



The Overlander Hotel

180 Richmond Road, Cambridge Gardens

Client // Simon Wells Architect
Office // NSW
Reference // 16S1499000
Date // 14/07/16

The Overlander Hotel
 180 Richmond Road, Cambridge Gardens
 Transport Impact Assessment

Issue: A 14/07/16

Client: Simon Wells Architect
 Reference: 16S1499000
 GTA Consultants Office: NSW

Quality Record


| Issue | Date | Description | Prepared By | Checked By | Approved By | Signed |
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1. Introduction

1.1 Background

This report has been prepared by GTA Consultants on behalf of Simon Wells Architect to accompany a development application to Penrith City Council seeking approval for the proposed alterations and additions to the existing Overlander Hotel at 180 Richmond Road, Cambridge Gardens. It has been prepared to accompany a development application to Penrith City Council seeking approval for the proposed development.

1.2 Purpose of this Report

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

- i the existing traffic and parking conditions surrounding the site
- ii the suitability of the proposed parking in terms of supply (quantum) and layout
- iii the appropriateness of service vehicle, and pedestrian and bicycle requirements
- iv the traffic generating characteristics of the proposed development and the suitability of the proposed access arrangements for the site
- v the acceptability of the transport/traffic impact of the proposed development on the surrounding road network.

1.3 References

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

- o an inspection of the site and its surrounds
- o Penrith City Council Development Control Plan (DCP) 2014
- o Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- o Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- o Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- o traffic and car parking surveys undertaken as referenced in the context of this report
- o plans for the proposed development prepared by Simon Wells Architect
- o other documents and data as referenced in this report.

2. Existing Conditions

2.1 Site Description

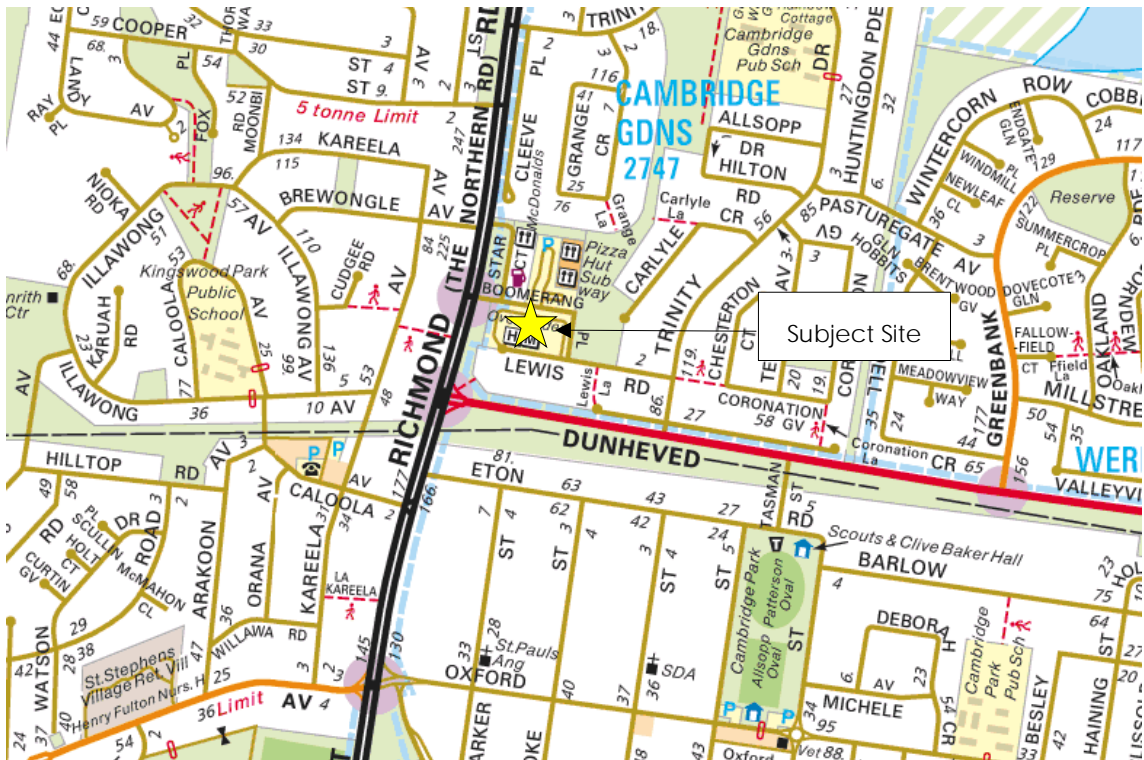
The site is located at 180 Richmond Road, Cambridge Gardens, and fronts Boomerang Place, Richmond Road and Lewis Street along the north and east, west and south boundary respectively.

The site of approximately 8,913m² has a land use classification of B6 Enterprise Corridor and is currently occupied by The Overlander Hotel.

The land in the vicinity of the subject site predominately consists of low density residential uses to the north-west and public recreation space to the east of the site. Additionally, mixed retail uses are present to the north of the site, notably a Coles Supermarket, McDonalds Fast Food Restaurant and Caltex Star Mart Petrol Station.

The location of the site and the surrounding road network is shown in Figure 2.1.

Figure 2.1: Subject Site Location



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2.2 Road Network

2.2.1 Surrounding Road Network

Roads are defined by a functional class according to their performance. These classifications are to guide the management of the road according to their intended service or qualities. The

classification involves the relative balance of the mobility and access functions. These road classes are:

- Arterial Roads – controlled by RMS, typically no limit in flow and designed to carry vehicles long distance between regional centres.
- Sub-Arterial Roads – can be managed by either Council or RMS. Generally, the range of the operating capacity is between 10,000 and 20,000 vehicles per day. The function of a sub-arterial road is to carry traffic between areas in a sub region, or provide connectivity from arterial road routes.
- Collector Roads – provide connectivity between local sites and the arterial road network, these generally carry around 2,000 and 10,000 vehicles per day.
- Local Roads – provide direct access to properties and the collector road system and generally carry up to 4,000 vehicles per day.

The existing road network in the vicinity of the subject site includes Richmond Road, Boomerang Place and Lewis Road. A description of these roads are provided below.

Richmond Road

Richmond Road is classified as an arterial road and is aligned in a north-south direction with a posted speed limit of 70 km/h.

It is a two-way road generally configured with four-lanes, separated by a central median island. An additional right turn lane is provided on the south approach near the subject site, providing northbound traffic with access to Boomerang Place and also the site.

Richmond Road is a main route for thoroughfare traffic travelling to and from Richmond and Camden areas via The Northern Road.

Figure 2.2 and Figure 2.3 show Richmond Road in the vicinity of the site.

Figure 2.2: Richmond Road (looking southbound, south of Boomerang Place)



Figure 2.3: Richmond Road (looking southbound south of Star Circuit)



Boomerang Place

Boomerang Place functions as a collector road providing access to Coles Supermarket and service centre. Boomerang Place is aligned in an L-shape and travels along the northern and eastern boundary of the site.

It is a two-way road across an 8.2m wide carriageway with a posted speed limit of 50km/h. Unrestricted kerbside parking is provided on both sides of the road. Two driveways are currently provided on the northern side of Boomerang Place, providing vehicular access to the petrol

station, Coles supermarkets and fast food outlets. One driveway is provided on the southern side of Boomerang Place providing access to the site.

Figure 2.4: Boomerang Place (looking west towards Richmond Road)



Figure 2.5: Boomerang Place (looking north along the eastern site boundary)



Lewis Street

Lewis Street functions as a two-way cul-de-sac local road, connecting to Trinity Drive at the eastern end and Boomerang Place near the centre of the road segment. The road predominately services local area traffic due to the presence of low density residential uses in the vicinity.

2.2.2 Site Access Arrangements

The site has two vehicular accesses provided along Lewis Street at the south-west and south-east corners of the site and one access off Boomerang Place on the north-west corner of the site.

