Traffic Engineering

14 Highfields Circuit, Port Macquarie – Proposed Medical Centre

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Revision Record

No.	Author	Reviewed/Approved	Description	Date
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4.				
5.				

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1 Introduction

1.1 Background

TTM Consulting has been engaged to prepare a traffic engineering report investigating a proposed medical centre at 14 Highfields Circuit, Port Macquarie. It is understood that a Development Application will be lodged with Port Macquarie Hastings Council (PMHC).

1.2 Scope

This report investigates the transport aspects associated with the proposed development. The scope of the transport aspects investigated includes:

- Parking supply required to cater for development demand
- Parking layout to provide efficient and safe internal manoeuvring
- Identification of likely traffic volumes and traffic distribution from the future development
- Identification of likely traffic impact of development on the public road network
- Access configuration to provide efficient and safe manoeuvring between the site and the public road network
- Suitability of access and internal facilities to provide for pedestrian and cyclist operation
- Access to suitable level of public transport

To assess the proposed transport arrangements, the development plans have been assessed against the following guidelines and planning documents:

- Port Macquarie-Hastings Development Control Plan 2013, specifically:
  - Part 2.5 - Transport, Traffic Management, Access and Car Parking
- Australian Standard AS2890 series

1.3 Site Location

The site is located at 14 Highfields Circuit, Port Macquarie, as shown in Figure 1.1. The property description is Lot 15 on DP262236. The site has road frontages to Highfields Circuit only, and the site is currently occupied by a single dwelling.

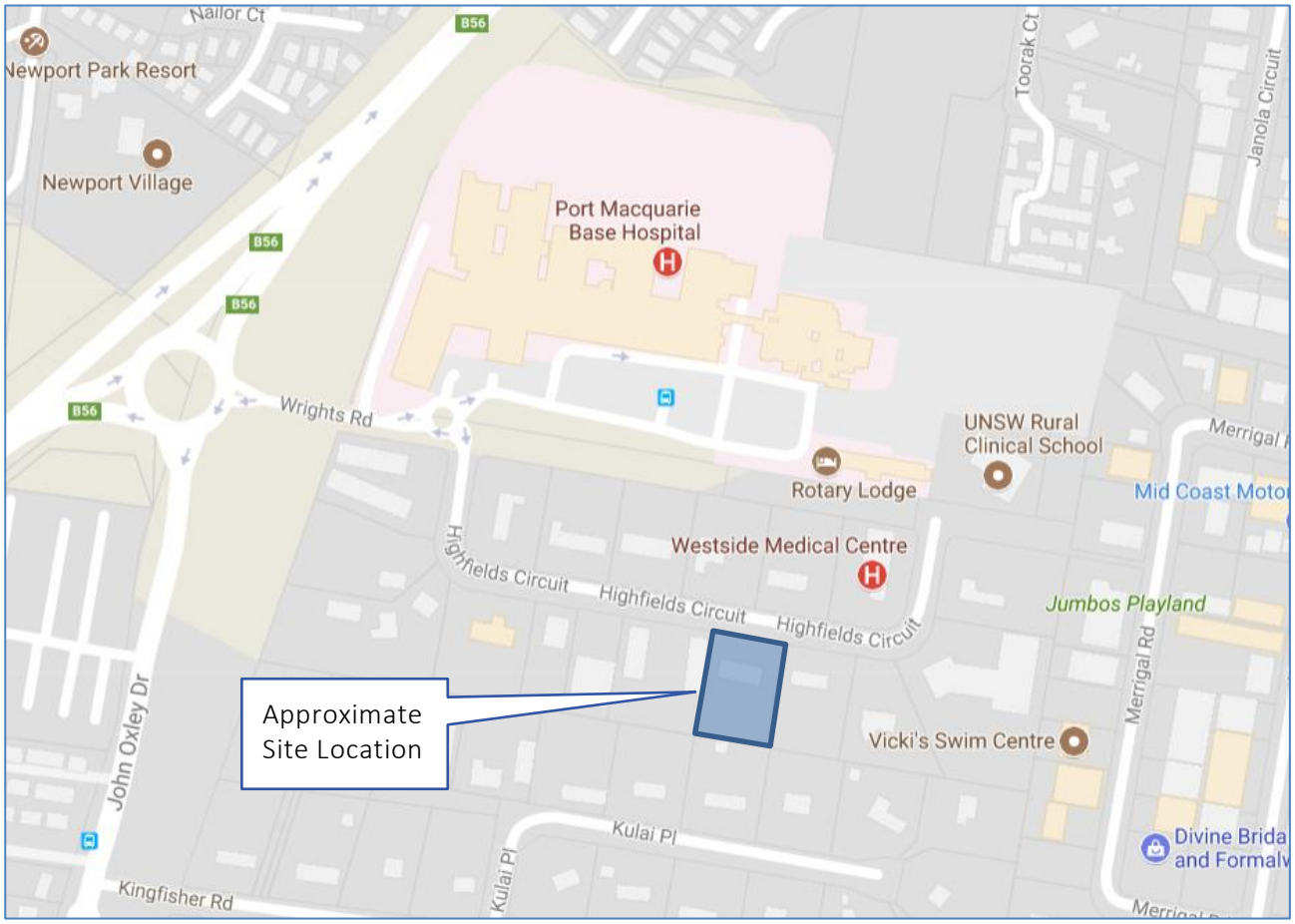

Figure 1.1: Site Location

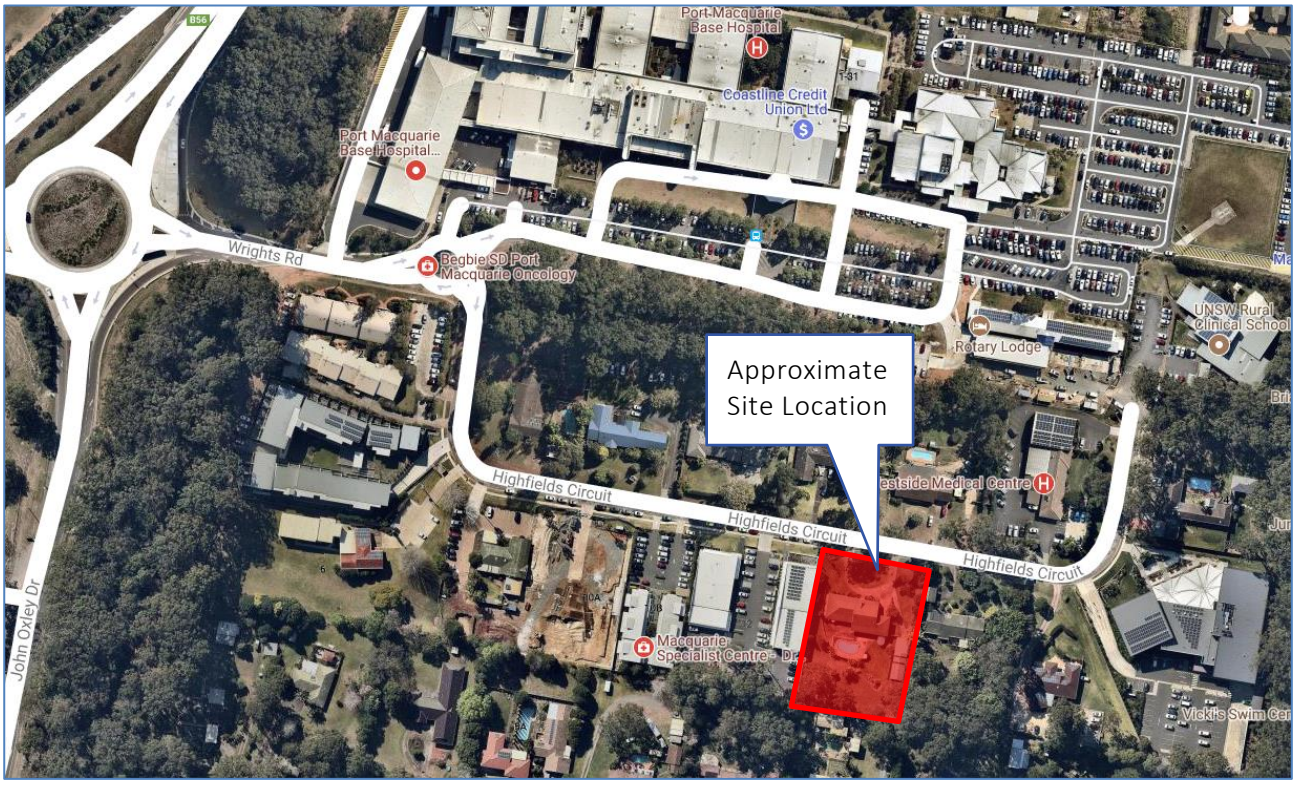

Figure 1.2: Site Area

1.4 Development Profile

The proposed land use for this development is summarised in Table 1.1.

Table 1.1: Proposed Land Uses

Use	Area
Medical Centre – Radiology and imagery practice	1,085m^2

1.5 Access

The development plan includes the following access arrangements:

- Highfields Circuit access located at the northern side of the subject site. The characteristics of this access include:
  - 6.5m wide, combined drive way access
  - Priority control with all turns permitted, however movements generally be limited to right in / left out due to road geometry

1.6 Parking

The development proposal includes the following parking supply:

- 53 general spaces (including three PWD spaces), which are located on-grade across the site.
- 1 ambulance bay, located at the north-west corner of the site.

2 Existing Transport Infrastructure

2.1 The Road Network

The majority of roads in the immediate vicinity of the site are administered by Council, the exception being the Oxley Highway. The hierarchy and characteristics of roads in the immediate vicinity of the site are shown below in Table 2.1.

Table 2.1: Local Road Hierarchy

Road	Speed Limit	Lanes	Classification	Road Authority
Oxley Highway	100kph	4 (divided)	State Road	RMS
Highfields Circuit	50kph	2 (undivided)	Local Road	PMHC
Wrights Road	50kph	2 – 4 (divided)	Local Road	PMHC

Highfields Circuit has a 7.5m wide carriageway at the site frontage. The intersection of Wrights Road and Oxley Highway is roundabout controlled.

2.2 Road Planning

The pre-lodgement minutes issued by Council identify that a concrete footpath will be required along the public road for the full frontage of the development site. The construction of the footpath is to comply with Council's standard drawing ASD-100.

No further works have been identified.

2.3 Public Transport and Pedestrian Facilities

Buses

Bus routes 325, 328, 335 and 335W operate between Port Macquarie and the Base Hospital (Wrights Road).

The 325 runs between 7:00am and 11pm, with services running hourly. The 328 runs every two to three hours between 9am and 4pm. The 335 and 335W run hourly between 7am and 5pm.

Pedestrians

Formal pedestrian footpaths are located on the southern side of Highfields Circuit. There are no formal pedestrian crossings provided within the immediate vicinity of the site.

3 Car Parking Arrangements

3.1 Council Parking Supply Requirement

Table 3.1 below identifies the required car parking provisions. The parking standards are based on rates set out in the Port Macquarie Hastings Development Control Plan (DCP).

It is understood that the staffing requirements for the development are as follows:

- 1.5 doctors (FTE)
- 12 technical staff (FTE)
- 7 admin (FTE)

The DCP provides does not define those employees who are classed as consultants vs those who are employees. Whilst a standard medical centre would have a clear definition between consultant (doctor) and employee (administration), the proposed use requires that technical staff who will primarily responsible for the operation of imaging machinery may may also briefly consult with patients.

TTM contacted Council to better understand the definition of a consultant and employee and how this would be applied to the proposed scheme. TTM were advised that:

- The consultant is someone who directly consults with patients
- If a technician does not consult the patient, but simply operates the equipment then they could be considered a staff member for the purpose of traffic calculations.

Despite this advice from Council, the parking assessment has been based upon the conservative assumption that all technical staff and doctors be classed as consultants and all admin be classed as employees.

