



PLANS AND DOCUMENTS
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DEVELOPMENT APPROVAL

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APPROVAL

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APPLICATION REF

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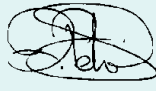
PROPOSED HEALTH CARE SERVICE DEVELOPMENT 29 KAKAWAN STREET, BOONDALL

TRAFFIC IMPACT ASSESSMENT

15 AUGUST 2023

PREPARED FOR
DUNCAN-ROSS HEALTH

DOCUMENT CONTROL RECORD

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Client:		Duncan-Ross Health				
Project Number:		23-483				
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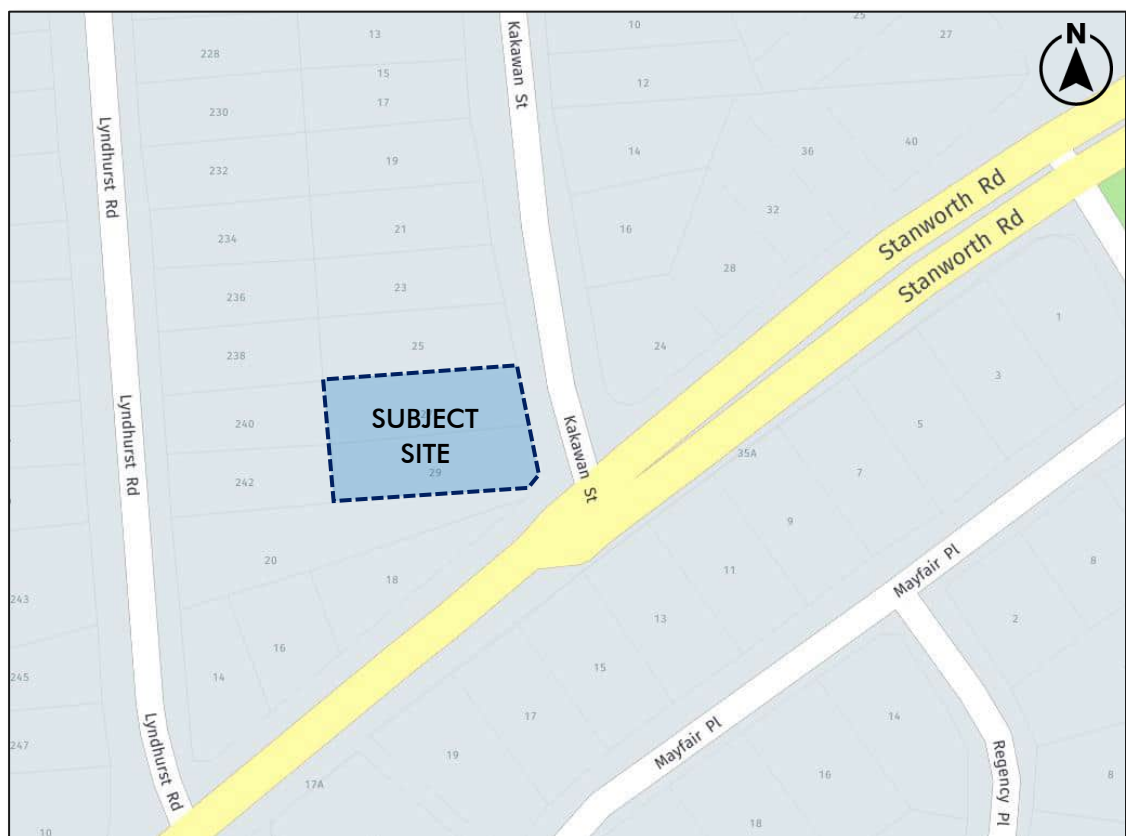
APPENDIX F: FORECAST TURNING MOVEMENTS

1.0 INTRODUCTION

1.1 BACKGROUND

In March 2023, Pekol Traffic and Transport (PTT) was commissioned by Duncan-Ross Health, on behalf of Blok Modular, to undertake a Traffic Impact Assessment (TIA) for a proposed health care facility at 29 Kakawan Street, Boondall. The location of the subject site is indicated in Figure 1.1.

Figure 1.1: SITE LOCALITY



1.2 AIM

The aim of this assessment is to review the proposed development in terms of its access, parking and servicing arrangements, pedestrian / cyclist facilities, likely peak hour traffic generation and impact on the surrounding road network.

1.3 SCOPE OF REPORT

This report begins by summarising the characteristics of the existing site, external road network and traffic operations (Chapter 2), followed by a description of the scope and scale of the proposed development, including a consideration of site access, parking and servicing arrangements (Chapter 3). The predicted peak hour traffic generation of the proposed development is estimated along with a consideration of its likely traffic impact on the surrounding road network (Chapter 4). The report concludes with a summary of key findings (Chapter 5).

2.0 EXISTING CONDITIONS

2.1 SUBJECT SITE

The subject site is located at 29 Kakawan Street, Boondall and is formally identified as Lot 13 on RP106512. According to the Brisbane City Council (Council) City Plan (2014) the site is zoned as low density residential and has an approximate site area of 1,477m². The site currently accommodates a residential dwelling, as shown in Figure 2.1.

Figure 2.1: SUBJECT SITE



2.2 SURROUNDING AREA

As shown in Figure 2.1, the subject site is bounded by residential uses to the north, south and west and by Kakawan Street to the east. The surrounding area primarily comprises residential uses.

2.3 ACCESS

The subject site is accessed via an all-movements crossover on Kakawan Street, as indicated in Figure 2.1.

2.4 SURROUNDING ROAD NETWORK

The key attributes of the surrounding road network in the vicinity of the site are summarised in Table 2.1

Table 2.1: INTERSECTION ATTRIBUTES

ATTRIBUTE	KAKAWAN STREET	STANWORTH ROAD
Road Hierarchy	Neighbourhood Road	Arterial Road
Cross Section	Undivided, with one lane of traffic in each direction	Undivided, with two lanes of traffic in each direction
Speed Limit (km/h)	50	60
Jurisdiction	Council	Council
Predominant Land Use	Residential	Residential
On-Street Parking	Yes	Yes
Footpaths	No	Yes
Bicycle Lanes	No	No
Bus Route	No	No

Kakawan Street meets Stanworth Road at a priority-controlled T-intersection at the south-east corner the site, as shown in Figure 2.1. Stanworth Road provides access to the Boondall Entertainment Centre. However, the events held at the Entertainment Centre are unlikely to coincide with the peak operational times of the proposed development.

2.5 TRAFFIC VOLUMES

To assist in the quantification of existing road network operations, turning movement surveys were conducted on Thursday 30 March 2023 from 7:00am to 9:00am and 4:00pm to 6:00pm, to capture the existing weekday morning and evening peak hour volumes at the Stanworth Road / Kakawan Street priority-controlled intersection.

The weekend morning and evening peak periods for the intersection are shown in Table 2.2, along with the key operational attributes of the intersection. The raw traffic count data is provided in Appendix A.

Table 2.2: INTERSECTION ATTRIBUTES

ATTRIBUTE	WEEKDAY MORNING PEAK	WEEKDAY AFTERNOON PEAK
Peak Hour	7:45am – 8:45am	4:00pm – 5:00pm
Volume (vph)	985	795
% Heavy Vehicles	3.4%	2.3%
Peak Flow Factor	98.6%	91.4%

2.6 INTERSECTION OPERATIONS

A series of SIDRA analyses were conducted to quantify the existing traffic operations at the Stanworth Road / Kakawan Street priority-controlled intersection. The analyses were based on the traffic count data presented in Appendix A with:

- Peak Flow Factors (PFF), as detailed in Table 2.2

- the observed proportion of heavy vehicles (%HV) for each movement
- SIDRA default values for other parameters

The results are presented in terms of the degree of saturation (DOS), 95th percentile vehicle queues, and critical movement at each intersection. The degree of saturation for a movement is defined as the ratio of traffic demand to the capacity of the movement. The critical movement relates to the approach or movement with the highest degree of saturation. Table 2.3 is an extract from the SIDRA manual and defines the operational rating and level of service for all intersection types.

Table 2.3: SIDRA INTERSECTION RATINGS

LEVEL OF SERVICE	DEGREE OF SATURATION		
	SIGNALS	ROUNDABOUT	PRIORITY
LOS A	$x \leq 0.60$	$x \leq 0.60$	$x \leq 0.60$
LOS B	$0.60 < x \leq 0.70$	$0.60 < x \leq 0.70$	$0.6 < x \leq 0.70$
LOS C	$0.70 < x \leq 0.90$	$0.70 < x \leq 0.85$	$0.70 < x \leq 0.80$
LOS D	$0.90 < x \leq 0.95$	$0.85 < x \leq 0.95$	$0.80 < x \leq 0.90$
LOS E	$0.95 < x \leq 1.00$	$0.95 < x \leq 1.00$	$0.90 < x \leq 1.00$
LOS F	$1.00 < x$	$1.00 < x$	$1.00 < x$

The existing intersection layout and equivalent SIDRA representation for the Stanworth Road / Kakawan Street priority-controlled intersection is shown in Figure 2.2.

Figure 2.2: STANWORTH ROAD / KAKAWAN STREET INTERSECTION LAYOUT



The results of the intersection analyses are summarised in Table 2.4 and included in Appendix B. The results indicate that the Stanworth Road / Kakawan Street priority-controlled intersection currently experiences LOS A conditions under existing weekday morning and evening peak conditions.

Table 2.4: INTERSECTION ATTRIBUTES

ATTRIBUTE	DOS	95% QUEUE	AVERAGE DELAY	CRITICAL MOVEMENT
Morning	16%	0.2veh	4.5s	Northeast Approach Right Turn
Evening	14%	0.1veh	4.4s	Northeast Approach Right Turn

2.7 ACTIVE AND PUBLIC TRANSPORT

2.7.1 Pedestrians and Cyclists

Pedestrian footpaths are provided on both sides of Stanworth Road. No pedestrian footpaths are provided on Kakawan Street.

No on-street cyclist lanes are currently provided in the vicinity of the site.

2.7.2 Public Transport

Public bus stops are located on both sides of Sandgate Road approximately 250m west of the site, as shown in Figure 2.1. These stops are serviced by Translink bus routes 310 and 335, which service areas between Brighton and Sandgate to the north and Brisbane City to the south. Route 310 operates approximately once an hour between 5:30am and 8:00pm on weekdays and between 6:50am and 4:50pm on weekends. Route 325 operates approximately one to two times per hour between 5:40am and 7:40pm on weekdays and approximately once an hour between 6:30am and 7:45pm on weekends. Accordingly, the subject site is served by public transport.

