

Construction Traffic Management Plan

S4 Data Centre

Prepared for NEXTDC

19 January 2026

211085

Contents

1.0	Introduction.....	6
1.1	Overview.....	6
1.2	Conditions of Consent.....	7
1.3	Council Consultation.....	9
2.0	Existing Conditions.....	10
2.1	The Site.....	10
2.1.1	State Road Network.....	11
2.1.2	Local Road Network.....	12
2.1.3	Planned Road Network.....	12
2.2	Public Transport.....	12
2.2.1	Buses.....	12
2.3	Active Transport.....	15
2.3.1	Pedestrians.....	15
2.3.2	Cyclists.....	16
2.4	Traffic Conditions.....	17
2.4.1	Traffic Data Collection.....	17
2.4.2	Traffic Volumes.....	18
2.5	Existing Traffic Model.....	19
2.5.1	Pedestrian Volumes.....	21
2.5.2	Performance Criteria.....	21
2.5.3	Existing Intersection Performance.....	22
2.6	Model Calibration.....	23
2.6.1	Signal Phasing & Timing.....	23
2.6.2	Queue Length Calibration.....	24
3.0	Construction Overview.....	25
3.1	Detailed Project Description.....	25
3.1.1	Overall Works.....	25
3.1.2	Construction Site Plan.....	27
3.1.3	HV External Cable and Sydney West Expansion.....	28
3.2	Estimated Construction Program.....	34
3.2.1	Overall Works.....	34
3.2.2	HV External Cable and Sydney West Expansion.....	35
3.3	Main Construction Activities.....	36

3.4	Hours of operation.....	37
4.0	Management of Construction Vehicles	38
4.1	Construction Truck Routes	38
4.2	Construction Vehicle Types.....	39
4.3	Construction Site Access.....	42
4.4	Vehicle Management.....	42
4.4.1	Heavy Vehicles	42
4.4.2	Light Vehicles.....	43
4.5	Construction Vehicle Parking.....	43
4.6	Work Zones	44
4.7	Swept Path Analysis.....	46
4.8	Road Closures	47
4.8.1	Main Works	47
4.8.2	HV External Cable and Sydney West Expansion	47
4.9	Traffic Guidance Scheme	47
5.0	Impact of the Proposed Works	48
5.1	Future Traffic Models	48
5.1.1	Modelling Scenarios	48
5.1.2	2026 Model	48
5.1.3	Trip Distribution	50
5.1.4	Construction Works Projected Traffic Volumes	51
5.1.5	Intersection Performance.....	53
5.2	Local Traffic Impacts	54
5.3	Public Transport.....	55
5.4	Parking Impacts	55
5.5	Pedestrians.....	55
5.6	Cyclists	55
5.7	Public Infrastructure	55
5.8	Cumulative Local Impact	56
5.8.1	Oakdale East Industrial Estate.....	56
5.8.2	NEXTDC “S7” Data Centre Campus (Eastern Creek):.....	56
5.8.3	Echidna Data Centre (Eastern Creek):.....	57
5.9	Road Safety	57
5.9.1	Construction Vehicle Access Points.....	57

5.9.2 Construction Vehicle Routes and Intersections	57
5.9.3 Emergency Services.....	57
5.9.4 Communication of Works.....	57
6.0 Driver Code of Conduct.....	59
Appendix A – Overall Site Plan	61
Appendix B – CVs.....	62
Appendix C – Traffic Guidance Scheme (TGS)	63
Appendix D – SIDRA Model Results	64
Appendix E – Swept Path Analysis.....	65

Revision Register

Rev	Date	Status	Prepared By	Reviewed By	Approved By
0	05/12/2025	Draft for comment	AA	SS	GC
1	09/12/2025	Updated Draft	AA	SS	GC
2	19/01/2026	Final	AA	SS	GC

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1.0 Introduction

1.1 Overview

This Final Construction Traffic Management Plan (CTMP) outlines the management of construction traffic for the NEXTDC S4 Data Centre development located at 16 Johnston Crescent, Horsley Park (SSD-63741210).

This report has been prepared as a final version of the preliminary report, prepared for the purposes of the Construction Certificate (CC). This report includes detailed construction methodology input from Multiplex and TransGrid/Lumea.

The construction and operation of the S4 data centre development include site preparation works, bulk earthworks and infrastructure, and construction of the buildings, ancillary facilities, and associated HV cable/substation works.

This CTMP has been prepared to address the external HV cable connection route which will be required as part of the greater Data Centre works and associated substation at Stage 1. The HV route follows the existing roadways from the SSDA site via Johnston Crescent and Old Wallgrove Road and connects to Sydney West TransGrid substation. Additional works at the Sydney West TransGrid substation will include the extension of the existing substation bench to enable the construction of two new 330KV feeder bays.

The key features of the construction works are summarised as follows:

- Site preparation works including bulk earthworks including tree removal.
- Staged construction and operation of two data centre buildings comprising a total gross floor area (GFA) of 61,695m² including 56,464m² of technical data hall floor space and 5,231m² of ancillary office floor space, including 'front of house' meeting and administrative spaces.
- Ancillary development including a centralised security office building at the main vehicle entrance, on-site parking for 200 cars, business identification signage (pylon and elevation signage), civil and stormwater works and 12,769m² of deep soil landscaping.
- Provision of a high-voltage (HV) power connection delivering 294 megawatts of power, including a 330kV substation and a 33kV switching station, plus above ground diesel storage tanks and above ground water tanks for industrial water and fire water.
- The project will be delivered in four construction stages as follows:
 - Stage 1 = Building C, HV switching building, 330kV substation, HV external cabling route, entrance to site, centralised security office, and water tanks.
 - Stage 2 = Building D
 - Stage 3 = Building A
 - Stage 4 = Building B

Stage 1 comprises installing two 330 kV underground transmission cable circuits over ~2.6 km, primarily within existing road reserves along Johnston Crescent and Old Wallgrove Road, linking the NEXTDC S4 onsite substation to TransGrid's Sydney West Substation and traversing both Fairfield and Blacktown Local Government Areas (LGAs).

This CTMP addresses the construction impacts of Stage 1 and the following stages, including haul routes, work-zone/TGS arrangements, access and parking arrangements, impacts on existing traffic, pedestrian and bicycle networks impacts and mitigation measures.

1.2 Conditions of Consent

Taylor Thomson Whitting (TTW) has been engaged by NEXTDC to provide traffic engineering consultancy services for the development of the S4 Data Centre. The objective of this CTMP is to ensure safe and efficient movement of vehicles and pedestrians onto, off and around the site, whilst minimising and mitigating disruptions/impacts and maintaining a safe environment for both vehicular and pedestrian traffic external to the site during the construction process.

The contractor shall be responsible for acquiring the necessary certificates, licences, consents, permits and approvals relevant to the construction on this site.

A CTMP is developed to satisfy the duties of various work health and safety legislation, regulations, and codes of practice. Traffic Guidance Scheme (TGS) will also need to be developed for the future site to demonstrate the traffic control procedures to be implemented.

The project was approved under SSDA in December 2025. A CTMP is required in accordance with the Condition of Development Consent No. B29 as shown in Table 1 whereby sections of this report are provided in response to the requirements of the Condition.

Table 1: Condition B36

Key items	Comments and references
<p>Construction Traffic Management Plan:</p> <p>B36. Prior to the commencement of construction, the Applicant must prepare a Construction Traffic Management Plan (CTMP) for the development to the satisfaction of the Planning Secretary. The CTMP must form part of the development's CEMP in accordance with condition C2 and must:</p>	
(a) be prepared by a suitably qualified and experienced person(s);	This report has been prepared by qualified traffic engineers. CVs have been attached to Appendix B of this report.
(b) be prepared in consultation with Council/s;	This version will be used for Council consultation. Consultation records are recorded in the following Section 1.3
(c) detail the measures that are to be implemented to ensure road safety and network efficiency during construction;	Refer to Section 5.9
(d). detail heavy vehicle routes, access and parking arrangements;	Refer to Section 4.0
(e) provide details of any oversized vehicles required for construction;	Refer to Section 4.0
(f) provide details of traffic control measures (such as an escort or other suitable traffic control measure) to manage the movement of oversized vehicles along public roads;	Refer to 4.4
<p>(g) include a Driver Code of Conduct to:</p> <p>(i) minimise the impacts of earthworks and construction on the local and regional road network;</p> <p>(ii) minimise conflicts with other road users;</p> <p>(iii) minimise road traffic noise; and</p> <p>(iv) ensure truck drivers use specified routes;</p>	Refer to Section 6.0
(h) include a program to monitor the effectiveness of these measures; and	Refer to Section 3.2
(i) if necessary, detail procedures for notifying residents and surrounding businesses of any potential disruptions to routes.	Refer to Section 6.0

1.3 Council Consultation

This CTMP has been prepared in consultation with the design team, relevant stakeholders and Fairfield City Council (FCC). The items raised from the council consultation and the responses are summarised in Table 2 below.

Table 2: Council Consultation

Key items	Comments and references
<p>A Construction Traffic Management Plan detailing the stages of works being carried out and the construction traffic impacts of the development proposal on the adjoining road network (state road and local road network) shall be assessed for each stage in detail.</p> <p>Received within the SEARs advisory letter from Fairfield City Council dated 22 November 2023:</p>	<p>Refer to this report Section 5.0 for impact of proposed works on the adjoining road network.</p>

2.0 Existing Conditions

2.1 The Site

The site is located at 16 Johnston Crescent, Horsley Park within the Fairfield Local Government Area (LGA). The site is legally described as Lot 305 in Deposited Plan 1275011.

An aerial photograph of the site is provided at Figure 1. The site comprises vacant land which has been cleared of vegetation and does not contain any existing built form structures. Bulk earthworks approved under DA-893-201 have been completed on site.

The site will be well serviced by infrastructure. The signalised intersection of Lenore Drive and Old Wallgrove Road at Eastern Creek is approximately 2 kilometres to the north, providing access to Wallgrove Road and the Westlink M7 Motorway to the east and Erskine Park Road and Mamre Road to the west. Each of these roads provides access to the M4 Motorway to the north and M5 Motorway to the south. A utilities and site services report will accompany the EIS.

The site is located approximately 35 kilometres west of the Sydney Central Business District (CBD), 17 kilometres west of the Parramatta CBD and 10 kilometres north-east of the future Western Sydney International (WSI) airport.

The site is within a developing employment precinct, including the ESR Horsley Logistics Park, Oakdale Central, Oakdale South and Horsley Park Employment Precinct. It is also close to other established and emerging employment-generating precincts, including Eastern Creek to the north, Huntingwood to the north-east, Wetherill Park and Mamre Road West to the north-west and Wetherill Park to the east.



Figure 1: Proposed staging of development design

Source: Nearmap

2.1.1 State Road Network

The state roads in the vicinity of the site are shown in Figure 2. To the north of the site, Old Wallgrove Road becomes a state road at its intersection with Lenore Drive, which is also a state road. The M7 and M4 motorways are also classified as state roads, as is Erskine Park Road. Ferrers Road to the east of the site is a regional road in the area.

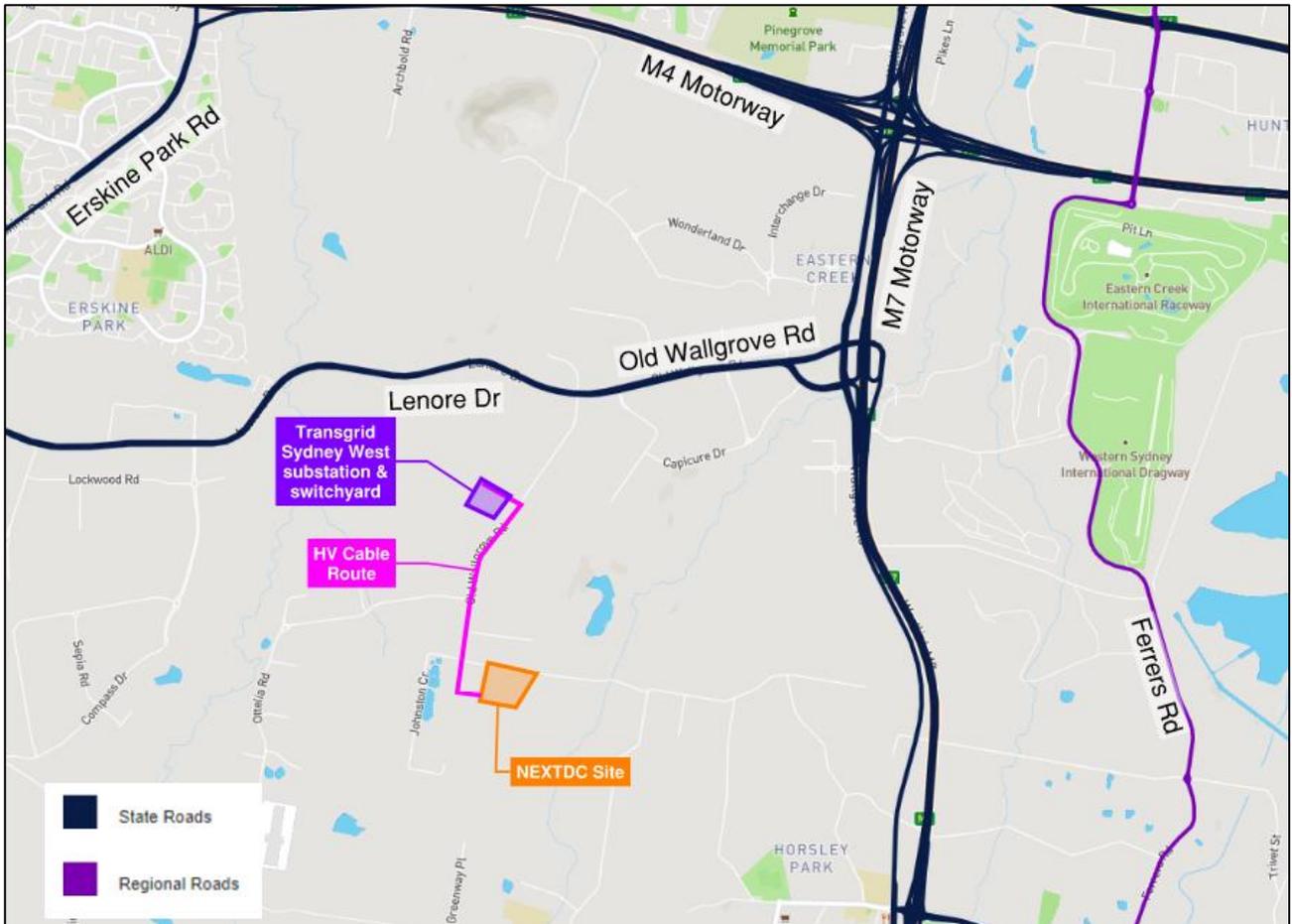


Figure 2: State Road Network

Source: TfNSW Road Network Classifications

M7 Motorway

The M7 motorway is an arterial route providing a primarily north-south alignment, connecting Prestons in the south and Baulkham Hills in the north. The M4 motorway is an arterial route providing a primarily east-west alignment, connecting the City in the Western Sydney suburbs in the west. The M4, M7 and Wallgrove Road intersect at the Lighthorse Interchange to the north-east of the site

Lenore Drive / Old Wallgrove Road (between M7 and Erskine Park Road)

Old Wallgrove Road intersects with Lenore Drive and Telopea Place under traffic signal operation. Old Wallgrove Road / Lenore Drive extends in an east-west alignment connecting the M7 motorway in the east and Erskine Park Road in the west. The road comprising a dual carriageway and providing two to three through lanes of traffic in each direction with additional dedicated turning lanes on approach to major intersections. The carriageways are separated by a central vegetated / concrete median. It is signposted with an 80 km/h speed limit. Old Wallgrove Road / Lenore Drive is an RMS approved 25/26m B-double Route.

2.1.2 Local Road Network

Burley Road

The site is located at 327 Burley Road on the southern side of the roadway. Burley Road is partially unsealed to the east of the development site for approximately 350 metres. The rest of the roadway has two traffic lanes, one in each direction. The road does not contain or kerb and gutter provisions and has sections with line marking and delineation. It is signposted with a 60 km/h speed limit.

Johnston Crescent

Johnston Crescent adjoins Burley Road at the intersection with Old Wallgrove Road. It then extends to the south, placing it to the west of the development site. The road contains one lane in each travel direction.

Old Wallgrove Road

Old Wallgrove Road intersects with Burley Road and Johnston Crescent to the north-west of the site. At this point, the road contains two traffic lanes, one in each direction. The road widens to the north of the site at its intersection with Millner Avenue to become a four lane roadway, with two lanes in each direction and a speed limit of 80 km/h. Further north, Old Wallgrove Road intersects with Lenore Drive and extends towards the M7 motorway. On approach to the motorway, the road widens to three lanes in each direction.

2.1.3 Planned Road Network

Southern Link Road

The site is located at 16 Johnston Crescent, on the southern side of the planned future Southern Link Road (SLR) roadway. The future SLR is being planned as an east-west arterial route, as part of the WSEA Strategic Transport Assessment. It is considered that the SLR would run parallel to the Erskine Park Link Road and would ultimately run adjacent to the northern boundary of the subject site. The road is to form a dual carriageway comprising 2 of 4 lanes of traffic divided by a central median. It is assumed that in the vicinity of the site the SLR would be signposted with a 60 km/h speed limit.

Northwest Link Road

The Northwest Link Road is a planned future road providing a connection between Old Wallgrove Road in the south-east and the M4 in the north-west. This road will create three future intersections with Old Wallgrove Road, Lenore Drive and the M4 motorway, the details for which are unknown at the time of writing this report. The Northwest Link Road is to provide 2 lanes of traffic in each direction. The Northwest Link Road is assumed to be signposted with a 60 km/h speed limit.

2.2 Public Transport

2.2.1 Buses

There are limited public transport services available to travel to and from the site. There are however bus stops located approximately 2 kilometres north of the site on Lenore Drive / Old Wallgrove Road and would take approximately 24 minutes to walk to. Other bus stops are available on Burley Road and Delaware Road to the east of the site. However, these bus stops are accessible via the unsealed segment of Burley Road, meaning that pedestrians cannot easily access these bus stops. The locations of all nearby bus stops are shown in Figure 3.

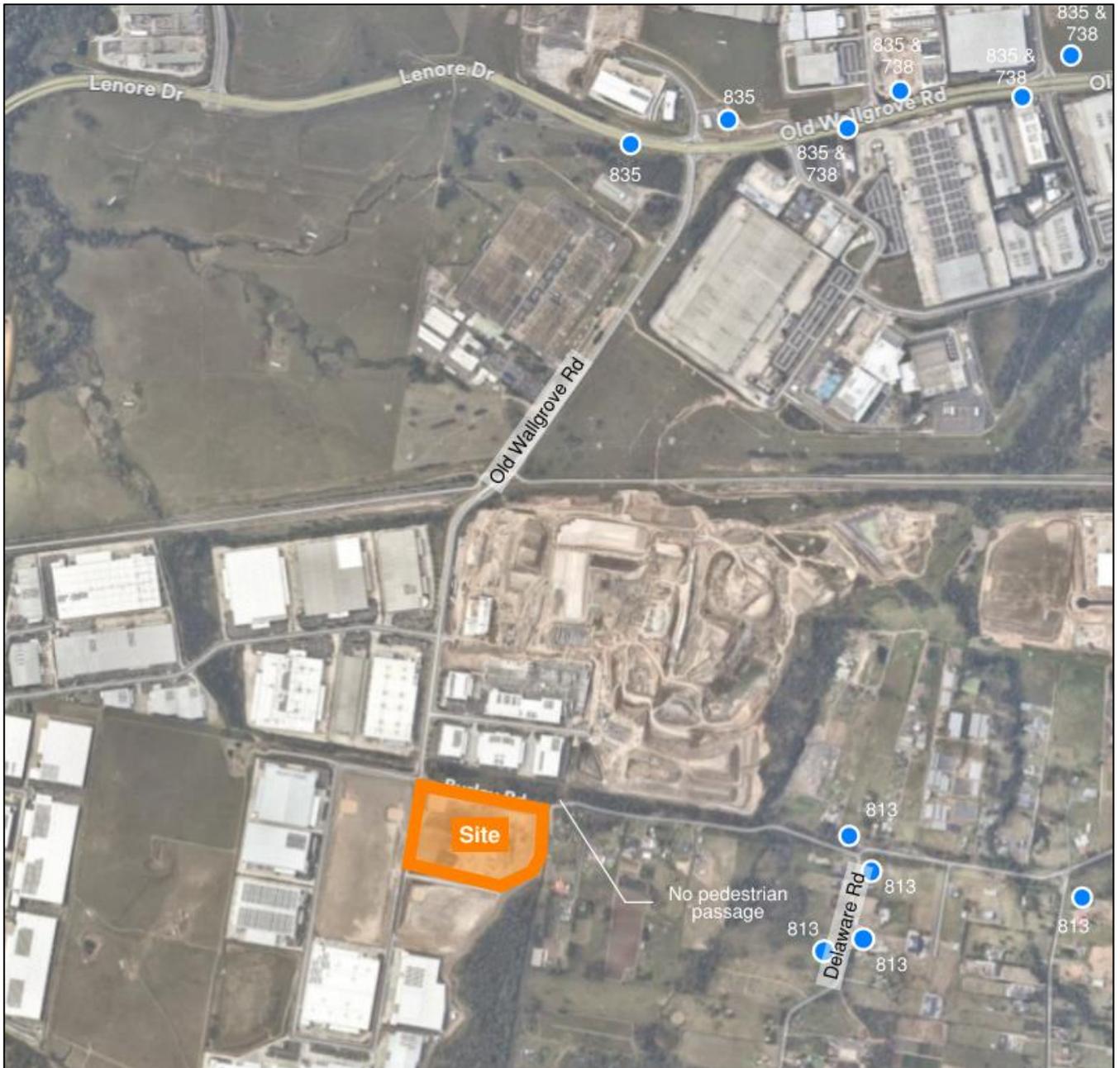


Figure 3: Nearby Bus Stop Facilities

Source: Nearmap

The bus routes available at these bus stops are summarised in Table 3 and the relevant bus network maps are included in Figure 4.

Table 3: Summary of Available Bus Services

Operator	Route Number	Route	Frequency during AM and PM peak hours
Busways Western Sydney	738	Mount Druitt to Eastern Creek via Rooty Hill (Loop Service)	AM: 30 minutes PM: 20 – 40 minutes
Transit Systems	813	Bonnyrigg and Western Sydney Parklands to Fairfield	AM: 105 minutes PM: 1 service offered
		Fairfield to Western Sydney Parklands and Bonnyrigg	AM: 1 service offered PM: 30 minutes
	835	WSU Penrith to Prairiewood	AM: 30 minutes PM: 30 minutes
		Prairiewood to WSU Penrith	AM: 30 minutes PM: 30 minutes

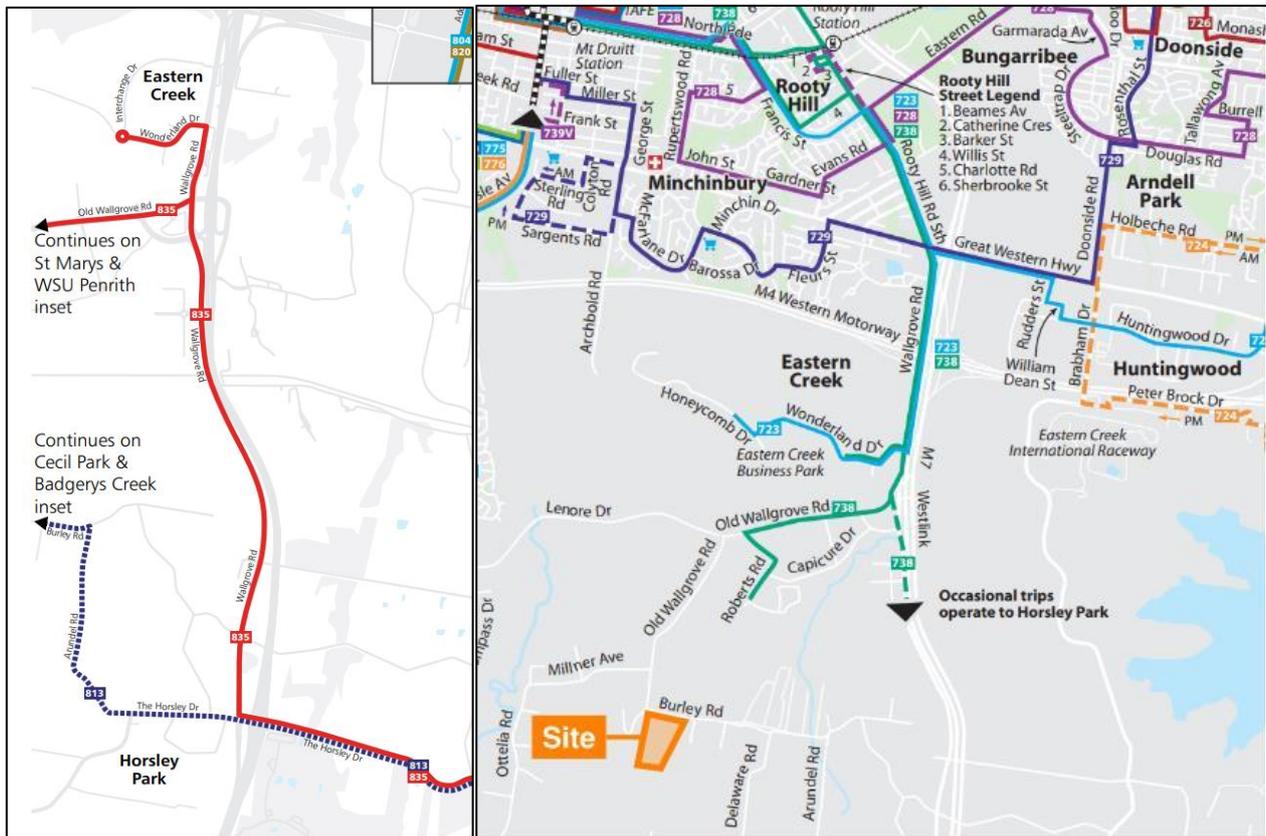


Figure 4: Transit Systems and Busways Bus Network Maps

Source: Transit Systems, 2021

2.3 Active Transport

2.3.1 Pedestrians

There is limited pedestrian infrastructure available in the road network local to the site. There are no pedestrian footpaths or safe road crossing points within 350 metres of the site. 350 metres north of the site is the signalised intersection between Old Wallgrove Road and Millner Avenue, providing a safe crossing opportunity for pedestrians. Old Wallgrove Road to the north of this intersection includes a shared path adjacent to the northbound lane, and footpaths are provided along both sides of Millner Avenue to the west.

The available pedestrian facilities near to the site are shown in Figure 5.



Figure 5: Existing Pedestrian Facilities

2.3.2 Cyclists

The closest designated cycleway to the site is 350 metres north on Old Wallgrove Road, as indicated in Figure 6. From here, the local cycle network provides good connection to the west along Lenore Drive and east along Old Wallgrove Road, with access to the local roads such as Roberts Road and Capicure Drive.

The Westlink M7 Shared Path is approximately 3.5 kilometres from the site, or a 12-minute cycle. The shared path runs alongside the motorway for approximately 40 kilometres between Baulkham Hills and Prestons and is separated from the roadway.

However, cycling infrastructure is still limited around the site, with no cyclist facilities to the south of the site.

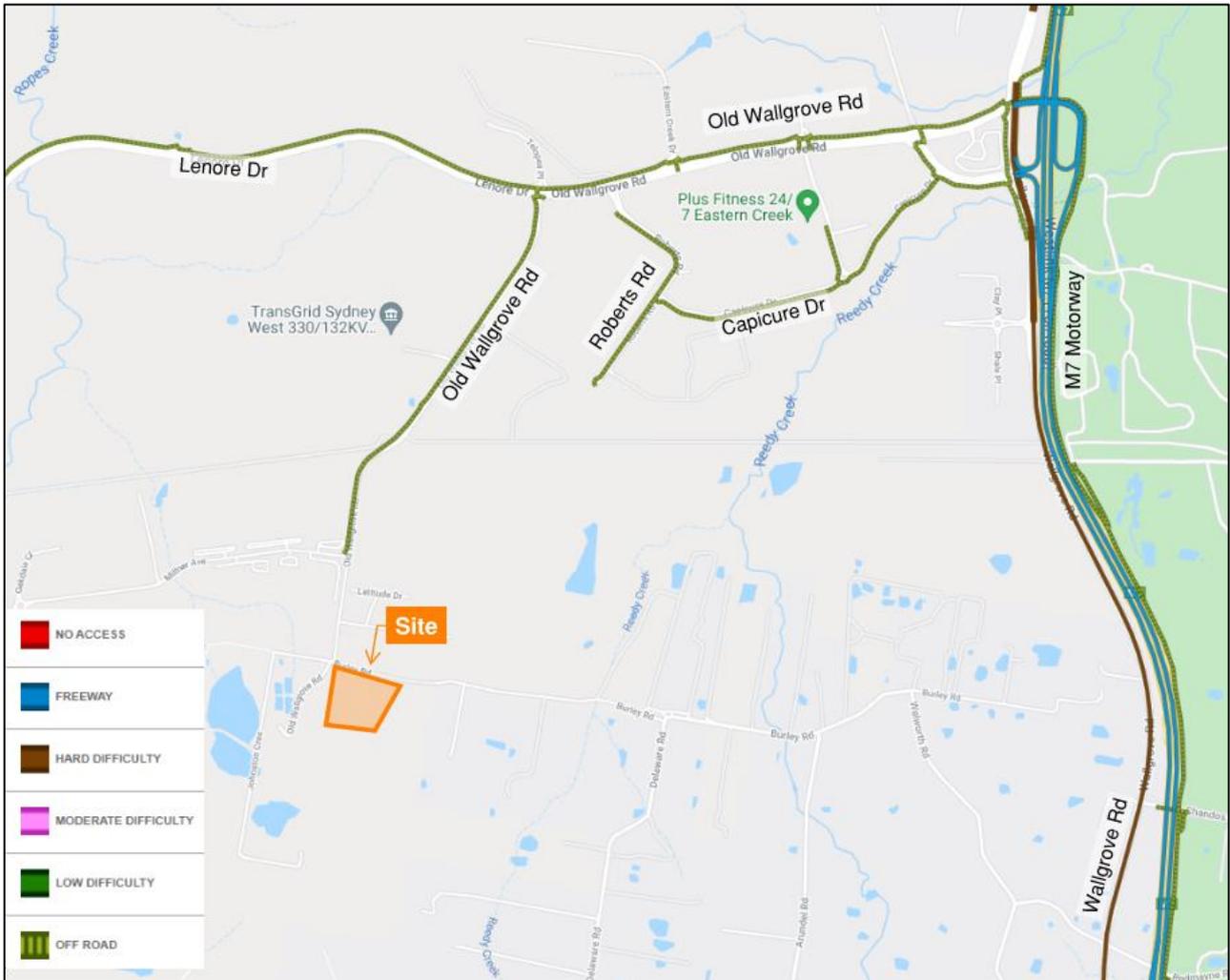


Figure 6: Existing Cyclist Facilities

Source: TfNSW Cycleway Finder

2.4 Traffic Conditions

2.4.1 Traffic Data Collection

The following intersections, shown in Figure 7, have been surveyed in the vicinity of the site during the morning and afternoon peak hours in order to determine the existing traffic volumes within the surrounding road network:

- Telopea Place / Lenore Dr / Old Wallgrove Rd (signalised)
- Old Wallgrove Rd / Millner Ave (signalised)
- Old Wallgrove Rd / Johnston Cres / Burley Rd (unsignalised)



Figure 7: Surveyed Intersections

Source: Nearmap (2024)

Traffic volume surveys were undertaken on Tuesday 5 December 2023 between 7:00 – 9:00am and 4:00 – 6:00pm. The traffic counts included light vehicles, heavy vehicles, cyclists and pedestrians. The date of data collection is considered representative of a typical day, as it fell within normal (non-school holiday) term period. The volumes surveyed below have been used as a baseline dataset from the SSSA. To reflect current conditions, these baseline volumes have been factored and re-modelled to a 2026 condition (Section 5.1.1), representing current traffic patterns (2026).

2.4.2 Traffic Volumes

The traffic volume surveys determined the following morning and afternoon network peak hours:

- AM Peak hour: 7:00am – 8:00am
- PM Peak hour: 4:15pm – 5:15pm

The peak hour traffic volumes collected at the surveyed intersections are summarised in Figure 8 and Figure 9, for the morning and afternoon survey periods, respectively.

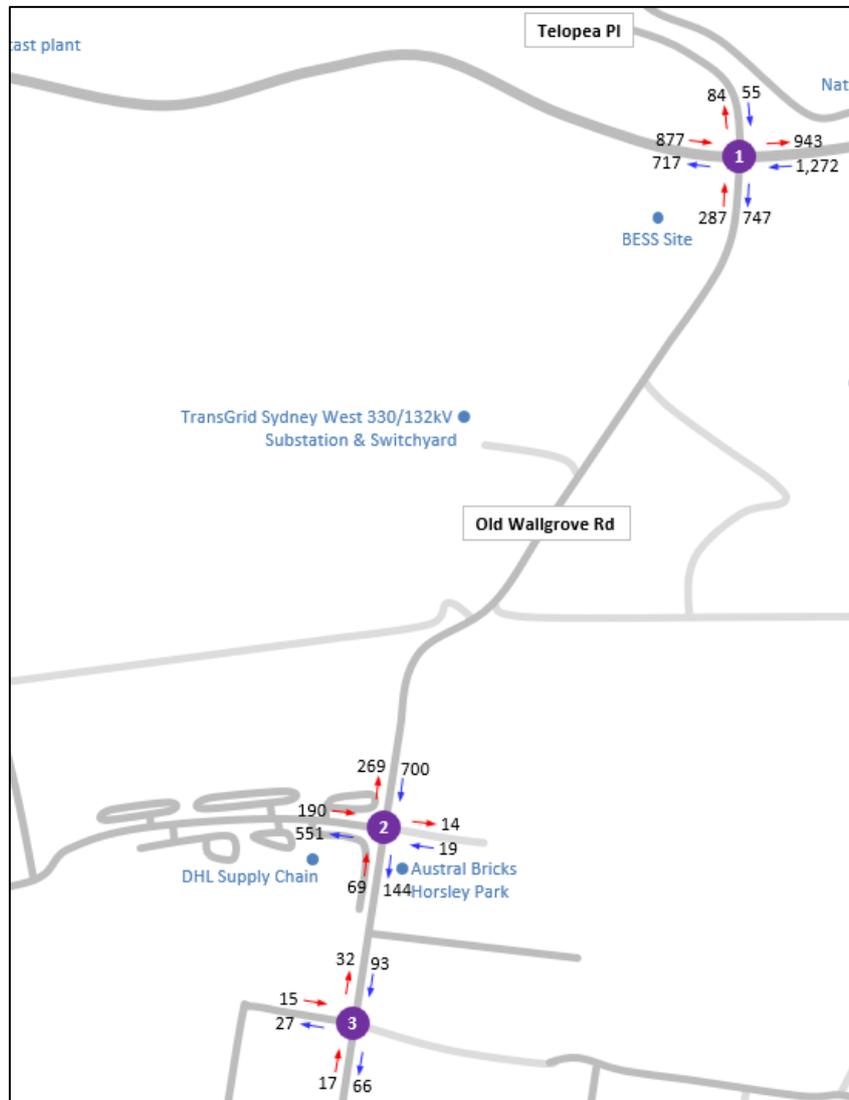


Figure 8: AM Peak Hour Traffic Volumes (7:00am – 8:00am)

Source: Matrix (2023)

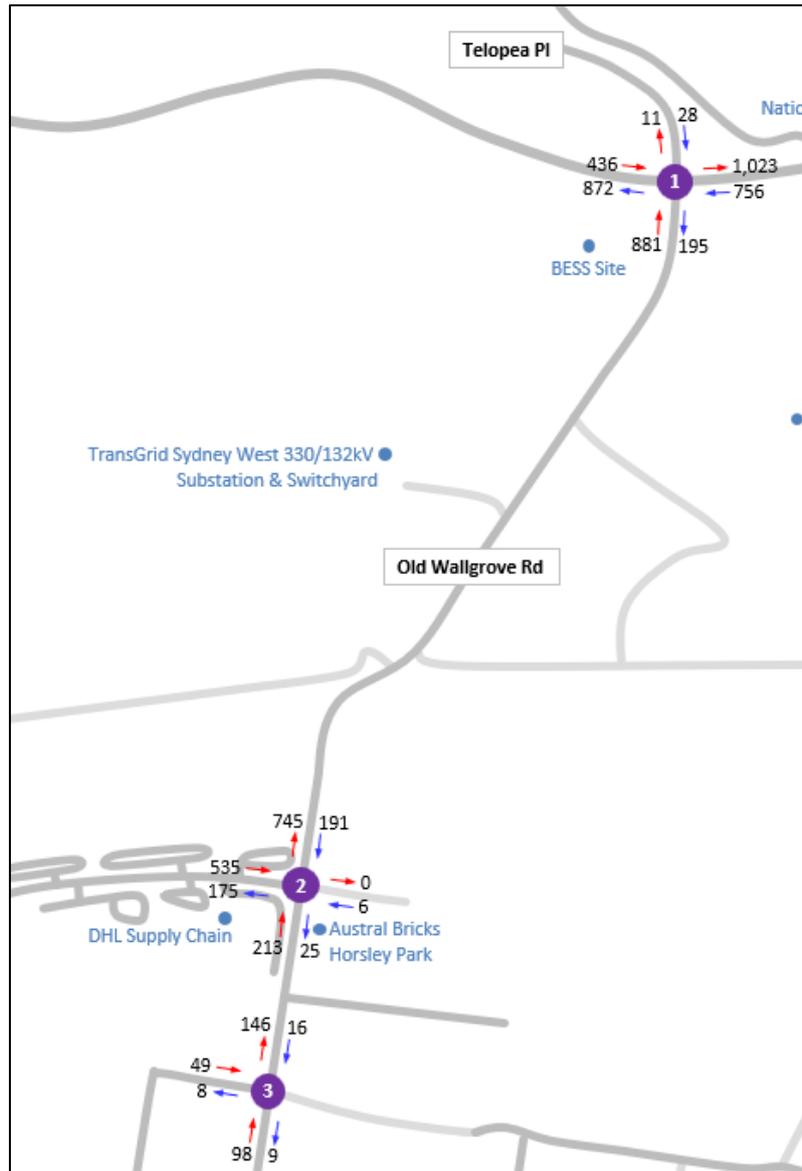


Figure 9: PM Peak Hour Traffic Volumes (4:15pm – 5:15pm)

Source: Matrix (2023)

Survey data indicates that the Johnston Crescent/Burley Road T-intersection carries comparatively lower traffic volumes in both the AM and PM peaks than the other surveyed locations

2.5 Existing Traffic Model

SIDRA intersection modelling has been undertaken to assess the existing traffic conditions and performance of the nearby surveyed intersections. Figure 10, Figure 11 and Figure 12 contains the layout of the three intersections, as modelled in SIDRA.