Table 3.1: Parking Supply Requirement

Land-Use	No./GFA	Rate	Standard	Provision
Health Services Facilities – Medical Centers	13.5 consultants 7 employees	3 spaces per consultant 1 space per two employees	40 spaces 4 spaces	53 spaces
Total			**44 spaces**	**53 spaces**

The above parking supply is to include PWD parking in communal parking areas. The general BCA requirement for a Class 9a (d) development is a minimum of 1 space per 50 spaces. Based upon a total of 53 spaces being provide, two PWD parking spaces are required. The development is to provide three PWD spaces, therefore satisfying BCA requirements.

3.2 Estimated Practical Parking Demands

As shown on the plans included in Appendix A, a total of 53 parking spaces is to be provided across the site. In terms of car parking allocation, it is intended that four spaces will be assigned to employees, whilst the remaining 49 spaces will be allocated as visitor spaces.

Overall, the proposed parking provisions exceed the minimum Council requirements and are considered suitable for the development site.

3.3 Car Park Layout

Table 3.2 identifies the characteristics of the proposed parking area with respect to the Council requirements. The last column identifies the compliance of each design aspect. Where compliance with Council is not achieved, further information is provided below

Table 3.2: Parking Design Requirements

Design Aspect	Minimum AS2890.1/6 Standard	Proposed Provision	Compliance
Parking space length: – Standard bay – Parallel bay*	 5.4m 7.8m	 5.4m 7.8m	 Compliant Compliant
Parking space width: – Staff – Visitor – Parallel bay* – PWD bay	 2.4m 2.6m 3.2m 2.4m + 2.4m loading bay	 2.6m 2.6m 3.2m 2.4m + 2.4m loading bay	 Compliant Compliant Compliant Compliant
Aisle Width: – Parking aisle – Access to parallel bays	 5.8m 3.6m	 5.8m (min) 5.8m	 Compliant Compliant
Maximum Gradient: – PWD parking – Parking aisle	 1:40 (2.5%) 1:16 (6.25%)	 Flat Flat	 Compliant Compliant
Parking Aisle Extension	1m beyond last bay	1m beyond last bay	Compliant

* Parallel bays are to allocated as PWD spaces and have been designed in accordance with Figure 2.4 of AS2890.6.

The proposed carpark layout complies with all Council requirements, and therefore no further assessment is required.

4 Existing Traffic Volumes

4.1 Peak Hour

TTM Data conducted an intersection movement survey at the Wright Road / John Oxley Highway roundabout, from 7:30 to 9:30am and 3:30 to 5:30pm on Thursday 26th October, 2017. The peak hours were found to be 7:15 to 8:15am and 3:30 to 4:30pm. The results of the survey are shown below in Figure 4.1.

The survey results indicate that the AM / PM peak hour traffic volumes on Wrights Road leading to the subject site are in the order of 400vph / 200vph.

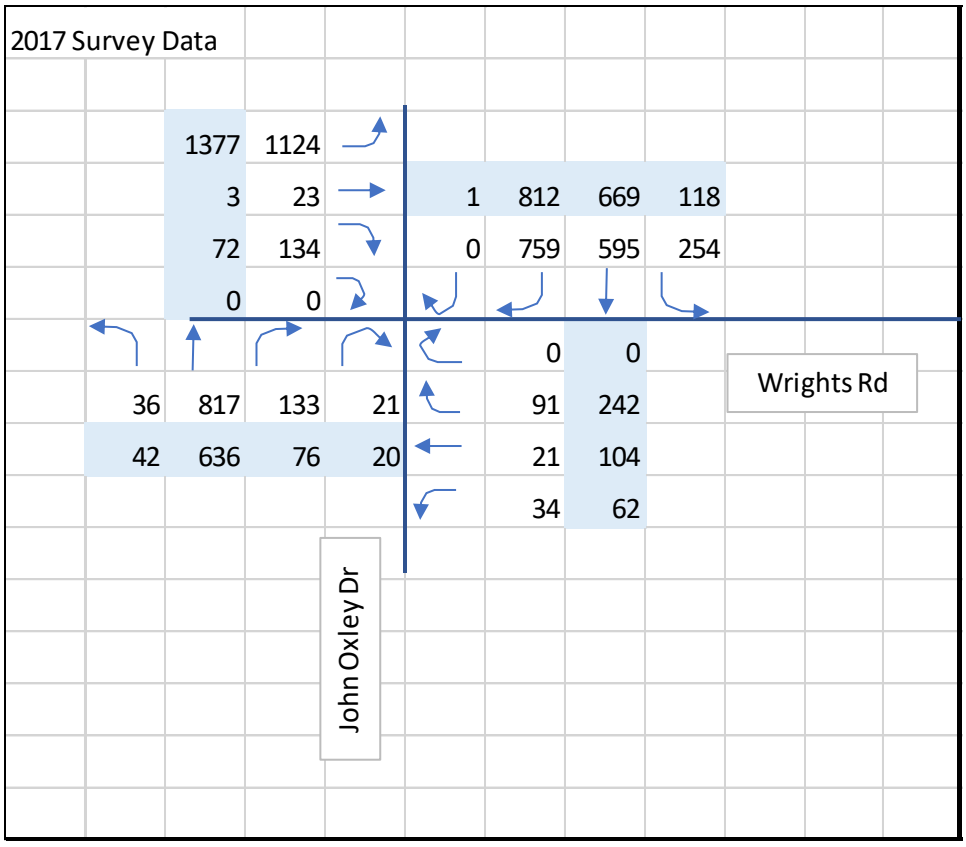

Figure 4.1: Surveyed Peak Hour Traffic Volumes 2017

5 Estimated Future Transport Demands

5.1 Development Scenarios

For the purpose of assessing the future traffic demands TTM has adopted an annual growth rate of 2%. This is based upon the expected development of the area, and the limited opportunity for significant growth.

TTM has identified three assessment periods for the road network as follows:

Current Traffic Scenario

This scenario includes the 2017 traffic volumes modelled over the existing road network. This analysis has been performed for both the AM and PM Peaks.

Opening Year (2019) Traffic Scenario

This analysis incorporates a 2% per annum increase in the background traffic volume for a period of two years from the most recent survey. For the base and development case scenario, the existing road network has been analysed.

Future Year (2029) Traffic Scenario

This analysis incorporates a 2% per annum increase in the background traffic volume for a period of 12 years (i.e. 10 years past opening year).

5.2 Estimated Development Traffic Generation

5.2.1 Existing Development Traffic

The current use on the site generates 10 vehicles per day and 1 vehicle per hour in the peaks. Once the existing use is removed these trips will no longer occur and have therefore been deducted from future development generation.

5.2.2 Proposed Development Traffic Volume

Peak traffic generation rates have been based on recommended specific generation rates for different development types provided in the RTA's 'Guide to Traffic Generating Developments' generation rate for a medical centre. As per Section 3.6.1 of the guidelines, the expected generation rate for a medical centre can be taken from the model for a shopping centre. This model is broken down into five specific components – slow trade, faster trade, super market, specialty shops and office / medical, and gives a peak hour generation rate (vehicle trips per 1000m^2) for each component. The individual components are then added together for the final generation rate of the shopping centre. In this instance, only the office/ medical portion of the model is applicable, and has been used as the basis for the peak hour generation of the proposed development. Given that the model is based upon survey data, the methodology for assessing the generation is considered suitable.

Weekday Evening Peak

Peak hour traffic generation for a medical centre = 22 vph / 1000m^2 GFA = 24vph (in+out)

5.3 Estimated Development Traffic Distribution

The distribution of development generation traffic is based on the following:

- Medical Centre
  - 70% of development traffic is inbound in the AM Peak, with the remaining 30% outbound
  - 30% of development traffic is inbound in the PM Peak, with the remaining 70% outbound

The remaining traffic movements are based on corresponding movements in the survey data.

The expected traffic distribution will result in local traffic movements generated by the proposed development as shown in Figure 5.1.

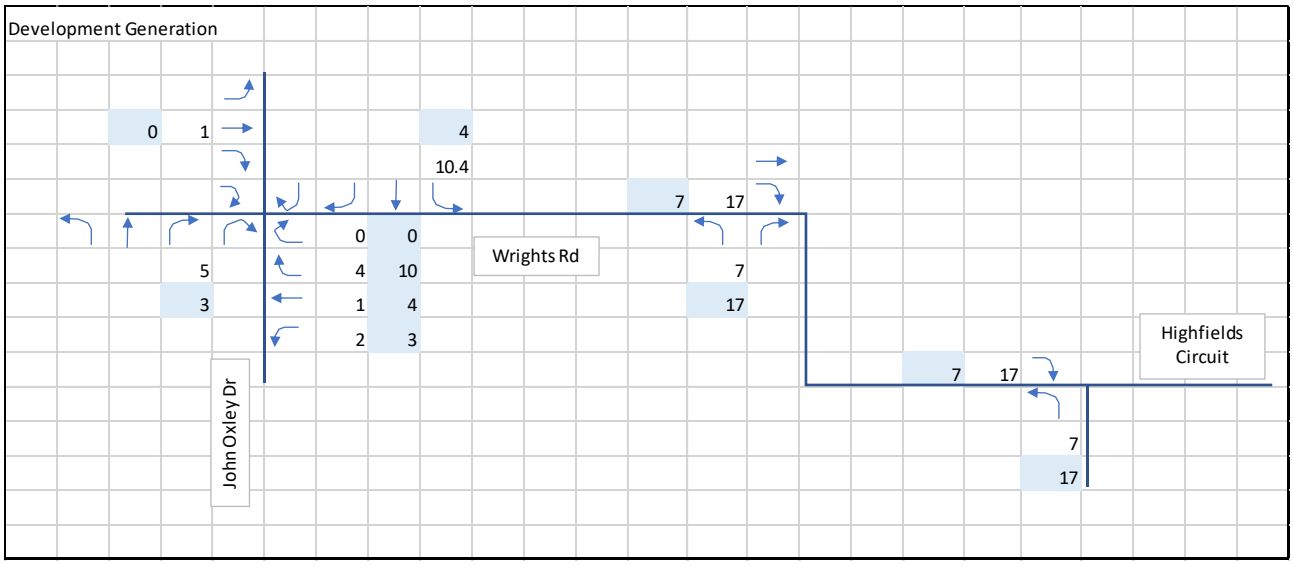

Figure 5.1: Expected Local Traffic Movements

5.4 Opening Day (2019) Base Traffic Demands

Figure 5.2 shows the opening day (2019) base traffic demands, based on an application of an annual growth rate of 1.5% for a period of 2 years to the 2017 traffic survey volumes.

