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Proposed Little Mindil Beach Hotel
Traffic Impact Assessment

Client // ADG Engineers Pty Ltd

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Proposed Little Mindil Beach Hotel-
25 Gilruth Avenue, The Gardens, Traffic Impact Assessment

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Document History

Revision	Date	Description	Prepared By
A	01/06/20	Traffic Impact Assessment–Proposed Little Mindil Beach Hotel	Afshin Beigi

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1.0 INTRODUCTION

1.1 BACKGROUND

ADG Engineers Pty Ltd (ADG) engaged SJ Traffic Consulting to prepare a Traffic Impact Assessment (TIA) to support a concept development application related to the proposed development 'Little Mindil Beach hotel' located at 25 Gilruth Avenue, The Gardens, in the City of Darwin.

The site is located immediate to the south of the Mindil Beach Casino Resort and currently used as an overflow car park with the vehicle access via the Right of Way easement through the Casino Resort car park and the Casino Drive.

All relevant information about the subject site has been reviewed and an assessment of the expected traffic and parking impacts arising from the proposed development has been undertaken with the findings our assessment documented in this TIA report.

1.2 PROJECT SCOPE

This traffic report is intended to form part of a Development Application being prepared for submission to the Department of Infrastructure, Planning and Logistics (DIPL) and the City of Darwin and addresses the following issues:

- Assessment of appropriate access opportunities for the site
- Assess the potential impact of proposal upon surrounding road network
- Integration with its surroundings; and

The report has been prepared in accordance with the Austroads document Guide to Traffic Management Part 12: Traffic Impacts of Developments.

1.3 REFERENCES

In preparing this report, reference has been made to a number of background documents, including:

- Austroads, Guide to Traffic Management, Part 12: Traffic Impacts of Developments, 2009
- Austroads, Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections, 2009
- Roads and Traffic Authority. Guide to Traffic Generating Developments, Sydney,2002
- NT Planning Scheme, Land and Planning Services (Dept of Lands Planning and the Environment), Mar 2014

2.0 EXISTING CONDITIONS

2.1 SUBJECT SITE

The area commonly known as Little Mindil is located at the Lot 7651, at the address of 25 Gilruth Avenue, The Gardens.

To the north-west of the site is the Little Mindil Beach foreshore and to the north-east is Mindil Creek and Mindil Beach Casino. While the site currently has no direct vehicle access from its wide frontage to Gilruth Avenue, an existing 230-space car park can be accessed via Casino Drive. Little Mindil is predominately an open, grassy and undeveloped area of just over 5 hectares that currently hosts gala, concert and other community events.

The subject site and surrounding road network are illustrated in Figure 1 below.

Figure 1- Locality Plan

2.2 EXISTING ZONING

The site is currently zoned Multi zone (MZ) in the current Northern Territory Planning Scheme (NTPS).

2.3 SURROUNDING ROAD NETWORK

The proposed bushfire station is bounded by Stuart Highway to the west and Townend Road to the north.

Gilruth Ave is a sub-arterial road under the care and control of City of Darwin. It is aligned in a north-south direction and provides connection between Goyder Road to the north and Smith Street to the south. Gilruth Avenue is an undivided road with an approximate carriageway width of 7.6 m, comprising of one traffic lane in each direction and footpaths on both sides of the road. Clearways apply at all times in both directions. Gilruth Avenue has a posted speed limit of 50 km/h adjacent to the subject site and changes to 60km/h north of the subject site.

Intersection of Smith Street/ Gilruth Avenue is a single lane roundabout with four approaches which are under the car and control of City of Darwin. Lambell Terrace, Kahlin Avenue and Smith Street function as collector roads and have posted speed limit of 50km/h.

Figure 2- Intersection of Smith Street/ Kahlin Avenue/ Lambell Terrace

2.4 PEDESTRIAN AND CYCLIST FACILITIES

There is pedestrian foothpath on the eastern side of the Gilruth Avenue and a shared path along the western side of Gilruth Avenue with a width of 2.5m.

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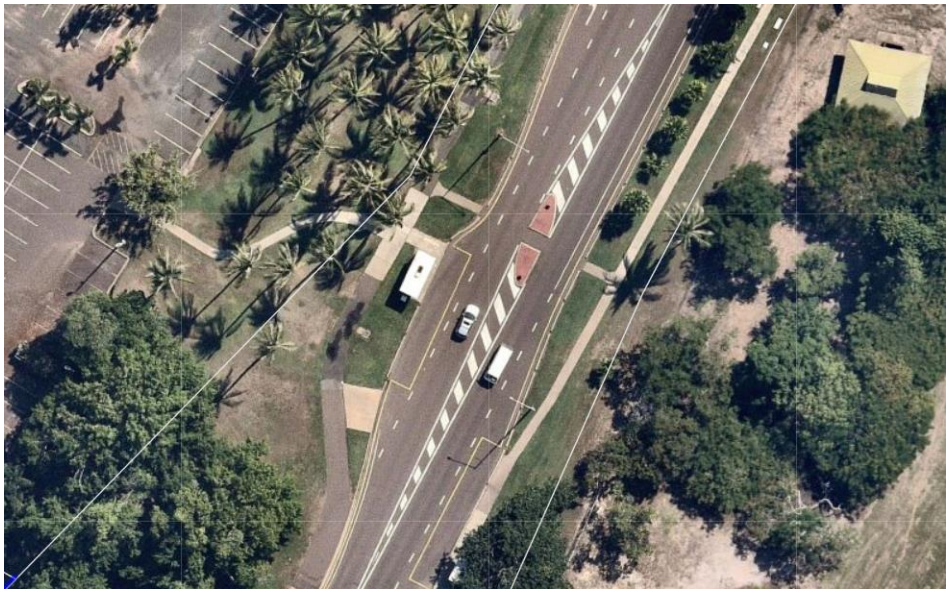
Figure 3- Existing shared path next to the subject site

A pedestrian refuge crossing is provided on Gilruth Avenue to the north of the subject site.

Figure 4- Existing pedestrian refuge crossing north of subject site



There is an existing footpath which runs along the northern side of the subject site, connecting from the shared path on the western side of Gilruth Avenue to the Mindil Beach foreshore. Footbridges also exist connecting the subject site to the Mindil Beach Casino.

2.5 PUBLIC TRANSPORT

The bus services operating along Gilruth Avenue is shown in the table below.

Table 1: Bus routes

Route	Average Frequency
Route 4, Casuarina – Darwin via Charles Darwin University, Alawa, Rapid Creek, Nightcliff and Fannie Bay	1 hour
Route 6, Darwin – Darwin via Mesum, Fannie Bay and Parap	30 mins
Route 15, Darwin Interchange – Mindil Beach Market via Cavenagh Street, Daly Street, Mitchell Street, Lambell Tce and Gilruth Avenue and return	20 mins (Thursday market days only)

