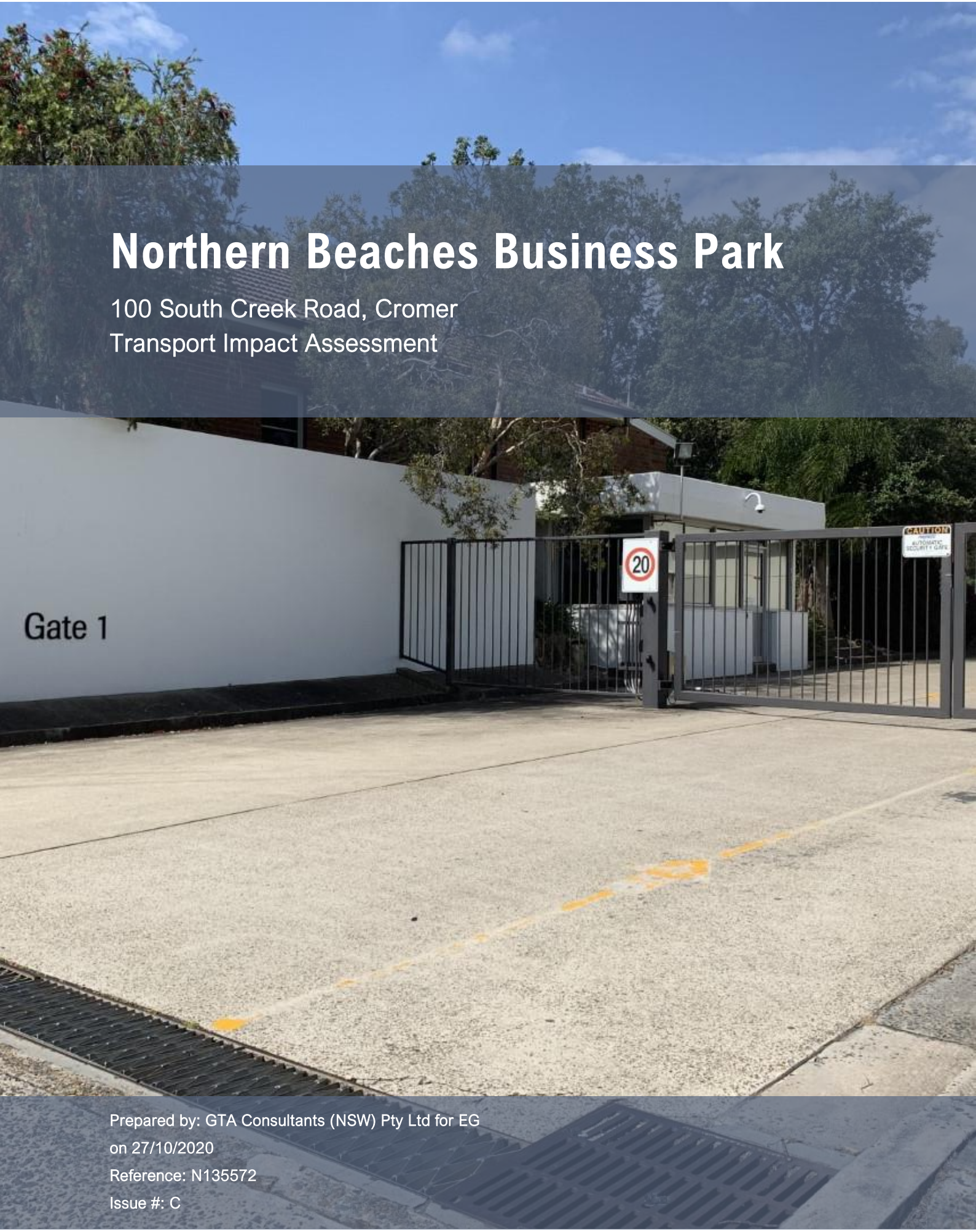
Northern Beaches Business Park

100 South Creek Road, Cromer
Transport Impact Assessment



Prepared by: GTA Consultants (NSW) Pty Ltd for EG
on 27/10/2020
Reference: N135572
Issue #: C

GTAconsultants

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	21/11/2019	Final	Sherry Merson Ashish Modessa	Brett Maynard	Brett Maynard	Brett Maynard
B	22/10/2020	Updated to reflect revised scheme	Sherry Merson Ashish Modessa	Ashish Modessa	Brett Maynard	Brett Maynard
C	27/10/2020	Minor further updates	Sherry Merson Ashish Modessa	Ashish Modessa	Brett Maynard	Brett Maynard

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1. INTRODUCTION

01

1.1. Background

It is understood that a development application is to be lodged with Northern Beaches Council (Council) for a proposed warehouse/ industrial and commercial development at 100 South Creek Road, Cromer. EG engaged GTA Consultants (GTA) to undertake a transport impact assessment for the proposed development.

The site is currently vacant, with existing light industrial/ warehouse facilities comprising approximately 13,450 square metres gross floor area (GFA) of warehouse use and 11,400 square metres GFA of office space (i.e. total GFA of approximately 24,850 square metres).

The proposed redevelopment of the site will include 11 warehouse units with mezzanine offices, a further five office tenancies, a self-storage facility and a café, totalling 27,658 square metres GFA. The proposed office space will only account for 18 per cent of the total GFA, compared to 46 per cent for the existing on-site facilities.

1.2. Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposed development
- suitability of the proposed access arrangements for the site
- the transport impact of the development proposal on the surrounding road network.

1.3. References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds
- Warringah Development Control Plan (DCP) 2011
- Warringah Local Environmental Plan (LEP) 2011
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2018
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- traffic and car parking surveys undertaken by Matrix as referenced in the context of this report
- plans for the proposed development prepared by SBA Architects, Drawing Number S4.55-202, Revision 1, dated 12 October 2020
- other documents and data as referenced in this report.

2. TRANSPORT CONTEXT

02

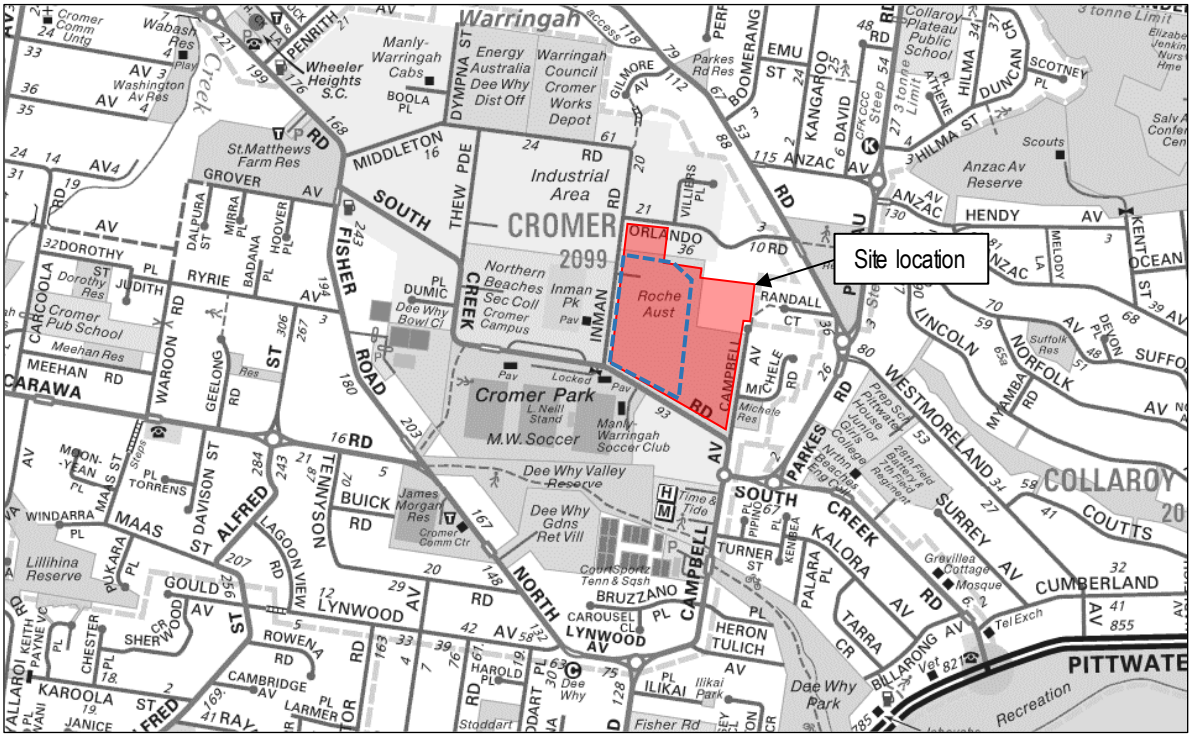
2.1. Location

The subject site is located at 100 South Creek Road, Cromer. The site of approximately 44,500 square metres has a frontage of 190 metres to South Creek Road and 210 metres to Inman Road. The site currently has a land use classification as IN1 General Industrial and is occupied by vacant industrial and commercial/ office facilities.

The surrounding properties predominantly include industrial developments to the north and south, Cromer Park sports fields to the southwest, Cromer High School to the west and residential uses to the east of the site.

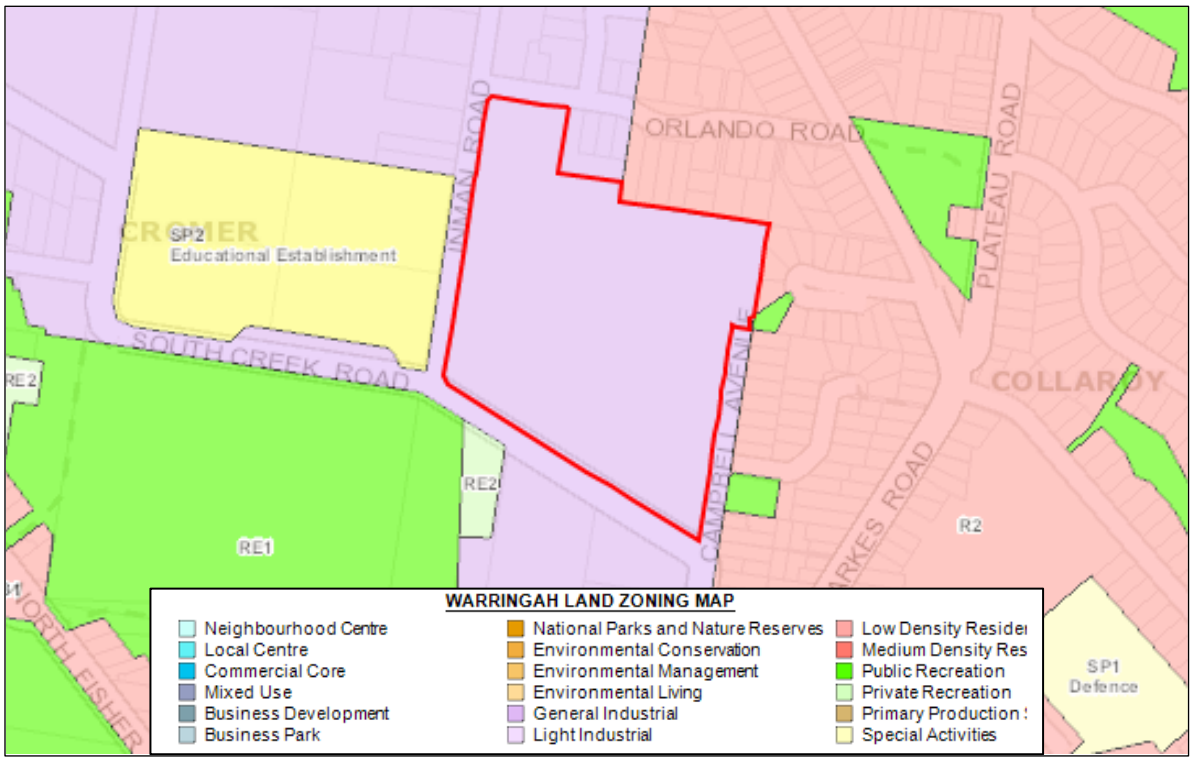
The location of the subject site and its surrounding environs is shown in Figure 2.1, while the Warringah LEP 2011 land use map is shown in Figure 2.2.

Figure 2.1: Subject site and its environs



Base image source: Sydway

Figure 2.2: Land use map



Base image source: Warringah LEP 2011

2.2. Transport Network

2.2.1. Road Hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions, and throughout the State. Roads and Maritime Services (Roads and Maritime) responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the Roads Act 1993, and the regulation to manage the road system is stated in the Australian Road Rules, most recently amended on 19 March 2018.

Roads and Maritime defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

Arterial Roads – Controlled by Roads and Maritime, typically no limit in flow and designed to carry vehicles long distance between regional centres.

Sub-Arterial Roads – Managed by either Council or Roads and Maritime under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).

Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.

Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.2. Surrounding Road Network

Along the frontages of the site, South Creek Road, Inman Road, Orlando Road and Campbell Avenue function as local roads. South Creek Road and Campbell Avenue become sub-arterial roads south and east of where they intersect.

These roads have a posted speed limit of 50km/h, with one traffic lane and kerbside parking or parking lane in each direction. There is a combination of unrestricted and eight-hour time restricted kerbside parking near the site. Inman Road and Orlando Road have dedicated on-road bicycle shoulder lanes between the kerbside parking and the traffic lanes.

Pittwater Road is a 20-kilometre arterial road that generally aligns north-south linking Mona Vale to the north with Manly to the south. It is a two-way road configured with three traffic lanes in each direction, including peak direction kerbside bus lanes (southbound in the morning peak periods and northbound in the afternoon peak periods) with kerbside parking at other times. It has a posted speed limit of 60km/h.

The key roads are shown in Figure 2.3 to Figure 2.8.

Figure 2.3: Inman Road (looking north)

Figure 2.4: Inman Road (looking south)

Figure 2.5: South Creek Road (looking east)

Figure 2.6: South Creek Road (looking west)

Figure 2.7: Pittwater Road (looking east)

Figure 2.8: Pittwater Road (looking west)

2.3. Traffic Volumes

GTA commissioned vehicle turning movement counts at the South Creek Road intersections with Inman Road and Pittwater Road on Wednesday 16 October 2019, during the morning and afternoon peak periods:

The AM and PM peak hours were found to occur from 7.45am to 8.45am and 5:00pm to 6:00pm respectively, with full survey results contained in Appendix A.

2.4. Intersection Operation

The operation of the surveyed intersections has been assessed using SIDRA INTERSECTION[1], a computer based modelling package which calculates intersection performance.

[1] Program used under license from Akcelik & Associates Pty Ltd.

The commonly used measure of intersection performance, as defined by the Roads and Maritime, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.1: SIDRA INTERSECTION level of service criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 presents a summary of the existing operation of the intersections, with full results presented in Appendix B. Signalised intersection results are based on the overall operation, whilst unsignalised intersection results are based on the worst movement.

