Hemanote Consultants

400-404 CABRAMATTA ROAD WEST, 2-18 ORANGE GROVE ROAD & 6 LINKS AVENUE, CABRAMATTA

PROPOSED RESIDENTIAL FLAT BUILDING AND TOWNHOUSES

UPDATED TRAFFIC & PARKING IMPACT ASSESSMENT

MAY 2023

HEMANOTE CONSULTANTS PTY LTD

TRAFFIC ENGINEERING & DESIGN CONSULTANTS

PO BOX 743, MOOREBANK NSW 1875

CONTACT: 0414 251 845

EMAIL: projects@hemanote.com.au

TRAFFIC & PARKING IMPACT ASSESSMENT
400-404 CABRAMATTA ROAD WEST, 2-18 ORANGE GROVE ROAD & 6 LINKS AVENUE, CABRAMATTA
PROPOSED RESIDENTIAL FLAT BUILDING AND TOWNHOUSES
DATE: 23 MAY 2023

DISCLAIMER

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1 INTRODUCTION

This report has been prepared by Hemanote Consultants to assess the traffic and parking implications of the proposed residential flat building and townhouses development to be located at **400-404 Cabramatta Road West, 2-18 Orange Grove Road and 6 Links Avenue, Cabramatta**, accommodating eighty-seven (87) residential apartments over two basement parking levels and fifty-three (53) townhouses with at-grade and basement parking.

This report is to be read in conjunction with the architectural plans prepared by Alexandar Projects and Designiche Building Designers (reduced copy of the architectural plans are attached in Appendix 'A' of this report) and submitted to Fairfield City Council as part of a Development Application.

This report is set as follows:

- *Section 2:* Description of the existing site location and its use;
- *Section 3:* Description of existing traffic conditions near the subject site;
- *Section 4:* Description of the proposal, vehicular access, on-site parking provision, layout and circulation;
- *Section 5:* Assessment of impacts on parking;
- *Section 6:* Assessment of impacts on traffic in the vicinity of the subject site; and
- *Section 7:* Outlines conclusions.

2 EXISTING SITE DESCRIPTION

➢ ***Site Location***

The subject site is located on the southern side of Cabramatta Road West at properties No. 400, 402, 402A and 404 (legally known as Lot 1 of DP29449, Lots 1 and 2 of DP503339, and Lot 6 of DP709126), on the eastern side Orange Grove Road at properties No. 2-18 (legally known as Lot 7 of DP709126), and on the northern side of Links Avenue at property No. 6 (legally known as Lot 3 of DP30217), within the suburb of Cabramatta. The site has a primary frontage of 49.9 metres to Cabramatta Road West from the north, a secondary frontage of approximately 185.8 metres to Orange Grove Road from the west and a third frontage of 14.9 metres to Links Avenue from the south. Refer to Figure 1 for a site locality map.

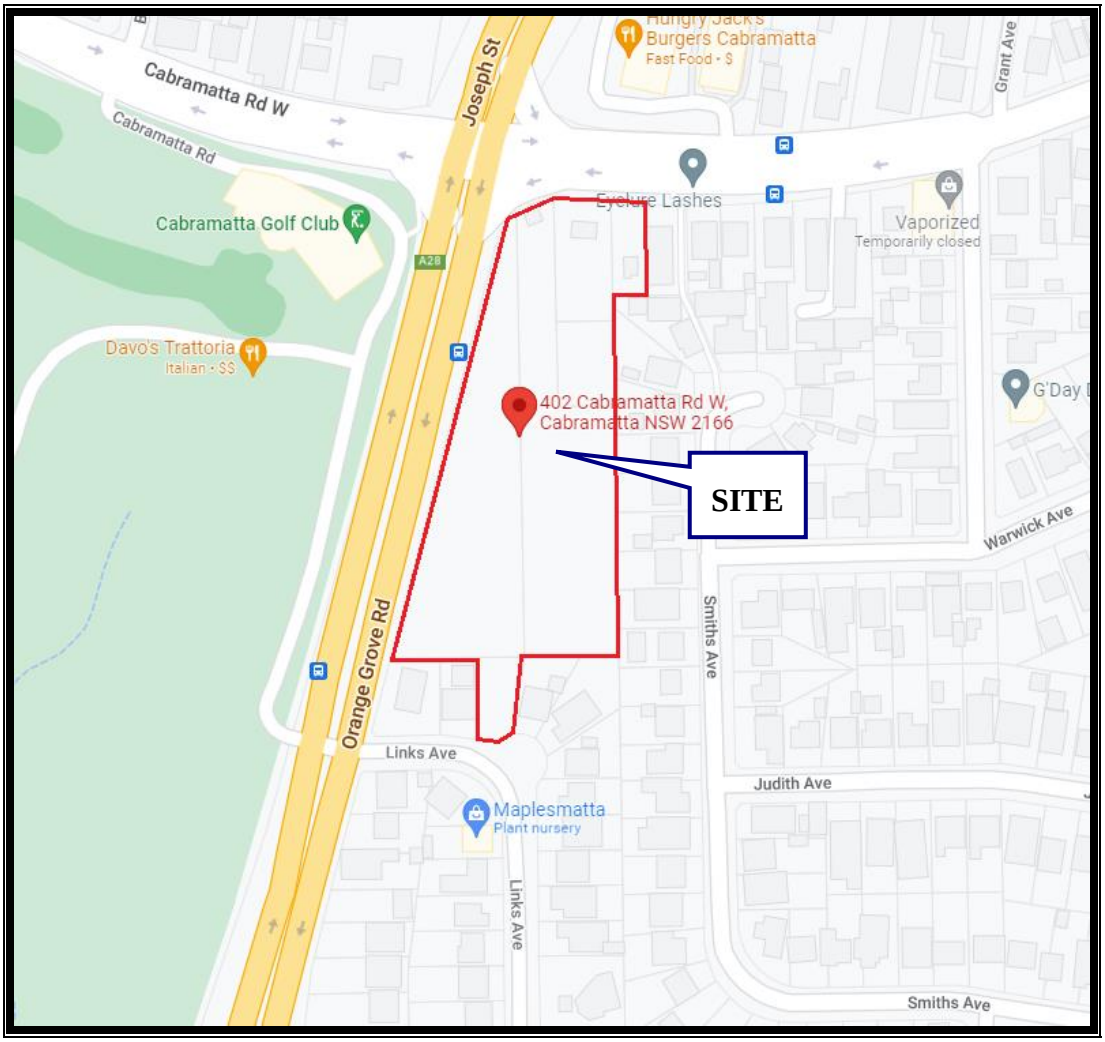


Figure 1: Site Locality Map

➢ ***Existing Site & Surrounding Land Use***

The subject site has a total area of 15,349m^2 and is currently occupied by vacant land. It is located in a mixed residential and commercial area, characterised by residential dwellings and is in close proximity to some retail and commercial sites. The site is located approximately 2 km from Cabramatta Railway Station and 3.2 km from Warwick Farm Railway Station.

Photo 1: Site frontage to Cabramatta Road West

Photo 2: Site frontage to Orange Grove Road

Photo 3: Site frontage to Links Avenue

3 EXISTING TRAFFIC CONDITIONS

3.1 Road Network and Classification

Cabramatta Road West is a state road that generally runs in an east to west direction, between Railway Parade (regional road) to the east and Elizabeth Drive (state road) to the west. Cabramatta Road West intersects with Orange Grove Road (state road) at the subject site.

3.2 Road Description and Traffic Control

Cabramatta Road West has a two-way divided carriageway with a width between kerbs of approximately 21 metres. This carriageway generally provides two travel lanes per direction. At present, parking is not permitted along Cabramatta Road West in the vicinity of the subject site, as per the signposted 'Clearway' between 6.00am and 7.00pm Mondays to Fridays and between 9.00am and 6.00pm on weekends and public holidays, as well as the signposted 'No Stopping' in the vicinity of the subject site.

The legal speed limit on Cabramatta Road West is signposted at 60km/h, with the exception of the signposted 'School Zone' of 40km/h during morning and afternoon school peak periods. Cabramatta Road West intersects with Orange Grove Road at the subject site and is controlled by traffic signals.

Figure 2: Aerial photograph of the subject site and surrounding road network

Photo 3: Cabramatta Road West at the subject site – facing east

Photo 4: Cabramatta Road West at the subject site – facing west

Orange Grove Road has a two-way divided carriageway, with a width between kerbs of approximately 24 metres. This carriageway generally provides three travel lanes per direction. At present, parking is not permitted on Orange Grove Road in the vicinity of the subject site, as per the signposted 'Clearway' between 6.00am and 7.00pm Mondays to Fridays and between 9.00am and 6.00pm on weekends and public holidays, as well as the signposted 'No Stopping' and 'No Parking' in front of the subject site. The legal speed limit on Orange Grove Road is signposted at 70km/h.

Photo 5: Orange Grove Road at the subject site – facing north

Photo 6: Orange Grove Road at the subject site – facing south

Links Avenue has a two-way undivided carriageway, with a width between kerbs of approximately 9 metres. This carriageway generally provides one travel lane per direction with kerbside parking available on both sides of the road. At present, unrestricted parking is permitted on Links Avenue, with the exception of the signposted 'No Stopping' at its near intersection with Orange Grove Road. The legal speed limit on Links Avenue is signposted at 50km/h.

Photo 7: Links Avenue at the subject site – facing south-east

Photo 8: Links Avenue at the subject site – facing west

3.3 Current Traffic Flows

A traffic volume count was undertaken by R.O.A.R. DATA Pty Ltd on behalf of Hemanote Consultants at the intersection of Orange Grove Road / Links Avenue / Access Road to Golf Club in the vicinity of the subject site on Tuesday 9 August 2022, during morning period (7.00am to 9.00am) and afternoon period (3.00pm to 6.00pm), considering traffic peak periods.

The current traffic flows in the morning & afternoon peak hours are shown in Table 1 below and Appendix 'C' of this report.

Traffic movement	Morning Peak Hour (Vehicles Per Hour)	Evening Peak Hour (Vehicles Per Hour)
	7.45am – 8.45am	3.45pm – 4.45pm
Orange Grove Road (North of Links Avenue) – 3 lanes		
Northbound	1,529	1,924
Southbound	1,715	1,851
Orange Grove Road (South of Links Avenue) – 3 lanes		
Northbound	1,512	1,922
Southbound	1,716	1,824
Links Avenue (East of Orange Grove Road)		
Eastbound	11	38
Westbound	32	16
Access Road to Golf Club (West of Orange Grove Road)		
Eastbound	4	2
Westbound	7	5

Table 1: Current Peak traffic flows in the vicinity of the subject site (on a typical weekday)

The results of the traffic volume counts undertaken determined that the traffic morning peak period was between 7.45am to 8.45am and the afternoon peak period was between 3.45pm to 4.45pm on a typical weekday.

The existing traffic flows on Orange Grove Road are typical for a state road in a mixed residential and commercial area.

The existing traffic flows on Links Avenue are low and typical for a local residential street, where traffic is controlled by the existing signalised intersection with Orange Grove Road.

It is determined that the existing mid-block level of service on Links Avenue is it level 'A', in accordance with Table 4.4 of the Roads & Maritime Services' *"Guide to Traffic Generating Developments - 2002"*, where peak hour flow is less than 200 vehicles/hr.

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Table 4.4: Urban road peak hour flows per direction RMS Guide)

- ***Current Intersection Performance***

Average Vehicle Delay (AVD) and Level of Service (LOS) – The AVD and LOS provide a measure of the operational performance of an intersection, as indicated in Table 4.2 of the Roads & Maritime Services "*Guide to Traffic Generating Developments - 2002*" (shown below).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Table 4.2: Level of Service Criteria for intersections (RMS Guide)

A SIDRA intersection performance analysis was undertaken for the existing cross-intersection of Orange Grove Road / Links Avenue in the vicinity of the subject site (Pre-development).

Refer to Figure 3 below, showing the existing cross-intersection layout controlled by traffic signals.

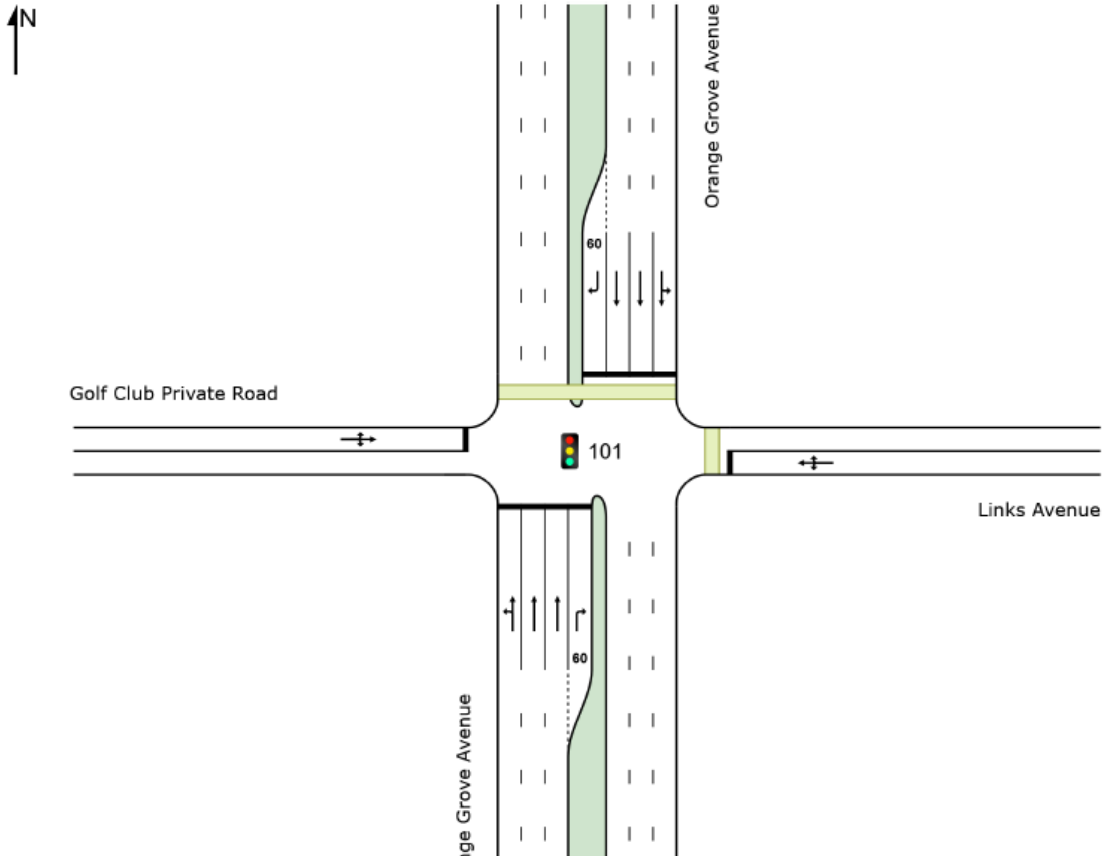


Figure 3: Existing intersection layout

The SIDRA performance analysis determined that the current operational performance during the AM peak period for the Orange Grove Road north approach leg is generally operating near capacity at a level of service 'D', with the exception of the right turn movement from Orange Grove Road into Links Avenue which is at level 'E'.

The existing operational performance during the AM peak period of the Orange Grove Road south approach is generally in good operation at a level of service 'A'. However, the left turn movement from Orange Grove Road into Golf Club Private

Road is at a level of service ‘B’ and the right turn movement from Orange Grove Road into Links Avenue is at level ‘C’.

The existing operational performance during the AM peak period of the Links Avenue east approach leg is at a level of service ‘D’.

The SIDRA performance analysis determined that the current operational performance during the PM peak period for the Orange Grove Road north approach leg is generally operating near capacity at a level of service ‘E’, with the exception of the right turn movement from Orange Grove Road into Links Avenue which is at level ‘F’.

The current operational performance during the PM peak period of the Orange Grove Road south approach is generally in good operation at a level of service ‘A’. However, the left turn movement from Orange Grove Road into Golf Club Private Road is at a level of service ‘B’ and the right turn movement from Orange Grove Road into Links Avenue is at level ‘C’.

The current operational performance during the PM peak period of the Links Avenue east approach leg is at a level of service ‘E’.

Refer to the summary of the results of the SIDRA intersection performance analysis attached in Appendix ‘D’ of this report.

3.4 Existing Transportation Services

The subject site has good access to existing public transport services in the form of trains and buses. The site is located approximately 2 km from Cabramatta Railway Station and approximately 3.2 km from Warwick Farm Railway Station.

Frequent bus services operate along Cabramatta Road West and Orange Grove Road, in close proximity to the subject site (i.e. bus routes 801, 815, 816 and 819).

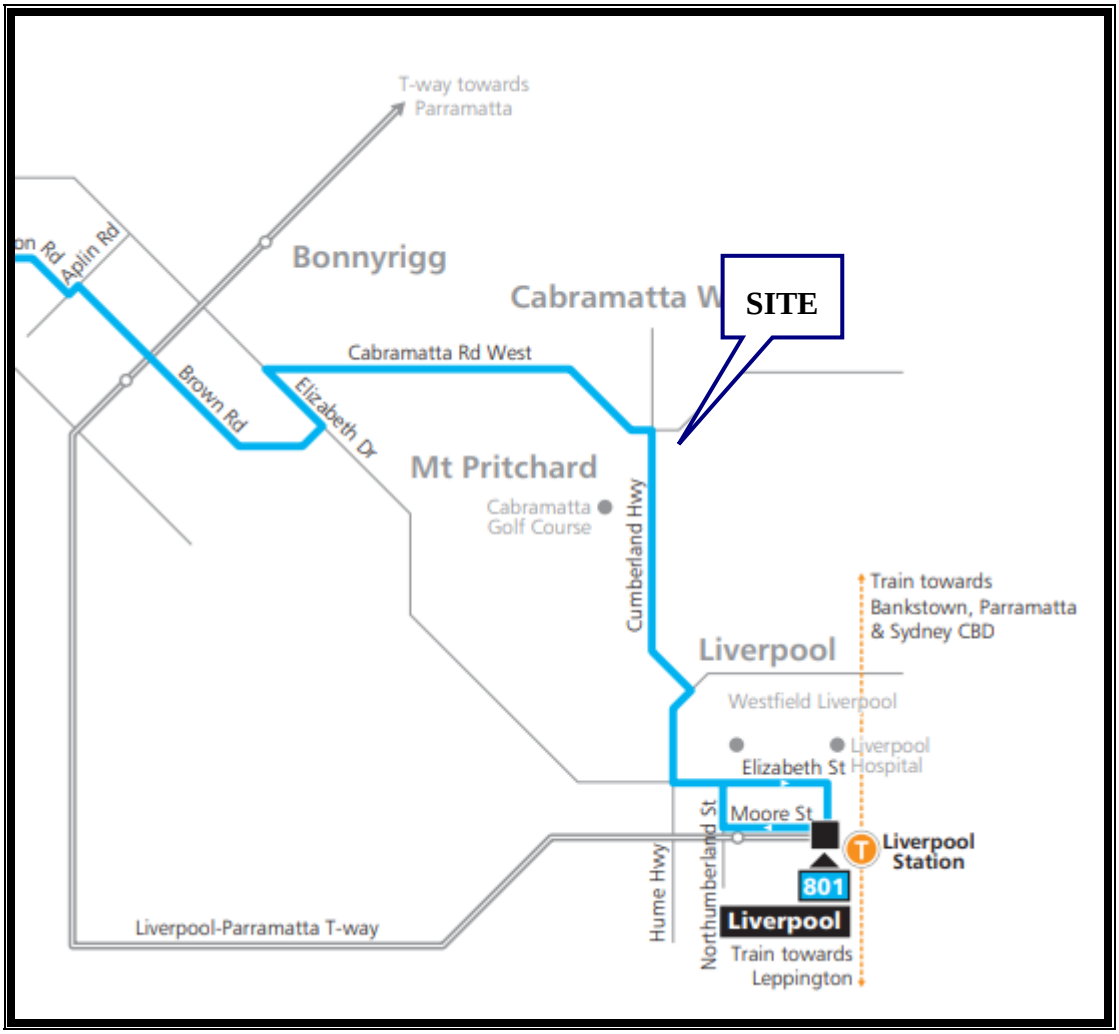
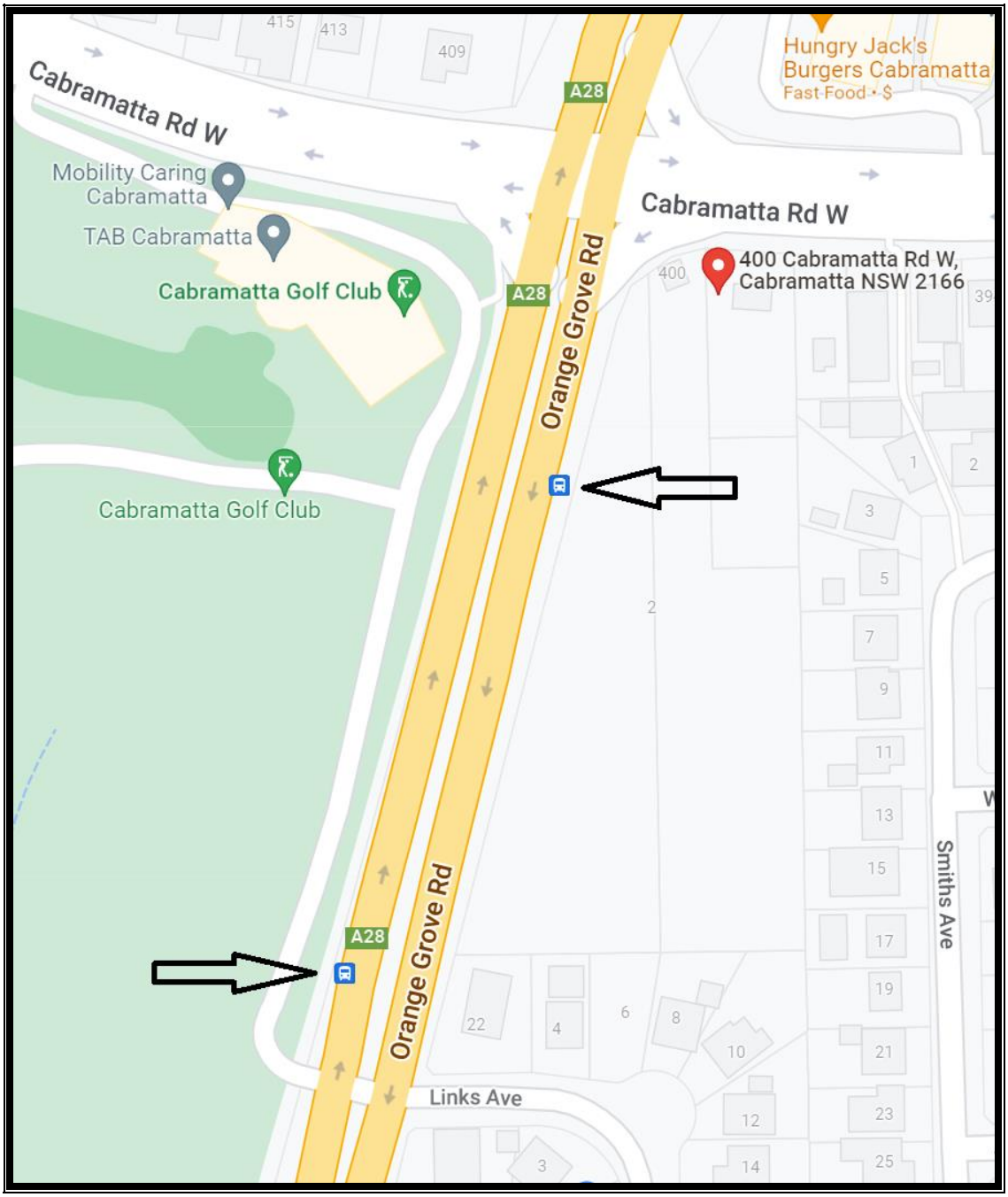


Figure 3: Bus services near the subject site (Bus no. 801)



Existing Bus stations near the subject site

4 PROPOSED DEVELOPMENT

4.1 Description of the proposal

The proposal is for the construction of a residential flat building and townhouses development, to be located at **400-404 Cabramatta Road West, 2-18 Orange Grove Road and 6 Links Avenue, Cabramatta**, with at-grade and basement parking levels.

The proposed development will include the following:

- A Residential Flat Building, with a total of eighty-seven (87) residential units consisting of:
    - 30 x 1-bedroom apartments.
    - 56 x two-bedroom apartments (including 9 adaptable units).
    - 1 x three-bedroom apartment.
- A total of one-hundred and nine (109) on-site car parking spaces, with 87 spaces for resident parking (including 9 adaptable parking spaces) and 22 spaces for visitor parking (including 3 accessible spaces with adjacent shared areas and a car wash bay), in addition to forty-four (44) bicycle storage spaces and a turning bay, over two basement parking levels and 9 visitor bicycle spaces on ground floor. A truck loading bay is located externally on ground level, accommodating up to a Heavy Rigid Vehicle (HRV – 12.5 metres in length).
- Fifty-three (53) residential townhouse dwellings consisting of:
    - 34 x three-bedroom townhouses (including 6 adaptable dwellings).
    - 19 x four-bedroom townhouses.
- A total of one-hundred and fifty-four (154) on-site car parking spaces allocated for the townhouses, with 59 open spaces and 48 enclosed garages (including 1 double garage and 6 adaptable garages) located on ground level, and 47 car spaces in basement level. **A total of 106 car spaces are allocated for residents (2 car spaces per townhouse) and 48 car spaces for visitors.**

Refer to ***Appendix 'A'*** for the proposed development plans.

4.2 Vehicular & Pedestrian Access

The vehicular access to and from the off-street parking facilities will be via a new access driveway crossing to be located in Links Avenue. The access driveway is to have a width of 7.7 metres, which is adequate for a low volume (Category 1) access driveway in accordance with AS2890.1:2004 and waste collection truck access.

The access driveway is to provide two-way vehicular movements, where two vehicles can pass each other at the same time without causing delays or congestion to traffic on the street. The proposed access driveway is located more than 6 metres from the tangent point of the adjacent kerbline, in accordance with Figure 3.1 of AS2890.1:2004.

Vehicular access is to be located and constructed in accordance with the requirements of AS2890.1:2004, where vehicles enter and exit the site in a forward direction at all times.

The existing vehicular crossings located in Orange Grove Road and Cabramatta Road West are to be removed and replaced with new kerb, gutter and footpath, to be constructed to Council specifications, to restore on-street car parking spaces.

The clear sight line triangle (2.5m x 2m) between the driver's eye view and pedestrians is to be provided on the exit side of the driveway, as per Figure 3.3 of AS2890.1:2004 and Figure 3.4 of AS2890.2:2018. Separate pedestrian access gates are also provided at the front of the site in Cabramatta Road West and Orange Grove Road, to segregate pedestrians and vehicles and improve safety within the site.

4.3 On-site Parking Provision

Fairfield CityWide Development Control Plan 2013, Chapter 12, Section 12.1, Table 1, requires off-street parking for multi-dwelling housing located less than 400m from a major bus station to be provided at a rate of:

- 1-2 bedrooms (less than 110m^2) – 1 space.
- 3 or more bedrooms (greater than 110m^2) – 1.5 spaces.
- 0.25 visitor spaces per dwelling.

Refer to Table 2 below for the required and proposed car parking provision for the proposed **townhouses**:

Proposed breakdown	Car parking rate	Proposed No. of units	Car parking required	Total car parking required	Total car parking provided
Multi-Dwelling Housing					
1-2 bed apartments (less than 110m^2)	1 space	-	-	94	154
3 or more bed apartments (greater than 110m^2)	1.5 spaces	53	80		
Visitor	0.25 spaces per dwelling	53	14		
				94	**154**
Compliance with on-site car parking					**Yes**

Table 2: On-site parking requirement and provision (Townhouses)

The proposed development provides for fifty-three (53) residential dwellings (including 34 x 3-bedroom dwellings and 19 x 4-bedroom dwellings), and therefore requires a minimum of 94 car parking spaces, as outlined above, including a minimum of 14 visitor car spaces and 80 resident car spaces.

The proposed development provides one-hundred and fifty-four (154) on-site car parking spaces allocated for the townhouses, with 59 open spaces and 48 enclosed garages (including 1 double garage and 6 adaptable garages) located on ground

level, and 47 car spaces in basement level. **A total of 106 car spaces are allocated for residents (2 car spaces per townhouse) and 48 car spaces for visitors.**

Fairfield CityWide Development Control Plan 2013, Chapter 12, Section 12.1, Table 1, requires off-street parking for residential flat buildings to be provided at a rate of:

- 1 space per dwelling, plus
- 1 visitor space per 4 dwellings where a development has more than 2 proposed dwellings.

Refer to Table 3 below for the required and proposed car parking provision for the proposed **RFB**:

Proposed breakdown	Car parking rate	Proposed No. of units	Car parking required	Total car parking required	Total car parking provided
Residential Flat Building					
Dwellings	1 space per dwelling	87	87	109	109
Visitor	1 space per 4 dwellings		22		
			Total	**109**	**109**
			Compliance with on-site car parking		**Yes**

Table 3: On-site parking requirement and provision (RFB)

The proposed development provides for eighty-seven (87) residential units (including 30 x 1-bedroom units, 56 x 2-bedroom units and 1 x 3-bedroom units), and therefore requires a total of 109 car parking spaces.

The proposed development provides one-hundred and nine (109) on-site car parking spaces, with 87 spaces for resident parking (including 9 adaptable parking spaces) and 22 spaces for visitor parking (including 3 accessible spaces with adjacent shared areas and a car wash bay), in addition to forty-four (44) bicycle storage spaces and a turning bay, over two basement parking levels and 9 visitor bicycle spaces on ground floor. A truck loading bay is located externally on ground level, accommodating up to a Heavy Rigid Vehicle (HRV – 12.5 metres in length). **Therefore, the proposed on-site parking provision is adequate for the proposed development and in compliance with Council's parking requirements.**

4.4 On-site Parking Layout and Circulation

The layout of the on-site car parking area and manoeuvring arrangements has been designed to enhance vehicular and pedestrian access, where vehicles enter and exit the site in a forward direction, through the provision of adequate internal aisle width and turning space.

AS2890.1:2004 Parking facilities Part 1: Off-street car parking requires a minimum parking space width of 2.4 meters (for User Class 1A – long-term residential parking) and 2.5 metres (for User Class 2 - medium-term visitor parking) and a minimum length of 5.4 meters. The proposed on-site car parking spaces have a minimum width of 2.4 metres (for residential parking) and a width of 2.5 metres (for visitor parking) and a minimum length of 5.4 meters each, which is adequate.

The accessible car parking spaces have a width of 2.4 metres, in addition to an adjacent 2.4 metres wide shared area, which is adequate in accordance with AS2890.6:2009.

The adaptable car parking spaces (for the RFB) have a width of 3.8 metres, which is adequate.

The single enclosed garages (for the townhouses) have an internal width of 3.1 metres, with the exception of 6 adaptable garages which have an internal width of 3.8 metres and the double garage at grade level, which has a width of 6 metres. The double enclosed garages located within the basement have an internal width of 5.8 metres, which is adequate

The loading bay located on ground level in a central position on the site, has a clear width of 3.5 metres and a length of 12.5 metres, which is adequate for HRV access in accordance with AS2890.2:2018.

Car parking spaces adjacent to walls or obstructions have been made wider than the minimum width, to accommodate full door opening in accordance with Clause 2.4.2(d) of AS2890.1:2004.

Clause 2.4.2 of AS2890.1:2004 requires a minimum aisle width of 5.8 metres for two-way aisles, adjacent to 90^{o} angle parking. The proposed aisles have a minimum

width of 5.8 metres, which is adequate for two-way traffic and manoeuvring into and out of parking spaces.

A turning area is also provided towards the rear of the basement carpark level for the townhouses and the basement 2 carpark level for the RFB, to allow vehicles to turn around and exit in a forward direction, if all other car parking spaces are occupied.

The ramp to the basement level of the RFB has a clear width of 6.5 metres at the top of the ramp which narrows down to a width of 5.5 metres, in addition to a 300mm kerb on either side and has a maximum grade of 1:20 (5%) for the first 6 metres within the site. It has a maximum grade of 1:4 (25%) with a change of grade of 1:8 (12.5%) over the 2 metres at either end of the ramp, which is adequate.

The ramp to the basement level for the townhouses is adequate and complies with AS2890.1:2004

A minimum 2.2 metres headroom clearance is to be provided from the car park basement levels to the underside of all services conduits and suspended stormwater pipelines, in accordance with Clause 5.3.1 of AS2890.1:2004. A “Maximum Headroom Clearance 2.2m” sign is to be erected at the entrance to the basement car park areas and is to be clearly visible to all drivers. A minimum 2.5 meters headroom clearance is to be provided above the accessible parking spaces and adjacent shared zones as well as the adaptable car parking spaces in accordance with Clause 2.4 of AS2890.6:2009.

Traffic convex mirrors are to be provided at the bottom of the vehicular ramps, to provide drivers with further assistance with viewing oncoming traffic, as an additional safety and traffic management measure.

All vehicular manoeuvring within the site has been designed and checked using the HRV, B99 and B85 standard design vehicle turning paths from AS2890.1:2004, AS2890.2:2018 and Austroads. Refer to the vehicle swept paths diagrams attached in Appendix ‘B’ of this report.

Therefore, the car parking layout and vehicular circulation are adequate in accordance with AS2890.1:2004, AS2890.6:2009 and AS2890.2:2018, where vehicles are to enter and exit the site in a forward direction at all times.

4.5 Waste Collection & Deliveries

Waste collection will be undertaken on-site within the dedicated truck loading bay located in a central position in the car parking area on ground level, by the waste collection vehicle.

The truck loading bay will also be used to service the site for ongoing deliveries and maintenance.

5 EXTERNAL PARKING IMPACT

5.1 Existing Parking Controls

The subject site is located in a mixed residential and commercial area, where parking is not permitted along Cabramatta Road West in the vicinity of the subject site, as per the signposted 'Clearway' between 6.00am and 7.00pm Mondays to Fridays and between 9.00am and 6.00pm on weekends and public holidays, as well as the signposted 'No Stopping' in the vicinity of the subject site

In addition, parking is not permitted on Orange Grove Road in the vicinity of the subject site, as per the signposted 'Clearway' between 6.00am and 7.00pm Mondays to Fridays and between 9.00am and 6.00pm on weekends and public holidays, as well as the signposted 'No Stopping' and 'No Parking' in front of the subject site.

Further, unrestricted parking is permitted on Links Avenue, with the exception of the signposted 'No Stopping' at its near intersection with Orange Grove Road.

5.2 Impacts of Proposed Development on Parking

The parking demand resulting from the proposed residential development can be accommodated within the proposed adequate on-site car and bicycle parking spaces for residents and visitors. The subject site has great access to existing public transport in the form of trains and bus services.

Therefore, the proposed development will not have adverse impacts on parking in the surrounding area.

6 EXTERNAL TRAFFIC IMPACT

6.1 Estimated Future Traffic Generation

An indication of the potential traffic generation of the proposed development is provided by the RMS *Guide to Traffic Generating Development - 2002*.

The Guide specifies the following traffic generation rates for **medium density** residential developments:

Larger units and town houses (three or more bedrooms):

- Weekday peak hour vehicle trips = 0.5-0.65 per dwelling.

