

TRAFFIC AND PARKING IMPACT ASSESSMENT OF A RESOURCE RECOVERY FACILITY

344 Park Road-Wallacia

Traffic and Parking Impact Report

Prepared for: Benbow Environmental

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1. INTRODUCTION

Motion Traffic Engineers was commissioned by Benbow Environmental to undertake a traffic and parking impact assessment of a proposed Resource Recovery Facility at 344 Park Road in Wallacia.

The proposed construction and operation of a resource recovery facility will process up to 95000 tonnes per year for construction and demolition (C&D) and commercial and industrial (C&I) waste material.

The premises will be divided into two parts; the first part is the main active working area where all activities associated with the business will occur and the second which will be left as per its original condition (non-active working area) and will be fenced off for that purpose. The premises are located to the north eastern part of the property.

The vehicle access and egress to the car park is via Park Road. The site is currently a vacant lot.

This traffic report focuses on the proposed resource recovery Facility and changes in car usage and car park utilisation and additional trips from the proposed resource Recovery Facility

In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED LOCATION

2.1 Location and Land Use

The proposed resource recovery facility is located to the West of The Northern Road and is in the area which is a primarily production. Residential buildings are primarily located far west to the site and south of Wallacia Country Club.

Currently the site is a large vacant lot.

Figures 1 and 2 shows the location of the resource recovery site from the aerial and street map perspective respectively.

Figures 3 shows the existing site.

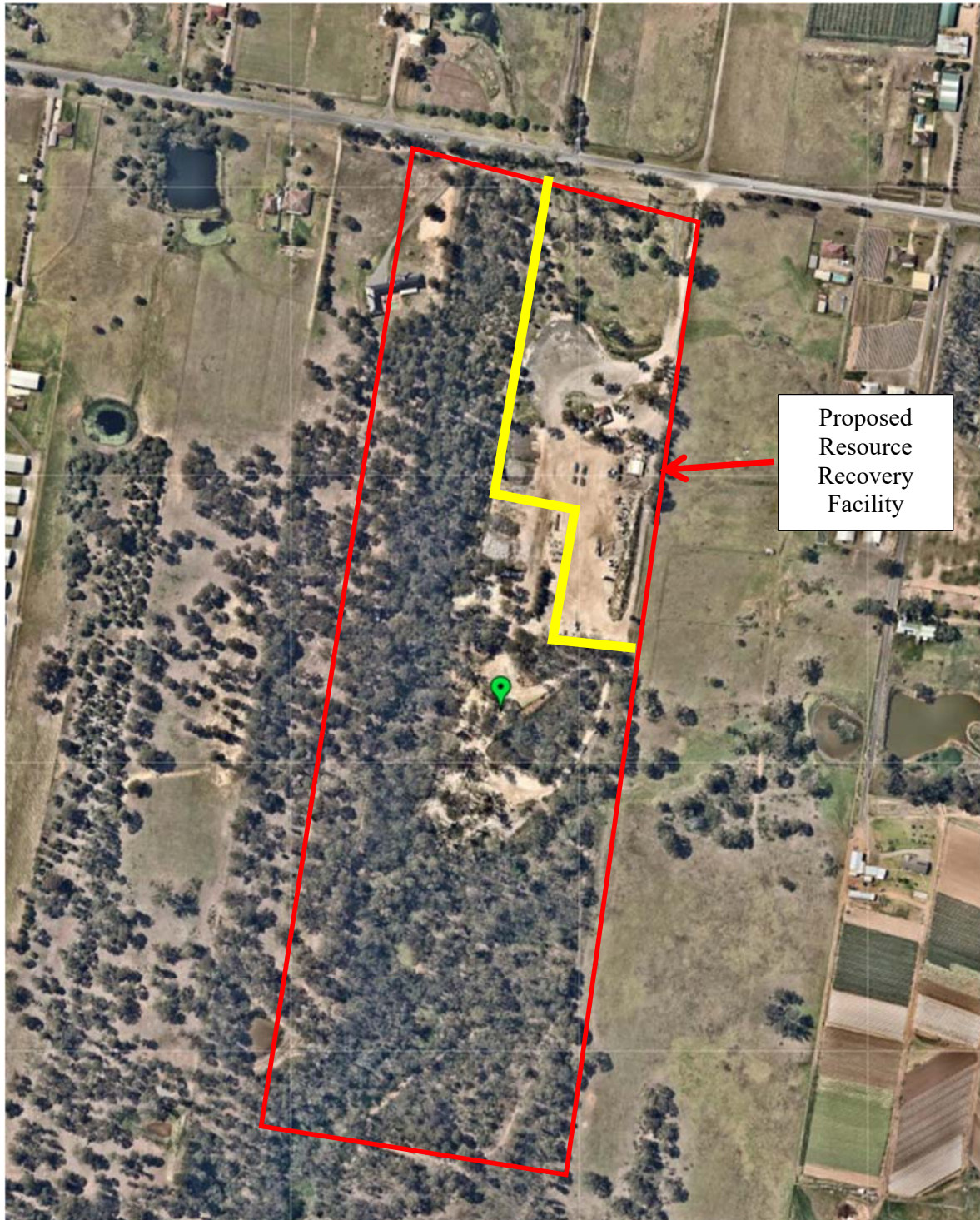


Figure 1: Location of the Subject Site on Aerial

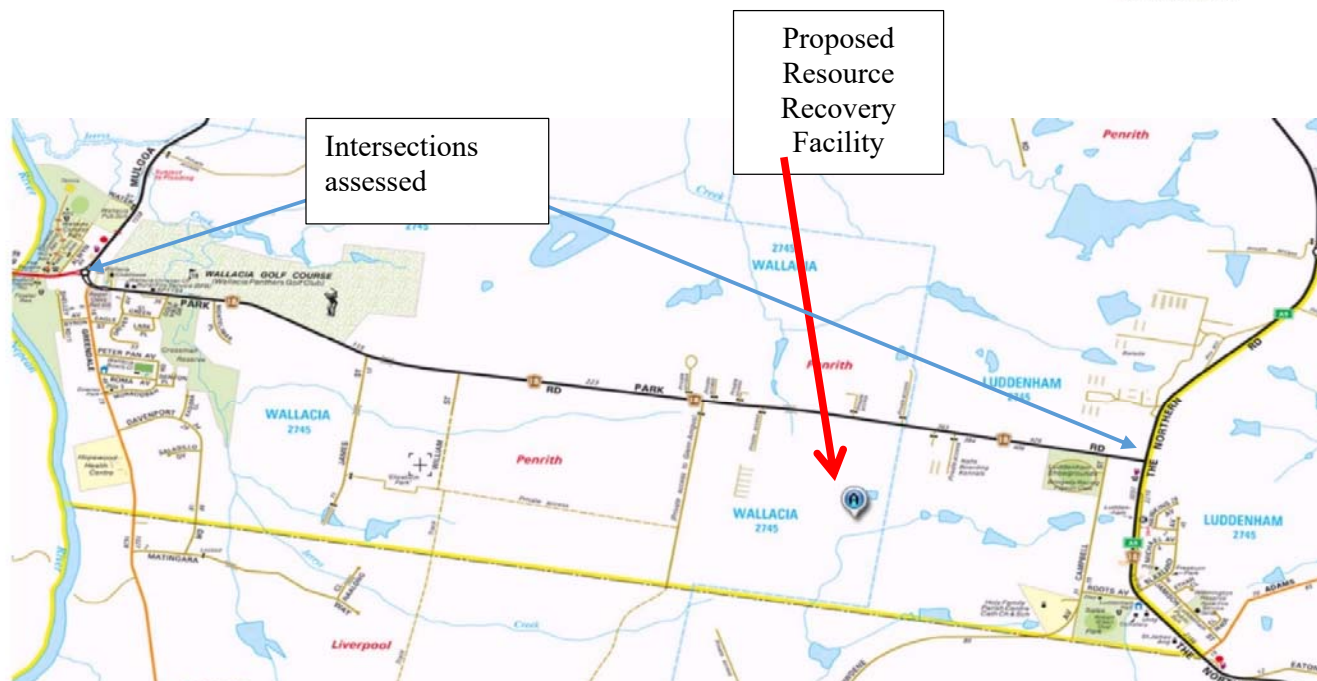


Figure 2: Street Map of the Location of the resource recovery site



Figure 3: Resource recovery site(344 Park Road in Wallacia)

2.2 Road Network

This section describes the roads near the proposed resource Recovery Facility. The entrance to the resource recovery site is from Park Road.

Park Road is a rural road with one lane each way with a sign posted speed limit of 60km/hr. On street parking is not permitted on either side of the road. The road shoulder is available for emergency vehicles to park. Figure 4 shows the photograph of Park Road.

The Northern Road is an arterial road with one lane each way near the intersection with Park Road. sign posted speed limit of 80km/hr south-bound and 60km/hr north-bound near the intersection with Park Road. Road shoulder is available for emergency vehicles to park. Figure 5 shows a photograph of The Northern Road near the intersection with Park Road.



Figure 4: Park Road looking west



Figure 5: The Northern Road intersection with Park Road

2.3 Public Parking Opportunities

The resource recovery site is located in a Primary Production zone (RU1). On-street parking is not available on either side of Park Road.

2.4 Intersection Description

As part of this traffic impact assessment two intersections is assessed:

- Stop intersection of The Northern Road with Park Road.
- Priority intersection of Park Road with Greendale Road

External traffic travelling to and from the site will most likely need to travel through the above intersection.

The stop intersection of The Northern Road with Park Road is a three-leg intersection with all turn movements permitted. Drivers on Park Road must stop and give way to vehicles on The Northern Road. A short lane with left turn movement is available on the north leg of the intersection. Figure 6 shows a layout of the intersection using SIDRA – an industry standard intersection assessment software. The number on the lane represent the length of a short lanes in metres.

The Priority Intersection of Park Road with Greendale Road is a three-leg intersection. All turn movements are permitted. Drivers on Greendale Road must give way to vehicles on Park Road. Figure 7 shows a layout of the intersection using SIDRA. an industry standard intersection assessment software

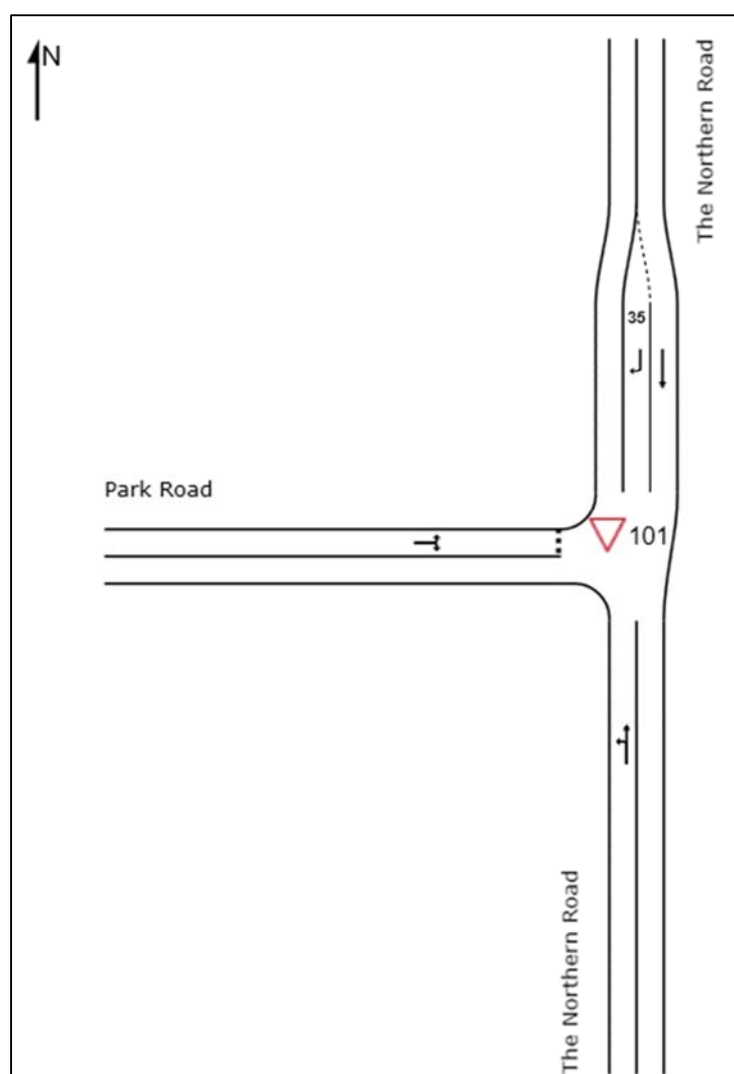


Figure 6: Stop Intersection of The Northern Road with Park Road (SIDRA)

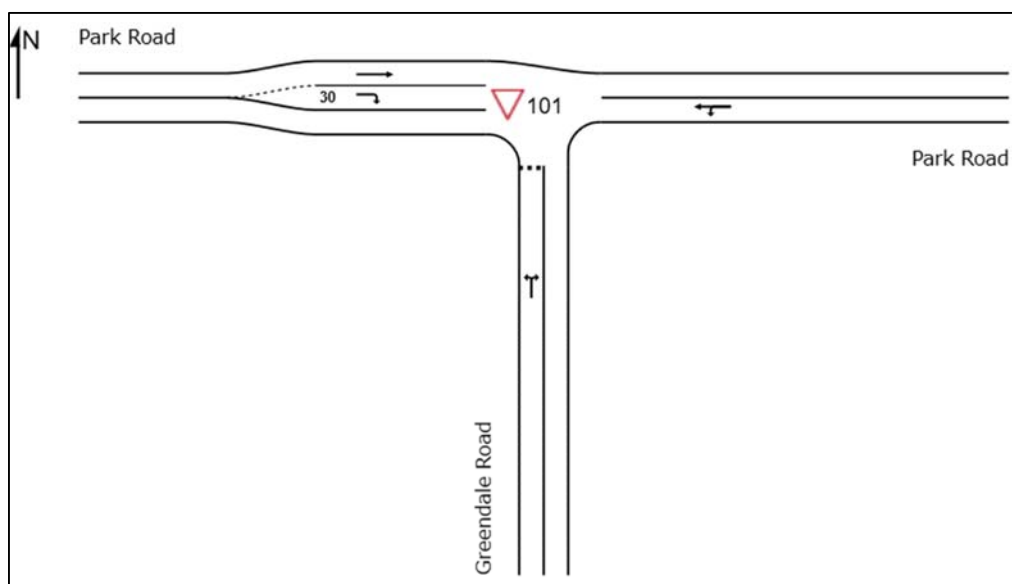


Figure 7: Priority Intersection of Park Road with Greendale Road (SIDRA)

2.5 Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the intersection for the weekday AM and PM peak hour periods. The peak hours are 8:00am to 9:00am and 5:00pm to 6:00pm for the weekday AM and PM peak hours respectively.

Figures 8 and 9 presents in vehicle numbers the existing weekday AM and PM peak hour traffic volumes respectively. The bracketed numbers are trucks/buses and unbracketed are cars.

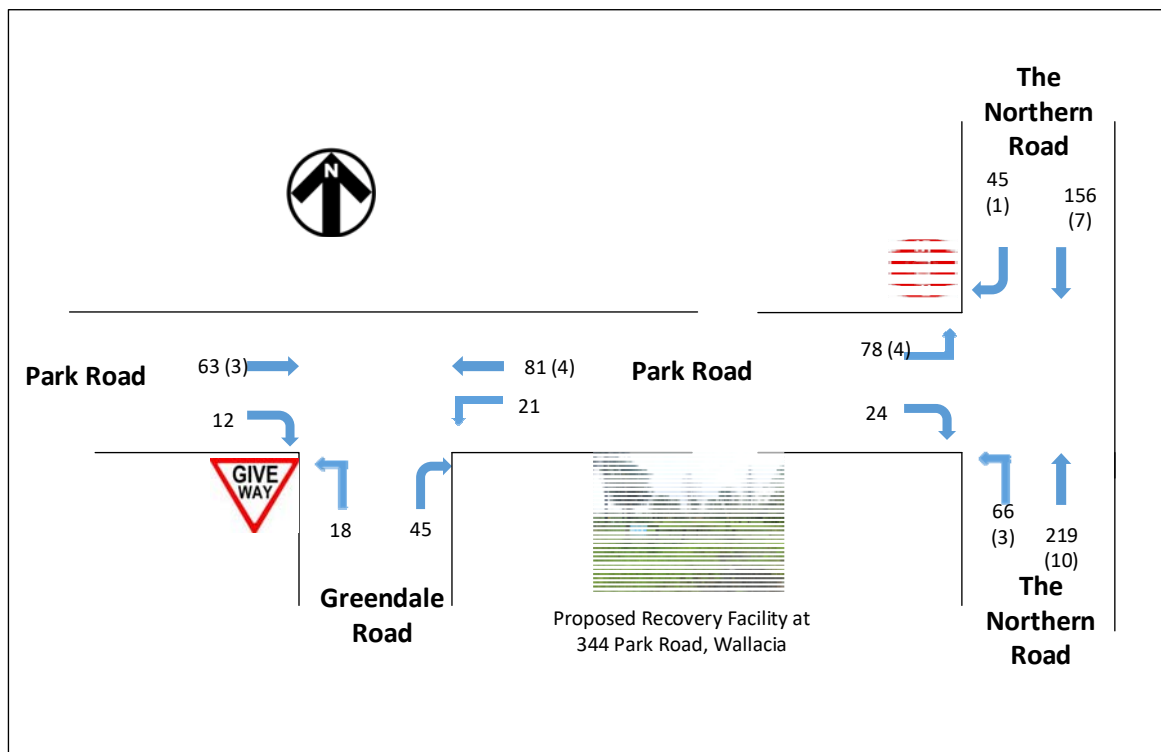


Figure 8: Existing Weekday Traffic Volumes AM Peak Hour

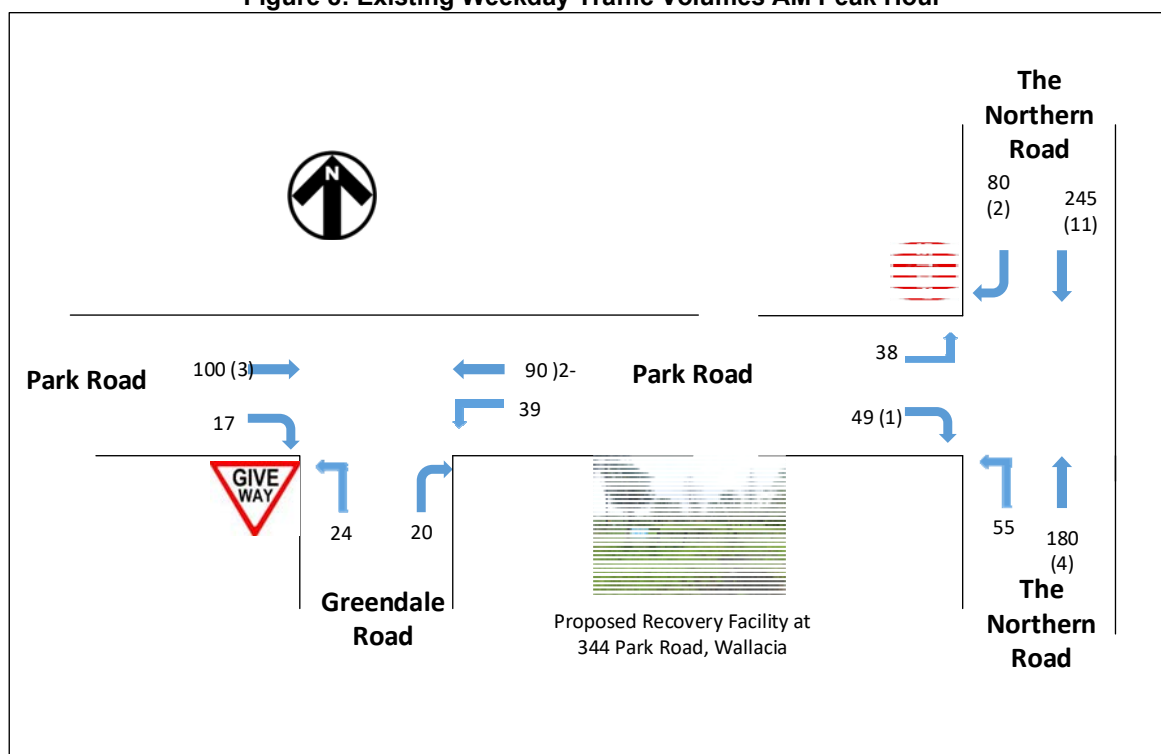


Figure 9: Existing Weekday Traffic Volumes PM Peak Hour

2.6 Intersection Assessment

An intersection assessment has been undertaken for:

- Stop intersection of The Northern Road with Park Road.
- Priority intersection of Park Road with Greendale Road

The existing intersection operating performance was assessed using the SIDRA software package (version 8) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner-city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The result of the intersection analysis is as follows:

Stop Intersection of The Northern Road with Park Road

- All turn movements have a LoS A for AM and PM peak hours
- There is a spare capacity at this intersection

Priority Intersection of Park Road with Greendale Road

- All turn movements have a LoS A for AM and PM peak hours
- There is spare capacity at this intersection.

