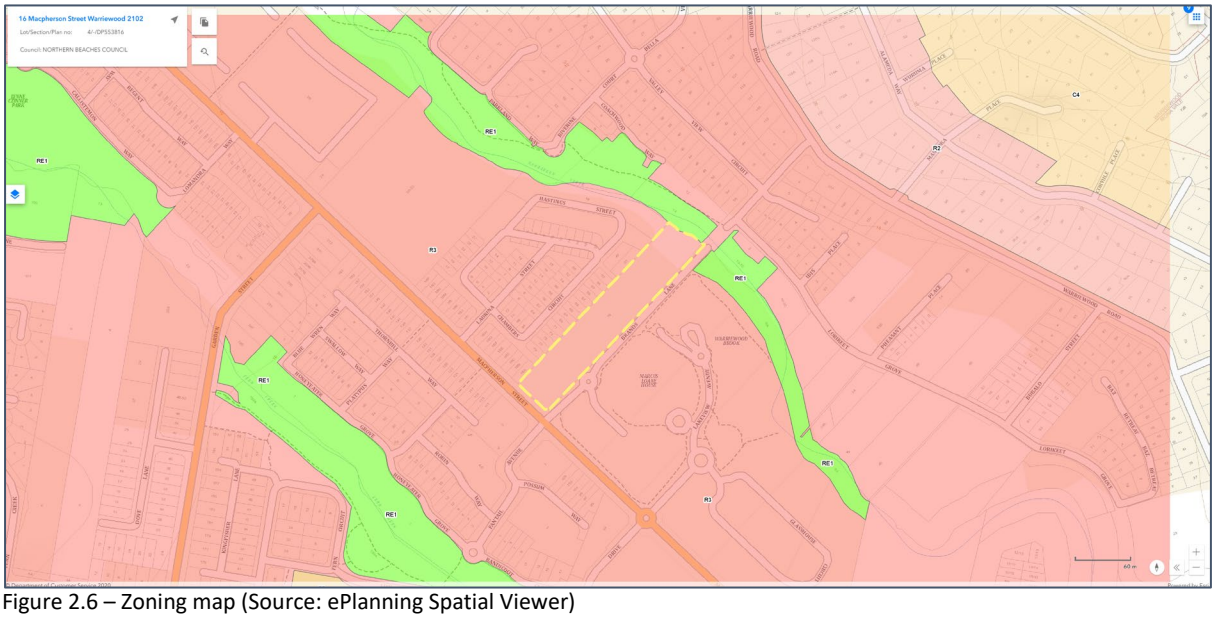


Figure 2.6 – Zoning map (Source: ePlanning Spatial Viewer)

2.3 Warriewood Valley Urban Release Area

The site lies within the Warriewood Valley Urban Release Area. In 1997, a staged land release was commenced in Warriewood Valley. The Warriewood Valley release area now encompasses 195 hectares with an anticipated 2,544 dwellings, associated facilities and infrastructure as well as 3.7 hectares of employment generating development.

The site is defined as "Sector 303", as indicated in the Warriewood Valley Release Area map below. Pittwater Local Environmental Plan 2014 (PLEP 2014), Clause 6.1, indicates that Sector 303 permits "*not more than 29 dwellings or less than 23 dwellings*".

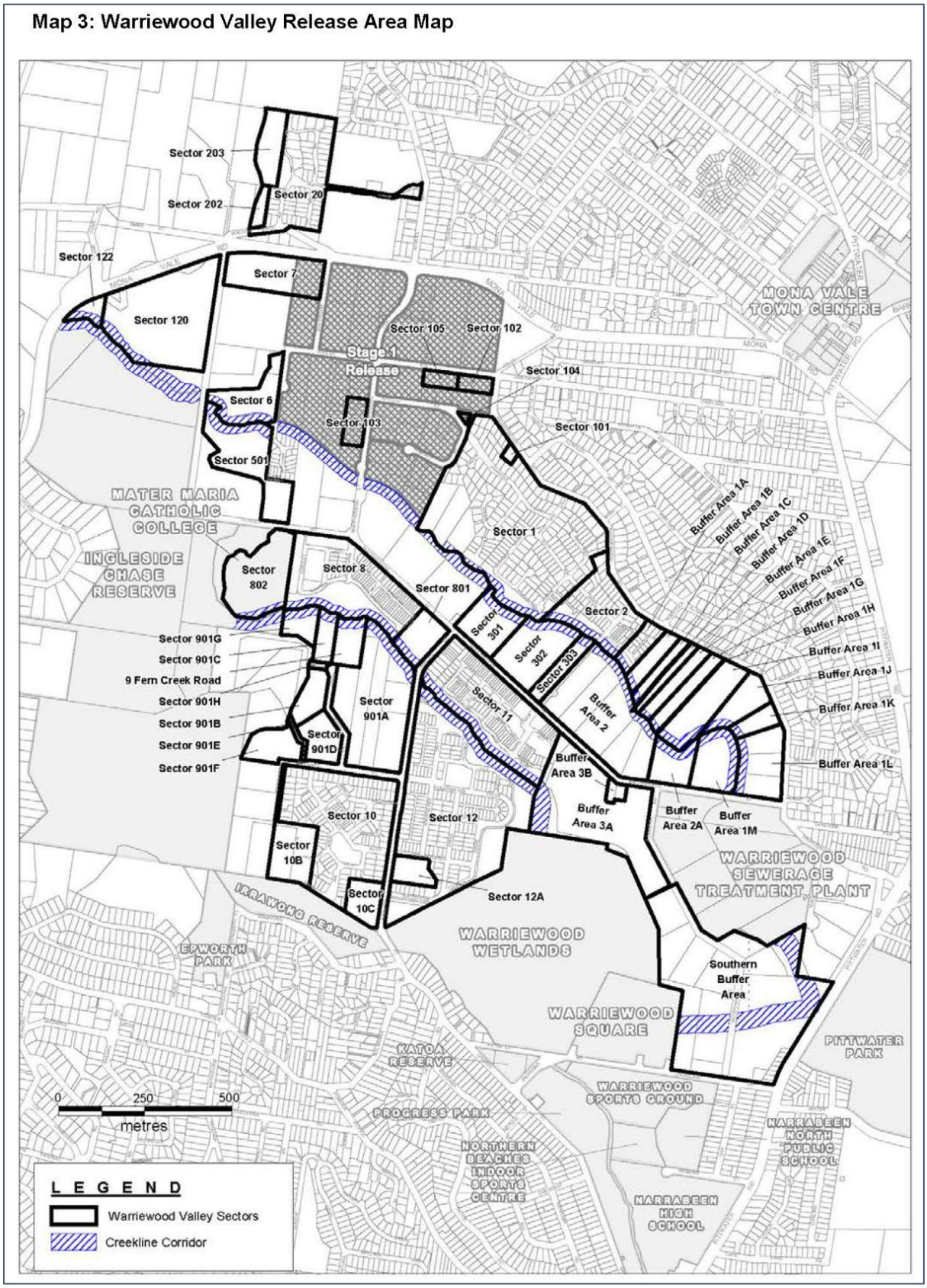


Figure 2.7 – Warriewood Valley Release Area map (Source: Warriewood Valley Strategic Review Addendum Report)

2.4 Existing Road Network

The Transport for NSW (TfNSW) road hierarchy comprises the following road classifications:

- State Roads: Freeways, Motorways and Primary Arterial Roads (TfNSW managed)
- Regional Roads: Secondary or Sub-Arterial (Council managed, partly funded by the State)
- Local Roads: Collector and Local Access Roads (Council managed)

The existing road hierarchy in the vicinity of the site is shown in the figure below, whilst the key roads and intersections are summarised as follows:

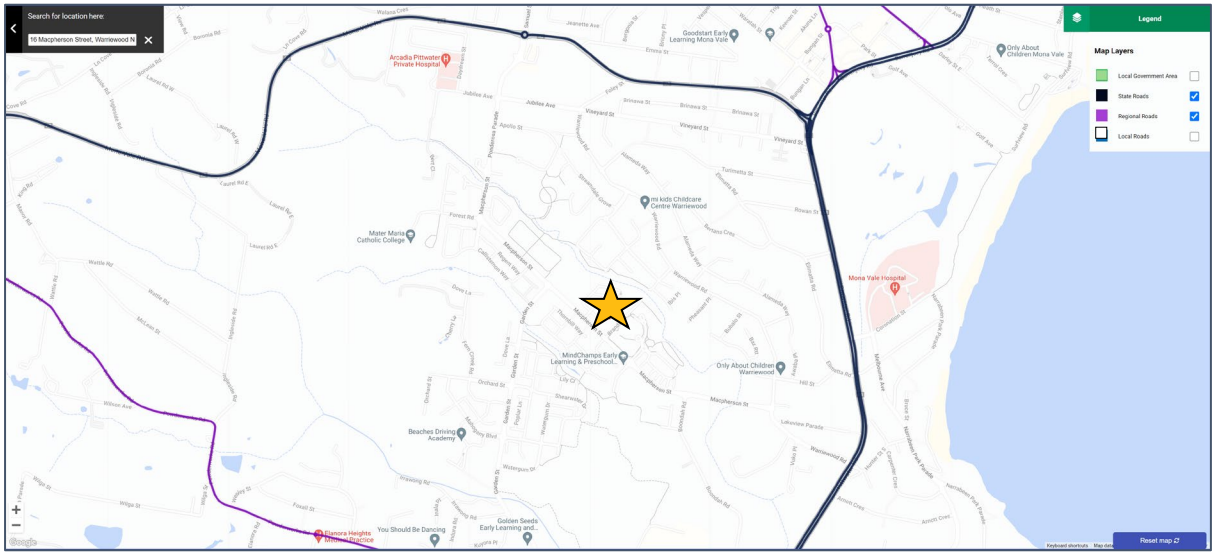


Figure 2.8 – Road Hierarchy (Source: Transport for NSW)

- Pittwater Road is classified as a State Road and provides the key north-south road link in the Northern Beaches area, linking Brookvale to Mona Vale. It carries two traffic lanes plus dedicated bus lanes in each direction in the vicinity of the site, with turning lanes provided at key intersections.

- Mona Vale Road is also classified as a State Road which provides a key east-west road link through the area, linking Pymble to Mona Vale. It carries one traffic lane in each direction, with additional lanes and turning lanes provided at key locations.

- Macpherson Street is a local road which performs the function of a collector route through the Warriewood area, as well as providing vehicular and pedestrian access to frontage properties. In terms of the Warriewood Valley Roads Masterplan, it is classified as a Sub-Arterial Road. It carries one traffic lane in each direction in the vicinity of the site, with kerbside parking generally permitted.

- Brands Lane is a local road which provides vehicular access to the existing plant nursery on the subject site as well as the existing seniors living development opposite. The existing formal section of the road terminates at the roundabout, however, extends beyond the roundabout in the form of a dirt road without kerb and gutter. Beyond that is a pedestrian walking track which connects to the northern section of Brands Lane, at the Lorikeet Grove intersection.

2.5 Future Road Network

As part of the redevelopment of the Warriewood Valley Urban Release Area, existing roads will be upgraded and new roads constructed. In this regard, the Warriewood Valley Roads Masterplan provides typical road plans and cross sections of the various road types, including sub-arterial roads such as Macpherson Street.

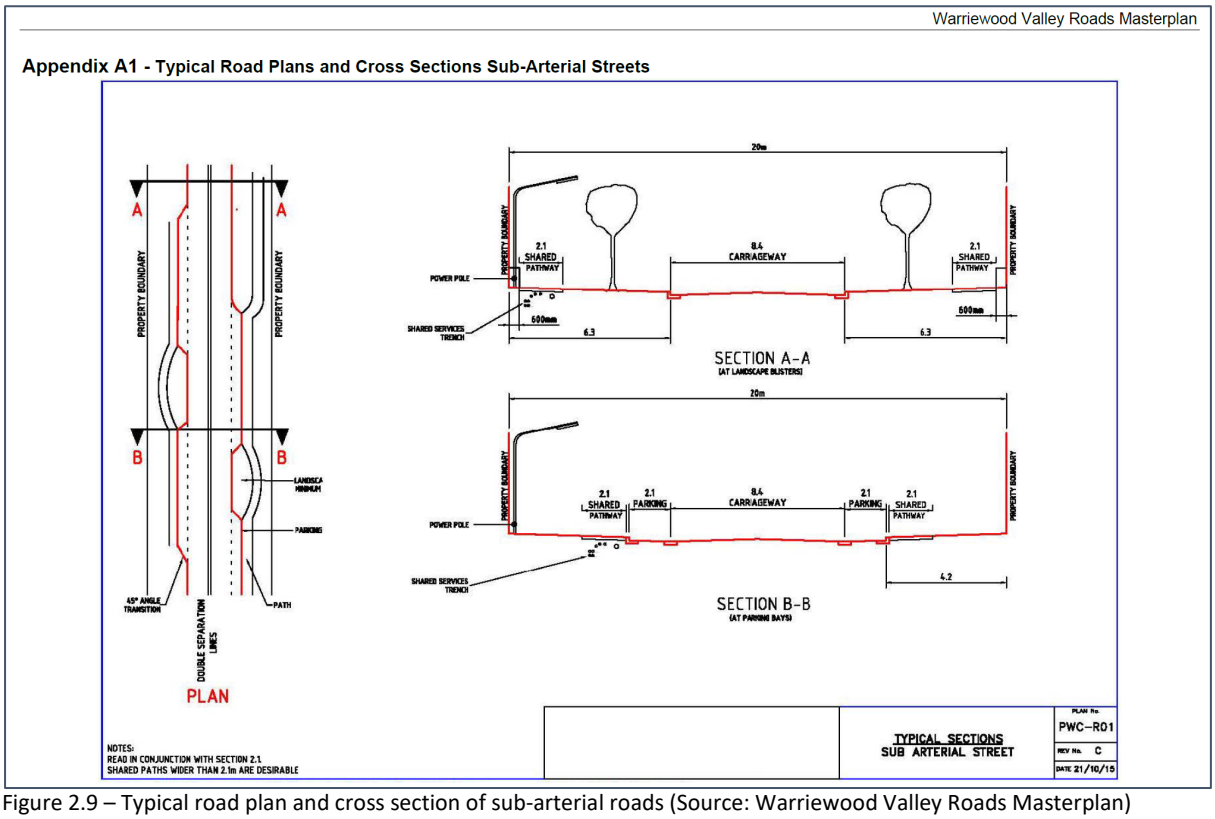


Figure 2.9 – Typical road plan and cross section of sub-arterial roads (Source: Warriewood Valley Roads Masterplan)

With respect to the Brands Lane extension as well as the new internal road through the subject site, their proposed profiles are as follows:

- Brands Lane extension: Laneway
  - 10.1m wide road reserve (existing and unchanged)
  - 6.0m wide two-way road carriageway with No Parking permitted
  - 2.3m wide verge along the northern side of the road, outside the site frontage, including 2.1m wide share path
  - 1.8m wide verge along the southern (opposite) side of the road

- Future internal road: 10km/h Shared Zone Community Title Road
  - 9.0m wide road reserve along spine road
    - 6.0m wide, two-way carriageway with No Parking permitted
    - 2.1m wide northern verge width, including 1.0m wide footpath
    - 0.9m wide southern verge width
  - 8.0m wide road reserve along north-eastern road link off Brands Lane
    - 6.0m wide, two-way road carriageway with No Parking permitted
    - 1.1m wide and 0.9m wide verges
  - 8.5m wide road reserve along south-western road link off Brands Lane
    - 6.0m wide, two-way road carriageway with No Parking permitted
    - 1.6m wide and 0.9m wide verges

- 7.5m wide road reserve at the internal T-handle within the site, outside Lots 1-5
  - 6.0m wide road, two-way carriageway with No Parking permitted
  - 0.75m wide verges on both sides

A plan extract of the proposed road profiles from the civil works package, prepared by Craig & Rhodes, is reproduced below.

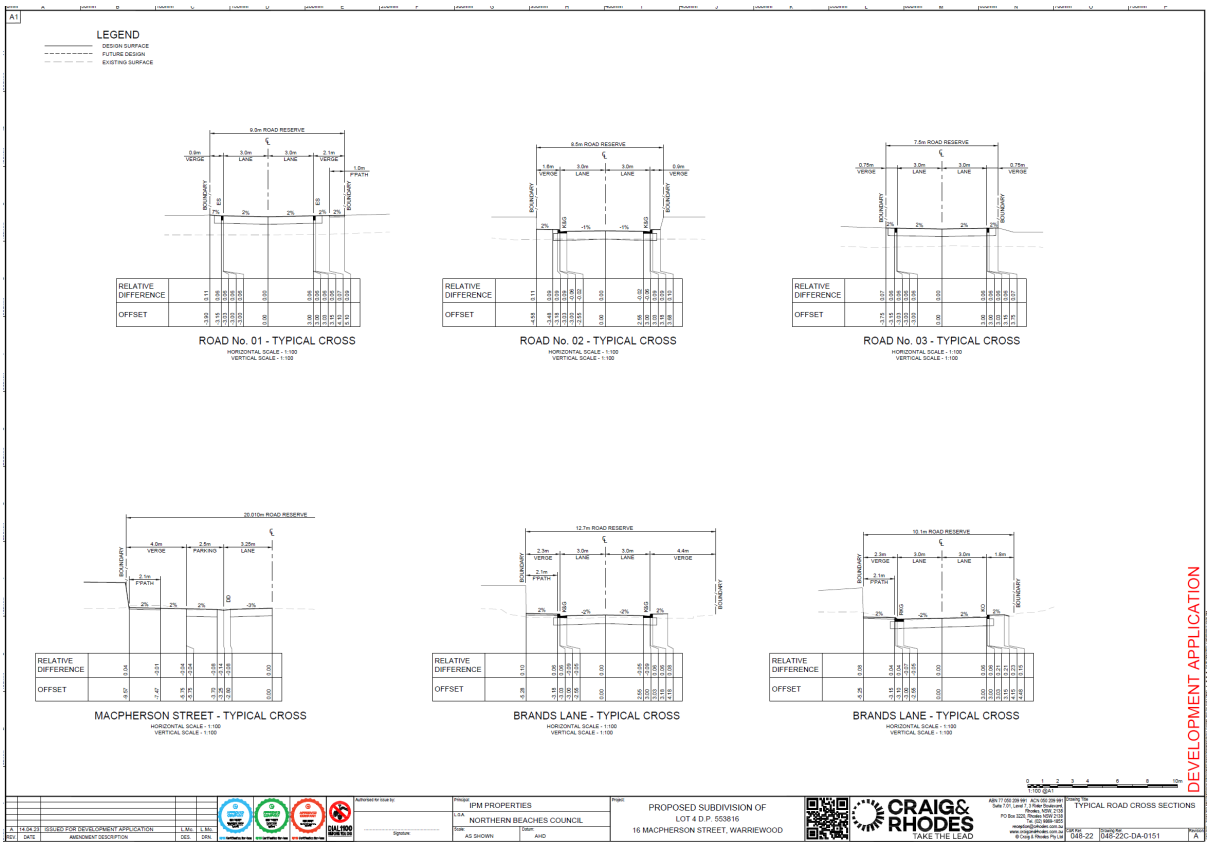


Figure 2.10 – Typical road cross section plan (Source: Craig & Rhodes)

It is pertinent to note that whilst the proposed road design profiles are not in strict compliance with the Warriewood Valley Roads Masterplan, they are considered acceptable in this instance, because of:

- the development's anticipated traffic volumes support the proposed road design,
- the swept turn path assessment of the proposed road design is functional and acceptable,
- the 10km/h Shared Zone speed limit within the proposed development's Community Title Road,
- other non-compliant road design profiles within a number of surrounding completed developments within the Warriewood Valley area, and
- Council's suggestion within the pre-lodgement meeting minutes support the proposed road profiles

In addition, signage and linemarking plans have been prepared along Brands Lane and within the subject site's internal laneway, both of which are provided in Appendix D.

2.6 Existing Traffic Flows & Volumes

In order to understand the existing traffic volumes on the surrounding road network, traffic surveys were undertaken during the weekday AM & PM road network peak periods on Tuesday 7th February 2023. The results of the surveys are reproduced in Appendix E and summarised in the diagram below.

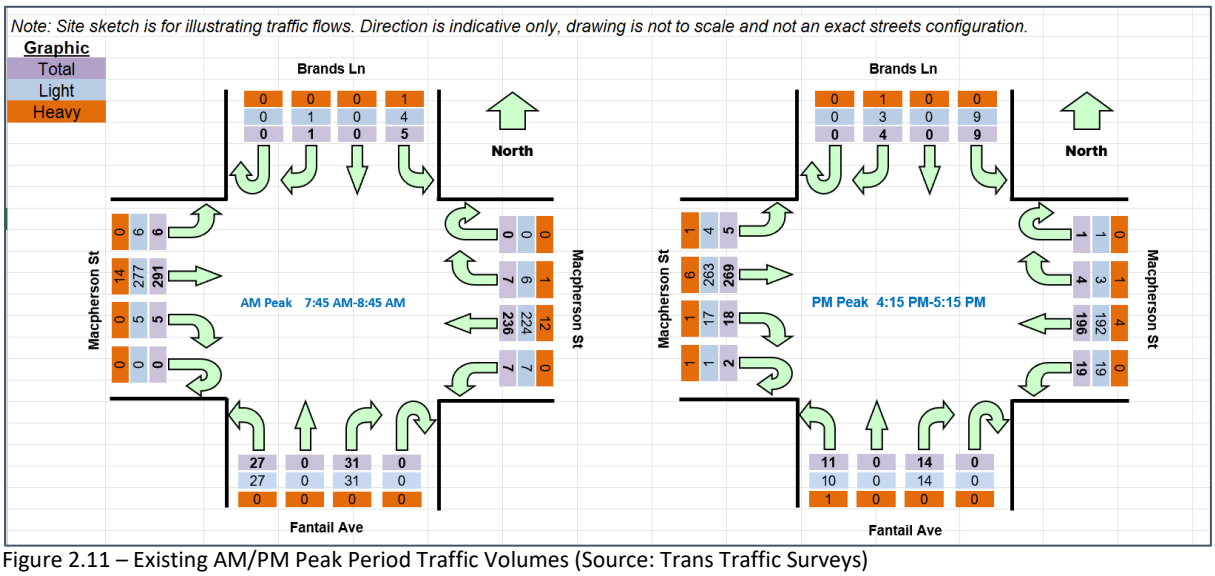


Figure 2.11 – Existing AM/PM Peak Period Traffic Volumes (Source: Trans Traffic Surveys)

2.7 Public & Active Transport

The existing bus network map is shown in the figure on the following page. The nearest bi-directional bus stop is located within 200m of the site along Macpherson Street and serviced by the 185 bus, operating 7 days per week between Narrabeen and Mona Vale via Warriewood.

There is also a bi-directional bus stop located within 400m of the site along Garden Street and serviced by the 182 bus, operating 7 days per week between Narrabeen and Mona Vale via Elanora Heights, North Narrabeen and Warriewood.

Both the 182 and 185 services also provide connections to B-Line services at Mona Vale. The B-Line provides high-frequency services 7 days per week between Mona Vale and Wynyard.

Research suggests that proximity to bus services influence the travel mode choice for areas within 400m (approximately 5 minutes) of a bus stop. As such, the proposed development has good potential for future residents within the development to utilise bus for their commute to/from work or other key points of interest.

In addition to the public transport services available in the vicinity of the site, there is also a good level of pedestrian connectivity, including safe and convenient footpaths to the abovementioned bus stops. All future footpaths in the surrounding area will be of good quality, with appropriate widths and pram ramps provided at most intersections.

The *Planning Guidelines for Walking and Cycling* identify a number of city-scale design principles that can assist the creation of walkable and cyclable cities and neighbourhoods. These principles emphasise urban renewal and the creation of compact, mixed use, accessible centres around public transport stops. At the neighbourhood scale, design principles can be reinforced through the creation of local and accessible centres and neighbourhoods with connected street patterns and road design which aim to reinforce local walking and cycling networks.

In particular, the *Guidelines* note that increased population density is an important element in creating a walkable and cyclable city. A compact development brings activities close together, making them more accessible by foot or by bicycle, without the need to use a car. Increased population density also enhances the viability of public transport services.