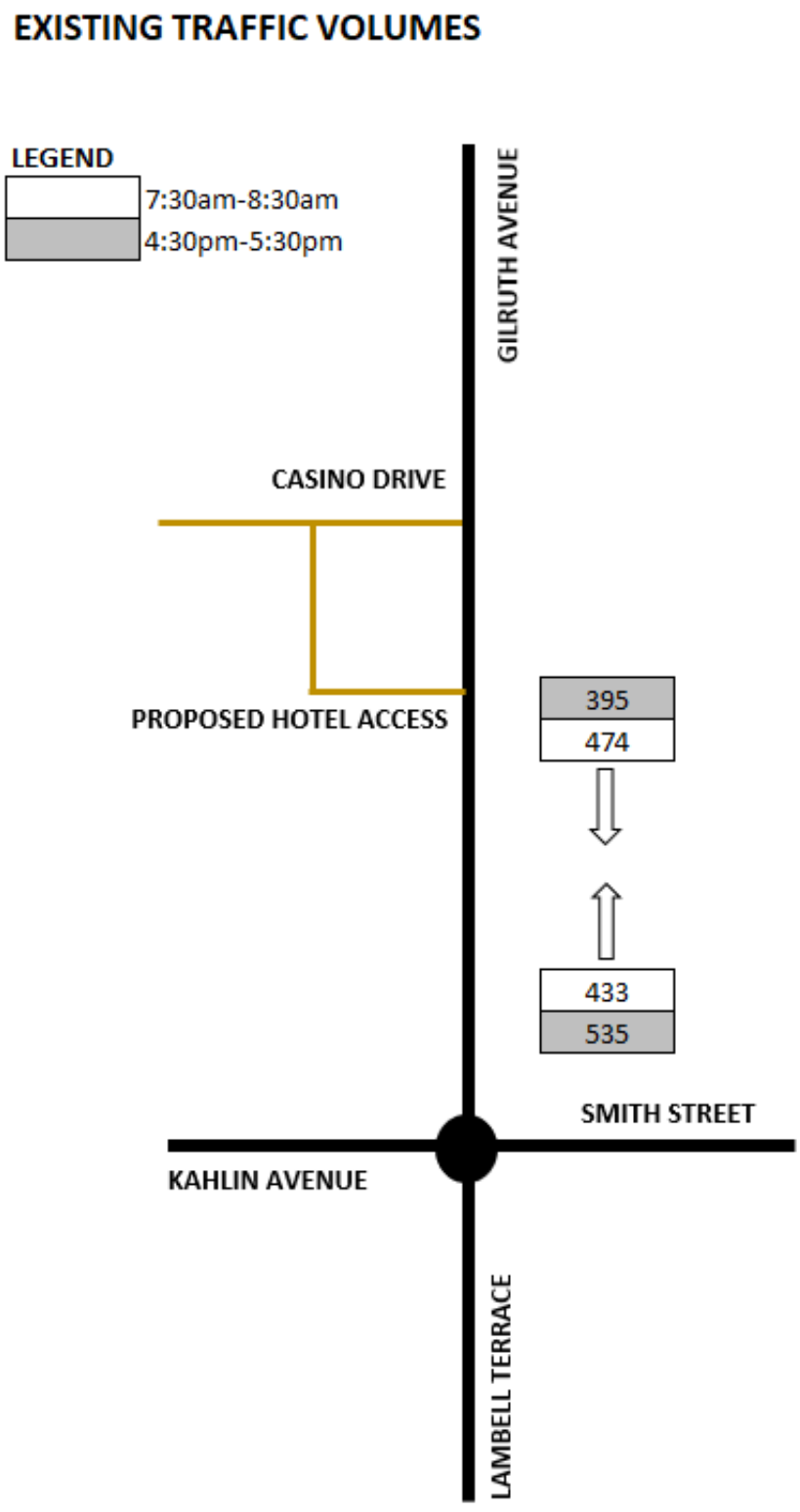
There are bus stops and indented bus bays for Route 4 and 6 on both sides of Gilruth Avenue to the north of the proposed development. There is a bus stop for Route 15 on Mitchell Street, approximately 500 m south of the proposed development access.

Figure 5- Existing intended bus bays north of the proposed development

2.6 EXISTING TRAFFIC VOLUMES

In order to determine current traffic volumes along Gilruth Avenue, SJ Traffic Consulting conducted peak period traffic counts (7.00-9:00 AM) and afternoon (4.00-6:00 PM) on Tuesday 26th May 2020. The results are illustrated in Figure 5.
No turning counts at the nearby intersections were conducted due to COVID-19 recovering period, which the road network still experiencing less traffic.

Figure 6- Existing Peak hours traffic volumes



3.0 PROPOSED DEVELOPEMENT

3.1 DEVELOPMENT PROPOSAL

The proposed development comprises of:

- 22 x 2-bedroom apartments
- 3 (2-bedroom) garden villa
- 16 (2-bedroom) lagoon villas
- 22 x 3-bedroom apartments
- 7 (3-bedroom foreshore) villas
- 2 x 4-bedroom apartments
- 149 hotel rooms
- Restaurants & bar
- Communal Garden and Events Space including market and Function Spaces.

Vehicular access to the development is proposed via Gilruth Avenue. The existing vehicular access from the Little Beach Casino Resort car park will be maintained.

A total of 277 car parking spaces proposed for the development, comprising of:

- 151 spaces within a semi-basement for the hotel and function areas
- 126 spaces on the ground level, comprising of a combination of at-grade car parking spaces and garage parking

72 bicycle parking spaces are proposed on the ground level.

A new pedestrian path network is proposed through the site, and the existing pedestrian pathway to the Casino will remain.

A copy of the proposed development plans prepared by Hachem is included in Appendix A.

4.0 CAR PARKING

4.1 STATUTORY CAR PARKING REQUIREMENTS

In accordance with the NT Planning Scheme, the Column 2 car parking rates outlined in the Northern Territory Planning Scheme Clause 6.5.1 are applicable for the proposed hotel, restaurant and bar component of the development. For the purposes of this calculation, it is assumed that the bar is an ancillary use of the restaurant, and will not be operating separately.

The car parking requirement for the proposed function space was based on the Northern Territory Planning Scheme requirements for a Community Centre.

The market and function area uses are not listed in Clause 6.5.1 of the Planning Scheme. Therefore, the car parking requirement has been based on the minimum provision specified in the RTA Guide to Traffic Generating Developments.

The statutory car parking requirements for the development is outlined in Table 2 below.

Table 2: Statutory car parking requirement

Development	**Car parking rate**	**Quantity**	**Car parking requirement**
Hotel	1 for every guest suite or bedroom	326 bedrooms	326 spaces
	50 for every 100m^2 of net floor area used as a bar	0	0
	3 for every 100m^2 used for dining	2,131 m^2	64 spaces
Market	2 spaces per stall	6 stalls	12 spaces
Function space	5 for every 100m^2 of net floor area	1,415 m^2	71 spaces
		TOTAL	**473 spaces**

The development incurs a parking requirement of 473 car parking spaces. A total of 277 parking spaces are currently proposed. Therefore, there is a parking shortfall of 196 car parking spaces.

4.2 LIKELY PARKING DEMAND

An assessment of the likely car parking demand should be based on a number of factors, as outlined in Clause 6.5.2 of the Northern Territory Planning Scheme.

Multi-purpose trips within the facility

The development is expected to exhibit a high degree of sharing of parking between the various components of the development. A high proportion of guests at the hotel will also

be attendees at events held at the function area, particularly for events which may be held over a number of days.

Similarly, it is likely that the proposed restaurants, bars and market will be used by hotel guests. During organised events and conferences attendees of the event will also use the hotel's restaurants and bars.

It is further noted that some of the restaurant patrons may also be attending the Mindil Beach Casino, and may choose to park in the casino car park.

For the purposes of this assessment, it is assumed that 30 % of the hotel rooms will be used by those attending a conference being held at the site. Furthermore, it is assumed that 25 % of the restaurant / bar patrons will be also staying at the hotel, attending an event at the conference centre or visiting the Mindil Beach Casino.

Suggested reduction in parking demand during peak times:

30 % reduction in hotel requirement

25 % reduction in restaurant requirement

The variation in car parking demand over time

Due to the mixed use nature of the development, the individual components of the proposed development are likely to have their peak car parking demands at different times of the day.

The parking demand associated with the restaurant is expected to peak during lunchtime (11:30 am – 1:30 pm) and dinnertime periods (5:30 pm – 7:30 pm). During these times, particularly during lunchtime, the hotel component will have a low demand for parking, as this falls between the check-out and check-in times. Conversely, during the expected peak parking period for the hotel component (5:30 pm – 8:00 am), the restaurant and function area components will have a low parking demand.

It is therefore considered unlikely that all of the proposed uses will generate their peak parking demands at the same time. For the purposes of this assessment, a 20 % overall reduction in parking demand has been applied to consider the variation in car parking demand associated with the various uses of the development.

Suggested reduction in parking demand during peak times:

20 % reduction to overall requirement

The availability of public transport in the locality

As discussed in Section 2.5, there are three bus routes operating along Gilruth Avenue, with bus stops for two of the three bus services (route 4 and 6) located just north of the development. Both bus routes operate from Darwin CBD. It is expected there will be a proportion of guests who may travel to the hotel facility by bus from the CBD.
Organisers of events within the function areas are likely to organise chartered buses for patrons in the event, which will reduce the demand for parking on site.

It is also noted that there are taxi parking available within the Casino car park. It is expected that a proportion of guests attending an event at the function area may arrive by taxi.

For the purposes of this study, a reduction of 5 % to the parking requirement has been applied to consider the use of bus services in the locality.

Suggested reduction in parking demand during peak times:

5 % reduction to overall requirement

Occupancy of hotel rooms

The parking rates are based on 100 % occupancy of the bedrooms. It is likely that in the majority of times, the hotel will not be fully occupied.

The RTA Guide to Traffic Generating Developments outline that where unit occupancy data is available for similar existing developments in the area, rates based on 85 percent occupancy on the peak day of the week may be more appropriate.

However, for the purposes of this calculation, a reduction has not been applied and a 100 % occupancy of hotel rooms will be assumed.

As discussed above, there are a number of factors which are expected to reduce the demand for parking from what is suggested in the Northern Territory Planning Scheme.

By applying the suggested reduction rates above to the Planning Scheme requirements, it is considered to provide a more accurate estimate of the actual peak parking demands associated with the development. This is summarised in Table 3 below.