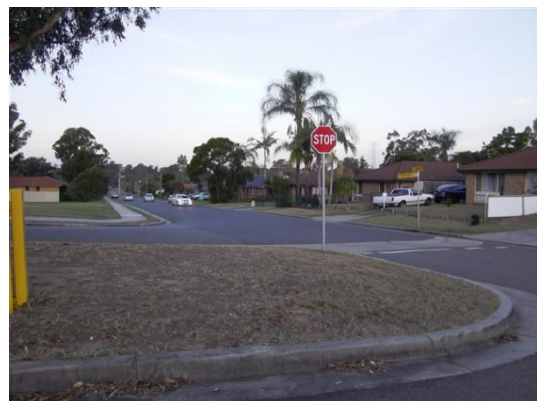
The south-west driveway is currently not operating and only vehicles under the 4.0 tonne limit (delivery vehicles exempt) are permitted to access the site. This 4.0 tonne mass limit restriction is signposted on the south-east driveway, as shown in Figure 2.6.

The Lewis Street / Boomerang Place intersection is controlled with a stop sign arrangement on the western section of Lewis Street, providing priority to Boomerang Place and Lewis Street (east). This arrangement is shown in Figure 2.7.

Figure 2.6: Lewis Street (looking at the south-east driveway)



Figure 2.7: Lewis Street (looking east)



2.2.3 Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

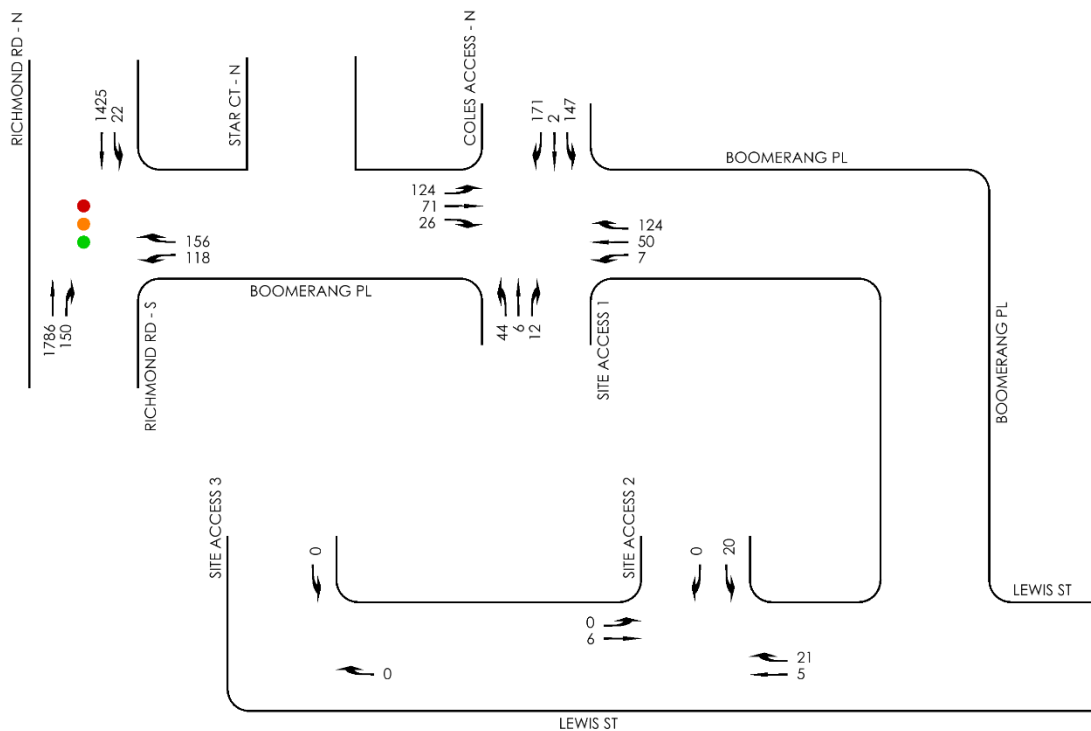
- Richmond Road/ Boomerang Place (signalised)
- Boomerang Place / Star Circuit (uncontrolled)
- Boomerang Place / Lewis Street (priority controlled)

2.3 Traffic Volumes

GTA Consultants commissioned traffic movement counts on key roads in the vicinity of the site on Thursday, 28 April 2016, during the evening peak period between 4:30pm and 6:30pm.

From the survey, the peak hour at the Richmond Road / Boomerang Place intersection was identified to be between 4:45pm and 5:30pm. The PM peak hour traffic volumes are summarised in Figure 2.8.

Figure 2.8: Existing – PM Peak Hour Traffic Volumes



The existing site generates a total of 138 vehicle trips in the evening peak, with of split of 40% inbound and 60% outbound traffic movements.

Based on the survey results, the majority of vehicle movements on the road network occurred at the Richmond Road / Boomerang Place signalised intersection, producing a total of 3,657 vehicle movements during the evening peak hour. The majority of vehicles at this intersection were travelling northbound and southbound on Richmond Road, with approximately 12% of total movements travelling into or out of Boomerang Place.

2.4 Intersection Performance

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION¹, a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RMS, 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 |

Using the SIDRA program, an intersection analysis of the Richmond Road and Boomerang Place was conducted for the existing conditions. Table 2.2 presents a summary of the existing operation of the intersection, with full results presented in Appendix B of this report.

Table 2.2: Existing Operating Conditions – PM Peak 2016

| Intersection | Peak | Leg | Degree of Saturation (DOS) | Average Delay (sec) | 95th Percentile Queue (m) | Level of Service (LOS) |
|---------------------------------|------|----------------|----------------------------|---------------------|---------------------------|------------------------|
| Richmond Road / Boomerang Place | PM | South | 0.65 | 11 | 211 | A |
| | | East | 0.80 | 58 | 80 | E |
| | | North | 0.68 | 20 | 251 | B |
| | | Overall | 0.80 | 18 | 251 | B |

Table 2.2 indicates that the intersection of Richmond Road and Boomerang Place currently operates well, with spare capacity during the PM peak. However, it is noted that delays are experienced on the Boomerang Place approach during the PM peak.

2.5 Car Parking

The Overlander Hotel currently provides 163 car parking spaces with vehicle access provided directly off Boomerang Place and Lewis Street.

Site observations in the evening peak indicate that the car park occupancy of the Overlander Hotel car park is generally low, typically of a parking utilisation rate of 30% or less.

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

Furthermore, there are approximately 77 unrestricted car parking spaces provided along Boomerang Place and Lewis Street on the north, east and south boundaries of the site. The on-street parking demand in the nominated area in the evening peak was also observed to be low.

During the site visit, it was also noted that properties in the vicinity of the site generally have off-street parking made available, e.g. on-site car park at the Coles Supermarket and also off-street parking within residential properties.

Therefore, the car parking supply is considered to be well-provided in the vicinity of the site.

2.6 Public Transport

Bus services in the vicinity of the site are provided by Busways via Richmond Road and Trinity Drive. A review of the public transport is summarised in Table 2.3, with the bus network diagram shown in Figure 2.9.

Table 2.3: Public Transport Provision

| Service | Route # | Route Description | Location of Stop | Distance to Nearest Stop | Frequency On/Off Peak |
|---------|---------|---|---------------------------|--------------------------|---------------------------------------|
| Bus | 677 | Richmond to Penrith via Londonderry & The Northern Road | Richmond Rd, near Star Ct | 150m | AM / PM peaks Only |
| | 678 | Richmond to Penrith via Agnes Banks, Castlereagh & Cranebrook | Richmond Rd, near Star Ct | 150m | 30-minutes peak / 1 trip off-peak |
| | 782 | Penrith to Werrington & St Marys via Cambridge Gardens | Richmond Rd, near Star Ct | 150m | 30-minutes peak / 60-minutes off-peak |

Figure 2.9: Bus Network Diagram



2.7 Pedestrian and Cycle Infrastructure

Pedestrian footpaths are provided in the vicinity of the site. In the immediate vicinity of the site, pedestrian paths are located as follows:

- Richmond Road (both sides) – 1.2-1.5m wide path, providing convenient access to local points of interest including bus stops and local parks.
- Boomerang Place (north side) – 1.2m wide path, providing linkage to the Coles Supermarket and other retail uses in the vicinity
- Lewis Road (east-north side) – 1.2m wide path, providing access to residential properties in the vicinity.

In addition, it is noted that signalised pedestrian crossings are provided along all three-legs at the Richmond Road / Boomerang Place intersection, providing a safe dedicated crossing point for pedestrians.

