TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

TRAFFIC IMPACT ASSESSMENT (TIA)

Proposed Mixed Use Development
Uniting War Memorial Hospital, Waverley (SSD-61389706)

Reference: 20.565r02v09
Date: December 2024

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TRAFFIX

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Appendices

1. INTRODUCTION

TRAFFIX has been commissioned by Uniting to undertake a traffic impact assessment (TIA) in support of a State Significant Development Application (SSDA) relating to the Uniting War Memorial Hospital Site (Uniting Waverley) located in Waverley. The development is located within the Waverley Council Local Government Area (LGA) and has been assessed under that Council's controls. In addition, the development has been assessed under the controls of the State Environment Planning Policy (Housing) 2021 (SEPP).

As part of the SSD Applicant process, the Secretary's Environmental Assessment Requirements (SEARs) have been issued for the proposal. This TIA has been prepared to assess the traffic and access impacts of the proposal and respond to the relevant SEARs. The report is structured as follows:

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- Section 2: Addresses the SSDA Responses.
- Section 3: Describes the site and its location.
- Section 4: Documents existing traffic conditions.
- Section 5: Describes the proposed development.
- Section 6: Assesses the parking requirements.
- Section 7: Assesses traffic impacts.
- Section 8: Discusses Sustainable Transportation.
- Section 9: Discusses access and internal design aspects.
- Section 10: Presents the overall study conclusions.

2. SSDA RESPONSES

2.1 SEARs Requirements

A response to each relevant transport requirement of the Secretary's Environmental Assessment Requirements (SEARs) is provided in **Table 1** below, including references to sections of this report where applicable. Reference should also be made to the SEARs and the below matters relate specifically to Traffic and Transport.

Table 1: Traffic, Transport and Accessibility

SEARS Requirements	Reference
Provide a transport and accessibility impact assessment which includes:	
• an analysis of the existing transport network, including the road hierarchy and any pedestrian, bicycle or public transport infrastructure, current daily and peak hour vehicle movements, and existing performance levels of nearby intersections.	**Refer to Section 4**
• details of the proposed development, including pedestrian and vehicular access arrangements (including swept path analysis of the largest vehicle and height clearances, and an explanation of how residents will access facilities and services), parking arrangements and rates (including bicycle and end-of-trip facilities), drop-off/pick-up-zone(s) and bus bays (if applicable), and provisions for servicing and loading/unloading	**Refer to Section 6, Section 9, Appendix C and Appendix E**
• analysis of the impacts of the proposed development during construction and operation (including justification for the methodology used), including predicted modal split, a forecast of additional daily and peak hour multimodal network flows as a result of the development (using industry standard modelling), identification of potential traffic impacts on road capacity, intersection performance and road safety (including pedestrian and cyclist conflict) and any cumulative impact from surrounding approved developments.	**Refer to Section 7 and a separate report for the Preliminary Construction and Pedestrian Traffic Management Plan**
• measures to mitigate any traffic impacts, including details of any new or upgraded infrastructure to achieve acceptable performance and safety, and the timing, viability and mechanisms of delivery (including	**Refer to Section 7**

proposed arrangements with local councils or government agencies) of any infrastructure improvements in accordance with relevant standards.	
• proposals to promote sustainable travel choices for employees, residents, guests and visitors, such as connections into existing walking and cycling networks, minimising car parking provision, encouraging car share and public transport, providing adequate bicycle parking and high quality end-of-trip facilities, and implementing a Green Travel Plan.	**Refer to Section 8 and Preliminary Green Travel Plan**
• Provide a Construction Traffic Management Plan detailing predicted construction vehicle routes, access and parking arrangements, coordination with other construction occurring in the area, and how impacts on existing traffic, pedestrian and bicycle networks would be managed and mitigated.	**Refer to Preliminary Construction and Pedestrian Traffic Management Plan**

2.2 TfNSW Correspondence

TRAFFIX consulted with TfNSW to discuss the type of land use proposed, development yields, location of proposed driveways and traffic generation of the proposed development. Reference should be made to the TfNSW correspondence dated: 4 November 2024 and provided in **Appendix A** noting:

"TfNSW has reviewed the preliminary material and advises that the proposed development will have a negligible impact on the surrounding state road network. As such, TfNSW has no further comments regarding the application."

3. LOCATION AND SITE

The identified portion of land, that is the subject of this development is described as the parcels pertaining to the War Memorial Hospital Waverley (Uniting Waverley) comprising frontages to Bronte Road, Birrell Street, Carrington Road and Church Street, Waverley – which includes the War Memorial Hospital. The Subject Site comprises 29 allotments as outlined in **Table 2** below.

Table 2: Site Identification

Street Address	Legal Description	Street Address	Legal Description
101 Birrell Street, Waverley	Lot 2 DP 515904	125 Birrell Street, Waverley	Lot 1 DP 172133
103 Birrell Street, Waverley	Lot 1 DP 515904		Lot 1 DP 567694
105 Birrell Street, Waverley	Lot A DP 437866		Lot 1 DP 948186
107 Birrell Street, Waverley	Lot B DP 437866		Lot 2 DP 1061588
109 Birrell Street, Waverley	Lot 1 DP 961790		Lot 3 DP 667555
111 Birrell Street, Waverley	Lot 11 DP 667554		Lot 2 DP 1061548
113 Birrell Street, Waverley	Lot 4 DP 520982		Lot 1 DP 1061548
115 Birrell Street, Waverley	Lot 3 DP 520982		Lot 7 DP 948185
117 Birrell Street, Waverley	Lot 2 DP 212655		Lot B DP 317831
119 Birrell Street, Waverley	Lot 1 DP 212655	2 Church Street, Waverley	Lot 1 DP 630460
121 Birrell Street, Waverley	Lot A DP 317831	4 Church Street, Waverley	Lot 2 DP 630460
124-160 Bronte Road, Waverley	Lot 4 DP 593710	6 Church Street, Waverley	Lot 1 DP 167332
162 Bronte Road, Waverley	Lot 1 DP 166786	8 Church Street, Waverley	Lot 1 DP 1098550
164 Bronte Road, Waverley	Lot 1 DP 1115706		Lot 2 DP 1098550
			Lot 3 DP 1098550

The entire Subject Site is subject to the applicable provisions outlined within the *State Environmental Planning Policy (Housing) 2021* (Housing SEPP) and *Waverley Local Environmental Plan 2012* (WLEP2012). Access to the Subject Site is currently obtained via Bronte Road, Birrell Street, Carrington Road and Church Street.

The Subject Site is situated approximately 5.15km southeast of the Sydney CBD. It is within close proximity to transport infrastructure routes (including the bus and rail networks) along Bronte Road and Birrell Street and close by (approximately 760m) to Bondi Junction Station, as well as sharing direct links with the wider regional road network, including connections to Oxford Street and Moore Park Road providing passage to the M1 Motorway and Sydney CBD. All of which provide enhanced connectivity to the Subject Site and immediate vicinity, as well as the wider locality. Additionally, the Subject Site is located within close proximity to active transport links,

such as bicycle routes, providing an additional mode of accessible transport available to the Subject Site.

In its existing state, the Subject Site comprises a mixture of land use typologies including medium density residential dwellings; the Uniting Edina Building and the existing War Memorial Hospital Campus and retirement living accommodation.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**.

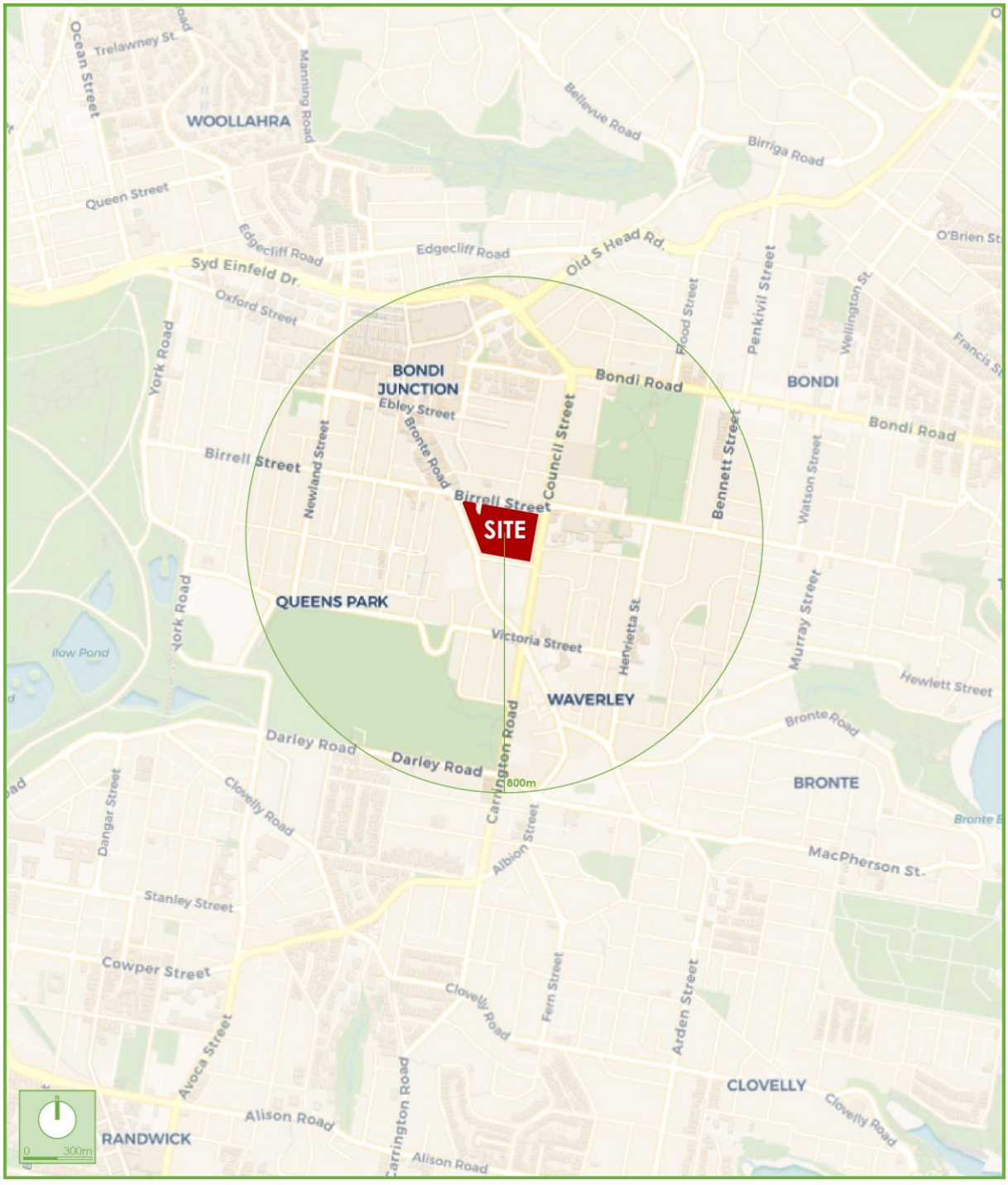


Figure 1: Location Plan

Figure 2: Site Plan

4. EXISTING TRAFFIC CONDITIONS

4.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Carrington Road: forms part of the TfNSW Main Road (MR 660) and generally traverses north-south, connecting Ocean Street in the north and Frenchmans Road to the south. It carries approximately 24,300 vehicles per day. In the vicinity of the site, Carrington Road is subject to a 60km/h speed zoning (subject to a 40km/h school zone) and provides two lanes of traffic in both directions with no parking and no stopping restrictions applied during the peak periods.
- Bronte Road: operates as the TfNSW Main Road (MR 340) to the north of Victoria Street and as a local road to the south. It generally traverses north to south, between Ebley Street to the north and Leichhardt Street to the south. In the vicinity of the site, it is subject to a 50 km/h speed zoning (40km/h during the school zone periods) and provides two lanes of traffic in both directions with on-street parking provided on either side.
- Birrell Street: an Unclassified Regional Road (RR 7335), Birrell Street traverses east west between York Road to the west and Cross Street to the east. It is subject to a 50km/h speed zoning and provides one lane of traffic in each direction and unrestricted kerbside parking permitted along both approaches.
- Church Street: a local road that traverses east-west between Bronte Road in the west and Carrington Road in the east. Church Street operates as a one-way westbound road providing a single lane of traffic, angled parking along the northern side and parallel parking along the southern side.

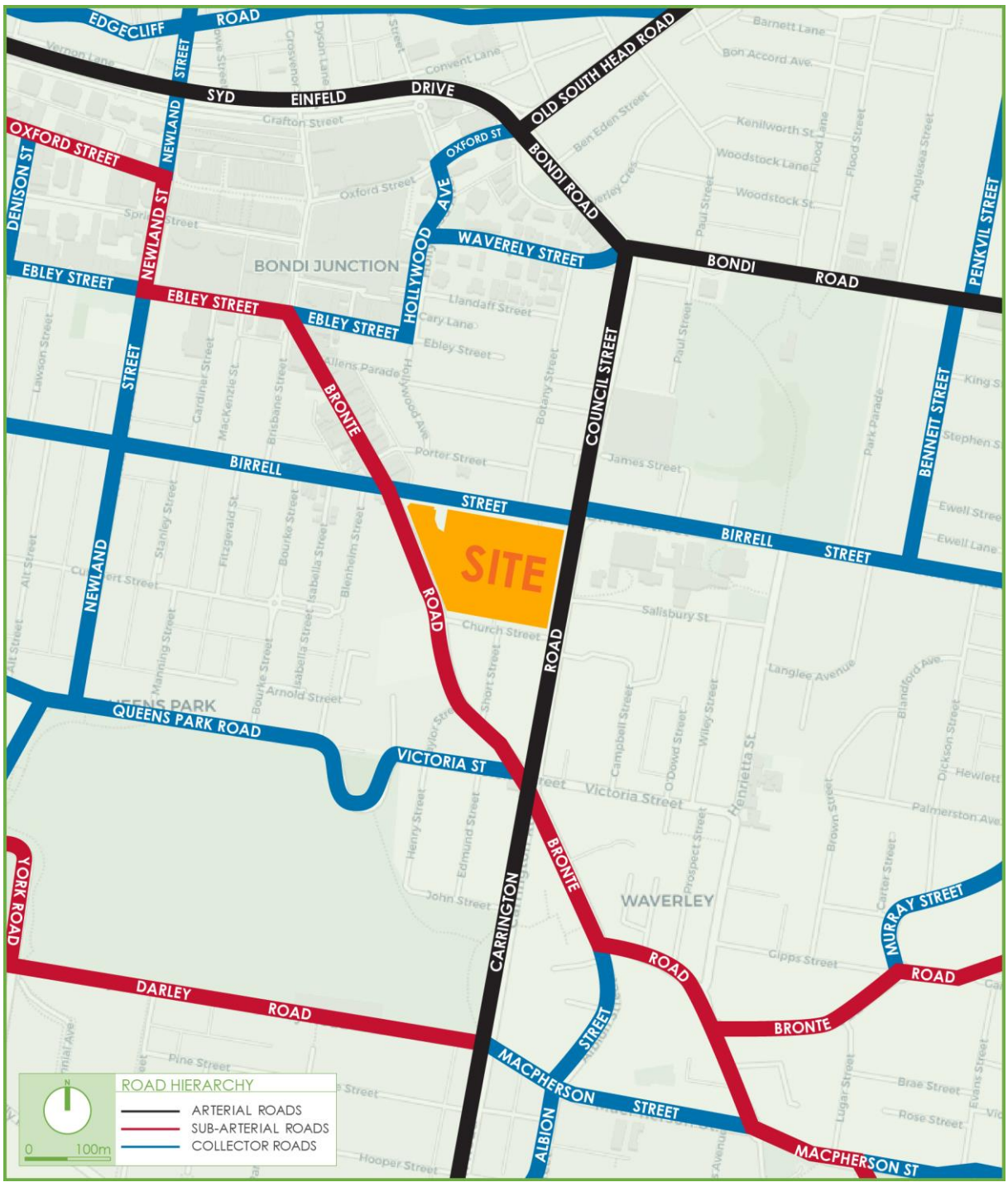


Figure 3: Road Hierarchy

4.2 Key Intersections

The key intersections in the vicinity of the site are shown below and provide an understanding of the existing road geometry and alignment.

4.2.1 Intersection of Birrell Street and Bronte Road

Figure 4: Intersection of Birrell Street and Bronte Road

It can be seen from **Figure 4** that the intersection of Birrell Street and Bronte Road is a four-legged signalised intersection, with signalised pedestrian crossings at each of the legs. The main attributes of each approach outlined as follows:

- Birrell Street (east and west legs)
  - The westbound approach provides a single through lane and a short right turn only lane.
  - The eastbound approach provides a single through lane and a short right turn only lane.
- Bronte Road (north and south legs)
  - The northbound approach provides a full through lane permitting right turns and a short through lane within the kerbside lane.
  - The southbound approach provides a full through lane permitting right turns and a short through lane within the kerbside lane.

4.2.2 Intersection of Birrell Street, Carrington Road and Council Street

Figure 5: Intersection of Birrell Street, Carrington Road and Council Street

It can be seen from **Figure 5** that the intersection of Birrell Street, Carrington Road and Council Street is a four-legged signalised intersection, with signalised pedestrian crossings at each of the legs. The main attributes of each approach outlined as follows:

- Birrell Street (east and west legs)
  - The westbound approach provides a single through lane and a left turn slip lane. It is noted that no right turn is posted for this approach.
  - The eastbound approach provides a single through lane also permitting right turns and a short through lane.
- Council Street (north leg)
  - The southbound approach provides a single through lane and a short through lane within the kerbside lane. No right turn is permitted for this approach.
- Carrington Road (south leg)
  - The northbound approach provides a single through lane also permitting right turns , a short through lane within the kerbside lane and a left turn slip lane.

4.2.3 Intersection of Church Street and Carrington Road

Figure 6: Intersection of Church Street and Carrington Road

It can be seen from **Figure 6** that the intersection of Church Street and Carrington Road is a three-legged priority intersection. The main attributes of each approach outlined as follows:

- Carrington Road (north and south leg)
  - The northbound approach provides a single through lane with parking along the kerbside.
  - The southbound approach provides a single through lane with 'No Parking' along the kerbside.
- Church Street (west leg)
  - Church Street permits one-way traffic in a westbound direction and as such there is no approach lane.

4.2.4 Intersection of Church Street and Bronte Road

Figure 7: Intersection of Church Street and Bronte Road

It can be seen from **Figure 7** that the intersection of Church Street and Bronte Road is a three-legged priority intersection. The main attributes of each approach outlined as follows:

- Bronte Road (north and south leg)
  - The northbound approach provides a single through lane with parking along the kerbside.
  - The southbound approach provides a single through lane.
- Church Street (east leg)
  - Church Street permits one-way traffic in a westbound direction with one approach lane at this intersection permitting left and right turns.

4.3 Existing Traffic Volumes

The existing peak hour throughputs as gathered by the intersection traffic surveys at each of the above key intersections is summarised in **Table 3** below.

Table 3: Existing Traffic Volumes

Intersection	Peak Hour	Traffic Volumes (veh/hr)			
		Northbound	Southbound	Eastbound	Westbound
Birrell Street and Bronte Road	AM	498	325	364	622
	PM	362	451	377	345
Birrell Street, Carrington Road and Council Street	AM	565	691	496	621
	PM	423	823	587	233
Church Street and Carrington Road	AM	862	547	N/A	241
	PM	600	808	N/A	44
Church Street and Bronte Road	AM	754	438	N/A	N/A
	PM	461	543	N/A	N/A

4.4 Public Transport

The existing bus and rail services that operate in the locality are shown in **Figure 8**. It is evident that the site benefits from excellent public transport services with multiple bus stops located along Bronte Road and Birrell Street. The bus routes provide frequent services connecting the site to Bondi Junction, Eastgardens, Coogee and Clovelly.

In addition, the Bondi Junction Interchange located 800 metres to the north and includes the Bondi Junction Railway Station. This station provides services to the T4 Eastern Suburbs and Illawarra Line, connecting to Sydney CBD and the wider rail network across the Sydney metropolitan area.

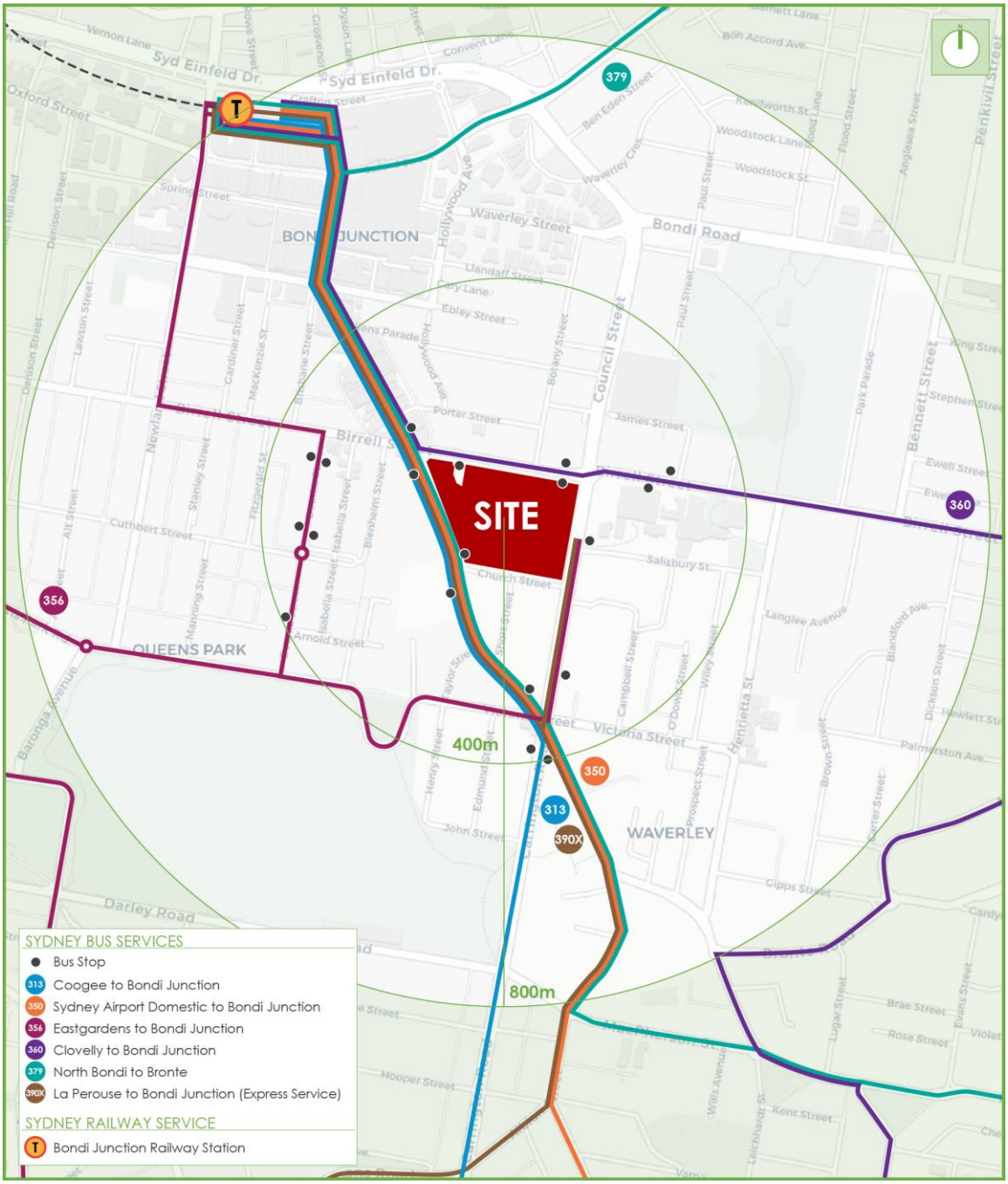


Figure 8: Public Transport

4.5 Sustainable Transport

4.5.1 Walking

The site is ideally located with respect to pedestrian facilities in the locality. Roads surrounding the site are paved and pedestrian crossing facilities are provided at key intersections, providing excellent connections to nearby public transport options and amenities.

Furthermore, the site is located within walking distance of several amenities within the Waverley area such as restaurants, cafés, bars, supermarkets. Walk Score (walkscore.com) is an excellent way of measuring the 'walkability' of the site with respect to nearby amenities based on distance and pedestrian friendly areas. The Walk Score results are presented in **Figure 9** below:

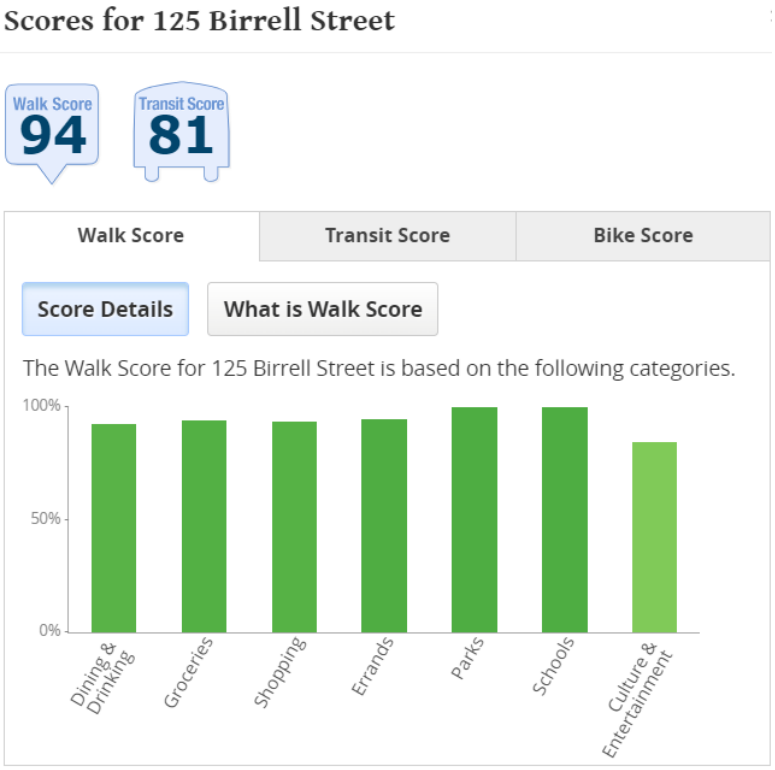


Figure 9: Walk Score Summary for Uniting Waverley

It can be seen from Figure 9 that the site has a Walk Score of 94/100 and Transit Score of 81/100. Accordingly, daily errands can be accomplished on foot, while also providing convenient access to public transport services in the locality.

4.5.2 Cycling

In addition to the various walking routes, the site is also located within proximity to various bicycle friendly roads available throughout the area. These cycleways can be used concurrently with other bicycle routes to provide connections to various areas, with the primary cycleways summarised as follows:

- Main On-Street Cycleways (High Traffic): Bronte Road between Leichhardt Street and Grafton Street and Leichhardt Street between Macpherson Street and Bronte Road provide main on-street cycleways between Waverley and Bondi Junction.
- Main On-Street Cycleways (Low Traffic): Bourke Street between Queens Park Road and Birrell Street, Brisbane Street between Birrell Street and Brisbane Street Square and Henrietta Street between Victoria Street and Birrell Street provide main on-street cycleways between Waverley and Bondi Junction.
- Local On-Street Cycleways: Birrell Street provides a local on street cycleway between Tamarama and Centennial Park.