Table 3: Likely parking demand (on-site)

Proposed development	Quantity	Unit	requirement	% reduction	parking demand
1-bedroom hotel room	149	no.	149	55%	67
3-bedroom apartment	22	no.	66	55%	30
2-bedroom apartment	22	no.	44	55%	20
3-bedroom foreshore villa	7	no.	21	55%	9
2-bedroom garden villa	3	no.	6	55%	3
2-bedroom lagoon villa	16	no.	32	55%	14
4-bedroom apartment	2	no.	8	55%	4
Restaurant + bar	2131	sq. m	64	50%	32
Communal garden		sq. m			
Event space incl market	6	stall	12	25%	9
Function space	1415	sq. m	71	25%	53
Total			**473 spaces**		**241 spaces**

On the basis of Table 3 above, the development is expected to generate a peak on-site parking demand of up to 241 spaces. With a total of 277 spaces currently proposed on site, this is expected to fully cater for the peak parking demands generated by the facilities.

4.3 CAR PARKING LAYOUT AND CIRCULATION

Car parking have been provided within both a basement car park and a ground level car park.

Basement level car park

The two-level basement car park provides parking for the hotel and function uses. Parking spaces have been typically provided with a width of 3 m and a length of 5.5 m, accessed from an aisle width of 6 m. This exceeds the requirements of the Northern Territory Planning Scheme.

3-point turning areas have been provided at the end of each blind aisle with a length more than the width of six 90 degree spaces to allow for vehicles to turn around, in accordance with AS 2890.1:2004.

Columns have been located at a distance of 0.75 m from the front of the space, and extending no further than 1.75 m from the front, to ensure door opening will not be impacted, in accordance with AS 2890.1:2004.

Access to the basement level car park is via a 6 m wide two way ramp. 250 mm wide kerbs have also been provided on each side of the ramp. The ramp comprises of a 1:8 for 2 m at the top of the ramp, a 1:4 for 13 m, and a final transition of 1:8 for 2.6 m at the bottom of the ramp. The gradient transitions fully comply with the requirements of AS2890.1:2004.

A single width ramp is also provided in the basement, accessed from the porte cochere. This ramp provides a gradient of 1:8 for 2 m, 1:4 for 13.1 m and a final transition of 1:8 for 2.6 m. The gradient transitions fully comply with the requirements of AS2890.1:2004.

All circulation access aisles are a minimum of 6 m, providing sufficient width for two – way movement.

Ground level car park

The ground level car park provides for parking for the apartments, and comprises of a combination of at-grade parking spaces and garage spaces.

The at-grade car park provides spaces with dimensions of 2.6 m x 5.5 m, accessed via an access aisle of 6 m, in accordance with the Northern Territory Planning Scheme.

Columns have been located at a distance of 0.75 m from the front of the space, and extending no further than 1.75 m from the front, to ensure door opening will not be impacted, in accordance with AS 2890.1:2004.

Garages have been provided with a width of 11 m and a length of 6 m, sufficient to accommodate up to 4 vehicles each.

All circulation access aisles are a minimum of 6 m, providing sufficient width for two – way movement.

5.0 TRAFFIC IMPACT ASSESSMENT

5.1 TRAFFIC GENERATION AND DISTRIBUTION

The expected traffic generation of the proposed development during the observed morning and afternoon peak hour at the Smith Street / Gilruth Avenue intersection is summarised below.

Hotel

The traffic generation rates in the RTA Guide for Motels have been used to determine the traffic generation for the proposed 206 hotel rooms, villas and apartments. The specified traffic generation rates for a motel land use are as follows:

- 3.0 daily trips per unit
- 0.4 evening peak hour trips per unit.

It is anticipated that the checkout time for the hotel will be at 10:00am and check in time will be at 2:00pm. It is expected that the majority of hotel guests will not depart during the observed morning commuter peak hour (7:30am – 8:30am), or arrive during the observed afternoon commuter peak hour (5:30pm – 6:30pm). Nevertheless, it has been assumed that 0.4 trips per unit will occur during both the morning and afternoon commuter peak.

Restaurant and bar

The traffic generation rates in the RTA for Restaurants have been used to determine the traffic generation for the proposed restaurants and bars on the ground floor and level 1. The specified traffic generation rates for a restaurant land use are as follows:

- 60 daily trips per 100 m^2 gross floor area
- 5 evening peak hour trips per 100 m^2 gross floor area.

It is anticipated that the proposed restaurants and bars will not operate during the morning commuter peak, but will operate during the afternoon commuter peak.

The total floor area of all proposed restaurants and bars is 2,131 sq. m.

Event space, including a market

The traffic generation rates in the RTA for Markets has been used for the traffic generation for the proposed market. The specified traffic generation rates for a market are as follows:

- 18 trips per stall for centres open for seven hours
- 4 peak hour trips per stall

It is anticipated that the market will be open during the morning commuter peak but not the afternoon commuter peak.

It is understood that seven market stalls are currently contemplated for the development, however this is subject to change.

Function Space

The traffic generation rates used for the proposed function space was based on the required provisional car parking spaces in in clause 6.5.1 of the Northern Territory Planning Scheme.

The proposed function space will behave similar to a 'community centre' which is defined as:

'a building or part of a building designed or adapted primarily to provide facilities for social, sporting or cultural purposes but does not include premises licensed under the Liquor Act.'

The specified column 2 minimum car parking requirements is as follows:

- 5 for every 100m^2 of net floor area.

It is anticipated that the proposed function space will be used between 8:30 am – 5:30 pm. It has been assumed that:

- 1 trip per car space occur during the morning commuter peak hour, and
- 1 trip per car space occur during the afternoon commuter peak hour

The total floor area of the function space on level 2 is 1,415 sq.m

Summary

The table below summarises the traffic generated from the proposed development.

Table 4: Trip generation

Proposed development	Quantity	Unit	AM		PM	
			Rate	Generation	Rate	Generation
1-bedroom hotel room	149	no.	0.4	60	0.4	60
3-bedroom apartment	22	no.	0.4	9	0.4	9
2-bedroom apartment	22	no.	0.4	9	0.4	9
3-bedroom executive villa	7	no.	0.4	3	0.4	3
2-bedroom private villa - garden villa	3	no.	0.4	1	0.4	1
2-bedroom lagoon villa	16	no.	0.4	6	0.4	6
4-bedroom apartment	2	no.	0.4	1	0.4	1
Restaurant + bar	2131	sq. m	0	0	0.05	107
Communal garden		sq. m	0	0	0	0
Event space incl market	6	stall	4	24	0	0
Function space	1415	sq. m	0.05	71	0.05	71
Total				183		266

The table below summarises the assumed proportion of inbound and outbound traffic during the peak hours.

Table 5: Inbound and outbound split

Proposed development	AM peak (7:30am – 8:30am)	PM peak (4:30pm-5:30pm)
Hotel accommodation	10% inbound 90% outbound	90% inbound 10% outbound
Other facilities open to non-hotel users	50% inbound 50% outbound	50% inbound 50% outbound

The table below summarises the assumed proportion of inbound and outbound traffic travelling either north or south.

Table 6: Northbound and southbound split

Direction	AM peak (7:30am – 8:30am)	PM peak (4:30pm-5:30pm)
Northbound	50%	50%
Southbound	50%	50%

The traffic distribution for both a left in, left out option and full movements and the anticipated traffic volumes at the site access point are presented in the blow figures.