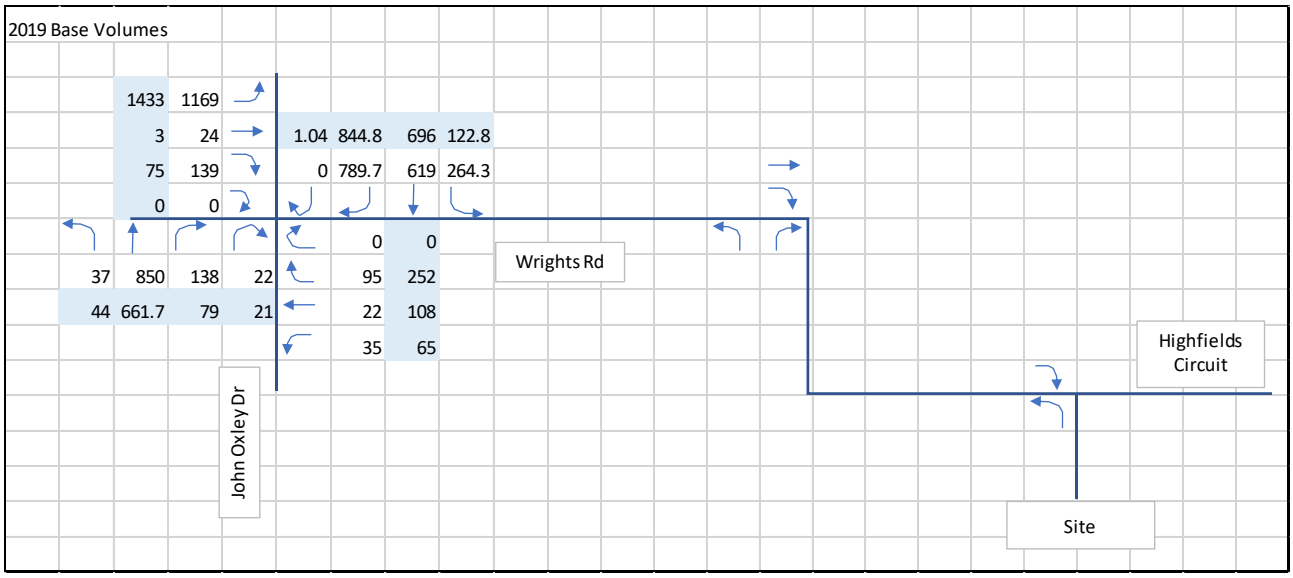

Figure 5.2: Estimated 2019 Peak Hour Traffic, Without Development (2%pa growth)

5.5 Opening Day (2019) Project Traffic Demands

The opening day project case scenario is obtained by the addition of development traffic generation shown in Figure 5.1 to the base traffic volumes shown in Figure 5.2. These expected traffic movements are shown in Figure 5.3.

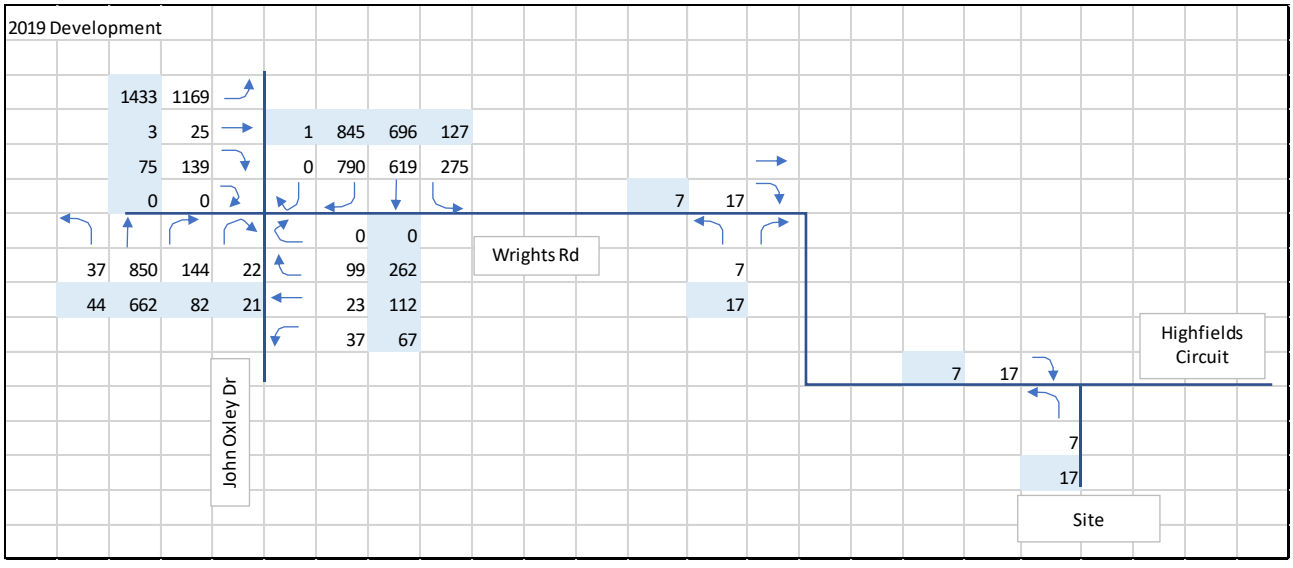

Figure 5.3: Estimated 2019 Peak Hour Traffic, With Development

5.6 Future (2029) Base Traffic Demands

Figure 5.4 shows the future (2029) base traffic demands, based on an application of an annual growth rate of 1.5% for a period of 12 years to the 2017 traffic volumes.

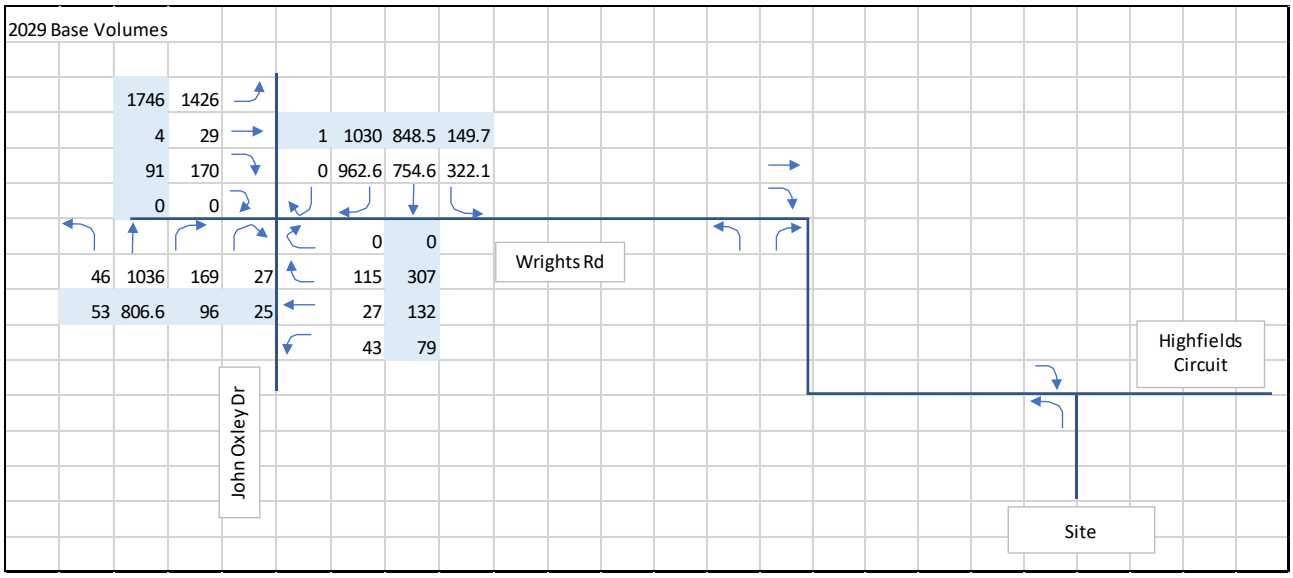

Figure 5.4: Estimated 2029 Peak Hour Traffic, Without Development (2%pa growth)

5.7 Future (2029) Project Traffic Demands

The future project case scenario is obtained by the addition of development traffic generation shown in Figure 5.1 to the base traffic volumes shown in Figure 5.4. These expected traffic movements are shown in Figure 5.5.

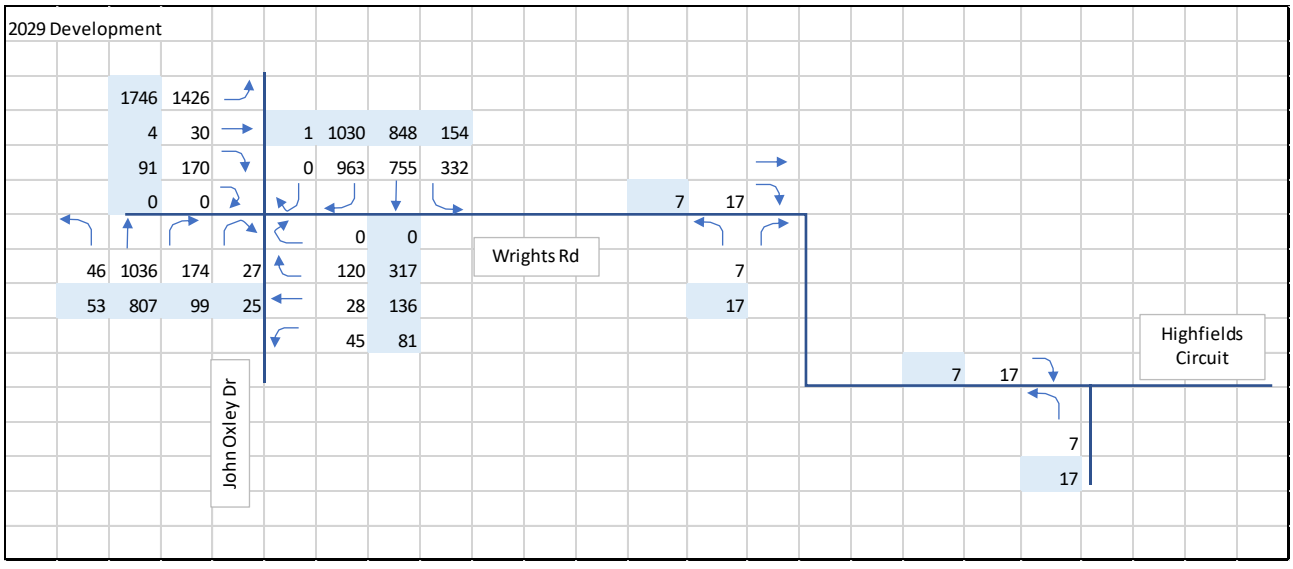

Figure 5.5: Estimated 2029 Peak Hour Traffic, With Development

6 Road Network Performance

6.1 Analysis of Wright Road / Oxley Highway Intersection

TTM has assessed the performance of these intersections utilising SIDRA analysis software (Version 6.1). For the intersection TTM has assessed all of the development scenarios up to 2019.

The SIDRA layout identified for this intersection is shown in Table 6.1 6.1. This layout is generally based on the existing intersection configuration. Note that due to the complexity of the intersection, the SIDRA layout will vary slightly for the western approach. This is due to the limits of SIDRA and the inability to input a terminating lane mid intersection.