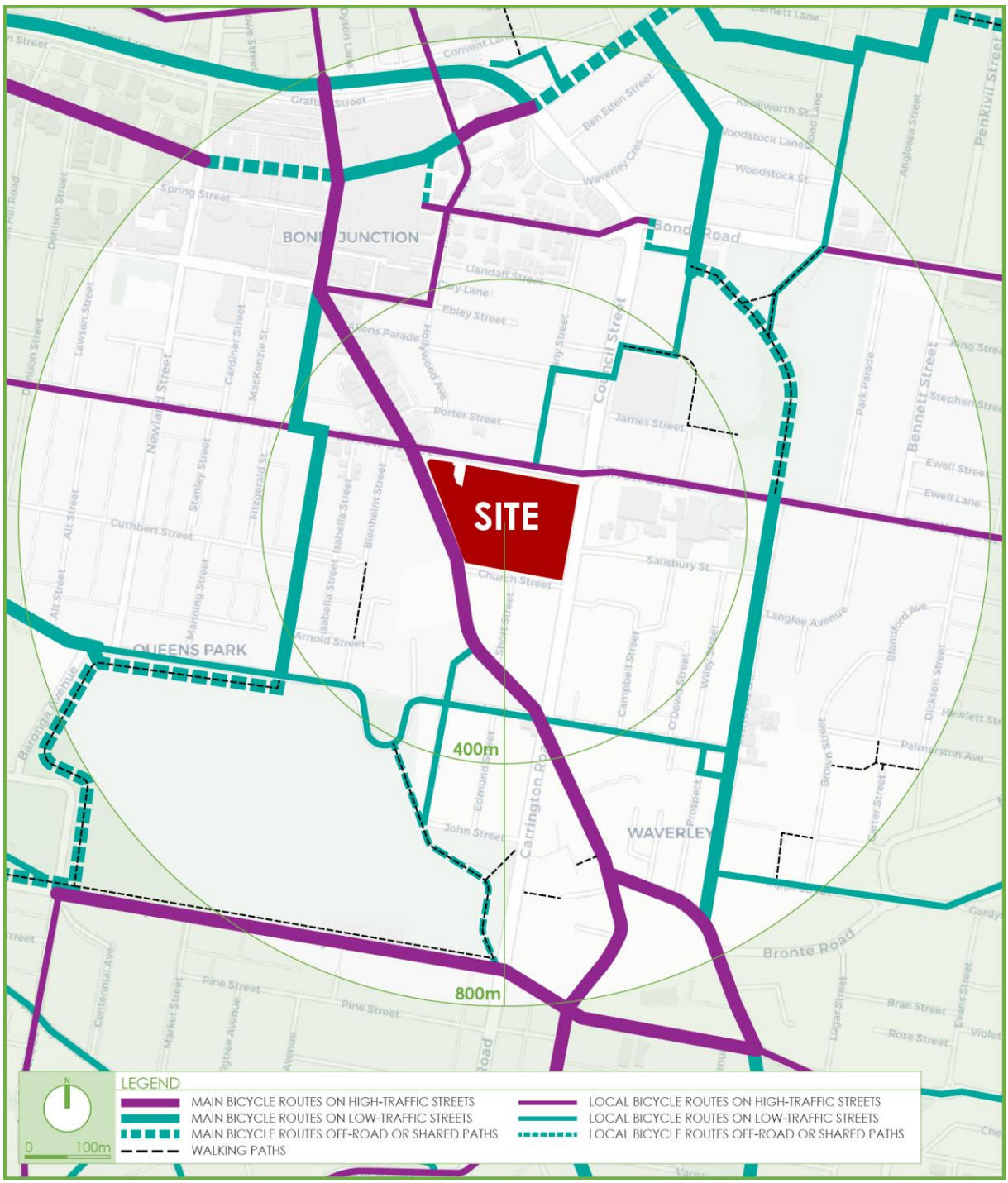


Figure 10: Cycleways

5. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the proposed development is provided in the Statement of Environmental Effects prepared separately by Willowtree Planning. The proposal involves the construction and operation of Seniors Housing at the Uniting Waverley Site, comprising:

- Earthworks involving cut and fill;
- Tree removal;
- Demolition of existing structures on the northern and western portion of the Subject Site;
- Demolition of Cadi Cottage;
- Adaptive Reuse of 3 heritage buildings (Ellerslie, Banksia and Wych Hazel, and Church St Cottages);
- Augmentation of existing services and infrastructure such as water, power, and sewer;
- Construction of two (2) basement car parks comprising 478 car parking spaces;
- Construction of a 6-storey Residential Aged Care Facility (RACF), including:
  - 105 beds;
  - 63 staff onsite at any one time;
  - Consulting rooms and staff administration areas;
  - Ancillary land uses including a salon, cafe, chapel;
  - Community facilities including a seniors' gym.
- Construction of 4-7-storey Independent Living Unit (ILU) buildings, including:
  - 231 units (including Affordable Rental Housing units);
- Construction of proposed driveway on Bronte Road and secondary driveways on Birrell Street;
- Ancillary facilities and amenities including:
  - Café providing 225m^2 GFA and four (4) staff.
  - Salon/day spa providing two (2) staff.
  - Consultation/allied health rooms providing five (5) staff.
  - 30 Staff for Chaplain, HACC, Aged Care Assessment Team (ACAT), Assisted Living, Administrative team; and other ancillary uses.
  - 18 Staff for other uses:

  - Non RAC maintenance, cleaning and catering; and
  - Community facilities

- Retention of the following uses:
  - Retention of the existing Hospital.
  - Retention of the existing Respite Daycare and Young Onset Dementia Services.
  - Retention of community facilities including a seniors' gym.
  - Relocation of the car parking consisting of 113 car parking spaces for the existing uses. Maintaining the existing number of car parking spaces.
- An internal loading dock (basement level) via Bronte Road access accommodating the following service bays;
  - 1 x service bay accommodating up to a 12.5 metre heavy rigid vehicle (HRV);
  - 1 x ambulance bay accommodating up to a 6.4 metre small rigid vehicle (SRV);
  - 6 x service bays accommodating Uniting village Toyota Coaster buses; and
  - 2 x service bays accommodating Uniting village vans
- A drop-off and pick-up zone on Level 2 (on grade) providing the following bays:
  - 2 x light vehicle bays;
  - 1 x bay accommodating a Uniting village bus (6.4m SRV); and
  - 1 x ambulance bay accommodating up to a 6.4 SRV.
- Provision of associated landscaping.

The parking and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**. Reference should be made to the plans submitted separately which are presented at reduced scale in **Appendix B**.

6. PARKING REQUIREMENTS

6.1 Council and SEPP Car Parking Requirements

Parking for the proposed development is to be assessed in accordance with the requirements of *Waverley Council's DCP (2022)* and *State Environment Planning Policy (Housing) 2021 (SEPP)*.

6.1.1 Independent Living Units

The parking rates for the independent living units (ILUs) within the proposed masterplan is governed by the SEPP rates reproduced here:

- 1 car space for each 5 dwellings where the development application is made by, or is made by a person jointly with, a social housing provider.

Uniting meets the requirements of a social housing provider being a 'not for profit organisation that is a direct provider of rental housing to tenants'. As such, the application of this rate to the proposed 231 ILU units require a minimum of 46 car parking spaces.

6.1.2 Residential Aged Care Facility

The minimum parking rates for the residential aged care facility component is also governed by the SEPP rates and are as follows:

- 1 parking space for each 15 beds; and
- 1 parking space for each 2 persons to be employed in connection with the development and on duty at any one time.

The application of the above rates to the proposed 105 beds and 63 staff (onsite at any one time) requires 39 car parking spaces, consisting of seven (7) RACF visitor parking spaces and 32 staff parking spaces.

6.1.3 Café

According to Part B7, Section 7.2.2 of the Waverley DCP (2022), the proposed use attracts a retail parking requirement which is a minimum of zero spaces and a maximum of 3.3 spaces/100m^2 GFA.

Applying the above rate to the proposed yield of 225m^2 of the retail gross floor area (GFA) results in the retail component required to provide a minimum of 0 and a maximum of seven (7) car parking spaces in accordance with the DCP.

6.1.4 Salon/Spa

According to Part B7, Section 7.2.2 of the Waverley DCP (2022) the proposed use attracts a commercial parking requirement which is a minimum of zero spaces and a maximum of 1 spaces/100m^2 GFA.

Applying the above rate to the proposed yield of 47.8m^2 of the GFA results in the commercial component required to provide a minimum of 0 and a maximum of one (1) car parking spaces in accordance with the DCP.

6.1.5 Consult/Allied Health

The DCP does not provide a car parking rate for this use, and it is considered ancillary to the other uses that are proposed on site. As such, it is recommended that 1 car parking space is provided per the maximum number of staff on site at any one time.

As the consult/allied health proposes a maximum of five (5) staff onsite at any one time, this component requires five (5) staff parking spaces.

6.1.6 Ancillary Facilities and Amenities

The additional ancillary facilities and amenities such as Chaplain, HACC, ACAT, assisted living administrative team and other ancillary uses provide services to support and serve the site full time. As such, it is recommended that 1 car parking space is provided per the maximum number of staff on site at any one time. As the development proposes a maximum of 30 staff for the above uses (onsite at any one time), these ancillary facilities are required to provide 30 staff parking spaces.

In addition, Non RAC (maintenance, cleaning and catering) and community facilities would require 1 space per 2 staff. It is proposed that 18 staff would be needed, as a result, a total of nine (9) car parking spaces required for these uses.

6.1.7 Hospital

This Hospital is an existing operation catering for dementia patients. It currently provides 35 beds which continue to operate in the same manner as part of the proposed development. As such, the existing 113 carpark provision which currently service the hospital will be retained, and relocated into the proposed basement, which is considered acceptable.

6.1.8 Respite Daycare and Young Onset Dementia Services

The Respite Daycare is an existing service and will continue to operate in its existing manner including the use of the existing carpark (113 spaces), the retention of the respite daycare is considered acceptable.

6.1.9 Community Facilities

The community facilities (including seniors gym and Mens Shed) are an existing facility catering for patients and residents which will be relocated as part of the proposed development. As it will continue to operate in its existing manner including the use of the existing carpark (113 spaces), the retention of the community facilities are considered acceptable.

6.1.10 Combined Parking Requirement

The total parking requirement for the proposed development has been summarised in **Table 4**.

Table 4: DCP and SEPP Parking Requirements and Proposed Car Parking Provision

Use	Area/No.	DCP / SEPP	DCP / SEPP
Independent Living Units	231 dwellings	1 space per 5 dwellings	46
		SEPP Sub-Total	46
Residential Aged Care Facility	105 beds	1 space per 15 beds (visitors)	7
	63 staff	1 space per 2 staff	32
		SEPP Sub-Total	39
Café	225m²	minimum of 0 maximum of 3.3 spaces / 100m² GFA	0-7
Salon/Spa	47.8m²	minimum of 0 maximum of 1 space / 100m² GFA	0-1
Consult/Allied Health	5 staff	1 space per staff	5
Other Ancillary Facilities	30 staff	1 space per staff	30
	18 staff	1 space per 2 staff	9
		DCP Sub-Total	44-52
Hospital	N/A	No expansion of this use is proposed – car parking provision unchanged	113
Respite Daycare	N/A	No expansion of this use is proposed – car parking provision unchanged	
Community Facilities	N/A	No expansion of this use is proposed – car parking provision unchanged	
		Existing Sub-Total	113
		Total	**242-250**

It can be seen from Table 4 above that the development is required to provide a minimum of 242 car parking spaces in accordance with the SEPP Housing and DCP requirements. That is, the ILU and RACF developments are minimum requirements in accordance with SEPP Housing and is required to provide a minimum of 46 spaces for ILUs and a minimum of 39 spaces for RACF.

In addition, the development is required to provide a minimum of 44 car parking spaces and a maximum of 52 car parking spaces for the other uses and retain the existing 113 car parking spaces for the hospital, respite daycare and community facilities.

The above rates do not reflect the true operations of the site. It is noted that Uniting generally provides design requirements for their developments which is discussed further in the below section.

6.2 Uniting Car Parking Requirements

6.2.1 Independent Living Units

Uniting design requirements recommend the below carparking provisions for ILU component in order to improve commercial feasibility and to ensure all parking provisions for residents are provided onsite:

- 1 car parking space for each ILU dwelling;
- 1 additional parking space for nominated premium dwellings; and
- 0.2 car parking space per dwelling for affordable dwellings

Application of the above Uniting design requirements to 231 dwellings being 208 dwellings (with 34 premium dwellings) and 23 affordable dwellings, results in 247 car parking spaces for ILU residents.

In addition to the above, SEPP Housing does not require any visitor car parking for ILU use. It is noted however that Uniting requires 1 car space for each 15 dwellings for ILU visitors. Application of this rate to 231 ILU dwellings result in 15 car parking spaces for visitors.

The ILU development also proposes to provide five (5) communal pool vehicles for their residents which is similar to that of a carshare scheme however, only operating for residents of the ILU development.

Finally, two (2) spaces are required for general service and maintenance vehicles

As a result, a total car parking requirement of 269 spaces for residents, visitors and servicing to accommodate the ILU development.

6.2.2 Residential Aged Care Facility

Uniting advises that visitor parking requirements for Uniting RACF developments generally requires 1 parking space for each 10 beds. As a result, a total car parking requirement of 43 car parking spaces for the RACF development consisting of 11 visitor parking spaces and 32 staff parking spaces.

6.2.3 Café

The Cafe is envisaged to be ancillary to the RACF, ILU and Hospital uses on site, with patrons of the café generally arriving from within the site itself. As such, it is considered supportable to provide 1 car parking spaces per the maximum number of staff on site at any one time. As the café proposes a maximum of four (4) staff onsite at any one time, this component requires four (4) staff parking spaces.

6.2.4 Salon/Spa

The Salon/Spa is an ancillary facility to the other uses on site. As such, it is considered supportable to provide 1 car parking spaces per the maximum number of staff on site at any one time. As the salon/spa proposes a maximum of one (1) staff onsite at any one time, this component requires one (1) staff parking spaces.

6.2.5 Consult/Allied Health, Ancillary Facilities and Amenities

Other uses such as Consult/Allied Health, Ancillary Facilities and Amenities car parking requirements are in-line with discussion previously in Section 6.1.5 – Section 6.1.6

6.2.6 Existing Uses

Existing uses (Hospital, Respite Daycare and Community Facilities) car parking requirements are in-line with discussion previously in Section 6.1.7 – Section 6.1.9.

6.2.7 Combined Parking Assessment and Provision

The total parking assessment and parking provision for the proposed development have been summarised in **Table 5**.

Table 5: Uniting and First Principal Parking Requirements and Proposed Car Parking Provision

Use	Area/No.	Uniting Design Requirements and First Principal	Required	Provision
Independent Living Units	208 dwellings	1 space per each dwelling	208	208
	34 premium	1 addition space for premium dwelling	34	34
	23 dwellings	0.2 spaces per affordable dwellings	5	5
	231 dwellings	1 space per 15 dwellings (visitors)	15	16
	Other	Uniting communal pool vehicles	5	5
		Service and maintenance vehicles	2	2
		Sub-Total	269	270
Residential Aged Care Facility	105 beds	1 space per 10 beds (visitors)	11	11
	63 staff	1 space per 2 staff	32	32
		Sub-Total	43	43
Café	4 staff	1 space per staff	4	52
Salon/Spa	1 staff	1 space per staff	1	
Allied Health	5 staff	1 space per staff	5	
Other Ancillary Facilities	30 staff	1 space per staff	30	
	18 staff	1 space per 2 staff	9	
		Sub-Total	49	52
Hospital	N/A	No expansion of this use is proposed – car parking provision unchanged	113	113
Respite Daycare	N/A	No expansion of this use is proposed – car parking provision unchanged		
Community Facilities	N/A	No expansion of this use is proposed – car parking provision unchanged		
		Sub-Total	113	113
		Total	**474**	**478**

It can be seen from Table 5 that when assessing the parking requirements in accordance with Uniting design requirements and first principal assessment, the development is required to provide 474 car parking spaces to accommodate the entire development. In response, the development proposes a total car parking provision of 478 car parking spaces with 263 spaces for ILU residents and visitors, seven (7) spaces for servicing and Uniting pool cars, 43 spaces for RACF staff and visitors, 52 spaces for ancillary uses and 113 spaces for existing use.

The 263 spaces for ILU residents and visitors and 43 spaces for RACF are considered supportable due to the following reasons:

- Uniting car parking rates have been derived from market experience with ILU and RACF developments;
- The car parking provision allows for commercial viability and appeal for residents, staff and visitors;
- Noting that the SEPP Housing requirements are minimum requirements;
- Ensures all parking requirements for the ILU and RACF developments are accommodated on-site with no to minimum reliance on on-street parking.

The total car parking provision is therefore supportable and meets the demands of the proposed development.

6.3 Accessible Parking

Accessible parking spaces are to be provided in accordance with the Accessibility Consultant's report.

6.4 Mobility Scooter Parking

Council's DCP and SEPP housing does not require any dedicated mobility scooter parking spaces. However, in accordance with Uniting development requirements, eight (8) scooter parking spaces have been proposed.

6.5 Ambulance Parking

SEPP (Housing) 2021 requires 1 parking space suitable for an ambulance for residential aged care facility component. In response, the proposed development proposes two (2) ambulance bays to accommodate a 6.4m small rigid vehicle (SRV) provided within the basement and at-grade (Level 2).

6.6 Bicycle Parking Controls

The bicycle parking requirements as specified within Council's DCP are presented in **Table 6** below:

Table 6: DCP Minimum Bicycle Parking Requirements

Use	Area/No.	DCP Rate	DCP Requirement	Provision
Independent Living Units				
Residents	231 dwellings	1 space per dwelling	231	231
Visitor		1 space per 10 dwellings	23	24
		Sub-Total	**254**	**255**
Residential Aged Care				
Staff	32 staff 105 beds,	0.1 spaces per staff	3.2 (3)	7
Visitors		0.05 space per visitor	5.3 (5)	6
		Sub-Total	**8**	**13**
Ancillary & Common Services				
Staff	41 staff (full time)	0.1 spaces per staff	4.1 (4)	5
Visitors	Ancillary	0.05 space per visitor	N/A	0
		Sub-Total	**4**	**5**
Existing Services				
Staff	N/A – No Expansion	0.1 spaces per staff	N/A	N/A
Visitors		0.05 space per visitor		
		Sub-Total	**N/A**	**N/A**
		Total	**266**	**273**

It is evident from Table 6 that the development is required to provide a total of 266 bicycle spaces consisting of 231 ILU resident bicycle spaces and 35 spaces for other uses including visitors (ILU/RACF) and staff (RAC) and ancillary components. In response, the development proposes a total provision of 273 bicycle parking spaces of which 218 bicycle parking spaces in the form of storage cages for ILU residents, 45 bicycle parking spaces in the form of horizontal bicycle rails to be shared among all the visitors/staff located in a secured basement area and 10 bicycle parking spaces located at grade for visitors.

In summary, the proposed development provides well over the minimum requirements and is considered acceptable due to the nature of the development being seniors housing and meets the objectives of the DCP.

6.7 Motorcycle Parking

Council's DCP requires the provision of one (1) motorcycle parking bay per three (3) car parking bays (including visitor). It is noted that the Council's DCP motorcycle provision is considered erroneous for the proposed development due to the below reasons:

- The development being seniors housing, has a very small percentage which ride/use motorcycles, as such the majority of motorcycle users for the development will be staff members and/or visitors.
- The small percentage of residents which use motorcycles will already have car parking spaces assigned to their ILU, hence they would be able to utilise their assigned parking space to store their motorcycle.
- Similarly, there is ample staff and visitor parking provided, which can be used as motorcycle parking.

Taking into account the above, the development proposes a total of 13 motorcycle parking spaces being one (1) space within the Birrell Street ILU carpark, four (4) spaces within the Bronte Road ILU/RACF carpark and eight (8) spaces within the public carpark noting that the existing uses (hospital, mens shed and respite daycare) do not currently provide any motorcycle parking spaces. The proposed arrangement is considered supportable and would cater for the demand for motorcycle parking spaces within the development.

6.8 Car Share Facilities

Section 7.2.2 of the DCP states the following:

- A minimum of 1 car share space is to be provided for every 90 residential units.
- A minimum of 1 car share space be provided for every 50 commercial car parking spaces.
- 1 car share space can be provided in lieu of 4 car spaces.

It is anticipated that persons using the RAC facilities would require assistance and therefore it is considered appropriate that no car shared parking is provided for this use on site. The ILU component would not be considered a standard residential or commercial development, hence the above rates would not be applicable.

The ancillary components of the development only provide car parking spaces for staff, with car parking spaces provided for all ancillary staff, as such, it is considered appropriate that no car shared parking is provided for the ancillary components to the site.

Nevertheless, Uniting proposes to provide five (5) Uniting Pool car share spaces which is considered supportable and would provide an amenity for the development.

6.9 Electric Vehicle (EV) Charging Facilities

The DCP requires that at a minimum:

- 100% of medium and high-density residential parking spaces are EV ready;
- 40% of retail parking spaces are EV ready; and
- 40% of 'other premise' parking spaces are EV ready.

Consideration should be given to the use of the site as seniors living with the residential components of the site comprised of a RAC facility and ILU dwellings. The 'other premises' uses are considered ancillary to the seniors living. It is also note that under current zoning, no retail is permissible on the site, hence, no retail provisions are applicable to this site. Therefore, a reduced provision of electric charging facilities is considered supportable. The following provision is proposed in lieu of the above:

- No EV charging spaces proposed for RACF use.
- ILU and RAC
  - 49 ILU car parking spaces are proposed to be EV charging installed.
  - 17 visitor car parking spaces are proposed to be EV charging installed
  - 197 ILU car parking spaces are proposed to be EV charging ready for future proofing
- Ten (10) car parking spaces for the ancillary components will be EV charging installed.
- Relocated hospital car park
  - 23 relocated parking spaces for the existing hospital will be EV charging installed.
  - Three (3) relocated parking spaces for the existing hospital will be EV charging ready.

As a result, the above EV charging facilities are considered supportable due to the nature of the proposed development being seniors living with ancillary uses.

6.10 Refuse Collection and Servicing

The development proposes a loading dock area within the basement accessed via Bronte Road providing a total of five (5) service bays as follows:

- A single service bay accommodating up to a 12.5m heavy rigid vehicle (HRV);
- A single service bay accommodating up to a 6.4m SRV (Ambulance vehicle);
- Six service bays accommodating up to a 7.2m long village buses; and
- A single service bay accommodate up to a B99 vehicle.

Waste collection for the ILU uses will be conducted with a private waste wise mini vehicle. These vehicles are designed to traverse through basements with constrained spatial and can travel on ramp grades up to a 1 in 5 (20%).

In addition, a drop-off and pick-up area is provided on Level 2 which provides the following:

- Two (2) drop off and pick up bays for light vehicles;
- A village bus drop off space accommodating up to a 7.2m long vehicle; and
- An ambulance space accommodating up to a 6.4m long SRV.

Waste collection for the RACF and for ancillary uses on site will be conducted from the Basement loading dock accommodating up to a 12.5m HRV.

A swept path analysis has been conducted of all critical design vehicle movements within the site. This analysis shows satisfactory movements of service and waste vehicles accessing the loading areas around the site and is included for reference within **Appendix C**.

7. TRAFFIC AND TRANSPORT IMPACTS

7.1 Additional Development Trip Generation

The impacts of the proposed additional uses at the development on the external road network have been assessed having regard for the yield scenarios as summarised in **Section 5** above. This assessment has been undertaken in accordance with the requirements of the TfNSW Guide to Traffic Generating Developments 2002 (TfNSW Guide), 2024 Guide to Transport Impact Assessment (GTIA) and TfNSW Technical Direction (TDT 2013/04a) and as such, the traffic generation rates published in the TfNSW Guide have been adopted for each individual land use. The result of this assessment is summarised below.

Noted in the 2024 GTIA, the factors that influence trip generation are proximity to centres and employment, transport options, site characteristics and network contact, and socioeconomic and demographic characteristics. The calculated development AM and PM trip generation is also noted to be the network AM and PM peaks. On the other hand, car parking provisions are determined by controls such as DCPs and SEPPs, while the factors that determine car parking provisions are land use, location, parking demand throughout the day, transport options, private vehicle ownership and surrounding amenities. Thus, it is important to note that the calculated AM and PM traffic generation has no correlation to the car parking provision on site. Specifically, in the case of the subject SSDA, the following is noted with respect to traffic generation and the proposed parking provision:

- Uniting parking provision of 1 space per unit for the non-social housing dwellings has been determined based on market analysis to meet residents' requirements.
- The total parking provision of 478 spaces includes the 113 parking spaces for the existing hospital and community facilities on the site to remain with no changes to these facilities proposed as part of this application.
- The 2024 GTIA recommends assessing traffic impacts during critical peak times (AM and PM network peaks), with other vehicle movements occurring throughout the day including ILU vehicle trips.
- The network peak traffic generation rate for the ILUs is only 0.08 vehicle trips per dwelling in the AM peak and 0.2 vehicle trips in PM based on the TDT 2013/04a and 2024 GTIA. These documents also specify an ILU site peak hour traffic generation rate of 0.4 vehicle trips per

dwelling. However, this occurs outside the network peak and therefore has not been assessed.

- The proposed development provides a variety of community and ancillary facilities for residents, including café, salon, day spa and several health and medical services, which reduces the need of residents to leave site on a regular basis (i.e. residents may only leave every other day to complete their shopping and/or complete other errands that are not provided onsite). This is reflected in the low traffic generation rates in the TDT 2013/04a and 2024 GTIA for seniors housing developments.
- The network peak vehicle trips outlined below are the additional trips associated with the additional land uses at the network peak times, and do not include the existing land uses currently operating on-site, such as the hospital, which are already captured in the traffic surveys of the surrounding road network.

Based on the above reasons, the parking provision does not directly influence the following network peak traffic generation assessment, which is considered an acceptable estimation of the expected number of trips during the network peak for the activities occurring on-site at these times.

7.1.1 Independent Living Units (ILUs)

The TDT 2013/04a provides updated traffic generation rates for a number of land uses, including seniors living developments. Specifically, Appendix C2 provides site peak, morning (AM) network peak and evening (PM) network peak traffic generation rates for seniors living developments, with the AM and PM network peaks the relevant rates for assessment. Appendix C2 recommends the following traffic generation rates:

- Site Peak 0.4 vehicle trips per dwelling;
- AM Peak 0.08 vehicle trips per dwelling (40% of the PM Peak); and
- PM Peak 0.2 vehicle trips per dwelling (Average of Sydney Metropolitan and Non-Metropolitan data).

Application of this rate to the proposed 231 ILUs and adopting an 80/20 split results in the following traffic generation during the morning and evening peak period respectively:

- 19 vehicle trips in the evening peak hour (4 in, 15 out);

- 47 vehicle trips in the evening peak hour (38 in, 9 out);

7.1.2 Residential Aged Care Facility

The TfNSW Guide and more recent TDT 2013/04a recommends a housing for senior's peak hour vehicle trip rate of 0.4 trips per dwelling during the evening peak period, noting that the morning peak does not coincide with the network peak hour.

This rate is however inappropriate for the RACF component. The rate is derived from data which includes a large proportion of ILUs, in most cases where residents drive. This is not consistent or comparable with the proposed aged care facility, which caters for residents generally requiring a higher level of care. In this regard, a trip rate of 0.2 trips per bed is appropriate for the RACF development and this has also historically being used for residential aged care facilities in line with the TfNSW Guide. It relates principally to staff movements.

Application of this rate to the proposed 105 bed facility results in the following traffic generation:

- 22 vehicle trips in the morning network peak hour (18 in, 4 out); and
- 22 vehicle trips in the evening network peak hour (4 in, 18 out);

7.1.3 Hospital and Community Facilities

No changes are proposed to the operations of the existing hospital and community facilities (including Seniors Gym) on site and as such no additional traffic generation will result from this use on site.

7.1.4 Ancillary Facilities

The ancillary facilities on site include a café, consultation/allied health rooms, a salon/day spa, respite daycare and a men's shed. These facilities aim to service the community on site as a result of the proposed RACF and ILU elements. As such, they are not anticipated to generate any external traffic generation outside of that calculated for the RACF and ILU. It is noted that staff movements for these facilities would be minimal and would largely occur outside of network peak hours.

7.1.5 Combined Generation

The combined traffic generation of the components of the site can be summarised as follows:

- 41 vehicle trips in the morning network peak hour (22 in, 19 out); and
- 69 vehicle trips in the evening network peak hour (42 in, 27 out);

7.2 Intersection Performance

7.2.1 Traffic Surveys

For the purposes of assessing the traffic impacts of this development, traffic surveys were obtained at the critical intersections within proximity of the site. These surveys were conducted on Tuesday 25 July 2023 during the critical network peak between 7:00am-9:00am and 4:00pm - 6:00pm at the key intersections detailed within **Section 4.2**.