Figure 7- Traffic distribution – Left in and Left out

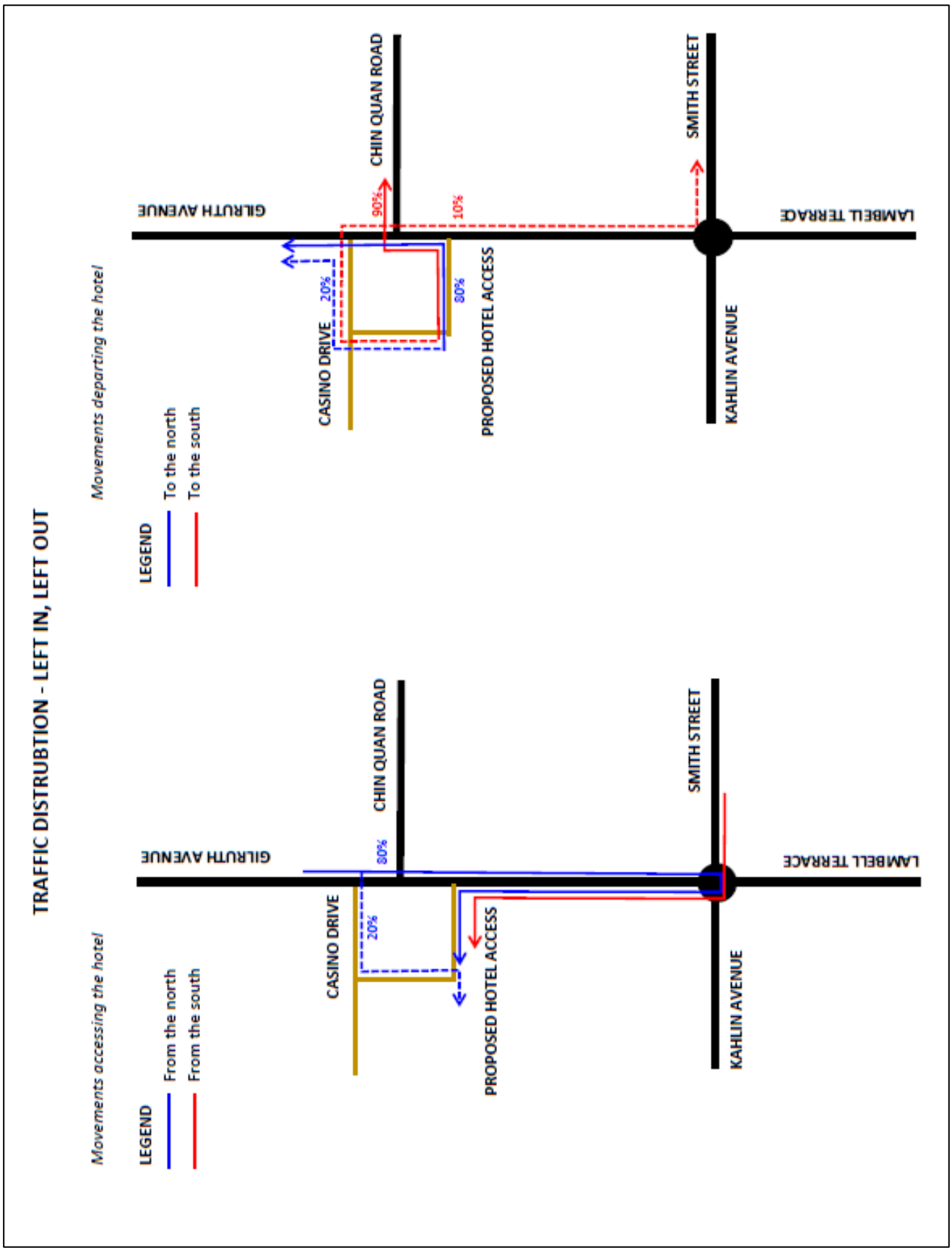


Figure 7: Traffic distribution – full movements

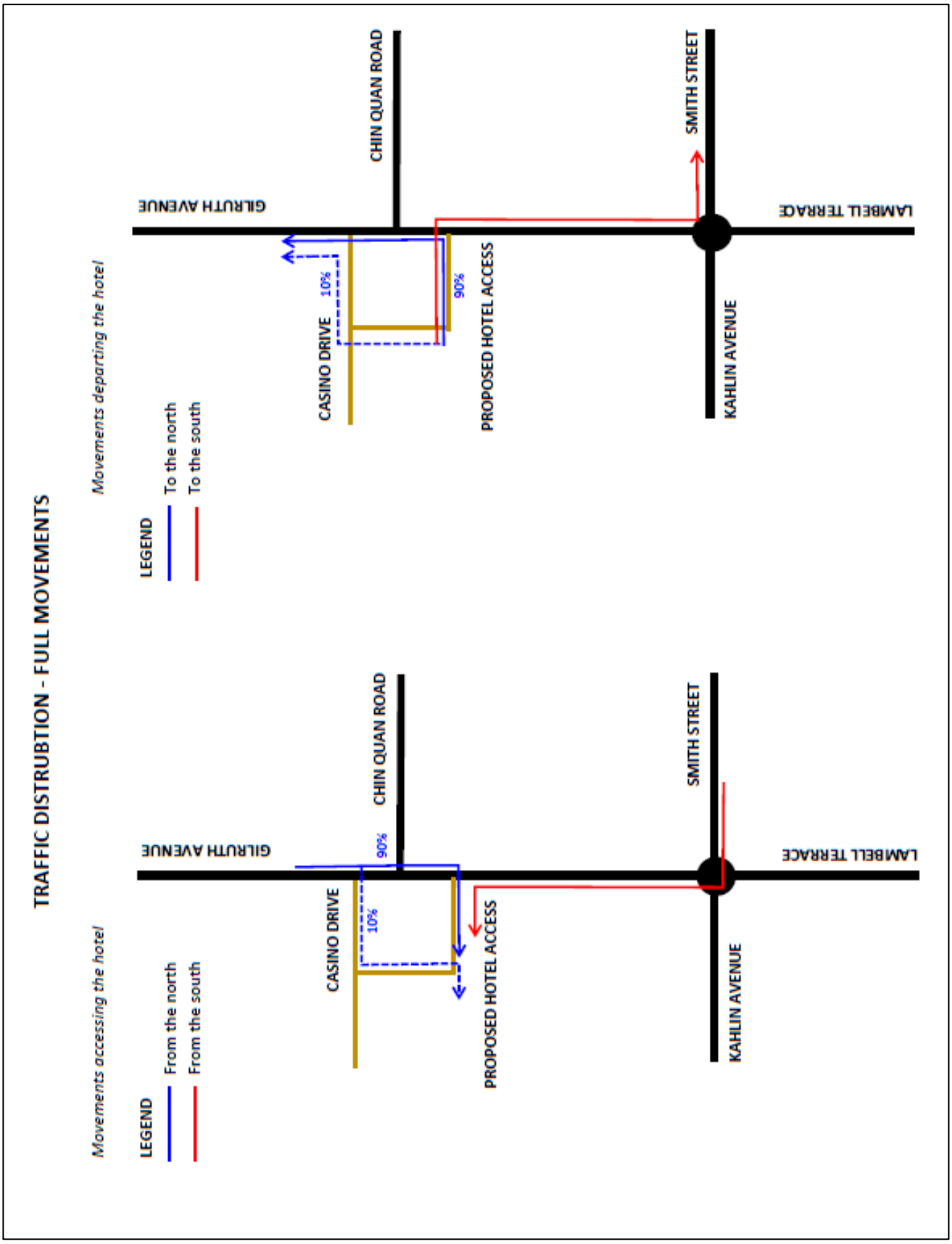


Figure 8: Proposed development added traffic – left-in, left-out

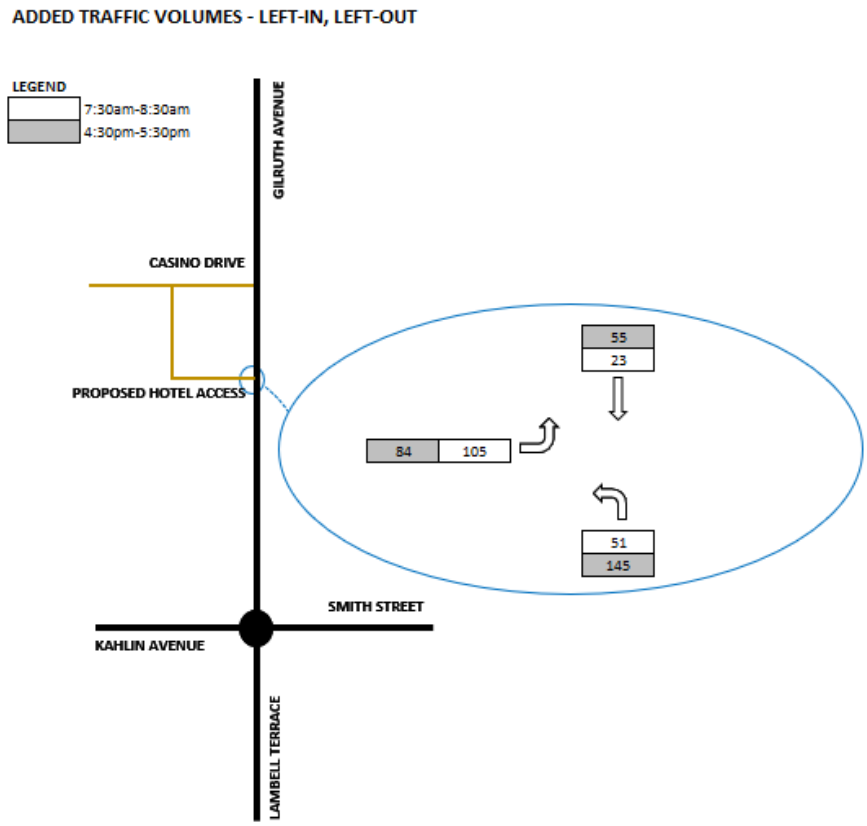
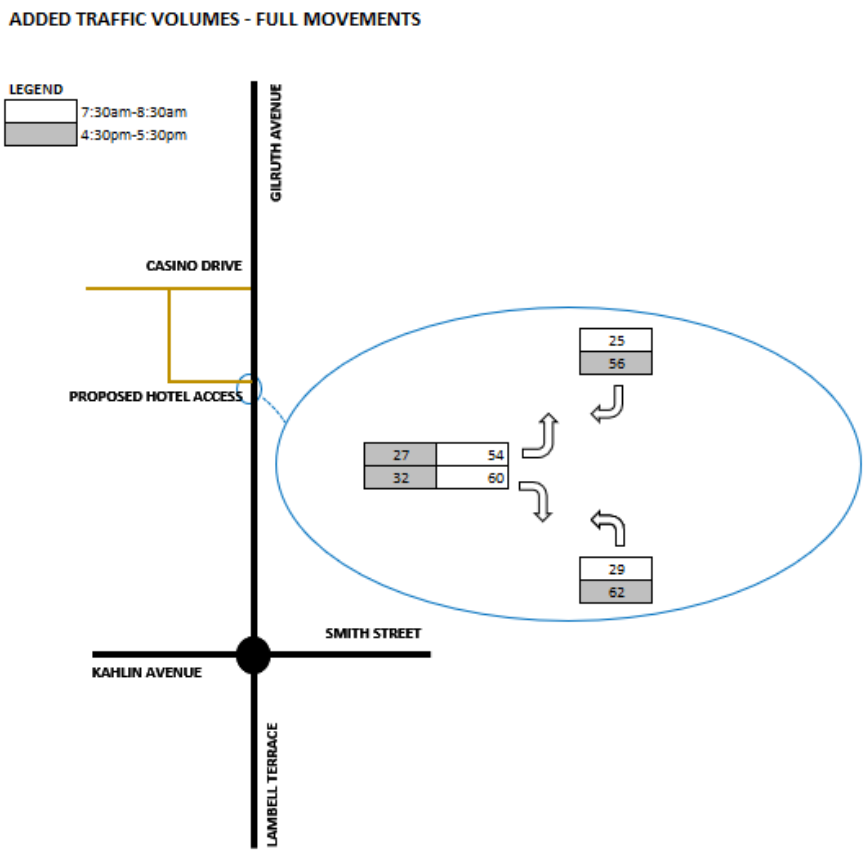