There are limited cycle routes available in the vicinity of the site. However, there is currently a dedicated on-road separated bicycle lane provided along the western boundary of the site on Richmond Road, providing linkage to the Cranbrook and Penrith surrounding areas.

3. Development Proposal

3.1 Proposal Description

The proposal involves alterations and additions to the existing Overlander Hotel site to increase the total gross floor area (GFA) from 2,080m² to 2,373.5m² (an increase of 14.1%) with an associated increase in on-site car parking from 163 spaces to 167 car spaces (an increase of 4 spaces).

The additions and alterations to the Overlander Hotel include inclosing the existing veranda area at the north of the building and also provide new western and eastern entry lobbies.

The total additional useable floor space area includes the smoker's veranda and gaming room 1 as shown in the development plans in Appendix A.

3.2 Vehicle Access

Vehicle access to the site is currently provided off Boomerang Place and Lewis Street, to the north and south boundary, respectively.

There is a driveway at the south-west corner of Lewis Street, near the cul-de-sac end which is currently not in use. As part of the proposal, this driveway would be removed and reconstructed to match the existing kerb line and therefore, only two vehicle accesses would be provided one from Boomerang Place and the other from the south-east corner of Lewis Street. Both accesses will continue to be two-way.

3.3 Loading Areas

One loading bay is proposed within the site and has been designed to accommodate for a 12.5m Heavy Rigid Vehicle (HRV) with dimensions of 12.5m long by 3.5m wide.

Service vehicle access would be via the existing access on Boomerang Place. It is noted that all service vehicles would enter and exit the site in a forward direction.

A swept path assessment has been undertaken to demonstrate a 12.5m HRV accessing and exiting the loading bay in a forward direction. Further, it is noted that a private contractor would be provisioned to undertake waste collection activities for the site. It is expected that a 10.8m long waste collection vehicle would be used to perform such waste collection activities within the designated loading bay on-site.

4. Car Parking

4.1 Car Parking Requirements

The car parking provision requirements for various land uses are set out in Penrith City Council's DCP 2014. A review of the car parking requirement rates and the floor area schedule for the entire development (existing and additional) is summarised in Table 4.1 below.

Table 4.1: DCP Car Parking Requirements

| Use | | Size | DCP Parking Rate | DCP Parking Requirement |
|------------------------|-------------------|-----------------------|--|-------------------------|
| Pub / Registered Clubs | Bar | 170.23 m ² | 1 space per 4m ² of bar floor area, plus 1 space per 6m ² lounge and dining room | 43 spaces |
| | Lounge and dining | 547.46 m ² | | 92 spaces |
| Motel | | 20 rooms | 1 space per unit plus 1 space per management, plus 1 space per 6 employees | 22 spaces |
| Specialty Retail | | 243.31 m ² | 1 space per 30m ² GFA | 9 spaces |
| Total | | | | 166 spaces |

[1] Gaming area has been assumed to have a similar uses to "lounge and dining" and has been incorporated in the "lounge and dining" category.

Based on the anticipated use of the site, the proposed development is required to provide a total of 166 car parking spaces.

The development proposes to provide 167 car parking spaces and therefore complies with the parking requirement as set out in the Penrith City Council DCP 2014. It is noted that the hotel also provides a mini shuttle bus for its patrons.

4.2 Car Parking Layout Review

The proposed new car park area has been reviewed against the requirements of the Penrith City Council's DCP 2014 and the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009). This assessment included a review of the following:

- bay and aisle width
- adjacent structures
- turnaround facilities
- circulation roads
- internal queuing
- pick-up / set-down area
- parking for persons with disabilities

It is noted that only the western end of the car park and a portion of car parking spaces along the building frontage is proposed to be reconfigured and therefore, the eastern end car park has not been assessed against the relevant Australian Standards as it currently exists.

A total of 81 car parking spaces are proposed to be installed along the western end of the car park and along the building frontage, with access provided directly from Boomerang Place. The 81 spaces are comprised of 77 standard and 4 accessible parking spaces.

The 77 car parking spaces have been designed as 90-degree Class 2 parking facilities with the dimensions of 2.5m wide by 5.4m long spaces, with a minimum aisle width of 5.8m. Additionally,

four disabled parking spaces have been provided and designed in accordance with AS2890.6:2009. A minimum headroom of 2.5m has been provided at the disabled parking spaces.

The loading bay provided within the site accommodates a 12.5m Heavy Rigid Vehicle. A minimum headroom of 4.5m has been provided within the car park to facilitate the service vehicle route within the car park.

The proposed car park layout is expected to operate satisfactorily.

5. Traffic Impact Assessment

5.1 Traffic Generation

As discussed in Section 2.3 of this report, traffic surveys were undertaken on Thursday 28 April 2016 to understand the current traffic movements surrounding the site. As indicated in Figure 2.8, the site generates a total of 138 vehicle trips in the evening peak, with a split of 40% inbound and 60% outbound traffic movements.

Based on the anticipated use of the site, the evening peak would likely generate the most trips and therefore, the morning peak has not been assessed for the purpose of the study. As the site is already operational the proposed traffic generation rate has been determined by surveying the existing peak traffic generation.

Therefore, based on the gross floor area (GFA) of 2,080m² and the existing traffic generated to and from the site, a traffic generation rate of 6.6 vehicle trips per 100m² GFA has been calculated.

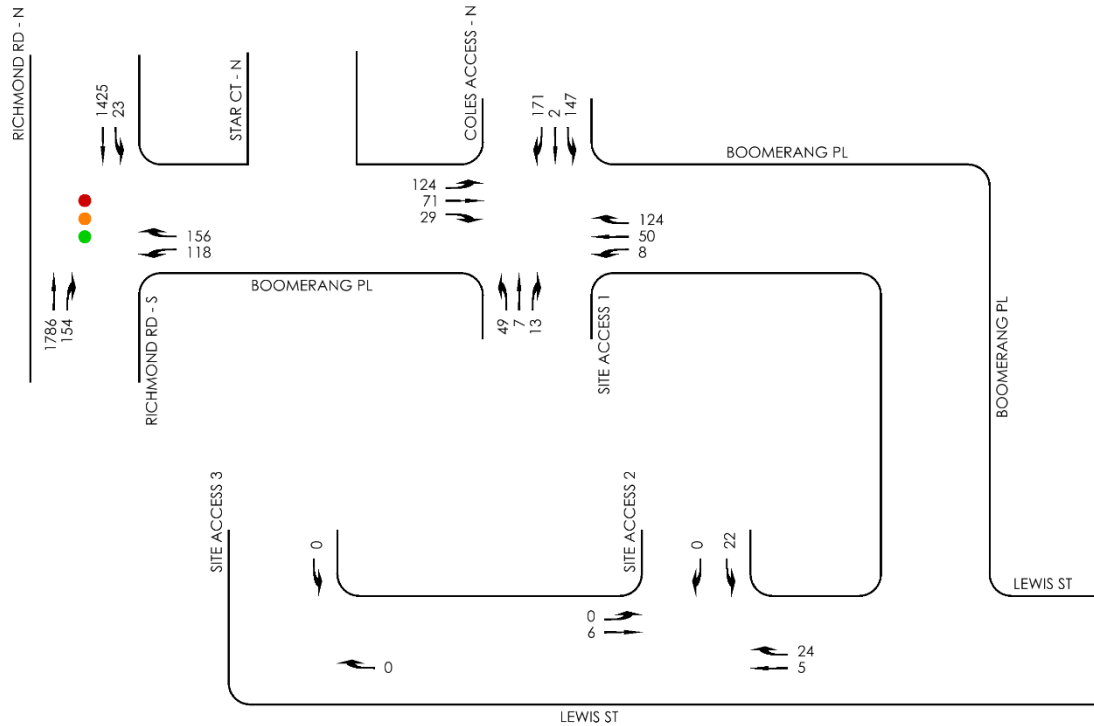
Taking into consideration of the above and the proposed increase of 293.5m² GFA of the site, the anticipated traffic generation associated with the redevelopment of the site has been summarised in Table 5.1.