7.2.2 Trip Distribution

Journey to work data from the 2016 Census for the Waverley SA2 area has been used to determine the future distribution of traffic to and from the RAC component of the proposed development, due to the principal traffic generation from staff arrivals and departures.

Additionally, the following assumptions have been made regarding the traffic distribution for the ILU residents and staff.

- 30% will head north towards Bondi Junction
- 30% will head east towards Bondi and Tamarama
- 20% will head northwest towards the Sydney CBD
- 20% will head southwest towards Kensington, Mascot and Sydney Airport

The adopted trip distribution of traffic onto the surrounding road network is summarised in **Figure 11** and **Figure 12** below.

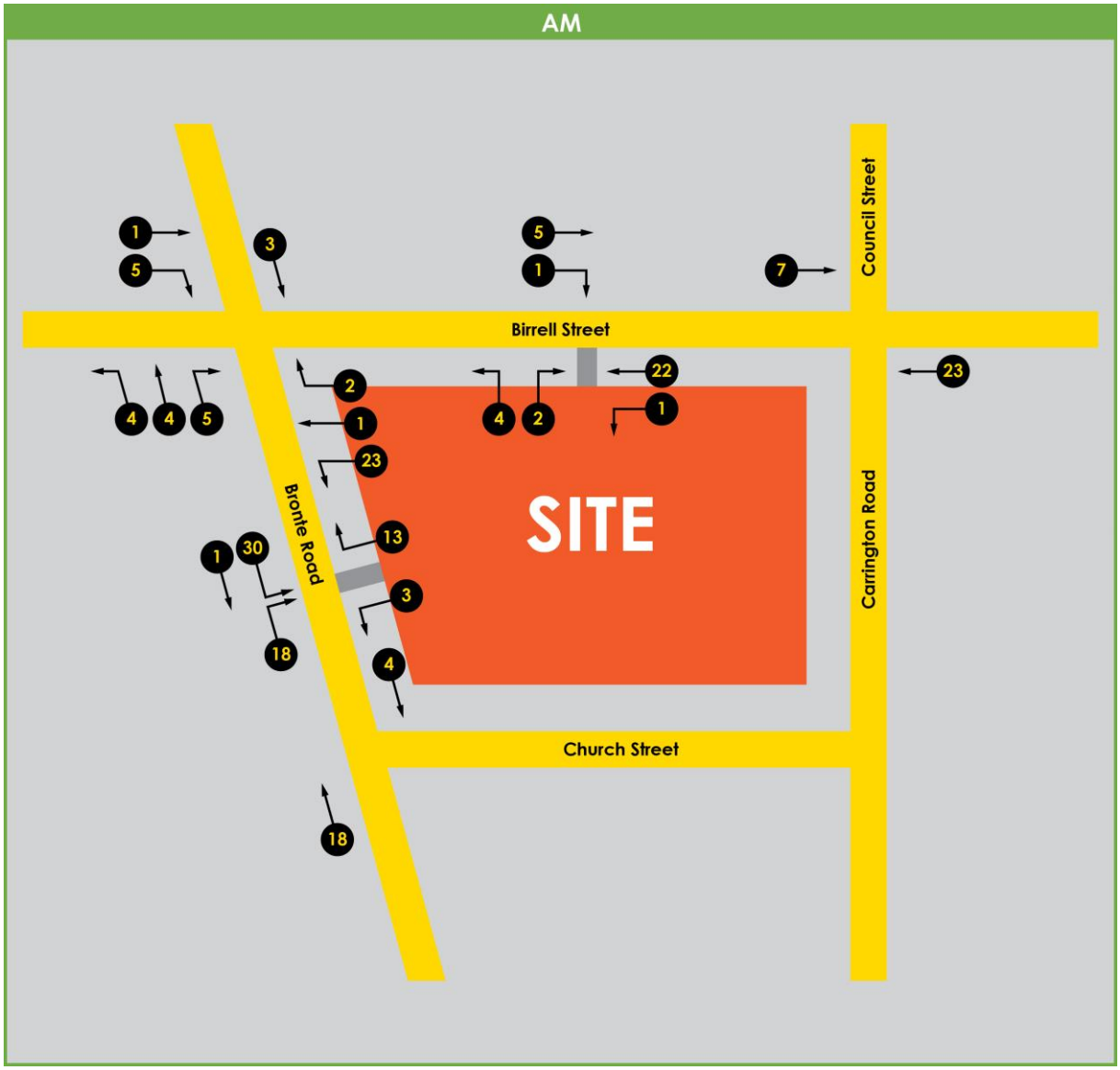


Figure 11: Morning Peak Hour Traffic Distribution

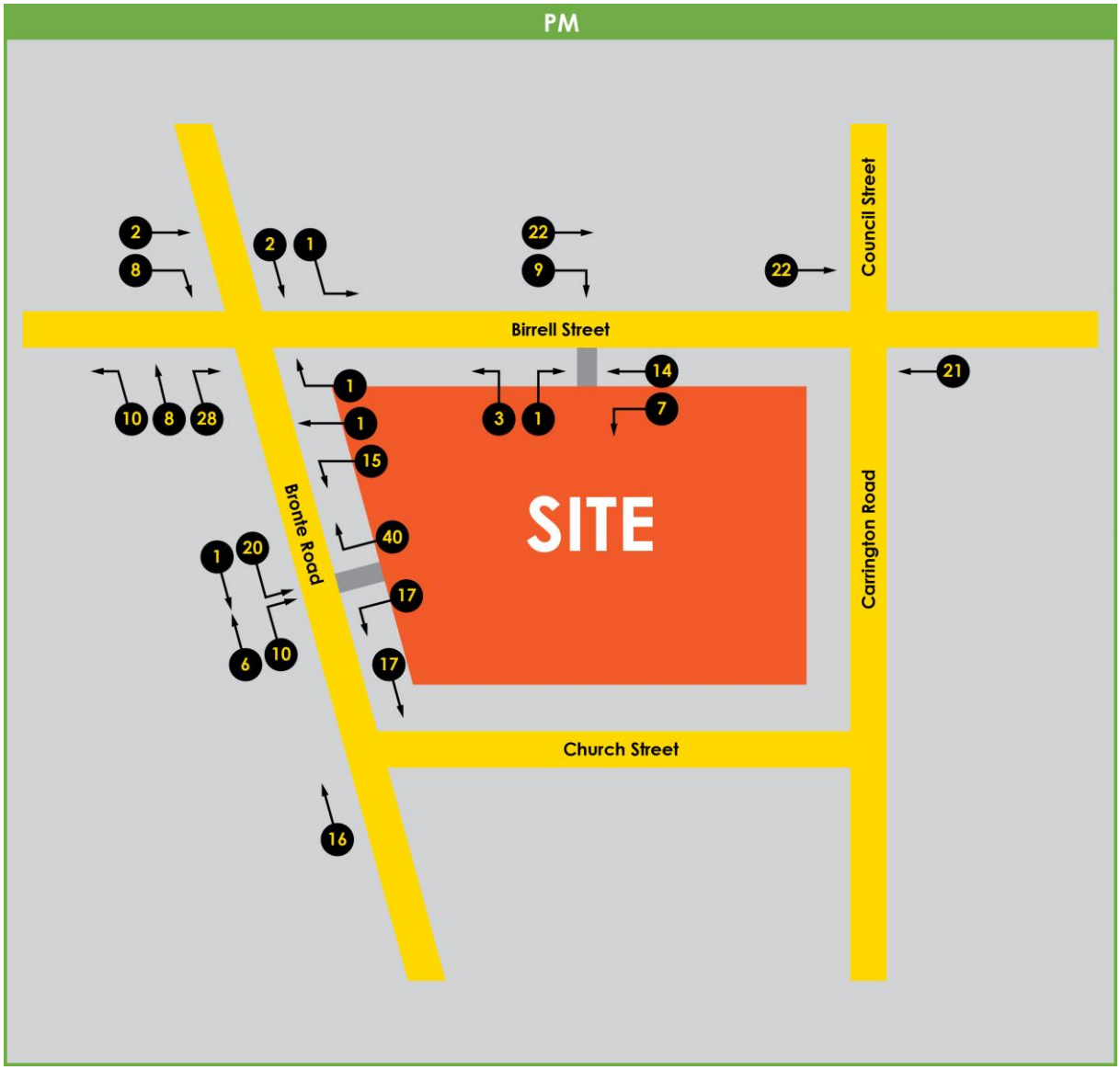


Figure 12: Evening Peak Hour Traffic Distribution

7.2.3 Scenarios

In order to assess the potential traffic impacts of the proposed development, the following scenarios were identified:

- Existing Scenario;
- Existing Plus Development Scenario; and
- Existing Plus Development Plus Approved Developments Scenarios (Cumulative Impacts).

7.2.4 SIDRA Intersection Analysis

The surveys were analysed using the SIDRA Intersection 9 computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations below with a summary shown in **Table 7.**

DoS the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way / stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS this is a comparative measure which provides an indication of the operating performance of an intersection.

Table 7: Intersection Performance Indicators (TfNSW)

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

A summary of the modelled results is provided in **Table 8** for existing and existing plus development scenarios. Reference should also be made to the SIDRA outputs provided in **Appendix D** which provide detailed results for each movement.

7.3 Existing and Existing Plus Development Scenario

Table 8: Existing and Existing plus Development Case Scenario

Intersection	Control Type	Scenario	Period	Degree of Saturation	Intersection Delay	Level of Service
Birrell Street and Bronte Road	Signalised	Existing	AM	0.840	42.7	D
			PM	0.583	27.4	B
		Development	AM	0.861	43.5	D
			PM	0.635	28.5	B
Birrell Street, Carrington Road, and Council Street	Signalised	Existing	AM	1.001	47.0	D
			PM	0.858	24.6	B
		Development	AM	1.029	48.4	D
			PM	0.858	24.8	B
Church Street and Carrington Road	Priority*	Existing	AM	0.447	37.2	C
			PM	0.238	15.8	B
		Development	AM	0.447	37.2	C
			PM	0.238	15.8	B
Church Street and Bronte Road	Priority*	Existing	AM	0.367	16.5	B
			PM	0.122	11.9	A
		Development	AM	0.379	17.2	B
			PM	0.127	12.4	A
Bronte Road Access	Priority*	Development	AM	0.042	10.9	A
			PM	0.257	11.2	A

*LoS of Priority intersections based on worst performing movement

It can be seen from **Table 8** that the model shows only two (2) intersections (the 2 signalised intersections) in the morning peak hour that operate at a LoS D being operating near capacity. However, this is considered acceptable as the proposed development results in no LoS change and only an increase intersection delay of 0.8 to 1.4 seconds which is negligible.

All other intersections in the vicinity of the site currently operate at LoS C or better in the AM and PM peak hour periods with only minor intersection delays with no change to 1.1 seconds.

It is evident that the key intersections in the vicinity of the site will continue to operate at existing levels of service. Most intersections experience small increases in degree of saturation and intersection delays; however, the increases are considered minor, and no concerns are raised in terms of intersection performance.

Based on the above results, no infrastructure upgrades or signal timing adjustments are considered necessary to facilitate the proposed development. These results are expected noting the moderate increase in traffic associated with developments of this nature (senior living), and the distribution of traffic through the local network.

Finally, it can be seen that the proposed Bronte Road Access would operate with a level of service A with average intersection delays for the worst performing movement of approximately 11 seconds. As a result, the proposed vehicular access from Bronte Road is considered supportable.

7.4 Cumulative Impacts Scenario

7.4.1 Nearby Approved Developments

In order to assess the cumulative impacts of nearby approved developments, the DA traffic reports/Council's Assessment Reports of the following developments were analysed in **Table 9** below.

Table 9: Nearby Approved Developments

Address	Proposed Development Description	Traffic Generation	Impacts
143 Ebley Street, Bondi Junction DA-365/2023	Four (4) terraces	No onsite parking	Minor impacts to intersections near subject site
1 Donald Place, Bondi Junction DA-226/2023	Apartment with two (2) apartments and one affordable apartment	Max 3 vehicles per hour (vph)	Minor impacts to intersections near subject site
7-15 Bondi Road, Bondi Junction DA-177/2022	Apartment with 16 apartments and 25 affordable apartments	Max 8 vph	Minor impacts to intersections near subject site
104 Bronte Road, Bondi Junction DA-327/2022	Mix Use development with six (6) units and a commercial component	Max 5 vph	Minor impacts to intersections near subject site
51 Llandlaff Street, Bondi Junction DA-66/2022	Dual Occupancy	Max 2 vph	Minor impacts to intersections near subject site
2A Edmund Street, Queens Park DA-63/2021	Apartment with five (5) social housing units	No onsite parking	Minor impacts to intersections near subject site
28-42 Bronte Road, 84 Ebley Street Bondi	Mixed Use comprising of -80 residential apartments	AM – 15 vph PM – 12 vph	Modelled traffic does not pass any of the

Junction (Club Bondi Junction) DA-533/2017	-RSL component -General retail component		intersections near subject site
163 Birrell Street, Waverley DA-483/2018	Mixed Use comprising of -Seniors living with 90 ILUs -Club/Pub component -Childcare centre component	AM – 88 vph PM – 154 vph	Under construction during surveys. Included in cumulative assessment
18-20 Allens Parade, Bondi Junction DA-88/2019	Apartment with six (6) apartments	Max 4 vph	Minor impacts to intersections near subject site
2 Blenheim Street, Queens Park DA-236/2018	Apartment with six (6) affordable apartments	No onsite parking	Minor impacts to intersections near subject site, no car parking proposed

It is noted that the traffic volumes from 163 Birrell Street, Waverley has been assessed along Birrell Street with a portion of traffic movements traveling through the key intersections of the proposed development. The traffic generated by the above approved and under construction developments, equates to the following:

- An additional 46 vehicles per hour in AM peak traveling on the key intersections; and
- An additional 104 vehicles per hour in AM peak traveling on the key intersections;

The assumptions within each traffic report listed above have been adopted in the cumulative modelling scenario for consistency. The trip distribution of traffic onto the surrounding road network is summarised in **Figure 11** and **Figure 12** below.

Figure 11: Morning Peak Hour Traffic Distribution including Approved Developments

Figure 12: Evening Peak Hour Traffic Distribution including Approved Developments

7.4.2 Existing Plus Development Plus Approved Developments Scenario

Table 10: Existing Plus Development Plus Approved Developments Scenario

Intersection	Control Type	Period	Degree of Saturation	Intersection Delay	Level of Service
Birrell Street and Bronte Road	Signalised	AM	0.909	48.6	D
		PM	0.662	30.1	C
Birrell Street, Carrington Road, and Council Street	Signalised	AM	1.036	55.3	D
		PM	0.856	26.4	B
Church Street and Carrington Road	Priority*	AM	0.452	37.8	C
		PM	0.244	16.4	B
Church Street and Bronte Road	Priority*	AM	0.385	17.5	B
		PM	0.131	12.8	A
Bronte Road Access	Priority*	AM	0.043	11.1	A
		PM	0.262	11.6	A

*LoS of Priority intersections based on worst performing movement

It can be seen from **Table 10** that the key intersections in the vicinity of the site will continue to operate at existing levels of service, except the Birrell Street / Bonte Road during the PM peak which would reduce to a 'LoS C'. Despite the drop in LoS, it is important to note that the overall intersection delay is only increased by 1.6 seconds, which is considered very minor. The remaining intersections experience small increases in degree of saturation and intersection delays; however, the increases are considered minor, and no concerns are raised in terms of intersection performance.

Based on the above results, no infrastructure upgrades or signal timing adjustments are considered necessary to facilitate the proposed development. These results are expected noting the moderate increase in traffic associated with developments of this nature (senior living), and the distribution of traffic through the local network.

Finally, it can be seen that the proposed Bronte Road Access would continue to operate with a level of service A with average intersection delays for the worst performing movement of approximately 11 seconds. As a result, the proposed vehicular access from Bronte Road is considered supportable.

8. SUSTAINABLE TRANSPORT

A Green Travel Plan has been prepared in response to the SEARs requirements and with the strategic goal of increasing sustainable transport. The encouragement of these alternative modes of transport will assist in reducing private vehicle trips, thus decreasing congestion, time, money and environmental impacts. Due to this, the aim of the proposed development is to encourage and support the existing and future sustainable transport services available within the vicinity of the site. This can be achieved by providing the staff, visitors and residents of the proposed development, bicycle parking, end of trip facilities and travel plans.

8.1.1 Green Travel Plan

A Green Travel Plan (GTP) has been prepared in response to the SEARs requirement. The development is located within close proximity of public bus stops located along Bronte Road, Birrell Street and Carrington Road. A GTP will provide a site-specific set of measures and initiatives to promote sustainable transport options such as walking, cycling, car sharing, Uniting bus services and public transport. It will assist in encouraging the staff, residents and visitors to use these options to replace all or part of their car journeys. The implementation of the GTP is expected to create a number of social, economic, environmental and health benefits for the residents. This GTP will comprise of the following:

- Targets – generally includes the reduction of single occupant car trips to and/or from the proposed development for journey to work.
- Travel Data – a prior estimate of the amount and types of trips to the proposed development is required, as well as an annual travel survey and review in order to estimate the change in travel behaviour of the residents.
- Measures – an outline of specified tools and methods to achieve goals.

8.1.2 Pedestrians and Cycling

The site is surrounded by excellent cycling and walking infrastructure with footpaths provided along both sides of Bronte Road, Birrell Street, Carrington Road and Church Street. Additionally, a main bicycle route is provided along Bronte Road, providing a connection between Waverley and Bondi Junction.

The signalised intersection of Bronte Road and Birrell Street provides signalised pedestrian crossings on all four legs, allowing staff, residents and visitors a safe crossing opportunity to reach public bus stops located along Bronte Road. Reference should be made to Section 4.5 for a detailed review of the existing sustainable infrastructure surrounding the site.

To encourage cycling as a mode of travel to the development, end of trip facilities will be made available to staff. This includes a provision of 50 bicycle parking spaces in the form of horizontal rails for visitors and staff located in the basement and at grade which should cater for the bicycle parking requirements for staff that is anticipated for the development.

As the site is ideally placed with good access to various pedestrian and cycling routes that are located in the vicinity of the site, no additional infrastructure required to accommodate the needs of the development.

A pedestrian flow within the basement, and ground level has been prepared and are presented in **Appendix E**.

9. ACCESS AND INTERNAL DESIGN ASPECTS

9.1 Site Vehicular Access

9.1.1 Bronte Road Access

The proposed vehicular access via Bronte Road will provide access to basement car parking to 363 car parking spaces and loading dock access. The Bronte Road access provides access the basement carpark which provides pedestrian access to ILU Buildings A, B, C and D, as well as the hospital and ancillary facilities. The proposed access will therefore require a Category 4 driveway under AS2890.1 (2004), being a separated access providing an entry width of 6.0 to 8.0 metres and an exit width of between 6.0 to 8.0 metres with a separation of 1.0 to 3.0 metres.

In response, the development provides a driveway entry width of 6.0 metre, an exit width of 6.0 metres with a separation between the two driveways of 1.0 metre and is shown in **Figure 13**. SIDRA Intersection modelling for the proposed vehicular access has been conducted showing that the access would operate with a level of service A being good operation.

In addition, servicing vehicles will utilise this access to arrive at the loading dock. The largest vehicle accessing this loading dock is to be a 12.5m HRV.

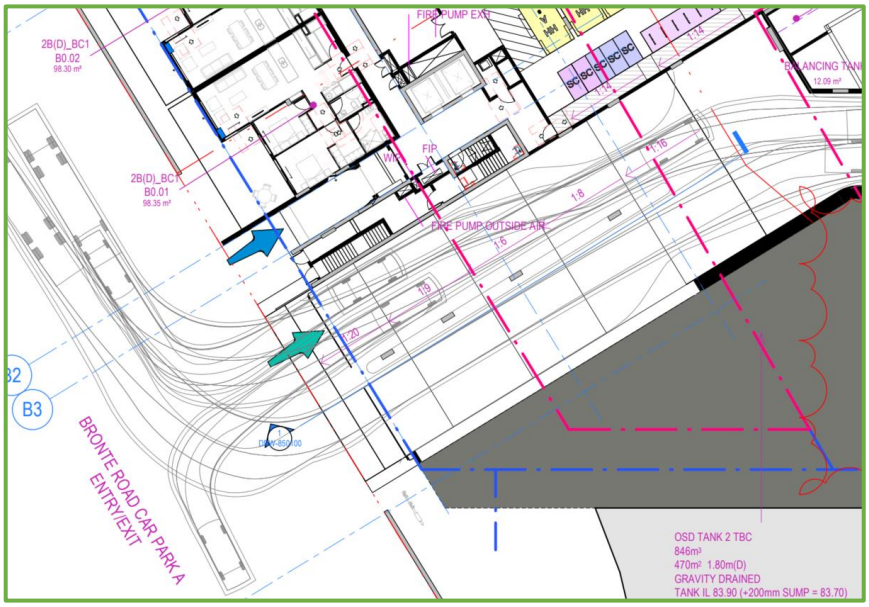


Figure 13: Bronte Road Vehicular Access

9.1.2 Birrell Street Basement Access

The Birrell Street basement access services 115 residential ILU, and ILU visitor parking spaces. The Birrell Street access provides access the basement carpark which provides pedestrian access to ILU Buildings E, F and G. The proposed access will therefore require a Category 2 access under AS 2890.1 (2004), being a combined access with a width between 6.0 to 9.0 metres. It is also noted that a 6.4m waste wise mini vehicle will utilise this access for waste collection.

In response, the development provides a driveway width of 7.6 metres being an entry width of 3.5 metres, an exit width of 3.5 metres and a central median of 600mm meeting the requirements of AS 2890.1 and accommodating the waste collection vehicle. The proposed location of the vehicular access is shown in **Figure 14**.

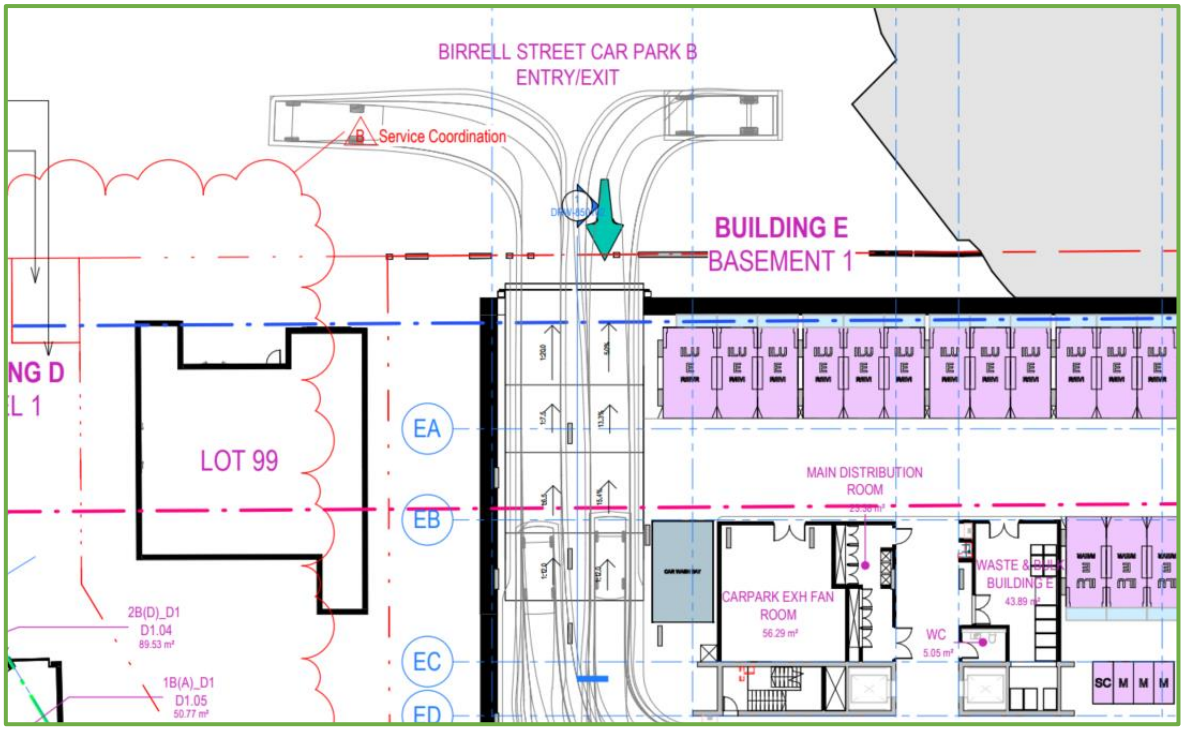


Figure 14: Birrell Street Vehicular Access

9.1.3 North/South Link

The Church Street (ingress and egress) and Birrell Street (egress only) vehicular accesses will accommodate entry and egress of drop off and pick up, ambulance and the critical 12.5m heavy rigid vehicle (HRV) fire truck movements.

The development provides an entry driveway width of 6.0 metres and an egress driveway width of 6.0 metres to accommodate the largest size vehicle to be accommodated onsite being a 12.5m long HRV. The proposed location of the vehicular accesses is shown in **Figure 15**.

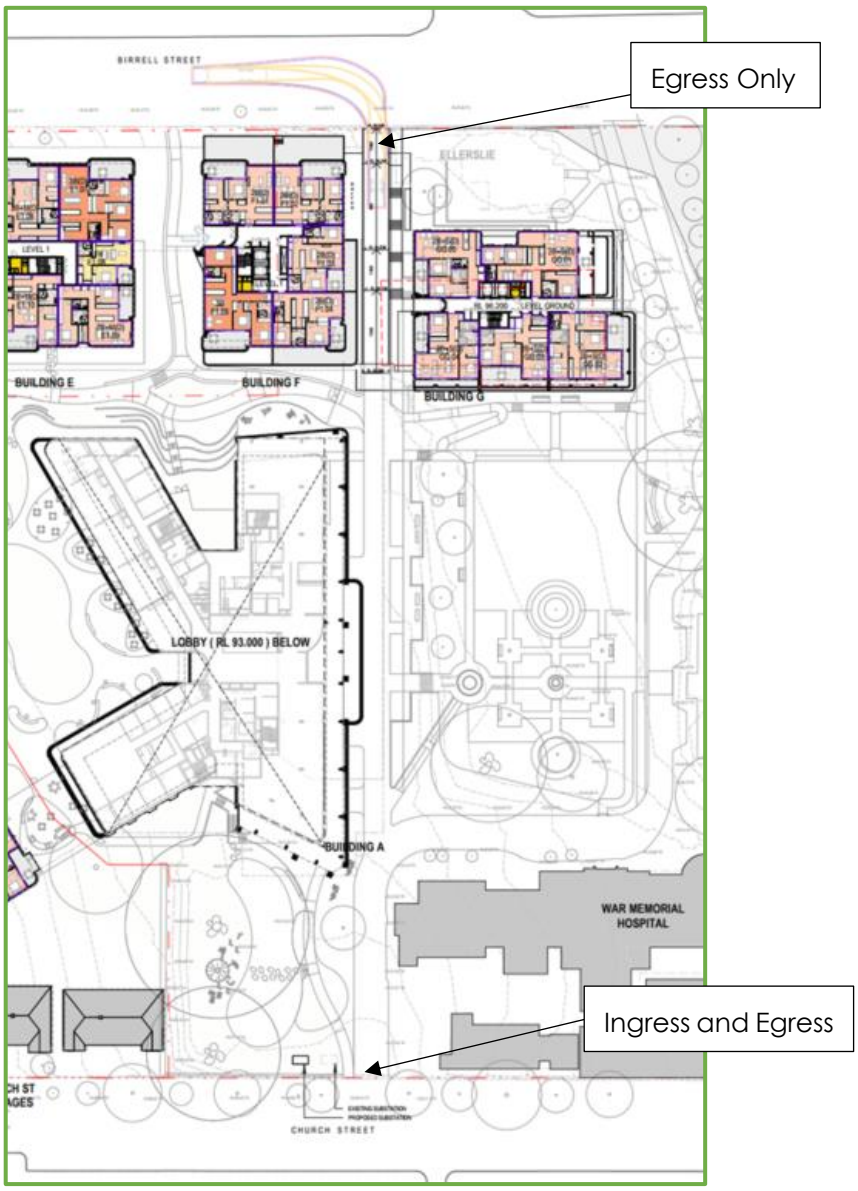


Figure 15: Church Street and Birrell Street Vehicular Access

9.2 Internal Design

The basement car parking areas, loading dock and drop-off and pick-up area complies with the requirements of AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2022), and the following characteristics are noteworthy:

9.2.1 Parking Modules

- Independent Living Units are provided with User Class 1A parking spaces have been designed in accordance with AS 2890.1 (2004), providing a minimum width of 2.4m, minimum length of 5.4m and a minimum aisle width of 5.8m.
- Residential Aged Care are provided with User Class 1A parking spaces have been designed in accordance with AS 2890.1 (2004). These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- Staff are provided with User Class 1A parking spaces have been designed in accordance with AS 2890.1 (2004) being for employee parking. These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- Ancillary Staff are provided with User Class 1A parking spaces have been designed in accordance with AS 2890.1 (2004) being for employee parking. These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- Hospital/Medical Visitors are provided with User Class 3 parking spaces have been designed in accordance with AS 2890.1 (2004) being for hospital and medical centre uses, providing a width of 2.6m, length of 5.4m and aisle width of 5.8m.
- Two parallel drop-off and pick-up car parking spaces are provided at-grade on Level 2, with a minimum space length of 6.2m for an obstructed end space and a minimum space length of 5.9 metres for an intermediate space, a minimum width of 2.1m and a minimum aisle of 3.6m.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1 (2004).