Table 2.2: Existing operating conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Pittwater Road/ South Creek Road	AM	East	0.82	13	319	A
		North	0.80	60	119	E
		West	0.70	18	228	B
		Overall	**0.82**	**21**	**319**	**B**
	PM	East	0.55	11	100	A
		North	0.55	48	66	D
		West	0.78	14	203	A
		Overall	**0.78**	**16**	**203**	**B**
South Creek Road/ Inman Road	AM	East	0.14	6	4	A
		North	0.11	7	3	A
		West	0.11	5	0	A
	PM	East	0.17	6	5	A
		North	0.16	8	4	A
		West	0.14	6	0	A

Table 2.2 indicates that the study intersections currently operate satisfactorily during the peak periods. There is some queuing along Pittwater Road in the peak direction, which is expected along an arterial road. South Creek Road experiences some delays during the peak periods as the green time priority is given to Pittwater Road.

2.5. Car Parking

A review of publicly available car parking near site indicates that eight-hour restricted parking is available on both sides of Inman Road and South Creek Road, with unrestricted parking on Orlando Road.

Observations of on-street car parking suggest there is low demand during the afternoon peak period. There were less than 30 vehicles parked in the afternoon along Inman Road (19 spaces both sides) and South Creek Road (nine spaces both sides), which have kerbside supply of approximately 80 spaces and 75 spaces respectively on both sides. This suggests there are at least 120 spaces available.

Along the site frontages there are currently 45 spaces between Inman Road and South Creek Road.

2.6. Public Transport

Bus route 158 services link Cromer with Manly via Dee Why and Brookvale. Bus stops are located on South Creek Road adjacent to the site. Buses are infrequent with one service running in the morning and one in the evening.

There are further bus services (bus routes 151, 185, 188, 199, E60, E83, E85) on Pittwater Road, with the nearest bus stops a 12-minute walking distance from site. These services have 15-minute frequency during peak periods, providing access to Palm Beach, Mona Vale, Warriewood Valley, Elanor Heights and Manly.

The surrounding bus network is shown in Figure 2.9.

Figure 2.9: Surrounding public transport network

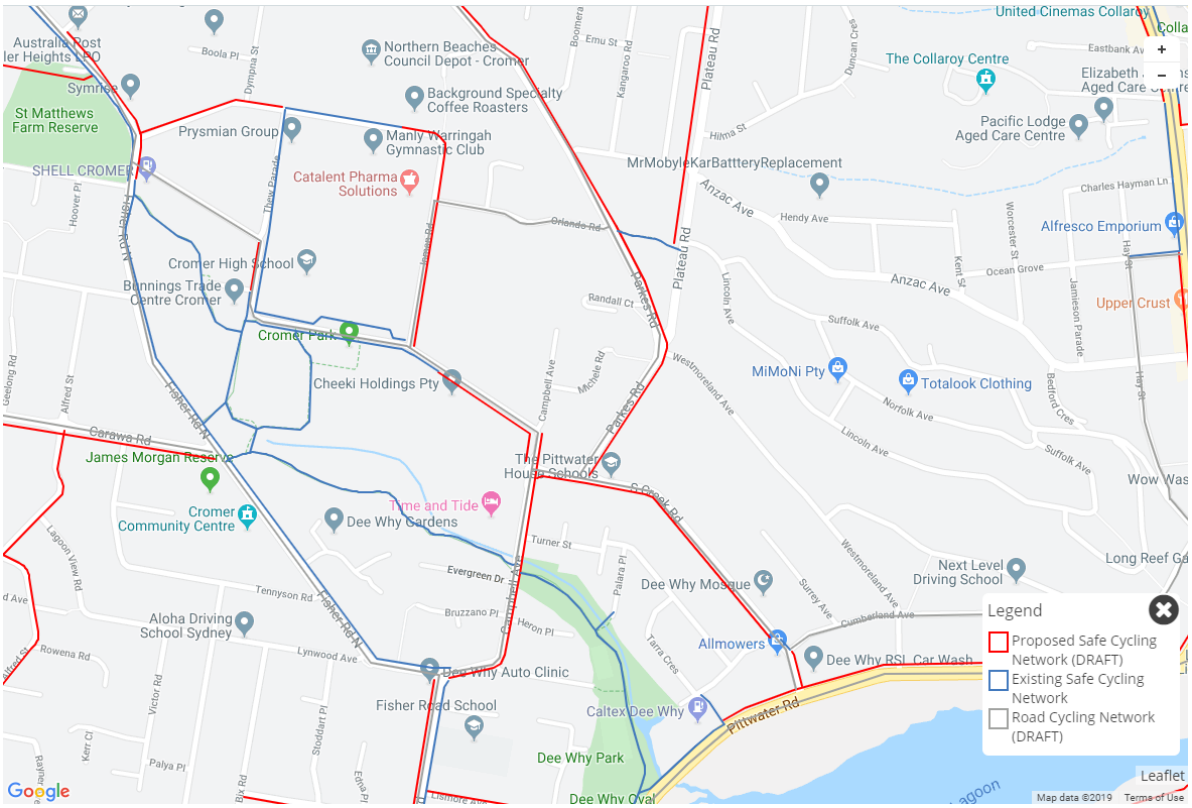
Base image source: https://transportnsw.info, accessed October 2019

2.7. Walking and Cycling Infrastructure

Footpaths are available on the south side of South Creek Road near the site and on the east side of Inman Road. The existing South Creek Road footpath ends at the bus stop adjacent to the site, with opportunity to extend the footpath to the South Creek Road/ Campbell Avenue roundabout.

On-road cycle shoulder lanes are located on both sides of Inman Road and Orlando Road, with off-road shared paths provided adjacent to Cromer Park and Cromer High School. The draft Northern Beaches Bike Plan proposes new and extended shared paths along Inman Road and South Creek Road towards Pittwater Road, illustrated in Figure 2.10.

Figure 2.10: Surrounding cycling network



Base image source: https://northernbeaches.mysocialpinpoint.com/northern-beaches-bike-plan?_ga=2.245940676.1585324789.1572220515-667743252.1572220515#/, accessed 28/10/19

3. DEVELOPMENT PROPOSAL

03

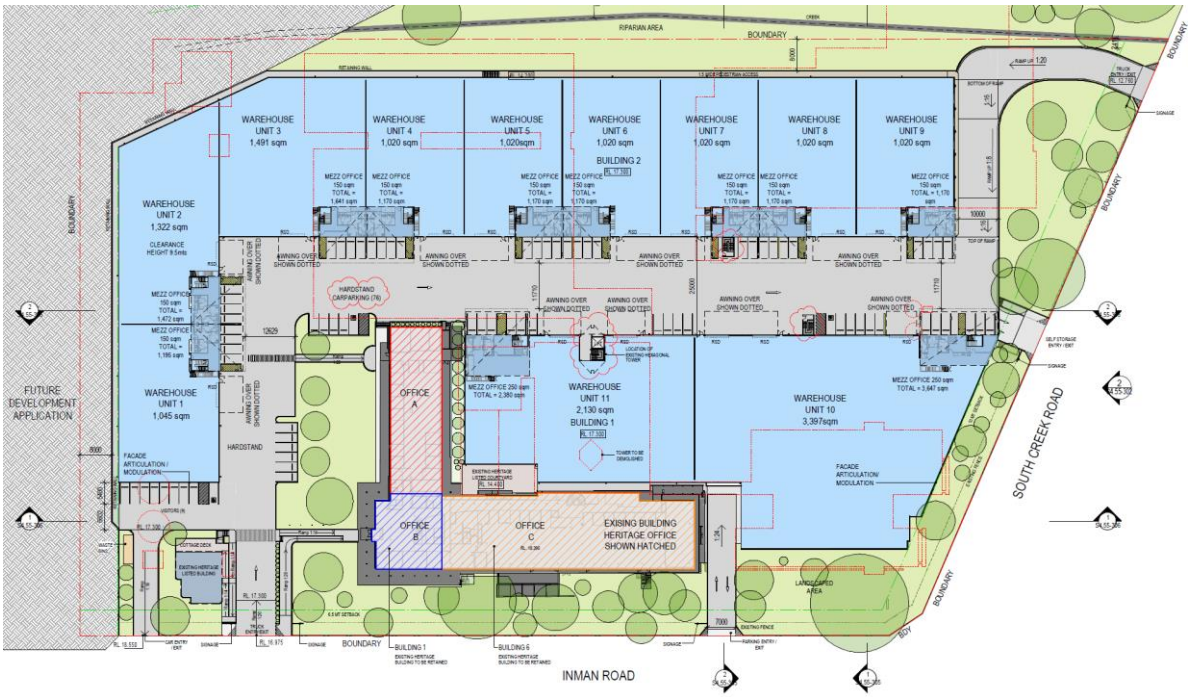
3.1. Land Uses

The proposed development incorporates light industrial, commercial and retail land uses fronting Inman Road. It intends to retain a heritage commercial building for five office tenancies, construct 11 warehouse units with mezzanine offices, a self-storage facility and a café also in a heritage building. The land use breakdown is summarised in Table 3.1, with the ground level site layout shown in Figure 3.1.

Table 3.1: Development schedule

Use	Description	Size (GFA)
Light Industrial/ Warehouse	Warehouse	15,505sq.m
	Mezzanine Office	1,850sq.m
Commercial		3,179sq.m
Self-storage facility		7,000sq.m
Café		124sq.m
Total		**27,658sq.m**

Figure 3.1: Proposed ground level site layout



Source: Ground Floor Plan, Drawing Number S4.55-202, Revision 1, prepared by SBA Architects, dated 12 October 2020

3.2. Vehicle Access and Parking

The proposal provides a total of 279 car parking spaces, with the breakdown of car parking spaces as follows:

- At-grade car parking – 76 spaces including nine visitor parking spaces
- Basement car parking – 203 spaces.

There are three separate site accesses proposed along Inman Road, as follows:

- a two-way visitor car park access (new driveway)
- an entry only at-grade car and truck access to the light industrial/ warehouse units (existing driveway location)
- a two-way basement car park access (existing driveway location).

A further two separate site accesses are proposed along South Creek Road, as follows:

- a two-way access to the self-storage facility (new driveway)
- an exit only access from the light industrial/ warehouse units (existing driveway location).

The at-grade circulation aisle that provides access to the light industrial/ warehouse units will be one-way, with clockwise circulation from Inman Road to South Creek Road.

4. PARKING ASSESSMENT

04

4.1. Bicycle Parking

The bicycle parking requirements for different development types are set out in Warringah DCP 2011. The DCP bicycle parking requirement for the proposal is summarised in Table 4.1, which indicates 44 bicycle spaces are required.

Table 4.1: Warringah DCP 2011 bicycle parking requirements

Use	Size	Bicycle parking rate	Bicycle parking requirement
Warehouse	15,505sq.m	1 per 600sq.m	26
Self-storage	7,000sq.m	1 per 600sq.m	12
Mezzanine	1,850sq.m	1 per 750sq.m	2
Office	3,179sq.m	1 per 750sq.m	4
Cafe	124sq.m	1 per 600sq.m	0
Total			**44 spaces**

40 bicycle parking spaces are currently shown on the architectural plans within the basement car park. The additional four spaces can be easily accommodated within a slightly larger bicycle parking facility that reduces the area designated as 'potential plant room location', as part of further design development.

4.2. Car Parking

In establishing the appropriate parking supply for the proposal, reference is made to both the Warringah Development Control Plan (DCP) 2011 and the Transport for NSW (formerly Roads and Maritime Services) *Guide to Traffic Generating Developments* 2002 (TfNSW Guide).

4.2.1. DCP Parking Requirements

The car parking requirements for different development types are set out in Warringah DCP 2011.

The Warringah DCP 2011 parking rates for warehouse and industry uses allows for up to 20 per cent office floor area within individual tenancies. A review of the area schedule suggests that the mezzanine office space for the 11 units will account for less than 15 per cent of the floor area, therefore no separate consideration of office floor area is required.

There are no specific rates for self-storage facilities, as such the warehouse rates have been applied.

The DCP car parking requirement for the proposal as summarised in Table 4.2.

Table 4.2: Warringah DCP 2011 car parking requirements

Use	Size	Car parking rate	Car parking requirement
Warehouse/ Factory	15,505sq.m	1.3 per 100sq.m	202
Self-storage	7,000sq.m	1.3 per 100sq.m	91
Mezzanine	1,850sq.m	1.3 per 100sq.m	24
Office	3,179sq.m	1 per 40sq.m	79
Cafe	124sq.m	12 per 100sq.m	15
Total			**411 spaces**

Table 4.2 suggests that the proposal requires 411 car parking spaces.

DCP 2011 also requires the proposal provides eight accessible spaces in accordance with the AS/NZ 2890.6.2009 – Parking facilities – Off-street parking for people with disabilities.

4.2.2. TfNSW Parking Requirements

The TfNSW Guide provides separate rates for factory and warehouse uses under the grouping of industry. The 20 per cent office floor area allowance also applies to the factory rate, however the warehouse rate does not specifically include this allowance and GTA typically considers ancillary office space separately for warehouses.

There are no specific rates for self-storage facilities, as such the warehouse rates have been applied.

The on-site café is ancillary to the overall development and surrounding area, and is not expected to be a destination in its own right. As such, any parking demand for the café (i.e. visitors not associated with other tenancies or immediate local area) would be minimal.

If the proposed warehouse component was considered to be all warehouse, the resulting car parking requirement is summarised in Table 4.3.

Table 4.3: TfNSW Guide 2002 – All Warehouse Rate

Use	Size	Car parking rate	Car parking requirement
Warehouse	15,505sq.m	1 per 300sq.m	52
Self-storage	7,000sq.m	1 per 300sq.m	23
Warehouse Mezzanine	1,850sq.m	1 per 40sq.m	46
Office	3,179sq.m	1 per 40sq.m	79
Cafe	124sq.m	-	-
Total			**200 spaces**

If the proposed warehouse component was considered to be all factory/ light industrial, the resulting car parking requirement is summarised in Table 4.4.

Table 4.4: TfNSW Guide 2002 – All Factory Rate

Use	Size	Car parking rate	Car parking requirement
Factory/ Light Industrial	15,489sq.m	1.3 per 100sq.m	202
Self-storage	7,000sq.m	1 per 300sq.m	23
Factory/ Light Industrial Mezzanine	1,850sq.m	1.3 per 100sq.m	24
Office	3,179sq.m	1 per 40sq.m	79
Cafe	124sq.m	-	-
Total			**328 spaces**

Table 4.3 and Table 4.4 suggests that the proposal requires between 200 and 328 car parking spaces with the proportion of factory and warehouse use to determine the requirement.

4.2.3. Empirical Assessment of Car Parking Demand

Warehouse/ Industry

There are no confirmed tenants for the individual units, however EG has advised that it is likely to include both warehouse and light industrial (e.g. medical equipment assembly) tenants. While the balance will vary over the life of the facility, it is unlikely that parking requirements will be skewed to either end of the range at a given point in time.

The rates adopted in TfNSW Guide for factory and warehouse uses better reflect the intended site occupancy/ operation compared with the single rate adopted in the Warringah DCP 2011. The DCP rate is considered an over-estimation of parking requirements as per above, also noting the size of facility offers economies of scale given the parking rates used would apply to a single warehouse/ factory unit as well as larger facilities such as this one. Further, it is noted that both Council and Planning Panel supported adopting TfNSW rates in determining the DA.

For the purposes of this assessment, a likely split of 70 per cent warehouse tenants to 30 per cent light industrial tenants has been assumed for the units based on advice from EG that it will be more skewed towards warehouse.