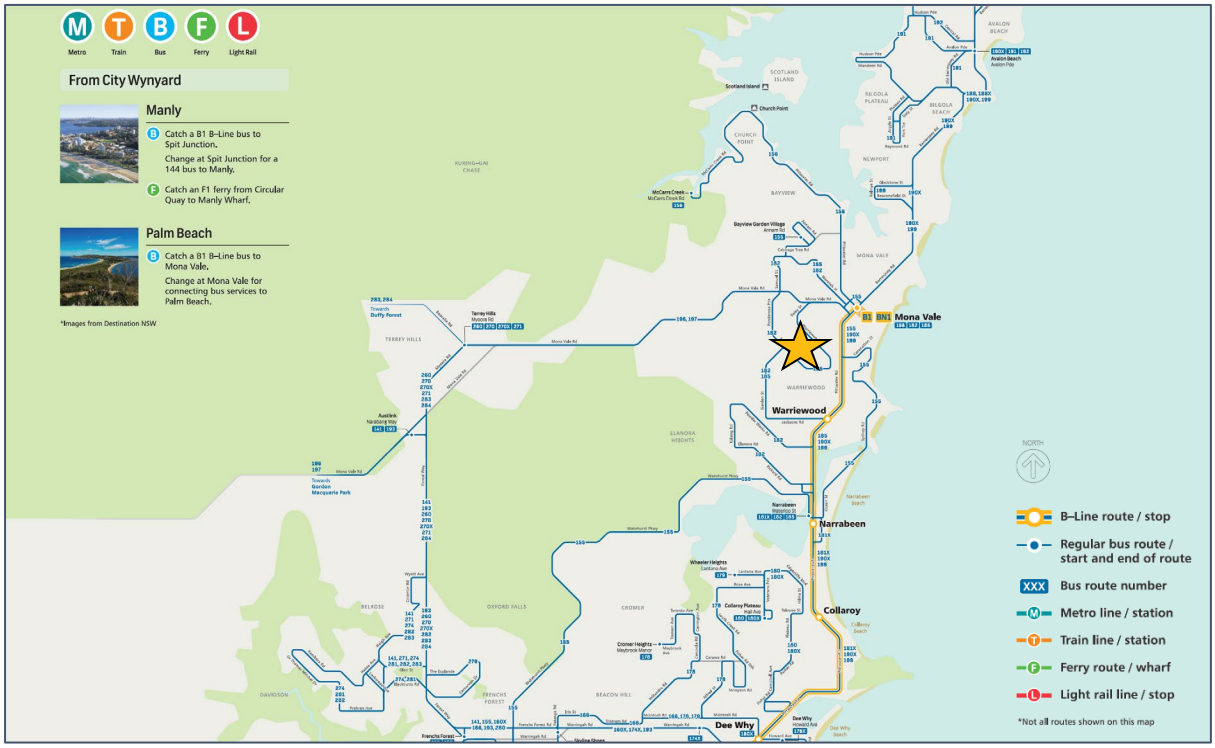


Figure 2.12 – Existing Public Transport Map (Source: Transport for NSW)

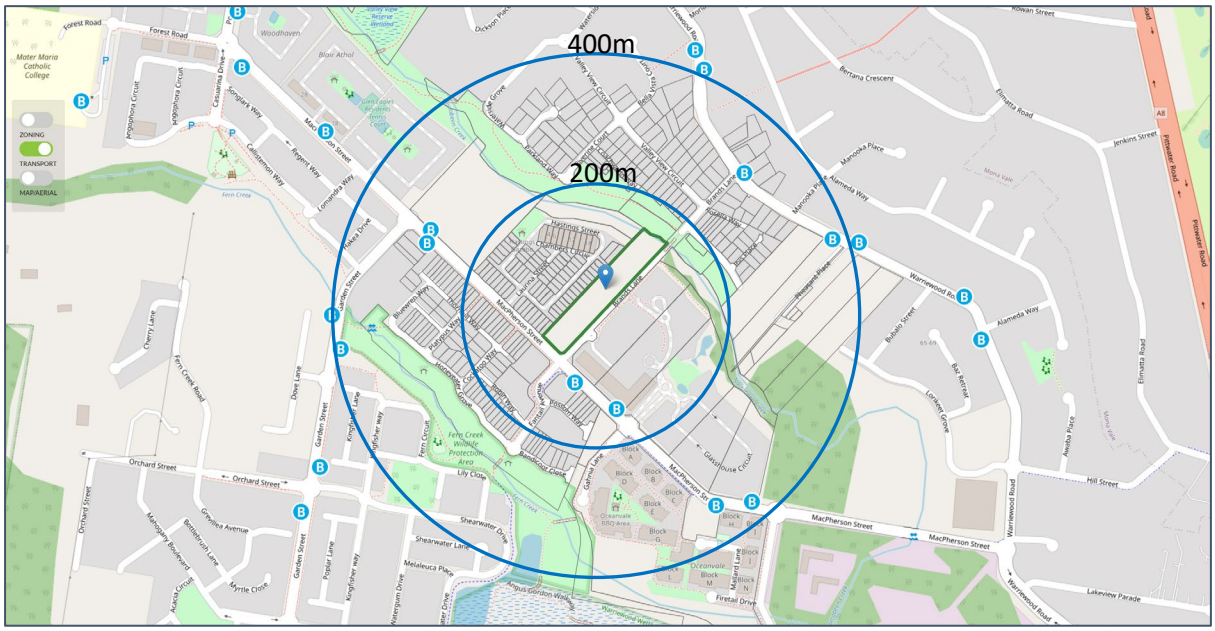


Figure 2.13 – Existing nearby bus stops (Source: Transport for NSW)

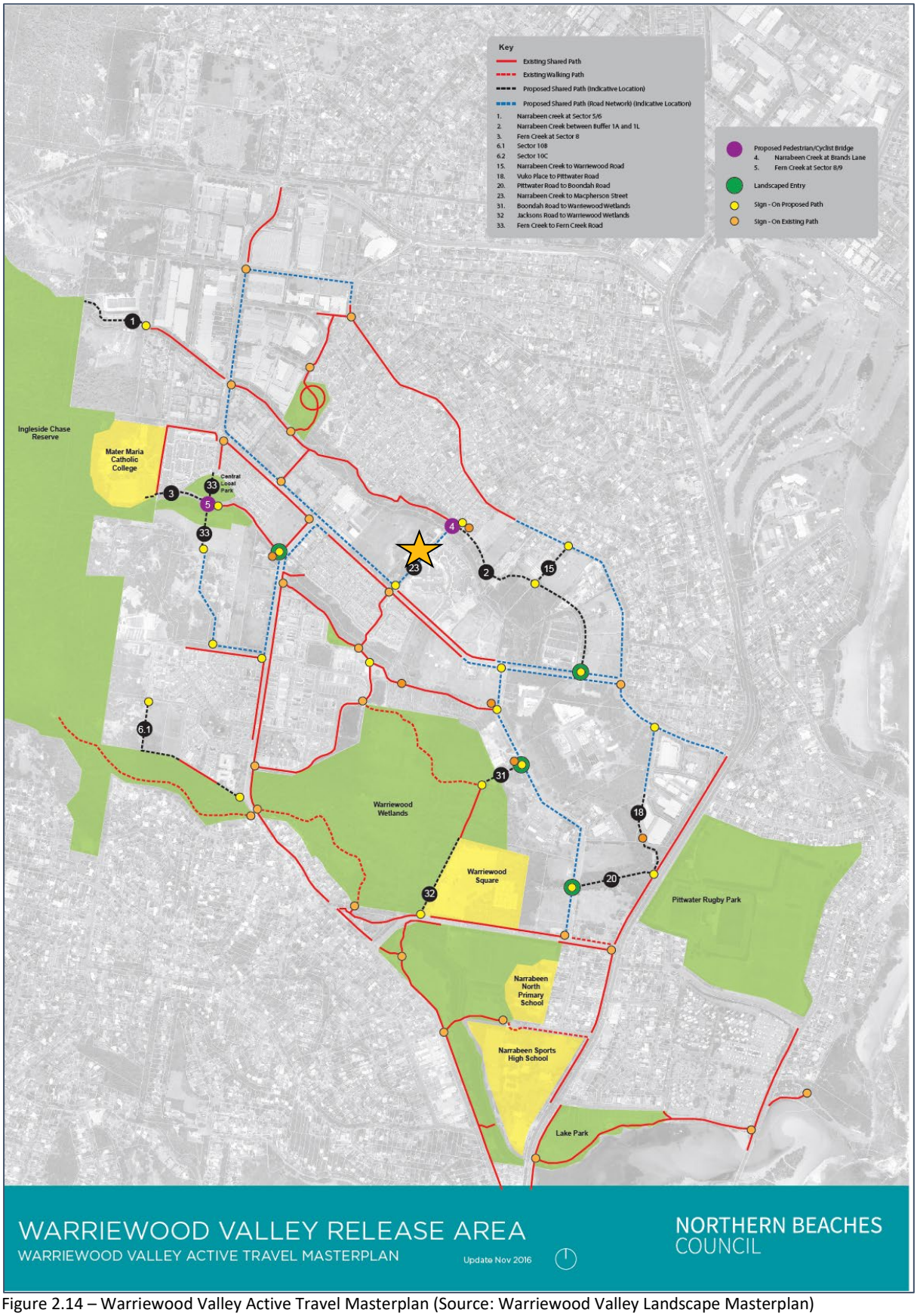


Figure 2.14 – Warriewood Valley Active Travel Masterplan (Source: Warriewood Valley Landscape Masterplan)

2.8 Existing Surrounding Traffic Controls

The existing traffic controls in the vicinity of the site comprise:

- Traffic signals at the Pittwater Road, Warriewood Road & Hunter Street intersection
- Roundabouts in Ponderosa Parade where it intersects with Mona Vale Road, Jubilee Avenue, and Macpherson Street
- Roundabouts in Macpherson Street where it intersects with Warriewood Road, Boondah Road, Anglicare Warriewood, Garden Street and Ponderosa Parade
- a 50km/h speed limit along Macpherson Street
- Give way restrictions in Brands Lane where it intersects with Macpherson Street
- Stop restrictions in Fantail Avenue where it intersects with Macpherson Street

2.9 Existing Surrounding Parking Restrictions

The existing parking restrictions in the vicinity of the site comprise:

- Unrestricted parallel kerbside parking in indented bays along both sides of Macpherson Street
- Bus Zones located at regular intervals along both sides of Macpherson Street
- No Stopping restrictions elsewhere along Macpherson Street
- No Stopping restrictions along both sides of Brands Lane, in between the roundabout and Macpherson Street
- Unrestricted angled parking along the northern side of Brands Lane, beyond the roundabout

3. Proposed Development

3.1 Development Description

The proposed development involves the demolition of the existing dwelling house and plant nursery on the site, the subdivision of the site into 28 low density community title residential allotments, the construction of a mix of townhouses and free-standing houses, as well as associated infrastructure works including drainage and road construction.

An extract of the proposed subdivision bundle, the pavement plan, is provided below.

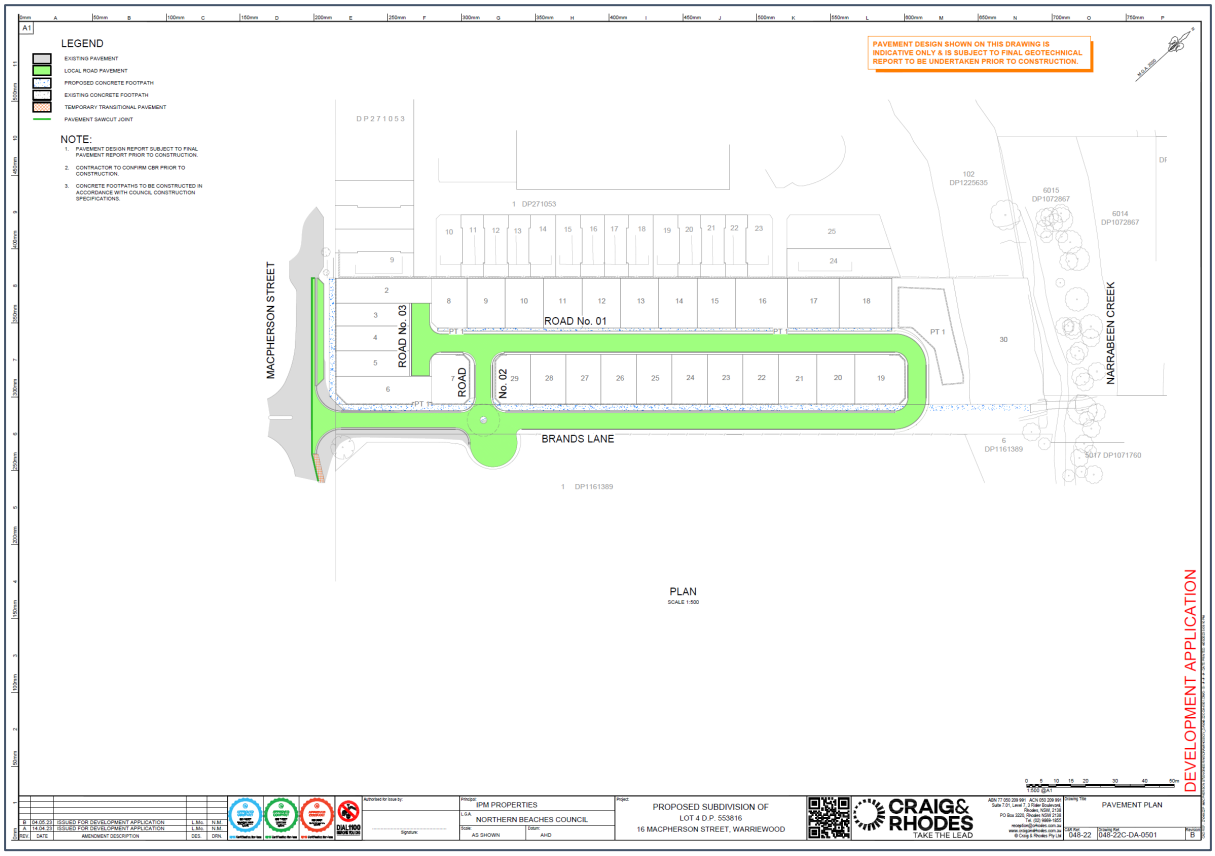


Figure 3.1 – Proposed pavement plan (Source: Craig & Rhodes)

The proposed works also includes the construction of new dwelling houses on the 28 proposed allotments, in accordance with Council's Pittwater Local Environmental Plan 2014 (PLEP 2014) requirements.

3.2 Road Construction & Infrastructure Upgrades

As noted in the foregoing, Brands Lane is an existing road reserve with an existing carriageway at its south-western end off Macpherson Street. The north-eastern portion of Brands Lane is currently unformed. It is expected that the upgrade of Brands Lane will ultimately be undertaken by the developer, as will the new internal lane within the subject site.

Advice received by Council within the pre-lodgement meeting minutes indicates that the Brands Lane extension and internal road must have a minimum width of 6.0m, allowing two-way traffic flow, with kerbside parking prohibited.

Reference to the pre-lodgement notes provided by Council following a meeting held on 1st December 2022, indicates that Council's Contributions Plan identifies the following public infrastructure to be provided within the vicinity of the subject site:

- Item 23 in the Traffic and Transport Schedule – Roundabout at Macpherson Street and Brands Lane

- Item 23 in the Pedestrian and Cyclist Network Strategy – Shared path connection (on road) from Narrabeen Creek to Macpherson Street

Council note that the preliminary design and investigation of this roundabout is currently underway by Council. The Contribution Plan anticipates that construction may commence in 2028/29. Furthermore, the construction of the shared path is anticipated to commence in 2029/30. In this regard, the developer is proposing to construct the shared path along the Macpherson Street site frontage as works-in-kind, however, not the roundabout.

3.3 Parking & Vehicular Access Arrangements

Off-street parking is proposed for 2 cars per allotment, in accordance with Council's Pittwater 21 Development Control Plan (P21 DCP) Section B6.3 requirements, to be provided on each individual allotment. Depending on the dwelling type, the 2 car parking spaces will either be in a traditional side-by-side double garage *or* a single-car garage with a tandem space in front of the garage.

It is worth noting that Section B6.3 of P21 DCP does not specify a visitor parking requirement for subdivisions, dwelling houses or attached dwellings. Council's pre-lodgement minutes also note that *"while it is preferred that a 2.5m wide footpath be provided as an absolute minimum, consideration may be given to a 2.1m wide footpath (with a) 6.0m wide road without on-street parking".*

Vehicular access to the site and the individual allotments is to be provided via two new intersections off Brands Lane, which connect with each other by way of an internal access lane through the site – i.e. there will not be any new driveways located off the Macpherson Street or Brands Lane frontages.

The site's proposed south-western vehicular access point has been relocated slightly to align with the existing roundabout that services the Anglicare residential aged care facility opposite, as per Council's Traffic Officer's suggestion. Notwithstanding, the existing dome roundabout island needs to be realigned to the centre of Brands Lane, as the existing island is currently offset closer towards the Anglicare development. The proposed centring of the island will ensure that motorists negotiate the intersection as intended – i.e. by driving around the island rather than over it. The centring of the island does not require any works to the Anglicare development, and their existing vehicular access driveways will remain unchanged. Appropriate chevron linemarking will be painted on the road pavement to ensure that those accessing the existing Anglicare driveways can continue to do so easily and in a logical fashion.

Furthermore, Brands Lane is to be realigned and extended towards the far north-eastern end of the site where it will terminate.

3.4 Waste Collection

Waste collection will be undertaken by Council's contractor using a 10.5m long side-loading garbage truck, travelling clockwise around the site. In this regard, bins will be lined up along the kerbside area on "bin night" for collection the following day.

A swept turn path assessment of a 10.5m long rigid truck has been prepared and provided in Appendix F, confirming that the truck can circulate around and through the site without difficulty, on the basis that kerbside parking is not permitted throughout the site.

4. Traffic Impact Assessment

The traffic implications of development proposals primarily concern the *nett change* in the traffic generation potential of a site compared to its existing and/or approved uses, and its impact on the operational performance of the surrounding road network, particularly during the weekday morning and afternoon road network peak periods.

An indication of the traffic generation potential of the existing and proposed uses on the site is provided by reference to the following documents:

- RMS Guide to Traffic Generating Developments 2002 (RMS Guide)
- RMS Technical Direction 2013/04a (TDT)

4.1 Existing Development Traffic Generation

The existing development on the site is defined by the RMS Guide as a "dwelling house" and a "plant nursery". Whilst the existing dwelling house generates approximately 1 vehicle trip during the weekday AM & PM peak periods, the existing plant nursery theoretically generates approximately 110 vehicle trips during the weekday AM & PM peak periods, based on the trip rate specified in the RMS Guide, as follows:

Plant Nursery

57 vehicles plus 0.7 vehicles per 100m^2 of site area

4.2 Proposed Development Traffic Generation

The proposed subdivision of the site and the future buildings on those new allotments are also defined by the RMS Guide as "dwelling houses".

The proposal involves the subdivision of the site into 28 new residential allotments, each consisting of a dwelling – i.e. 28 dwelling houses in total. Based on the RMS trip generation rates, the proposed development has a traffic generation potential of 28 vehicle trips during the weekday morning and afternoon peak hour.

4.3 Traffic Impact

As noted above, the traffic implications of development proposals primarily concern the *nett change* in the traffic generation potential of a site compared to its existing and/or approved uses.

Based on the RMS trip generation rates above, the proposed development is expected to result in a *nett reduction* of approximately 82 trips during the weekday AM & PM peak periods, as set out in the table below.

Table 4.1 – Nett Peak Traffic Generation

Period	Proposed Peak Trips	Existing Peak Trips	Nett Peak Trips*
AM & PM Peak Hour	28 vph	110 vph	-82 vph

* entry/exit combined

Notwithstanding, it is possible that the existing plant nursery generates a lower volume of traffic than is indicated by the RMS Guide, such that the *nett reduction* is likely to be much lower. In any event, the proposed peak period traffic volumes are minimal and consistent with the existing R3 zoning of the site and future desired character of the area. This will have minimal impacts on the surrounding road network.

4.4 Road Network Capacity & Traffic Impact – Completed Development

An important consideration in determining the impact of a development proposal on the road network 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 and is broken down into six ratings. This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom of manoeuvres.

The traffic implications of development proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA 9 program which is widely used by TfNSW and most LGAs for this purpose. TfNSW's criteria for evaluating the results of SIDRA analysis are summarised in the table on the following page.

Table 4.2 – Level of Service Criteria for Intersections (Table 4.2 of RMS Guide)

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabouts	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
F	>70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode or major treatment

For the purposes of undertaking a rigorous assessment, it has been assumed that the entire 28 peak vehicle trips expected to be generated by the proposed subdivision will be new, or additional, to the surrounding road network.

The SIDRA movements summaries of the Macpherson Street, Brands Lane & Fantail Avenue intersection are reproduced in Appendix G and summarised in Table 4.3 on the following page.

In essence, the SIDRA modelling confirms that the intersection is currently operating at Level of Service A on *all* approaches, and will continue to do so under the proposed development scenario. Accordingly, the traffic impact of the proposed development on the intersection is statistically insignificant and does not trigger an upgrade of the intersection.

Table 4.3 – Summary of SIDRA analysis of surrounding road network – Macpherson St, Brands Ln & Fantail Avenue intersection				
	Existing Base Case Scenario		Proposed Scenario with Development	
	AM	PM	AM	PM
Macpherson St (NW)				
LOS	A	A	A	A
DOS	0.161	0.158	0.162	0.164
AVD (sec/veh)	0.2	0.5	0.3	0.7
Brands Ln (NE)				
LOS	A	A	A	A
DOS	0.007	0.015	0.035	0.022
AVD (sec/veh)	4.7	4.9	5.4	5.1
Macpherson St (SE)				
LOS	A	A	A	A
DOS	0.134	0.118	0.136	0.126
AVD (sec/veh)	0.4	0.5	0.4	0.9
Fantail Ave (SW)				
LOS	A	A	A	A
DOS	0.085	0.036	0.086	0.037
AVD (sec/veh)	10.0	9.7	10.1	9.7
Overall Intersection				
LOS	A	A	A	A
DOS	0.161	0.158	0.162	0.164
AVD (sec/veh)	1.3	1.1	1.5	1.3

LOS – Level of Service; DOS – Degree of Saturation; AVD – Average Vehicle Delays

Importantly, the road network operation is expected to remain at the same level of service and therefore the proposal is supportable on traffic grounds.

5. Parking Assessment

5.1 Applicable Car Parking Rates

The off-street car parking rates applicable to the proposed development are specified in the Pittwater 21 DCP, Section B6.3 – Off-Street Vehicle Parking Requirements, as set out below.

Controls
The minimum number of vehicle parking spaces to be provided for off-street parking is as follows for dual occupancies, dwelling houses, secondary dwellings, exhibition homes, rural workers' dwellings and tourist and visitor accommodation:

Number of bedrooms per dwelling but not a secondary dwelling	Parking requirements per dwelling
1 bedroom	1 space
2 bedrooms or more	2 spaces

(Source: Pittwater 21 DCP)

5.2 Car Parking Requirements

Based on the proposal for 28 new dwellings, the proposed development requires the provision of 56 car parking spaces. Pittwater 21 DCP does not require the provision of visitor parking in this instance.

5.3 Proposed Car Parking Provisions

Off-street parking is proposed for 2 cars per allotment, in accordance with Council's Pittwater 21 Development Control Plan (P21 DCP) requirements, to be provided on each individual allotment. Depending on the dwelling type, the 2 car parking spaces will either be in a traditional side-by-side double garage *or* a single-car garage with a tandem space in front of the garage, as illustrated in the plan extract below.

Figure 5.1 – Proposed Masterplan ground floor level plan extract (Source: PBD Architects)

6. Design Assessment

6.1 Applicable Design Standards

The following design standards are used as the basis for compliance with respect to the vehicular access and parking requirements:

- Australian Standards 2890.1:2004 – Off-Street Car Parking (AS2890.1)
- Australian Standards 2890.2:2018 – Off-Street Commercial Vehicle Facilities (AS2890.2)

Whilst the vehicular access and parking areas have been designed in accordance with the above Australian Standards, it is expected that a condition of consent would be imposed requiring reconfirmation of compliance at the Construction Certificate stage (CC). Any minor amendments required to the current DA design can therefore be addressed at the CC stage.

6.2 Vehicular Access & Circulation Design

The following key compliances are noted with respect to the vehicular access design and circulation system:

- a 6.0m wide two-way internal roadway
- maximum gradient of 9% (1:11) along the proposed internal roadway
- typical gradient of 0.5-1.0% (1:200-1:100) along the proposed internal roadway

Further to the above, the vehicular access and internal circulation arrangements have been designed to accommodate the swept turning path requirements of the B99 design vehicle as specified in *AS2890.1,* allowing them to circulate through the site without difficulty, pass another vehicle, and to enter and exit the site in a forward direction at all times.

Similarly, the vehicular access and internal circulation arrangements have also been designed to accommodate the swept turning path requirements of Council's 10.5m long garbage truck, allowing it to circulate through the site without difficulty, pass another vehicle on the straight section of the internal road and also Brands Lane, and to enter and exit the site in a forward direction at all times.

Swept turn path diagrams are reproduced in Appendix F.

6.3 Parking Design

The following key compliances are noted with respect to the parking area design:

- minimum 6.0m long x 3.0m wide single car garages
- minimum 6.0m long x 3.0m wide tandem spaces outside single car garages
- minimum 6.0m long x 5.7m wide double car garages
- minimum 2.2m overhead clearance provided above all garaged parking spaces
- no obstructions within the "design envelope" of any car parking spaces

7. Conclusion

In summary, the proposed development involves the demolition of the existing dwelling house and plant nursery on the site and the subdivision of the site into 28 low density community title residential allotments, as well as associated infrastructure works including drainage and road construction.

The proposed works also includes the construction of new dwelling houses on the 28 proposed allotments, in accordance with Council's Pittwater Local Environmental Plan 2014 (PLEP 2014) requirements.

Off-street parking is proposed for 2 cars per allotment, in accordance with Council's Pittwater 21 Development Control Plan (P21 DCP) requirements, to be provided on each individual allotment. Vehicular access to the site and the individual allotments is to be provided via two new intersections off Brands Lane, which connect with each other by way of an internal access road through the site.

Based on the findings contained within this report, the following conclusions are made:

- the site is located within 400m of two bus services which both operate 7 days per week, providing services between Narrabeen and Mona Vale
- the proposed development is expected to result in a theoretical *nett reduction* of 82 vehicle trips during the weekday AM and PM peak periods, based on the trip rates specified in the RMS Guide
- putting aside the existing plant nursery traffic, the proposed subdivision traffic is minimal, consistent with the desired future character of the site, and will clearly not result in any unacceptable traffic or environmental capacity implications to the surrounding road network
- the SIDRA modelling indicates that the traffic impact of the proposed development on the Macpherson Street, Brands Lane & Fantail Avenue intersection is statistically insignificant and does not trigger an upgrade of the intersection
- the proposed road design and sections of Macpherson Street, Brands Lane and the future internal community road are all in accordance with Council's pre-lodgement comments
- given the proposed 6.0m wide road carriageway widths, kerbside parking will not be permitted throughout the site or the Brands Lane extension
- the proposed lot layout and road design can accommodate the swept turn path requirements of a 10.5m long rigid truck.

In light of the foregoing assessment, it is therefore concluded that the proposed subdivision and residential dwellings is supportable on vehicular access, traffic, parking and servicing grounds and will not result in any unacceptable implications.