Therefore, the proposed townhouses with fifty-three (53) residential apartments (34 x 3-bed units and 19 x 4-bed units) has an estimated traffic generation as follows:

- 27 to 35 peak hour vehicle trips (In and Out trips).

The Guide also specifies the following traffic generation rates for **high density** residential developments:

- AM peak (1 hour) vehicle trips per unit = 0.19.
- PM peak (1 hour) vehicle trips per unit = 0.15.

Therefore, the proposed RFB with eighty-seven (87) residential units (30 x 1-bed units, 56 x 2-bed units and 1 x 3-bed unit) has an estimated traffic generation as follows:

- 17 AM peak hour vehicle trips (In and Out trips).
- 13 PM peak hour vehicle trips (In and Out trips).

The total estimated peak hour traffic generation is:

- **52 AM peak hour vehicle trips (In and Out trips).**
- **48 PM peak hour vehicle trips (In and Out trips).**

6.2 Projected Intersection Performance

Average Vehicle Delay (AVD) and Level of Service (LOS) – The AVD and LOS provides a measure of the operational performance of an intersection, as indicated in Table 4.2 of the Roads & Maritime Services "*Guide to Traffic Generating Developments - 2002*" (shown below).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Table 4.2: Level of Service Criteria for intersections (RMS Guide)

A post-development SIDRA intersection performance modelling analysis was undertaken for the cross-intersection of Orange Grove Road / Links Avenue in the vicinity of the subject site, and it was modelled as the proposed network layout as shown in Figure 5 on the following page.

Refer to the summary of the results of the SIDRA intersection performance analysis (undertaken for pre & post development, including the 10-year future growth) attached in Appendix 'D' of this report.

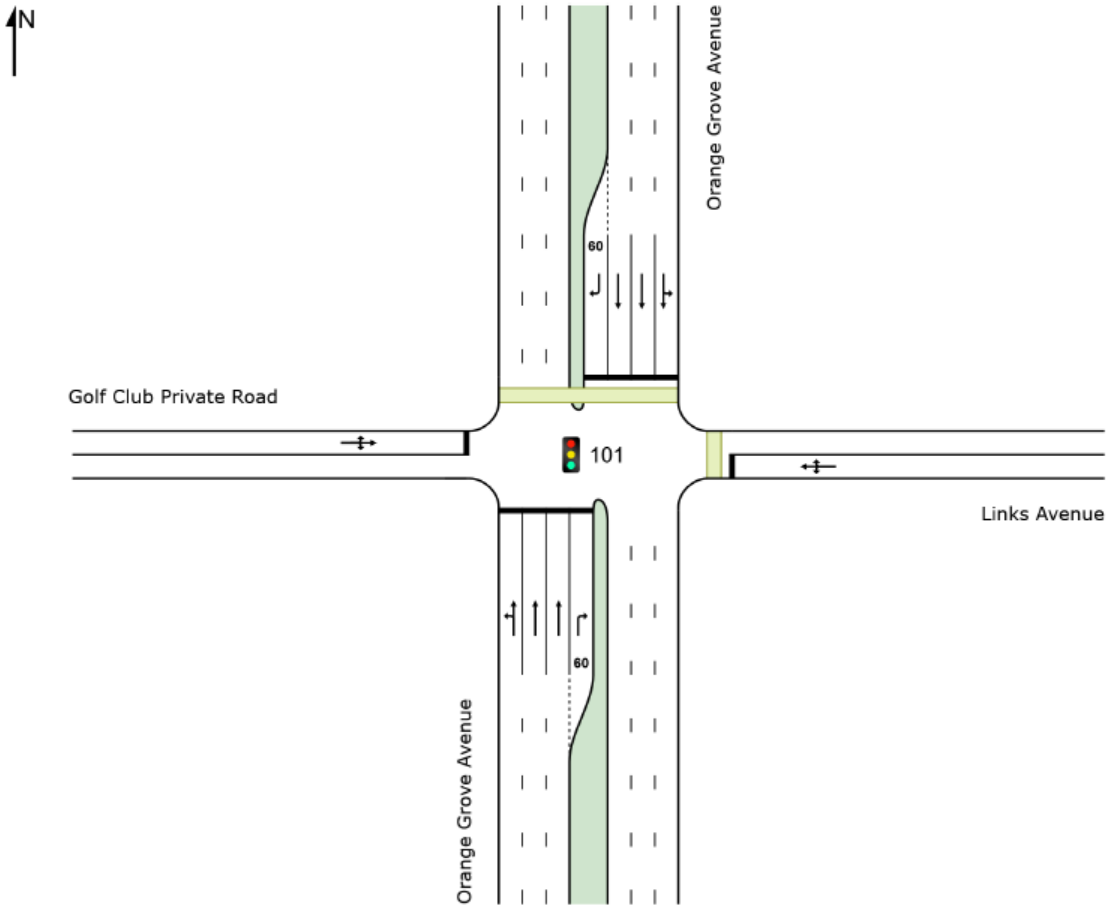


Figure 5: Intersection Layout

The following assumptions have been considered and adopted in the SIDRA Network Intersection modelling for the post-development conditions considering that the main access to and from the subject site is through Links Avenue:

- Morning and afternoon peak traffic generation from *RMS Guide to Traffic Generating Developments* has been used, as outlined in Section 6.1 of this report.
- AM & PM Traffic generated by the development was equally adopted for inbound and outbound traffic.
- Pre-development network analysis is modelled for the base year (2022) and 10 years of future growth (2032) in surrounding traffic. The annual traffic growth rate for the 10-year future period was based on the SIDRA intersection analysis software, which allows for future analysis in surrounding traffic by applying a uniform growth rate of 2% for each year over the 10-year period.
- Post-development network analysis is modelled for when the residential development is in operation and after 10 years of future growth in surrounding traffic.
- The entered traffic flow was inputted as 95% of the modelled flow.

These assumptions will result in the development trip distribution shown in Figures 6 and 7 for relevant traffic movement and modelled intersection.

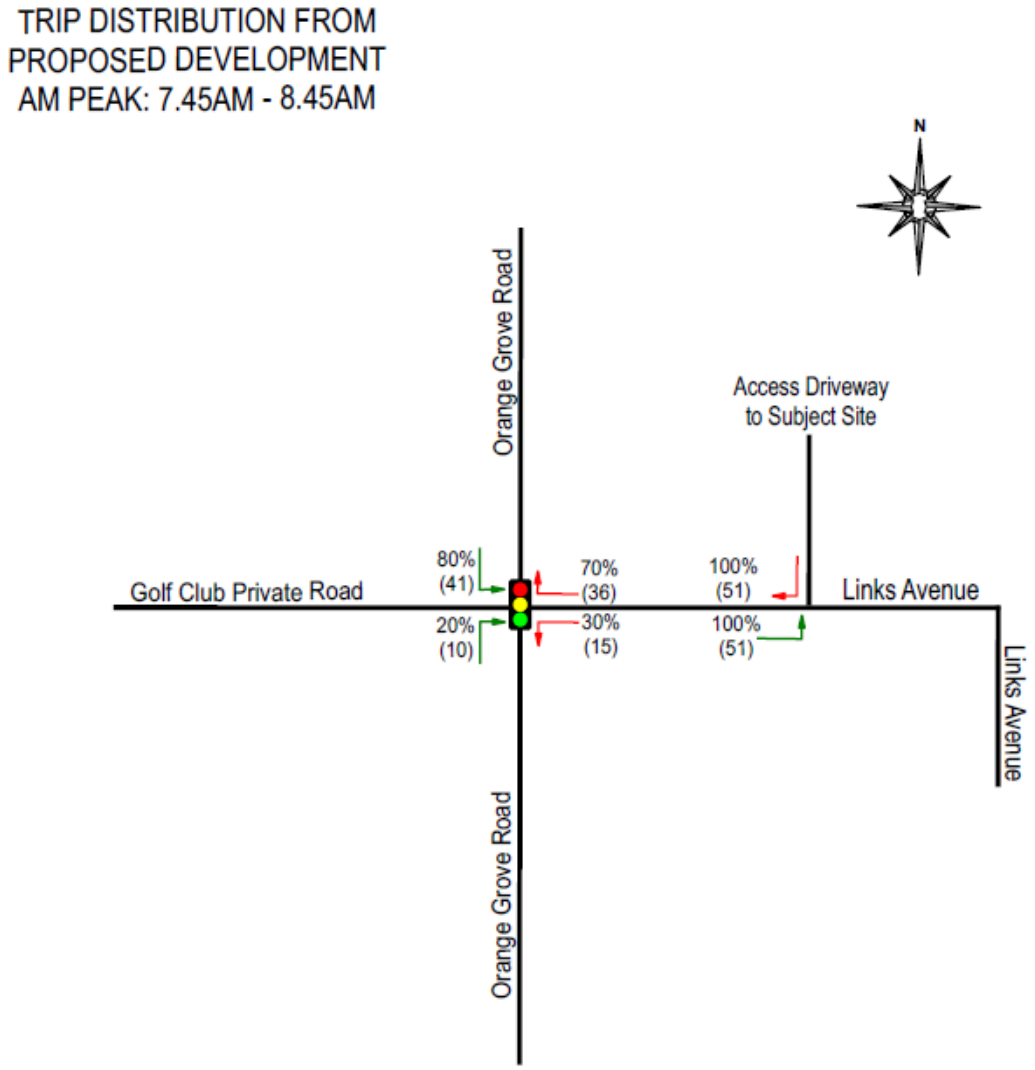


Figure 6: Development Traffic Distribution on the Surrounding Road Network – **AM Peak**

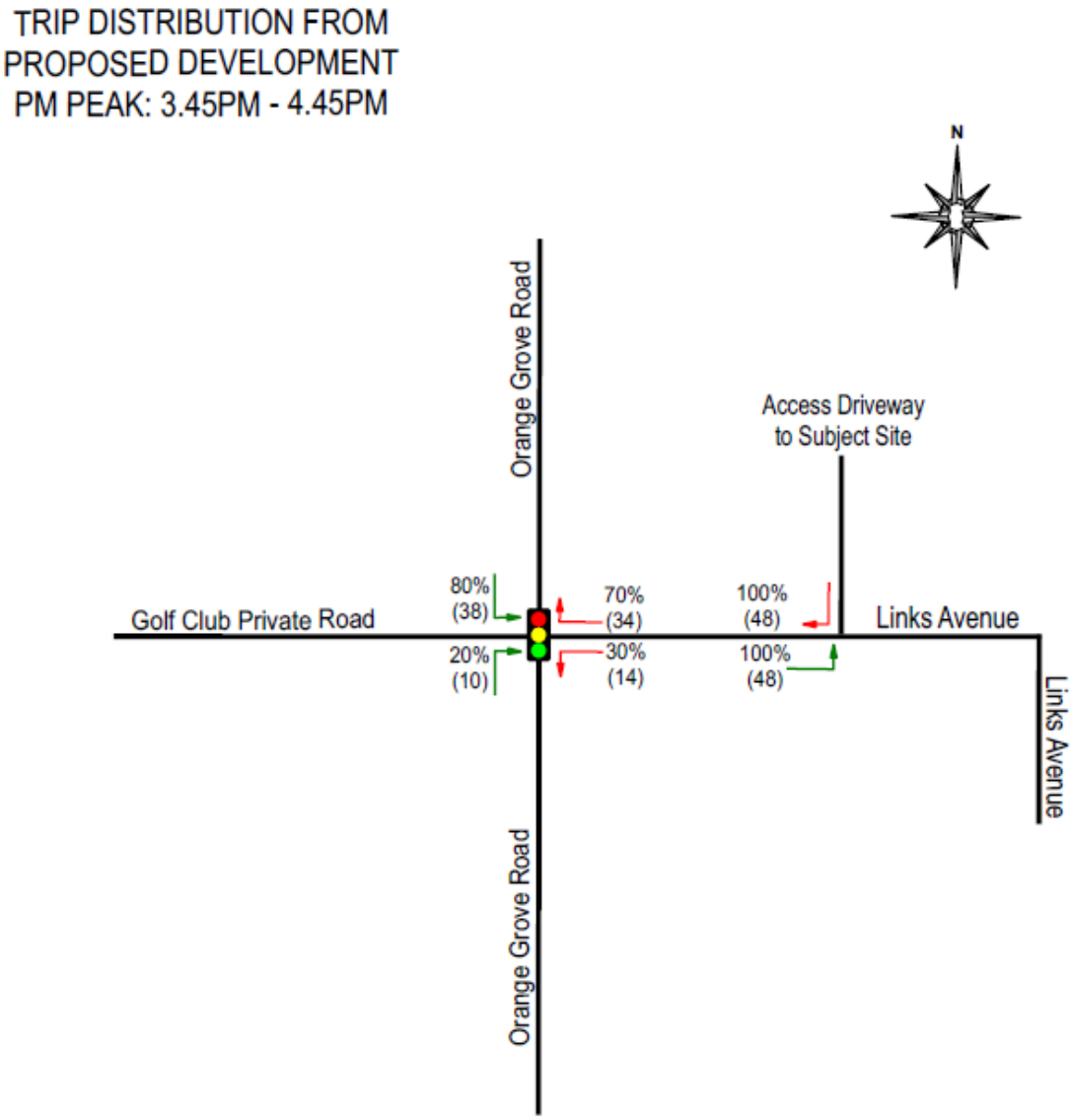


Figure 7: Development Traffic Distribution on the Surrounding Road Network – **PM Peak**

The outcome of the SIDRA modelling

A summary of the results of the SIDRA intersection performance analysis has been provided in Tables 4 and 5 below, as well as the SIDRA Movement Summary Tables attached in Appendix 'D' of this report.

Modelled Peak	Average LOS	Average Delay (sec)	DOS (Veh/C)
Base Year 2022 – Pre-Development	C	30.0	0.880
Base Year 2022 – Post Development	C	32.8	0.901
Future Year 2032 – Pre-Development	D	47.1	0.968
Future Year 2032 – Post Development	D	49.4	0.975

Table 4: Network SIDRA Modelling – Orange Grove Road / Links Avenue – 7.45am – 8.45am

Modelled Peak	Average LOS	Average Delay (sec)	DOS (Veh/C)
Base Year 2022 – Pre-Development	C	33.2	0.900
Base Year 2022 – Post Development	C	36.3	0.919
Future Year 2032 – Pre-Development	F	87.7	1.099
Future Year 2032 – Post Development	F	96.8	1.122

Table 5: Network SIDRA Modelling – Orange Grove Road / Links Avenue – 3.45pm – 4.45pm

It can be concluded from the results of the SIDRA modelling that:

- The current operational performance (pre-development) at the cross-intersection of Orange Grove Road / Links Avenue is currently operating at a Level of Service (LOS) ranging between 'A' and 'F' during weekday AM & PM peak.
- The proposed residential development will generally not alter the current LOS at the subject intersection, with the exception of the left turn movement into Links Avenue during the AM peak period which will change from level 'D' to 'E' (a minor increase of 4.1 seconds).
- The vehicle queue length on Links Avenue at the existing intersection will increase from 12.2m to 32.3m (an increase of 3 vehicles) and from 7.9m to 31.5m (an increase of 3 vehicles), during the AM and PM peak periods, respectively. This is acceptable and the post development queue length will be well within the distance between the proposed access driveway and the intersection, and will not impact on vehicular access for the subject site.
- The future 10-year (pre-development) analysis indicates that the subject intersection will operate at a LOS ranging between 'A' and 'F', during weekday AM & PM peak.
- The proposed residential development will generally not alter the future LOS at the subject intersection, with the exception of the right turn movement into Links Avenue during the AM peak period which will change from level 'C' to 'D' (a minor increase in 1.4 seconds).

Therefore, the estimated traffic generation from the proposed development is of low impact on existing flows on Orange Grove Road, Links Avenue and surrounding streets and will not have adverse impacts on the current operational performance of the subject existing intersection, which will generally continue to operate at the same level of service.

The additional traffic generated by the proposed development can be readily accommodated within the existing road layout, without adverse impacts on the amenity of the area.

7 RECOMMENDATIONS

The following measures are recommended for the proposed development, to increase traffic and pedestrian safety and reduce the reliance to travel by private cars and vehicle trips, in line with Clause 2.122 *Traffic Generating Development* of the State Environmental Planning Policy (Transport and Infrastructure) 2021.

- A Green Travel Plan be prepared for the subject site, to encourage residents to utilise existing public transport services in the local area and other modes of travel, in order to reduce the reliance on private vehicle trips, where possible.

- Install advisory warning signage at the entrance and throughout the subject site, to advise motorists of a signposted speed limit of 10km/h, 'Slow Down' and 'Watch for pedestrians' signage, to increase traffic and pedestrian safety.

- Install speed cushions where needed, to further reduce the speed environment within the site.

- Install adequate lighting within the subject site, to increase traffic and pedestrian safety.

8 CONCLUSION

It can be concluded from the traffic and parking impact assessment that the proposed residential flat building and townhouses development at 400-404 Cabramatta Road West, 2-18 Orange Grove Road and 6 Links Avenue, Cabramatta, will not have adverse impacts on existing traffic or parking conditions and is worthy of Council's support in its present form.

- The existing traffic flows on Orange Grove Road and Links Avenue are typical for a state road and a local road, respectively, located in a mixed residential and commercial area, where traffic is well controlled by the existing signalised intersection, with spare capacity.

- The estimated traffic generation from the proposed development is of low impact on existing flows on Orange Grove Road, Links Avenue and surrounding streets and will not have adverse impacts on the current operational performance of the subject existing intersection, which will continue to operate at similar and acceptable levels of service. The traffic generated by the proposed residential development can be readily accommodated within the existing road network.

- The potential increase in the number of vehicle movements in and about Orange Grove Road, Links Avenue and adjacent streets will not have adverse impacts on the amenity of the area.

- The parking demand resulting from the proposed residential development can be easily accommodated within the proposed adequate off-street car and bicycle parking for both residents and visitors, which is in compliance with AS2890.1:2004 and Council's parking requirements.

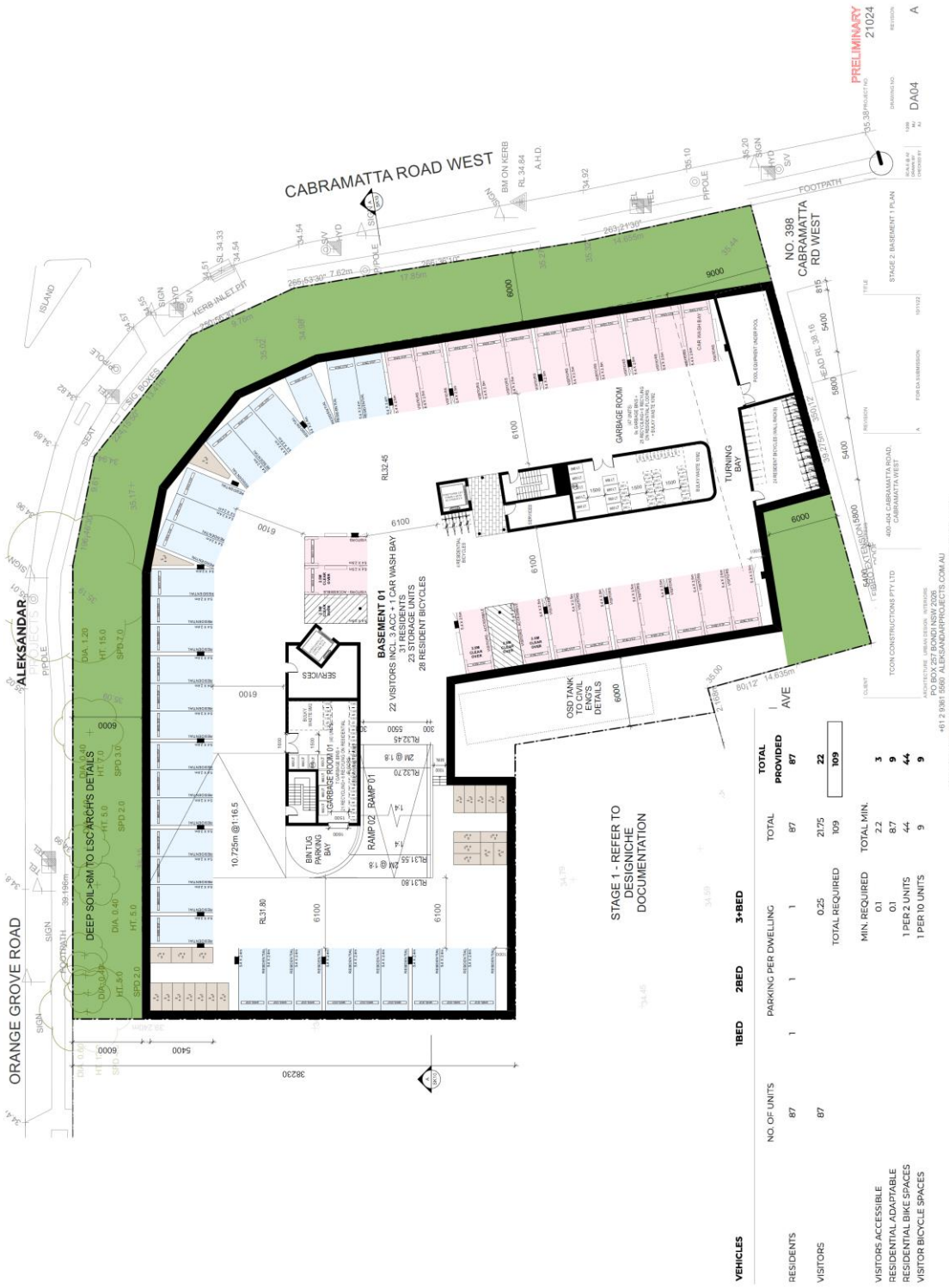
- The on-site vehicular access, car parking layout and vehicular circulation is adequate for the proposed development and in accordance with AS2890.1:2004, AS2890.6:2009 and AS2890.2:2018, where vehicles enter and exit the site in a forward direction at all times.

- The subject site has good access to existing public transport services.

- The proposed development will not have adverse impacts on parking in the surrounding area.

Appendix A – Proposed Development Plans (Residential Flat Building)


CABRAMATTA ROAD WEST
FOOTPATH
NO. 398 CABRAMATTA RD WEST
ORANGE GROVE ROAD
ALEKSANDAR
NO. 1 SMITHS AVE
NO. 3 SMITHS AVE
STAGE 1 - REFER TO DESIGNICHE DOCUMENTATION
BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
DEEP SOIL >6M TO LSC ARCH'S DETAILS
PRELIMINARY
21024
DA03
STAGE 2- BASEMENT 2 PLAN
400-404 CABRAMATTA ROAD, CABRAMATTA WEST
TCON CONSTRUCTIONS PTY. LTD



VEHICLES	1BED	2BED	3+BED	NO. OF UNITS	PARKING PER DWELLING	TOTAL	TOTAL PROVIDED
RESIDENTS	1	1		87	1	87	87
VISITORS				87	0.25	21.75	22
					TOTAL REQUIRED	109	109

	MIN. REQUIRED	TOTAL MIN.	
VISITORS ACCESSIBLE	0.1	2.2	3
RESIDENTIAL ADAPTABLE	0.1	8.7	9
RESIDENTIAL BIKE SPACES	1 PER 2 UNITS	44	44
VISITOR BICYCLE SPACES	1 PER 10 UNITS	9	9


CABRAMATTA ROAD WEST
ORANGE GROVE ROAD
ALEKSANDAR
NO. 398 CABRAMATTA RD WEST
NO. 1 SMITHS AVE
NO. 3 SMITHS AVE
NO. 5 SMITHS AVE
STAGE 1 - REFER TO DESIGN/CHE DOCUMENTATION
HAB (LOWER ZONE)
POOL
RAMP 01
COS TO LSC DETAILS
PRELIMINARY
DA05
21024


CABRAMATTA ROAD WEST
ORANGE GROVE ROAD
NO. 398 CABRAMATTA RD WEST
NO. 1 SMITHS AVE
NO. 3 SMITHS AVE
STAGE 1 - REFER TO DESIGNICHE DOCUMENTATION
POST ADPATION PLAN
SILVER LEVEL APARTMENTS
HAB (LOWER ZONE)
PRELIMINARY
21024
DA06
STAGE 2: TYPICAL LEVEL 2-4 PLANS
400-404 CABRAMATTA ROAD, CABRAMATTA WEST
TCON CONSTRUCTIONS PTY LTD
ALEKSANDAR PROJECTS

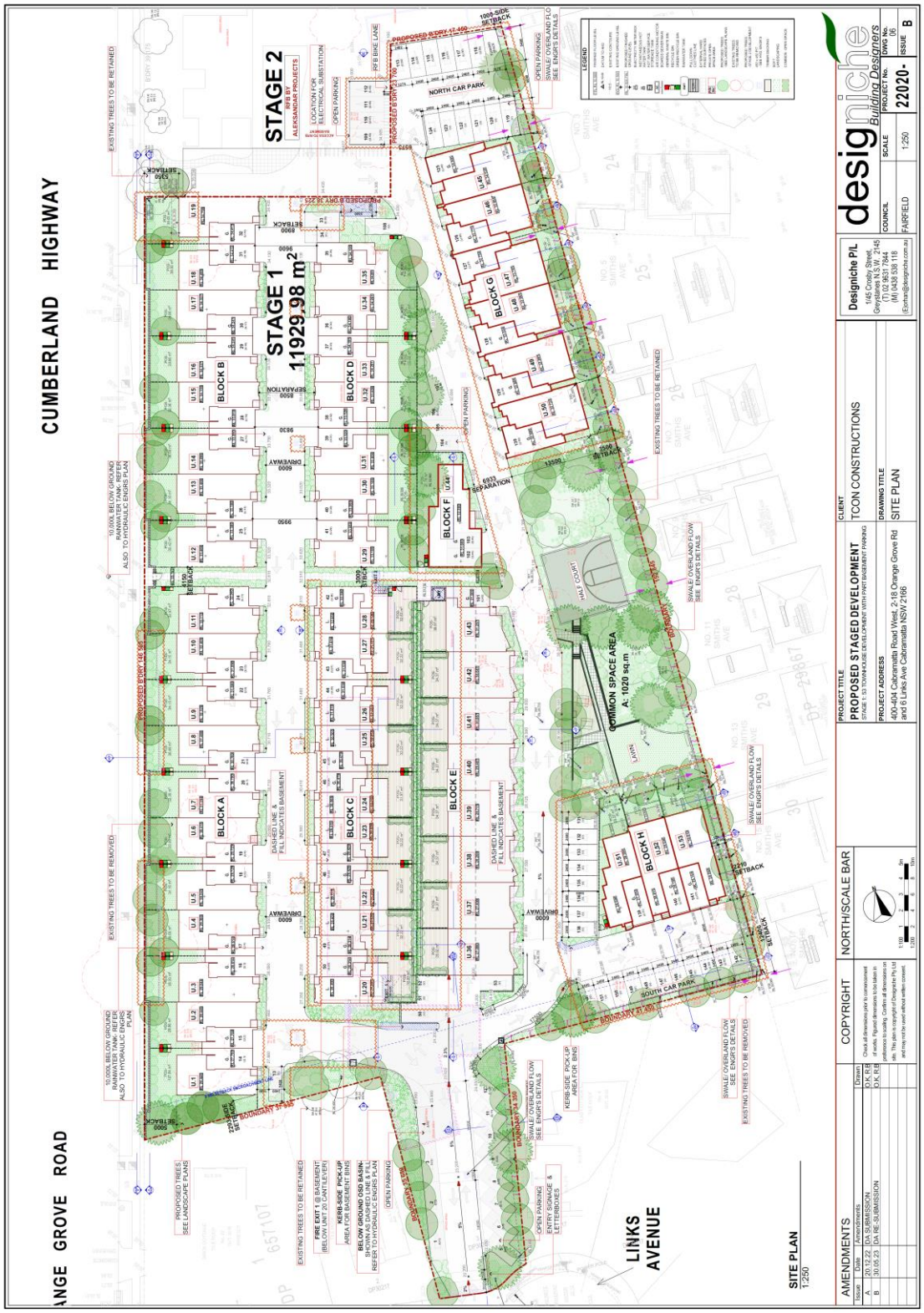

PRELIMINARY
21024
A
DA07
CABRAMATTA ROAD WEST
NO. 398 CABRAMATTA RD WEST
9000
7500
NON (LOWER ZONE)
6000
12000
HAB (LOWER ZONE)
7500
NON (LOWER ZONE)
NO. 1 SMITHS AVE
NO. 3 SMITHS AVE
STAGE 1 - REFER TO DESIGNICHE DOCUMENTATION
ORANGE GROVE ROAD
ALEKSANDAR PROJECTS
6000
5400
6000
38230
STAGE 2 - LEVEL 5 FLOOR PLAN
400-404 CABRAMATTA ROAD, CABRAMATTA WEST
TCON CONSTRUCTIONS PTY LTD

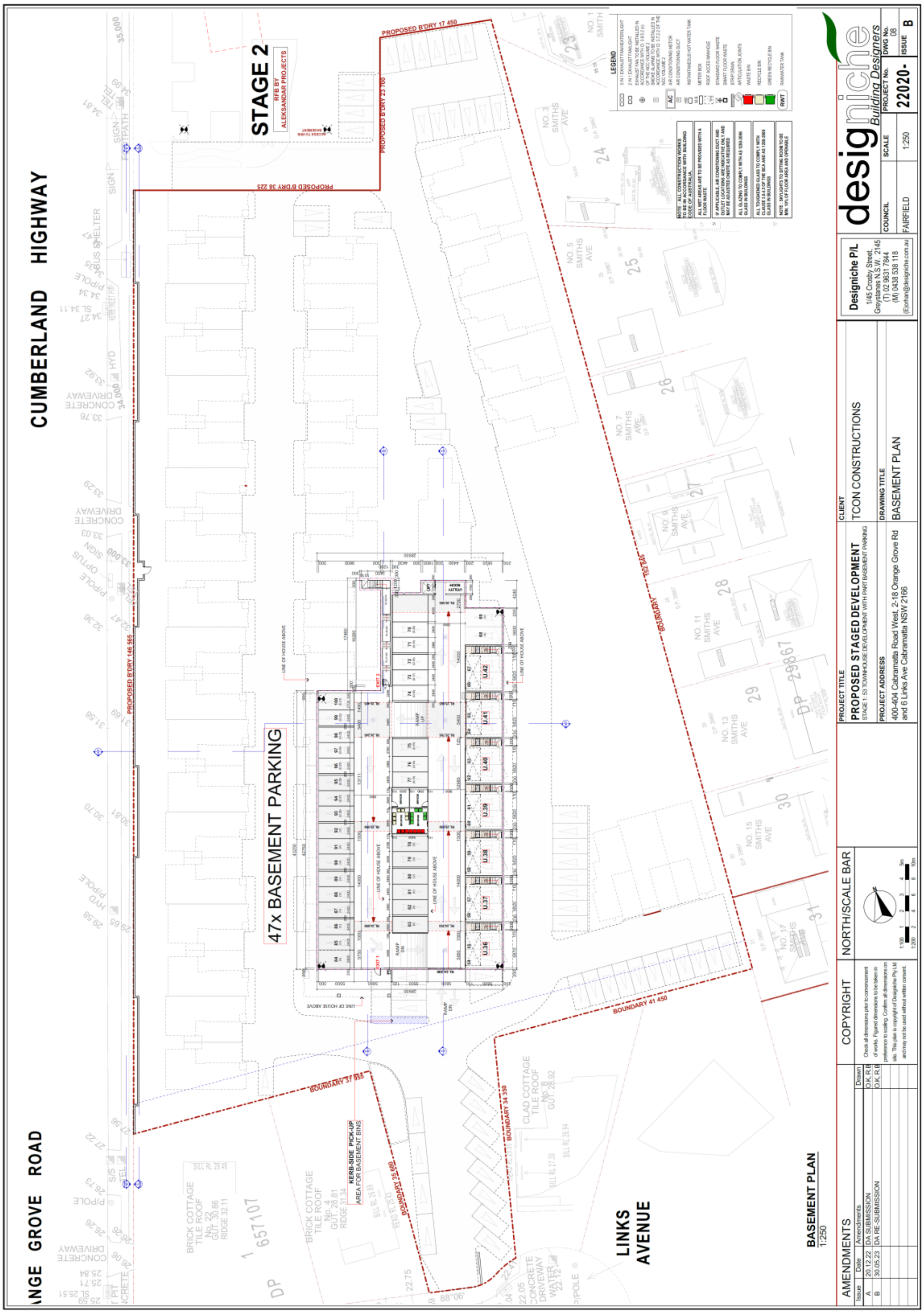

PRELIMINARY
21024
A
DA08
STAGE 2: LEVEL 6 FLOOR PLAN
FOR DA SUBMISSION
400-404 CABRAMATTA ROAD, CABRAMATTA WEST
TCON CONSTRUCTIONS PTY LTD
ALEKSANDAR PROJECTS
PO BOX 257 BONDI NSW 2026
+61 2 9361 5560 ALEKSANDARPROJECTS.COM.AU
CABRAMATTA ROAD WEST
NO. 398 CABRAMATTA RD WEST
NO. 1 SMITHS AVE
NO. 3 SMITHS AVE
NO. 5 SMITHS AVE
ORANGE GROVE ROAD
STAGE 1 - REFER TO DESIGNICHE DOCUMENTATION
NON (LOWER ZONE)
HAB (LOWER ZONE)
6000
9000
7500
12000
5400
30230

ALEKSANDAR
PROJECTS
20M HEIGHT LIMIT
CABRAMATTA ROAD WEST
RL54.05
RL50.95
RL47.85
RL44.75
RL41.65
RL38.55
RL35.45
RL32.45
RL29.45
2300
2300
3100
3100
3100
3100
3100
3100
3000
3000
ROOF RL 54.050
LEVEL 06 RL 50.950
LEVEL 05 RL 47.850
LEVEL 04 RL 44.750
LEVEL 03 RL 41.650
LEVEL 02 RL 38.550
LEVEL 01 RL 35.450
BASEMENT 01 RL 32.450
BASEMENT 02 RL 29.450
SECTION A-A

PRELIMINARY
21024
A
DA10
STAGE 2: SECTION A-A
FOR DA SUBMISSION
400-404 CABRAMATTA ROAD, CABRAMATTA WEST
TCON CONSTRUCTIONS PTY LTD
PO BOX 257 BONDI NSW 2026
+61 2 9361 1560 ALEKSANDARPROJECTS.COM.AU