The full Sidra results are presented in Appendix A.

2.7 Acceleration & Deceleration lane for entry truck manoeuvrability

Acceleration and deceleration lane are required at the intersection of Park Road with entry driveway for the purpose of road safety.

Part of the deceleration lane is on adjacent property as the location of the entry driveway does not allow for a deceleration lane on the site frontage only.

The current location of the site frontage and the site entry allow to have an acceleration lane and this can be the condition of the development consent.

2.8 Public Transport

There is no public transport close to the development site. Visitors must use their private vehicles in order to reach to the site.

2.9 Conclusions on the Existing Conditions

The proposed resource recovery facility is located to the West of The Northern Road and is in the area which zoned as primarily production

The nearby intersection performs well to accommodate additional traffic of the development site.

3. PROPOSED RESOURCE RECOVERY FACILITY

The details of the proposed resource recovery facility are as follows:

- The building area for the resource recovery is 5,807 m²
- Existing house to be used as an office and a new office attached to the resource recovery building is 146m²
- Thirty-two car spaces are provided in parking area
- A truck parking area for eleven high rigid trucks (12.5 metres in length)

The annual capacity of resource recovery facility is 95,000 per annum.

The proposed operating hours 24 hours 7 days per week operations. Typically there would operations would take place Monday to Saturday 7:00am to 10:00pm with night work limited to maintenance only. Truck movements would be restricted to 7:00am to 6:00pm Monday to Saturday.

The expected number of staff involved directly in the resource recovery facility and office is up to 26 people.

A resource recovery facility is an uncommon landuse. The car space parking provision has been designed to meet the staff numbers i.e. the site is purposely built to the needs of the Resource Recovery Facility and is not a generic landuse such as a warehouse. The parking rate is equivalent to one car space per 305m².

The car parking is provided on the ground floor.

The site has frontage to Park Road. The car and truck access and egress to the car park area is from Park Road.

The site is near the future A9 motorway. A9 motorway is an arterial road joining Campbelltown with Penrith and Windsor. This route plays a vital role to connect three expanding western Sydney area. Western Sydney is growing rapidly with various developments. Western Sydney airport will host an airport by 2025. All these updates will become a strong reason for NSW Government to propose M9 motorway.

There is insufficient public information on the M9 for an assessment to be made for this proposed resource recovery facility.

A full scaled plan of the proposed resource recovery facility is provided as part of the Development Application.

4. CAR AND TRUCK PARKING CONSIDERATIONS

4.1 Penrith City Council Development Control Plan 2014

The car parking requirements for the proposed recovery facility are not presented in the Penrith Council Development Control Plan 2014.

The parking demand has been calculated based on the number of staff.

The resource recovery facility will employ 26 staff The provision of 32 car spaces will accommodate all car parking demand.

Eleven on-site parking spaces for high rigid truck (12.5 metres-long) are also provided.

5. VEHICLE TRAFFIC IMPACT CONSIDERATIONS

5.1 Car Trip Generation for the Proposed Resource Recovery Facility

The NSW RTA Guide to Traffic Generating Development document publishes trip generation rates as follows:

Office Units:

- 2 trips per 100m² of GFA for both AM and PM peak hour

Table 6 presents the estimated total AM and PM peak period trips generated by the office units during the AM and PM peak hours. The total generated trips in the peak hour are low.

Proposed				
Peak Hour	Use	Area GFA(m ²)	Trip Generation Rate per GFA(m ²)	Trip Generated
AM/PM	Office	146	0.02	3

Table 6: Trips Generated by the Factory during the AM Peak Period

Table 7 presents the peak hour trips and trip distribution. The generated trips in the peak hour are modest.

Peak Hour	Origin	Destination	Total
AM	1	2	3
PM	2	1	3

Table 8: Trip distribution for the Proposed resource Recovery Facility in the Weekday Peak Hour

5.2 Truck Trip Generation for the Proposed Resource Recovery Facility

The resource recovery facility will process 95,000 tonnes a year. An estimate has been made of the tonnage per day has be made by dividing by 2 weeks and six days per week.

The assumed load capacity for a large rigid truck is 5.5 tonnes and results in 55 trucks per day. Truck movements are restricted to 7:00am to 6:00pm Monday to Saturday. The truck arrivals and departures do not have a peak period. This leads to six generated truck trips per hour (six arrivals and six departures).

5.3 Traffic Volumes

The additional development trips are assigned onto the local traffic network. The following figures present the existing with the development trips (in red for origin and blue for destination trips) for the respective peak hours.

The additional development trips represent a low proportion of the existing traffic volumes.

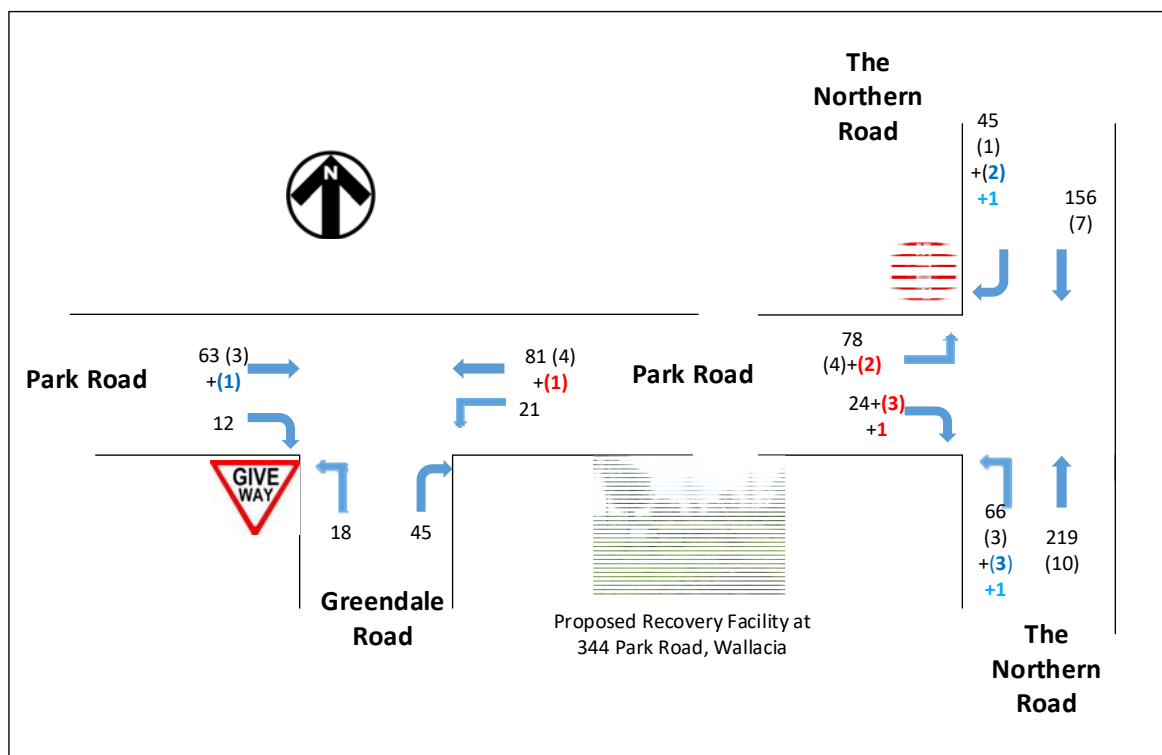


Figure 10: Weekday AM Peak Hour Traffic Volumes with resource recovery facility traffic

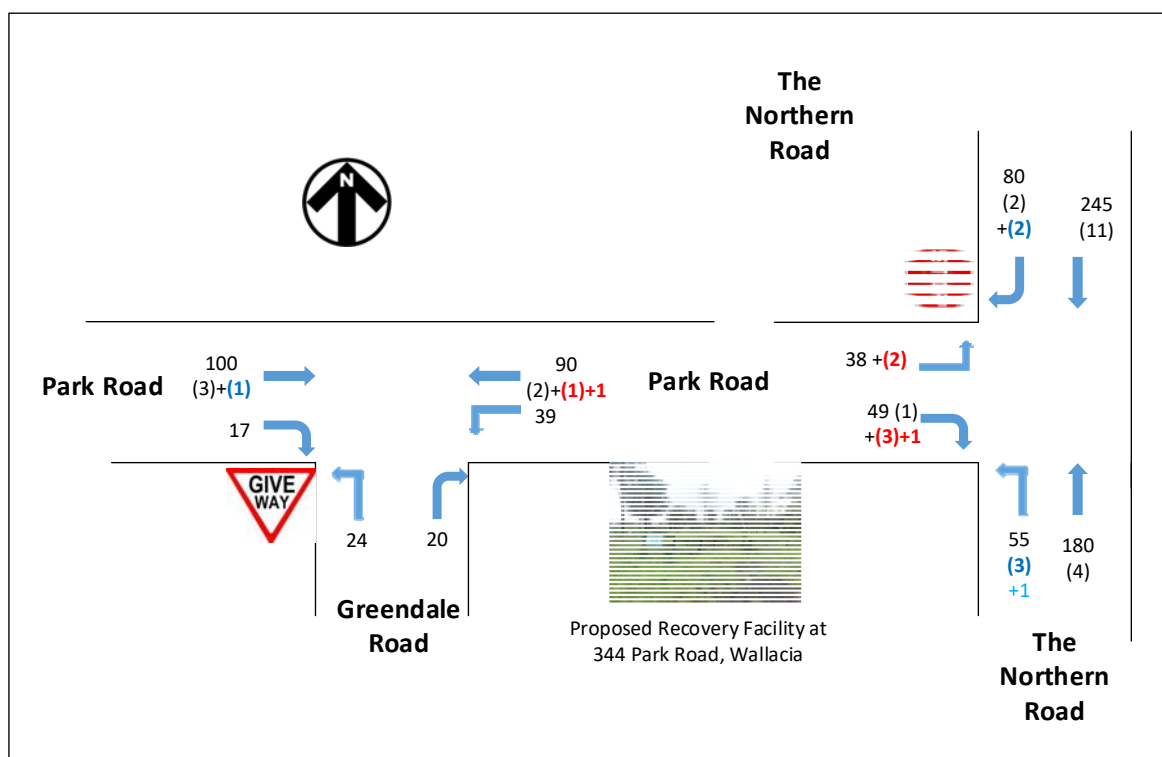


Figure 11: Weekday PM Peak Hour Traffic Volumes with resource recovery facility traffic

5.4 Intersection Assessment

An intersection assessment has been undertaken for the surveyed intersection.

The results of the intersection analysis are as follows:

Stop Intersection of The Northern Road with Park Road

- The overall intersection has a LoS A for both the AM and PM peak hours
- The additional trips do not change the LoS for any turn movement or the overall intersection.

Priority Intersection of Park Road with Greendale Road

- The overall intersection has a LoS A for the AM and PM peak hours respectively
- The additional trips do not change the LoS for any turn movement or the overall intersection.

The full SIDRA results with the resource recovery facility traffic are presented in Appendix B.

6. PROPOSED ACCESS ARRANGEMENTS

Proposed access arrangements / intersection treatment on Park Road have been addressed in a separate report and are not within the scope of this assessment. This is provided in Appendix 12 of the EIS.

7. CONCLUSIONS

Based on the considerations presented in this report, it is considered that:

Parking

The proposed resource Recovery Facility has enough on site car and truck parking to accommodate all parking demand

Traffic

- The proposed resource Recovery Facility is a low trip generator for the weekday AM and PM peak hours.
- The additional trips from the proposed resource Recovery Facility can be accommodated at the nearby intersection without significantly affecting intersection performance, delays or queues.
- There are no traffic engineering reasons why a planning permit for the proposed Recovery Facility at 344 Park Road in Wallacia should be refused.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		veh	m				km/h
South: The Northern Road												
1	L2	73	4.3	0.167	5.4	LOS A	0.0	0.0	0.00	0.14	0.00	55.1
2	T1	241	4.4	0.167	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	56.5
Approach		314	4.4	0.167	1.3	NA	0.0	0.0	0.00	0.14	0.00	56.2
North: The Northern Road												
8	T1	172	4.3	0.091	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	48	2.2	0.037	5.7	LOS A	0.2	1.1	0.39	0.58	0.39	45.3
Approach		220	3.8	0.091	1.3	NA	0.2	1.1	0.09	0.13	0.09	56.0
West: Park Road												
10	L2	86	4.9	0.106	7.9	LOS A	0.4	3.1	0.38	0.66	0.38	53.4
12	R2	25	0.0	0.106	10.3	LOS A	0.4	3.1	0.38	0.66	0.38	52.9
Approach		112	3.8	0.106	8.4	LOS A	0.4	3.1	0.38	0.66	0.38	53.3
All Vehicles		645	4.1	0.167	2.5	NA	0.4	3.1	0.09	0.22	0.09	55.6

Table A1: Weekday Intersection Performance of The Northern Road with Park Road AM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Greendale Road												
1	L2	19	0.0	0.061	4.8	LOS A	0.2	1.7	0.26	0.54	0.26	25.8
3	R2	47	0.0	0.061	5.6	LOS A	0.2	1.7	0.26	0.54	0.26	45.6
Approach		66	0.0	0.061	5.4	LOS A	0.2	1.7	0.26	0.54	0.26	40.0
East: Park Road												
4	L2	22	0.0	0.059	5.4	LOS A	0.0	0.0	0.00	0.25	0.00	55.1
5	T1	89	4.7	0.059	0.9	LOS A	0.0	0.0	0.00	0.25	0.00	55.8
Approach		112	3.8	0.059	1.8	NA	0.0	0.0	0.00	0.25	0.00	55.6
West: Park Road												
11	T1	69	4.5	0.037	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	13	0.0	0.008	4.1	LOS A	0.0	0.2	0.21	0.50	0.21	43.6
Approach		82	3.8	0.037	0.6	NA	0.0	0.2	0.03	0.08	0.03	48.9
All Vehicles		260	2.8	0.061	2.3	NA	0.2	1.7	0.08	0.27	0.08	47.7

Table A2: Weekday Intersection Performance of Park Road with Greendale Road AM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		veh	m				km/h
South: The Northern Road												
1	L2	58	0.0	0.132	5.3	LOS A	0.0	0.0	0.00	0.13	0.00	55.3
2	T1	194	2.2	0.132	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	56.6
Approach		252	1.7	0.132	1.2	NA	0.0	0.0	0.00	0.13	0.00	56.3
North: The Northern Road												
8	T1	269	4.3	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	86	2.4	0.061	5.4	LOS A	0.3	1.9	0.35	0.57	0.35	45.4
Approach		356	3.8	0.143	1.3	NA	0.3	1.9	0.09	0.14	0.09	55.6
West: Park Road												
10	L2	40	0.0	0.120	7.6	LOS A	0.5	3.3	0.42	0.70	0.42	52.5
12	R2	53	2.0	0.120	11.2	LOS A	0.5	3.3	0.42	0.70	0.42	51.9
Approach		93	1.1	0.120	9.6	LOS A	0.5	3.3	0.42	0.70	0.42	52.2
All Vehicles		700	2.7	0.143	2.4	NA	0.5	3.3	0.10	0.21	0.10	55.4

Table A3: Weekday Intersection Performance of The Northern Road with Park Road PM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Greendale Road												
1	L2	25	0.0	0.040	4.8	LOS A	0.2	1.1	0.23	0.53	0.23	25.8
3	R2	21	0.0	0.040	5.9	LOS A	0.2	1.1	0.23	0.53	0.23	45.7
Approach		46	0.0	0.040	5.3	LOS A	0.2	1.1	0.23	0.53	0.23	34.9
East: Park Road												
4	L2	41	0.0	0.072	5.3	LOS A	0.0	0.0	0.00	0.28	0.00	54.0
5	T1	97	2.2	0.072	0.8	LOS A	0.0	0.0	0.00	0.28	0.00	54.5
Approach		138	1.5	0.072	2.1	NA	0.0	0.0	0.00	0.28	0.00	54.3
West: Park Road												
11	T1	108	2.9	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	18	0.0	0.011	4.2	LOS A	0.0	0.3	0.24	0.51	0.24	43.5
Approach		126	2.5	0.057	0.6	NA	0.0	0.3	0.03	0.07	0.03	49.0
All Vehicles		311	1.7	0.072	2.0	NA	0.2	1.1	0.05	0.23	0.05	47.8

Table A4: Weekday Intersection Performance of Park Road with Greendale Road PM Peak Hour

APPENDIX B

SIDRA Intersection Results for Existing Conditions with the Resource recovery facility traffic

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	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: The Northern Road												
1	L2	77	8.2	0.171	5.4	LOS A	0.0	0.0	0.00	0.14	0.00	54.9
2	T1	241	4.4	0.171	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	56.4
Approach		318	5.3	0.171	1.3	NA	0.0	0.0	0.00	0.14	0.00	56.1
North: The Northern Road												
8	T1	172	4.3	0.091	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	52	6.1	0.041	5.8	LOS A	0.2	1.3	0.40	0.58	0.40	45.3
Approach		223	4.7	0.091	1.3	NA	0.2	1.3	0.09	0.14	0.09	55.8
West: Park Road												
10	L2	88	7.1	0.120	8.0	LOS A	0.5	3.6	0.39	0.66	0.39	53.2
12	R2	29	10.7	0.120	11.1	LOS A	0.5	3.6	0.39	0.66	0.39	52.5
Approach		118	8.0	0.120	8.8	LOS A	0.5	3.6	0.39	0.66	0.39	53.0
All Vehicles		659	5.6	0.171	2.7	NA	0.5	3.6	0.10	0.23	0.10	55.4

Table B1: Weekday Intersection Performance of The Northern Road with Park Road AM Peak Hour with resource recovery facility traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows 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
South: Greendale Road												
1	L2	19	0.0	0.061	4.8	LOS A	0.2	1.7	0.26	0.54	0.26	25.7
3	R2	47	0.0	0.061	5.6	LOS A	0.2	1.7	0.26	0.54	0.26	45.6
Approach		66	0.0	0.061	5.4	LOS A	0.2	1.7	0.26	0.54	0.26	40.0
East: Park Road												
4	L2	22	0.0	0.060	5.4	LOS A	0.0	0.0	0.00	0.25	0.00	55.1
5	T1	91	5.8	0.060	0.9	LOS A	0.0	0.0	0.00	0.25	0.00	55.8
Approach		113	4.7	0.060	1.8	NA	0.0	0.0	0.00	0.25	0.00	55.6
West: Park Road												
11	T1	71	6.0	0.038	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	13	0.0	0.008	4.2	LOS A	0.0	0.2	0.21	0.50	0.21	43.5
Approach		83	5.1	0.038	0.6	NA	0.0	0.2	0.03	0.08	0.03	48.9
All Vehicles		262	3.6	0.061	2.3	NA	0.2	1.7	0.08	0.27	0.08	47.8

Table B2: Weekday Intersection Performance of Park Road with Greendale Road AM Peak Hour with resource recovery facility traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows 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
South: The Northern Road												
1	L2	62	5.1	0.135	5.4	LOS A	0.0	0.0	0.00	0.14	0.00	55.0
2	T1	194	2.2	0.135	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	56.4
Approach		256	2.9	0.135	1.3	NA	0.0	0.0	0.00	0.14	0.00	56.1
North: The Northern Road												
8	T1	269	4.3	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	88	4.8	0.064	5.5	LOS A	0.3	2.1	0.36	0.57	0.36	45.4
Approach		358	4.4	0.143	1.4	NA	0.3	2.1	0.09	0.14	0.09	55.5
West: Park Road												
10	L2	42	5.0	0.135	7.7	LOS A	0.5	3.9	0.43	0.71	0.43	52.2
12	R2	57	7.4	0.135	11.7	LOS A	0.5	3.9	0.43	0.71	0.43	51.6
Approach		99	6.4	0.135	10.0	LOS A	0.5	3.9	0.43	0.71	0.43	51.9
All Vehicles		713	4.1	0.143	2.6	NA	0.5	3.9	0.10	0.22	0.10	55.2

Table B3: Weekday Intersection Performance of The Northern Road with Park Road PM Peak Hour with resource recovery facility traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows 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
South: Greendale Road												
1	L2	25	0.0	0.040	4.8	LOS A	0.2	1.1	0.23	0.53	0.23	25.8
3	R2	21	0.0	0.040	5.9	LOS A	0.2	1.1	0.23	0.53	0.23	45.7
Approach		46	0.0	0.040	5.3	LOS A	0.2	1.1	0.23	0.53	0.23	34.9
East: Park Road												
4	L2	41	0.0	0.074	5.3	LOS A	0.0	0.0	0.00	0.28	0.00	54.1
5	T1	99	3.2	0.074	0.8	LOS A	0.0	0.0	0.00	0.28	0.00	54.5
Approach		140	2.3	0.074	2.1	NA	0.0	0.0	0.00	0.28	0.00	54.3
West: Park Road												
11	T1	109	3.8	0.058	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	18	0.0	0.011	4.2	LOS A	0.0	0.3	0.24	0.51	0.24	43.5
Approach		127	3.3	0.058	0.6	NA	0.0	0.3	0.03	0.07	0.03	49.0
All Vehicles		314	2.3	0.074	2.0	NA	0.2	1.1	0.05	0.23	0.05	47.9

Table B4: Weekday Intersection Performance of Park Road with Greendale Road PM Peak Hour with resource recovery facility traffic

CARPARK AND DRIVEWAY CERTIFICATION OF A PROPOSED RESOURCE RECOVERY FACILITY

344 Park Road Wallacia

Prepared for: Benbow Environmental

A201693N (Version 1d)

May 2020

Motion Traffic Engineers Pty Ltd
Telephone:
94033588
sydney@motiontraffic.com.au

ACN 600201583

1. INTRODUCTION

Motion Traffic Engineers was commissioned by Benbow Environmental to prepare a car parking certification report of a proposed resource recovery facility at 344 Park Road in Wallacia.