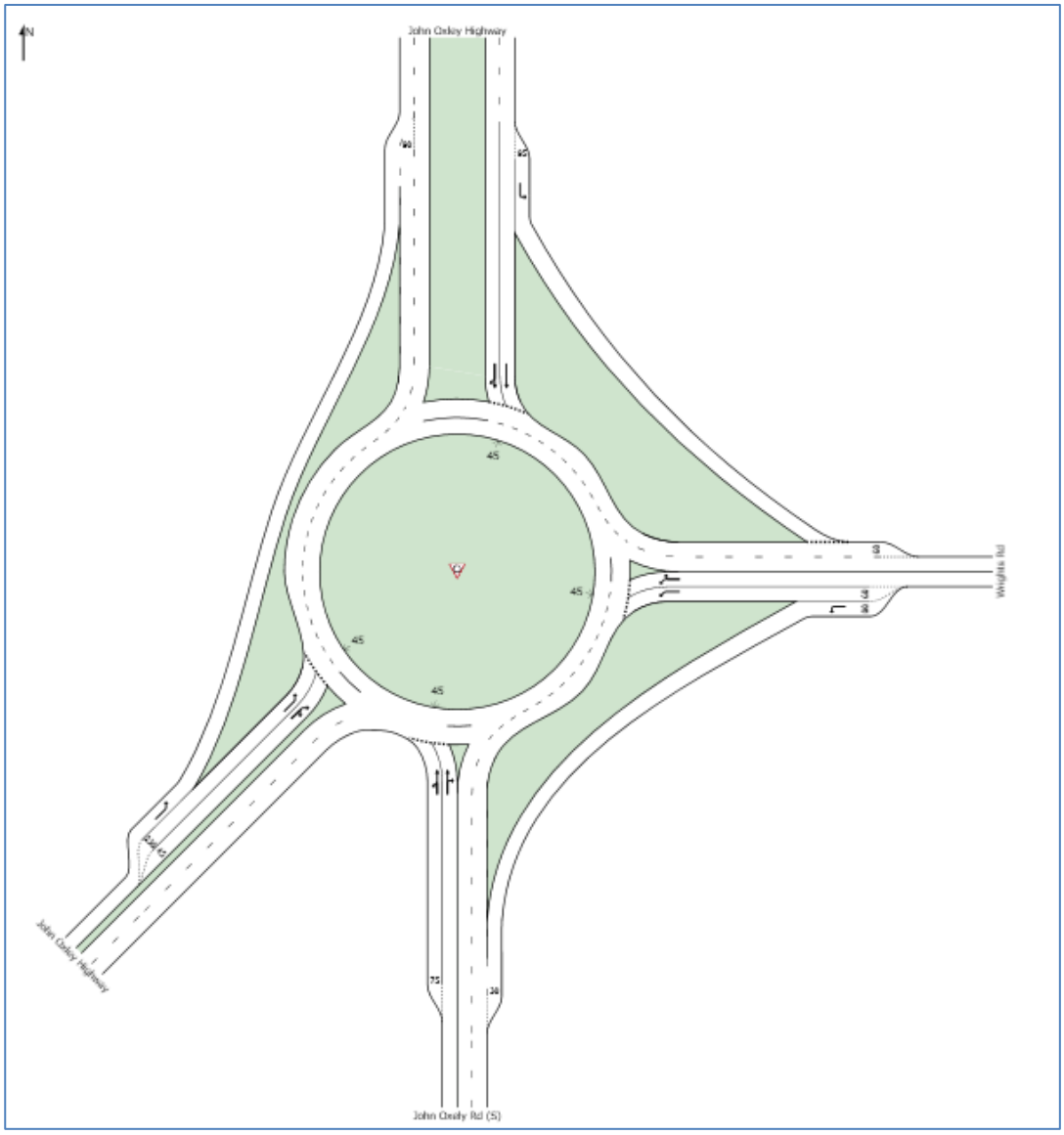

Figure 6.1: Existing Wrights Road / John Oxley Highway Intersection Layout

6.2 Analysis Results

Table 6.1 gives a summary of the outputs for the various traffic cases applied to the intersection. The detailed outputs for this analysis are provided in Appendix C.

Table 6.1: Summary of Sidra Outputs (Wrights Road / John Oxley Highway Intersection Intersection)

Case	Degree of Saturation	Average Delay	Level of Service	95th Percentile Critical Queue (m)			
				South	East	North	West
AM Current Case 2017	71.2%	7.3	A	61.4	4.4	23.8	20.7
AM Base Case 2019	77.2%	8.0	A	76.7	4.9	25.8	23.8
AM Project Case 2019	78.2%	8.2	A	79.8	5.2	26.1	24.3
AM Base Case 2029	120.8%	43.5	D	794.7	9.2	37.6	37.3
AM Project Case 2029	122%	45.5	D	828.5	9.8	37.9	37.4
PM Current Case 2017	59.5%	7.1	A	40.8	11.3	23.9	34.7
PM Base Case 2019	64.8%	7.6	A	49.5	12.6	25.8	40.9
PM Project Case 2019	65.8%	7.8	A	51.2	13.3	26.0	42.1
PM Base Case 2029	106.6%	25.0	C	387.3	28.1	36.9	105
PM Project Case 2029	108.7	27.1	C	427.5	30.0	37.0	105.5

6.3 Analysis Conclusions

Table 6.1 identifies that the existing roundabout has insufficient capacity to cater for future (2029) traffic increases, both with and without development traffic. This intersection will 'fail' prior to 2029 with excessive delays and queues on Oxley Highway (south) without development traffic.

Given the intersection is above capacity during both the base and project cases, TTM have undertaken an indicative assessment of a signalised intersection at this location. Note that given the intersection is above capacity during the base case, works to upgrade this intersection are associated with general growth in the local traffic catchment, and not specifically this development. As such, the future configuration of this intersection should be considered as part Councils future road planning, rather than attributed to a single site.

7 Site Access Arrangements

The development is to be accessed via Highfields Circuit. The access driveway requirements are specified in Table 7.1.

Table 7.1: Typical Driveway Requirements for the Highfields Circuit Access

Design Aspect	AS2890.1 / AS2890.2 Requirement	Proposed Provision	Compliance
Sight Distance - 50kph	Desirable – 69m Minimum - 45m	110m	Compliant
Design Type / Width	Cars: 6m to 9m, combined Service Vehicles: 6m / 9m, combined	6.5m wide, combined	Compliant Further explanation provided
Minimum Queuing Provisions	2 cars (12m)	4m	Performance Solution
Gradient at Site Boundary	1:20 for first 6m	1:20 (max)	Compliant

The proposed access arrangements generally complies with Council requirements, however the following items are resolved with performance solutions.

Driveway Width

The development is to provide a 6.5m wide driveway crossover, which satisfies the requirements for cars to access the site. The proposed development is to allow for ambulance access to the site. AS2890.1 does not specify a crossover width for this type of vehicle. The 6m/ 9m requirement detailed in Table 7.1 is based upon AS2890.1 requirements for a SRV and MRV respectively. A typical ambulance is slightly longer than an SRV, and therefore TTM have undertaken a swept path analysis to demonstrate that the proposed crossover width will allow for ambulance access. TTM Drawing 17SYT0138-01, demonstrates ambulance access to/from the site.

Queuing Provisions

The net peak hour traffic flow for this driveway is expected to be in the order of 24 vph. Assuming a directional split of up to 70% inbound traffic (which will occur in the AM peak, when most employees are entering the site) this equates to a peak access inflow of 17vph. The probability of more than 1 vehicle entering the site simultaneously (or say within a 30 second period) and queuing on the access driveway for this flow of traffic is less than 1%. This is based on the 'Poisson Distribution' equation for queuing theory, as outlined in the 'Austroads Guide to Traffic Management Part2: Traffic Theory'.

It is also noted that the first point of conflict within the site is the internal intersection where the one-way aisle connects to the main aisle. At this location, vehicles exiting the one-way section will be required to give way to all traffic entering and travelling along the entrance aisle. As priority is given to vehicles entering the site, this is not expected to result in any additional traffic accessing the site. Therefore, a reduced queueing provision is considered suitable for the development site.

8 Service Vehicle Arrangements

The Council DCP does not specify a service vehicle requirement for a medical centre, and therefore the proposed service vehicle arrangements have been based upon the expected practical demands of the site.

In this instance, TTM consider it suitable that the layout of the site accommodates an Ambulance as the regular access vehicle and a refuse collection vehicle (RCV) as the occasional access vehicle.

8.1 Council Requirements

In terms of loading bay requirements, the DCP identifies the following:

- Off street commercial vehicles facilities are provided in accordance with AS/NZS 2890.2 - Parking facilities - Off-street commercial vehicle facilities.
- Loading bays will be provided in accordance with the following requirements;
  - Minimum dimensions to be 3.5m wide x 6m long (this may increase according to the size and type of vehicle).
  - Vertical clearance shall be a minimum of 5m.
  - Adequate provision shall be made on-site for the loading, unloading and manoeuvring of delivery vehicles in an area separate from any customer car parking area.
  - Loading areas shall be designed to accommodate appropriate turning paths for the maximum design vehicle using the site.
  - Vehicles are to be capable of manoeuvring in and out of docks without causing conflict with other street or on-site traffic.
  - Vehicles are to stand wholly within the site during such operations.
- The location and design of loading bays should integrate into the overall design of the building and car parking areas.

8.2 Proposed Service Vehicle Provisions

8.2.1 Regular Access – Ambulance

The development is to provide an allocated ambulance bay at the north-west corner of site. The bay is located adjacent to the 'hot waiting' area and therefore allows for expedient and private patient movement.

The proposed ambulance bay is to be 10m long x 3.2m wide with an unrestricted height clearance. The typical dimensions for an ambulance are 6.3m long x 2.7m wide with an overall body height of 2.5m. As such, the proposed loading bay dimensions will accommodate an ambulance.

In terms of on-site manoeuvring, the ambulance will enter the site and continue through the site utilising the one-way aisle. The ambulance will then reverse into the loading bay. Once patient movement is complete, the truck will then exit the site in forward gear. For reference, the ambulance manoeuvre is shown in TTM Drawing 17SYT0138-01.

8.2.2 Occasional Access – Refuse Collection

The bin store area is located at the eastern boundary, adjacent to the site entrance. To service the site, it is intended that an RCV will enter the site in forward gear, load directly adjacent the bins, turnaround and exit the site in forward gear.

As the development is non-residential, waste collection will be undertaken by a private waste contractor and is to occur outside of hours. Due to this, the truck can utilise vacant parking spaces in order to perform the on-site turnaround.

Given the size of the medical centre, it is expected that waste will be collected every two days.

TTM Drawing 17SYT0138-03 demonstrates the on-site manoeuvring for a 9.24m, rear load RCV.

8.2.3 Occasional Access – Deliveries

Deliveries will occur outside of patient consultation hours, and therefore vehicles can stand within the parking aisle for loading and unloading. Given that the demand for deliveries will typically be for the office use, a small rigid vehicle (SRV) is considered suitable.

Similar to the RCV, an SRV will enter the site in forward gear, load/unload within the aisle and then exit the site in forward gear. As deliveries occur outside of consultation hours, the loading within the aisle will have no impact on the functionality of the car park.

TTM Drawing 17SYT0138-02 demonstrates the on-site manoeuvring for an SRV.

9 Active Transport

9.1 Public Transport and Pedestrian Access

Access to public transport from the site is considered suitable due to the presence of multiple bus routes which service the Base Hospital. From the hospital, it is a short walk to the development site.

TTM consider the high-availability of public transportation provisions in the vicinity of the site will satisfy the site's requirements for such facilities.

Pedestrian access to the site is considered to be acceptable with pedestrian access points available along the site frontage. The construction of a pedestrian path within the verge will be conditioned as part of this approval.

10 Summary and Conclusions

10.1 Development Access

The development provides a combined 6.5m wide, crossover onto Highfields Circuit. The design and location of the driveway crossover is generally compliant with AS2890.1 / AS2890.2 standards, however the following aspects are provided with alternate solutions;

- Driveway width; and
- Queuing provisions

Overall, the proposed access arrangements are considered suitable for the development.

10.2 Car Parking Arrangements

As shown on the plans included in Appendix A, a total of 53 parking spaces is to be provided across the site. In terms of car parking allocation, it is intended that four spaces will be assigned to employees, whilst the remaining 49 spaces will be allocated as visitor spaces.

Overall, the proposed parking provisions exceed the minimum Council requirements and are considered suitable for the development site.

10.3 Impact on Surrounding Road Network

Assessment of the proposed development indicates that the development will not have a significant impact on the future road network. Whilst the intersection is shown to 'fail' in the future year, this is due to general traffic growth along the network and can therefore not be attributed to a single development site. On this basis, no further impact assessment is considered necessary.

10.4 Service Vehicle Arrangements

The development provides a 10m long x 3.2m wide dedicated ambulance bay. Refuse vehicles will reverse from Highfields Circuit and stand within the aisle. Overall, the proposed service vehicle arrangements are considered adequate to meet the needs of the proposed development.

10.5 Active Transport Facilities

The current public transport infrastructure and proposed site provisions for pedestrian facilities are considered adequate for the development.

10.6 Conclusion

Based on the assessment contained within this report, TTM see no traffic engineering reason why the relevant approvals should not be granted.