Self-storage Facility

Self-storage facilities typically require less staff than traditional warehouse facilities, whilst users have access to the facility 24 hour/ seven days a week. These facilities do not have defined peak parking demand, with user arrivals dispersed across the day. In addition, such facilities are not a high traffic and parking generator as users typically leave their goods stored for extended periods of time without accessing. All of the above suggests that a more suitable car parking provision would be aligned with the TfNSW Guide rate for warehouse uses. Alternatively, a comparison of similar sites can be referenced.

In this regard, the parking provision for self-storage facilities have been sourced from the Aurecon *Self Storage Facility Traffic and Parking Study* 2009 and *SSAA Supplementary Australian Traffic and Parking Study* 2017, reproduced in Table 4.5. These recommended parking rates are based on surveys of a range of self-storage facilities.

Table 4.5: Recommended number of parking spaces per maximum leasable area

Size	Office Parking	Storage Parking	Staff Parking	Vehicle/ Trailer Parking	Total
0m^2-3,000m^2	1	2	2	1	**6**
3,000m^2-6,000m^2	2	5	2	1	**10**
6,000m^2-9,500m^2	3	5	2	1	**11**

The proposal includes a self-storage facility of 7,000m^2, therefore up to 11 parking spaces would be sufficient, including one space for vehicle/ trailer parking. It should also be noted that many self-storage facilities also have parking spaces within the tenancy area to allow the direct transfer of goods to internal lifts and the like.

Anticipated Parking Demand

The anticipated car parking demand is provided in Table 4.6 and suggests that the proposal could generate a demand of 226 spaces.

Table 4.6: Anticipated Parking Demand

Land Use	Adopted Parking Rate	Parking Requirement	Proposed Provision
Self-Storage	as per Table 4.5 (Aurecon, 2009)	11 spaces	**279 spaces**
Warehouse (70% of units)	Warehouse - 1 space per 300 sqm (TfNSW Rate) Mezzanine Office - 1 space per 40 sqm (Warringah DCP rate)	68 spaces (36 + 32 spaces)	
Industry (30% of units)	1.3 spaces per 100 sqm (incl. mezzanine office, Warringah DCP rate)	68	
Office	1 space per 40 sqm (Warringah DCP rate)	79	
Café	*Ancillary to overall development (infrequent external trips expected)*		
Total		**226 spaces**	

Note: total parking requirement subject to rounding of requirements for each land use

4.2.4. Adequacy of Car Parking Supply

The most appropriate approach to understanding anticipated demand generated by the proposal is to consider a mix of warehouse and light industrial (factory) tenants. Adopting the higher Warringah DCP 2011 or solely adopting the TfNSW Guide factory parking rates is an over-estimation of parking requirements given the local leasing market, number of tenancies and size of the facility.

The adopted parking rate for self-storage is considered appropriate, based on comparison to similar sites and industry guidance.

The expected parking demand generated by the proposal (226 spaces) can be accommodated by the proposed supply (279 spaces). The balance of warehouse and light industrial/ factory uses will influence the demand, which could range between 188 spaces and 316 spaces when considering the relevant rates in the TfNSW Guide. However, as noted above, it is unlikely that parking requirements will be skewed to either end of the range at a given point in time.

As previously mentioned, the café is expected to be ancillary to the site and surrounding area (i.e. school, sports fields and other industrial uses), with a predominant walk-up catchment. As such, it is not expected to be a vehicle trip destination in itself.

The site has some 400 metres of frontages along South Creek Road and Inman Road. Discounting locations of proposed vehicle accesses, there is opportunity to park up to 40 vehicles directly adjacent to these site frontages. Site observations suggests that 21 spaces were occupied along the site frontages.

It is generally considered acceptable for a development to rely on 50 to 60 per cent of the available site frontage(s) to accommodate parking demand, which promotes on-street activation and traffic calming.

Therefore and notwithstanding the anticipated tenant mix (70% warehouse/ 30% light industrial), the proposed off-street provision of 279 spaces can accommodate a mix of up to 15% warehouse/ 85% light industrial tenants (~297 spaces) on the basis that on-street parking would be made available along the site frontage (40 spaces). It would be reasonable for this additional demand to use on-street parking noting the high parking availability along the site frontages since the closure of the previous on-site use and limited parking demand from other nearby uses (school and sports fields having different peaks).

4.3. Site Layout Review

The site layout has been reviewed against the requirements of the Australian Standard for Off Street Parking Facilities (AS/NZS2890.1:2004, AS2890.2:2002 and AS/NZS2890.6:2009). This assessment included a review of the following:

- bay and aisle width
- adjacent structures
- circulation roads and ramps
- ramp grades
- height clearances
- internal queuing
- parking for persons with disabilities.

Details of this review are provided below. This review indicates that the proposed site layout is expected to operate satisfactorily, subject to the adoption of recommendations discussed below and shown graphically at Appendix C.

The proposed car parking spaces will be designed as a User Class 2 facility with each space to be a minimum 2.5m wide and 5.4m long, with adjacent 5.8m wide aisles. Car parking spaces for people with disabilities will be designed as a User Class 4 facility with each a minimum 2.4m wide and 5.4m long, with a shared area 2.4m wide and 5.4m long on one side of the dedicated space, that includes a centrally located bollard.

It is recommended that the outer circulation aisles within the basement car park are one-way (either clockwise or counter-clockwise) with give-way control for the exiting aisle leading up to the ramp.

The site access driveways are designed to accommodate entry and/or exit movements for the largest design vehicle requiring access. Swept paths have been completed and show that vehicles up to and including Australian Standard 20-metre-long articulated vehicles can enter and exit the site in a forward direction.

5. TRAFFIC ASSESSMENT

05

5.1. Traffic Generation

Traffic generation estimates for the proposed development have been sourced from the Roads and Maritime Guide to Traffic Generating Developments 2002 (the Guide) and Technical Direction: Updated Traffic Surveys (TDT 2013/ 04a).

5.1.1. Existing Development

The existing site is currently unoccupied and therefore, not generating any traffic. The peak hour traffic volume estimates for the previous uses are set out in Table 5.1.

Table 5.1: Existing Use - Traffic generation estimates

Use	Size	Traffic generation rate (trips / hour)		Traffic generation estimates (trips / hour)	
		AM	PM	AM	PM
Warehouse	13,444sq.m	0.52 trips per 100sq.m	0.56 trips per 100sq.m	70	75
Office	11,407sq.m	2 trips per 100sq.m	2 trips per 100sq.m	228	228
Total				**298**	**303**

Table 5.1 indicates that the previous use on the site could have generated approximately 300 vehicle trips in any peak hour.

5.1.2. Proposed Development

The peak hour traffic volume estimates of the proposed use are set out in Table 5.2.

Table 5.2: Proposed Use - Traffic generation estimates

Use	Size	Traffic generation rate (trips / hour)		Traffic generation estimates (trips / hour)	
		AM	PM	AM	PM
Warehouse	15,505sq.m	0.52 trips per 100sq.m	0.56 trips per 100sq.m	81	87
Self-Storage	7,000sq.m	0.1 trip per 100sq.m	0.2 trips per 100sq.m	7	14
Mezzanine	1,850sq.m	0.52 trips per 100sq.m	0.56 trips per 100sq.m	10	10
Office	3,179sq.m	2 trips per 100sq.m	2 trips per 100sq.m	64	64
Café	124sq.m	5 trips per 10sq.m	5 trips per 100sq.m	6	6
Total				**168**	**181**

Table 5.2 indicates that the site could potentially generate 168 and 181 vehicle trips in the AM and PM peak hours respectively.

5.1.3. Summary

Whilst the previous use had similar overall GFA to the proposal, there was a higher proportion of office space. As a result, the proposal is expected to generate approximately 130 vehicles less during the peak hours, or at least 40 per cent less traffic compared with previous site operations.

Notwithstanding, the impact of the proposal on the surrounding road network has been reviewed in subsequent sections.

5.2. Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposal have been estimated based on a number of factors, including the:

- configuration of the arterial road network in the immediate vicinity of the site
- existing operation of intersections providing access between the local and arterial road network
- distribution of households in the vicinity of the site
- likely distribution of employee's residences in relation to the site
- configuration of access points to the site.

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) for the proposal has been assessed as 80 percent entering and 20 per cent exiting during the AM with 30 per cent entering and 70 per cent exiting in the PM.

5.3. Traffic Impact

The study intersections have been reassessed to include traffic associated with the proposed development, with the SIDRA modelling results summarised in Table 5.3, with full results presented in Appendix B.

Table 5.3: Existing and development operating conditions

Intersection	Peak	Leg	Existing Level of Service (LOS)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Pittwater Road/ South Creek Road	AM	East	A	0.85	16	343	B
		North	E	0.81	60	127	E
		West	B	0.74	19	245	B
		Overall	**B**	**0.85**	**23**	**343**	**B**
	PM	East	A	0.61	11	100	A
		North	D	0.71	52	92	D
		West	A	0.78	14	203	A
		Overall	**A**	**0.78**	**17**	**203**	**B**
South Creek Road/ Inman Road	AM	East	A	0.23	6	9	A
		North	A	0.13	8	4	A
		West	A	0.11	5	0	A
	PM	East	A	0.18	6	5	A
		North	A	0.22	9	6	A
		West	A	0.14	6	0	A

Table 5.3 indicates the proposed development would not affect the existing LoS for any movement such that it drops below an acceptable LoS D (note: South Creek Road is already LoS E in the AM peak under existing conditions).

The 95th percentile queuing from Pittwater Road into South Creek Road in the right turn bay is expected to increase marginally from 59 to 66 metres (one vehicle) and is therefore at the limit of the right turn bay and taper. Given this is an infrequent occurrence (statistically less than twice in the PM peak hour), GTA does not consider that this warrants mitigation. It is also noted that the filtered right turn allows at least the first vehicle to store in front of the stop line during the phase. This marginal increase in queue length is also within the tolerance/ accuracy of the intersection modelling, traffic generation estimates and traffic distribution.

On this basis, the anticipated traffic volumes associated with the proposal could not be expected to compromise the safety or function of the surrounding road network.

6. CONCLUSION

06

CONCLUSION

Based on the analysis and discussions presented within this report, the following conclusions are made:

1. The proposal incorporates 11 warehouse units with mezzanine offices, a further five office tenancies, a self-storage facility and a café. The overall gross floor area is similar to the existing on-site facilities, however with a lower proportion of office space.
2. Whilst the proposal generates a Warringah DCP 2011 car parking requirement of 411 spaces (as the DCP has a single rate for industrial and warehouse uses), an assessment based on likely tenants, Roads and Maritime Services *Guide to Traffic Generating Developments* 2002 and other industry guidance suggests that proposal would generate an expected parking demand of 226 spaces.
3. The proposed supply of 279 spaces is considered appropriate and will be able to accommodate the expected parking demand of 226 spaces.
4. Notwithstanding this, some use of available on-street parking along the site frontages is reasonable, to promote on-street activation and traffic calming, noting the high parking availability since the closure of the previous on-site use and limited parking demand from other nearby uses (school and sports fields having different peaks).
5. The proposed site layout is generally consistent with the dimensional requirements as set out Australian Standard for Off Street Parking Facilities (AS/NZS2890.1:2004, AS2890.2:2002 and AS/NZS2890.6:2009).
6. The proposed hardstand area has been designed to accommodate vehicles up to Australian Standard 20-metre-long articulated vehicles.
7. It is recommended that the proposal provides at least 44 bicycle spaces for use by staff and/ or visitors across the tenancies with end of trip facilities in accordance with DCP 2011.
8. The proposal is expected to generate up to 168 and 181 vehicle movements in the AM and PM peak hours respectively, which is at least 40 per cent less vehicles than estimated for the previous site uses.
9. Intersection analysis suggests that the surrounding intersections would continue to operate satisfactorily during the road network peak periods post development and the anticipated traffic volumes associated with the proposal could not be expected to compromise the safety or function of the surrounding road network.

A.SURVEY RESULTS

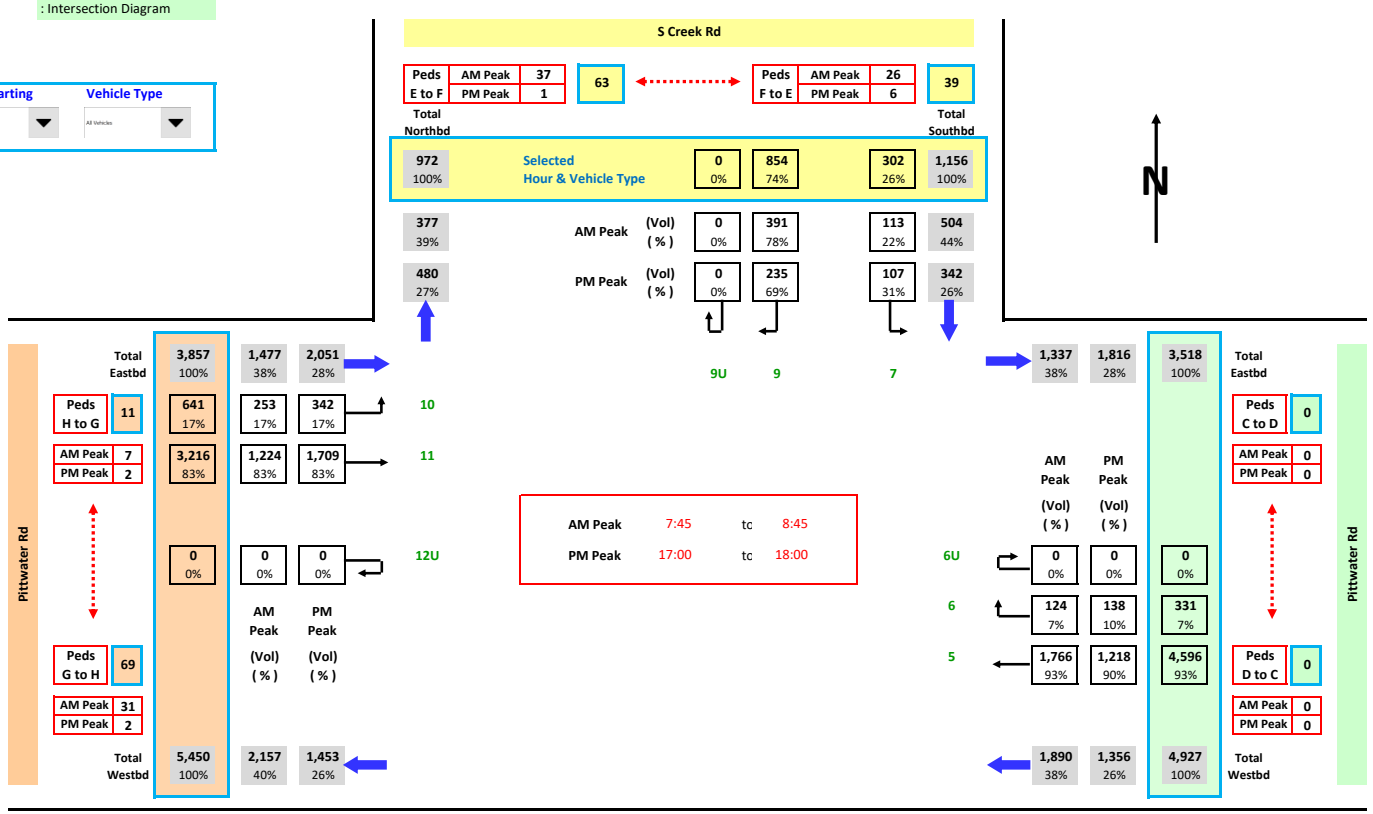
A

Job No. : N5364
Client : GTA
Suburb : Cromer
Location : 1. Pittwater Rd / S Creek Rd