The upgrades to the signalised intersections layout from the 2023 model are captured in the 2026 modelling scenario, detailed in Section 5.1.2.

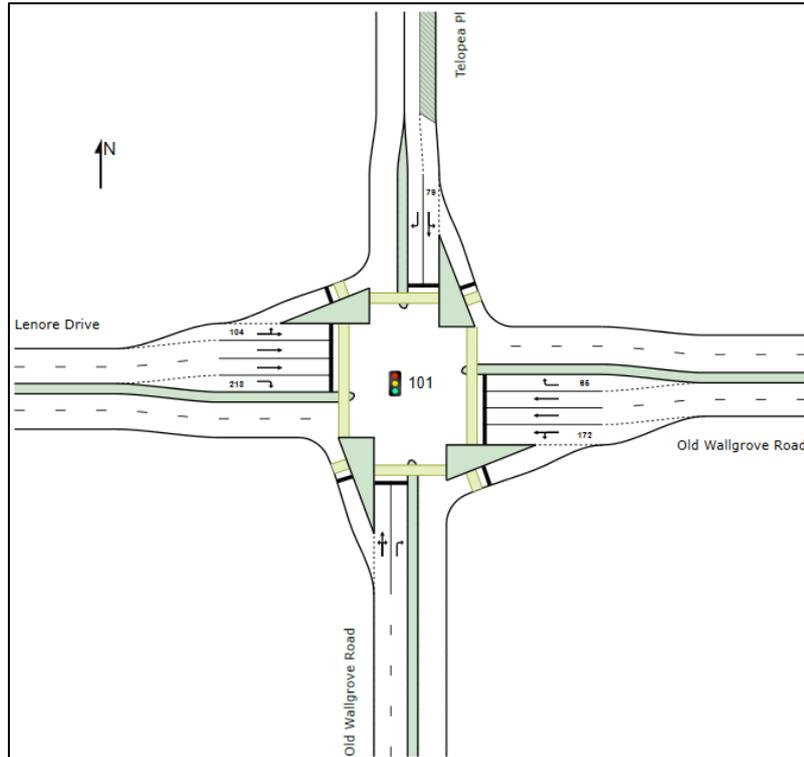


Figure 10: SIDRA Existing Intersection Layout – Old Wallgrove Rd / Lenore Dr / Telopea PI

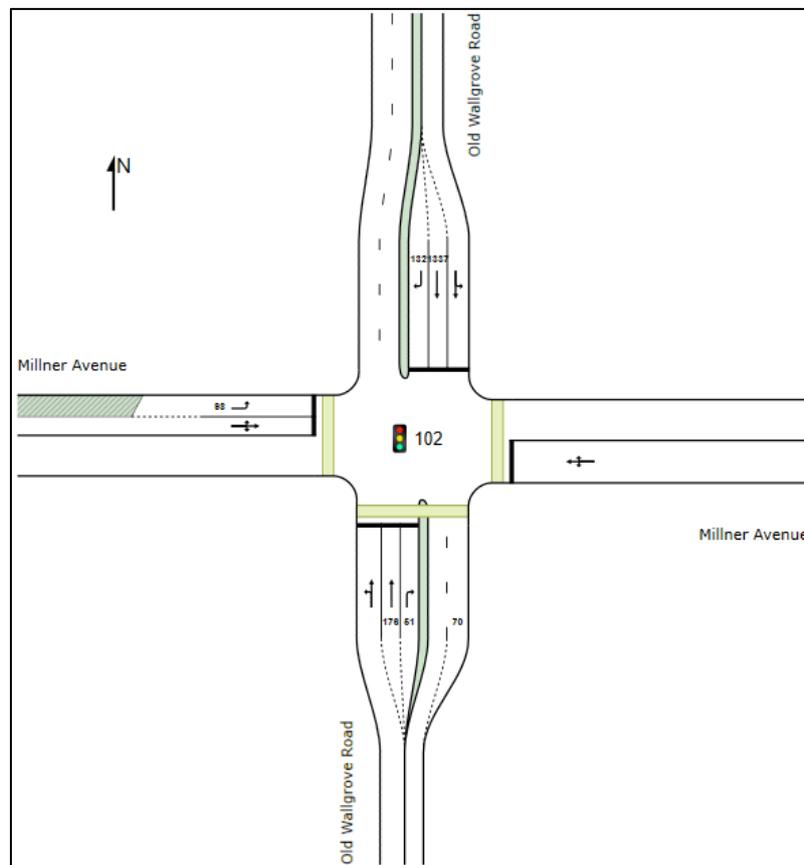


Figure 11: SIDRA Existing Intersection Layout – Millner Ave / Old Wallgrove Rd

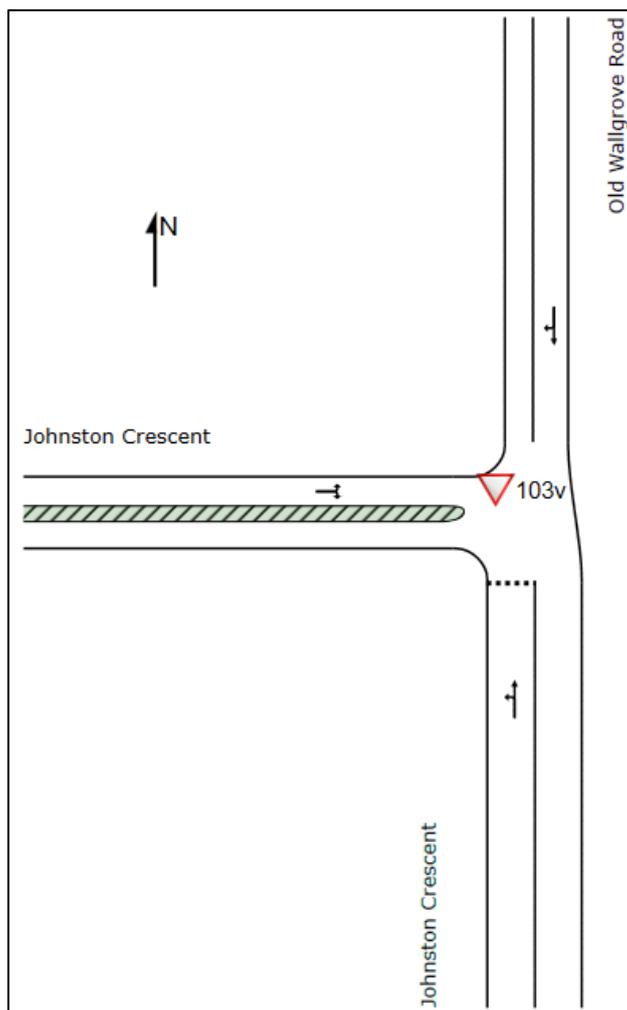


Figure 12: SIDRA Existing Intersection Layout – Old Wallgrove Rd / Johnston Cres

2.5.1 Pedestrian Volumes

Pedestrian volumes were also captured during the above surveys and determined that the pedestrian movements in this area are minimal. During the morning and afternoon peak hours, the pedestrian volume across a single approach of any of the surveyed intersections never exceeded five pedestrians over the whole hour.

As the default volumes in SIDRA are 50 pedestrians per hour for each intersection approach, the actual pedestrian volumes have been input into the model as the default volume would significantly exceed the actual volume.

2.5.2 Performance Criteria

SIDRA modelling outputs provide a range of performance measures, in particular the following parameters are given:

- Degree of saturation (DOS) – The DOS is used to measure the performance of intersections, where a value of 1.0 represents an intersection at theoretical capacity. As the performance of an intersection approaches DOS of 1.0, queue lengths and delays increase rapidly. It is usual to attempt to keep DOS to less than 0.9, with satisfactory intersection operation generally achieved with a DOS below 0.8.

- Average Vehicle Delay (AVD) – The AVD (or average delay per vehicle in seconds) for intersections also provides a measure of the operational performance of an intersection and is used to determine an intersection’s Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection. For priority intersections, the AVD reported relates to the worst performing vehicle movement at the intersection.
- 95th Percentile Queue Length – the queue length at an approach to an intersection whereby the value for which 95% of all observed queue lengths fall
- Level of Service (LOS) – This is a comparative measure that provides an indication of the operating performance, based on AVD.
- Table 4 below further describes what each level of service represents.

Table 4: Intersection Performance Criteria

LOS	AVD (Seconds)	Traffic Signals	Give Way and Roundabouts
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 delays	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2.5.3 Existing Intersection Performance

Table 5 summarises the existing operation and performance of the surveyed intersections.

Table 5: Existing Intersection Performance

Note: Data for unsignalised intersections is taken from the movement with the worst delay

Data for signalised intersections is the intersection total

Peak	DOS	AVD	95% Queue Length (veh)	LOS
Teloepa Place / Lenore Dr / Old Wallgrove Rd (signalised)				
AM	0.665	26.1	13.7	B
PM	0.872	31.4	23.3	C
Old Wallgrove Rd / Millner Ave (signalised)				
AM	0.590	15.2	10.2	A
PM	0.374	14.7	5.8	A
Old Wallgrove Rd / Johnston Cres / Burley Rd (unsignalised)				
AM	0.012	6.2	0.0	A
PM	0.087	6.8	0.3	A

The results in Table 5 indicate that all surveyed intersections are currently performing at a satisfactory level of service during the morning and afternoon peak periods.

2.6 Model Calibration

Reference is made to SIDRA User Guide Section 2.6.2 – 2.6.4 which states the tools, measurements and procedures that should be followed in order to accurately calibrate the existing SIDRA model. The User Guide States that the SIDRA model performance should be compared to field observation.

2.6.1 Signal Phasing & Timing

To accurately model the signalised intersections within the network, the phasing and timing information has been input for the existing conditions models based on the following data sources:

- Intersection movement count video footage
 - Footage has been reviewed from the traffic data collection undertaken on 5th of December 2023.
 - The 30-minute AM and PM peak periods have been analysed to understand which phases ran during the modelling period, and which phases were skipped.
- Sydney Coordinated Adaptive Traffic System (SCATS) data
 - Data has been collected for the same day as the intersection movement counts for consistency (5th of December 2023).
 - SCATS data is presented in 15-minute blocks and describes the frequency and timing of each phase called within that period.

Based on analysis of the above data sources, *User-Given Phase Times* and *Phase Frequencies* have been input to the SIDRA model to calibrate the model to the on-site conditions.

For future conditions models, the *Practical Cycle Time* timing option is selected, based on previous advice provided directly by SIDRA Technical Support.

2.6.2 Queue Length Calibration

The SIDRA model has been further calibrated by reviewing the modelled queue lengths against on-site queue length observations. Site observations of the morning and afternoon peak periods were undertaken on the same day as the intersection movement counts for consistency (31st August 2023). The maximum queues were recorded at each intersection, which represent the 95th percentile output queues in SIDRA.

Table 5 indicates the queue length field survey results, in metres, observed at each approach of the signalised intersections of Old Wallgrove Road, Lenore Drive and Telopea Place and Old Wallgrove Road and Millner Avenue during each peak hour and the resultant 95th percentile queue from the existing model, thereby providing an indication of the relevancy of the model.

No queuing was observed at the unsignalised intersection of Johnston Crescent, Burley Road and Old Wallgrove Road. Accordingly, the 95th percentiles queues resulted from the SIDRA analysis existing model were less than one vehicle in length.

Table 6: Maximum Observed Queue and 95th Percentile SIDRA Queue Lengths

	AM Peak (7:00am – 8:00am)			PM Peak (4:15pm – 5:15pm)		
	Field Survey (veh)	SIDRA 95 th Percentile Queue (veh)	Difference	Field Survey (veh)	SIDRA 95 th Percentile Queue (veh)	Difference
Telopea Place / Lenore Dr / Old Wallgrove Rd (signalised)						
Old Wallgrove Rd (South)	6	8.5	+2.5	17	23.3	+3.3
Old Wallgrove Rd (East)	10	13.7	+3.7	11	9.9	-1.1
Telopea Pl (North)	1	2.7	+1.7	4	4.9	+0.9
Lenore Dr (West)	12	10.9	-1.1	5	5.6	+0.6
Old Wallgrove Rd / Millner Ave (signalised)						
Old Wallgrove Rd (North)	14	10.2	-3.8	6	5.8	-0.2
Old Wallgrove Rd (South)	1	0.8	-0.2	2	2	0
Millner Ave (West)	3	1.7	-1.3	7	5.3	-1.2
Access Rd (East)	1	0.6	-0.4	2	0.2	-1.8

As shown in Table 6 review of the SIDRA outputs indicates that the model accurately reflects the observed onsite queues for the same day and peak period.

3.0 Construction Overview

3.1 Detailed Project Description

3.1.1 Overall Works

The key features of the proposed works are summarised as follows:

- Site preparation works including bulk earthworks including tree removal.
- Staged construction and operation of two data centre buildings comprising a total gross floor area (GFA) of 61,695m² including 56,464m² of technical data hall floor space and 5,231m² of ancillary office floor space, including 'front of house' meeting and administrative spaces.
- Ancillary development including a centralised security office building at the main vehicle entrance, on-site parking for 200 cars, business identification signage (pylon and elevation signage), civil and stormwater works and 12,769m² of deep soil landscaping.
- Provision of a high-voltage (HV) power connection delivering 294 megawatts of power, including a 330kV substation and a 33kV switching station, plus above ground diesel storage tanks and above ground water tanks for industrial water and fire water. This is further discussed in Section 3.1.3.
- The project will be delivered in four construction stages as follows:
 - Stage 1 = Building C, HV switching building, 330kV substation, HV external cabling route, entrance to site, centralised security office, and water tanks.
 - Stage 2 = Building D
 - Stage 3 = Building A
 - Stage 4 = Building B

The key components of the proposed data centre development are listed in Table 7. Figure 7 (attached in Appendix A) shows the proposed general arrangement for the data centre development, including the site layout.

Table 7: Project Details

Element	Amended Proposal
Land Use Activity	Data centre with 24 data halls, ancillary office floor space
Development Area	8.206 ha (site) plus land within HV route (11,617 m ²)
Site Area	8.206 ha
Total GFA	61,695m ²
Data Hall GFA	56,464m ²
Ancillary Office / Admin GFA	5,231m ²
Floor Space Ratio	0.75:1
Car Parking	200 spaces
Bicycle Parking	8 spaces
Motorbike Parking	5 spaces
Maximum Building Height	Building AB – 38.67 metres over four storeys Building CD – 38.67 metres over four storeys
Deep Soil	12,769m ² (15.6% of site area)
Tree Removal	0 trees required to be removed for main data centre site. Six trees to be removed on Old Wallgrove Road at interface with TransGrid substation for the HV external cabling route.
Cut and Fill Volume	Net cut 26,000m ³ (approximately)
Power Consumption	<ul style="list-style-type: none"> ▪ 294 megawatts
Operating Hours	<ul style="list-style-type: none"> ▪ 24-hours, 7 days a week
Jobs - full-time equivalent (FTE) employees	Construction: 1,800 Operation: 411
Generators	120

Element	Amended Proposal
<p>Utilities and services</p>	<p><u>Diesel Tanks:</u></p> <p>Building AB: 16 x 136kL</p> <p>Building CD: 16 x 136kL</p> <p><u>Industrial Water Tanks:</u></p> <p>Building A+B: 3 x 2124kL</p> <p>Building C+D: 3 x 2124kL</p> <p><u>Fire Water Tanks:</u></p> <p>2 x 400kL</p> <p><u>Substation:</u></p> <p>330kV substation plus a 33kV switching station on site</p>

3.1.2 Construction Site Plan

A site plan has been provided by Multiplex to indicate the overall construction works within the site and the key elements of the construction methodology including works zone, traffic control location, truck turning area and marshalling areas as well as fencing/hoarding locations. This site plan is provided as Figure 13.

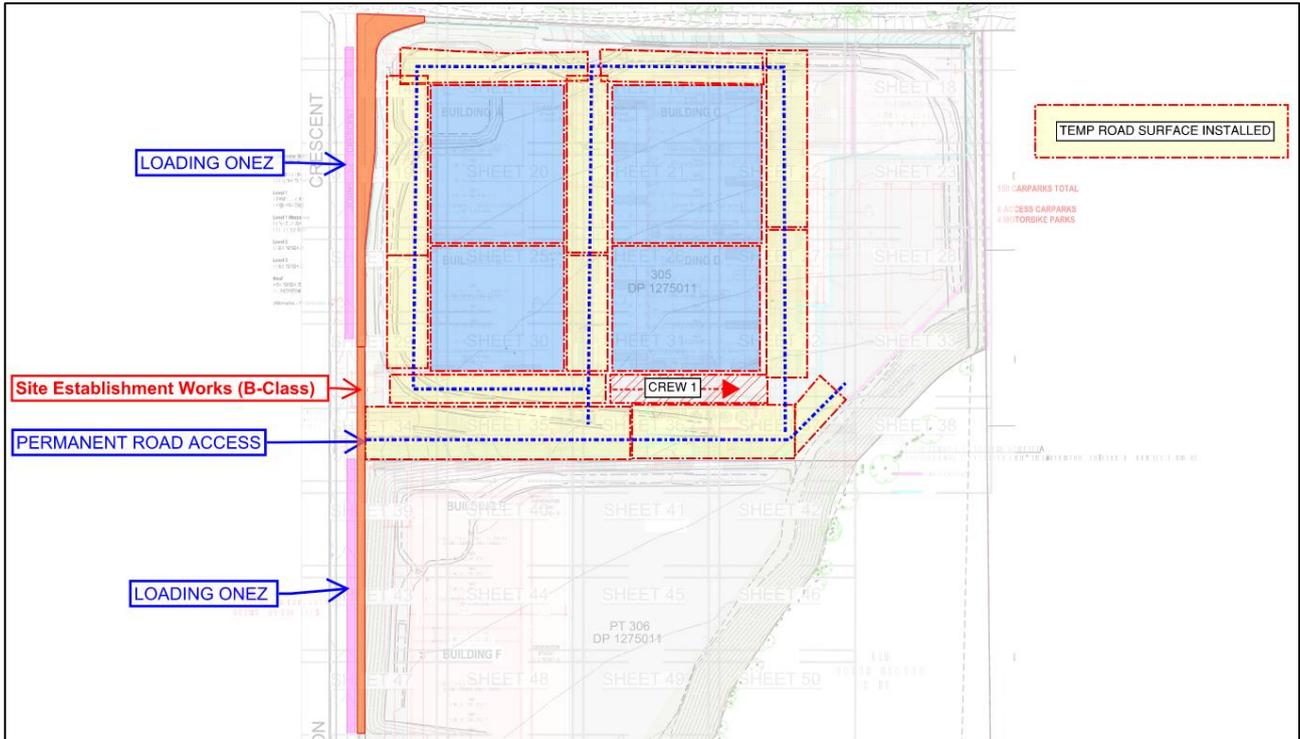


Figure 13: Overall Site Plan

Source: Multiplex (MPX)

3.1.3 HV External Cable and Sydney West Expansion

The HV works include installing two underground high-voltage cable circuits to connect the NEXTDC S4 site to TransGrid's Sydney West Substation on Old Wallgrove Road. The alignment is approximately 2.6 km long and runs predominantly within existing road reserves along Johnston Crescent and Old Wallgrove Road, traversing both the Fairfield City Council and Blacktown City Council local government areas.

Key components of the project include:

- Cable works connecting TransGrid Sydney West Substation with the NEXTDC S4 onsite substation comprising:
 - Two x 330 kV underground transmission cable circuit comprising three cables installed in three conduits;
 - Two smaller conduits for carrying optical fibres;
 - Approx. 2-4 joint bays, per circuit, where sections of cable would be joined together, located approximately every 600-800 metres along the transmission cable route;
 - link boxes and sensor boxes associated with each joint bay to allow cable testing and maintenance;
- Upgrade works at the TransGrid Sydney West substation to facilitate the new 330 kV transmission cable circuit including:
 - The extension of the existing substation bench to enable the construction of two new 330KV feeder bays including:

- Relocation of internal access road.
- Relocation of the fence line.
- Installation of lightning rods (20m in height)
- Extension to 330KV Busbar-B Section-2 at Sydney West Substation.
- The construction of two new 330kV switch bays and associated primary and secondary equipment.
- The construction of a new secondary systems building.
- All required secondary systems work.
- Underground electrical and telecommunications cabling will be installed throughout the broader Sydney West 330kV switchyard as part of the connection of the new switch bay equipment.
- Four temporary construction laydown areas to facilitate construction of the project.

Associated works required to facilitate the construction of the project, such as potential utility relocations, have been considered. No major utility relocations are anticipated and where smaller services may need to be moved to accommodate the transmission cable circuit, this relocation would be restricted to within the project area.

A summary of the external HV works is provided in Table 8.

Table 8: Project Summary – External HV Works

Project element	Summary of proposal
Excavation method	Trenching – Within the Sydney West substation - up to 2 metres wide and up to 4 metres deep Trenching – outside of the substation along road corridor – two separate trenches 1 metre wide and up to 2 metres deep and 2 metres apart
Cable life	Minimum of 40 years
Cable length	2.6 km
Key components	330 kV cables, conduits, joint bays, substation upgrades and temporary construction laydown areas.
Timing and duration	Around a 14-month construction period, proposed to commence in 2026 (subject to project approval). Operations to commence in 2028.
Workforce	Peak construction workforce of around 70 personnel (excludes traffic management personnel)
Estimated spoil volume	Approximately 7,500 cubic metres of spoil would be removed during excavation and trenching.

Project element	Summary of proposal
Hours of construction	<p>Standard construction hours would be adopted where reasonable and feasible:</p> <ul style="list-style-type: none"> • Monday to Friday 7:00 am to 6:00 pm. • Saturday 8:00 am to 1:00 pm; and • No works on Sundays and public holidays. <p>Works outside standard construction hours, including night works and 24-hour operations, may be required for activities along Old Wallgrove Road and Johnston Crescent, at cable jointing locations, and in other areas as necessary or as requested by relevant authorities.</p>
Capital investment for HV component (included in overall amended EDC)	<ol style="list-style-type: none"> 1. Sydney Wests Bay extension works \$25M 2. 330kV cable works from Sydney West Site to the substation at NEXTDC S4 site \$44M 3. GIS substation works within NEXTDC S4 site \$86M <p>TOTAL: \$155M</p>

Figure 14 details the works area and the extent of cabling route that will be required to connect the site and the TransGrid Sydney West Substation site.



Figure 14: Project Area Map
Source: TransGrid, 2025

Figure 15 and Figure 16 detail the proposed works within the TransGrid Sydney West Substation site. A typical trench configuration for two cable circuits is provided at Figure 17.



Figure 15: TransGrid Sydney West Substation - Extent of Works
Source: TransGrid, 2025

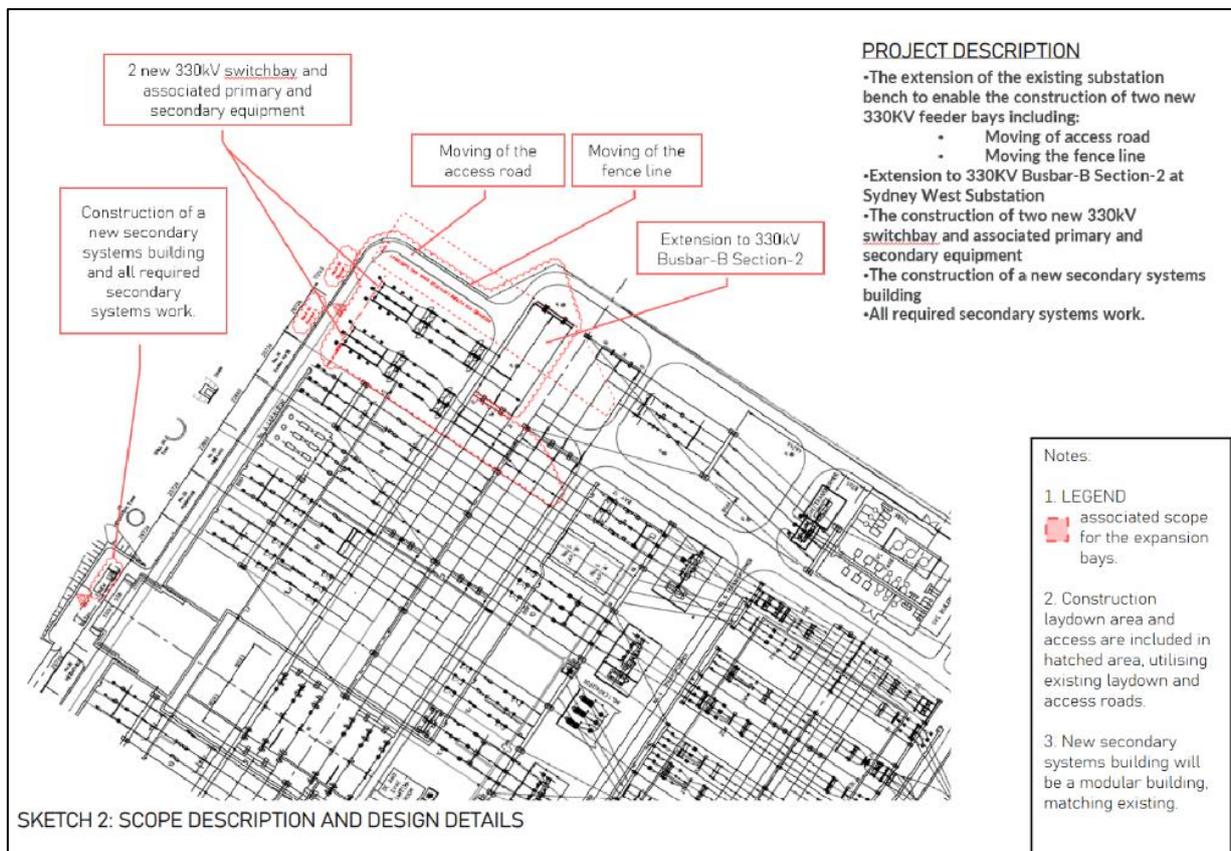


Figure 16: TransGrid Sydney West Substation – Site Plan
Source: TransGrid, 2025

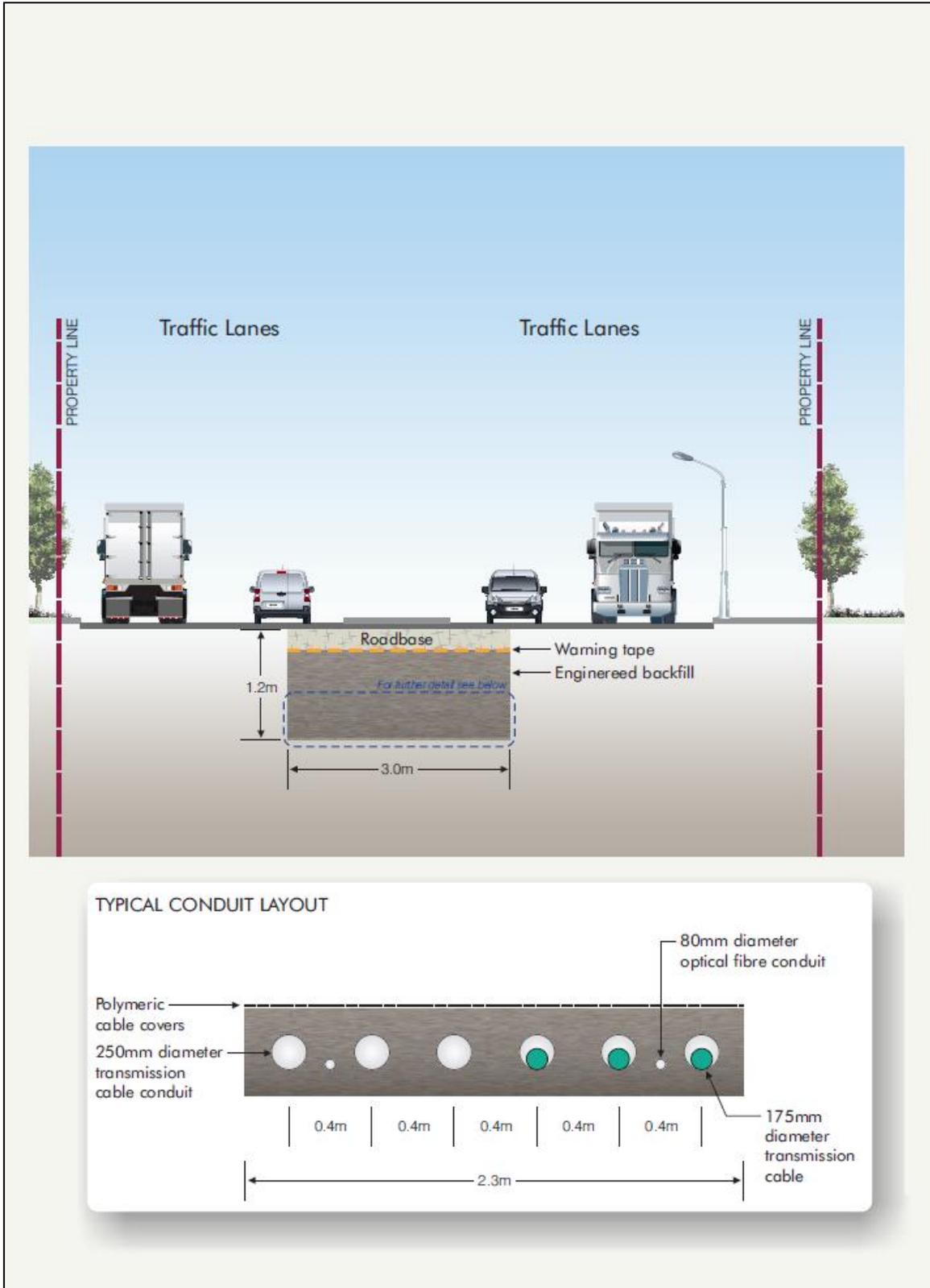


Figure 17: Typical Flat Trench Configuration for Two Cable Circuits
Source: TransGrid (Powering Sydney's Future) 2025

3.2 Estimated Construction Program

3.2.1 Overall Works

The proposed site is to be constructed in four stages with construction of the stages overlapping and occurring concurrently. Table 9 presents the indicative construction milestones, with an average on-site workforce of approximately 1,800 and an average of 130–180 truck movements per day during peak construction. These estimates are derived from Multiplex’s Milestone Program.

Table 9: Estimated Construction Program (Overall Works)

Phase	Key Milestone	Schedule (approx.)	Duration (approx.)
Stage 1 Building C & D	Demolition	March 2026 to April 2026	1 month
	Bulk Excavation	March 2026 to June 2026	3 months
	Structure	August 2026 to April 2026	9 months
	Fitout & Finishes	October 2026 to October 2028	2 years
Stage 2 Integrated with Stage 1	Demolition	March 2026 to April 2026	1 month
	Bulk Excavation	March 2026 to June 2026	3 months
	Structure	February 2027 to October 2027	9 months
	Fitout & Finishes	April 2027 to April 2029	2 years
Stage 3 Building A	Demolition	March 2026 to April 2026	1 month
	Bulk Excavation	March 2026 to June 2026	3 months
	Structure	February 2028 to October 2028	9 months
	Fitout & Finishes	June 2026 to February 2027	9 months
Stage 4 Building B	Bulk Excavation	June 2026 to June 2028	2 years
	Structure	March 2026 to June 2026	3 months
	Fitout & Finishes	July 2026 to July 2028	2 years

3.2.2 HV External Cable and Sydney West Expansion

Stage 1 will deliver the on-site substation together with Building C, the main site entrance, Centralised Security Office (CSO), water tank farm and associated car parking. The HV cable and Sydney West Substation expansion will proceed in five stages with a maximum on-site workforce of approximately 40–50 personnel. These estimates are derived from the Lumea–Transgrid Milestone Program, as shown in Table 10.

Table 10: Estimated Construction Program (HV External Cable and Sydney West Expansion)

Phase	Key Milestone	Average Workers On-Site	Duration (approx.)
Stage 1 Site Establishment	Temp Fencing	10 -15	5 Days
	Site Sheds	10 -15	10 Days
	Sediment Controls	10 -15	3 Days
Stage 2 Bulk Earthworks & Drainage	Bench Earthworks	25 -30	66 Days
	Drainage	30 -35	80 Days
Stage 3 Conduits & Foundations	Foundations	40 -50	200 Days
	Conduits	30 -35	60 Days
Stage 4 Electrical Works (Excl. 3rd party TG Contractors)	Electrical Install	40 -50	210 Days
	Testing & Commissioning	20 -25	51 Days
Stage 5 Demobilisation	Temp Fencing	10 -15	5 Days
	Site Sheds	10 -15	10 Days

3.3 Main Construction Activities

The proposed works are anticipated to be undertaken over a timeframe of approximately 3 years, commencing in March 2026 and concluding in April 2029. As previously noted, the construction works will be delivered in four stages, with the following breakdown of key activities:

- **Early works (Site Preparation, demolition, bulk earthworks)**
 - Demolition is undertaken concurrently at the commencement of the project.
 - Bulk excavation follows demolition and is generally carried out in parallel across the site to establish foundation levels.
- **Substructure and structural construction**
 - Structural works are delivered in a staged manner by building, with Buildings C & D constructed first, followed by Stage 2 works, then Buildings A and B.
 - Structure works overlap between stages to optimise program efficiency.
- **Fitout and finishes**
 - Internal fitout and finishes commence progressively once individual buildings reach structural completion.
 - These works extend over the longest period of the program and overlap across multiple stages, reflecting the complexity and scale of the development.
- **Overall program approach**
 - The construction program is characterised by overlapping stages, allowing demolition, excavation, structure, and fitout activities to occur concurrently in different areas of the site.
 - This staged and integrated approach minimises overall construction duration while maintaining a logical build sequence.

A temporary road is to be established at the commencement of construction to allow for construction vehicle access to the site while the permanent road access is being constructed. Once completed, the permanent road access will be used as the vehicular access to the site for the remaining periods of construction.

Internal roads and parking are to be delivered next to each building as required through the above stages. Once the permanent road is completed, Lumea vehicle access will be provided to the substation compound area unobstructed to authorised vehicles. Access will be managed through security-controlled boom-gates/construction fencing around the compound.

In addition to the above main construction activities, the HV cable route construction will consist of 2 x trenches, which will transition along Johnston Crescent and Old Wallgrove Road. Construction activities will also take place concurrently at Sydney west for expansion works.

3.4 Hours of operation

The on-site works will be undertaken in accordance with those specified in Condition B1, which are as follows:

- Monday to Friday 7am to 6pm
- Saturdays 8am to 1pm
- Sundays and Public Holidays None

Night works will occur subject to approval.