Appendix A Proposed Site Plan

EXISTING PROFILED METAL SHEET FENCING ALONG WESTERN BOUNDARY RETAINED

NEW/ADDITIONAL PROFILED METAL SHEET FENCING ALONG SOUTHERN BOUNDARY AT 1.8m HIGH

NEW/ADDITIONAL PROFILED METAL SHEET FENCING ALONG EASTERN BOUNDARY AT 1.8m HIGH ON STEPPED RETAINING WALL

MRI EQUIP 8.5 SQ.M
STORE
MRI 29.5 SQ.M
24.3 SQ.M
CT EQUIP
36.5 SQ.M
CT CONTROL 6.2 SQ.M
GENERAL X-RAY SCREENING 33 SQ.M
X-RAY CONROL
ACC. CH/WC 4 SQ.M
CH
PR
STORE 5.9 SQ.M
TYPING 7.7 SQ.M
DR X-RAY 30 SQ.M
ADMIN 29.3 SQ.M
RECEPTION 21 SQ.M
ACC. W.C.
AMB. M W.C.
AMB. F W.C.
AIR LOCK
STATE MANAGER 12.2 SQ.M
REPORTING 9.5 SQ.M
AREA MANAGER 10.9 SQ.M
OFFICE 3 7.8 SQ.M
STORE 6.5 SQ.M
SPECT 2 33 SQ.M
PRACTICE MANAGEMENT OFFICE 8.7 SQ.M
CONTROL 13.3 SQ.M
DB
TEA
SPECT 1 33.1 SQ.M
PET 39.8 SQ.M
UPTAKE 1 7 SQ.M
UPTAKE 2 7 SQ.M
UPTAKE 3 7 SQ.M
UPTAKE 4 7.8 SQ.M
4500
AUTO DOOR
1600
1800
CANNULATION
CH
AMB. W.C.
REPORTING 12.4 SQ.M
MAMMOGRAPHY 16.3 SQ.M
INTERVENTIONAL ULTRASOUND 4 16.4 SQ.M
ULTRASOUND 1 11.6 SQ.M
PATIENT HOLDING BAY 8.4 SQ.M
OPG 8.2 SQ.M
ELEC
COLLECTION 7.7 SQ.M
WAITING
ENTRY
ULTRASOUND 3 11.8 SQ.M
ULTRASOUND 2 11.6 SQ.M
EQUIP
OFFICE/FUTURE U/SOUND 11.9 SQ.M
COLLECTION 9.1 SQ.M
CUPBOARD
HOT WATER PLANT ROOM
STORE 6.3 SQ.M
STAFF W.C
CONFERENCE 20.8 SQ.M
STORE 5.9 SQ.M
STAFF ROOM 37.7 SQ.M
ACC. W.C. STAFF
COMMS 8.2 SQ.M
CONSULTING 1 14.7 SQ.M
DEXA 15.9 SQ.M
STRESS TESTING 16.8 SQ.M
HOT LAB 12 SQ.M
STORE
ACC. W.C. STAFF EMERGENCY SHOWER
NUCMED HOT WAIT 14.3 SQ.M
AMB. HOT WAIT W.C.
PET HOT WAIT
10.4 SQ.M
MAIN SWITCH ROOM

PROPOSED IMAGING CENTRE CARPARK

53 CAR SPACES

REFER TO CIVIL ENGINEERING DOCUMENTATION FOR SURFACE GRADING AND STORMWATER MANAGEMENT

REFER TO LANDSCAPE ARCHITECT DOCUMENTATION FOR LANDSCAPE DESIGN PROPOSAL OF SITE

PROTECTION BOLLARS AND TSGI ADJACENT TO PRINCIPAL PEDESTRIAN ENTERANCE

UNDERCOVER AMBULANCE BAY

LINE OF AWNING OVER

LINE OF AWNING OVER
STAFF 'BREAKOUT' TERRACE
(REFER TO LANDSCAPE ARCHITECT DRAWINGS)

TURNING BAY

DFH

7800 TYP.
3200 TYP
5800
2600 TYP.
5400 TYP.
6200
1000
2000
6500

PUMP ROOMS LOCATION TO BE CONFIRMED BY SERVICES ENGINEERS
POTABLE COLD WATER PUMP SET
FIRE HYDRANT PUMP SET
5290

KIOSK SUBSTATION
WASTE / RECYCLING STORE

1 PROPOSED GF LEVEL
1 : 100

1 : 100

NOTE:

1. ROAD LEVELS FOR PROPOSED CARPARK DRIVEWAY TO BE CONFIRMED WITH CIVIL & TRAFFIC CONSULTANTS. RAMP GRADIENTS TO COMPLY WITH AS2890.1:2004.
2. ON GRADE CARPARK LEVELS TO BE CONFIRMED BY CIVIL & TRAFFIC CONSULTANTS.
3. CAR PARK LAYOUT TO COMPLY WITH AS2890.1:2004 AND AS 2890.6:2009.
4. ONSITE DETENTION TANK LOCATION TO BE CONFIRMED WITHCIVIL AND HYDRAULIC CONSULTANTS.
5. HYDRANT, SPRINKLER AND WATER PUMP LOCATIONS TO BE CONFIRMED BY HYDRAULIC CONSULTANTS.
6. FIRE HOSE REEL & FIRE HYDRANT LOCATIONS TO BE CONFIRMED BY HYRAULIC CONSULTANTS.
7. LANDSCAPING DESIGN OF SITE TO LANDSCAPE ARCHITECTS DRAWINGS AND SPECIFICATIONS

ISSUE	DATE	DESCRIPTION
DA - A	17-11-17	FOR APPROVAL
DA-PD	27-10-17	FOR INFORMATION
DA-PC	23-10-17	FOR INFORMATION
DA-PB	17-10-17	FOR INFORMATION
DA-PA	12-10-17	FOR INFORMATION

Coordinated Reference Drawings

Discipline	Company
SURVEY	
STRUCTURE	
CIVIL	
MECHANICAL	
HYDRAULIC	
ELECTRICAL	
LANDSCAPE	
FIRE	

Client

PRIMARY HEALTH
203 Pacific Hwy, St Leonards NSW 2065
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Project Manager

EPM PROJECTS
2/146 Arthur St, North Sydney NSW 2060
T: (02) 9452 8300

Architect

BN
Architecture
Urban Design
Masterplanning
Graphics
Interiors

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Crows Nest, NSW 2065
ABN 43 092 960 499

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sydney@bngrouponline.com

Project

PROJECT HORIZONS IMAGING & PATHOLOGY CENTRE
14 HIGHFIELDS CIRCUIT
PORT MACQUARIE, NSW 2444

Sheet name

PROPOSED GROUND FLOOR PLAN

Scale @ A1: As indicated
Project No.: 1747
Drawn By: IE Checked By: MF

A06 SERIES - SETOUT PLANS

Drawing No. A06.02
Stage - Rev DA - A

FOR APPROVAL
NOT FOR CONSTRUCTION

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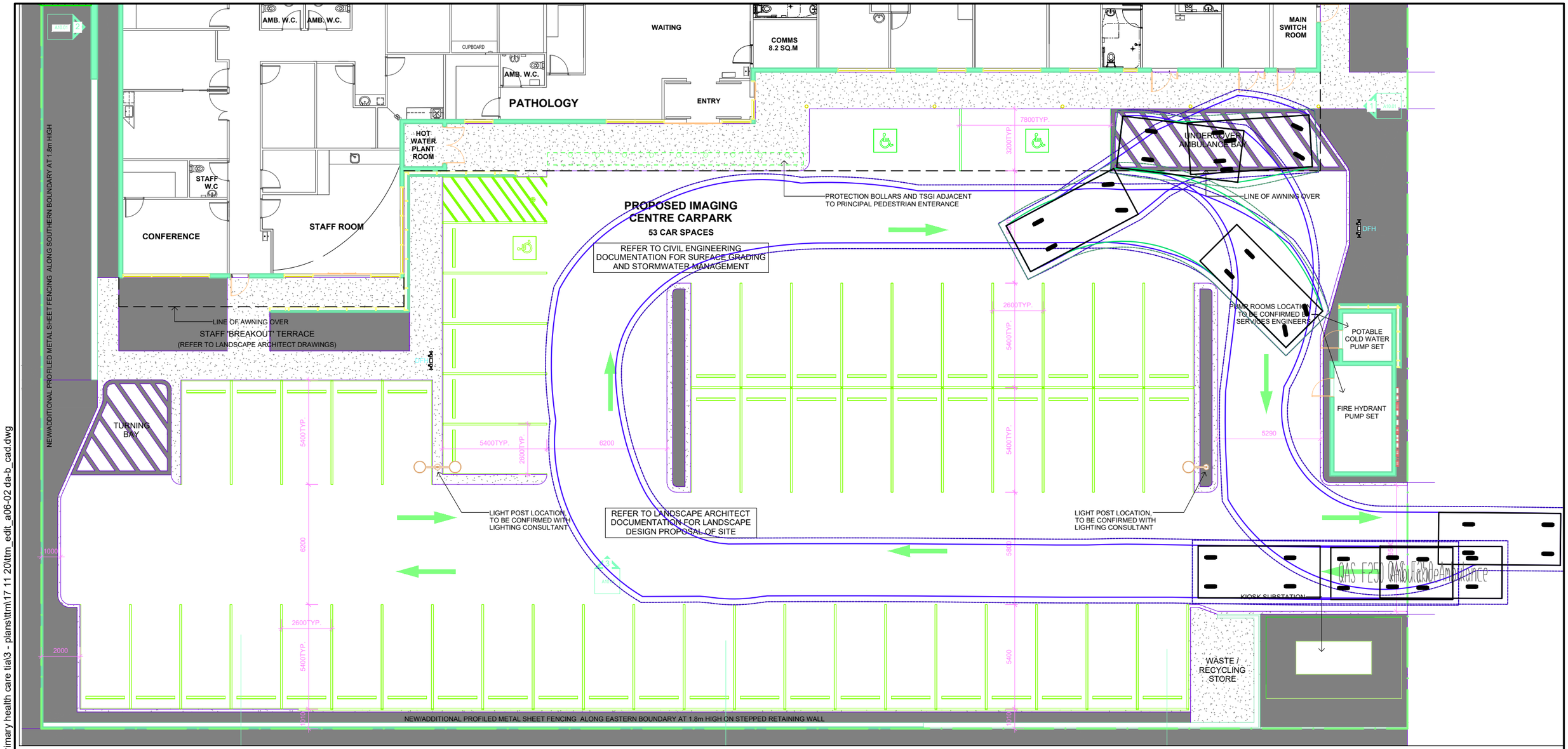
PRINTED: 17/11/2017 4:10:46 PM

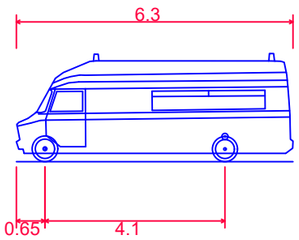
Appendix B Vehicle Swept Paths



o:\synergy\projects\17syt\17syt0138 14 highfields circuit, port macquarie - primary health care tia\3 - plans\ttm\17 11 20\ttm_edit_a06-02 da-b_cad.dwg

AMBULANCE SWEPT PATH

SCALE 1:200



QAS F250 Ambulance

Overall Length	6.300m
Overall Width	2.680m
Overall Body Height	2.461m
Min Body Ground Clearance	0.189m
Max Track Width	1.670m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	8.500m

PRELIMINARY
ADVICE ONLY
20 November 2017

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	20-11-17	ORIGINAL ISSUE	SD	JB	JB