CJP | CONSULTING ENGINEERS

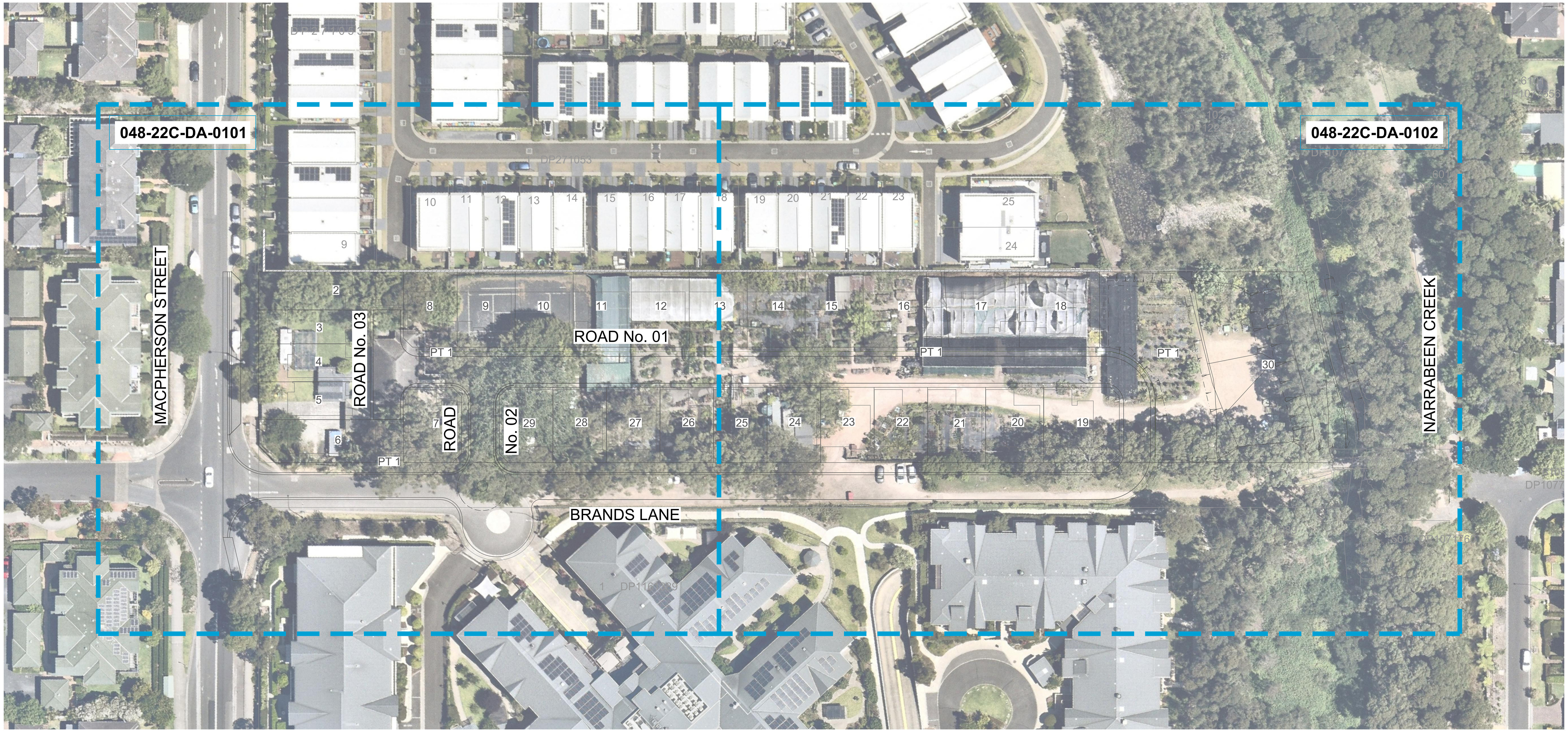
Appendix A

Proposed Subdivision Plan

A1

LEGEND

PLAN OUTLINE



PLAN

SCALE 1:500

0 5 10 15 20 30 40 50m
1:500 @A1

DEVELOPMENT APPLICATION

REV.	DATE	AMENDMENT DESCRIPTION	DES.	DRN.
B	04.05.23	ISSUED FOR DEVELOPMENT APPLICATION	L.Mc.	N.M.
A	14.04.23	ISSUED FOR DEVELOPMENT APPLICATION	L.Mc.	N.M.

Authorised for issue by:

Signature:

Principal: IPM PROPERTIES

L.G.A. NORTHERN BEACHES COUNCIL

Scale: AS SHOWN

Datum: AHD

Project:
PROPOSED SUBDIVISION OF
LOT 4 D.P. 553816
16 MACPHERSON STREET, WARRIEWOOD

CRAIG& RHODES
TAKE THE LEAD

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Drawing Title: KEY PLAN

C&R Ref. 048-22

Drawing Ref. 048-22C-DA-0004

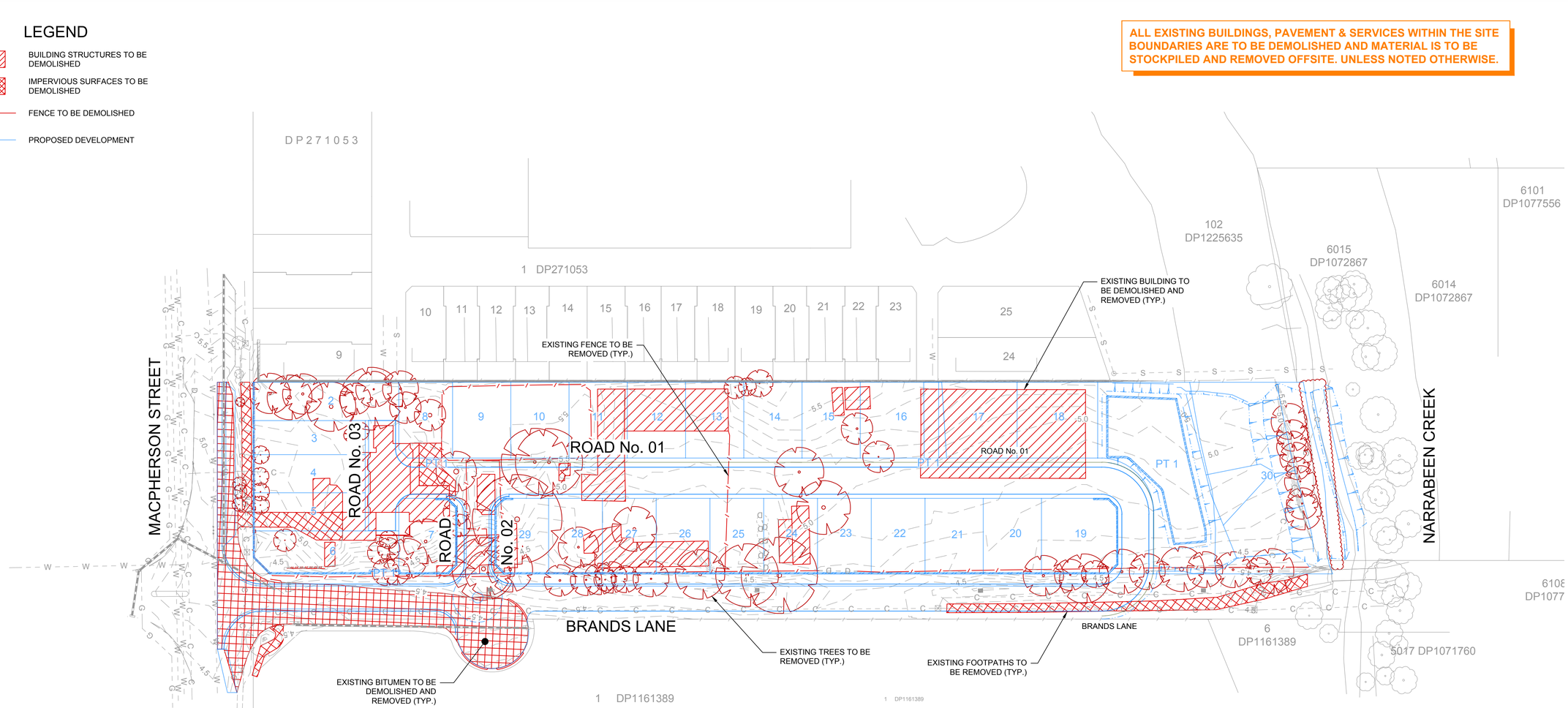
Revision B

A1

LEGEND

- BUILDING STRUCTURES TO BE DEMOLISHED
- IMPERVIOUS SURFACES TO BE DEMOLISHED
- FENCE TO BE DEMOLISHED
- PROPOSED DEVELOPMENT

ALL EXISTING BUILDINGS, PAVEMENT & SERVICES WITHIN THE SITE BOUNDARIES ARE TO BE DEMOLISHED AND MATERIAL IS TO BE STOCKPILED AND REMOVED OFFSITE. UNLESS NOTED OTHERWISE.



PLAN

SCALE 1:500

DEVELOPMENT APPLICATION

0 5 10 15 20 30 40 50m
1:500 @A1

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DIAL 1100 BEFORE YOU DIG

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Principal: IPM PROPERTIES

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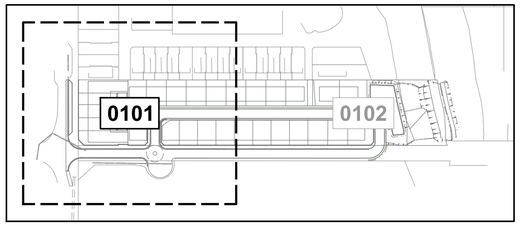
www.craigandrhodes.com.au

Drawing Title: DEMOLISHION PLAN

C&R Ref. 048-22 | Drawing Ref. 048-22C-DA-0021 | Revision B

A1



KEY PLAN

M:\CA 2020

SAWCUT EXISTING EDGE OF PAVEMENT, MAKE SMOOTH CONNECTION AND TIE IN AT COMPLIANT GRADES WITH EXISTING PAVEMENT. TO BE IN ACCORDANCE WITH NORTHERN BEACHES COUNCIL STANDARD.

PROPOSED PARKING BAYS.

STAIRS IN RETAINING WALL TO BE PROVIDED. REFER TO CONSTRUCTION CERTIFICATE DRAWINGS FOR DETAILS

2.1m WIDE CONCRETE SHARED PATH TO NORTHERN BEACHES COUNCIL STANDARD.

RECONSTRUCT LINTEL OVER EXISTING PIT

PROVIDE STORMSACKS TO ALL PITS IN DRAINAGE LINE 2 & 3

EXISTING RETAINING WALL TO REMAIN. FILL TO BE PLACED NEXT TO EXISTING RETAINING WALL AND COMPACTED ENSURE NO DAMAGE TO EXISTING STRUCTURES.

1.0m WIDE CONCRETE FOOTPATH TO NORTHERN BEACHES COUNCIL STANDARD.

ROAD No. 01

ROAD No. 02

ROAD No. 03

MACPHERSON STREET

BRANDS LANE

1 DP271053

1 DP1161389

SAWCUT EXISTING EDGE OF PAVEMENT, MAKE SMOOTH CONNECTION AND TIE IN AT COMPLIANT GRADES WITH EXISTING PAVEMENT. TO BE IN ACCORDANCE WITH NORTHERN BEACHES COUNCIL STANDARD.

CONSTRUCT NEW PIT OVER EXISTING STORMWATER LINE

REMOVE LINTEL AND CONSTRUCT NEW GSIP OVER EXISTING PIT

PROPOSED CULVERT TO DRAIN INTO NARRABEEN CREEK. REFER DRG.No. 0753 FOR HEADWALL & SCOUR PROTECTION DETAILS

2.1m WIDE CONCRETE SHARED PATH TO NORTHERN BEACHES COUNCIL STANDARD.

EXISTING KERB & PAVEMENT TO BE DEMOLISHED AND REMOVED. REINSTATE VERGE TO NORTHERN BEACHES COUNCIL STANDARDS.

EXISTING DRAINAGE TO REMAIN

PROPOSED ROUNDABOUT

RECONSTRUCT PAVEMENT TO MATCH NEW ROUNDABOUT LEVELS AND LOCATION. EXISTING KERBS & VEHICLE CROSSINGS TO REMAIN

2.1m WIDE CONCRETE SHARED PATH TO NORTHERN BEACHES COUNCIL STANDARD.

FOR CONTINUATION SEE DRG. No.048-22C-DA-0102

PLAN

SCALE 1:250

NOTES:

1. REFER TO DRG. No. 0003 FOR LEGEND & ABBREVIATIONS
2. REFER TO NORTHERN BEACHES COUNCIL FOR STANDARD DETAILS & DRAWINGS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR INTERNAL DRIVEWAY & BUILDING DETAILS.
4. STORMWATER DRAINAGE EASEMENT SIZES:

   "A" = 1.5m WIDE STORMWATER DRAINAGE EASEMENT

   "B" = 2.0m WIDE TEMPORARY STORMWATER DRAINAGE EASEMENT
5. PROPOSED SEWER, WATER AND ELECTRIC SUBSTATION SHOWN ARE INDICATIVE ONLY. REFER TO APPROVED PLANS PRIOR TO CONSTRUCTION.

0 2.5 5 7.5 10 15 20 25m

1:250 @A1

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APPROVED COMPANY ISO 45001 · ISO 14001 · ISO 9001 — SAI Certification Services

DIAL 1100 BEFORE YOU DIG

Authorised for issue by:

Signature:

Principal: IPM PROPERTIES

L.G.A. NORTHERN BEACHES COUNCIL

Scale: AS SHOWN

Datum: AHD

Project: PROPOSED SUBDIVISION OF LOT 4 D.P. 553816 16 MACPHERSON STREET, WARRIEWOOD

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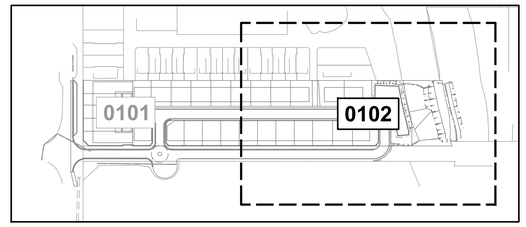
Drawing Title: ROAD & DRAINAGE PLAN SHEET 1 of 2

C&R Ref. 048-22 | Drawing Ref. 048-22C-DA-0101 | Revision B

C:\Users\Craig & Rhodes\Desktop\048-22C-DA-0101.DWG - B - DATE PRINTED: 4/05/2023 3:59:20 PM

A1



KEY PLAN

M.G.A. 2020

102
DP1225635

6014
DP1072867

PROVIDE OVERLAND FLOW PATH INBETWEEN HOUSES.

EXISTING RETAINING WALL TO REMAIN. FILL TO BE PLACED NEXT TO EXISTING RETAINING WALL AND COMPACTED ENSURE NO DAMAGE TO EXISTING STRUCTURES.

1.0m WIDE CONCRETE FOOTPATH TO NORTHERN BEACHES COUNCIL STANDARD.

PROPOSED GPT

PROPOSED BIO-RETENTION BASIN. REFER DRG. No. 0751 FOR DETAILS

FOR NARRABEEN CREEK CENTRELINE PROFILE, CROSS SECTIONS & DETAILS REFER 048-22C-CK DRAWING SET.

EXISTING CREEK ALIGNMENT

REFER TO 048-22C-CK PLANS FOR CREEK DETAILS.

ROAD No. 01

BRANDS LANE

NARRABEEN CREEK

RECONSTRUCT FOOTPATH TO EXISTING FOOT BRIDGE. MAX GRADE TO BE 5%.

EXISTING FOOT BRIDGE OVER NARRABEEN CREEK TO REMAIN

PROVIDE SMOOTH TRANSITION WITH EXISTING FOOTPATH.

PROPOSED HOUSE PAD. FINISHED HOUSE LEVELS SHOWN.

2.1m WIDE CONCRETE SHARED PATH TO NORTHERN BEACHES COUNCIL STANDARD.

EXISTING COMMS PIT TO BE RAISED TO MATCH NEW ROAD LEVELS.

PROVIDE REMOVABLE BOLLARDS AROUND CORNER

EXISTING COMMS PIT TO BE RAISED TO MATCH NEW ROAD LEVELS.

EXISTING COMMS TO BE ACCURATELY LOCATED PRIOR TO COMMENCEMENT OF ANY WORKS.

PROPOSED CULVERT TO DRAIN INTO NARRABEEN CREEK. REFER DRG.No. 0753 FOR HEADWALL & SCOUR PROTECTION DETAILS

FOR CONTINUATION SEE DRG. No.048-22C-DA-0101

1 DP1161389

6 DP1161389

5017 DP1071760

PLAN
SCALE 1:250

NOTES:
1. REFER TO DRG. No. 0101 FOR NOTES.

0 2.5 5 7.5 10 15 20 25m
1:250 @A1

DEVELOPMENT APPLICATION

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DIAL 1100 BEFORE YOU DIG

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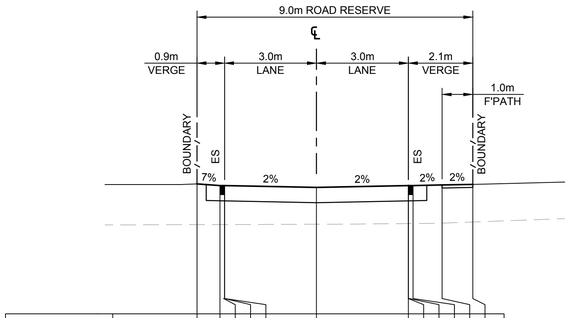
Drawing Title: ROAD & DRAINAGE PLAN SHEET 1 of 2
C&R Ref: 048-22
Drawing Ref: 048-22C-DA-0102
Revision: B

A1

LEGEND

DESIGN SURFACE
FUTURE DESIGN
EXISTING SURFACE



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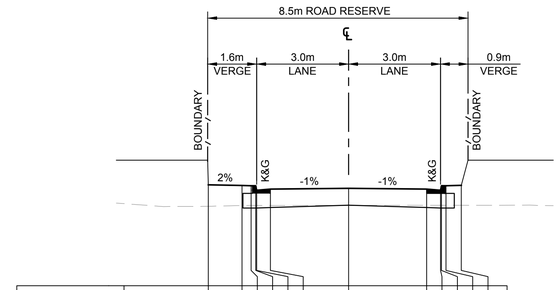
ROAD No. 01 - TYPICAL CROSS

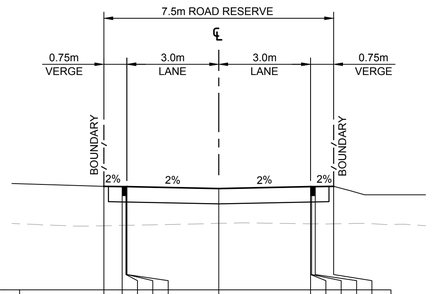
HORIZONTAL SCALE - 1:100
VERTICAL SCALE - 1:100



RELATIVE DIFFERENCE	0.11	0.09	0.09	0.09	-0.06	-0.02	0.00	-0.02	-0.06	0.09	0.09	0.10
OFFSET	-4.58	-3.48	-3.18	-3.03	-3.00	-2.55	0.00	2.55	3.00	3.03	3.18	3.68

ROAD No. 02 - TYPICAL CROSS

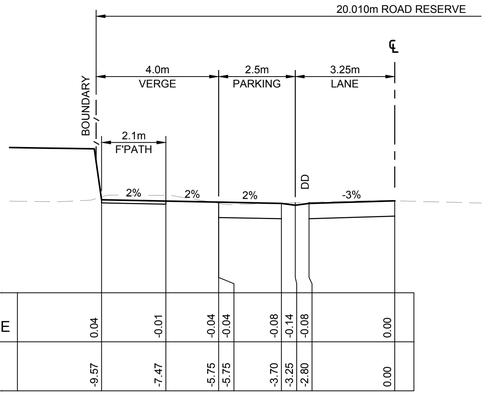
HORIZONTAL SCALE - 1:100
VERTICAL SCALE - 1:100



RELATIVE DIFFERENCE	0.07	0.06	0.06	0.06	0.06	0.00	0.06	0.06	0.06	0.06	0.06	0.07
OFFSET	-3.75	-3.15	-3.03	-3.00	-3.00	0.00	3.00	3.00	3.03	3.15	3.75	

ROAD No. 03 - TYPICAL CROSS

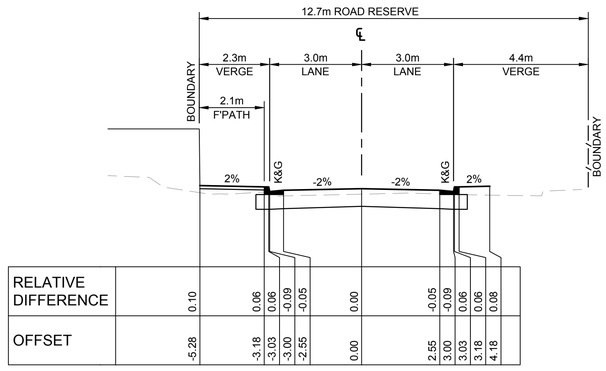
HORIZONTAL SCALE - 1:100
VERTICAL SCALE - 1:100



RELATIVE DIFFERENCE	0.04	-0.01	-0.04	-0.04	-0.08	-0.14	-0.08	0.00
OFFSET	-9.57	-7.47	-5.75	-5.75	-3.70	-3.25	-2.80	0.00

MACPHERSON STREET - TYPICAL CROSS

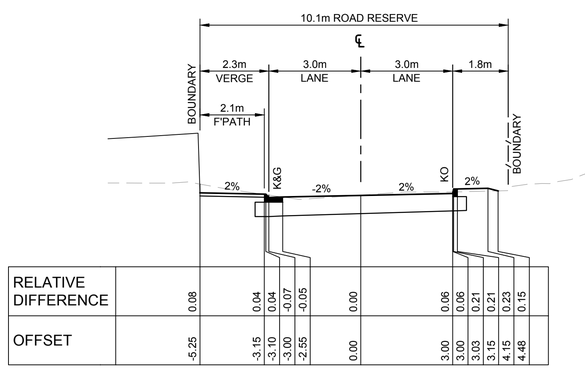
HORIZONTAL SCALE - 1:100
VERTICAL SCALE - 1:100



RELATIVE DIFFERENCE	0.10	0.06	0.06	-0.09	-0.05	0.00	-0.05	-0.09	0.06	0.06	0.08	
OFFSET	-5.28	-3.18	-3.03	-3.00	-2.55	0.00	2.55	3.00	3.03	3.18	4.18	

BRANDS LANE - TYPICAL CROSS

HORIZONTAL SCALE - 1:100
VERTICAL SCALE - 1:100



RELATIVE DIFFERENCE	0.08	0.04	0.04	-0.07	-0.05	0.00	0.06	0.06	0.21	0.21	0.23	0.15
OFFSET	-5.25	-3.15	-3.10	-3.00	-2.55	0.00	3.00	3.00	3.03	3.15	4.15	4.48

BRANDS LANE - TYPICAL CROSS

HORIZONTAL SCALE - 1:100
VERTICAL SCALE - 1:100

0 1 2 3 4 6 8 10m
1:100 @A1

DEVELOPMENT APPLICATION

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Drawing Title: TYPICAL ROAD CROSS SECTIONS
C&R Ref. 048-22
Drawing Ref. 048-22C-DA-0151
Revision B

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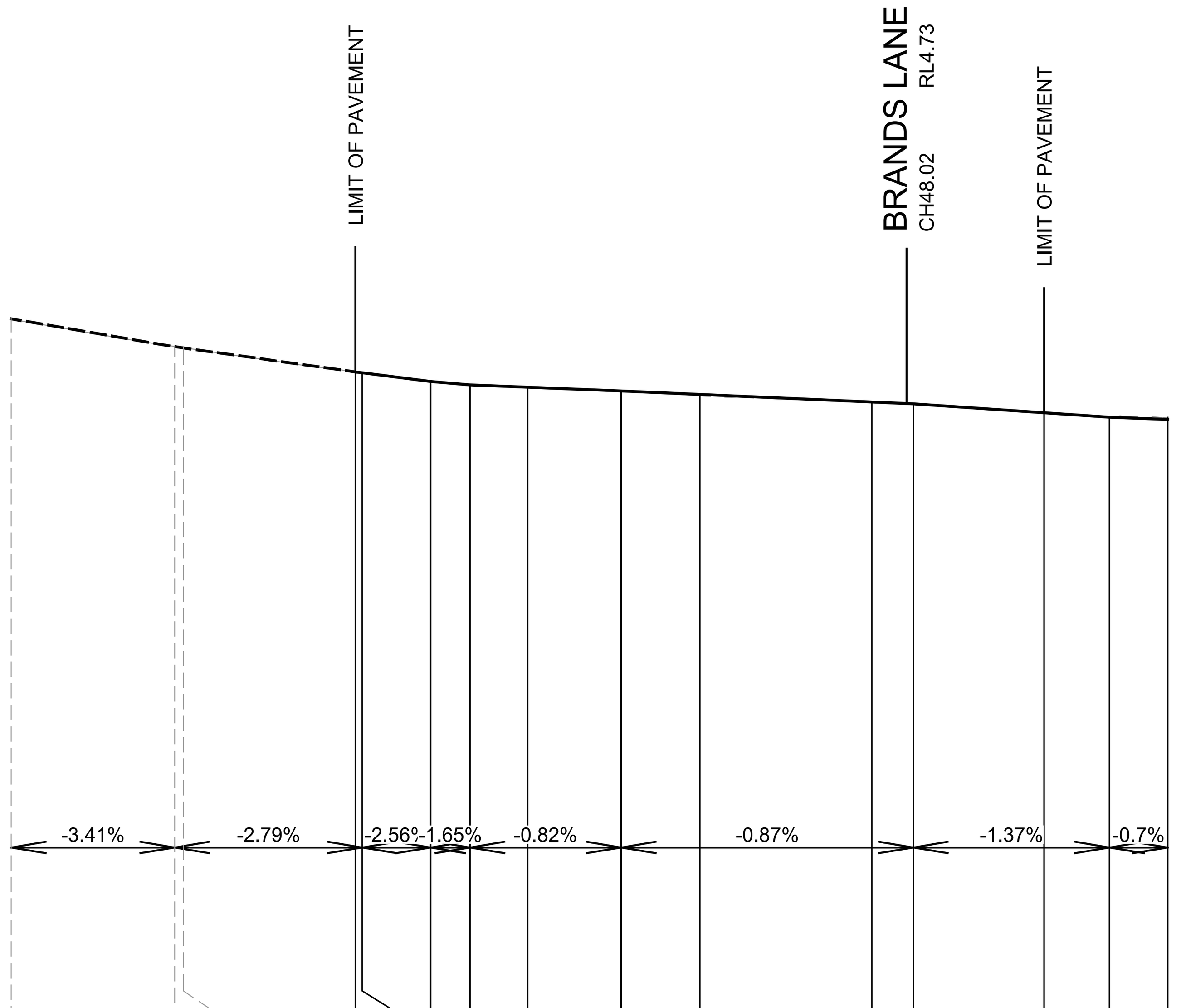
A1

LEGEND

- DESIGN SURFACE
- FUTURE DESIGN
- EXISTING SURFACE

NOTES:

1. SERVICES SHOWN INDICATIVE ONLY.
2. FOR STORM WATER DRAINAGE SETOUT REFER TO COUNCIL STANDARDS & SPECIFICATIONS

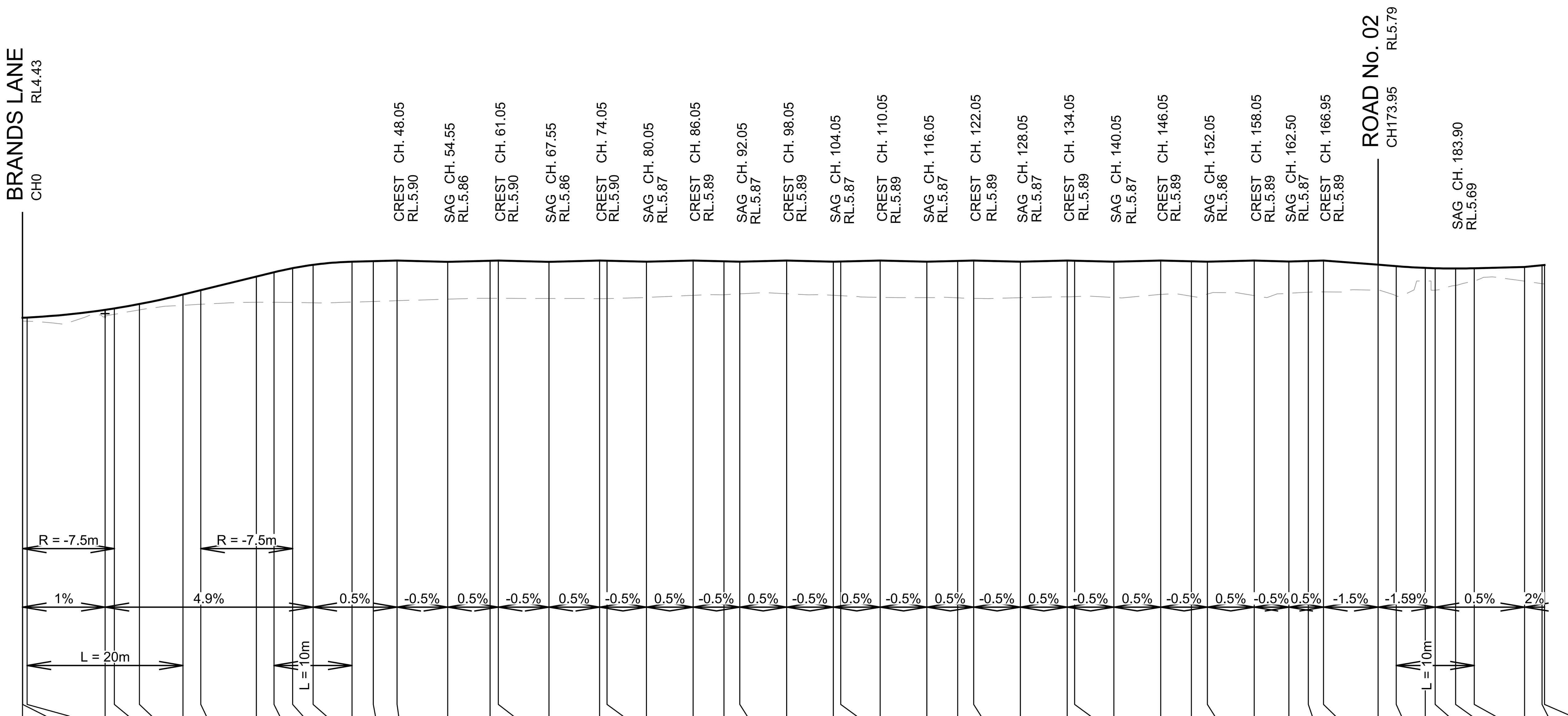


CHAINAGE	DESIGN LEVEL	EXISTING LEVEL
-30	6.21	6.20
-15.75	5.72	5.73
-15	5.70	5.71
0	5.28	5.29
0.59	5.27	5.27
6.54	5.12	5.12
9.97	5.06	5.06
15	5.02	5.02
23.15	4.95	4.95
30	4.89	4.87
45	4.76	4.76
48.6	4.73	4.73
60	4.57	4.57
65.7	4.49	4.50
70.77	4.46	4.49

WAE: (blank)

MACPHERSON STREET - LONGITUDINAL SECTION

HORIZONTAL SCALE - 1:500
VERTICAL SCALE - 1:100



CHAINAGE	DESIGN LEVEL	EXISTING LEVEL
0	4.43	4.34
0	4.43	4.34
0.59	4.43	4.34
10.59	4.63	4.46
11.79	4.67	4.52
15	4.78	4.63
20.59	5.02	4.75
22.87	5.14	4.77
30	5.48	4.82
32.27	5.60	4.83
34.65	5.70	4.82
37.27	5.79	4.81
42.27	5.87	4.83
45	5.88	4.85
48.05	5.90	4.86
54.55	5.86	4.90
60	5.89	4.93
61.05	5.90	4.93
67.55	5.86	4.92
74.05	5.90	4.92
75	5.89	4.92
80.05	5.87	4.95
86.05	5.89	5.00
90	5.88	5.02
92.05	5.87	5.04
98.05	5.89	5.04
104.05	5.87	5.00
105	5.87	4.99
110.05	5.89	4.95
116.05	5.87	4.94
120	5.88	4.94
122.05	5.89	4.93
128.05	5.87	4.94
134.05	5.89	4.96
135	5.89	4.97
140.05	5.87	4.95
146.05	5.89	5.03
150	5.88	4.98
152.05	5.86	5.03
158.05	5.89	5.00
162.5	5.87	5.06
165	5.89	5.08
166.95	5.89	5.09
173.95	5.79	5.14
176.29	5.75	4.99
180	5.71	5.37
181.29	5.70	5.14
183.9	5.69	5.26
186.29	5.70	5.37
192.75	5.73	5.37
195	5.78	5.30
195.3	5.78	5.29

WAE: (blank)

ROAD No. 01 - LONGITUDINAL SECTION

HORIZONTAL SCALE - 1:500
VERTICAL SCALE - 1:100

0 1 2 3 4 6 8 10m — 1:100 @A1
0 5 10 15 20 30 40 50m — 1:500 @A1

DEVELOPMENT APPLICATION

REV.	DATE	AMENDMENT DESCRIPTION	DES.	DRN.
B	04.05.23	ISSUED FOR DEVELOPMENT APPLICATION	L.Mc.	N.M.
A	14.04.23	ISSUED FOR DEVELOPMENT APPLICATION	L.Mc.	N.M.

APPROVED COMPANY ISO 45001 Occupational Health & Safety Management Systems — QMS Certification Services
APPROVED COMPANY ISO 14001 Environmental Management Systems — QMS Certification Services
APPROVED COMPANY ISO 9001 Quality Management Systems — QMS Certification Services
DIAL 1100 BEFORE YOU DIG

Authorised for issue by:
Signature:

Principal: IPM PROPERTIES
L.G.A. NORTHERN BEACHES COUNCIL
Scale: AS SHOWN
Datum: AHD

Project: PROPOSED SUBDIVISION OF LOT 4 D.P. 553816 16 MACPHERSON STREET, WARRIEWOOD

CRAIG& RHODES TAKE THE LEAD

ABN 77 050 209 991 ACN 050 209 991
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PO Box 3220, Rhodes NSW 2138
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reception@crhodes.com.au
www.craigandrhodes.com.au

Drawing Title: ROAD LONGITUDINAL SECTIONS MacPHERSON STREET & ROAD No. 01
C&R Ref. 048-22
Drawing Ref. 048-22C-DA-0201
Revision B

CAD REF.: Z:\048-22P MACPHERSON ST\ENGINEERING\DRAWINGS\CIV_DA\048-22C-DA-0201.DWG - B - # - # - DATE PRINTED: 4/05/2023 5:08:52 PM

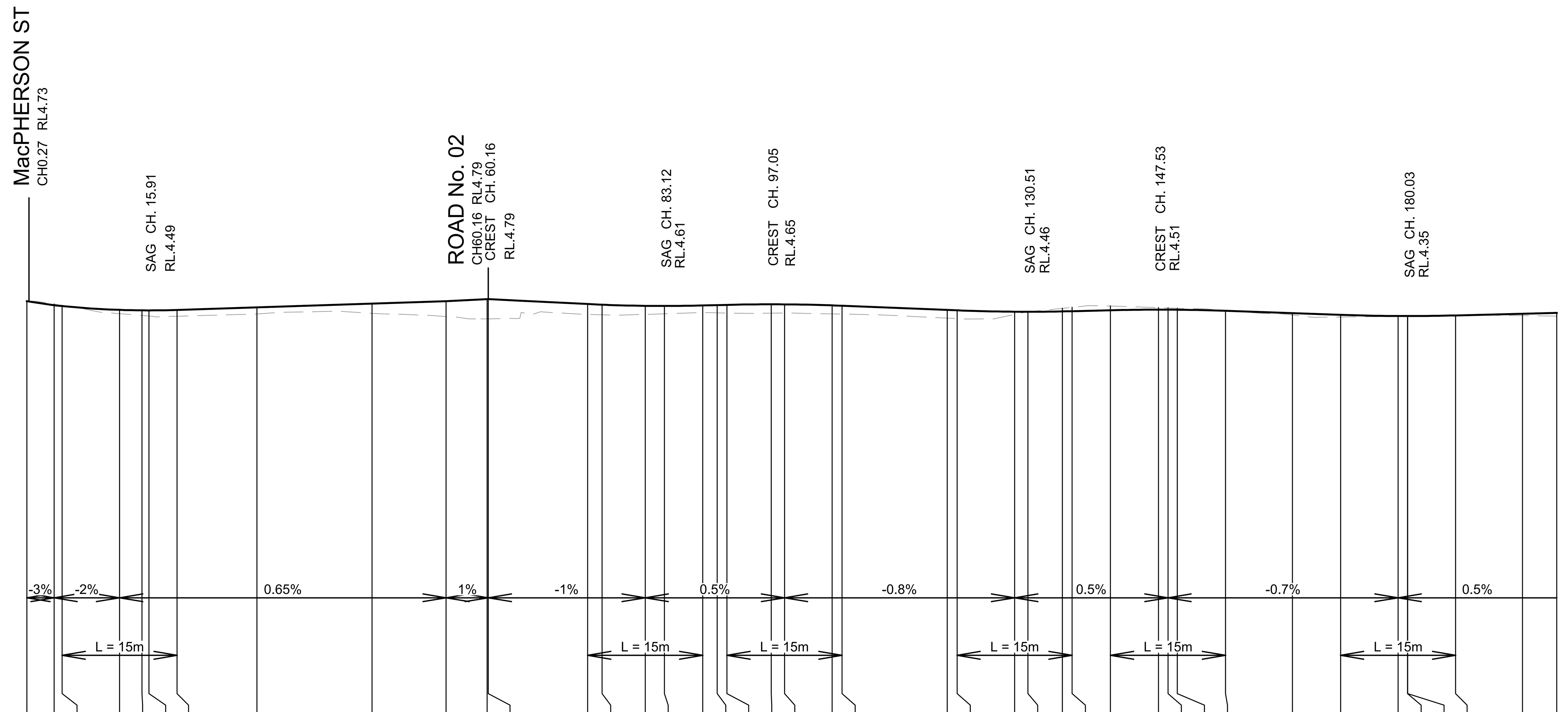
A1

LEGEND

- DESIGN SURFACE (solid line)
- FUTURE DESIGN (dashed line)
- EXISTING SURFACE (light dashed line)

NOTES:

1. SERVICES SHOWN INDICATIVE ONLY.
2. FOR STORM WATER DRAINAGE SETOUT REFER TO COUNCIL STANDARDS & SPECIFICATIONS



HORIZ GEOMETRY

GRADE (%): -3% | -2% | 0.65% | 1% | -1% | 0.5% | -0.8% | 0.5% | -0.7% | 0.5%

V.C. LENGTH (m): L = 15m | L = 15m | L = 15m | L = 15m | L = 15m | L = 15m

DATUM R.L.-6

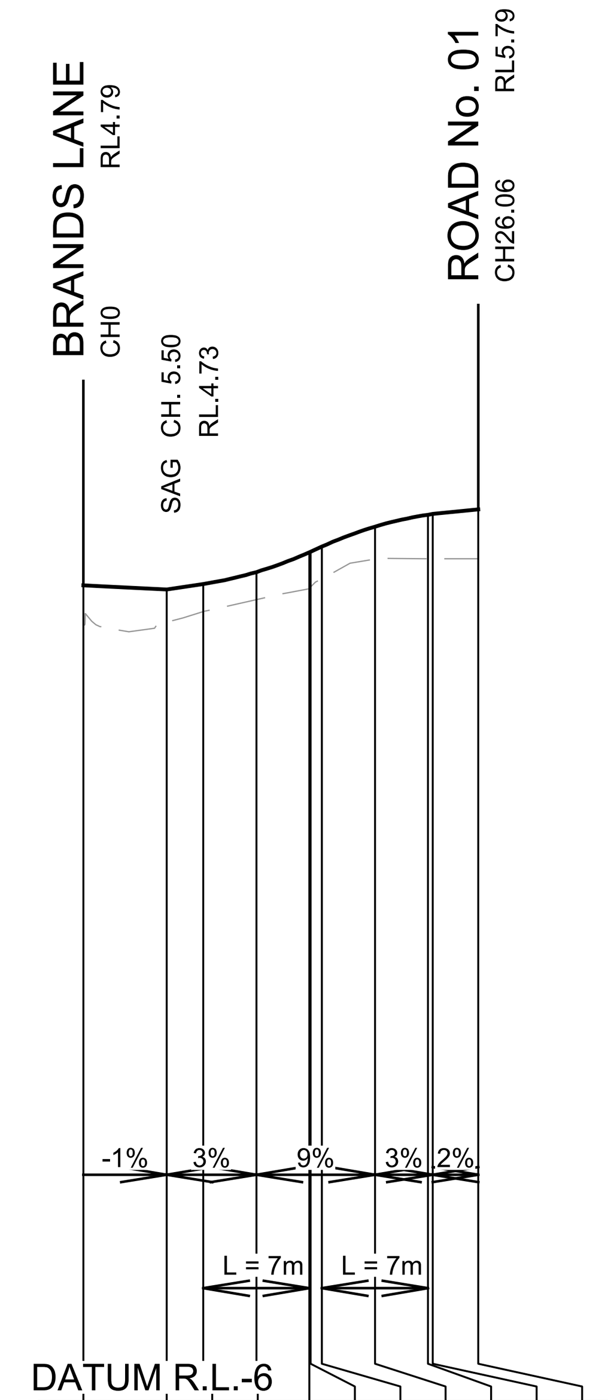
WAE														
DESIGN LEVEL	4.73	4.63	4.61	4.51	4.49	4.49	4.51	4.57	4.67	4.73	4.79	4.79	4.66	4.64
EXISTING LEVEL	4.73	4.66	4.62	4.41	4.36	4.35	4.34	4.40	4.42	4.33	4.27	4.27	4.39	4.38
CHAINAGE	0	3.55	4.59	12.09	15	15.91	19.59	30	45	54.66	60	60.16	73.12	75

WAE														
DESIGN LEVEL	4.61	4.61	4.62	4.63	4.64	4.65	4.65	4.62	4.61	4.50	4.49	4.46	4.46	4.47
EXISTING LEVEL	4.39	4.41	4.44	4.43	4.42	4.42	4.42	4.40	4.40	4.29	4.27	4.39	4.45	4.55
CHAINAGE	80.62	83.12	88.12	90	91.28	97.05	98.78	105	106.28	120	121.28	128.78	130.51	135

WAE														
DESIGN LEVEL	4.47	4.50	4.51	4.51	4.51	4.48	4.42	4.38	4.35	4.35	4.35	4.36	4.41	4.43
EXISTING LEVEL	4.57	4.61	4.57	4.56	4.55	4.49	4.37	4.32	4.34	4.34	4.34	4.36	4.36	4.34
CHAINAGE	136.28	141.28	147.53	148.78	150	156.28	165	171.28	178.78	180	180.03	186.28	195	199.45

BRANDS LANE - LONGITUDINAL SECTION

HORIZONTAL SCALE - 1:500
VERTICAL SCALE - 1:100



GRADE (%): -1% | 3% | 9% | 3% | 2%

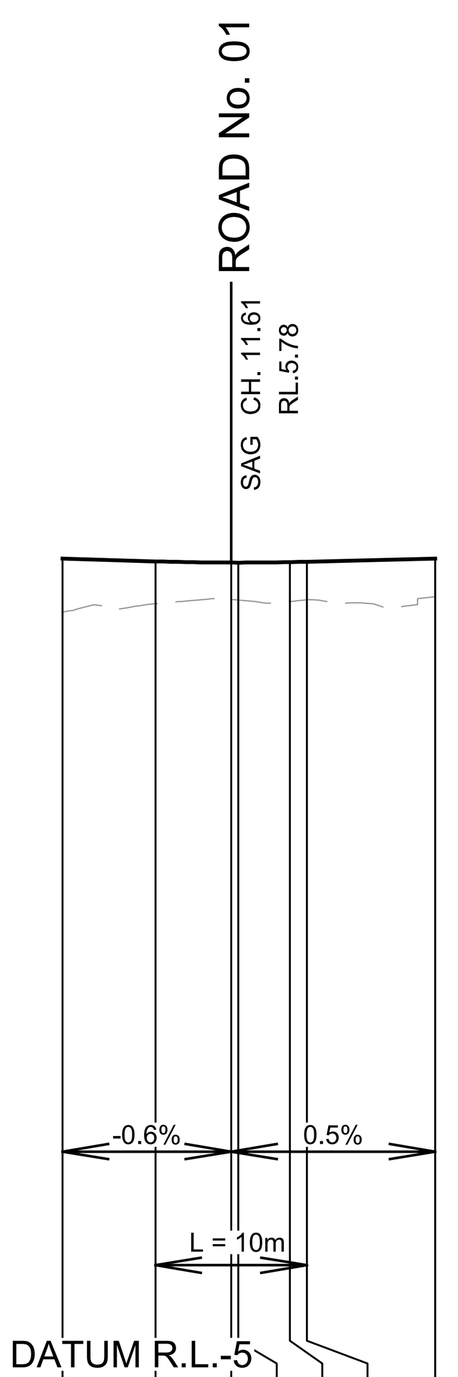
V.C. LENGTH (m): L = 7m | L = 7m

DATUM R.L.-6

WAE											
DESIGN LEVEL	4.79	4.73	4.81	4.96	5.23	5.23	5.30	5.56	5.72	5.73	5.79
EXISTING LEVEL		4.31	4.44	4.60	4.75	4.77	4.88	5.13	5.14	5.14	5.14
CHAINAGE	0	5.5	7.91	11.41	14.91	15	15.75	19.25	22.75	23.06	26.06

ROAD No. 02 LONGITUDINAL SECTION

HORIZONTAL SCALE - 1:500
VERTICAL SCALE - 1:100



GRADE (%): -0.6% | 0.5%

V.C. LENGTH (m): L = 10m

DATUM R.L.-5

WAE							
DESIGN LEVEL	5.83	5.80	5.78	5.78	5.79	5.79	5.83
EXISTING LEVEL	5.13	5.24	5.29	5.29	5.27	5.29	5.33
CHAINAGE	0	6.13	11.13	11.61	15	16.13	24.6

ROAD No. 03 LONGITUDINAL SECTION

HORIZONTAL SCALE - 1:500
VERTICAL SCALE - 1:100

0 1 2 3 4 6 8 10m
1:100 @A1
0 5 10 15 20 30 40 50m
1:500 @A1

DEVELOPMENT APPLICATION

REV.	DATE	AMENDMENT DESCRIPTION	DES.	DRN.
B	04.05.23	ISSUED FOR DEVELOPMENT APPLICATION	L.Mc.	N.M.
A	14.04.23	ISSUED FOR DEVELOPMENT APPLICATION	L.Mc.	N.M.

APPROVED COMPANY ISO 45001 Occupational Health & Safety Management Systems — QMS Certification Services
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DIAL 1100 BEFORE YOU DIG

Authorised for issue by:

Signature:

Principal: IPM PROPERTIES
L.G.A.: NORTHERN BEACHES COUNCIL
Scale: AS SHOWN
Datum: AHD

Project:
PROPOSED SUBDIVISION OF
LOT 4 D.P. 553816
16 MACPHERSON STREET, WARRIEWOOD

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www.craigandrhodes.com.au

Drawing Title:
ROAD LONGITUDINAL SECTIONS
BARNDS LANE
ROAD No. 02 & ROAD No. 03

C&R Ref.: 048-22
Drawing Ref.: 048-22C-DA-0202
Revision: B

CAD REF.: Z:\048-22P MACPHERSON ST\ENGINEERING\DRAWINGS\CIV_DA\048-22C-DA-0202.DWG - B - # - # - DATE PRINTED: 4/05/2023 5:09:01 PM

A1

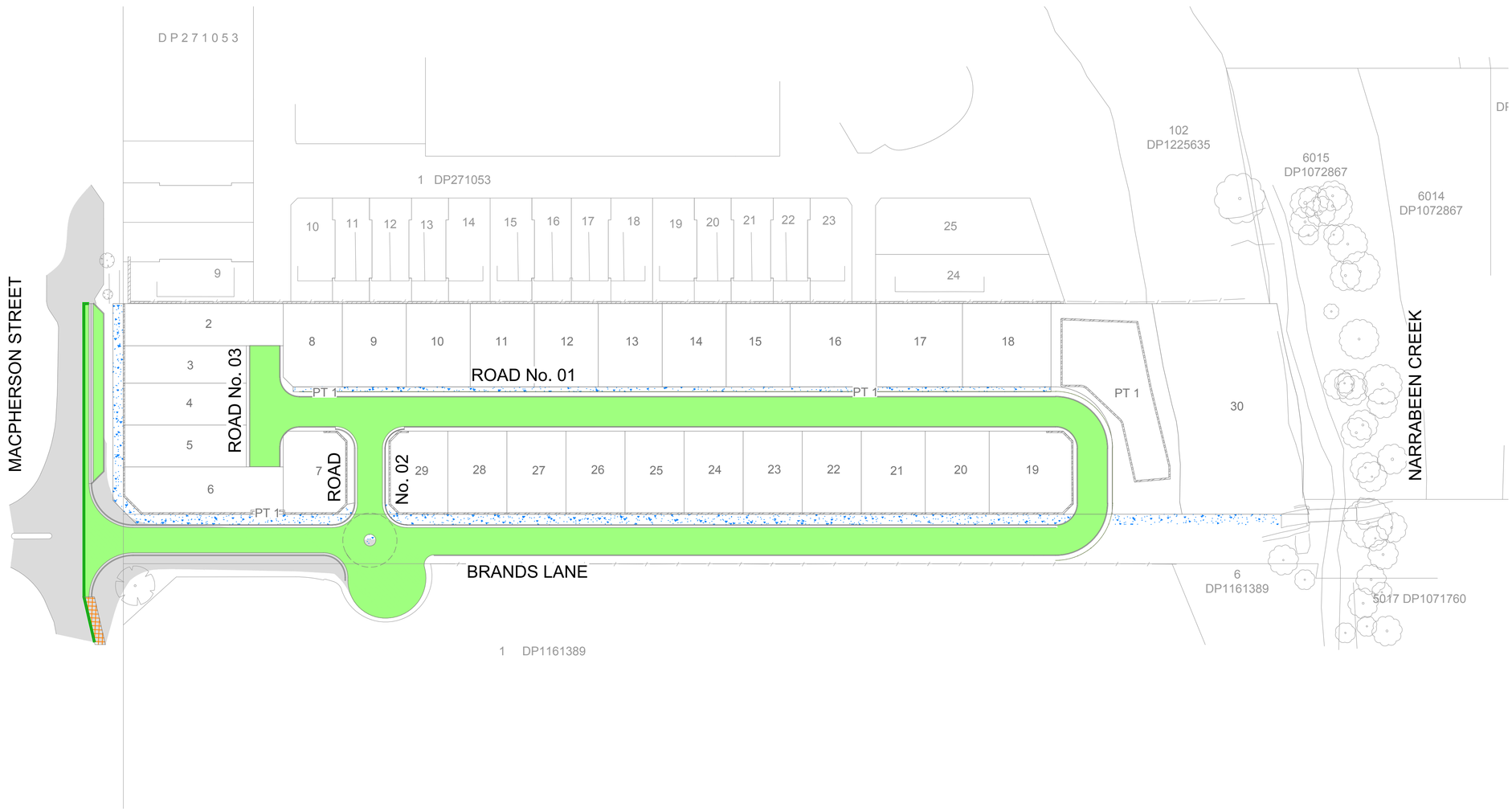
LEGEND

- EXISTING PAVEMENT
- LOCAL ROAD PAVEMENT
- PROPOSED CONCRETE FOOTPATH
- EXISTING CONCRETE FOOTPATH
- TEMPORARY TRANSITIONAL PAVEMENT
- PAVEMENT SAWCUT JOINT

NOTE:

1. PAVEMENT DESIGN REPORT SUBJECT TO FINAL PAVEMENT REPORT PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CBR PRIOR TO CONSTRUCTION.
3. CONCRETE FOOTPATHS TO BE CONSTRUCTED IN ACCORDANCE WITH COUNCIL CONSTRUCTION SPECIFICATIONS.

PAVEMENT DESIGN SHOWN ON THIS DRAWING IS INDICATIVE ONLY & IS SUBJECT TO FINAL GEOTECHNICAL REPORT TO BE UNDERTAKEN PRIOR TO CONSTRUCTION.