4.0 Management of Construction Vehicles

4.1 Construction Truck Routes

The construction site access will occur from a construction driveway connecting with Johnston Crescent in the south-western corner of the site. Following this, access to the site will be via the following routes (refer to Figure 18):

From/To the north:

- Inbound – from southbound Westlink M7, exit to Old Wallgrove Road, turn left to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, through to Johnston Crescent and left turn into the site
- Outbound – right turn out of the site to Johnston Crescent, through to Old Wallgrove Road, right turn to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, right turn to Mini Link Road and left turn onto Northbound Westlink M7

From/To the south:

- Inbound – from northbound Westlink M7, exit to Mini Link Road, turn left to Old Wallgrove Road, turn left to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, through to Johnston Crescent and left turn into the site
- Outbound – right turn out of the site to Johnston Crescent, through to Old Wallgrove Road, right turn to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, through to Westlink M7 Onramp to access southbound lanes

From/To the east:

- Inbound – from westbound Western Motorway (M4), exit to Wallgrove Road, right turn to Old Wallgrove Road, turn left to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, through to Johnston Crescent and turn left into the site
- Outbound – right turn out of the site to Johnston Crescent, through to Old Wallgrove Road, right turn to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, left turn to Wallgrove Road, right turn to eastbound Western Motorway (M4)

From/To the west:

- Inbound – from eastbound Western Motorway (M4), exit to Wallgrove Road, right turn to Old Wallgrove Road, turn left to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, through to Johnston Crescent and turn left into the site
- Outbound – right turn out of the site to Johnston Crescent, through to Old Wallgrove Road, right turn to Old Wallgrove Road at the intersection of Lenore Drive / Telopea Place / Old Wallgrove Road, left turn to Wallgrove Road, left to westbound Western Motorway (M4)

The above construction vehicle routes have been chosen to avoid local roads and school zones, where possible.

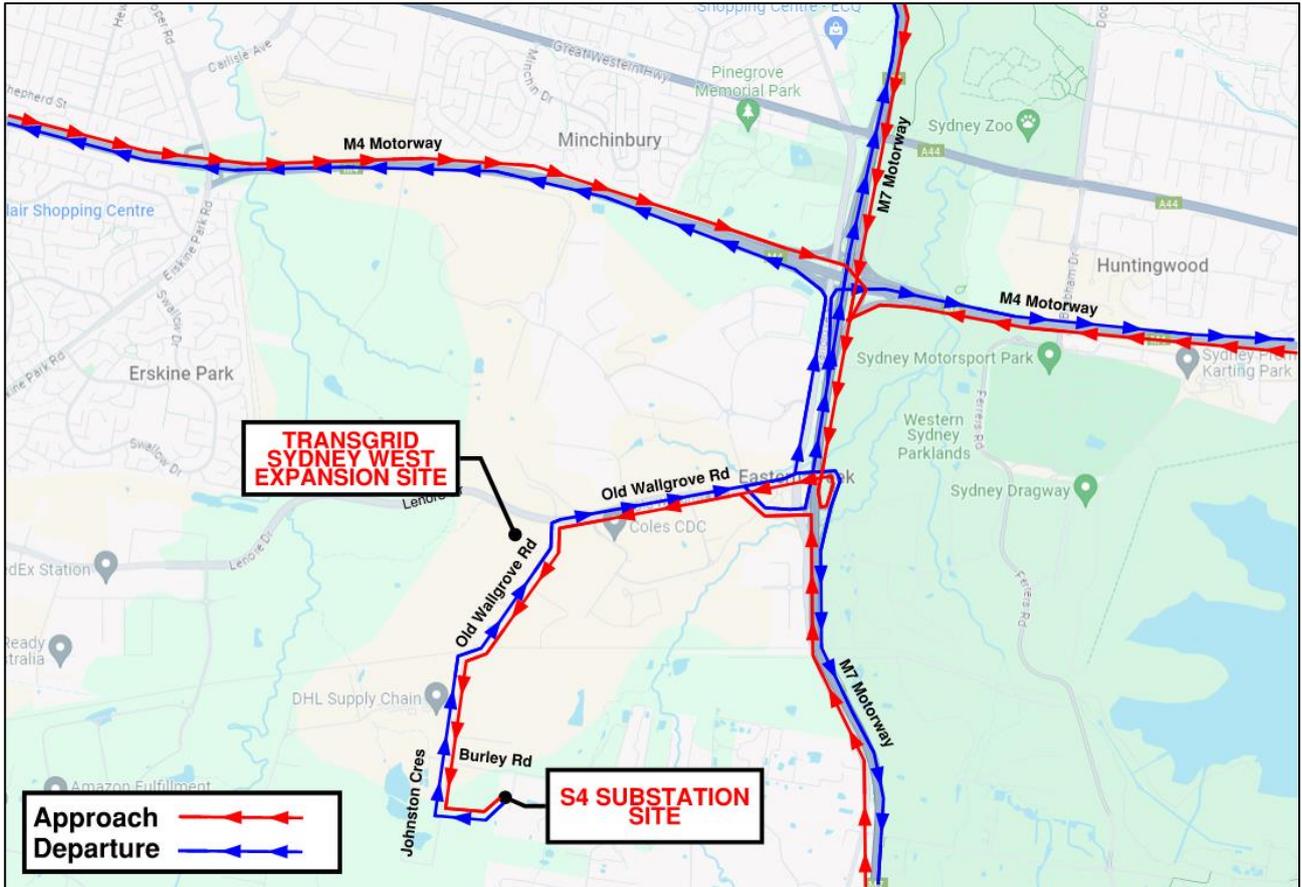


Figure 18: Construction Vehicle Access Routes

4.2 Construction Vehicle Types

Proposed truck types to be used during the construction works are expected to be vehicles up to and including 20m long Articulated Vehicles, mobile cranes, wide loaders and truck and dog type vehicles.

Additionally, the following vehicles are anticipated for the HV cable and Sydney West Expansion works, but are not limited to:

- Heavy Rigid Vehicles (HRV)
- Cranes, excavators, concrete trucks, bulldozers, vehicle loading cranes (VLCs), Tesmecs, Elevated Work Platforms (EWP), Telehandlers
- Mobile (60T Slew or Franna)
- Truck and Dog
- Oversized vehicles (including a limited number of high-risk oversized vehicles – for largest vehicle type more information provided below)
- Water tankers
- Passenger vehicles

The substation works will require the delivery of oversize vehicles (including transformer transport), which will be subject to separate approval and management plans. Notwithstanding this, the construction access has been designed to accommodate vehicle entry and exit in a forward direction.

The configurations of the typical construction vehicles anticipated, being a standard design HRV and 20 m AV are illustrated in Figure 19, Figure 20.

The largest vehicle anticipated to access the site is the oversized transformer delivery vehicle that will enter the site and access the Lumea substation compound. The detail of this vehicle is provided in Figure 21.

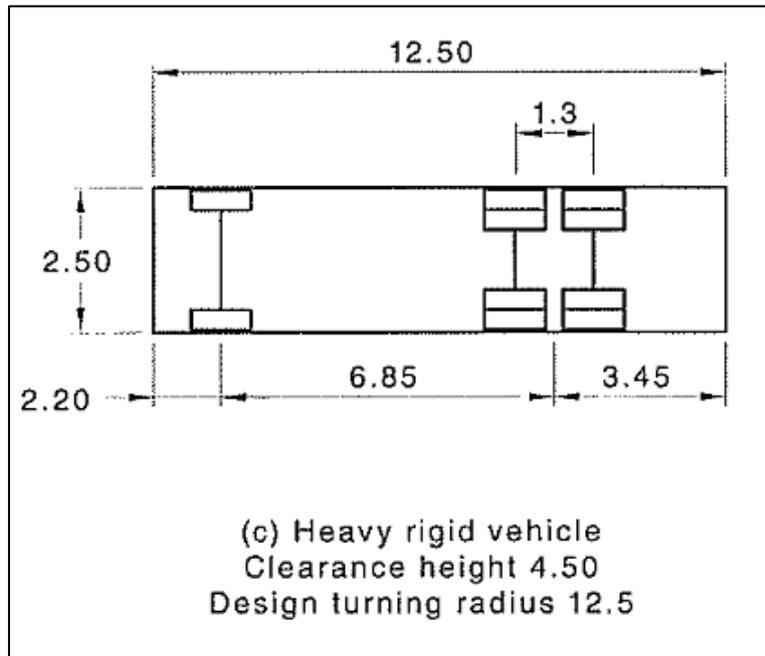


Figure 19: HRV Configuration

Source: *Parking facilities, Part 2: Off-street commercial vehicle facilities AS2890.2*

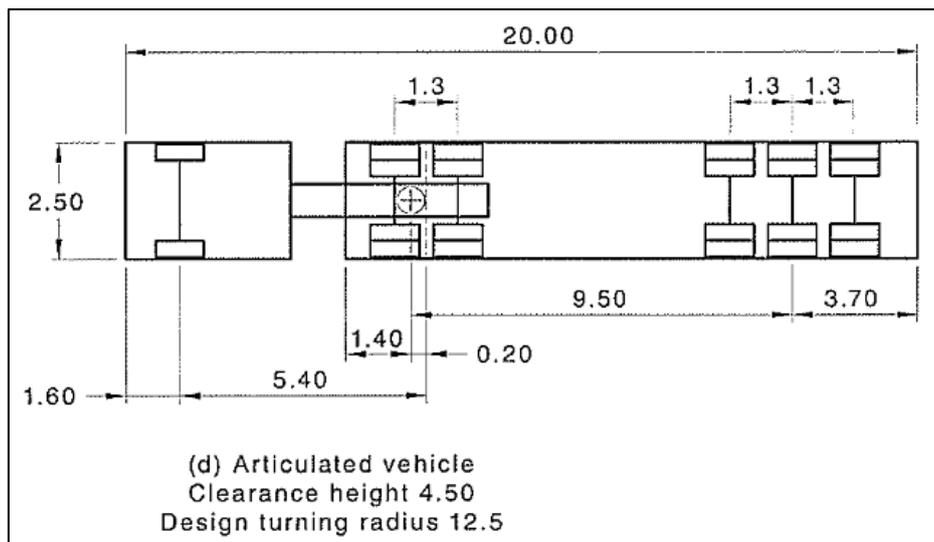


Figure 20: AV Configuration

Source: *Parking facilities, Part 2: Off-street commercial vehicle facilities AS2890.2*

4.3 Construction Site Access

Vehicles will enter the site from the construction driveway connecting with Johnston Crescent (permanent access) in the south-western corner of the site. Access is approximately 10 m wide, which is sufficient to accommodate two-way vehicle movements and controlled heavy-vehicle entry/exit.

An alternative access (Road 9), including a dedicated turnaround area, will be used while the permanent road is under construction, as shown in Figure 22. A separate passenger vehicle access will be provided at Lot 306 for construction vehicle parking.

Given the HV cabling works and Sydney West Expansion will occur simultaneously with the NEXTDC S4 Stage 1 construction, it is important that any construction schedule, construction vehicle access, and construction traffic between the substation and NEXTDC S4 be coordinated, communicated and managed to avoid overlaps/conflicts with the site. All vehicles are to enter and exit the site in a forward direction at all times.

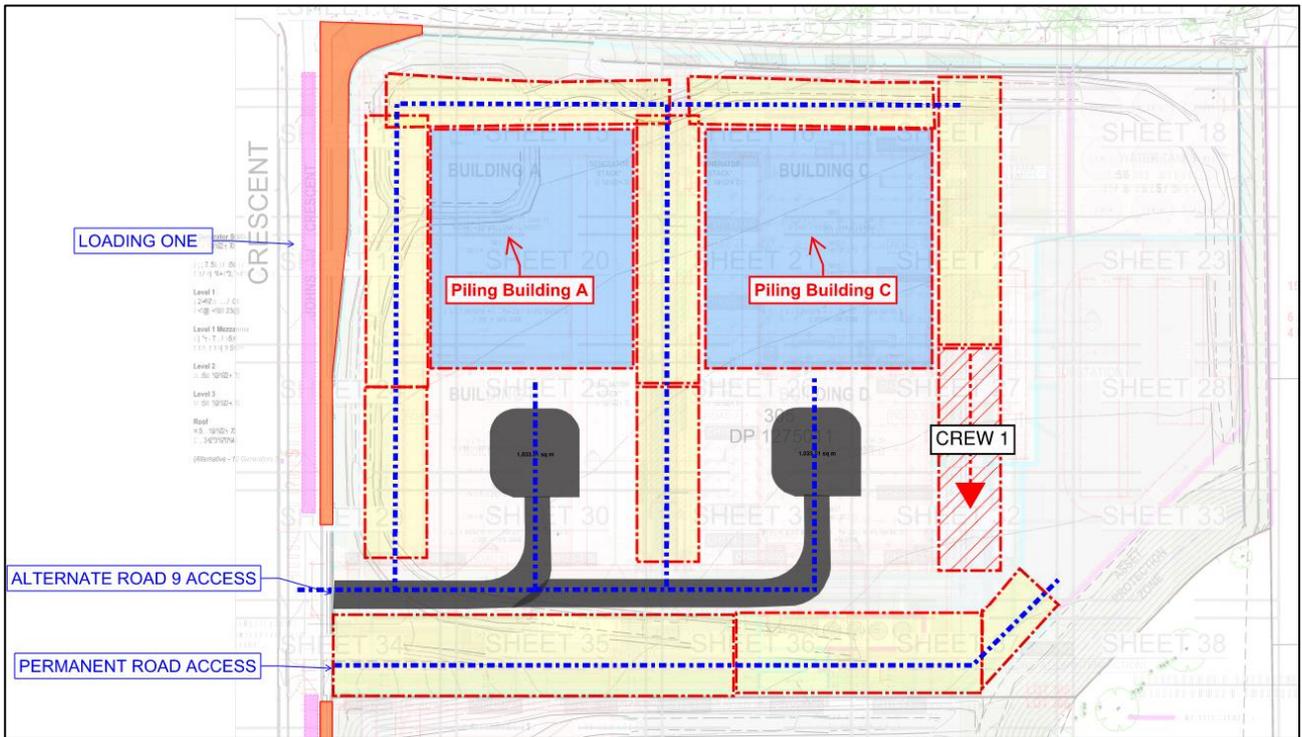


Figure 22: Construction Site Access

Source: Multiplex (MPX)

4.4 Vehicle Management

4.4.1 Heavy Vehicles

Construction vehicle traffic volumes at peak months for the NEXTDC S4 works are likely to reach 180 vehicles per day for the main works (within 11 construction hours, up to 16 vehicles per hour). For the HV cable works, volumes are approximately 7 vehicles per day and will be scheduled outside of the network peaks, with a portion of works (trenching) to be undertaken primarily at night to minimise network impacts. These heavy construction vehicle volumes have been modelled to assess the impacts on the external road network, which is detailed in Section 5.1.

Construction vehicle movements will occur throughout the day and may involve concrete trucks, articulated hauliers, or delivery trucks. All deliveries will be made within the approved work hours. Truck movements to

and from the site will be scheduled outside of network peak hours where possible, to reduce impacts on the local road network. Avoiding network peak hours aims to prevent both the queuing of construction vehicles on the local roadway and congestion in the neighbouring areas.

During days of high estimated vehicle movements, communication between the site, concrete batching plant and/or vehicles will be maintained to stagger the arrival of vehicles, for them to be accommodated within the worksite and to minimise traffic disruptions.

Loading and unloading activities will be managed within the site boundaries, with trucks entering and exiting in a forward direction. Careful management of heavy construction vehicles exiting the site will ensure traffic safety at all site access points. The relatively low traffic volumes on Johnston Crescent mean vehicles will be able to use suitable traffic gaps to exit, subject to appropriate management.

All vehicle movement controls and access management measures described above are detailed in the Traffic Guidance Schemes (TGS) appended to this report. The TGS plans illustrate the location of site access points, vehicle entry and exit movements, and pedestrian protection arrangements, ensuring that the management measures outlined in this section are effectively implemented on site.

4.4.2 Light Vehicles

It is also anticipated that construction workers will generate traffic movements to and from the site in the form of vans, utilities and utes. At peak construction, the workforce is expected to be approximately 1,800 for the main works, with an additional 50 workers for the HV cabling.

For a conservative assessment at peak construction, a total on-site workforce of 1,850 (inclusive of Lumea HV cabling works) is assumed, with 70% travelling as car drivers (resulting in 1,295 light-vehicle generated). Noting that the road network peak is 07:00–08:00 am, while the construction works start at 7 am, by which the majority of workers arrive before the network peak. Accordingly, only 30% of worker traffic is expected to coincide with the network peak, yielding an estimated 389 peak-hour LV trips ($1,850 \times 70\% \times 30\% = 389$).

Actual peak flows are expected to be lower through staggered shift times, shuttle services aligned to shift changes, and active car-pool/public transport incentives. Impacts due to the traffic generation of the construction worker population has been assessed by modelling the nearby intersection, which has been discussed further in Section 5.1.

4.5 Construction Vehicle Parking

Limited worker or subcontractor parking will be provided on the construction site. All workforce parking will be off-site at the following locations:

- A portion of a leased Goodman warehouse to the north of the site
- A vacant Goodman lot north of the warehouse (Lot 106) has also been leased for worker parking
- Adjacent to the south of the site, which is a currently vacant NEXTDC-owned site.

Figure 23 shows the locations for workers' parking.

As the parking strategy relies on off-site supply, the parking arrangements will be supported by supplementary shuttle services to manage worker movements to and from the above parking areas and the site. Given the scale of the development, the Contractor will also prepare and implement a Construction Worker Transport Strategy to reduce single-occupant vehicle use and minimise on-street parking demand.

If additional parking management measures are required, they will include a formal car-pool program (ride-matching, priority set-down and reserved parking spaces for carpooling) and a shuttle bus linking the site and the nearest train station to the site at shift changes with published headways aligned to local public transport

timetables. An on-site secure tool shed will be established in order to allow workers to safely leave tools and supplies to facilitate public transportation and carpooling as a more feasible option.

Monitoring (arrival counts, parking occupancy and worker surveys) will be used to adjust shuttle capacity and satellite supply so that adequate spare capacity is maintained and no public-road queuing occurs. Furthermore, the Contractor will continue to investigate further off-site/satellite parking within nearby industrial properties as required based on the evolving parking demands of construction.



Figure 23: Construction Worker Parking

4.6 Work Zones

Two Works Zones are proposed along the site frontage on Johnston Crescent and the NEXTDC owned lot to the south, extending approximately 164 m and 154 m, respectively. The zones will be established under FCC s138 approval and operated in accordance with AS 1742.3 and the approved TGS plans, with accredited traffic controllers providing continuous coverage to maintain safe traffic flow as shown in Figure 24.

Suitably qualified traffic controllers will provide continuous coverage during operating hours to meter truck arrivals/departures, manage pedestrian movements and ensure no queuing occurs on the live carriageway. Access to adjacent properties and services will be maintained at all times via delineated lanes and, where required, temporary driveway plates.

The Works Zones will be delineated through posted work-zone signage and pedestrian fencing/hoarding with setup/removal scheduled outside commuter peaks to minimise impacts on the local network. The Works Zone may be staged and repositioned as frontage works progress.

The Work Zones will be established strictly in accordance with the approved construction hours and will only be installed during periods when construction activities are being undertaken. Outside of approved work times, all temporary traffic control devices, signage, and delineation associated with the work zone will be removed or made inactive to reinstate normal traffic conditions. The works zone locations, length and width are shown in the TGS plans in Appendix C.

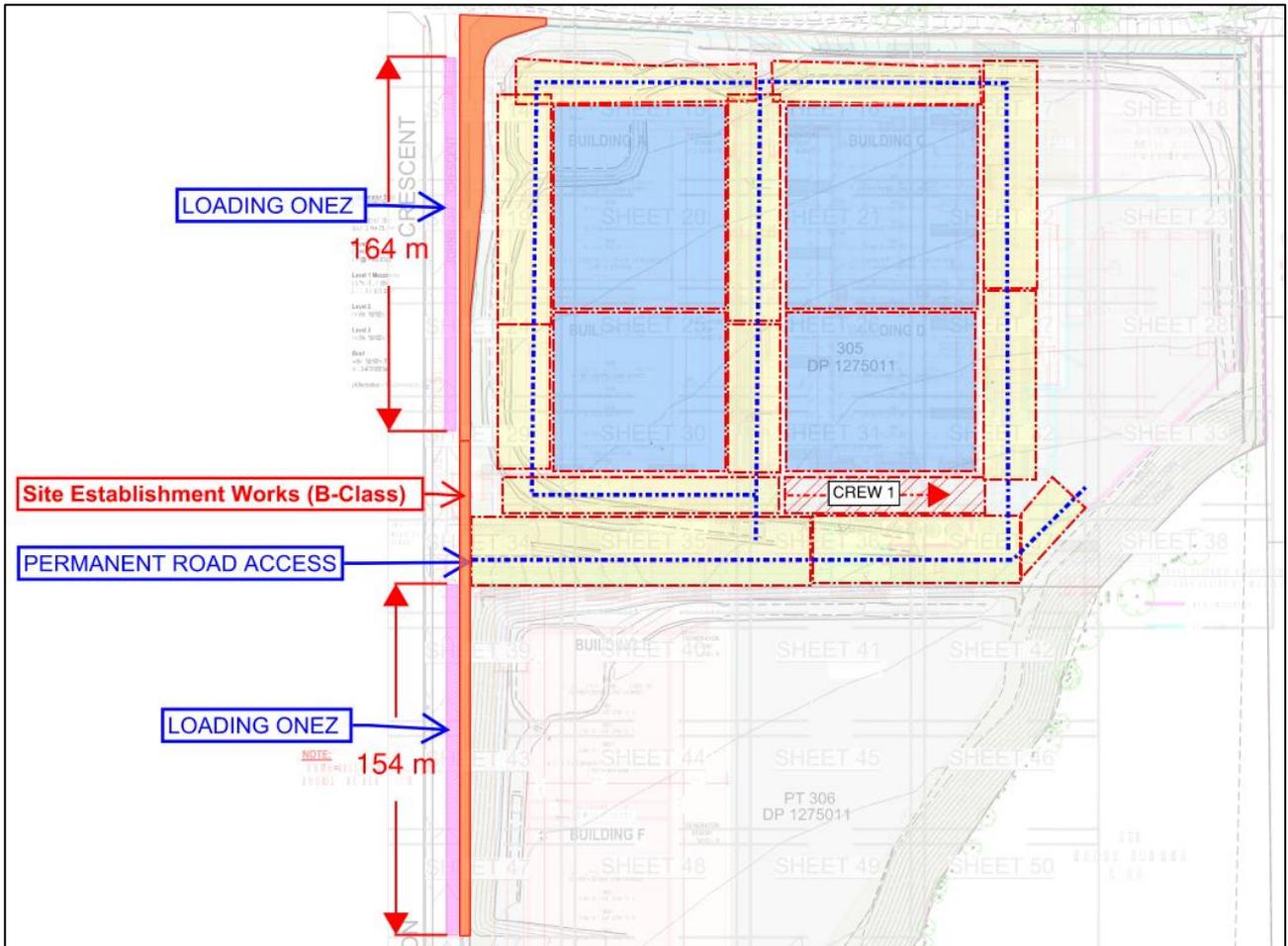


Figure 24: Work Zone Locations

Source: Multiplex (MPX)

The access and exit from and to the work zone is shown in Figure 25.



Figure 25: Work/Loading Zone Access and Exit

4.7 Swept Path Analysis

A swept path assessment has been undertaken to confirm that the proposed site access and internal circulation arrangements can safely accommodate the largest vehicles expected to access the site during construction. The assessment includes the substation transformer transport vehicle, which represents the critical design vehicle for the works. The swept path analysis confirms that the transformer vehicle can enter and exit the site in a forward direction. The transformer delivery will be subject to separate approval; however, the access has been designed to accommodate entry and exit in forward direction.

In addition, swept path testing has been carried out for other construction-related vehicles, including wide-load vehicles and articulated vehicles (AVs) accessing and egressing the designated work zone. All assessed vehicle movements demonstrate sufficient manoeuvrability within Johnston Crescent and site access arrangements. The swept path diagrams supporting this assessment are provided in Appendix D.

4.8 Road Closures

4.8.1 Main Works

Managed road and lane occupations would be carried out on Johnston Crescent to facilitate the tower-crane works during Stages 2–4. A temporary diversion will be established along the site frontage to install stormwater infrastructure during Stage 1; any associated road or lane closures will be subject to Council approval at the time of implementation.

Access to adjacent driveways will be maintained at all times via delineated lanes, temporary plates or short, scheduled holds under traffic control.

4.8.2 HV External Cable and Sydney West Expansion

As mentioned previously, the HV cable route will be delivered via two trenches progressing along Johnston Crescent and Old Wallgrove Road and will require sequential lane closures overnight. The lane closures will result in one lane of traffic in each direction where possible within portions of Old Wallgrove Road. Lane closures will be managed in accordance with the approved Traffic Guidance Schemes (TGS) provided in Appendix C.

Where practicable, traffic will be maintained in both directions through the use of a contraflow arrangement, particularly within sections of Old Wallgrove Road where sufficient carriageway width is available. This arrangement will allow one lane of traffic to operate in each direction under controlled conditions, minimising disruption to the surrounding road network.

All lane closures will be temporary, localised, and progressively reinstated as trenching works advance, ensuring that the duration and extent of traffic impacts are minimised. If other lane closures are in effect during the cabling works, alternative control/detour routes will be provided in accordance with the TGS to allow equipment/installations to progress.

4.9 Traffic Guidance Scheme

The Traffic Guidance Scheme (TGS) outlines the proposed traffic management to inform road users of changed traffic conditions in the vicinity of the construction site. TGS plans are prepared in accordance with TfNSW Traffic Control at Work Sites (TCAWS) Technical Manual Version 6.1 and included in Appendix C.

For the main works areas, temporary work zones will be established along Johnston Crescent and Old Wallgrove Road during construction hours. Where practicable, two-way traffic will be maintained at all times through the work zone. Temporary barriers, delineation devices, advance warning signage and reduced speed limits will be implemented in accordance with the approved TGS to provide a safe separation between live traffic and construction activities. Construction vehicle access and egress will be controlled by qualified traffic controllers, with vehicles required to wait for a suitable gap in traffic before entering or exiting the site. This will occur under the supervision of accredited traffic controller(s).

The trenching will be delivered in short, sequential sections, with the extent of works clearly delineated using temporary barriers or cones as shown in the TGS plans. Temporary speed limits will be implemented through the work zones, with advance warning signage provided on all approaches.

5.0 Impact of the Proposed Works

5.1 Future Traffic Models

5.1.1 Modelling Scenarios

The following traffic modelling scenarios detailed below in Table 11 have been prepared in order to assess the traffic impacts of the construction works on the road network, with the existing layout of the nearby intersections.

For assessment purposes, the 2023 volumes have been adjusted to a 2026 condition by applying a 2% annual growth rate over three years, to better reflect current background growth. The construction volume has been prepared based on information provided by Multiplex and Transgrid/Lumea.

Table 11: Modelling Scenarios

Scenario	Year / Time	Peak Hour Period	Description
Existing Model (refer to Section 2.5)	2023	7:00-8:00am 4:15-5:15pm	<ul style="list-style-type: none"> Existing (2023) intersection configurations Existing traffic volumes
2026 Model	2026		<ul style="list-style-type: none"> Existing (2026) intersection configurations 2023 traffic volumes with 2% per annum growth rate over three years
2026 Model + Construction Workers Traffic	2026 During Construction		<ul style="list-style-type: none"> Existing intersection configurations 2023 traffic volumes + 2% per annum growth rate over three years + Construction Volumes (heavy and light vehicles)

The following subsections describe the and present the projected intersection performance for each modelling scenario. It should be noted that the construction modelling scenario has been utilising *Practical Cycle Times*.

5.1.2 2026 Model

SIDRA intersection modelling has been undertaken to assess the traffic conditions and performance of the surveyed intersections; layout changes have been reflected in the 2026 model. Figures 25, 26, and 27 contain the layouts of the three intersections for the 2026 model and the 2026 model with construction traffic, as modelled in SIDRA.

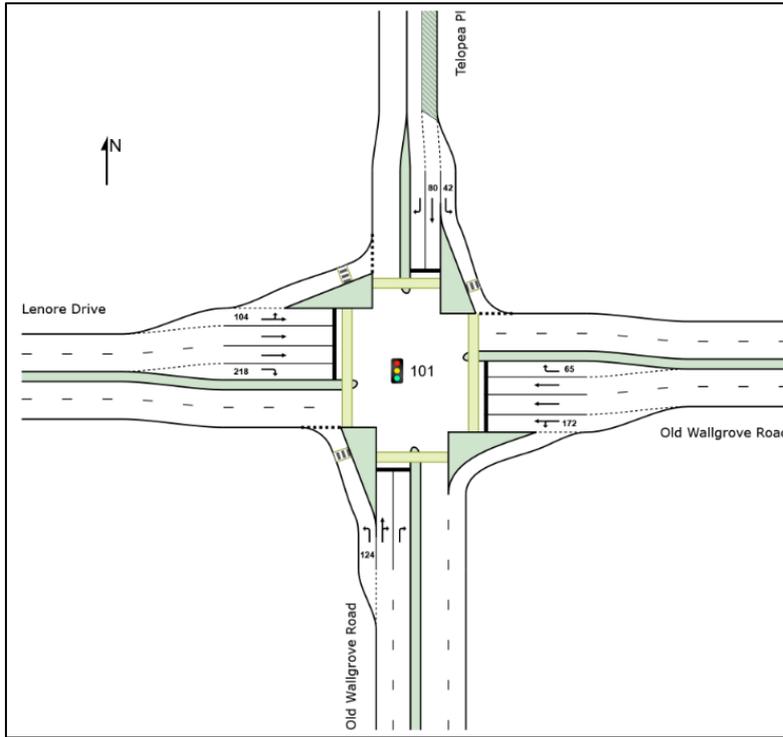


Figure 26: SIDRA Existing Intersection Layout – Old Wallgrove Rd / Lenore Dr / Telopea PI

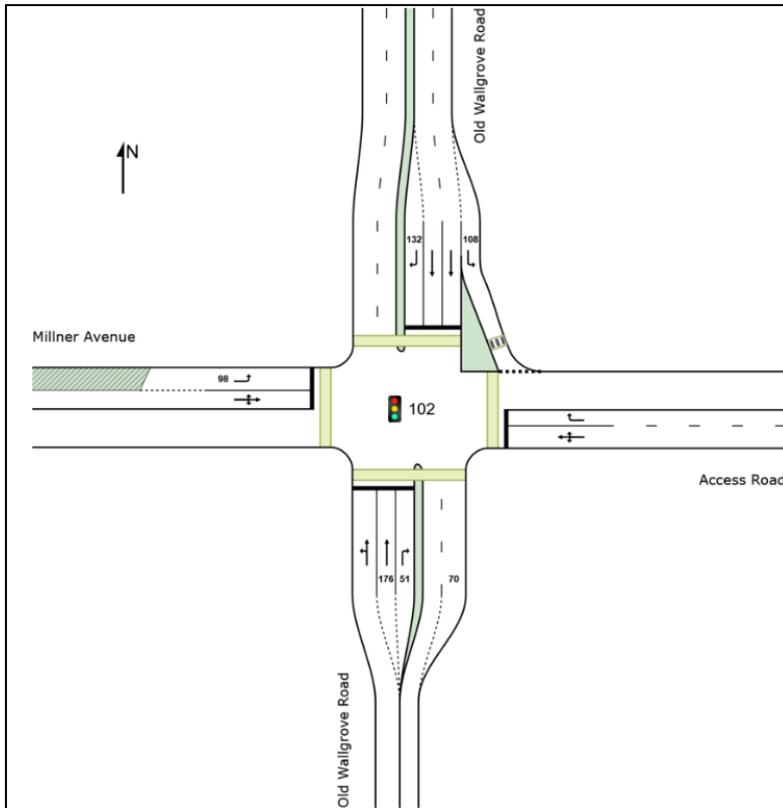


Figure 27: SIDRA Existing Intersection Layout – Millner Ave / Old Wallgrove Rd

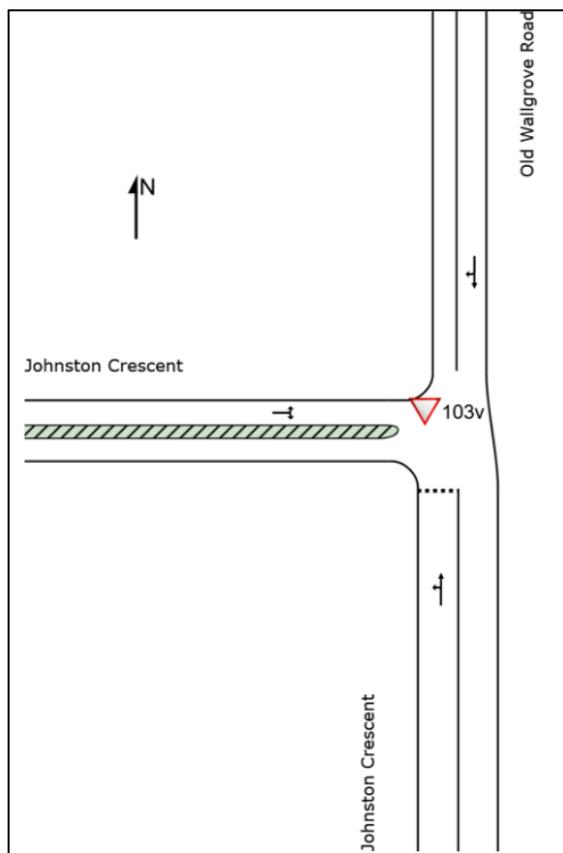


Figure 28: SIDRA Existing Intersection Layout – Old Wallgrove Rd / Johnston Cres

The construction works have been assessed to generate approximately 389 light-vehicle trips in the morning peak hour and 389 in the afternoon peak hour, based on a peak on-site workforce of 1,850 (inclusive of Lumea), with 30% travelling in the peaks (07:00–08:00 and 16:15–17:15) and 70% of workers driving rate ($1,850 \times 30\% \times 70\% = 389$). To determine the impacts on the surrounding road network, nearby intersections have been modelled under the 2026 model plus construction volumes scenario.

As a conservative measure, although heavy vehicles are unlikely to arrive during network peaks, 33 heavy-vehicle movements have been added to the peak-hour model; this allowance is derived from an expected 180 HV movements per day over an 11-hour workday (16 per hour on average).

5.1.3 Trip Distribution

A traffic distribution has been developed based upon the existing traffic volume patterns and distributions surveyed and provided in Section 2.4.2.

All traffic accessing and departing the subject site will do so via a through movement onto Johnston Crescent from Old Wallgrove Road and vice versa. All development traffic has been assumed to originate evenly from either westbound Old Wallgrove Road or eastbound Lenore Drive.

Accordingly, the development and cumulative traffic volumes assessed have been distributed across the network during the morning and afternoon peak periods as illustrated in Figure 29.

Light vehicle traffic will be distributed across the designated off-site parking areas (leased Goodman warehouse, Lot 106 and Lot 306); however, as a conservative assessment, the end destination has been assumed as the construction site. Heavy vehicle movements have been distributed on the network in accordance with the identified construction haul routes, as provided in Section 4.1.

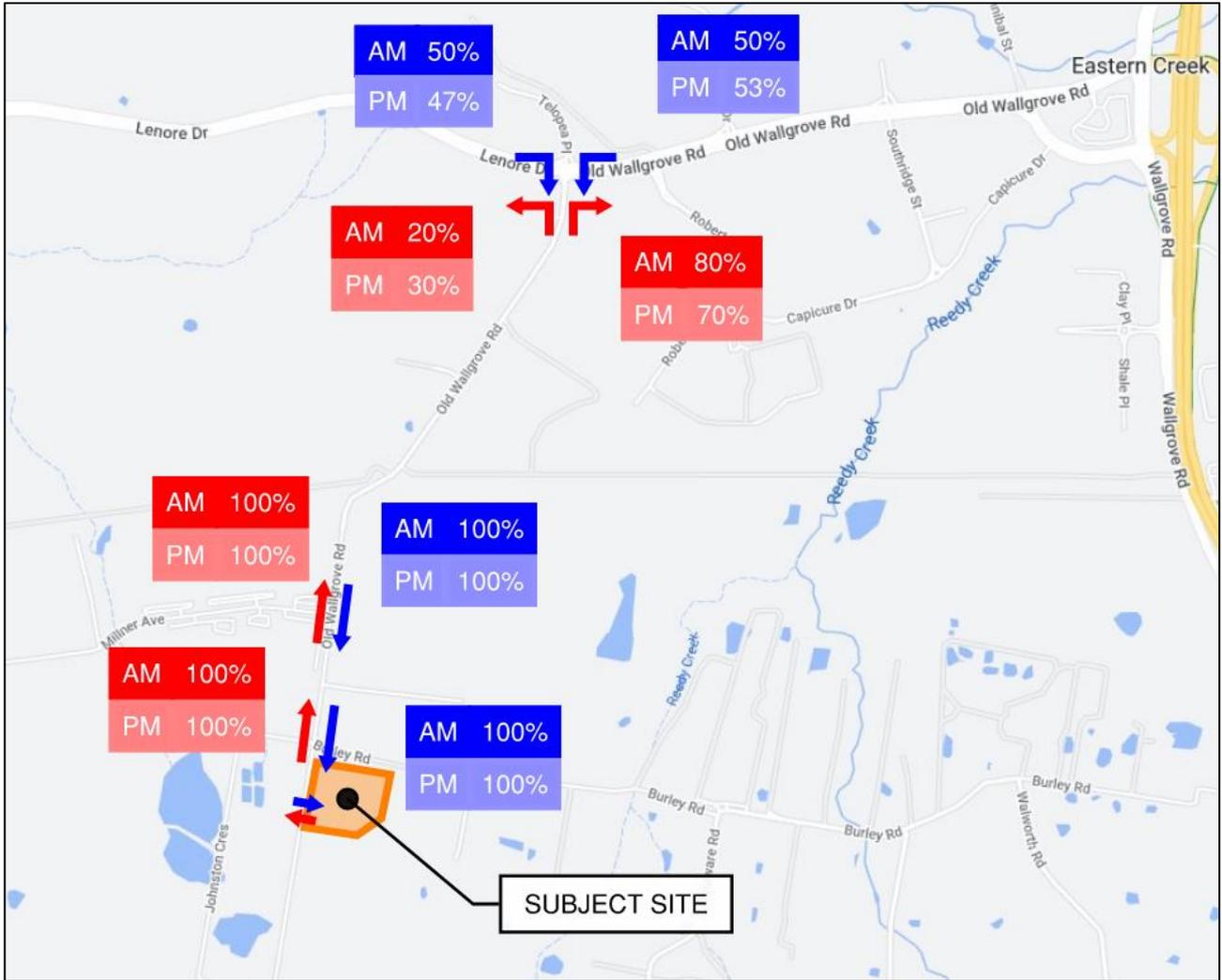


Figure 29: Post Development Trip Distribution

5.1.4 Construction Works Projected Traffic Volumes

Based on the traffic generation assessment for the construction works and the distribution provided above, Figure 30 – Figure 32 indicate the projected traffic volumes at the subject intersections.