SCALE 0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

NORTH

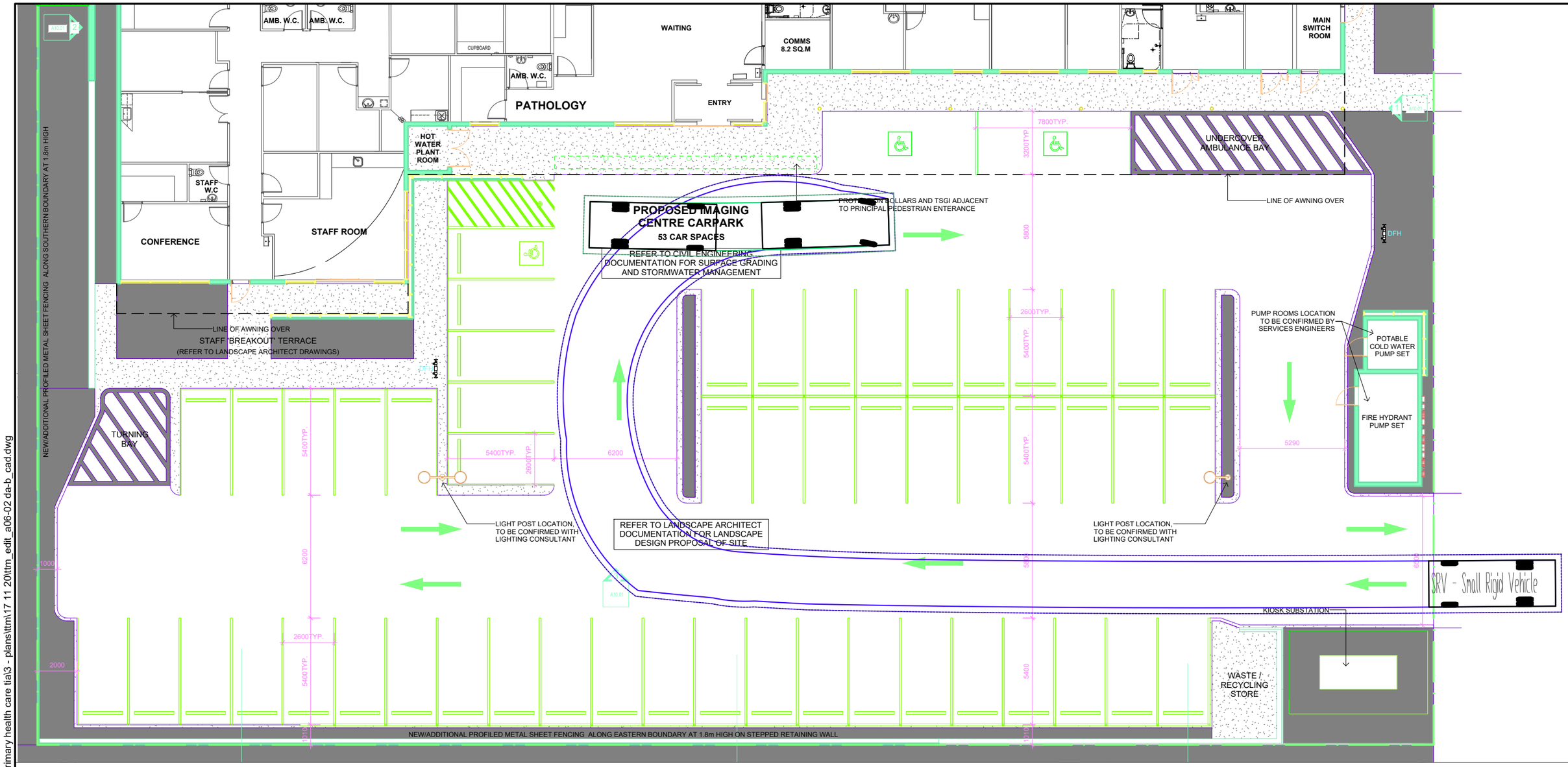
CLIENT: Idameneo (No. 789) Ltd

TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 1, 129 LOGAN ROAD, WOOLLOONGABBA, QLD, 4102
P.O. BOX 1310, COORPAROO BC, QLD, 4151
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT: **14 Highfields Circuit, Port Macquarie - Primary Health Care TIA**

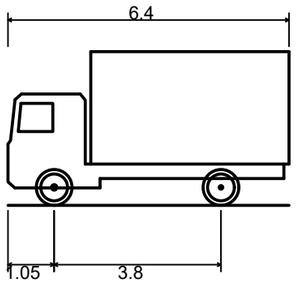
DRAWING TITLE: **SWEPT PATH ANALYSIS**
DESIGN VEHICLE F250 AMBULANCE

PROJECT NUMBER: 17SYT0138	ORIGINAL SIZE: A3
DRAWING NUMBER: 17SYT0138-01	REVISION: A
DATE: 20 Nov 2017	SHEET: 1 OF 1



SMALL RIGID VEHICLE SWEPT PATH

SCALE 1:200



SRV - Small Rigid Vehicle

Overall Length	6.400m
Overall Width	2.330m
Overall Body Height	3.500m
Min Body Ground Clearance	0.398m
Track Width	2.330m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m

PRELIMINARY ADVICE ONLY

20 November 2017

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	20-11-17	ORIGINAL ISSUE	SD	JB	JB

SCALE 0 2 4 6 8 10m

SCALE 1:200 AT ORIGINAL SIZE

NORTH

CLIENT: Idameneo (No. 789) Ltd

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LEVEL 1, 129 LOGAN ROAD, WOOLLOONGABBA, QLD, 4102
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E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT: **14 Highfields Circuit, Port Macquarie - Primary Health Care TIA**

DRAWING TITLE: **SWEPT PATH ANALYSIS**
DESIGN VEHICLE F250 AMBULANCE

PROJECT NUMBER: 17SYT0138	ORIGINAL SIZE: A3
DRAWING NUMBER: 17SYT0138-02	REVISION: A
DATE: 20 Nov 2017	SHEET: 1 OF 1

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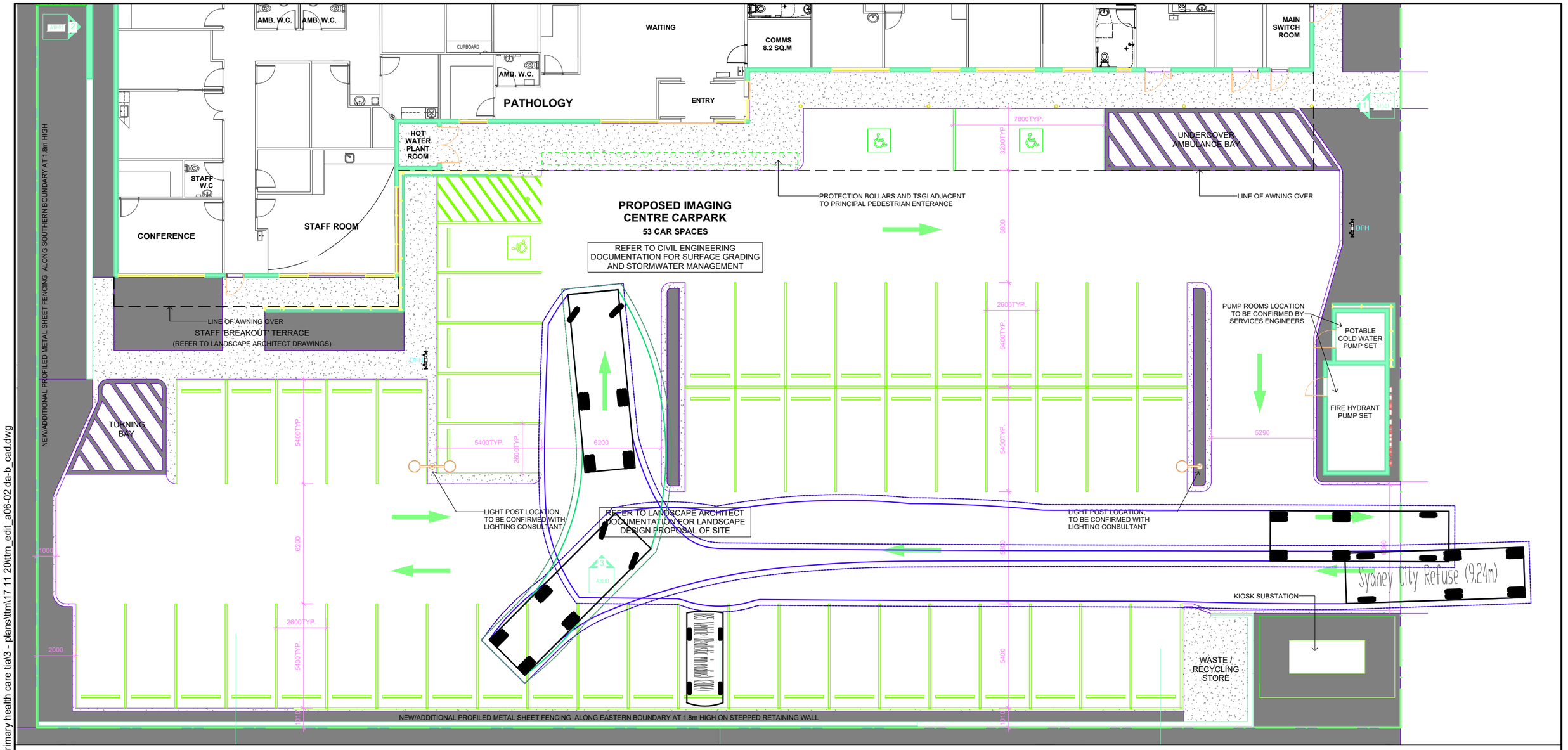
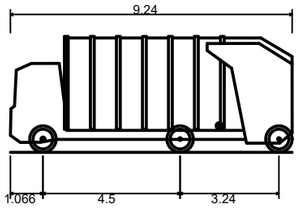


SYDNEY CITY REFUSE SWEPT PATH

SCALE 1:200



Sydney City Refuse (9.24m)	
Overall Length	9.240m
Overall Width	2.600m
Overall Body Height	3.800m
Min Body Ground Clearance	0.300m
Track Width	2.480m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

PRELIMINARY ADVICE ONLY
20 November 2017

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	20-11-17	ORIGINAL ISSUE	SD	JB	JB