Table 5.1: Traffic Generation Estimates

| | Size | Traffic Rate | Traffic Generation Estimate | Vehicle Movements | |
|-----------------------|---------------------------|---|-----------------------------|----------------------|-----------------------|
| | | | | In | Out |
| Existing | 2,080m ² GFA | 6.6 vehicle trips per 100m ² GFA | 138 veh trips | 56 veh trips | 83 veh trips |
| Proposed | 2,373.5m ² GFA | | 157 veh trips | 63 veh trips | 95 veh trips |
| Net difference | | | + 19 veh trips | + 7 veh trips | + 12 veh trips |

Table 5.1 indicates that proposed redevelopment of the site is anticipated to generate a total of 157 vehicle trips, with an additional 19 vehicle trips in the evening peak from its existing use. The surrounding local network following the full development of the site is shown in Figure 5.1.

Figure 5.1: Post Development – PM Peak Hour Traffic Volumes



Based on the above, the associated development traffic relating to the proposed alterations and additions of the Overlander Hotel site (i.e. 19 vehicle trips) is considered minor in nature and is not expected to result in any adverse impacts or any operational or safety issues on the surrounding local network.

5.2 Intersection Operation

The anticipated development traffic associated with the redevelopment of the site has been examined using SIDRA INTERSECTION to assess the intersection performance at the Richmond Road / Boomerang Place intersection. The results of the analysis have been summarised in Table 5.2.

Table 5.2: Future Operating Conditions

| Intersection | Peak | Leg | Degree of Saturation (DOS) | Average Delay (sec) | 95th Percentile Queue (m) | Level of Service (LOS) |
|---------------------------------|------|----------------|----------------------------|---------------------|---------------------------|------------------------|
| Richmond Road / Boomerang Place | PM | South | 0.84 | 16 | 389 | B |
| | | East | 0.65 | 52 | 74 | D |
| | | North | 0.68 | 20 | 251 | B |
| | | Overall | 0.84 | 21 | 389 | B |

The assessment of post development traffic conditions of the site indicate that the intersection would continue to operate well with acceptable delays and spare capacity in the future.

Therefore, the proposed redevelopment of the Overlander Hotel site is not anticipated to generate any adverse traffic impacts or any operational or safety issues on the surrounding local network.

6. Conclusion

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

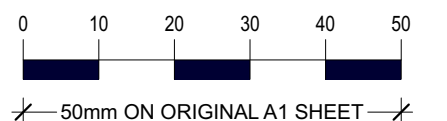
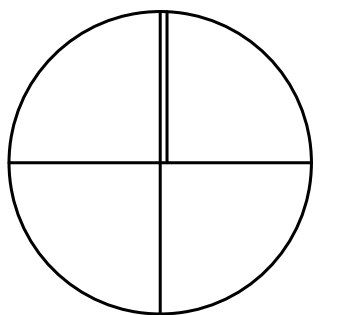
- i The proposed development generates a DCP parking requirement of 166 spaces.
- ii The proposed development currently provides 163 spaces and proposes to provide 167 parking spaces post development, this complies with the DCP parking requirements.
- iii The proposed parking layout is consistent with the dimensional requirements as set out in the Penrith City Council DCP 2014 and/or Australian/New Zealand Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009).
- iv One loading bay has been provided and designed to accommodate a 12.5m Heavy Rigid Vehicle for all loading and unloading associated with the site, notably the Bottle Shop.
- v The redevelopment of the site is expected to generate an additional 19 vehicle movements in evening peak.
- vi There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development.

Overall, the traffic and parking implications associated with the proposed alterations and additions to the Overlander Hotel at 180 Richmond Road, Cambridge Gardens is considered minimal and is not anticipated to result in any operational or safety issues on the surrounding local network.