- All accessible parking spaces have been designed in accordance with AS 2890.6 (2022), being 2.4m wide, 5.4m long and situated immediately adjacent to a dedicated shared area or the circulating aisle.

9.2.2 Access / Basement Ramps

- The access roadways have a maximum gradient of 5% (1 in 20) for the first 6.0m inside the property boundary, in accordance with Section 3.3 (a) of AS 2890.1 (2004).
- The internal ramps have a maximum gradient of 20% (1 in 5) with sag and summit transitions of 12.5% (1:8) respectively. These provisions satisfy the requirements of AS 2890.1 (2004).

9.2.3 Through Site Access Grades

- Ramps provided along the through site link between Church Street and Birrell Street provide a maximum roadway grade of 1:6.5(15.4%) with a maximum rate of change of 1:16 (6.25%).
- A head height clearance of 4.5m is to be maintained above the path of travel of service vehicles along the through site roadway.

9.2.4 Clear Head Heights

- A minimum clear head height of 2.2m is provided for all areas within the basement car park as required by AS 2890.1 (2004).
- A minimum clear head height of 2.5m is to be provided above all accessible spaces and share areas in accordance with AS 2890.6 (2009).

9.2.5 Loading

- The 12.5m HRV bay is designed in accordance with AS 2890.2 (2018), providing a service bay 12.5m in length and 3.5m wide.
- All service bays accommodating 6.4m long ambulances and 7.2m long village buses are designed in accordance with AS 2890.2 (2018), providing a service bay 6.4m and 7.2m in length and 3.5m wide.
- A minimum head height clearance of 4.5m is required above the service bays and all areas traversed by 12.5m HRVs.

- A minimum head height clearance of 3.5m is required above the service bays and all areas traversed by 6.4m SRVs.

9.2.6 Other Considerations

- All columns are located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).
- Visual splays have been provided at the access driveways in accordance with Figure 3.3 of AS 2890.1 (2004).
- Limited wayfinding and line marking has been provided showing the traffic flow and split between ILU and relocated existing hospital parking. Additional wayfinding signage and identification of dedicated parking spaces can be provided at CC stage.

9.3 Summary

In summary, the internal configuration of the car park and loading areas have been designed in accordance with AS 2890.1 (2004), AS 2890.2 (2018), AS 2890.3 (2015) and AS 2890.6 (2021). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

10. CONCLUSIONS

In summary:

- The proposal seeks approval to construct a mixed-use development at the Uniting Waverley site, containing ILUs, a RACF, relocation of hospital parking, existing community facilities (respite daycare, men's shed and seniors gym), and ancillary facilities (café, consulting rooms, salon/day spa, etc). The proposed development will involve the construction of a through link roadway between Church Street and Birrell Street with a drop-off and pick-up area and two (2) separated multi-storey basements accommodating a total of 478 car parking spaces and a loading dock accommodating up to a 12.5m long HRV.
- The subject site is well connected to the public transport network with reliable access to regular bus services. These, along with existing pedestrian and cycle links, provide a good opportunity to encourage future staff, tenants and visitors to use sustainable transport modes to access the site.
- The proposed development provides a total of 478 car parking spaces consisting of 263 ILU and affordable housing car parking spaces for residents and visitors, seven (7) spaces for servicing and Uniting pool cars, 43 RACF car parking spaces including visitors , 52 car parking spaces for ancillary use and 113 relocated hospital car parking spaces.
- The traffic generation arising from the development has been assessed as an additional 41 vehicle trips per hour during the weekday AM peak and 69 vehicle trips per hour in the weekday PM. The net impacts have been distributed across the adjacent road network and the SIDRA Intersection results demonstrate satisfactory results for key intersections in the vicinity of the site.
- Assessment has also been made of the cumulative impacts of nearby approved developments. The results indicate that all intersections experience small increases in degree of saturation and intersection delays with only one intersection (Birrell Street / Bonte Road) during the PM peak which would reduce to a 'LoS C'. Despite the drop in LoS, it is important to note that the overall intersection delay is only increased by 1.6 seconds.
- No infrastructure upgrades or signal timing adjustments are considered necessary to facilitate the proposed development. These results are expected noting the moderate increase in traffic associated with developments of this nature (senior living), and the distribution of traffic through the local network.

- The basement car parking areas, accesses, loading dock and pick-up and drop-off zone have been assessed to comply with the requirements of AS 2890.1 (2004), AS 2890.2 (2018), AS 2890.3 (2015) and AS 2890.6 (2022).
- Waste collection and servicing for the site is to be undertaken within the basement loading dock via the provision of a 12.5m HRV bay, a single 6.4m SRV bay (ambulance bay), six (6) bays for village buses and a single bay for a B99 vehicle. This is with the exception of waste collection for ILUs which will be collected by a private waste wise mini vehicle from within the basement areas for ILUs. It is also noted that the drop-off and pick-up area accommodates a service bay for a village bus and an ambulance bay.

This traffic impact assessment therefore demonstrates that the subject application is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

APPENDIX A

TfNSW Correspondence

Vince Doan

From: Vic Naidu
Sent: Monday, 4 November 2024 3:43 PM
To: Vince Doan
Cc: Stephan Hoang
Subject: RE: TfNSW Response - New Project in Waverley [20.565] Uniting Memorial Hospital Site

Dear Vince

TfNSW has reviewed the preliminary material and advises that the proposed development will have a negligible impact on the surrounding state road network. As such, TfNSW has no further comments regarding the application.

It is emphasised that the comments provided above are informal and of a Pre-DA nature. They are not to be interpreted as binding upon TfNSW and may change following formal assessment of a submitted development application from the appropriate consent authority.

Regards

Vic Naidu
Land Use Planner
Transport Planning
Planning, Integration and Passenger
Transport for NSW

transport.nsw.gov.au

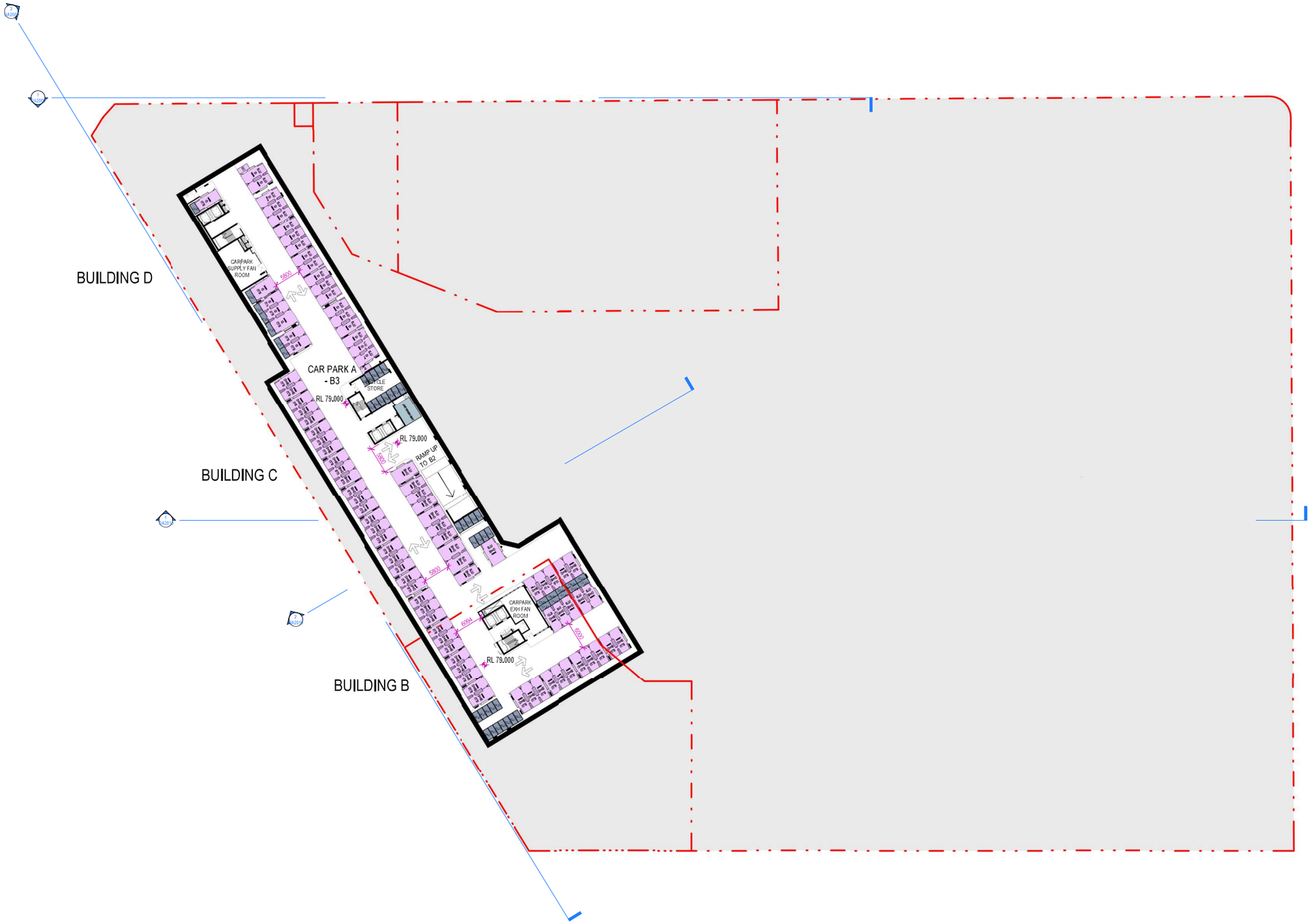
Level 4, 4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2150

Transport for NSW

OFFICIAL

APPENDIX B

Reduced Plans



Nominated Architect
Ray Brown, NSWARB 6359

Do not scale drawings. Verify all dimensions on site

issue	amendment	date
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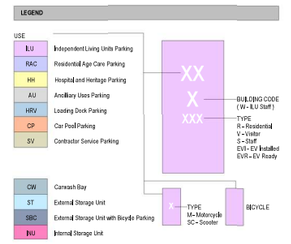

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SITE LEVEL B1	B2	B1	B1	-	-	-
SITE LEVEL GF	B1	**GF**	**GF**	B2	B2	-
SITE LEVEL L1	LG	L1	L1	B1	B1	B1
SITE LEVEL L2	**UG**	L2	L2	**GF**	**GF**	**GF**
SITE LEVEL L3	VOID	L3	L3	L1	L1	**L1**
SITE LEVEL L4	1	L4	L4	L2	L2	L2
SITE LEVEL L5	2	L5	L5	L3	L3	L3
SITE LEVEL L6	3	L6	ROOF	L4	L4	L4
SITE LEVEL L7	4	ROOF	-	L5	L5	ROOF
SITE LEVEL L8	ROOF	-	-	ROOF	ROOF	-

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GF BUILDING ENTRANCES LEVELS ARE BOLD AND UNDERLINED

FOR DEVELOPMENT APPLICATION

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ABN 90 131 245 684

project

Uniting Waverley

124 – 164 BRONTE RD., 7-8 CHURCH ST., 101 – 125 BIRRELL ST. WAVERLEY NSW 2024

drawing

Site Level Basement 02

scale	1 : 500@A1	drawing no.	**DA1098**
drawn	DK/KY/NK		
checked	CA/SH	issue	**1**
project no	170454.00		

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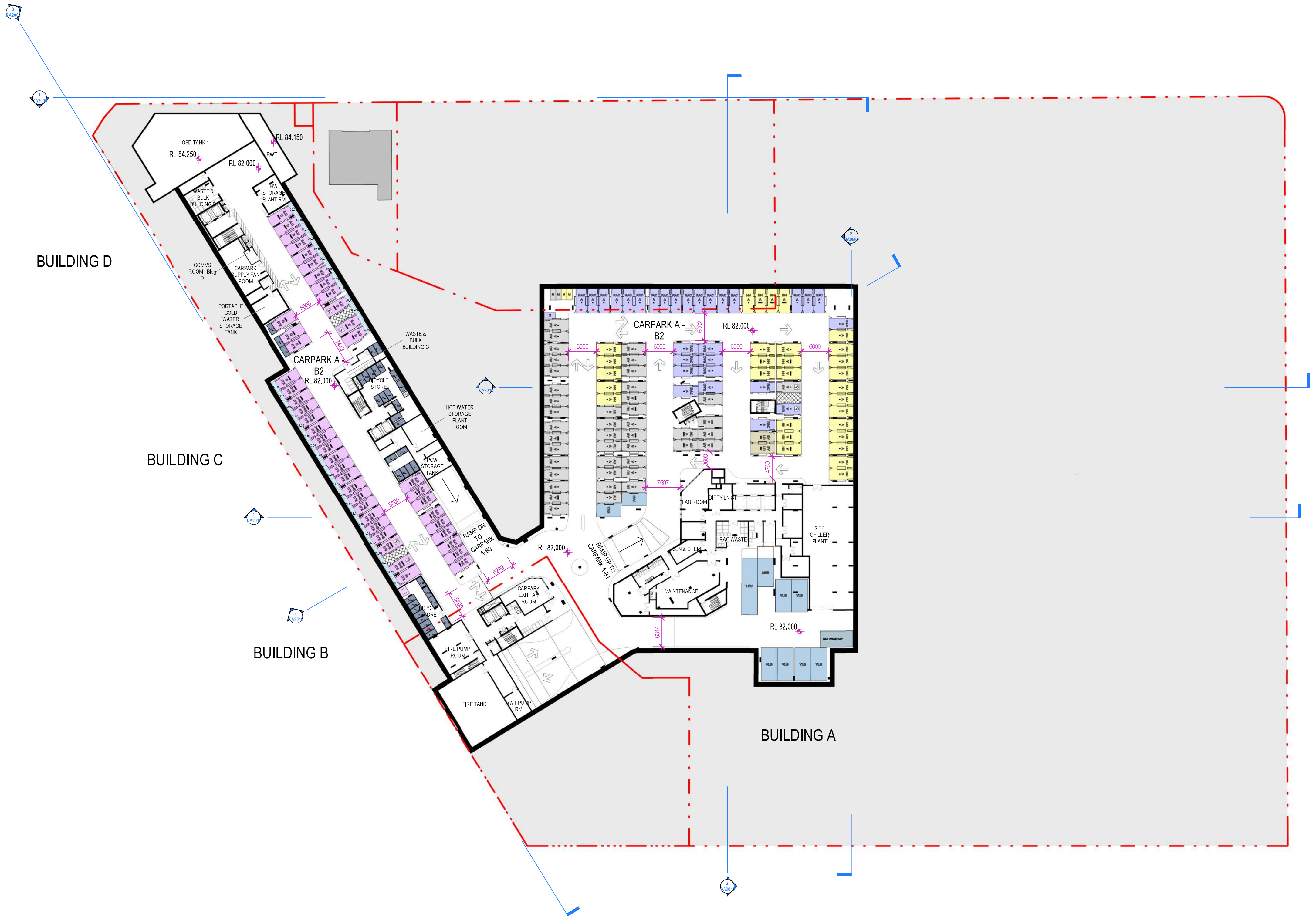

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Nominated Architect
Ray Brown, NSWARB 6359

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issue	amendment	date
1	FOR DEVELOPMENT APPLICATION	28.NOV.24

LEGEND

USE
- ILU – Independent Living Units Parking
- RAC – Residential Age Care Parking
- HH – Hospital and Heritage Parking
- AU – Ancilliary Uses Parking
- HRV – Loading Dock Parking
- CP – Car Pool Parking
- SV – Contractor Service Parking
- CW – Carwash Bay
- ST – External Storage Unit
- SBC – External Storage Unit with Bicycle Parking
- INU – Internal Storage Unit

XX / X / XXX — BUILDING CODE (W - ILU Staff); TYPE: R - Residential, V - Visitor, S - Staff, EVI - EV Installed, EVR - EV Ready

X — TYPE: M - Motorcycle, SC - Scooter

BICYCLE

BUILDINGS	A	BC	D	E	F	G
SITE LEVEL B2		B2	B2	-	-	-
SITE LEVEL B1	B2	B1	B1	-	-	-
SITE LEVEL GF	B1	**GF**	**GF**	B2	B2	-
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SITE LEVEL L7	4	ROOF	-	L5	L5	ROOF
SITE LEVEL L8	ROOF	-	-	ROOF	ROOF	-

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FOR DEVELOPMENT APPLICATION

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project
Uniting Waverley

124 – 164 BRONTE RD., 7-8 CHURCH ST., 101 – 125 BIRRELL ST. WAVERLEY NSW 2024

drawing
Site Level Basement 01

scale	1 : 500@A1
drawn	DK/KY/NK
checked	CA/SH
project no	170454.00
drawing no.	**DA1099**
issue	1

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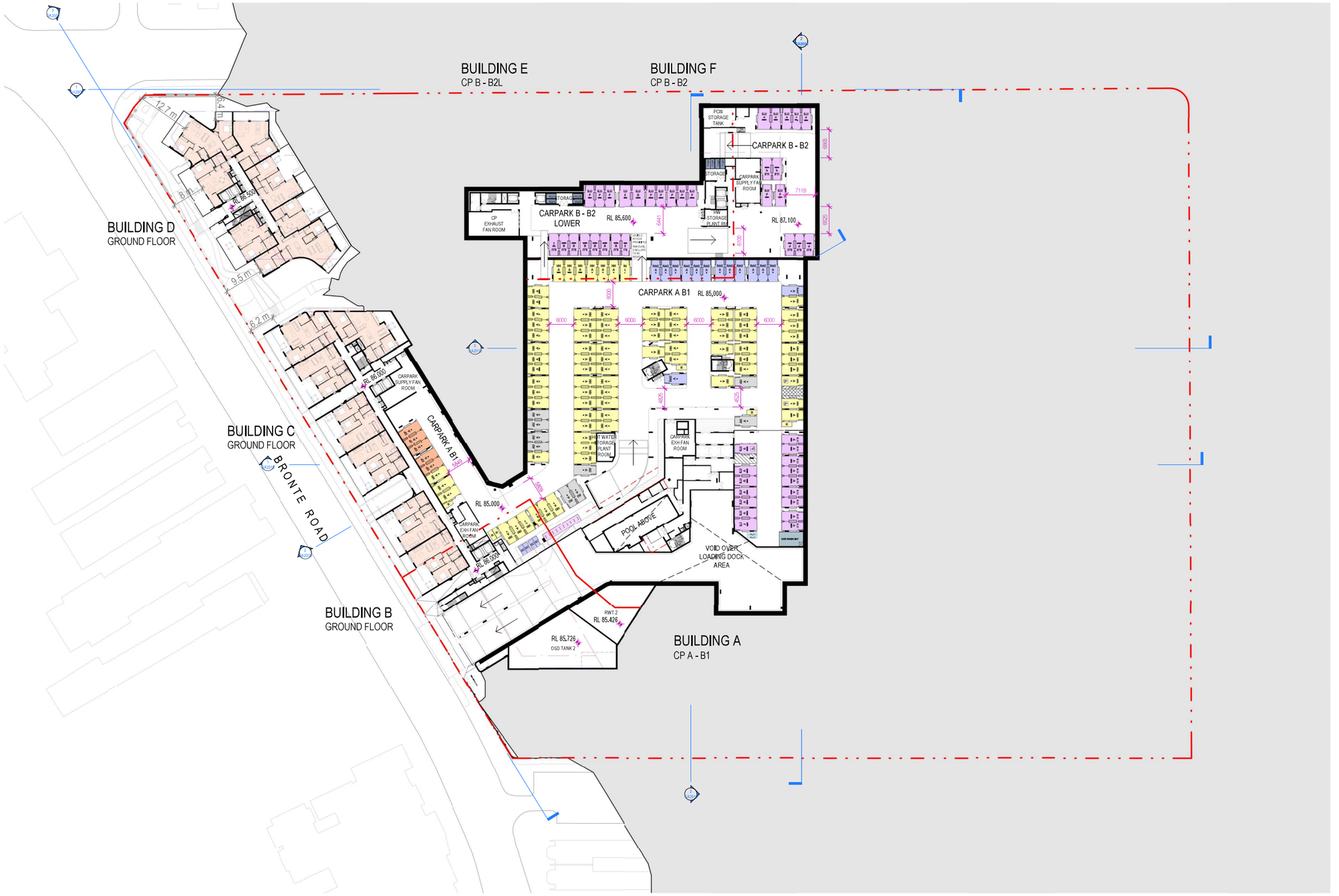

Nominated Architect
Ray Brown, NSWARB 6359

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issue	amendment	date
1	FOR DEVELOPMENT APPLICATION	28.NOV.24

LEGEND

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DCP SETBACK REQUIREMENTS LEGEND

DCP LOWER STORIES SETBACK

DCP UPPER STORIES SETBACK

ADG PRIVACY SETBACK

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ABN 90 131 246 684

project

Uniting Waverley

124 – 164 BRONTE RD., 7-8 CHURCH ST., 101 – 125 BIRRELL ST. WAVERLEY NSW 2024

drawing

Site Level Ground

scale	1 : 500@A1	drawing no.	DA1100
drawn	DK/KY/NK		
checked	CA/SH	issue	1
project no	170454.00		

FOR DEVELOPMENT APPLICATION

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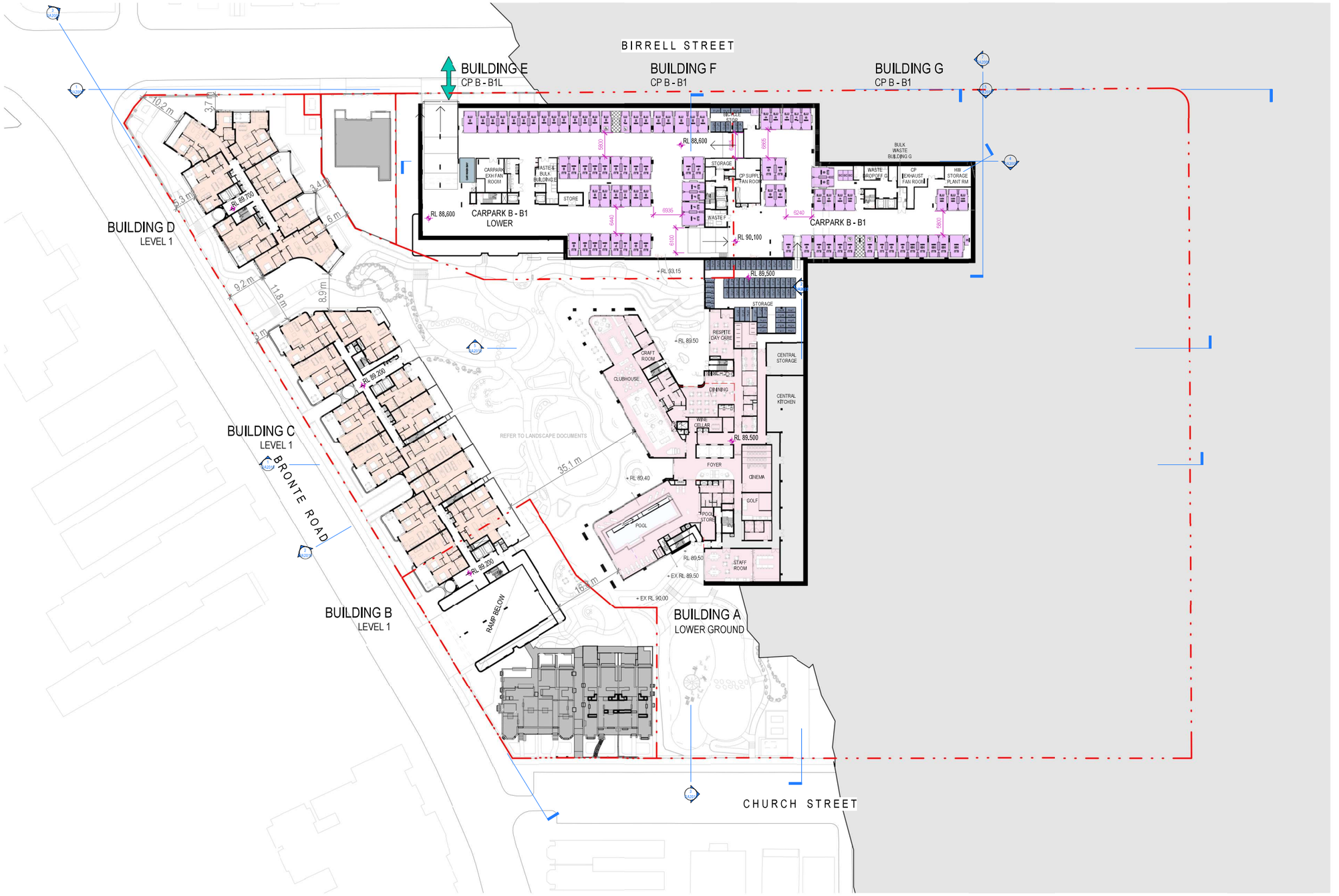

Nominated Architect
Ray Brown, NSWARB 6359

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issue	amendment	date
1	FOR DEVELOPMENT APPLICATION	28.NOV.24

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DCP SETBACK REQUIREMENTS LEGEND
- DCP LOWER STORIES SETBACK
- DCP UPPER STORIES SETBACK
- ADG PRIVACY SETBACK

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ABN 90 131 246 684

project
Uniting Waverley

124 – 164 BRONTE RD., 7-8 CHURCH ST., 101 – 125 BIRRELL ST. WAVERLEY NSW 2024

drawing
Site Level 01

scale	1 : 500@A1	drawing no.	DA1101
drawn	DK/KY/NK		
checked	CA/SH	issue	1
project no	170454.00		