The car park is on the ground floor with vehicle access and egress via Park Road. Separate entry and exit driveways are provided.

Trucks circulate around the waste resource facility building.

Reference is made to AS2890.1 (2004), AS2890.2 (2018) and Council's Development Control Plan for compliance.

2. DRIVEWAY

The details of the entry driveway from Park Road into the ground level are as follows:

- The driveway at the property line is 7 metres wide and remains constant to the ground floor
- Gradients are less than 5 percent

A 14 metre long short lane is provided for cars to turn into the parking area. The intersection is managed by a giveway sign on the parking area access road.

The details of the exit driveway from Park Road into the ground level are as follows:

- The driveway at the property line is 5.9 metres wide and remains constant to the ground floor
- Gradients are less than 5 percent

3. CAR SPACES

The details of the car parking areas are as follows:

Ground Floor

- The car parking aisle is compliant with Australian Standards
- The general 90-degree car spaces are 2.6 metres wide with a length of 5.5 metres
- The disabled car space is 2.6 metres wide and 5.5 metres long
 - A disabled shared zone has the same dimensions as the disabled car space
 - A bollard with a compliant setback should be provided within the shared zone
- Compliant blind aisle extensions are provided

4. SWEEP PATHS

A swept turning path analysis is performed using a 19 metres articulated truck (travelling around the resource recovery building), Heavy Rigid Vehicle with 12.5 metres in length and B85 car with 4.9 metre long, as set in the Australian Standards to confirm that vehicle movements are adequate.

The following Swept Paths have been performed:

- 19 metres long articulated truck inbound movement to the Resource Recovery Facility
- 19 metres long articulated truck left turn outbound movement from the Resource Recovery Facility
 - The truck will have to encroach into the bitumen shoulder adjacent to the driveway to avoid crossing over into Park Road eastbound lane.
- A rejected 19 metres long articulated truck turning from the weighbridge into the exit lane and into the exit driveway.
- 12.5 metres long HRV forward inbound and outbound from the hardstand parking area
 - A 12.5 metres rigid truck is the largest truck that can park and exit the hardstand parking area adequately
- B85 car forward inbound and reverse outbound car movement

The swept paths are provided in Appendix A.

5. CAR SIGHT DISTANCE

The car driver's sight distance requirement to enter the external road is stated in Figure 3.2 of AS2890.1.

The sight distance varies according to the speed of the external road. Park Road has a default speed limit of 60km/hr.

The minimum sight distance required is 65 metres. Site measurements showed that the minimum sight distance looking left or right is met without permanent obstructions.

The pedestrian sight triangle (as set out in Figure 3.3) is met as well.

6. TRUCK SIGHT DISTANCE

The car driver's sight distance requirement to enter the external road is stated in Figure 3. of AS2890.2.

The sight distance varies according to the speed of the external road. Park Road has a default speed limit of 60km/hr.

The minimum sight distance required is 83 metres. Site measurements showed that the minimum sight distance looking left or right is met without permanent obstructions (for a forward out movement)

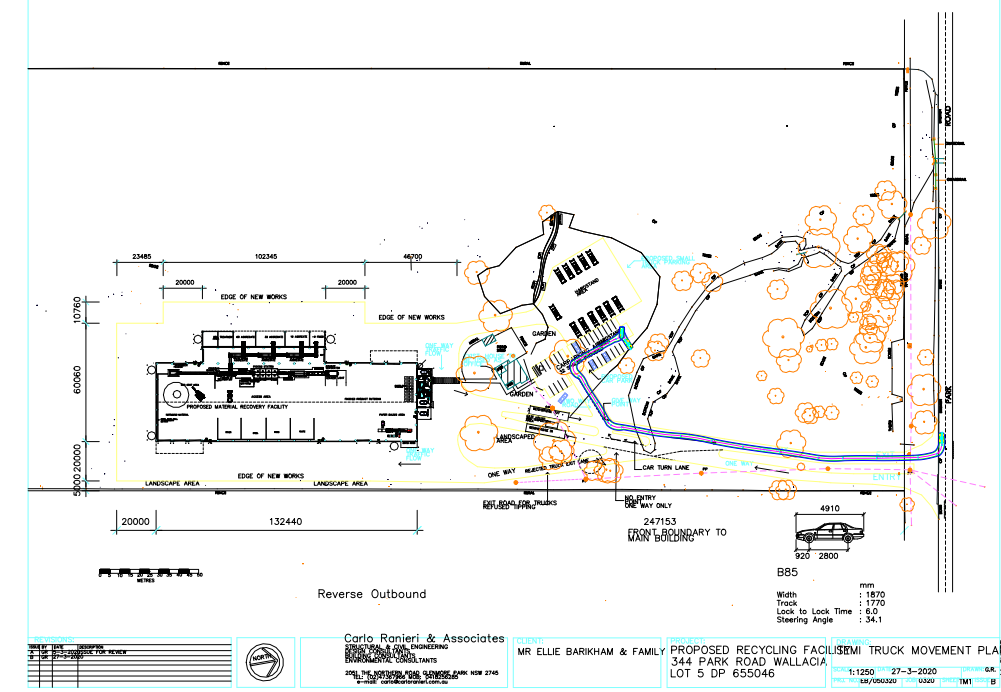
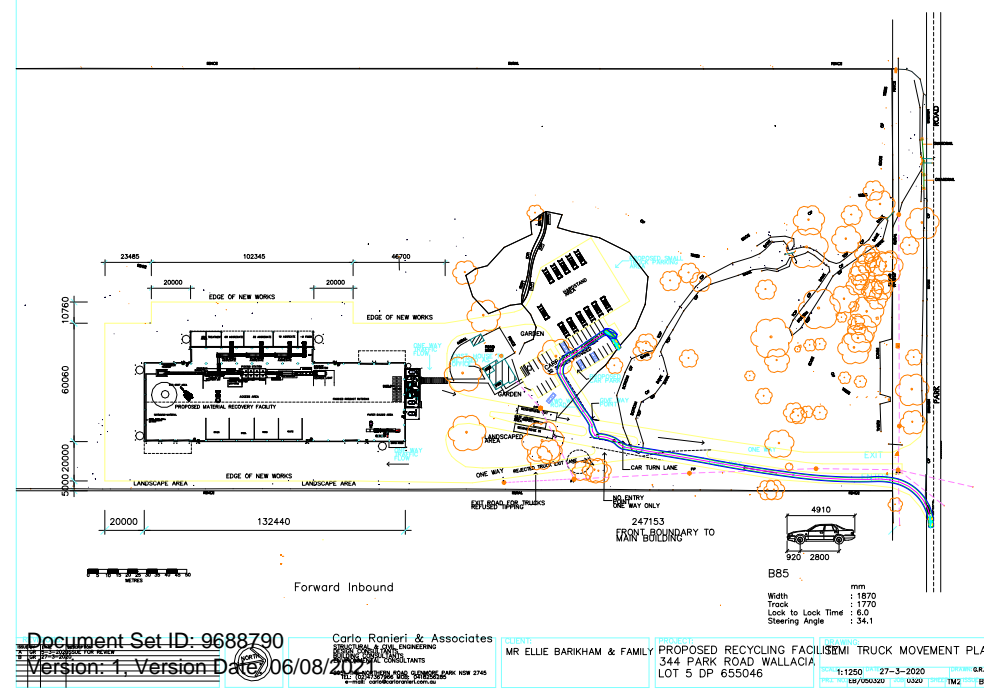
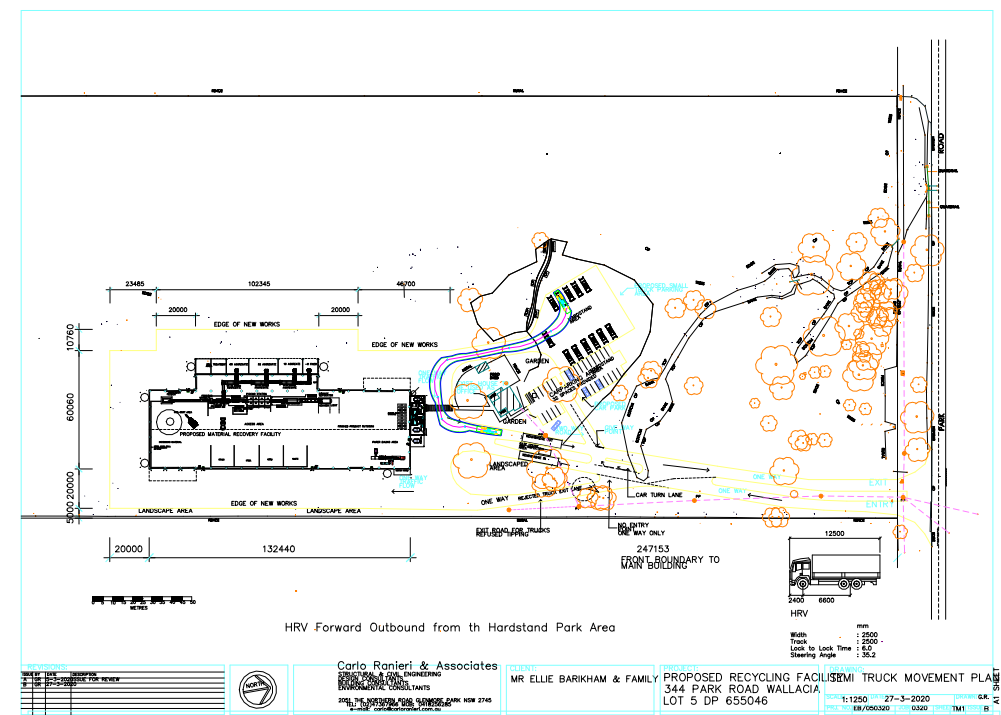
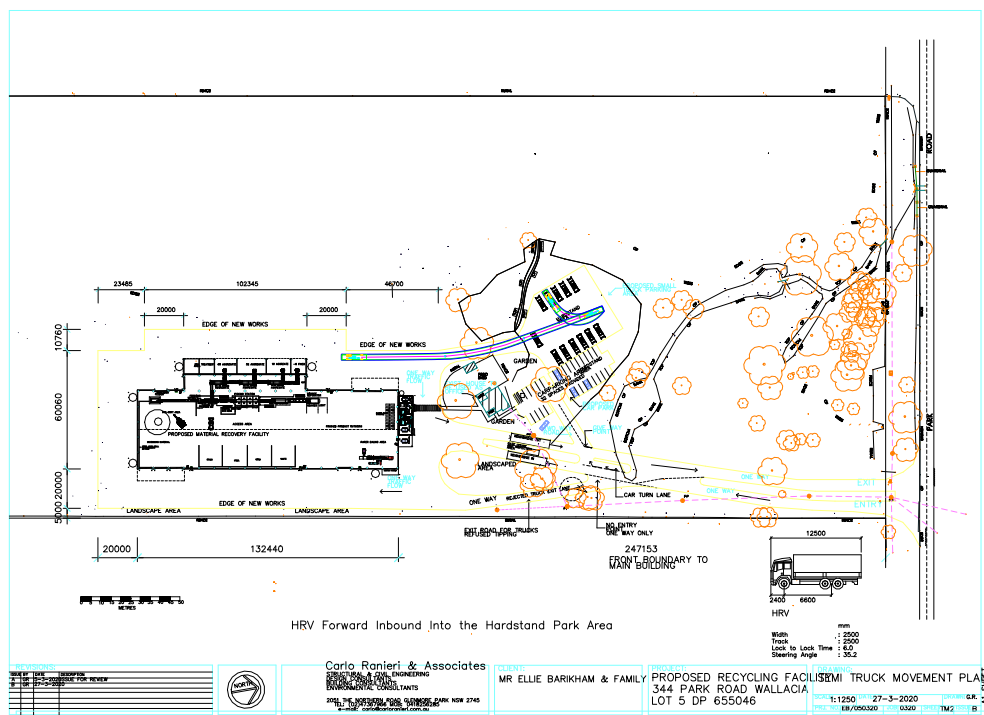
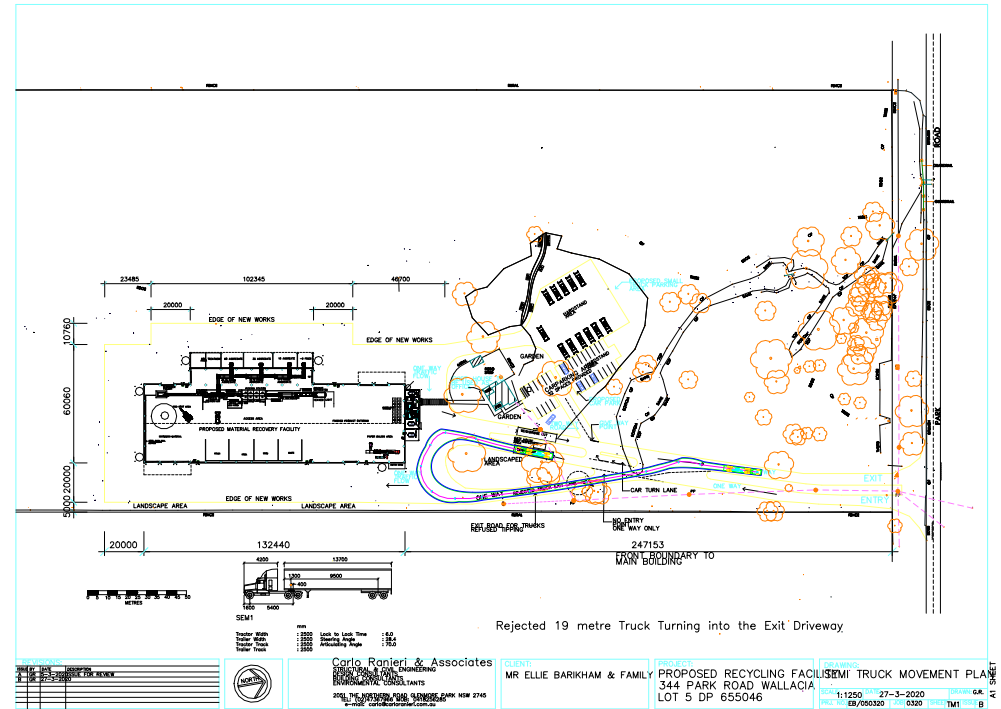
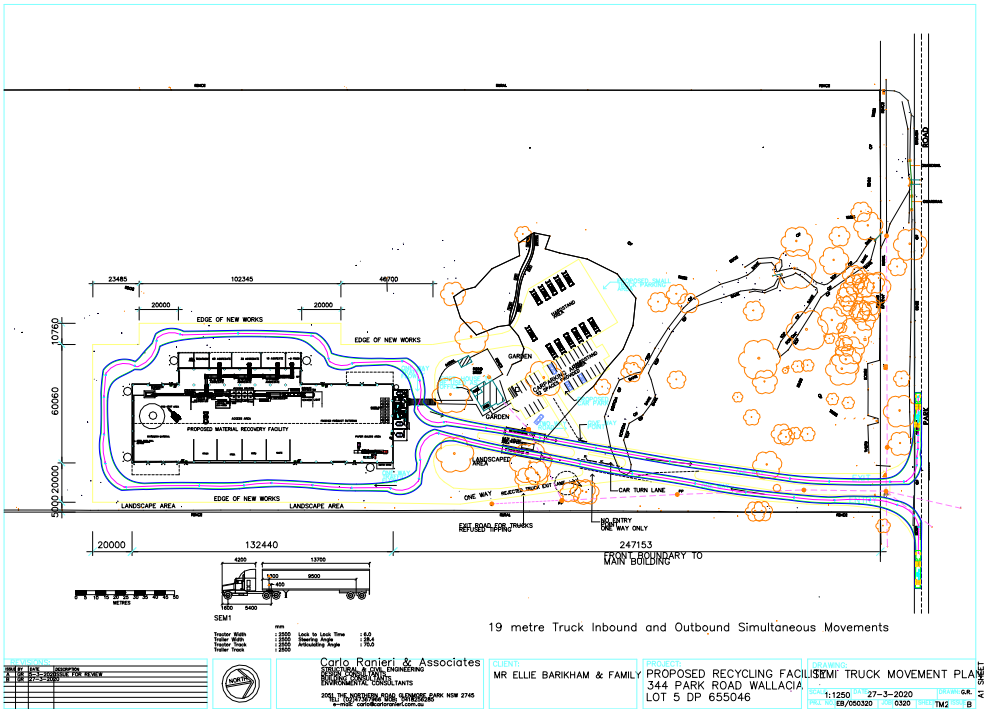
The pedestrian sight triangle (as set out in Figure 3.3) is met as well.

7. CONCLUSIONS AND RECOMMENDATIONS

The car parking area and driveway is compliant with Australian Standards and Council's DCP.

SWEPT PATHS

APPENDIX A





10 May, 2021

Transport for NSW
231 Elizabeth Street
Sydney
NSW 2000

Attention: Zhaleh Alamouti – Senior Land Use Assessment Coordinator

Dear Sir,

DEVELOPMENT APPLICATION DA 20/0262
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

Reference is made to your correspondence dated 3 December 2020 to Kathryn Saunders of Penrith City Council with respect to the suitability or otherwise of a proposed resource recovery facility at the abovementioned address of 344 Park Road, Wallacia, currently the subject of a development application with Penrith City Council.

ML Traffic Engineers prepared a Traffic & Parking Impact Assessment dated May 2020 in support of the subject Development Application.

This Practice has been engaged by the applicant to address and / or provide comment in response to Items 1 – 5 contained with your abovementioned correspondence with Council, as detailed within the below.