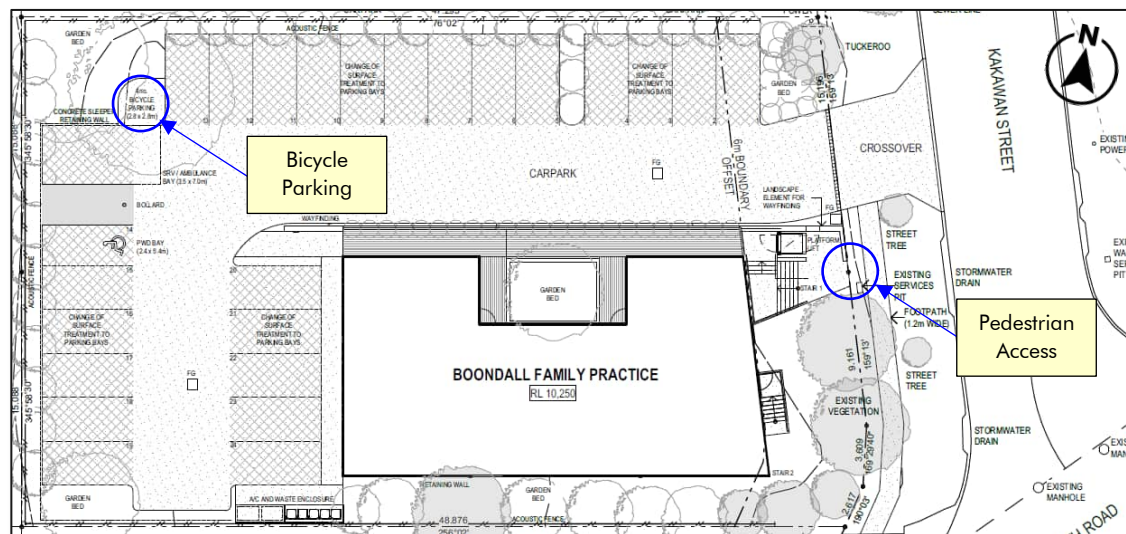
3.0 PROPOSED DEVELOPMENT

3.1 SITE LAYOUT

The proposal involves a medical centre development (ie health care service) totalling 275m² gross floor area (GFA). PTT has been advised that the proposed hours of operation of the development are 8:00am – 8:00pm Monday to Friday and 8:00am – 5:00pm on Saturdays.

The proposed site layout is shown in Figure 3.1, with development plans attached in Appendix C.

Figure 3.1: PROPOSED SITE LAYOUT



3.2 VEHICULAR ACCESS

3.2.1 Location

Vehicular access to the site is proposed via a crossover on Kakawan Street, generally located as per the existing site access driveway. Council's TAPS Policy requires that access driveways on minor roads (ie Kakawan Street) be located 20m from adjacent intersections with a major road and 3m from adjacent driveways. The proposed access driveway is located approximately 17m from the Stanworth Road / Kakawan Street priority-controlled intersection and well in excess of 3m from the access driveways to the north and south, respectively.

The proposed separation to the nearby intersection is inconsistent with Council's TAPS Policy. However, the proposed separation is consistent with Australian Standards Parking Facilities Part 1: Off-Street Car Parking (AS2890.1), which requires at least 6.0m separation be provided between an access driveway and the tangent point of a nearby intersection. In addition, there is limited scope to comply with the 20m separation requirement given the limited frontage to Kakawan Street.

3.2.2 Design

The proposed development will require on-site access for a Small Rigid Vehicle (SRV). Based on the type of access road (ie minor road) and the design service vehicle (SRV), Council's TAPS Policy requires a 6.0m wide Type B1 crossover be provided.

Vehicular access to the site is proposed via a 6.0m wide all-movements crossover on Kakawan Street. The proposed crossover has been designed as a Type B1 crossover in accordance with Council's Standard Drawing BSD-2021.

3.2.3 Sight Distance

On a 50km/h road (ie Kakawan Street), Council's TAPS Policy specifies a desirable sight distance requirement of 90m and a minimum requirement of 70m. On-site observations indicate that there is in excess of 100m sight distance to the north. However, when measured from a point 5.0m out from the through carriageway, the sight lines to the north are obstructed by the existing street on the northern side of the driveway. Therefore, it is recommended that this street tree be maintained so low-lying branches do not obstruct sight lines to the north of the proposed access location.

Given the close proximity of the subject site to the Stanworth Road / Kakawan Street priority-controlled intersection, vehicles turning left into Kakawan Street from Stanworth Road are likely to be travelling significantly slower than 50km/h (ie around 20km/h – 30km/h). For a 20km/h – 30km/h speed environment, extrapolation of Council's minimum sight distance requirements indicates a minimum sight distance of 25m – 40m. Similarly, extrapolation of the minimum sight distance requirements outlined in AS2890.1 indicates a minimum sight distance of approximately 15m – 25m.

It is estimated that there is approximately 27m of available sight distance to the south to view vehicles turning left into Kakawan Street at the priority-controlled intersection. Therefore, the reduced sight distance to the south is considered adequate, given that vehicles are likely to be travelling significantly slower than 50km/h when turning onto Kakawan Street from Stanworth Road.

3.2.4 Queuing

Section 4.8(8) of Council's TAPS Policy recommends that queuing be provided based on the car park capacity and design, service rate and frontage road classification, in order to allow a free influx of traffic which will not adversely affect traffic or pedestrian flows on the frontage road. The 99th percentile queue at the site access is considered to be an adequate measure of an acceptable queue. The 99th percentile queue at the site access has been calculated using queuing theory outlined in the PTT Queuing Practice Note, attached in Appendix D.

The predicted 99th percentile queue at the proposed access has been calculated based on 11 vehicles arriving during the peak hours, as outlined in Section 4.2. The results of the analysis indicate a 99th percentile queue of 0.47 vehicles. Based on an average vehicle length of 6.0m, this equates to a 99th percentile queue length of 2.8m.

The proposed layout provides approximately 4.2m of clear queuing space at the site access, measured between the property boundary and the first internal conflict point (ie the first on-site parking space). Therefore, the proposed queuing provision is sufficient to cater for the predicted 99th percentile queue and is consistent with Section 4.8(8) of Council's TAPS Policy for queuing.

3.3 CAR PARKING

3.3.1 Requirement

The car parking requirement for the site has been determined based on the parking provision rates outlined within Council's TAPS Policy. A car parking provision of 28 spaces is required, as shown in Table 3.1.

Table 3.1: COUNCIL PARKING REQUIREMENT

LAND USE	SCALE	RATE	REQUIRED
Health Care Service	275m ² GFA	14 spaces plus 5 spaces per 100m ² GFA	28 spaces

3.3.2 Provision

The proposed layout provides 24 car parking spaces plus one shared SRV / ambulance space on-site, which equates to a shortfall of four parking spaces compared to Council's TAPS Policy requirements. However, Performance Outcome 13 (PO13) of Council's Transport, Access, Parking and Servicing Code states:

"Development outside of the City core and City frame as identified in Figure a provides on-site car parking spaces to accommodate the design peak parking demand without any overflow of car parking to an adjacent premises or adjacent street."

Accordingly, the expected peak parking demand for the proposed development has been estimated using a first principles approach, based on the scale / capacity of the proposed development. The assumptions are as follows:

- each treatment room would accommodate one staff member (ie a total of eight staff)
- the reception area space would accommodate three staff members
- for each treatment room, two patients (ie one receiving treatment and one in the waiting room) would be on-site at any one time (ie a total of 16 patients)
- 85% of staff / patients would travel and park on-site via private vehicle

Based on the eight treatment rooms and two administration rooms proposed, it is expected that 11 staff and 16 patients would be on-site at peak times. Assuming 85% of users travel to / from the site via private vehicle, this equates to a peak parking demand of 23 spaces. However, this is considered to be an extreme scenario that is unlikely to occur on a day-to-day basis. Therefore, the proposed parking provision is expected to be adequate to accommodate the parking demands of the site.

3.3.3 Persons With Disabilities (PWD) Parking

Council's TAPS Policy requires PWD parking be provided at a rate of one space per 50 ordinary spaces, constructed in accordance with Australian Standards AS2890.6: 'Parking Facilities Part 6: Off-Street Parking for People with Disabilities'. The proposed layout provides one PWD bay, which is consistent with Council's TAPS Policy for a total parking provision of 24 spaces.

3.3.4 Design

The proposed on-site parking layout has been designed generally in accordance with Council's TAPS Policy, AS2890.1 and AS2890.6. This is typified by:

- regular car parking spaces dimensioned 2.6m wide by 5.4m long
- PWD car parking space dimensioned 2.4m wide by 5.4m long with an adjacent shared bay dimensioned 2.4m wide by 5.4m long
- two-way parking aisles dimensioned 5.8m wide
- 1.5m end-of-aisle extension

3.4 SERVICING

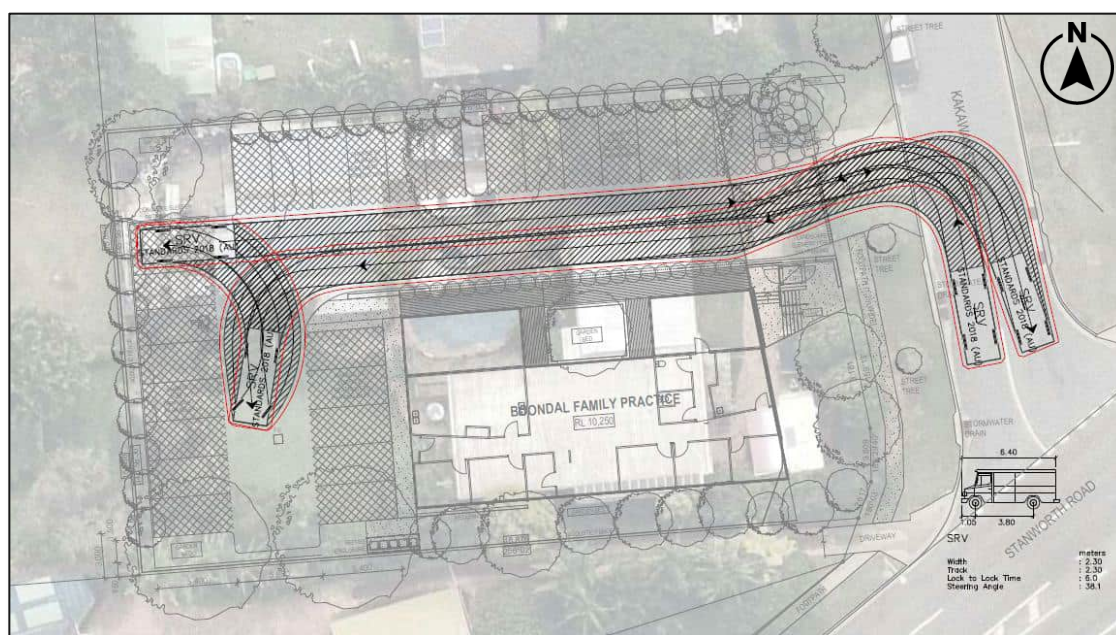
3.4.1 Requirement

Council's TAPS Policy requires that health care service developments accommodate occasional access for a SRV and regular access for a VAN.