FOR DEVELOPMENT APPLICATION

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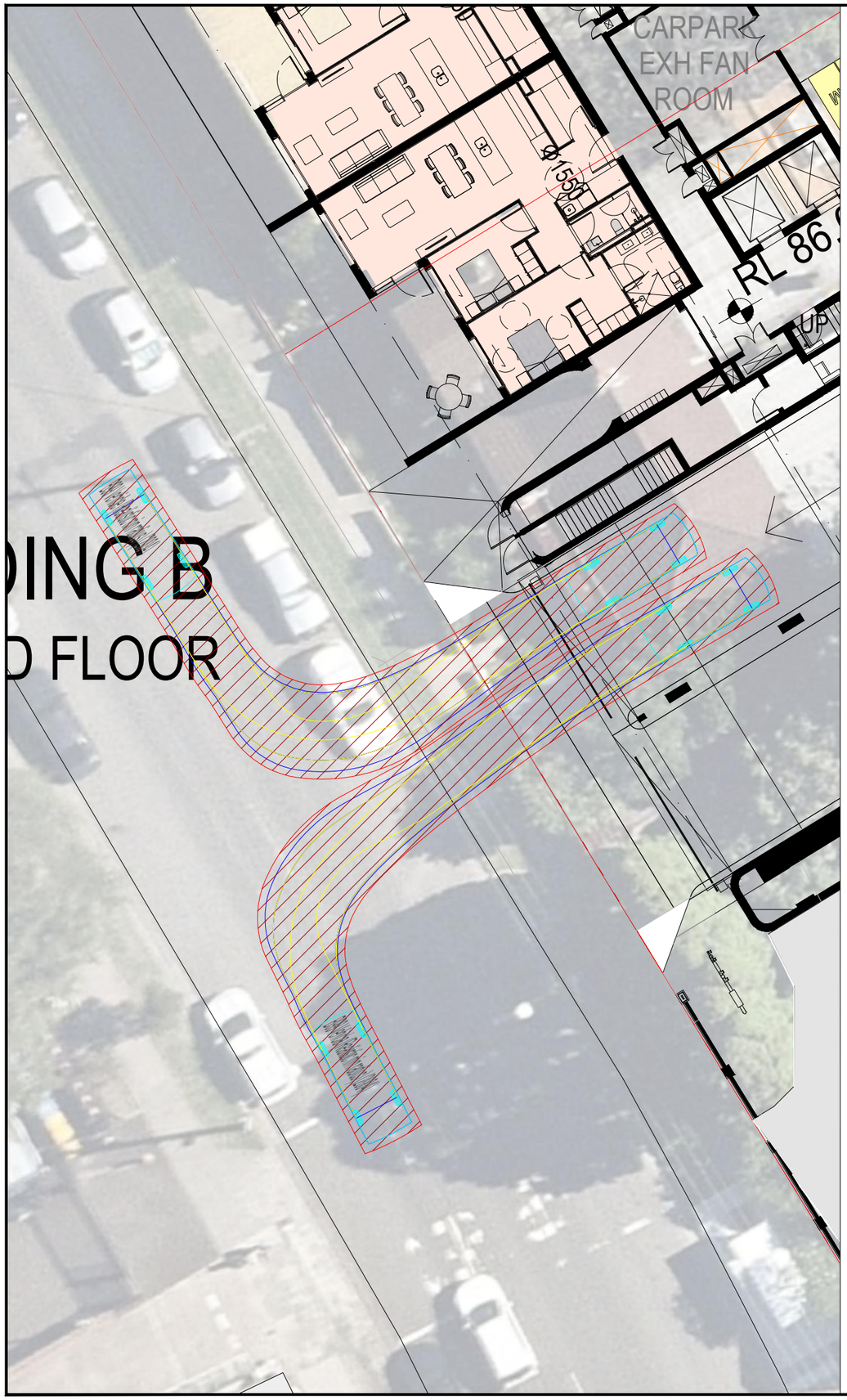
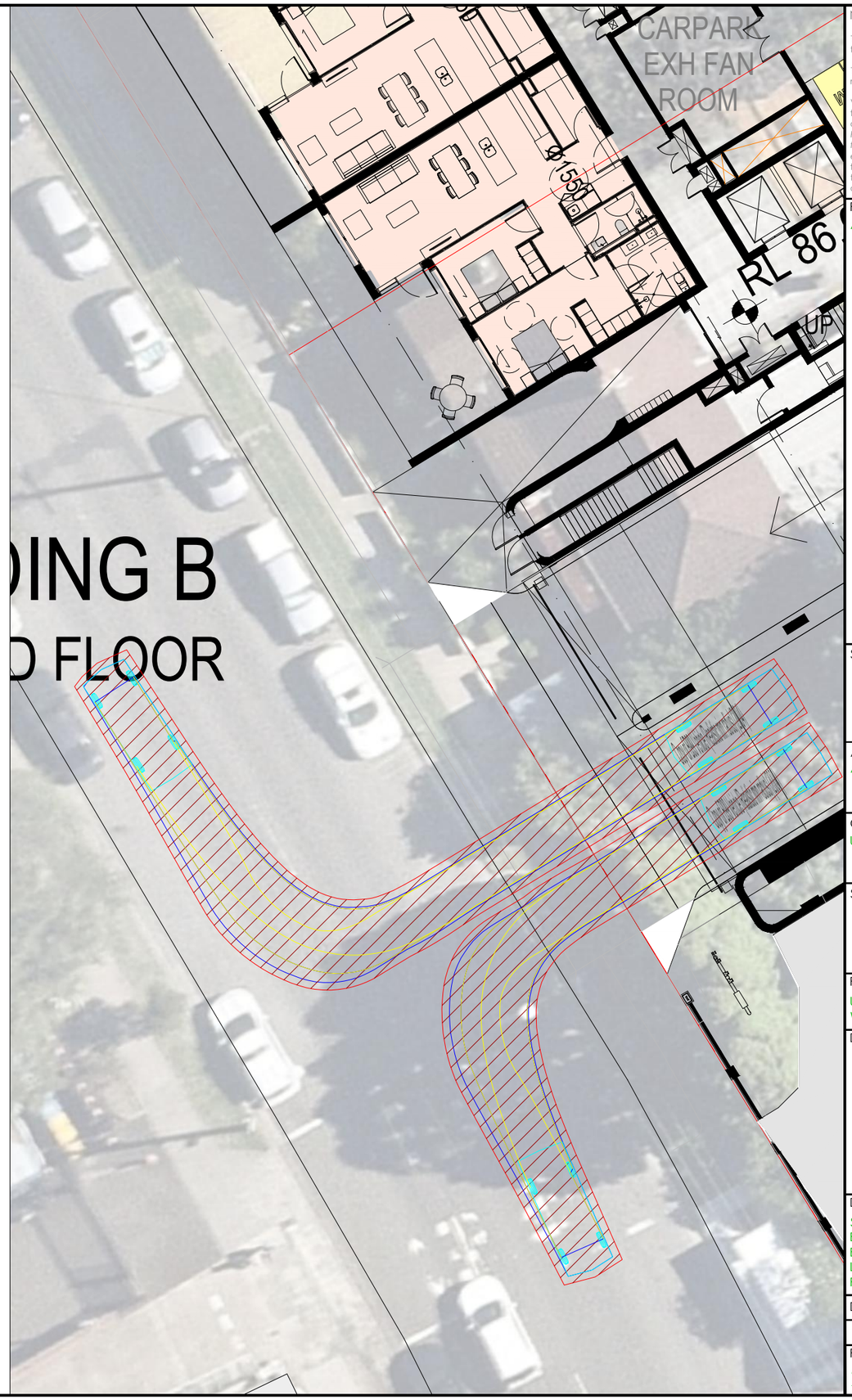
APPENDIX C

Swept Path Analysis





Notes:

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TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (*AS/NZS 2890.1:2004 Parking facilities - Off-street car parking*, and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle 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 vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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Surry Hills, NSW 2010
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Strawberry Hills, NSW 2012

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f: +61 2 9830 4481
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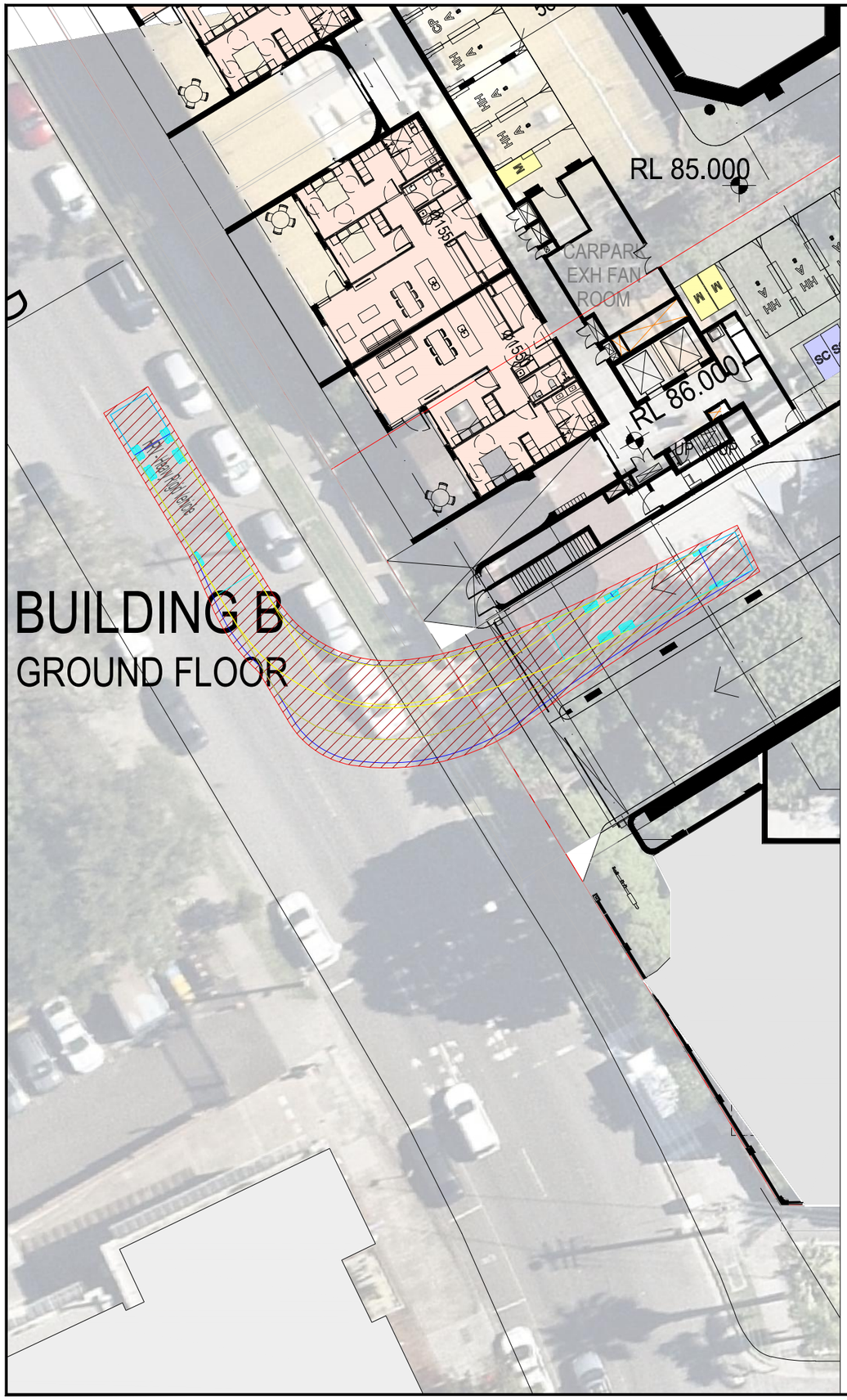
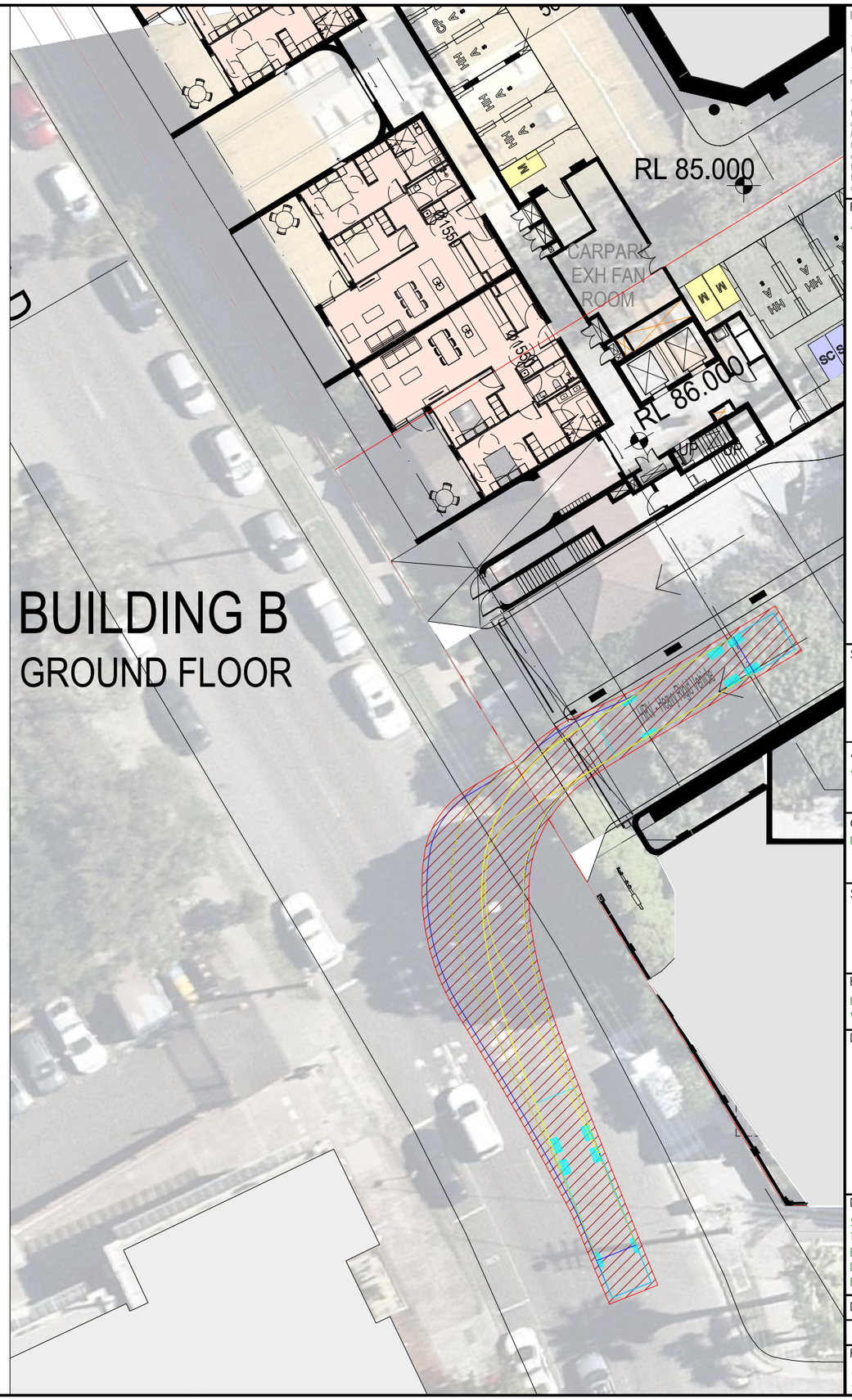
Drawing Title
Swept Path Analysis
B99 Vehicle
Bronte Road Access
Left: Entry Manoeuvre
Right: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.01	A





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Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

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1:300 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

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Strawberry Hills, NSW 2012

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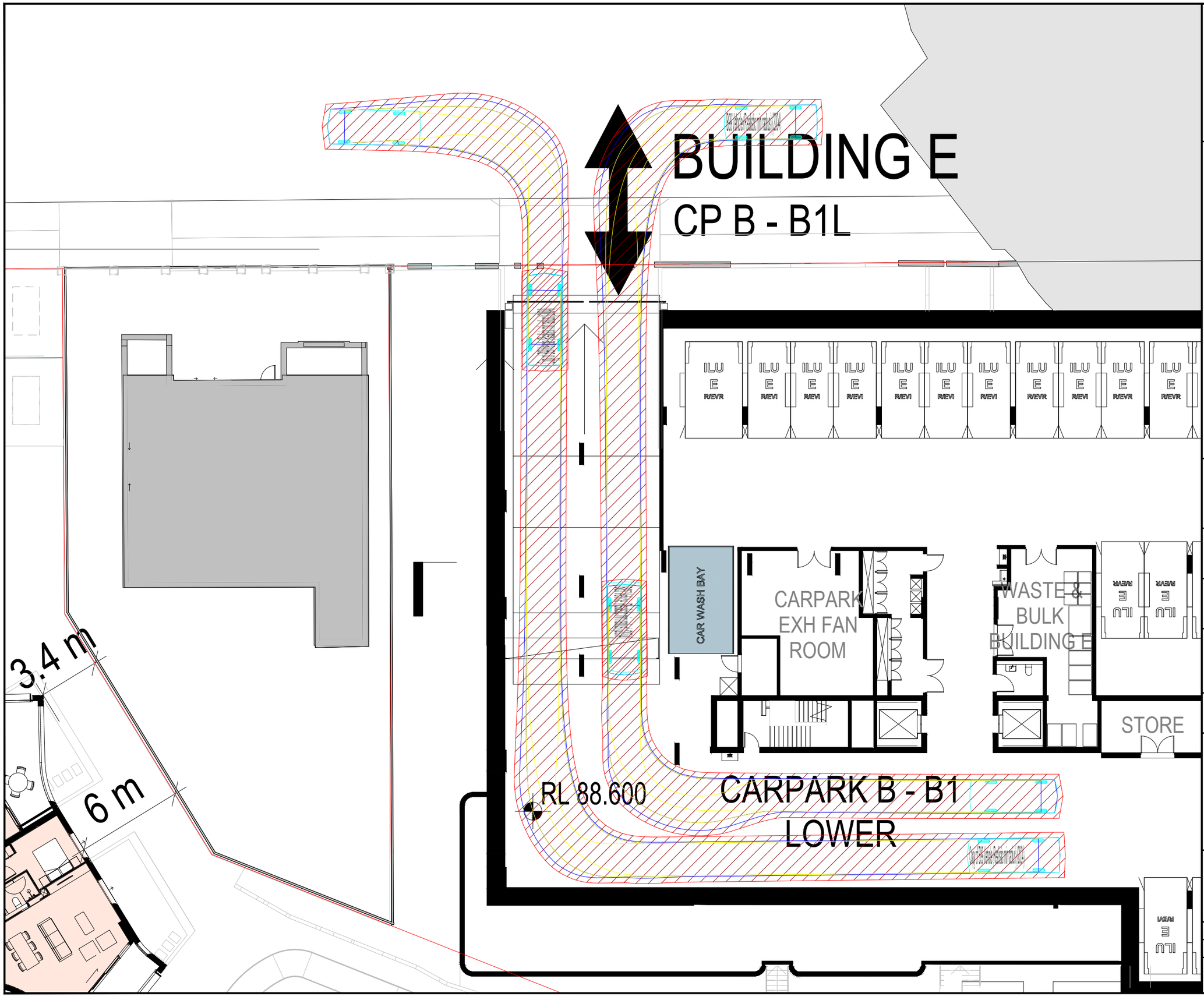
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
12.5m Heavy Rigid Vehicle
Bronte Road Access
Left: Entry Manoeuvre
Right: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.02	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
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PO Box 1124
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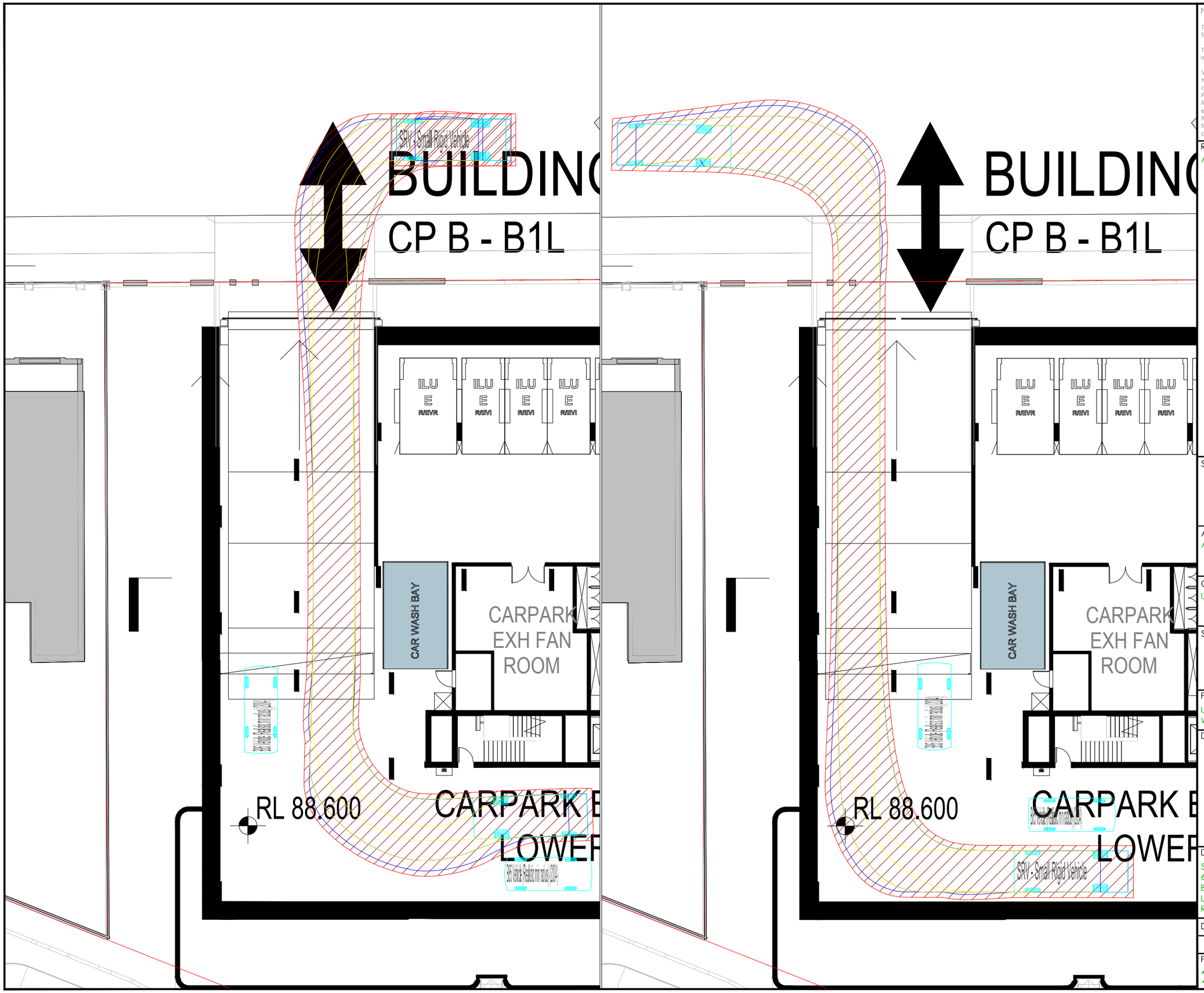
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
B99 Vehicle
Birrell Street Access

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.03	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
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PO Box 1124
Strawberry Hills, NSW 2012
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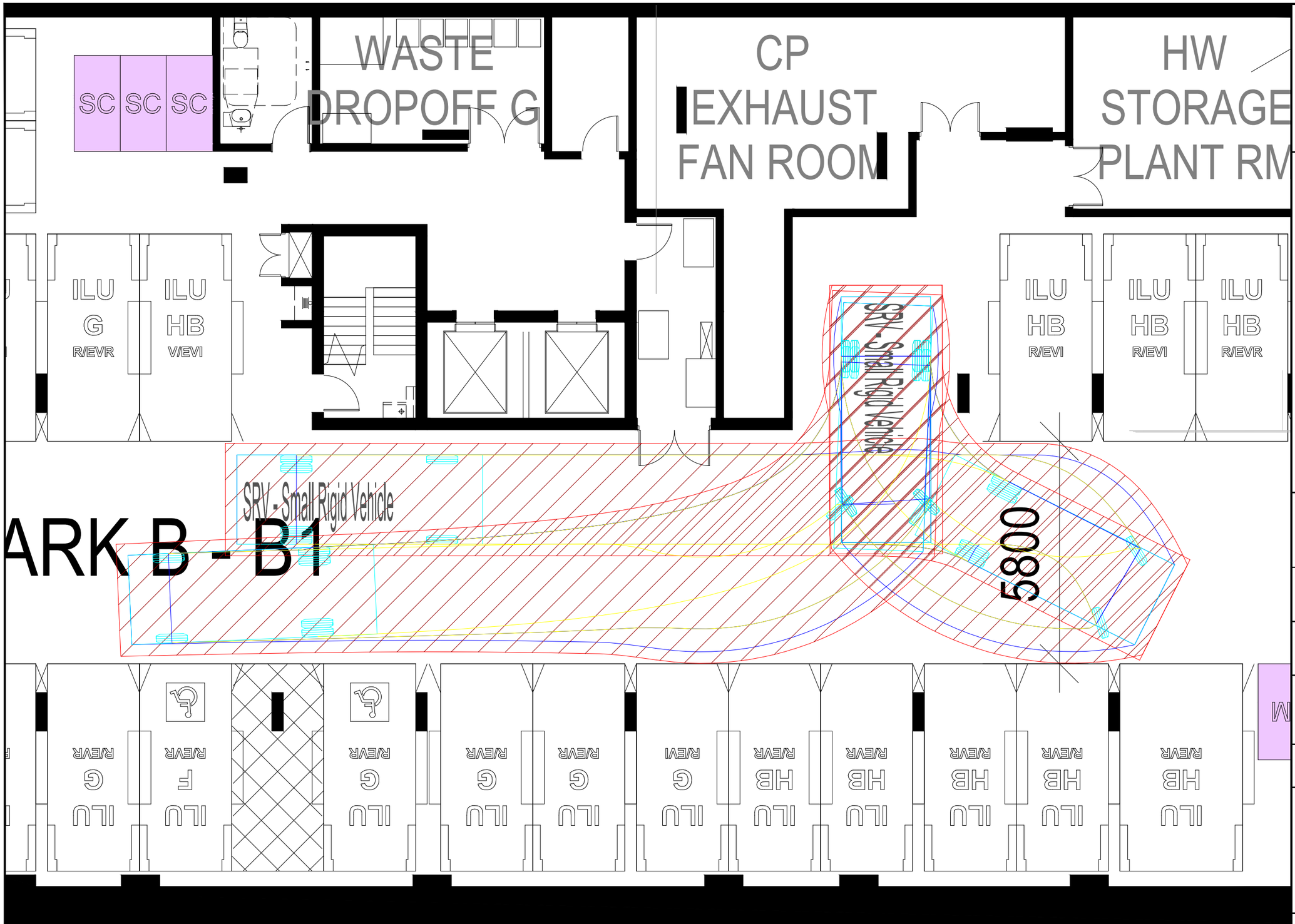
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
6.4m Small Rigid Vehicle
Birrell Street Access
Left: Entry Manoeuvre
Right: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.04	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 1 2 3 4m
1:100 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
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f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
6.4m Small Rigid Vehicle
Birrell Street Carpark - SRV Turning Bay