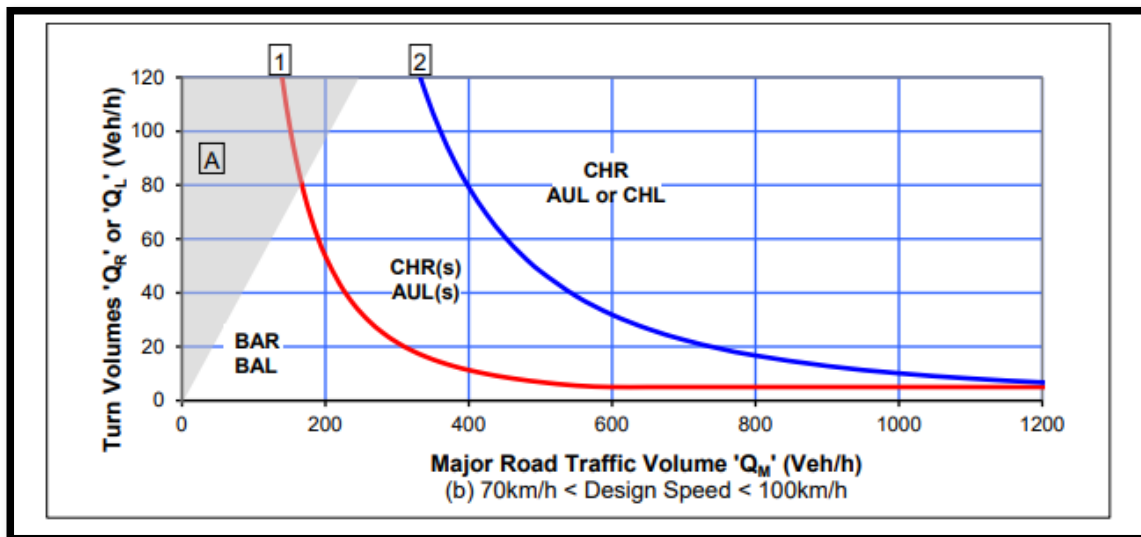
TfNSW Items

1. *TfNSW requests the type of proposed access on Park Road in compliance with AUSTROADS. The applicant should investigate the required access arrangement / intersection treatment in compliance with AUSTROADS Guide to Road Design and the type of right and left turn treatments required (based on the volume of turning traffic versus through traffic).*

Comment

AUSTROADS provide a turning treatment warrant analysis within its *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossing Management* providing turning treatment warrant analysis based on varying design speeds relevant to the subject roads. **Figure 1** overleaf provides turning treatment warrants for roads governed by design speeds of between 70km/h and 100km/h, as applicable to the frontage road of Park Road, being sourced from Figure 3.25 (b) of the abovementioned *Guide*.

FIGURE 1
WARRANT FOR TURN TREATMENTS ON MAJOR ROADS AT UNSIGNALISED INTERSECTIONS
GOVERNED BY A DESIGN SPEED OF BETWEEN 70KM/H AND 100KM/H



An assessment of the projected turn treatment warrants has been undertaken for the junction of Park Road and the proposed site access driveway, based upon the Austroads criteria illustrated within **Figure 1**. The assessment utilised traffic demand surveys and the projected site ingress / egress movements to be undertaken by heavy vehicles servicing the development, as outlined within the development application traffic report.

Table 1 below provides a summary of the analysis results.

TABLE 1 PROJECTED RIGHT / LEFT TURN TREATMENT WARRANT ANALYSIS JUNCTION OF PROPOSED SITE ACCESS DRIVEWAY AND PARK ROAD		
	Projected Conditions	
	AM Peak	PM Peak
Left Turn Treatment Analysis		
Left Turn Volume	7	6
Major Road Volume 'Q _m '	106	131
Warrant	BAL	BAR
Right Turn Treatment Analysis		
Right Turn Volume	1	1
Major Road Volume 'Q _m '	212	219
Warrant	BAL	BAR

Table 1 indicates that the projected traffic demands at the junction of Park Road and the proposed site access driveway warrant a basic left turn treatment (BAL) and a basic right turn treatment (BAR), respectively.

The incorporation of a BAL / BAR treatment at the junction of Park Road and the site access driveway necessitates a notable extent of pavement widening. In this regard, Figures 7.5 and 8.2 of AUSTROADS' *Guide to Road Design – Part 4a: Unsignalised and Signalised Intersections* specifies the following pavement widening works:

- An eastbound Park Road pavement width of 6.5m for a length of 64m, to facilitate an ability for trailing through eastbound vehicles to undertake or pass a decelerating or stopped vehicle wishing to turn right into the subject site;
- A taper length of 36m on approach and departure from the abovementioned widened eastbound Park Road pavement; and
- A westbound Park Road pavement width of 6.5m is required on approach to the development site to facilitate a left turn movement of 19m long semi-trailer.

A concept design for the above BAR / BAL treatment at the junction of Park Road and the site access driveway in accordance with the relevant AUSTORADS requirements has been prepared and is attached to this correspondence as **Appendix 1**. The concept design indicates the extent of additional pavement widening required on both sides of Park Road.

The above referenced junction upgrading works (contained within **Appendix 1**) are recommended, the requirement for which can reasonably be imposed as a condition of development consent.

2. *Sight Distance at the proposed access on Park Road should comply with requirements set out in AUSTROADS Guide to Road Design. An assessment should be provided demonstrating the proposed access meet this requirement.*

The provision of sight distance is a critical factor in the level of safety provided at any public road intersection. Austroads *Guide to Road Design Part 4A* provides a minimum safe intersection sight distance of 170m for a roadway connection to a public road which provides an applicable speed limit of 80km/h. Such a sight distance facilitates a motorist travelling at 80km/h a reaction time of between 1.5 seconds prior to braking heavily and stopping prior to entering into a conflict situation.

In order to ascertain the extent of sight distance afforded the proposed site access driveway location, an engineering survey of Park Road was undertaken by Freeburn Surveying, copies of which are submitted under separate cover. This engineering survey has been utilised as a base to prepare a series of sight distance diagrams demonstrating the available sight distance between Park Road directional through traffic and vehicles entering and exiting the proposed site access driveway in accordance with the specifications of Figure 3.2 of Austroads *Guide to Road Design Part 4A*, whereby driver eye height and top of the car are taken at 1.1 and 1.25m above ground level, respectively.

The following provides a summary of the sight distance assessment results whilst full details are contained within **Appendix 2**:

Proposed Site Access Driveway - Exit Movement Sight Distance

- Horizontal Sight Distance between exiting vehicles and westbound Park Road traffic (to the east) > 254m;
- Horizontal Sight Distance between exiting vehicles and eastbound Park Road traffic (to the west) > 453m;
- Vertical Sight Distance between exiting vehicles and westbound Park Road traffic (to the east) = 238m; and
- Vertical Sight Distance between exiting vehicles and eastbound Park Road traffic (to the east) > 461m.

Proposed Site Access Driveway - Entry Movement Sight Distance

- Horizontal Sight Distance between entering vehicles and westbound Park Road traffic (to the east) > 247m;
- Horizontal Sight Distance between entering vehicles and eastbound Park Road traffic (to the west) > 455m;
- Vertical Sight Distance between entering vehicles and westbound Park Road traffic (to the east) = 232m; and
- Vertical Sight Distance between entering vehicles and eastbound Park Road traffic (to the east) > 463m.

The above sight distance assessment therefore indicates that the available sight distance between entering / exiting vehicles and Park Road through traffic exceeds the minimum Austroads *Guide to Road Design Part 4A* criteria for the sign posted speed limit of 80km/h within Park Road.

The sight distance provisions associated with the proposed site access driveway location is therefore projected to provide motorists with satisfactorily safe conditions with which to enter and exit the site.

3. *TfNSW requests swept path plans for the longest vehicle accessing the site on Park Road for review. The plans should show how simultaneous entry / exit can be achieved at the access.*

Comment

In order to assess the suitability of the above recommended junction upgrade arrangements, a series of swept path plans have been prepared and are attached as **Appendix 3** for reference. These swept path plans illustrate the following:

- The proposed BAR treatment is capable of allowing a trailing B99 passenger vehicle within Park Road to pass a 19m long semi-trailer vehicle turning right into the site, in conjunction with a further 19m long semi-trailer vehicle exiting the site, with both design vehicles providing 300m clearance; and
- A 19m long semi-trailer with 300mm manoeuvring clearance is capable of undertaking a left turn movement to the subject site utilising the proposed BAL treatment in conjunction with a further 19m long semi-trailer with 300mm manoeuvring clearance undertaking a forward right turn movement from the site to Park Road.

On the basis of the above discussion, it is accordingly considered that the proposed compliant BAR and BAL treatments to the junction of Park Road and the site access driveway effectively accommodate the manoeuvring requirements of 19m long semi-trailer movements travelling to and from the site, in a safe and efficient manner.

4. *The proposed access is located opposite of an existing access to the property on the other side of Park Road. TfNSW has concerns regarding the conflicting traffic movements at this location and potential adverse road safety and network efficiency impact. Additional information is required how conflicting traffic movements are managed at this location.*

Comment

It is acknowledged that the previously presented BAR treatment encroaches upon the existing access driveway on the opposite side of the road, servicing 353 – 361 Park Road. The provision of a full width BAL turning treatment (in addition to the proposed BAR treatment) to the abovementioned existing opposite access driveway is however considered impractical given the proximity of existing fencing defining the subject property.

In consideration of the above, it is alternatively proposed that a further driveway splay be applied in addition to the BAR treatment thereby servicing left turn movements from Park Road to 353 – 361 Park Road. The details of the above splay have been included within the turning treatment concept design contained within **Appendix 1**. The requirement for the provision of the abovementioned splay could reasonably be imposed by Council as a Condition of Consent.

5. *The swept path plans provided for the largest vehicle for the two key intersections – Park Road / The Northern Road and Park Road / Greendale Road are not satisfactory. The paths should be a smooth, single radius and not have a kink as currently demonstrated. Please provide amended plans demonstrating the swept paths in a smooth, single radius.*

In order to assess the suitability of 19m long semi-trailer vehicles to negotiate the intersections of Park Road / The Northern Road and Park Road / Greendale Road, a series of swept path plans have been prepared and are attached as **Appendix 4** for reference. These swept path plans have been generated utilising aerial images as a base and illustrate the following:

- A 19m long semi-trailer with 300mm manoeuvring clearance is capable of undertaking a left turn movement from Park Road to The Northern Road in conjunction with a further 19m long semi-trailer with 300mm manoeuvring clearance undertaking a forward right turn movement from The Northern Road to Park Road;
- A 19m long semi-trailer with 300mm manoeuvring clearance is capable of undertaking a left turn movement from The Northern Road to Park Road in conjunction with a further 19m long semi-trailer with 300mm manoeuvring clearance undertaking a forward right turn movement from Park Road to The Northern Road; and
- A 19m long semi-trailer with 300mm manoeuvring clearance is capable of undertaking a left turn movement from Park Road to Greendale Road in conjunction with a further 19m long semi-trailer with 300mm manoeuvring clearance undertaking a forward right turn movement from Greendale Road to Park Road.

The pavement widths servicing the above subject intersections of Park Road / The Northern Road and Park Road / Greendale Road are such that 19m long semi-trailer vehicle manoeuvring is able to occur without any unreasonable encroachment on opposing travel lanes, kerbs and / or parking lanes. The largest vehicle proposed to service the development, being 19m long semi-trailers, are accordingly considered to negotiate the intersections of Park Road / The Northern Road and Park Road / Greendale Road in a safe and efficient manner.

It would be appreciated if Council could consider the additional information contained within this correspondence to assist in its ongoing assessment of the development application.

Submitted for your consideration.

Yours sincerely,

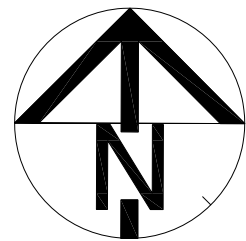


Morgan Stanbury
Director
Traffic Engineer

Enclosed:

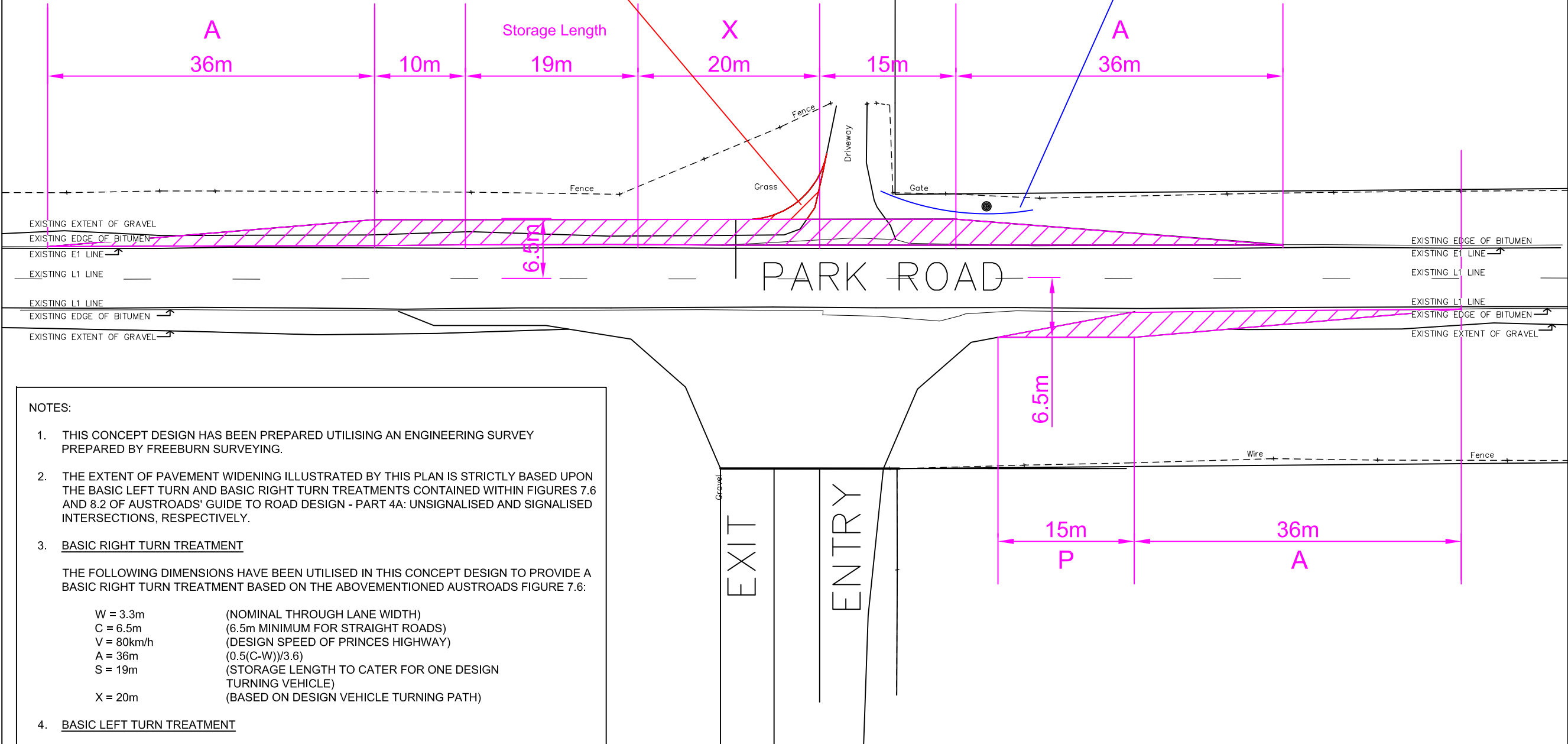
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|------------|---|
| Appendix 1 | Proposed concept design – basic left & right turn treatments |
| Appendix 2 | Existing horizontal and vertical sight distance diagrams at the junction of the proposed site access driveway and Park Road |
| Appendix 3 | Swept path plans – incorporating proposed turning treatments |
| Appendix 4 | Swept path plans – heavy vehicle manoeuvring within site precinct |

APPENDIX 1



ADDITIONAL SPLAY TO SERVICE EXISTING
DRIVEWAY OPPOSITE DEVELOPMENT SITE

PROVIDE GUARDRAIL AROUND
EXISTING POLE



NOTES:

1. THIS CONCEPT DESIGN HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING.
2. THE EXTENT OF PAVEMENT WIDENING ILLUSTRATED BY THIS PLAN IS STRICTLY BASED UPON THE BASIC LEFT TURN AND BASIC RIGHT TURN TREATMENTS CONTAINED WITHIN FIGURES 7.6 AND 8.2 OF AUSTRROADS' GUIDE TO ROAD DESIGN - PART 4A: UNSIGNALISED AND SIGNALISED INTERSECTIONS, RESPECTIVELY.
3. BASIC RIGHT TURN TREATMENT

THE FOLLOWING DIMENSIONS HAVE BEEN UTILISED IN THIS CONCEPT DESIGN TO PROVIDE A BASIC RIGHT TURN TREATMENT BASED ON THE ABOVEMENTIONED AUSTRROADS FIGURE 7.6:




W = 3.3m (NOMINAL THROUGH LANE WIDTH)
C = 6.5m (6.5m MINIMUM FOR STRAIGHT ROADS)
V = 80km/h (DESIGN SPEED OF PRINCES HIGHWAY)
A = 36m $(0.5(C-W))/3.6$
S = 19m (STORAGE LENGTH TO CATER FOR ONE DESIGN TURNING VEHICLE)
X = 20m (BASED ON DESIGN VEHICLE TURNING PATH)

4. BASIC LEFT TURN TREATMENT

THE FOLLOWING DIMENSIONS HAVE BEEN UTILISED IN THIS CONCEPT DESIGN TO PROVIDE A BASIC LEFT TURN TREATMENT BASED ON THE ABOVEMENTIONED AUSTRROADS FIGURE 8.2:

W = 3.3m (NOMINAL THROUGH LANE WIDTH)
C = 6.5m (6.0m MINIMUM FOR STRAIGHT ROADS)
V = 80km/h (DESIGN SPEED OF PRINCES HIGHWAY)
F = 3.2m (FORMATION / CARRIAGEWAY WIDENING)
P = 15m (MIN. LENGTH OF PARALLEL WIDENED SHOULDER)
Sb = 8m (SETBACK DISTANCE BETWEEN CENTRE OF MAJOR ROAD AND GIVEWAY OR STOP LINE IN MINOR ROAD)
A = 36m $(0.5*V*F)/3.6$