SCALE 0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

NORTH

CLIENT: Idameneo (No. 789) Ltd

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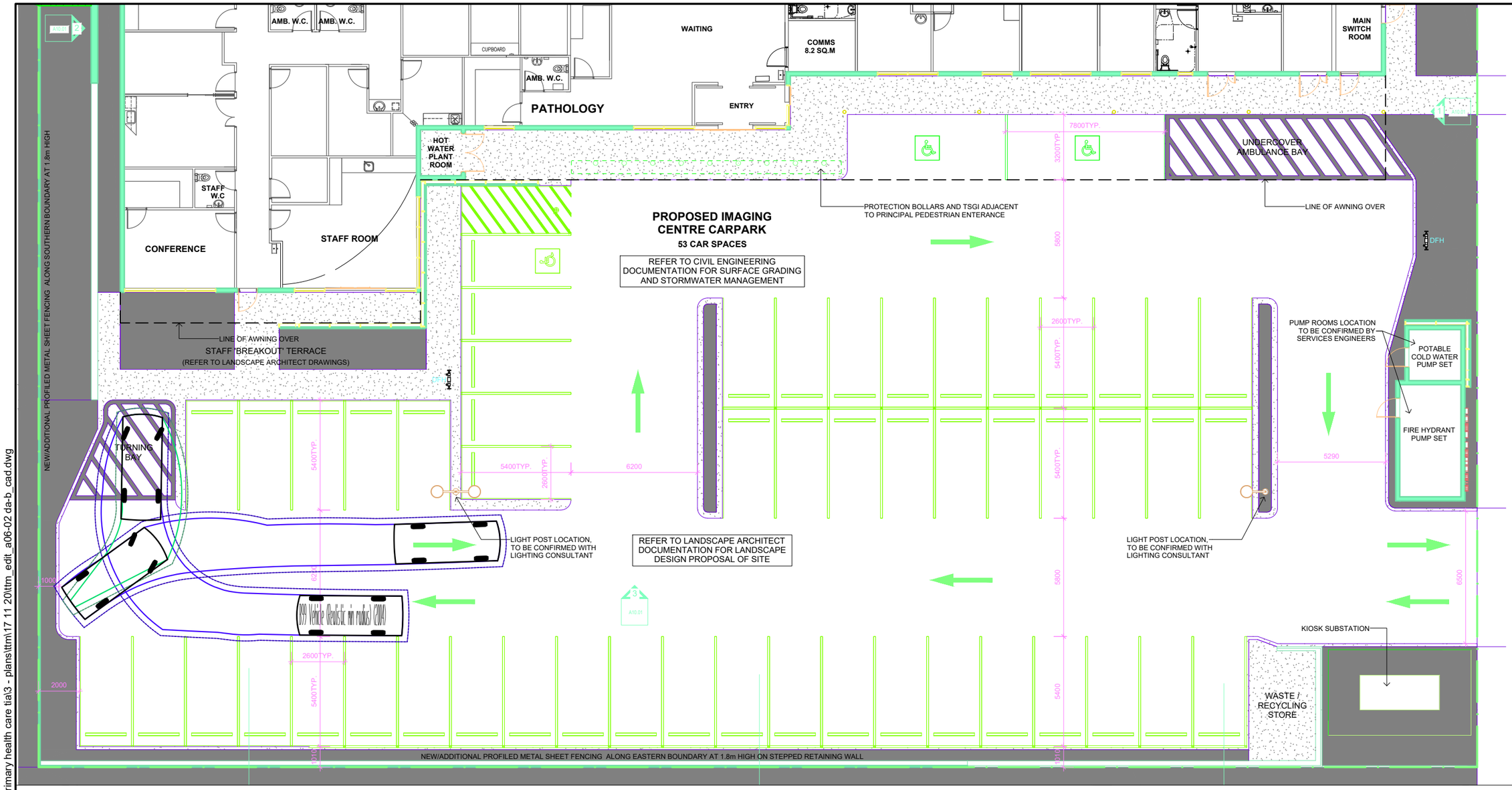
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT: **14 Highfields Circuit, Port Macquarie - Primary Health Care TIA**

DRAWING TITLE: **SWEPT PATH ANALYSIS**
DESIGN VEHICLE F250 AMBULANCE

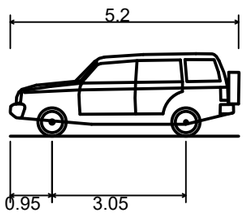
PROJECT NUMBER	ORIGINAL SIZE
17SYT0138	A3
DRAWING NUMBER	REVISION
17SYT0138-03	A
DATE	SHEET
20 Nov 2017	1 OF 1

o:\synergy\projects\17syt\17syt0138 14 highfields circuit, port macquarie - primary health care tia\a3 - plans\ttm\17 11 20\ttm_edit_a06-02 da-b_cad.dwg



B99 SWEPT PATH

SCALE 1:200



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

PRELIMINARY ADVICE ONLY
20 November 2017

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	20-11-17	ORIGINAL ISSUE	SD	JB	JB

SCALE 0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE
NORTH
CLIENT: Idameneo (No. 789) Ltd

TTM CONSULTING PTY LTD
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PROJECT: **14 Highfields Circuit, Port Macquarie - Primary Health Care TIA**
DRAWING TITLE: **SWEPT PATH ANALYSIS**
DESIGN VEHICLE B99