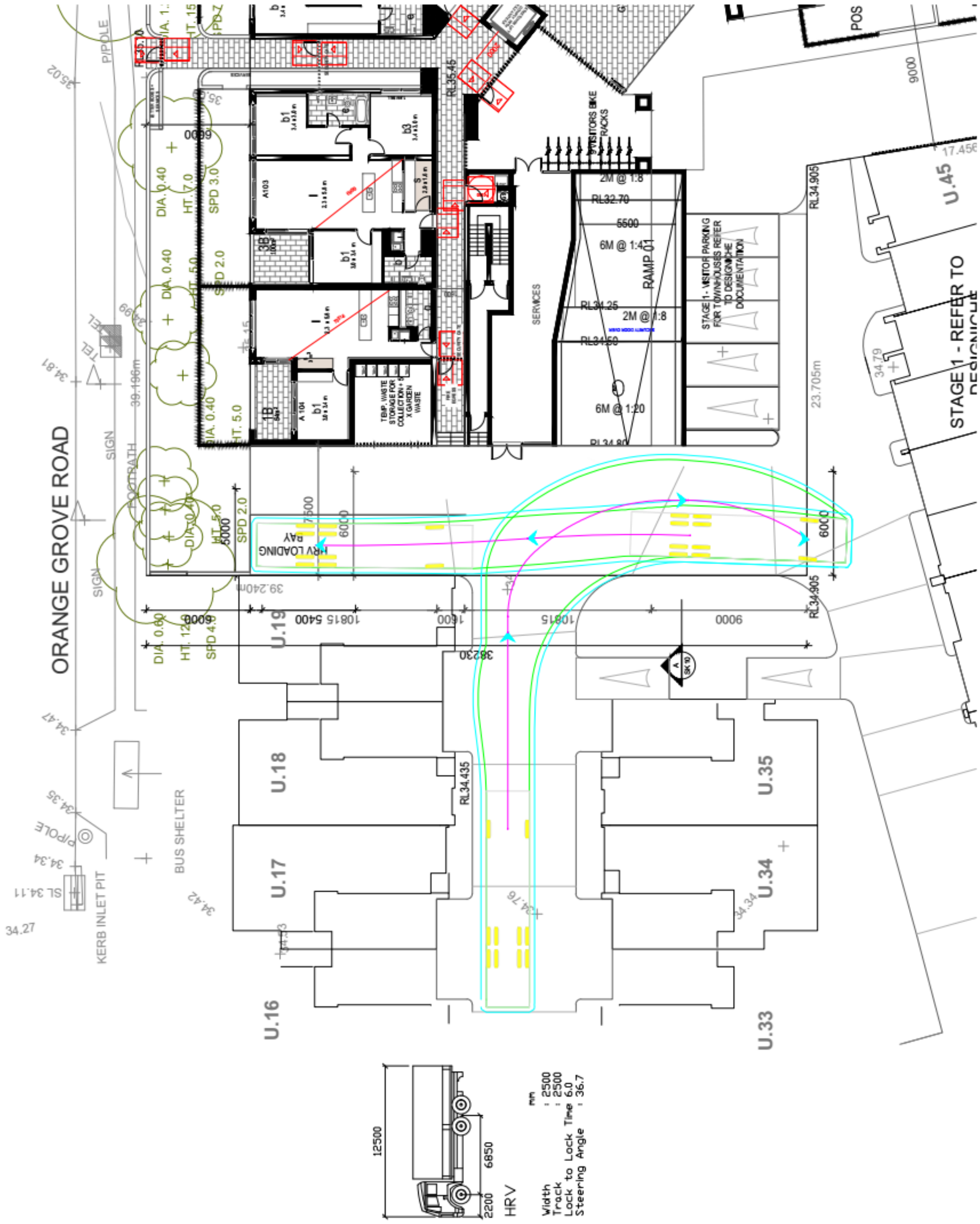
Appendix A – Proposed Development Plans (Townhouses)

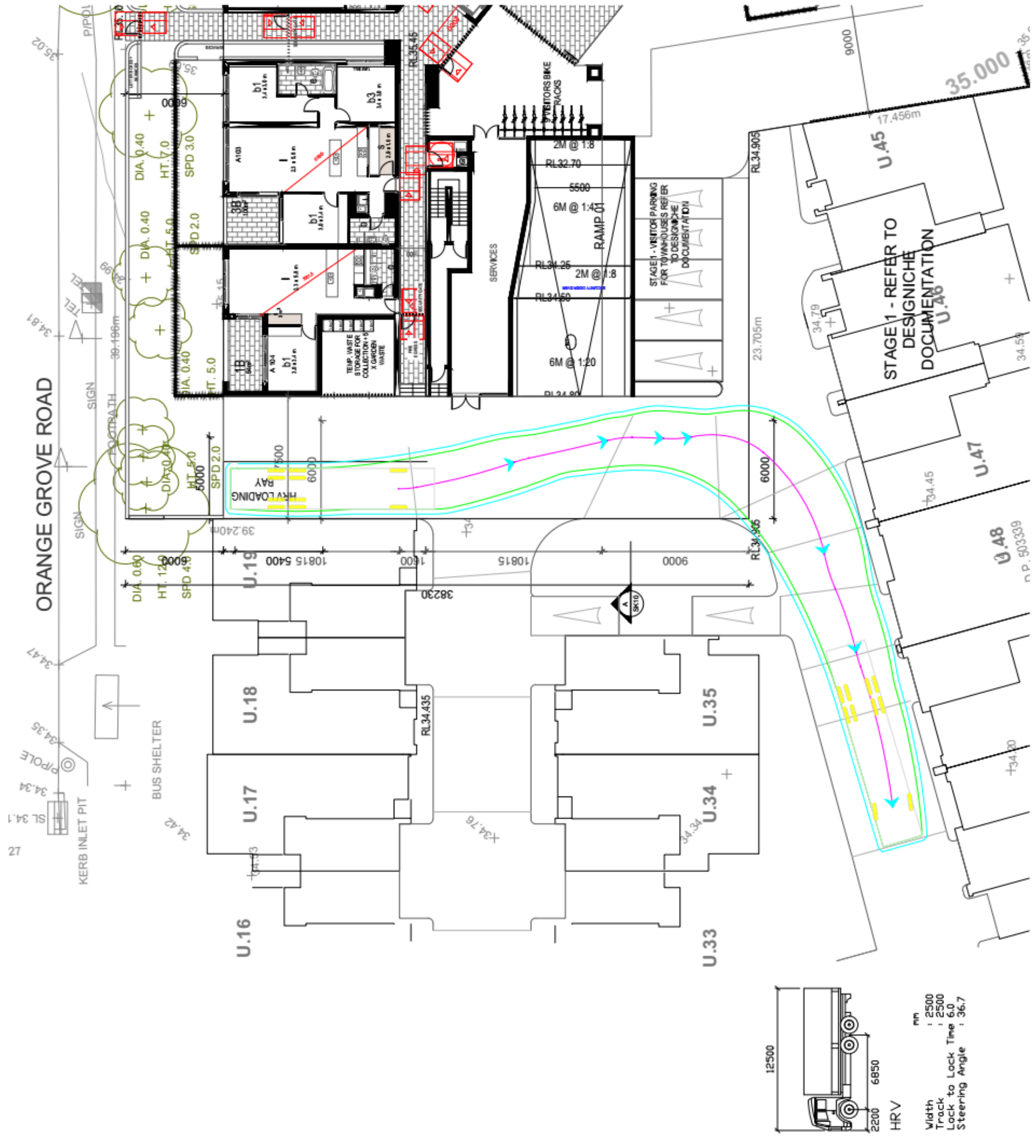

CUMBERLAND HIGHWAY
ANGE GROVE ROAD
LINKS AVENUE
STAGE 2
STAGE 1
11929.98 m²
NORTH CAR PARK
SOUTH CAR PARK
COMMON SPACE AREA
A: 1020 sq.m
BLOCK A
BLOCK B
BLOCK C
BLOCK D
BLOCK E
BLOCK F
BLOCK G
BLOCK H
SITE PLAN
1:250
AMENDMENTS
COPYRIGHT
NORTH/SCALE BAR
PROJECT TITLE
PROPOSED STAGED DEVELOPMENT
STAGE 1: 53 TOWNHOUSE DEVELOPMENT WITH PART BASEMENT PARKING
CLIENT
TCON CONSTRUCTIONS
PROJECT ADDRESS
400-404 Cabramatta Road West, 2-18 Orange Grove Rd and 6 Links Ave Cabramatta NSW 2166
DRAWING TITLE
SITE PLAN
Designiche P/L
145 Crosby Street, Greystanes N.S.W. 2145
(M) 0430 539 118
COUNCIL
FAIRFIELD
SCALE
1:250
PROJECT No.
22020-
DWG No.
06
ISSUE
B
designiche
Building Designers

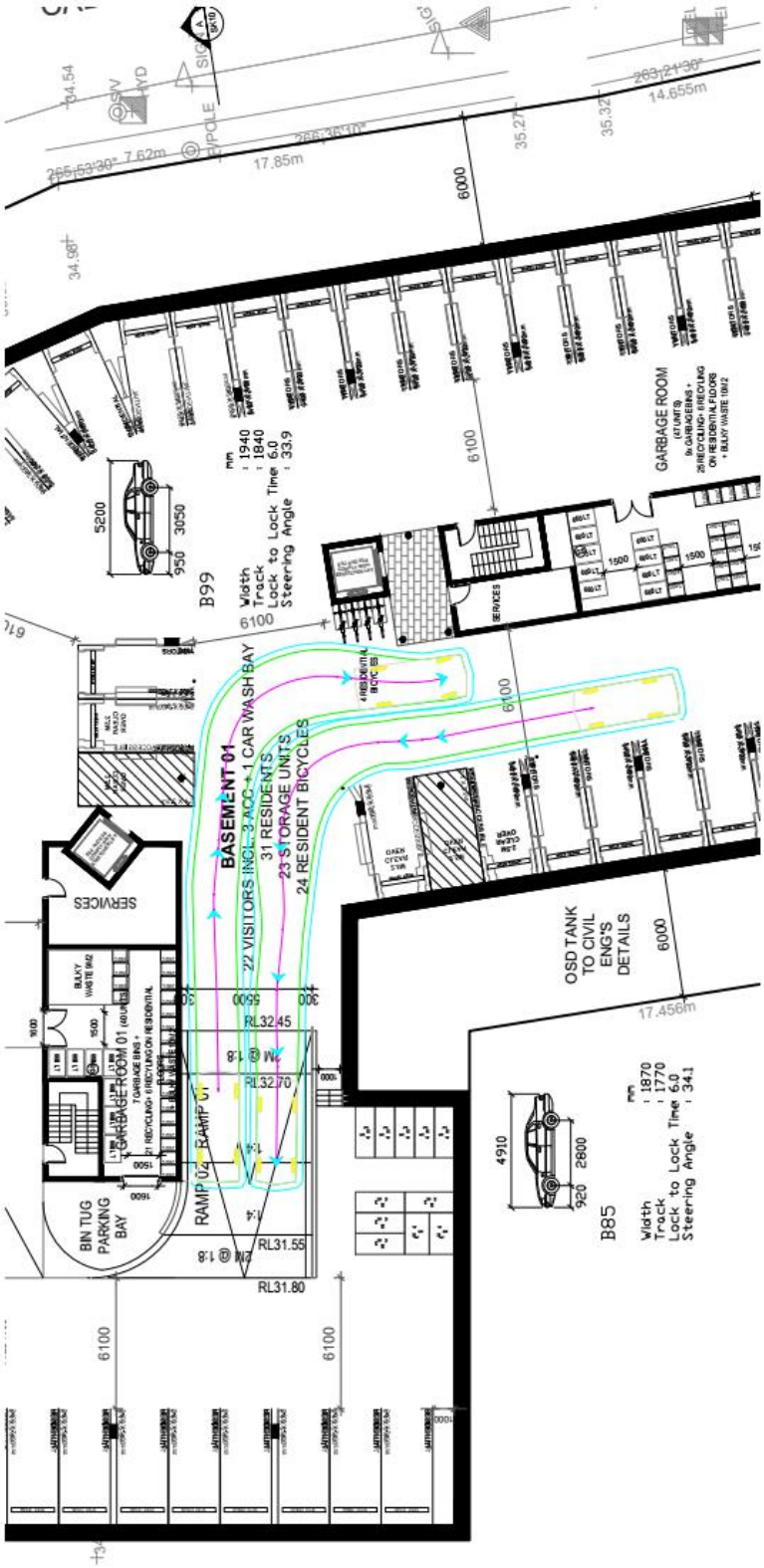


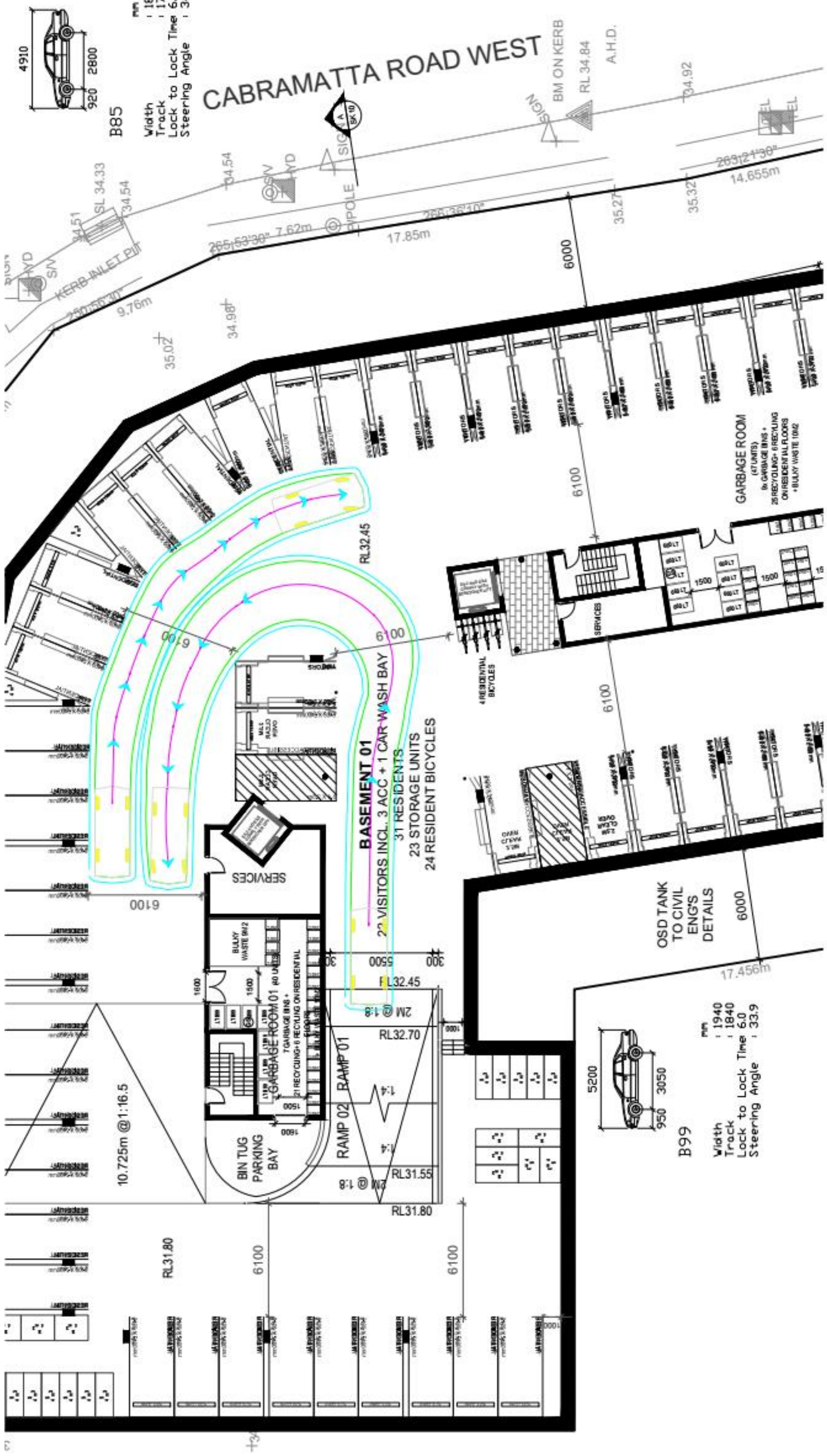
CUMBERLAND HIGHWAY
NGE GROVE ROAD
LINKS AVENUE
STAGE 2
47x BASEMENT PARKING
BASEMENT PLAN
1:250
PROPOSED STAGED DEVELOPMENT
TOON CONSTRUCTIONS
BASEMENT PLAN
400-404 Cabramatta Road West, 2-18 Orange Grove Rd and 6 Links Ave Cabramatta NSW 2166
designiche
Building Designers
FAIRFIELD
1:250
22020-
B

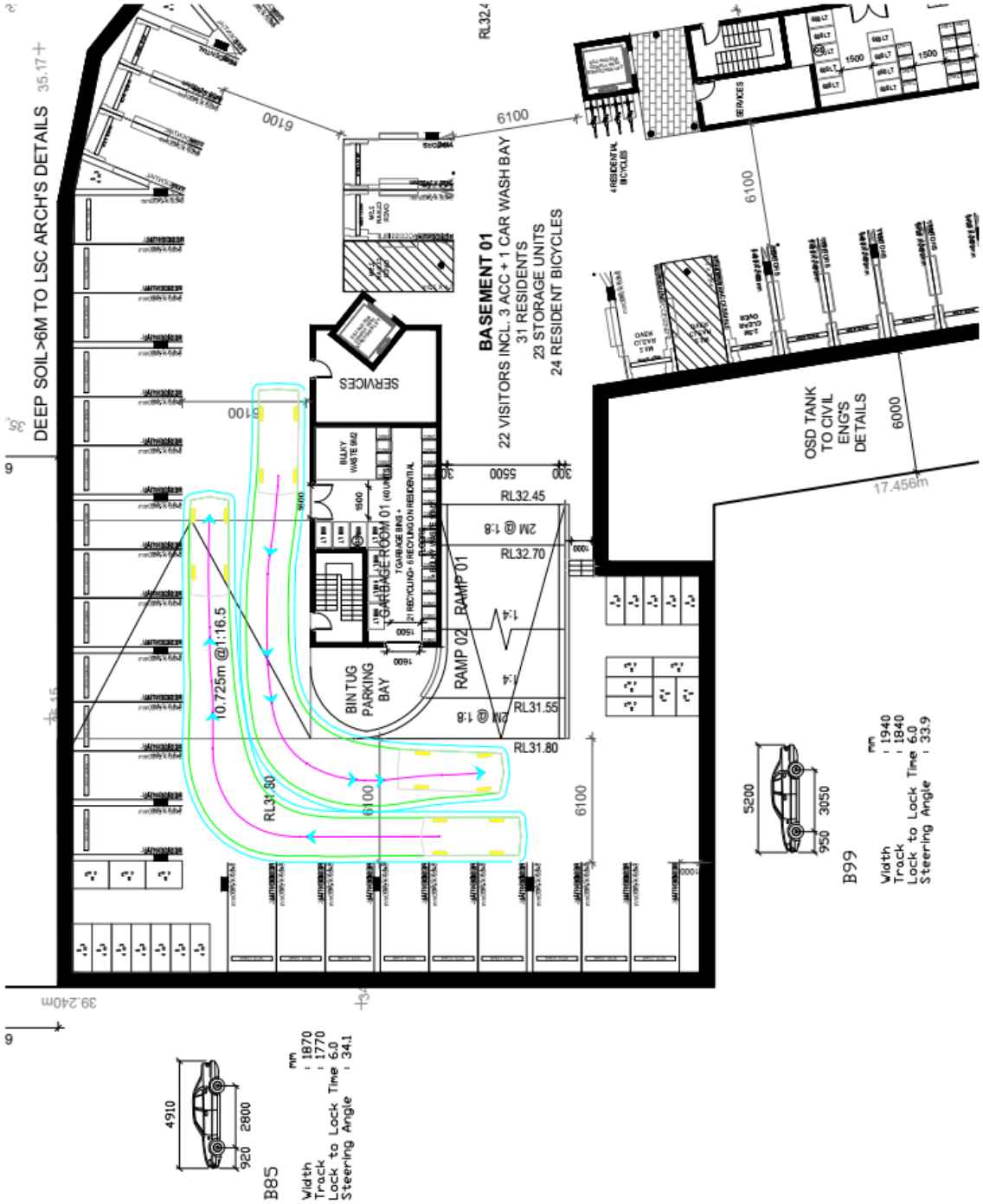
Appendix B – Vehicle Swept Paths (Residential Flat Building)

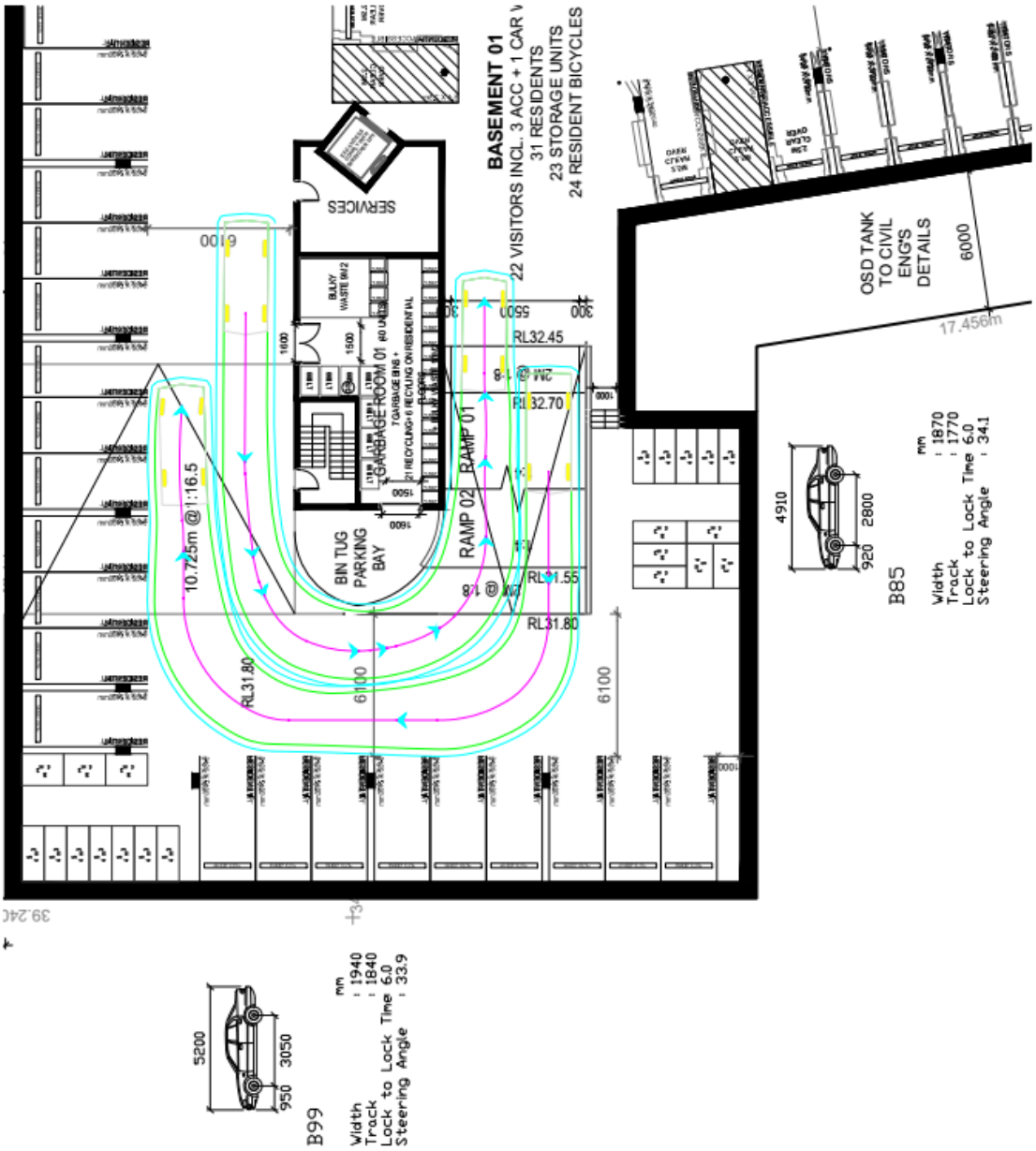

ORANGE GROVE ROAD
HRV LOADING BAY
BUS SHELTER
KERB INLET PIT
SERVICES
RAMP 01
STAGE 1 - VISITOR PARKING FOR TOWNHOUSES REFER TO DESIGNICHE DOCUMENTATION
TEMP. WASTE STORAGE FOR COLLECTION - GARDEN WASTE
VISITORS BIKE RACKS
U.19
U.18
U.17
U.16
U.35
U.34
U.33
U.45
HRV
Width : 2500
Track : 2500
Lock to Lock Time 6.0
Steering Angle : 36.7
12500
6850
2200

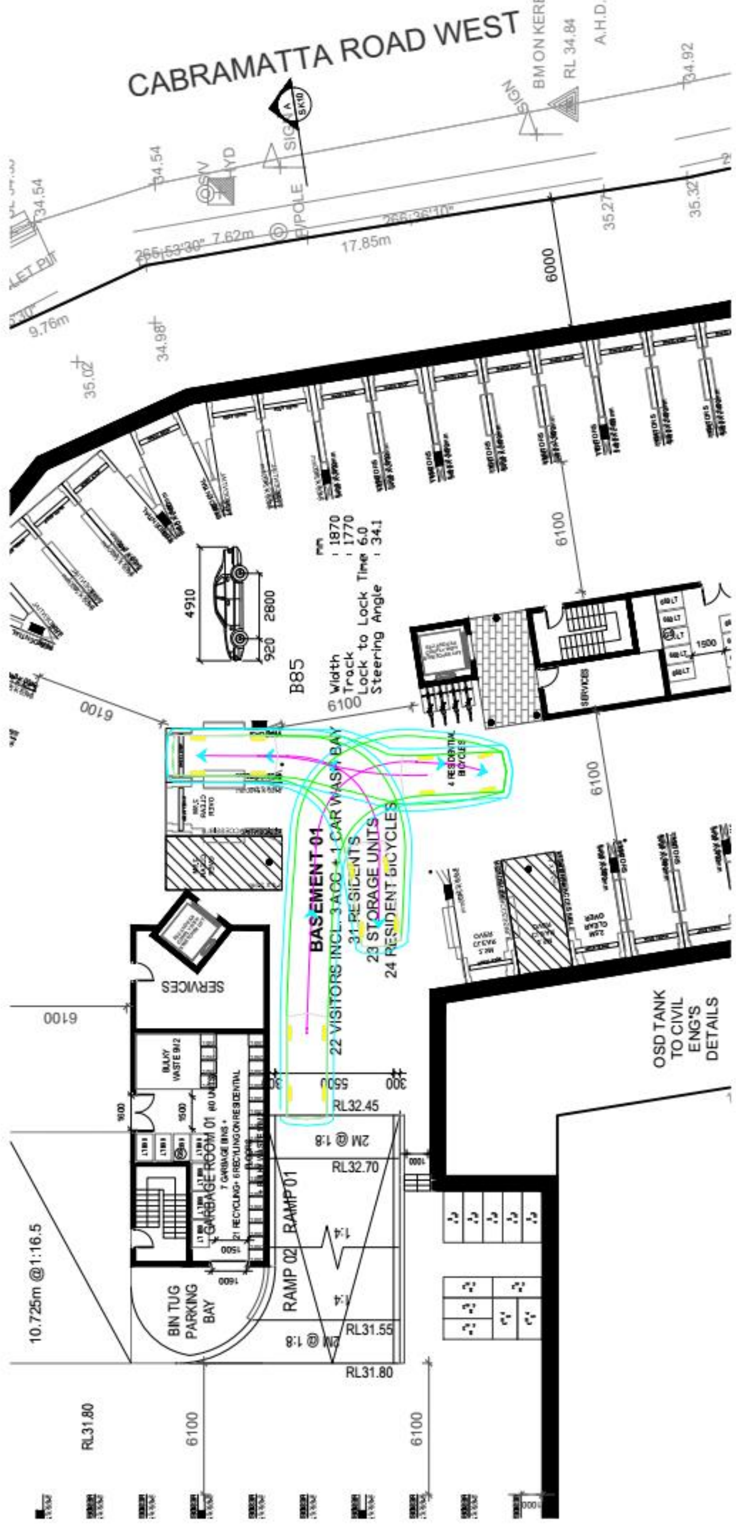

ORANGE GROVE ROAD
HRV LOADING BAY
RAMP 01
SERVICES
STAGE 1 - REFER TO DESIGNICHE DOCUMENTATION
BUS SHELTER
KERB INLET PIT
U.45
U.47
U.48
U.19
U.18
U.17
U.16
U.35
U.34
U.33
HRV
12500
6850
2200
Width : 2500
Track : 2500
Lock to Lock Time : 6.0
Steering Angle : 36.7

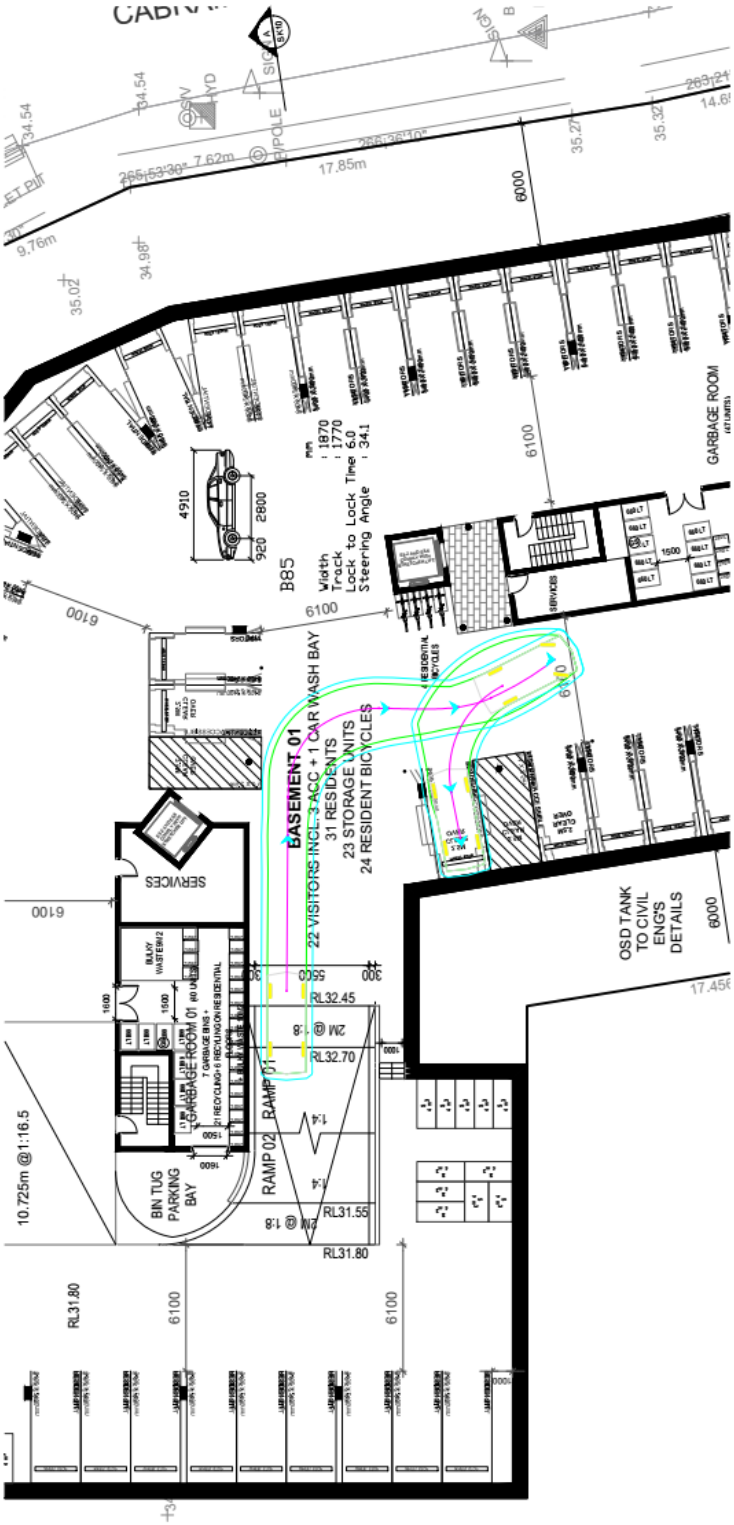

BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
GARBAGE ROOM 01
BIN TUG PARKING BAY
RAMP 02
RAMP 01
OSD TANK TO CIVIL ENG'S DETAILS
GARBAGE ROOM
SERVICES
B99
B85
Width
Track
Lock to Lock Time
Steering Angle
RL32.45
RL32.70
RL31.55
RL31.80
17.85m
14.655m
17.456m
6000
6100

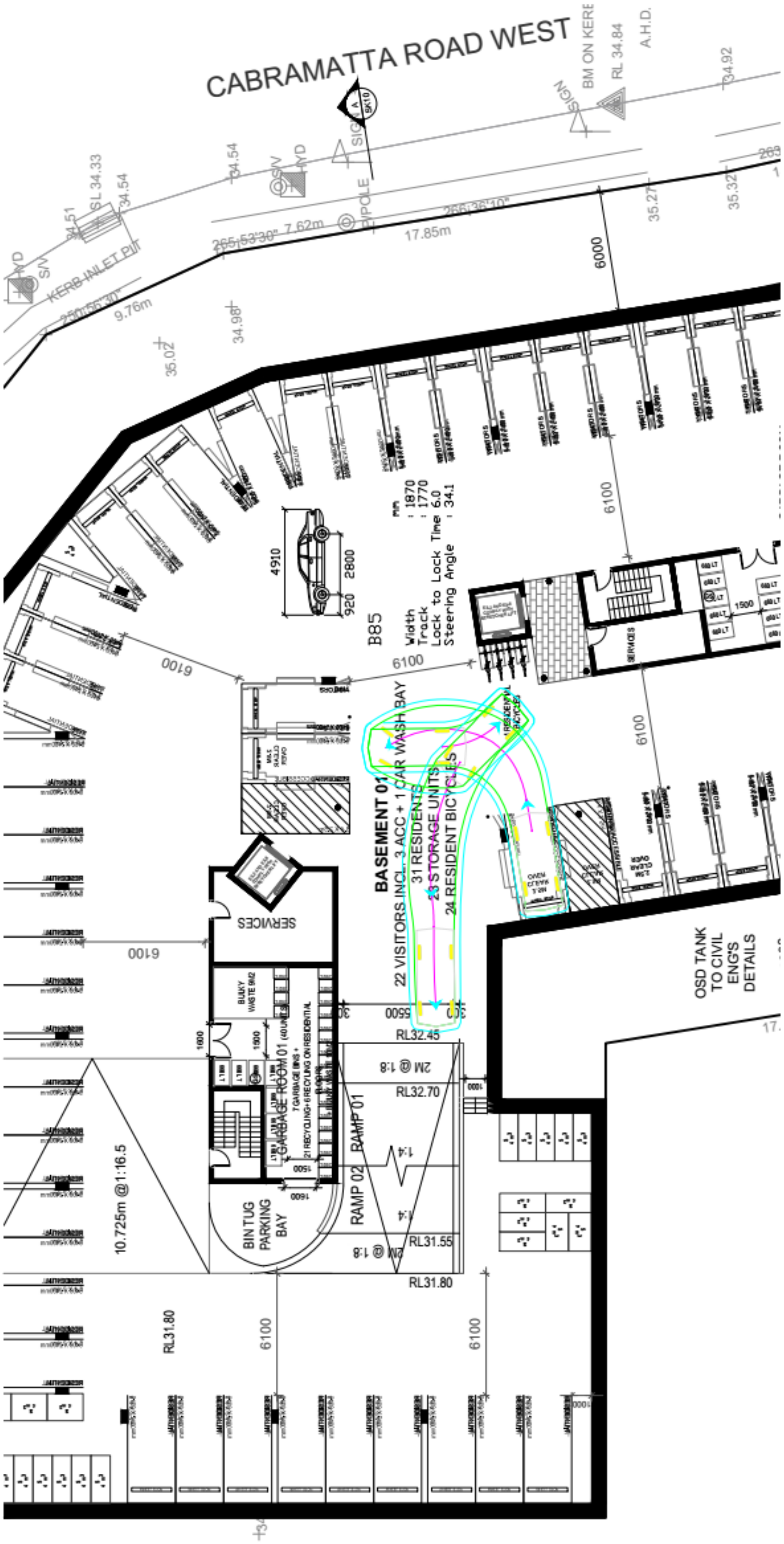

CABRAMATTA ROAD WEST
BASEMENT 01
22 VISITORS INCL 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
GARBAGE ROOM
SERVICES
BIN TUG PARKING BAY
RAMP 01
RAMP 02
OSD TANK TO CIVIL ENG'S DETAILS
10.725m @1:16.5
B85
B99