Appendix A

Architectural Layout Plans

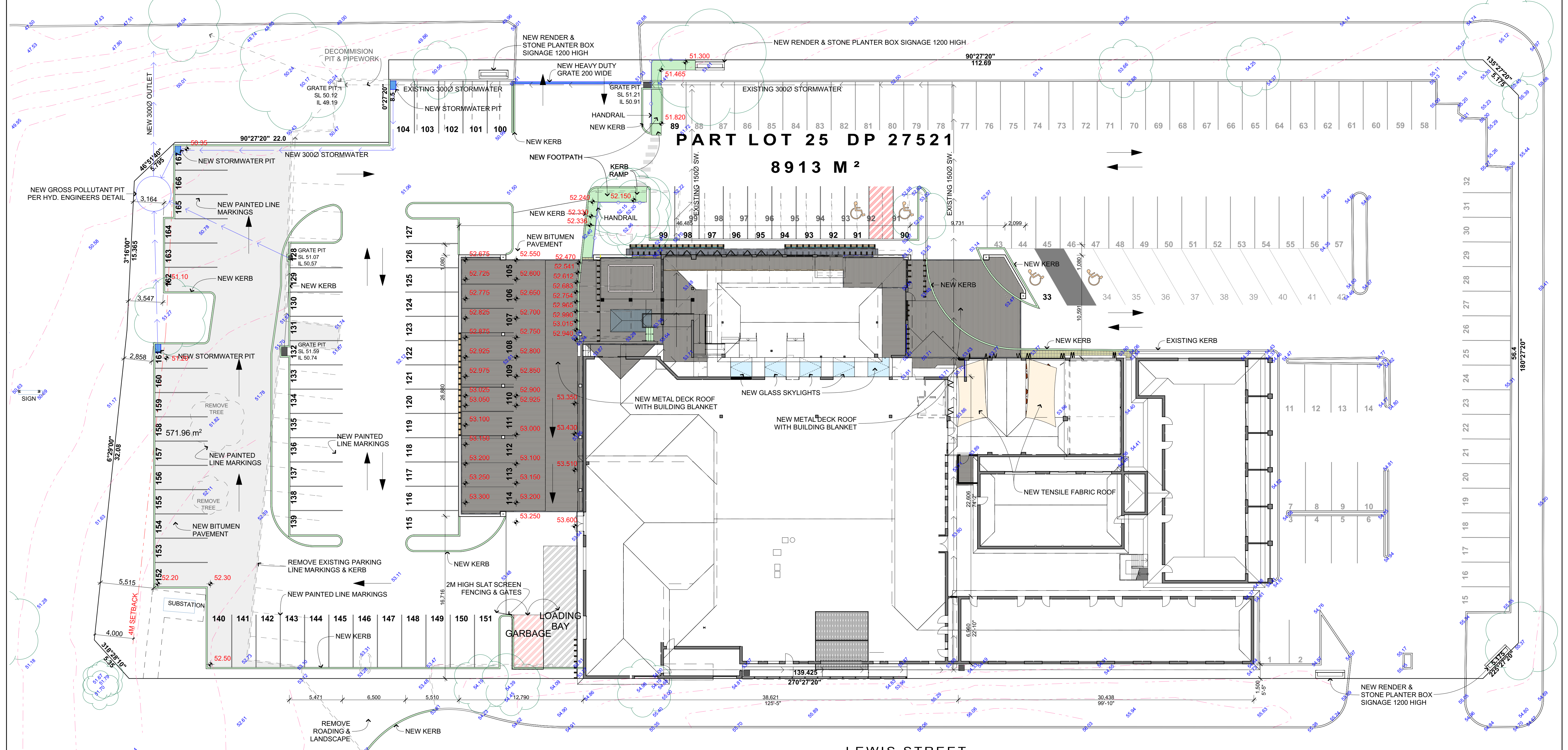
PROJECT NORTH



50mm ON ORIGINAL A1 SHEET

TO RICHMOND ROAD

BOOMERANG PLACE



SITE PLAN

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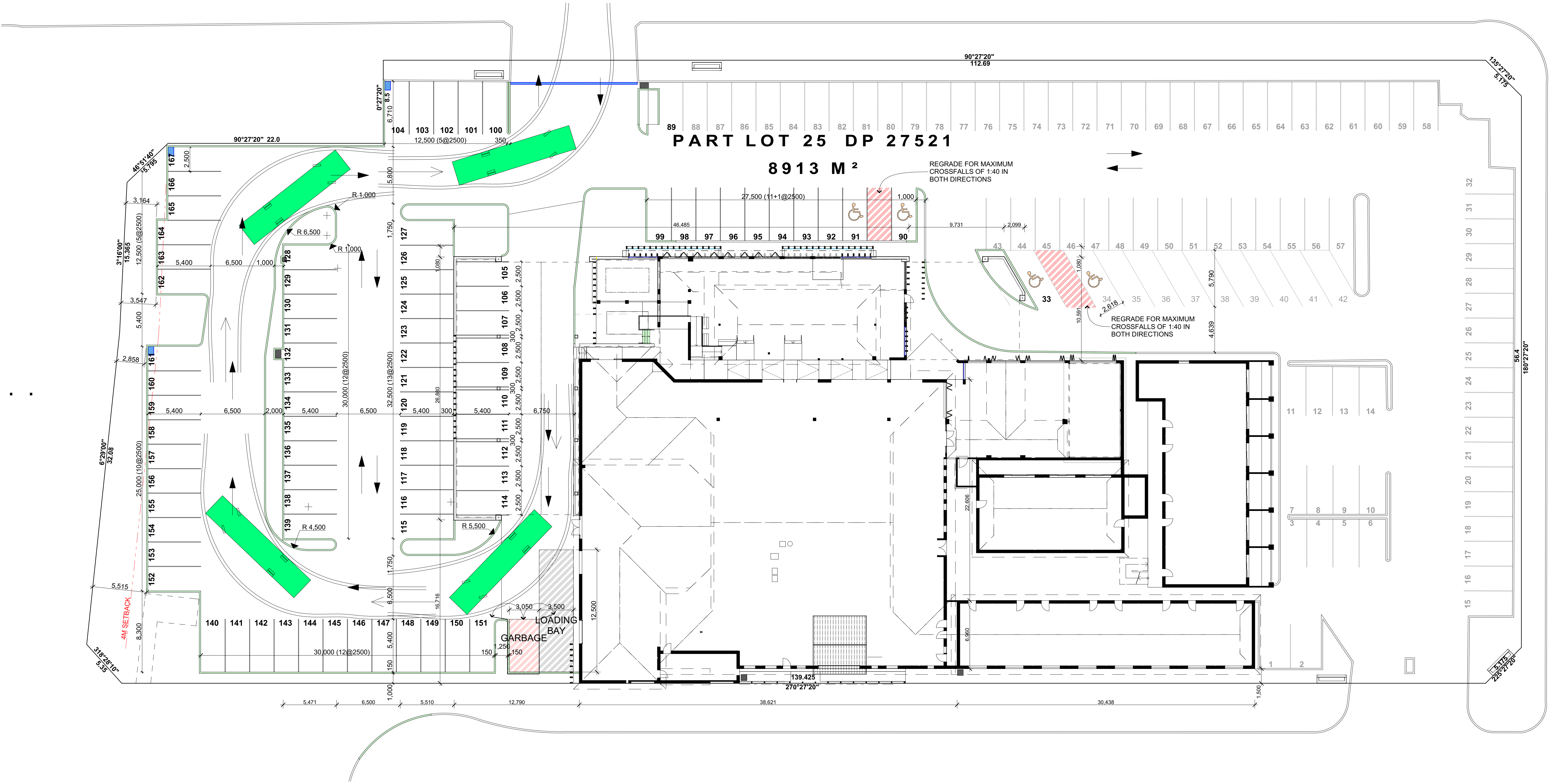
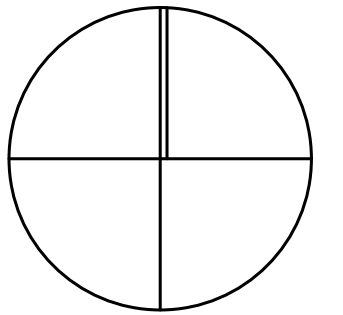
client
BRISCOE HOTEL GROUP

project name
ALTERATIONS & ADDITIONS TO OVERLANDER HOTEL RICHMOND ROAD CAMBRIDGE GARDENS

SITE PLAN

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PROJECT NORTH



TRAFFIC PLAN

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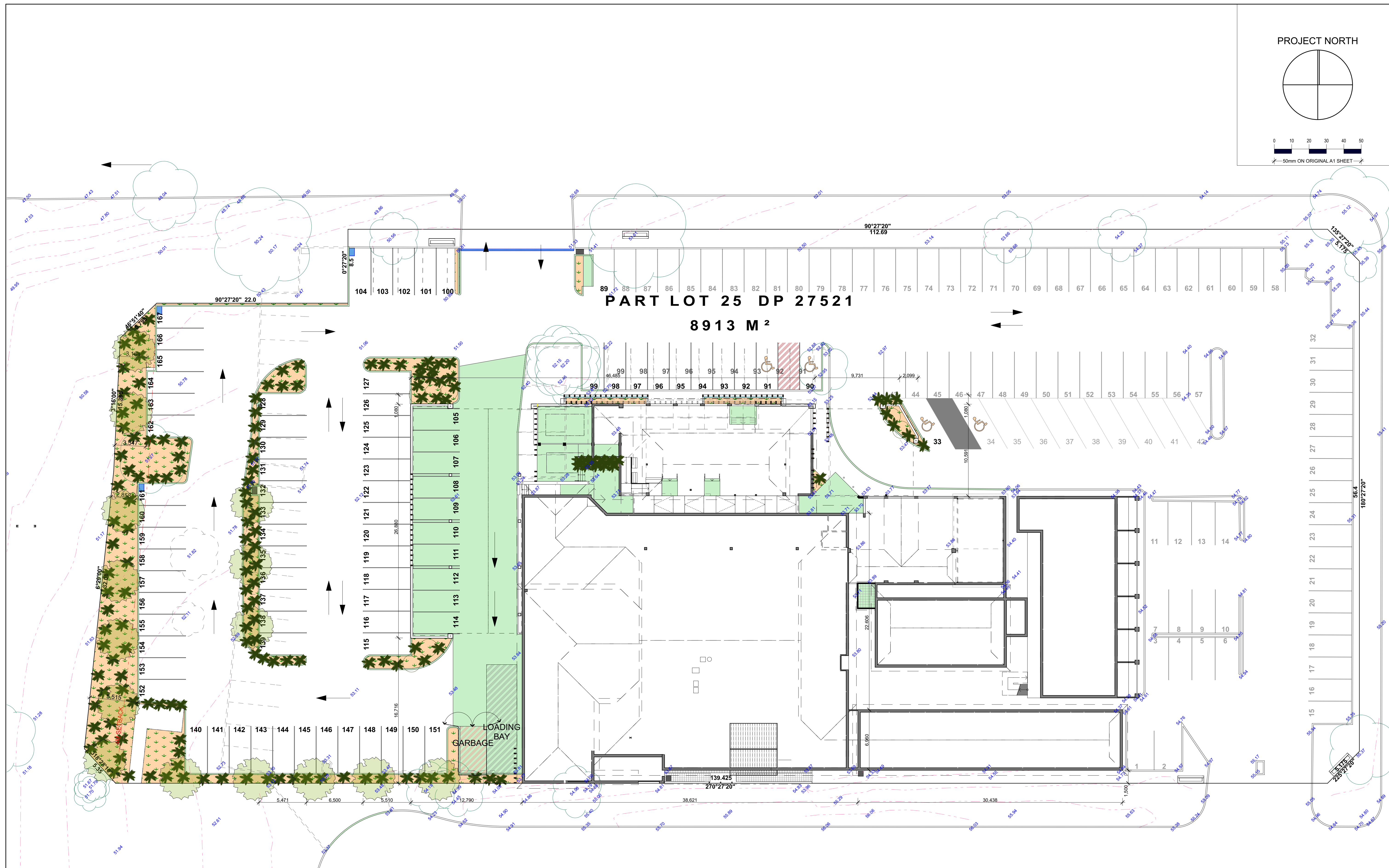
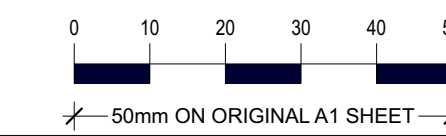
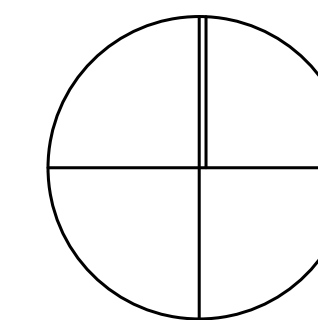


client
BRISCOE HOTEL GROUP

project name
ALTERATIONS & ADDITIONS TO OVERLANDER HOTEL RICHMOND ROAD CAMBRIDGE GARDENS

| TRAFFIC PLAN | |
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PROJECT NORTH