3.4.2 SRV / Ambulance Provision

The proposed layout provides one shared SRV / ambulance loading bay on-site. The bay is dimensioned 3.5m wide by 7.0m long, which is consistent with Council's TAPS Policy requirements for an SRV. A swept path analysis of the largest vehicle to be accommodated on-site (ie the SRV) has been undertaken, as shown in Figure 3.2 and attached in Appendix E. As demonstrated, the proposed layout is sufficient to facilitate SRV access and egress in a forward gear and manoeuvring to / from the loading bay.

Figure 3.2: SRV MANOEUVRING



3.4.3 Refuse Collection Arrangements

The proposed development is expected to generate medical waste and general waste. Refuse collection of medical waste is proposed to be undertaken on-site by a private contractor. General waste collection is proposed to be undertaken via kerbside collection on Kakawan Street.

PTT has been advised that the refuse collection vehicle used for the collection of medical waste is a 5.8m long Isuzu Pantech truck, approximate to the size of a SRV. As demonstrated in Figure 3.2, the proposed layout is sufficient to facilitate a 6.4m long SRV on-site for the collection of medical waste.

3.5 ACTIVE TRANSPORT

3.5.1 Pedestrians

Pedestrian access to the site is proposed via a pedestrian entrance on the southern side of the vehicular access, as indicated in Figure 3.1. It is also proposed to provide a 1.2m wide pedestrian footpath along the Kakawan Street site frontage to connect to the existing footpath on Stanworth Road. The proposed pedestrian facilities are expected to provide safe and convenient access between the site and the external road network.

3.5.2 Cyclists

Council's TAPS Policy does not specify a requirement for bicycle parking for health care uses. Nevertheless, on-site bicycle parking is provided with capacity for four bicycles to promote active travel to the site, as shown in Figure 3.1.

4.0 TRAFFIC OPERATIONS

4.1 DEVELOPMENT STAGING

4.1.1 Timing

It is standard practice to adopt a ten-year design horizon from the year of full occupation when analysing future year traffic operations on Council's road network. Therefore, the following development staging has been adopted:

- Traffic Counts: 2023
- Development Application: 2023
- Construction and Opening: 2025
- Occupation plus 10 Years: 2035

4.1.2 Timing

The following assessment scenarios have been considered:

- Opening Year (2025) pre-development
- Opening Year (2025) post-development
- Future Year (2035) pre-development
- Future Year (2035) post-development

4.1.3 Background Traffic Growth Rate

According to the Office of Economic and Statistical Research (OESR), Queensland Treasury and Trade (QTT), the population of Boondall and surrounding areas is expected to grow at a rate of 1.4% per annum. While population growth is not equal to traffic growth, it is a useful proxy in the absence of site-specific traffic growth data or modelling. The application of this rate equates to a 17.6% increase in background traffic volumes over the next 12 years (2023 – 2035).

4.2 TRAFFIC GENERATION

The likely peak hour traffic generation of the proposed development has been determined based on 85th percentile trip generation rates for medical centres, as sourced from the Queensland Government traffic generation data (2004 – 2019) available via the Open Data Portal. An in:out split of 50:50 has been adopted for the morning and evening peak hours. As shown in Table 4.1, the proposed development is expected to generate 22 trips (11 in and 11 out) during the weekday morning and evening peak hours.

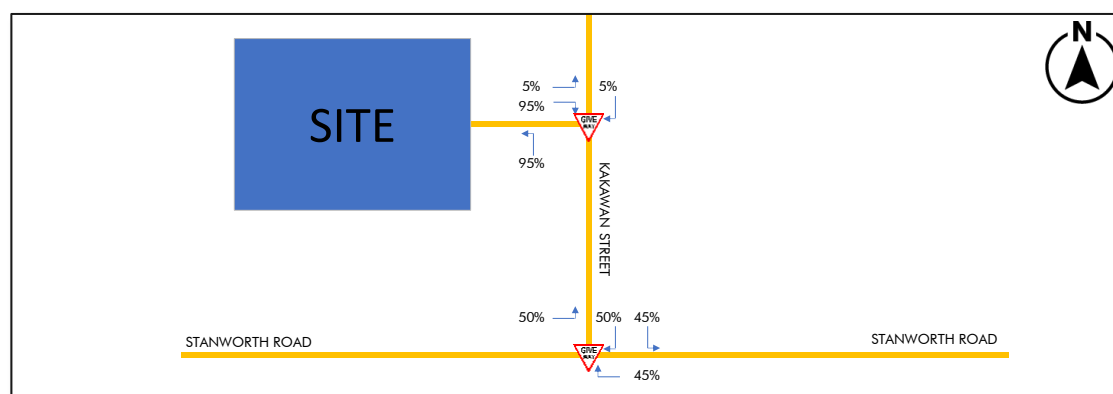
Table 4.1: PREDICTED PEAK HOUR TRAFFIC GENERATION

PEAK HOUR	SCALE	TRIP GENERATION RATE	TRIPS	IN : OUT SPLIT	IN : OUT (VPH)
Weekday Morning	275m ² GFA	7.7 trips per 100m ² GFA	22	50 : 50	11 : 11
Weekday Evening	275m ² GFA	7.7 trips per 100m ² GFA	22	50 : 50	11 : 11

4.3 DIRECTIONAL DISTRIBUTION

The distribution of new development traffic on the existing road network has been estimated based on the directional split inherent in the traffic surveys. The resulting distribution of new development traffic for both the weekday morning and evening peak hours is summarised in Figure 4.1.

Figure 4.1: DIRECTIONAL DISTRIBUTION



4.4 TRAFFIC IMPACT

The likely impact of the proposed development on the peak hour operations of the Stanworth Road / Kakawan Street priority-controlled intersection has been assessed using SIDRA. These analyses are based on the peak hour turning movement forecasts presented in Appendix F and the SIDRA intersection representation shown in Figure 2.2.

The results of the analysis of the intersection are summarised in Table 4.2 and attached in Appendix B. The results indicate that the intersection is expected to experience LOS A operations during the weekday morning and evening peak hours, under 2025 and 2035 pre and post development scenarios. Therefore, the addition of development generated traffic is not expected to have a significant adverse impact on the intersection operations.

Table 4.2: STANWORTH ROAD / KAKAWAN STREET OPERATIONS

LAND USE	DOS	95% QUEUE	AVG DELAY	CRITICAL MOVEMENT
Weekday Morning				
2025 Pre-Development	16%	0.2veh	4.5s	Northeast Approach Right Turn
2025 Post-Development	16%	0.3veh	4.5s	Northeast Approach Right Turn
2035 Pre-Development	18%	0.3veh	4.5s	Northeast Approach Right Turn
2035 Post-Development	18%	0.4veh	4.6s	Northeast Approach Right Turn
Weekday Evening				
2025 Pre-Development	15%	0.1veh	4.4s	Northeast Approach Right Turn
2025 Post-Development	15%	0.2veh	4.5s	Northeast Approach Right Turn
2035 Pre-Development	17%	0.1veh	4.4s	Northeast Approach Right Turn
2035 Post-Development	17%	0.2veh	4.5s	Northeast Approach Right Turn

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The proposed development has been evaluated in terms of its site access arrangements, parking provision and design, servicing arrangements, pedestrian and cyclist facilities and impact on the surrounding road network. The main points to note are:

- the proposal involves a medical centre (ie health care use) totalling 275m² GFA
- access is proposed via a 6.0m wide Type B1 crossover from Kakawan Street, which is in accordance with Council's TAPS Policy requirements
- the development would be supported by 24 on-site car parking spaces
- the proposed parking provision is adequate to cater for the expected parking demands of the site
- the on-site parking layout has been designed generally in accordance with Council's TAPS Policy, AS2890.1 and AS2890.6 requirements
- an SRV can be accommodated on-site, with access and egress in a forward gear
- medical waste collection is proposed to be undertaken on-site and general waste collection is proposed to be undertaken on-street
- the proposed pedestrian facilities are expected to provide safe and convenient access between the site and the external road network
- the proposed development is expected to generate 22 trips (11 in and 11 out) during the weekday morning and evening peak hours
- the addition of development generated traffic is not expected to have a significant adverse impact on intersection operations

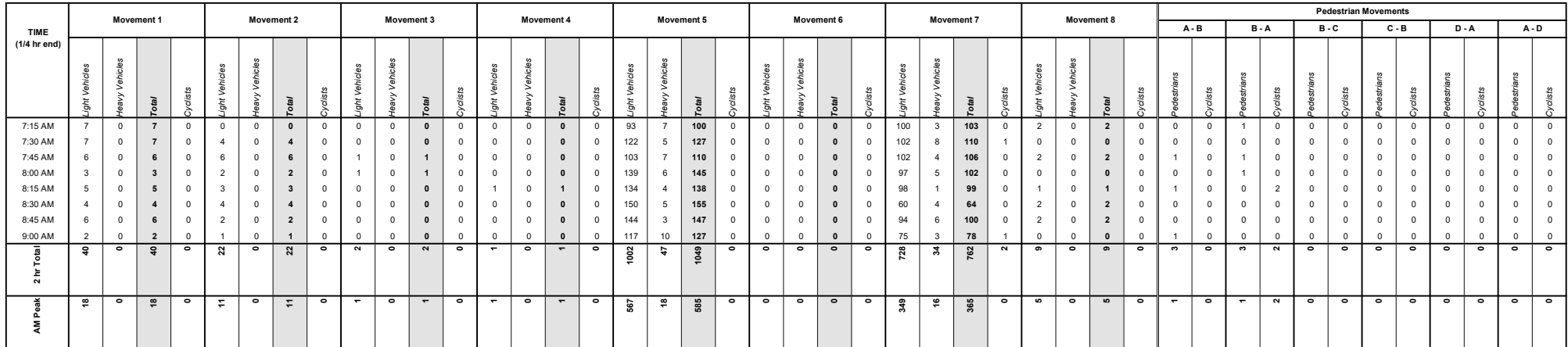
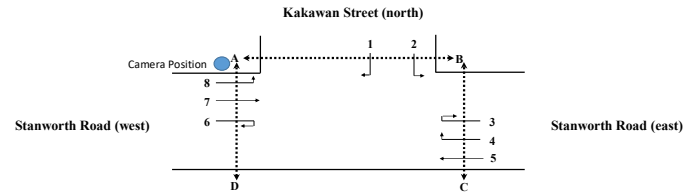
5.2 RECOMMENDATIONS

Based on the above, it is recommended that:

- the existing street tree on the northern side of the proposed access driveway be maintained so low-lying branches do not obstruct sight lines to the north

APPENDIX A TRAFFIC COUNT SURVEYS

Site No.: 1 **Weather:** Intermittent showers
Location: Stanworth Road/Kakawan Street, Boondall
Day/Date: Thursday, 30 March 2023
AM Peak: Hour ending - 8:45 AM
PM Peak: Hour ending - 5:00 PM

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APPENDIX B INTERSECTION ANALYSES

SITE LAYOUT

▽ Site: 101 [2023 AM Existing (Site Folder: General)]