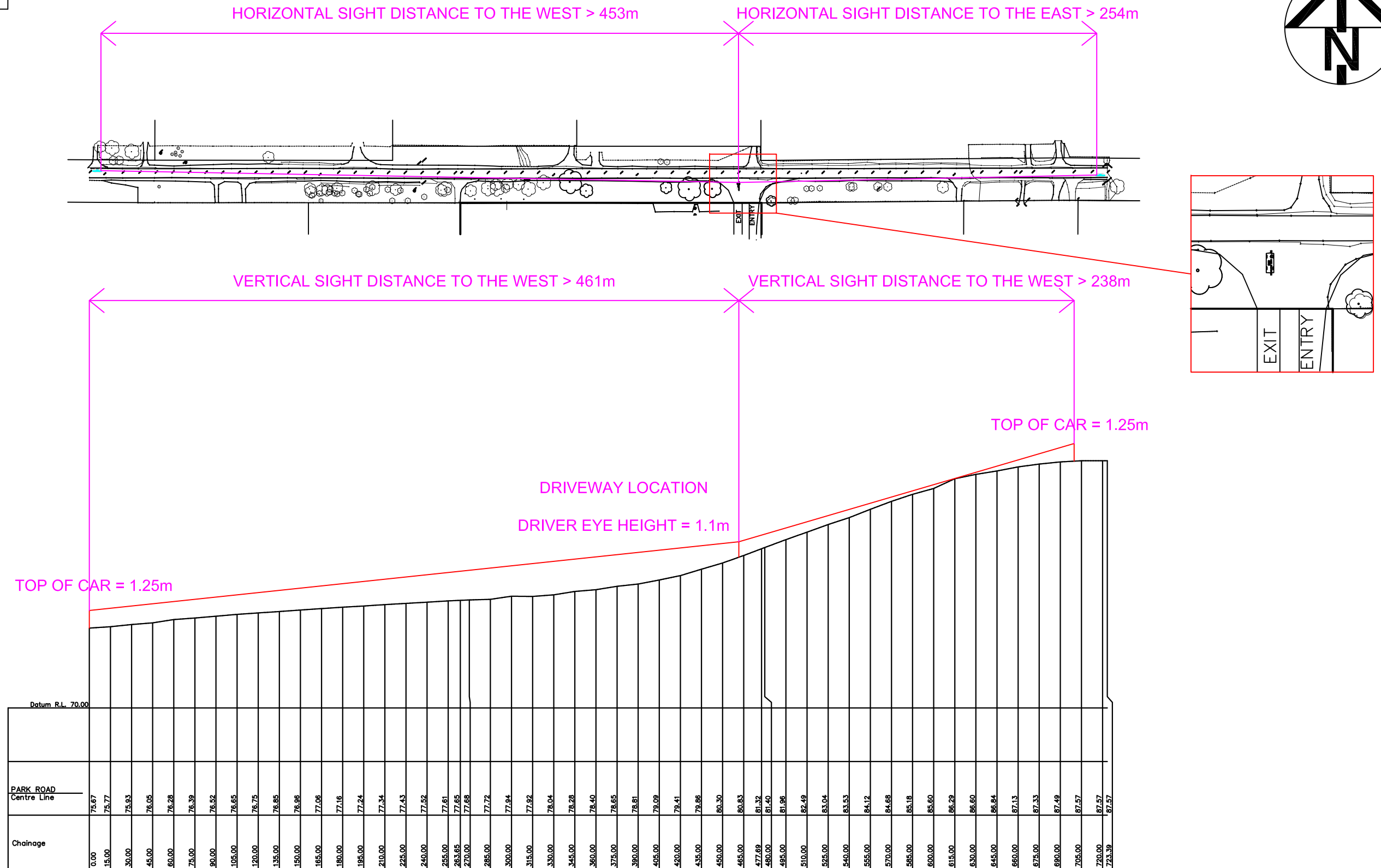
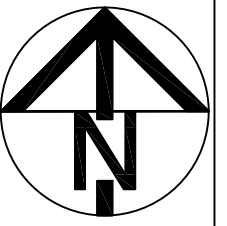
LEGEND

-  EXTENT OF PAVEMENT WIDENING REQUIRED TO ACCOMMODATE TURNING TREATMENTS
-  PROPOSED ADDITIONAL SPLAY SERVICING EXISTING ACCESS DRIVEWAY OPPOSITE SITE
-  PROPOSED INDICATIVE GUARDRAIL



APPENDIX 2

DRAWN BY CADD
DO NOT AMEND MANUALLY



NOTES:

1. THIS VERTICAL SIGHT DISTANCE DIAGRAM HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING AS A BASE.

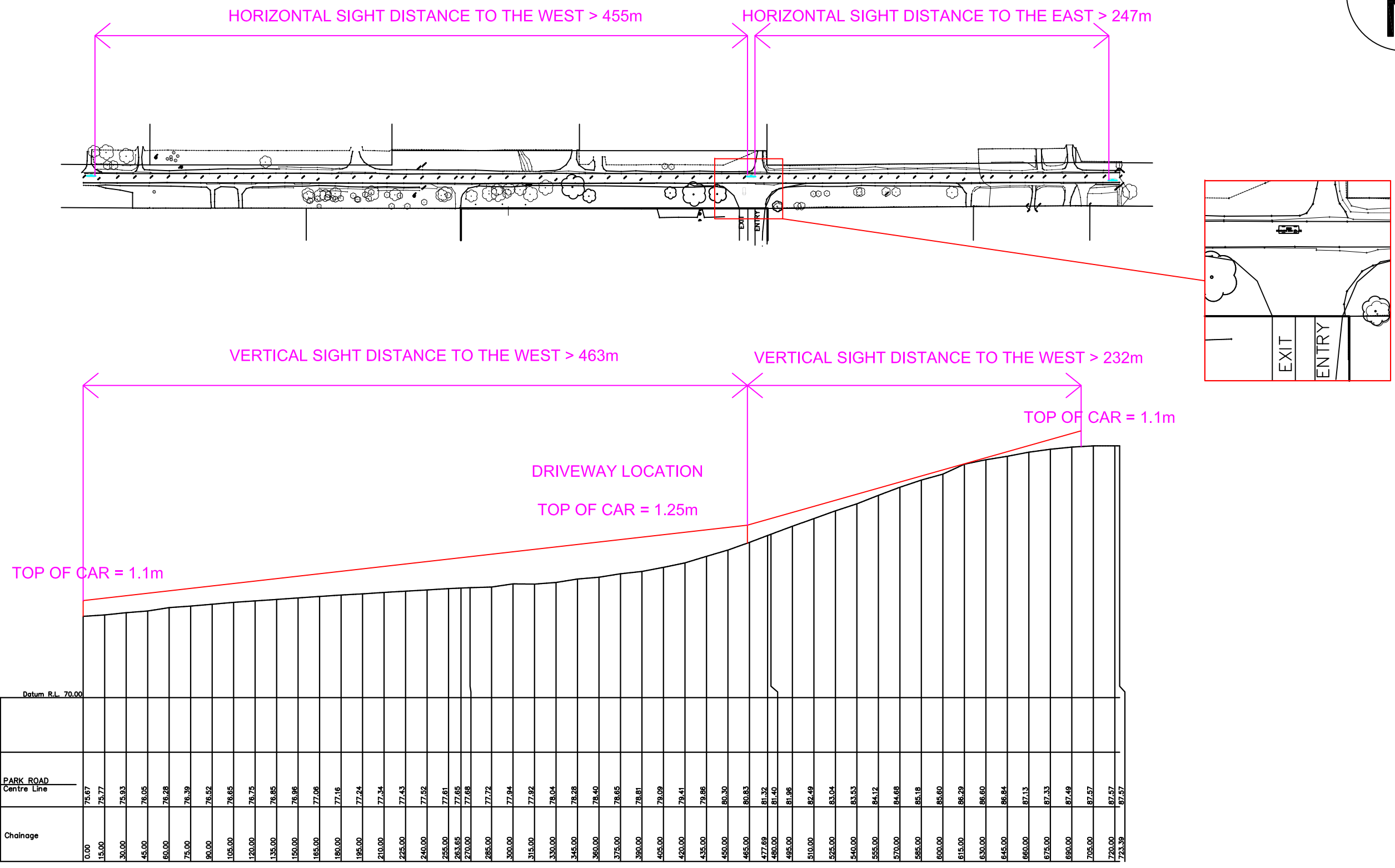
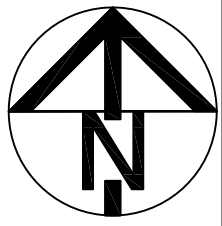
A ORIGINAL ISSUE



STANBURY TRAFFIC PLANNING
ADDRESS: 302/166 GLEBE POINT RD, GLEBE
PH: (02) 8971 8314
MOB: 0410 561 848
EMAIL: info@stanburytraffic.com.au
WEBSITE: www.stanburytraffic.com.au

VERTICAL & HORIZONTAL SIGHT DISTANCE DIAGRAM
SITE ACCESS DRIVEWAY EGRESS MOVEMENT
JUNCTION OF PARK ROAD AND SITE ACCESS DRIVEWAY
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

	ISSUE	A
SCALE: 1:300 @ A3		
FILE: 21-009	SHEET	2
DATE: MAY 2021		



NOTES:

1. THIS VERTICAL SIGHT DISTANCE DIAGRAM HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING AS A BASE.

A ORIGINAL ISSUE

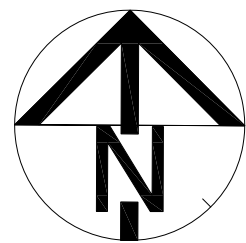


STANBURY TRAFFIC PLANNING
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VERTICAL & HORIZONTAL SIGHT DISTANCE DIAGRAM
SITE ACCESS DRIVEWAY INGRESS MOVEMENT
JUNCTION OF PARK ROAD AND SITE ACCESS DRIVEWAY
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

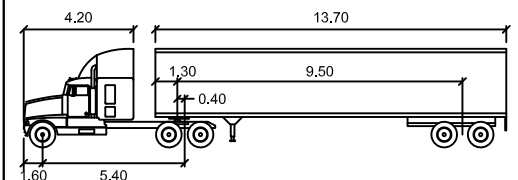
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FILE: 21-009		A
DATE: MAY 2021		SHEET
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APPENDIX 3



NOTES:

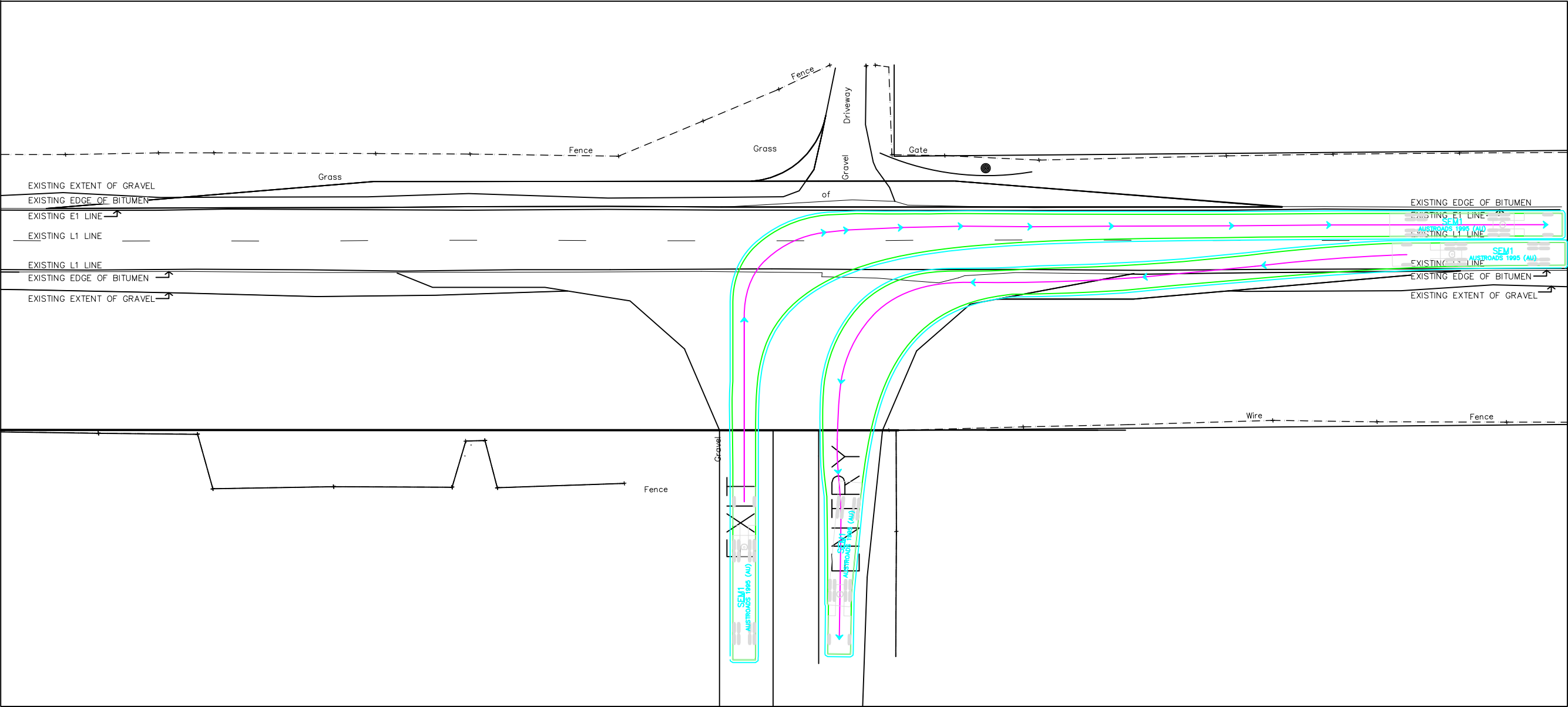
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2. THE SWEEP PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 11 IN CONJUNCTION WITH MANOEUVRING SPECIFICATIONS FOR A 19m LONG SEMI TRAILER VEHICLE.



SEM1	meters
Tractor Width	: 2.50
Trailer Width	: 2.50
Tractor Track	: 2.50
Trailer Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.4
Articulating Angle	: 70.0

LEGEND

- VEHICLE BODY PATH (INCLUDING OVERHANG)
- MANOEUVRING CLEARANCE (300mm)



A ORIGINAL ISSUE

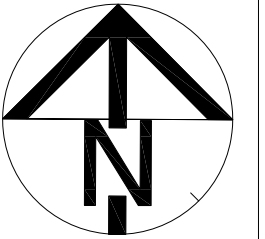


STANBURY TRAFFIC PLANNING
ADDRESS: 302/166 GLEBE POINT RD, GLEBE
PH: (02) 8971 8314
MOB: 0410 561 848
EMAIL: info@stanburytraffic.com.au
WEBSITE: www.stanburytraffic.com.au

19m SEMI TRAILER VEHICLE SWEEP PATH PLAN
SITE INGRESS / EGRESS MOVEMENTS
PROPOSED SITE ACCESS DRIVEWAY
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

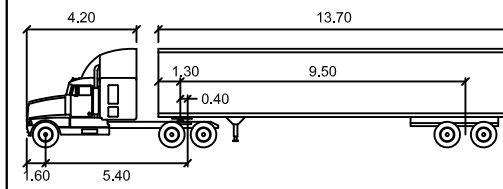
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DATE: MAY 2021

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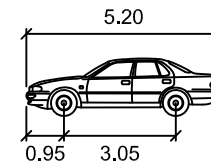


NOTES:

1. THIS PLAN IS BASED ON ENGINEERING SURVEYS PREPARED BY FREEBURN SURVEYING.
2. THE SWEEP PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 11 IN CONJUNCTION WITH MANOEUVRING SPECIFICATIONS FOR A 19m LONG SEMI TRAILER VEHICLE AND B99 PASSENGER VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 1:OFF-STREET CAR PARKING (AS2890.1:2004).



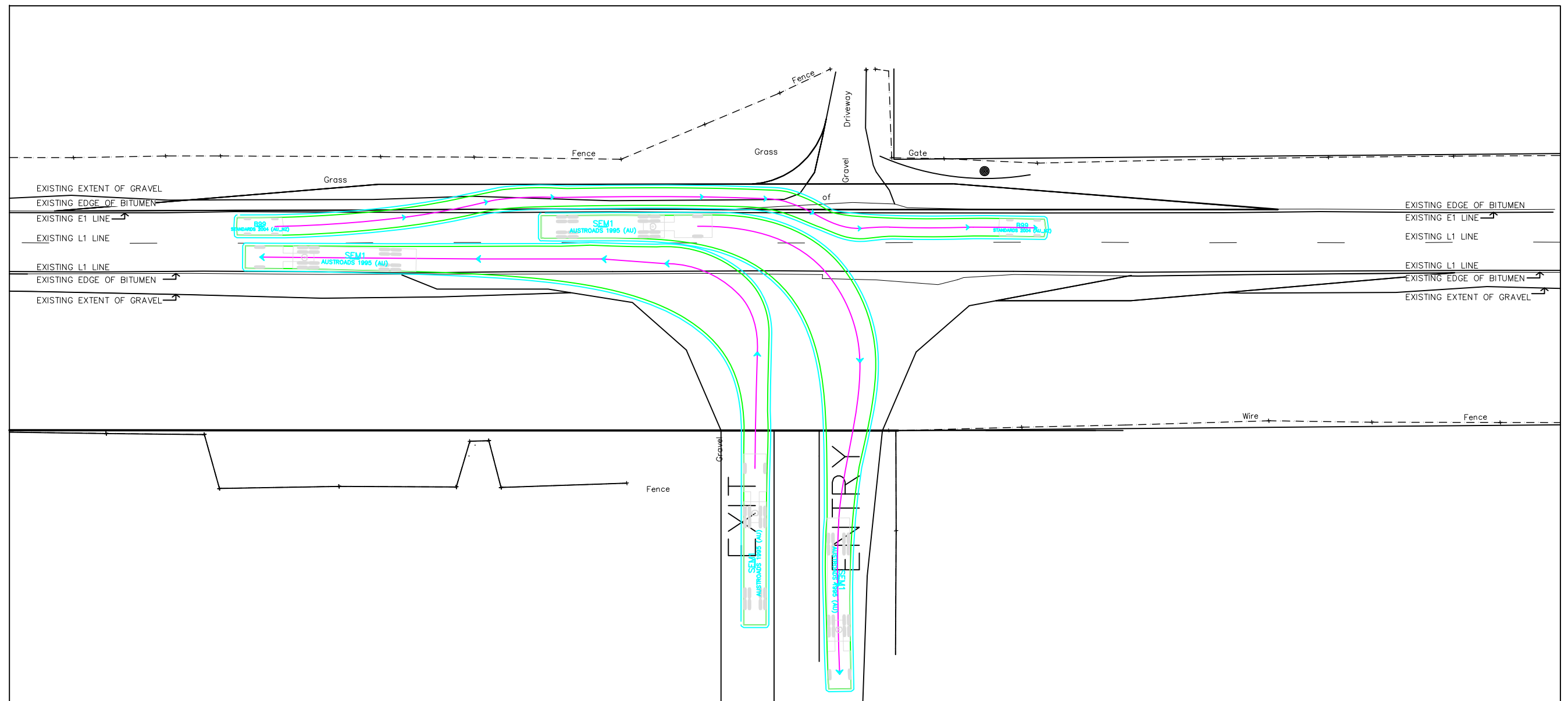
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Tractor Width	: 2.50
Trailer Width	: 2.50
Tractor Track	: 2.50
Trailer Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.4
Articulating Angle	: 70.0



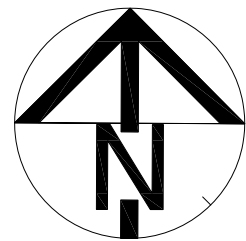
B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

LEGEND

- VEHICLE BODY PATH (INCLUDING OVERHANG)
- MANOEUVRING CLEARANCE (300mm)

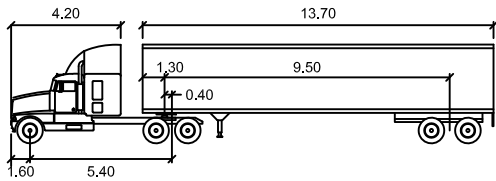


APPENDIX 4



NOTES:

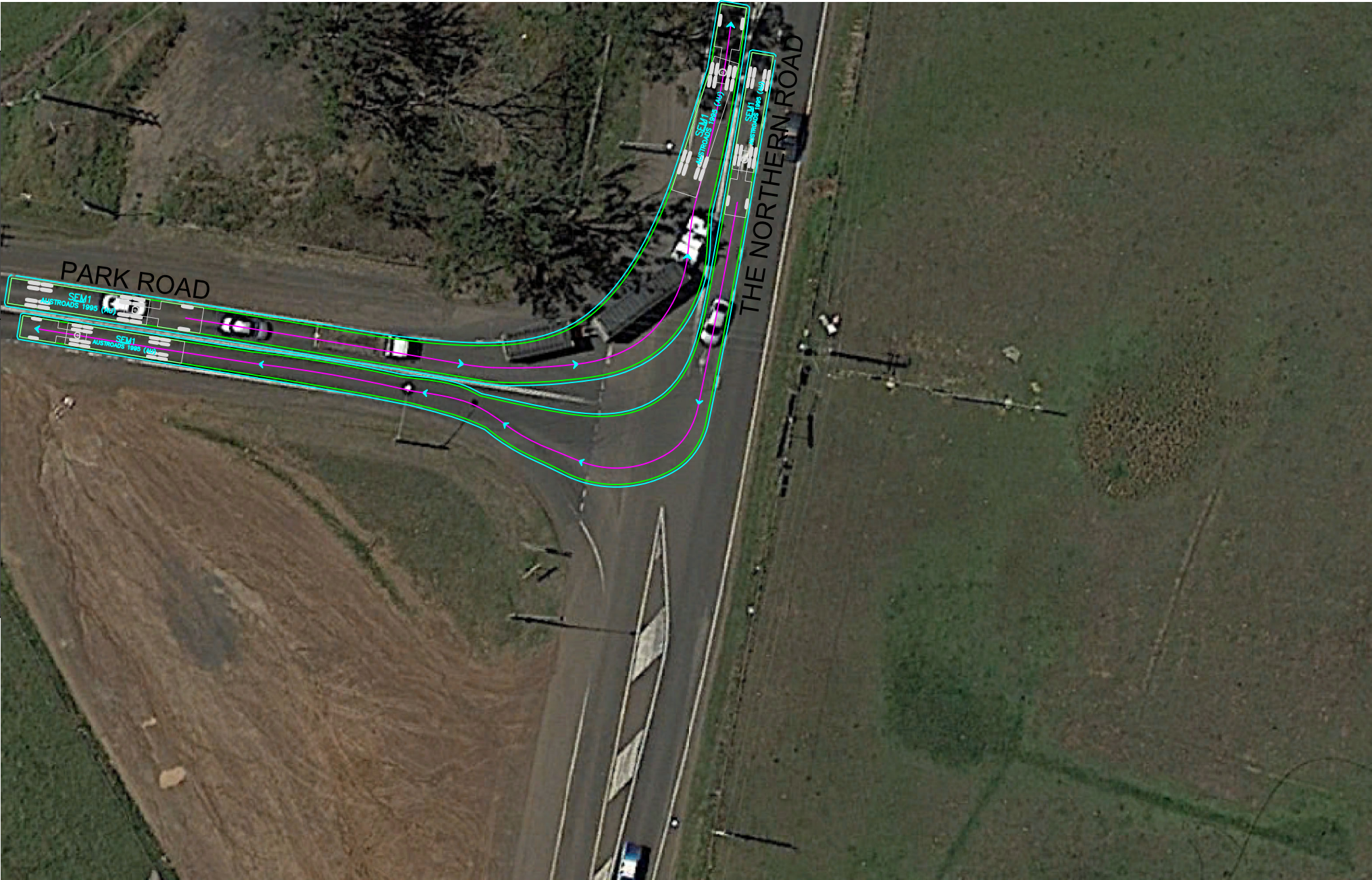
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2. THE SWEEP PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 11 IN CONJUNCTION WITH MANOEUVRING SPECIFICATIONS FOR A 19m LONG SEMI TRAILER VEHICLE.