Figure 9: Proposed development added traffic – full movements



5.2 FUTURE TRAFFIC VOLUME

In order to estimate the future background traffic volumes, a growth rate of 1.5% p.a. for 10 years has been applied to Gilruth Avenue. The resultant estimates of future peak hour traffic movements are shown in Figure 7.

Figure 10- Projected Future (2030) Traffic Volumes – Left in, Left out

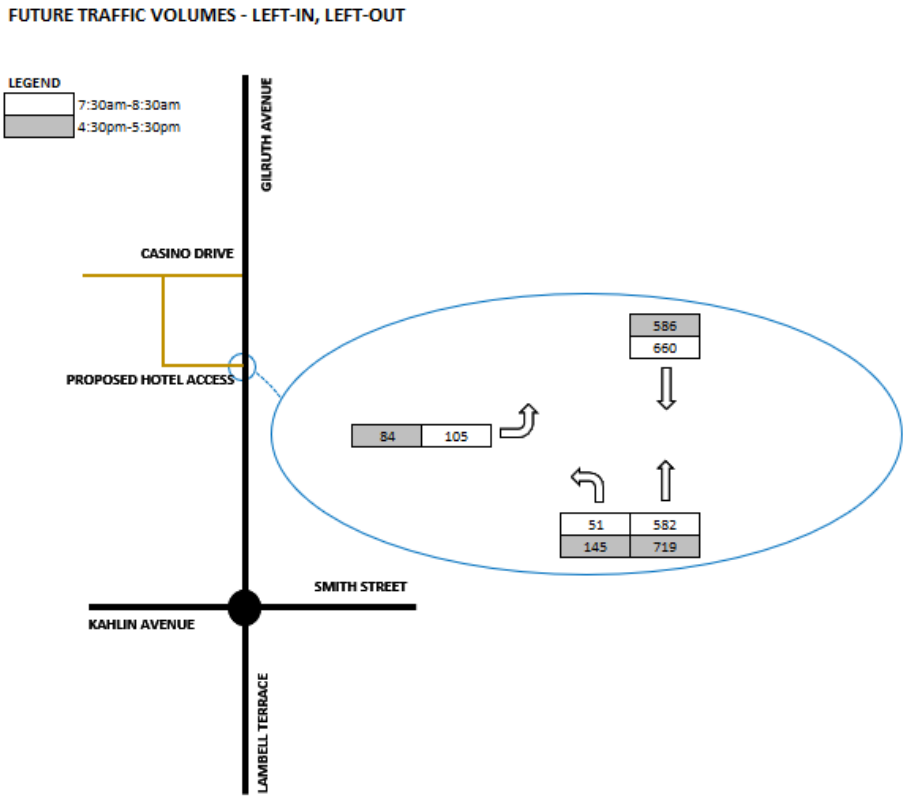
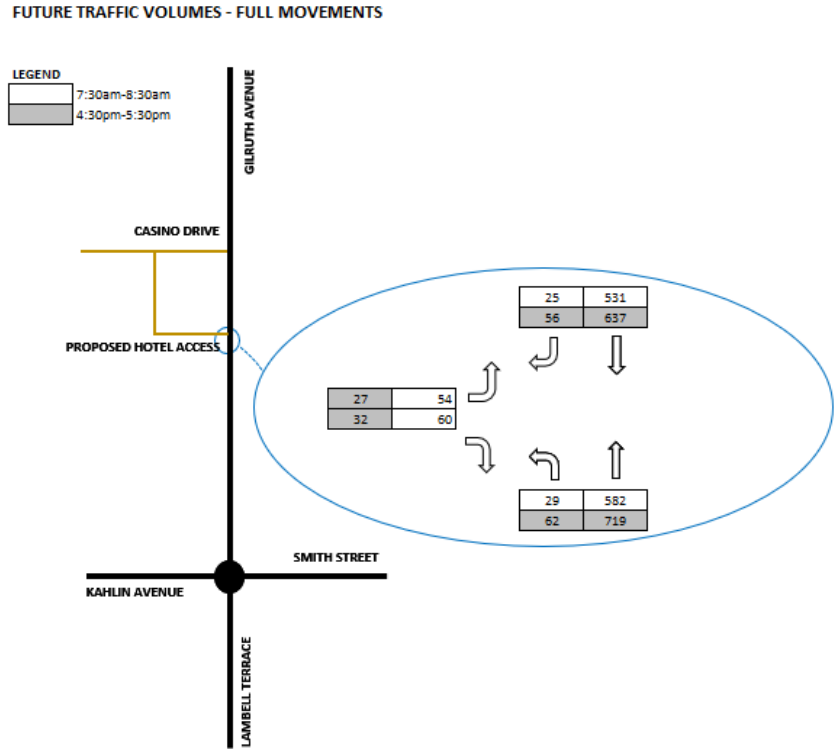


Figure 14: Projected future (2030) traffic volumes – full movements



6.0 VEHICLE ACCESS

6.1 ASSESSMENT OF TURNING LANE WARRANTS

Access to the development is proposed to/from Gilruth Avenue.

To determine the type of intersection required at Gilruth Avenue, a turn warrant assessment was performed in accordance with Section 4.8 of the Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections.

Two options have been assessed:

- left-in, left-out
- full movement access arrangement

It is noted that the assessment at the intersection has been undertaken based on the projected traffic volumes in 2030.

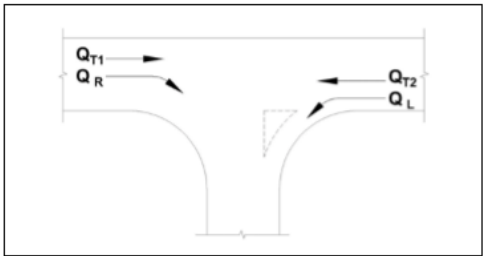
Table 7– Access Turning Movements – left in, left out

2030	Inward		Outward		Gilruth Avenue	
Peak Period	Left In	Right In	Left Out	Right Out	Northbound Through	Southbound Through
AM PEAK	51	N/A	105	N/A	582	586
PM PEAK	145	N/A	84	N/A	719	660

Table 8– Access Turning Movements – full movements

2030	Inward		Outward		Gilruth Avenue	
Peak Period	Left In	Right In	Left Out	Right Out	Northbound Through	Southbound Through
AM PEAK	29	25	54	60	582	531
PM PEAK	62	56	27	32	719	637

Figure 11-Calculation of the major road traffic volume parameter QM



Turn type	Splitter island	Q_M (veh/h)
Right	No	$= Q_{T1} + Q_{T2} + Q_L$
Right	Yes	$= Q_{T1} + Q_{T2}$
Left	No/Yes	$= Q_{T2}$