23-483 29 Kakawan Street, Boondall

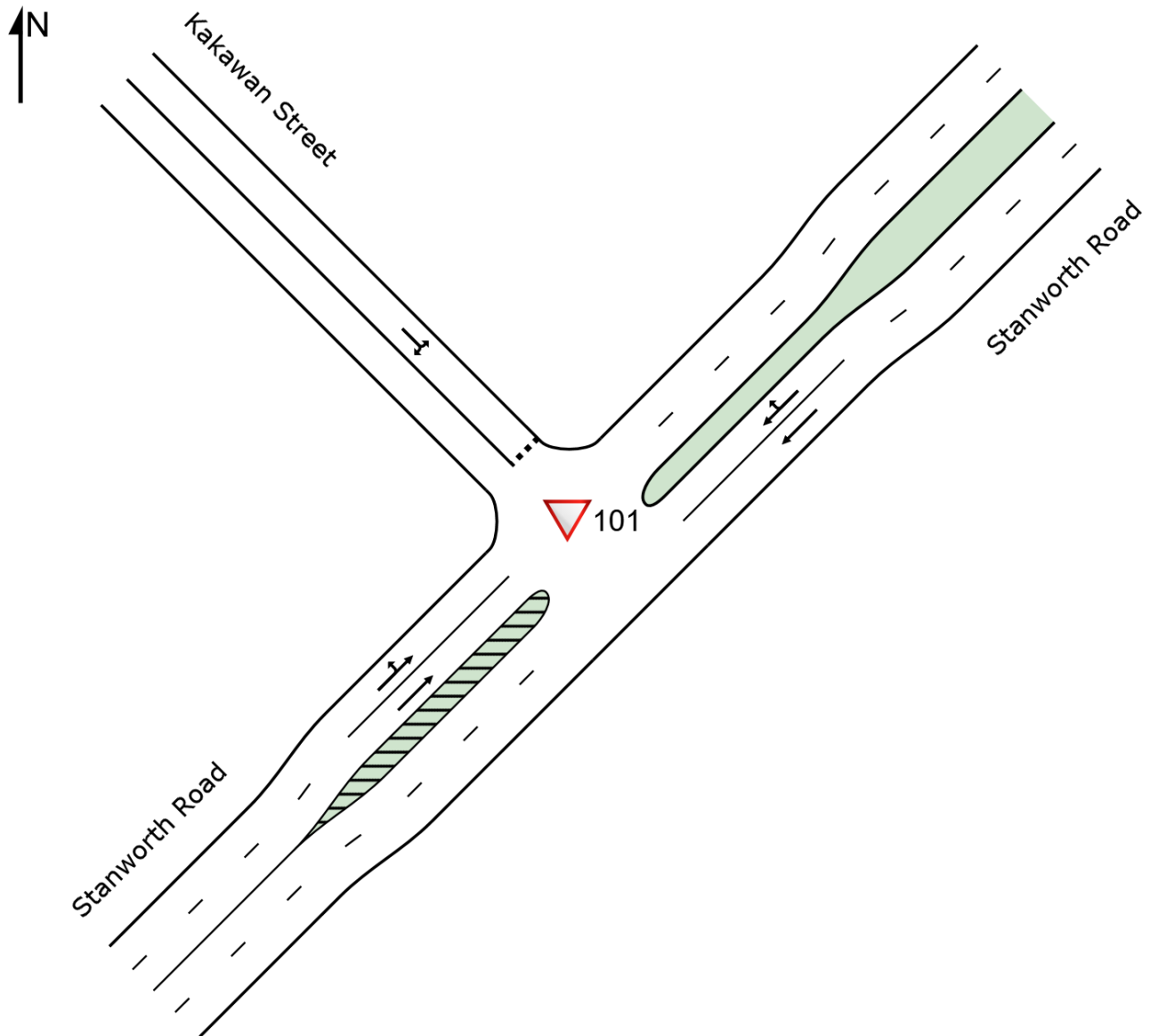
Existing Scenario

AM Peak Hour

Site Category: (None)

Give-Way (Two-Way)

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



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Project: P:\2022-23\23-483 29 Kakawan Street, Boondall\Calcs\Kakawan Street - Stanworth Road.sip9

MOVEMENT SUMMARY

▼ Site: 101 [2023 AM Existing (Site Folder: General)]

23-483 29 Kakawan Street, Boondall

Existing Scenario

AM Peak Hour

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	585	3.1	593	3.1	0.156	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	2	0.0	2	0.0	0.156	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		587	3.1	595	3.1	0.156	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	11	0.0	11	0.0	0.060	6.1	LOS A	0.2	1.3	0.45	0.69	0.45	49.7
29	R2	18	0.0	18	0.0	0.060	13.8	LOS B	0.2	1.3	0.45	0.69	0.45	49.6
Approach		29	0.0	29	0.0	0.060	10.9	LOS B	0.2	1.3	0.45	0.69	0.45	49.6
SouthWest: Stanworth Road														
30	L2	5	0.0	5	0.0	0.100	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	365	4.4	370	4.4	0.100	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		370	4.3	375	4.3	0.100	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		986	3.4	1000	3.4	0.156	4.5	NA	0.2	1.3	0.01	0.53	0.01	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: P:\2022-23\23-483 29 Kakawan Street, Boondall\Calcs\Kakawan Street - Stanworth Road.sip9

MOVEMENT SUMMARY

▼ Site: 101 [2023 PM Existing (Site Folder: General)]

23-483 29 Kakawan Street, Boondall

Existing Scenario

PM Peak Hour

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	494	2.6	540	2.6	0.144	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	9	0.0	10	0.0	0.144	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		503	2.6	550	2.6	0.144	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	2	0.0	2	0.0	0.033	5.9	LOS A	0.1	0.7	0.51	0.74	0.51	49.6
29	R2	12	0.0	13	0.0	0.033	11.8	LOS B	0.1	0.7	0.51	0.74	0.51	49.5
Approach		14	0.0	15	0.0	0.033	11.0	LOS B	0.1	0.7	0.51	0.74	0.51	49.5
SouthWest: Stanworth Road														
30	L2	10	0.0	11	0.0	0.080	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	270	1.9	295	1.9	0.080	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
Approach		280	1.8	306	1.8	0.080	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		797	2.3	872	2.3	0.144	4.4	NA	0.1	0.7	0.01	0.53	0.01	54.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: P:\2022-23\23-483 29 Kakawan Street, Boondall\Calcs\Kakawan Street - Stanworth Road.sip9

MOVEMENT SUMMARY

▼ Site: 101 [2025 AM Pre Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Pre Development Scenario
AM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	601	3.1	610	3.1	0.160	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	2	0.0	2	0.0	0.160	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		603	3.1	612	3.1	0.160	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	11	0.0	11	0.0	0.062	6.1	LOS A	0.2	1.4	0.46	0.69	0.46	49.6
29	R2	18	0.0	18	0.0	0.062	14.2	LOS B	0.2	1.4	0.46	0.69	0.46	49.4
Approach		29	0.0	29	0.0	0.062	11.1	LOS B	0.2	1.4	0.46	0.69	0.46	49.4
SouthWest: Stanworth Road														
30	L2	5	0.0	5	0.0	0.102	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	375	4.4	380	4.4	0.102	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		380	4.3	385	4.3	0.102	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		1012	3.5	1026	3.5	0.160	4.5	NA	0.2	1.4	0.01	0.53	0.01	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: 101 [2025 PM Pre Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Pre Development Scenario
PM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	508	2.6	556	2.6	0.148	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	9	0.0	10	0.0	0.148	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		517	2.6	566	2.6	0.148	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	2	0.0	2	0.0	0.034	6.0	LOS A	0.1	0.8	0.52	0.75	0.52	49.5
29	R2	12	0.0	13	0.0	0.034	12.2	LOS B	0.1	0.8	0.52	0.75	0.52	49.3
Approach		14	0.0	15	0.0	0.034	11.3	LOS B	0.1	0.8	0.52	0.75	0.52	49.3
SouthWest: Stanworth Road														
30	L2	10	0.0	11	0.0	0.082	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	277	1.9	303	1.9	0.082	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
Approach		287	1.8	314	1.8	0.082	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		818	2.3	895	2.3	0.148	4.4	NA	0.1	0.8	0.01	0.53	0.01	54.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: 101 [2025 AM Post Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Post Development Scenario
AM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	601	3.1	610	3.1	0.161	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	7	0.0	7	0.0	0.161	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		608	3.0	617	3.0	0.161	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	16	0.0	16	0.0	0.084	6.1	LOS A	0.3	1.9	0.46	0.69	0.46	49.6
29	R2	24	0.0	24	0.0	0.084	14.5	LOS B	0.3	1.9	0.46	0.69	0.46	49.4
Approach		40	0.0	41	0.0	0.084	11.1	LOS B	0.3	1.9	0.46	0.69	0.46	49.4
SouthWest: Stanworth Road														
30	L2	11	0.0	11	0.0	0.104	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	375	4.4	380	4.4	0.104	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		386	4.3	391	4.3	0.104	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		1034	3.4	1049	3.4	0.161	4.5	NA	0.3	1.9	0.02	0.53	0.02	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: 101 [2025 PM Post Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Post Development Scenario
PM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	508	2.6	556	2.6	0.149	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	14	0.0	15	0.0	0.149	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		522	2.6	571	2.6	0.149	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	7	0.0	8	0.0	0.054	6.0	LOS A	0.2	1.2	0.43	0.70	0.43	49.9
29	R2	18	0.0	20	0.0	0.054	12.4	LOS B	0.2	1.2	0.43	0.70	0.43	49.7
Approach		25	0.0	27	0.0	0.054	10.6	LOS B	0.2	1.2	0.43	0.70	0.43	49.8
SouthWest: Stanworth Road														
30	L2	16	0.0	18	0.0	0.084	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.5
31	T1	277	1.9	303	1.9	0.084	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		293	1.7	321	1.7	0.084	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		840	2.2	919	2.2	0.149	4.5	NA	0.2	1.2	0.01	0.53	0.01	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: 101 [2035 AM Pre Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Pre Development Scenario
AM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	688	3.1	698	3.1	0.183	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	2	0.0	2	0.0	0.183	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		690	3.1	700	3.1	0.183	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	13	0.0	13	0.0	0.088	6.2	LOS A	0.3	1.9	0.53	0.72	0.53	48.4
29	R2	21	0.0	21	0.0	0.088	17.1	LOS C	0.3	1.9	0.53	0.72	0.53	48.2
Approach		34	0.0	34	0.0	0.088	12.9	LOS B	0.3	1.9	0.53	0.72	0.53	48.3
SouthWest: Stanworth Road														
30	L2	6	0.0	6	0.0	0.117	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	429	4.4	435	4.4	0.117	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		435	4.3	441	4.3	0.117	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		1159	3.4	1175	3.4	0.183	4.5	NA	0.3	1.9	0.02	0.53	0.02	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: 101 [2035 PM Pre Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Pre Development Scenario
PM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	581	2.6	636	2.6	0.169	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	11	0.0	12	0.0	0.169	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		592	2.6	648	2.6	0.169	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	2	0.0	2	0.0	0.047	6.0	LOS A	0.1	1.0	0.61	0.80	0.61	48.2
29	R2	14	0.0	15	0.0	0.047	14.1	LOS B	0.1	1.0	0.61	0.80	0.61	48.1
Approach		16	0.0	18	0.0	0.047	13.1	LOS B	0.1	1.0	0.61	0.80	0.61	48.1
SouthWest: Stanworth Road														
30	L2	12	0.0	13	0.0	0.095	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	318	1.9	348	1.9	0.095	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		330	1.8	361	1.8	0.095	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		938	2.3	1026	2.3	0.169	4.4	NA	0.1	1.0	0.01	0.53	0.01	54.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: 101 [2035 AM Post Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Post Development Scenario
AM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	688	3.1	698	3.1	0.184	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	7	0.0	7	0.0	0.184	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		695	3.0	705	3.0	0.184	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	18	0.0	18	0.0	0.115	6.2	LOS A	0.4	2.6	0.53	0.72	0.53	48.4
29	R2	27	0.0	27	0.0	0.115	17.4	LOS C	0.4	2.6	0.53	0.72	0.53	48.2
Approach		45	0.0	46	0.0	0.115	12.9	LOS B	0.4	2.6	0.53	0.72	0.53	48.3
SouthWest: Stanworth Road														
30	L2	11	0.0	11	0.0	0.119	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.6
31	T1	429	4.4	435	4.4	0.119	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		440	4.3	446	4.3	0.119	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		1180	3.4	1197	3.4	0.184	4.6	NA	0.4	2.6	0.02	0.53	0.02	54.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