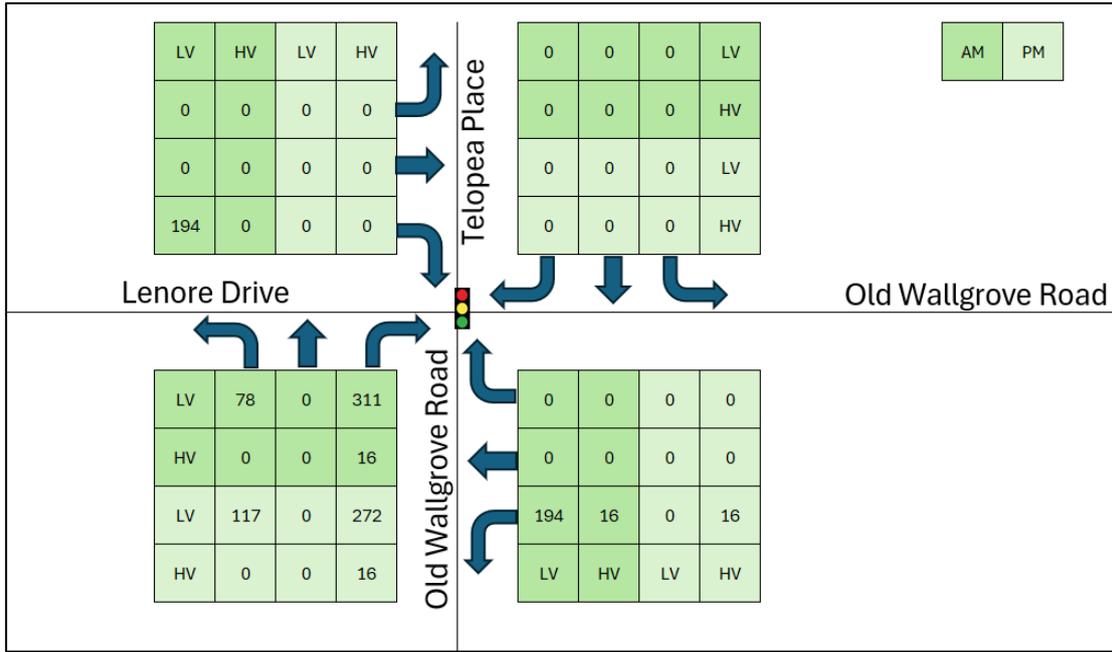


Figure 30: Construction Works Volumes Lenore Drive / Old Wallgrove Road / Telopea Place

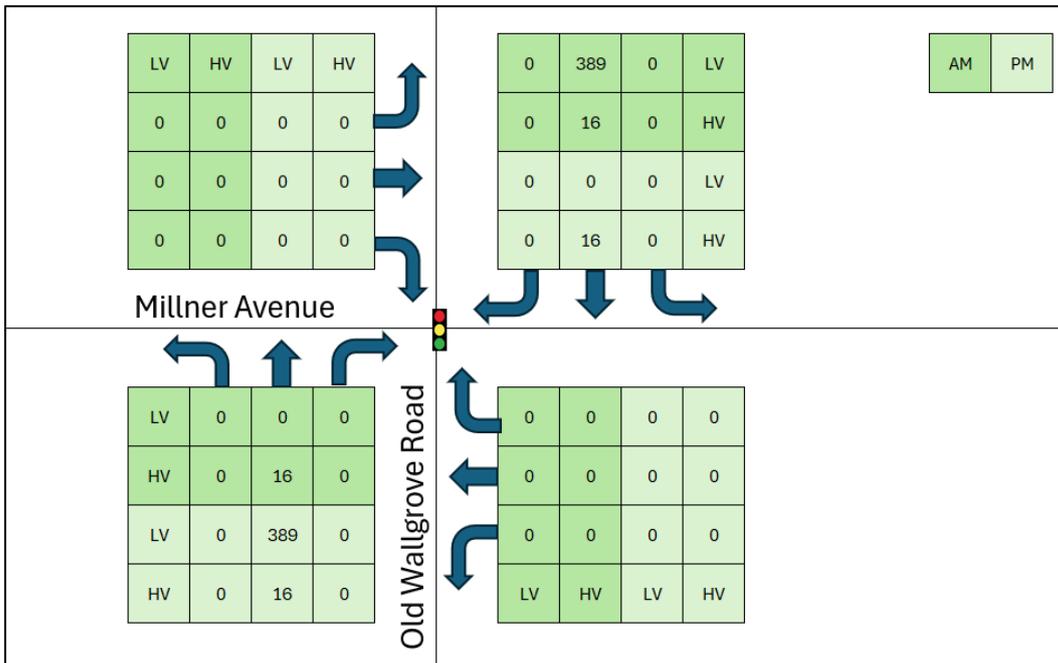


Figure 31: Construction Works Volumes Intersection of Old Wallgrove Road / Millner Avenue

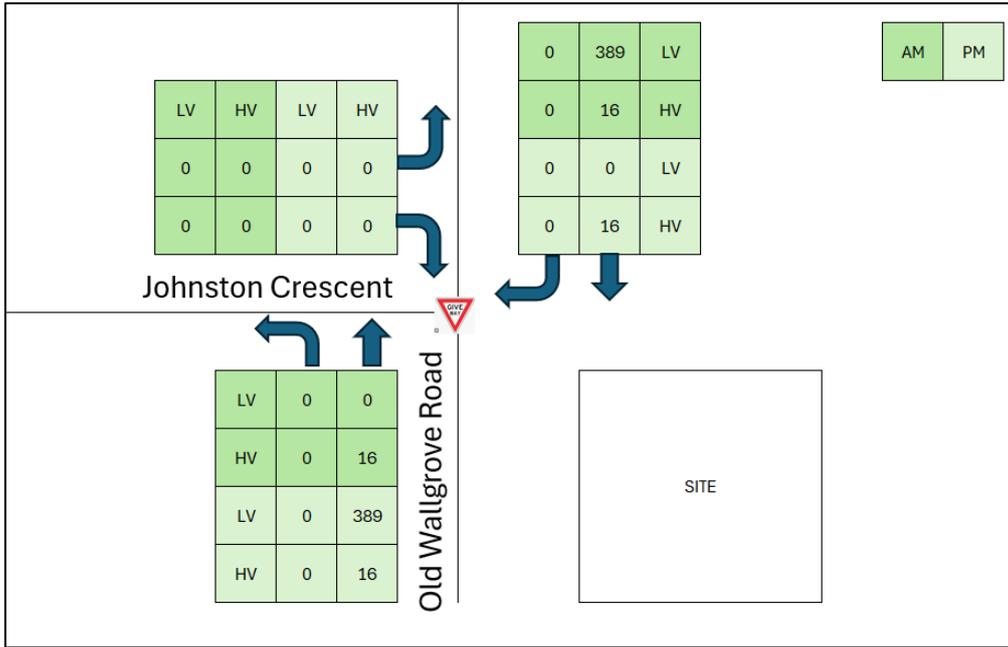


Figure 32: Construction Works Volumes Intersection of Old Wallgrove Road / Johnston Crescent

5.1.5 Intersection Performance

Table 12 summarises the existing and projected operation and performance of the surveyed intersections during the peak construction works of the proposed development. Full SIDRA results are provided in Appendix D.

Table 12: Construction Works Intersection performance

Note: Data for unsignalised intersections is taken from the movement with the worst delay

Data for signalised intersections is the intersection total

Peak Period	DOS			AVD			95% Queue Length (veh)			LOS		
	2023 Existing	2026 Model	2026 + CV	2023 Existing	2026 Model	2026 + CV	2023 Existing	2026 Model	2026 + CV	2023 Existing	2026 Model	2026 + CV
Telopea Place / Lenore Dr / Old Wallgrove Rd (signalised)												
AM	0.665	0.918	0.929	26.1	24.0	26.4	13.7	16.6	20.4	B	B	B
PM	0.872	0.825	0.914	31.4	30.0	27.1	23.3	9.6	17.2	C	B	B
Old Wallgrove Rd / Millner Ave (signalised)												
AM	0.590	0.620	0.623	15.2	13.5	12.1	10.2	10.0	10.1	A	A	A
PM	0.374	0.402	0.472	14.7	11.6	13.1	5.8	3.9	5.4	A	A	A
Old Wallgrove Rd / Johnston Cres (unsignalised)												
AM	0.012	0.013	0.059	6.2	6.2	7.9	0.0	0.0	0.2	A	A	A
PM	0.087	0.093	0.469	6.8	6.8	6.8	0.3	0.3	2.7	A	A	A

As shown in Table 12, while there are minor increases in degree of saturation (DoS) at some approaches, the average delays and 95th-percentile queues at the signalised intersection improve relative to 2023 due to the 2026 layout upgrades. The overall Level of Service at the signalised junction improves from LoS C to LoS B in the PM peak.

Across all surveyed intersections, the addition of construction volumes is not expected to materially change performance in either peak period. On this basis, no intersection upgrades are required as a result of the construction works and all intersections are expected to continue operating at a satisfactory level of service under the 2026 + construction scenario.

5.2 Local Traffic Impacts

Traffic impacts from the construction works are expected to be limited to the truck routes and construction workers' parking detailed in this report.

As noted above, the signalised intersection performs better in the 2026 scenario than in 2023 due to layout changes. Under the 2026 + construction scenario, intersection operation remains satisfactory relative to 2026, with only minor changes observed. Accordingly, construction traffic is not expected to alter local traffic patterns or intersection operations.

Traffic flows will be further moderated by the delivery booking/call-up system, gate metering with internal holding (no public-road queuing), and workforce mode-shift measures (off-site parking with shuttle, car-pooling, staggered shifts).

5.3 Public Transport

All public bus stops and routes as described in Section 2.2 of this report will continue operation without distribution. Bus routes and timetables on Old Wallgrove Road/Wallgrove Road/The Horsley Drive corridors will not be impacted by the construction works.

The Contractor will maintain safe pedestrian access and queuing at all times. Access to all adjoining properties will be maintained throughout the works.

5.4 Parking Impacts

Construction will increase worker parking demand; however, this CTMP adopts an off-site parking hierarchy to keep the frontage clear and prevent spill-over. As mentioned previously, the Contractor will accommodate workforce parking off-site at the leased Goodman warehouse, the vacant Goodman lot north of the warehouses (Lot 106), and the adjacent vacant lot, supported by shuttle services at shift changes (headways aligned to rostered starts/finishes). These supplies will be brought online as the workforce ramps up, ensuring adequate spare capacity.

Worker kerbside parking on Johnston Crescent and nearby streets is strictly prohibited due to prevailing 'No Stopping' conditions. Workers will be encouraged through induction and ongoing communications to car-pool and use public transport or other sustainable modes to reduce single-occupant vehicle trips. Shuttle capacity, roster staggering and satellite supply will be scaled as required based on monitoring (occupancy counts, gate logs and complaints register) so that parking demand is contained off-site and no queuing occurs on the public road. Parking demand will be monitored closely to ensure there are no adverse impacts on surrounding businesses.

5.5 Pedestrians

Public pedestrian movements through the site shall be prohibited at all times during construction. The site will need to be secured from pedestrian access with site fencing and hoarding.

As pedestrian volumes within the surrounding road network are minimal, it is not anticipated that the proposed works will generate significant impacts to the safety and amenity of pedestrians. The footpath along the site frontage will be maintained at all times and protected by Class B hoarding. During periods of active vehicle loading/unloading, short-term restrictions may apply; during these periods traffic controllers will temporarily divert pedestrians to the western side of Johnston Crescent via a signed detour.

Appropriate pedestrian traffic measures will be in place such as signage, traffic controllers and barriers to control access. This will be detailed in a Traffic Guidance Scheme as detailed in Appendix C. Pedestrian access to the site will be restricted by site fencing and boarding. Directional signage will be provided to guide pedestrians around the site and access will be maintained to adjacent operational buildings.

5.6 Cyclists

No dedicated cycleways are present in the vicinity of the site and cycling activity is expected to be limited. Any cyclists on the roadway will continue to follow the same routes and impacts to cyclists is anticipated to be negligible.

5.7 Public Infrastructure

When an oversize vehicle is required to access the site, some mounting or crossing of public kerbs and medians may be necessary. The builder will be responsible for repairing any damage to public infrastructure due to vehicle movements. Any other road markings damaged as a result of vehicles associated with the construction shall be repaired as the responsibility of the builder.

The developer may be held liable for any damage to public infrastructure in the vicinity of the site occurring as

a result of the construction works.

5.8 Cumulative Local Impact

The surrounding area is characterised predominantly by industrial uses, including Horsley Park, Eastern Creek and Smithfield. Any nearby construction activity that does occur is anticipated to be primarily reliant on the arterial road network, including Old Wallgrove Road, The Horsley Drive and the M7 Motorway. These roads are designed to accommodate heavy vehicle movements associated with industrial uses and are expected to have sufficient capacity to absorb construction traffic and the proposed development traffic.

Nearby projects and construction works have been identified in the following subsections. The cumulative impact will be further assessed and addressed below.

Should alternative project construction works commence near the site, the site manager shall be responsible for liaising with the site manager of the nearby site. In particular, communication across sites should ensure:

- Overall project programs are to be identified and shared
- High-volume days or periods (such as concrete pours) are to be communicated, and where possible are to be coordinated to avoid excessive impact to the road network and commenced so as to complete works within the permitted construction hours
- Oversize / over mass delivery days are to be communicated, and where possible are to be coordinated to avoid excessive impact to the road network
- Traffic control measures (including Traffic Guidance Schemes) are to be shared if these may be relevant to construction vehicle routes for surrounding projects

Overall, given the nature of surrounding land uses, the capacity of the surrounding road network, and the proposed traffic management measures, the cumulative local traffic impacts associated with the proposed works are expected to be manageable and acceptable.

5.8.1 Oakdale East Industrial Estate

The Oakdale East Industrial Estate is a major industrial development located at 2–10 Old Wallgrove Road, Horsley Park, immediately adjacent to and north of the S4 site. The project comprises multiple precincts and warehouse/distribution centre buildings delivered in multiple stages (including warehouse precincts, civil works and intersection upgrades) and has been progressively constructed from late 2023 into 2025 and beyond. Given the advanced state of works and the staged delivery over recent years, this project is not anticipated to generate substantial concurrent construction traffic that would materially compound the S4 works on the local road network. Furthermore, as construction works has been ongoing over the last few years the traffic volumes generated by this site would have been picked up in the traffic surveys incorporated into the intersection modelling presented earlier in this report.

5.8.2 NEXTDC “S7” Data Centre Campus (Eastern Creek):

S7 Project is in Eastern Creek, roughly 5–6 km north of S4. Subject to planning approval, the first phase of S7 is expected to be delivered by the second half of 2027. It's expected that S7 construction would overlap with S4 timeline. Any concurrent construction traffic would likely use the arterial road network (e.g. Wallgrove Road, Old Wallgrove Road, and the M4/M7 motorways) that connects these sites. Those arterial routes have substantial capacity, and the additional trucks from both S4 and S7 can be absorbed into the traffic flow. The S4 project team will coordinate with the S7 developers as needed to stagger peak construction activities and ensure traffic management plans are aligned.

5.8.3 Echidna Data Centre (Eastern Creek):

Echidna data centre has been under construction at Eastern Creek, roughly 5 km north of the S4 site. This two-storey, 35 MW facility is currently in its fit-out phase with base building works complete. The project is expected to be operational and completed before S4's main construction begins; it is not anticipated to occur concurrently with S4. Thus, no cumulative traffic impact is expected from this project's construction period.

During construction, traffic impacts will be temporary, localised, and managed through staged works in accordance with the approved Construction Traffic Management Plan and TGS Plans.

5.9 Road Safety

5.9.1 Construction Vehicle Access Points

The vehicle access points will be managed via automated gates that ensure no unauthorised or unsafe access is permitted for vehicles or pedestrians. These gates will have warning systems to notify pedestrians of movements to ensure safety. Traffic control at key pedestrian/vehicle interface points will also enable safe pedestrian movements across the construction access driveway.

No adjoining property access will be blocked as a result of the construction works, and all loading and unloading activities will be undertaken within the site boundary to prevent disruption to neighbouring properties.

All access control and pedestrian management measures will be implemented in accordance with the approved Traffic Guidance Schemes (TGS), which outline the placement of signage, barriers, and warning systems to ensure compliance with Austroads and TfNSW traffic control requirements.

5.9.2 Construction Vehicle Routes and Intersections

The state and regional road network is constructed to a high standard and would comfortably accommodate all construction vehicles. The state and regional roads used to access the site include Lenore Drive and Old Wallgrove Road (refer to Figure 2).

Key nearby intersections comprise two signalised junctions at Old Wallgrove Road/Millner Avenue and Old Wallgrove Road/Lenore Drive, and one unsignalised T-intersection at Johnston Crescent/Burley Road.

Signalised intersections have minimal safety concerns as all road users are managed in a safe and controlled manner.

The unsignalised T-intersection at Johnston Crescent/Burley Road contains suitable sight distances for truck drivers turning left onto Johnston Crescent.

5.9.3 Emergency Services

Emergency access to the site will be maintained during the works.

Emergency services access to all adjacent properties will be maintained under the existing conditions, with no impacts as a result of the construction works. Emergency vehicle access within the construction site, if required, will be managed on a case-by-case basis.

5.9.4 Communication of Works

Prior to any site works taking place, notification of commencement of the works shall be distributed to the neighbourhood. Notification is to include information on the type of works, hours of operation and contact numbers for further information or comment. Community notification will be undertaken as per a Construction Management Plan that will be prepared once the Contractor has been appointed.

Traffic control advance warning signage in accordance with Roads and Maritime Services guidelines and Australian Standards is to be in place to notify motorists of roadwork and when traffic controllers are present. Sign size is to be size "A" and is to be monitored throughout the works to ensure they are clearly visible.

As part of the site induction procedures, all contractors will be made aware of the finalised Construction Traffic Management Plan, the Traffic Guidance Scheme(s) and their responsibility to adhere to these plans.

6.0 Driver Code of Conduct

The objectives of the Driver Code of Conduct are to minimise the impact on the road network, reducing conflicts with other road users, limit road traffic noise, and ensure drivers are using the designated routes for accessing and leaving the site. This document shall be distributed to site workers and drivers as necessary.

It is recommended to establish a program or a checklist to ensure that truck drivers comply with the Driver Code of Conduct.

Minimise Impacts to Road Network

To minimise the impacts of earthworks and construction on the local and regional road network:

- Always obey all applicable road rules and laws
- Drivers to obey road speed limit and reduce the speed while approaching nearby intersections. Heavy braking can damage the roads.
- Drivers should avoid local, narrow roadways where possible.
- Drivers should follow specified truck routes (see Section 4.1 of CTMP, and enquire if unsure)

Minimise Conflicts with Other Road Users

To minimise conflicts with other road users including pedestrians, cyclists or private vehicle drivers:

- Drivers should be mindful of pedestrians and cyclists along all haulage routes
- Drivers should not obstruct access to any public roads, residential driveways, or pedestrian footpaths
- All loading and unloading will occur wholly within the site or any approved Works Zones
- Drivers should exit the site in a forward motion and check their left and right twice while exiting to ensure the safety of pedestrians, cyclists and other vehicles is maintained
- Upon exiting, drivers must wait for a suitable gap in traffic. The Roads Act does not give any special treatment to trucks exiting a construction site, but the vehicles on the road have the right-of-way
- Drivers should obey the traffic controllers while entering and exiting the site
- Drivers should be aware of site's surrounding conditions including speed limits, other traffic controls and pedestrian routes. This information can be presented to drivers during site inductions
- Drivers should be aware that construction vehicle movements are to be scheduled outside of peak traffic periods where possible.

Minimise Road Traffic Noise

To minimise the noise impacts on the community resulting from driving heavy vehicles:

- Drivers should reduce speed to reduce instances and severity of compression braking, including when approaching speed humps or raised zebra crossings
- Limit any excessive or unnecessary use of horns, in particular outside of working hours

Environmental Control

For safe environmental management:

- Construction vehicle wheels shall be cleaned prior to leaving the site to prevent transport or dust, dirt, or gravel from the worksite onto the road network or pedestrian footpaths.
- All loads are to be sealed or covered when entering or leaving the site. Loading of disposable material into vehicles leaving the site is to occur only within site.

Certificate and Approvals

Approval may need to be obtained from TfNSW, Fairfield City Council and other relevant authorities. Approval may be required for items including, but not limited to:

- Road occupancy approvals
- Hoarding/fencing approvals
- Oversized vehicle use on local roads

Only certified personnel will be used on site to implement, monitor and carry out the Traffic Control Plan.

Responsibility for acquiring the necessary certificates, permits and/or approvals rests with the Contractor and must be completed prior to commencement of the associated works.

Traffic Guidance Scheme and Signage

Temporary construction traffic related signposting will need to be developed in accordance with AS 1742.3 – Traffic Control Devices for Works on Roads.

During construction the contractor shall each morning, prior to work commencing, ensure all signage is erected in accordance with the TGS and is clearly visible. Each evening, upon completion of work, the contractor is to ensure relevant signage is removed as required. A review of the TGS(s) can be undertaken as required to determine any need for future amendments.

Prepared by
TTW (NSW) PTY LTD



AMMAR AHMED
Traffic Engineer

Authorised By
TTW (NSW) PTY LTD



SOPHIE SLADE
Senior Traffic Engineer

Appendix A – Overall Site Plan

FLIP BOOK

MONTH 1

Decommission and
relocate basin



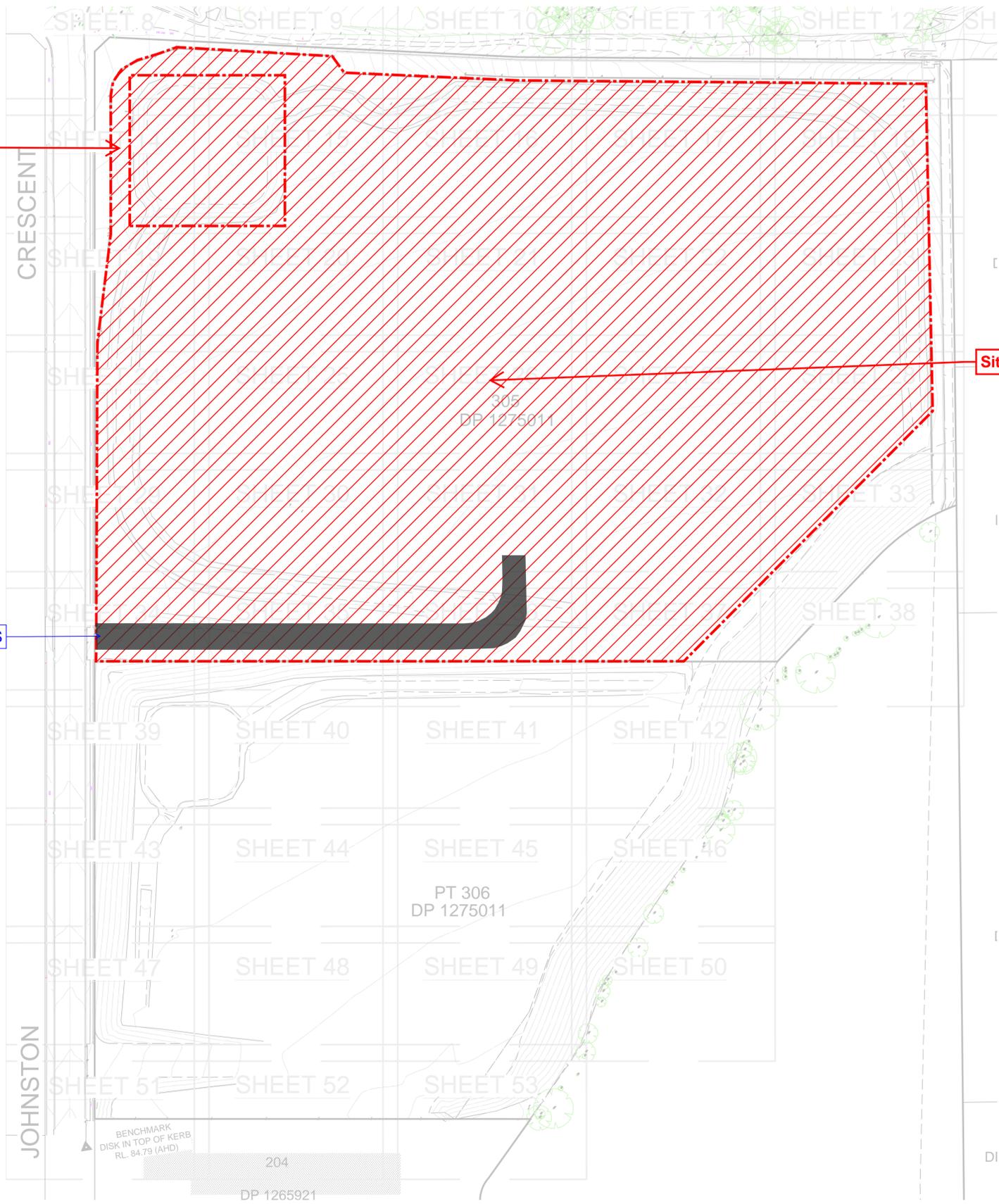
FLIP BOOK

MONTH 2

Decommission and relocate basin

Site Wide Bulk Ex

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TEMP ROAD SURFACE INSTALLED

NO.	DATE	BY	FOR INFORMATION	REV.	CHK	QA
1						

PRINCIPAL CONSULTANTS

Architect HDR
 Services Aurecon
 Structural TTW

PRINCIPAL CONTRACTOR

CLIENT



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Document Author Project Number
 10335877

Key Plan



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S*	0101	10115-77

Project Address:
 16 JOHNSTON CRESCENT,
 HORSELY PARK, NSW 2175.

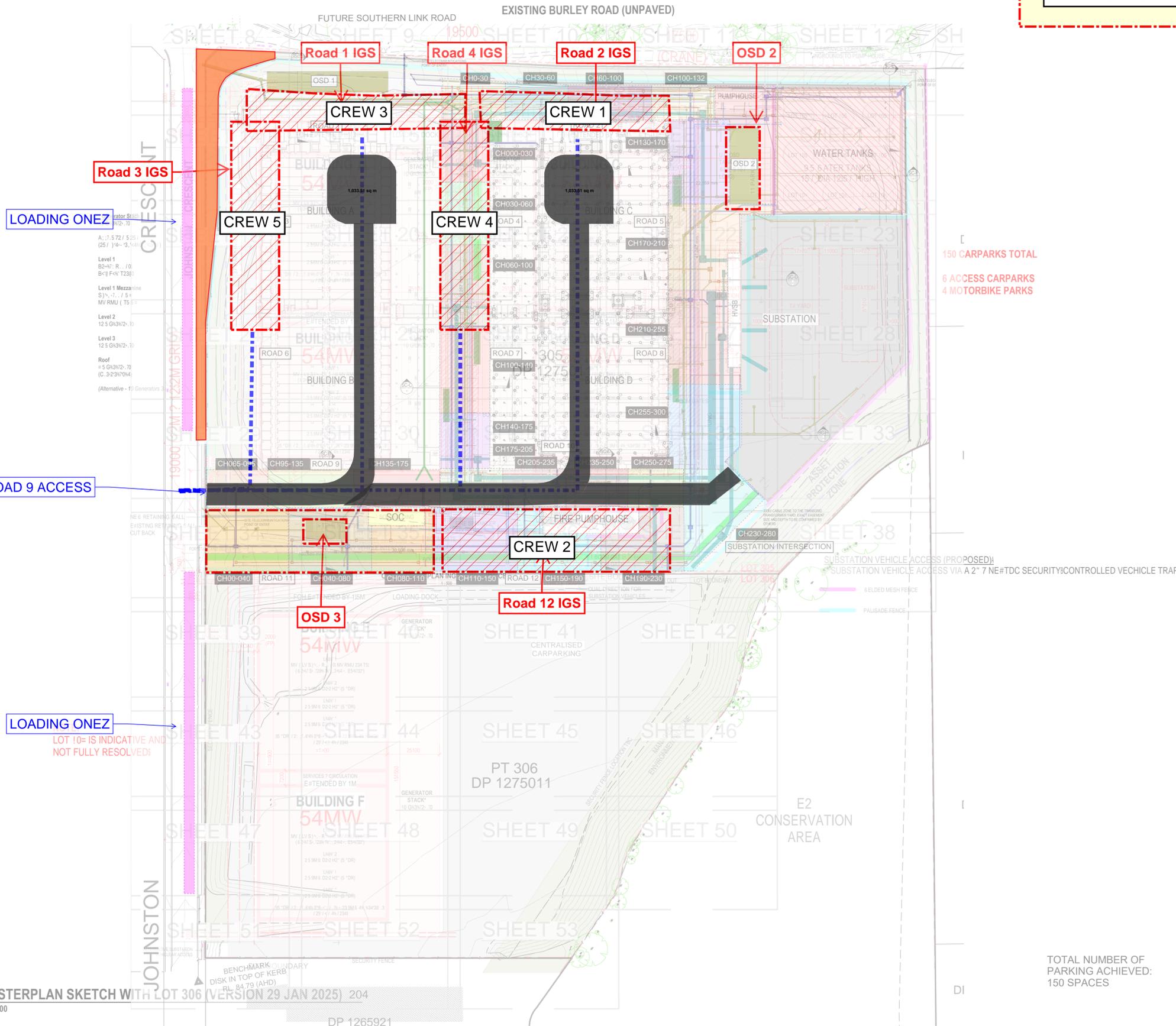
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 306 (VERSION 29 JAN 2025)

Drawing Status:
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CHK	Date
AH	30.01.25

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Drawing Number	Rev	
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LOADING ONEZ

ALTERNATE ROAD 9 ACCESS

LOADING ONEZ

LOT !0= IS INDICATIVE AND NOT FULLY RESOLVED!

150 CARPARKS TOTAL
 6 ACCESS CARPARKS
 4 MOTORBIKE PARKS

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TOTAL NUMBER OF
 PARKING ACHIEVED:
 150 SPACES

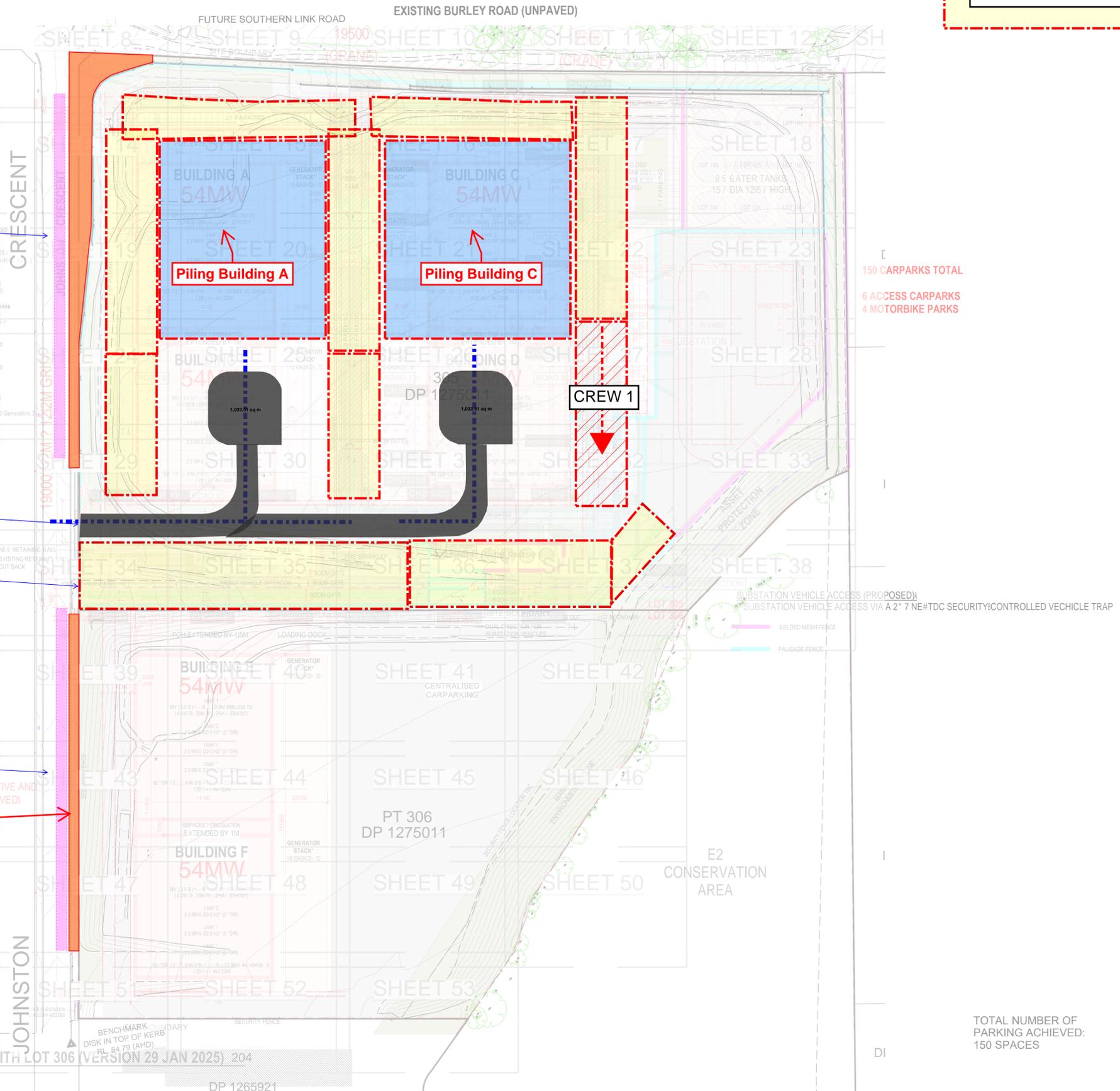
FLIP BOOK

MONTH 6

FUTURE SOUTHERN LINK ROAD

WORK IN PROGRESS

TEMP ROAD SURFACE INSTALLED



LOADING ONEZ

Piling Building A

Piling Building C

CREW 1

ALTERNATE ROAD 9 ACCESS

PERMANENT ROAD ACCESS

LOADING ONEZ

Site Establishment Works (B-Class)

150 CARPARKS TOTAL
6 ACCESS CARPARKS
4 MOTORBIKE PARKS

1 MASTERPLAN SKETCH WITH LOT 306 (VERSION 29 JAN 2025) 204
1:1000

TOTAL NUMBER OF PARKING ACHIEVED: 150 SPACES

PRINCIPAL CONSULTANTS	
Architect	HDR
Services	Aurecon
Structural	TTW
PRINCIPAL CONTRACTOR	
CLIENT	
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PROJECT ARCHITECT	
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Document Author Project Number	
10335877	
Key Plan	
Site:	Stage:
S*	0101
NEXTDC Project Number:	
10115777	
Project Address:	
16 JOHNSTON CRESCENT, HORSELY PARK, NSW 2175.	
Project Name:	
NEXTDC Shiraz 4	
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CHK	Date
AH	30.01.25
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Drawing Number	
S4-ARC-HDR-DRG-A-SK072	
Rev	IF12

TEMP ROAD SURFACE INSTALLED

NO	DATE	BY	REVISION
1			

PRINCIPAL CONSULTANTS

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 Services Aurecon
 Structural TTW

PRINCIPAL CONTRACTOR

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PROJECT ARCHITECT

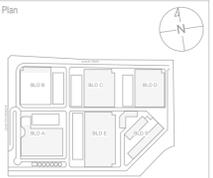


NOMINATED ARCHITECTS
 NSW Civil Contractors 10786, Qld. 2nd Milehigh 8889, Mark Gray 7286,
 Simon Flett 6393
 VIC Civil Contractors 10211
 ACT Civil Contractors 2387
 TAS Civil Contractors 1479
 SA Civil Contractors 6139

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Document Author Project Number
 10335877

Key Plan



Site: S* Stage: 0101 NEXTRDC Project Number: 10115777

Project Address:
 16 JOHNSTON CRESCENT,
 HORSELY PARK, NSW 2175.