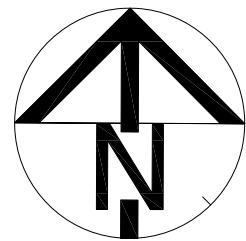


SEM1	metres
Tractor Width	: 2.50
Trailer Width	: 2.50
Tractor Track	: 2.50
Trailer Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.4
Articulating Angle	: 70.0

LEGEND

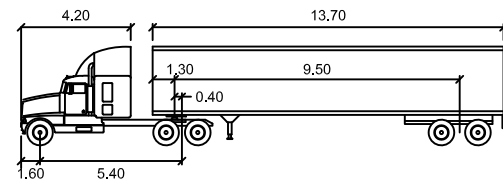
- VEHICLE BODY PATH (INCLUDING OVERHANG)
- MANOEUVRING CLEARANCE (300mm)





NOTES:

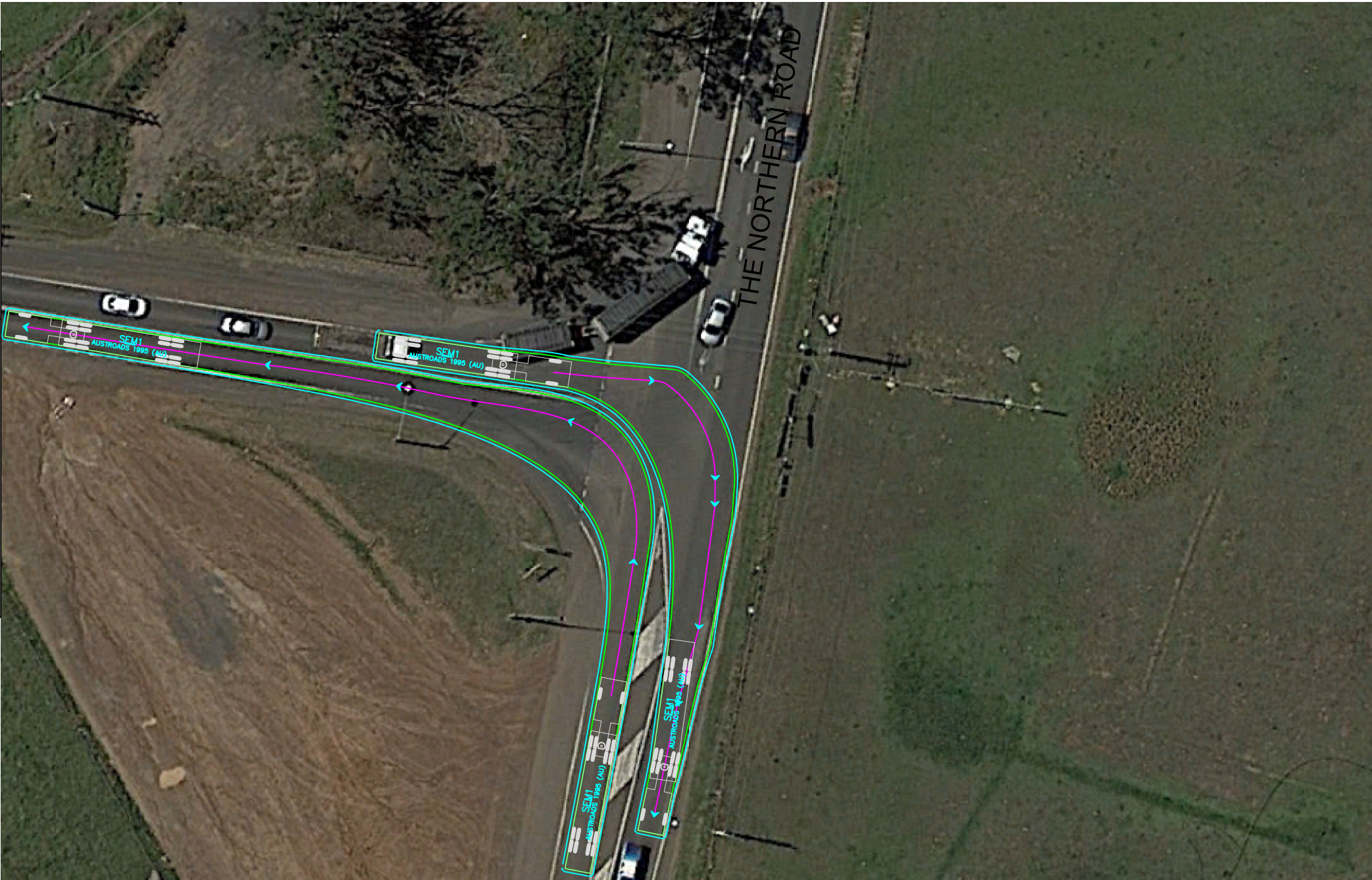
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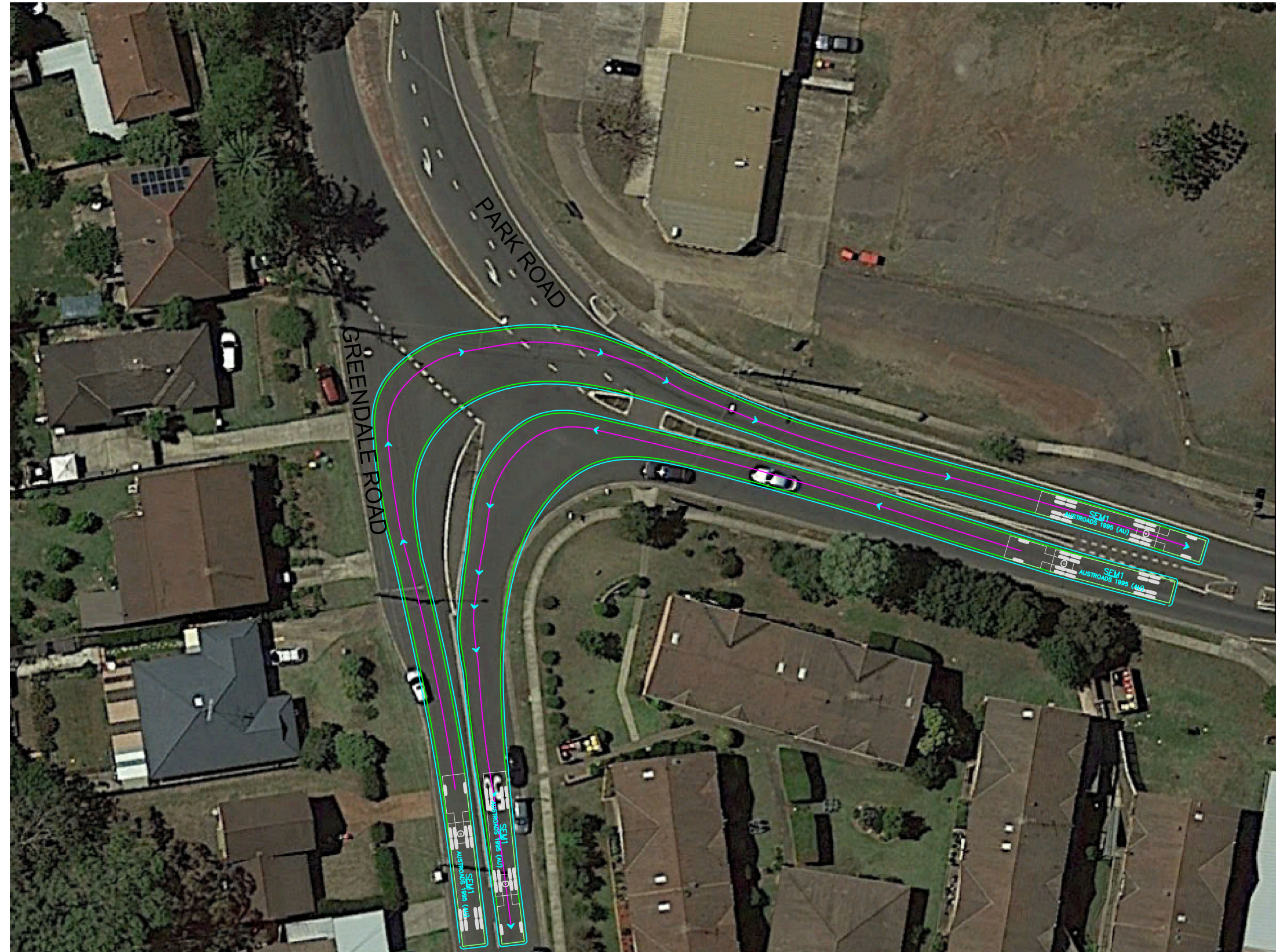
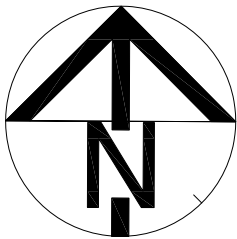


SEM1	metres
Tractor Width	: 2.50
Trailer Width	: 2.50
Tractor Track	: 2.50
Trailer Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.4
Articulating Angle	: 70.0

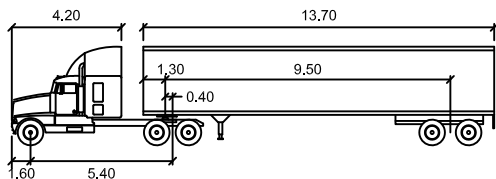
LEGEND

- VEHICLE BODY PATH (INCLUDING OVERHANG)
- MANOEUVRING CLEARANCE (300mm)





- NOTES:
1. THIS PLAN IS BASED ON AERIAL IMAGES TAKEN FROM GOOGLE MAPS.
 2. THE SWEEP PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 11 IN CONJUNCTION WITH MANOEUVRING SPECIFICATIONS FOR A 19m LONG SEMI TRAILER VEHICLE.



SEM1		SEM1
Tractor Width	: 2.50	Tractor Width
Trailer Width	: 2.50	Trailer Width
Tractor Track	: 2.50	Tractor Track
Trailer Track	: 2.50	Trailer Track
Lock to Lock Time	: 6.0	Lock to Lock Time
Steering Angle	: 28.4	Steering Angle
Articulating Angle	: 70.0	Articulating Angle

LEGEND

- VEHICLE BODY PATH (INCLUDING OVERHANG)
- MANOEUVRING CLEARANCE (300mm)



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19m SEMI TRAILER VEHICLE SWEEP PATH PLAN
HEAVY VEHICLE MANOEUVRING WITHIN
INTERSECTION OF GREENDALE ROAD / PARK ROAD
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

SCALE: 1:500 @ A3
FILE: 21-057
DATE: MAY 2021

ISSUE

A

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8



5 August, 2021

Transport for NSW
Locked Bag 5085
Parramatta
NSW 2124

Attention: Pahee Rathan – Senior Land Use Assessment Coordinator

TfNSW reference: SYD20/00933/04

Dear Sir,

DEVELOPMENT APPLICATION DA 20/0262
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

Reference is made to your correspondence dated 28 May 2021 to Kathryn Saunders of Penrith City Council with respect to the suitability or otherwise of a proposed resource recovery facility at the abovementioned address of 344 Park Road, Wallacia, currently the subject of a development application with Penrith City Council.

Stanbury Traffic Planning prepared a letter dated 10th of May 2021 in support of the subject development application.

This Practice has been subsequently retained by applicant to address and / or provide comment in response to items pertaining to Traffic with your abovementioned correspondence with Council, as detailed within the below.

TfNSW Items

1. *TfNSW notes that a Basic Right and left turn treatment (BAR and BAL) are being proposed for the access to the development. TfNSW does not support the proposed BAL treatment, however would support a rural auxiliary left turn treatment (AUL).*

The intended use for the site will generate heavy vehicle movements. With the access located on a downhill gradient, with one lane for through traffic and a speed limit of 80km/h, a formalized left turn auxiliary lane will be required to adequately remove slowing vehicles from the through traffic. In this regard the design is to be updated to include an AUL treatment.

2. *The proposed driveway access, shoulder widening and left turn auxiliary lane along Park Road shall be designed to meet TfNSW requirements, and endorsed by a suitably qualified practitioner. The design requirements shall be in accordance with AUSTROADS and other Australian Codes of Practice. The certified copies of the civil design plans shall be submitted to TfNSW for consideration and approval prior to the release of the Construction Certificate by the Principal Certifying Authority and commencement of road works. Please send all documentation to development.sydney@rms.nsw.gov.au.*

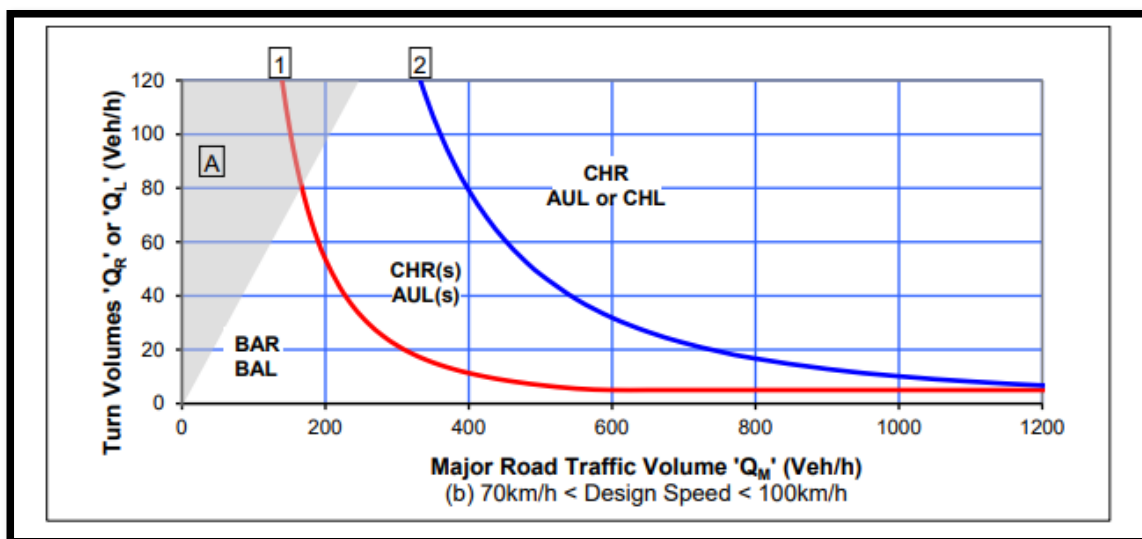
The developer is required to enter into a Works Authorisation Deed (WAD) for the abovementioned works.

TfNSW fees for administration, plan checking, civil works inspections and project management shall be paid by the developer prior to the commencement of works.

Comment

AUSTROADS provide a turning treatment warrant analysis within its *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossing Management* providing turning treatment warrant analysis based on varying design speeds relevant to the subject roads. **Figure 1** overleaf provides turning treatment warrants for roads governed by design speeds of between 70km/h and 100km/h, as applicable to the frontage road of Park Road, being sourced from Figure 3.25 (b) of the abovementioned *Guide*.

FIGURE 1
WARRANT FOR TURN TREATMENTS ON MAJOR ROADS AT UNSIGNALISED INTERSECTIONS
GOVERNED BY A DESIGN SPEED OF BETWEEN 70KM/H AND 100KM/H



An assessment of the projected turn treatment warrants has been undertaken for the junction of Park Road and the proposed site access driveway, based upon the Austroads criteria illustrated within **Figure 1**. The assessment utilised traffic demand surveys and the projected site ingress / egress movements to be undertaken by heavy vehicles servicing the development, as outlined within the development application traffic report.

Table 1 overleaf provides a summary of the analysis results.

TABLE 1 PROJECTED RIGHT / LEFT TURN TREATMENT WARRANT ANALYSIS JUNCTION OF PROPOSED SITE ACCESS DRIVEWAY AND PARK ROAD		
	Projected Conditions	
	AM Peak	PM Peak
Left Turn Treatment Analysis		
Left Turn Volume	7	6
Major Road Volume 'Q _m '	106	131
Warrant	BAL	BAR
Right Turn Treatment Analysis		
Right Turn Volume	1	1
Major Road Volume 'Q _m '	212	219
Warrant	BAL	BAR

Table 1 indicates that the projected traffic demands at the junction of Park Road and the proposed site access driveway warrant a basic left turn treatment (BAL) and a basic right turn treatment (BAR), respectively.

Notwithstanding the abovementioned warrant for a basic left turn treatment (BAL) and a basic right turn treatment (BAR), it is understood that TfNSW does not support the proposed BAL treatment and alternatively would support a rural auxiliary left turn treatment (AUL).

The incorporation of a AUL / BAR treatment at the junction of Park Road and the site access driveway necessitates a notable extent of pavement widening. In this regard, Figures 7.5 and 8.2.3 of AUSTROADS' *Guide to Road Design – Part 4a: Unsignalised and Signalised Intersections* specifies the following pavement widening works:

- An eastbound Park Road pavement width of 6.5m for a length of 64m, to facilitate an ability for trailing through eastbound vehicles to undertake or pass a decelerating or stopped vehicle wishing to turn right into the subject site;
- A taper length of 36m on approach and departure from the abovementioned widened eastbound Park Road pavement; and
- A westbound Park Road pavement width of 6.3m for a length of 85m is required on approach to the development site to facilitate the provision of an auxiliary left-turn lane capable of accommodating a left turn movement of a 19m long semi-trailer.

A concept design for the above BAR / AUL treatment at the junction of Park Road and the site access driveway in accordance with the relevant AUSTROADS requirements has been prepared and is attached to this correspondence as **Appendix 1**. The concept design indicates the extent of additional pavement widening required on both sides of Park Road.

The requirement for detailed civil design of the site access treatment and the proponent to enter into a Works Authorisation Deed with respect to the works can reasonably be imposed as a condition of development consent.