Figure 12-Austroads Warrants for turn treatments – left in, left out

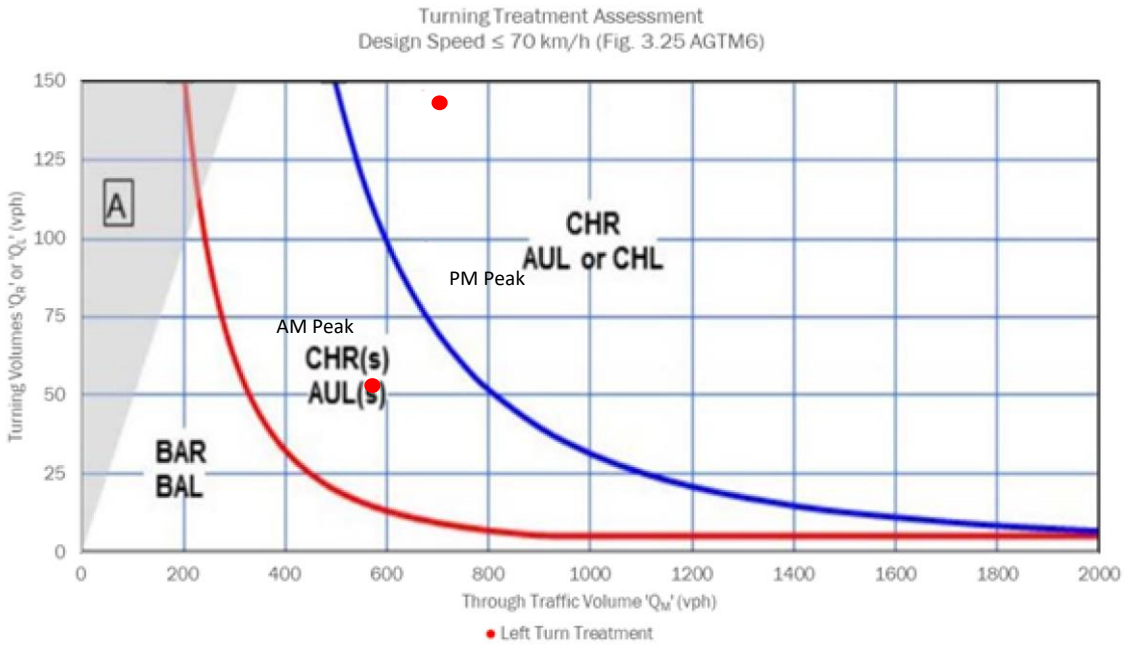
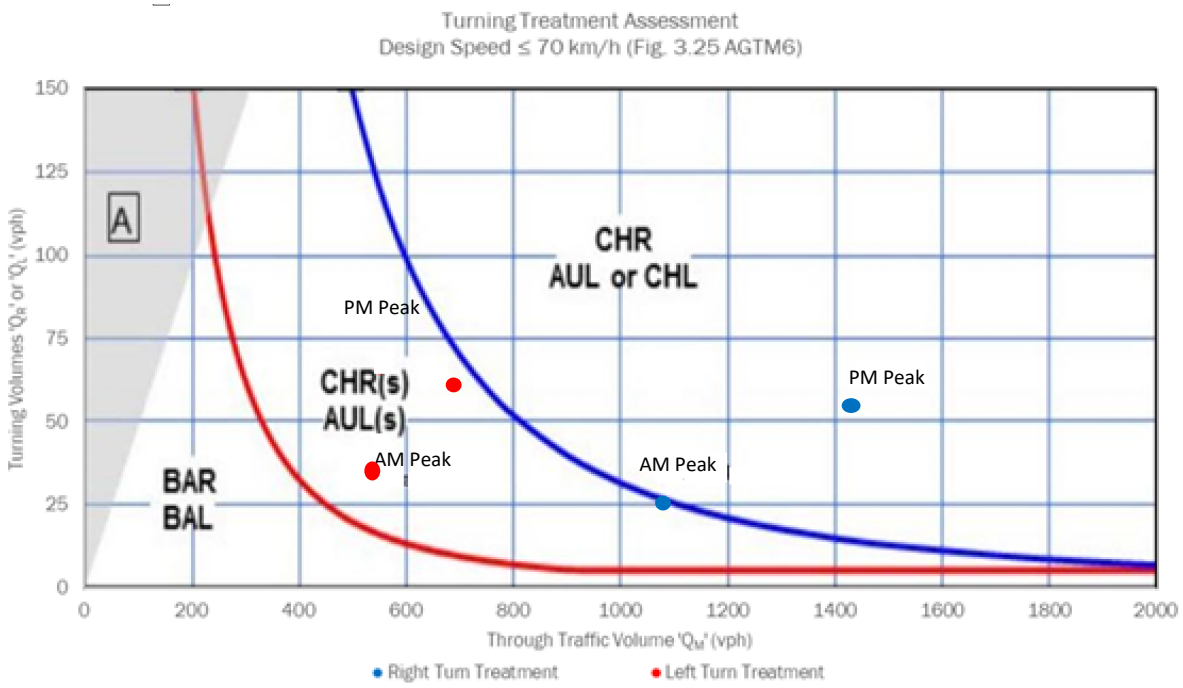


Figure 13-Austroads Warrants for turn treatments – full movements



Based on the turn warrant assessment as indicated above the following treatments are considered satisfactory:

- auxiliary left turn lane (short) and a channelised right turn lane configuration are required if all movements are permitted
- auxiliary left turn lane if only left in and left out movements are permitted.

Road widening and relocation of road safety barrier is required to install either a left turn or right turn treatment.

6.2 INTERSECTION DESIGN GUIDELINES

Left in, left out

As discussed in Section 5.1, a left in, left out site access will require a full length auxiliary left turn lane. The total length of the auxiliary lane is determined by the deceleration length. Storage length will not be required as the left turn in will be free-flowing.

Table 5.2 of Austroads Guide to Road Design Part 4A specifies the deceleration distance required for cars based on the approach design speed. This is replicated in Table x below.

Table 9: Deceleration distances for cars on a level grade

Design speed of approach road (km/h)	Length of deceleration D – including diverge taper *T* (m)										Diverge length L_d[3] for lane widths (m)	
	Stop condition[1] (m)		Design speed of exit curve (km/h)[2]									
	0	0	20	30	40	50	60	70	80	90	3.5 m[4]	3.0 m[4]
	Comfortable 2.5 m/s²	Maximum 3.5 m/s²	Comfortable average rate of deceleration 2.5 m/s²									
50	40	30	30	25	15						33	27
60	55	40	50	40	30	15					40	33
70	75	55	70	60	50	40	20				47	40
80	100	70	95	85	75	60	45	25			54	44
90	125	90	120	110	100	85	70	50	25		60	50
100	155	110	150	140	130	115	100	80	55	30	67	57
110	185	135	180	175	160	150	130	110	90	60	74	62

Source: Table 5.2 Austroads Guide to Road Design Part 4A

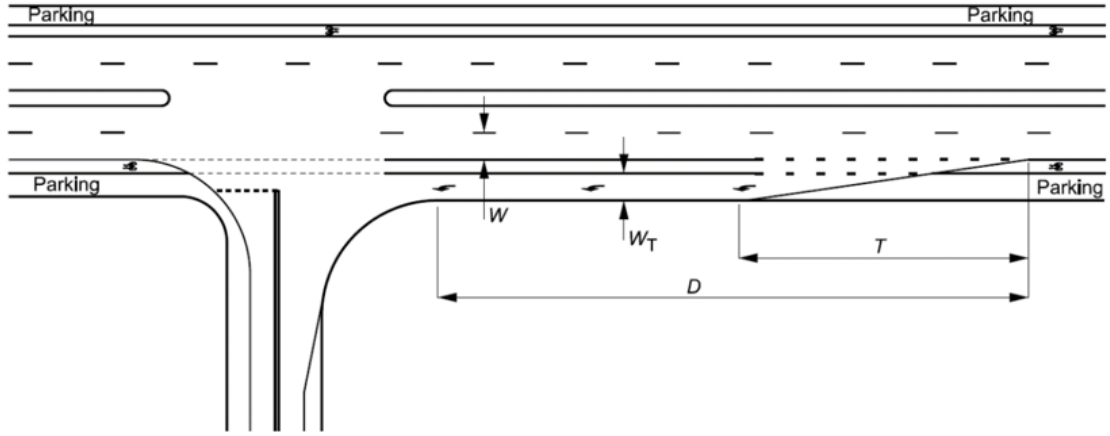
It is recommended that the total length of auxiliary lane for design speed of 60km/h should be 55 metres with comfortable deceleration rate of 2.5m/ s^2. The total length of auxiliary lane could be reduced to 40 metres if the maximum allowable deceleration rate of 3.5m/ s^2 is used. Both lengths also include a 17m taper.