Day/Date : Wed, 16th October 2019
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting AM Totals **Vehicle Type** All Vehicles

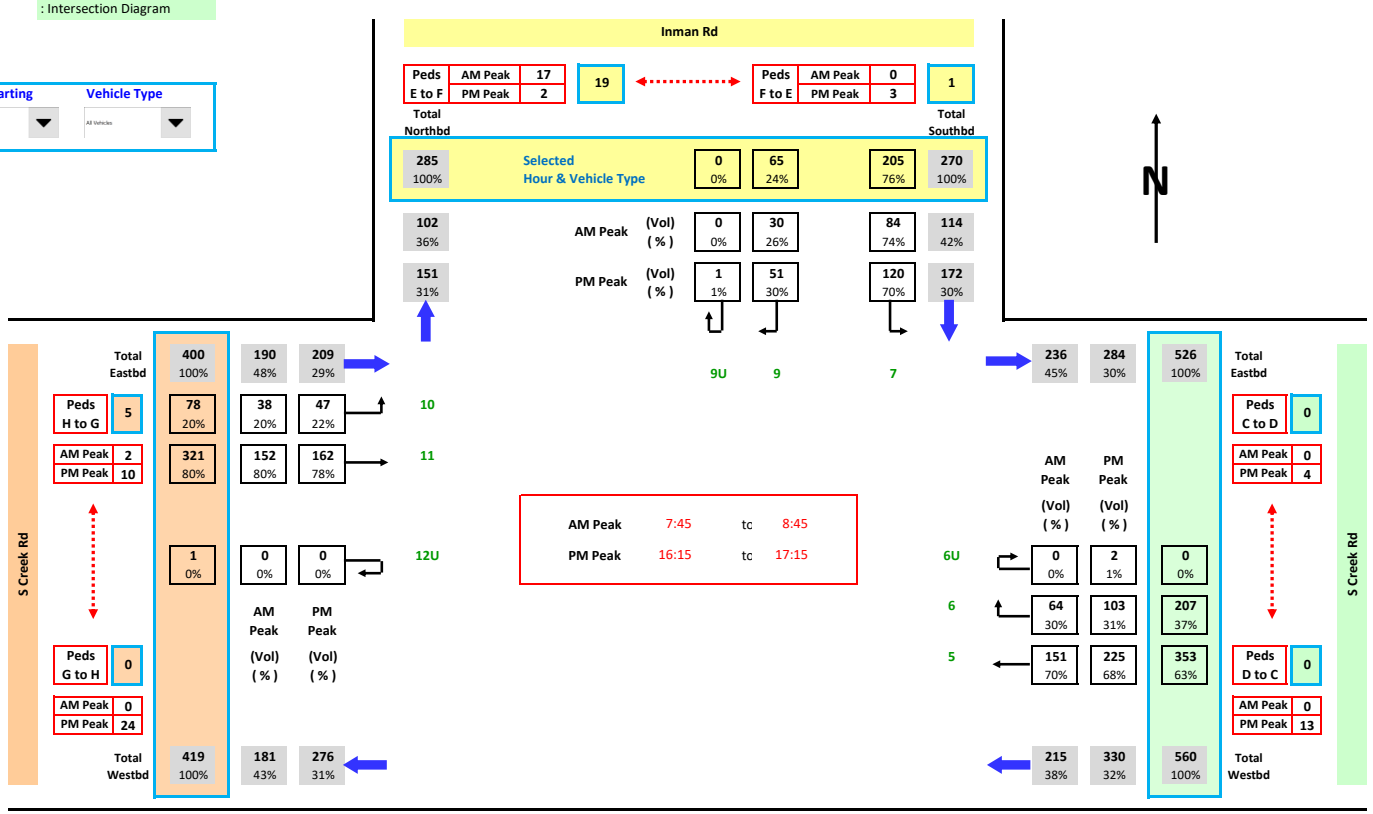


Job No. : N5364
Client : GTA
Suburb : Cromer
Location : 2. S Creek Rd / Inman Rd

Day/Date : Wed, 16th October 2019
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting AM Totals **Vehicle Type** All Vehicles



B.SIDRA RESULTS

B

USER REPORT FOR SITE

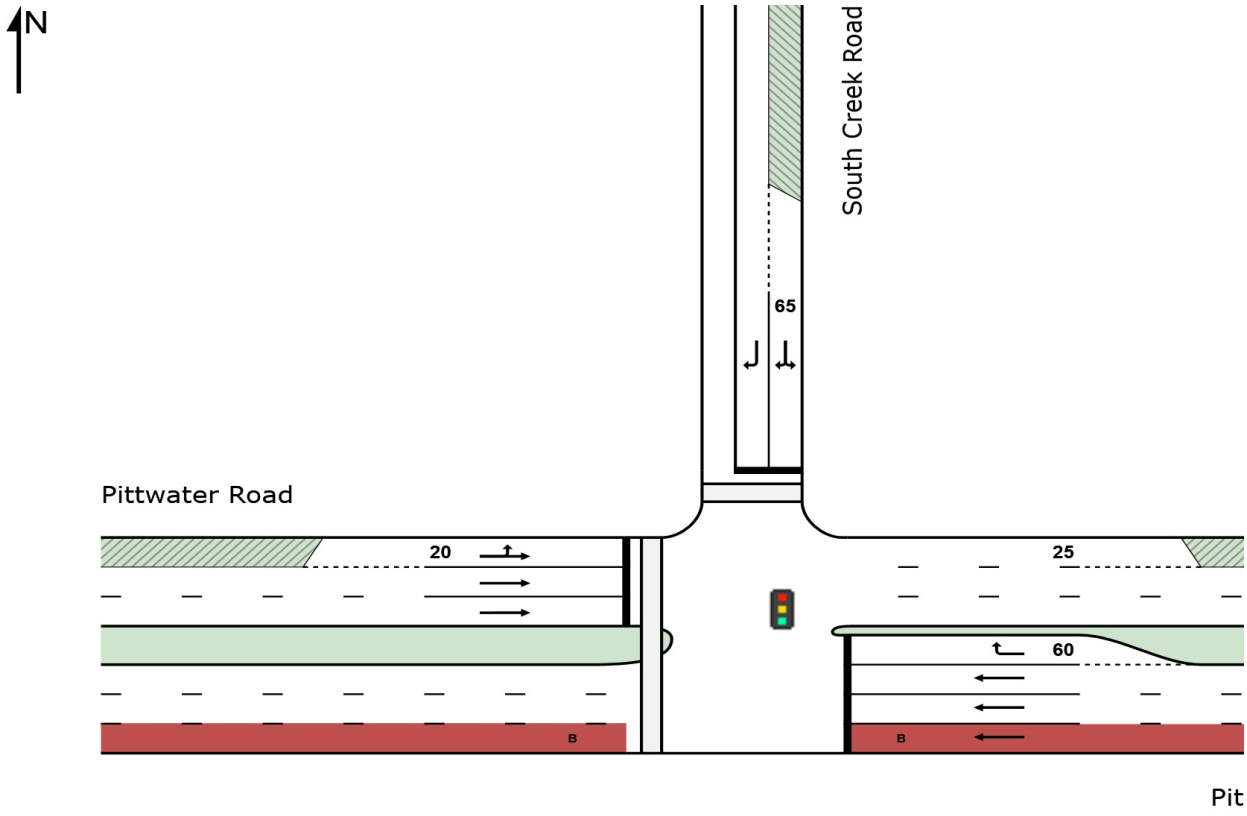
Project: 201008sid-N135572 100 South Creek Road, Cromer | **Template: Default Site User Report**

Site: [1 Pittwater Road/ South Creek Road - Ex AM]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout

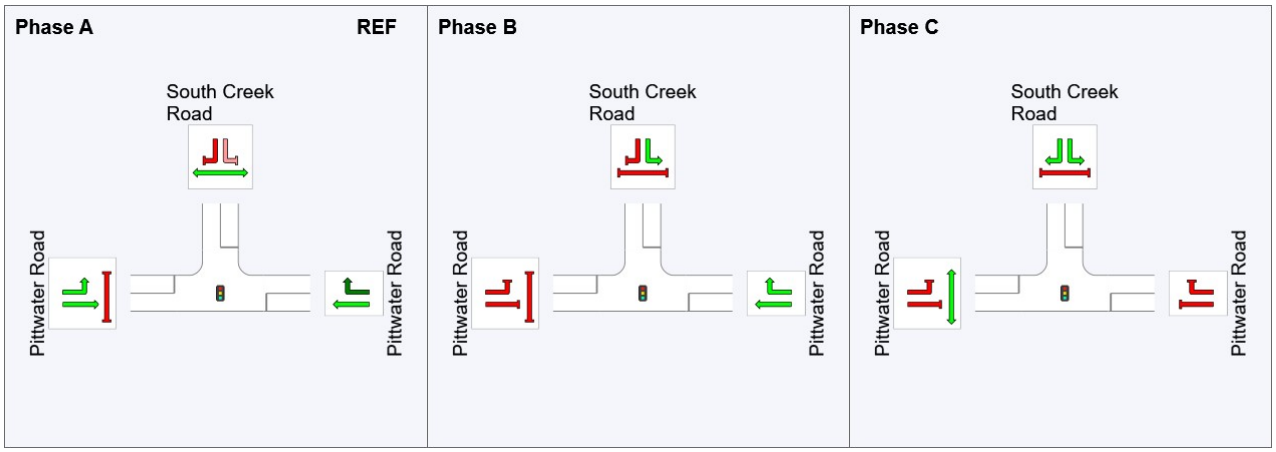


Movement Performance - Vehicles

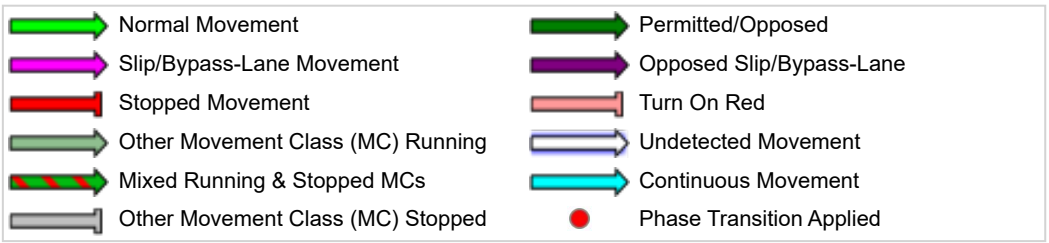
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1859	4.2	0.822	11.7	LOS A	44.8	319.1	0.63	0.60	0.65	49.8
6	R2	131	9.7	0.449	37.7	LOS C	6.0	45.8	0.81	0.83	0.87	34.8
Approach		1989	4.6	0.822	13.4	LOS A	44.8	319.1	0.64	0.61	0.66	48.3
North: South Creek Road												
7	L2	119	18.6	0.798	59.5	LOS E	15.7	119.3	1.00	0.99	1.47	28.4
9	R2	412	3.1	0.798	60.2	LOS E	15.7	119.3	1.00	0.94	1.27	27.4
Approach		531	6.5	0.798	60.0	LOS E	15.7	119.3	1.00	0.95	1.31	27.6
West: Pittwater Road												
10	L2	266	8.7	0.576	19.0	LOS B	8.6	68.0	0.56	0.68	0.56	41.5
11	T1	1288	5.1	0.703	18.4	LOS B	31.5	227.5	0.72	0.65	0.72	45.3
Approach		1555	5.7	0.703	18.4	LOS B	31.5	227.5	0.69	0.66	0.69	44.6
All Vehicles		4075	5.2	0.822	21.4	LOS B	44.8	319.1	0.71	0.67	0.76	42.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	74	93
Green Time (sec)	68	13	21
Phase Time (sec)	74	19	27
Phase Split	62%	16%	23%

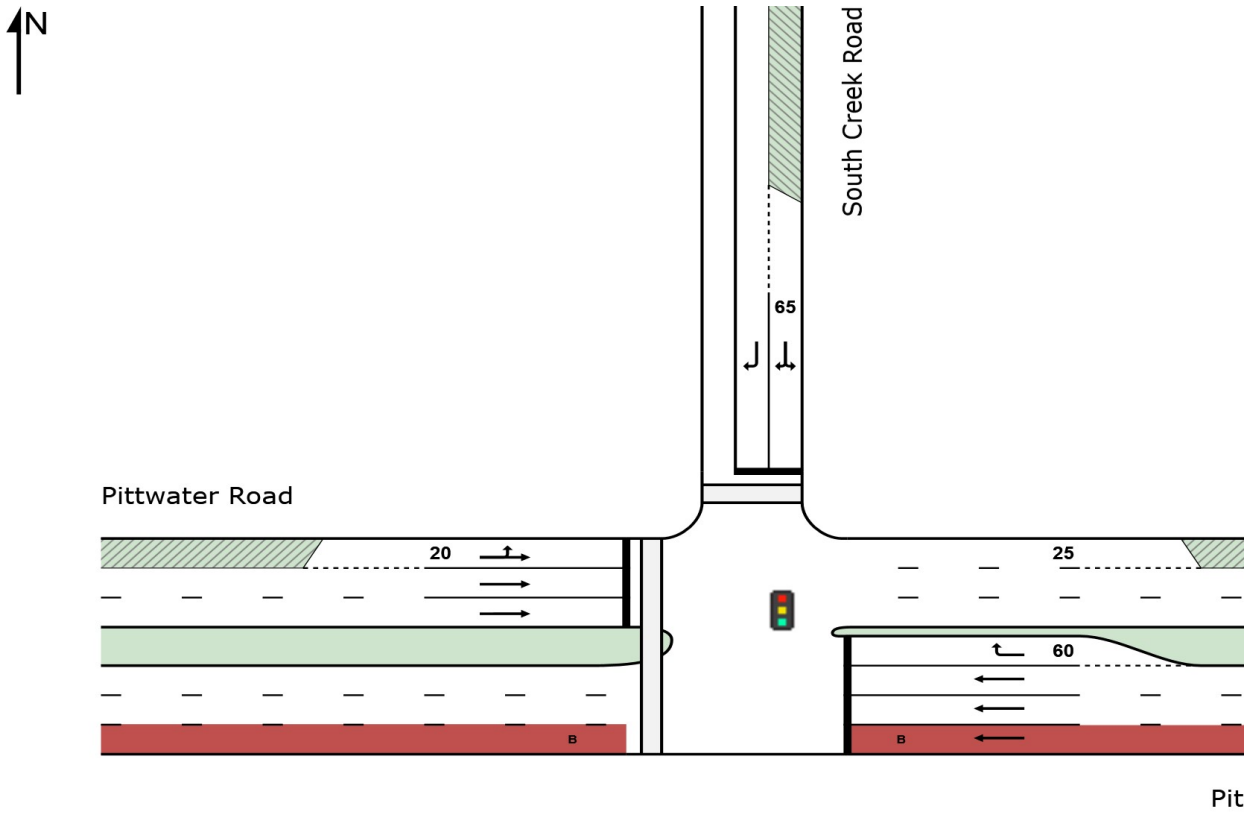
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Site: [1 Pittwater Road/ South Creek Road - Dev AM - fixed Ex phase times]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout

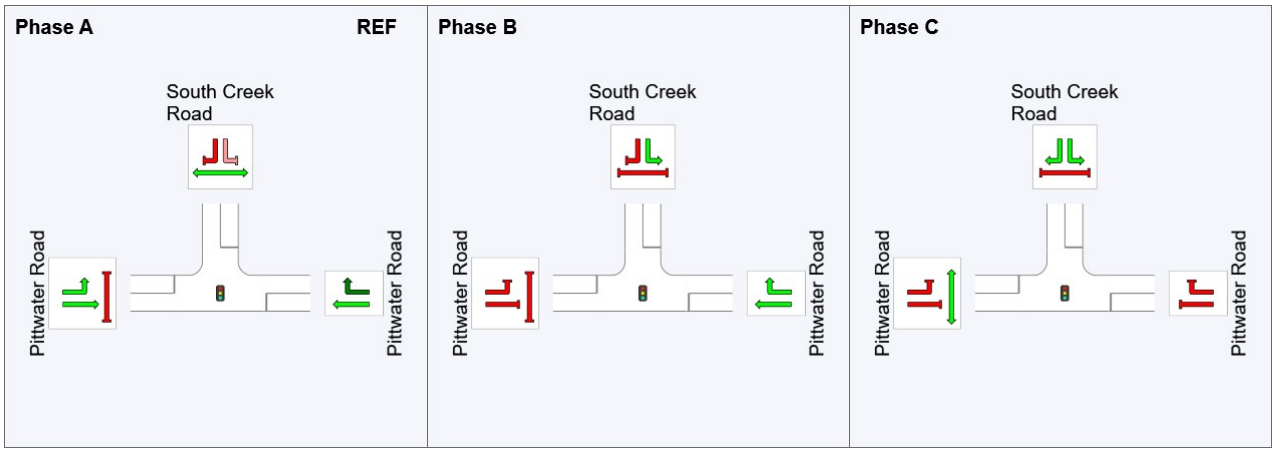


Movement Performance - Vehicles

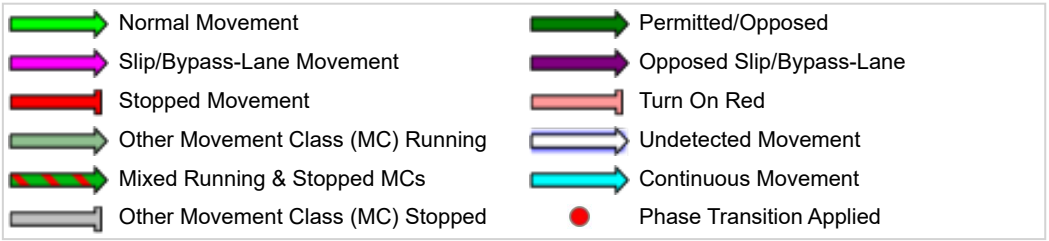
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1859	4.2	0.846	13.6	LOS A	48.2	343.1	0.65	0.63	0.68	48.5
6	R2	169	8.7	0.596	46.2	LOS D	8.3	62.8	0.88	0.93	1.16	32.2
Approach		2028	4.6	0.846	16.3	LOS B	48.2	343.1	0.67	0.66	0.72	46.4
North: South Creek Road												
7	L2	129	17.9	0.807	59.9	LOS E	16.8	127.1	1.00	1.00	1.50	28.3
9	R2	432	3.4	0.807	60.3	LOS E	16.8	127.1	1.00	0.95	1.28	27.3
Approach		561	6.8	0.807	60.2	LOS E	16.8	127.1	1.00	0.96	1.33	27.6
West: Pittwater Road												
10	L2	348	9.4	0.696	19.9	LOS B	11.8	92.4	0.59	0.71	0.59	40.9
11	T1	1288	5.1	0.734	18.7	LOS B	33.9	244.7	0.73	0.67	0.73	45.1
Approach		1637	6.0	0.734	18.9	LOS B	33.9	244.7	0.70	0.68	0.70	44.1
All Vehicles		4226	5.4	0.846	23.2	LOS B	48.2	343.1	0.73	0.70	0.80	41.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	73	92
Green Time (sec)	68	13	22
Phase Time (sec)	74	19	27
Phase Split	62%	16%	23%

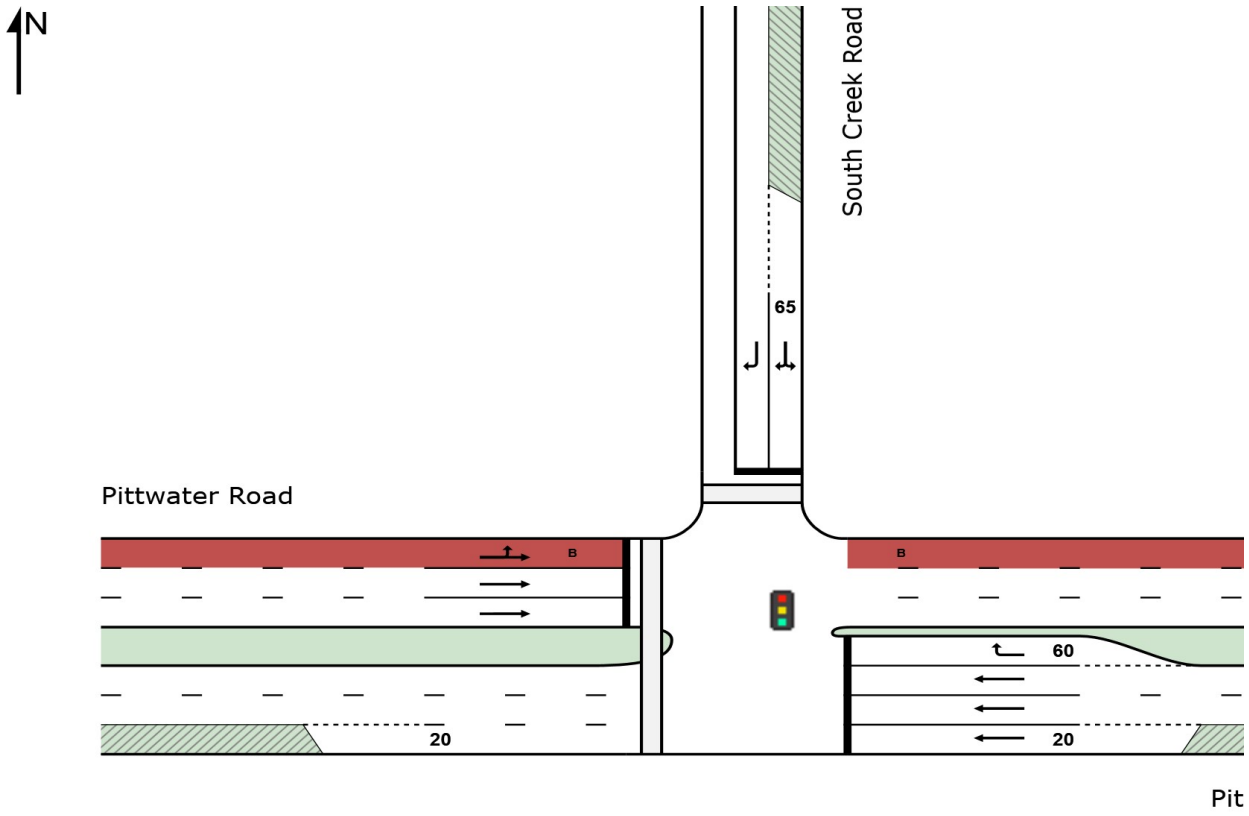
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Site: [1 Pittwater Road/ South Creek Road - Ex PM]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout

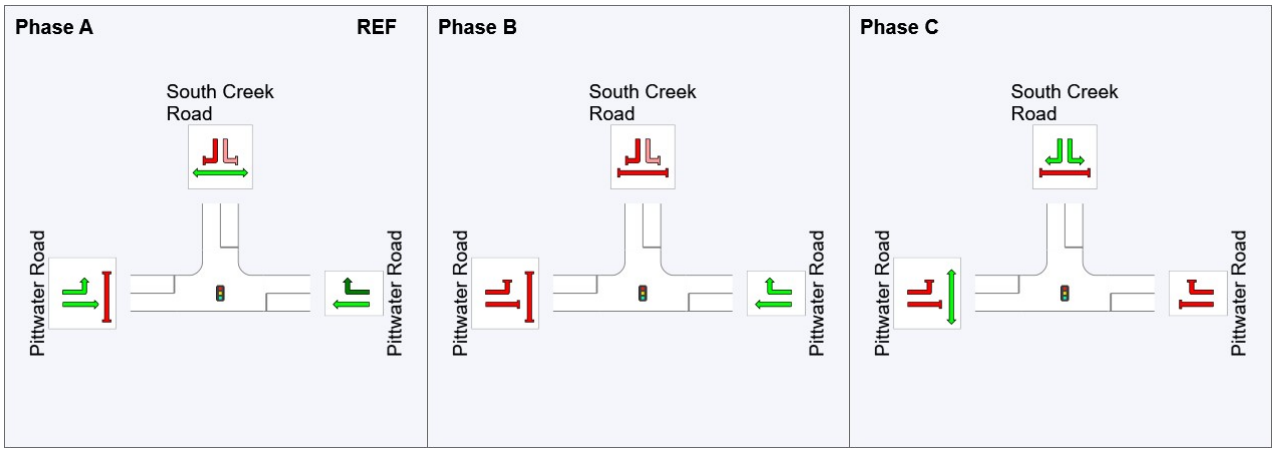


Movement Performance - Vehicles

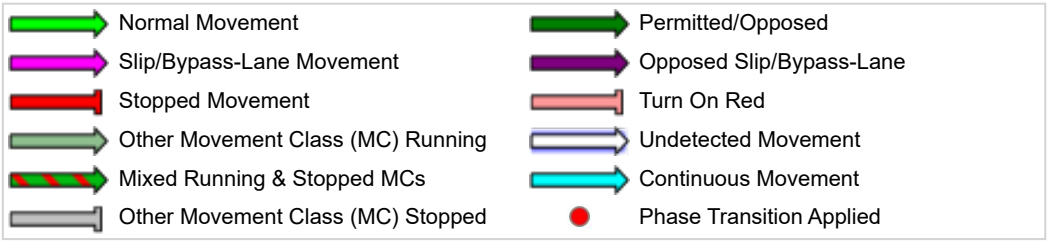
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1282	3.4	0.440	6.3	LOS A	14.1	99.6	0.40	0.36	0.40	54.0
6	R2	145	2.2	0.547	47.5	LOS D	8.2	58.8	0.99	0.95	1.27	31.9
Approach		1427	3.3	0.547	10.5	LOS A	14.1	99.6	0.46	0.42	0.49	50.2
North: South Creek Road												
7	L2	113	0.9	0.551	41.7	LOS C	7.9	55.8	0.96	0.86	1.12	35.0
9	R2	247	2.1	0.551	51.4	LOS D	9.2	65.7	0.96	0.83	1.02	31.1
Approach		360	1.8	0.551	48.3	LOS D	9.2	65.7	0.96	0.84	1.05	32.3
West: Pittwater Road												
10	L2	360	1.5	0.392	19.3	LOS B	11.9	91.4	0.56	0.70	0.56	44.1
11	T1	1799	3.3	0.779	12.5	LOS A	28.7	202.5	0.61	0.57	0.61	49.2
Approach		2159	3.0	0.779	13.5	LOS A	28.7	202.5	0.60	0.59	0.60	48.2
All Vehicles		3946	3.0	0.779	15.7	LOS B	28.7	202.5	0.59	0.55	0.60	46.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	76	94
Green Time (sec)	70	12	20
Phase Time (sec)	76	18	26
Phase Split	63%	15%	22%

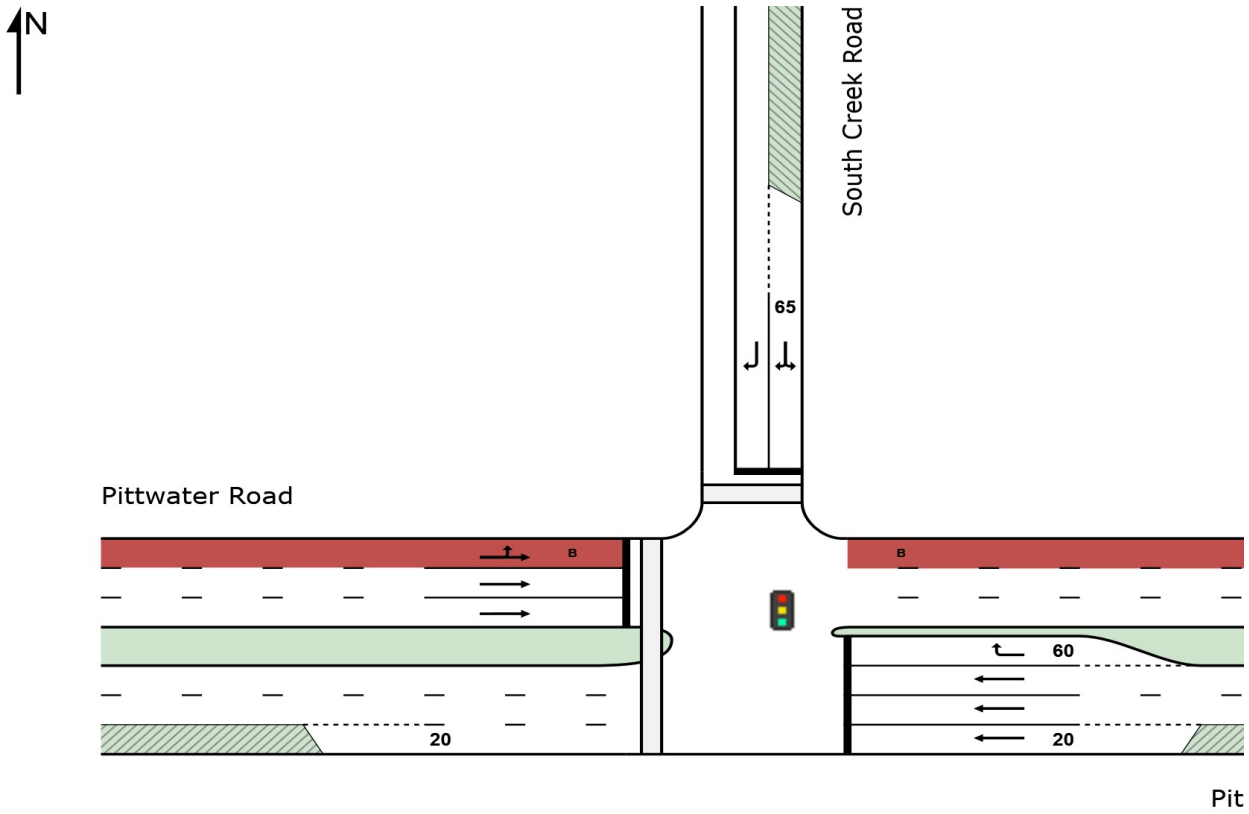
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Site: [1 Pittwater Road/ South Creek Road - Dev PM - fixed Ex phase times]