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.05	A

OSD TANK 1

RL 84.250

RL 84.150

RWT 1

RL 82.000

WASTE & BULK BUILDING D

HW STORAGE PLANT RM

SRV - Small Rigid Vehicle

RVEVR

ILU

D

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 1 2 3 4m

1:100 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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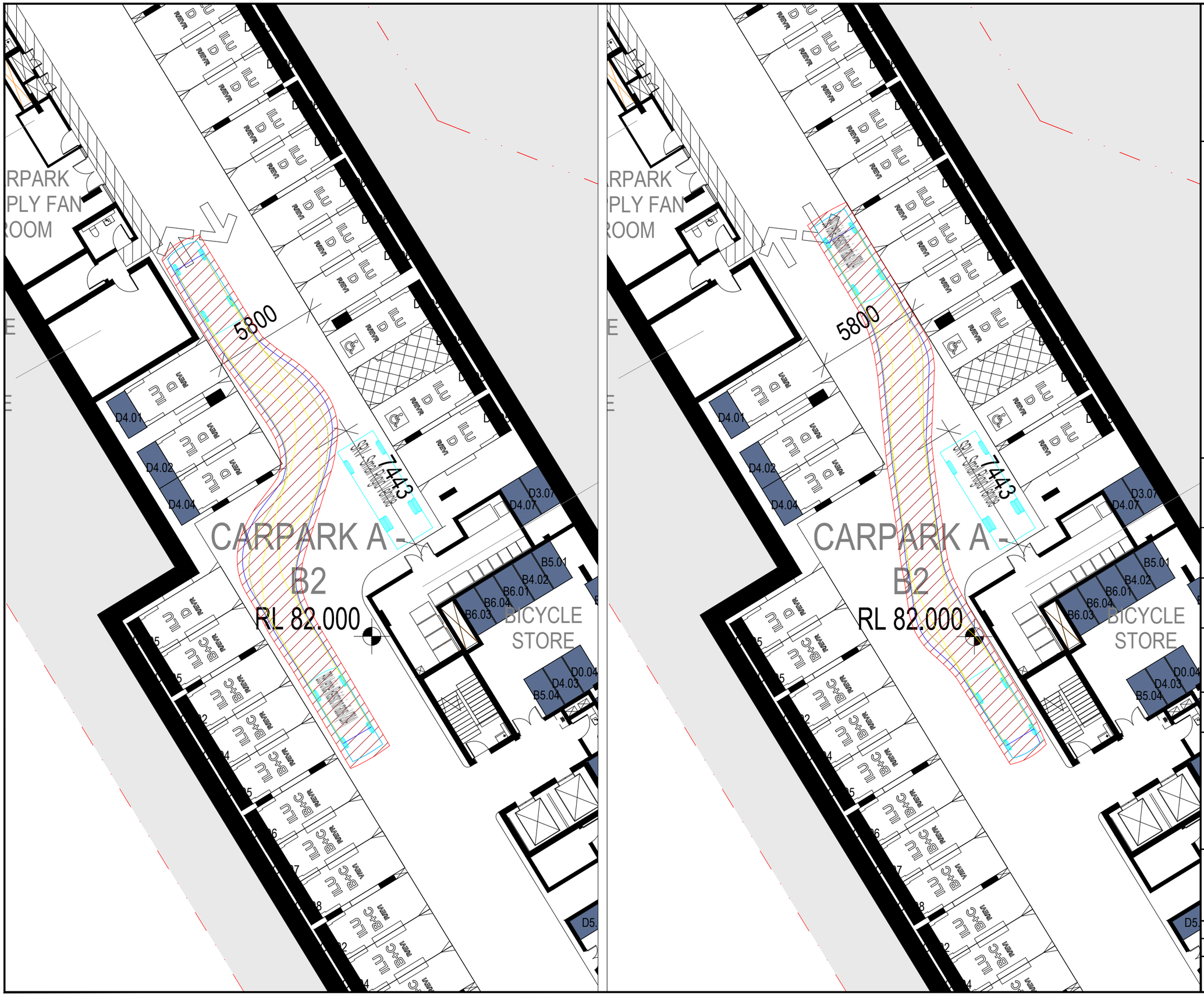
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
6.4m Small Rigid Vehicle
Birrell Street Carpark - SRV Turning Bay

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.06	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 3 6 9 12m

1:300 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
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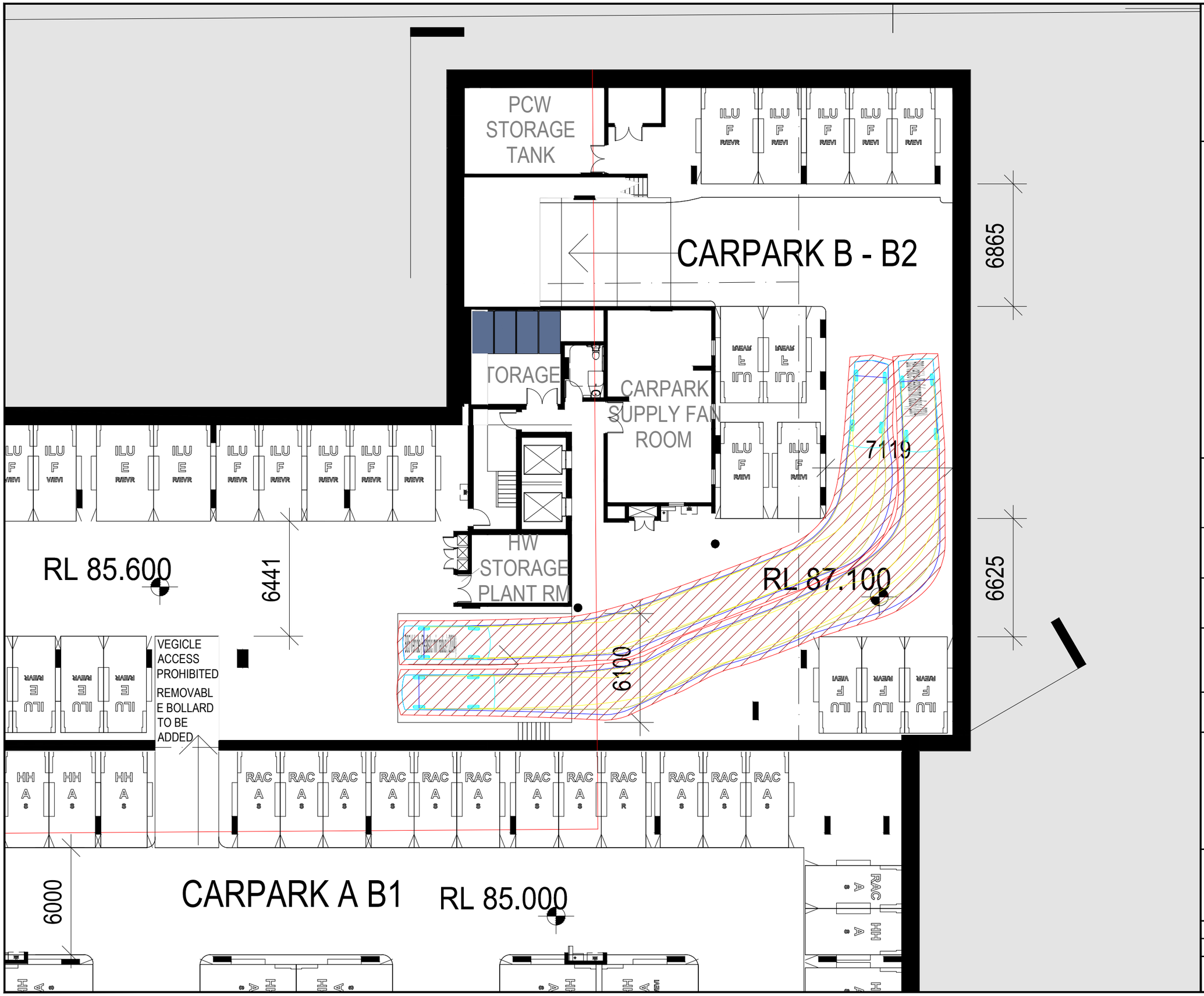
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
12.5m Heavy Rigid Vehicle
Bronte Road Access
Left: Entry Manoeuvre
Right: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.07	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
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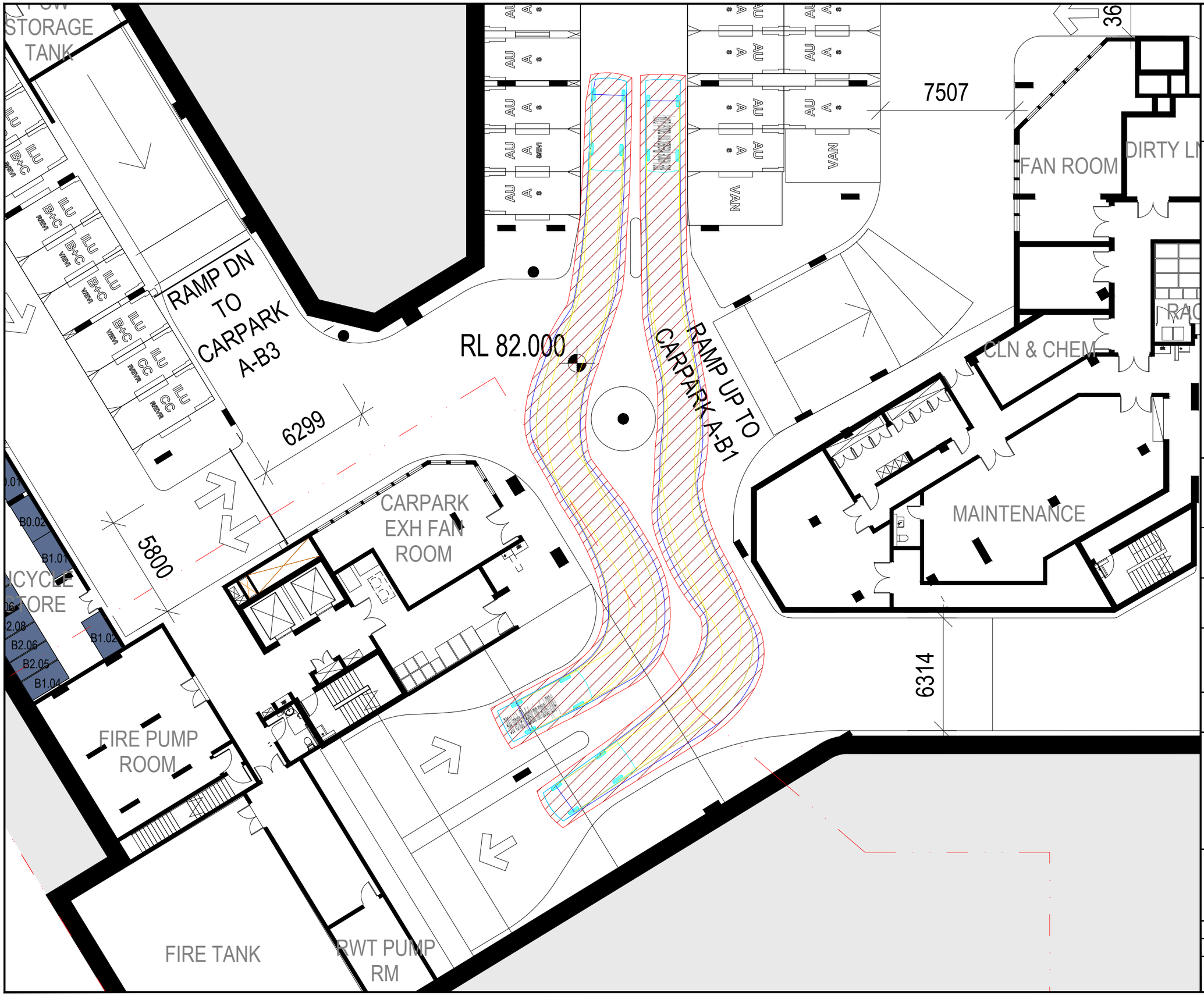
Drawing Title
Swept Path Analysis
B99 Vehicle
Bronte Road Access
Basement 2 Circulation

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.08	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
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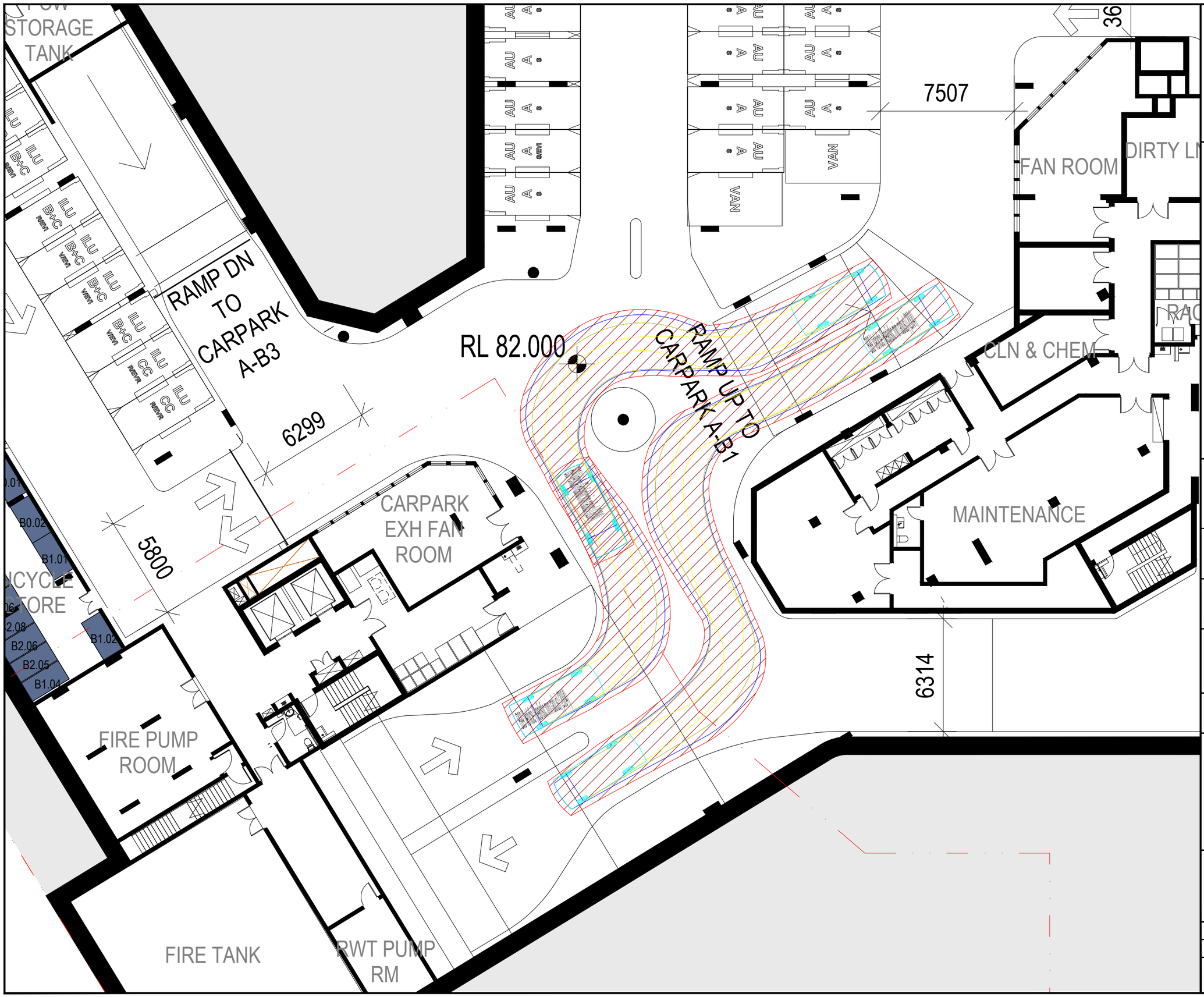
Drawing Title
Swept Path Analysis
B99 Vehicle
Bronte Road Access - Internal Roundabout
Basement 1 Access

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.09	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
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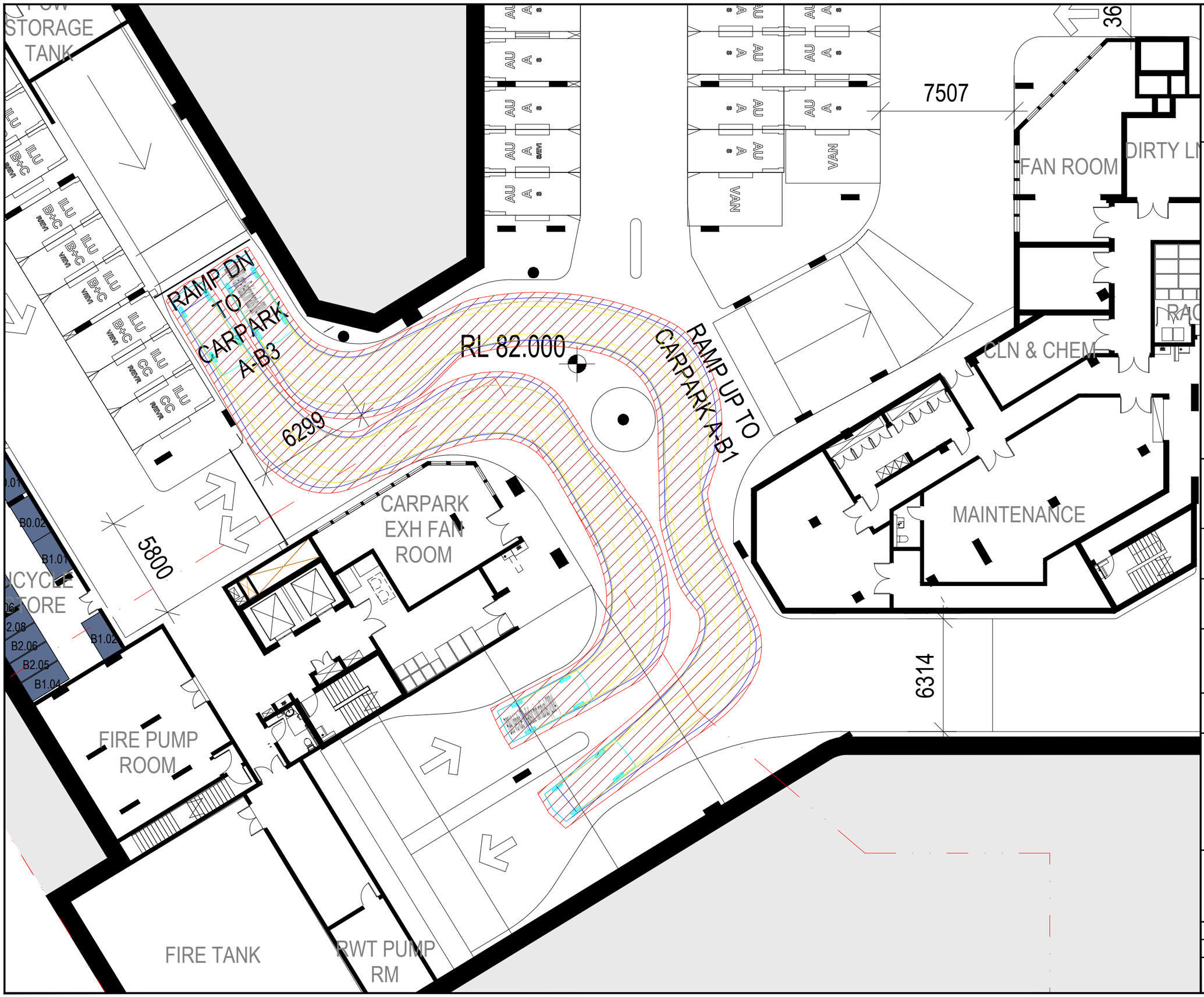
Drawing Title
Swept Path Analysis
B99 Vehicle
Bronte Road Access - Internal Roundabout
Ground Floor Access

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.10	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
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f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
B99 Vehicle
Bronte Road Access - Internal Roundabout
Basement 2 Access

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.11	A

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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Surry Hills, NSW 2010
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w: www.traffix.com.au

Drawing Title
Swept Path Analysis
12.5m Heavy Rigid Vehicle
Bronte Road Access - Loading Dock
Top: Entry Manoeuvre
Bottom: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.12	A

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
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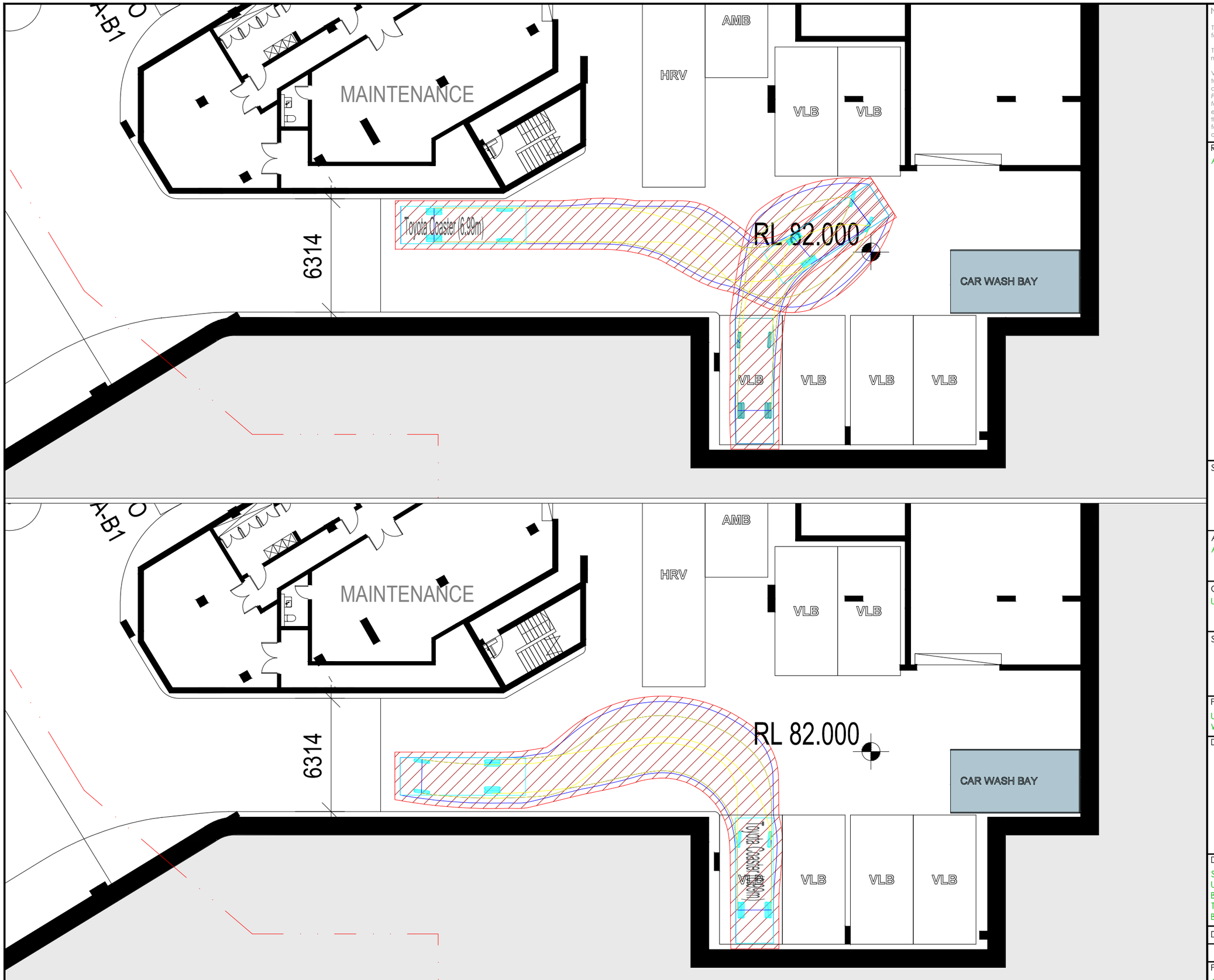
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Uniting Toyota Coaster
Bronte Road Access - Loading Dock
Top: Entry Manoeuvre
Bottom: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.13	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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Surry Hills, NSW 2010
PO Box 1124
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f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Uniting Toyota Coaster
Bronte Road Access - Loading Dock
Top: Entry Manoeuvre
Bottom: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.14	A

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Uniting Toyota Coaster
Bronte Road Access - Loading Dock
Top: Entry Manoeuvre
Bottom: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.15	A

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	SH	03-12-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Architectus

Client
Uniting

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
Uniting War Memorial Hospital, Waverley (Uniting Waverley)

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
6.4m Small Rigid Vehicle (Ambulance)
Bronte Road Access - Loading Dock
Top: Entry Manoeuvre
Bottom: Exit Manoeuvre