PLAN

SCALE 1:500

0 5 10 15 20 30 40 50m

1:500 @A1

DEVELOPMENT APPLICATION

REV.	DATE	AMENDMENT DESCRIPTION	DES.	DRN.
B	04.05.23	ISSUED FOR DEVELOPMENT APPLICATION	L.Mc.	N.M.
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Authorised for issue by:

Signature:

Principal: IPM PROPERTIES

L.G.A. NORTHERN BEACHES COUNCIL

Scale: AS SHOWN

Datum: AHD

Project: PROPOSED SUBDIVISION OF LOT 4 D.P. 553816 16 MACPHERSON STREET, WARRIEWOOD

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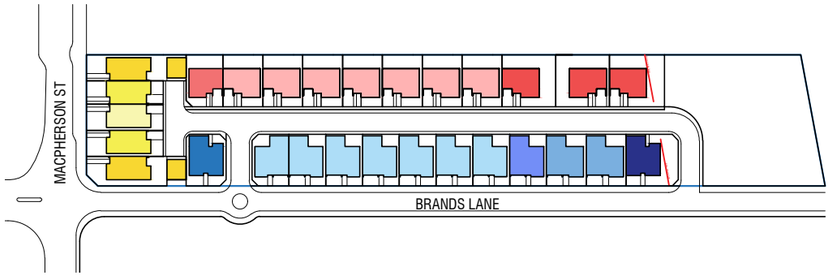
Drawing Title: PAVEMENT PLAN

C&R Ref.	Drawing Ref.	Revision
048-22	048-22C-DA-0501	B

CJP | CONSULTING ENGINEERS

Appendix B

Proposed Architectural Plans



1 LOCATION PLAN
SCALE 1:1000@A1 / 1:2000@A3

N

PROJECT INFORMATION

16 Macpherson St, Warriewood
Site Area = **10 121** m^2
Lot 4 DP 553814

Zoning : **R3** Medium Density Residential
Height of building : **10.5**m
8.5m within the area that is 12.5m measured from the boundary fronting Macpherson St
Floor space ration : N/A
Minimum lot size : N/A
Heritage : the site does not contain a heritage item nor is it within a heritage conservation area
Setbacks : see Lot Plan (DA 004)

TERRACES MIX + AREAS

28 Lots
28 Dwellings
7 Adaptable

SITE COVERAGE

Total Landscaped Area = 4822 m^2
47.64 % of the Site Area

Total Covered Area =4922 m^2
(impervious area) **48.63% of the Site Area**

A1 type
7 Dwellings / 25 % of total
3 Bed.
Internal Area = 152m^2
P.O.S = 5x4m = 20m^2
Storage = 9m^3
2 car parking spaces

A2 type
1 Dwelling / 3% of total
3 Bed.
Internal Area = 145m^2
P.O.S = 5x4m = 20m^2
Storage = 8m^3
2 car parking spaces

A3 type
3 Dwelling / 7 % of total
3 Bed.
Internal Area = 152m^2
P.O.S = 5x4m = 20m^2
Storage = 9m^3
2 car parking spaces

B1 type
7 Dwellings / 25% of total
3 Bed. (4 Bed. post Adaptation)
Internal Area = 169m^2
P.O.S = 5x4m = 20m^2
Storage = 9m^3
2 car parking spaces

B2 type
2 Dwellings / 7% of total
3 Bed.
Internal Area = 188m^2
P.O.S = 5x4m = 20m^2
Storage = 8m^3
2 car parking spaces

B3 type
1 Dwelling / 3% of total
3 Bed.
Internal Area = 172m^2
P.O.S = 6.7x3m = 20m^2
Storage = 10m^3
2 car parking spaces

B4 type
1 Dwelling / 3% of total
3 Bed.
Internal Area = 169m^2
P.O.S = 5x4m = 20m^2
Storage = 9m^3
2 car parking spaces

B5 type
1 Dwelling / 3% of total
3 Bed.
Internal Area = 172m^2
P.O.S = 6.7x3m = 20m^2
Storage = 10m^3
2 car parking spaces

C1 type
2 Dwellings / 7% of total
3 Bed.
Internal Area = 157m^2
P.O.S = 5x4m = 20m^2
Storage = 9m^3
2 car parking spaces

C2 type
1 Dwelling / 3% of total
3 Bed.
Internal Area = 157m^2
P.O.S = 4.5x4m = 18m^2
Storage = 9m^3
2 car parking spaces

C3 type
2 Dwellings / 7% of total
4 Bed.
Internal Area = 172m^2
P.O.S = 5x4m = 20m^2
Storage = 9m^3
2 car parking spaces

GENERAL NOTES:

- ALL WORKS TO COMPLY WITH BUILDING CODE OF AUSTRALIA, REQUIREMENTS OF RELEVANT STATUTORY AUTHORITIES/ LOCAL GOVERNMENT & RELEVANT AUSTRALIAN BUILDING STANDARDS
- DRAWINGS FOR THE PURPOSES OF DA ONLY - FURTHER CONSULTANT/ AUTHORITY COORDINATION WILL BE REQUIRED AT CC STAGE WHICH MAY IMPACT ON DESIGN AND PLANNING LAYOUTS
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LEGEND:

AW	AWNING
HW	HIGHLIGHT WINDOW
CU	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
MV	MECHANICAL RISER TO FUTURE DETAIL
GC	GARBAGE CHUTE
MB	MAILBOX TO FUTURE DETAIL
PB	PLANTERBOX
R	240L RECYCLING BIN
SK	SKYLIGHT
ST	STORAGE
WT	HOT WATER UNITS

ISSUE	DATE	DESCRIPTION
01	12.04.23	ISSUE FOR DA

CLIENT:
IPM PROPERTY

ARCHITECT:
PBD | ARCHITECTS
ABN 36 147 035 550
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Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD
APR. 2023

DRAWING TITLE:
PROJECT SUMMARY

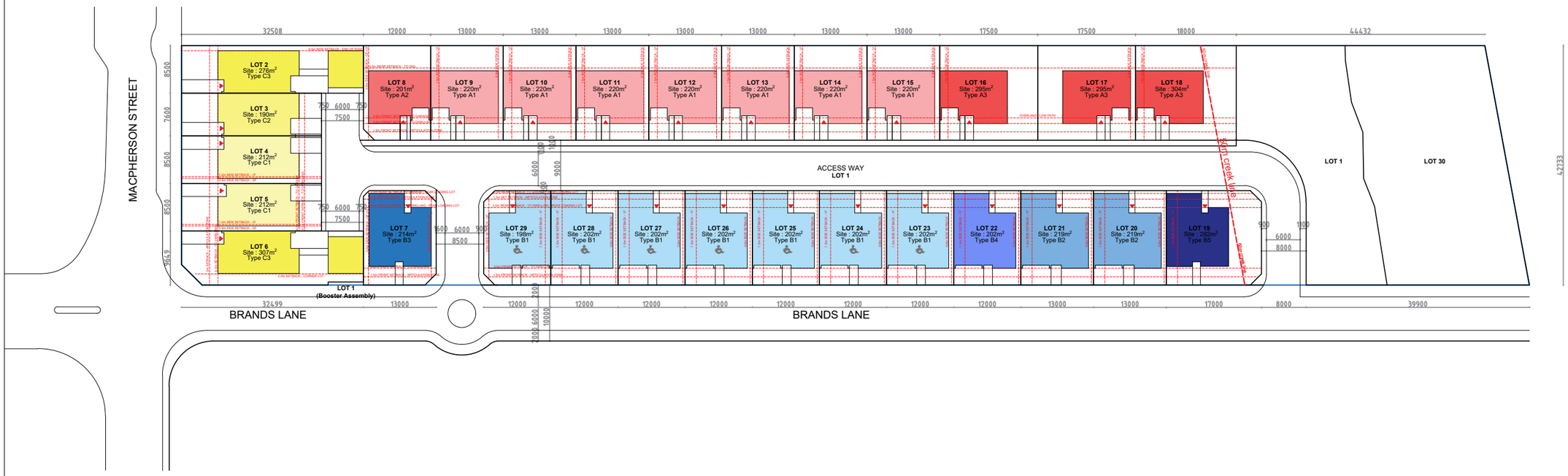
DRAWN BY: SS
CHECKED BY: HV
SCALE: VARIOUS
DRAWING NO: DA 001
ISSUE: 01
PROJECT NO: 2235

N

28 Lots
28 Dwellings
7 Adaptable (25%)

TYPES

A1	7	25%
A2	1	3.5%
A3	3	11%
B1	7	25%
B2	2	7%
B3	1	3.5%
B4	1	3.5%
B5	1	3.5%
C1	2	7%
C2	1	3.5%
C3	2	7%



1 LOT PLAN
SCALE 1:400@A1 / 1:800@A3

GENERAL NOTES:

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LEGEND:

AW	AWNING
HW	HIGHLIGHT WINDOW
CU	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
MV	MECHANICAL RISER TO FUTURE DETAIL
GC	GARBAGE CHUTE
MB	MAILBOX TO FUTURE DETAIL
PB	PLANTERBOX
R	240L RECYCLING BIN
SK	SKYLIGHT
ST	STORAGE
WT	HOT WATER UNITS

ISSUE	DATE	DESCRIPTION
01	12.04.23	ISSUE FOR DA

N

CLIENT:
IPM PROPERTY

ARCHITECT:
PBD | ARCHITECTS

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P - 02 9698 8140 E - info@pbdarchitects.com.au W - www.pbdarchitects.com.au
Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD
APR. 2023

DRAWING TITLE:
LOT PLAN

DRAWN BY: SS	CHECKED BY: HV	
SCALE: 1:400@A1 / 1:800@A3	DRAWING NO: DA 004	ISSUE: 01
PROJECT NO: 2235		

1 MASTER PLAN GROUND LEVEL

SCALE 1:500@A1 / 1:1000@A3

GENERAL NOTES:

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LEGEND:

AW	AWNING
HW	HIGHLIGHT WINDOW
CU	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
MV	MECHANICAL RISER TO FUTURE DETAIL
GC	GARBAGE CHUTE
MB	MAILBOX TO FUTURE DETAIL
PB	PLANTERBOX
R	240L RECYCLING BIN
SK	SKYLIGHT
ST	STORAGE
WT	HOT WATER UNITS

ISSUE	DATE	DESCRIPTION
01	12.04.23	ISSUE FOR DA

N

CLIENT:
IPM PROPERTY

ARCHITECT:
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Nominated Architect: Paul Buljevic NSW 7768

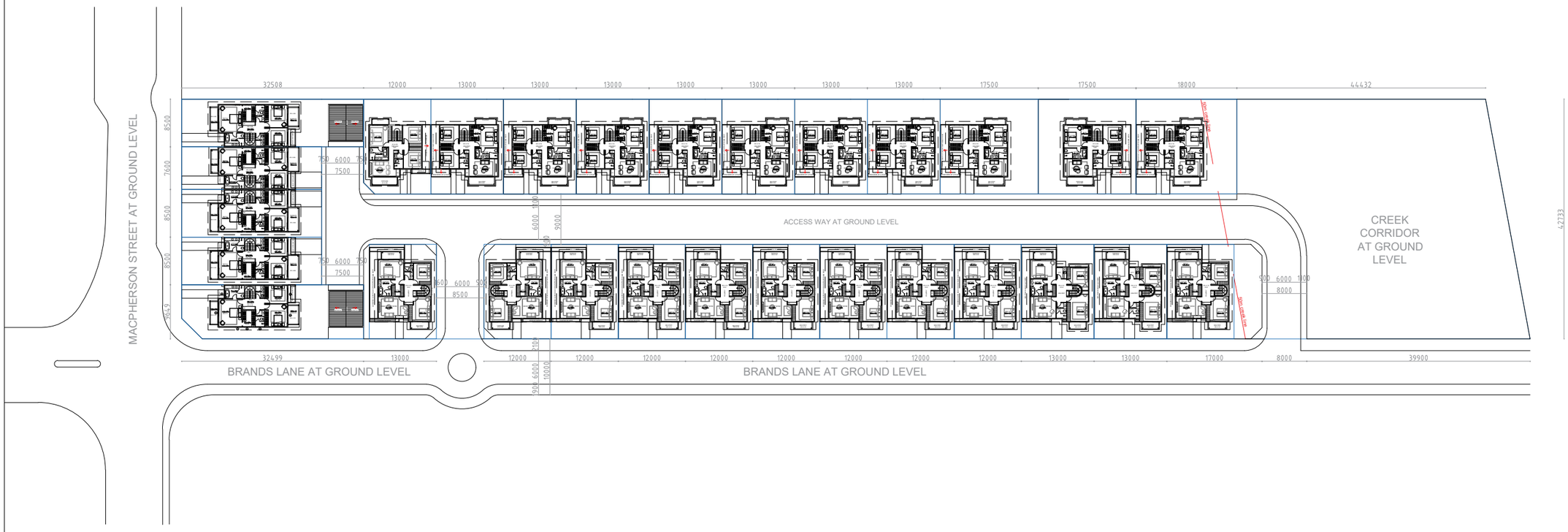
PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD

APR. 2023

DRAWING TITLE:
MASTER PLAN
GROUND LEVEL

DRAWN BY: SS
CHECKED BY: HV

SCALE: 1:400@A1 / 1:800@A3
PROJECT NO: 2235
DRAWING NO: DA 005
ISSUE: 01



1 MASTER PLAN - FIRST FLOOR

SCALE 1:500@A1 / 1:1000@A3

GENERAL NOTES:

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LEGEND:

AW	AWNING
HW	HIGHLIGHT WINDOW
CU	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
MV	MECHANICAL RISER TO FUTURE DETAIL
GC	GARBAGE CHUTE
MB	MAILBOX TO FUTURE DETAIL
PB	PLANTERBOX
R	240L RECYCLING BIN
SK	SKYLIGHT
ST	STORAGE
WT	HOT WATER UNITS

ISSUE	DATE	DESCRIPTION
01	12.04.23	ISSUE FOR DA

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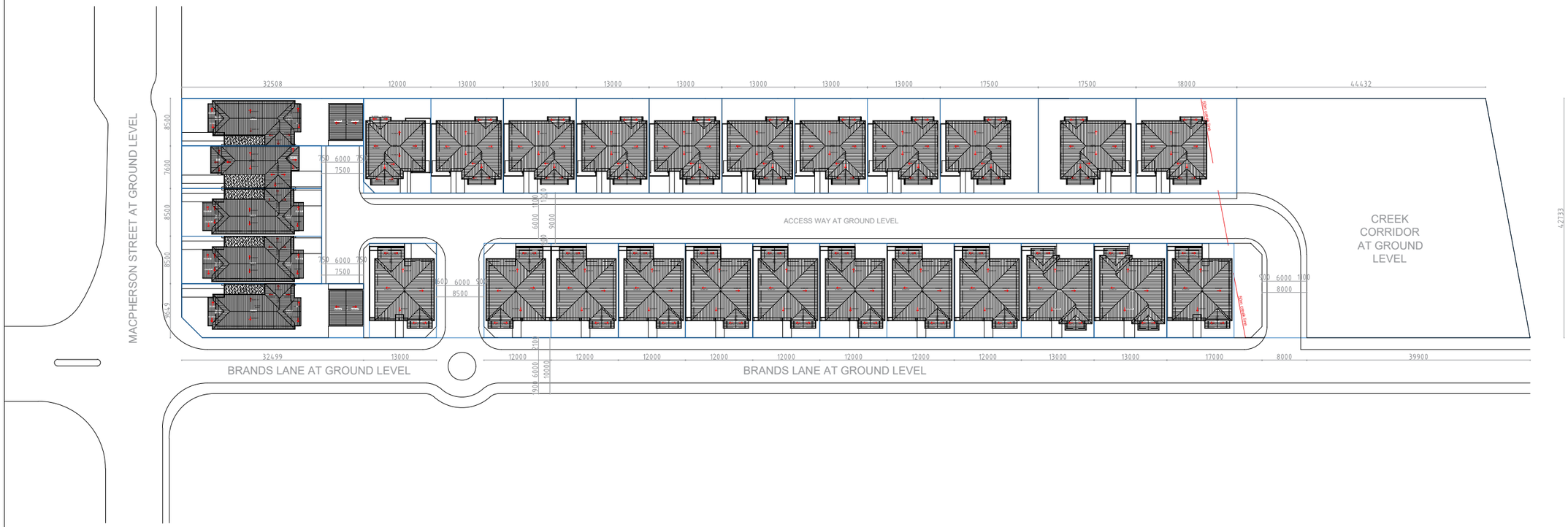
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD

APR. 2023

DRAWING TITLE:
MASTER PLAN
FIRST FLOOR

DRAWN BY: SS	CHECKED BY: HV	
SCALE: 1:400@A1 / 1:800@A3	DRAWING NO: DA 006	ISSUE: 01
PROJECT NO: 2235		



1 MASTER PLAN - ROOF LEVEL

SCALE 1:500@A1 / 1:1000@A3

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LEGEND:

AW	AWNING
HW	HIGHLIGHT WINDOW
CU	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
MV	MECHANICAL RISER TO FUTURE DETAIL
GC	GARBAGE CHUTE
MB	MAILBOX TO FUTURE DETAIL
PB	PLANTERBOX
R	240L RECYCLING BIN
SK	SKYLIGHT
ST	STORAGE
WT	HOT WATER UNITS

ISSUE	DATE	DESCRIPTION
01	12.04.23	ISSUE FOR DA

N

CLIENT:
IPM PROPERTY

ARCHITECT:
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Nominated Architect: Paul Buljevic NSW 7768

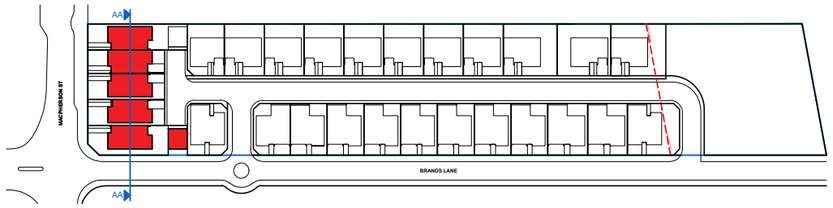
PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD

APR. 2023

DRAWING TITLE:
MASTER PLAN
ROOF LEVEL

DRAWN BY: SS
CHECKED BY: HV

SCALE: 1:400@A1 / 1:800@A3
PROJECT NO: 2235
DRAWING NO: DA 007
ISSUE: 01



1 LOCATION PLAN

SCALE 1:1000@A1 / 1:2000@A3

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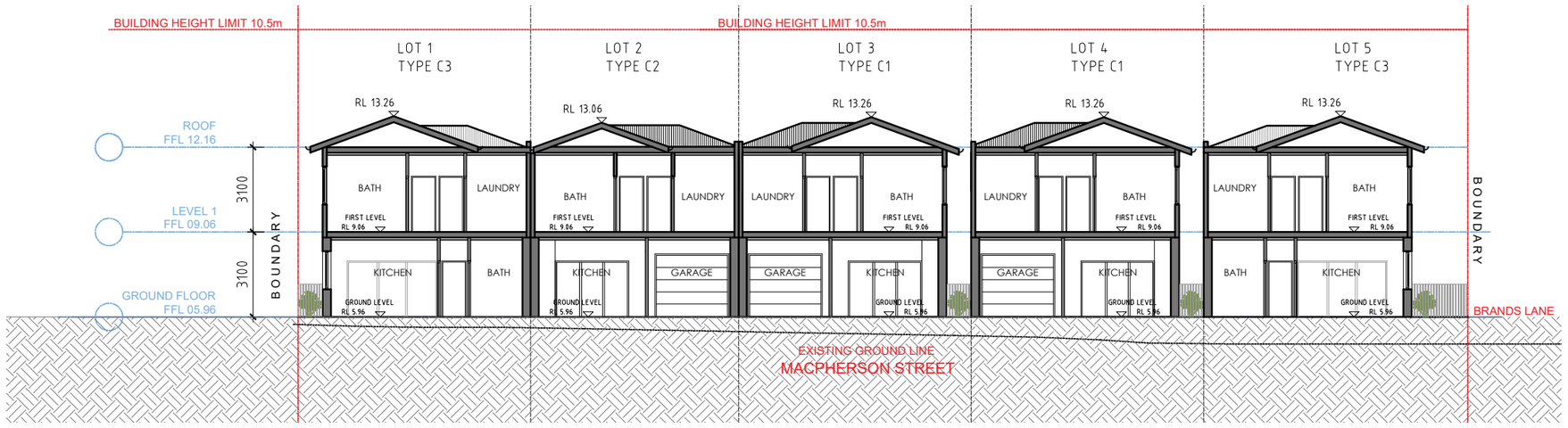

2 SECTION AA

SCALE 1:100@A1 / 1:200@A3

PRELIMINARY

GENERAL NOTES:

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- AREA SCHEDULES SUPPLIED ARE APPROXIMATE ONLY - FUTURE ALLOWANCE FOR VERTICAL SERVICE DUCTS, STRUCTURAL WALL SYSTEMS AND CONSULTANT INPUT WILL BE REQUIRED

LEGEND:

AW	AWNING
HW	HIGHLIGHT WINDOW
CU	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
MV	MECHANICAL RISER TO FUTURE DETAIL
GC	GARBAGE CHUTE
MB	MAILBOX TO FUTURE DETAIL
PB	PLANTERBOX
R	240L RECYCLING BIN
SK	SKYLIGHT
ST	STORAGE
WT	HOT WATER UNITS

ISSUE	DATE	DESCRIPTION
P11	06.04.23	ISSUE TO CLIENT FOR REVIEW
P10	30.03.23	ISSUE TO CLIENT FOR REVIEW
P9	15.03.23	ISSUE TO CLIENT FOR REVIEW
P8	10.03.23	ISSUE TO CLIENT FOR REVIEW
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P6	28.02.23	ISSUE TO CLIENT FOR REVIEW
P5	22.02.23	ISSUE TO CLIENT FOR REVIEW
P4	21.02.23	ISSUE TO CLIENT FOR REVIEW
P3	01.02.23	ISSUE TO CLIENT FOR REVIEW
P2	31.01.23	ISSUE TO CLIENT FOR REVIEW
P1	16.12.22	ISSUE TO CLIENT FOR REVIEW

0 1 2 3m

CLIENT:
IPM PROPERTY

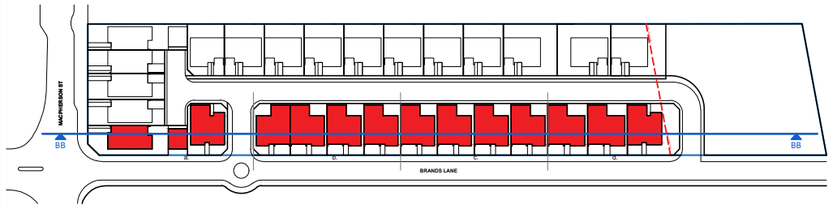
ARCHITECT:
PBD | ARCHITECTS
ABN 36 147 035 550
P - 02 9698 8140 E - info@pbdarchitects.com.au W - www.pbdarchitects.com.au
Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD

NOV. 2022

DRAWING TITLE:
SECTION AA

DRAWN BY: VdLH
CHECKED BY: PB
SCALE: 1:100@A1 / 1:200@A3
DRAWING NO: DA 301
ISSUE: P11
PROJECT NO: 2235



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SCALE 1:1000@A1 / 1:2000@A3

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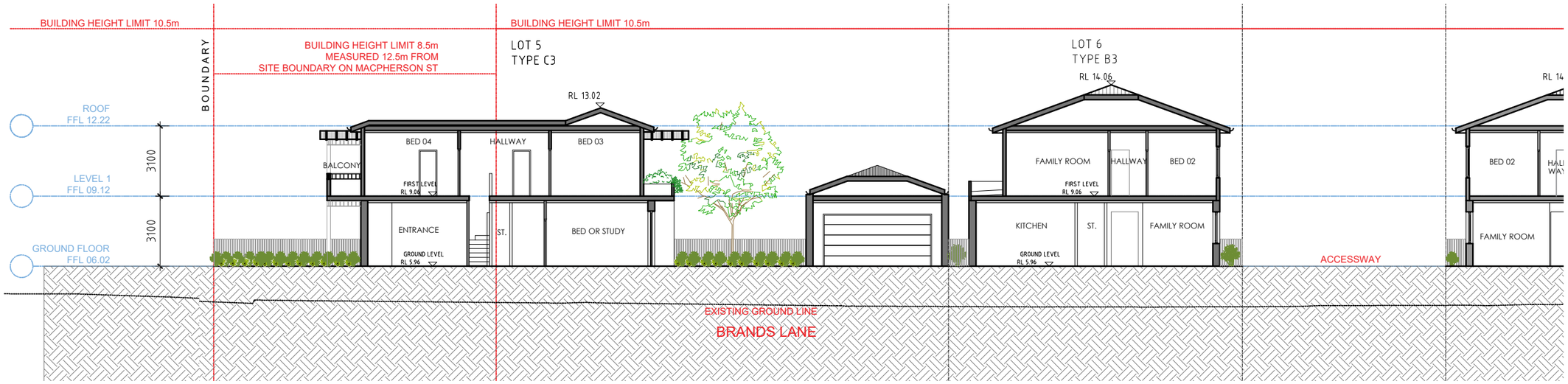
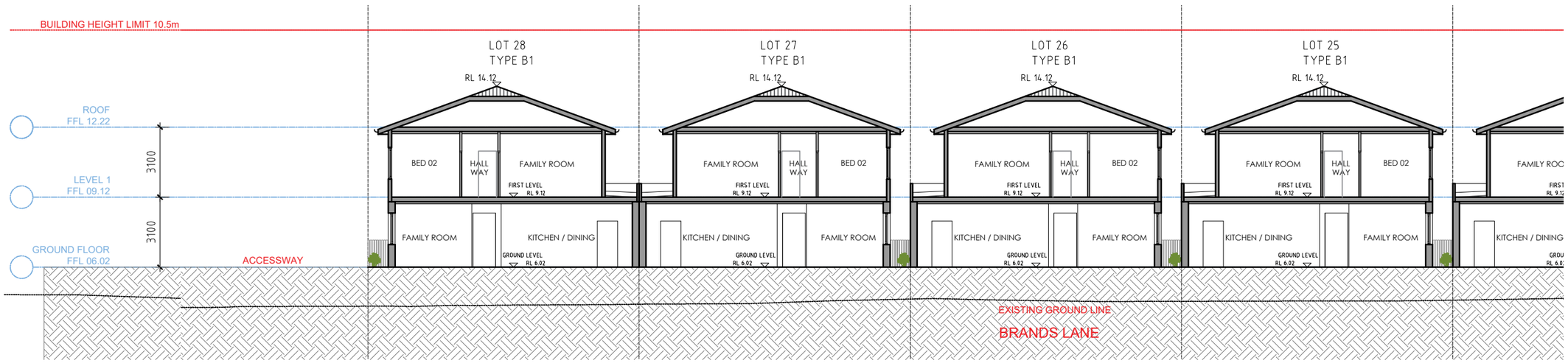


2 SECTION BB.a
SCALE 1:100@A1 / 1:200@A3



3 SECTION BB.b
SCALE 1:100@A1 / 1:200@A3

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LEGEND:

AW	AWNING
HW	HIGHLIGHT WINDOW
CU	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
MV	MECHANICAL RISER TO FUTURE DETAIL
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P1	16.12.22	ISSUE TO CLIENT FOR REVIEW

0 1 2 3m

CLIENT:
IPM PROPERTY

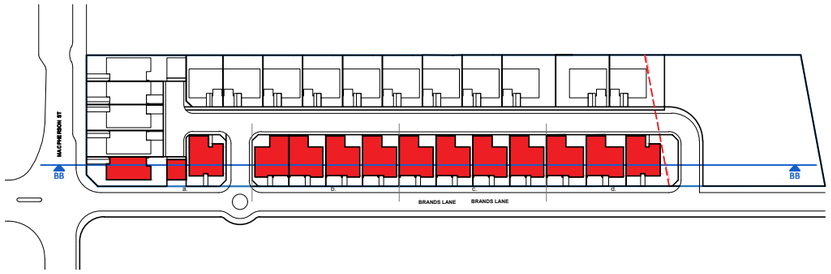
ARCHITECT:
PBD | ARCHITECTS
ABN 36 147 035 550
P - 02 9698 8140 E - info@pbdarchitects.com.au W - www.pbdarchitects.com.au
Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD
NOV. 2022