3. *The swept path of the longest vehicle (including garbage trucks, building maintenance vehicles and removalists) entering and exiting the subject site, as well as manoeuvrability through the site, shall be in accordance with AUSTROADS. In this regard, a plan shall be submitted to Council for approval, which shows that the proposed development complies with this requirement.*
4. *The largest vehicle to access the site is to be restricted to 19 metres.*
5. *All vehicles are to enter and leave the site in a forward direction.*
6. *All vehicles are to be wholly contained on site before being required to stop.*

Comment

This Practice acknowledges and accepts items 4, 5 and 6 and notes that these operational management measures can reasonably be imposed as conditions of consent.

In order to assess the suitability of the proposed site access arrangements, and in direct response to Item 3, a series of swept path plans have been prepared and are attached as **Appendix 2** for reference. These swept path plans illustrate the following:

- The proposed BAR treatment is capable of allowing a trailing B99 passenger vehicle within Park Road to pass a 19m long semi-trailer vehicle turning right into the site, in conjunction with a further 19m long semi-trailer vehicle exiting the site, with both design vehicles providing 300m clearance; and
- A 19m long semi-trailer with 300mm manoeuvring clearance is capable of undertaking a left turn movement to the subject site utilising the proposed AUL treatment in conjunction with a further 19m long semi-trailer with 300mm manoeuvring clearance undertaking a forward right turn movement from the site to Park Road.

On the basis of the above discussion, it is accordingly considered that the proposed compliant BAR and AUL treatments to the junction of Park Road and the site access driveway effectively accommodate the manoeuvring requirements of 19m long semi-trailer movements travelling to and from the site, in a safe and efficient manner.

7. *Detail design plans and hydraulic calculations of any changes to the stormwater drainage system are to be submitted to TfNSW for approval, prior to the commencement of any works. Please send all documentation to develompent.sydney@rms.nsw.gov.au.*

A plan checking fee will be payable and a performance bond may be required before TfNSW approval is issued.

8. *A Road Occupancy Licence (ROL) should be obtained from Transport Management Centre (TMC) for any works that may impact on traffic flows on Park Road during construction activities. A ROL can be obtained through <https://myrta.com/oplinc2/pages/security/oplincLogin.jsf>.*
9. *A Construction Pedestrian Traffic Management Plan (CPTMP) detailing construction vehicle routes, number of trucks, hours of operation, access arrangements and traffic control should be submitted to Council for approval prior to the issue of a Construction Certificate.*

10. *All demolition and construction vehicles are to be contained wholly within the site and vehicles must enter the site before stopping. A construction zone will not be permitted on Park Road.*

Comment

Items 7 – 10 are noted and can reasonably be imposed as conditions of consent.

11. *Sight distances from the proposed vehicular crossings to vehicles on Park Road are to be in accordance with the Austroads Guide to Road Design: Part 4A: Unsignalised and Signalised Intersections (Section 3 – Sight Distance) and AS 2890. Vegetation and proposed landscaping/fencing must not hinder sight lines to and from the vehicular crossings to motorists, pedestrians and cyclists.*

The analysis is to include vehicles exiting from 353-361 Park Road Driveway.

Comment

The provision of sight distance is a critical factor in the level of safety provided at any public road intersection. Austroads *Guide to Road Design Part 4A* provides a minimum safe intersection sight distance of 170m for a roadway connection to a public road which provides an applicable speed limit of 80km/h. Such a sight distance facilitates a motorist travelling at 80km/h a reaction time of between 1.5 seconds prior to braking heavily and stopping prior to entering into a conflict situation.

In order to ascertain the extent of sight distance afforded by the proposed site access driveway location and the existing driveway servicing 353 – 361 Park Road, an engineering survey of Park Road was undertaken by Freeburn Surveying, copies of which are submitted under separate cover. This engineering survey has been utilised as a base to prepare a series of sight distance diagrams demonstrating the available sight distance between Park Road directional through traffic and vehicles entering and exiting the proposed site access driveway in accordance with the specifications of Figure 3.2 of Austroads *Guide to Road Design Part 4A*, whereby driver eye height and top of the car are taken at 1.1 and 1.25m above ground level, respectively.

The following provides a summary of the sight distance assessment results whilst full details are contained within **Appendix 3**:

Proposed Site Access Driveway - Exit Movement Sight Distance

- Horizontal Sight Distance between exiting vehicles and westbound Park Road traffic (to the east) > 254m;
- Horizontal Sight Distance between exiting vehicles and eastbound Park Road traffic (to the west) > 453m;
- Vertical Sight Distance between exiting vehicles and westbound Park Road traffic (to the east) = 238m; and
- Vertical Sight Distance between exiting vehicles and eastbound Park Road traffic (to the east) > 461m.

Proposed Site Access Driveway - Entry Movement Sight Distance

- Horizontal Sight Distance between entering vehicles and westbound Park Road traffic (to the east) > 247m;
- Horizontal Sight Distance between entering vehicles and eastbound Park Road traffic (to the west) > 455m;
- Vertical Sight Distance between entering vehicles and westbound Park Road traffic (to the east) = 232m; and
- Vertical Sight Distance between entering vehicles and eastbound Park Road traffic (to the east) > 463m.

Existing Driveway servicing 353 – 361 Park Road - Exit Movement Sight Distance

- Horizontal Sight Distance between exiting vehicles and westbound Park Road traffic (to the east) > 242m;
- Horizontal Sight Distance between exiting vehicles and eastbound Park Road traffic (to the west) > 464m;
- Vertical Sight Distance between exiting vehicles and westbound Park Road traffic (to the east) = 229m; and
- Vertical Sight Distance between exiting vehicles and eastbound Park Road traffic (to the east) > 473m.

Existing Driveway servicing 353 – 361 Park Road - Entry Movement Sight Distance

- Horizontal Sight Distance between entering vehicles and westbound Park Road traffic (to the east) > 234m;
- Horizontal Sight Distance between entering vehicles and eastbound Park Road traffic (to the west) > 468m;
- Vertical Sight Distance between entering vehicles and westbound Park Road traffic (to the east) = 220m; and
- Vertical Sight Distance between entering vehicles and eastbound Park Road traffic (to the east) > 481m.

The above sight distance assessment therefore indicates that the available sight distance between entering / exiting vehicles and Park Road through traffic exceeds the minimum Austroads *Guide to Road Design Part 4A* criteria for the sign posted speed limit of 80km/h within Park Road.

The sight distance provisions associated with the proposed site access driveway location and the existing driveway servicing 353 – 361 Park Road are therefore concluded to provide motorists with satisfactorily safe conditions with which to enter and exit the site.

12. *The layout of the proposed car parking areas associated with the subject development (including driveways, grades, turn paths, sight distance requirements in relation to landscaping and / or fencing, aisle widths, aisle lengths and parking bay dimensions) should be in accordance with AS2890.1:2004, AS2890.6:2009 and AS2890.2:2018 for heavy vehicle usage. Parking restrictions may be required to maintain the required sight distances at the driveway.*

Comment

Item 12 is noted and can reasonably be imposed as conditions of consent.

The requirement or otherwise for parking restrictions along Park Road can reasonably be included within the civil design package required in response to Item 2.

It would be appreciated if TfNSW could consider the additional information contained within this correspondence to assist in its ongoing assessment of the development application.

Submitted for your consideration.

Yours sincerely,



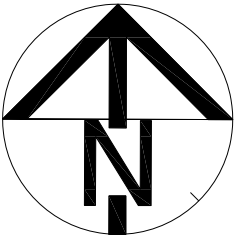
Morgan Stanbury
Director
Traffic Engineer

Enclosed:

- | | |
|------------|---|
| Appendix 1 | Proposed concept design – basic right turn & auxiliary left turn treatments |
| Appendix 2 | Swept path plans – incorporating proposed turning treatments |
| Appendix 3 | Existing horizontal and vertical sight distance diagrams at the junctions of the proposed site access driveway / existing driveway servicing 353 – 361 Park Road and Park Road. |

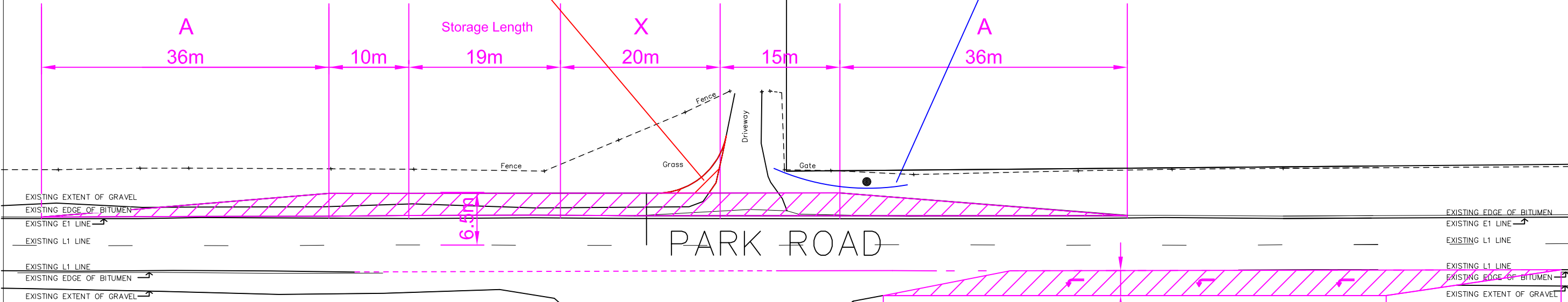
APPENDIX 1

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ADDITIONAL SPLAY TO SERVICE EXISTING
DRIVEWAY OPPOSITE DEVELOPMENT SITE

PROVIDE GUARDRAIL AROUND
EXISTING POLE



NOTES:

- THIS CONCEPT DESIGN HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING.
- THE EXTENT OF PAVEMENT WIDENING ILLUSTRATED BY THIS PLAN IS STRICTLY BASED UPON THE BASIC LEFT TURN AND BASIC RIGHT TURN TREATMENTS CONTAINED WITHIN FIGURES 7.6 AND 8.2.3 OF AUSTRADS' GUIDE TO ROAD DESIGN - PART 4A: UNSIGNALISED AND SIGNALISED INTERSECTIONS, RESPECTIVELY.
- BASIC RIGHT TURN TREATMENT

THE FOLLOWING DIMENSIONS HAVE BEEN UTILISED IN THIS CONCEPT DESIGN TO PROVIDE A BASIC RIGHT TURN TREATMENT BASED ON THE ABOVEMENTIONED AUSTRADS FIGURE 7.6:

W = 3.3m (NOMINAL THROUGH LANE WIDTH)
C = 6.5m (6.5m MINIMUM FOR STRAIGHT ROADS)
V = 80km/h (DESIGN SPEED OF PRINCES HIGHWAY)
A = 36m $(0.5(C-W)/3.6)$
S = 19m (STORAGE LENGTH TO CATER FOR ONE DESIGN TURNING VEHICLE)
X = 20m (BASED ON DESIGN VEHICLE TURNING PATH)

4. BASIC LEFT TURN TREATMENT

THE FOLLOWING DIMENSIONS HAVE BEEN UTILISED IN THIS CONCEPT DESIGN TO PROVIDE A RURAL AUXILIARY LEFT-TURN TREATMENT BASED ON THE ABOVEMENTIONED AUSTRADS FIGURE 8.2.3:

W = 3.3m (NOMINAL THROUGH LANE WIDTH)
WT = 3.0m (3.0m MINIMUM)
D = 85m (BASED ON TABLE 5.2)
T = 22m $((0.33 \times V \times WT)/3.6)$
V = 80km/h (DESIGN SPEED OF PRINCES HIGHWAY)

LEGEND

- EXTENT OF PAVEMENT WIDENING REQUIRED TO ACCOMMODATE TURNING TREATMENTS
- PROPOSED ADDITIONAL SPLAY SERVICING EXISTING ACCESS DRIVEWAY OPPOSITE SITE
- PROPOSED INDICATIVE GUARDRAIL

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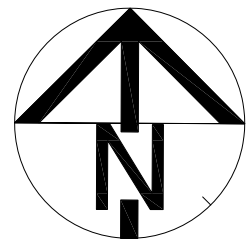
STANBURY TRAFFIC PLANNING
ADDRESS: 302/166 GLEBE POINT RD, GLEBE
PH: (02) 8971 8314
MOB: 0410 561 848
EMAIL: info@stanburytraffic.com.au
WEBSITE: www.stanburytraffic.com.au

RECOMMENDED CONCEPT DESIGN
AUXILIARY LEFT TURN & BASIC RIGHT TURN TREATMENT
PROPOSED SITE ACCESS DRIVEWAY
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

SCALE: 1:500 @ A3
FILE: 21-009
DATE: AUGUST 2021

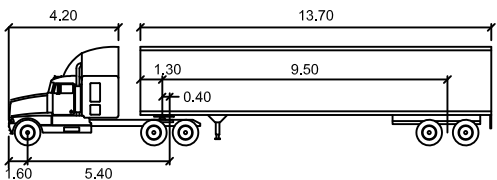
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APPENDIX 2



NOTES:

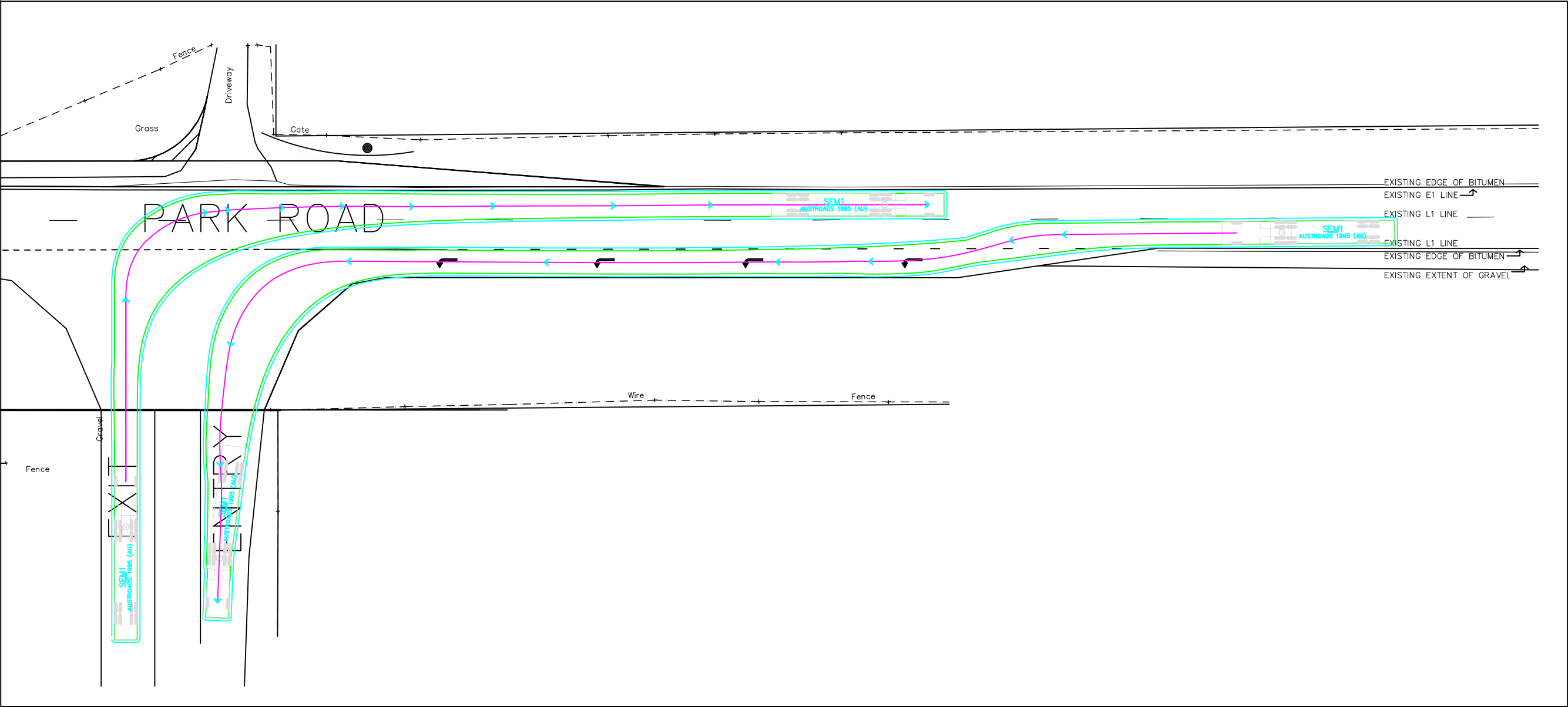
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2. THE SWEEP PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 11 IN CONJUNCTION WITH MANOEUVRING SPECIFICATIONS FOR A 19m LONG SEMI TRAILER VEHICLE.



SEM1	meters
Tractor Width	: 2.50
Trailer Width	: 2.50
Tractor Track	: 2.50
Trailer Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.4
Articulating Angle	: 70.0

LEGEND

- VEHICLE BODY PATH (INCLUDING OVERHANG)
- MANOEUVRING CLEARANCE (300mm)



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19m SEMI TRAILER VEHICLE SWEEP PATH PLAN
SITE INGRESS / EGRESS MOVEMENTS
PROPOSED SITE ACCESS DRIVEWAY
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

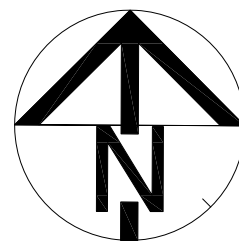
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FILE: 21-057
DATE: AUGUST 2021

ISSUE

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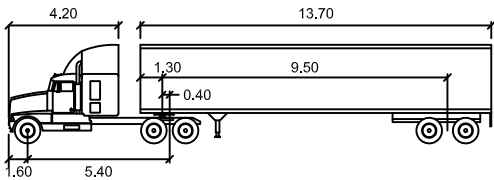
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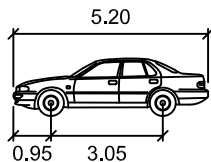


NOTES:

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- THE SWEEP PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 11 IN CONJUNCTION WITH MANOEUVRING SPECIFICATIONS FOR A 19m LONG SEMI TRAILER VEHICLE AND B99 PASSENGER VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 1:OFF-STREET CAR PARKING (AS2890.1:2004).