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LANDSCAPE PLAN

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client
BRISCOE HOTEL GROUP

project name
**ALTERATIONS & ADDITIONS
 TO OVERLANDER HOTEL
 RICHMOND ROAD CAMBRIDGE
 GARDENS**

LANDSCAPE PLAN

| | |
|----------------------------|-----------------------------------|
| project no: 1025 | drawing (issue)#: 1.3() |
| checked by: SW | plot date: 23/05/2016 |

Appendix B

SIDRA INTERSECTION Results



MOVEMENT SUMMARY

Site: The Overlander Hotel, Cambridge Gardens - Ex PM

16S1499000 Boomerang Place / Richmond Road Intersection, Cambridge Gardens

Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Richmond Rd - S | | | | | | | | | | | |
| 2 | T1 | 1880 | 3.7 | 0.646 | 8.1 | LOS A | 29.1 | 210.5 | 0.51 | 0.47 | 60.6 |
| 3 | R2 | 158 | 2.0 | 0.467 | 47.7 | LOS D | 9.9 | 70.1 | 0.95 | 0.92 | 32.9 |
| Approach | | 2038 | 3.6 | 0.646 | 11.1 | LOS A | 29.1 | 210.5 | 0.54 | 0.51 | 56.9 |
| East: Boomerang PI - E | | | | | | | | | | | |
| 4 | L2 | 124 | 0.8 | 0.209 | 41.3 | LOS C | 6.1 | 43.0 | 0.77 | 0.75 | 34.2 |
| 6 | R2 | 164 | 1.3 | 0.796 | 70.4 | LOS E | 11.3 | 79.9 | 0.98 | 0.89 | 26.8 |
| Approach | | 288 | 1.1 | 0.796 | 57.9 | LOS E | 11.3 | 79.9 | 0.89 | 0.83 | 29.5 |
| North: Richmond Rd - N | | | | | | | | | | | |
| 7 | L2 | 23 | 4.5 | 0.676 | 26.5 | LOS B | 34.0 | 246.0 | 0.72 | 0.67 | 43.7 |
| 8 | T1 | 1500 | 3.9 | 0.676 | 20.3 | LOS B | 34.7 | 251.0 | 0.73 | 0.67 | 50.3 |
| Approach | | 1523 | 3.9 | 0.676 | 20.3 | LOS B | 34.7 | 251.0 | 0.73 | 0.67 | 50.2 |
| All Vehicles | | 3849 | 3.5 | 0.796 | 18.3 | LOS B | 34.7 | 251.0 | 0.64 | 0.60 | 50.7 |

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

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.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

| Movement Performance - Pedestrians | | | | | | | | | |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------------|--------------|-----------------------------|--|
| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Queue Distance m | Prop. Queued | Effective Stop Rate per ped | |
| P1 | South Full Crossing | 53 | 64.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | |
| P2 | East Full Crossing | 53 | 14.7 | LOS B | 0.1 | 0.1 | 0.46 | 0.46 | |
| P3 | North Full Crossing | 53 | 61.4 | LOS F | 0.2 | 0.2 | 0.94 | 0.94 | |
| All Pedestrians | | 158 | 46.8 | LOS E | | | 0.79 | 0.79 | |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: GTA CONSULTANTS | Processed: Monday, 2 May 2016 4:38:40 PM

Project: P:\16S1400-1499\16S1499000 180 Richmond Road, Cambridge Gardens TIA\Modelling\160502-16S1499000.sip6

MOVEMENT SUMMARY

Site: The Overlander Hotel, Cambridge Gardens - Post Dev PM

16S1499000 Boomerang Place / Richmond Road Intersection, Cambridge Gardens

Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles | | | | | | | | | | | |
|---------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------------|--------------|-----------------------------|--------------------|
| Mov ID | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Richmond Rd - S | | | | | | | | | | | |
| 2 | T1 | 1880 | 3.7 | 0.836 | 13.2 | LOS A | 53.8 | 388.7 | 0.65 | 0.62 | 55.8 |
| 3 | R2 | 162 | 1.9 | 0.594 | 53.8 | LOS D | 10.6 | 75.1 | 0.99 | 0.94 | 31.2 |
| Approach | | 2042 | 3.6 | 0.836 | 16.4 | LOS B | 53.8 | 388.7 | 0.68 | 0.64 | 52.6 |
| East: Boomerang PI - E | | | | | | | | | | | |
| 4 | L2 | 127 | 0.8 | 0.222 | 41.4 | LOS C | 6.3 | 44.2 | 0.77 | 0.75 | 34.1 |
| 6 | R2 | 168 | 1.3 | 0.652 | 60.3 | LOS E | 10.5 | 73.9 | 0.95 | 0.81 | 28.9 |
| Approach | | 296 | 1.1 | 0.652 | 52.2 | LOS D | 10.5 | 73.9 | 0.87 | 0.78 | 30.9 |
| North: Richmond Rd - N | | | | | | | | | | | |
| 7 | L2 | 24 | 4.3 | 0.677 | 26.5 | LOS B | 34.0 | 246.3 | 0.72 | 0.67 | 43.7 |
| 8 | T1 | 1500 | 3.9 | 0.677 | 20.3 | LOS B | 34.7 | 251.3 | 0.73 | 0.67 | 50.3 |
| Approach | | 1524 | 3.9 | 0.677 | 20.4 | LOS B | 34.7 | 251.3 | 0.73 | 0.67 | 50.2 |
| All Vehicles | | 3862 | 3.5 | 0.836 | 20.7 | LOS B | 53.8 | 388.7 | 0.71 | 0.67 | 49.0 |

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

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.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