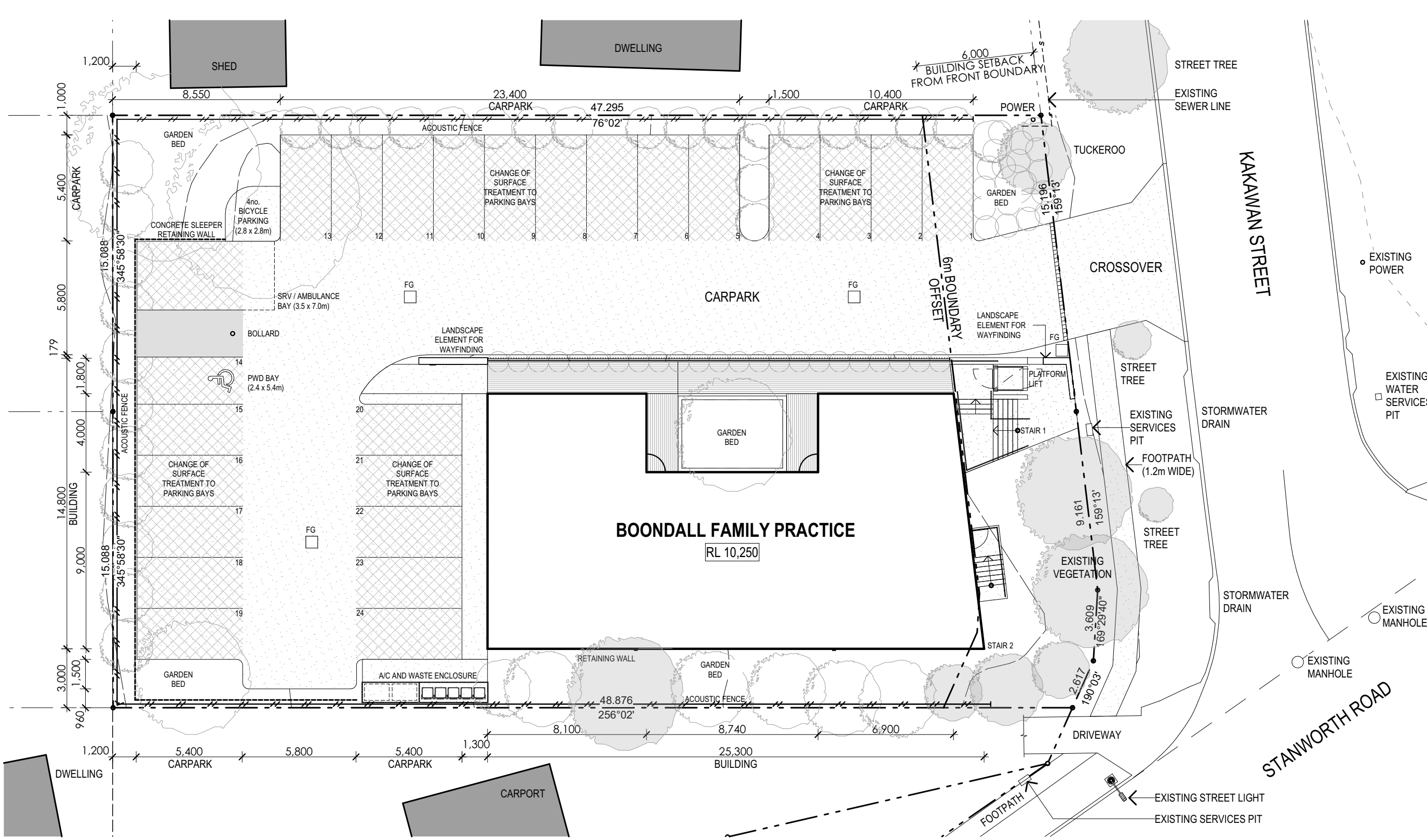
▼ Site: 101 [2035 PM Post Development (Site Folder: General)]

23-483 29 Kakawan Street, Boondall
Post Development Scenario
PM Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
NorthEast: Stanworth Road														
25	T1	581	2.6	636	2.6	0.170	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
26	R2	15	0.0	16	0.0	0.170	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	54.4
Approach		596	2.6	652	2.6	0.170	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
NorthWest: Kakawan Street														
27	L2	7	0.0	8	0.0	0.068	6.0	LOS A	0.2	1.5	0.51	0.73	0.51	48.9
29	R2	19	0.0	21	0.0	0.068	14.4	LOS B	0.2	1.5	0.51	0.73	0.51	48.7
Approach		26	0.0	28	0.0	0.068	12.2	LOS B	0.2	1.5	0.51	0.73	0.51	48.8
SouthWest: Stanworth Road														
30	L2	17	0.0	19	0.0	0.096	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.5
31	T1	318	1.9	348	1.9	0.096	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
Approach		335	1.8	367	1.8	0.096	4.3	NA	0.0	0.0	0.00	0.53	0.00	54.7
All Vehicles		957	2.2	1047	2.2	0.170	4.5	NA	0.2	1.5	0.01	0.53	0.01	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX C DEVELOPMENT PLANS



RP DATA
LOT 12 & 13 ON RP106512
SUBURB: BOONDALL
LOCAL AUTHORITY: BRISBANE C.C.
SITE AREA: 1,477m²

SITE COVER

SITE AREA: 1,477m²
TOTAL SITE COVER: 341m²
SITE COVER: 23.1%

GROSS FLOOR AREA

GFA: 275m²

LEGEND

FG FIELD GULLY
POWER POWER POLE
EXISTING TREES / PLANTING
PROPOSED TREES / PLANTING
EXISTING BUILDINGS
PROPOSED BUILDING
PROPOSED PAVING

GENERAL NOTES

1. Site information based on **AXIS SURVEYS** Detail Survey **2205433 REV A** Issued **24.11.22**. All levels and site features to be confirmed on site prior to construction. Notify Architect of any discrepancies.

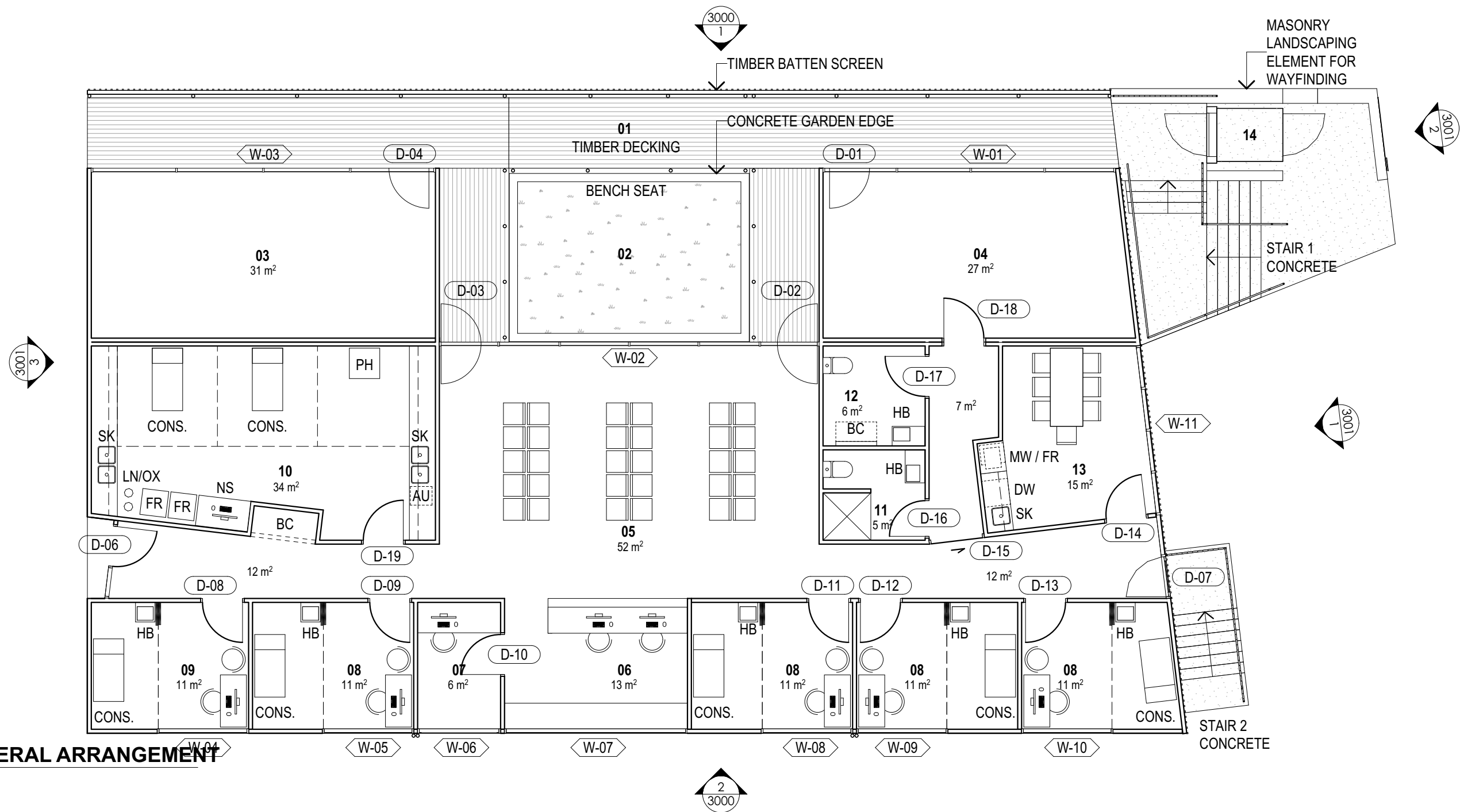
2. Location of all existing buildings and vegetation have been plotted from aerial and street view images (Google Maps and Queensland Globe) and are indicative only. Location of all existing buildings and vegetation to be confirmed on site prior to work commencing.