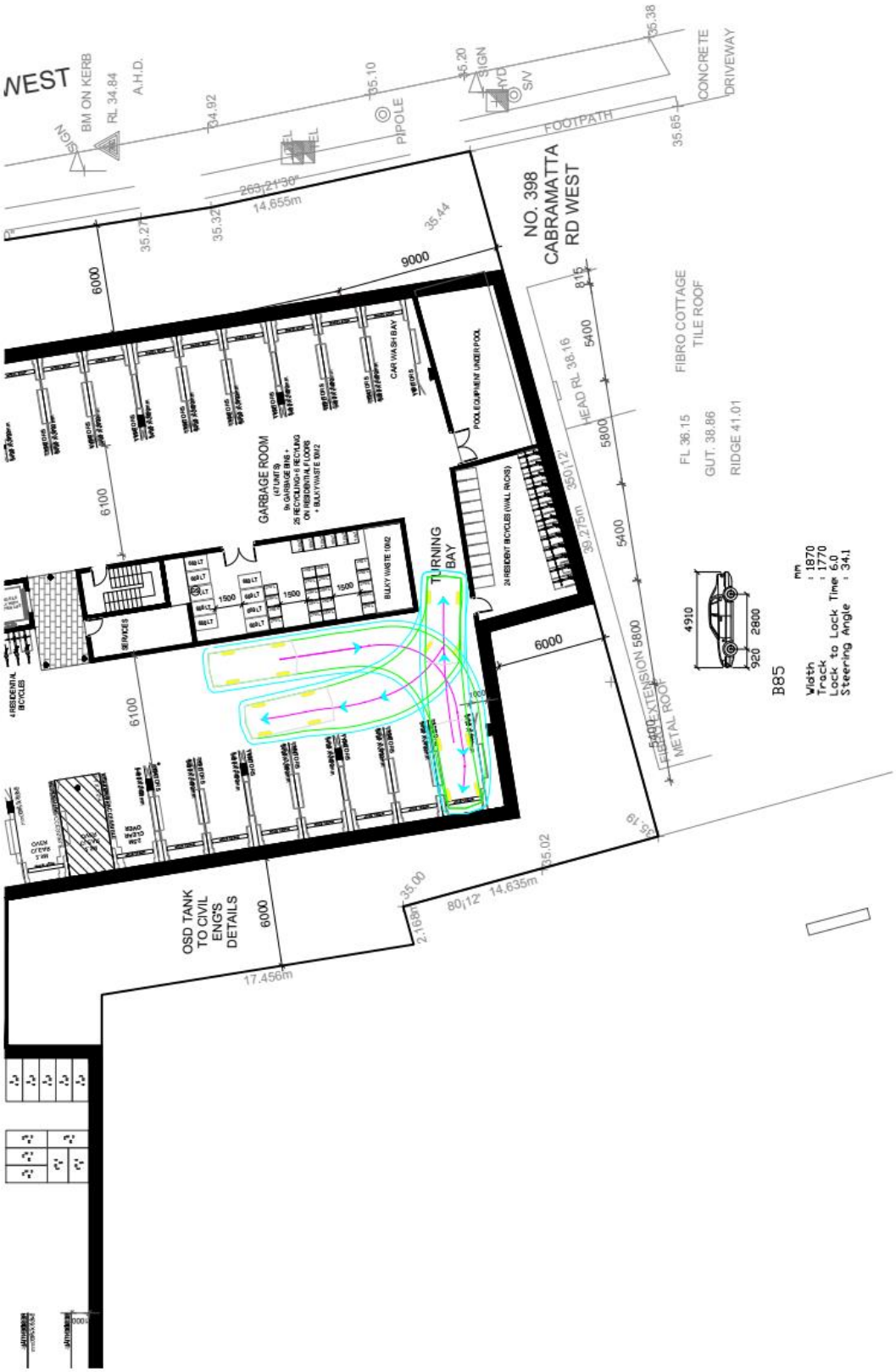

DEEP SOIL>6M TO LSC ARCH'S DETAILS
BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
GARBAGE ROOM 01
BIN TUG PARKING BAY
RAMP 01
RAMP 02
10.725m @1:16.5
OSD TANK TO CIVIL ENG'S DETAILS
17.456m
RL32.45
RL32.70
RL31.55
RL31.80
6100
6000
5500
B85
B99
Width
Track
Lock to Lock Time
Steering Angle

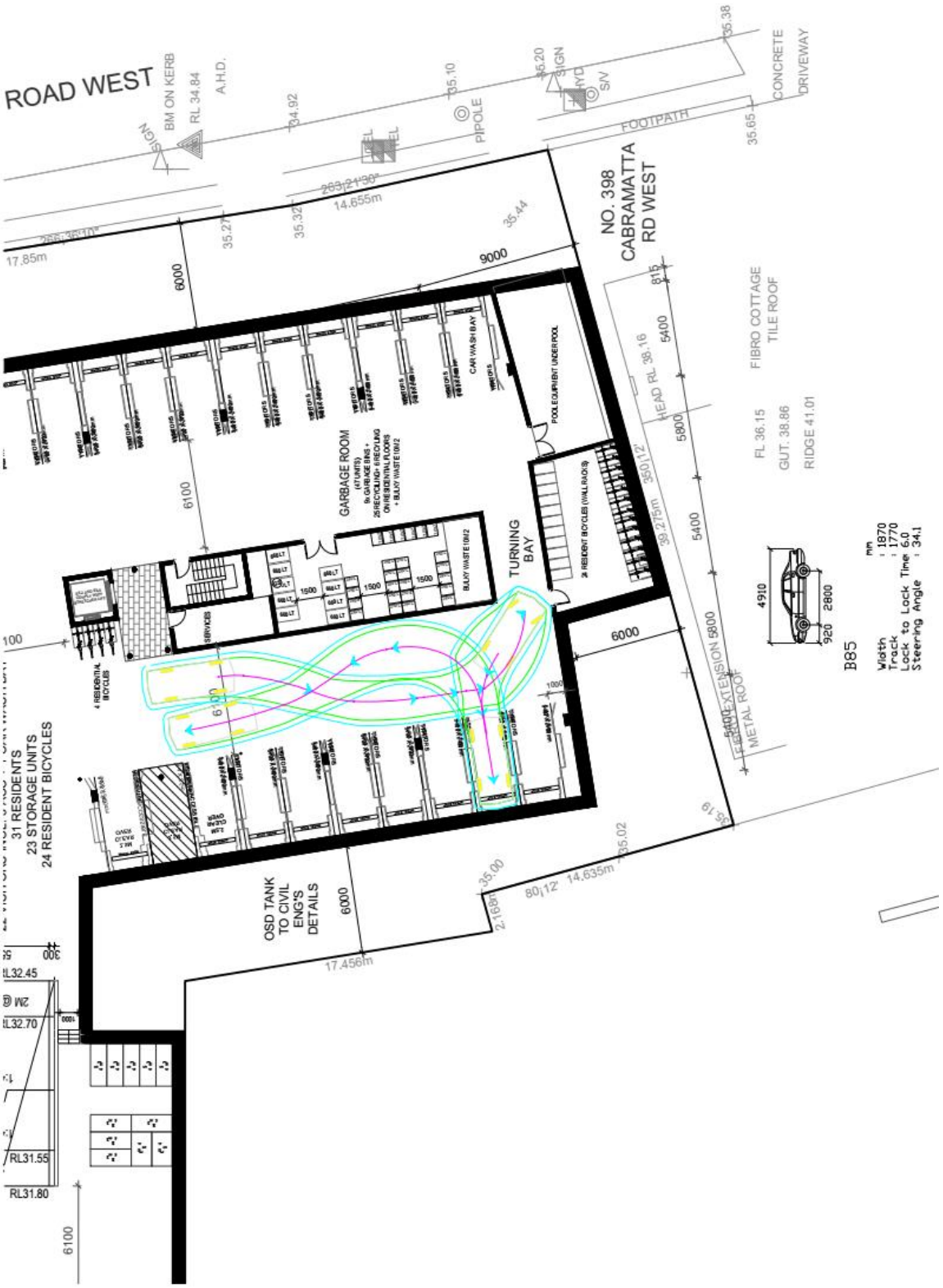

BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR W
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
GARBAGE ROOM 01
BIN TUG PARKING BAY
RAMP 01
RAMP 02
RL32.45
RL32.70
RL31.55
RL31.80
10.725m @ 1:16.5
6100
OSD TANK TO CIVIL ENG'S DETAILS
17.456m
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
B99
Width : 1940
Track : 1840
Lock to Lock Time 6.0
Steering Angle : 33.9

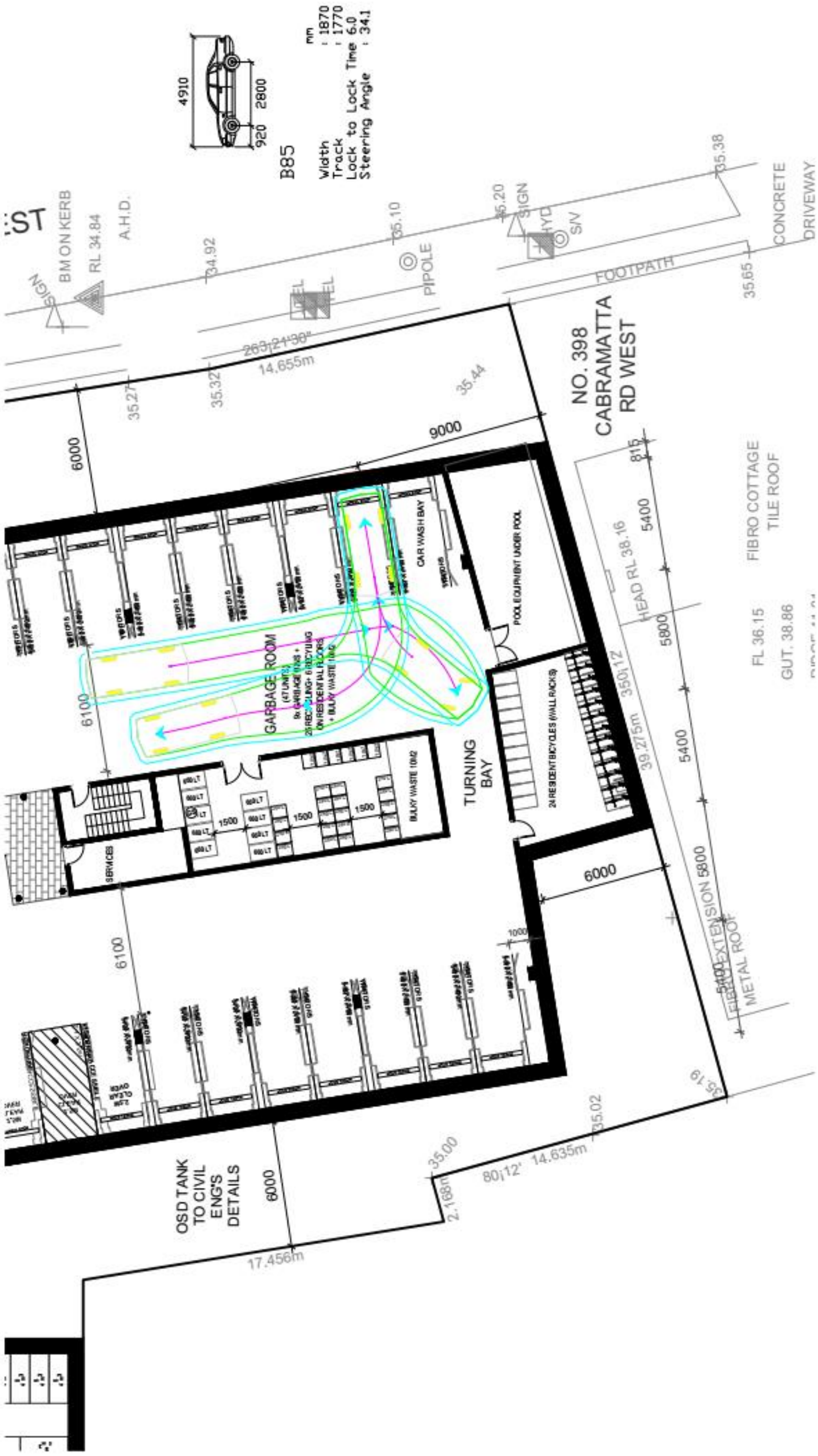

CABRAMATTA ROAD WEST
BM ON KERB
RL 34.84
A.H.D.
BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
B85
Width 1870
Track 1770
Lock to Lock Time 6.0
Steering Angle 34.1
SERVICES
GARBAGE ROOM 01
BIN TUG PARKING BAY
RAMP 01
RAMP 02
RL32.45
RL32.70
RL31.55
RL31.80
2M @ 1:8
10.725m @1:16.5
OSD TANK TO CIVIL ENG'S DETAILS
6100
6000
5500

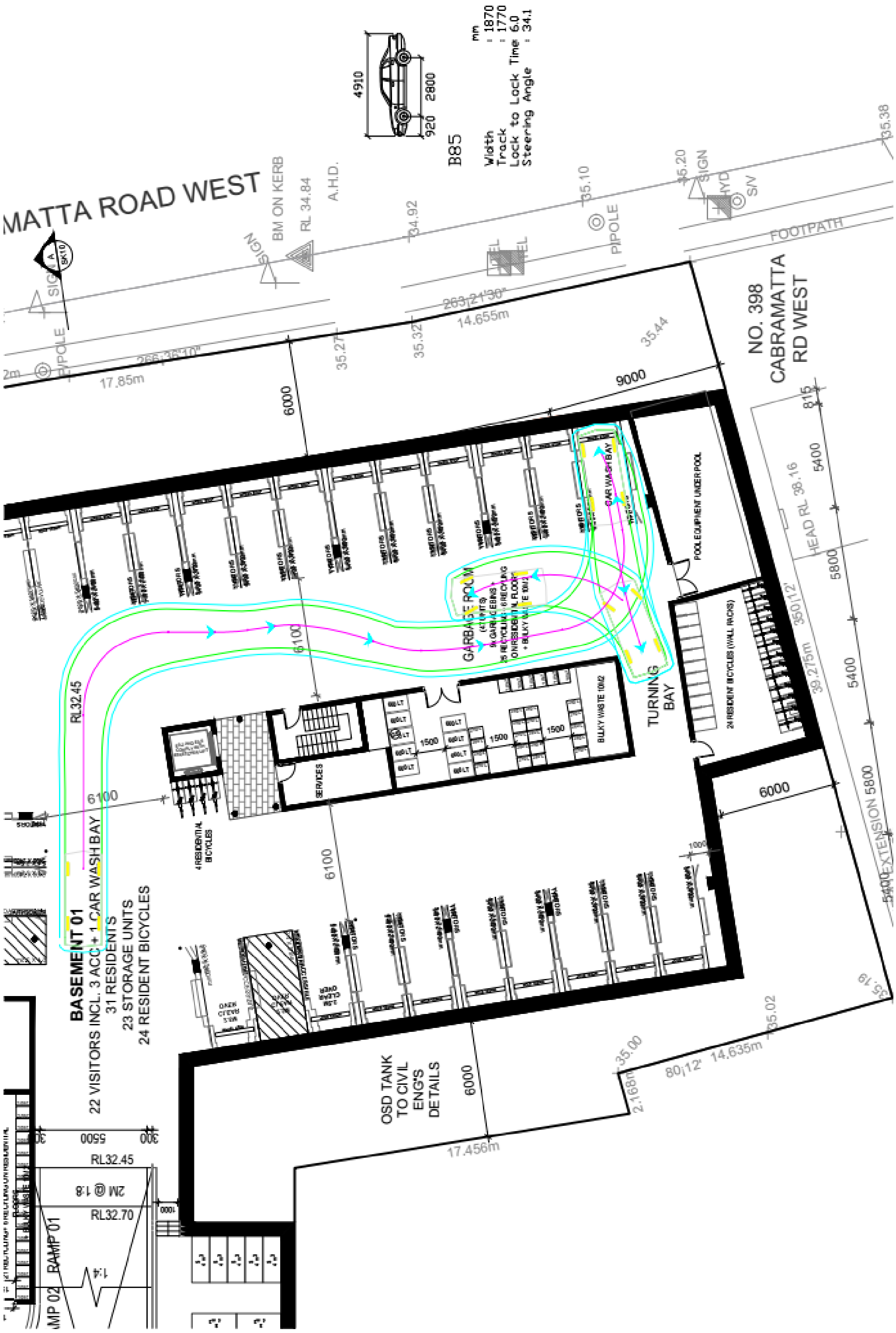

BASEMENT 01
22 VISITORS INCL 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
RAMP 01
RAMP 02
GARBAGE ROOM
SERVICES
BIN TUG PARKING BAY
OSD TANK TO CIVIL ENG'S DETAILS
10.725m @1:16.5
RL32.45
RL32.70
RL31.55
RL31.80
6100
6000

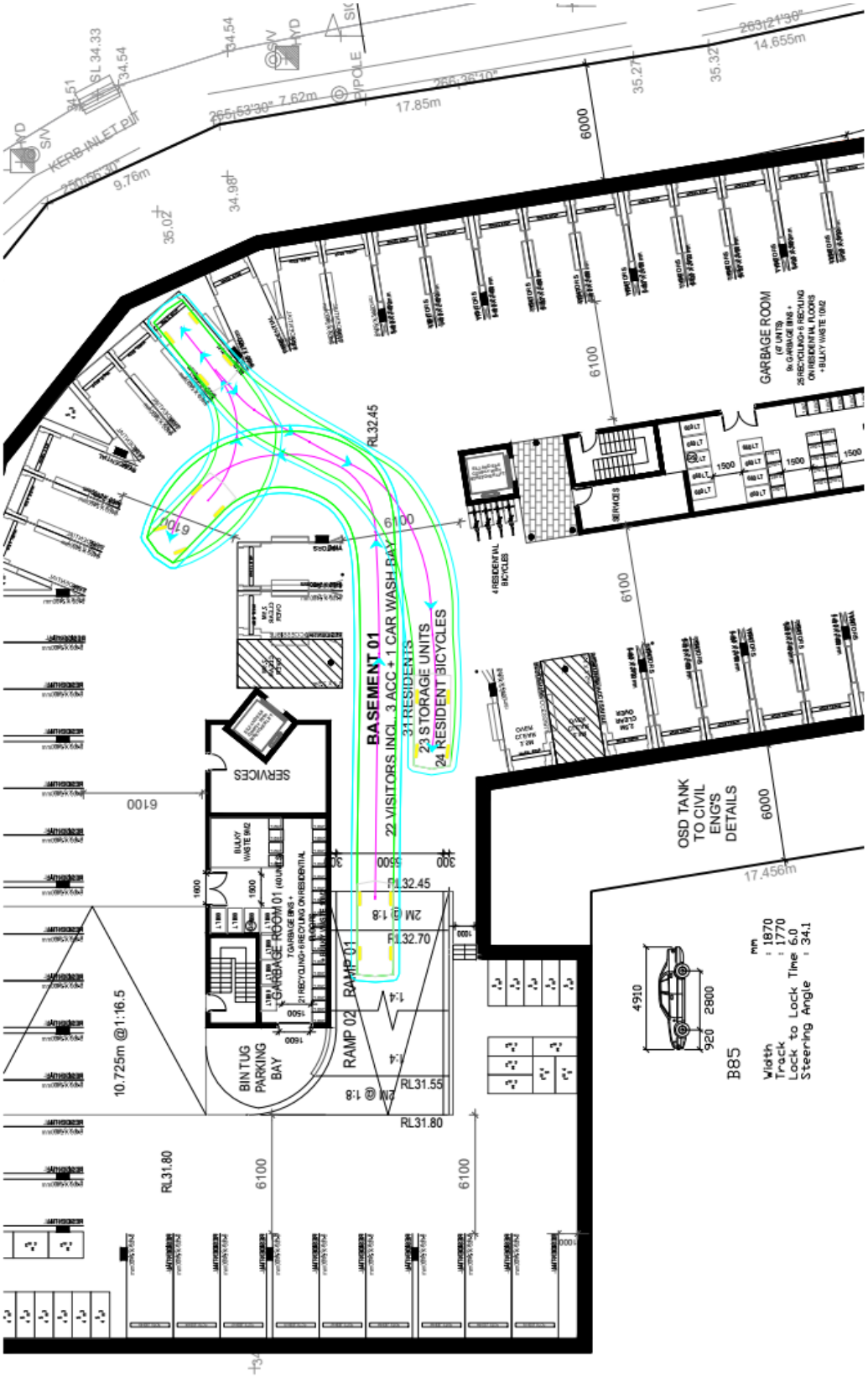

CABRAMATTA ROAD WEST
KERB INLET PIT
BM ON KERB
RL 34.84
A.H.D.
17.85m
9.76m
6000
6100
4910
2800
920
B85
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1
BASEMENT 01
22 VISITORS INCL 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
BULKY WASTE
GARBAGE ROOM 01
BIN TUG PARKING BAY
RAMP 01
RAMP 02
RL32.45
RL32.70
RL31.55
RL31.80
2M @ 1:8
1:4
10.725m @1:16.5
OSD TANK TO CIVIL ENG'S DETAILS

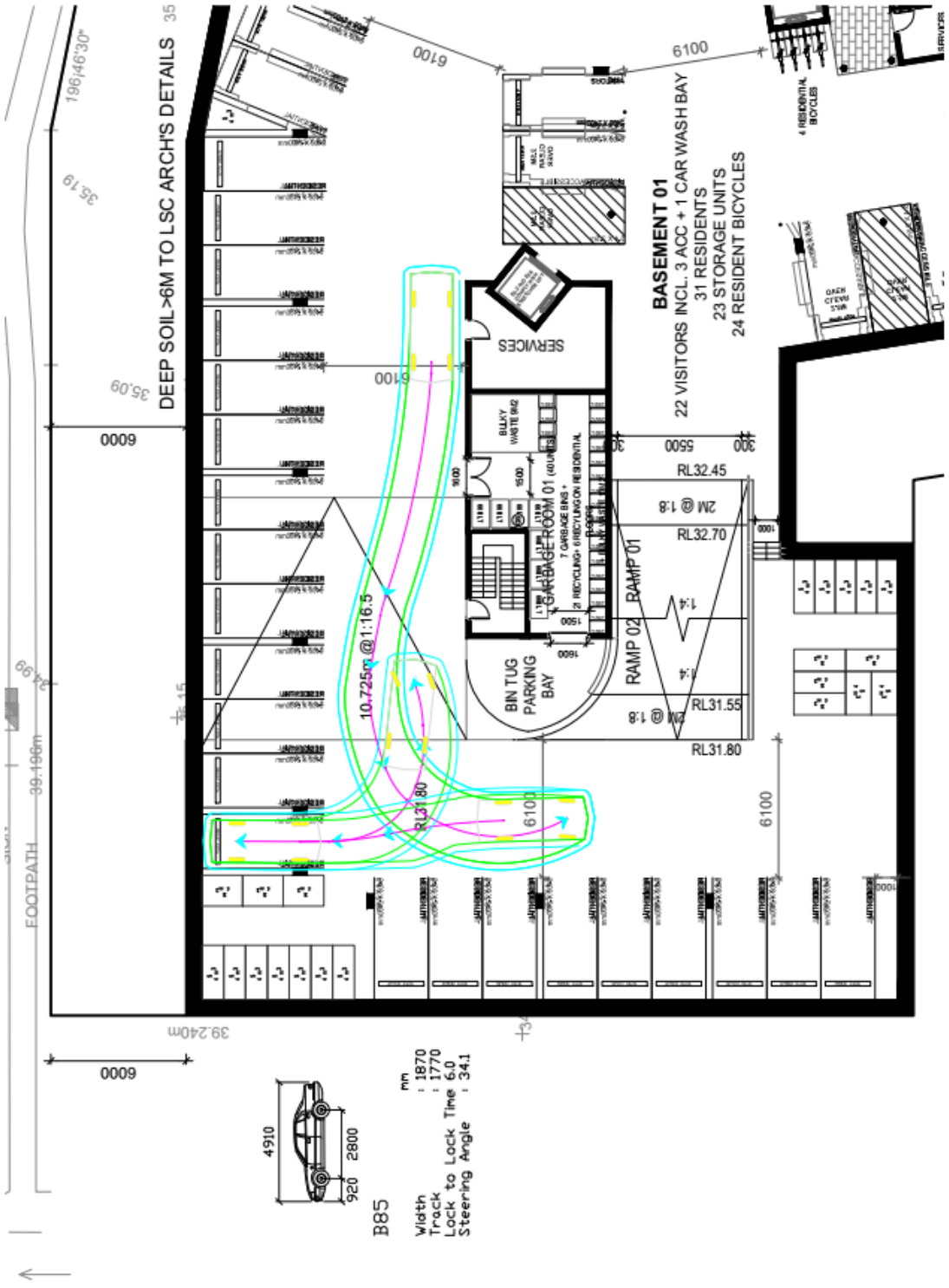

NEST
BM ON KERB
RL 34.84
A.H.D.
SIGN
34.92
35.10
P/POLE
35.20
SIGN
HYD
S/V
35.38
CONCRETE DRIVEWAY
FOOTPATH
35.65
NO. 398 CABRAMATTA RD WEST
263°21'30"
14.655m
35.27
35.32
35.44
9000
6000
6100
GARBAGE ROOM
CAR WASH BAY
POOL EQUIPMENT UNDER POOL
TURNING BAY
24 RESIDENT BICYCLES (WALL RACKS)
BULKY WASTE 10M2
SERVICES
4 RESIDENTIAL BICYCLES
6000
6100
OSD TANK TO CIVIL ENGS DETAILS
6000
17.456m
35.00
2.108m
80°12'
14.635m
35.02
HEAD RL 38.16
815
5400
5800
350°12'
39.275m
5400
5800 EXTENSION
METAL ROOF
FIBRO COTTAGE
TILE ROOF
FL. 36.15
GUT. 38.86
RIDGE 41.01
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

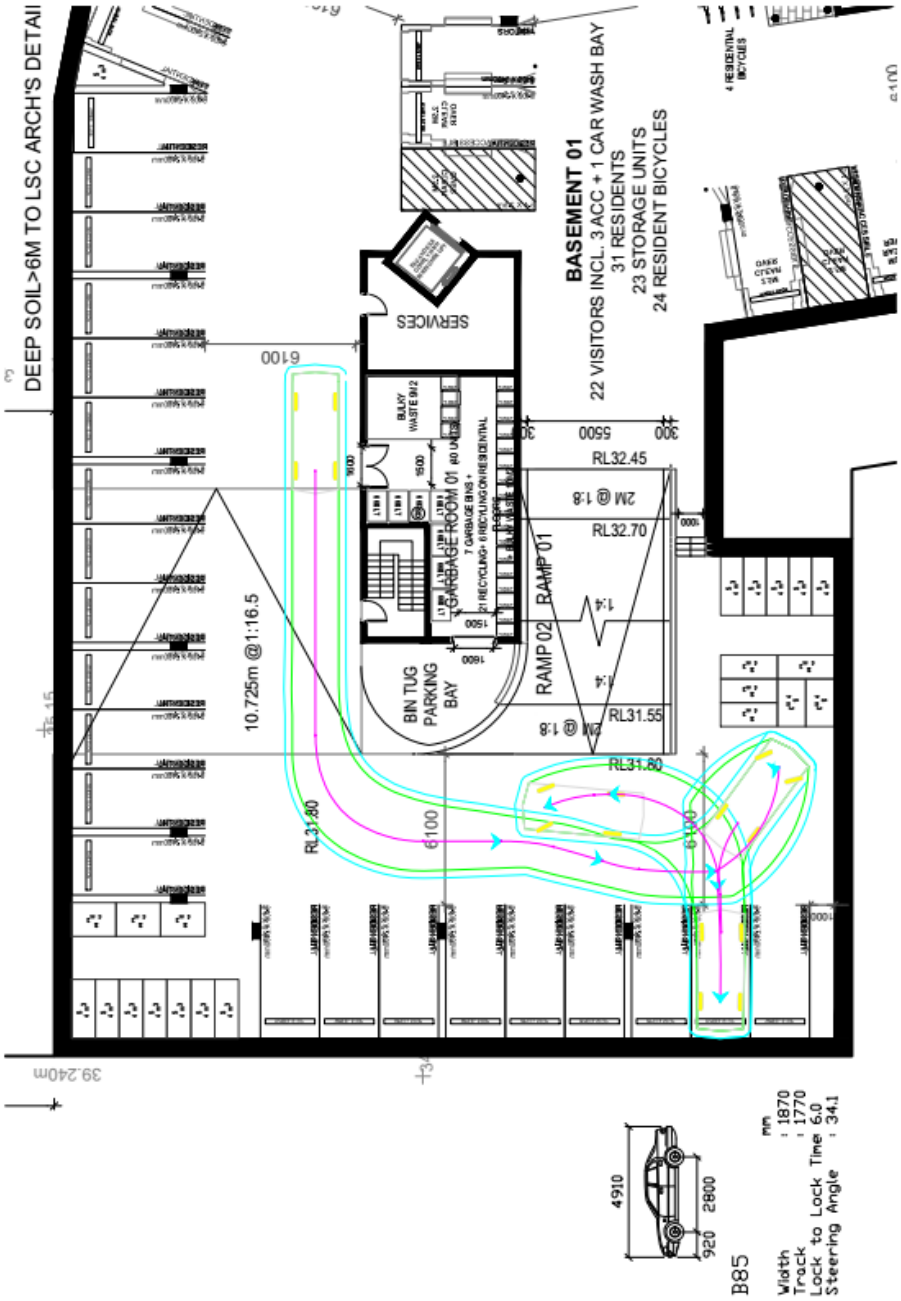

ROAD WEST
BM ON KERB
RL 34.84
A.H.D.
SIGN
PIPOLE
HYD
S/V
FOOTPATH
CONCRETE DRIVEWAY
NO. 398 CABRAMATTA RD WEST
FIBRO COTTAGE TILE ROOF
FL 36.15
GUT. 38.86
RIDGE 41.01
HEAD RL 38.16
GARBAGE ROOM
TURNING BAY
POOL EQUIPMENT UNDER POOL
CAR WASH BAY
SERVICES
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
OSD TANK TO CIVIL ENG'S DETAILS
EXTENSION
METAL ROOF
B85
Width 1870
Track 1770
Lock to Lock Time 6.0
Steering Angle 34.1
RL31.55
RL31.80
17.85m
14.655m
14.635m
17.456m
9000
6000
6100
5400
5800

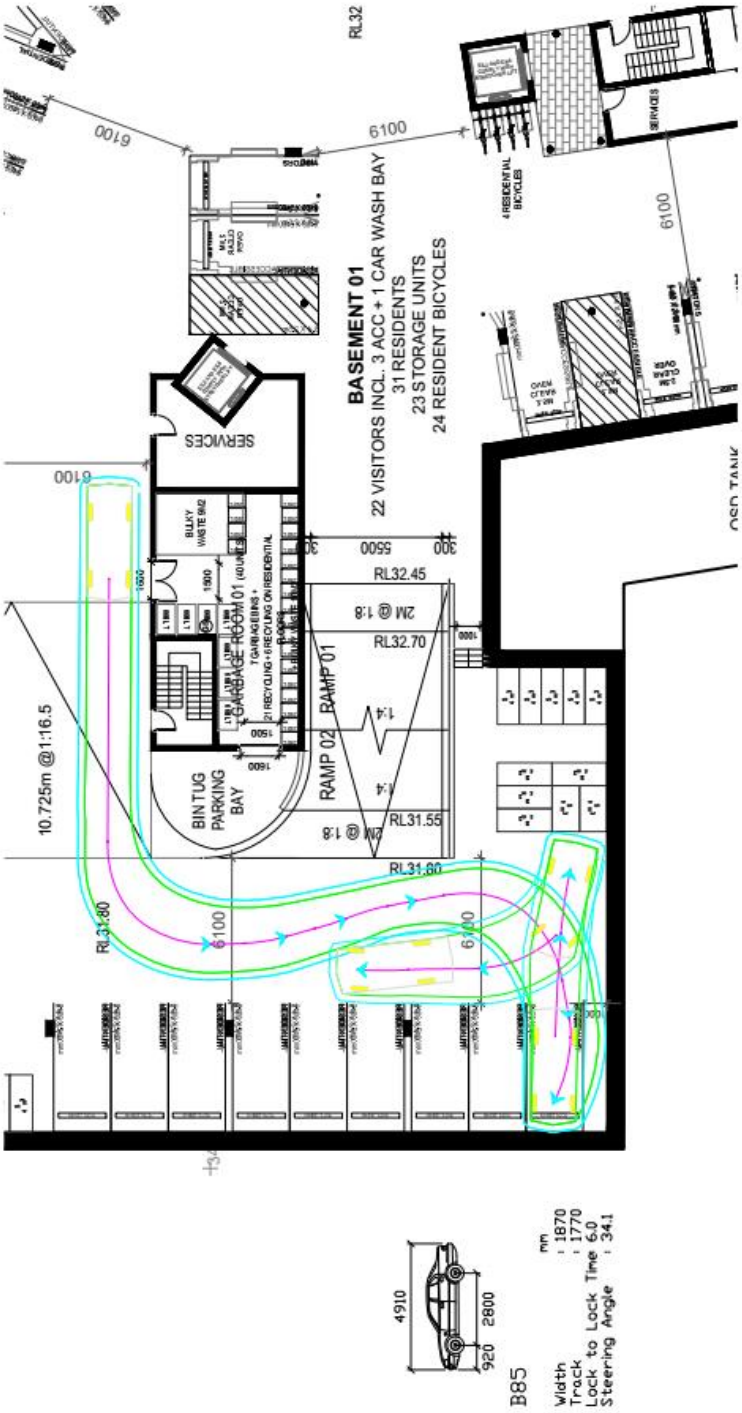

B85
Width
Track
Lock to Lock Time 6.0
Steering Angle
4910
920
2800
BM ON KERB
RL 34.84
A.H.D.
SIGN
PIPOLE
FOOTPATH
CONCRETE
DRIVEWAY
NO. 398
CABRAMATTA
RD WEST
FIBRO COTTAGE
TILE ROOF
FL 36.15
GUT. 38.86
GARBAGE ROOM
CAR WASH BAY
POOL EQUIPMENT UNDER POOL
24 RESIDENT BICYCLES (WALL RACKS)
TURNING
BAY
BULKY WASTE 10M2
SERVICES
OSD TANK
TO CIVIL
ENG'S
DETAILS
METAL ROOF
14.655m
14.635m
17.456m
39.275m
9000
6000
6100
5400
5800
1500
1000