The deceleration distance determined from table above should be increased for a downgrade in accordance with table below.

Table 10- Correction to deceleration distance D for grade

Grade	Ratio of 'length on grade' to 'length on level'	
	Upgrade	Downgrade
0–2%	1.0	1.0
3–4%	0.9	1.2
5–6%	0.8	1.35

Figure 14- Auxiliary left-turn treatment (AUL) on the major leg of an urban road



Notes:
For setting out details of the left-turn geometry, use vehicle turning path templates.
The dimensions of the treatment are defined as:

- W = *Nominal through lane width (m) (incl. widening for curves).*
- W_T = *Nominal width of turn lane (m) (incl. widening for curves based on the design turning vehicle) = 3.0 m minimum.*
- D = *Diverge/deceleration length including taper – Table 5.2. (adjust for grade by applying the 'correction to grade' factor in Table 5.3).*
- T = *Physical taper length (m) given by:* $T = \frac{0.33VW_T}{3.6}$
- V = *Design speed of major road approach (km/h).*

In addition to this, to physically restrict motorists undertaking illegal right turns into or out of the site, it is recommended to construct a splitter island on the site access approach, with the approach lane at a 70 degree angle to Gilruth Avenue. The island will need to be 2.5 m at the pedestrian crossing point to shelter pedestrians and provide a refuge.

Full movements

Allowing full turning movements at the site access point will require a short Auxilliary left turn lane and a channelised right turn lane.

The length of a short Auxilliary left turn lane is provided in AGRD Part 4A Table 8.2, replicated tin Table x below.

Table 11: Dimensions of AUL(S) treatment

Design speed of major road approach (km/h)	Diverge/deceleration length *D* (m)[1]	Taper length *T* (m)[2]
50	15	15
60	25	15
70	35	20
80	45	20
90	55	25
100	70	30
110	85	30
120	100	35

For a design speed of 60 km/h, a left turn lane length of 25 m is required, including a 15 m long taper.

The required length of a channelised right turn lane is outlined in AGRD Part 4A, and includes the deceleration length (D) plus the storage length (S), which is the greater of:

- Length of one design turning vehicle
- Calculated queue using SIDRA analysis

Given the relatively low volumes of right turners expected to turn in to the site, the length of one design vehicle (10 m long vehicle) has been adopted for the storage length.

As shown in Table 11, the required deceleration length (D) for a 60 km/h design approach speed to a stop condition is 55 m, based on a comfortable deceleration rate of 2.5 m/s2. Therefore the required length of the right turn lane is D + S = 65 m. This includes a 15 m long taper.

6.3 ADEQUACY OF SIGHTLINES AT PROPOSED ACCESS

The assessed safe intersection sight distance is 127m based on equation 2 of AGRD04A.

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + (0.01 \times a))}$$

SISD = Approach sight distance (m)

R_T = reaction time (s)

V = operating (85%ile) speed (km/h)

d = coefficient of deceleration

a = longitudinal grade (%: +uphill, -downhill)

The operating speed assumed is 10km/h more than posted speed limit.

$$SISD = \frac{5.5 \times 60}{3.6} + \frac{3600}{254 \times (0.29 + (0.01 \times 0))}$$

SISD = 141 m

An inspection of the site found that sight distance along Gilruth Avenue was in excess of these requirements at the proposed development access intersection therefore it is considered that the requirements of Austroads for SISD could be met and a safe access intersection provided.

Figure 15-Available sightlines to the right at the proposed access

Figure 16-Available sightlines to the left at the proposed access

7.0 CONCLUSIONS AND RECOMMENDATIONS

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

- The proposed car parking provision falls short of the requirements of the Northern Territory Planning Scheme. However, the parking provision is expected to cater for the estimated peak parking demand.
- The on-site car parking have been designed in accordance with the Northern Territory Planning Scheme and the relevant clauses of AS 2890.1:2004
- The proposed access point location will have sufficient sightlines, in excess of SISD requirements.
- Implementing a left in, left out restriction at the intersection will require a full length Auxilliary left turn lane (AUL)
- Allowing full movements at the site access point will require a short Auxilliary left turn lane (AUL(S)) and a channelised right turn lane (CHR)
- It is recommended to implement a left-in, left-out restrictions at the site access point
- The additional traffic generated by the development is not likely to result in adverse impacts in the surrounding road network.

APPENDIX A

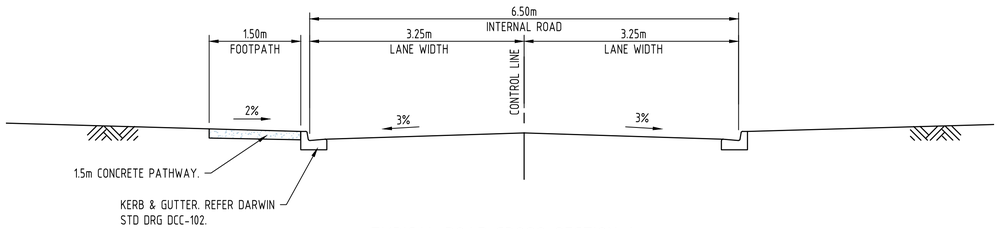
Development Plans

LEGEND

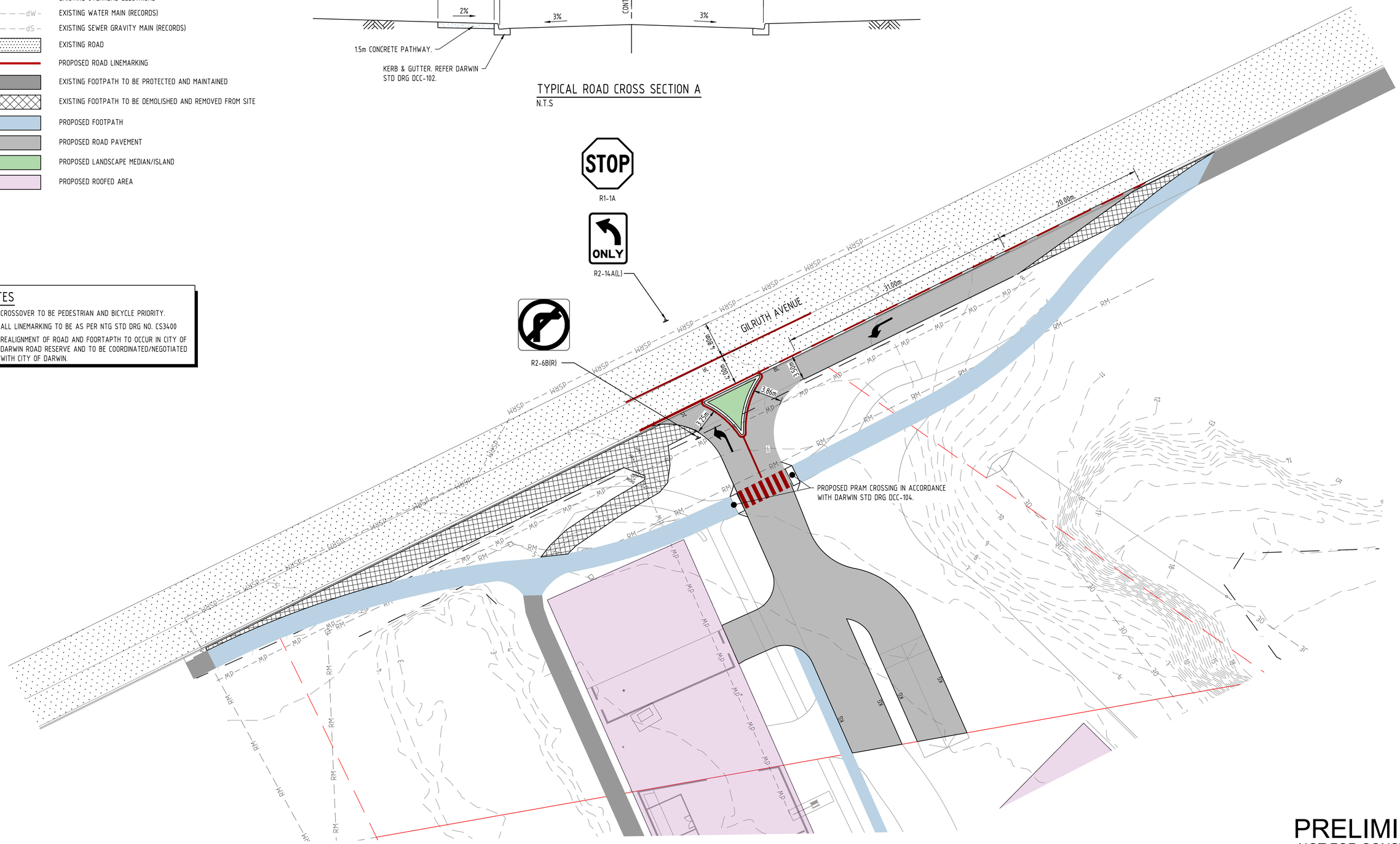
- SITE BOUNDARY
- PROJECTION OF SITE BOUNDARY
- EXISTING PROPERTY BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING OVERHEAD ELECTRICAL
- EXISTING WATER MAIN (RECORDS)
- EXISTING SEWER GRAVITY MAIN (RECORDS)
- EXISTING ROAD
- PROPOSED ROAD LINEMARKING
- EXISTING FOOTPATH TO BE PROTECTED AND MAINTAINED
- EXISTING FOOTPATH TO BE DEMOLISHED AND REMOVED FROM SITE
- PROPOSED FOOTPATH
- PROPOSED ROAD PAVEMENT
- PROPOSED LANDSCAPE MEDIAN/ISLAND
- PROPOSED ROOFED AREA