4. Locations of all underground services to be confirmed on site prior to excavation. Locations provided on drawings have been plotted from service provider records and are indicative only.

5. Confirm all dimensions on site prior to fabrication and construction.

1 SITE PLAN - PROPOSED
1:200

BCC DS
Plans/Documents
RECEIVED
04/09/2023
APPLICATION REF
A006310258



1 GROUND FLOOR GENERAL ARRANGEMENT
1:100

LEGEND

01	COVERED DECK	AU	AUTOCLAVE
02	ENTRY GARDEN	BC	BABY CHANGE TABLE
03	ALLIED HEALTH TENANCY 01	CBD.	CUPBOARD
04	ALLIED HEALTH TENANCY 02	CONS.	CONSULT BED
05	WAITING AREA	DW	DISHWASHER
06	RECEPTION	FR	FRIDGE
07	PRACTICE MANAGER	HB	HANDWASH BASIN
08	CONSULT ROOM	LN	LIQUID NITROGEN BOTTLE
09	INFECTIOUS DISEASE/ISOLATION ROOM	NS	NURSE STATION
10	TREATMENT ROOM & NURSE OFFICE	MW	MICROWAVE
11	UNISEX WC AMBULENT	OX	OXYGEN BOTTLE
12	UNISEX ACCESSIBLE WC	PH	PHLOBOTOMY CHAIR
13	STAFF KITCHEN	SK	SINK
14	ACCESSIBLE PLATFORM LIFT		

GENERAL NOTES

1. ROOM AREAS HAVE BEEN MEASURED TO INSIDE FACE OF EXTERNAL WALLS AND CENTRE LINE OF INTERNAL WALLS.

APPENDIX D

PTT QUEUING PRACTICE NOTE

PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSSES



BACKGROUND

On-site queuing areas are required at site access locations to ensure that vehicles do not queue across pedestrian paths or back onto the frontage road.

However, with queuing requirements in planning scheme policies becoming increasingly onerous, the usage of these figures can result in excessive queuing areas which can unnecessarily have an adverse effect construction costs and development yields.

This practice note demonstrates how conventional queuing theory can be used in traffic engineering to determine the anticipated queue length at access locations as a function of local conditions.

QUEUING THEORY

To calculate the amount of queuing space required, we must estimate the probability of a number of vehicles in a queue (n) exceeding a specified number of vehicles (N) at any instant. This is calculated using the following formula:

$$\Pr(n > N) = \rho^{N+1} \leq \alpha$$

Where:

- ρ is the queue utilisation factor
- α is the probability of a queue of N vehicles being exceeded

Rearranging this formula enables the calculation of the design queue length in terms of the number of vehicles as follows:

$$N = \frac{\log(\alpha)}{\log(\rho)} - 1$$

The **minimum** design queue would be calculated as N vehicles, which may include a fraction of a vehicle (eg 1.2 vehicles). This

design queue could be applied subject to engineering judgment.

The **desirable** design queue would be the smallest integer which contains the value, N (ie rounded up to the nearest integer).

Application of a standard vehicle length of 6m per vehicle results in a design queue length in metres.

QUEUE UTILISATION FACTOR

The utilisation factor, ρ , is the ratio of the mean arrival rate (r) and the mean service rate (s), ie:

$$\rho = \frac{r}{s}$$

The mean arrival rate (veh/hr) varies for each situation. It is calculated using the peak hour trip generation for the facility. This is expressed in vehicles per hour.

The mean service rate (veh/hr) is determined by observing the operations of similar facilities.

PTT has calculated the mean service rate for a non-controlled (ie no boom gate) parking facility by surveying the average time taken for cars to enter and leave from visitor parks in a residential development.

This survey was undertaken at a recently approved and constructed mixed use commercial/residential development at Nundah on a Wednesday in July 2014 between 4:30-6:00pm. A minimum of 30 observations were made for both "parking" and "unparking" manoeuvres. The results of this analysis are shown in Table 1.

PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSSES



Table 1: MEAN VEHICLE MANOEUVRING TIME (seconds/vehicle)

MANOEUVRE	MEAN TIME	STD DEV	MIN	MAX
Parking	12.2	13.8	1.1	69.5
Unparking	14.7	7.1	2.1	37.2

The application of the mean “unparking” value from Table 1 assumes that each vehicle which enters the access will be waiting for a car to “unpark” from the space nearest to the access. This is an extremely conservative assumption, which will result in an over-estimate of queue lengths.

The mean service time for car parks with entrance controls such as boom gates, ticket dispensing machines, car stackers and mechanical parking installations can usually be provided by the supplier of the product.

PROBABILITY OF EXCEEDANCE

The queuing formula is used to calculate the queue length given a specified probability (α).

Generally, the 95th percentile queue is considered an adequate measure of an acceptable queue at access driveways. This infers that there is a 5% probability that the queue length will be exceeded (ie $\alpha=0.05$).

Australian Standards, AS2890.1, outlines the requirement to provide a 98th percentile queue for situations where mechanical parking installations such as car stackers are used (ie $\alpha=0.02$).

EXAMPLE

A development with a mean peak hour trip generation of 100 veh/hr and a 80:20 in:out split results in a vehicle arrival rate of 80 veh/hr.

The service rates from Table 1 can be applied to calculate the queue utilisation factor. However common units are required to find a ratio.

Therefore, the service rate, s , is:

$$\frac{\text{vehicle}}{\text{hour}} = 3,600 \left(\frac{\text{seconds}}{\text{vehicle}} \right)^{-1}$$
$$s = \frac{3,600}{14.7} = 244.9 \text{ vehicles per hour}$$

The queue utilisation factor is:

$$\rho = \frac{r}{s} = \frac{80}{244.9} = 0.327$$

The 95th percentile design queue:

$$N = \frac{\log(\alpha)}{\log(\rho)} - 1$$
$$N = \frac{\log(0.05)}{\log(0.327)} - 1$$
$$N = 1.68 \text{ vehicles}$$

Therefore, desirably, the development should be designed to allow for an entrance queue of two vehicles (ie 12m). However, an available queuing distance of 1.68 vehicles (ie 10.1m) would be considered acceptable to cater for the 95th percentile queue, subject to engineering judgment.

PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSSES



CONCLUSION

Conventional traffic engineering queuing theory can be used to determine the anticipated queue length at access locations. This ensures that queuing does not adversely impact on nearby traffic or pedestrian flows whilst ensuring that the queuing area is not excessive.

REFERENCES

Bennett, DW and Rose, G (1988), *Unsignalised Intersection Analysis*, University of Melbourne

Institute of Transport Studies Monash University (2003), *Traffic Engineering and Management*, Volume 2, Caulfield East

Standards Australia (2004), *AS2890.1:2004 Parking facilities Part 1: Off-street car parking*, Sydney

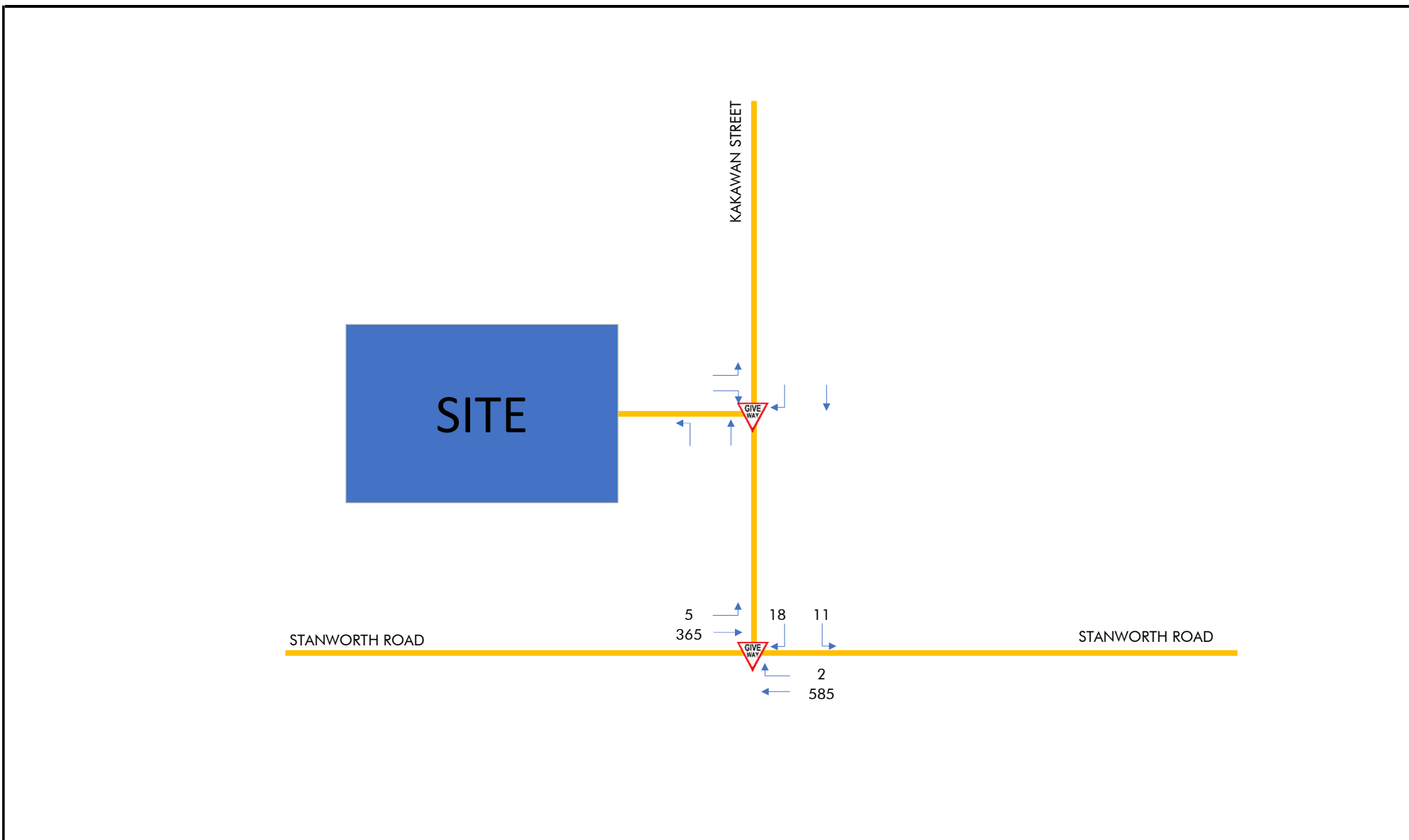
DISCLAIMER

The material contained in this practice note is of a general nature, for information only. Pekol Traffic and Transport accepts no liability for any damage caused by any error or omission contained herein.