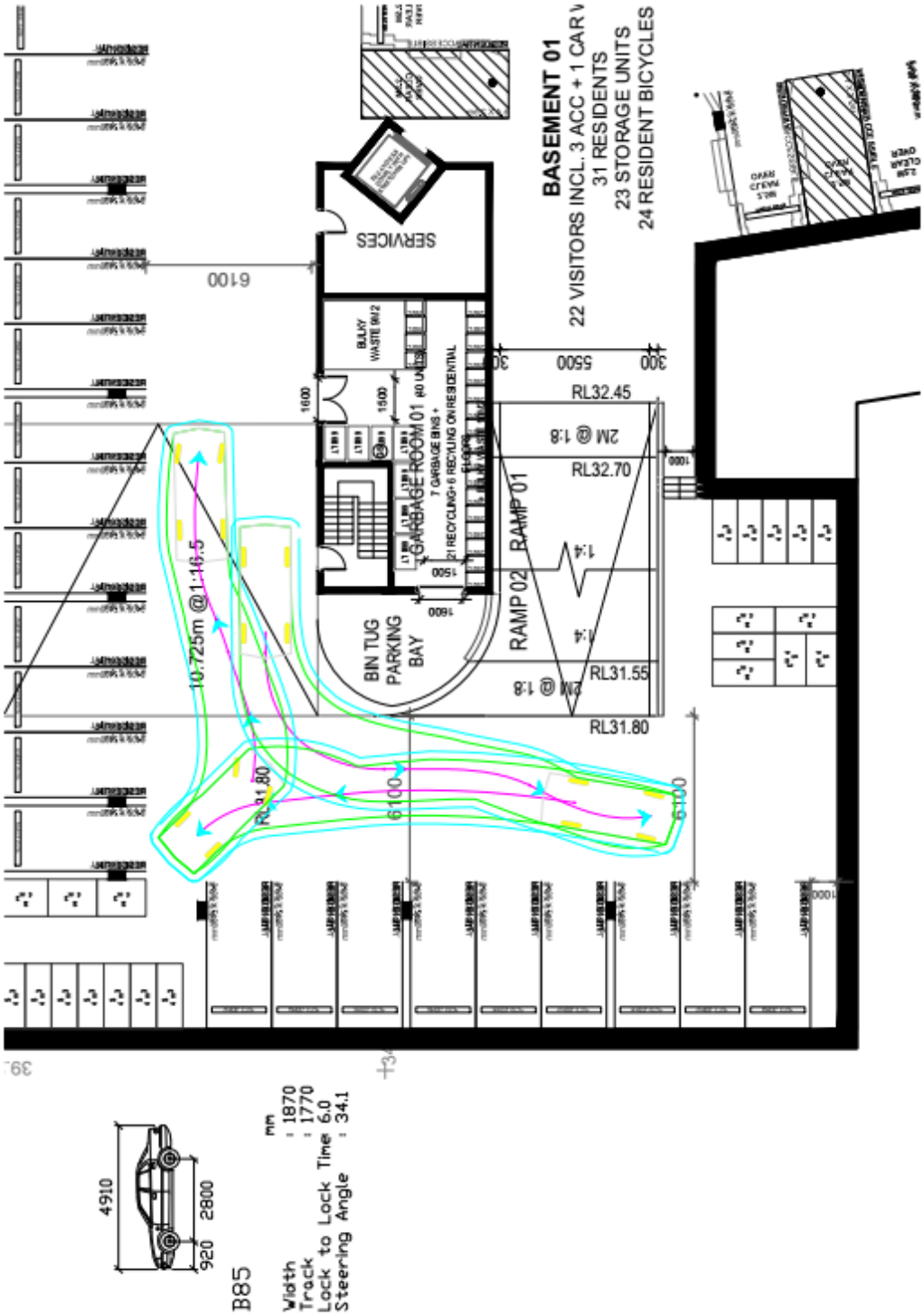

MATTA ROAD WEST
NO. 398 CABRAMATTA RD WEST
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
GARBAGE ROOM
CAR WASH BAY
TURNING BAY
POOL EQUIPMENT UNDER POOL
24 RESIDENT BICYCLES (WALL RACKS)
BULKY WASTE 10M2
SERVICES
4 RESIDENTIAL BICYCLES
BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
OSD TANK TO CIVIL ENG'S DETAILS
RAMP 01
FOOTPATH

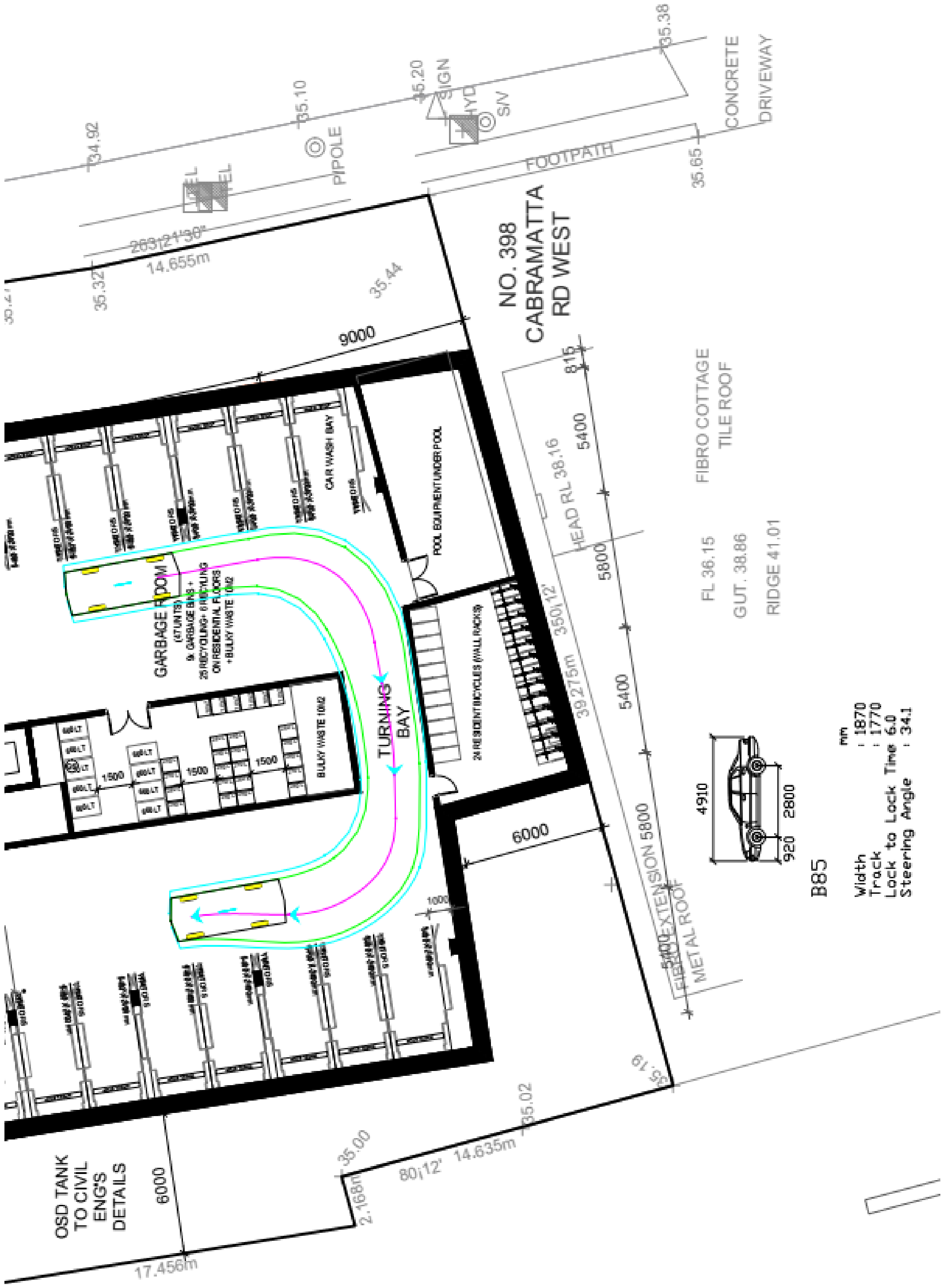

BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
GARBAGE ROOM
SERVICES
RAMP 01
RAMP 02
BIN TUG PARKING BAY
10.725m @1:16.5
OSD TANK TO CIVIL ENG'S DETAILS
RL32.45
RL32.70
RL31.55
RL31.80
6100
6000
17.456m
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

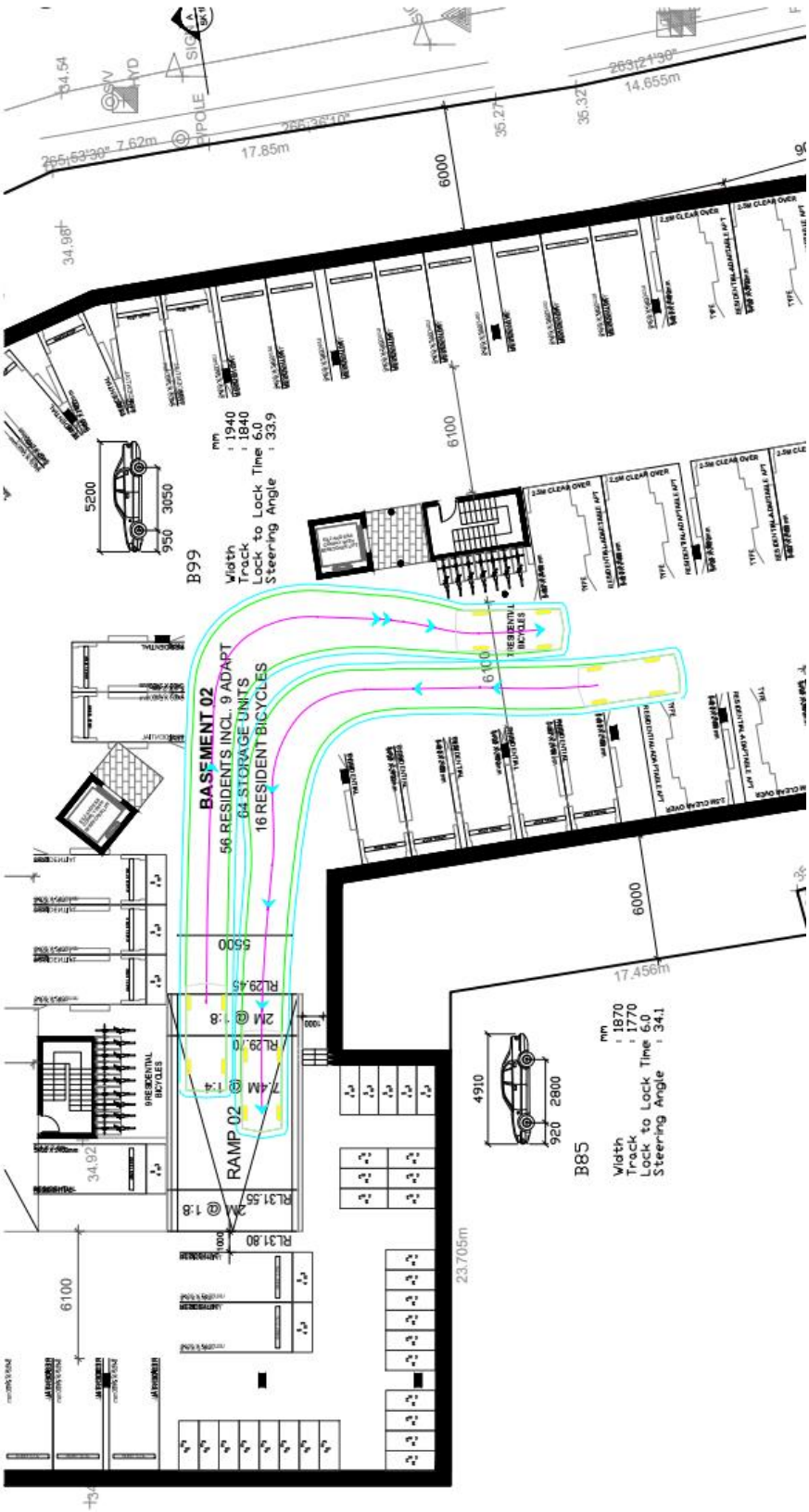

DEEP SOIL>6M TO LSC ARCH'S DETAILS
BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
GARBAGE ROOM 01
RAMP 01
RAMP 02
BIN TUG PARKING BAY
RL32.45
RL32.70
RL31.55
RL31.80
2M @ 1:8
10.725m @1:16.5
6100
6000
FOOTPATH
39.240m
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

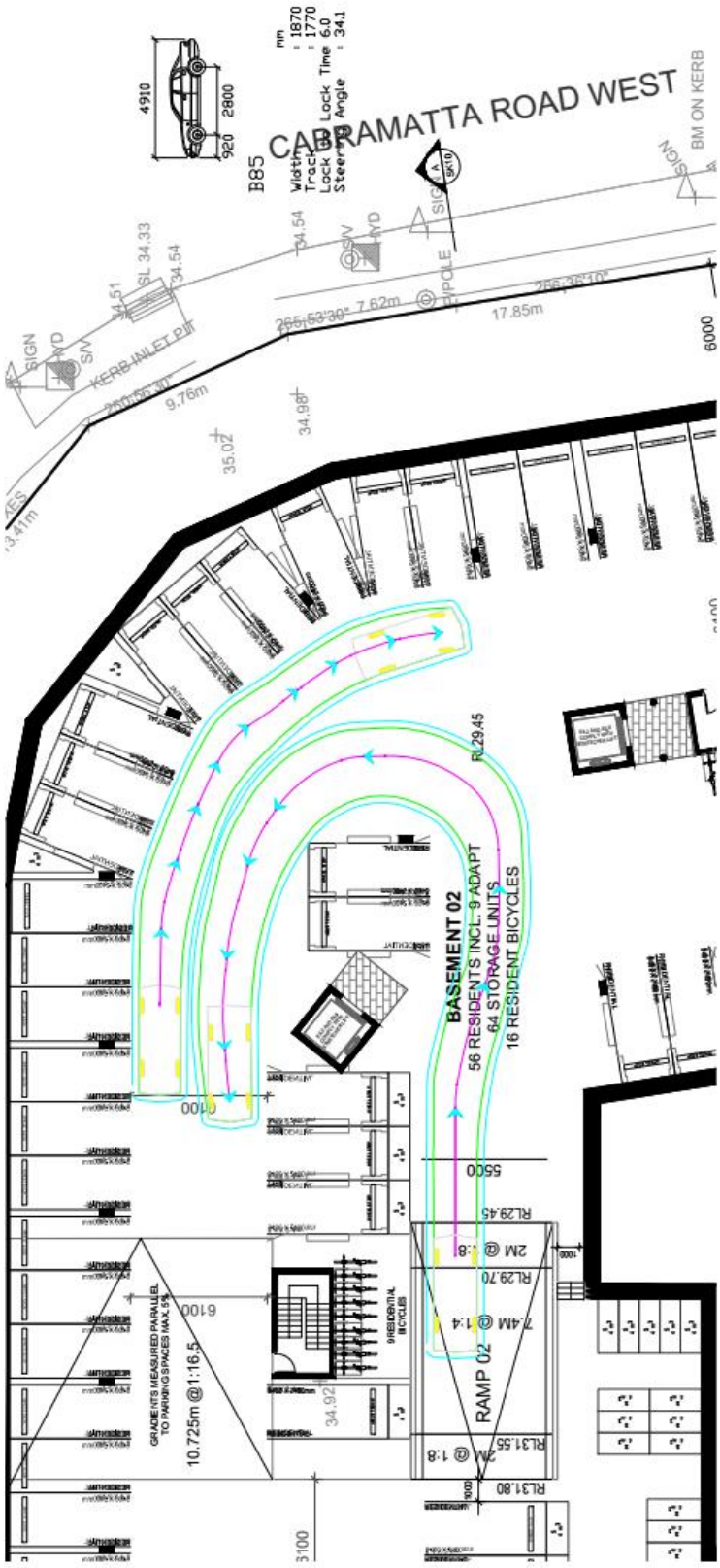

DEEP SOIL>6M TO LSC ARCH'S DETAI
BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
GARBAGE ROOM 01
BIN TUG PARKING BAY
RAMP 01
RAMP 02
RL32.45
RL32.70
RL31.55
RL31.80
10.725m @1:16.5
6100
5500
39.240m
B85
4910
2800
920
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

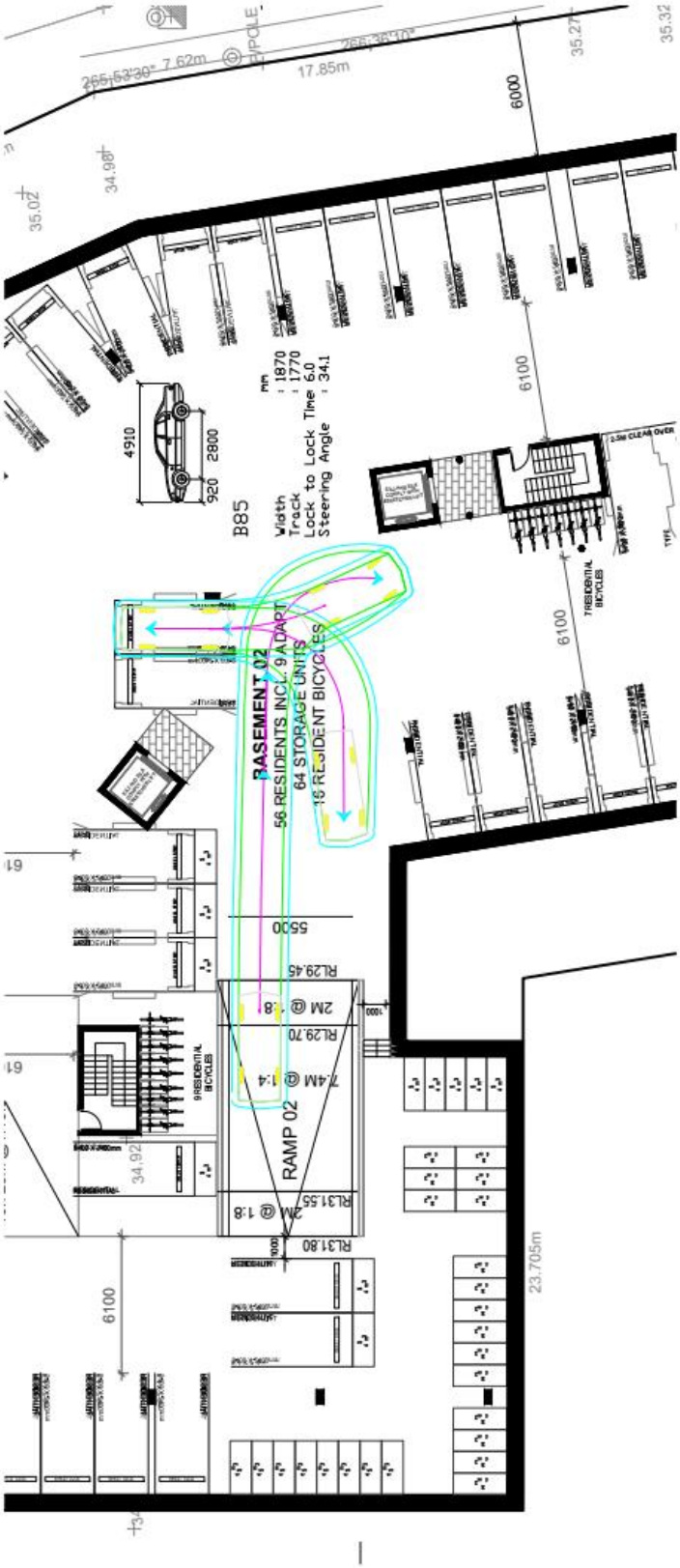

BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR WASH BAY
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
GARBAGE ROOM 01
BIN TUG PARKING BAY
RAMP 01
RAMP 02
RL32.45
RL32.70
RL31.55
RL31.80
10.725m @1:16.5
6100
6500
4910
2800
920
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

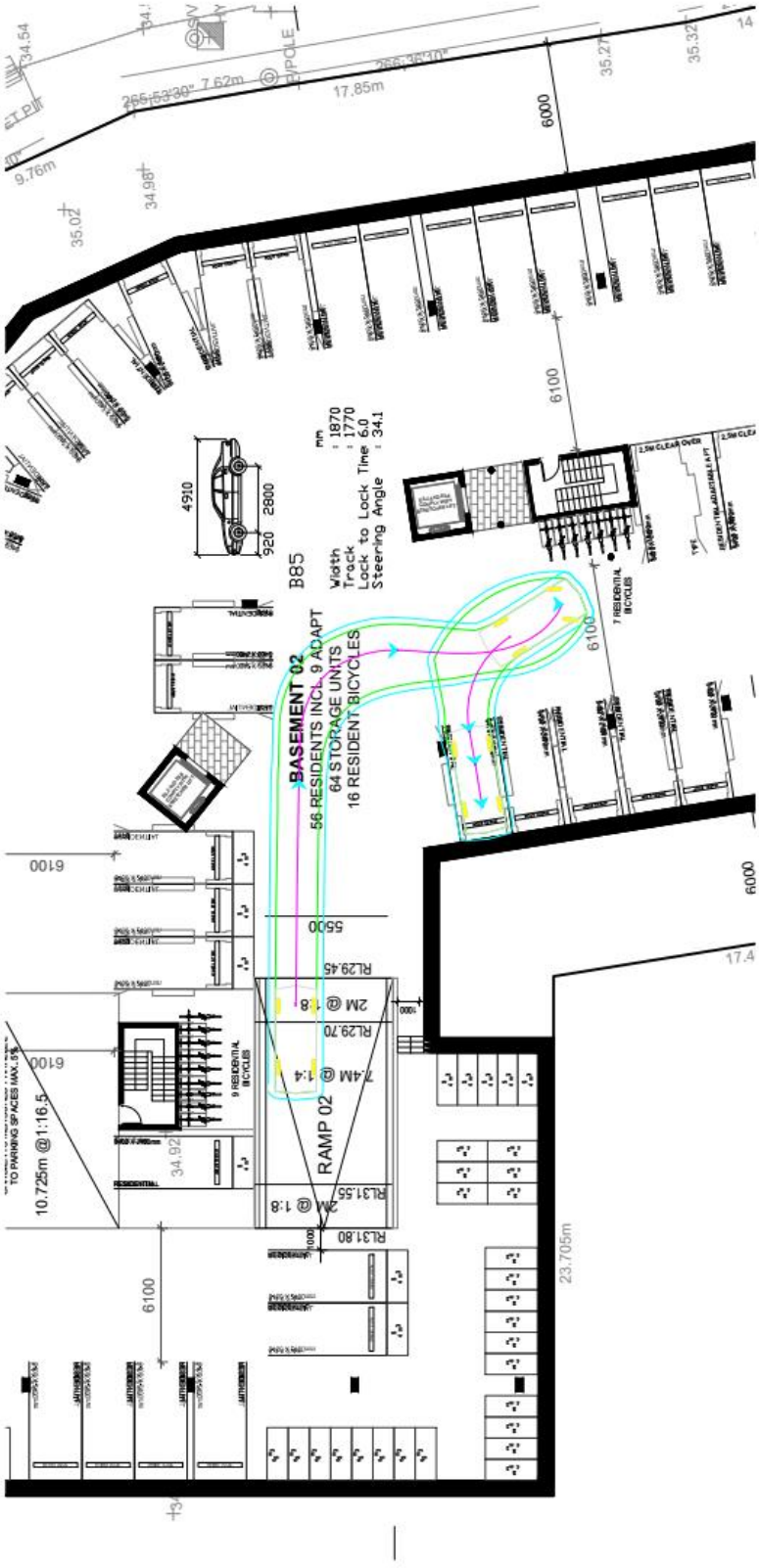

BASEMENT 01
22 VISITORS INCL. 3 ACC + 1 CAR W
31 RESIDENTS
23 STORAGE UNITS
24 RESIDENT BICYCLES
SERVICES
BULKY WASTE 6M2
GARBAGE ROOM 01
7 GARBAGE BINS +
21 RECYCLING+6 RECYCLING ON RESIDENTIAL
BIN TUG PARKING BAY
RAMP 02
RAMP 01
RL32.45
RL32.70
RL31.55
RL31.80
2M @ 1:8
1:4
6100
5500
10.725m @ 1:16.5
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
4910
2800
920

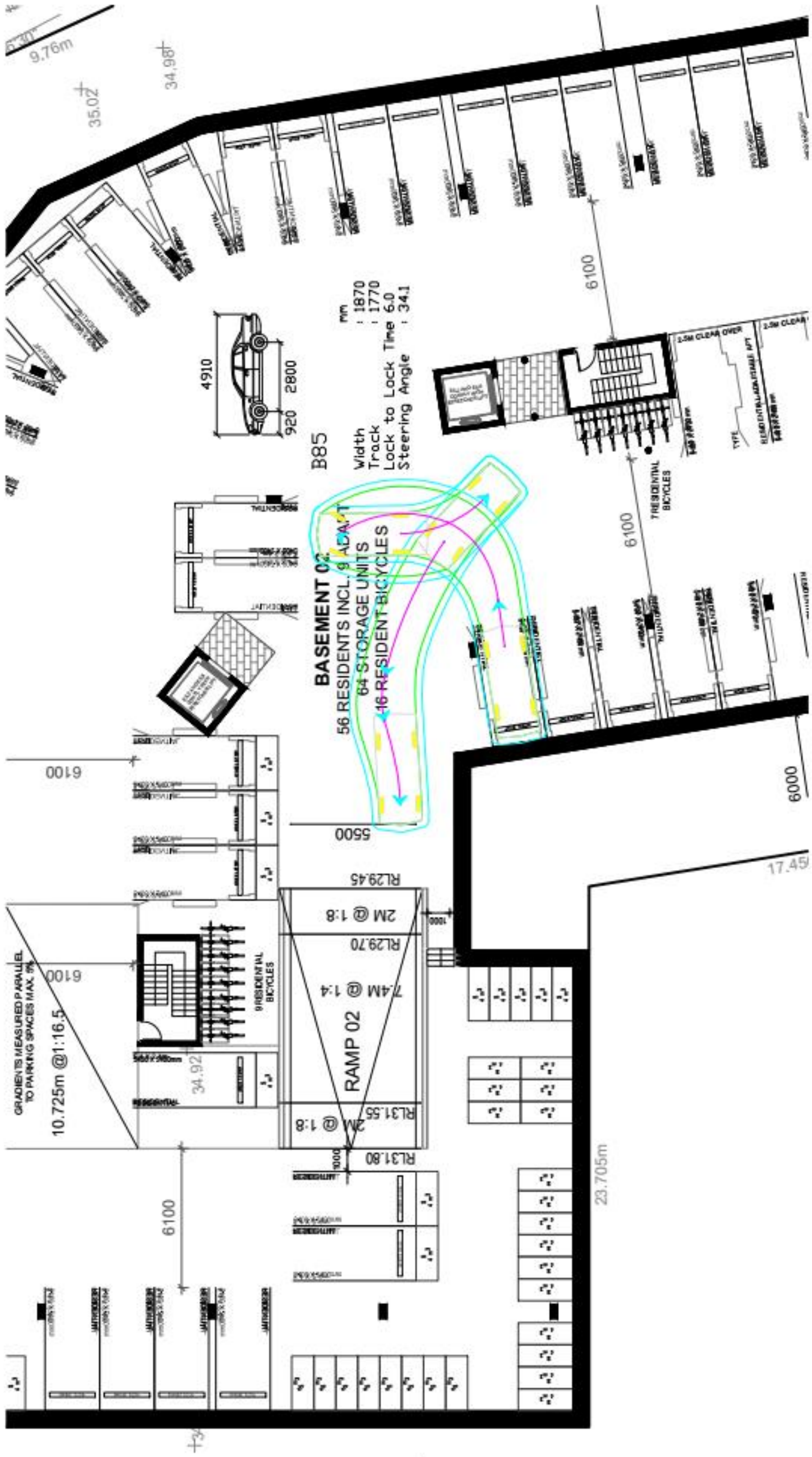

NO. 398
CABRAMATTA
RD WEST
FOOTPATH
CONCRETE
DRIVEWAY
FIBRO COTTAGE
TILE ROOF
FL 36.15
GUT. 38.86
RIDGE 41.01
GARBAGE ROOM
TURNING
BAY
POOL EQUIPMENT UNDER POOL
CAR WASH BAY
BULKY WASTE 10M2
FIBRO EXTENSION
METAL ROOF
OSD TANK
TO CIVIL
ENG'S
DETAILS
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1


BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
B99
B85
Width
Track
Lock to Lock Time
Steering Angle
6000
6100
17.85m
14.655m
17.456m
23.705m


CABRAMATTA ROAD WEST
B85
BM ON KERB
KERB INLET PIT
BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
10.725m @ 1:16.5
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
RESIDENTIAL BICYCLES
RL29.45
RL29.70
RL31.55
RL31.80
2M @ 1:8
7.4M @ 1:4
6000
6100
5500
3100

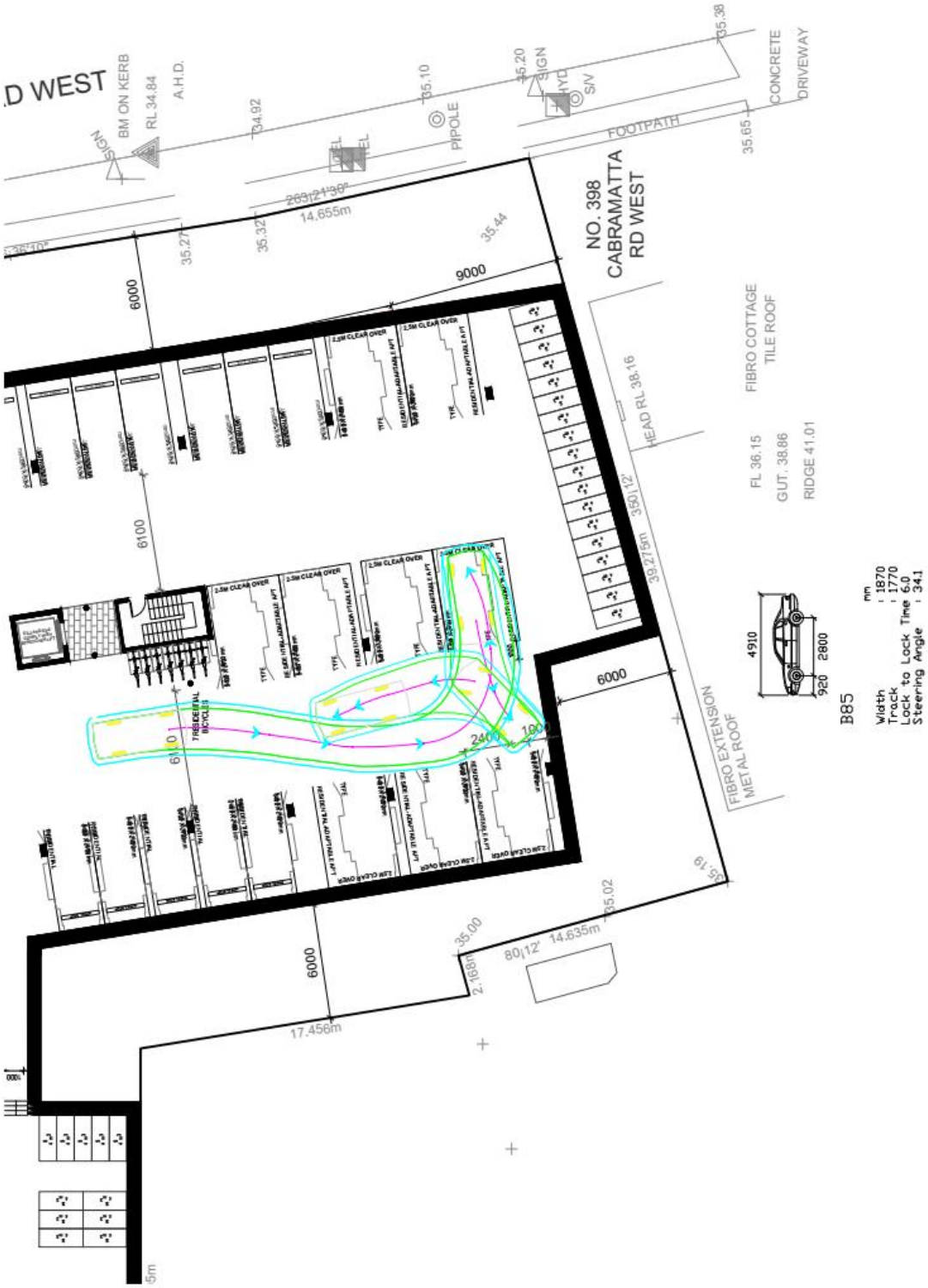

17.85m
6000
6100
6100
6100
4910
2800
920
B85
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1
BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
2M @ 18
7.4M @ 14
2M @ 18
RL29.45
RL29.70
RL31.55
RL31.80
5500
23.705m
34.98
35.02
35.27
35.32
34.92

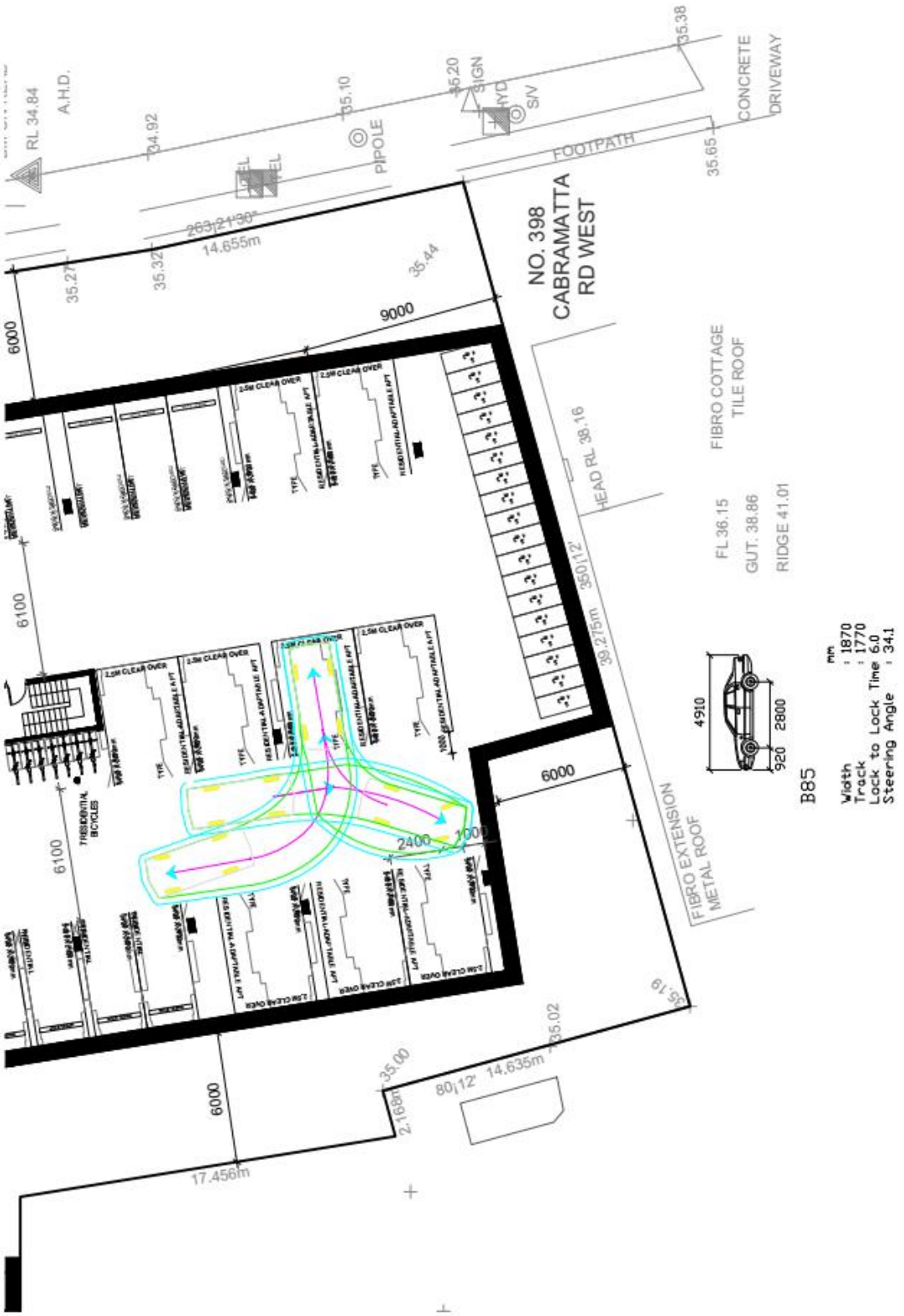

BASEMENT 02
56 RESIDENTS INCL 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
10.725m @1:16.5
2M @ 1:8
7.4M @ 1:4
RL29.45
RL29.70
RL31.55
RL31.80
6100
6000
5500
23.705m
B85
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1