Project Name:
 NEXTRDC Shiraz 4

Drawing title:
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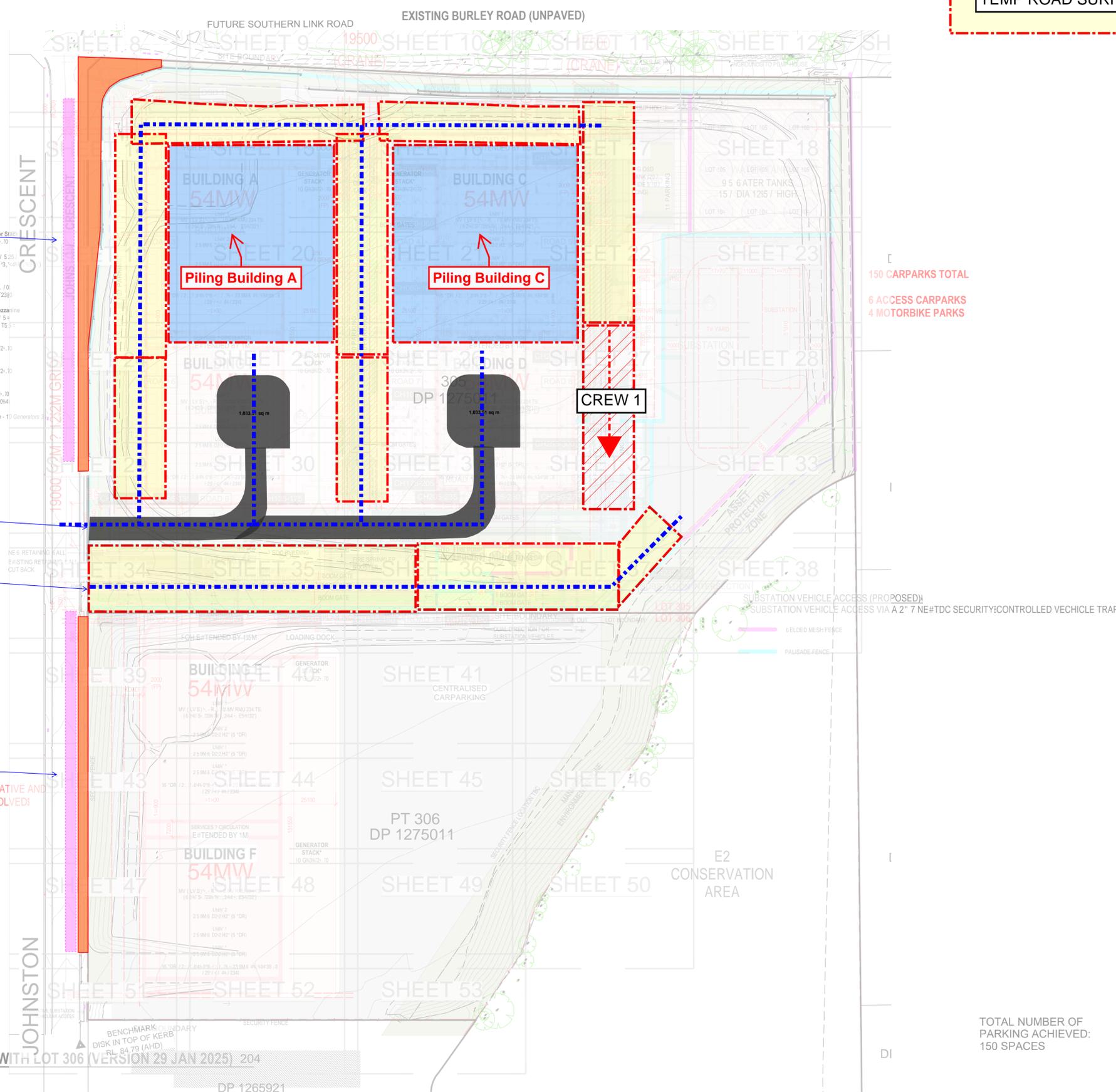
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CHK: AH Date: 30.01.25

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LOADING ONE

Piling Building A

Piling Building C

CREW 1

ALTERNATE ROAD 9 ACCESS

PERMANENT ROAD ACCESS

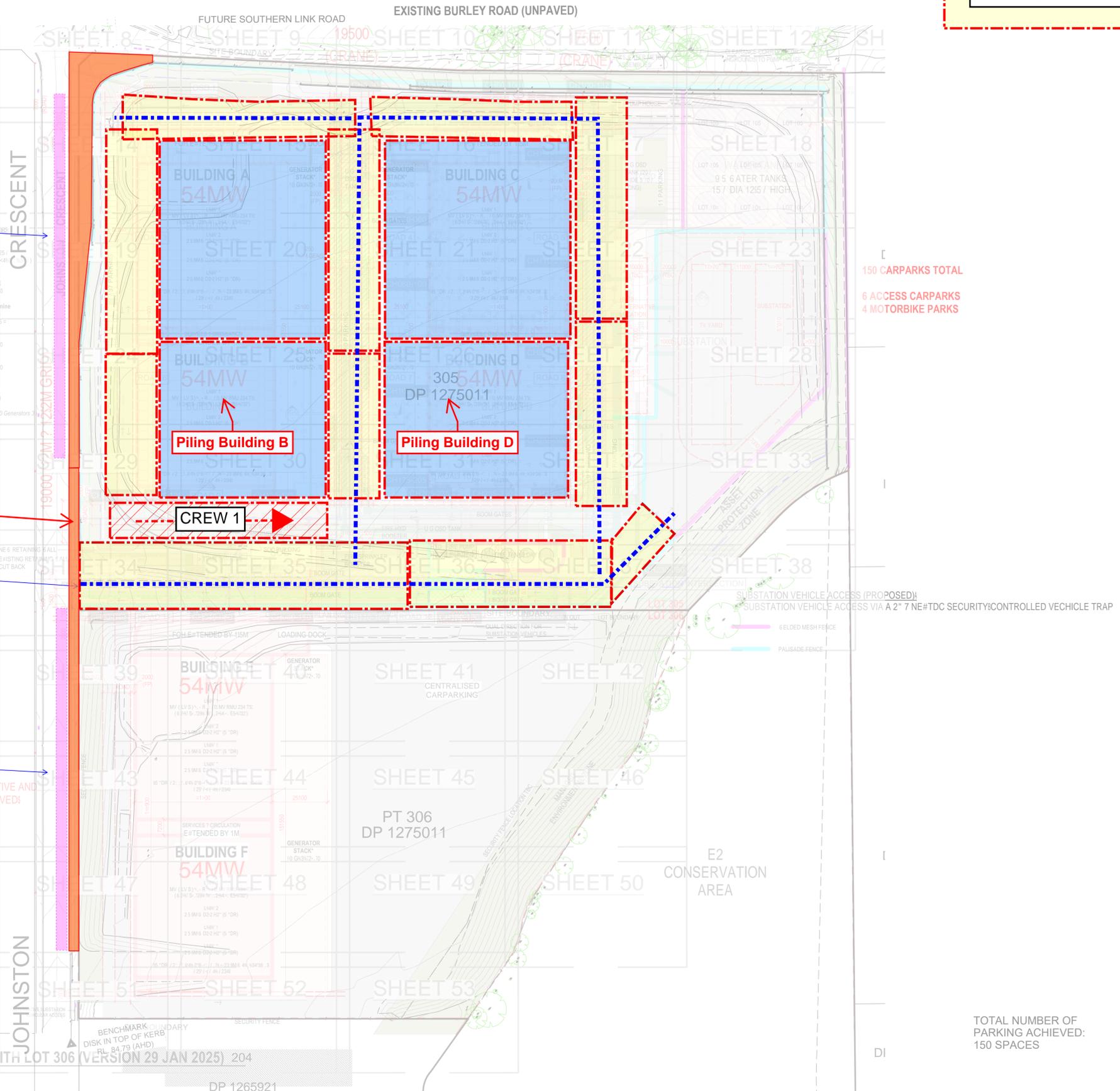
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TOTAL NUMBER OF
 PARKING ACHIEVED:
 150 SPACES

TEMP ROAD SURFACE INSTALLED



LOADING ONEZ

Site Establishment Works (B-Class)

PERMANENT ROAD ACCESS

LOADING ONEZ

LOT !0= IS INDICATIVE AND NOT FULLY RESOLVED!

1 MASTERPLAN SKETCH WITH LOT 306 (VERSION 29 JAN 2025) 204 1:1000

NO.	DATE	BY	FOR INFORMATION	BY	FOR INFORMATION
1					

PRINCIPAL CONSULTANTS

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Services Aurecon

Structural TTW

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VIC Civil Contractors 15211
ACT Civil Contractors 2767
TAS Civil Contractors 1479
LD Civil Contractors 6739

Document Author Project Number
10335877

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Project Name:
NEXTDC Shiraz 4

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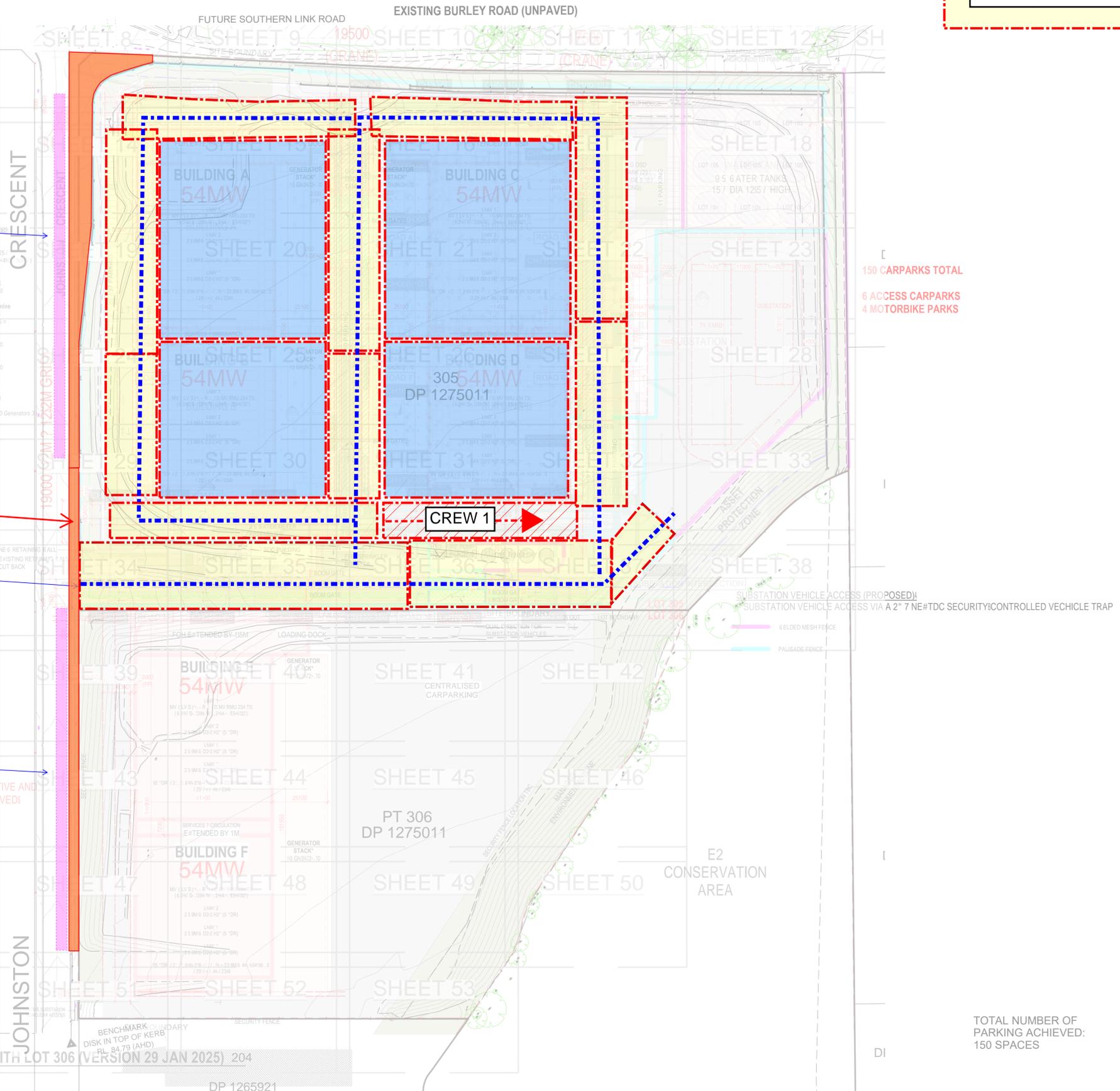
FLIP BOOK

MONTH 9

FUTURE SOUTHERN LINK ROAD

WORK IN PROGRESS

TEMP ROAD SURFACE INSTALLED



Appendix B – CVs



Ammar Ahmed

Engineer, Traffic

BEng (Hons) in Civil Engineering

ammar.ahmed@ttw.com.au

Experience

2022 - Current
Traffic Engineer, TTW

During his tenure at TTW, Ammar has actively participated in numerous traffic engineering projects spanning diverse sectors, including education, health, commercial ventures, art facilities and community initiatives.

His expertise extends to the design development of car parks and various traffic elements, encompassing traffic data analysis, loading docks, and pick-up and drop-off bays. This proficiency extends to addressing intricate and project-specific requirements.

Ammar possesses valuable experience in preparing comprehensive traffic impact assessments, construction traffic management plans, school transport plans, and green travel plans across a variety of projects types, notably in the domains of schools, hospitals, and community facilities. His knowledge extends to intersection modelling and traffic data analysis, and he is proficient in utilising various software programs, including AutoTURN, AutoCAD and SIDRA

Education

UNE Tamworth Campus
Brigidne College
St Vincent's College
University of Sydney
Jerrabomberra HS stage 2
Wee Waa HS
Meriden School

Health

Bathurst Hospital

Residential + Accommodation

Wahroonga Estate Stage 3
Boarding House Project for Loreto

Commercial

NEXTDC 54 Data Centre

Community + Public

Uniting Edinglassie
Mt Druitt Hub
Barangaroo Cutaway Fitout



Sophie Slade

Senior Traffic Engineer

B.Eng (Civil), MIEAust, Road Safety Auditor (Level 1)

sophie.slade@ttw.com.au

Experience

2023 – Current
Senior Traffic Engineer, TTW

2022 – 2023
Senior Traffic Engineer, Stanbury Traffic Planning

2020 – 2022
Traffic Engineer, Stanbury Traffic Planning

Sophie is a highly motivated and ambitious traffic engineer with four years' experience working on various projects throughout New South Wales.

Sophie has assessed the parking and traffic impacts of a range of land use projects on the greater road network. She has formed part of many successful project teams to bring forth safe, efficient and sustainable development.

Sophie is an accredited Road Safety Auditor (Level 1) and has attained the SafeWork NSW – Work Health & Safety Prepare Work Zone and Traffic Management Plans (PWZ TMP) qualification. She is also proficient in relevant engineering tools such as SIDRA traffic modelling, Auto CAD and AutoTurn.

Mixed Development

27 Yattenden Crescent, Baulkham Hills
388 Lane Cove Road, Macquarie Park
Arncliffe Central
1 Bilambee Avenue, Bilgola Plateau
Lidcombe Rise

Industrial

30 Loftus Road, Yennora
Thornleigh Community Recycling Centre

Education

St Agnes Catholic High School
Redlands Preparatory School
Regents Park Christian School
International Chinese School

Masterplanning

Mount Druitt Town Centre Revitalisation

Health + Aged Care

Somerset Private Hospital

Sports + Recreation

Sawtell Bowling Club
Wests Illawarra RSL
Earlwood Bardwell Park RSL
Club Singleton

Child Care Centre

35D Sefton Road, Thornleigh
1458 Pacific Highway, Turramurra
129 & 133 Ninth Avenue, Belfield



Grace Carpp

Associate

BE(Hons) Road Safety Auditor (Level 1)

grace.carpp@ttw.com.au

Experience

2021 – Current
Associate, TTW

2019 – Current
Senior Traffic and Civil Engineer, TTW

2015 – 2019
Traffic and Civil Engineer, TTW

Grace is part of TTW's Senior Management team and is experienced in both civil and traffic engineering as well as Road Safety Auditing, leading to solutions that are integrated and consider user safety in all aspects of design. Her experience extends across a number of sectors and regions with a particular focus on Education and Health projects. With a focus on project planning, Grace works collaboratively with the consultant design team to establish key design criteria early in the project planning process prior to these becoming critical items.

Hospitals

Cowra Hospital Redevelopment
Bathurst Hospital Redevelopment
Hornsby Ku-ring-gai Hospital Redevelopment
Lismore Base Hospital
Goulburn Hospital and Health Services Redevelopment
Bulli Aged Care Centre of Excellence
Campbelltown Hospital Multi Storey Car Park
Wyong Hospital

Aged Care

Uniting Edinglassie ILU and RACF
Schofields Age Exclusive Village
Uniting Epping ILU and RACF
Sir Moses Montefioe Jewish Home
Opal Fernleigh

Schools

St Vincents College
Meriden School
Edmondson Park High School
Brigidine College
Oxford Falls Grammar School
Knox Preparatory School
Wee Waa High School
St Catherines School
Murrumbidgee School
Willoughby Public School
Willoughby Girls High School
Russell Lea Infants School
Loreto Normanurst Early Learning Centre
Ravenswood
Barker College Master Plan

Arts & Culture

Australian Museum Master Plan
Museum of Applied Arts and Sciences
Western Sydney Performing Arts Centre
Mosman Civic Centre

Public Infrastructure

Macquarie Park Innovation Precinct
Edmondson Park North and South Commuter Car Parks
Leppington Commuter Car Park
Bondi Surf Bathers Life Saving Club
Brookvale Oval
City of Sydney Small Parks
Wombeyan Caves Precinct Plan
Young Street Plaza
Mittagong Station Transport Access Program
Hughes Street Car Park
Edgecliff Station Transport Access Program
T Way Cycleway Stage 2
Kevin Betts Stadium

Universities

TAFE Gosford Campus
CSU Port Macquarie
UOW Molecular Life Sciences Building Master Plan
UOW Arts and Social Sciences Building
UNSW Electrical Engineering Building Capital Renewal and Modernisation Project
UNSW Sciences and Engineering Building

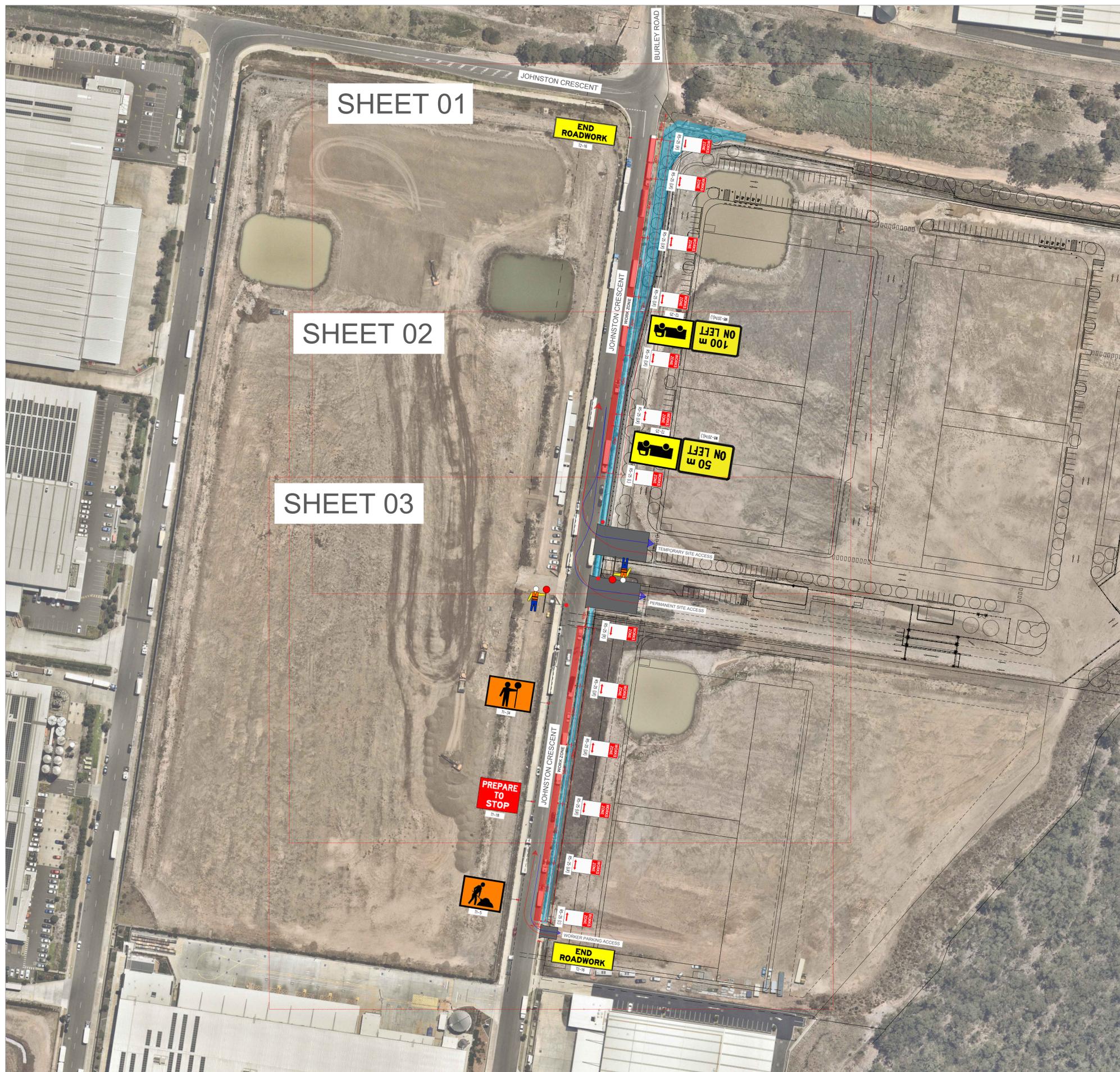
Commercial

MADE Marrickville
Wicks Park Mixed Use
Rosenthal Avenue Redevelopment

Residential

Wahroonga Estate
Lotus Apartment
Elara Medium Density Stages 10 and 11
9A 9B Green Square
Spencer Street Rose Bay

Appendix C – Traffic Guidance Scheme (TGS)



SITE NOTES:

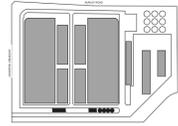
- TfNSW Authorised Traffic Controllers to assist with truck movements in and out of the site.
- Traffic Controllers may stop pedestrians for short periods to allow vehicles to enter / exit the site.
- Two (2) Authorised Traffic Controllers will be present when a truck is exiting the site.

TRAFFIC GUIDANCE SCHEME NOTES:

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- Dimension D provided in accordance with TCAWS V6.1
- Refer to Truck Route Figures within the CTMP report for specified inbound / outbound routes.
- Traffic Controllers to manage vehicles, pedestrians and cyclists movements, as required.

LEGEND

- ➡ VEHICLE INGRESS
- ➡ VEHICLE EGRESS
- HOARDING CLASS B

19/01/26	CC-1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA
<p>NOTE:</p> <ol style="list-style-type: none"> 1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ASSOCIATED SPECIFICATION 2. DO NOT SCALE FROM DRAWINGS 3. CONFIRM ALL MEASUREMENTS ON SITE 4. CHECK ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES 5. ENSURE COORDINATION WITH OTHER TRADES ON SITE 6. ASL = ABOVE SLAB LEVEL 					
<p>Principal Consultants Architect: HJR Services: aurecon Structural: TTW</p>					
<p>Principal Contractor: MULTIPLEX</p>					
<p>Client:</p>  <p>NEXTDC where the cloud lives™ NEXTDC GPO Box 3219 Brisbane QLD 4001 T: +61 7 3177 4777</p>					
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<p>Document Author Project Number 211085</p>					
<p>Key Plan:</p> 					
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<p>NEXTDC Project Number: S4.0002</p>					
<p>Project Address: 16 JOHNSTON CRESCENT, HORSLEY PARK NSW 2175</p>					
<p>Project Name: NEXTDC S4</p>					
<p>Drawing Title: TRAFFIC GUIDANCE SCHEME - SITE OVERALL</p>					
<p>Drawing Status: SPATIAL COORDINATION NOT FOR CONSTRUCTION</p>					
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Checked:	SS	Date:	19/01/26		
Scale:	1:1000	Sheet:	A1	File Name:	S4-TRF-TTW-SW-DRG-0000-1001
Drawing Number:	S4-TRF-TTW-SW-DRG-0000-1001	Rev:	CC-1		

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CONTINUE TO S4-TRF-TTW-SW-DRG-0000-1003

SITE NOTES:

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- Traffic Controllers may stop pedestrians for short periods to allow vehicles to enter / exit the site.
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- Refer to Truck Route Figures within the CTMP report for specified inbound / outbound routes.
- Traffic Controllers to manage vehicles, pedestrians and cyclists movements, as required.

LEGEND

- ➡ VEHICLE INGRESS
- ➡ VEHICLE EGRESS
- HOARDING CLASS B

19/01/26	CC1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA
NOTE:					
1. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ASSOCIATED SPECIFICATION					
2. DO NOT SCALE FROM DRAWINGS					
3. CONFIRM ALL MEASUREMENTS ON SITE					
4. CHECK ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES					
5. ENSURE COORDINATION WITH OTHER TRADES ON SITE					
6. ASL = ABOVE SLAB LEVEL					
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Architect					
H2R					
Services					
aurecon					
Structural					
TTW					
Principal Contractor					
MULTIPLEX					
Client					
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211085					
Key Plan					
Site:	S4	Stage:	01	Phase:	01
NEXTDC Project Number:					
S4.0002					
Project Address					
16 JOHNSTON CRESCENT, HORSLEY PARK NSW 2175					
Project Name					
NEXTDC S4					
Drawing Title					
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Drawing Status					
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Checked	SS	Date	19/01/26		
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Drawing Number					Rev
S4-TRF-TTW-SW-DRG-0000-1002					CC-1

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CONTINUE TO S4-TRF-TTW-SW-DRG-0000-1002



CONTINUE TO S4-TRF-TTW-SW-DRG-0000-1004

SITE NOTES:

- TfNSW Authorised Traffic Controllers to assist with truck movements in and out of the site.
- Traffic Controllers may stop pedestrians for short periods to allow vehicles to enter / exit the site.
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- Traffic Controllers to manage vehicles, pedestrians and cyclists movements, as required.

LEGEND

- VEHICLE INGRESS
- VEHICLE EGRESS
- HOARDING CLASS B

19/01/26	CC1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA
<p>NOTE:</p> <ol style="list-style-type: none"> ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ASSOCIATED SPECIFICATION DO NOT SCALE FROM DRAWINGS CONFIRM ALL MEASUREMENTS ON SITE CHECK ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES ENSURE COORDINATION WITH OTHER TRADES ON SITE ASL = ABOVE SLAB LEVEL 					
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Architect					
Structural					
Principal Contractor					
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211085					
Key Plan					
Site:	S4	Stage:	01	Phase:	01
NEXTDC Project Number: S4.0002					
Project Address					
16 JOHNSTON CRESCENT, HORSLEY PARK NSW 2175					
Project Name					
NEXTDC S4					
Drawing Title					
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Drawing Status					
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SITE NOTES:

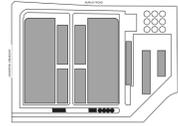
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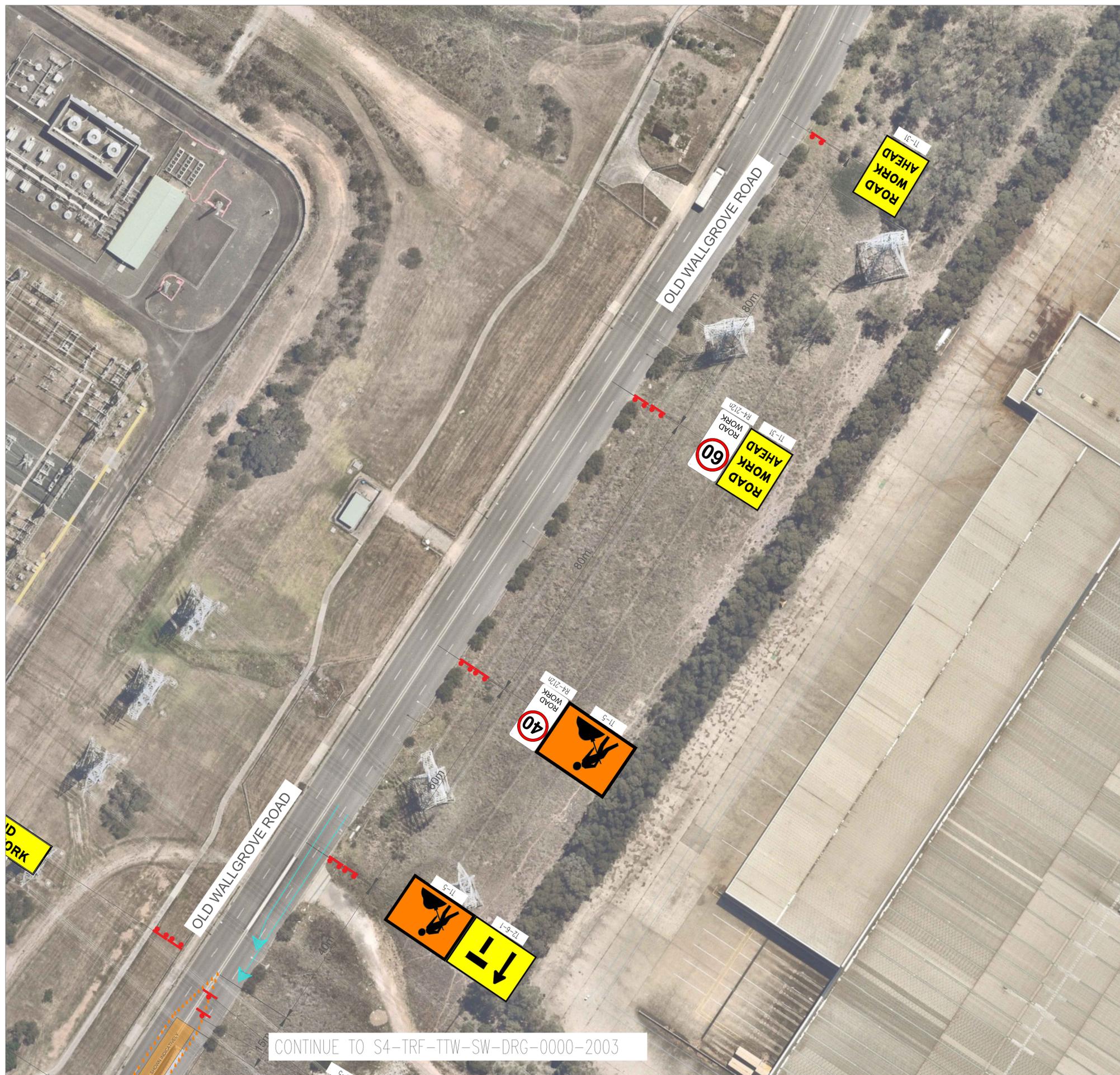
LEGEND

- ➡ VEHICLE INGRESS
- ➡ VEHICLE EGRESS
- HOARDING CLASS B

19/01/26	CC1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA
NOTE:					
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Architect HJR					
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Structural TTW					
Principal Contractor MULTIPLEX					
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Document Author Project Number 211085					
Key Plan					
					
Site:	S4	Stage:	01	Phase:	01
NEXTDC Project Number: S4.0002					
Project Address 16 JOHNSTON CRESCENT, HORSLEY PARK NSW 2175					
Project Name NEXTDC S4					
Drawing Title TRAFFIC GUIDANCE SCHEME - SITE OVERALL SHEET 03					
Drawing Status SPATIAL COORDINATION NOT FOR CONSTRUCTION					
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Drawing Number		Rev			
S4-TRF-TTW-SW-DRG-0000-1004 CC-1					

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SITE NOTES:

- The signage and traffic control devices illustrated in this drawing is provided as a typical arrangement only. Additional traffic guidance schemes must be developed and supplied for any non-standard or special conditions
- The extent of the trench is shown indicatively. Contractor to ensure delineation of works is clearly shown and safety barrier to be installed to ensure safety of workers.