DRAWING TITLE:
SECTION BB

DRAWN BY: VdLH
CHECKED BY: PB

SCALE: 1:100@A1 / 1:200@A3
PROJECT NO: 2235
DRAWING NO: DA 302
ISSUE: P11



1 LOCATION PLAN
SCALE 1:1000@A1 / 1:2000@A3

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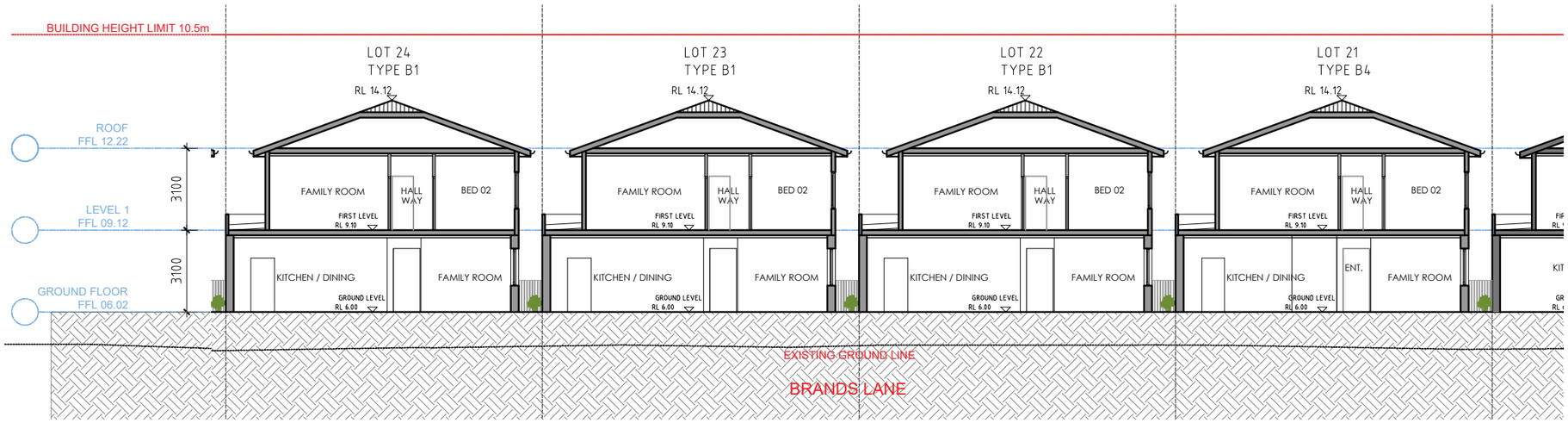
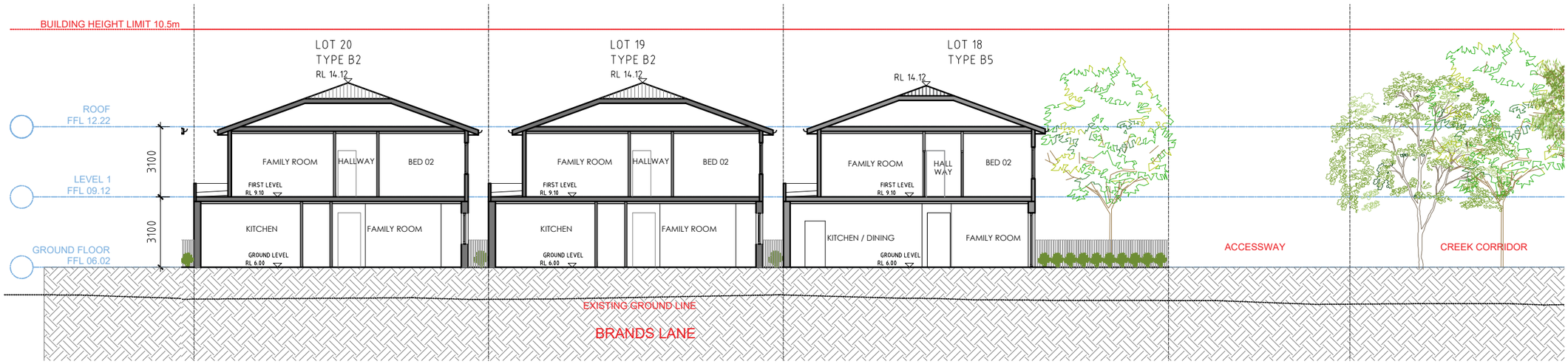


2 SECTION BB.c
SCALE 1:100@A1 / 1:200@A3



3 SECTION BB.d
SCALE 1:100@A1 / 1:200@A3

PRELIMINARY

GENERAL NOTES:

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0 1 2 3m

CLIENT:
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ARCHITECT:
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Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
28 TERRACES
16 MACPHERSON STREET
WARRIEWOOD

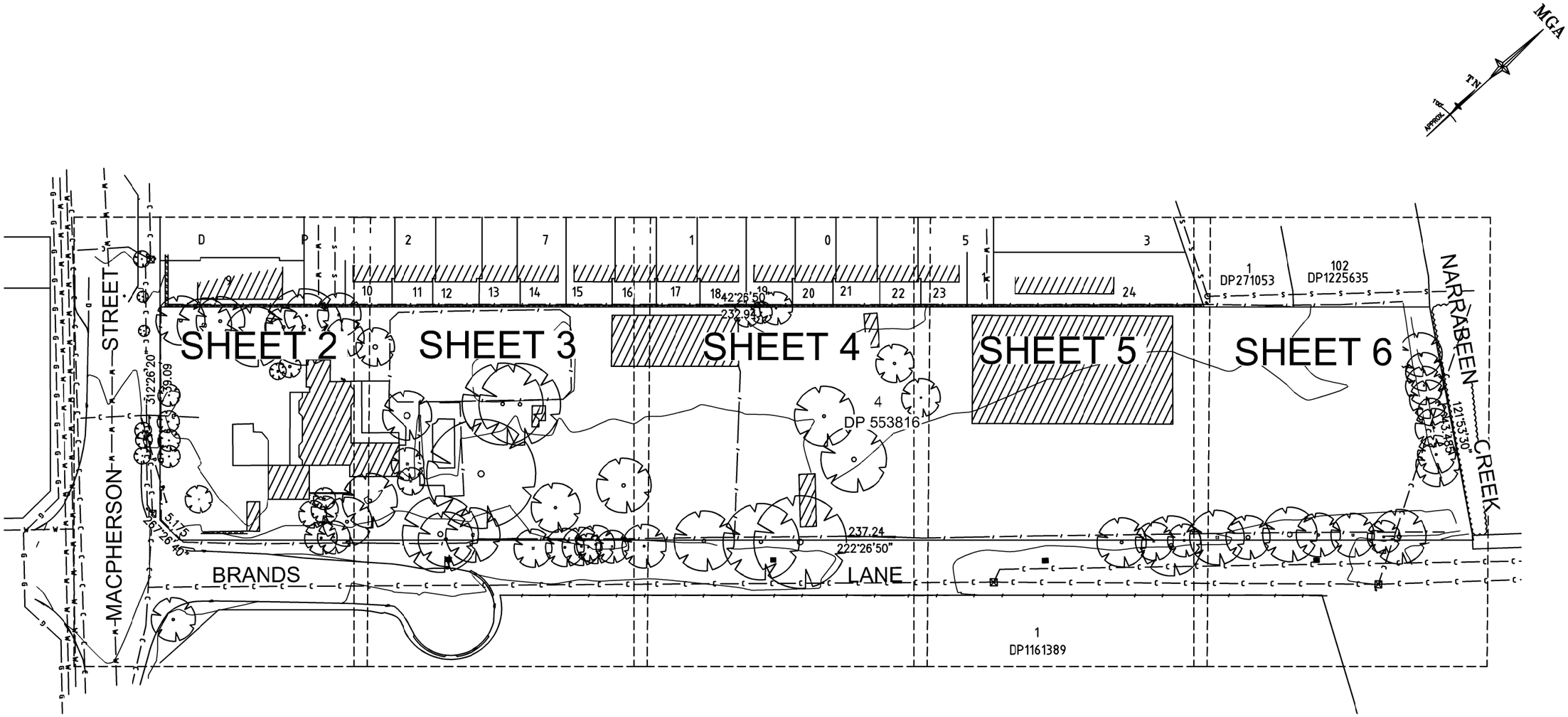
NOV. 2022

DRAWING TITLE:
SECTION DD

DRAWN BY: VdLH	CHECKED BY: PB	
SCALE: 1:100@A1 / 1:200@A3	DRAWING NO: DA 303	ISSUE: P11
PROJECT NO: 2235		

Appendix C

Existing Survey Plan



LEGEND

BENCH MARK	▲
TELSTRA PIT	TEL
LIGHT (MOUNTED)	ELP
PIT WITH CONCRETE LID	CLID
GRATED INLET PIT	GIP
KERB INLET PIT	KIP
STOP VALVE	SV
HYDRANT	HYD
GATE	
GAS VALVE	GAS
BOTTOM OF WALL	BW
TOP OF WALL	TW
POWER POLE	PP
STORM WATER PIT UNABLE TO OPEN	SW PIT (UTO)
VEHICLE CROSSING	(VC)
PRAM CROSSING	(PC)
TELSTRA	C
WATER	W
SEWER	S
ELECTRICITY (OVERHEAD)	P
STORMWATER	SW
GAS	G

NOTES

1 THE BOUNDARIES HAVE NOT BEEN MARKED ON GROUND
2 ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM PLANS MADE AVAILABLE BY NSW LAND REGISTRY SERVICES AND ARE SUBJECT TO FINAL SURVEY
3 ORIGIN OF LEVELS ON AHD IS TAKEN FROM SSM145906 RL 4 777 (AHD) IN MACPHERSON STREET
4 CONTOUR INTERVAL 0 5 m
5 CONTOURS ARE INDICATIVE ONLY ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
6 KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
7 FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
8 NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
9 8/4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0 4m & APPROX HEIGHT OF 7m
10 BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX 1°00' FOR TRUE NORTH

UNDERGOUND POWER MAY BE IN THIS AREA BUT NOT SHOWN ON ASSET UTILITY PLANS USE CAUTION

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 8 16 24 32 40
SCALE 1 400 @ A1

Revision	Date	Description	Reference
H	00/00/00	–	00
G	00/00/00	–	00
F	00/00/00	–	00
E	00/00/00	–	00
D	00/00/00	–	00
C	00/00/00	–	00
B	00/00/00	–	00
A	00/00/00	–	00

LTS CONFIDENCE TOGETHER
www.lts.com.au P 1300 587 000

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

Registered Surveyor NSW

Client - IPM PTY LTD
Drawing title
PLAN OF DETAIL AND LEVELS OVER LOT 4 IN DP553816 KNOWN AS 16 MACPHERSON STREET WARRIEWOOD

datum AHD
reference number 51644 001DT
site Area 1.012ha
scale 1:400 @A1
date of survey 08/02/2022
LGA NORTHERN BEACHES
SHEET 1 OF 6

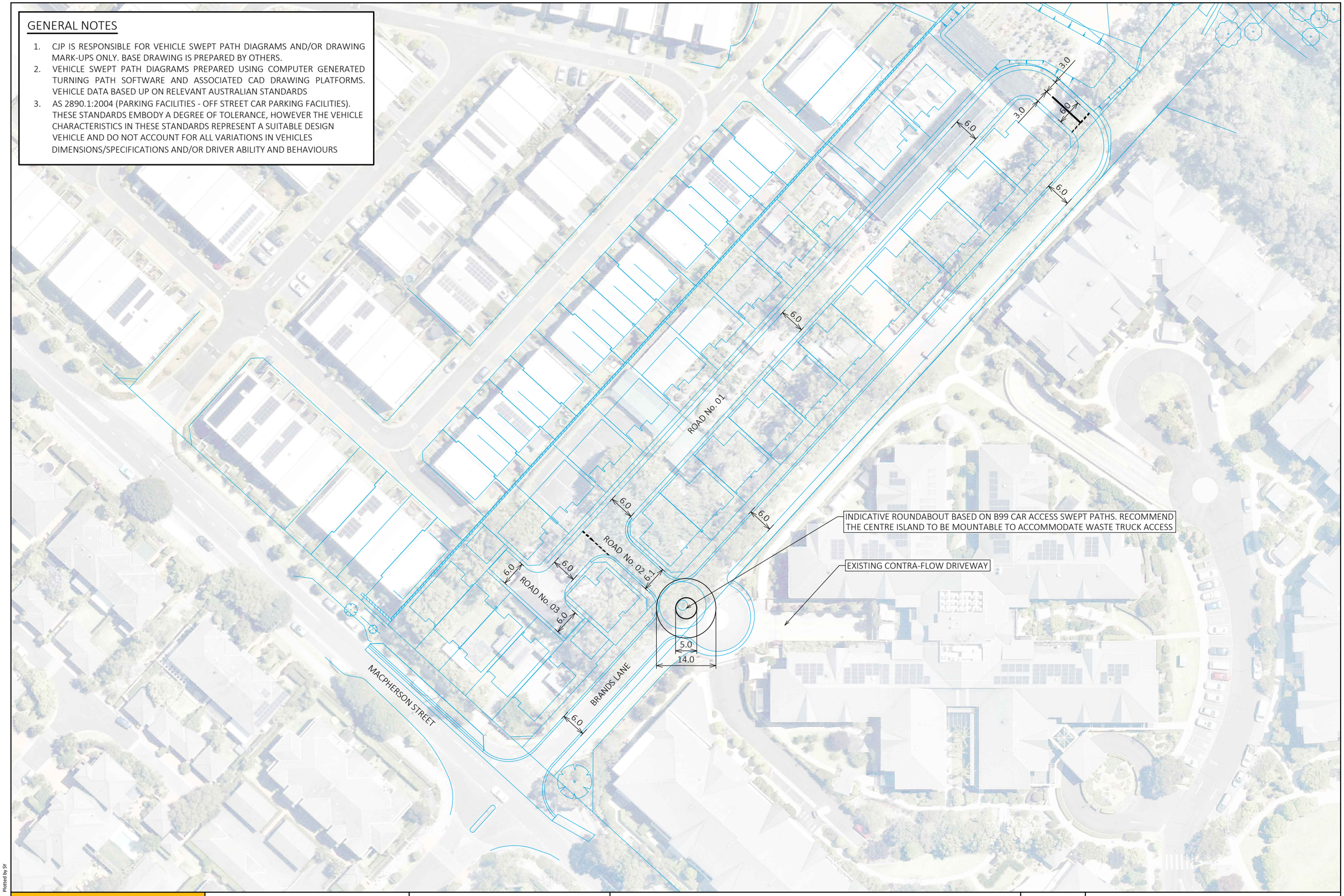
CJP | CONSULTING ENGINEERS

Appendix D

Signage & Linemarking Plans

GENERAL NOTES

1. CJP IS RESPONSIBLE FOR VEHICLE SWEPT PATH DIAGRAMS AND/OR DRAWING MARK-UPS ONLY. BASE DRAWING IS PREPARED BY OTHERS.
2. VEHICLE SWEPT PATH DIAGRAMS PREPARED USING COMPUTER GENERATED TURNING PATH SOFTWARE AND ASSOCIATED CAD DRAWING PLATFORMS. VEHICLE DATA BASED UP ON RELEVANT AUSTRALIAN STANDARDS
3. AS 2890.1:2004 (PARKING FACILITIES - OFF STREET CAR PARKING FACILITIES). THESE STANDARDS EMBODY A DEGREE OF TOLERANCE, HOWEVER THE VEHICLE CHARACTERISTICS IN THESE STANDARDS REPRESENT A SUITABLE DESIGN VEHICLE AND DO NOT ACCOUNT FOR ALL VARIATIONS IN VEHICLES DIMENSIONS/SPECIFICATIONS AND/OR DRIVER ABILITY AND BEHAVIOURS



Plotted by SY

CJP CONSULTING ENGINEERS

CJP Consulting Engineers
PO Box 1184
Hunters Hill NSW 2110
M: 0415 256 233
E: info@cjpconsultingengineers.com.au

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

16 MACPHERSON STREET, WARRIEWOOD
CAR PARK COMPLIANCE REVIEW - GROUND
CONCEPT LAYOUT

N

SCALE 0 8.0 16.0 1:800 @ A3

DRAWING NO. 22131-D01-V2 | SHEET NO. 01 OF 07

ISSUE DATE 11 May 2023 | DRAWN BY Y.HUANG | REVIEWED BY C.PALMER

GENERAL NOTES

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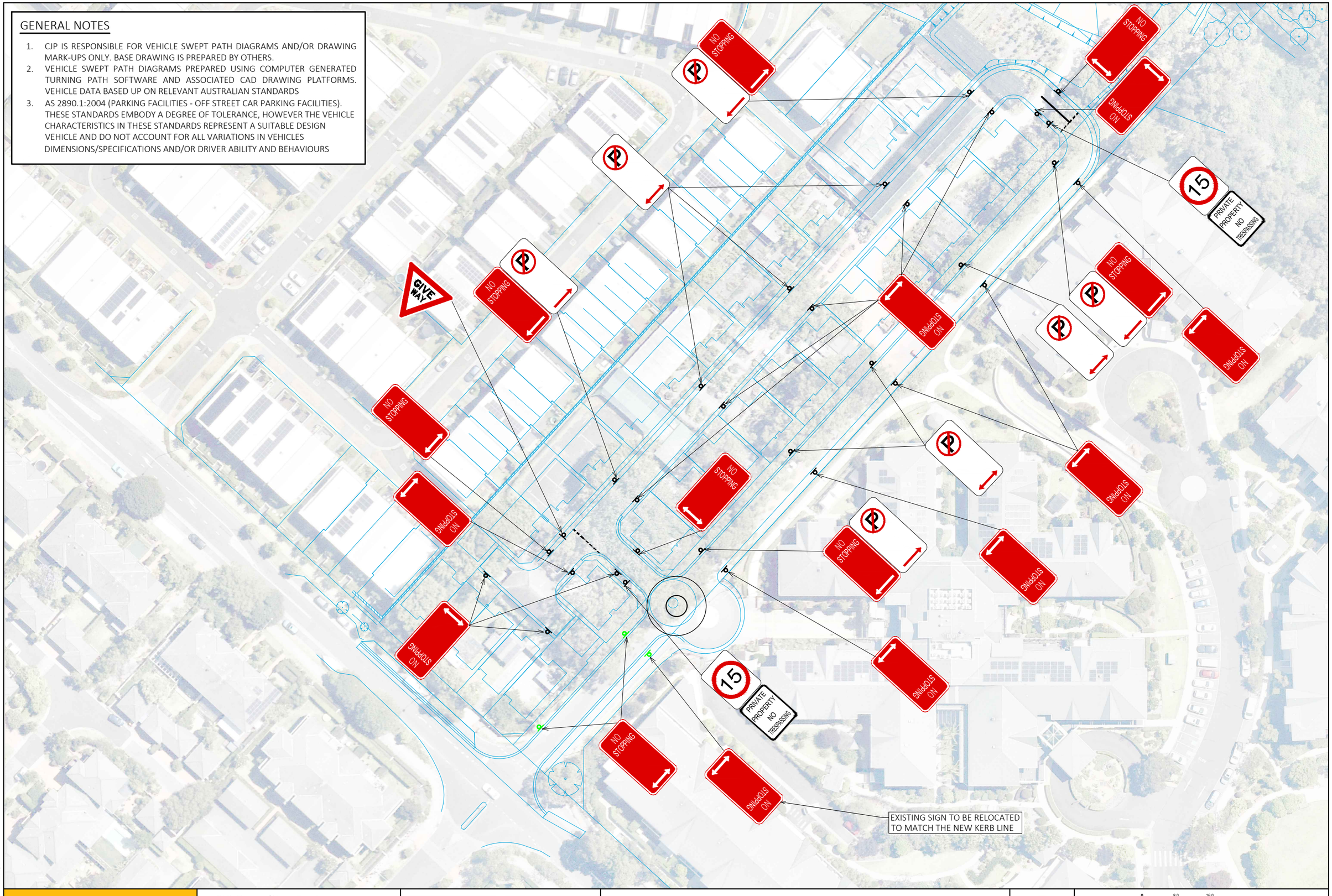

Plotted by SY

CJP CONSULTING ENGINEERS

CJP Consulting Engineers
PO Box 1184
Hunters Hill NSW 2110
M: 0415 256 233
E: info@cjpconsultingengineers.com.au

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16 MACPHERSON STREET, WARRIEWOOD
PROPOSED ON-STREET PARKING - GROUND SIGNAGE PLAN

N

SCALE 0 8.0 16.0 1:800 @ A3

DRAWING NO. 22131-D01-V2 | SHEET NO. 02 OF 07

ISSUE DATE 11 May 2023 | DRAWN BY Y.HUANG | REVIEWED BY C.PALMER

CJP | CONSULTING ENGINEERS

Appendix E

Traffic Survey Results

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Macpherson St and Brands Ln, Warriewood

GPS *-33.687592, 151.293402*

Date:	Tue 07/02/23
Weather:	Fine
Suburban:	Warriewood
Customer:	CJP

North:	Brands Ln
East:	Macpherson St
South:	Fantail Ave
West:	Macpherson St

Survey Period	AM:	6:30 AM-9:30 AM
	PM:	3:30 PM-6:30 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	4:15 PM-5:15 PM

All Vehicles

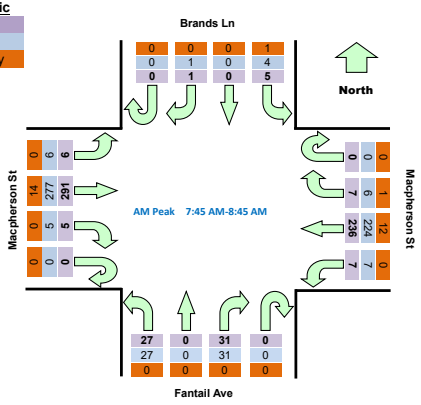
Time		North Approach Brands Ln				East Approach Macpherson St				South Approach Fantail Ave				West Approach Macpherson St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:30	6:45	0	0	0	0	0	2	26	1	0	2	0	3	0	0	23	0	295	
6:45	7:00	0	1	0	1	0	0	30	0	0	5	0	1	0	2	27	0	336	
7:00	7:15	0	0	0	1	0	0	32	2	0	4	0	5	0	2	33	1	392	
7:15	7:30	0	1	0	0	0	2	26	2	0	2	0	3	0	3	52	0	448	
7:30	7:45	0	1	0	1	0	2	33	1	0	3	0	1	0	2	53	1	529	
7:45	8:00	0	0	0	2	0	2	53	0	0	5	0	6	0	1	54	0	616	Peak
8:00	8:15	0	0	0	2	0	0	57	2	0	5	0	10	0	0	58	2	612	
8:15	8:30	0	0	0	0	0	4	68	2	0	11	0	5	0	2	78	2	576	
8:30	8:45	0	1	0	1	0	1	58	3	0	10	0	6	0	2	101	2	504	
8:45	9:00	0	1	0	1	0	2	41	1	0	5	0	7	0	3	56	2		
9:00	9:15	0	0	0	2	0	2	48	3	0	2	0	2	0	2	38	1		
9:15	9:30	0	0	0	3	0	2	38	3	0	4	0	1	0	3	45	1		
15:30	15:45	0	1	0	1	0	0	44	6	0	3	0	3	0	6	73	2	542	
15:45	16:00	0	4	0	0	0	2	56	7	0	5	0	3	0	4	53	1	545	
16:00	16:15	0	2	0	0	0	0	49	3	0	5	0	4	0	2	64	2	531	
16:15	16:30	0	1	0	2	1	2	45	6	0	5	0	6	0	2	66	1	552	Peak
16:30	16:45	0	0	0	2	0	0	56	2	0	6	0	2	0	4	69	1	541	
16:45	17:00	0	1	0	1	0	0	47	7	0	3	0	1	1	6	54	0	528	
17:00	17:15	0	2	0	4	0	2	48	4	0	0	0	2	1	6	80	3	529	
17:15	17:30	0	2	0	0	0	0	33	8	0	4	0	1	0	3	75	0	507	
17:30	17:45	0	0	0	1	0	0	56	4	0	3	0	4	0	8	53	0	477	
17:45	18:00	0	0	0	0	0	0	48	6	0	3	0	4	0	4	56	1		
18:00	18:15	0	1	0	0	0	1	43	8	0	5	0	2	1	7	61	1		
18:15	18:30	0	0	0	1	0	0	42	2	0	5	0	4	0	4	38	0		

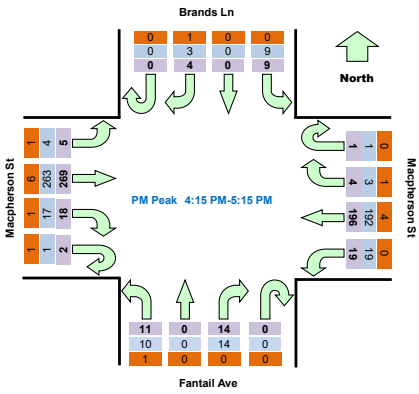
Peak Time		North Approach Brands Ln				East Approach Macpherson St				South Approach Fantail Ave				West Approach Macpherson St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	1	0	5	0	7	236	7	0	31	0	27	0	5	291	6	616
16:15	17:15	0	4	0	9	1	4	196	19	0	14	0	11	2	18	269	5	552