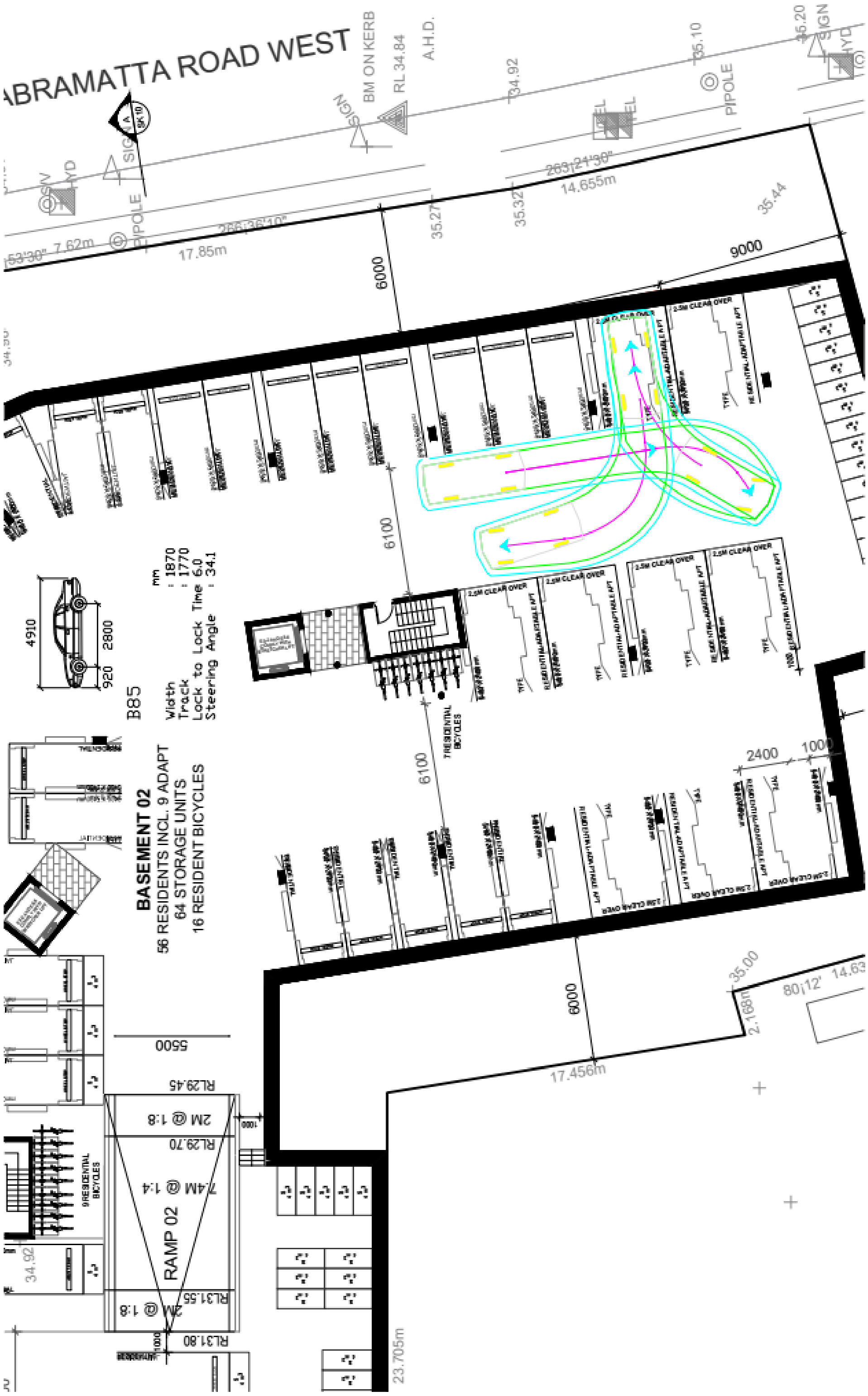

BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
B85
Width
Track
Lock to Lock Time 6.0
Steering Angle
mm
: 1870
: 1770
: 34.1
4910
2800
920
6100
6000
5500
17.45
23.705m
10.725m @1:16.5
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
2M @ 1:8
7.4M @ 1:4
RL29.45
RL29.70
RL31.55
RL31.80
34.92
35.02
34.98
9.76m
RESIDENTIAL BICYCLES

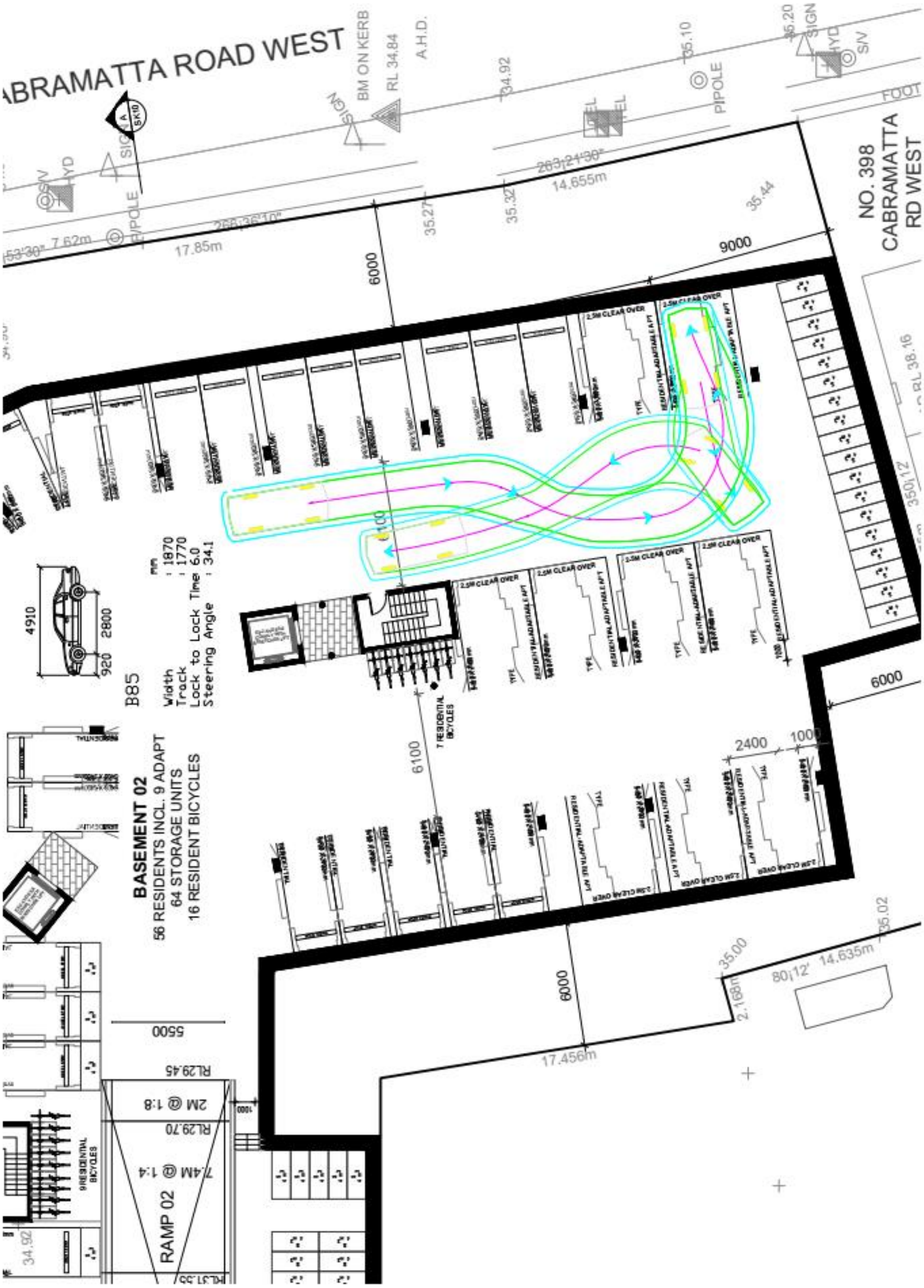

NO. 398
CABRAMATTA
RD WEST
FOOTPATH
PIPOLE
BM ON K
RL 34.8
14.655m
9000
6000
6100
6100
6000
6000
2400
1000
39.275m
HEAD RL 38.16
FIBRO COTTAGE
TILE ROOF
FL 36.15
GUT. 38.86
RIDGE 41.01
FIBRO EXTENSION
METAL ROOF
14.635m
17.456m
2.168m
3.705m
35.27
35.32
35.44
35.65
34.92
35.02
35.00
4910
920
2800
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1


NO. 398
CABRAMATTA
RD WEST
FIBRO COTTAGE
FIBRO EXTENSION
METAL ROOF
FOOTPATH
PIPOLE
9000
6000
6100
6000
2400
6000
14.655m
39.275m
14.635m
17.456m
2.168m
B85
4910
920 2800
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1

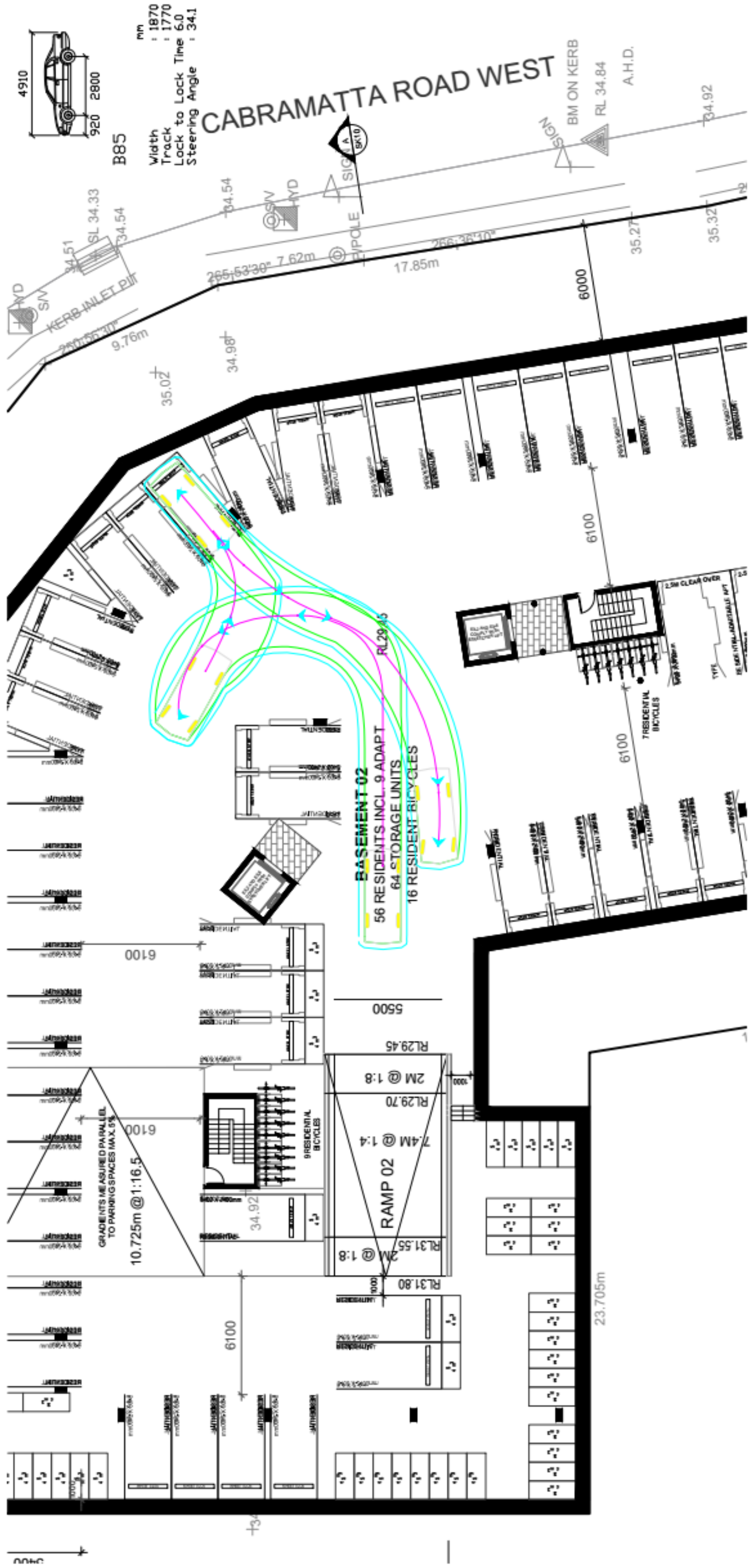

D WEST
BM ON KERB
RL 34.84
A.H.D.
SIGN
34.92
35.10
PIPOLE
35.20
SIGN
HYD
S/V
35.38
CONCRETE DRIVEWAY
FOOTPATH
35.65
NO. 398 CABRAMATTA RD WEST
14.655m
35.27
35.32
35.44
9000
6000
6100
6000
6000
FIBRO COTTAGE TILE ROOF
HEAD RL 38.16
FL 36.15
GUT. 38.86
RIDGE 41.01
39.275m
FIBRO EXTENSION METAL ROOF
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
2400
1000
35.00
35.02
14.635m
2.168m
17.456m
5m

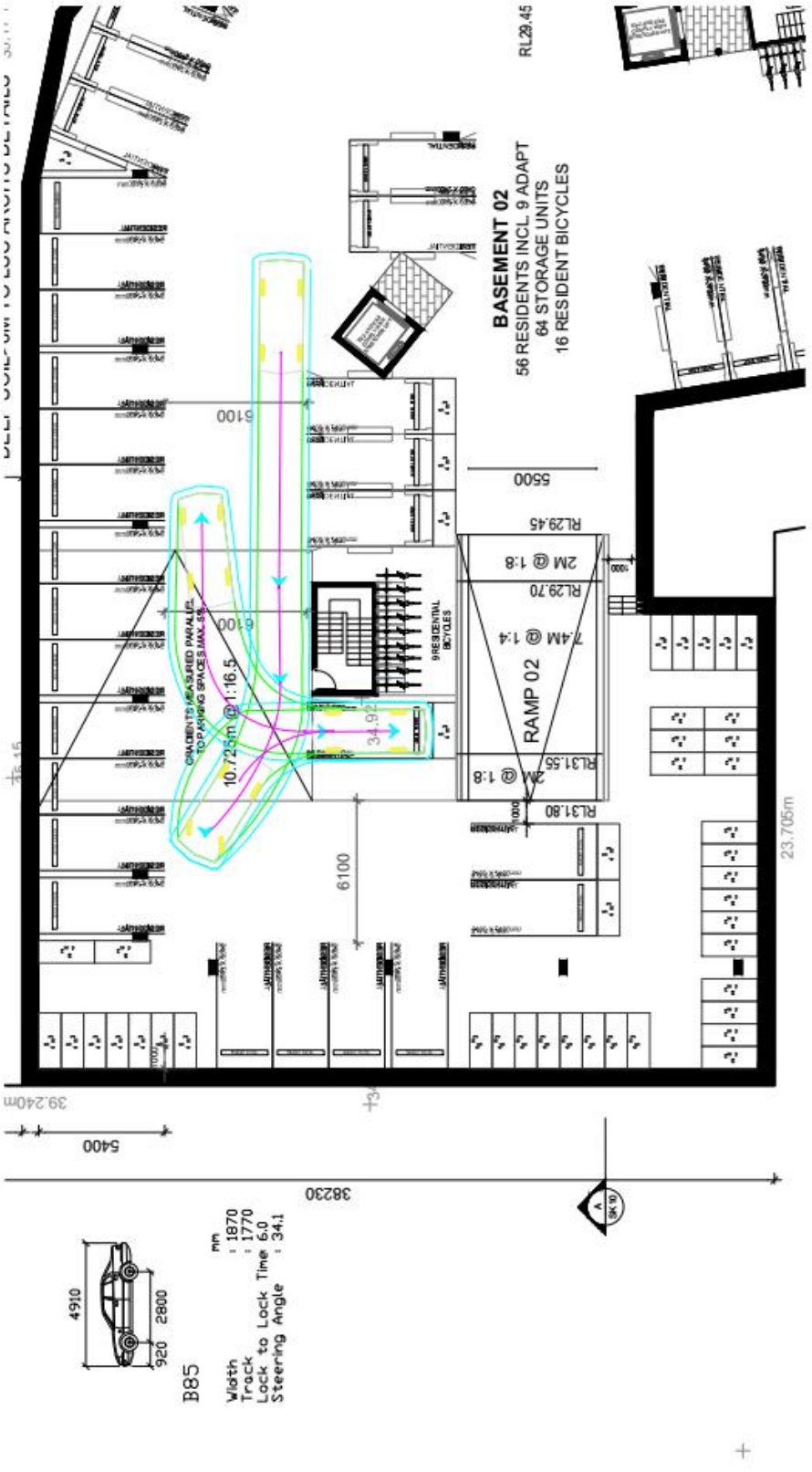

RL 34.84
A.H.D.
34.92
35.10
PIPOLE
35.20
SIGN
HYD
S/V
35.38
CONCRETE DRIVEWAY
FOOTPATH
35.65
263°21'30"
14.655m
35.27
35.32
35.44
NO. 398 CABRAMATTA RD WEST
9000
6000
6100
HEAD RL 38.16
FIBRO COTTAGE
TILE ROOF
FL 36.15
GUT. 38.86
RIDGE 41.01
350°12'
39.275m
6000
2400
1000
FIBRO EXTENSION
METAL ROOF
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
6100
RESIDENTIAL BICYCLES
35.19
35.02
35.00
80°12'
14.635m
2.168m
6000
17.456m

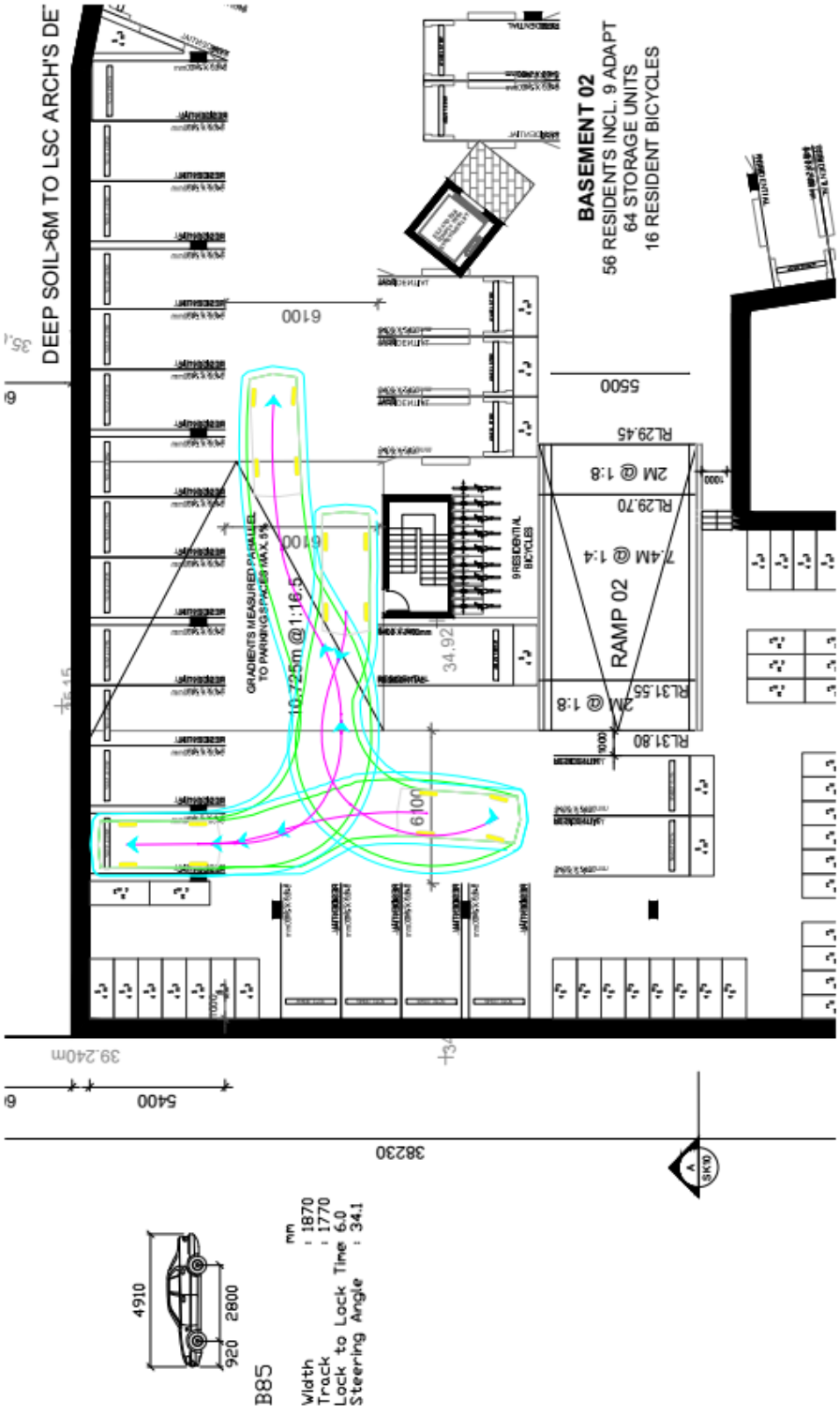

CABRAMATTA ROAD WEST
BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
B85
RAMP 02

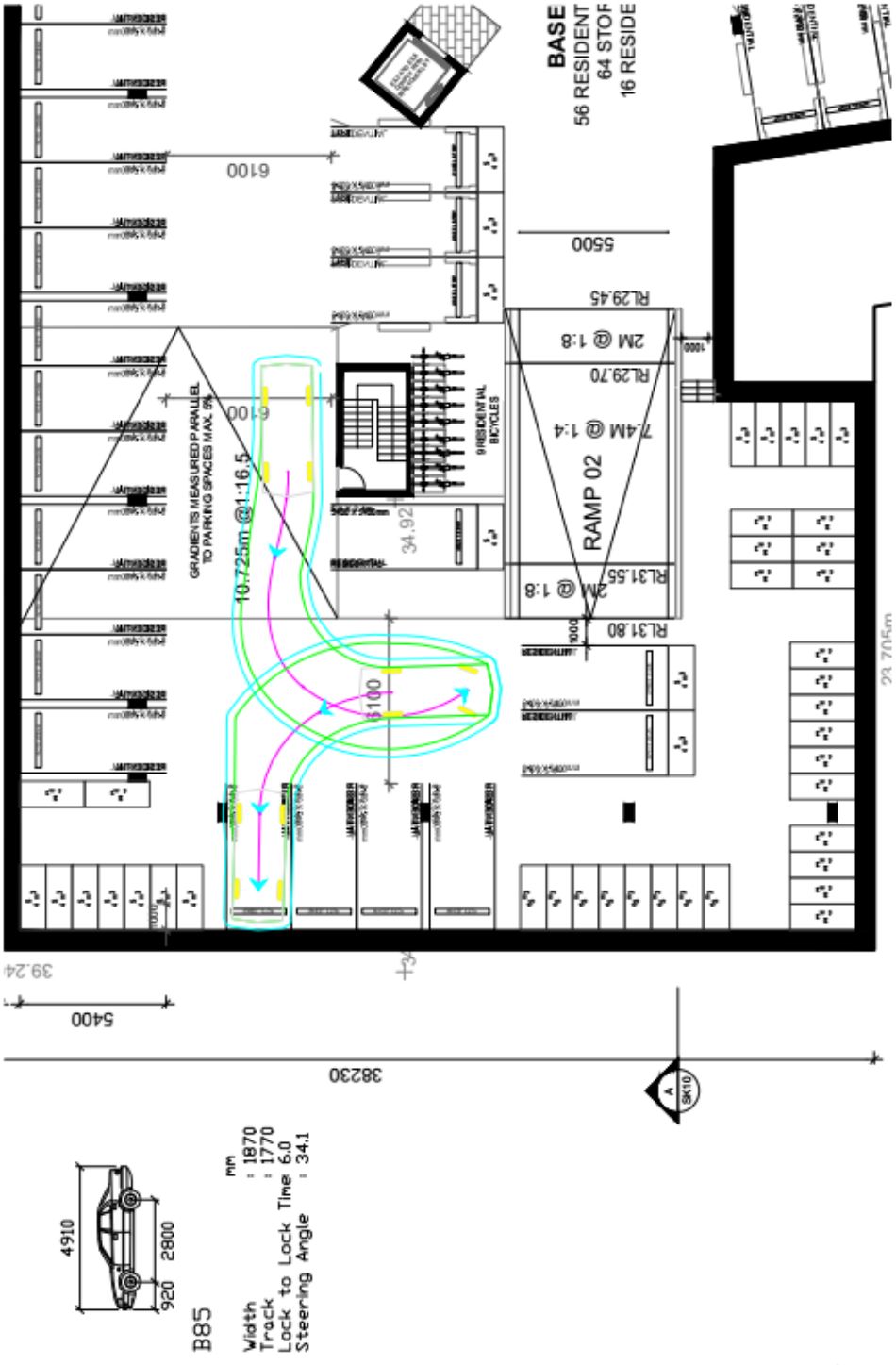


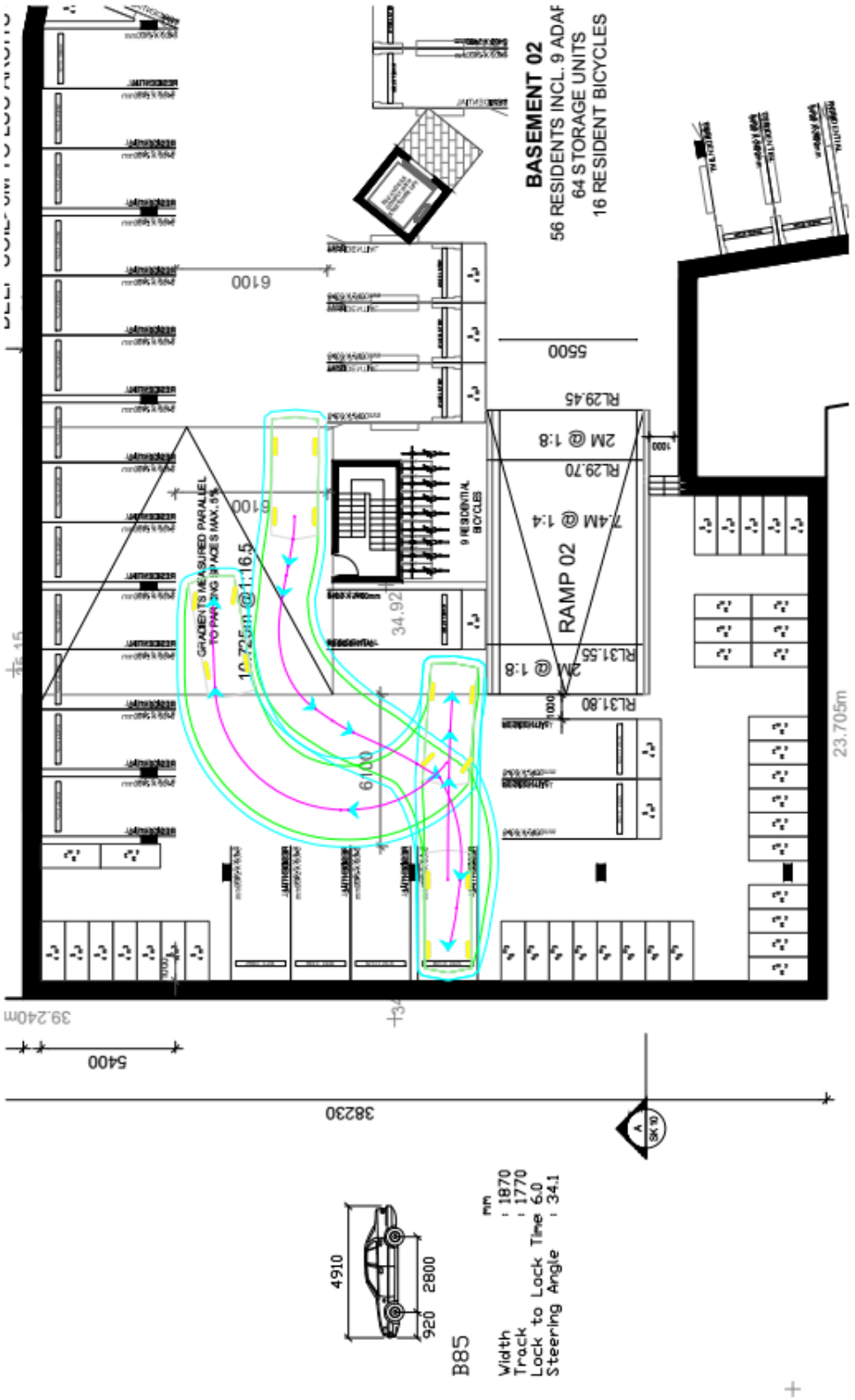
ABRAMATTA ROAD WEST
NO. 398 CABRAMATTA RD WEST
BM ON KERB
RL 34.84
A.H.D.
BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
B85
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1
4910
2800
920
6000
9000
6100
2400
5500
RL29.45
2M @ 1:8
RL29.70
7.4M @ 1:4
RAMP 02
17.456m
14.635m
14.655m
17.85m

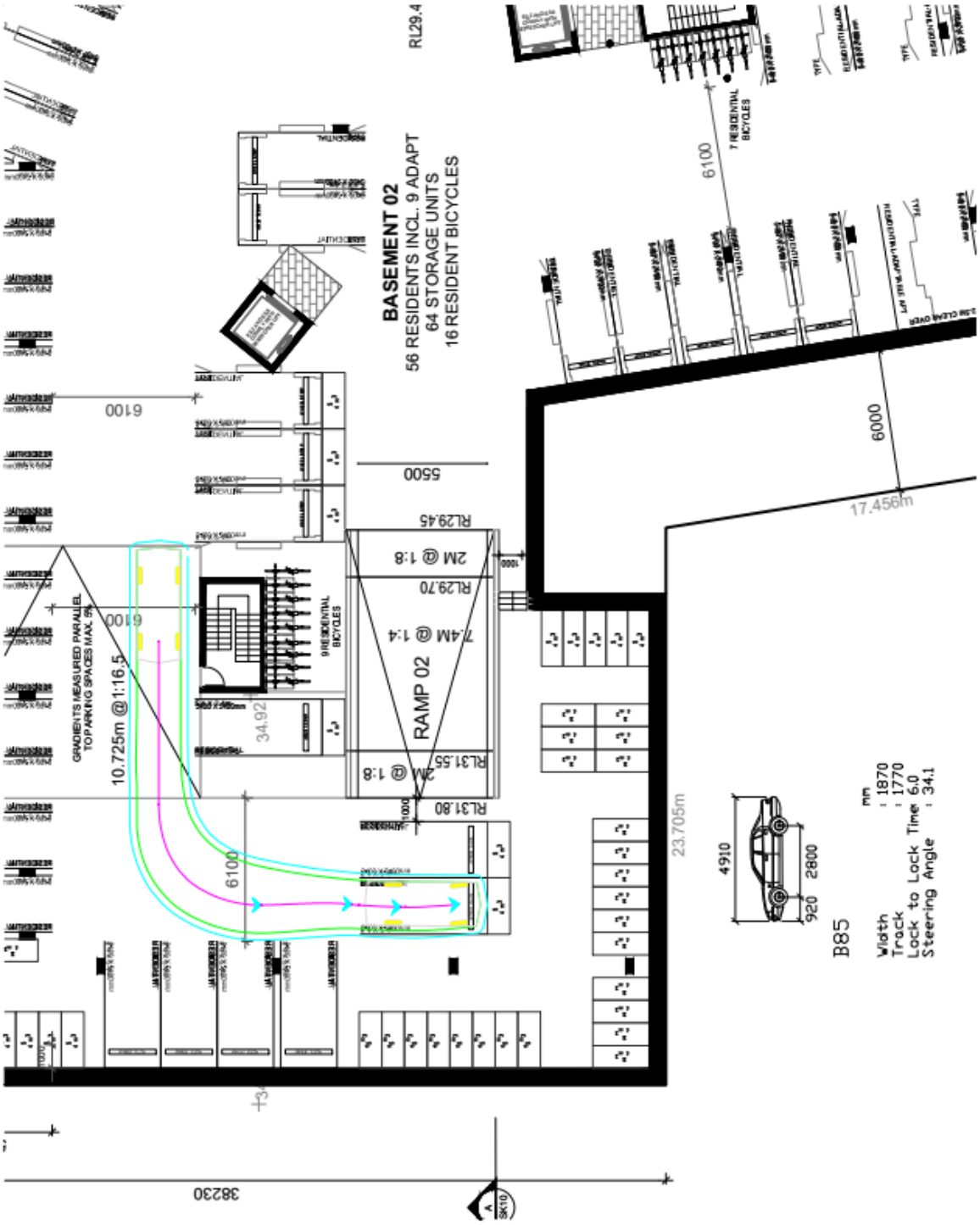

CABRAMATTA ROAD WEST
B85
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1
4910
2800
920
KERB INLET PIT
BM ON KERB
RL 34.84
A.H.D.
6000
6100
BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RL29.45
7 RESIDENTIAL BICYCLES
9 RESIDENTIAL BICYCLES
5500
RAMP 02
2M @ 1:8
7.4M @ 1:4
RL29.70
RL31.55
RL31.80
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX.5%
10.725m @1:16.5
23.705m