Site Category: -
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout

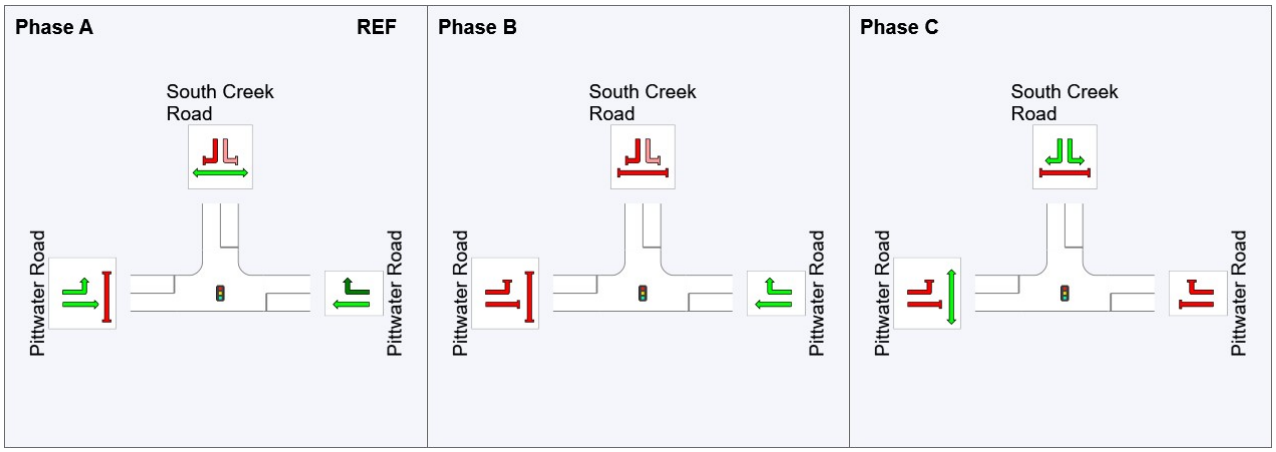


Movement Performance - Vehicles

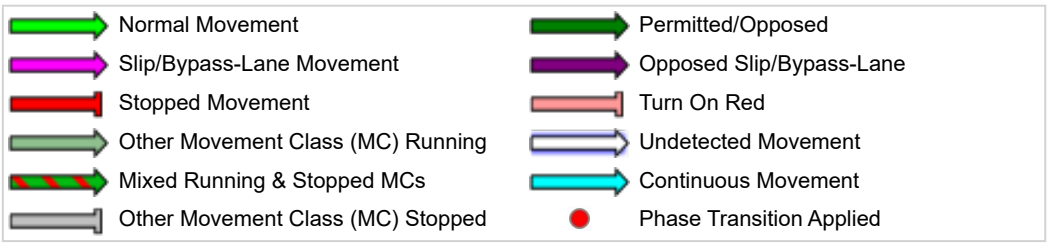
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Pittwater Road												
5	T1	1282	3.4	0.440	6.3	LOS A	14.1	99.6	0.40	0.36	0.40	54.0
6	R2	161	2.6	0.610	50.1	LOS D	9.2	65.7	1.00	0.98	1.34	31.2
Approach		1443	3.4	0.610	11.2	LOS A	14.1	99.6	0.47	0.43	0.51	49.7
North: South Creek Road												
7	L2	149	2.1	0.702	47.0	LOS D	11.8	84.7	0.99	0.91	1.24	33.3
9	R2	325	4.2	0.702	54.3	LOS D	12.7	91.7	0.99	0.87	1.10	30.3
Approach		475	3.5	0.702	52.0	LOS D	12.7	91.7	0.99	0.88	1.14	31.2
West: Pittwater Road												
10	L2	393	2.1	0.424	19.7	LOS B	13.3	101.7	0.57	0.72	0.57	43.9
11	T1	1799	3.3	0.779	12.5	LOS A	28.7	202.5	0.61	0.57	0.61	49.1
Approach		2192	3.1	0.779	13.7	LOS A	28.7	202.5	0.61	0.60	0.61	48.1
All Vehicles		4109	3.2	0.779	17.3	LOS B	28.7	202.5	0.60	0.57	0.63	45.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

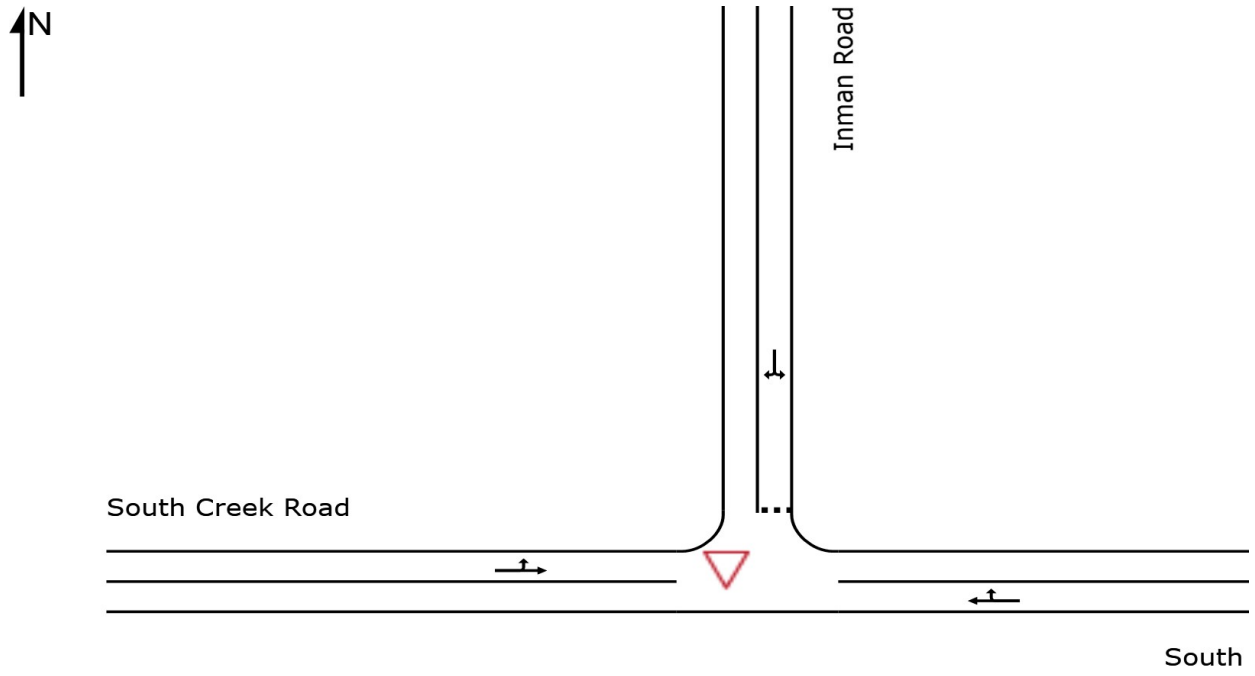
Phase	A	B	C
Phase Change Time (sec)	0	75	93
Green Time (sec)	70	12	21
Phase Time (sec)	76	18	26
Phase Split	63%	15%	22%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Site: [2 Inman Road/ South Creek Road - Ex AM]

Site Category: -
Giveway / Yield (Two-Way)

Site Layout



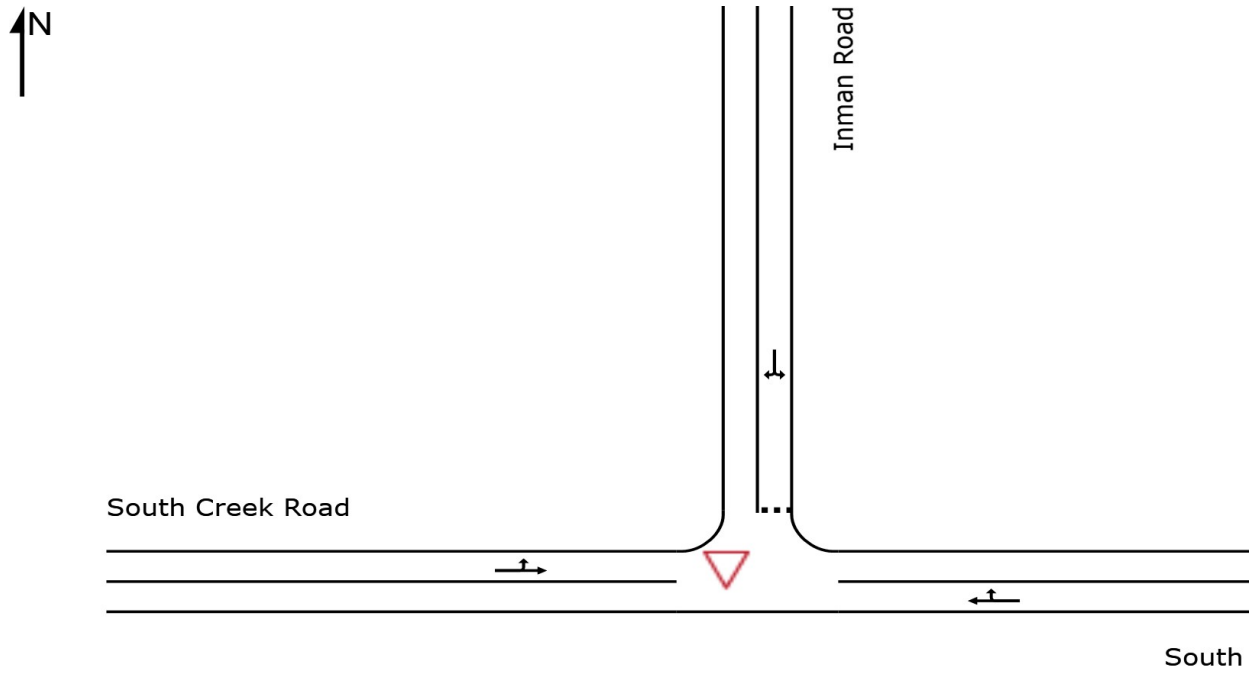
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: South Creek Road												
5	T1	159	6.6	0.135	0.4	LOS A	0.5	3.6	0.22	0.17	0.22	48.2
6	R2	67	10.9	0.135	5.5	LOS A	0.5	3.6	0.22	0.17	0.22	46.2
Approach		226	7.9	0.135	1.9	NA	0.5	3.6	0.22	0.17	0.22	47.7
North: Inman Road												
7	L2	88	15.5	0.107	5.3	LOS A	0.4	3.2	0.29	0.56	0.29	43.7
9	R2	32	10.0	0.107	6.7	LOS A	0.4	3.2	0.29	0.56	0.29	43.9
Approach		120	14.0	0.107	5.7	LOS A	0.4	3.2	0.29	0.56	0.29	43.7
West: South Creek Road												
10	L2	40	5.3	0.110	4.6	LOS A	0.0	0.0	0.00	0.11	0.00	48.4
11	T1	160	10.5	0.110	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	49.2
Approach		200	9.5	0.110	0.9	NA	0.0	0.0	0.00	0.11	0.00	49.0
All Vehicles		546	9.8	0.135	2.4	NA	0.5	3.6	0.15	0.23	0.15	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
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.

Site: [2 Inman Road/ South Creek Road - Dev AM]

Site Category: -
Giveway / Yield (Two-Way)

Site Layout



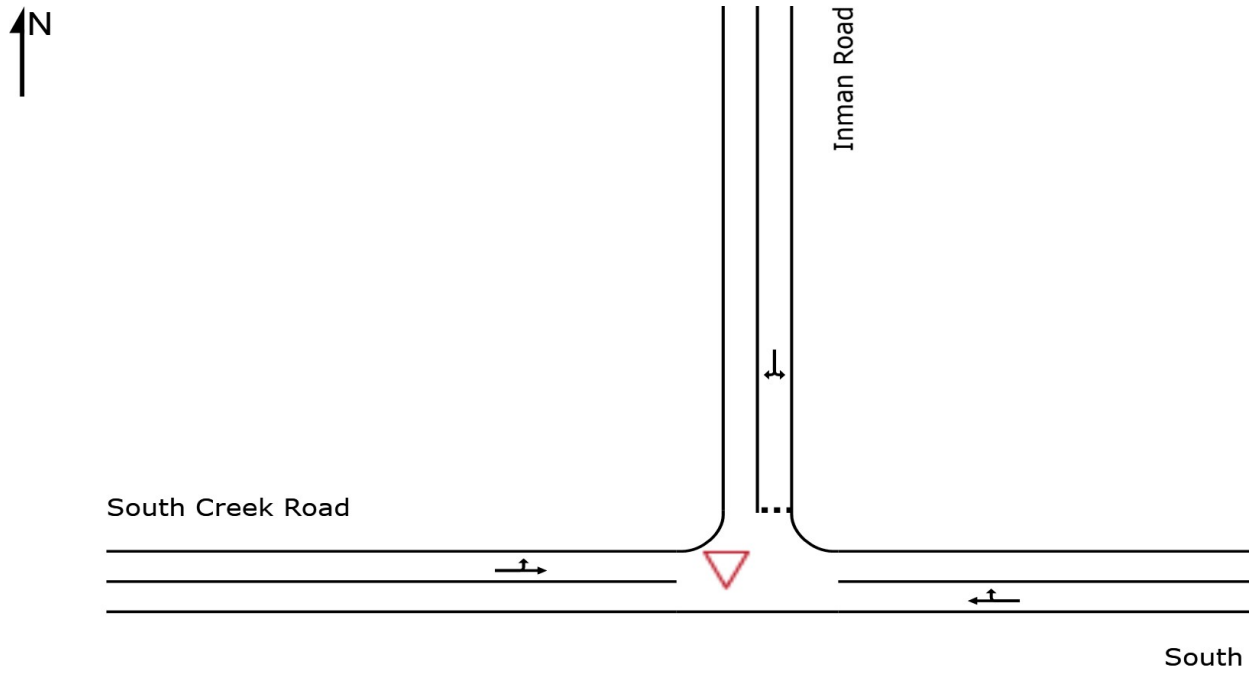
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: South Creek Road												
5	T1	159	6.6	0.227	0.8	LOS A	1.2	9.0	0.35	0.32	0.35	47.0
6	R2	193	10.4	0.227	5.6	LOS A	1.2	9.0	0.35	0.32	0.35	44.8
Approach		352	8.7	0.227	3.4	NA	1.2	9.0	0.35	0.32	0.35	45.9
North: Inman Road												
7	L2	108	12.6	0.129	5.3	LOS A	0.5	3.9	0.29	0.57	0.29	43.7
9	R2	33	9.7	0.129	7.8	LOS A	0.5	3.9	0.29	0.57	0.29	43.9
Approach		141	11.9	0.129	5.9	LOS A	0.5	3.9	0.29	0.57	0.29	43.7
West: South Creek Road												
10	L2	46	4.5	0.113	4.6	LOS A	0.0	0.0	0.00	0.12	0.00	48.3
11	T1	160	10.5	0.113	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	49.1
Approach		206	9.2	0.113	1.0	NA	0.0	0.0	0.00	0.12	0.00	48.9
All Vehicles		699	9.5	0.227	3.2	NA	1.2	9.0	0.23	0.31	0.23	46.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
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.