Drawn:	Checked:	Date:
SH	VD	03-12-24

Project No.	Drawing Phase	Drawing No.	Rev.
20.565	DA	TX.16	A

APPENDIX D

SIDRA Outputs

MOVEMENT SUMMARY

Site: 101 [101_EXAM_Birrell St x Carrington Rd (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Carrington Road
Existing Scenario
AM Peak: 7:45am-8:45am
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	107	0.0	107	0.0	0.197	9.1	LOS A	2.6	18.5	0.53	0.59	0.53	38.0
2	T1	All MCs	534	2.2	534	2.2	0.984	45.1	LOS D	27.8	198.7	0.92	1.36	1.59	22.6
3	R2	All MCs	207	3.6	207	3.6	* 0.984	71.0	LOS F	27.8	198.7	1.00	1.51	1.80	11.6
Approach			848	2.2	848	2.2	0.984	46.9	LOS D	27.8	198.7	0.89	1.30	1.51	21.0
East: Birrell Street															
4	L2	All MCs	274	3.1	274	3.1	0.753	33.1	LOS C	8.4	60.6	1.00	0.93	1.17	17.7
5	T1	All MCs	546	1.9	546	1.9	* 1.001	64.8	LOS E	28.3	201.6	1.00	1.59	1.96	15.8
Approach			820	2.3	820	2.3	1.001	54.2	LOS D	28.3	201.6	1.00	1.37	1.70	16.2
North: Council Street															
7	L2	All MCs	85	6.2	85	6.2	0.300	26.9	LOS B	2.8	20.9	0.88	0.75	0.88	29.1
8	T1	All MCs	427	5.2	427	5.2	* 0.982	54.8	LOS D	18.9	138.2	0.99	1.41	1.84	21.4
Approach			513	5.3	513	5.3	0.982	50.1	LOS D	18.9	138.2	0.97	1.30	1.68	22.3
West: Birrell Street															
10	L2	All MCs	60	0.0	60	0.0	0.419	26.2	LOS B	5.3	38.2	0.86	0.73	0.86	35.1
11	T1	All MCs	229	4.6	229	4.6	0.419	20.2	LOS B	5.3	38.2	0.89	0.74	0.89	28.2
12	R2	All MCs	26	8.0	26	8.0	0.419	44.8	LOS D	2.9	21.0	0.96	0.75	0.96	25.5
Approach			316	4.0	316	4.0	0.419	23.4	LOS B	5.3	38.2	0.89	0.74	0.89	29.6
All Vehicles			2497	3.1	2497	3.1	1.001	47.0	LOS D	28.3	201.6	0.94	1.25	1.53	20.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Carrington Road												
P1	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Birrell Street												
P2	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Council Street												
P3	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Birrell Street												
P4	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		200	211	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [102_EXPM_Birrell St x Carrington Rd (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Carrington Road
Existing Scenario
PM Peak: 4:30pm-5:30pm
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	34	0.0	34	0.0	0.157	6.0	LOS A	1.2	8.7	0.49	0.48	0.49	40.7
2	T1	All MCs	402	2.6	402	2.6	0.785	13.6	LOS A	12.6	89.6	0.84	0.83	0.94	35.9
3	R2	All MCs	208	1.0	208	1.0	* 0.785	24.5	LOS B	12.6	89.6	0.95	0.94	1.09	23.0
Approach			644	2.0	644	2.0	0.785	16.7	LOS B	12.6	89.6	0.86	0.85	0.97	32.9
East: Birrell Street															
4	L2	All MCs	263	0.4	263	0.4	0.533	25.5	LOS B	6.8	47.9	0.90	0.80	0.90	20.4
5	T1	All MCs	212	3.0	212	3.0	0.474	22.2	LOS B	5.5	39.8	0.91	0.75	0.91	28.8
Approach			475	1.6	475	1.6	0.533	24.0	LOS B	6.8	47.9	0.91	0.78	0.91	24.4
North: Council Street															
7	L2	All MCs	87	1.2	87	1.2	* 0.858	38.2	LOS C	11.0	78.0	1.00	1.08	1.38	25.9
8	T1	All MCs	563	2.1	563	2.1	0.858	32.6	LOS C	11.3	80.3	1.00	1.08	1.37	27.6
Approach			651	1.9	651	1.9	0.858	33.4	LOS C	11.3	80.3	1.00	1.08	1.37	27.4
West: Birrell Street															
10	L2	All MCs	43	4.9	43	4.9	0.517	29.3	LOS C	5.9	42.5	0.92	0.77	0.92	33.8
11	T1	All MCs	322	2.6	322	2.6	* 0.517	22.2	LOS B	5.9	42.5	0.92	0.77	0.92	27.9
12	R2	All MCs	40	5.3	40	5.3	0.517	32.1	LOS C	5.0	35.8	0.93	0.77	0.93	27.4
Approach			405	3.1	405	3.1	0.517	23.9	LOS B	5.9	42.5	0.92	0.77	0.92	28.7
All Vehicles			2175	2.1	2175	2.1	0.858	24.6	LOS B	12.6	89.6	0.92	0.89	1.07	28.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Carrington Road												
P1	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Birrell Street												
P2	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Council Street												
P3	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Birrell Street												
P4	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		200	211	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 201 [201_EXAM_Birrell St x Bronte Road (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Bronte Road
Existing Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Bronte Road															
21a	L1	All MCs	240	3.1	240	3.1	0.840	32.6	LOS C	32.6	241.8	0.94	0.92	1.02	32.4
22	T1	All MCs	375	10.1	375	10.1	0.840	27.6	LOS B	32.6	241.8	0.94	0.92	1.02	31.1
23b	R3	All MCs	85	4.9	85	4.9	* 0.840	45.3	LOS D	32.6	241.8	0.94	0.92	1.02	28.8
Approach			700	7.1	700	7.1	0.840	31.5	LOS C	32.6	241.8	0.94	0.92	1.02	31.3
East: Birrell Street															
4b	L3	All MCs	23	0.0	23	0.0	0.831	49.2	LOS D	20.7	145.0	0.98	0.97	1.13	26.2
5	T1	All MCs	386	0.3	386	0.3	* 0.831	73.4	LOS F	20.7	145.0	0.98	0.97	1.13	30.7
6a	R1	All MCs	78	6.8	78	6.8	0.330	61.9	LOS E	3.4	25.1	0.90	0.77	0.90	26.4
Approach			487	1.3	487	1.3	0.831	70.4	LOS E	20.7	145.0	0.96	0.94	1.09	29.8
NorthWest: Bronte Road															
27a	L1	All MCs	47	15.6	47	15.6	0.485	27.3	LOS B	11.2	88.2	0.81	0.73	0.81	31.4
28	T1	All MCs	224	16.0	224	16.0	0.485	22.2	LOS B	11.2	88.2	0.81	0.73	0.81	33.5
29b	R3	All MCs	28	3.7	28	3.7	0.485	63.3	LOS E	11.2	88.2	0.81	0.73	0.81	35.3
Approach			300	14.7	300	14.7	0.485	26.9	LOS B	11.2	88.2	0.81	0.73	0.81	33.3
West: Birrell Street															
10b	L3	All MCs	72	5.9	72	5.9	0.564	43.9	LOS D	12.7	90.3	0.86	0.76	0.86	34.2
11	T1	All MCs	251	1.3	251	1.3	0.564	34.8	LOS C	12.7	90.3	0.86	0.76	0.86	35.5
12a	R1	All MCs	95	2.2	95	2.2	0.457	53.5	LOS D	4.3	30.9	0.94	0.79	0.94	27.4
Approach			417	2.3	417	2.3	0.564	40.6	LOS C	12.7	90.3	0.87	0.76	0.87	33.1
All Vehicles			1904	5.7	1904	5.7	0.840	42.7	LOS D	32.6	241.8	0.91	0.86	0.97	31.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Bronte Road												
P5	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Birrell Street												
P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
NorthWest: Bronte Road												
P7	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Birrell Street												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 202 [202_EXPM_Birrell St x Bronte Road (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Bronte Road
Existing Scenario
PM Peak: 4:45pm-5:45pm
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Bronte Road															
21a	L1	All MCs	131	2.4	131	2.4	0.548	21.4	LOS B	15.3	114.5	0.73	0.71	0.73	38.4
22	T1	All MCs	286	11.0	286	11.0	0.548	16.4	LOS B	15.3	114.5	0.73	0.71	0.73	37.7
23b	R3	All MCs	47	2.2	47	2.2	0.548	36.8	LOS C	15.3	114.5	0.73	0.71	0.73	35.0
Approach			464	7.7	464	7.7	0.548	19.9	LOS B	15.3	114.5	0.73	0.71	0.73	37.7
East: Birrell Street															
4b	L3	All MCs	15	0.0	15	0.0	0.372	10.3	LOS A	7.2	50.8	0.82	0.70	0.82	30.5
5	T1	All MCs	178	1.8	178	1.8	0.372	31.1	LOS C	7.2	50.8	0.82	0.70	0.82	35.3
6a	R1	All MCs	49	6.4	49	6.4	0.237	44.7	LOS D	2.2	16.0	0.90	0.74	0.90	25.8
Approach			242	2.6	242	2.6	0.372	32.6	LOS C	7.2	50.8	0.83	0.71	0.83	32.9
NorthWest: Bronte Road															
27a	L1	All MCs	97	9.8	97	9.8	0.572	21.8	LOS B	16.3	121.0	0.74	0.71	0.74	35.6
28	T1	All MCs	332	7.9	332	7.9	0.572	16.7	LOS B	16.3	121.0	0.74	0.71	0.74	37.8
29b	R3	All MCs	55	0.0	55	0.0	* 0.572	36.2	LOS C	16.3	121.0	0.74	0.71	0.74	39.2
Approach			483	7.4	483	7.4	0.572	19.9	LOS B	16.3	121.0	0.74	0.71	0.74	37.5
West: Birrell Street															
10b	L3	All MCs	45	0.0	45	0.0	* 0.583	46.9	LOS D	12.2	86.0	0.89	0.77	0.89	33.5
11	T1	All MCs	253	0.8	253	0.8	0.583	37.7	LOS C	12.2	86.0	0.89	0.77	0.89	34.2
12a	R1	All MCs	128	0.0	128	0.0	0.375	45.3	LOS D	5.3	36.9	0.87	0.78	0.87	30.2
Approach			426	0.5	426	0.5	0.583	40.9	LOS C	12.2	86.0	0.88	0.77	0.88	32.9
All Vehicles			1616	5.0	1616	5.0	0.583	27.4	LOS B	16.3	121.0	0.79	0.73	0.79	35.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Bronte Road												
P5	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Birrell Street												
P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
NorthWest: Bronte Road												
P7	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Birrell Street												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 301 [301_EXAM_Bronte Rd x Church St (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Church Street
Existing Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	700	7.1	700	7.1	0.375	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach			700	7.1	700	7.1	0.375	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
East: Church Street															
4	L2	All MCs	119	0.0	119	0.0	0.367	7.0	LOS A	1.7	11.9	0.66	0.86	0.86	27.4
6	R2	All MCs	94	1.1	94	1.1	0.367	16.5	LOS B	1.7	11.9	0.66	0.86	0.86	31.1
Approach			213	0.5	213	0.5	0.367	11.1	LOS A	1.7	11.9	0.66	0.86	0.86	29.4
North: Bronte Road															
8	T1	All MCs	342	11.1	342	11.1	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach			342	11.1	342	11.1	0.188	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Vehicles			1255	7.0	1255	7.0	0.375	1.9	NA	1.7	11.9	0.11	0.15	0.15	37.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 302 [302_EXPM_Bronte Rd x Church St (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Church Street
Existing Scenario
PM Peak: 5:00pm-6:00pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	453	7.4	453	7.4	0.243	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach			453	7.4	453	7.4	0.243	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
East: Church Street															
4	L2	All MCs	41	2.6	41	2.6	0.122	7.0	LOS A	0.4	2.9	0.58	0.81	0.58	29.4
6	R2	All MCs	33	0.0	33	0.0	0.122	11.9	LOS A	0.4	2.9	0.58	0.81	0.58	32.6
Approach			74	1.4	74	1.4	0.122	9.1	LOS A	0.4	2.9	0.58	0.81	0.58	31.2
North: Bronte Road															
8	T1	All MCs	531	5.8	531	5.8	0.282	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
Approach			531	5.8	531	5.8	0.282	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Vehicles			1057	6.2	1057	6.2	0.282	0.7	NA	0.4	2.9	0.04	0.06	0.04	39.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 401 [401_EXAM_Carrington Rd x Church St (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Carrington Road and Church Street
Existing Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	155	0.7	155	0.7	0.278	3.4	LOS A	0.0	0.0	0.00	0.14	0.00	38.7
2	T1	All MCs	907	2.1	907	2.1	0.278	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.1
Approach			1062	1.9	1062	1.9	0.278	0.5	NA	0.0	0.0	0.00	0.07	0.00	39.0
North: Carrington Road															
8	T1	All MCs	576	4.8	576	4.8	0.447	2.3	LOS A	4.6	33.4	0.35	0.40	0.56	30.4
9	R2	All MCs	99	1.1	99	1.1	0.447	37.2	LOS C	4.6	33.4	0.54	0.62	0.87	32.2
Approach			675	4.2	675	4.2	0.447	7.5	NA	4.6	33.4	0.38	0.43	0.60	30.9
All Vehicles			1737	2.8	1737	2.8	0.447	3.2	NA	4.6	33.4	0.15	0.21	0.23	35.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 402 [402_EXPM_Carrington Rd x Church St (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Carrington Road and Church Street
Existing Scenario
PM Peak: 4:30pm-5:30pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	22	0.0	22	0.0	0.057	3.4	LOS A	0.0	0.0	0.00	0.10	0.00	38.9
2	T1	All MCs	632	1.7	632	1.7	0.283	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	39.7
Approach			654	1.6	654	1.6	0.283	0.3	NA	0.0	0.0	0.00	0.02	0.00	39.7
North: Carrington Road															
8	T1	All MCs	851	1.7	851	1.7	0.238	0.0	LOS A	0.4	3.0	0.05	0.06	0.05	39.2
9	R2	All MCs	24	0.0	24	0.0	0.238	15.8	LOS B	0.4	3.0	0.12	0.13	0.12	38.2
Approach			875	1.7	875	1.7	0.238	0.4	NA	0.4	3.0	0.06	0.06	0.06	39.1
All Vehicles			1528	1.7	1528	1.7	0.283	0.4	NA	0.4	3.0	0.03	0.04	0.03	39.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [103_DEVAM_Birrell St x Carrington Rd (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Carrington Road
Development Scenario
AM Peak: 7:45am-8:45am
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	107	0.0	107	0.0	0.206	9.7	LOS A	2.8	19.8	0.56	0.60	0.56	37.4
2	T1	All MCs	534	2.2	534	2.2	1.029	55.8	LOS D	32.1	229.8	0.92	1.44	1.88	18.4
3	R2	All MCs	207	3.6	207	3.6	* 1.029	74.9	LOS F	32.1	229.8	1.00	1.61	2.15	8.8
Approach			848	2.2	848	2.2	1.029	54.6	LOS D	32.1	229.8	0.90	1.38	1.78	17.1
East: Birrell Street															
4	L2	All MCs	274	3.1	274	3.1	0.821	36.5	LOS C	9.0	64.8	1.00	1.01	1.31	16.6
5	T1	All MCs	571	1.8	571	1.8	* 0.987	57.8	LOS E	28.0	199.1	1.00	1.52	1.85	17.1
Approach			844	2.2	844	2.2	0.987	50.9	LOS D	28.0	199.1	1.00	1.36	1.67	17.0
North: Council Street															
7	L2	All MCs	85	6.2	85	6.2	0.300	26.9	LOS B	2.8	20.9	0.88	0.75	0.88	29.1
8	T1	All MCs	427	5.2	427	5.2	* 0.982	54.8	LOS D	18.9	138.2	0.99	1.41	1.84	21.4
Approach			513	5.3	513	5.3	0.982	50.1	LOS D	18.9	138.2	0.97	1.30	1.68	22.3
West: Birrell Street															
10	L2	All MCs	60	0.0	60	0.0	0.410	25.3	LOS B	5.4	38.9	0.84	0.72	0.84	35.5
11	T1	All MCs	237	4.4	237	4.4	0.410	19.4	LOS B	5.4	38.9	0.88	0.73	0.88	28.6
12	R2	All MCs	26	8.0	26	8.0	0.410	45.8	LOS D	2.8	20.7	0.96	0.75	0.96	25.6
Approach			323	3.9	323	3.9	0.410	22.6	LOS B	5.4	38.9	0.88	0.73	0.88	30.0
All Vehicles			2528	3.1	2528	3.1	1.029	48.4	LOS D	32.1	229.8	0.94	1.27	1.61	19.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Carrington Road												
P1	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Birrell Street												
P2	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Council Street												
P3	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Birrell Street												
P4	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		200	211	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 104 [104_DEVPM_Birrell St x Carrington Rd (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Carrington Road
Development Scenario
PM Peak: 4:30pm-5:30pm
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	34	0.0	34	0.0	0.157	6.3	LOS A	1.3	9.4	0.49	0.48	0.49	40.4
2	T1	All MCs	402	2.6	402	2.6	0.786	13.7	LOS A	12.6	89.6	0.84	0.83	0.94	35.8
3	R2	All MCs	208	1.0	208	1.0	* 0.786	24.5	LOS B	12.6	89.6	0.95	0.94	1.09	23.0
Approach			644	2.0	644	2.0	0.786	16.8	LOS B	12.6	89.6	0.86	0.85	0.97	32.8
East: Birrell Street															
4	L2	All MCs	263	0.4	263	0.4	0.533	25.5	LOS B	6.8	47.9	0.90	0.80	0.90	20.4
5	T1	All MCs	234	2.7	234	2.7	0.523	22.5	LOS B	6.2	44.5	0.92	0.76	0.92	28.6
Approach			497	1.5	497	1.5	0.533	24.1	LOS B	6.8	47.9	0.91	0.78	0.91	24.5
North: Council Street															
7	L2	All MCs	87	1.2	87	1.2	* 0.858	38.2	LOS C	11.0	78.0	1.00	1.08	1.38	25.9
8	T1	All MCs	563	2.1	563	2.1	0.858	32.6	LOS C	11.3	80.3	1.00	1.08	1.37	27.6
Approach			651	1.9	651	1.9	0.858	33.4	LOS C	11.3	80.3	1.00	1.08	1.37	27.4
West: Birrell Street															
10	L2	All MCs	43	4.9	43	4.9	0.552	29.5	LOS C	6.4	45.8	0.93	0.78	0.93	33.9
11	T1	All MCs	345	2.4	345	2.4	* 0.552	22.7	LOS B	6.4	45.8	0.94	0.78	0.94	27.8
12	R2	All MCs	40	5.3	40	5.3	0.552	34.2	LOS C	5.3	37.9	0.95	0.78	0.95	27.1
Approach			428	2.9	428	2.9	0.552	24.4	LOS B	6.4	45.8	0.94	0.78	0.94	28.6
All Vehicles			2220	2.0	2220	2.0	0.858	24.8	LOS B	12.6	89.6	0.93	0.89	1.07	28.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Carrington Road												
P1	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Birrell Street												
P2	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Council Street												
P3	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Birrell Street												
P4	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		200	211	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 203 [203_DEVAM_Birrell St x Bronte Road (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Bronte Road
Development Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Bronte Road															
21a	L1	All MCs	244	3.0	244	3.0	0.861	35.2	LOS C	34.9	258.8	0.95	0.95	1.07	31.3
22	T1	All MCs	379	10.0	379	10.0	0.861	30.2	LOS C	34.9	258.8	0.95	0.95	1.07	29.9
23b	R3	All MCs	91	4.7	91	4.7	* 0.861	48.0	LOS D	34.9	258.8	0.95	0.95	1.07	27.7
Approach			714	6.9	714	6.9	0.861	34.1	LOS C	34.9	258.8	0.95	0.95	1.07	30.1
East: Birrell Street															
4b	L3	All MCs	47	0.0	47	0.0	0.859	47.1	LOS D	22.9	160.4	0.99	1.02	1.19	25.1
5	T1	All MCs	387	0.3	387	0.3	* 0.859	73.0	LOS F	22.9	160.4	0.99	1.02	1.19	29.6
6a	R1	All MCs	80	6.6	80	6.6	0.341	56.7	LOS E	3.5	25.8	0.90	0.77	0.90	26.4
Approach			515	1.2	515	1.2	0.859	68.1	LOS E	22.9	160.4	0.98	0.98	1.14	28.7
NorthWest: Bronte Road															
27a	L1	All MCs	47	15.6	47	15.6	0.498	27.4	LOS B	11.4	89.6	0.82	0.73	0.82	31.3
28	T1	All MCs	227	15.7	227	15.7	0.498	22.2	LOS B	11.4	89.6	0.82	0.73	0.82	33.4
29b	R3	All MCs	28	3.7	28	3.7	0.498	65.0	LOS E	11.4	89.6	0.82	0.73	0.82	35.3
Approach			303	14.6	303	14.6	0.498	27.0	LOS B	11.4	89.6	0.82	0.73	0.82	33.2
West: Birrell Street															
10b	L3	All MCs	72	5.9	72	5.9	0.567	44.0	LOS D	12.7	90.7	0.86	0.76	0.86	34.1
11	T1	All MCs	252	1.3	252	1.3	0.567	34.9	LOS C	12.7	90.7	0.86	0.76	0.86	35.5
12a	R1	All MCs	100	2.1	100	2.1	0.494	54.7	LOS D	4.6	33.1	0.95	0.79	0.95	27.1
Approach			423	2.2	423	2.2	0.567	41.1	LOS C	12.7	90.7	0.88	0.77	0.88	32.9
All Vehicles			1955	5.6	1955	5.6	0.861	43.5	LOS D	34.9	258.8	0.92	0.88	1.01	30.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Bronte Road												
P5	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Birrell Street												
P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
NorthWest: Bronte Road												
P7	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Birrell Street												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 204 [204_DEVPM_Birrell St x Bronte Road (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Bronte Road
Development Scenario
PM Peak: 4:45pm-5:45pm
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Bronte Road															
21a	L1	All MCs	141	2.2	141	2.2	0.635	22.4	LOS B	18.3	135.8	0.79	0.76	0.79	37.1
22	T1	All MCs	295	10.7	295	10.7	0.635	17.4	LOS B	18.3	135.8	0.79	0.76	0.79	36.3
23b	R3	All MCs	77	1.4	77	1.4	* 0.635	39.0	LOS C	18.3	135.8	0.79	0.76	0.79	33.8
Approach			513	7.0	513	7.0	0.635	22.0	LOS B	18.3	135.8	0.79	0.76	0.79	36.2
East: Birrell Street															
4b	L3	All MCs	31	0.0	31	0.0	0.397	10.4	LOS A	7.8	55.1	0.83	0.73	0.83	30.4
5	T1	All MCs	179	1.8	179	1.8	0.397	33.3	LOS C	7.8	55.1	0.83	0.73	0.83	35.1
6a	R1	All MCs	51	6.3	51	6.3	0.262	46.8	LOS D	2.3	16.8	0.92	0.75	0.92	25.2
Approach			260	2.4	260	2.4	0.397	33.2	LOS C	7.8	55.1	0.85	0.73	0.85	32.4
NorthWest: Bronte Road															
27a	L1	All MCs	98	9.7	98	9.7	0.575	21.6	LOS B	16.4	122.1	0.75	0.71	0.75	35.6
28	T1	All MCs	334	7.9	334	7.9	0.575	16.5	LOS B	16.4	122.1	0.75	0.71	0.75	37.8
29b	R3	All MCs	55	0.0	55	0.0	0.575	38.3	LOS C	16.4	122.1	0.75	0.71	0.75	39.2
Approach			486	7.4	486	7.4	0.575	20.0	LOS B	16.4	122.1	0.75	0.71	0.75	37.5
West: Birrell Street															
10b	L3	All MCs	45	0.0	45	0.0	* 0.615	48.8	LOS D	12.6	88.4	0.91	0.78	0.91	33.0
11	T1	All MCs	255	0.8	255	0.8	0.615	39.5	LOS C	12.6	88.4	0.91	0.78	0.91	33.7
12a	R1	All MCs	133	0.0	133	0.0	0.404	47.1	LOS D	5.5	38.8	0.88	0.78	0.88	29.8
Approach			433	0.5	433	0.5	0.615	42.8	LOS D	12.6	88.4	0.90	0.78	0.90	32.4
All Vehicles			1692	4.7	1692	4.7	0.635	28.5	LOS B	18.3	135.8	0.81	0.75	0.81	34.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Bronte Road												
P5	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Birrell Street												
P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
NorthWest: Bronte Road												
P7	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Birrell Street												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 303 [303_DEVAM_Bronte Rd x Church St (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Church Street
Development Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	719	6.9	719	6.9	0.385	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.2
Approach			719	6.9	719	6.9	0.385	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.2
East: Church Street															
4	L2	All MCs	119	0.0	119	0.0	0.379	7.1	LOS A	1.8	12.4	0.67	0.87	0.89	27.0
6	R2	All MCs	94	1.1	94	1.1	0.379	17.2	LOS B	1.8	12.4	0.67	0.87	0.89	30.8
Approach			213	0.5	213	0.5	0.379	11.5	LOS A	1.8	12.4	0.67	0.87	0.89	29.1
North: Bronte Road															
8	T1	All MCs	346	10.9	346	10.9	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.1
Approach			346	10.9	346	10.9	0.190	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.1
All Vehicles			1278	6.9	1278	6.9	0.385	1.9	NA	1.8	12.4	0.11	0.15	0.15	37.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 304 [304_DEVPM_Bronte Rd x Church St (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Church Street
Development Scenario
PM Peak: 5:00pm-6:00pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	469	7.2	469	7.2	0.252	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.4
Approach			469	7.2	469	7.2	0.252	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.4
East: Church Street															
4	L2	All MCs	41	2.6	41	2.6	0.127	7.1	LOS A	0.4	3.0	0.59	0.82	0.59	29.1
6	R2	All MCs	33	0.0	33	0.0	0.127	12.4	LOS A	0.4	3.0	0.59	0.82	0.59	32.4
Approach			74	1.4	74	1.4	0.127	9.4	LOS A	0.4	3.0	0.59	0.82	0.59	30.9
North: Bronte Road															
8	T1	All MCs	548	5.6	548	5.6	0.291	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	40.3
Approach			548	5.6	548	5.6	0.291	0.1	NA	0.0	0.0	0.00	0.00	0.00	40.3
All Vehicles			1092	6.0	1092	6.0	0.291	0.7	NA	0.4	3.0	0.04	0.06	0.04	39.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 403 [403_EXAM_Carrington Rd x Church St (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Carrington Road and Church Street
Development Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	155	0.7	155	0.7	0.278	3.4	LOS A	0.0	0.0	0.00	0.14	0.00	38.7
2	T1	All MCs	907	2.1	907	2.1	0.278	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.1
Approach			1062	1.9	1062	1.9	0.278	0.5	NA	0.0	0.0	0.00	0.07	0.00	39.0
North: Carrington Road															
8	T1	All MCs	576	4.8	576	4.8	0.447	2.3	LOS A	4.6	33.4	0.35	0.40	0.56	30.4
9	R2	All MCs	99	1.1	99	1.1	0.447	37.2	LOS C	4.6	33.4	0.54	0.62	0.87	32.2
Approach			675	4.2	675	4.2	0.447	7.5	NA	4.6	33.4	0.38	0.43	0.60	30.9
All Vehicles			1737	2.8	1737	2.8	0.447	3.2	NA	4.6	33.4	0.15	0.21	0.23	35.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 404 [404_DEVPM_Carrington Rd x Church St (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Carrington Road and Church Street
Development Scenario
PM Peak: 4:30pm-5:30pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	22	0.0	22	0.0	0.057	3.4	LOS A	0.0	0.0	0.00	0.10	0.00	38.9
2	T1	All MCs	632	1.7	632	1.7	0.283	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	39.7
Approach			654	1.6	654	1.6	0.283	0.3	NA	0.0	0.0	0.00	0.02	0.00	39.7
North: Carrington Road															
8	T1	All MCs	851	1.7	851	1.7	0.238	0.0	LOS A	0.4	3.0	0.05	0.06	0.05	39.2
9	R2	All MCs	24	0.0	24	0.0	0.238	15.8	LOS B	0.4	3.0	0.12	0.13	0.12	38.2
Approach			875	1.7	875	1.7	0.238	0.4	NA	0.4	3.0	0.06	0.06	0.06	39.1
All Vehicles			1528	1.7	1528	1.7	0.283	0.4	NA	0.4	3.0	0.03	0.04	0.03	39.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: T:\Synergy\Projects\20\20.565\Modelling\20.565m01v01 Uniting Waverley.sip9