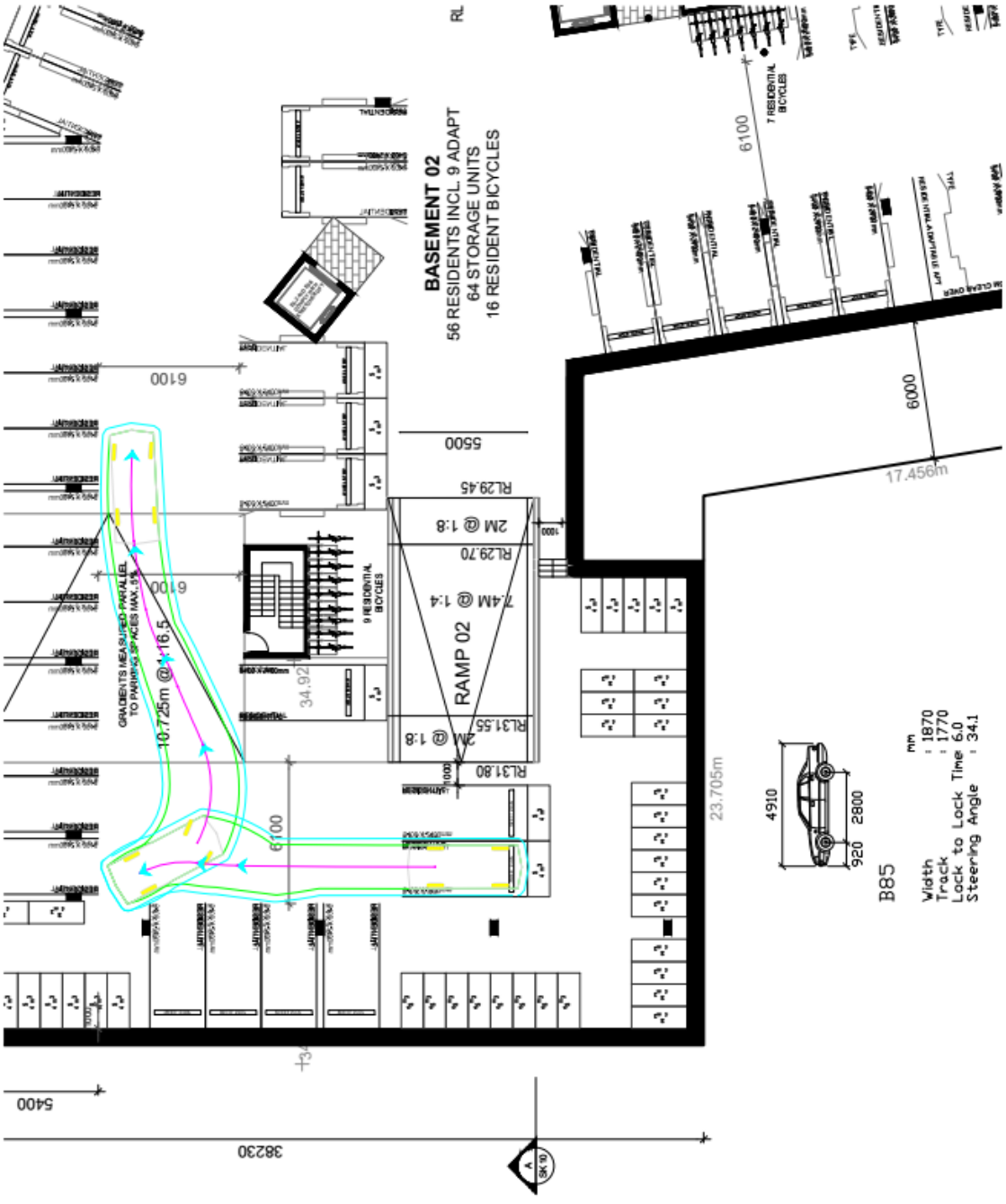

BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
7.4M @ 1:4
2M @ 1:8
2M @ 1:8
RL29.45
RL29.70
RL31.55
RL31.80
9 RESIDENTIAL BICYCLES
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
10.723m @ 1:16.5
34.92
6100
5100
5500
23.705m
39.240m
5400
38230
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
4910
2800
920

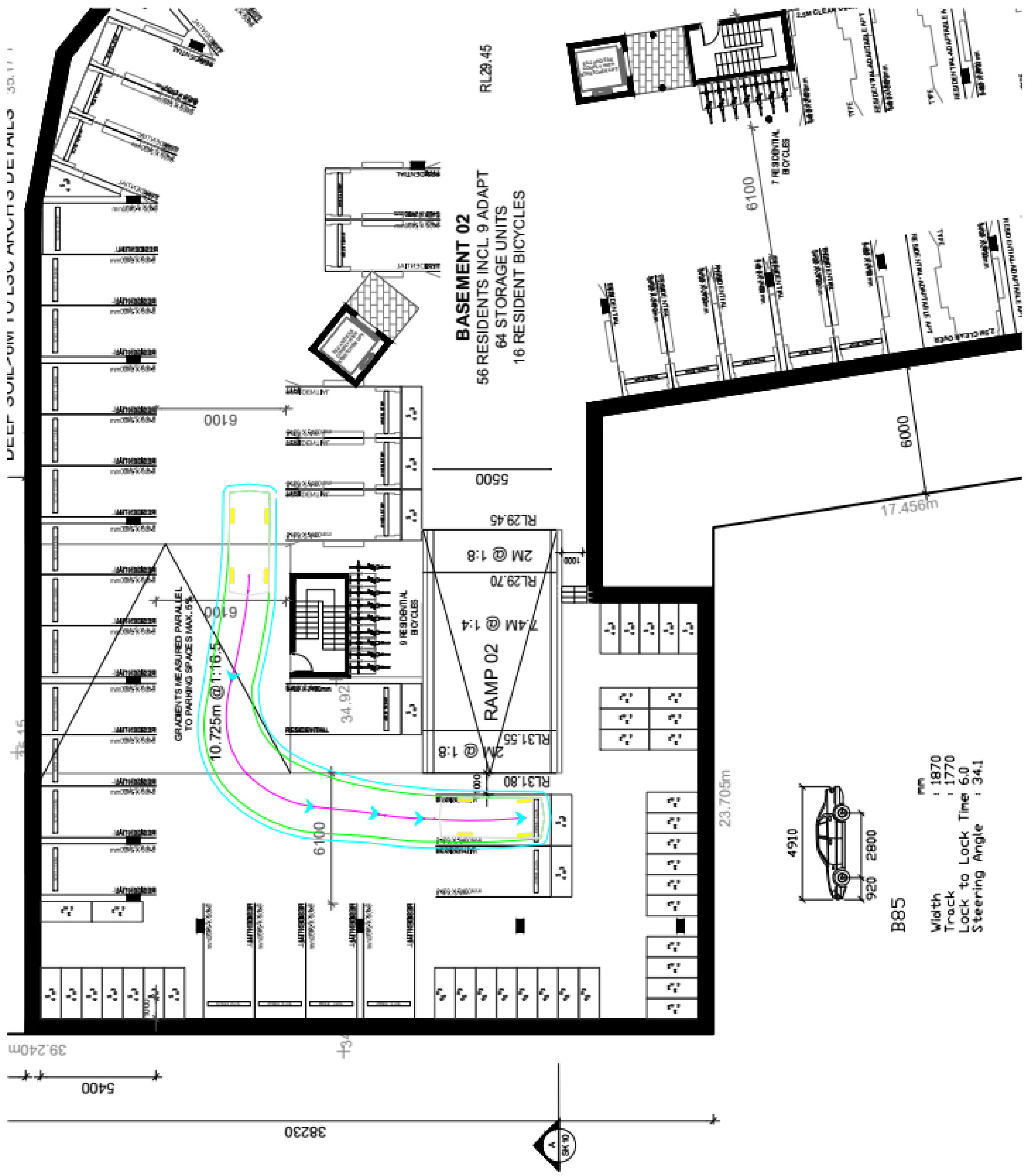

DEEP SOIL>6M TO LSC ARCH'S DE
BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX 5%
10.725m @ 1:16.5
9 RESIDENTIAL BICYCLES
RL29.45
RL29.70
RL31.55
RL31.80
2M @ 1:8
7.4M @ 1:4
6100
5500
5400
38230
39.240m
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
4910
2800
920

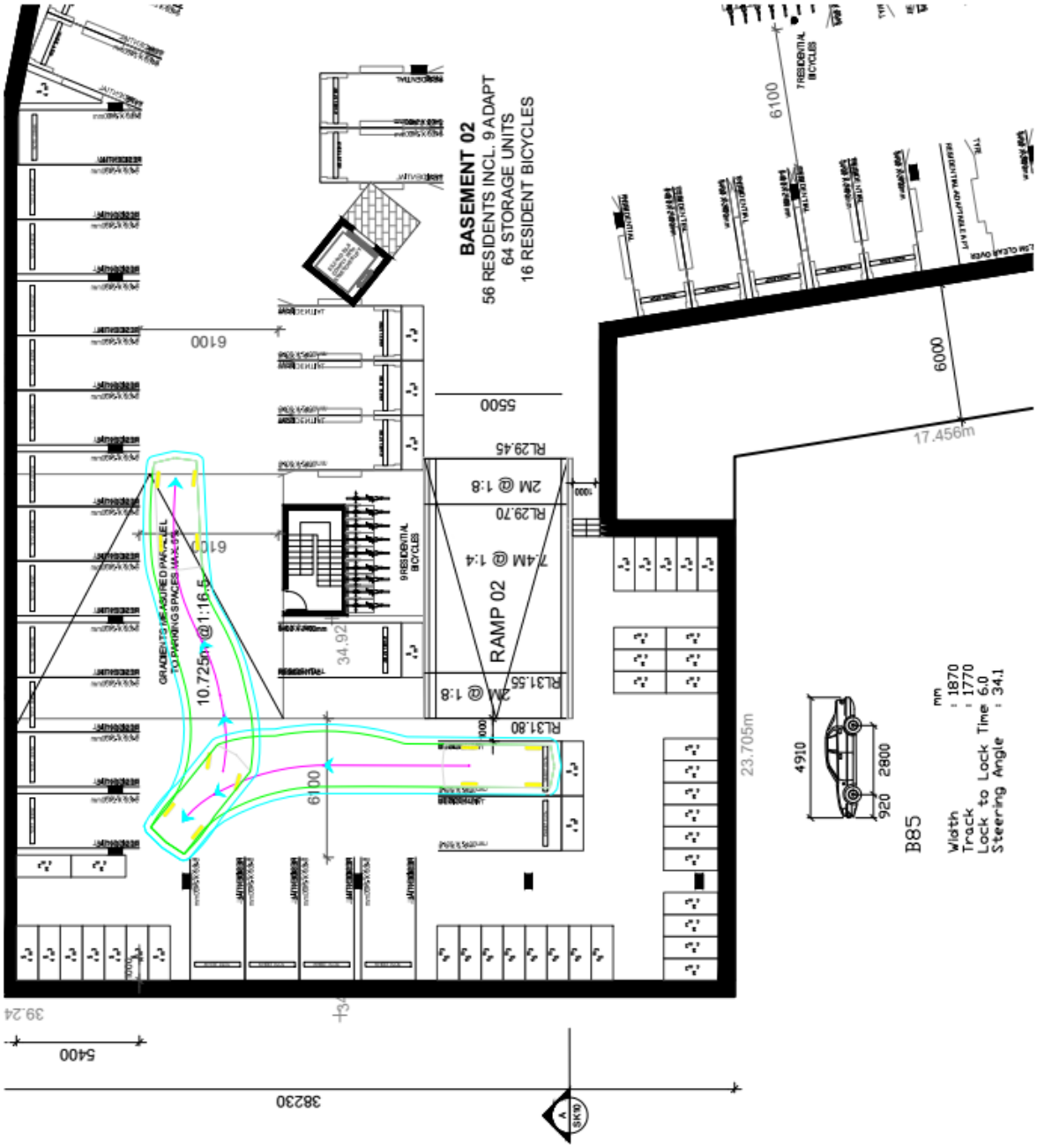

BASE
56 RESIDENT
64 STOF
16 RESIDE
RAMP 02
2M @ 1:8
7.4M @ 1:4
2M @ 1:8
RL29.45
RL29.70
RL31.55
RL31.80
9 RESIDENTIAL BICYCLES
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
10.725m @1:16.5
6100
5500
34.92
39.24
5400
38230
23.705m
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
4910
2800
920

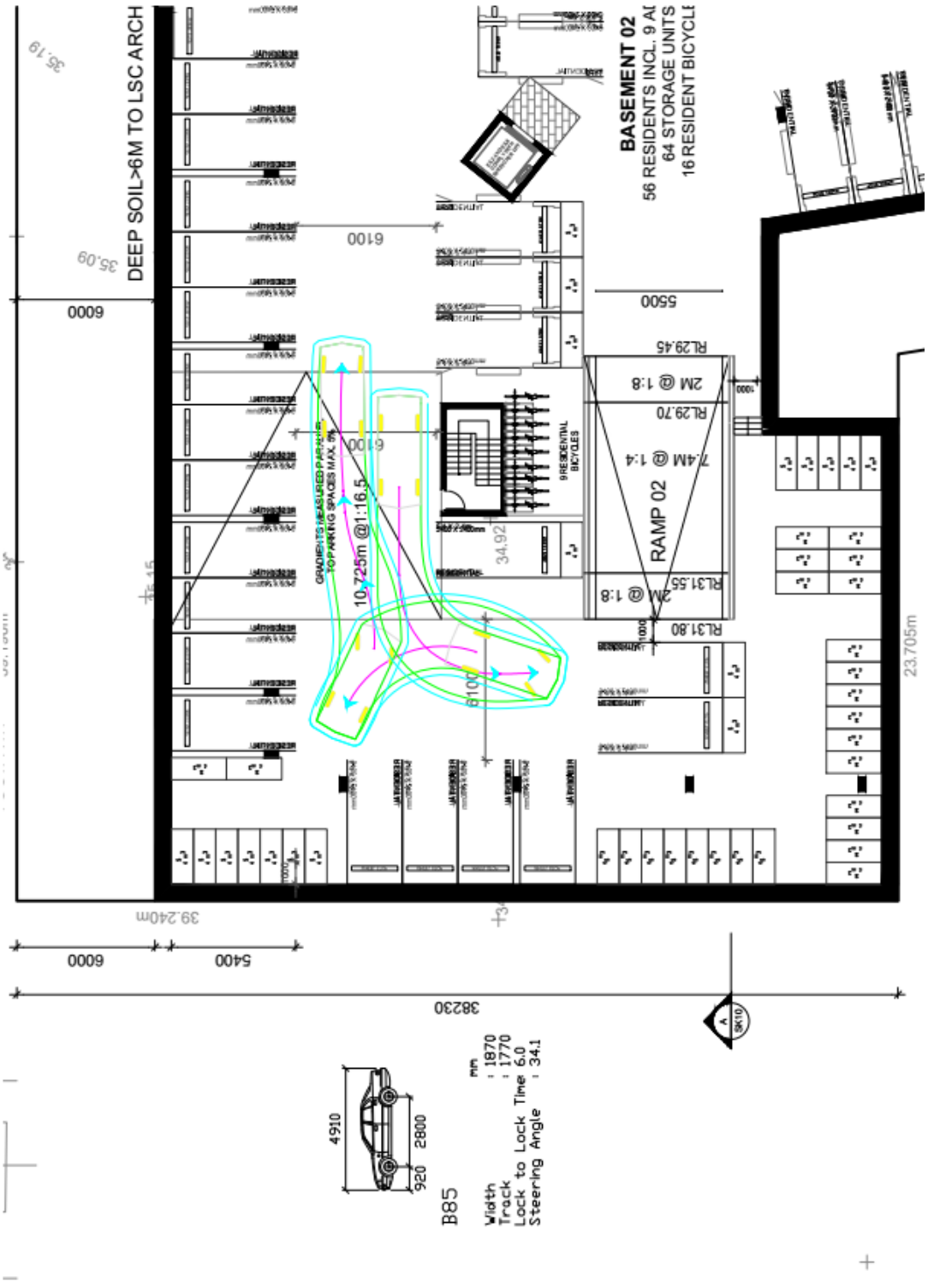

BASEMENT 02
56 RESIDENTS INCL. 9 ADAP
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
7.4M @ 1:4
2M @ 1:8
2M @ 1:8
9 RESIDENTIAL BICYCLES
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
10.725m @1:16.5
6100
5500
RL29.45
RL29.70
RL31.55
RL31.80
34.92
6100
23.705m
39.240m
5400
38230
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1


BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RL29.4
RL29.45
RL29.70
RL31.55
RL31.80
RAMP 02
2M @ 1:8
7.4M @ 1:4
2M @ 1:8
9 RESIDENTIAL BICYCLES
7 RESIDENTIAL BICYCLES
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
10.725m @1:16.5
6100
6100
6100
5500
6000
17.456m
34.92
23.705m
38230
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

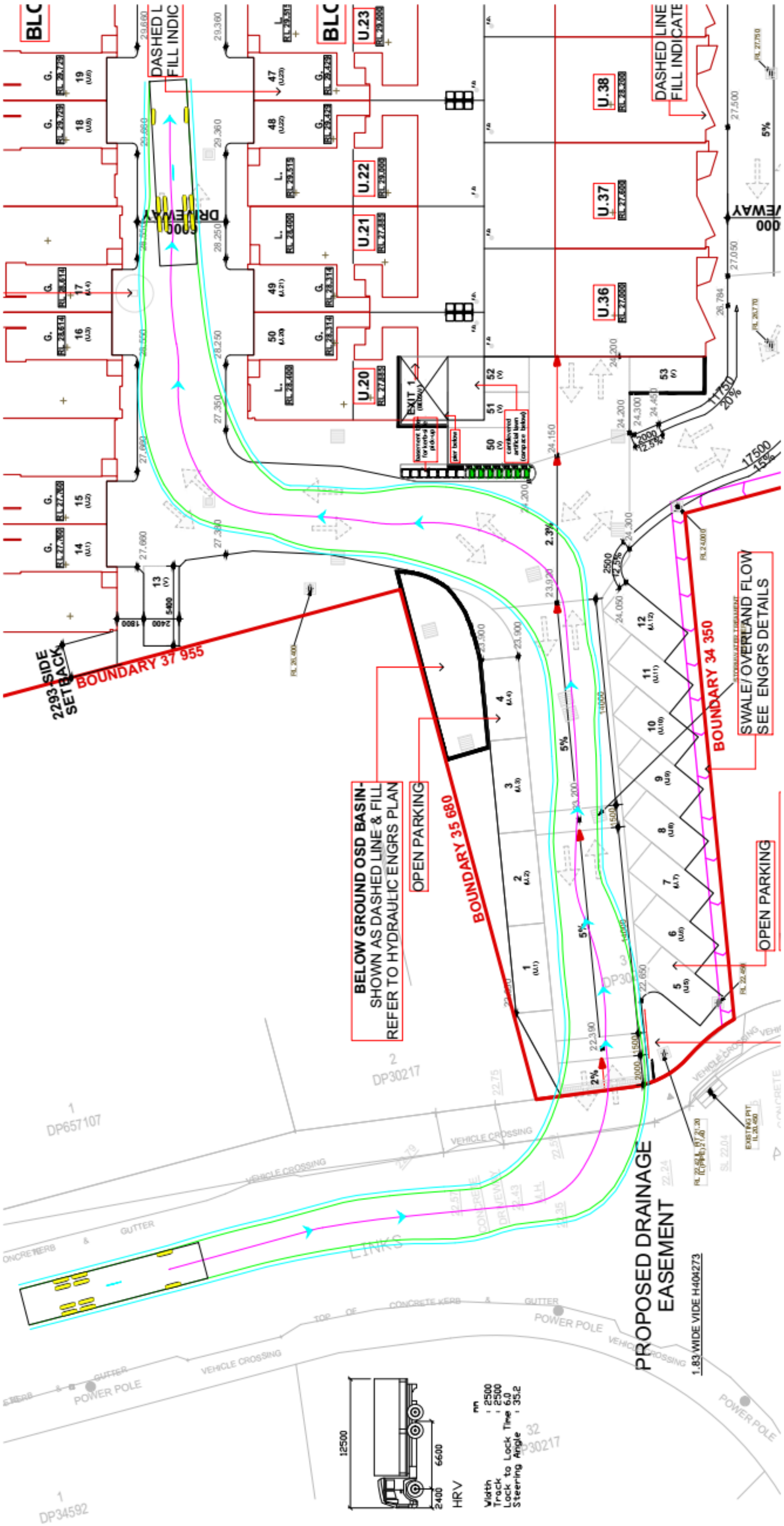

BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
2M @ 1:8
7.4M @ 1:4
2M @ 1:8
9 RESIDENTIAL BICYCLES
7 RESIDENTIAL BICYCLES
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
10.725m @ 1:16.5
17.456m
23.705m
6100
6000
5500
5400
38230
4910
2800
920
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

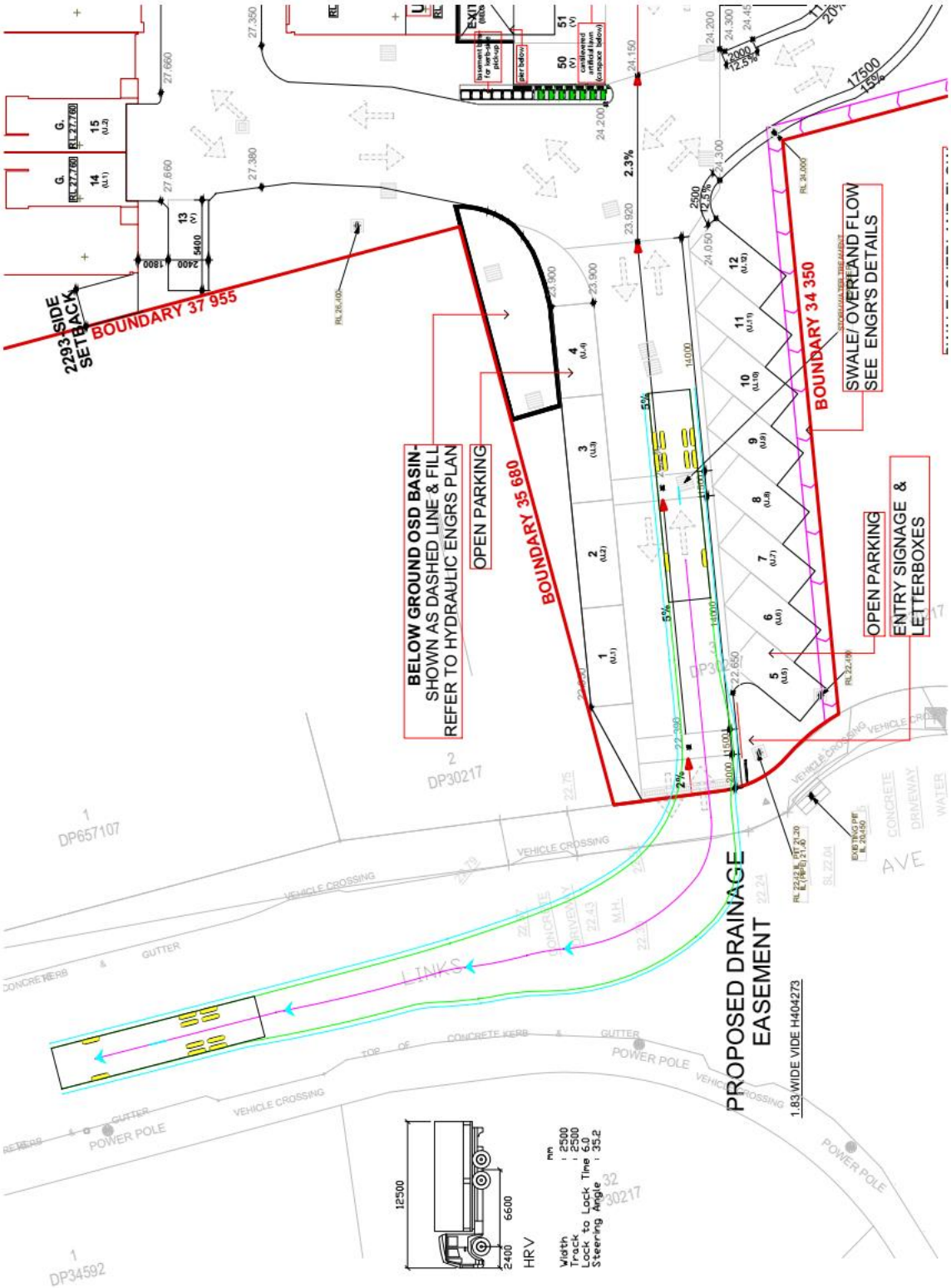

BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RL29.45
RAMP 02
2M @ 1:8
7.4M @ 1:4
RL29.70
RL31.55
RL31.80
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX. 5%
10.725m @1:16.5
9 RESIDENTIAL BICYCLES
7 RESIDENTIAL BICYCLES
6100
6000
5500
5400
38230
39.240m
23.705m
17.456m
34.92
B85
Width : 1870
Track : 1770
Lock to Lock Time : 6.0
Steering Angle : 34.1
4910
2800
920

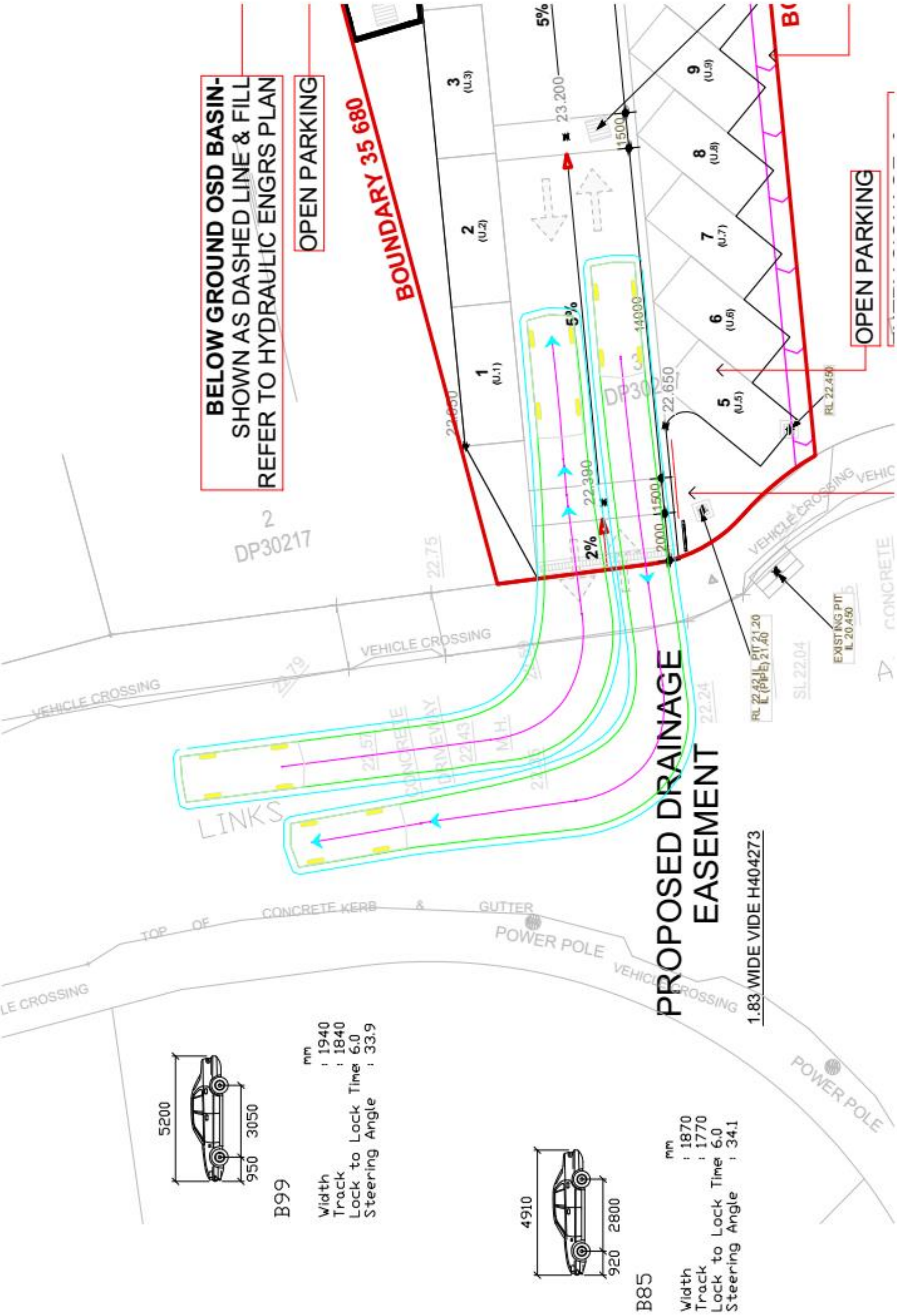

BASEMENT 02
56 RESIDENTS INCL. 9 ADAPT
64 STORAGE UNITS
16 RESIDENT BICYCLES
RAMP 02
7.4M @ 1:4
2M @ 1:8
2M @ 1:8
RL29.45
RL29.70
RL31.55
RL31.80
10.725m @1:16.5
GRADIENTS MEASURED PARALLEL TO PARKING SPACES MAX 5%
9 RESIDENTIAL BICYCLES
6100
5500
6000
17.456m
23.705m
34.92
39.24
5400
38230
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

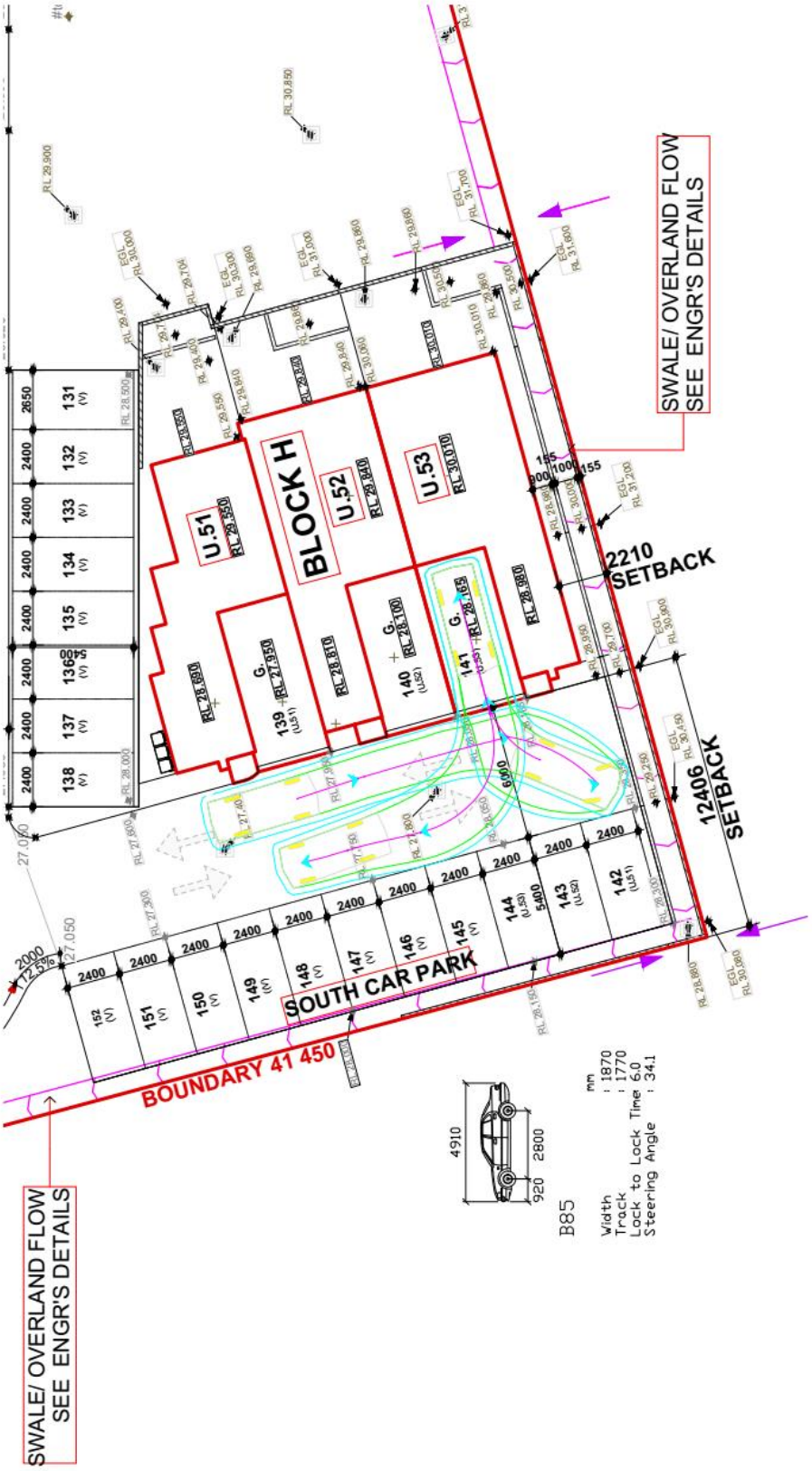

BASEMENT 02
56 RESIDENTS INCL. 9 A
64 STORAGE UNITS
16 RESIDENT BICYCL
DEEP SOIL>6M TO LSC ARCH
RAMP 02
2M @ 1:8
7.4M @ 1:4
2M @ 1:8
RL29.45
RL29.70
RL31.55
RL31.80
9 RESIDENTIAL BICYCLES
10.725m @1:16.5
6100
5500
6000
5400
38230
39.240m
23.705m
4910
2800
920
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

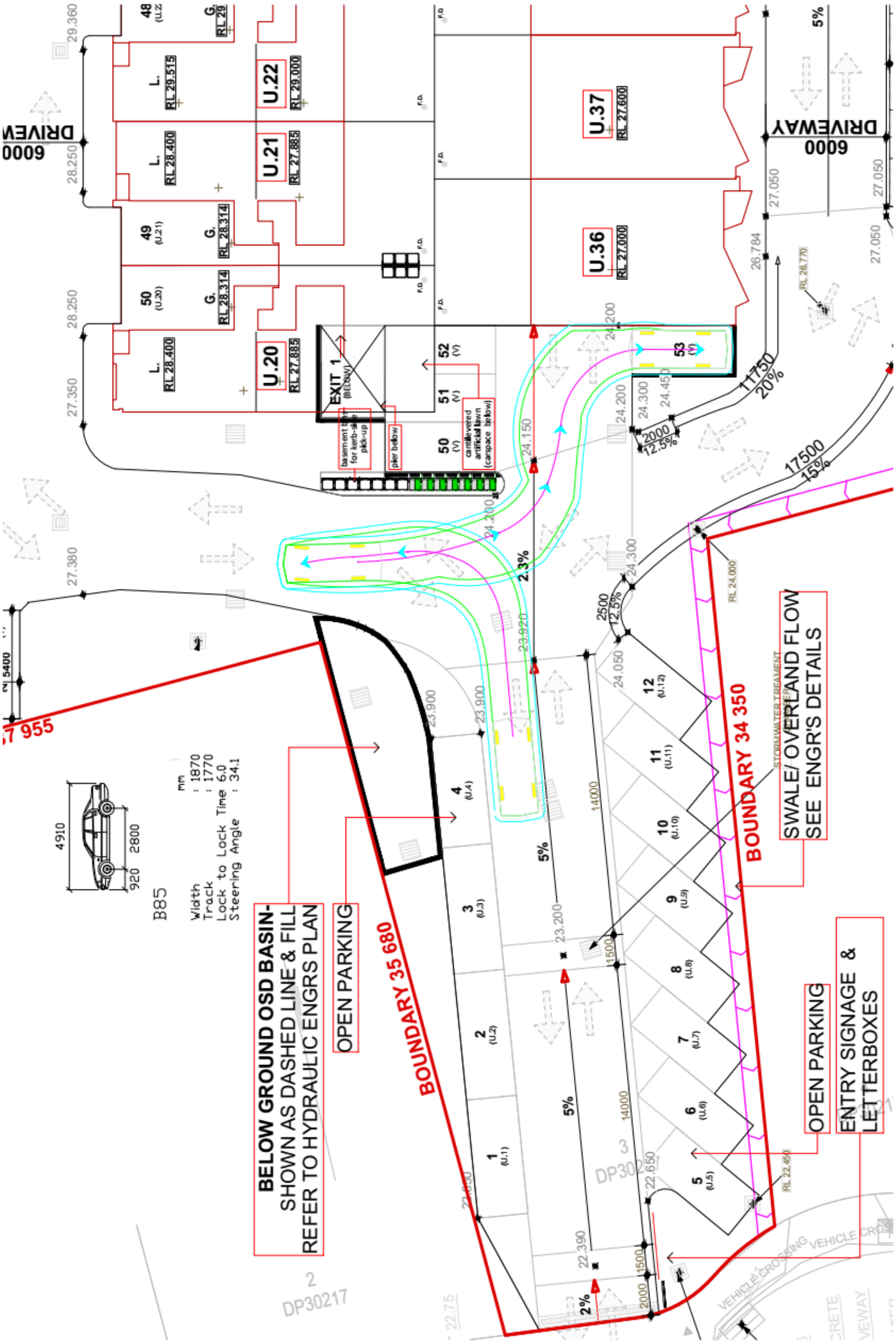
Appendix B – Vehicle Swept Paths (Townhouses)