Site: [2 Inman Road/ South Creek Road - Ex PM]

Site Category: -
Giveway / Yield (Two-Way)

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
East: South Creek Road												
5	T1	213	2.0	0.171	0.5	LOS A	0.6	4.5	0.24	0.15	0.24	48.4
6	R2	73	14.5	0.171	5.9	LOS A	0.6	4.5	0.24	0.15	0.24	46.3
Approach		285	5.2	0.171	1.9	NA	0.6	4.5	0.24	0.15	0.24	47.9
North: Inman Road												
7	L2	101	2.1	0.157	6.3	LOS A	0.6	4.3	0.35	0.64	0.35	49.0
9	R2	62	3.4	0.157	8.2	LOS A	0.6	4.3	0.35	0.64	0.35	49.4
Approach		163	2.6	0.157	7.0	LOS A	0.6	4.3	0.35	0.64	0.35	49.2
West: South Creek Road												
10	L2	58	0.0	0.140	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	56.3
11	T1	211	1.5	0.140	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	58.5
Approach		268	1.2	0.140	1.2	NA	0.0	0.0	0.00	0.13	0.00	58.1
All Vehicles		717	3.1	0.171	2.8	NA	0.6	4.5	0.17	0.25	0.17	51.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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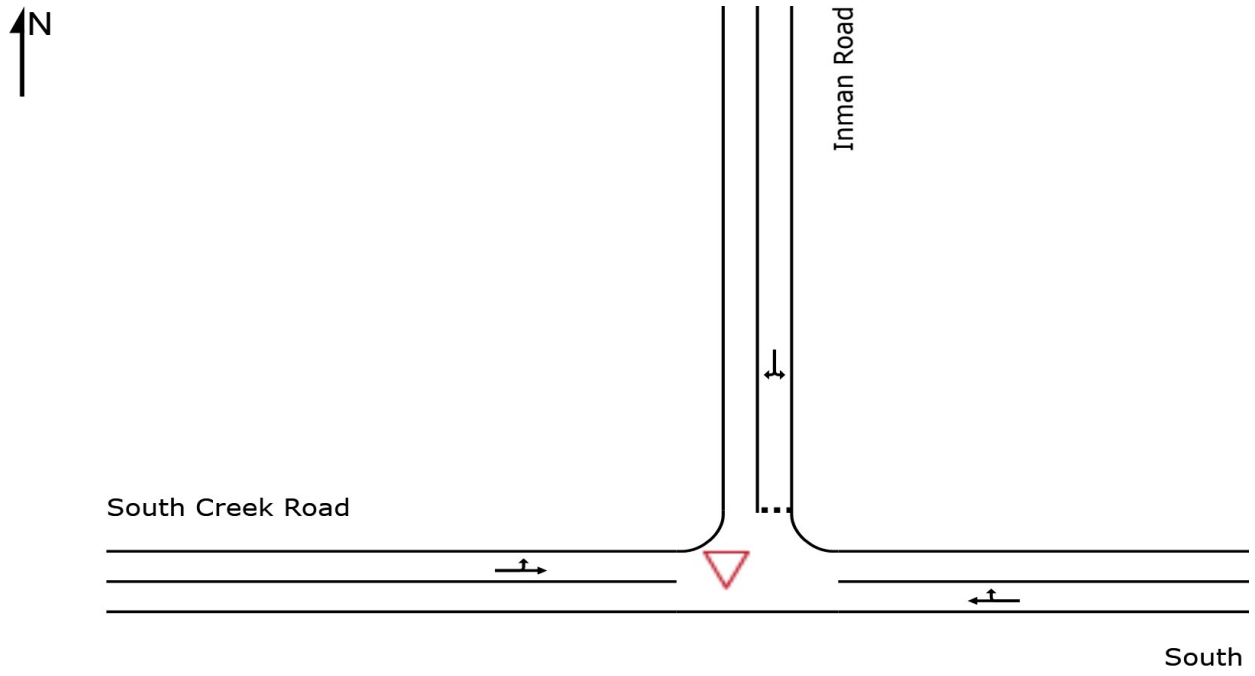
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: [2 Inman Road/ South Creek Road - Dev PM]

Site Category: -
Giveway / Yield (Two-Way)

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
East: South Creek Road												
5	T1	215	2.0	0.180	0.6	LOS A	0.7	5.1	0.25	0.15	0.25	48.3
6	R2	79	18.7	0.180	6.0	LOS A	0.7	5.1	0.25	0.15	0.25	46.1
Approach		294	6.5	0.180	2.0	NA	0.7	5.1	0.25	0.15	0.25	47.8
North: Inman Road												
7	L2	177	1.2	0.220	6.3	LOS A	0.9	6.4	0.35	0.63	0.35	49.1
9	R2	66	3.2	0.220	8.5	LOS A	0.9	6.4	0.35	0.63	0.35	49.5
Approach		243	1.7	0.220	6.9	LOS A	0.9	6.4	0.35	0.63	0.35	49.2
West: South Creek Road												
10	L2	60	0.0	0.141	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	56.3
11	T1	211	1.5	0.141	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	58.5
Approach		271	1.2	0.141	1.2	NA	0.0	0.0	0.00	0.13	0.00	58.0
All Vehicles		807	3.3	0.220	3.2	NA	0.9	6.4	0.20	0.29	0.20	51.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.

C. COMPLIANCE REVIEW AND SWEPT PATH ASSESSMENT

C

FUTURE DEVELOPMENT APPLICATION

FUTURE DEVELOPMENT APPLICATION

DRIVEWAY IS SUITABLE FOR ONE-WAY EXIT ONLY. NO APPROPRIATE PASSING OF ARTICULATED VEHICLES IS AVAILABLE, SEE SWEPT PATHS

TRUCK EXIT ONLY

RL12.760

RL13.550

PROPOSED LAYBACK TO ACCOMMODATE SWEPT PATH

WHEEL STOPS SHOULD BE LOCATED 0.9m FROM THE END OF SPACE WITH NO OR LOW KERB, OR 1.1m FROM A HIGH WALL FOR REAR IN PARKING. MEASURED TO THE POINT OF CONTACT WITH VEHICLE TYRE

RL14.175

RL16.675

RL17.300

CLARIFICATION OF GRADES/ RLS REQUIRED. GRADES CAN BE MADE TO COMPLY WITH AS2890.2:2018.
ENSURE 1:20 MAXIMUM GRADE IS PROVIDED FOR 10m PRIOR TO PROPERTY LINE ALONG BOTH KERBLINES AND CENTRELINE FOR AN ARTICULATED VEHICLE EXIT.

PROPOSED LAYBACK TO ACCOMMODATE SWEPT PATH

ENSURE 1:20 MAXIMUM GRADE IS PROVIDED FOR 6m PRIOR TO PROPERTY LINE ALONG BOTH KERBLINES AND CENTRELINE

INDICATIVE KERB LINE

INDICATIVE ROAD CENTRE LINE

INDICATIVE KERB LINE

PROPOSED LAYBACK TO ACCOMMODATE SWEPT PATH

DRIVEWAY IS SUITABLE FOR ONE-WAY ENTRY ONLY. NO APPROPRIATE PASSING OF ARTICULATED VEHICLES IS AVAILABLE, SEE SWEPT PATHS.

FOR ENTRY DRIVEWAY, ACCOMMODATING ARTICULATED VEHICLES, MAXIMUM CHANGE IN GRADE OF UP TO 1:16 ARE COMPLIANT. ENSURE A MAXIMUM GRADE OF 1:16 IS PROVIDED FROM PROPERTY LINE AND ALONG BOTH KERBLINES AND CENTRELINE.

ENSURE 1:20 MAXIMUM GRADE IS MAINTAINED FOR 6m PRIOR TO PROPERTY LINE ALONG BOTH KERBLINES AND CENTRELINE FOR A CAR EXIT

INMAN ROAD

SOUTH CREEK ROAD

BOUNDARY

BASE PLAN
DRAWING NO: S4.55-202, REVISION 1 BY SBA ARCHITECTS, DATED 12.10.2020

NOTES:
1. MINIMUM HEIGHT CLEARANCE OF 2.2m(TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE PARKING SPACES
2. MINIMUM HEIGHT CLEARANCE OF 2.5m (TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE DISABLED PARKING SPACES
3. TO COMPLY WITH AS2890.2-2002 A MINIMUM HEIGHT CLEARANCE (TO SERVICES AND STRUCTURE) OF 4.5m SHOULD BE PROVIDED ABOVE FOR LOADING DOCKS AND ACCESS ROADWAYS FOR SERVICE VEHICLES LONGER THAN 6.4m RIGID VEHICLES

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED R.ZHANG	DESIGN CHECK H.OBERMAIER
APPROVED BY B.MAYNARD	DATE ISSUED 19 OCTOBER 2020
SCALE A3	0 5 10 20 1:1000
CAD FILE NO. N135573-01-P3.DWG	

100 SOUTH CREEK ROAD, CROMER

GROUND LEVEL
CAR PARK COMPLIANCE REVIEW

DRAWING NO. N135573-01-01 SHEET 01 OF 06 ISSUE P3

POTENTIAL TRIP HAZARD. RECOMMEND REMOVING WHEEL STOPS BETWEEN BACK-TO-BACK CAR PARKING BAYS.

WHEEL STOPS SHOULD BE LOCATED 0.9m FROM THE END OF SPACE WITH NO OR LOW KERB, OR 1.1m FROM A HIGH WALL FOR REAR IN PARKING. MEASURED TO THE POINT OF CONTACT WITH VEHICLE TYRE

BICYCLE PARKING PROVIDED AS VERTICAL BICYCLE PARKING. A MINIMUM OF 20% OF GROUND LEVEL (HORIZONTAL) BICYCLE PARKING SHOULD BE PROVIDED, IN ACCORDANCE WITH AS2890.3:2015.

RECOMMEND RELOCATION OF BICYCLE ACCESS OUTSIDE OF CAR TRAVEL PATHS.
RECOMMEND PROVIDING WIDER DOOR TO ACCOMMODATE ACCESS FOR CYCLIST OR PEDESTRIAN PUSHING A BICYCLE. MINIMUM 1.5m FOR ONE-WAY OR 2.5m FOR TWO-WAY ACCESS PATH, IN ACCORDANCE WITH AS2890.3:2015 FIGURE 2.4.

SECURITY DOOR HAS BEEN SHOWN. HOW WILL IT BE OPERATED? (DURING AND AFTER HOURS)
VEHICULAR CONTROL POINTS (SIGNALS / BOOMGATES / INTERCOMS) SHOULD HAVE A MAXIMUM GRADE OF 1:20 FOR 6m PRIOR TO CONTROL POINT

PROPOSED 'GIVE WAY' LINE

RECOMMEND PROVIDING A MIRROR TO IMPROVE VISIBILITY

PROPOSED CIRCULATION

SECURITY DOOR HAS BEEN SHOWN. HOW WILL IT BE OPERATED? (DURING AND AFTER HOURS). HOW WILL VISITORS GAIN ACCESS?

PROVIDE A MAXIMUM GRADE OF 1:20 FOR AT LEAST 6.6m (RECOMMEND 7m TO COMPLY WITH CHANGE IN GRADE TRANSITION LENGTH) PRIOR TO PROPERTY LINE / PEDESTRIAN WALKWAY FOR A 12.5m LARGE RIGID VEHICLE EXIT
MAXIMUM CHANGE IN GRADE FOR UP TO A 12.5m RIGID VEHICLE SHOULD BE 1:16 OVER 7m TO A MAXIMUM GRADE OF 1:6.5 (eg from a grade of 1:16 the maximum grade of the next transition should be 1:8), FROM A GRADE OF 1:20 TO 1:8.9.

CREEK
RIPARIAN AREA
LANDSCAPED AREA
EXISTING FENCE
10 MTS SETBACK
6.5 MTS SETBACK
EXISTING HERITAGE LISTED COURTYARD RL.14.400
EXISTING HERITAGE BUILDING TO BE RETAINED
BUILDING 6
CARPARK (203) 5,520SQM
PREVIOUS BASEMENT WALL LOCATION
RL.14.200
EXISTING TOWER LOCATION
POTENTIAL PLANT ROOM LOCATION
FIRE HYDRANT TANK & SPRINKLER TANK
FIRE PUMP ROOM
SLIDING DOOR
RAMP 1:24
RAMP UP
TRUCKS ENTRY / EXIT SLIDING DOOR
RL.13.565
SELF STORAGE UNITS 3,920 SQM
RL.13.850
SELF STORAGE UNITS 3,080 SQM
RL.13.850
SELF STORAGE ENTRY / EXIT
RSD
ENTRY
EXIT
RAMP 1:11
1:20
RL.12.700
STAFF PARKING MOTORCYCLES / E-BIKES ENTRY / EXIT
INDICATIVE KERB LINE
INDICATIVE ROAD CENTRE LINE
INDICATIVE KERB LINE
INMAN ROAD
SOUTH CREEK ROAD

BASE PLAN
DRAWING NO: S4.55-203, REVISION 4 BY SBA ARCHITECTS, DATED 12.10.2020

NOTES:
1. MINIMUM HEIGHT CLEARANCE OF 2.2m(TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE PARKING SPACES
2. MINIMUM HEIGHT CLEARANCE OF 2.5m (TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE DISABLED PARKING SPACES