PROJECT NUMBER: 17SYT0138	ORIGINAL SIZE: A3
DRAWING NUMBER: 17SYT0138-04	REVISION: A
DATE: 20 Nov 2017	SHEET: 1 OF 1

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Appendix C SIDRA Outputs

MOVEMENT SUMMARY

Site: 101 [2017 AM Survey]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	38	1.0	0.542	10.6	LOS B	4.3	30.5	0.87	0.99	51.4
2	T1	860	1.0	0.712	11.3	LOS B	8.7	61.4	0.93	1.08	52.9
3	R2	140	1.0	0.712	19.0	LOS B	8.7	61.4	0.96	1.14	52.9
Approach		1038	1.0	0.712	12.3	LOS B	8.7	61.4	0.93	1.08	52.8
East: Wrights Rd											
4	L2	36	0.0	0.057	6.4	LOS A	0.4	2.9	0.66	0.72	54.9
4a	L1	22	0.0	0.057	7.1	LOS A	0.4	2.9	0.66	0.72	56.2
6	R2	96	0.0	0.114	13.0	LOS B	0.6	4.4	0.77	0.85	52.9
Approach		154	0.0	0.114	10.6	LOS B	0.6	4.4	0.73	0.80	53.8
North: John Oxley Highway											
7	L2	267	0.0	0.147	3.3	LOS A	0.9	6.2	0.31	0.40	56.5
8	T1	626	0.0	0.467	4.0	LOS A	3.4	23.8	0.54	0.41	57.3
9a	R1	799	0.0	0.467	9.2	LOS A	3.4	23.8	0.50	0.63	54.0
Approach		1693	0.0	0.467	6.3	LOS A	3.4	23.8	0.48	0.51	55.5
SouthWest: John Oxley Highway											
30a	L1	1183	0.0	0.390	3.2	LOS A	3.0	20.7	0.33	0.36	58.3
32a	R1	24	0.0	0.185	10.6	LOS B	1.1	7.9	0.77	0.81	51.5
32b	R3	141	0.0	0.185	13.3	LOS B	1.1	7.9	0.77	0.81	53.3
Approach		1348	0.0	0.390	4.4	LOS A	3.0	20.7	0.38	0.41	57.5
All Vehicles		4233	0.2	0.712	7.3	LOS A	8.7	61.4	0.57	0.63	55.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2017 PM Survey]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	44	1.0	0.453	11.7	LOS B	3.1	21.8	0.85	0.96	50.6
2	T1	669	1.0	0.595	11.7	LOS B	5.8	40.8	0.90	1.04	52.7
3	R2	80	1.0	0.595	18.9	LOS B	5.8	40.8	0.92	1.09	53.2
Approach		794	1.0	0.595	12.4	LOS B	5.8	40.8	0.90	1.04	52.6
East: Wrights Rd											
4	L2	65	0.0	0.217	7.7	LOS A	1.4	9.7	0.76	0.83	54.1
4a	L1	109	0.0	0.217	7.7	LOS A	1.4	9.7	0.76	0.83	55.4
6	R2	255	0.0	0.288	13.4	LOS B	1.6	11.3	0.79	0.89	52.9
Approach		429	0.0	0.288	11.1	LOS B	1.6	11.3	0.78	0.87	53.7
North: John Oxley Highway											
7	L2	124	0.0	0.066	3.1	LOS A	0.4	2.6	0.21	0.36	57.0
8	T1	704	0.0	0.473	3.4	LOS A	3.4	23.9	0.40	0.34	58.1
9a	R1	855	0.0	0.473	8.7	LOS A	3.4	23.9	0.36	0.58	54.6
Approach		1683	0.0	0.473	6.0	LOS A	3.4	23.9	0.37	0.46	56.1
SouthWest: John Oxley Highway											
30a	L1	1449	0.0	0.552	3.9	LOS A	5.0	34.7	0.41	0.46	57.8
32a	R1	3	0.0	0.072	10.2	LOS B	0.4	3.0	0.70	0.74	51.6
32b	R3	76	0.0	0.072	12.8	LOS B	0.4	3.0	0.70	0.74	53.3
Approach		1528	0.0	0.552	4.4	LOS A	5.0	34.7	0.43	0.47	57.4
All Vehicles		4435	0.2	0.595	7.1	LOS A	5.8	40.8	0.52	0.61	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2019 AM Base]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	39	1.0	0.587	12.0	LOS B	5.0	35.5	0.90	1.04	50.5
2	T1	895	1.0	0.772	13.7	LOS B	10.9	76.7	0.96	1.16	51.2
3	R2	145	1.0	0.772	21.9	LOS C	10.9	76.7	1.00	1.25	50.8
Approach		1079	1.0	0.772	14.7	LOS B	10.9	76.7	0.96	1.17	51.1
East: Wrights Rd											
4	L2	37	0.0	0.061	6.8	LOS A	0.5	3.3	0.69	0.74	54.6
4a	L1	23	0.0	0.061	7.4	LOS A	0.5	3.3	0.69	0.74	56.0
6	R2	100	0.0	0.124	13.3	LOS B	0.7	4.9	0.79	0.87	52.8
Approach		160	0.0	0.124	10.9	LOS B	0.7	4.9	0.75	0.82	53.6
North: John Oxley Highway											
7	L2	278	0.0	0.154	3.3	LOS A	0.9	6.5	0.32	0.40	56.5
8	T1	652	0.0	0.490	4.1	LOS A	3.7	25.8	0.56	0.42	57.1
9a	R1	832	0.0	0.490	9.2	LOS A	3.7	25.8	0.52	0.64	53.9
Approach		1761	0.0	0.490	6.4	LOS A	3.7	25.8	0.51	0.52	55.4
SouthWest: John Oxley Highway											
30a	L1	1231	0.0	0.426	3.4	LOS A	3.4	23.8	0.34	0.38	58.2
32a	R1	25	0.0	0.200	10.9	LOS B	1.3	8.8	0.80	0.83	51.4
32b	R3	146	0.0	0.200	13.5	LOS B	1.3	8.8	0.80	0.83	53.2
Approach		1402	0.0	0.426	4.6	LOS A	3.4	23.8	0.40	0.44	57.4
All Vehicles		4402	0.2	0.772	8.0	LOS A	10.9	76.7	0.59	0.66	54.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2019 AM Project]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	39	1.0	0.595	12.3	LOS B	5.2	36.4	0.91	1.05	50.3
2	T1	895	1.0	0.782	14.1	LOS B	11.3	79.8	0.96	1.18	50.9
3	R2	153	1.0	0.782	22.5	LOS C	11.3	79.8	1.00	1.27	50.4
Approach		1086	1.0	0.782	15.2	LOS B	11.3	79.8	0.97	1.19	50.8
East: Wrights Rd											
4	L2	39	0.0	0.064	6.8	LOS A	0.5	3.5	0.69	0.74	54.6
4a	L1	24	0.0	0.064	7.4	LOS A	0.5	3.5	0.69	0.74	56.0
6	R2	105	0.0	0.132	13.3	LOS B	0.7	5.2	0.80	0.87	52.8
Approach		168	0.0	0.132	10.9	LOS B	0.7	5.2	0.76	0.82	53.6
North: John Oxley Highway											
7	L2	292	0.0	0.162	3.3	LOS A	1.0	7.0	0.33	0.40	56.4
8	T1	652	0.0	0.493	4.1	LOS A	3.7	26.1	0.57	0.42	57.0
9a	R1	832	0.0	0.493	9.3	LOS A	3.7	26.1	0.53	0.64	53.8
Approach		1775	0.0	0.493	6.4	LOS A	3.7	26.1	0.51	0.52	55.4
SouthWest: John Oxley Highway											
30a	L1	1231	0.0	0.430	3.5	LOS A	3.5	24.3	0.34	0.39	58.2
32a	R1	26	0.0	0.204	10.9	LOS B	1.3	8.9	0.80	0.83	51.4
32b	R3	146	0.0	0.204	13.6	LOS B	1.3	8.9	0.80	0.83	53.1
Approach		1403	0.0	0.430	4.7	LOS A	3.5	24.3	0.40	0.44	57.4
All Vehicles		4433	0.2	0.782	8.2	LOS A	11.3	79.8	0.60	0.67	54.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2019 PM Base]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	46	1.0	0.493	13.3	LOS B	3.6	25.3	0.88	1.00	49.6
2	T1	697	1.0	0.648	13.8	LOS B	7.0	49.5	0.93	1.11	51.3
3	R2	83	1.0	0.648	21.2	LOS C	7.0	49.5	0.96	1.17	51.5
Approach		826	1.0	0.648	14.5	LOS B	7.0	49.5	0.93	1.11	51.2
East: Wrights Rd											
4	L2	68	0.0	0.236	8.1	LOS A	1.6	10.9	0.78	0.84	53.8
4a	L1	114	0.0	0.236	8.2	LOS A	1.6	10.9	0.78	0.84	55.1
6	R2	265	0.0	0.311	13.7	LOS B	1.8	12.6	0.82	0.91	52.8
Approach		447	0.0	0.311	11.4	LOS B	1.8	12.6	0.80	0.89	53.5
North: John Oxley Highway											
7	L2	129	0.0	0.069	3.1	LOS A	0.4	2.8	0.22	0.36	56.9
8	T1	733	0.0	0.494	3.4	LOS A	3.7	25.8	0.42	0.35	57.9
9a	R1	889	0.0	0.494	8.7	LOS A	3.7	25.8	0.38	0.58	54.5
Approach		1752	0.0	0.494	6.1	LOS A	3.7	25.8	0.39	0.47	56.0
SouthWest: John Oxley Highway											
30a	L1	1508	0.0	0.598	4.3	LOS A	5.8	40.9	0.43	0.51	57.7
32a	R1	3	0.0	0.076	10.3	LOS B	0.5	3.3	0.73	0.75	51.5
32b	R3	79	0.0	0.076	12.9	LOS B	0.5	3.3	0.73	0.75	53.2
Approach		1591	0.0	0.598	4.7	LOS A	5.8	40.9	0.45	0.52	57.3
All Vehicles		4616	0.2	0.648	7.6	LOS A	7.0	49.5	0.55	0.64	55.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2019 PM Project]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	46	1.0	0.501	13.7	LOS B	3.7	25.9	0.88	1.01	49.4
2	T1	697	1.0	0.658	14.3	LOS B	7.3	51.2	0.93	1.12	50.9
3	R2	86	1.0	0.658	21.8	LOS C	7.3	51.2	0.96	1.18	51.1
Approach		829	1.0	0.658	15.0	LOS B	7.3	51.2	0.93	1.12	50.8
East: Wrights Rd											
4	L2	72	0.0	0.247	8.2	LOS A	1.6	11.5	0.79	0.85	53.8
4a	L1	119	0.0	0.247	8.2	LOS A	1.6	11.5	0.79	0.85	55.1
6	R2	278	0.0	0.327	13.7	LOS B	1.9	13.3	0.82	0.92	52.7
Approach		468	0.0	0.327	11.5	LOS B	1.9	13.3	0.81	0.89	53.4
North: John Oxley Highway											
7	L2	135	0.0	0.072	3.1	LOS A	0.4	2.9	0.22	0.36	56.9
8	T1	733	0.0	0.495	3.4	LOS A	3.7	26.0	0.43	0.35	57.9
9a	R1	889	0.0	0.495	8.7	LOS A	3.7	26.0	0.39	0.58	54.5
Approach		1757	0.0	0.495	6.1	LOS A	3.7	26.0	0.39	0.47	56.0
SouthWest: John Oxley Highway											
30a	L1	1508	0.0	0.605	4.4	LOS A	6.0	42.1	0.44	0.52	57.7
32a	R1	3	0.0	0.076	10.3	LOS B	0.5	3.3	0.74	0.75	51.5
32b	R3	79	0.0	0.076	13.0	LOS B	0.5	3.3	0.74	0.75	53.2
Approach		1591	0.0	0.605	4.8	LOS A	6.0	42.1	0.45	0.54	57.3
All Vehicles		4645	0.2	0.658	7.8	LOS A	7.3	51.2	0.55	0.65	55.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
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.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2029 AM Base]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	48	1.0	0.919	46.0	LOS D	17.4	122.6	1.00	1.67	34.8
2	T1	1091	1.0	1.208	150.2	LOS F	112.6	794.7	1.00	3.58	18.1
3	R2	178	1.0	1.208	223.5	LOS F	112.6	794.7	1.00	4.80	13.9
Approach		1317	1.0	1.208	156.2	LOS F	112.6	794.7	1.00	3.67	17.7
East: Wrights Rd											
4	L2	45	0.0	0.094	9.7	LOS A	0.9	6.3	0.80	0.86	52.4
4a	L1	28	0.0	0.094	10.4	LOS B	0.9	6.3	0.80	0.86	53.6
6	R2	121	0.0	0.203	15.8	LOS B	1.3	9.2	0.92	0.95	51.5
Approach		195	0.0	0.203	13.6	LOS B	1.3	9.2	0.88	0.92	52.0
North: John Oxley Highway											
7	L2	339	0.0	0.188	3.3	LOS A	1.2	8.2	0.34	0.40	56.4
8	T1	795	0.0	0.613	4.9	LOS A	5.4	37.6	0.67	0.52	56.4
9a	R1	1014	0.0	0.613	9.6	LOS A	5.3	37.1	0.63	0.67	53.5
Approach		2147	0.0	0.613	6.9	LOS A	5.4	37.6	0.60	0.57	55.0
SouthWest: John Oxley Highway											
30a	L1	1501	0.0	0.562	4.1	LOS A	5.3	37.3	0.37	0.48	58.1
32a	R1	31	0.0	0.259	11.3	LOS B	1.7	11.8	0.85	0.85	51.2
32b	R3	179	0.0	0.259	14.0	LOS B	1.7	11.8	0.85	0.85	53.0
Approach		1711	0.0	0.562	5.3	LOS A	5.3	37.3	0.43	0.53	57.2
All Vehicles		5369	0.2	1.208	43.3	LOS D	112.6	794.7	0.65	1.33	36.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
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Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2029 AM Project]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	48	1.0	0.929	48.9	LOS D	18.3	129.3	1.00	1.71	33.9
2	T1	1091	1.0	1.220	157.6	LOS F	117.3	828.5	1.00	3.68	17.5
3	R2	184	1.0	1.220	234.3	LOS F	117.3	828.5	1.00	4.93	13.3
Approach		1323	1.0	1.220	164.3	LOS F	117.3	828.5	1.00	3.78	17.1
East: Wrights Rd											
4	L2	47	0.0	0.098	9.7	LOS A	0.9	6.6	0.80	0.86	52.4
4a	L1	29	0.0	0.098	10.4	LOS B	0.9	6.6	0.80	0.86	53.6
6	R2	127	0.0	0.214	15.9	LOS B	1.4	9.8	0.93	0.96	51.5
Approach		204	0.0	0.214	13.6	LOS B	1.4	9.8	0.88	0.92	52.0
North: John Oxley Highway											
7	L2	353	0.0	0.196	3.3	LOS A	1.2	8.6	0.34	0.41	56.4
8	T1	795	0.0	0.615	5.0	LOS A	5.4	37.9	0.68	0.53	56.4
9a	R1	1014	0.0	0.615	9.6	LOS A	5.3	37.2	0.63	0.67	53.5
Approach		2161	0.0	0.615	6.9	LOS A	5.4	37.9	0.60	0.58	54.9
SouthWest: John Oxley Highway											
30a	L1	1501	0.0	0.563	4.1	LOS A	5.3	37.4	0.37	0.48	58.1
32a	R1	32	0.0	0.261	11.4	LOS B	1.7	11.9	0.85	0.85	51.2
32b	R3	179	0.0	0.261	14.0	LOS B	1.7	11.9	0.85	0.85	53.0
Approach		1712	0.0	0.563	5.3	LOS A	5.3	37.4	0.43	0.53	57.2
All Vehicles		5400	0.2	1.220	45.2	LOS D	117.3	828.5	0.65	1.36	35.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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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 [2029 PM Base]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	56	1.0	0.811	42.3	LOS D	10.5	74.3	1.00	1.47	36.0
2	T1	849	1.0	1.066	97.7	LOS F	54.9	387.3	1.00	2.58	24.1
3	R2	101	1.0	1.066	134.5	LOS F	54.9	387.3	1.00	3.18	20.4
Approach		1006	1.0	1.066	98.3	LOS F	54.9	387.3	1.00	2.58	24.1
East: Wrights Rd											
4	L2	83	0.0	0.378	13.0	LOS B	3.1	21.6	0.89	0.97	50.2
4a	L1	139	0.0	0.378	13.1	LOS B	3.1	21.6	0.89	0.97	51.4
6	R2	323	0.0	0.508	19.9	LOS B	4.0	28.1	0.96	1.09	48.9
Approach		545	0.0	0.508	17.1	LOS B	4.0	28.1	0.94	1.04	49.7
North: John Oxley Highway											
7	L2	158	0.0	0.084	3.1	LOS A	0.5	3.5	0.24	0.37	56.8
8	T1	893	0.0	0.612	3.7	LOS A	5.3	36.9	0.53	0.38	57.3
9a	R1	1084	0.0	0.612	9.0	LOS A	5.3	36.9	0.47	0.59	54.1
Approach		2135	0.0	0.612	6.3	LOS A	5.3	36.9	0.48	0.49	55.6
SouthWest: John Oxley Highway											
30a	L1	1838	0.0	0.856	9.2	LOS A	15.0	105.0	0.48	0.79	54.8
32a	R1	4	0.0	0.101	10.9	LOS B	0.7	5.0	0.84	0.78	51.1
32b	R3	96	0.0	0.101	13.6	LOS B	0.7	5.0	0.84	0.78	52.8
Approach		1938	0.0	0.856	9.5	LOS A	15.0	105.0	0.50	0.79	54.2
All Vehicles		5624	0.2	1.066	24.9	LOS C	54.9	387.3	0.62	1.02	44.3

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MOVEMENT SUMMARY

Site: 101 [2029 PM Project]

Wrights Road / John Oxley Rd
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: John Oxely Rd (S)											
1b	L3	56	1.0	0.827	45.7	LOS D	11.2	78.9	1.00	1.51	34.9
2	T1	849	1.0	1.087	108.4	LOS F	60.6	427.5	1.00	2.73	22.6
3	R2	105	1.0	1.087	149.2	LOS F	60.6	427.5	1.00	3.38	18.9
Approach		1011	1.0	1.087	109.2	LOS F	60.6	427.5	1.00	2.73	22.6
East: Wrights Rd											
4	L2	86	0.0	0.393	13.3	LOS B	3.3	22.8	0.90	0.98	50.1
4a	L1	144	0.0	0.393	13.4	LOS B	3.3	22.8	0.90	0.98	51.2
6	R2	336	0.0	0.530	20.4	LOS C	4.3	30.0	0.97	1.11	48.6
Approach		566	0.0	0.530	17.6	LOS B	4.3	30.0	0.94	1.05	49.4
North: John Oxley Highway											
7	L2	163	0.0	0.087	3.1	LOS A	0.5	3.6	0.24	0.37	56.8
8	T1	893	0.0	0.613	3.7	LOS A	5.3	37.0	0.53	0.38	57.2
9a	R1	1084	0.0	0.613	9.0	LOS A	5.3	37.0	0.48	0.60	54.1
Approach		2140	0.0	0.613	6.3	LOS A	5.3	37.0	0.48	0.49	55.6
SouthWest: John Oxley Highway											
30a	L1	1838	0.0	0.857	9.3	LOS A	15.1	105.5	0.48	0.79	54.8
32a	R1	4	0.0	0.101	10.9	LOS B	0.7	5.0	0.84	0.78	51.1
32b	R3	96	0.0	0.101	13.6	LOS B	0.7	5.0	0.84	0.78	52.8
Approach		1938	0.0	0.857	9.5	LOS A	15.1	105.5	0.50	0.79	54.1
All Vehicles		5655	0.2	1.087	26.9	LOS C	60.6	427.5	0.63	1.05	43.3

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