| Movement Performance - Pedestrians | | | | | | | | | |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------------|--------------|-----------------------------|--|
| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Queue Distance m | Prop. Queued | Effective Stop Rate per ped | |
| P1 | South Full Crossing | 53 | 59.6 | LOS E | 0.2 | 0.2 | 0.92 | 0.92 | |
| P2 | East Full Crossing | 53 | 14.7 | LOS B | 0.1 | 0.1 | 0.46 | 0.46 | |
| P3 | North Full Crossing | 53 | 56.8 | LOS E | 0.2 | 0.2 | 0.90 | 0.90 | |
| All Pedestrians | | 158 | 43.7 | LOS E | | | 0.76 | 0.76 | |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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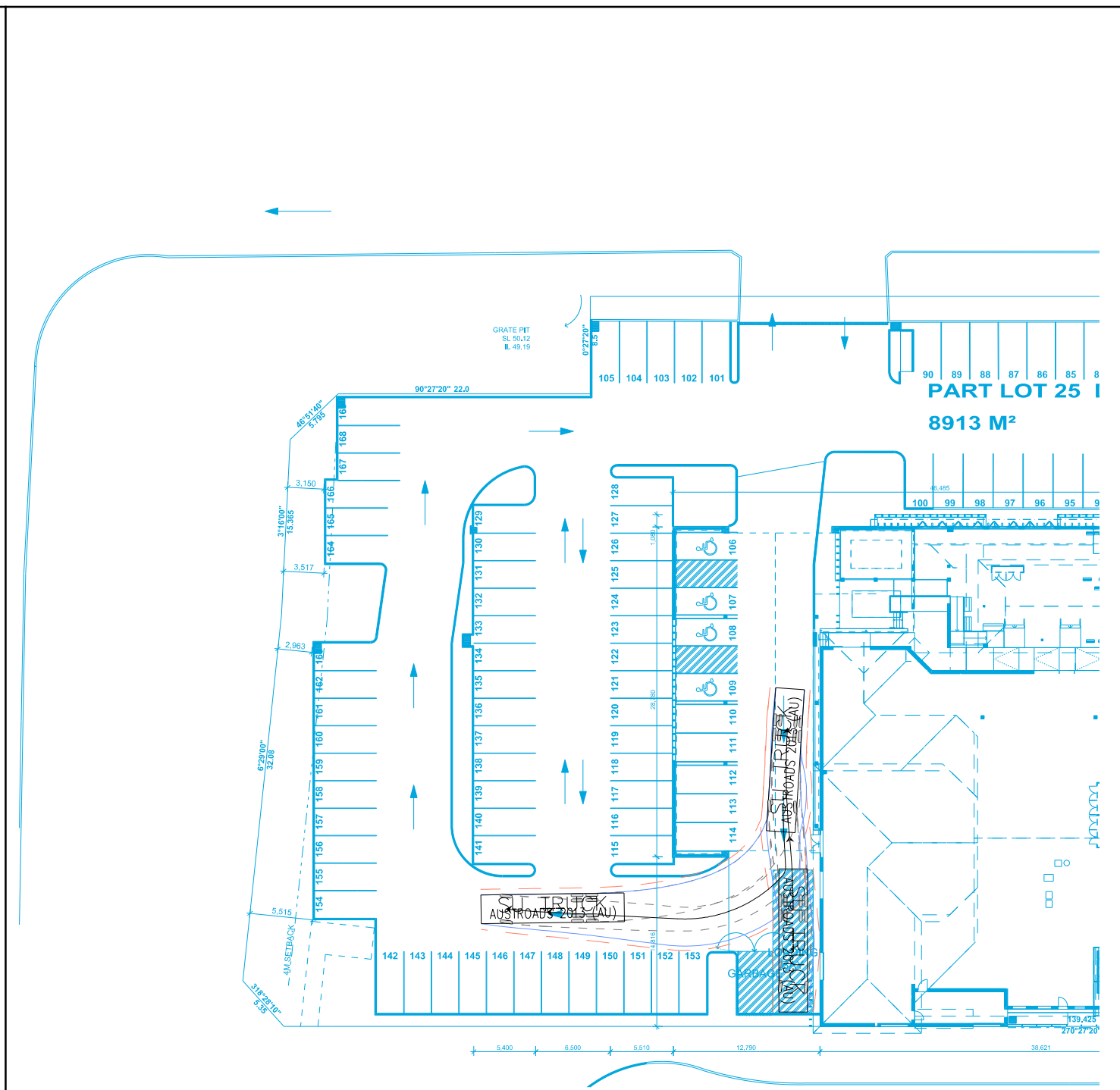
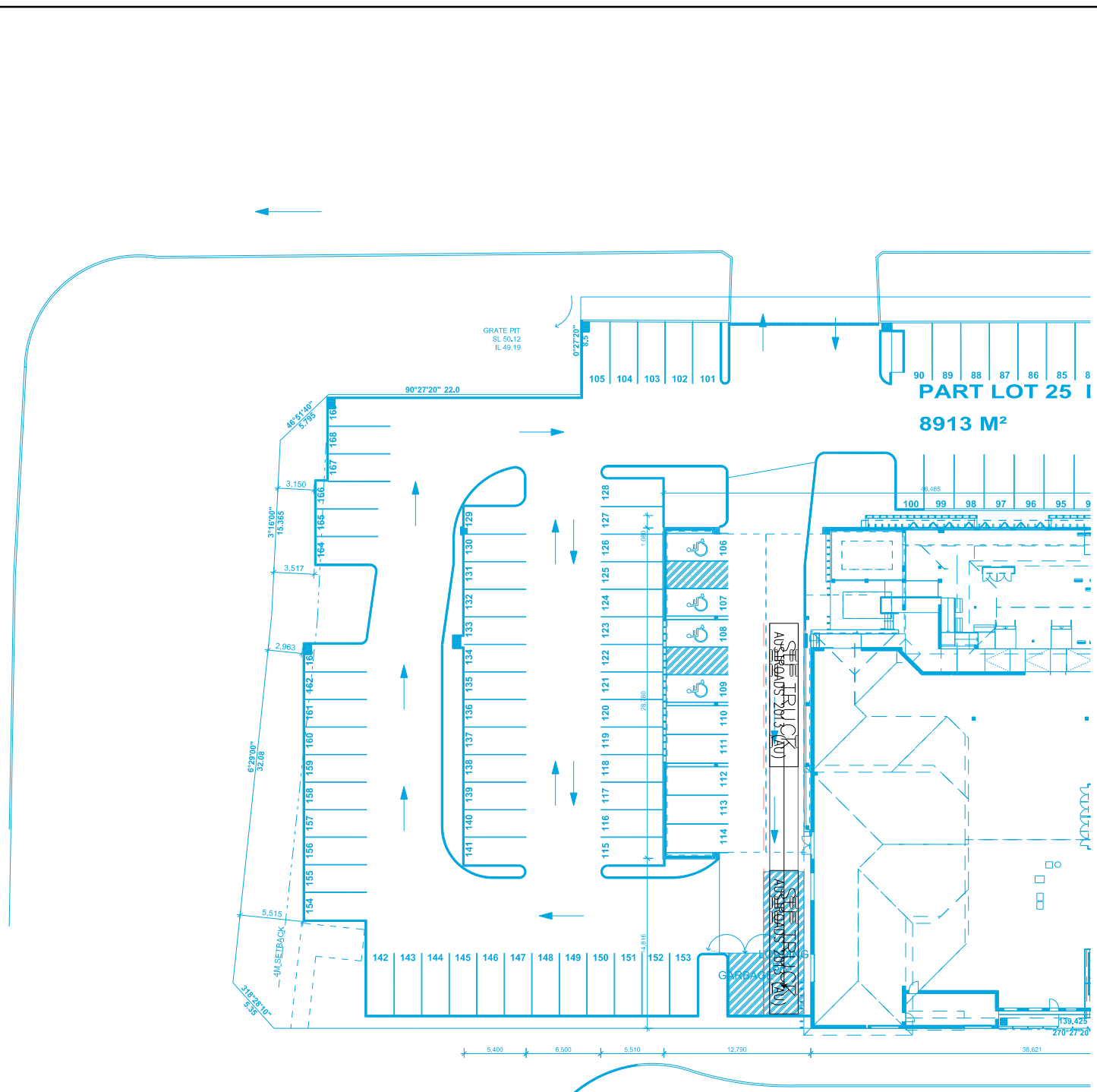
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Project: P:\16S1400-1499\16S1499000 180 Richmond Road, Cambridge Gardens TIA\Modelling\160502-16S1499000.sip6

Appendix C

Swept Path Assessment

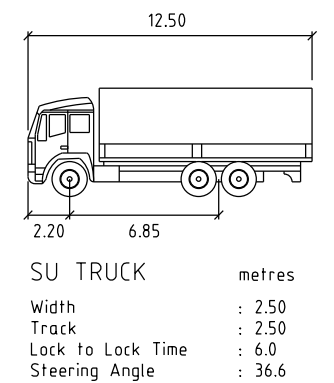
PLOTTED BY : Paramics_SVD ON 04-May-16 AT 11:12:12 AM 16S1499000-01-P1.dgn



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



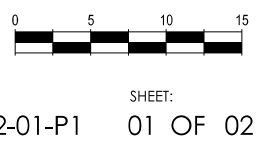
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 Sydney 02 8448 1800
 Brisbane 07 3113 5000
 Canberra 02 6243 9400
 Adelaide 08 8334 3600
 Gold Coast 07 5510 4814
 Townsville 07 4722 2765
 Perth 08 6316 4634