TRAFFIC GUIDANCE SCHEME NOTES:

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- Dimension D provided in accordance with TCAWS V6.1
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LEGEND

- VEHICLE MOVEMENTS
- INDICATIVE TRENCH EXTENT

19/01/26	CC1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA
<p>NOTE:</p> <ol style="list-style-type: none"> ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ASSOCIATED SPECIFICATION DO NOT SCALE FROM DRAWINGS CONFIRM ALL MEASUREMENTS ON SITE CHECK ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES ENSURE COORDINATION WITH OTHER TRADES ON SITE ASL = ABOVE SLAB LEVEL 					
<p>Principal Consultants</p> <p>Architect HJR</p> <p>Services aurecon</p> <p>Structural TTW</p> <p>Principal Contractor MULTIPLEX</p> <p>Client NEXTDC where the cloud lives™ NEXTDC GPO Box 3219 Brisbane QLD 4001 T: +61 7 3177 4777</p> <p>(Contractor / Consultant / Document Author) TTW www.ttweengineers.com</p> <p>Level 6, 73 Miller street North Sydney NSW 2060 NOMINATED ENGINEERS NSW GRACE CARPP, CHRIS GENTILE</p> <p>THIS DRAWING IS COPYRIGHT AND IS THE PROPERTY OF TTW AND MUST NOT BE USED WITHOUT AUTHORIZATION. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS.</p> <p>Document Author Project Number 211085</p> <p>Key Plan </p>					
Site:	S4	Stage:	01	Phase:	01
<p>NEXTDC Project Number: S4.0002</p> <p>Project Address 16 JOHNSTON CRESCENT, HORSLEY PARK NSW 2175</p> <p>Project Name NEXTDC S4</p> <p>Drawing Title TRAFFIC GUIDANCE SCHEME - TYPICAL SIGNAGE FOR TRENCHING SHEET 01</p> <p>Drawing Status SPATIAL COORDINATION NOT FOR CONSTRUCTION</p> <p>Drawn MP Date 19/01/26</p> <p>Checked SS Date 19/01/26</p> <p>Scale 1:500</p> <p>Sheet A1</p> <p>File Name S4-TRF-TTW-SW-DRG-0000-2002</p> <p>Drawing Number S4-TRF-TTW-SW-DRG-0000-2002</p> <p>Rev CC-1</p>					

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CONTINUE TO S4-TRF-TTW-SW-DRG-0000-2002



CONTINUE TO S4-TRF-TTW-SW-DRG-0000-2004

SITE NOTES:

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LEGEND

- VEHICLE MOVEMENTS
- INDICATIVE TRENCH EXTENT

19/01/26	CC1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA

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 - CHECK ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES
 - ENSURE COORDINATION WITH OTHER TRADES ON SITE
 - ASL = ABOVE SLAB LEVEL

Principal Consultants
 Architect
HR
 Services
aurecon
 Structural
TTW
 Principal Contractor
MULTIPLEX

Client

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Site: **S4** Stage: **01** Phase: **01**
 NEXTDC Project Number:
 S4.0002

Project Address
 16 JOHNSTON CRESCENT,
 HORSLEY PARK NSW 2175

Project Name
 NEXTDC S4

Drawing Title
 TRAFFIC GUIDANCE
 SCHEME -
 TYPICAL SIGNAGE FOR
 TRENCHING
 SHEET 02

Drawing Status
 SPATIAL COORDINATION
 NOT FOR CONSTRUCTION

Drawn
 MP
 Date
 19/01/26

Checked
 SS
 Date
 19/01/26

Scale
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 Sheet
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 File Name
 S4-TRF-TTW-SW-DRG-0000-2003
 Drawing Number
 S4-TRF-TTW-SW-DRG-0000-2003
 Rev
 CC-1

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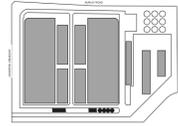
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LEGEND

- VEHICLE MOVEMENTS
- ▭ INDICATIVE TRENCH EXTENT

19/01/26	CC1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA
<p>NOTE:</p> <ol style="list-style-type: none"> ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ASSOCIATED SPECIFICATION DO NOT SCALE FROM DRAWINGS CONFIRM ALL MEASUREMENTS ON SITE CHECK ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES ENSURE COORDINATION WITH OTHER TRADES ON SITE ASL = ABOVE SLAB LEVEL 					
<p>Principal Consultants Architect HJR Services aurecon Structural TTW Principal Contractor MULTIPLEX</p>					
<p>Client  NEXTDC where the cloud lives™ NEXTDC GPO Box 3219 Brisbane QLD 4001 T: +61 7 3177 4777</p>					
<p>(Contractor / Consultant / Document Author)  www.ttweengineers.com Level 6, 73 Miller street North Sydney NSW 2060 NOMINATED ENGINEERS NSW GRACE CARPP, CHRIS GENTILE</p>					
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<p>Key Plan </p>					
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NEXTDC Project Number: S4.0002					
Project Address 16 JOHNSTON CRESCENT, HORSLEY PARK NSW 2175					
Project Name NEXTDC S4					
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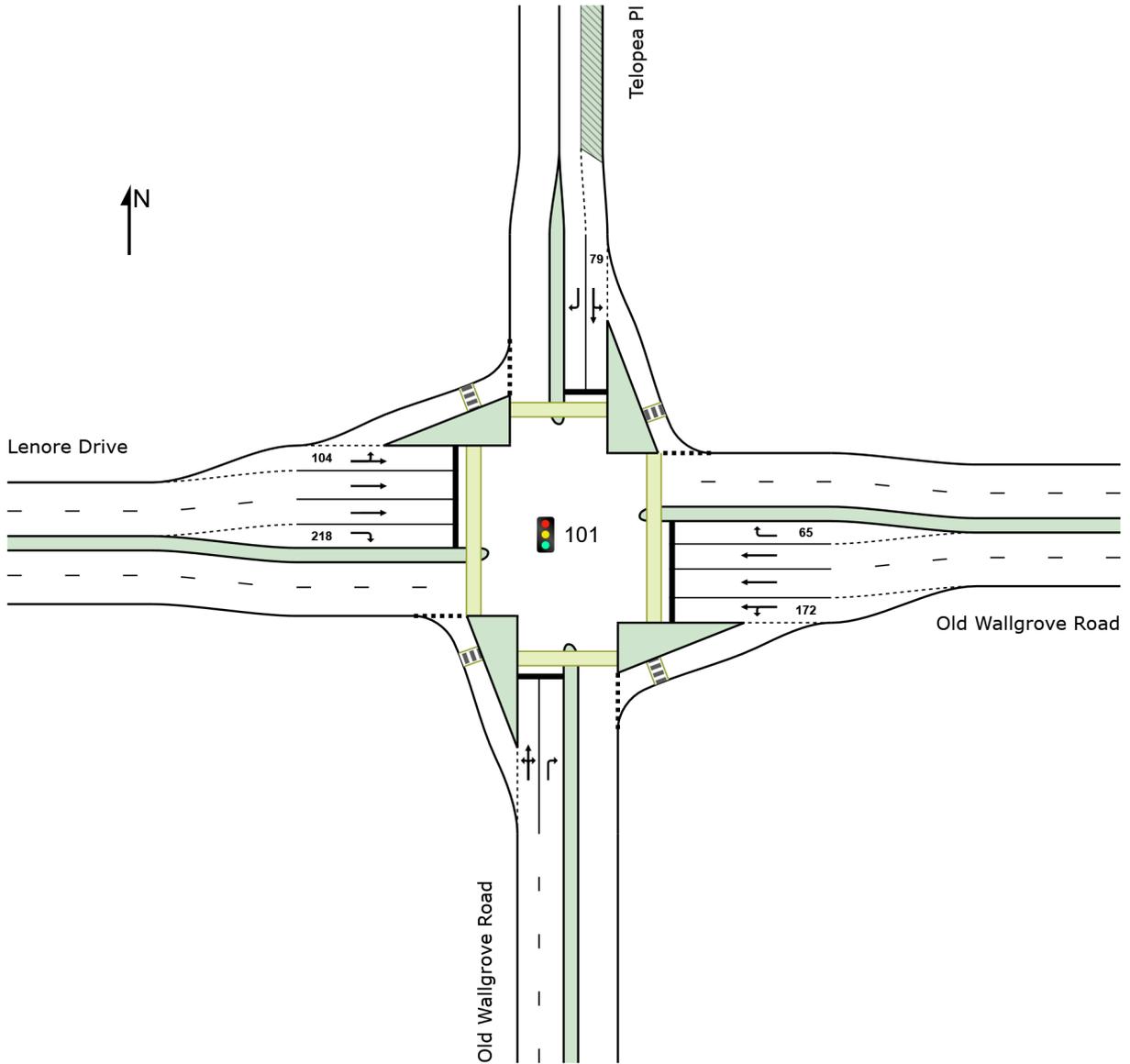
Appendix D – SIDRA Model Results

SITE LAYOUT

**Site: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - AM
(Site Folder: Existing Scenario 2023)]**

Existing Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

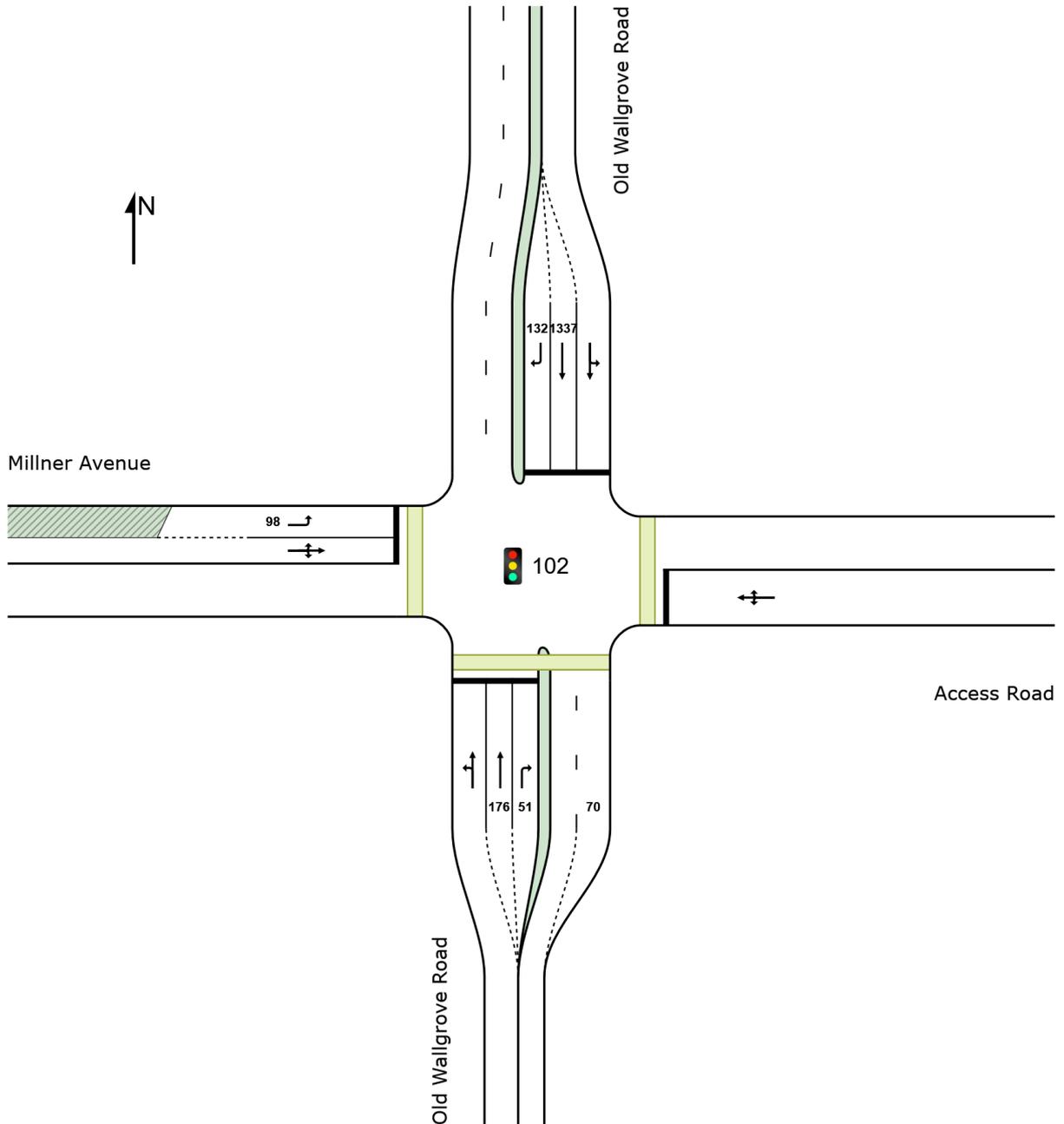


SITE LAYOUT

 Site: 102 [Millner Ave & Old Wallgrove Rd - AM (Site Folder: Existing Scenario 2023)]

Existing Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

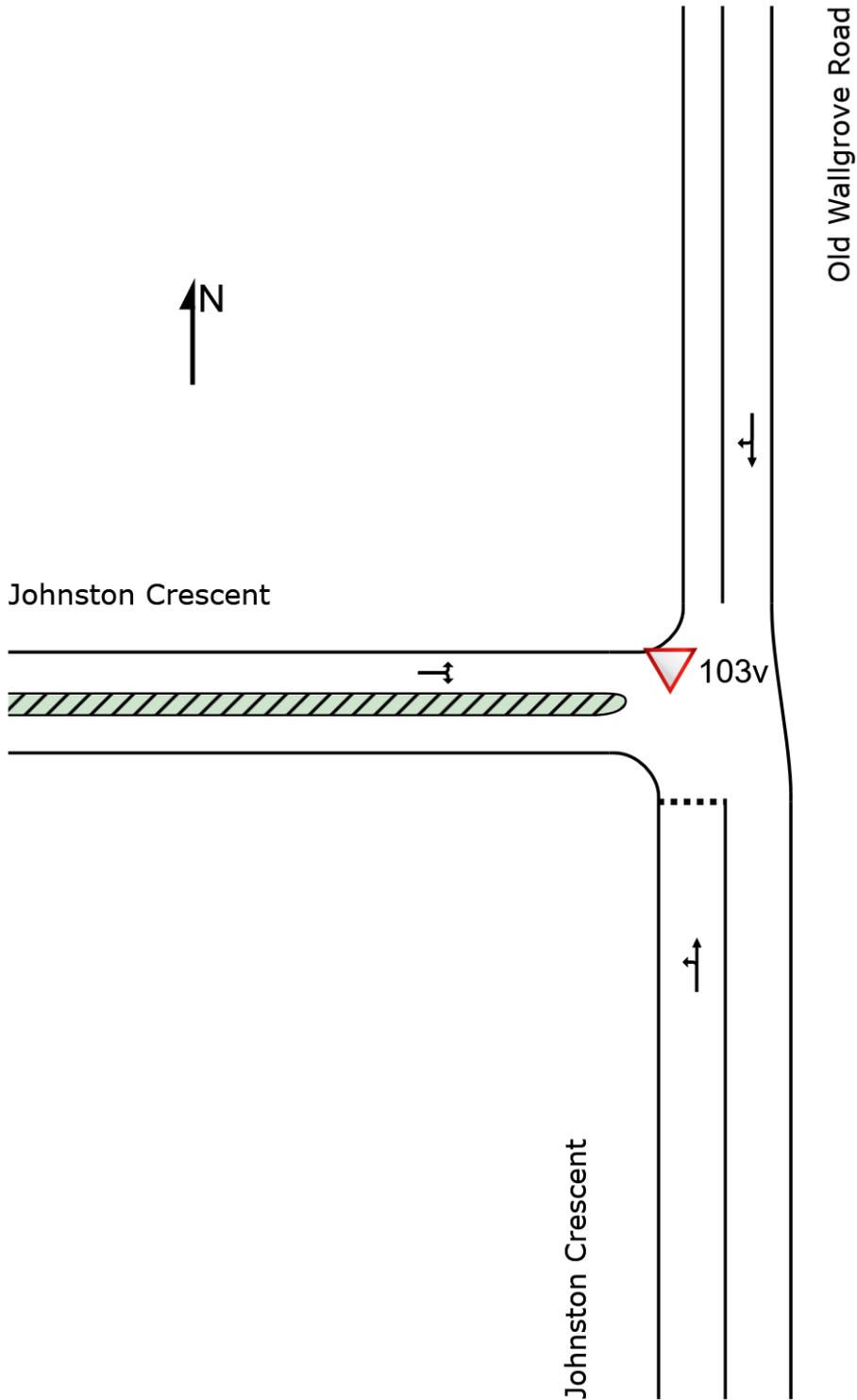


SITE LAYOUT

▼ Site: 103v [Johnston Cres & Old Wallgrove Rd - AM (Site Folder: Existing Scenario 2023)]

Existing Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Existing Design
Give-Way (Two-Way)

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



MOVEMENT SUMMARY

**Site: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - AM
(Site Folder: Existing Scenario 2023)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Scenario - AM

AM Peak: 7:00 - 8:00am

Site Category: Existing Design

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 111 seconds (Site User-Given Phase Times)

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]					
			veh/h	%	veh/h	%	v/c	sec			veh	m				km/h
South: Old Wallgrove Road																
1	L2	All MCs	51	58.3	51	58.3	0.665	9.4	LOS A	8.5	90.9	0.97	0.85	1.02	46.4	
2	T1	All MCs	4	25.0	4	25.0	*0.665	68.1	LOS E	8.5	90.9	0.97	0.85	1.02	46.9	
3	R2	All MCs	247	63.4	247	63.4	0.665	64.3	LOS E	8.5	90.9	0.97	0.85	1.03	42.4	
Approach			302	62.0	302	62.0	0.665	55.2	LOS D	8.5	90.9	0.97	0.85	1.03	43.2	
East: Old Wallgrove Road																
4	L2	All MCs	587	20.4	587	20.4	0.462	10.4	LOS A	8.7	71.3	0.30	0.70	0.30	66.1	
5	T1	All MCs	693	18.7	693	18.7	*0.486	24.9	LOS B	13.7	111.6	0.78	0.68	0.78	47.2	
6	R2	All MCs	59	3.6	59	3.6	*0.306	49.5	LOS D	2.8	20.0	0.96	0.75	0.96	25.3	
Approach			1339	18.8	1339	18.8	0.486	19.7	LOS B	13.7	111.6	0.58	0.69	0.58	56.4	
North: Telopea PI																
7	L2	All MCs	35	15.2	35	15.2	0.535	6.1	LOS A	2.7	20.9	1.00	0.76	1.04	20.6	
8	T1	All MCs	12	9.1	12	9.1	*0.535	241.9	LOS F	2.7	20.9	1.00	0.76	1.04	42.8	
9	R2	All MCs	12	0.0	12	0.0	0.141	64.3	LOS E	0.6	4.5	0.99	0.68	0.99	28.2	
Approach			58	10.9	58	10.9	0.535	64.9	LOS E	2.7	20.9	1.00	0.74	1.03	28.0	
West: Lenore Drive																
10	L2	All MCs	25	0.0	25	0.0	0.015	7.4	LOS A	0.0	0.3	0.04	0.62	0.04	58.8	
11	T1	All MCs	711	27.1	711	27.1	*0.426	18.3	LOS B	10.9	93.6	0.65	0.64	0.65	53.2	
12	R2	All MCs	187	16.9	187	16.9	*0.601	46.2	LOS D	7.2	57.4	0.96	0.87	0.96	51.1	
Approach			923	24.3	923	24.3	0.601	23.6	LOS B	10.9	93.6	0.69	0.68	0.69	52.5	
All Vehicles			2622	25.5	2622	25.5	0.665	26.1	LOS B	13.7	111.6	0.67	0.71	0.68	51.7	

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.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped]	[Dist]					
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Old Wallgrove Road												
P1	Full	1	1	49.7	LOS E	0.0	0.0	0.95	0.95	203.5	200.0	0.98

East: Old Wallgrove Road												
P2	Full	1	1	49.7	LOS E	0.0	0.0	0.95	0.95	203.5	200.0	0.98
North: Telopea PI												
P3	Full	1	1	22.1	LOS C	0.0	0.0	0.89	0.89	175.9	200.0	1.14
West: Lenore Drive												
P4	Full	1	1	49.7	LOS E	0.0	0.0	0.95	0.95	203.5	200.0	0.98
All Pedestrians		4	4	42.8	LOS E	0.0	0.0	0.93	0.93	196.6	200.0	1.02

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: 102 [Millner Ave & Old Wallgrove Rd - AM (Site Folder: Existing Scenario 2023)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Scenario - AM

AM Peak: 7:00 - 8:00am

Site Category: Existing Design

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 63 seconds (Site User-Given Phase Times)

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h	
South: Old Wallgrove Road													
1	L2	All MCs	4 50.0	4 50.0	* 0.086	15.3	LOS B	0.7 6.3	0.79	0.60	0.79	45.2	
2	T1	All MCs	66 39.7	66 39.7	* 0.086	16.9	LOS B	0.8 7.7	0.79	0.60	0.79	66.4	
3	R2	All MCs	2 50.0	2 50.0	0.004	13.5	LOS A	0.0 0.2	0.57	0.62	0.57	40.6	
Approach			73 40.6	73 40.6	0.086	16.7	LOS B	0.8 7.7	0.78	0.60	0.78	65.1	
East: Access Road													
4	L2	All MCs	2 50.0	2 50.0	0.324	18.8	LOS B	0.6 7.8	0.99	0.70	0.99	25.1	
5	T1	All MCs	1 0.0	1 0.0	* 0.324	29.0	LOS C	0.6 7.8	0.99	0.70	0.99	30.9	
6	R2	All MCs	18 100.0	18 100.0	0.324	34.2	LOS C	0.6 7.8	0.99	0.70	0.99	46.6	
Approach			21 90.0	21 90.0	0.324	32.4	LOS C	0.6 7.8	0.99	0.70	0.99	44.7	
North: Old Wallgrove Road													
7	L2	All MCs	13 66.7	37 66.7	0.092	15.8	LOS B	2.4 23.4	0.51	0.56	0.51	61.8	
8	T1	All MCs	148 19.9	224 19.9	0.217	13.8	LOS A	4.7 38.1	0.59	0.51	0.59	71.5	
9	R2	All MCs	576 21.0	626 21.0	* 0.590	15.9	LOS B	10.2 84.4	0.56	0.76	0.56	61.2	
Approach			737 21.6	887 22.7	0.590	15.3	LOS A	10.2 84.4	0.57	0.69	0.57	62.9	
West: Millner Avenue													
10	L2	All MCs	199 65.6	199 65.6	0.151	13.5	LOS A	1.7 18.4	0.55	0.68	0.55	55.1	
11	T1	All MCs	1 0.0	1 0.0	0.151	37.1	LOS C	1.6 17.4	0.58	0.68	0.58	39.3	
12	R2	All MCs	1 100.0	1 100.0	0.151	42.4	LOS C	1.6 17.4	0.58	0.68	0.58	38.7	
Approach			201 65.4	201 65.4	0.151	13.8	LOS A	1.7 18.4	0.55	0.68	0.55	55.0	
All Vehicles			1032 32.9	1182 28.7	0.590	15.2	LOS A	10.2 84.4	0.59	0.69	0.59	60.9	

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	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped Dist] ped m	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed		
		ped/h	sec					sec	m	m/sec		
South: Old Wallgrove Road												

P1 Full	1	1	25.8	LOS C	0.0	0.0	0.90	0.90	179.6	200.0	1.11
East: Access Road											
P2 Full	1	1	25.8	LOS C	0.0	0.0	0.90	0.90	179.6	200.0	1.11
West: Millner Avenue											
P4 Full	1	1	25.8	LOS C	0.0	0.0	0.90	0.90	179.6	200.0	1.11
All Pedestrians	3	3	25.8	LOS C	0.0	0.0	0.90	0.90	179.6	200.0	1.11

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: 103v [Johnston Cres & Old Wallgrove Rd - AM (Site Folder: Existing Scenario 2023)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Scenario - AM
 AM Peak: 7:00 - 8:00am
 Site Category: Existing Design
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h		veh/h					veh	m				
South: Johnston Crescent															
1	L2	All MCs	1	0.0	1	0.0	0.019	5.6	LOS A	0.1	0.6	0.18	0.50	0.18	52.3
2	T1	All MCs	18	41.2	18	41.2	0.019	5.2	LOS A	0.1	0.6	0.18	0.50	0.18	50.9
Approach			19	38.9	19	38.9	0.019	5.3	LOS A	0.1	0.6	0.18	0.50	0.18	51.0
North: Old Wallgrove Road															
8	T1	All MCs	69	6.1	69	6.1	0.055	0.0	LOS A	0.2	1.4	0.01	0.17	0.01	58.4
9	R2	All MCs	28	25.9	28	25.9	0.055	5.8	LOS A	0.2	1.4	0.01	0.17	0.01	53.2
Approach			98	11.8	98	11.8	0.055	1.7	NA	0.2	1.4	0.01	0.17	0.01	57.0
West: Johnston Crescent															
10	L2	All MCs	16	53.3	16	53.3	0.012	6.2	LOS A	0.0	0.1	0.02	0.56	0.02	47.9
12	R2	All MCs	1	0.0	1	0.0	0.012	5.6	LOS A	0.0	0.1	0.02	0.56	0.02	52.1
Approach			17	50.0	17	50.0	0.012	6.1	NA	0.0	0.1	0.02	0.56	0.02	48.2
All Vehicles			134	20.5	134	20.5	0.055	2.8	NA	0.2	1.4	0.04	0.27	0.04	54.9

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.

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: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - PM
(Site Folder: Existing Scenario 2023)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Scenario - PM

PM Peak: 4:15 - 5:15pm

Site Category: Existing Design

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 92 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h		veh/h					veh	m				
South: Old Wallgrove Road															
1	L2	All MCs	280	9.8	280	9.8	0.872	18.3	LOS B	23.3	178.2	1.00	0.97	1.23	48.5
2	T1	All MCs	2100	100.0	2100	100.0	0.872	89.3	LOS F	23.3	178.2	1.00	0.97	1.23	48.4
3	R2	All MCs	645	10.6	645	10.6	*0.872	62.9	LOS E	23.3	178.2	1.00	0.97	1.23	46.2
Approach			927	10.6	927	10.6	0.872	49.5	LOS D	23.3	178.2	1.00	0.97	1.23	47.0
East: Old Wallgrove Road															
4	L2	All MCs	162	70.8	162	70.8	0.147	9.0	LOS A	0.7	8.2	0.15	0.63	0.15	63.3
5	T1	All MCs	627	29.0	627	29.0	*0.430	19.5	LOS B	9.9	86.8	0.74	0.64	0.74	51.9
6	R2	All MCs	616	16.7	616	16.7	*0.176	56.0	LOS D	0.3	2.5	1.00	0.63	1.00	23.4
Approach			796	37.4	796	37.4	0.430	17.6	LOS B	9.9	86.8	0.62	0.64	0.62	55.1
North: Telopea PI															
7	L2	All MCs	18	11.8	103	11.8	0.067	6.3	LOS A	4.9	39.0	0.62	0.62	0.62	39.0
8	T1	All MCs	1100	100.0	6100	100.0	0.067	256.1	LOS F	4.9	39.0	0.62	0.62	0.62	61.3
9	R2	All MCs	11	10.0	11	10.0	*0.567	66.4	LOS E	0.6	4.5	1.00	0.68	1.13	27.0
Approach			29	14.3	119	16.1	0.567	24.2	LOS A	4.9	39.0	0.66	0.63	0.67	33.7
West: Lenore Drive															
10	L2	All MCs	3	33.3	3	33.3	0.002	7.9	LOS A	0.0	0.0	0.00	0.60	0.00	57.2
11	T1	All MCs	414	28.2	414	28.2	*0.257	15.1	LOS B	5.6	49.0	0.63	0.52	0.63	56.3
12	R2	All MCs	42	55.0	42	55.0	0.415	55.8	LOS D	2.0	20.3	0.99	0.74	0.99	46.6
Approach			459	30.7	459	30.7	0.415	18.8	LOS B	5.6	49.0	0.66	0.54	0.66	54.0
All Vehicles			2212	24.5	2302	23.5	0.872	31.4	LOS C	23.3	178.2	0.78	0.76	0.87	49.8

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	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed	
	ped/h	ped/h	sec		[Ped]	[Dist]			sec	m	m/sec	
					ped	m						
South: Old Wallgrove Road												

P1 Full	1	1	40.2	LOS E	0.0	0.0	0.93	0.93	194.0	200.0	1.03
East: Old Wallgrove Road											
P2 Full	1	1	40.2	LOS E	0.0	0.0	0.93	0.93	194.0	200.0	1.03
North: Telopea Pl											
P3 Full	1	1	17.5	LOS B	0.0	0.0	0.87	0.87	171.3	200.0	1.17
West: Lenore Drive											
P4 Full	1	1	40.2	LOS E	0.0	0.0	0.93	0.93	194.0	200.0	1.03
All Pedestrians	4	4	34.5	LOS D	0.0	0.0	0.92	0.92	188.4	200.0	1.06

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: 102 [Millner Ave & Old Wallgrove Rd - PM (Site Folder: Existing Scenario 2023)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Scenario - PM

PM Peak: 4:15 - 5:15pm

Site Category: Existing Design

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 54 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h		veh/h					veh	m				
South: Old Wallgrove Road															
1	L2	All MCs	4	100.0	4	100.0	* 0.167	13.7	LOS A	2.0	15.5	0.72	0.59	0.72	44.5
2	T1	All MCs	220	7.2	220	7.2	* 0.167	13.4	LOS A	2.0	15.5	0.72	0.58	0.72	68.8
3	R2	All MCs	1	0.0	1	0.0	0.001	11.8	LOS A	0.0	0.1	0.53	0.60	0.53	45.9
Approach			225	8.9	225	8.9	0.167	13.4	LOS A	2.0	15.5	0.72	0.58	0.72	68.4
East: Access Road															
4	L2	All MCs	1	100.0	1	100.0	0.100	15.8	LOS B	0.2	1.4	0.97	0.65	0.97	27.4
5	T1	All MCs	1	0.0	1	0.0	* 0.100	21.9	LOS B	0.2	1.4	0.97	0.65	0.97	34.2
6	R2	All MCs	5	20.0	5	20.0	0.100	26.5	LOS B	0.2	1.4	0.97	0.65	0.97	54.3
Approach			7	28.6	7	28.6	0.100	24.3	LOS B	0.2	1.4	0.97	0.65	0.97	49.4
North: Old Wallgrove Road															
7	L2	All MCs	1	100.0	91	100.0	0.129	28.5	LOS B	5.8	75.0	0.44	0.71	0.44	61.5
8	T1	All MCs	21	35.0	21	35.0	0.028	6.4	LOS A	0.3	2.8	0.56	0.49	0.56	72.5
9	R2	All MCs	180	72.5	180	72.5	* 0.284	13.2	LOS A	2.1	23.7	0.53	0.72	0.53	60.3
Approach			202	68.8	292	78.4	0.284	17.6	LOS A	5.8	75.0	0.51	0.69	0.51	61.2
West: Millner Avenue															
10	L2	All MCs	559	13.0	559	13.0	0.374	15.8	LOS B	5.3	41.3	0.72	0.76	0.72	57.0
11	T1	All MCs	1	0.0	1	0.0	0.374	27.8	LOS B	4.9	38.6	0.72	0.76	0.72	38.1
12	R2	All MCs	4	75.0	4	75.0	0.374	32.9	LOS C	4.9	38.6	0.72	0.76	0.72	36.2
Approach			564	13.4	564	13.4	0.374	16.0	LOS B	5.3	41.3	0.72	0.76	0.72	56.9
All Vehicles			999	23.7	1089	21.7	0.374	14.7	LOS A	5.8	75.0	0.66	0.70	0.66	59.8

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	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
	ped/h	ped/h	sec		[Ped]	[Dist]			sec	m	m/sec
					ped	m					

South: Old Wallgrove Road												
P1	Full	1	1	21.3	LOS C	0.0	0.0	0.89	0.89	175.2	200.0	1.14
East: Access Road												
P2	Full	1	1	21.3	LOS C	0.0	0.0	0.89	0.89	175.2	200.0	1.14
West: Millner Avenue												
P4	Full	1	1	21.3	LOS C	0.0	0.0	0.89	0.89	175.2	200.0	1.14
All Pedestrians		3	3	21.3	LOS C	0.0	0.0	0.89	0.89	175.2	200.0	1.14

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: 103v [Johnston Cres & Old Wallgrove Rd - PM (Site Folder: Existing Scenario 2023)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Scenario - PM
 PM Peak: 4:15 - 5:15pm
 Site Category: Existing Design
 Give-Way (Two-Way)

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h	
South: Johnston Crescent													
1	L2	All MCs	100.0	100.0	0.087	6.8	LOSA	0.3 2.5	0.16	0.50	0.16	48.2	
2	T1	All MCs	102 10.3	102 10.3	0.087	4.8	LOSA	0.3 2.5	0.16	0.50	0.16	52.3	
Approach			103 11.2	103 11.2	0.087	4.8	LOSA	0.3 2.5	0.16	0.50	0.16	52.2	
North: Old Wallgrove Road													
8	T1	All MCs	9 22.2	9 22.2	0.011	0.0	LOSA	0.0 0.4	0.01	0.26	0.01	58.1	
9	R2	All MCs	7 57.1	7 57.1	0.011	6.2	LOSA	0.0 0.4	0.01	0.26	0.01	51.1	
Approach			17 37.5	17 37.5	0.011	2.7	NA	0.0 0.4	0.01	0.26	0.01	55.0	
West: Johnston Crescent													
10	L2	All MCs	52 12.2	52 12.2	0.030	5.7	LOSA	0.0 0.0	0.00	0.57	0.00	50.0	
12	R2	All MCs	1 0.0	1 0.0	0.030	5.6	LOSA	0.0 0.0	0.00	0.57	0.00	52.1	
Approach			53 12.0	53 12.0	0.030	5.7	NA	0.0 0.0	0.00	0.57	0.00	50.1	
All Vehicles			173 14.0	173 14.0	0.087	4.9	NA	0.3 2.5	0.10	0.50	0.10	51.9	

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.

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.

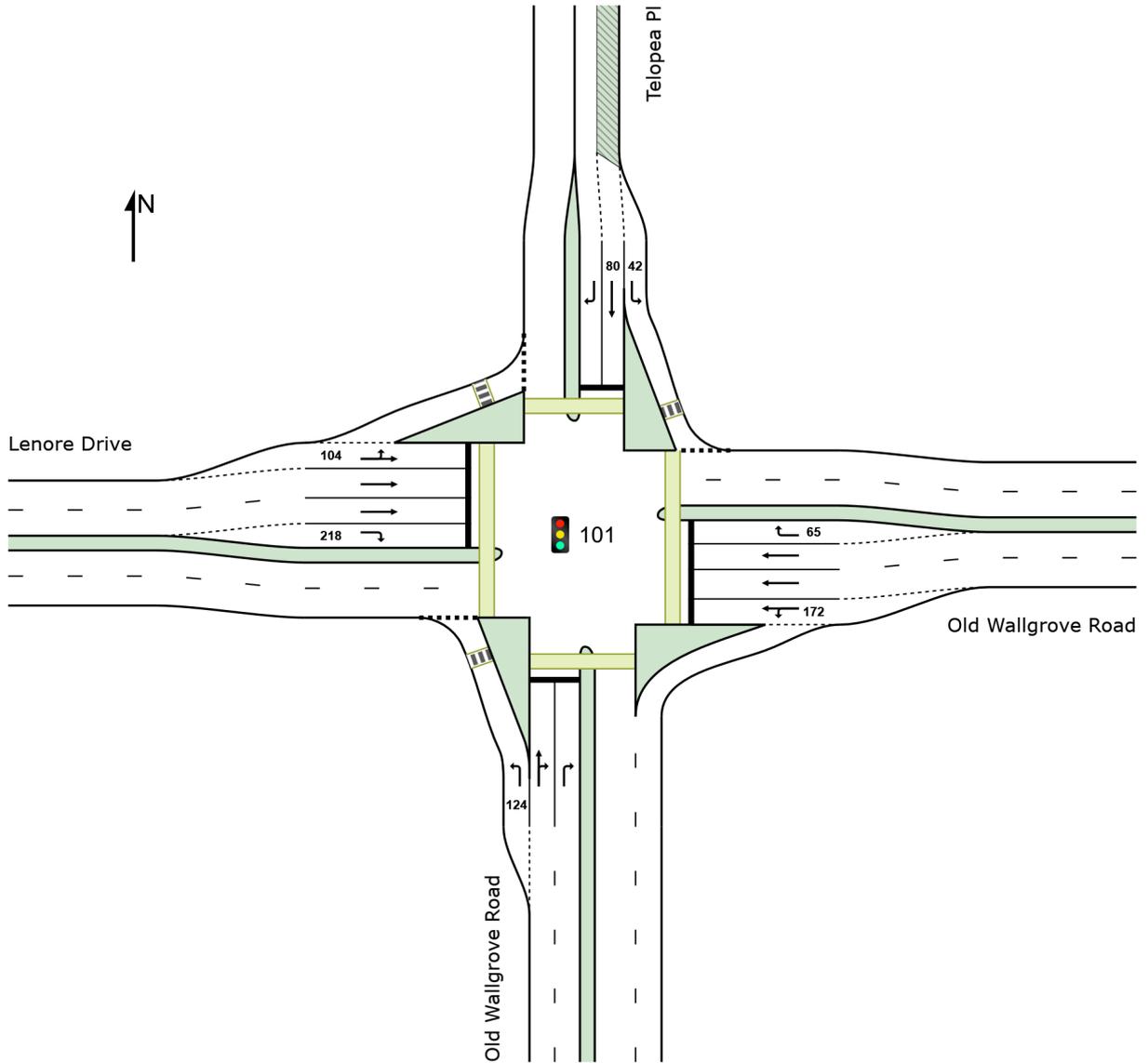
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - AM - Approved Upgrades (Site Folder: 2026)]

2026 Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

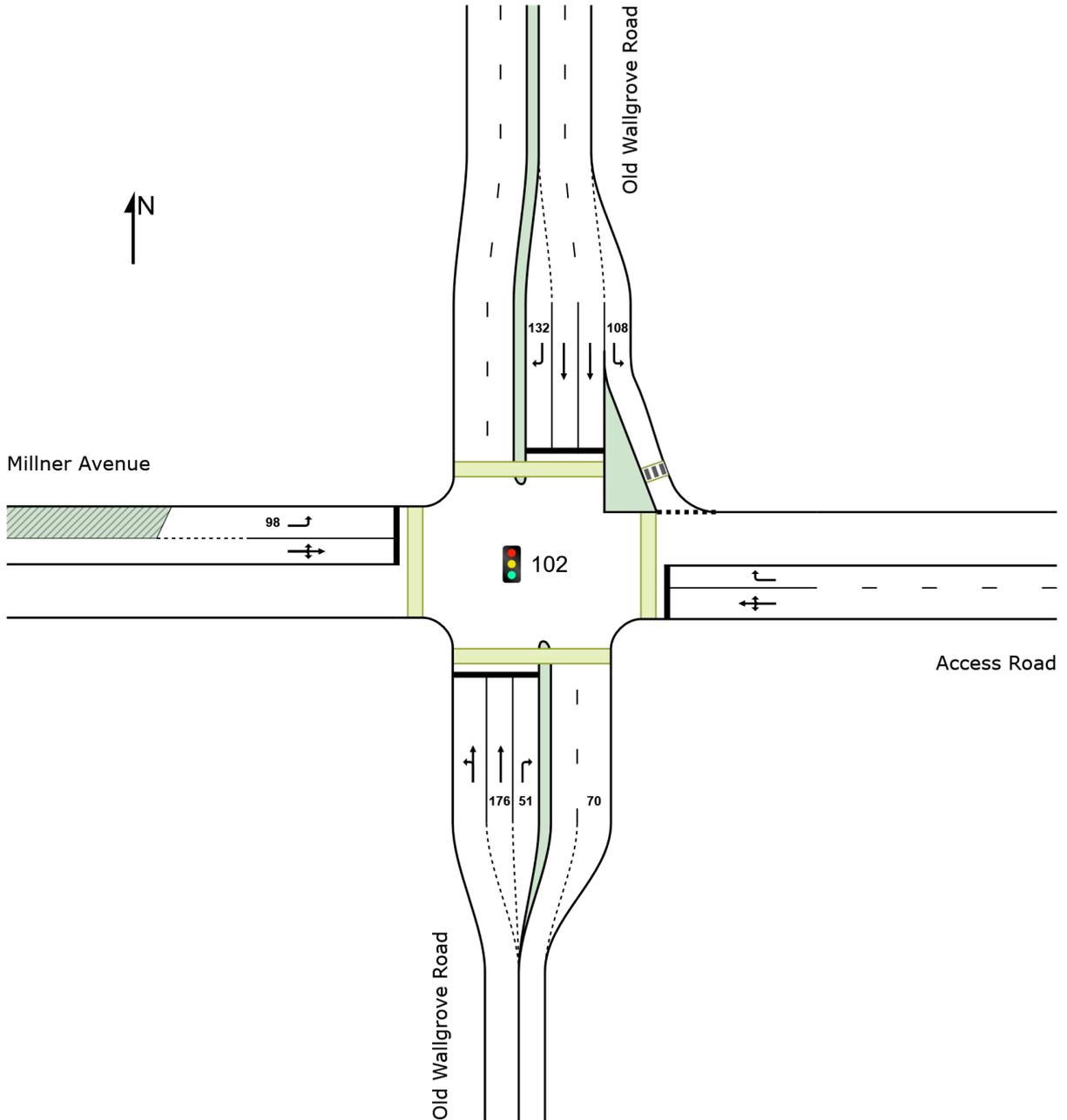


SITE LAYOUT

 Site: 102 [Millner Ave & Old Wallgrove Rd - AM - Approved Upgrades (Site Folder: 2026)]