MOVEMENT SUMMARY

Site: 501 [501_DEVAM_Bronte Rd x Site Access (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Site Access
Development Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	700	7.1	700	7.1	0.384	0.0	LOS A	0.1	0.8	0.02	0.02	0.02	39.8
3	R2	All MCs	11	0.0	11	0.0	0.384	6.5	LOS A	0.1	0.8	0.02	0.02	0.02	33.8
Approach			711	7.0	711	7.0	0.384	0.1	NA	0.1	0.8	0.02	0.02	0.02	39.8
East: Site Access															
4	L2	All MCs	3	0.0	3	0.0	0.042	3.9	LOS A	0.1	0.9	0.66	0.80	0.66	16.8
6	R2	All MCs	14	0.0	14	0.0	0.042	10.9	LOS A	0.1	0.9	0.66	0.80	0.66	31.5
Approach			17	0.0	17	0.0	0.042	9.6	LOS A	0.1	0.9	0.66	0.80	0.66	29.6
North: Bronte Road															
7	L2	All MCs	33	0.0	33	0.0	0.206	3.6	LOS A	0.0	0.0	0.00	0.07	0.00	33.2
8	T1	All MCs	343	11.0	343	11.0	0.206	0.2	LOS A	0.0	0.0	0.00	0.07	0.00	40.3
Approach			376	10.1	376	10.1	0.206	0.5	NA	0.0	0.0	0.00	0.07	0.00	39.7
All Vehicles			1103	7.9	1103	7.9	0.384	0.4	NA	0.1	0.9	0.02	0.05	0.02	39.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 502 [502_DEVPM_Bronte Rd x Site Access (Site Folder: Existing + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Site Access
Development Scenario
PM Peak: 5:00pm-6:00pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	459	7.3	459	7.3	0.257	0.0	LOS A	0.1	0.9	0.04	0.05	0.04	39.9
3	R2	All MCs	11	0.0	11	0.0	0.257	11.2	LOS A	0.1	0.9	0.04	0.05	0.04	33.5
Approach			469	7.2	469	7.2	0.257	0.3	NA	0.1	0.9	0.04	0.05	0.04	39.8
East: Site Access															
4	L2	All MCs	18	0.0	18	0.0	0.122	5.0	LOS A	0.4	2.7	0.65	0.83	0.65	18.2
6	R2	All MCs	42	0.0	42	0.0	0.122	9.7	LOS A	0.4	2.7	0.65	0.83	0.65	33.1
Approach			60	0.0	60	0.0	0.122	8.3	LOS A	0.4	2.7	0.65	0.83	0.65	30.1
North: Bronte Road															
7	L2	All MCs	22	0.0	22	0.0	0.295	3.5	LOS A	0.0	0.0	0.00	0.03	0.00	32.6
8	T1	All MCs	532	5.7	532	5.7	0.295	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	40.1
Approach			554	5.5	554	5.5	0.295	0.2	NA	0.0	0.0	0.00	0.03	0.00	39.8
All Vehicles			1083	5.9	1083	5.9	0.295	0.7	NA	0.4	2.7	0.05	0.08	0.05	39.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [105_DEV+APPAM_Birrell St x Carrington Rd (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Carrington Road
Development+Approved Scenario
AM Peak: 7:45am-8:45am
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	107	0.0	107	0.0	0.207	9.7	LOS A	2.8	19.9	0.56	0.60	0.56	37.3
2	T1	All MCs	534	2.2	534	2.2	1.036	59.4	LOS E	33.3	238.3	0.92	1.46	1.93	17.9
3	R2	All MCs	211	3.5	211	3.5	*1.036	79.5	LOS F	33.3	238.3	1.00	1.65	2.21	8.4
Approach			852	2.2	852	2.2	1.036	58.1	LOS E	33.3	238.3	0.90	1.40	1.82	16.5
East: Birrell Street															
4	L2	All MCs	279	3.0	279	3.0	0.837	37.4	LOS C	9.4	67.2	1.00	1.03	1.35	16.3
5	T1	All MCs	592	1.8	592	1.8	*1.023	76.6	LOS F	33.3	236.6	1.00	1.71	2.12	14.1
Approach			871	2.2	871	2.2	1.023	64.0	LOS E	33.3	236.6	1.00	1.49	1.87	14.5
North: Council Street															
7	L2	All MCs	94	5.6	94	5.6	0.306	27.0	LOS B	2.9	21.0	0.88	0.75	0.88	29.1
8	T1	All MCs	427	5.2	427	5.2	*1.001	63.6	LOS E	20.8	152.2	0.99	1.51	1.99	19.6
Approach			521	5.3	521	5.3	1.001	57.0	LOS E	20.8	152.2	0.97	1.37	1.79	20.8
West: Birrell Street															
10	L2	All MCs	60	0.0	60	0.0	0.416	25.4	LOS B	5.5	39.5	0.85	0.72	0.85	35.6
11	T1	All MCs	245	4.3	245	4.3	0.416	19.3	LOS B	5.5	39.5	0.88	0.73	0.88	28.8
12	R2	All MCs	26	8.0	26	8.0	0.416	44.9	LOS D	2.9	21.4	0.95	0.75	0.95	26.0
Approach			332	3.8	332	3.8	0.416	22.4	LOS B	5.5	39.5	0.88	0.73	0.88	30.2
All Vehicles			2575	3.0	2575	3.0	1.036	55.3	LOS D	33.3	238.3	0.94	1.34	1.71	17.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Carrington Road												
P1	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Birrell Street												
P2	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Council Street												
P3	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Birrell Street												
P4	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		200	211	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 106 [106_DEV+APPPM_Birrell St x Carrington Rd (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Carrington Road
Development+Approved Scenario
PM Peak: 4:30pm-5:30pm
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	34	0.0	34	0.0	0.171	7.3	LOS A	1.7	12.1	0.49	0.49	0.49	39.2
2	T1	All MCs	402	2.6	402	2.6	0.856	17.7	LOS B	14.7	106.2	0.86	0.91	1.07	33.4
3	R2	All MCs	219	5.8	219	5.8	* 0.856	30.7	LOS C	14.7	106.2	0.99	1.05	1.27	20.0
Approach			655	3.5	655	3.5	0.856	21.5	LOS B	14.7	106.2	0.88	0.94	1.11	30.0
East: Birrell Street															
4	L2	All MCs	276	5.0	276	5.0	0.615	27.1	LOS B	7.5	54.7	0.94	0.82	0.95	19.6
5	T1	All MCs	278	18.2	278	18.2	* 0.683	25.7	LOS B	8.0	64.8	0.97	0.87	1.05	27.8
Approach			554	11.6	554	11.6	0.683	26.4	LOS B	8.0	64.8	0.95	0.85	1.00	24.0
North: Council Street															
7	L2	All MCs	107	19.6	107	19.6	* 0.835	36.7	LOS C	10.7	80.3	1.00	1.04	1.31	26.2
8	T1	All MCs	563	2.1	563	2.1	0.835	30.5	LOS C	11.5	81.9	1.00	1.04	1.30	28.5
Approach			671	4.9	671	4.9	0.835	31.5	LOS C	11.5	81.9	1.00	1.04	1.30	28.1
West: Birrell Street															
10	L2	All MCs	43	4.9	43	4.9	0.621	30.3	LOS C	7.2	53.7	0.95	0.81	0.97	33.6
11	T1	All MCs	365	7.8	365	7.8	0.621	23.9	LOS B	7.2	53.7	0.96	0.82	0.99	27.3
12	R2	All MCs	40	5.3	40	5.3	0.621	38.0	LOS C	5.4	40.5	0.97	0.83	1.03	26.4
Approach			448	7.3	448	7.3	0.621	25.8	LOS B	7.2	53.7	0.96	0.82	0.99	28.1
All Vehicles			2327	6.6	2327	6.6	0.856	26.4	LOS B	14.7	106.2	0.95	0.92	1.12	27.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Carrington Road												
P1	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Birrell Street												
P2	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Council Street												
P3	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Birrell Street												
P4	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		200	211	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 205 [205_DEV+APPAM_Birrell St x Bronte Road (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Bronte Road
Development+ Approved Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Bronte Road															
21a	L1	All MCs	244	3.0	244	3.0	0.895	41.7	LOS C	38.5	286.7	0.99	1.01	1.17	28.8
22	T1	All MCs	379	10.0	379	10.0	0.895	36.7	LOS C	38.5	286.7	0.99	1.01	1.17	27.2
23b	R3	All MCs	94	7.9	94	7.9	* 0.895	56.4	LOS D	38.5	286.7	0.99	1.01	1.17	25.1
Approach			717	7.3	717	7.3	0.895	41.0	LOS C	38.5	286.7	0.99	1.01	1.17	27.5
East: Birrell Street															
4b	L3	All MCs	53	10.0	53	10.0	0.909	57.2	LOS E	26.6	191.5	1.00	1.12	1.31	22.0
5	T1	All MCs	397	2.7	397	2.7	* 0.909	83.5	LOS F	26.6	191.5	1.00	1.12	1.31	26.6
6a	R1	All MCs	86	13.4	86	13.4	0.372	56.9	LOS E	3.8	29.4	0.90	0.77	0.90	26.4
Approach			536	5.1	536	5.1	0.909	76.6	LOS F	26.6	191.5	0.98	1.06	1.24	26.1
NorthWest: Bronte Road															
27a	L1	All MCs	51	20.8	51	20.8	0.523	28.9	LOS C	11.9	94.1	0.84	0.75	0.84	30.1
28	T1	All MCs	227	15.7	227	15.7	0.523	23.7	LOS B	11.9	94.1	0.84	0.75	0.84	32.5
29b	R3	All MCs	28	3.7	28	3.7	0.523	69.4	LOS E	11.9	94.1	0.84	0.75	0.84	34.5
Approach			306	15.5	306	15.5	0.523	28.8	LOS C	11.9	94.1	0.84	0.75	0.84	32.3
West: Birrell Street															
10b	L3	All MCs	72	5.9	72	5.9	0.566	43.3	LOS D	12.8	92.0	0.85	0.75	0.85	34.4
11	T1	All MCs	256	2.9	256	2.9	0.566	34.2	LOS C	12.8	92.0	0.85	0.75	0.85	35.8
12a	R1	All MCs	100	2.1	100	2.1	0.512	55.0	LOS D	4.7	33.3	0.96	0.79	0.96	27.0
Approach			427	3.2	427	3.2	0.566	40.6	LOS C	12.8	92.0	0.87	0.76	0.87	33.1
All Vehicles			1986	7.1	1986	7.1	0.909	48.6	LOS D	38.5	286.7	0.94	0.93	1.07	28.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Bronte Road												
P5	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Birrell Street												
P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
NorthWest: Bronte Road												
P7	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Birrell Street												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 206 [206_DEV+APPPM_Birrell St x Bronte Road (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Birrell Street and Bronte Road
Development+Approved Scenario
PM Peak: 4:45pm-5:45pm
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Bronte Road															
21a	L1	All MCs	141	2.2	141	2.2	0.662	23.0	LOS B	19.1	142.7	0.81	0.78	0.81	36.6
22	T1	All MCs	295	10.7	295	10.7	0.662	18.0	LOS B	19.1	142.7	0.81	0.78	0.81	35.7
23b	R3	All MCs	82	7.7	82	7.7	* 0.662	41.4	LOS C	19.1	142.7	0.81	0.78	0.81	32.6
Approach			518	7.9	518	7.9	0.662	23.1	LOS B	19.1	142.7	0.81	0.78	0.81	35.4
East: Birrell Street															
4b	L3	All MCs	41	25.6	41	25.6	0.493	11.0	LOS A	9.1	70.8	0.86	0.76	0.86	28.2
5	T1	All MCs	196	10.2	196	10.2	0.493	35.6	LOS C	9.1	70.8	0.86	0.76	0.86	34.6
6a	R1	All MCs	67	29.7	67	29.7	* 0.420	49.7	LOS D	3.2	28.0	0.96	0.77	0.96	24.1
Approach			304	16.6	304	16.6	0.493	35.4	LOS C	9.1	70.8	0.88	0.77	0.88	31.1
NorthWest: Bronte Road															
27a	L1	All MCs	106	16.8	106	16.8	0.594	22.3	LOS B	17.1	129.0	0.76	0.73	0.76	34.4
28	T1	All MCs	334	7.9	334	7.9	0.594	17.2	LOS B	17.1	129.0	0.76	0.73	0.76	37.2
29b	R3	All MCs	55	0.0	55	0.0	0.594	40.7	LOS C	17.1	129.0	0.76	0.73	0.76	38.7
Approach			495	8.9	495	8.9	0.594	20.9	LOS B	17.1	129.0	0.76	0.73	0.76	36.7
West: Birrell Street															
10b	L3	All MCs	45	0.0	45	0.0	0.651	50.7	LOS D	13.1	94.4	0.92	0.79	0.92	32.8
11	T1	All MCs	263	4.0	263	4.0	0.651	41.4	LOS C	13.1	94.4	0.92	0.79	0.92	33.5
12a	R1	All MCs	133	0.0	133	0.0	0.436	50.5	LOS D	5.7	40.0	0.90	0.79	0.90	29.1
Approach			441	2.4	441	2.4	0.651	45.0	LOS D	13.1	94.4	0.91	0.79	0.91	32.0
All Vehicles			1758	8.3	1758	8.3	0.662	30.1	LOS C	19.1	142.7	0.84	0.76	0.84	33.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Bronte Road												
P5	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Birrell Street												
P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
NorthWest: Bronte Road												
P7	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Birrell Street												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 305 [305_DEV+APPAM_Bronte Rd x Church St (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Church Street
Development+Approved Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	722	7.3	722	7.3	0.388	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.3
Approach			722	7.3	722	7.3	0.388	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.3
East: Church Street															
4	L2	All MCs	119	0.0	119	0.0	0.385	7.2	LOS A	1.8	12.7	0.68	0.88	0.91	26.8
6	R2	All MCs	94	1.1	94	1.1	0.385	17.5	LOS B	1.8	12.7	0.68	0.88	0.91	30.7
Approach			213	0.5	213	0.5	0.385	11.7	LOS A	1.8	12.7	0.68	0.88	0.91	28.9
North: Bronte Road															
8	T1	All MCs	352	12.3	352	12.3	0.195	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.3
Approach			352	12.3	352	12.3	0.195	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.3
All Vehicles			1286	7.5	1286	7.5	0.388	2.0	NA	1.8	12.7	0.11	0.15	0.15	37.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 306 [306_DEV+APPPM_Bronte Rd x Church St (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Church Street
Development+Approved Scenario
PM Peak: 5:00pm-6:00pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	475	8.2	475	8.2	0.256	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	40.5
Approach			475	8.2	475	8.2	0.256	0.0	NA	0.0	0.0	0.00	0.00	0.00	40.5
East: Church Street															
4	L2	All MCs	41	2.6	41	2.6	0.131	7.2	LOS A	0.4	3.1	0.61	0.83	0.61	28.8
6	R2	All MCs	33	0.0	33	0.0	0.131	12.8	LOS A	0.4	3.1	0.61	0.83	0.61	32.2
Approach			74	1.4	74	1.4	0.131	9.7	LOS A	0.4	3.1	0.61	0.83	0.61	30.7
North: Bronte Road															
8	T1	All MCs	559	7.3	559	7.3	0.300	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	40.6
Approach			559	7.3	559	7.3	0.300	0.1	NA	0.0	0.0	0.00	0.00	0.00	40.6
All Vehicles			1107	7.3	1107	7.3	0.300	0.7	NA	0.4	3.1	0.04	0.06	0.04	39.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 405 [405_EX+APPAM_Carrington Rd x Church St (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Carrington Road and Church Street
Development+Approved Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	155	0.7	155	0.7	0.279	3.4	LOS A	0.0	0.0	0.00	0.14	0.00	38.7
2	T1	All MCs	911	2.4	911	2.4	0.279	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.2
Approach			1065	2.2	1065	2.2	0.279	0.5	NA	0.0	0.0	0.00	0.07	0.00	39.0
North: Carrington Road															
8	T1	All MCs	581	5.6	581	5.6	0.452	2.5	LOS A	4.7	34.5	0.35	0.40	0.56	30.3
9	R2	All MCs	99	1.1	99	1.1	0.452	37.8	LOS C	4.7	34.5	0.54	0.62	0.88	32.1
Approach			680	5.0	680	5.0	0.452	7.6	NA	4.7	34.5	0.38	0.43	0.61	30.8
All Vehicles			1745	3.3	1745	3.3	0.452	3.3	NA	4.7	34.5	0.15	0.21	0.24	35.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 406 [406_DEV+APPPM_Carrington Rd x Church St (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Carrington Road and Church Street
Development+Approved Scenario
PM Peak: 4:30pm-5:30pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road															
1	L2	All MCs	22	0.0	22	0.0	0.058	3.4	LOS A	0.0	0.0	0.00	0.10	0.00	39.1
2	T1	All MCs	642	3.3	642	3.3	0.290	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	39.9
Approach			664	3.2	664	3.2	0.290	0.3	NA	0.0	0.0	0.00	0.02	0.00	39.8
North: Carrington Road															
8	T1	All MCs	863	3.2	863	3.2	0.244	0.1	LOS A	0.4	3.1	0.05	0.09	0.05	39.3
9	R2	All MCs	24	0.0	24	0.0	0.244	16.4	LOS B	0.4	3.1	0.12	0.18	0.12	38.2
Approach			887	3.1	887	3.1	0.244	0.5	NA	0.4	3.1	0.06	0.09	0.06	39.3
All Vehicles			1552	3.1	1552	3.1	0.290	0.4	NA	0.4	3.1	0.03	0.06	0.03	39.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 503 [503_DEV+APPAM_Bronte Rd x Site Access (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Site Access
Development+Approved Scenario
AM Peak: 8:00am-9:00am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	703	7.5	703	7.5	0.387	0.0	LOS A	0.1	0.8	0.02	0.02	0.02	39.9
3	R2	All MCs	11	0.0	11	0.0	0.387	6.7	LOS A	0.1	0.8	0.02	0.02	0.02	33.8
Approach			714	7.4	714	7.4	0.387	0.1	NA	0.1	0.8	0.02	0.02	0.02	39.8
East: Site Access															
4	L2	All MCs	3	0.0	3	0.0	0.043	3.9	LOS A	0.1	0.9	0.67	0.81	0.67	16.6
6	R2	All MCs	14	0.0	14	0.0	0.043	11.1	LOS A	0.1	0.9	0.67	0.81	0.67	31.3
Approach			17	0.0	17	0.0	0.043	9.7	LOS A	0.1	0.9	0.67	0.81	0.67	29.4
North: Bronte Road															
7	L2	All MCs	33	0.0	33	0.0	0.211	3.6	LOS A	0.0	0.0	0.00	0.07	0.00	32.6
8	T1	All MCs	348	12.4	348	12.4	0.211	0.2	LOS A	0.0	0.0	0.00	0.07	0.00	40.5
Approach			381	11.3	381	11.3	0.211	0.5	NA	0.0	0.0	0.00	0.07	0.00	39.7
All Vehicles			1112	8.6	1112	8.6	0.387	0.4	NA	0.1	0.9	0.02	0.05	0.02	39.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 504 [504_DEV+APPPM_Bronte Rd x Site Access (Site Folder: Existing + Development + Approved)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection of Bronte Road and Site Access
Development+Approved Scenario
PM Peak: 5:00pm-6:00pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bronte Road															
2	T1	All MCs	464	8.4	464	8.4	0.262	0.0	LOS A	0.1	1.0	0.04	0.05	0.04	40.1
3	R2	All MCs	11	0.0	11	0.0	0.262	11.6	LOS A	0.1	1.0	0.04	0.05	0.04	33.5
Approach			475	8.2	475	8.2	0.262	0.3	NA	0.1	1.0	0.04	0.05	0.04	40.0
East: Site Access															
4	L2	All MCs	18	0.0	18	0.0	0.127	5.1	LOS A	0.4	2.8	0.66	0.84	0.66	17.9
6	R2	All MCs	42	0.0	42	0.0	0.127	10.1	LOS A	0.4	2.8	0.66	0.84	0.66	32.7
Approach			60	0.0	60	0.0	0.127	8.6	LOS A	0.4	2.8	0.66	0.84	0.66	29.7
North: Bronte Road															
7	L2	All MCs	22	0.0	22	0.0	0.304	3.5	LOS A	0.0	0.0	0.00	0.03	0.00	32.5
8	T1	All MCs	542	7.6	542	7.6	0.304	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	40.3
Approach			564	7.3	564	7.3	0.304	0.3	NA	0.0	0.0	0.00	0.03	0.00	40.0
All Vehicles			1099	7.3	1099	7.3	0.304	0.7	NA	0.4	2.8	0.05	0.09	0.05	39.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

APPENDIX E

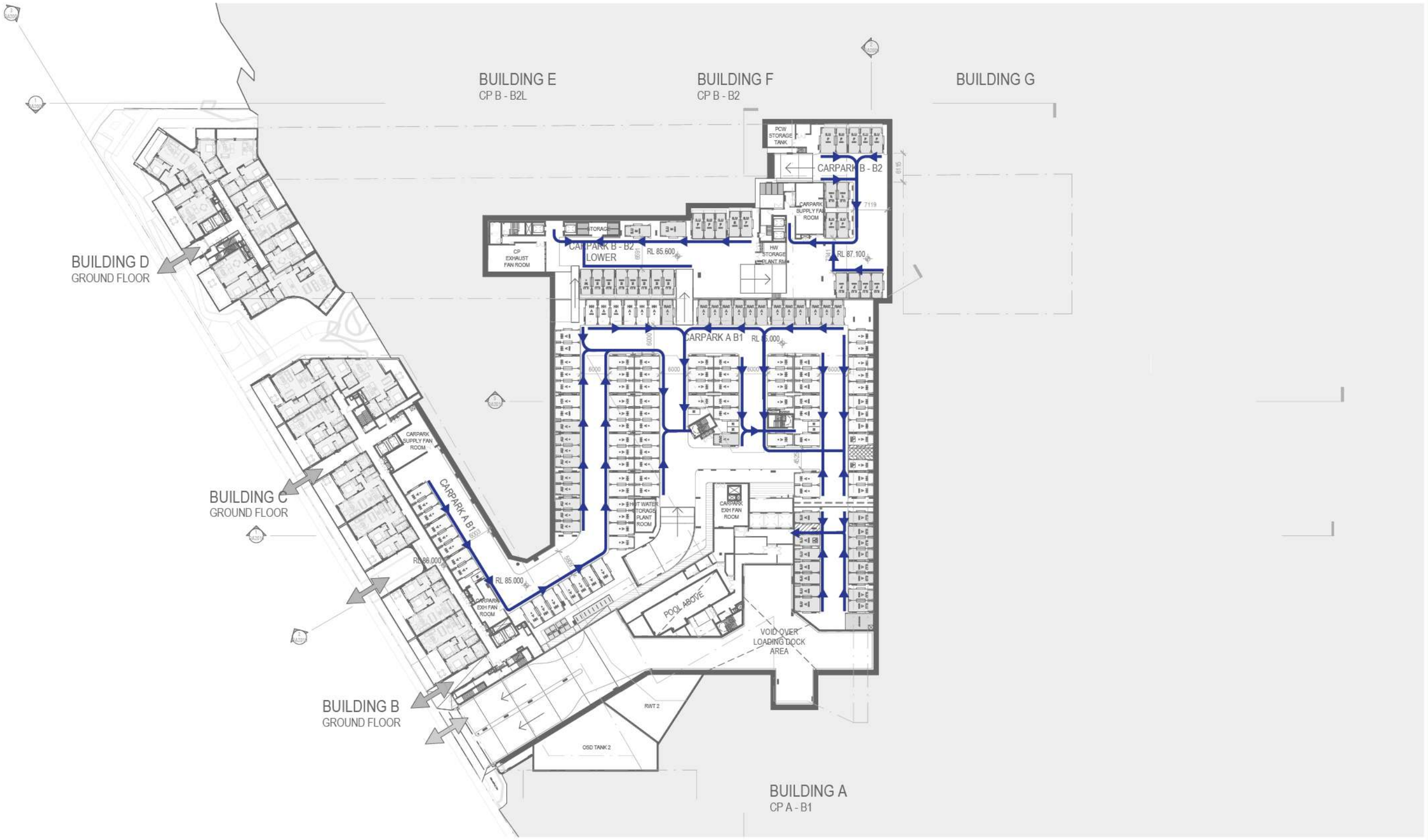
Pedestrian Flow and Access

SITE LEVEL 01

LEGEND

Pedestrian Movements

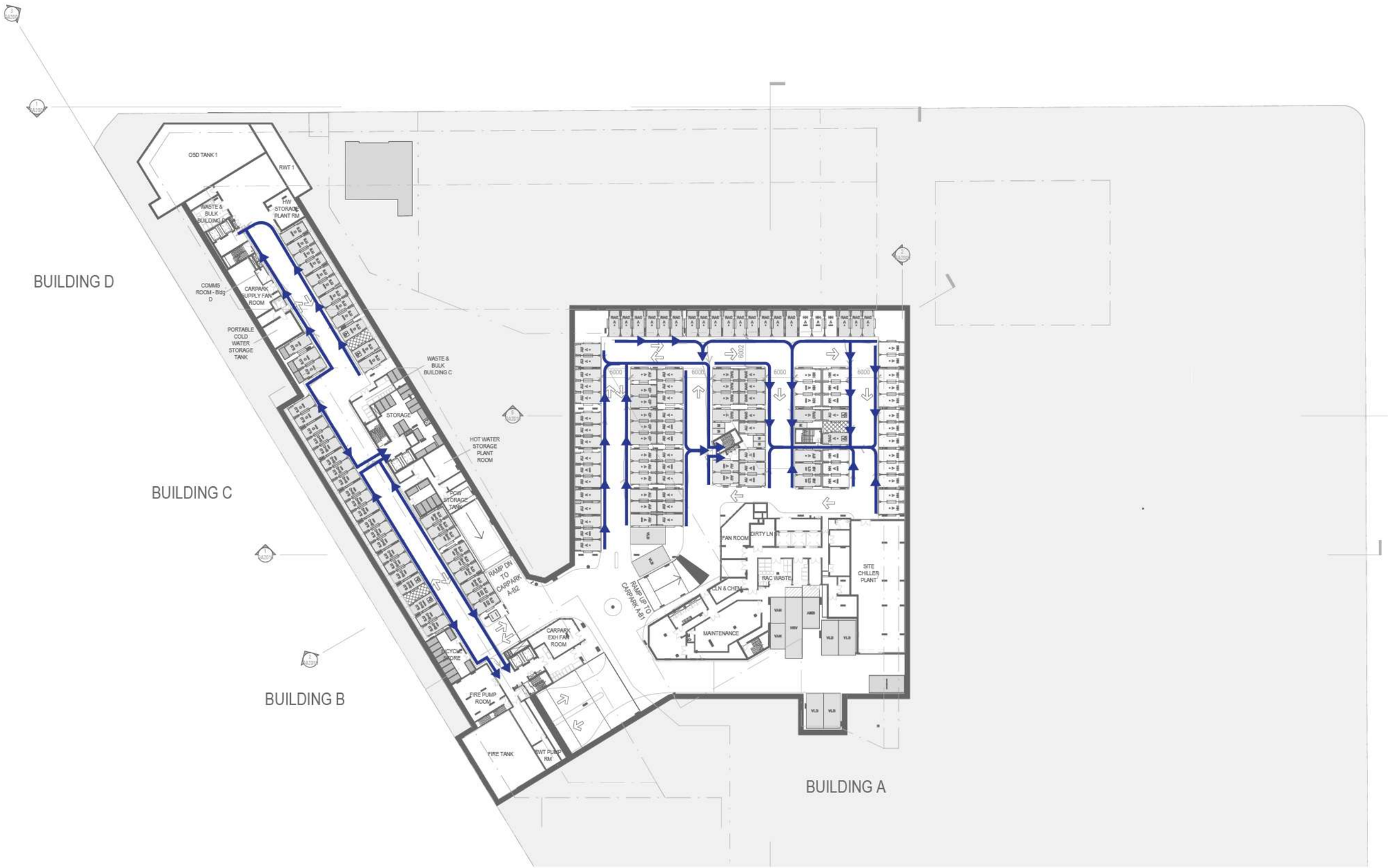
SITE LEVEL GROUND



LEGEND

Pedestrian Movements

SITE LEVEL BASEMENT 01



LEGEND

Pedestrian Movements

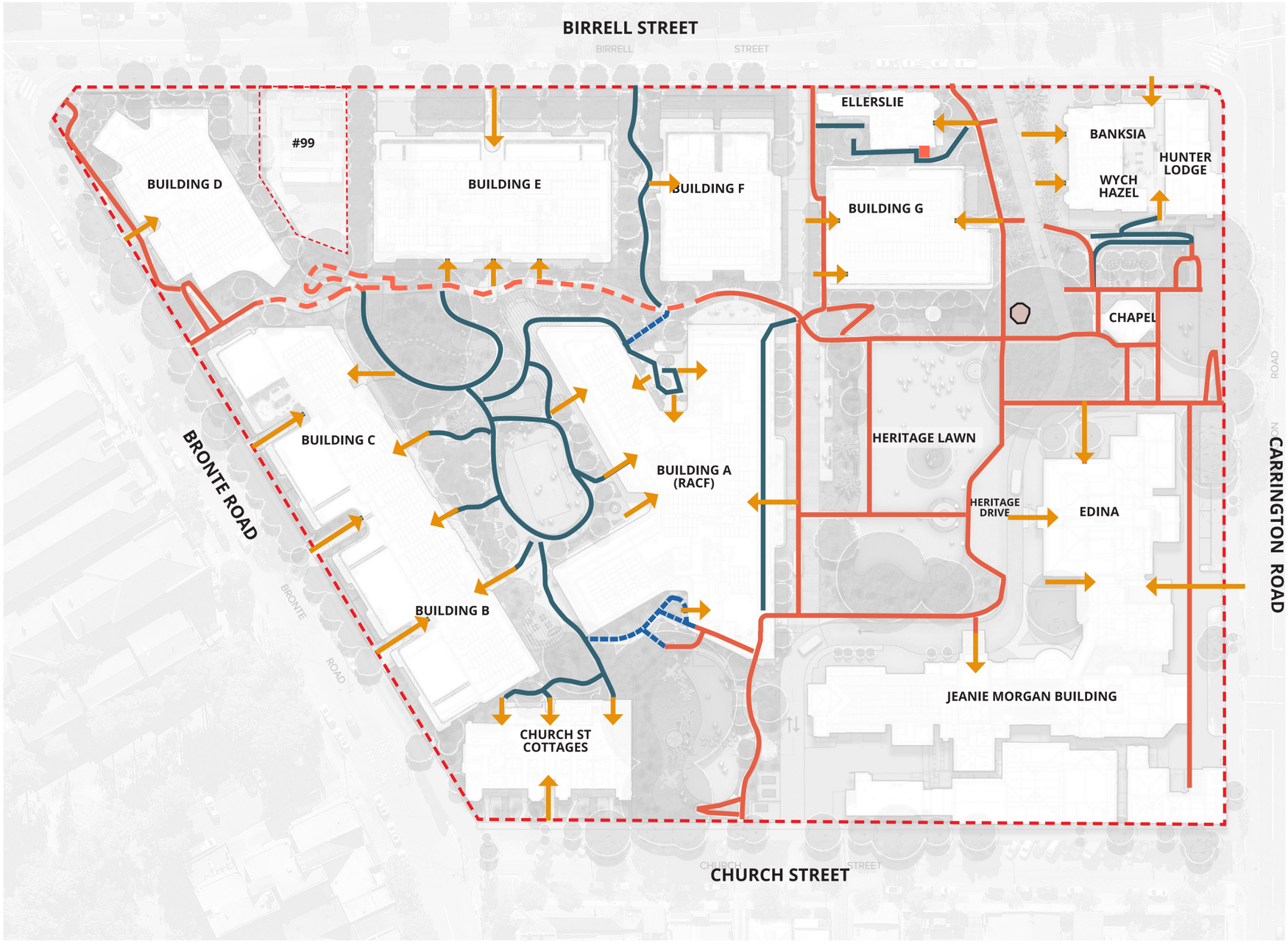
SITE LEVEL BASEMENT 02

LEGEND

Pedestrian Movements

Design Outcomes

Access & Movement - Pedestrian Circulation



KEY

- PUBLIC CONNECTION
- RESIDENT CONNECTION
- PUBLIC CONNECTION WITHIN CONTROLED TIMEFRAME
- STAFF/MAINTENANCE ACCESS
- LIFT ACCESS
- BUILDING ENTRY/EXIT

1:1250 @ A3

0 12.5 25 37.5 50m

ARCADIA