APPENDIX E SWEPT PATHS

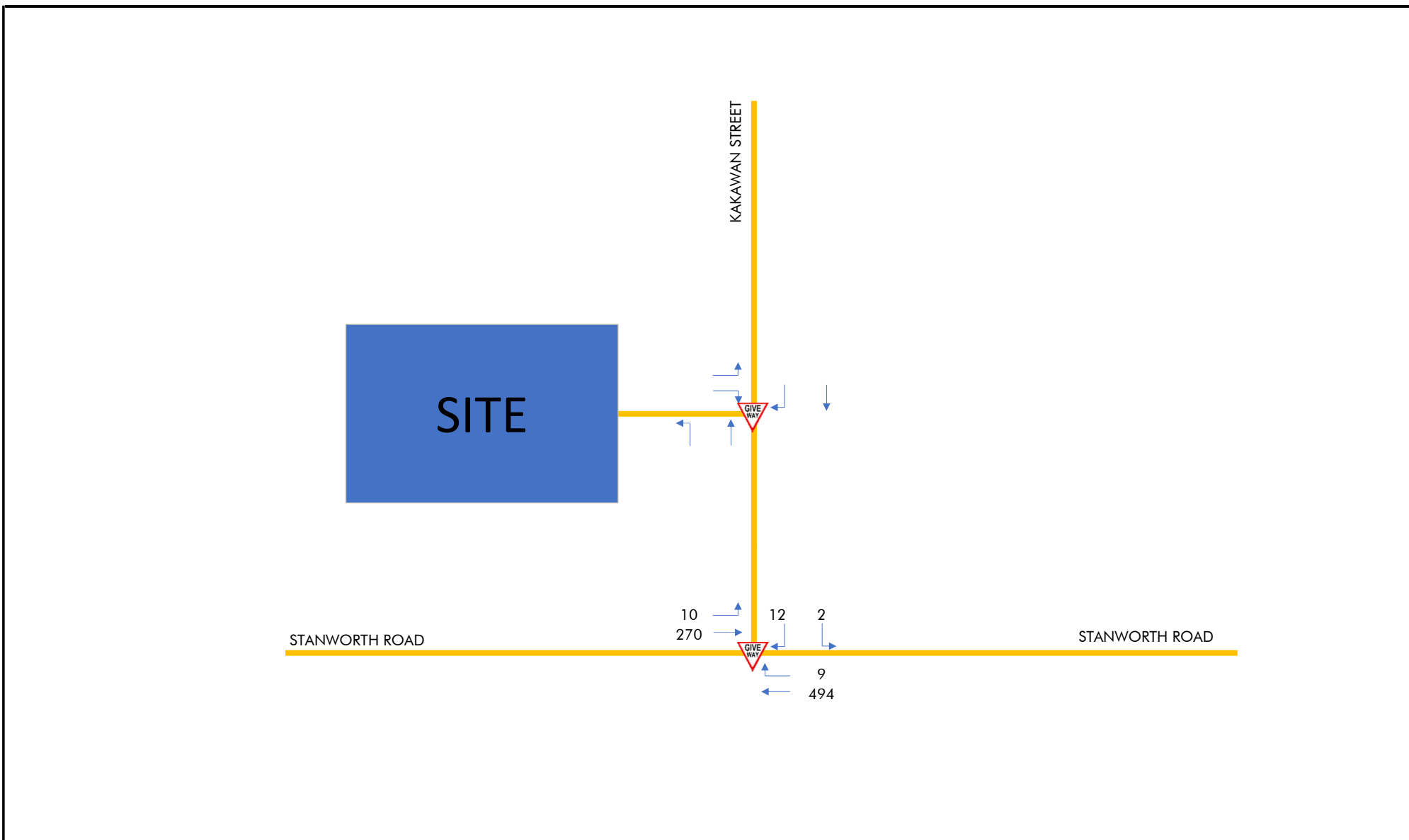
APPENDIX F

FORECAST TURNING MOVEMENTS



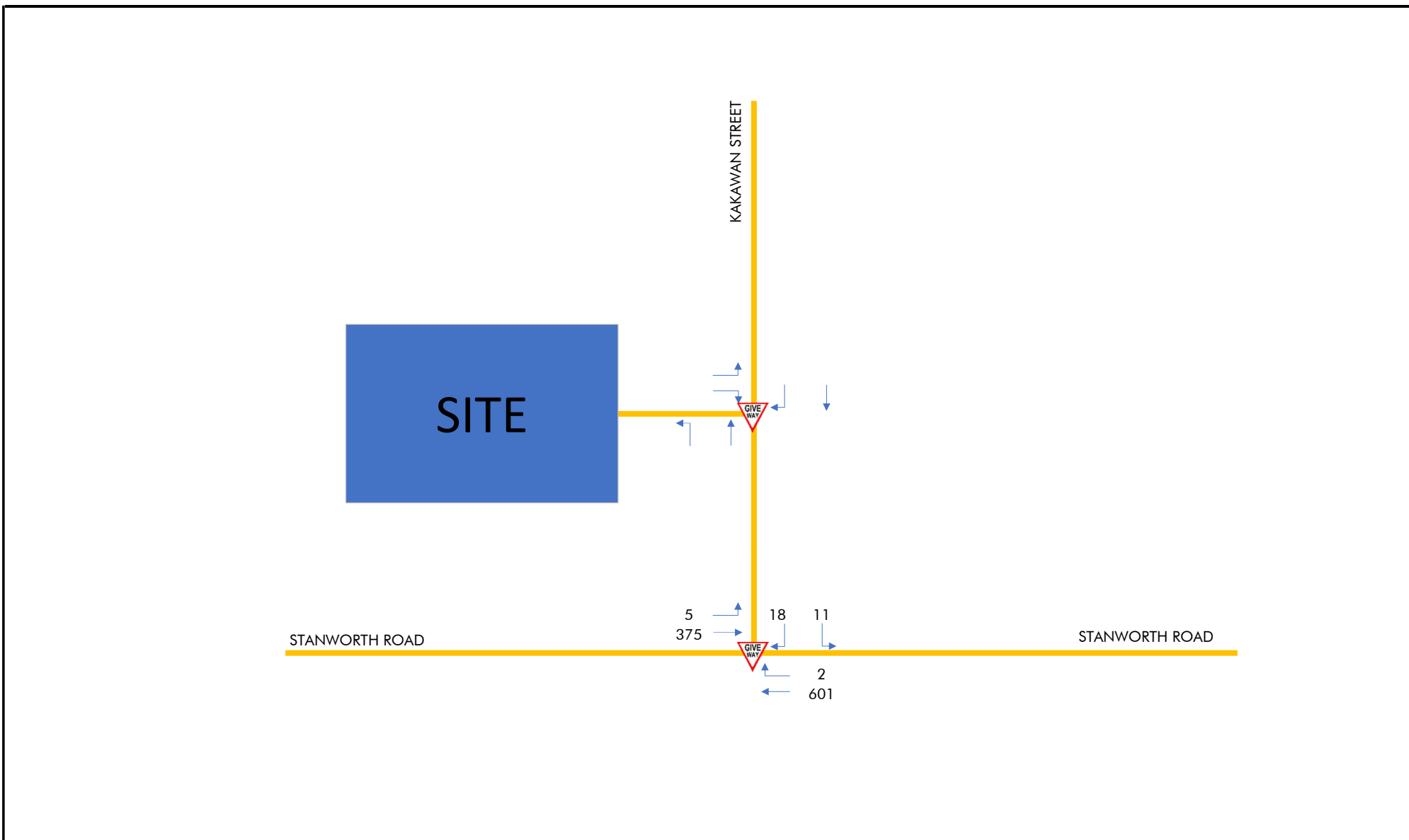
 PTT TRAFFIC & TRANSPORT ENGINEERING ABN 96 067 593 962 P 07 3839 6771 WWW.PTT.COM.AU Level 2, 62 Astor Tce, Spring Hill QLD 4000	Client		Duncan-Ross Health		Project		29 Kakawan Street, Boondall	
	Date	26/06/2023		Figure	Figure 1		Job No.	23-483
	2023 Existing Morning Peak Hour							

2023 Existing Morning Peak Hour



 PTT TRAFFIC & TRANSPORT ENGINEERING ABN 96 067 593 962 P 07 3839 6771 WWW.PTT.COM.AU Level 2, 62 Astor Tce, Spring Hill QLD 4000	Client		Duncan-Ross Health		Project		29 Kakawan Street, Boondall					
	Date		26/06/2023		Figure		Figure 2		Job No.		23-483	
	2023 Existing Evening Peak Hour											

2023 Existing Evening Peak Hour

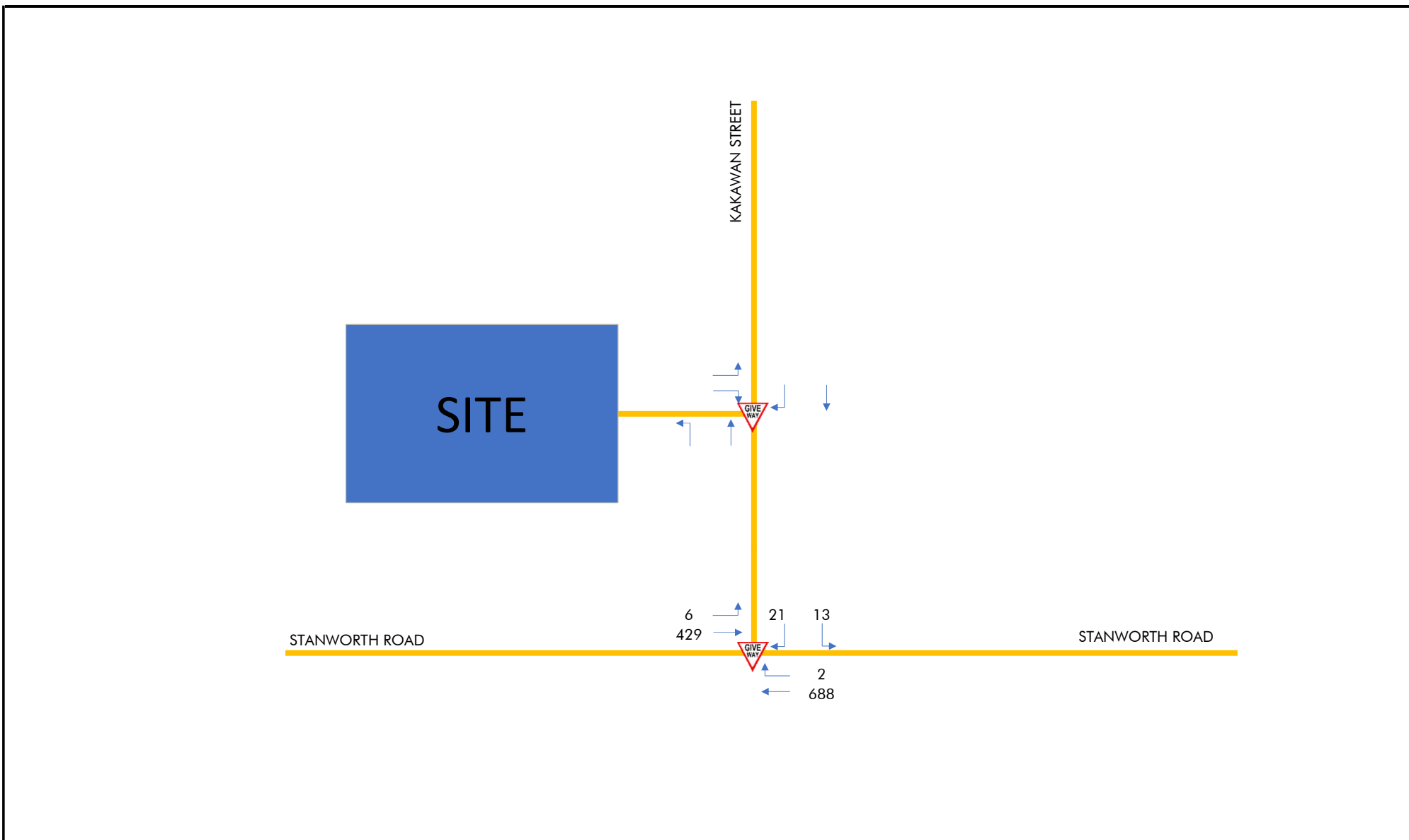


 PTT TRAFFIC & TRANSPORT ENGINEERING ABN 96 067 593 962 P 07 3839 6771 WWW.PTT.COM.AU Level 2, 62 Astor Tce, Spring Hill QLD 4000	Client		Duncan-Ross Health		Project		29 Kakawan Street, Boondall					
	Date		26/06/2023		Figure		Figure 3		Job No.		23-483	
	2025 Pre-Development Morning Peak Hour											