NOTES

1. CROSSOVER TO BE PEDESTRIAN AND BICYCLE PRIORITY.
2. ALL LINEMARKING TO BE AS PER NTG STD DRG NO. CS3400
3. REALIGNMENT OF ROAD AND FOORTAPTH TO OCCUR IN CITY OF DARWIN ROAD RESERVE AND TO BE COORDINATED/NEGOTIATED WITH CITY OF DARWIN.



TYPICAL ROAD CROSS SECTION A
N.T.S



PRELIMINARY
NOT FOR CONSTRUCTION

Rev	Date	Description	By	Chk
C	01.02.21	ISSUED FOR DISCUSSION	JMB	HD
B	05.06.20	ISSUED FOR DISCUSSION	JMB	HD
A	03.06.20	ISSUED FOR DISCUSSION	JMB	HD

0 2 4 6 8 10m
SCALE 1:200
AT ORIGINAL SIZE (A1)

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Client: KTT Investments Pty Ltd	Discipline: CIVIL		Status: DISCUSSION
Project Name: LITTLE MINDIL BEACH THE GARDENS, NORTHEN TERRITORY	Designed By: HD	Checked By: HD	Approved By: BL
	Project No.: 23085	Drawn By: JMB	Scale at A1: 1:500

Title: DRIVEWAY CROSSOVER OPTION A

Drawing No.: DA_C022 | Revision: C

PLOT DATE: 6/17/2021 4:45 PM FILENAME: J:\23000\23085\CVL\DWG\DA\23085_DA_C022_DRIVEWAY CROSSOVER OPTION A.DWG

FULL SIZE ON ORIGINAL 0 10 20 30 40 50 60 70 80 90 100mm

LEGEND

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- PROJECTION OF SITE BOUNDARY
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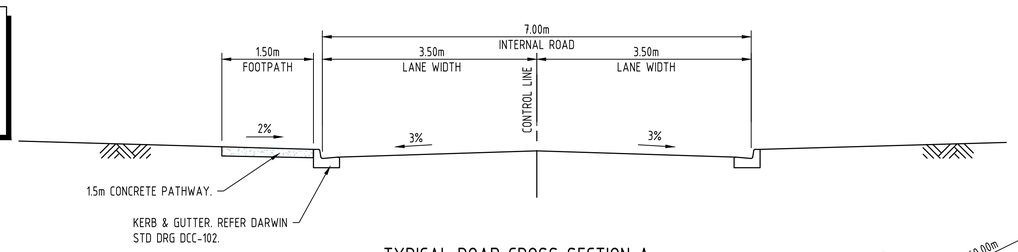
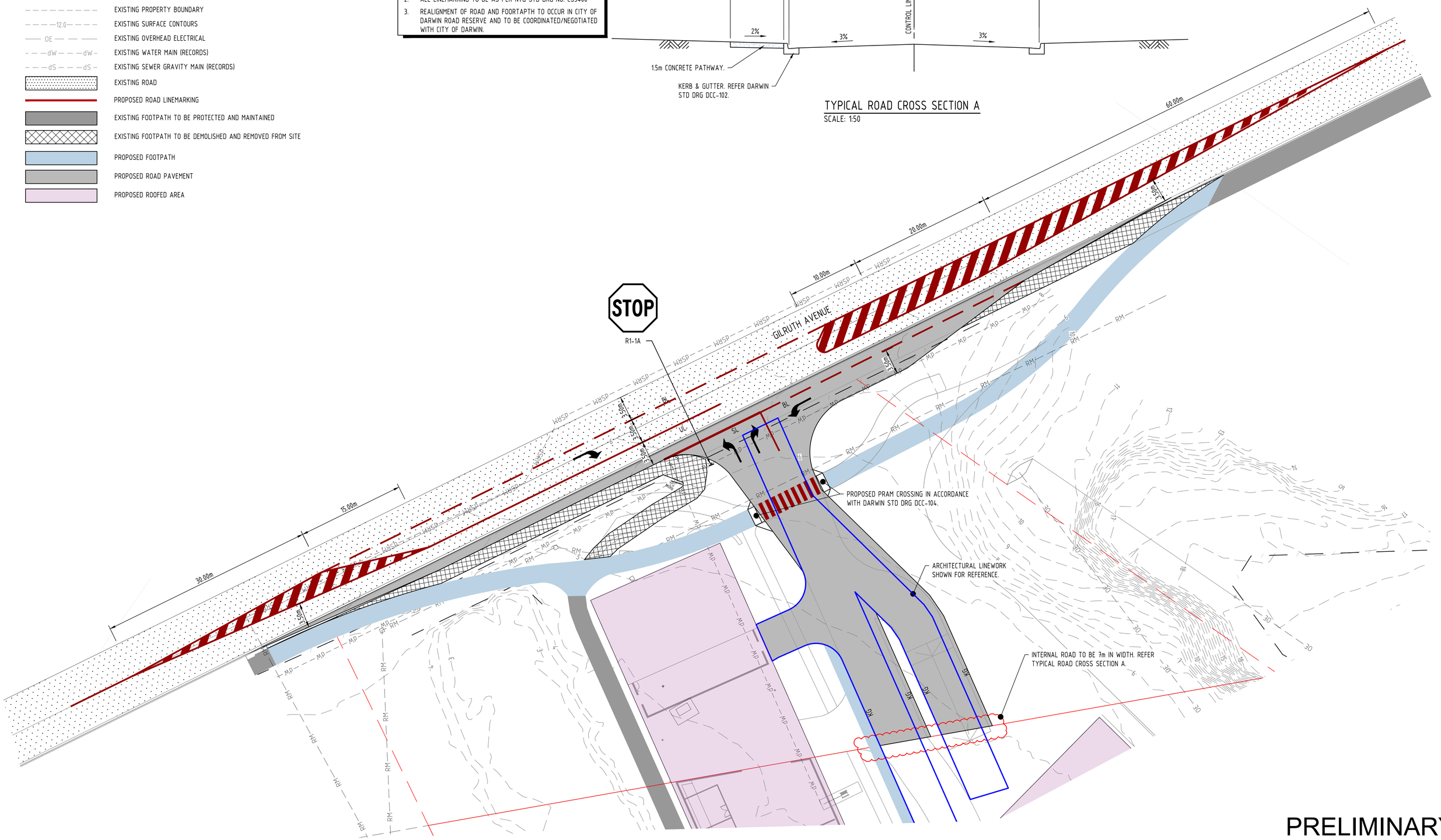


TYPICAL ROAD CROSS SECTION A

SCALE: 1:50



PRELIMINARY
NOT FOR CONSTRUCTION

Rev	Date	Description	By	Chk
C	17.06.21	ISSUED FOR DISCUSSION	AM	HD
B	05.06.20	ISSUED FOR DISCUSSION	JMB	HD
A	03.06.20	ISSUED FOR DISCUSSION	JMB	HD

0 2 4 6 8 10m
SCALE 1:200
AT ORIGINAL SIZE (A1)

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Client: KTT Investments Pty Ltd

Project Name: LITTLE MINDIL BEACH
THE GARDENS, NORTHEN TERRITORY

Discipline		Status
CIVIL		DISCUSSION
Designed By	Checked By	Approved By
HD	HD	BL
Project No.	Drawn By	Scale at A1
23085	JMB	1:500

Title: DRIVEWAY CROSSOVER
OPTION B

Drawing No.: DA_C023
Revision: C

PLOT DATE: 6/17/2021 4:45 PM FILENAME: J:\23000\23085\CVL\DWG\DA\23085_DA_C023_DRIVEWAY CROSSOVER OPTION B.DWG

FULL SIZE ON ORIGINAL 0 10 20 30 40 50 60 70 80 90 100mm