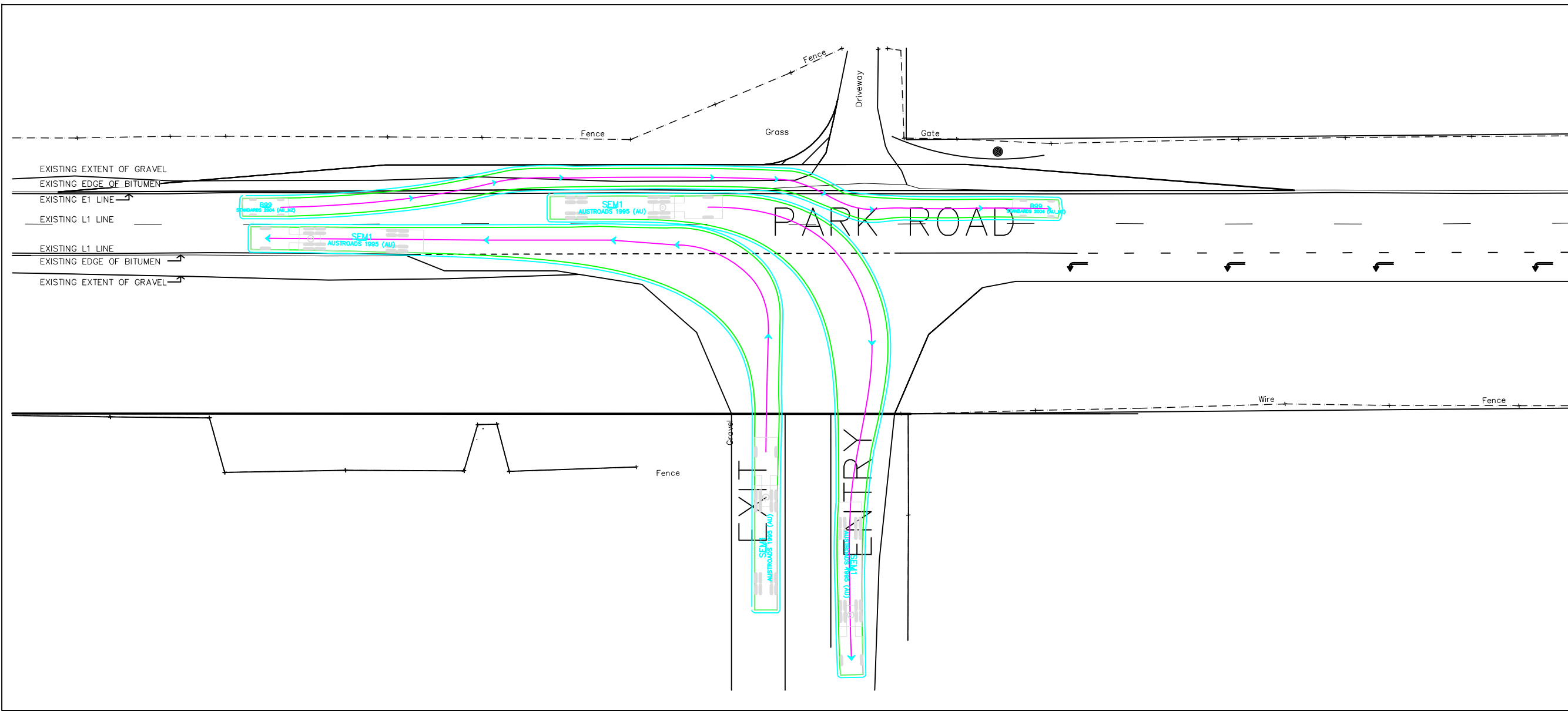
SEM1	meters
Tractor Width	: 2.50
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B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

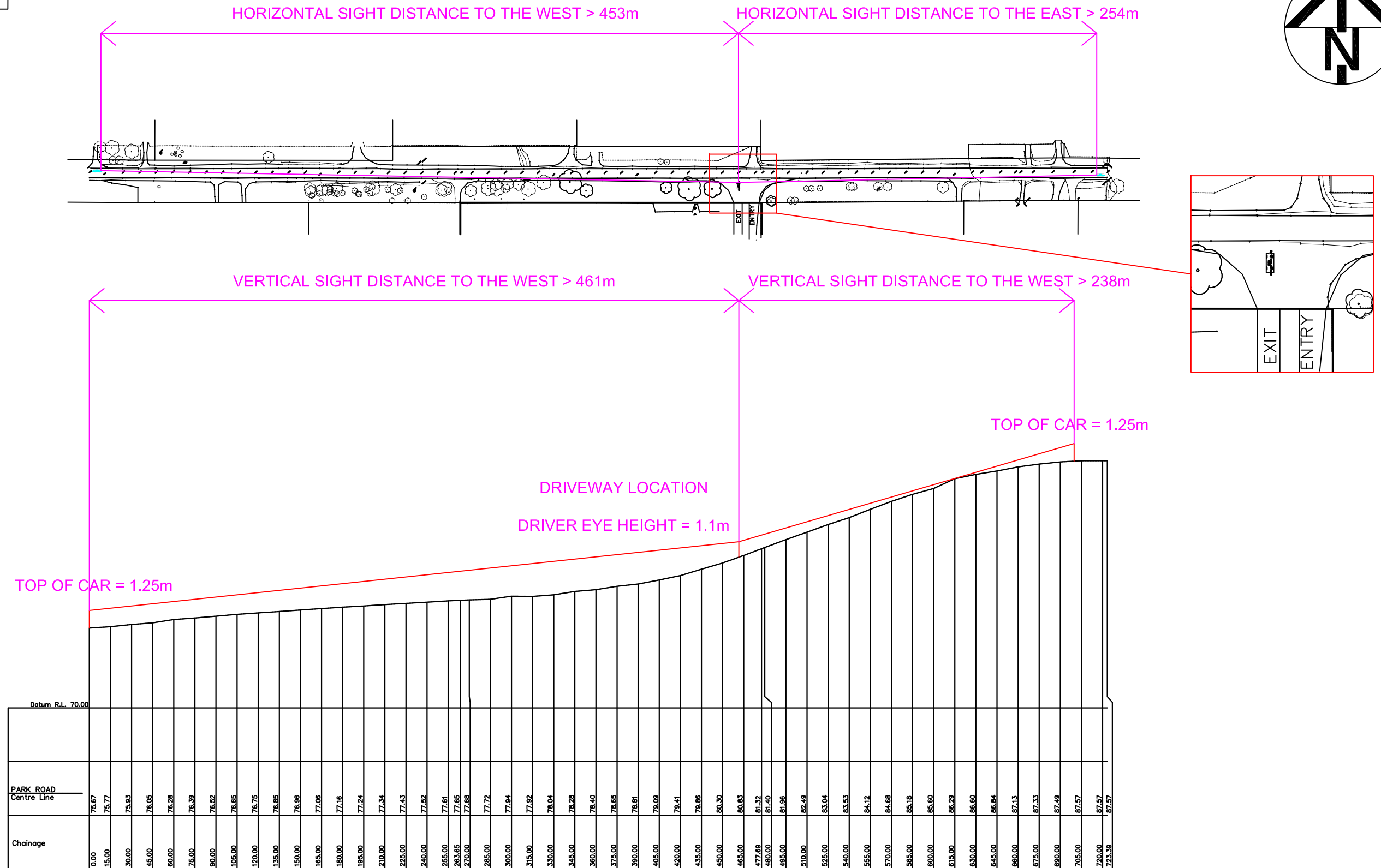
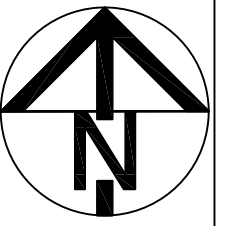
LEGEND

- VEHICLE BODY PATH (INCLUDING OVERHANG)
- MANOEUVRING CLEARANCE (300mm)



APPENDIX 3

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NOTES:

1. THIS VERTICAL SIGHT DISTANCE DIAGRAM HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING AS A BASE.

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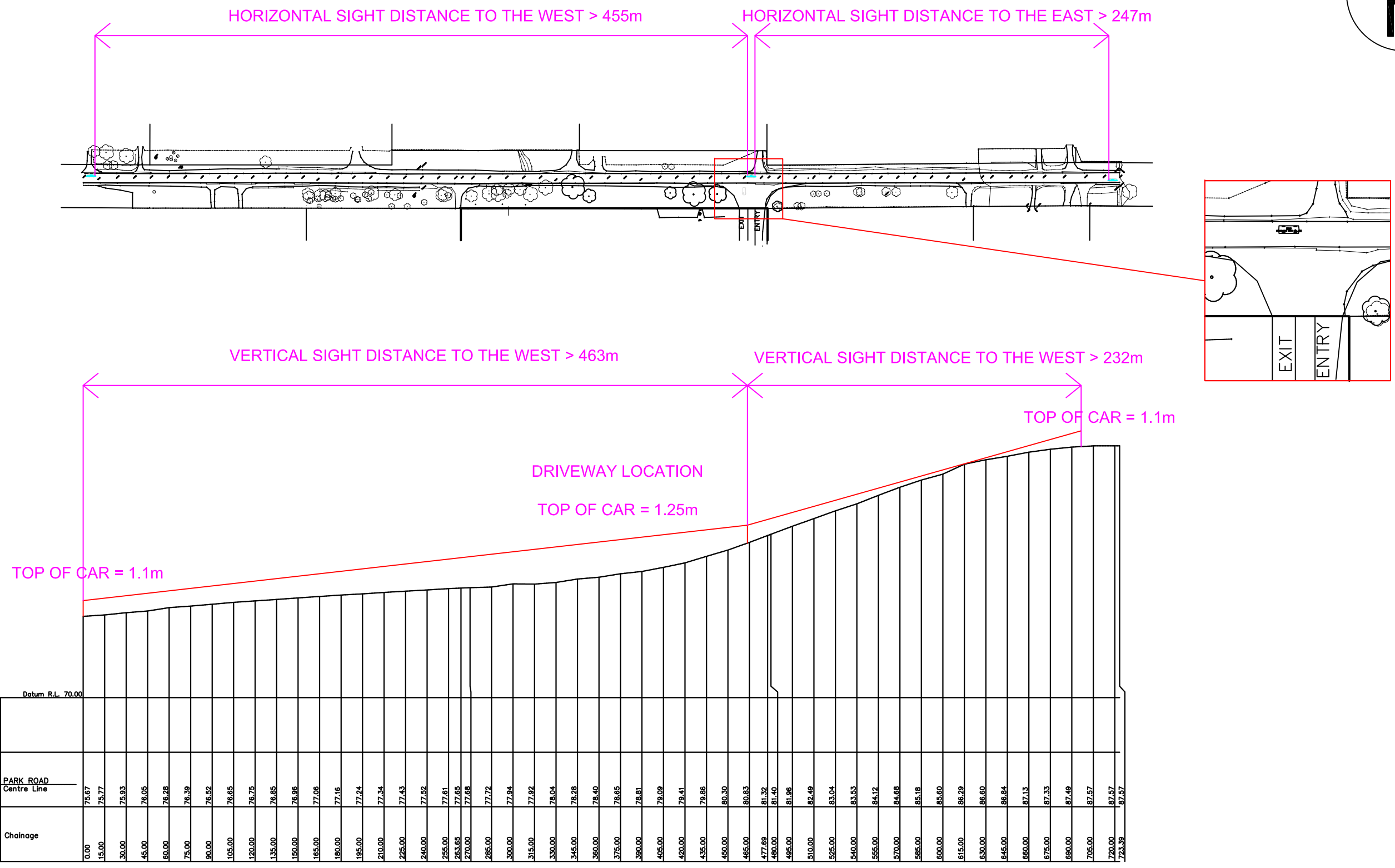
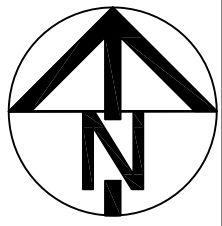
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WEBSITE: www.stanburytraffic.com.au

VERTICAL & HORIZONTAL SIGHT DISTANCE DIAGRAM
SITE ACCESS DRIVEWAY EGRESS MOVEMENT
JUNCTION OF PARK ROAD AND SITE ACCESS DRIVEWAY
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

	ISSUE
SCALE: 1:300 @ A3	A
FILE: 21-009	SHEET
DATE: MAY 2021	4

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NOTES:

1. THIS VERTICAL SIGHT DISTANCE DIAGRAM HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING AS A BASE.

A ORIGINAL ISSUE

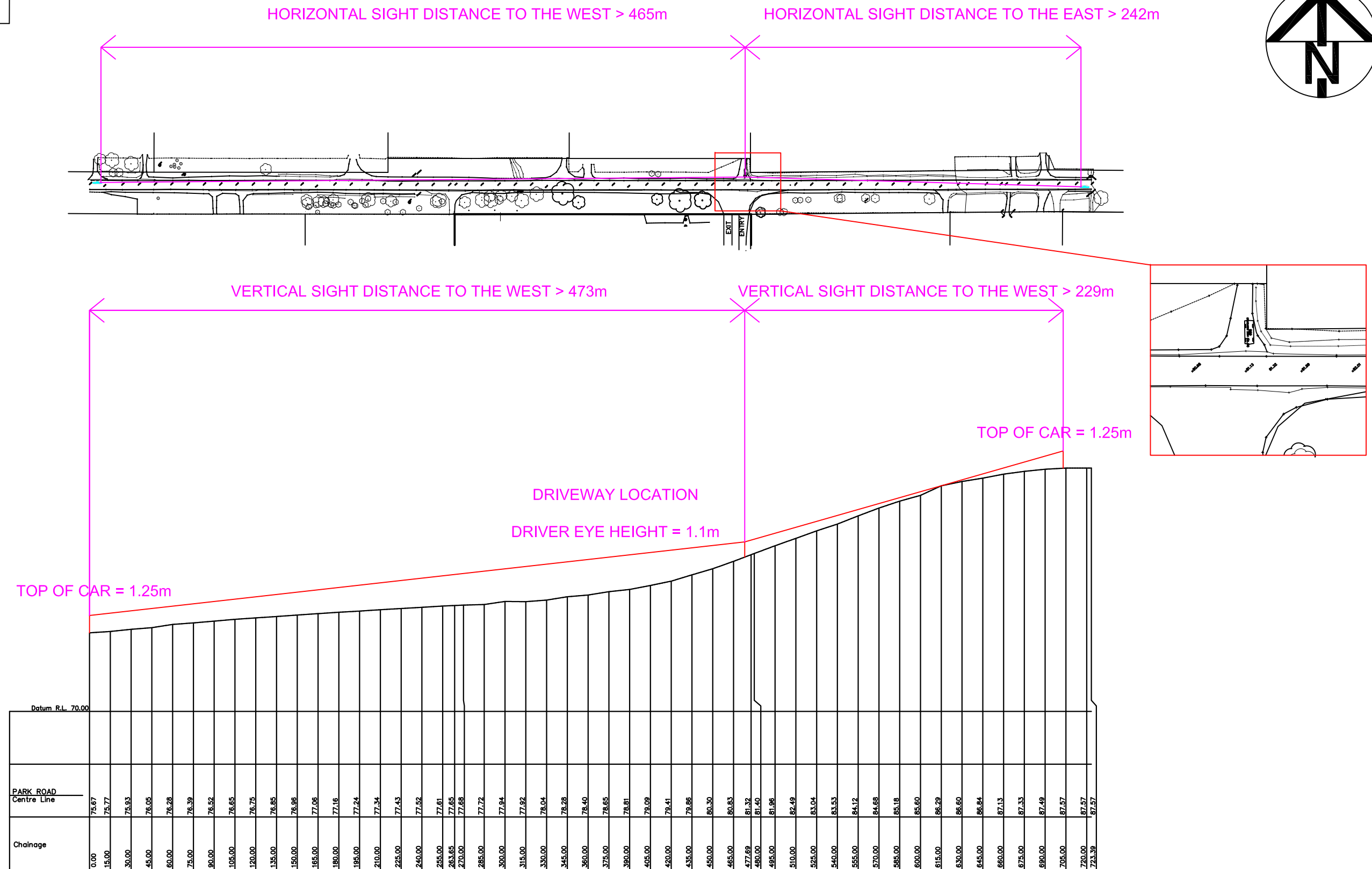
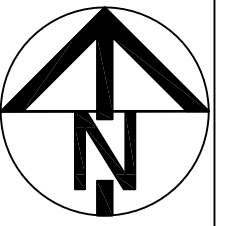


STANBURY TRAFFIC PLANNING
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PH: (02) 8971 8314
MOB: 0410 561 848
EMAIL: info@stanburytraffic.com.au
WEBSITE: www.stanburytraffic.com.au

VERTICAL & HORIZONTAL SIGHT DISTANCE DIAGRAM
SITE ACCESS DRIVEWAY INGRESS MOVEMENT
JUNCTION OF PARK ROAD AND SITE ACCESS DRIVEWAY
PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

SCALE: 1:300 @ A3		ISSUE
FILE: 21-009		A
DATE: MAY 2021		SHEET
		5

DRAWN BY CADD
DO NOT AMEND MANUALLY



NOTES:

1. THIS VERTICAL SIGHT DISTANCE DIAGRAM HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING AS A BASE.

A ORIGINAL ISSUE



STANBURY TRAFFIC PLANNING

ADDRESS: 302/166 GLEBE POINT RD, GLEBE

PH: (02) 8971 8314

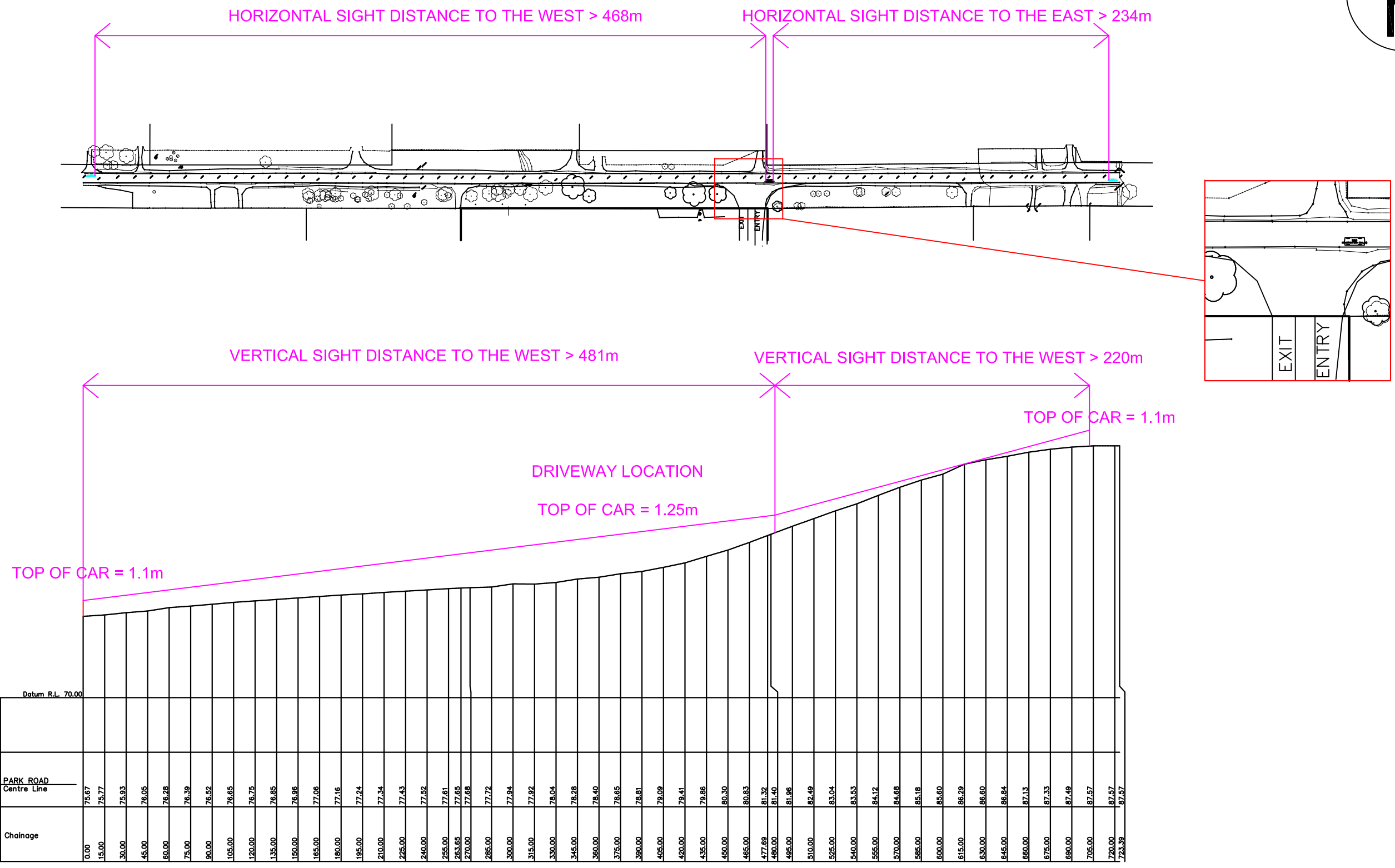
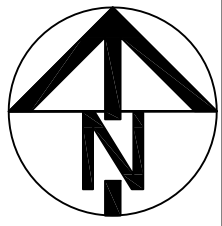
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VERTICAL & HORIZONTAL SIGHT DISTANCE DIAGRAM
BE DRIVEWAY EGRESS MOVEMENT - JUNCTION OF PARK ROAD AND
EXISTING DRIVEWAY SERVICING 353 - 361 PARK ROAD DRIVEWAY
ASSOCIATED WITH PROPOSED RESOURCE RECOVERY FACILITY
344 PARK ROAD, WALLACIA

	ISSUE
SCALE: 1:300 @ A3	A
FILE: 21-009	SHEET
DATE: AUGUST 2021	6



NOTES:

1. THIS VERTICAL SIGHT DISTANCE DIAGRAM HAS BEEN PREPARED UTILISING AN ENGINEERING SURVEY PREPARED BY FREEBURN SURVEYING AS A BASE.