2026 Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

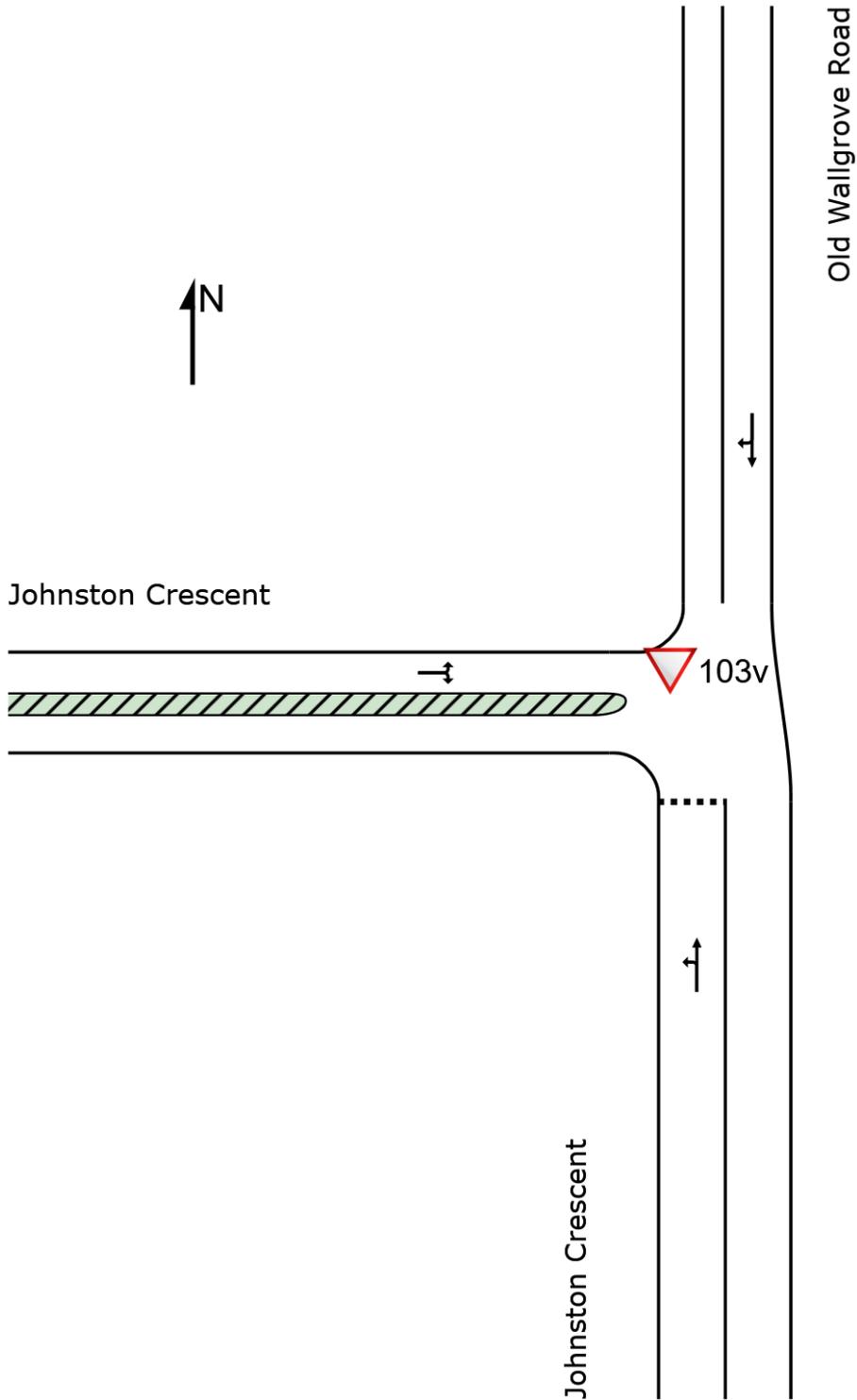


SITE LAYOUT

▼ Site: 103v [Johnston Cres & Old Wallgrove Rd - AM (Site Folder: 2026)]

2026 Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Future Conditions 1
Give-Way (Two-Way)

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



MOVEMENT SUMMARY

Site: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - AM - Approved Upgrades (Site Folder: 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026 Scenario - AM

AM Peak: 7:00 - 8:00am

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist]				
South: Old Wallgrove Road															
1	L2	All MCs	54	58.3	54	58.3	0.045	8.4	LOS A	0.1	1.1	0.05	0.61	0.05	65.2
2	T1	All MCs	4	25.0	4	25.0	* 0.918	57.6	LOS E ¹¹	6.7	72.0	1.00	1.08	1.68	43.9
3	R2	All MCs	262	63.4	262	63.4	0.918	63.7	LOS E ¹¹	6.7	72.0	1.00	1.08	1.68	40.2
Approach			320	62.0	320	62.0	0.918	54.3	LOS D ¹¹	6.7	72.0	0.84	1.00	1.41	43.5
East: Old Wallgrove Road															
4	L2	All MCs	623	20.4	623	20.4	0.380	7.9	LOS A	0.0	0.0	0.00	0.59	0.00	68.1
5	T1	All MCs	734	18.7	734	18.7	* 0.869	41.1	LOS C	16.6	134.9	1.00	1.02	1.29	37.5
6	R2	All MCs	62	3.6	62	3.6	* 0.252	28.3	LOS B	1.7	12.0	0.93	0.74	0.93	34.1
Approach			1419	18.8	1419	18.8	0.869	26.0	LOS B	16.6	134.9	0.56	0.82	0.71	52.2
North: Telopea PI															
7	L2	All MCs	37	15.2	37	15.2	0.020	5.9	LOS A	0.1	0.6	0.05	0.55	0.05	48.9
8	T1	All MCs	12	9.1	12	9.1	* 0.135	42.6	LOS D ¹¹	0.5	3.8	0.98	0.66	0.98	50.1
9	R2	All MCs	12	0.0	12	0.0	0.134	48.1	LOS D ¹¹	0.5	3.5	0.98	0.67	0.98	32.9
Approach			61	10.9	61	10.9	0.135	21.7	LOS B	0.5	3.8	0.43	0.60	0.43	45.0
West: Lenore Drive															
10	L2	All MCs	27	0.0	27	0.0	0.015	7.4	LOS A	0.1	0.4	0.05	0.62	0.05	58.7
11	T1	All MCs	753	27.1	753	27.1	* 0.433	9.7	LOS A	8.0	69.0	0.67	0.55	0.67	63.0
12	R2	All MCs	199	16.9	199	16.9	* 0.309	17.4	LOS B	3.2	25.5	0.73	0.76	0.73	64.0
Approach			979	24.3	979	24.3	0.433	11.2	LOS A	8.0	69.0	0.66	0.59	0.66	63.3
All Vehicles			2779	25.5	2779	25.5	0.918	24.0	LOS B	16.6	134.9	0.62	0.76	0.77	53.1

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.

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.

¹¹ Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
					[Ped]	Dist]					
South: Old Wallgrove Road											

P1 Full	1	1	34.2	LOS D	0.0	0.0	0.93	0.93	188.1	200.0	1.06
East: Old Wallgrove Road											
P2 Full	1	1	34.2	LOS D	0.0	0.0	0.93	0.93	188.1	200.0	1.06
North: Telopea Pl											
P3 Full	1	1	15.3	LOS B	0.0	0.0	0.85	0.85	169.1	200.0	1.18
West: Lenore Drive											
P4 Full	1	1	34.2	LOS D	0.0	0.0	0.93	0.93	188.1	200.0	1.06
All Pedestrians	4	4	29.5	LOS C	0.0	0.0	0.91	0.91	183.3	200.0	1.09

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: 102 [Millner Ave & Old Wallgrove Rd - AM - Approved Upgrades (Site Folder: 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026 Scenario - AM

AM Peak: 7:00 - 8:00am

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	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: Old Wallgrove Road													
1	L2	All MCs	4 50.0	4 50.0	* 0.164	16.3	LOS B	0.7 6.3	0.91	0.68	0.91	44.6	
2	T1	All MCs	70 39.7	70 39.7	* 0.164	18.4	LOS B	0.8 7.8	0.91	0.67	0.91	65.4	
3	R2	All MCs	2 50.0	2 50.0	0.008	18.1	LOS B	0.0 0.3	0.82	0.62	0.82	36.9	
Approach			77 40.6	77 40.6	0.164	18.3	LOS B	0.8 7.8	0.91	0.67	0.91	64.1	
East: Access Road													
4	L2	All MCs	2 50.0	2 50.0	0.212	21.7	LOS B	0.3 3.9	0.98	0.68	0.98	26.8	
5	T1	All MCs	1 0.0	1 0.0	* 0.212	24.1	LOS B	0.3 3.9	0.98	0.68	0.98	32.7	
6	R2	All MCs	19 100.0	19 100.0	0.212	32.5	LOS C	0.3 3.9	0.98	0.67	0.98	47.0	
Approach			22 90.0	22 90.0	0.212	31.0	LOS C	0.3 3.9	0.98	0.67	0.98	45.3	
North: Old Wallgrove Road													
7	L2	All MCs	13 66.7	63 66.7	0.057	10.8	LOS A	1.1 12.6	0.19	0.62	0.19	63.1	
8	T1	All MCs	157 19.9	207 19.9	0.139	5.4	LOS A	1.6 13.4	0.45	0.37	0.45	75.7	
9	R2	All MCs	610 21.0	660 21.0	* 0.620	16.2	LOS B	10.0 82.9	0.64	0.78	0.64	61.1	
Approach			781 21.6	931 23.9	0.620	13.4	LOS A	10.0 82.9	0.57	0.68	0.57	63.4	
West: Millner Avenue													
10	L2	All MCs	211 65.6	211 65.6	0.144	10.3	LOS A	1.2 13.6	0.49	0.66	0.49	56.4	
11	T1	All MCs	1 0.0	1 0.0	0.144	32.8	LOS C	1.2 13.4	0.52	0.67	0.52	41.4	
12	R2	All MCs	1 100.0	1 100.0	0.144	38.1	LOS C	1.2 13.4	0.52	0.67	0.52	40.3	
Approach			213 65.4	213 65.4	0.144	10.6	LOS A	1.2 13.6	0.49	0.66	0.49	56.3	
All Vehicles			1093 32.9	1243 28.9	0.620	13.5	LOS A	10.0 82.9	0.58	0.69	0.58	61.5	

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	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped Dist] ped m	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed	
	ped/h	ped/h	sec					sec	m	m/sec	

South: Old Wallgrove Road												
P1	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
East: Access Road												
P2	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
North: Old Wallgrove Road												
P3	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
West: Millner Avenue												
P4	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
All Pedestrians		4	4	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15

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: 103v [Johnston Cres & Old Wallgrove Rd - AM (Site Folder: 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026 Scenario - AM
 AM Peak: 7:00 - 8:00am
 Site Category: Future Conditions 1
 Give-Way (Two-Way)
 Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Johnston Crescent															
1	L2	All MCs	1	0.0	1	0.0	0.020	5.6	LOS A	0.1	0.7	0.19	0.50	0.19	52.3
2	T1	All MCs	19	41.2	19	41.2	0.020	5.3	LOS A	0.1	0.7	0.19	0.50	0.19	50.9
Approach			20	38.9	20	38.9	0.020	5.3	LOS A	0.1	0.7	0.19	0.50	0.19	50.9
North: Old Wallgrove Road															
8	T1	All MCs	74	6.1	74	6.1	0.058	0.0	LOS A	0.2	1.4	0.01	0.17	0.01	58.4
9	R2	All MCs	30	25.9	30	25.9	0.058	5.8	LOS A	0.2	1.4	0.01	0.17	0.01	53.2
Approach			104	11.8	104	11.8	0.058	1.7	NA	0.2	1.4	0.01	0.17	0.01	57.0
West: Johnston Crescent															
10	L2	All MCs	17	53.3	17	53.3	0.013	6.2	LOS A	0.0	0.1	0.02	0.56	0.02	47.9
12	R2	All MCs	1	0.0	1	0.0	0.013	5.6	LOS A	0.0	0.1	0.02	0.56	0.02	52.1
Approach			18	50.0	18	50.0	0.013	6.1	NA	0.0	0.1	0.02	0.56	0.02	48.2
All Vehicles			142	20.5	142	20.5	0.058	2.8	NA	0.2	1.4	0.04	0.27	0.04	54.9

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.

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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MOVEMENT SUMMARY

**Site: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - PM
Approved Upgrades (Site Folder: 2026)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026 Scenario - PM

PM Peak: 4:15 - 5:15pm

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh. veh]	[Dist]				km/h
			veh/h	%	veh/h	%				veh	m				
South: Old Wallgrove Road															
1	L2	All MCs	297	9.8	297	9.8	0.203	7.7	LOS A	0.7	5.4	0.10	0.63	0.10	66.5
2	T1	All MCs	2100		2100		0.825	28.3	LOS B	9.6	73.5	1.00	0.98	1.33	54.7
3	R2	All MCs	684	10.6	684	10.6	*0.825	33.1	LOS C	9.6	73.5	1.00	0.98	1.33	52.9
Approach			983	10.6	983	10.6	0.825	25.4	LOS B	9.6	73.5	0.73	0.87	0.96	56.8
East: Old Wallgrove Road															
4	L2	All MCs	172	70.8	172	70.8	0.138	8.6	LOS A	0.0	0.0	0.00	0.57	0.00	64.2
5	T1	All MCs	665	29.0	665	29.0	*0.825	25.6	LOS B	9.4	82.5	1.00	0.99	1.34	46.9
6	R2	All MCs	716	7	716	7	*0.101	27.6	LOS B	0.2	1.2	0.98	0.64	0.98	34.3
Approach			844	37.4	844	37.4	0.825	22.2	LOS B	9.4	82.5	0.80	0.90	1.06	51.8
North: Telopea PI															
7	L2	All MCs	19	11.8	109	11.8	0.059	8.2	LOS A	2.1	16.1	0.11	0.57	0.11	49.1
8	T1	All MCs	1100		1100		0.048	32.5	LOS C	0.0	0.4	1.00	0.58	1.00	53.6
9	R2	All MCs	11	10.0	11	10.0	*0.327	38.4	LOS C	0.3	2.6	1.00	0.66	1.00	35.4
Approach			31	14.3	121	12.4	0.327	11.2	LOS A	2.1	16.1	0.20	0.58	0.20	42.4
West: Lenore Drive															
10	L2	All MCs	333	3	333	3	0.002	7.9	LOS A	0.0	0.0	0.00	0.60	0.00	57.2
11	T1	All MCs	439	28.2	439	28.2	*0.361	10.8	LOS A	3.8	33.2	0.77	0.59	0.77	61.3
12	R2	All MCs	51	60.9	51	60.9	0.220	28.6	LOS C	1.2	12.3	0.89	0.74	0.89	56.2
Approach			493	31.7	493	31.7	0.361	12.7	LOS A	3.8	33.2	0.78	0.61	0.78	60.1
All Vehicles			2351	24.7	2441	23.8	0.825	21.5	LOS B	9.6	82.5	0.74	0.82	0.92	55.6

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	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
	ped/h	ped/h	sec		[Ped ped]	[Dist]			sec	m	m/sec

South: Old Wallgrove Road												
P1	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
East: Old Wallgrove Road												
P2	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
North: Telopea Pl												
P3	Full	1	1	9.2	LOS A	0.0	0.0	0.76	0.76	163.1	200.0	1.23
West: Lenore Drive												
P4	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
All Pedestrians		4	4	16.8	LOS B	0.0	0.0	0.85	0.85	170.7	200.0	1.17

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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Project: P:\2021\2110\211085\Reports\TTW\Traffic\3. CTMP\SIDRA\S4 Traffic Modelling (CTMP).sip9

MOVEMENT SUMMARY

Site: 102 [Millner Ave & Old Wallgrove Rd - PM Approved Upgrades (Site Folder: 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026 Scenario - PM

PM Peak: 4:15 - 5:15pm

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	[Dist] m				
South: Old Wallgrove Road															
1	L2	All MCs	4	100.0	4	100.0	* 0.266	13.3	LOS A	1.5	11.3	0.85	0.68	0.85	45.8
2	T1	All MCs	233	7.2	233	7.2	* 0.266	11.1	LOS A	1.5	11.3	0.85	0.68	0.85	70.4
3	R2	All MCs	1	0.0	1	0.0	0.002	11.4	LOS A	0.0	0.1	0.64	0.60	0.64	45.9
Approach			239	8.9	239	8.9	0.266	11.2	LOS A	1.5	11.3	0.85	0.68	0.85	70.0
East: Access Road															
4	L2	All MCs	1	100.0	1	100.0	0.056	11.1	LOS A	0.1	0.6	0.96	0.62	0.96	31.7
5	T1	All MCs	1	0.0	1	0.0	* 0.056	12.7	LOS A	0.1	0.6	0.96	0.62	0.96	39.1
6	R2	All MCs	6	20.0	6	20.0	0.056	20.4	LOS B	0.1	0.6	0.97	0.61	0.97	56.9
Approach			8	28.6	8	28.6	0.056	18.0	LOS B	0.1	0.6	0.97	0.61	0.97	52.8
North: Old Wallgrove Road															
7	L2	All MCs	1	100.0	91	100.0	0.098	18.6	LOS B	3.9	51.0	0.37	0.64	0.37	63.7
8	T1	All MCs	22	35.0	22	35.0	0.033	8.3	LOS A	0.2	1.5	0.73	0.50	0.73	72.7
9	R2	All MCs	191	72.5	191	72.5	* 0.335	13.4	LOS A	1.7	19.7	0.70	0.75	0.70	60.1
Approach			214	68.8	304	78.0	0.335	14.6	LOS A	3.9	51.0	0.60	0.70	0.60	61.1
West: Millner Avenue															
10	L2	All MCs	592	13.0	592	13.0	0.402	11.2	LOS A	3.3	25.6	0.73	0.75	0.73	59.2
11	T1	All MCs	1	0.0	1	0.0	0.402	16.3	LOS B	3.0	23.8	0.73	0.75	0.73	41.1
12	R2	All MCs	4	75.0	4	75.0	0.402	21.3	LOS B	3.0	23.8	0.73	0.75	0.73	38.3
Approach			598	13.4	598	13.4	0.402	11.3	LOS A	3.3	25.6	0.73	0.75	0.73	59.0
All Vehicles			1059	23.7	1149	21.9	0.402	11.6	LOS A	3.9	51.0	0.72	0.73	0.72	61.4

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.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped]	[Dist]					

		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Old Wallgrove Road												
P1	Full	1	1	9.6	LOS A	0.0	0.0	0.80	0.80	163.4	200.0	1.22
East: Access Road												
P2	Full	1	1	9.6	LOS A	0.0	0.0	0.80	0.80	163.4	200.0	1.22
North: Old Wallgrove Road												
P3	Full	1	1	9.6	LOS A	0.0	0.0	0.80	0.80	163.4	200.0	1.22
West: Millner Avenue												
P4	Full	1	1	9.6	LOS A	0.0	0.0	0.80	0.80	163.4	200.0	1.22
All	Pedestrians	4	4	9.6	LOS A	0.0	0.0	0.80	0.80	163.4	200.0	1.22

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: 103v [Johnston Cres & Old Wallgrove Rd - PM (Site Folder: 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026 Scenario - PM
 PM Peak: 4:15 - 5:15pm
 Site Category: Future Conditions 1
 Give-Way (Two-Way)
 Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist]				
South: Johnston Crescent															
1	L2	All MCs	100	0	100	0	0.093	6.8	LOS A	0.3	2.7	0.17	0.50	0.17	48.2
2	T1	All MCs	108	10.3	108	10.3	0.093	4.8	LOS A	0.3	2.7	0.17	0.50	0.17	52.3
Approach			109	11.2	109	11.2	0.093	4.8	LOS A	0.3	2.7	0.17	0.50	0.17	52.2
North: Old Wallgrove Road															
8	T1	All MCs	10	22.2	10	22.2	0.012	0.0	LOS A	0.0	0.4	0.01	0.26	0.01	58.1
9	R2	All MCs	8	57.1	8	57.1	0.012	6.2	LOS A	0.0	0.4	0.01	0.26	0.01	51.0
Approach			18	37.5	18	37.5	0.012	2.7	NA	0.0	0.4	0.01	0.26	0.01	55.0
West: Johnston Crescent															
10	L2	All MCs	55	12.2	55	12.2	0.032	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	50.0
12	R2	All MCs	1	0.0	1	0.0	0.032	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	52.1
Approach			56	12.0	56	12.0	0.032	5.7	NA	0.0	0.0	0.00	0.57	0.00	50.1
All Vehicles			183	14.0	183	14.0	0.093	4.9	NA	0.3	2.7	0.10	0.50	0.10	51.8

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.

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.

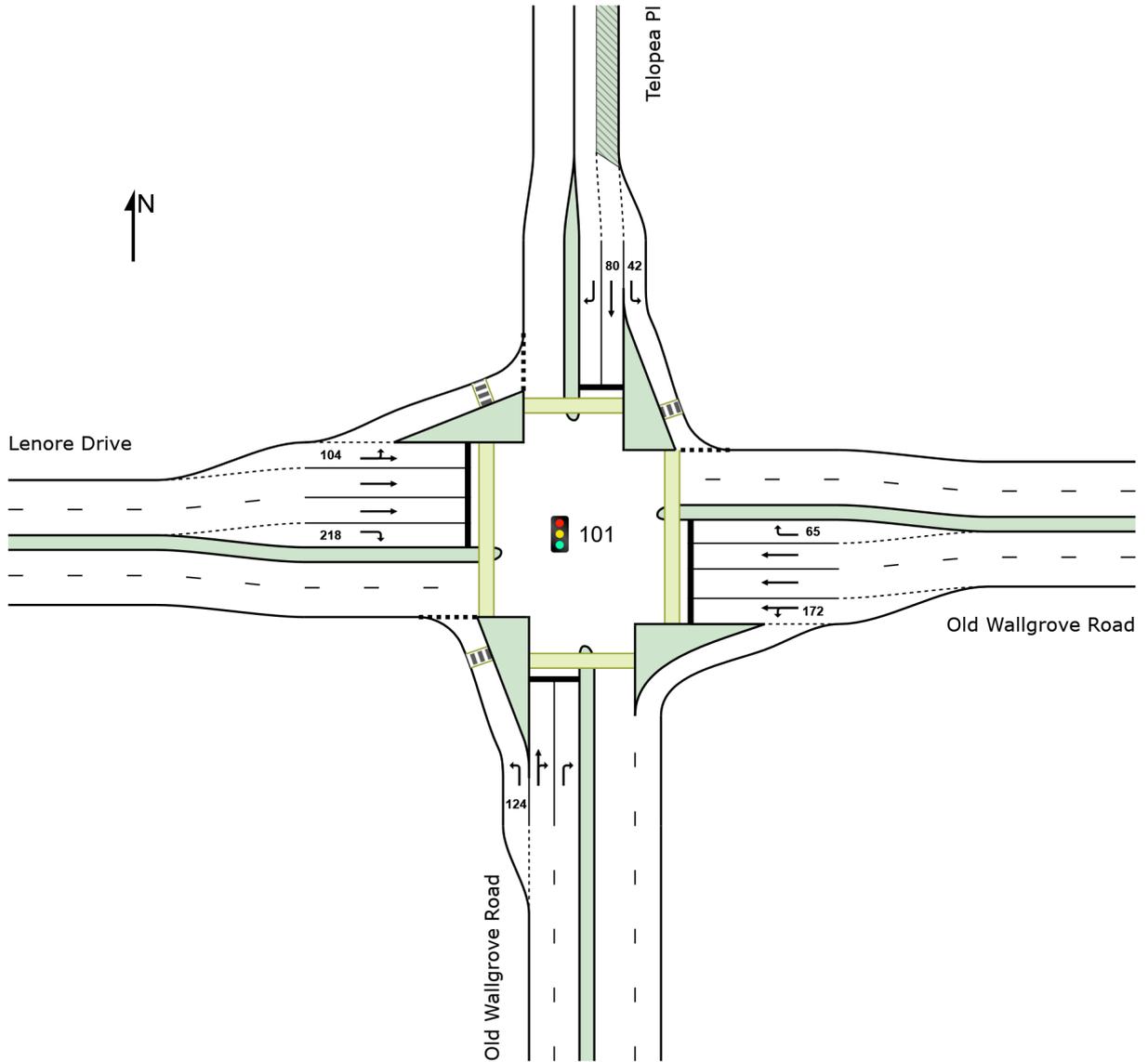
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

**Site: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - AM
(Site Folder: 2026+Construction)]**

2026+Construction Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Future Conditions 2
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

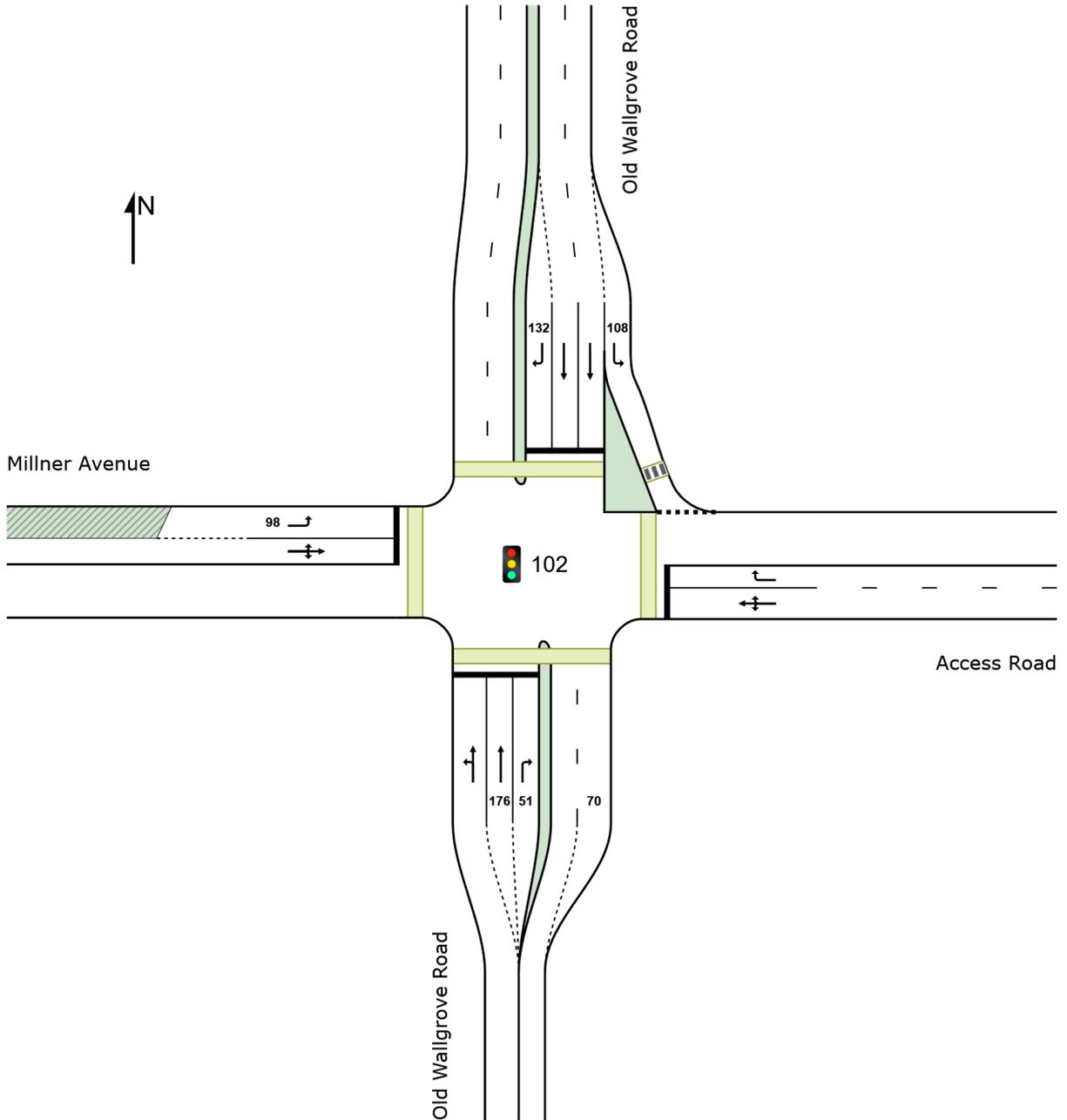


SITE LAYOUT

 Site: 102 [Millner Ave & Old Wallgrove Rd - AM (Site Folder: 2026+Construction)]

2026+construction Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Future Conditions 2
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

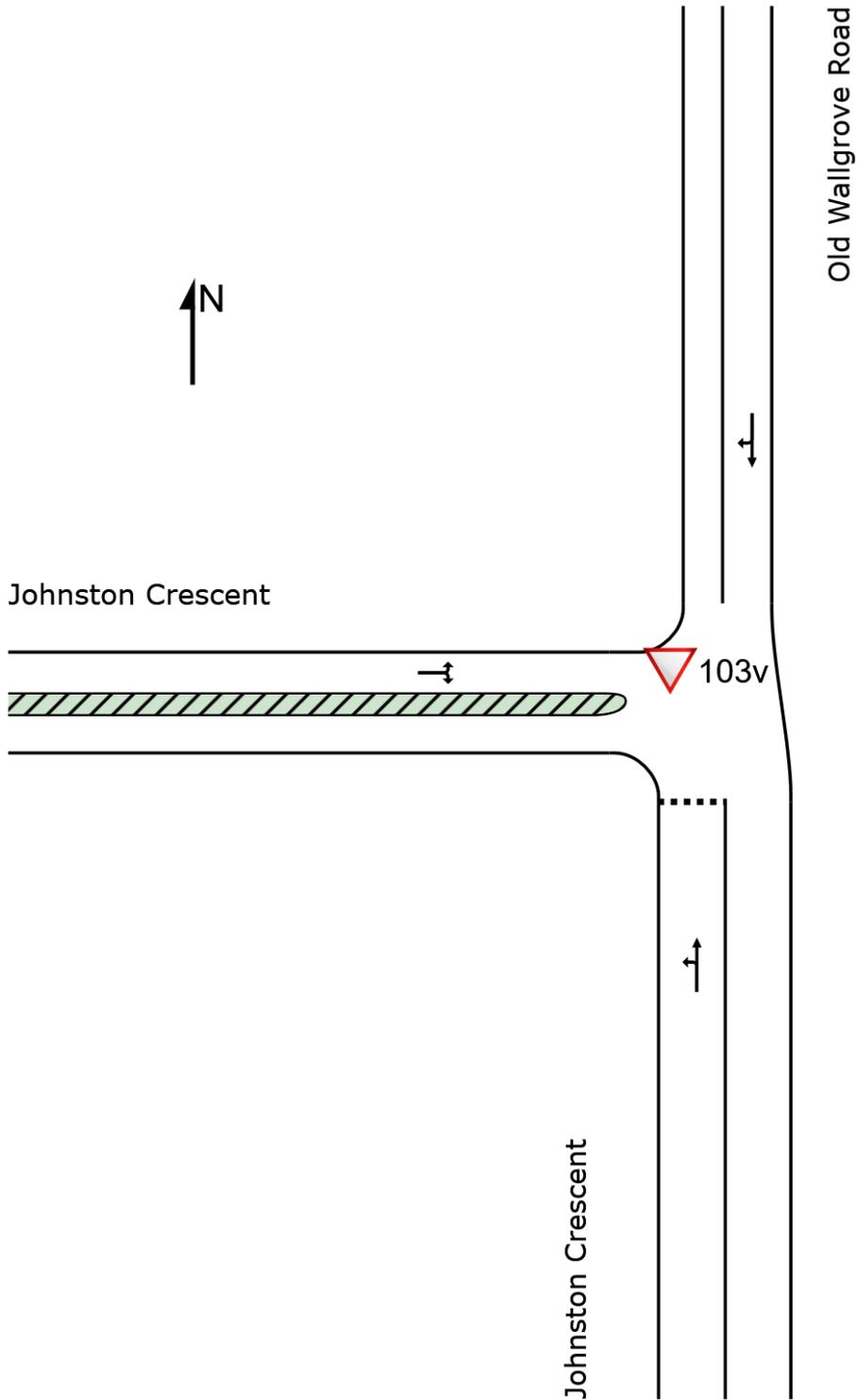


SITE LAYOUT

▼ Site: 103v [Johnston Cres & Old Wallgrove Rd - AM (Site Folder: 2026+Construction)]

2026+construction Scenario - AM
AM Peak: 7:00 - 8:00am
Site Category: Future Conditions 2
Give-Way (Two-Way)

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



MOVEMENT SUMMARY

**Site: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - AM
(Site Folder: 2026+Construction)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026+Construction Scenario - AM

AM Peak: 7:00 - 8:00am

Site Category: Future Conditions 2

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh. veh]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Old Wallgrove Road															
1	L2	All MCs	54	58.3	54	58.3	0.045	8.4	LOS A	0.1	1.1	0.04	0.60	0.04	65.2
2	T1	All MCs	4	25.0	4	25.0	* 0.929	70.4	LOS E ¹¹	8.9	96.3	1.00	1.09	1.59	40.2
3	R2	All MCs	280	65.7	280	65.7	0.929	76.4	LOS F ¹¹	8.9	96.4	1.00	1.08	1.59	36.9
Approach			338	64.0	338	64.0	0.929	65.5	LOS E ¹¹	8.9	96.4	0.85	1.01	1.35	40.1
East: Old Wallgrove Road															
4	L2	All MCs	857	16.9	857	16.9	0.512	7.3	LOS A	0.0	0.0	0.00	0.57	0.00	64.2
5	T1	All MCs	734	18.7	734	18.7	* 0.870	52.0	LOS D ¹¹	20.4	165.8	1.00	1.01	1.24	33.9
6	R2	All MCs	62	3.6	62	3.6	* 0.267	40.3	LOS C	2.1	15.5	0.94	0.74	0.94	31.0
Approach			1654	17.2	1654	17.2	0.870	28.4	LOS B	20.4	165.8	0.48	0.77	0.58	49.8
North: Telopea PI															
7	L2	All MCs	37	15.2	37	15.2	0.020	5.9	LOS A	0.1	0.6	0.04	0.55	0.04	49.0
8	T1	All MCs	12	9.1	12	9.1	* 0.169	54.3	LOS D ¹¹	0.6	4.8	0.99	0.67	0.99	46.0
9	R2	All MCs	12	0.0	12	0.0	0.168	59.9	LOS E ¹¹	0.6	4.4	0.99	0.68	0.99	29.3
Approach			61	10.9	61	10.9	0.169	26.4	LOS B	0.6	4.8	0.42	0.60	0.42	42.2
West: Lenore Drive															
10	L2	All MCs	27	0.0	27	0.0	0.015	7.4	LOS A	0.1	0.4	0.04	0.62	0.04	58.8
11	T1	All MCs	753	27.1	753	27.1	* 0.396	9.3	LOS A	8.6	74.6	0.60	0.52	0.60	63.7
12	R2	All MCs	415	8.1	415	8.1	* 0.550	18.6	LOS B	8.7	64.7	0.80	0.81	0.80	57.3
Approach			1195	19.9	1195	19.9	0.550	12.5	LOS A	8.7	74.6	0.66	0.62	0.66	59.8
All Vehicles			3248	22.9	3248	22.9	0.929	26.4	LOS B	20.4	165.8	0.58	0.74	0.69	50.9

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.

¹¹ Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
					[Ped]	[Dist]					
	ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Old Wallgrove Road											

P1 Full	1	1	44.2	LOS E ¹²	0.0	0.0	0.94	0.94	198.0	200.0	1.01
East: Old Wallgrove Road											
P2 Full	1	1	44.2	LOS E ¹²	0.0	0.0	0.94	0.94	198.0	200.0	1.01
North: Telopea Pl											
P3 Full	1	1	19.6	LOS B	0.0	0.0	0.88	0.88	173.5	200.0	1.15
West: Lenore Drive											
P4 Full	1	1	44.2	LOS E ¹²	0.0	0.0	0.94	0.94	198.0	200.0	1.01
All Pedestrians	4	4	38.0	LOS D	0.0	0.0	0.93	0.93	191.9	200.0	1.04

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.