PRELIMINARY PLAN
 FOR DISCUSSION PURPOSES ONLY
 SUBJECT TO CHANGE WITHOUT
 NOTIFICATION

THE OVERLANDER HOTEL, CAMBRIDGE GARDENS
 SWEPT PATH ASSESSMENT
 12.5m HEAVY RIGID VEHICLE

DATE: 04-May-16
 SCALE: 1:500@A3
 APPROVED: KAM
 DRAWING NO.: 16S1499000-02-01-P1

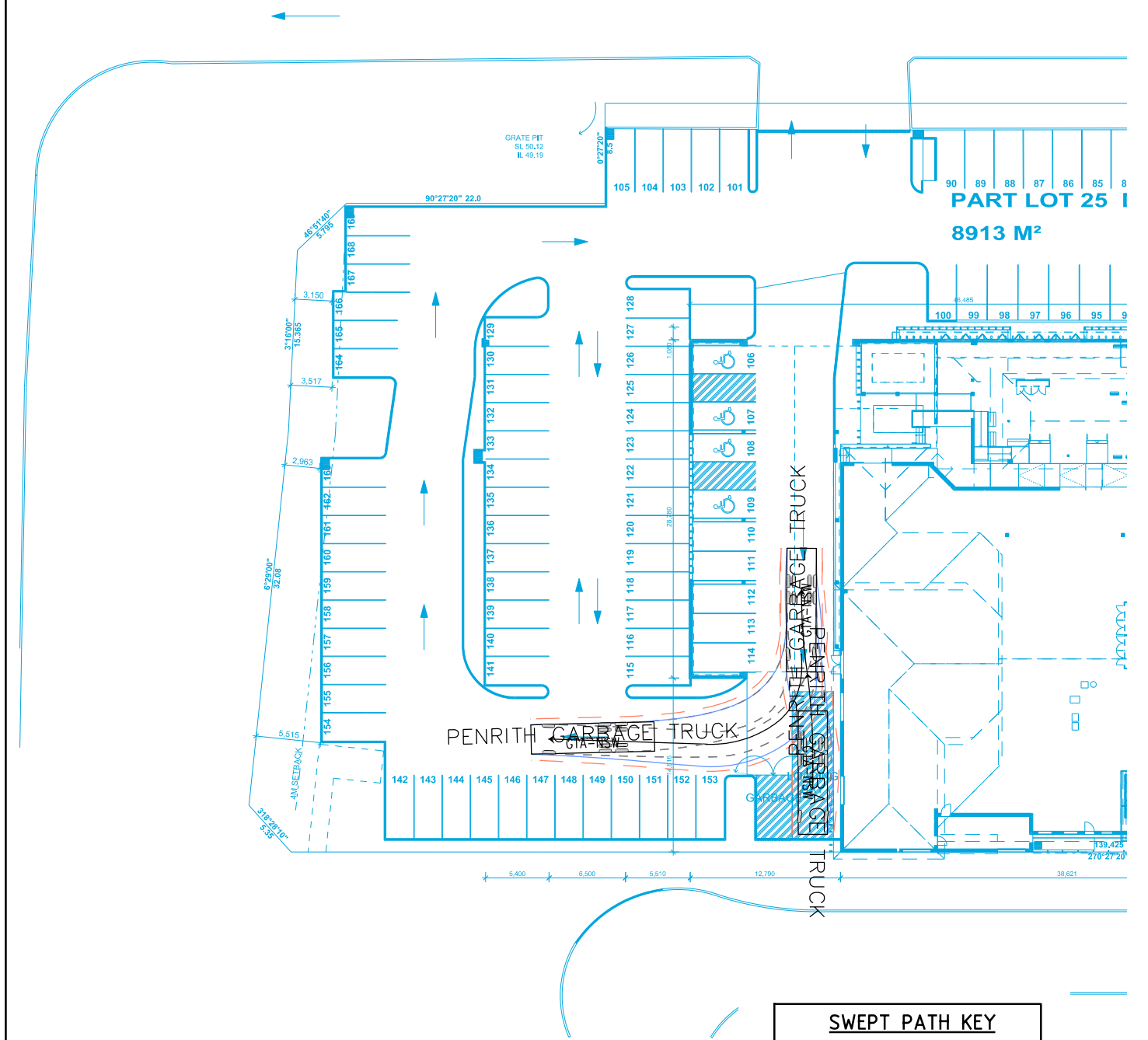
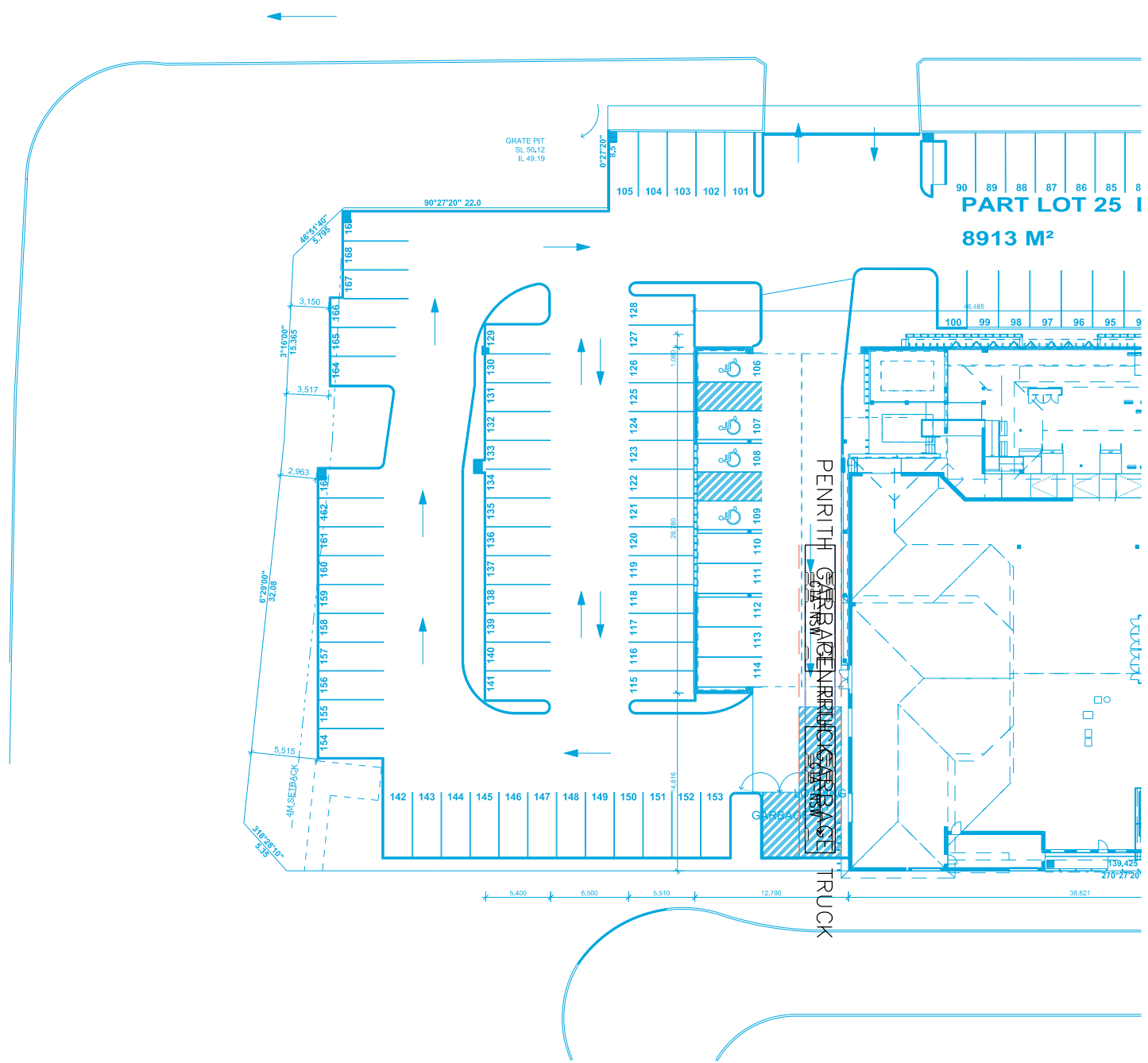


PLOTTED BY : Paramics_SVD ON 04-May-16 AT 11:16:08 AM 16S1499000-02-P1.dgn

Melbourne 03 9851 9600
 Sydney 02 8448 1800
 Brisbane 07 3113 5000
 Canberra 02 6243 9400
 Adelaide 08 8334 3600
 Gold Coast 07 5510 4814
 Townsville 07 4722 2765
 Perth 08 6316 4634



PRELIMINARY PLAN
 FOR DISCUSSION PURPOSES ONLY
 SUBJECT TO CHANGE WITHOUT
 NOTIFICATION



| SWEEP PATH KEY | |
|----------------------|-----------------------------------|
| | VEHICLE CENTRE LINE |
| | VEHICLE TYRE PATH |
| | VEHICLE BODY PATH |
| | 500mm CLEARANCE FROM VEHICLE BODY |
| ASSUMED SPEED 10km/h | |

THE OVERLANDER HOTEL, CAMBRIDGE GARDENS
 SWEEP PATH ASSESSMENT
 10.5m PENRITH WASTE TRUCK

DATE: 04-May-16
 SCALE: 1:500@A3
 APPROVED: KAM
 DRAWING NO. 16S1499000-02-02-P1

0 5 10 15

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