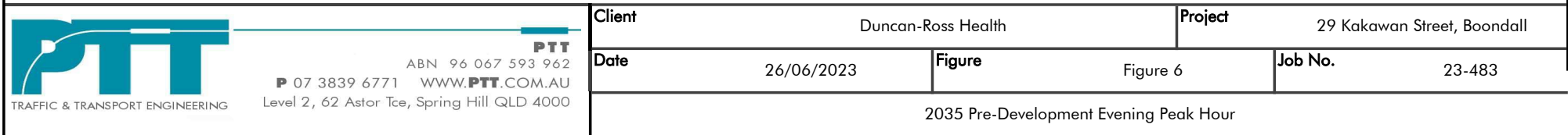
2025 Pre-Development Morning Peak Hour

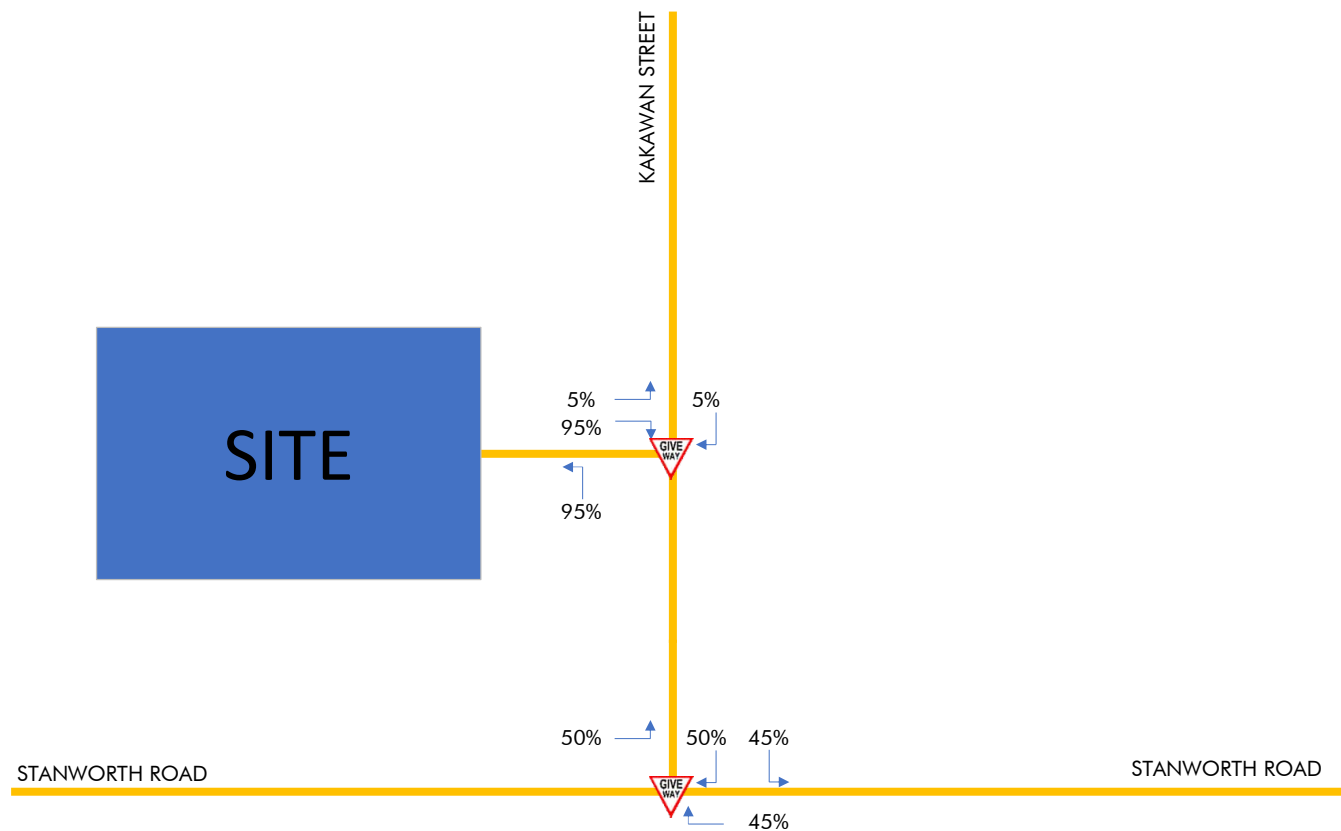


Client	Duncan-Ross Health	Project	29 Kakawan Street, Boondall
Date	26/06/2023	Figure	Figure 4
		Job No.	23-483
2025 Pre-Development Evening Peak Hour			

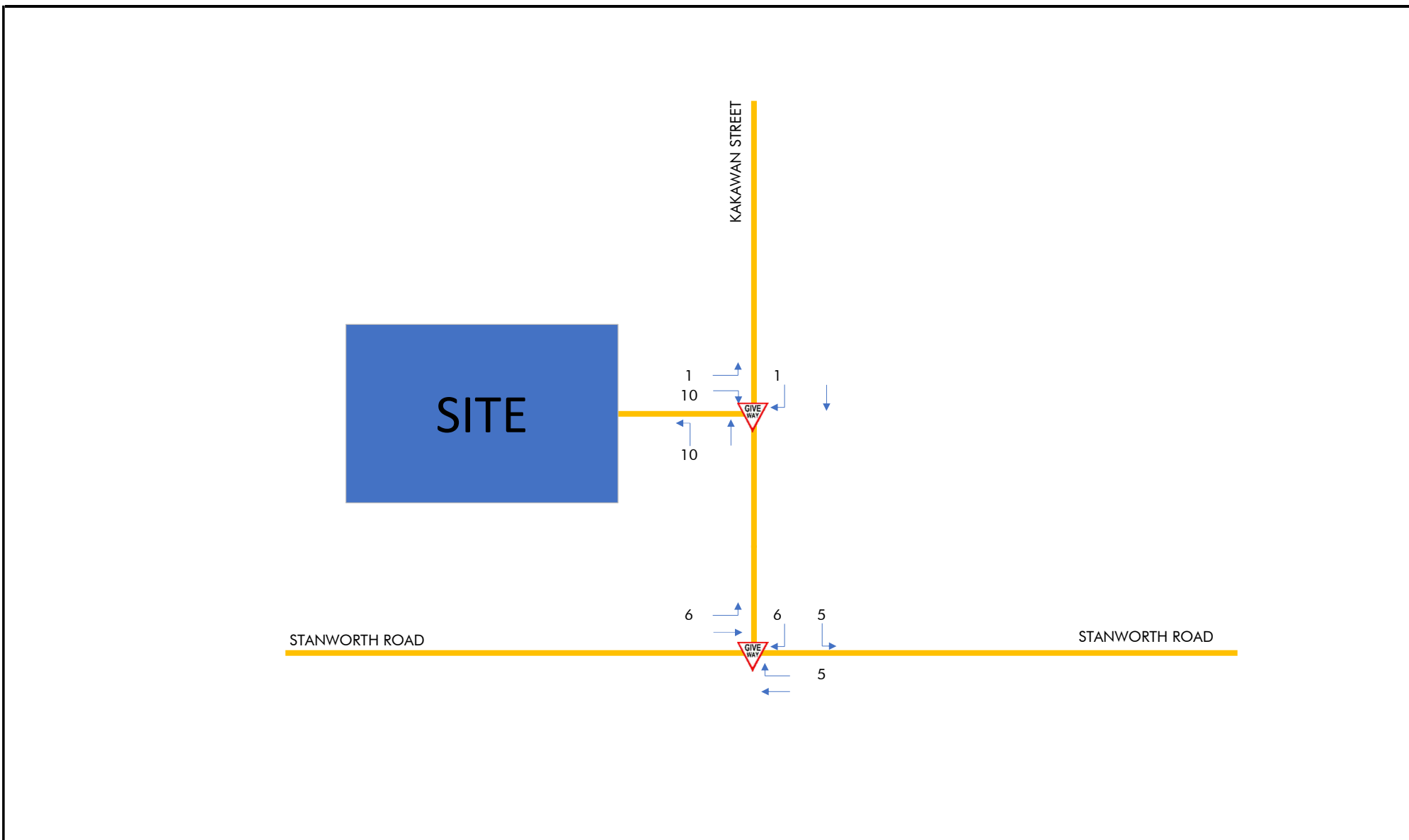


 PTT TRAFFIC & TRANSPORT ENGINEERING ABN 96 067 593 962 P 07 3839 6771 WWW.PTT.COM.AU Level 2, 62 Astor Tce, Spring Hill QLD 4000	Client Duncan-Ross Health		Project 29 Kakawan Street, Boondall	
	Date 26/06/2023	Figure Figure 5		Job No. 23-483
	2035 Pre-Development Morning Peak Hour			





Client		Duncan-Ross Health		Project		29 Kakawan Street, Boondall					
Date		26/06/2023		Figure		Figure 8		Job No.		23-483	
Development Traffic Distribution - Evening Peak Hour											



 PTT TRAFFIC & TRANSPORT ENGINEERING ABN 96 067 593 962 P 07 3839 6771 WWW.PTT.COM.AU Level 2, 62 Astor Tce, Spring Hill QLD 4000	Client	Duncan-Ross Health	Project	29 Kakawan Street, Boondall
	Date	26/06/2023	Figure	Figure 9
	Job No.	23-483	Development Traffic Generation - Morning Peak Hour	



Client	Duncan-Ross Health	Project	29 Kakawan Street, Boondall
Date	26/06/2023	Figure	Figure 11
		Job No.	23-483
2025 Post-Development Morning Peak Hour			