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

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Brands Ln				East Approach Macpherson St				South Approach Fantail Ave				West Approach Macpherson St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:30	6:45	0	0	0	0	0	2	23	0	0	2	0	3	0	0	21	0
6:45	7:00	0	1	0	1	0	0	28	0	0	5	0	1	0	2	26	0
7:00	7:15	0	0	0	1	0	0	30	2	0	4	0	5	0	2	33	0
7:15	7:30	0	1	0	0	0	2	25	2	0	2	0	3	0	3	50	0
7:30	7:45	0	0	0	1	0	1	31	1	0	3	0	1	0	2	51	1
7:45	8:00	0	0	0	2	0	2	51	0	0	5	0	6	0	1	51	0
8:00	8:15	0	0	0	1	0	0	52	2	0	5	0	10	0	0	53	2
8:15	8:30	0	0	0	0	0	4	64	2	0	11	0	5	0	2	74	2
8:30	8:45	0	1	0	1	0	0	57	3	0	10	0	6	0	2	99	2
8:45	9:00	0	1	0	1	0	2	40	1	0	5	0	7	0	3	55	2
9:00	9:15	0	0	0	2	0	2	47	3	0	2	0	2	0	2	37	1
9:15	9:30	0	0	0	2	0	2	35	3	0	4	0	1	0	3	41	0
15:30	15:45	0	1	0	1	0	0	43	6	0	3	0	3	0	6	70	2
15:45	16:00	0	4	0	0	0	2	53	7	0	5	0	3	0	4	50	1
16:00	16:15	0	1	0	0	0	0	48	3	0	5	0	4	0	2	64	1
16:15	16:30	0	0	0	2	1	1	44	6	0	5	0	6	0	2	65	0
16:30	16:45	0	0	0	2	0	0	55	2	0	6	0	2	0	4	68	1
16:45	17:00	0	1	0	1	0	0	45	7	0	3	0	0	0	5	51	0
17:00	17:15	0	2	0	4	0	2	48	4	0	0	0	2	1	6	79	3
17:15	17:30	0	2	0	0	0	0	32	8	0	4	0	1	0	3	73	0
17:30	17:45	0	0	0	1	0	0	56	4	0	3	0	4	0	8	52	0
17:45	18:00	0	0	0	0	0	0	46	6	0	3	0	4	0	4	54	1
18:00	18:15	0	1	0	0	0	1	43	8	0	5	0	2	1	7	60	1
18:15	18:30	0	0	0	1	0	0	42	2	0	5	0	4	0	4	35	0

Peak Time		North Approach Brands Ln				East Approach Macpherson St				South Approach Fantail Ave				West Approach Macpherson St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	1	0	4	0	6	224	7	0	31	0	27	0	5	277	6	588
16:15	17:15	0	3	0	9	1	3	192	19	0	14	0	10	1	17	263	4	536

Heavy Vehicles

Time		North Approach Brands Ln				East Approach Macpherson St				South Approach Fantail Ave				West Approach Macpherson St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:30	6:45	0	0	0	0	0	0	3	1	0	0	0	0	0	0	2	0
6:45	7:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
7:00	7:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1
7:15	7:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
7:30	7:45	0	1	0	0	0	1	2	0	0	0	0	0	0	0	2	0
7:45	8:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0
8:00	8:15	0	0	0	1	0	0	5	0	0	0	0	0	0	0	5	0
8:15	8:30	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	0
8:30	8:45	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0
8:45	9:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
9:00	9:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
9:15	9:30	0	0	0	1	0	0	3	0	0	0	0	0	0	0	4	1
15:30	15:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0
15:45	16:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0
16:00	16:15	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1
16:15	16:30	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1
16:30	16:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
16:45	17:00	0	0	0	0	0	0	2	0	0	0	0	1	1	1	3	0
17:00	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:15	17:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:45	18:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0

Peak Time		North Approach Brands Ln				East Approach Macpherson St				South Approach Fantail Ave				West Approach Macpherson St				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	0	0	1	0	1	12	0	0	0	0	0	0	0	14	0	28
16:15	17:15	0	1	0	0	0	1	4	0	0	0	0	1	1	1	6	1	16

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Appendix F

Swept Turn Paths

GENERAL NOTES

1. CJP IS RESPONSIBLE FOR VEHICLE SWEPT PATH DIAGRAMS AND/OR DRAWING MARK-UPS ONLY. BASE DRAWING IS PREPARED BY OTHERS.
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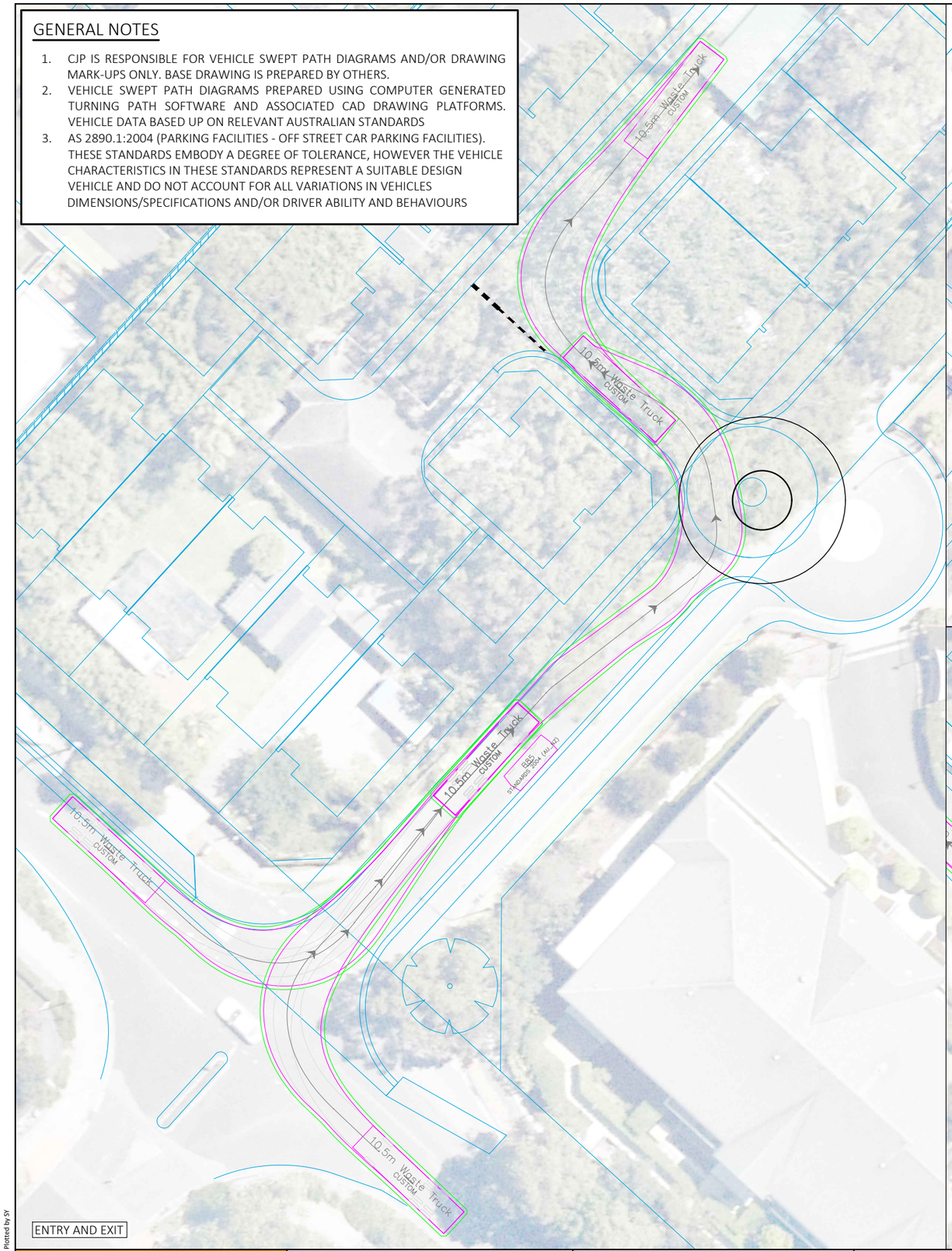

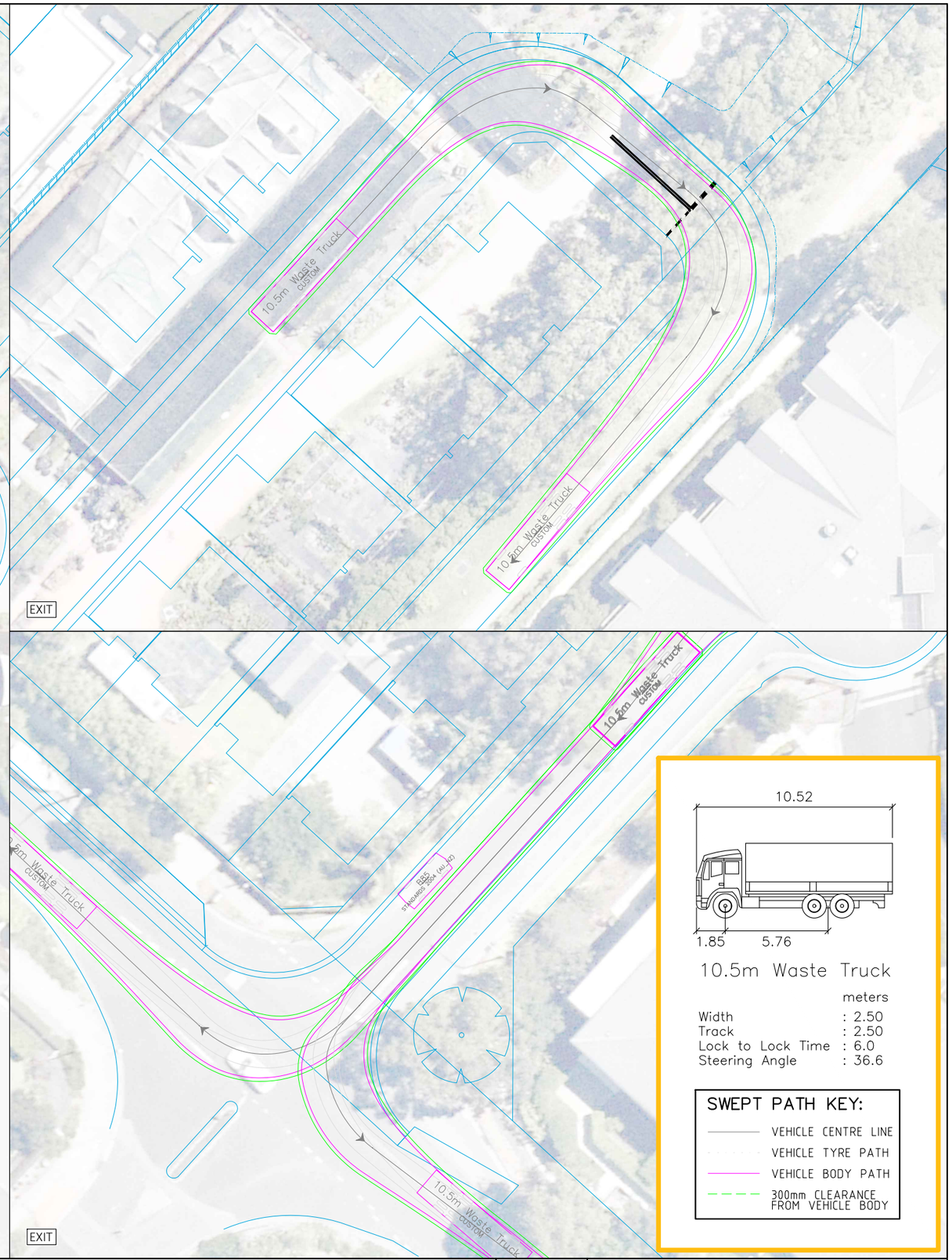

10.5m Waste Truck

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

Plotted by SY

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PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING

THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY. THE EXACT LOCATIONS SHALL BE PROVEN ON SITE. ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

16 MACPHERSON STREET, WARRIEWOOD
CAR PARK COMPLIANCE REVIEW - GROUND
SWEPT PATH ASSESSMENT

SCALE 0 4.0 8.0 1:400 @ A3

DRAWING NO. 22131-D01-V2	SHEET NO. 03 OF 07
ISSUE DATE 11 May 2023	DRAWN BY Y.HUANG
	REVIEWED BY C.PALMER

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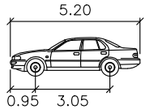

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

EXISTING CONTRA-FLOW DRIVEWAY

EXIT

ENTRY

EXISTING CONTRA-FLOW DRIVEWAY

EXIT

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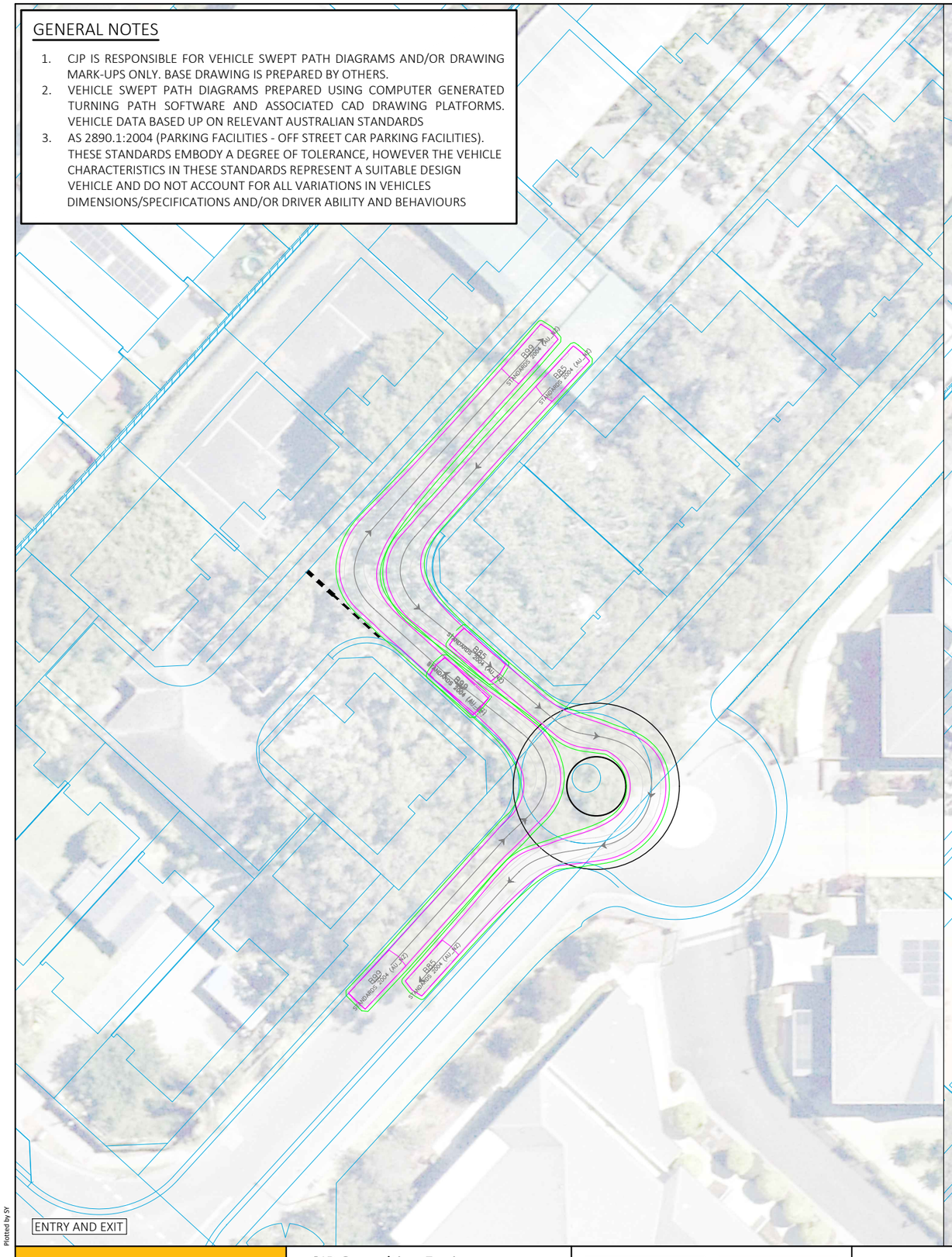

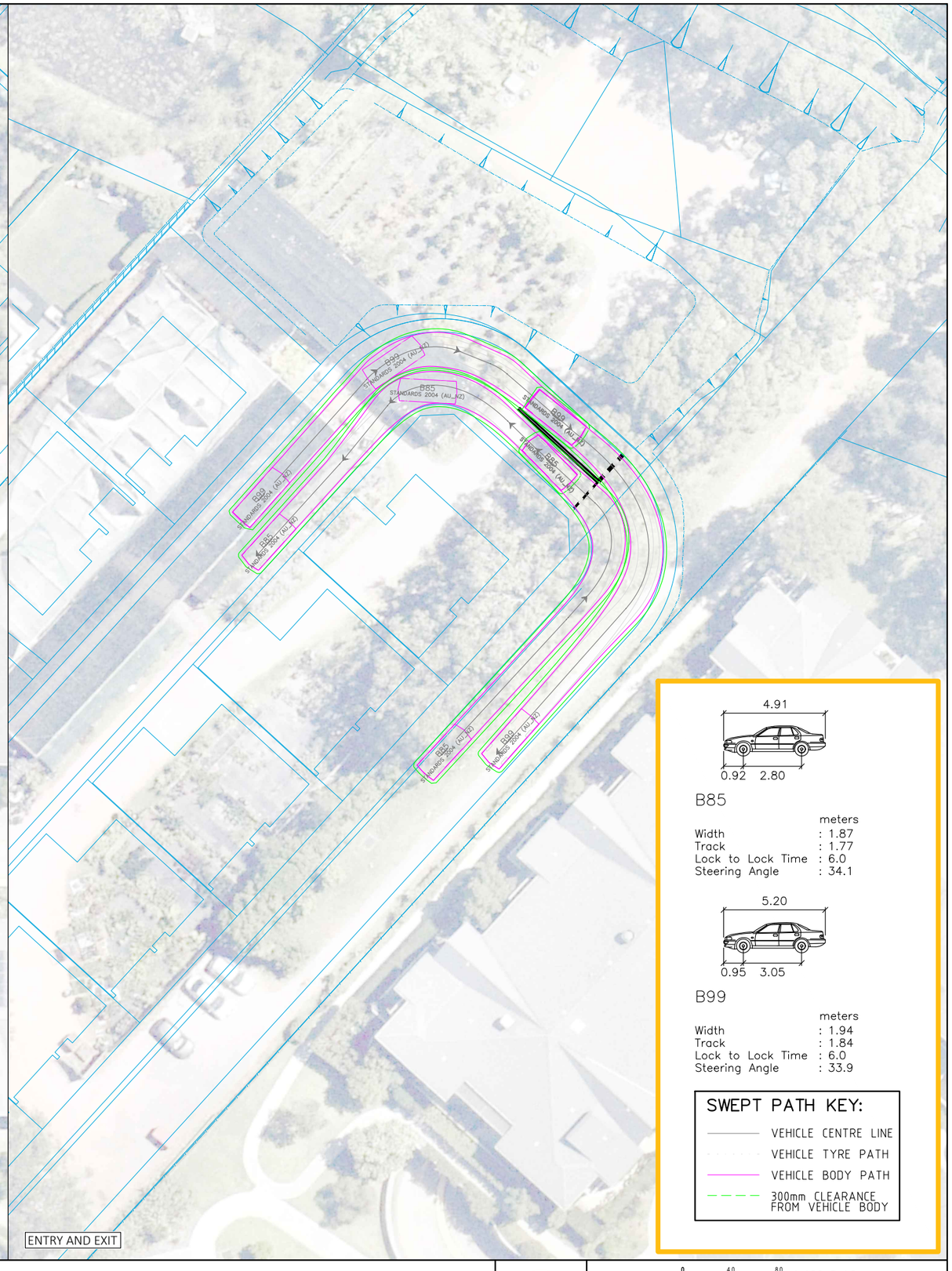

B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

Plotted by SY

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SWEPT PATH ASSESSMENT

N

SCALE 0 4.0 8.0 1:400 @ A3

DRAWING NO. 22131-D01-V2 | SHEET NO. 05 OF 07

ISSUE DATE 11 May 2023 | DRAWN BY Y.HUANG | REVIEWED BY C.PALMER

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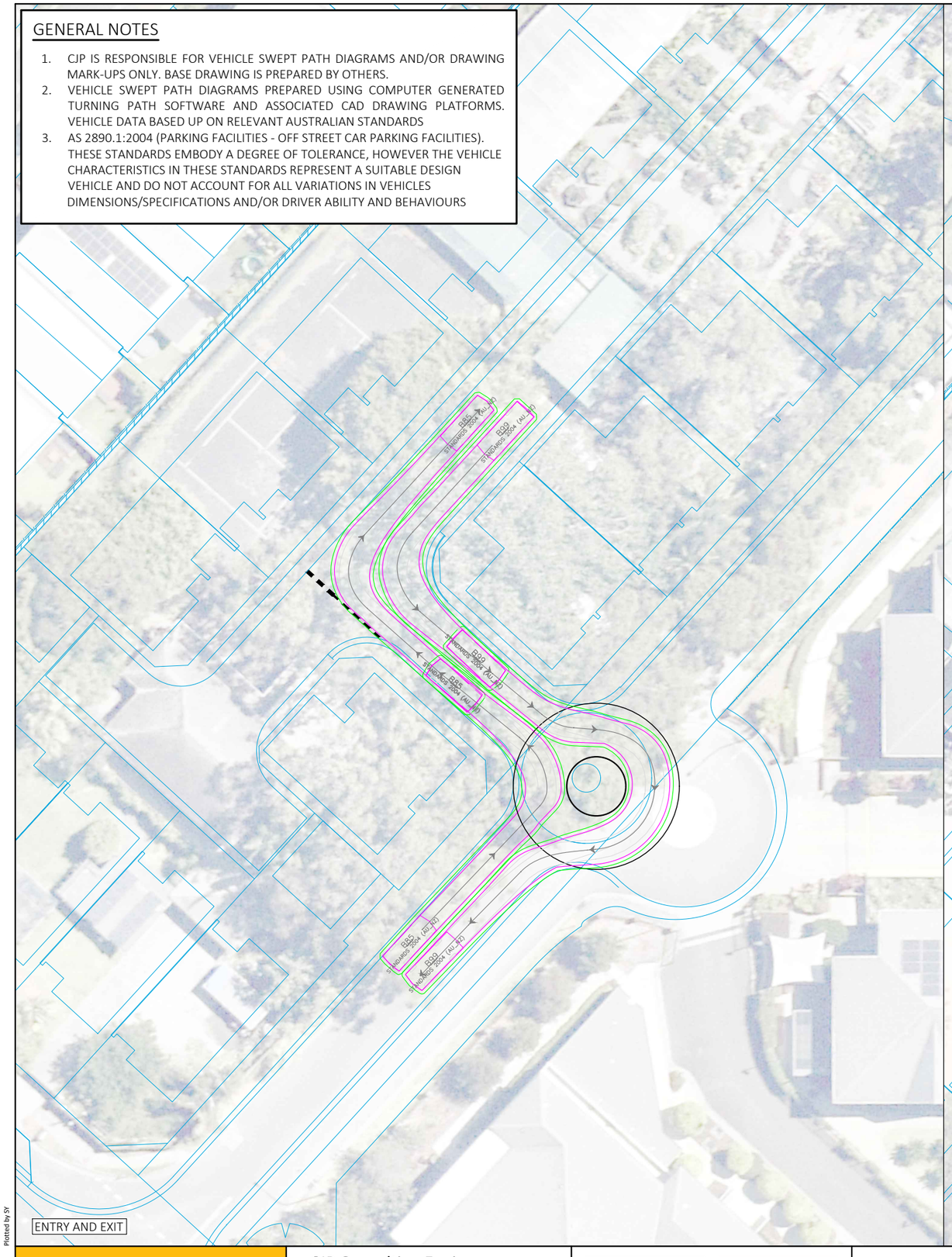

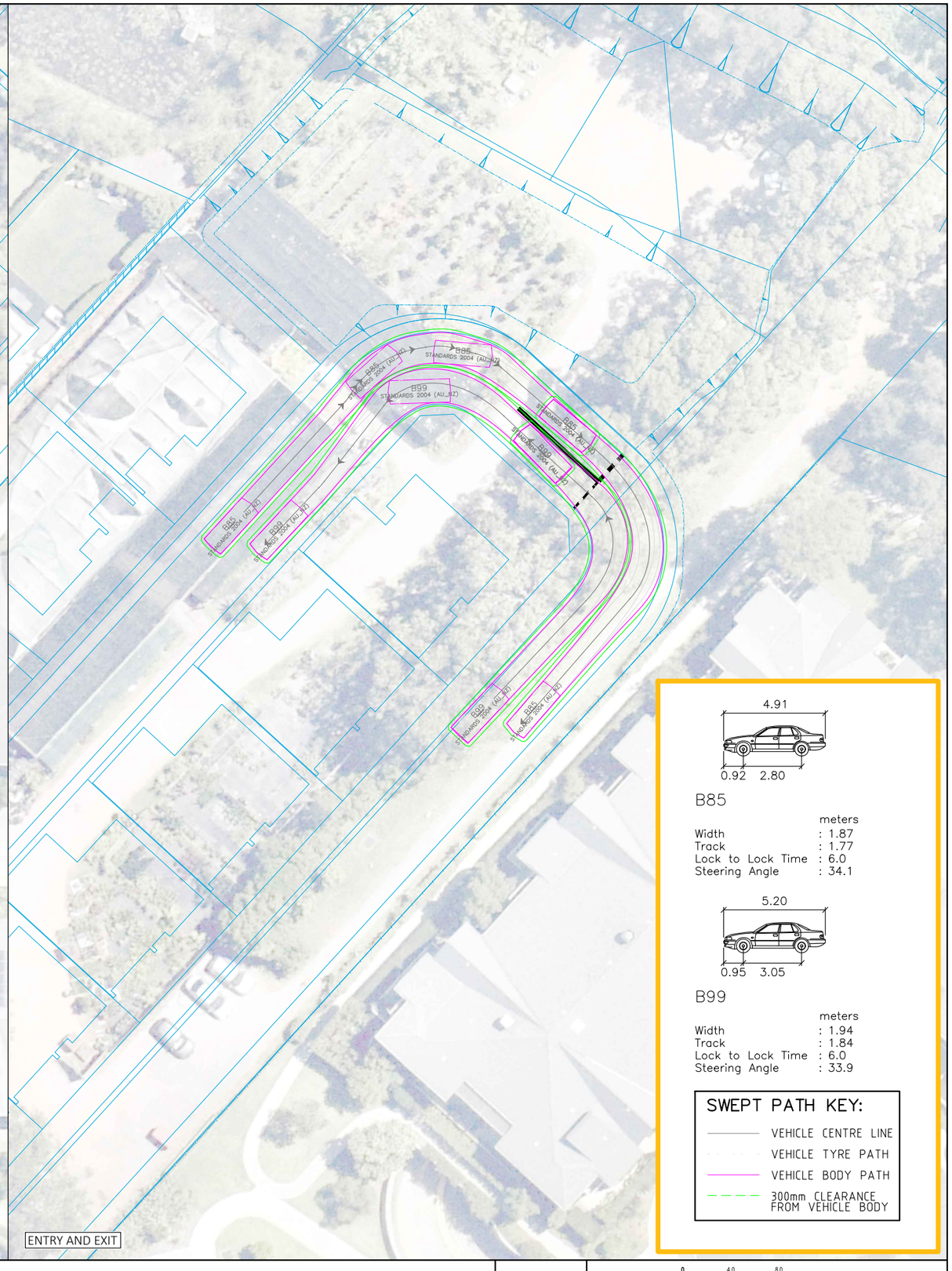

B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

SWEPT PATH KEY:

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SCALE 0 4.0 8.0 1:400 @ A3

DRAWING NO. 22131-D01-V2 | SHEET NO. 06 OF 07

ISSUE DATE 11 May 2023 | DRAWN BY Y.HUANG | REVIEWED BY C.PALMER

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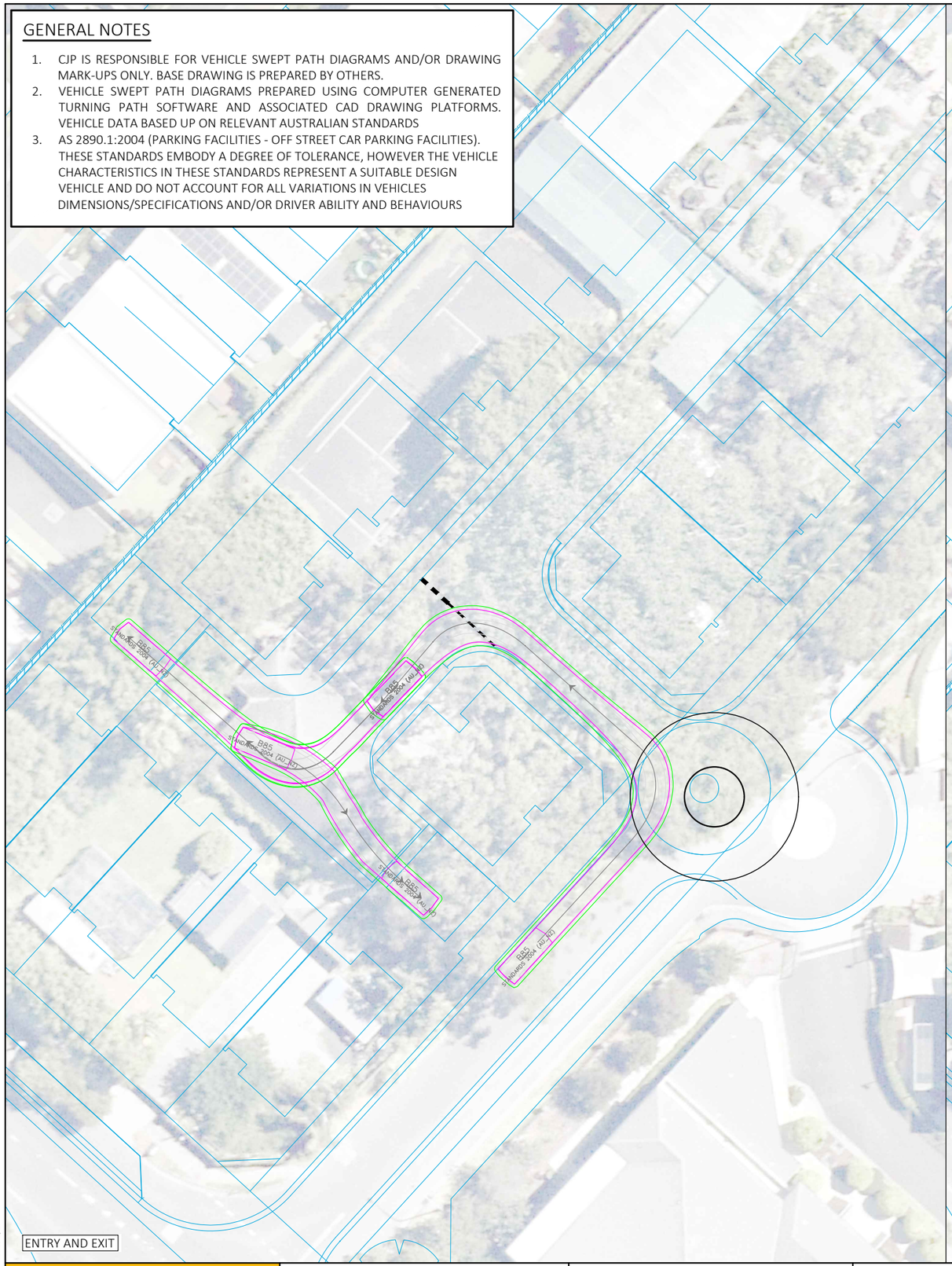

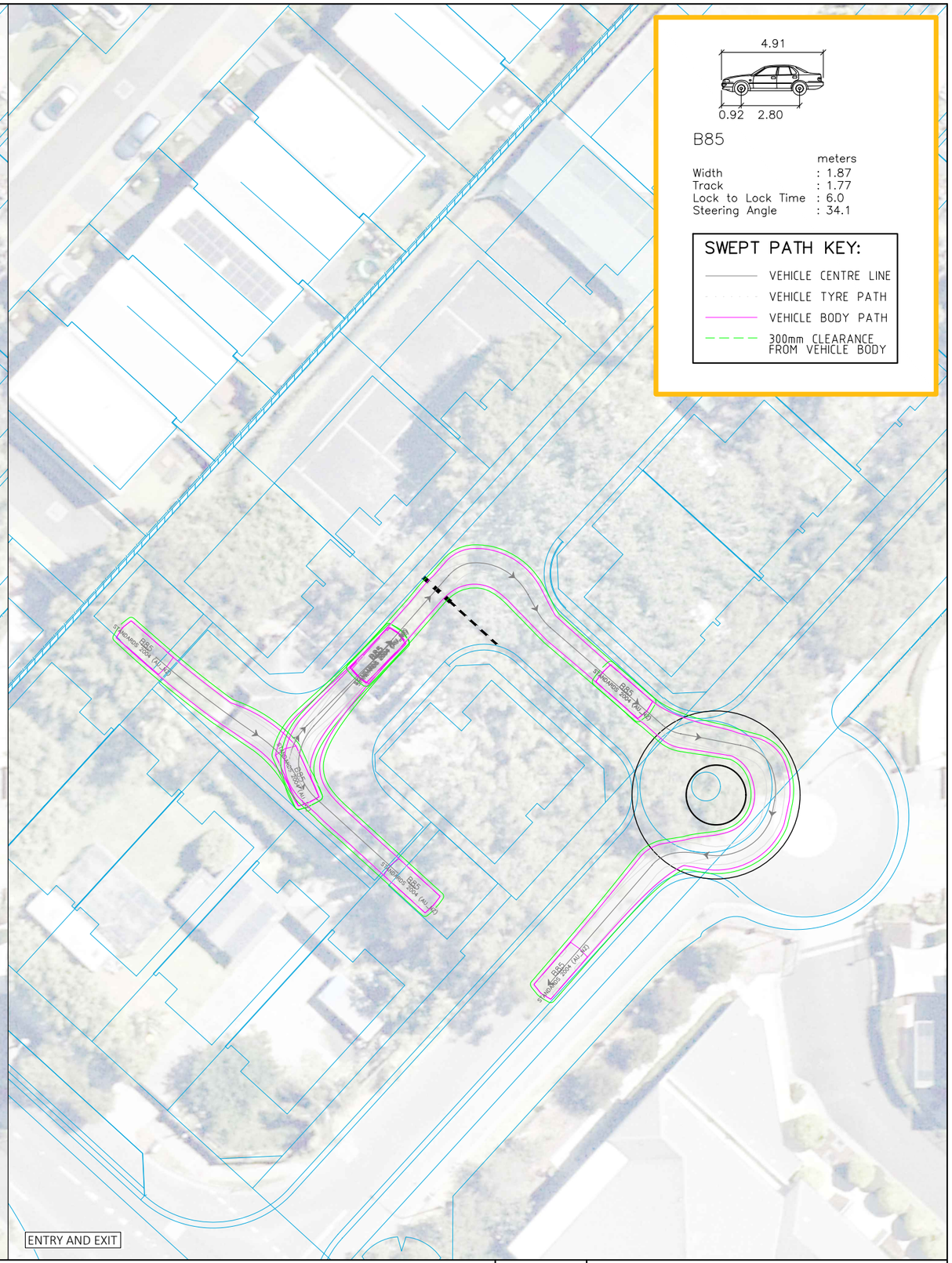

B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

SWEPT PATH KEY:

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SWEPT PATH ASSESSMENT

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DRAWING NO. 22131-D01-V2	SHEET NO. 07 OF 07
ISSUE DATE 11 May 2023	DRAWN BY Y.HUANG
	REVIEWED BY C.PALMER

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Appendix G

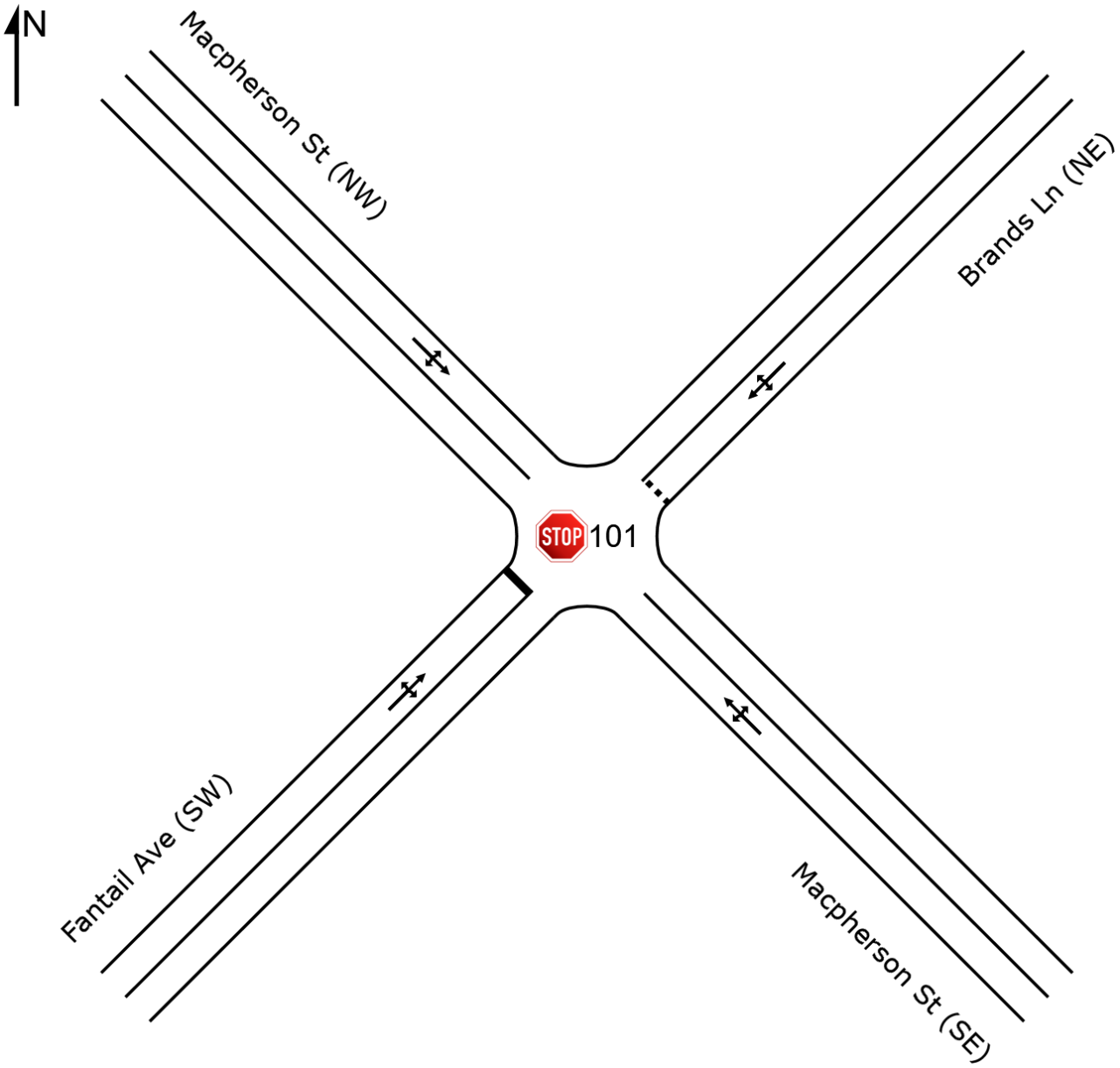
SIDRA Movement Summaries

SITE LAYOUT

Site: 101 [MAC_BRA_FANX PM (Site Folder: General)]

Macpherson St, Brands Ln & Fantail Ave, Warriewood
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 101 [MAC_BRA_FANX AM (Site Folder: General)]

Macpherson St, Brands Ln & Fantail Ave, Warriewood
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Macpherson St (SE)														
21	L2	7	0	7	0.0	0.134	5.2	LOS A	0.1	0.5	0.04	0.03	0.04	47.5
22	T1	236	12	236	5.1	0.134	0.0	LOS A	0.1	0.5	0.04	0.03	0.04	49.4
23	R2	7	0	7	0.0	0.134	5.7	LOS A	0.1	0.5	0.04	0.03	0.04	42.0
Approach		250	12	250	4.8	0.134	0.4	NA	0.1	0.5	0.04	0.03	0.04	49.2
NorthEast: Brands Ln (NE)														
24	L2	5	0	5	0.0	0.007	4.3	LOS A	0.0	0.2	0.38	0.53	0.38	35.4
25	T1	1	0	1	0.0	0.007	4.7	LOS A	0.0	0.2	0.38	0.53	0.38	37.1
26	R2	1	0	1	0.0	0.007	6.8	LOS A	0.0	0.2	0.38	0.53	0.38	40.7
Approach		7	0	7	0.0	0.007	4.7	LOS A	0.0	0.2	0.38	0.53	0.38	36.8
NorthWest: Macpherson St (NW)														
27	L2	6	0	6	0.0	0.161	5.0	LOS A	0.1	0.4	0.02	0.02	0.02	35.1
28	T1	291	14	291	4.8	0.161	0.0	LOS A	0.1	0.4	0.02	0.02	0.02	49.6
29	R2	5	0	5	0.0	0.161	5.5	LOS A	0.1	0.4	0.02	0.02	0.02	47.7
Approach		302	14	302	4.6	0.161	0.2	NA	0.1	0.4	0.02	0.02	0.02	49.3
SouthWest: Fantail Ave (SW)														
30	L2	27	0	27	0.0	0.085	8.4	LOS A	0.3	2.1	0.43	0.92	0.43	39.1
31	T1	1	0	1	0.0	0.085	10.8	LOS A	0.3	2.1	0.43	0.92	0.43	25.2
32	R2	31	0	31	0.0	0.085	11.4	LOS A	0.3	2.1	0.43	0.92	0.43	33.6
Approach		59	0	59	0.0	0.085	10.0	LOS A	0.3	2.1	0.43	0.92	0.43	36.4
All Vehicles		618	26	618	4.2	0.161	1.3	NA	0.3	2.1	0.07	0.12	0.07	47.8

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [MAC_BRA_FANX PM (Site Folder: General)]

Macpherson St, Brands Ln & Fantail Ave, Warriewood
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Macpherson St (SE)														
21	L2	19	0	19	0.0	0.118	4.8	LOS A	0.0	0.3	0.02	0.06	0.02	47.1
22	T1	196	12	196	6.1	0.118	0.0	LOS A	0.0	0.3	0.02	0.06	0.02	49.1
23	R2	4	0	4	0.0	0.118	5.6	LOS A	0.0	0.3	0.02	0.06	0.02	41.5
Approach		219	12	219	5.5	0.118	0.5	NA	0.0	0.3	0.02	0.06	0.02	48.9
NorthEast: Brands Ln (NE)														
24	L2	9	0	9	0.0	0.015	4.3	LOS A	0.1	0.4	0.37	0.55	0.37	35.2
25	T1	1	0	1	0.0	0.015	4.5	LOS A	0.1	0.4	0.37	0.55	0.37	36.9
26	R2	4	0	4	0.0	0.015	6.3	LOS A	0.1	0.4	0.37	0.55	0.37	40.5
Approach		14	0	14	0.0	0.015	4.9	LOS A	0.1	0.4	0.37	0.55	0.37	37.5
NorthWest: Macpherson St (NW)														
27	L2	5	0	5	0.0	0.158	5.3	LOS A	0.2	1.1	0.06	0.04	0.06	34.7
28	T1	269	14	269	5.2	0.158	0.1	LOS A	0.2	1.1	0.06	0.04	0.06	49.1
29	R2	18	0	18	0.0	0.158	5.4	LOS A	0.2	1.1	0.06	0.04	0.06	47.2
Approach		292	14	292	4.8	0.158	0.5	NA	0.2	1.1	0.06	0.04	0.06	48.7
SouthWest: Fantail Ave (SW)														
30	L2	11	0	11	0.0	0.036	8.2	LOS A	0.1	0.9	0.39	0.89	0.39	39.3
31	T1	1	0	1	0.0	0.036	10.2	LOS A	0.1	0.9	0.39	0.89	0.39	25.5
32	R2	14	0	14	0.0	0.036	10.8	LOS A	0.1	0.9	0.39	0.89	0.39	33.9
Approach		26	0	26	0.0	0.036	9.7	LOS A	0.1	0.9	0.39	0.89	0.39	36.4
All Vehicles		551	26	551	4.7	0.158	1.1	NA	0.2	1.1	0.07	0.10	0.07	47.9

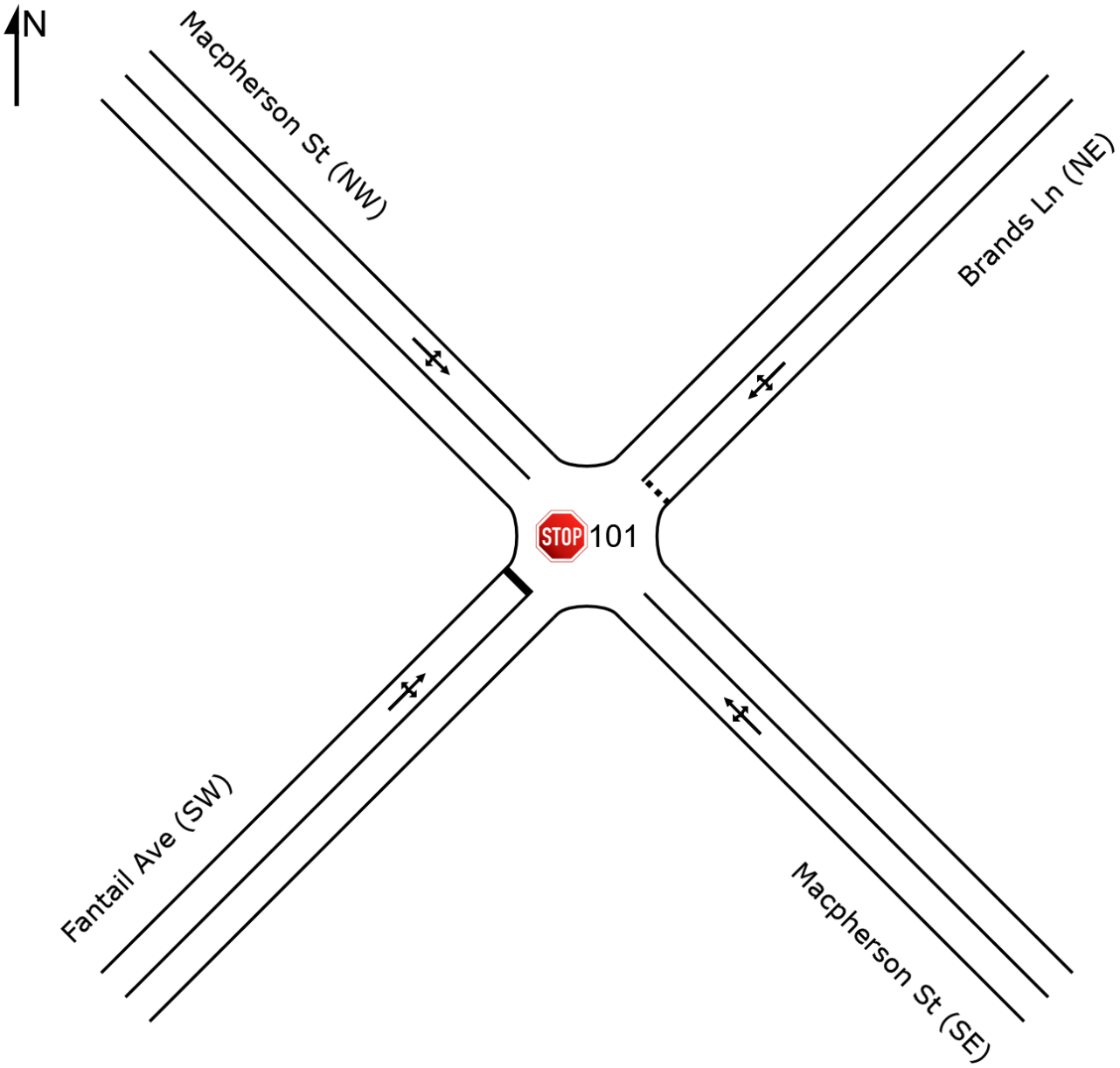
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS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

SITE LAYOUT

Site: 101 [MAC_BRA_FANP AM (Site Folder: General)]

Macpherson St, Brands Ln & Fantail Ave, Warriewood
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 101 [MAC_BRA_FANP AM (Site Folder: General)]

Macpherson St, Brands Ln & Fantail Ave, Warriewood
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Macpherson St (SE)														
21	L2	7	0	7	0.0	0.136	5.4	LOS A	0.1	0.7	0.05	0.04	0.05	47.3
22	T1	236	12	236	5.1	0.136	0.1	LOS A	0.1	0.7	0.05	0.04	0.05	49.2
23	R2	10	0	10	0.0	0.136	5.7	LOS A	0.1	0.7	0.05	0.04	0.05	41.7
Approach		253	12	253	4.7	0.136	0.4	NA	0.1	0.7	0.05	0.04	0.05	49.0
NorthEast: Brands Ln (NE)														
24	L2	17	0	17	0.0	0.035	4.4	LOS A	0.1	0.9	0.41	0.60	0.41	34.1
25	T1	1	0	1	0.0	0.035	4.9	LOS A	0.1	0.9	0.41	0.60	0.41	35.9
26	R2	12	0	12	0.0	0.035	7.0	LOS A	0.1	0.9	0.41	0.60	0.41	39.8
Approach		30	0	30	0.0	0.035	5.4	LOS A	0.1	0.9	0.41	0.60	0.41	37.2
NorthWest: Macpherson St (NW)														
27	L2	9	0	9	0.0	0.162	4.9	LOS A	0.1	0.4	0.02	0.03	0.02	35.0
28	T1	291	14	291	4.8	0.162	0.0	LOS A	0.1	0.4	0.02	0.03	0.02	49.5
29	R2	5	0	5	0.0	0.162	5.5	LOS A	0.1	0.4	0.02	0.03	0.02	47.6
Approach		305	14	305	4.6	0.162	0.3	NA	0.1	0.4	0.02	0.03	0.02	49.0
SouthWest: Fantail Ave (SW)														
30	L2	27	0	27	0.0	0.086	8.4	LOS A	0.3	2.1	0.43	0.92	0.43	39.0
31	T1	1	0	1	0.0	0.086	10.9	LOS A	0.3	2.1	0.43	0.92	0.43	25.1
32	R2	31	0	31	0.0	0.086	11.6	LOS A	0.3	2.1	0.43	0.92	0.43	33.5
Approach		59	0	59	0.0	0.086	10.1	LOS A	0.3	2.1	0.43	0.92	0.43	36.4
All Vehicles		647	26	647	4.0	0.162	1.5	NA	0.3	2.1	0.09	0.14	0.09	47.3

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [MAC_BRA_FANP PM (Site Folder: General)]

Macpherson St, Brands Ln & Fantail Ave, Warriewood
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Macpherson St (SE)														
21	L2	19	0	19	0.0	0.126	5.1	LOS A	0.2	1.2	0.08	0.08	0.08	46.2
22	T1	196	12	196	6.1	0.126	0.1	LOS A	0.2	1.2	0.08	0.08	0.08	48.4
23	R2	16	0	16	0.0	0.126	5.6	LOS A	0.2	1.2	0.08	0.08	0.08	40.3
Approach		231	12	231	5.2	0.126	0.9	NA	0.2	1.2	0.08	0.08	0.08	48.0
NorthEast: Brands Ln (NE)														
24	L2	12	0	12	0.0	0.022	4.3	LOS A	0.1	0.5	0.38	0.57	0.38	34.8
25	T1	1	0	1	0.0	0.022	4.7	LOS A	0.1	0.5	0.38	0.57	0.38	36.5
26	R2	7	0	7	0.0	0.022	6.5	LOS A	0.1	0.5	0.38	0.57	0.38	40.3
Approach		20	0	20	0.0	0.022	5.1	LOS A	0.1	0.5	0.38	0.57	0.38	37.5
NorthWest: Macpherson St (NW)														
27	L2	16	0	16	0.0	0.164	5.1	LOS A	0.2	1.3	0.06	0.06	0.06	34.6
28	T1	269	14	269	5.2	0.164	0.1	LOS A	0.2	1.3	0.06	0.06	0.06	48.8
29	R2	18	0	18	0.0	0.164	5.4	LOS A	0.2	1.3	0.06	0.06	0.06	47.0
Approach		303	14	303	4.6	0.164	0.7	NA	0.2	1.3	0.06	0.06	0.06	47.9
SouthWest: Fantail Ave (SW)														
30	L2	11	0	11	0.0	0.037	8.2	LOS A	0.1	0.9	0.39	0.89	0.39	39.3
31	T1	1	0	1	0.0	0.037	10.4	LOS A	0.1	0.9	0.39	0.89	0.39	25.4
32	R2	14	0	14	0.0	0.037	10.9	LOS A	0.1	0.9	0.39	0.89	0.39	33.8
Approach		26	0	26	0.0	0.037	9.7	LOS A	0.1	0.9	0.39	0.89	0.39	36.3
All Vehicles		580	26	580	4.5	0.164	1.3	NA	0.2	1.3	0.10	0.12	0.10	47.1

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.
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Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.