¹² Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

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Project: P:\2021\2110\211085\Reports\TTW\Traffic\3. CTMP\SIDRA\S4 Traffic Modelling (CTMP).sip9

MOVEMENT SUMMARY

Site: 102 [Millner Ave & Old Wallgrove Rd - AM (Site Folder: 2026+Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026+construction Scenario - AM

AM Peak: 7:00 - 8:00am

Site Category: Future Conditions 2

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh. veh]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Old Wallgrove Road															
1	L2	All MCs	4 50.0		4 50.0		* 0.216	18.1	LOS B	0.9	9.5	0.92	0.70	0.92	42.3
2	T1	All MCs	88 51.9		88 51.9		* 0.216	20.5	LOS B	1.0	10.6	0.92	0.70	0.92	61.6
3	R2	All MCs	2 50.0		2 50.0		0.009	18.1	LOS B	0.0	0.3	0.82	0.62	0.82	36.8
Approach			95 51.8		95 51.8		0.216	20.3	LOS B	1.0	10.6	0.92	0.70	0.92	60.6
East: Access Road															
4	L2	All MCs	2 50.0		2 50.0		0.212	22.5	LOS B	0.3	3.9	0.98	0.68	0.98	26.8
5	T1	All MCs	1 0.0		1 0.0		* 0.212	24.1	LOS B	0.3	3.9	0.98	0.68	0.98	32.7
6	R2	All MCs	19 100.0		19 100.0		0.212	32.5	LOS C	0.3	3.9	0.98	0.67	0.98	47.0
Approach			22 90.0		22 90.0		0.212	31.1	LOS C	0.3	3.9	0.98	0.67	0.98	45.3
North: Old Wallgrove Road															
7	L2	All MCs	13 66.7		63 66.7		0.057	10.8	LOS A	1.1	12.6	0.19	0.62	0.19	63.1
8	T1	All MCs	609 8.1		659 8.1		0.413	7.1	LOS A	6.1	45.5	0.54	0.52	0.54	61.7
9	R2	All MCs	610 21.0		660 21.0		* 0.623	16.3	LOS B	10.1	83.1	0.64	0.78	0.64	61.1
Approach			1233 15.1		1383 16.9		0.623	11.7	LOS A	10.1	83.1	0.57	0.65	0.57	61.4
West: Millner Avenue															
10	L2	All MCs	211 65.6		211 65.6		0.144	10.3	LOS A	1.2	13.6	0.49	0.66	0.49	56.4
11	T1	All MCs	1 0.0		1 0.0		0.144	32.8	LOS C	1.2	13.4	0.52	0.67	0.52	41.4
12	R2	All MCs	1 100.0		1 100.0		0.144	38.1	LOS C	1.2	13.4	0.52	0.67	0.52	40.3
Approach			213 65.4		213 65.4		0.144	10.6	LOS A	1.2	13.6	0.49	0.66	0.49	56.3
All Vehicles			1563 25.3		1713 23.1		0.623	12.1	LOS A	10.1	83.1	0.59	0.66	0.59	60.4

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.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped]	[Dist]					
		ped/h	ped/h	sec		ped	m			sec	m	m/sec

South: Old Wallgrove Road												
P1	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
East: Access Road												
P2	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
North: Old Wallgrove Road												
P3	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
West: Millner Avenue												
P4	Full	1	1	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15
All Pedestrians		4	4	19.4	LOS B	0.0	0.0	0.88	0.88	173.2	200.0	1.15

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: 103v [Johnston Cres & Old Wallgrove Rd - AM (Site Folder: 2026+Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026+construction Scenario - AM
 AM Peak: 7:00 - 8:00am
 Site Category: Future Conditions 2
 Give-Way (Two-Way)
 Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	[Dist] m				
South: Johnston Crescent															
1	L2	All MCs	1	0.0	1	0.0	0.059	5.6	LOSA	0.2	2.3	0.41	0.60	0.41	50.7
2	T1	All MCs	37	69.7	37	69.7	0.059	7.9	LOSA	0.2	2.3	0.41	0.60	0.41	48.2
Approach			38	67.6	38	67.6	0.059	7.8	LOSA	0.2	2.3	0.41	0.60	0.41	48.3
North: Old Wallgrove Road															
8	T1	All MCs	526	4.2	526	4.2	0.283	0.0	LOSA	0.3	2.0	0.00	0.03	0.00	59.7
9	R2	All MCs	30	25.9	30	25.9	0.283	5.8	LOSA	0.3	2.0	0.00	0.03	0.00	54.4
Approach			556	5.4	556	5.4	0.283	0.3	NA	0.3	2.0	0.00	0.03	0.00	59.4
West: Johnston Crescent															
10	L2	All MCs	17	53.3	17	53.3	0.013	6.3	LOSA	0.0	0.1	0.07	0.58	0.07	47.7
12	R2	All MCs	1	0.0	1	0.0	0.013	7.6	LOSA	0.0	0.1	0.07	0.58	0.07	51.9
Approach			18	50.0	18	50.0	0.013	6.4	NA	0.0	0.1	0.07	0.58	0.07	48.0
All Vehicles			611	10.6	611	10.6	0.283	1.0	NA	0.3	2.3	0.03	0.08	0.03	58.2

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: 101 [Telopea PI & Old Wallgrove Rd & Lenore Dr - PM
(Site Folder: 2026+Construction)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026+construction Scenario - PM

PM Peak: 4:15 - 5:15pm

Site Category: Future Conditions 2

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh. veh]	[Dist]				km/h
			veh/h	%	veh/h	%				veh	m				
South: Old Wallgrove Road															
1	L2	All MCs	427	6.8	427	6.8	0.291	7.2	LOS A	1.1	8.4	0.10	0.62	0.10	63.6
2	T1	All MCs	2 100.		2 100.		0.862	31.8	LOS C	17.2	130.0	1.00	1.00	1.30	50.9
			0		0										
3	R2	All MCs	1005	9.0	1005	9.0	* 0.862	36.1	LOS C	17.2	130.0	1.00	1.00	1.30	49.2
Approach			1435	8.5	1435	8.5	0.862	27.5	LOS B	17.2	130.0	0.73	0.89	0.94	53.2
East: Old Wallgrove Road															
4	L2	All MCs	190	73.5	190	73.5	0.154	8.4	LOS A	0.0	0.0	0.00	0.56	0.00	62.9
5	T1	All MCs	665	29.0	665	29.0	* 0.914	39.6	LOS C	13.0	113.3	1.00	1.13	1.58	38.2
6	R2	All MCs	7	16.7	7	16.7	* 0.122	32.9	LOS C	0.2	1.5	0.99	0.64	0.99	31.6
Approach			861	38.7	861	38.7	0.914	32.7	LOS C	13.0	113.3	0.78	1.00	1.23	44.9
North: Telopea PI															
7	L2	All MCs	19	11.8	109	11.8	0.059	8.1	LOS A	2.1	16.1	0.09	0.57	0.09	49.2
8	T1	All MCs	1 100.		1 100.		0.058	39.2	LOS C	0.0	0.5	1.00	0.58	1.00	50.7
			0		0										
9	R2	All MCs	11	10.0	11	10.0	* 0.392	45.2	LOS D ¹¹	0.4	3.1	1.00	0.67	1.06	32.9
Approach			31	14.3	121	12.4	0.392	11.8	LOS A	2.1	16.1	0.18	0.58	0.19	40.6
West: Lenore Drive															
10	L2	All MCs	3	33.3	3	33.3	0.002	7.9	LOS A	0.0	0.0	0.00	0.60	0.00	57.2
11	T1	All MCs	439	28.2	439	28.2	* 0.390	14.7	LOS B	4.9	42.3	0.81	0.63	0.81	56.8
12	R2	All MCs	51	60.9	51	60.9	0.238	33.3	LOS C	1.4	14.9	0.90	0.75	0.90	54.2
Approach			493	31.7	493	31.7	0.390	16.6	LOS B	4.9	42.3	0.81	0.64	0.81	56.2
All Vehicles			2821	21.8	2911	21.2	0.914	27.1	LOS B	17.2	130.0	0.74	0.87	0.97	51.4

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.

¹¹ Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed	
					[Ped Dist]						

		ped/h	ped/h	sec		ped	m		sec	m	m/sec	
South: Old Wallgrove Road												
P1	Full	1	1	24.3	LOS C	0.0	0.0	0.90	0.90	178.1	200.0	1.12
East: Old Wallgrove Road												
P2	Full	1	1	24.3	LOS C	0.0	0.0	0.90	0.90	178.1	200.0	1.12
North: Telopea Pl												
P3	Full	1	1	12.9	LOS B	0.0	0.0	0.80	0.80	166.7	200.0	1.20
West: Lenore Drive												
P4	Full	1	1	24.3	LOS C	0.0	0.0	0.90	0.90	178.1	200.0	1.12
All	Pedestrians	4	4	21.4	LOS C	0.0	0.0	0.88	0.88	175.3	200.0	1.14

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: 102 [Millner Ave & Old Wallgrove Rd - PM (Site Folder: 2026+Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026+construction Scenario - PM

PM Peak: 4:15 - 5:15pm

Site Category: Future Conditions 2

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh. veh]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Old Wallgrove Road															
1	L2	All MCs	4100.0	100.0	4100.0	100.0	*0.472	12.6	LOS A	5.4	39.7	0.81	0.69	0.81	43.9
2	T1	All MCs	685	5.0	685	5.0	*0.472	11.1	LOS A	5.4	39.7	0.81	0.69	0.81	60.1
3	R2	All MCs	1	0.0	1	0.0	0.001	11.2	LOS A	0.0	0.1	0.53	0.60	0.53	46.2
Approach			691	5.7	691	5.7	0.472	11.2	LOS A	5.4	39.7	0.81	0.69	0.81	60.0
East: Access Road															
4	L2	All MCs	1100.0	100.0	1100.0	100.0	0.075	14.3	LOS A	0.1	0.8	0.97	0.62	0.97	29.5
5	T1	All MCs	1	0.0	1	0.0	*0.075	17.6	LOS B	0.1	0.8	0.97	0.62	0.97	36.6
6	R2	All MCs	620.0	20.0	620.0	20.0	0.075	26.3	LOS B	0.1	0.8	0.98	0.61	0.98	54.0
Approach			828.6	28.6	828.6	28.6	0.075	23.3	LOS B	0.1	0.8	0.98	0.62	0.98	49.9
North: Old Wallgrove Road															
7	L2	All MCs	1100.0	100.0	91100.0	100.0	0.102	19.4	LOS B	4.2	54.0	0.33	0.64	0.33	63.9
8	T1	All MCs	40	63.9	40	63.9	0.048	8.4	LOS A	0.3	3.6	0.61	0.49	0.61	65.4
9	R2	All MCs	191	72.5	191	72.5	*0.435	14.0	LOS A	2.0	22.5	0.73	0.76	0.73	59.9
Approach			232	71.2	322	79.2	0.435	14.9	LOS A	4.2	54.0	0.60	0.69	0.60	60.7
West: Millner Avenue															
10	L2	All MCs	592	13.0	592	13.0	0.464	15.2	LOS B	4.8	37.3	0.80	0.78	0.80	57.3
11	T1	All MCs	1	0.0	1	0.0	0.464	20.5	LOS B	4.4	34.8	0.80	0.78	0.80	38.6
12	R2	All MCs	4	75.0	4	75.0	0.464	25.6	LOS B	4.4	34.8	0.80	0.78	0.80	36.6
Approach			598	13.4	598	13.4	0.464	15.3	LOS B	4.8	37.3	0.80	0.78	0.80	57.2
All Vehicles			1529	18.8	1619	17.7	0.472	13.1	LOS A	5.4	54.0	0.76	0.73	0.76	58.9

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.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
						[Ped]	[Dist]					

		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Old Wallgrove Road												
P1	Full	1	1	14.5	LOS B	0.0	0.0	0.85	0.85	168.3	200.0	1.19
East: Access Road												
P2	Full	1	1	14.5	LOS B	0.0	0.0	0.85	0.85	168.3	200.0	1.19
North: Old Wallgrove Road												
P3	Full	1	1	14.5	LOS B	0.0	0.0	0.85	0.85	168.3	200.0	1.19
West: Millner Avenue												
P4	Full	1	1	14.5	LOS B	0.0	0.0	0.85	0.85	168.3	200.0	1.19
All	Pedestrians	4	4	14.5	LOS B	0.0	0.0	0.85	0.85	168.3	200.0	1.19

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: 103v [Johnston Cres & Old Wallgrove Rd - PM (Site Folder: 2026+Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2026+construction Scenario - PM

PM Peak: 4:15 - 5:15pm

Site Category: Future Conditions 2

Give-Way (Two-Way)

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	[Dist] m				
South: Johnston Crescent															
1	L2	All MCs	100.0	100.0	100.0	100.0	0.469	6.8	LOS A	2.7	19.8	0.28	0.51	0.28	47.8
2	T1	All MCs	560	5.2	560	5.2	0.469	5.0	LOS A	2.7	19.8	0.28	0.51	0.28	52.1
Approach			561	5.4	561	5.4	0.469	5.0	LOS A	2.7	19.8	0.28	0.51	0.28	52.1
North: Old Wallgrove Road															
8	T1	All MCs	2872.0	2872.0	2872.0	2872.0	0.025	0.0	LOS A	0.1	0.6	0.01	0.13	0.01	58.1
9	R2	All MCs	857.1	857.1	857.1	857.1	0.025	6.2	LOS A	0.1	0.6	0.01	0.13	0.01	51.1
Approach			3668.8	3668.8	3668.8	3668.8	0.025	1.4	NA	0.1	0.6	0.01	0.13	0.01	56.6
West: Johnston Crescent															
10	L2	All MCs	5512.2	5512.2	5512.2	5512.2	0.032	5.7	LOS A	0.0	0.1	0.01	0.57	0.01	50.0
12	R2	All MCs	10.0	10.0	10.0	10.0	0.032	5.6	LOS A	0.0	0.1	0.01	0.57	0.01	52.1
Approach			5612.0	5612.0	5612.0	5612.0	0.032	5.7	NA	0.0	0.1	0.01	0.57	0.01	50.1
All Vehicles			653	9.4	653	9.4	0.469	4.9	NA	2.7	19.8	0.24	0.49	0.24	52.1

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).

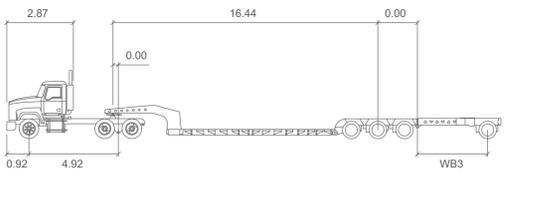
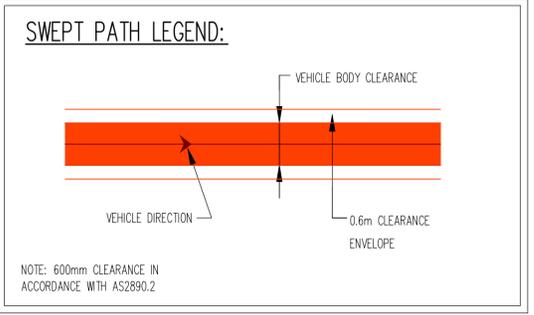
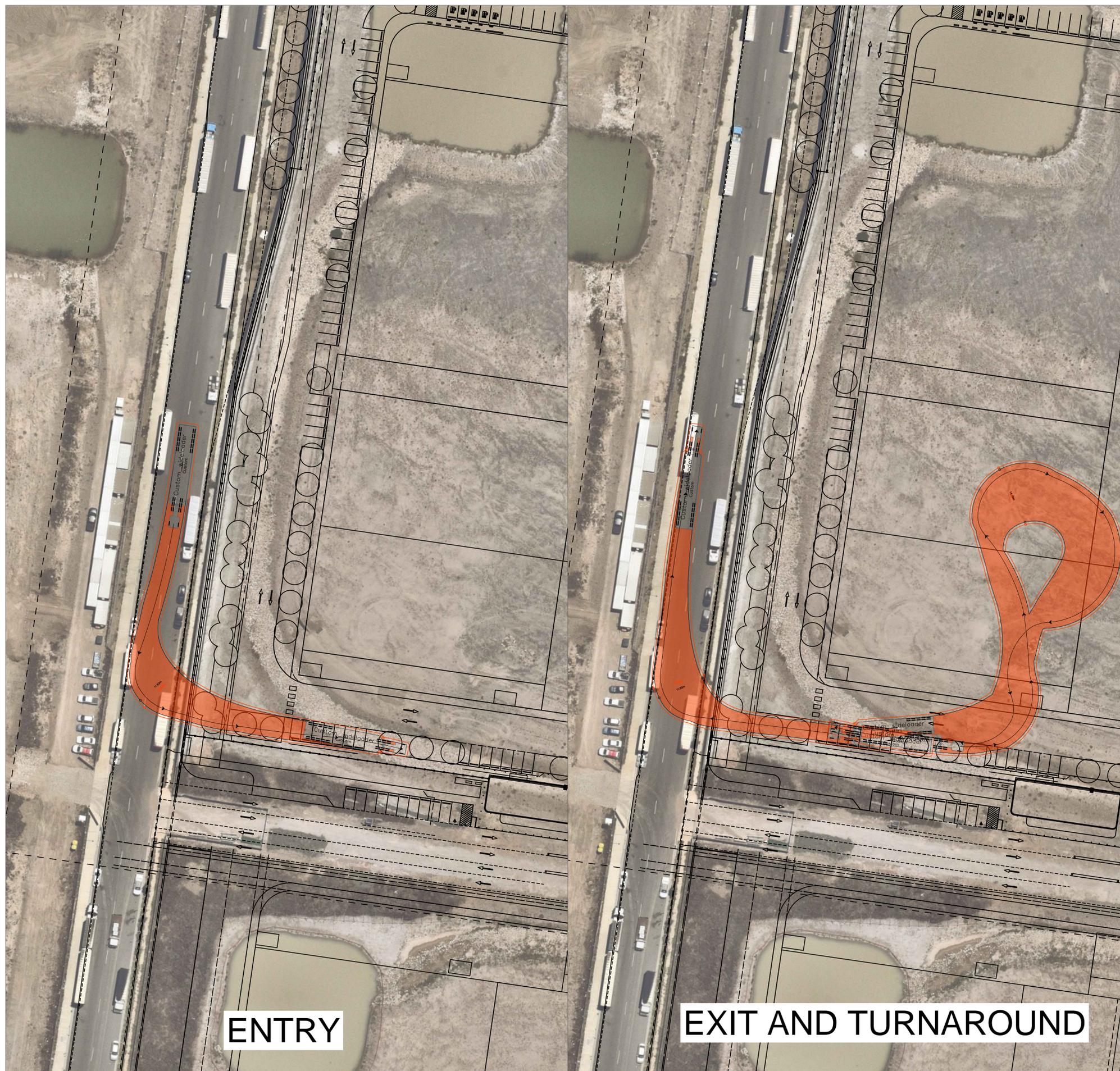
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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.

Appendix E – Swept Path Analysis



Custom_12-axle trailer

First Unit Width	: 2.49	Lock to Lock Time	: 6.0
Trailer Width	: 4.60	Steering Angle	: 25.8
First Unit Track	: 2.59	Articulating Angle	: 70.0
Trailer Track	: 4.27		

19/01/26	CC-1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA

NOTE:

- ALL DRAWINGS TO BE READ IN CONJUNCTION WITH ASSOCIATED SPECIFICATION
- DO NOT SCALE FROM DRAWINGS
- CONFIRM ALL MEASUREMENTS ON SITE
- CHECK ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES
- ENSURE COORDINATION WITH OTHER TRADES ON SITE
- ASL = ABOVE SLAB LEVEL

Principal Consultants
 Architect: **HR**
 Services: **aurecon**
 Structural: **TTW**
 Principal Contractor: **MULTIPLEX**

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 Document Author Project Number
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Key Plan:

Site:	S4	Stage:	01	Phase:	01
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NEXTDC Project Number:
 S4.0002

Project Address:
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 HORSLEY PARK NSW 2175

Project Name:
 NEXTDC S4

Drawing Title:
 CONSTRUCTION
 SWEPT PATH-
 WIDE LOADER SITE
 MOVEMENTS

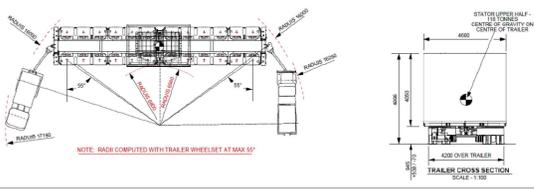
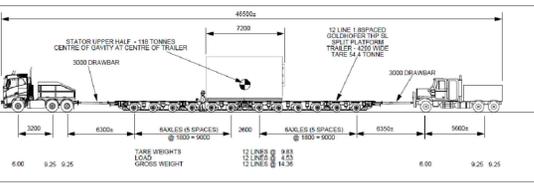
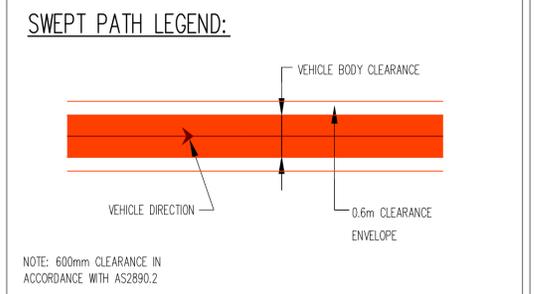
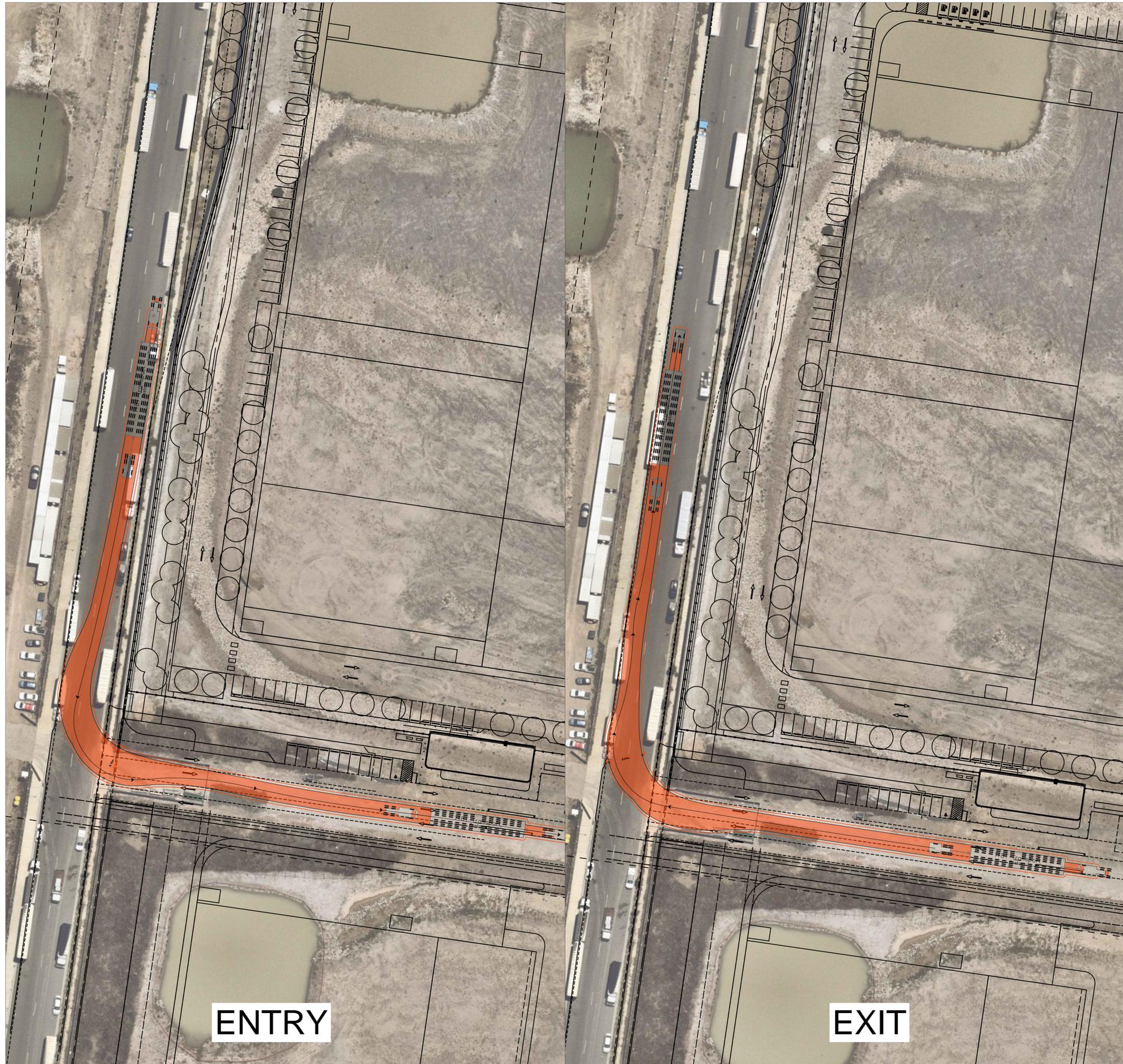
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Checked	SS	Date	19/01/26

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S4-TRF-TTW-SW-DRG-0000-3001 CC-1



19/01/26	CC-1	CTMP	MP	SS	GC
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 - ENSURE COORDINATION WITH OTHER TRADES ON SITE
 - ASL = ABOVE SLAB LEVEL

Principal Consultants
 Architect
H2R
 Services
aurecon
 Structural
TTW
 Principal Contractor
MULTIPLEX

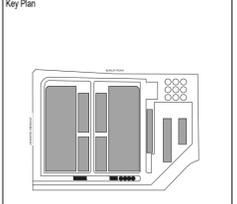
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 Document Author Project Number
 211085



Site: **S4** Stage: **01** Phase: **01**

NEXTDC Project Number:
S4.0002

Project Address
**16 JOHNSTON CRESCENT,
 HORSLEY PARK NSW 2175**

Project Name
NEXTDC S4

Drawing Title
**CONSTRUCTION SWEEP PATH
 116 TONNE SUBSTATION
 TRANSFORMER DELIVERY
 VEHICLE
 SITE ACCESS**

Drawing Status
**SPATIAL COORDINATION
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Checked	SS	Date	19/01/26

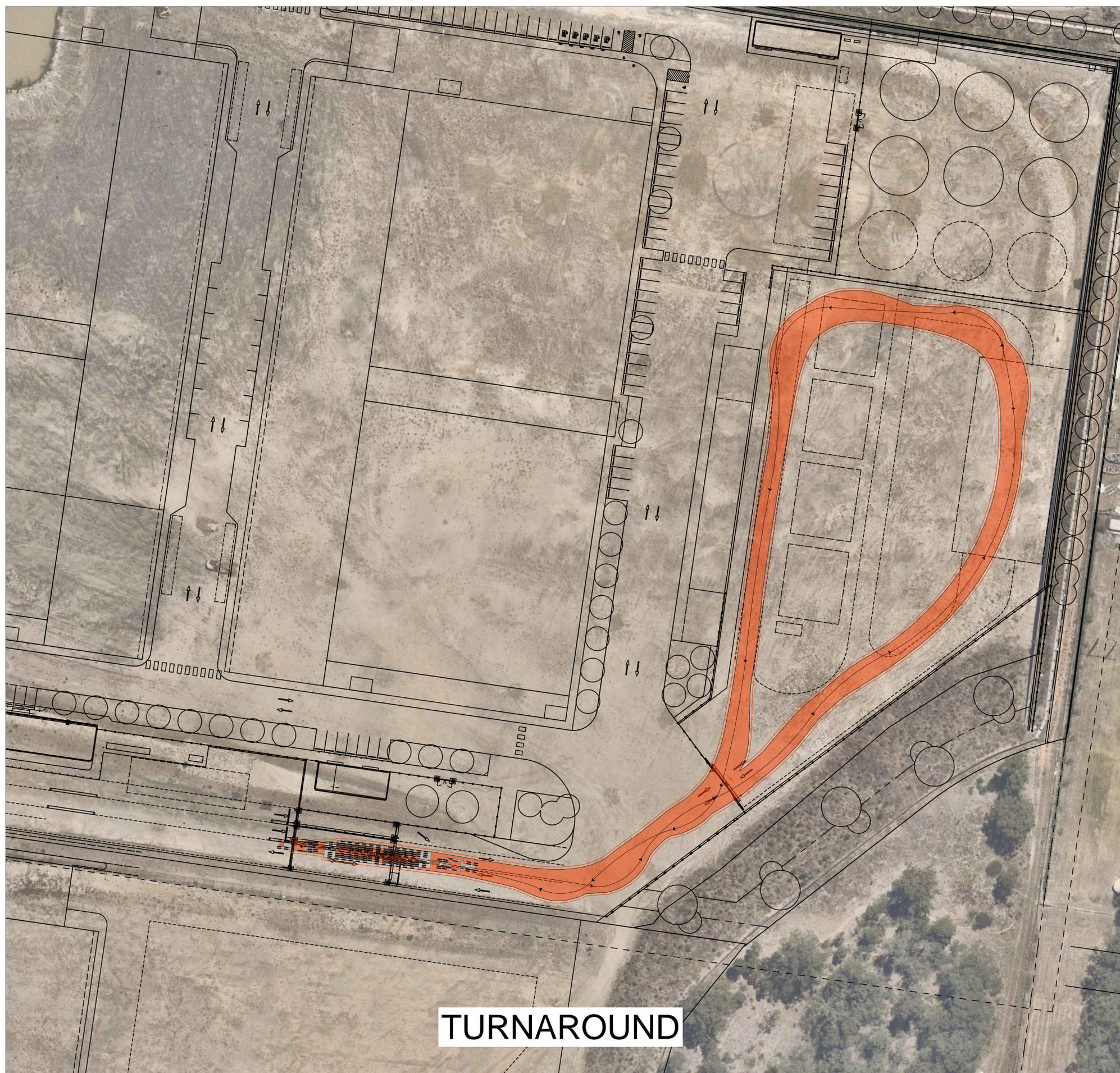
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Drawing Number		Rev			

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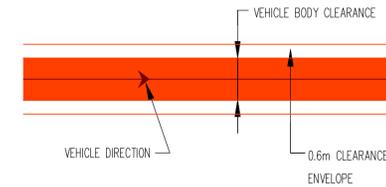
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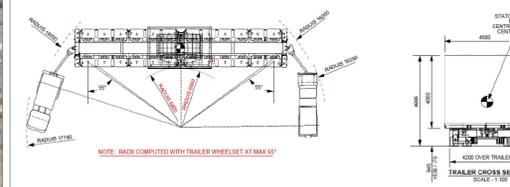
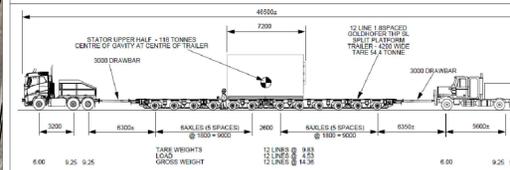


TURNAROUND

SWEPT PATH LEGEND:



NOTE: 600mm CLEARANCE IN ACCORDANCE WITH AS2890.2



19/01/26	CC-1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA

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Principal Consultants
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HJR
 Services
aurecon
 Structural
TTW
 Principal Contractor
MULTIPLEX

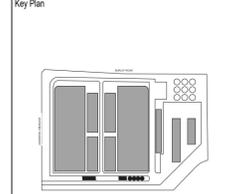
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Site: **S4** Stage: **01** Phase: **01**

NEXTDC Project Number:
S4.0002

Project Address
**16 JOHNSTON CRESCENT,
 HORSLEY PARK NSW 2175**

Project Name
NEXTDC S4

Drawing Title
**CONSTRUCTION SWEEP PATH
 116 TONNE SUBSTATION
 TRANSFORMER DELIVERY
 VEHICLE
 TURNAROUND**

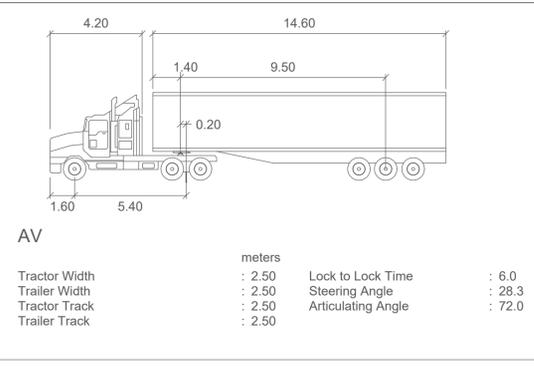
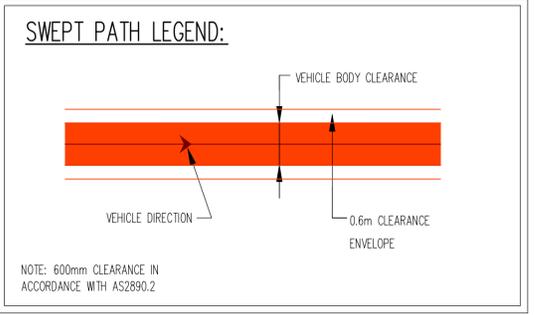
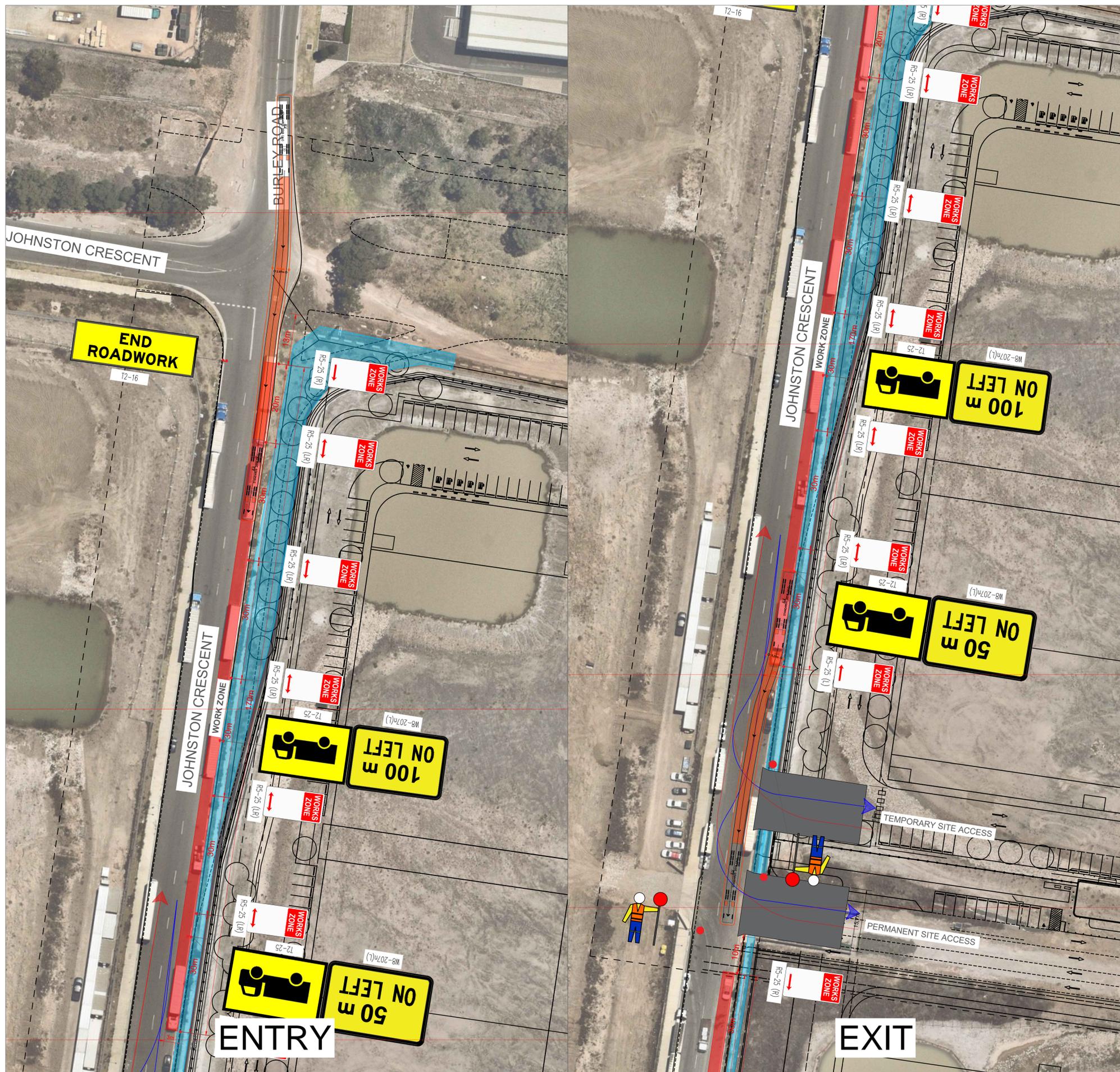
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Checked	SS	Date	19/01/26
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Drawing Number
S4-TRF-TTW-SW-DRG-0000-3003 CC-1

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19/01/26	CC-1	CTMP	MP	SS	GC
DATE	No.	REVISION HISTORY	DRW	CHK	QA

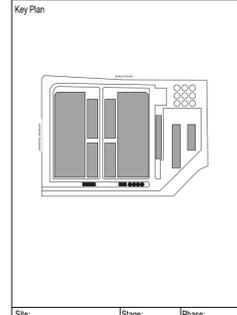
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Site:	S4	Stage:	01	Phase:	01
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NEXTDC Project Number:
 S4.0002
 Project Address
 16 JOHNSTON CRESCENT,
 HORSLEY PARK NSW 2175

Project Name
 NEXTDC S4

Drawing Title
 CONSTRUCTION
 SWEEP PATH-
 WORK ZONE - 20m
 ARTICULATED VEHICLE
 MOVEMENTS

Drawing Status
 SPATIAL COORDINATION
 NOT FOR CONSTRUCTION

Drawn	MP	Date	19/01/26
Checked	SS	Date	19/01/26

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Drawing Number		Rev			

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