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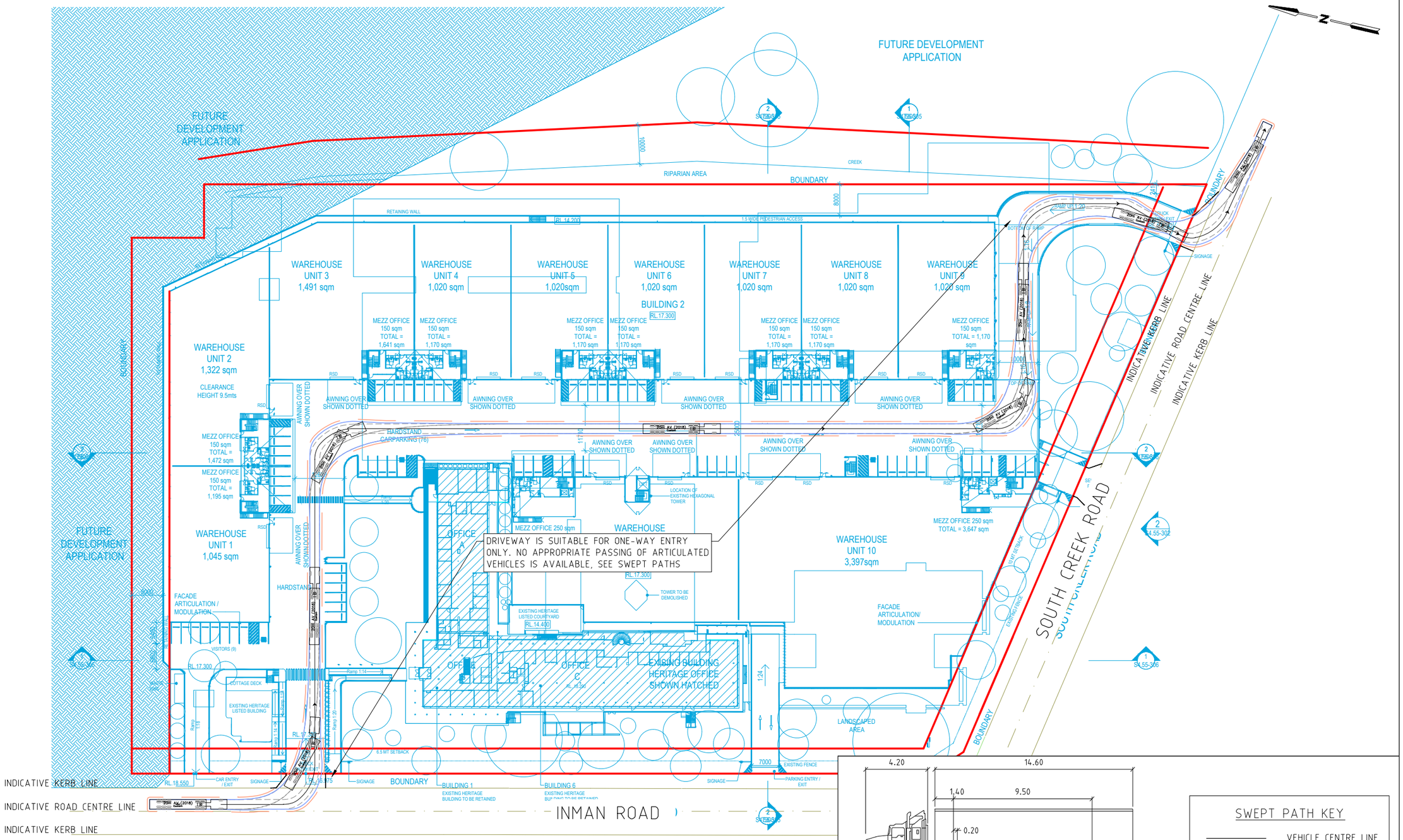
DESIGNED R.ZHANG
DESIGN CHECK H.OBERMAIER
APPROVED BY B.MAYNARD
DATE ISSUED 19 OCTOBER 2020
SCALE A3 - N/A
CAD FILE NO. N135573-01-P3.DWG

100 SOUTH CREEK ROAD, CROMER

BASEMENT LEVEL
CAR PARK COMPLIANCE REVIEW

DRAWING NO. N135573-01-02 SHEET 02 OF 06 ISSUE P3



20m AV (2018)

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

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DESIGN CHECK	H.OBERMAIER
APPROVED BY	B.MAYNARD
DATE ISSUED	19 OCTOBER 2020
CAD FILE NO.	N135573-01-P3.DWG

SCALE A3 0 5 10 20 1:1000

100 SOUTH CREEK ROAD, CROMER

GROUND LEVEL
SWEPT PATH ASSESSMENT

DRAWING NO. N135573-01-03 SHEET 03 OF 06 ISSUE P3

\\GTA.COM.AU\PROJECTFILES\PROJECTFILESSYD\N13500-13599\N135573 100 SOUTH CREEK ROAD, CROMER - ADDITIONAL WORK\CAD\N135573-01-P3.DWG PLOTTED BY RAYMOND ZHANG ON 19/10/2020 AT 10:42

DEVELOPMENT APPLICATION

RIPARIAN AREA

CREEK

BOUNDARY

RETAINING WALL

RL 14.200

1.5 WIDE PEDESTRIAN ACCESS

WAREHOUSE UNIT 3 1,491 sqm

WAREHOUSE UNIT 4 1,020 sqm

WAREHOUSE UNIT 5 1,020sqm

WAREHOUSE UNIT 6 1,020 sqm

WAREHOUSE UNIT 7 1,020 sqm

WAREHOUSE UNIT 8 1,020 sqm

WAREHOUSE UNIT 9 1,020 sqm

BUILDING 2

RL.17.300

MEZZ OFFICE 150 sqm TOTAL = 1,641 sqm

MEZZ OFFICE 150 sqm TOTAL = 1,170 sqm

MEZZ OFFICE 150 sqm TOTAL = 1,170 sqm

MEZZ OFFICE 150 sqm TOTAL = 1,170 sqm

MEZZ OFFICE 150 sqm TOTAL = 1,170 sqm

MEZZ OFFICE 150 sqm TOTAL = 1,170 sqm

MEZZ OFFICE 150 sqm TOTAL = 1,170 sqm

WAREHOUSE UNIT 2 1,322 sqm

CLEARANCE HEIGHT 9.5mts

AWNING OVER SHOWN DOTTED

HARDSTAND CARPARKING (76)

MEZZ OFFICE 150 sqm TOTAL = 1,472 sqm

MEZZ OFFICE 150 sqm TOTAL = 1,195 sqm

WAREHOUSE UNIT 1 1,045 sqm

HARDSTAND

FACADE ARTICULATION / MODULATION

FUTURE DEVELOPMENT APPLICATION

OFFICE

MEZZ OFFICE 250 sqm TOTAL = 2,380 sqm

LOCATION OF EXISTING HEXAGONAL TOWER

WAREHOUSE UNIT 11 2,130 sqm BUILDING 1

RL.17.300

TOWER TO BE DEMOLISHED

EXISTING HERITAGE LISTED COURTYARD

RL 14.400

WAREHOUSE UNIT 10 3,397sqm

MEZZ OFFICE 250 sqm TOTAL = 3,647 sqm

FACADE ARTICULATION/ MODULATION

RAMP UP 1:20

BOTTOM OF RAMP

1:16

RAMP UP 1:8

TOP OF RAMP

TRUCK ENTRY / EXIT

RL 12.760

SIGNAGE

INDICATIVE KERB LINE

INDICATIVE ROAD CENTRE LINE

INDICATIVE KERB LINE

SOUTH CREEK ROAD

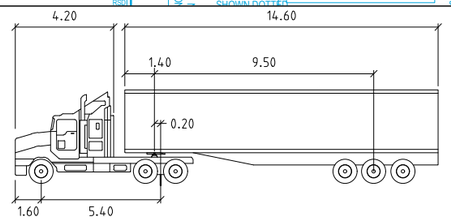
ENTRY

EXIT

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



20m AV (2018)

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

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DESIGNED R.ZHANG	DESIGN CHECK H.OBERMAIER
APPROVED BY B.MAYNARD	DATE ISSUED 19 OCTOBER 2020

SCALE A3 0 5 10 20 1:1000

CAD FILE NO. N135573-01-P3.DWG

100 SOUTH CREEK ROAD, CROMER

GROUND LEVEL
SWEPT PATH ASSESSMENT

DRAWING NO. N135573-01-04 SHEET 04 OF 06 ISSUE P3

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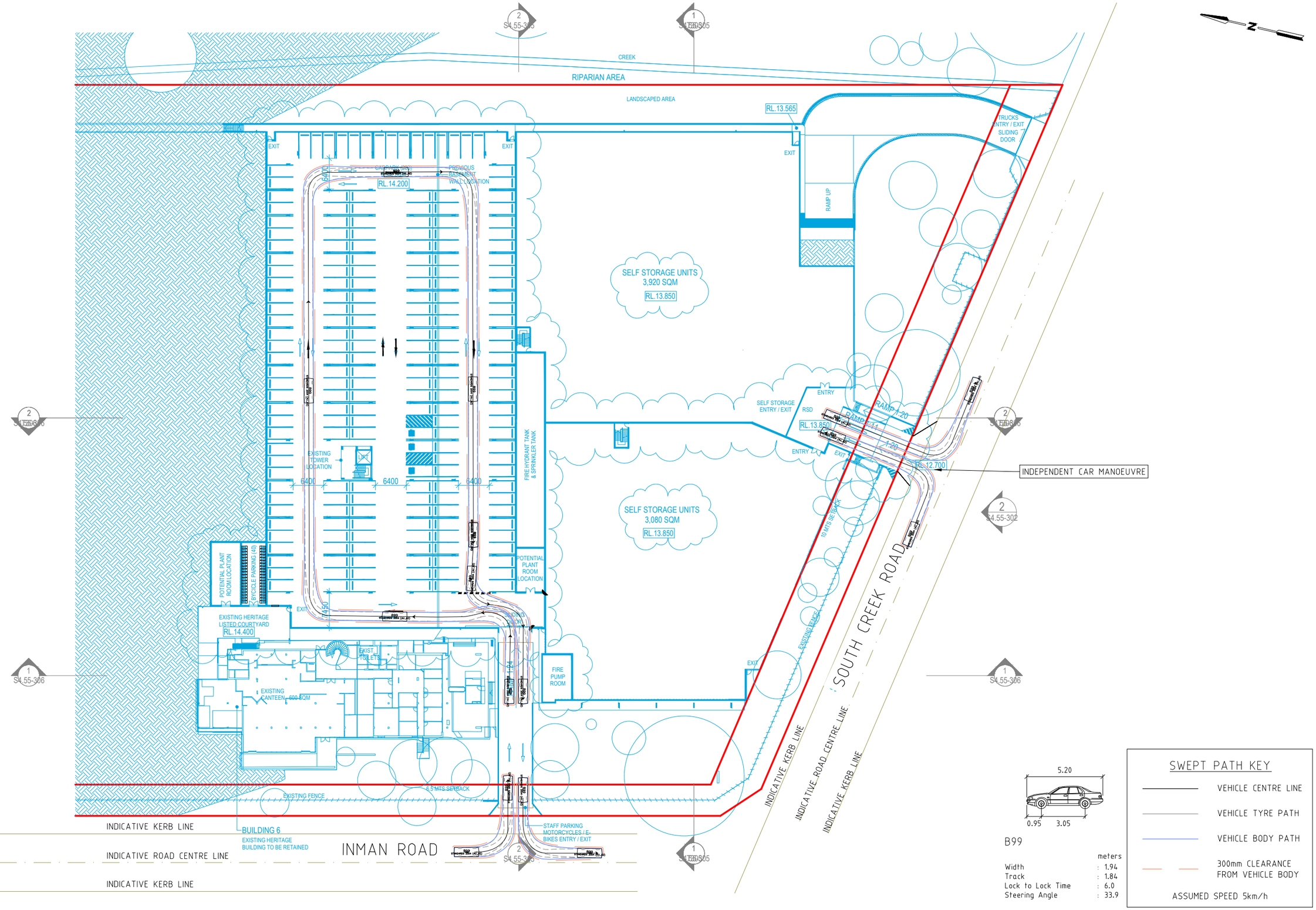

5.20

0.95 3.05

B99

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

SWEPT PATH KEY

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

ASSUMED SPEED 5km/h

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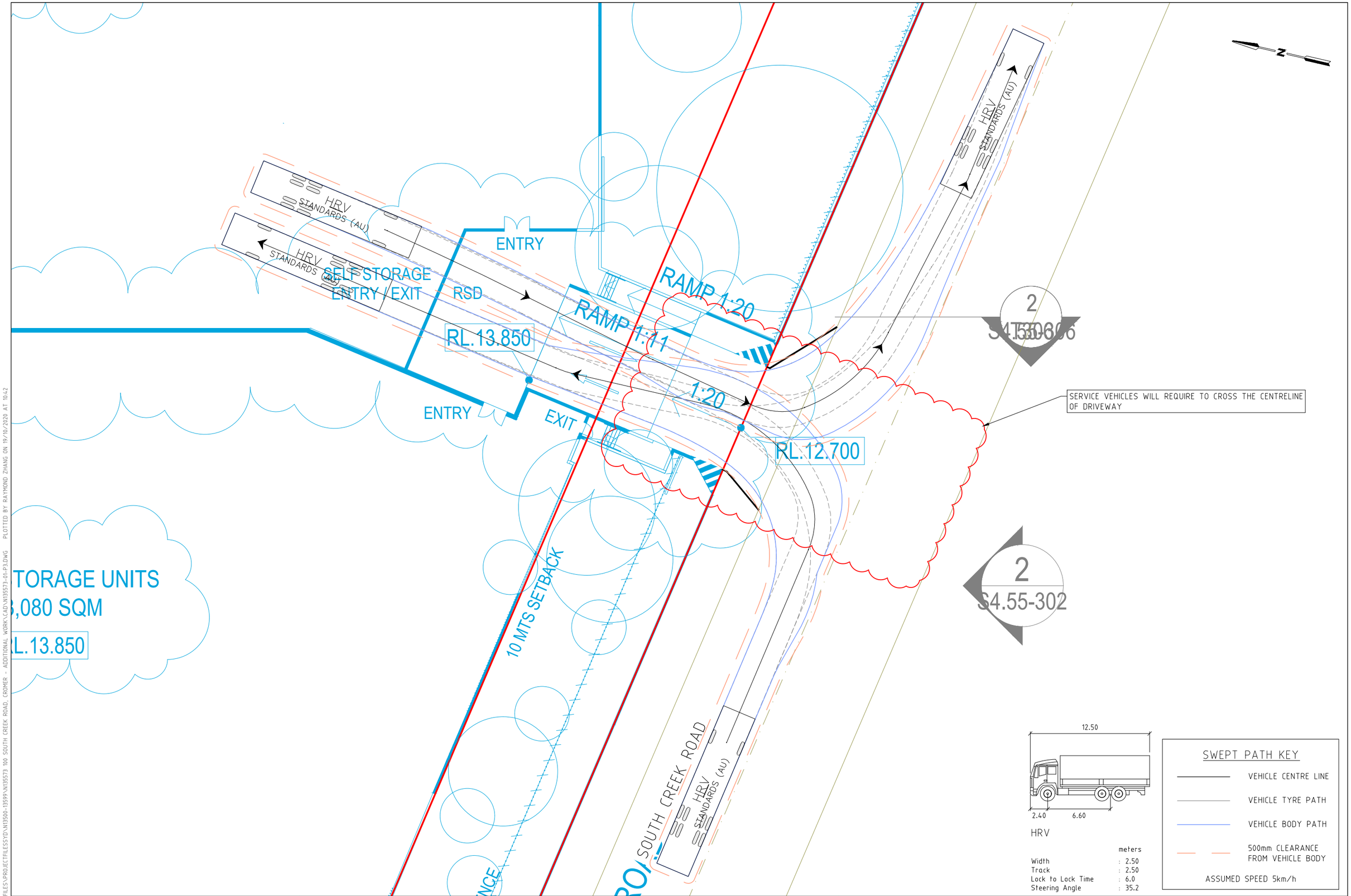
DESIGNED	R.ZHANG
DESIGN CHECK	H.OBERMAIER
APPROVED BY	B.MAYNARD
DATE ISSUED	19 OCTOBER 2020
SCALE	A3 - N/A
CAD FILE NO.	N135573-01-P3.DWG

100 SOUTH CREEK ROAD, CROMER

BASEMENT LEVEL SWEPT PATH ASSESSMENT

DRAWING NO. N135573-01-05 SHEET 05 OF 06 ISSUE P3



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DESIGNED R.ZHANG
DESIGN CHECK H.OBERMAIER
APPROVED BY B.MAYNARD
DATE ISSUED 19 OCTOBER 2020
SCALE A3 0 1.25 2.5 5 1:250
CAD FILE NO. N135573-01-P3.DWG

100 SOUTH CREEK ROAD, CROMER

BASEMENT LEVEL SWEPT PATH ASSESSMENT

DRAWING NO. N135573-01-06 SHEET 06 OF 06 ISSUE P3

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