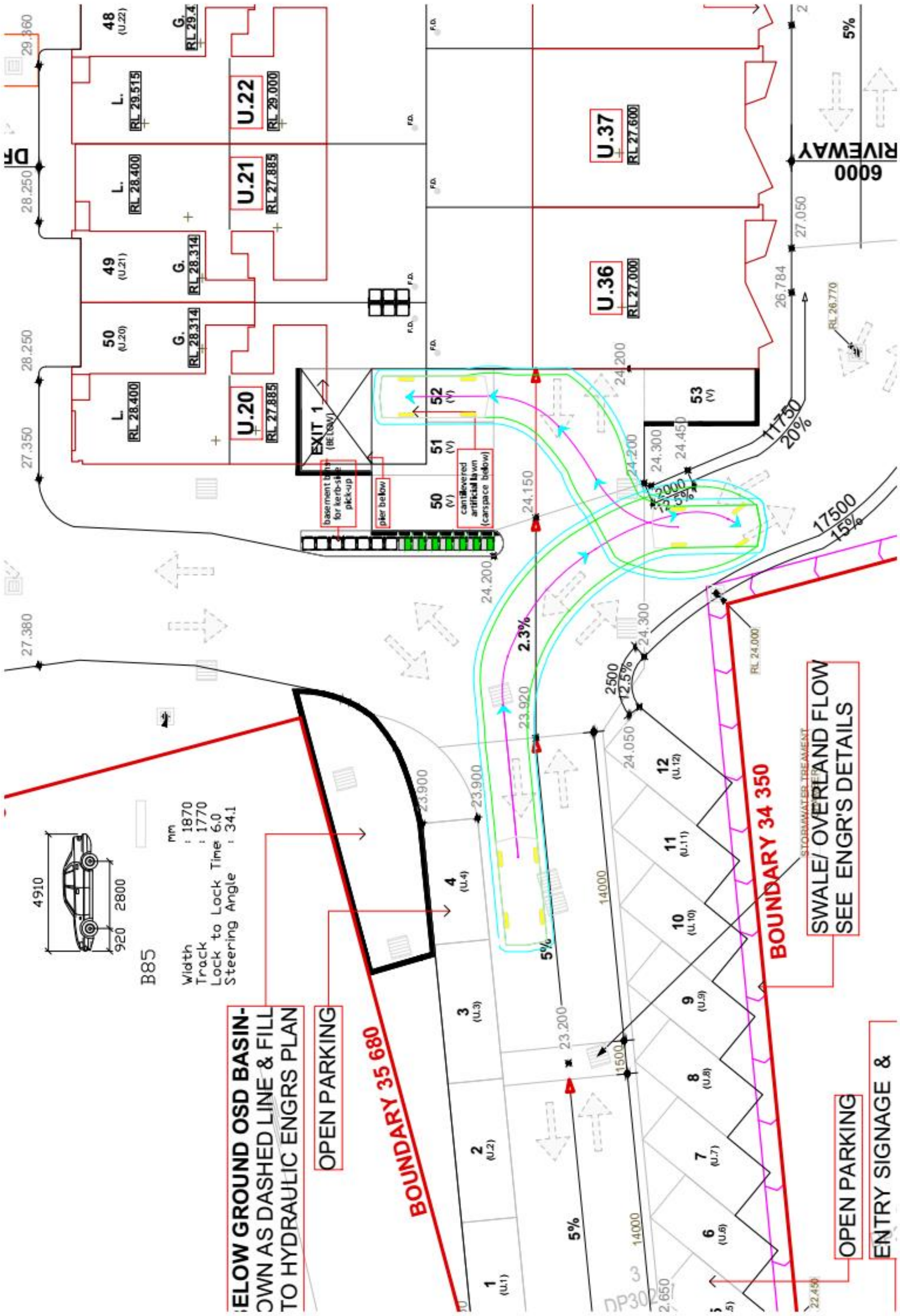

BOUNDARY 37 955
BOUNDARY 35 680
BOUNDARY 34 350
2293 SIDE SETBACK
BELOW GROUND OSD BASIN-SHOWN AS DASHED LINE & FILL REFER TO HYDRAULIC ENGRS PLAN
OPEN PARKING
SWALE / OVERLAND FLOW SEE ENGR'S DETAILS
PROPOSED DRAINAGE EASEMENT
1.83 WIDE VIDE H404273
DRIVEWAY
EXIT 1
POWER POLE
VEHICLE CROSSING
HRV

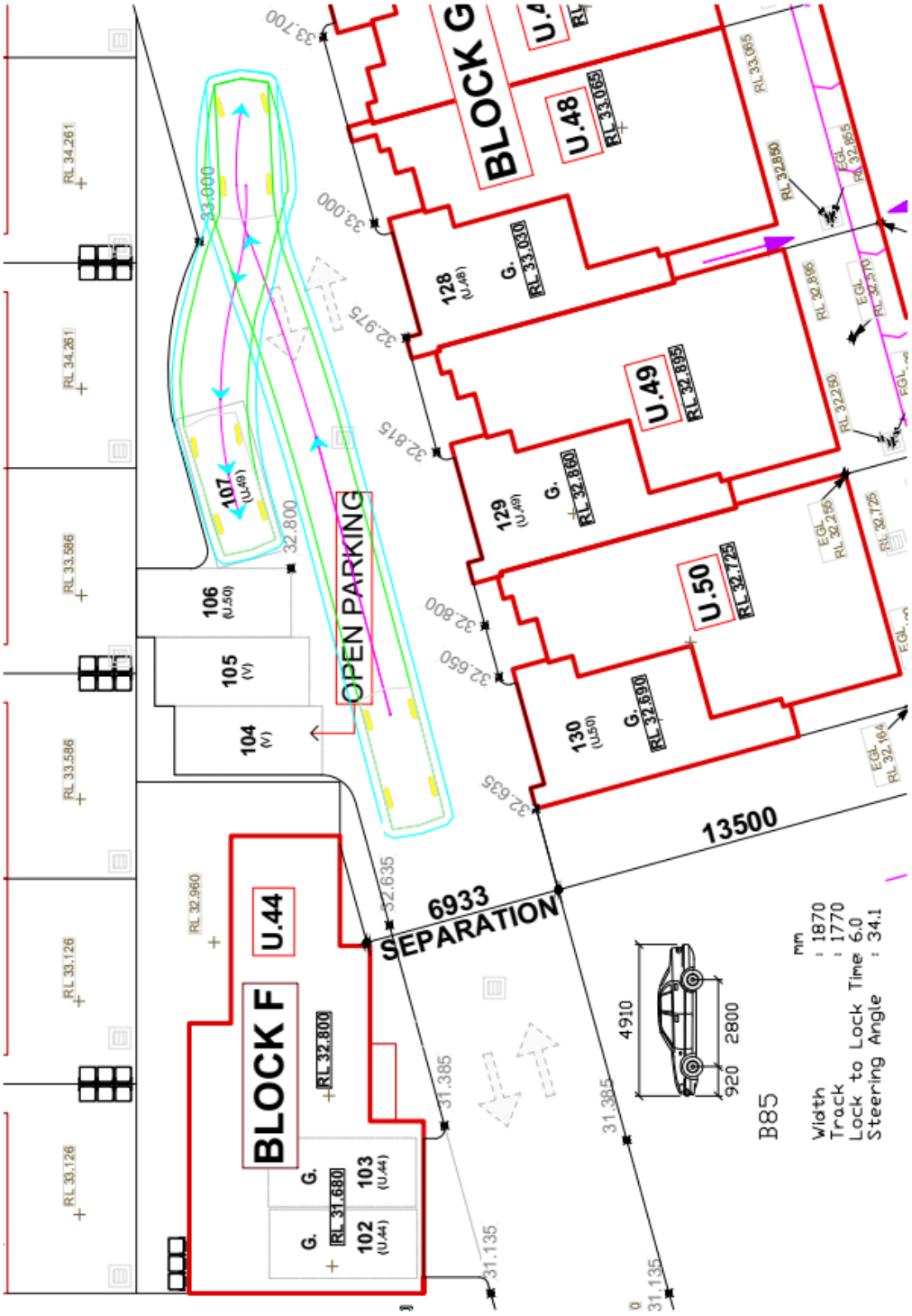

BOUNDARY 37 955
2293 SIDE SETBACK
BOUNDARY 35 680
BOUNDARY 34 350
BELOW GROUND OSD BASIN-
SHOWN AS DASHED LINE & FILL
REFER TO HYDRAULIC ENGRS PLAN
OPEN PARKING
SWALE/ OVERLAND FLOW
SEE ENGR'S DETAILS
OPEN PARKING
ENTRY SIGNAGE &
LETTERBOXES
PROPOSED DRAINAGE
EASEMENT
1.83 WIDE VIDE H404273
VEHICLE CROSSING
POWER POLE
CONCRETE KERB & GUTTER
DP657107
DP30217
DP34592
HRV
Width : 2500
Track to Lock Time : 6.0
Lock to Lock Time : 35.2
Steering Angle : 32
12500
6600
2400

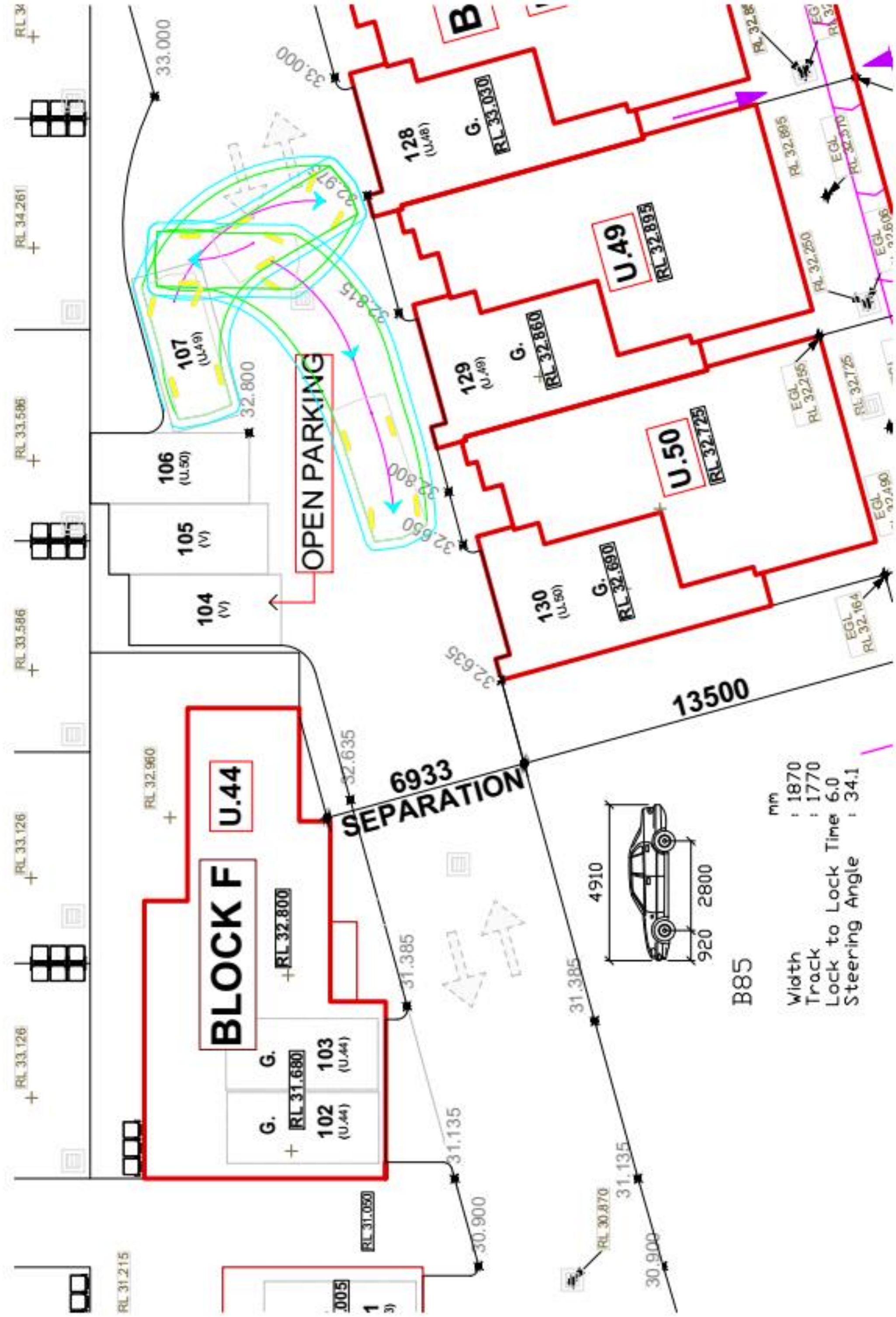

BELOW GROUND OSD BASIN-
SHOWN AS DASHED LINE & FILL
REFER TO HYDRAULIC ENGRS PLAN
OPEN PARKING
BOUNDARY 35 680
OPEN PARKING
PROPOSED DRAINAGE
EASEMENT
1.83 WIDE VIDE H404273
VEHICLE CROSSING
CONCRETE KERB & GUTTER
POWER POLE
LINKS
2
DP30217
B99
Width : 1940
Track : 1840
Lock to Lock Time 6.0
Steering Angle : 33.9
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

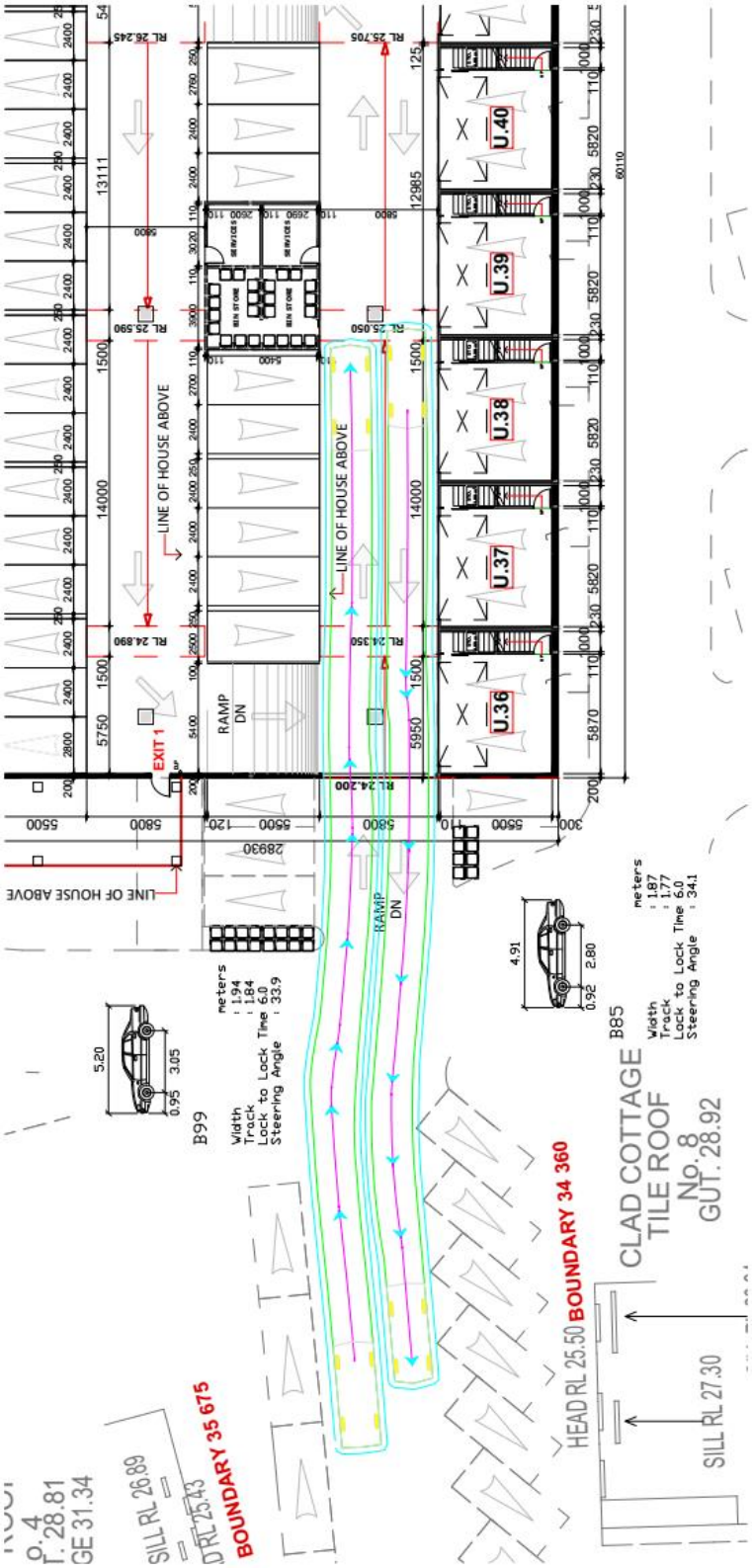

SWALE/ OVERLAND FLOW
SEE ENGR'S DETAILS
BLOCK H
U.51
U.52
U.53
2210
SETBACK
12406
SETBACK
SOUTH CAR PARK
BOUNDARY 41 450
SWALE/ OVERLAND FLOW
SEE ENGR'S DETAILS
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

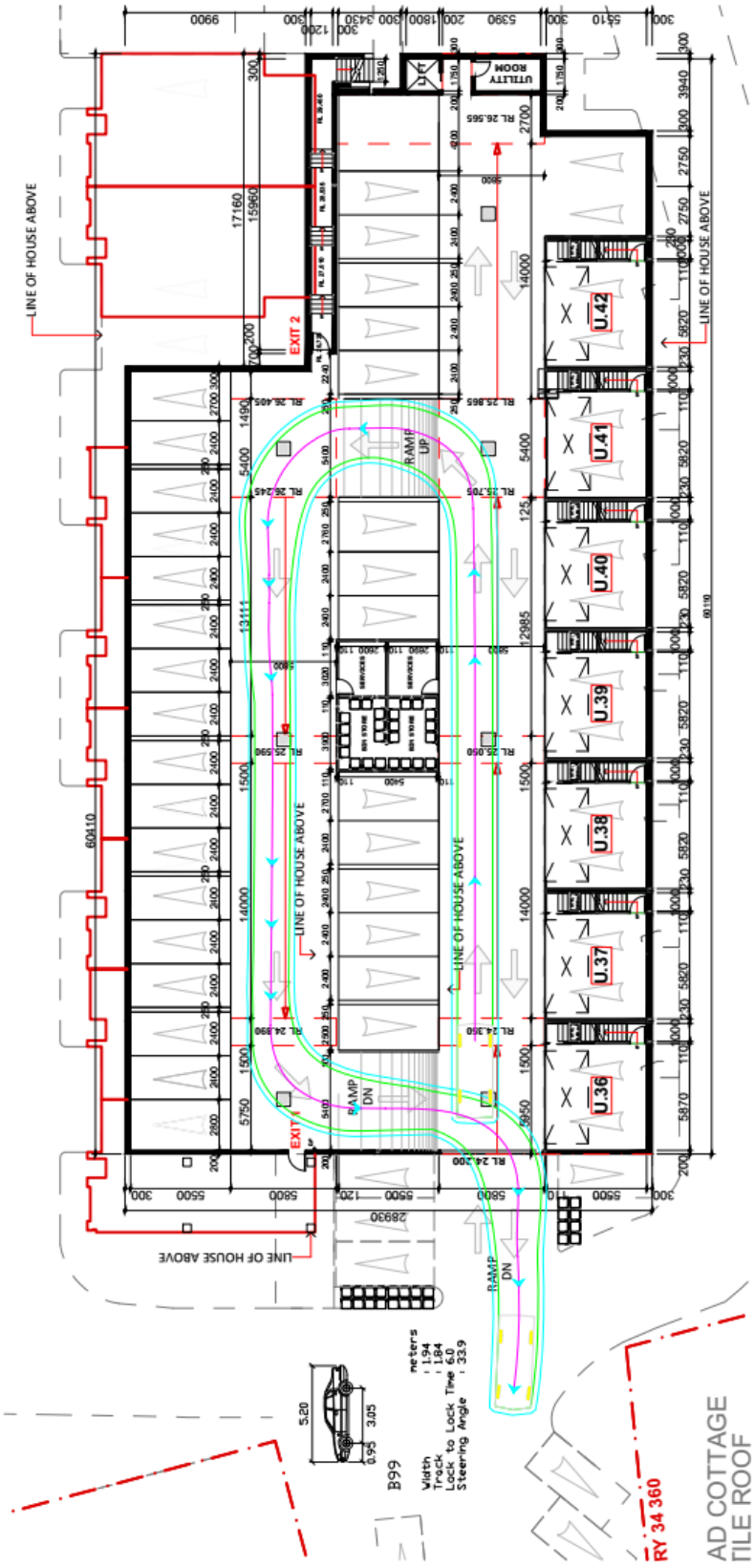

BELOW GROUND OSD BASIN-
SHOWN AS DASHED LINE & FILL
REFER TO HYDRAULIC ENGRS PLAN
OPEN PARKING
BOUNDARY 35 680
BOUNDARY 34 350
SWALE/ OVERLAND FLOW
SEE ENGR'S DETAILS
OPEN PARKING
ENTRY SIGNAGE &
LETTERBOXES
6000
DRIVEWAY
EXIT 1
B85
U.20
U.21
U.22
U.36
U.37
DP30217

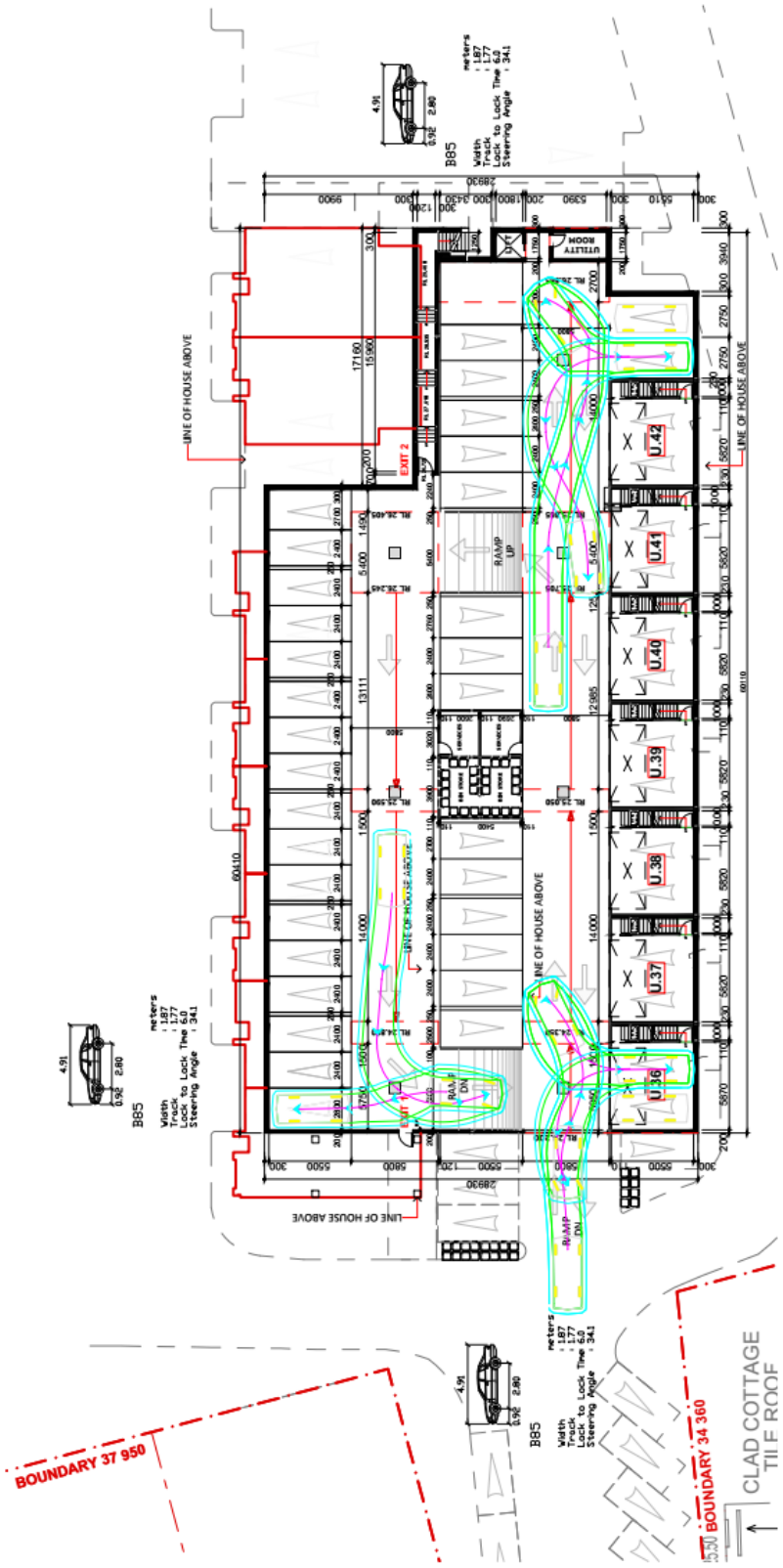

BELOW GROUND OSD BASIN- SHOWN AS DASHED LINE & FILL TO HYDRAULIC ENGRS PLAN
OPEN PARKING
BOUNDARY 35 680
BOUNDARY 34 350
SWALE/ OVERLAND FLOW SEE ENGR'S DETAILS
OPEN PARKING
ENTRY SIGNAGE &
EXIT 1
U.20
U.21
U.22
U.36
U.37
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
4910
2800
920
5%
2.3%
17500 15%
11750 20%
2500 12.5%
DRIVEWAY 6000
basement bins for kerb-side pick-up
pier below
cantilevered artificial lawn (carspace below)

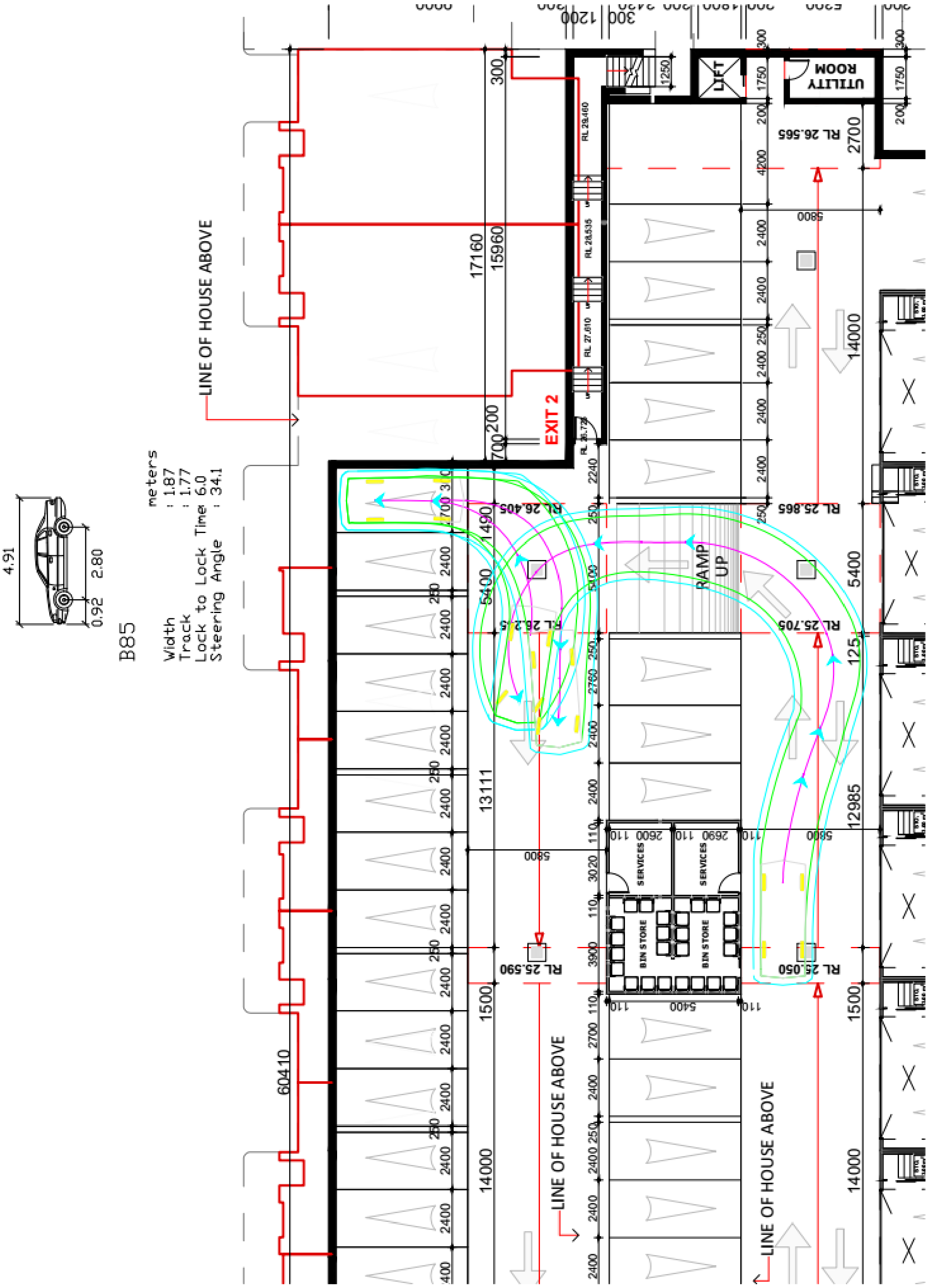

BLOCK G
U.48
RL 33.065
U.49
RL 32.895
U.50
RL 32.725
128 (U.48)
G.
RL 33.030
129 (U.49)
G.
RL 32.860
130 (U.50)
G.
RL 32.690
OPEN PARKING
107 (U.49)
106 (U.50)
105 (V)
104 (V)
BLOCK F
U.44
RL 32.800
G.
RL 31.680
102 (U.44)
103 (U.44)
13500
6933
SEPARATION
4910
2800
920
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

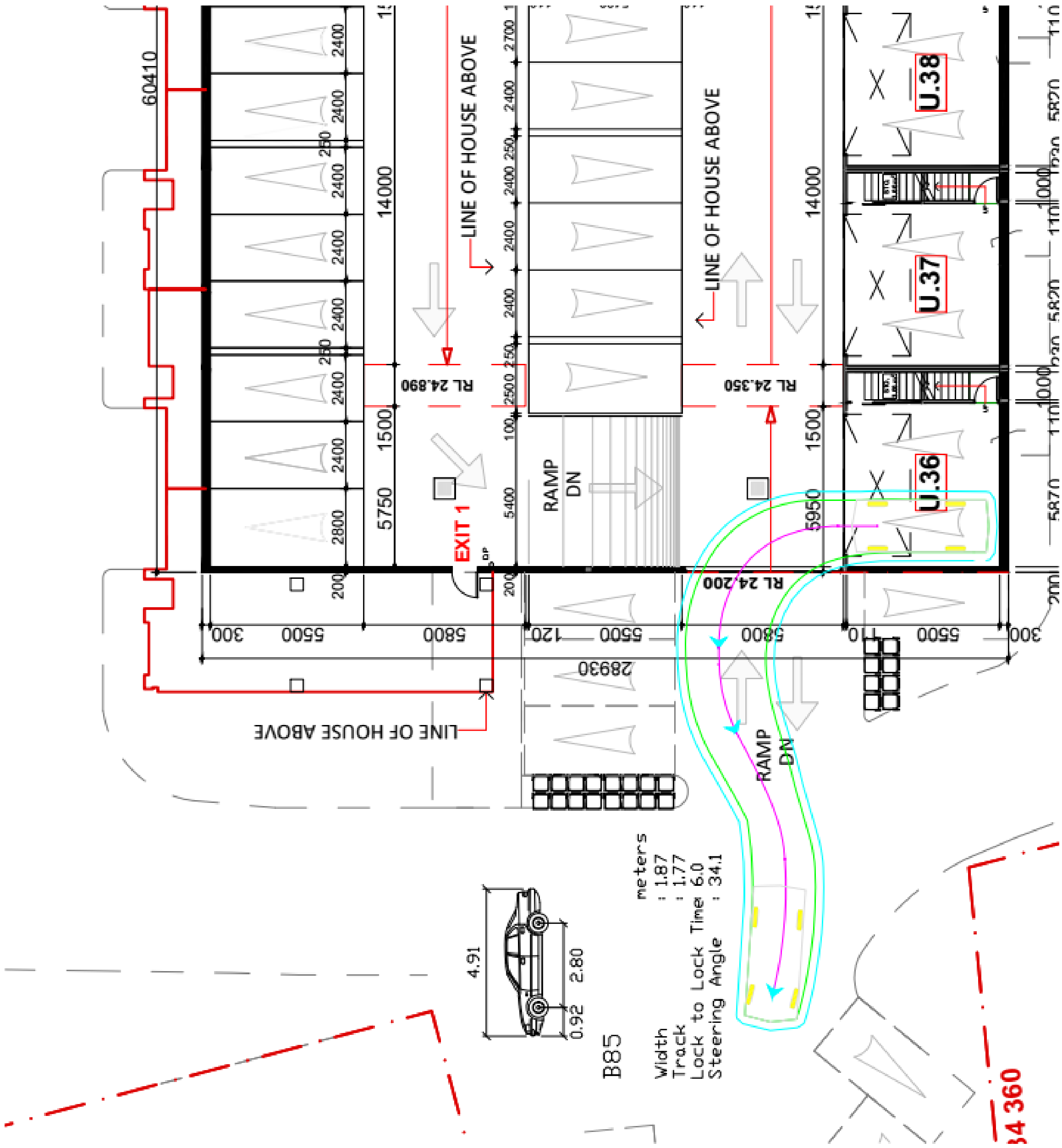

OPEN PARKING
BLOCK F
U.44
U.49
U.50
128 (U.48)
129 (U.49)
130 (U.50)
107 (U.49)
106 (U.50)
105 (V)
104 (V)
103 (U.44)
102 (U.44)
6933
SEPARATION
13500
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1

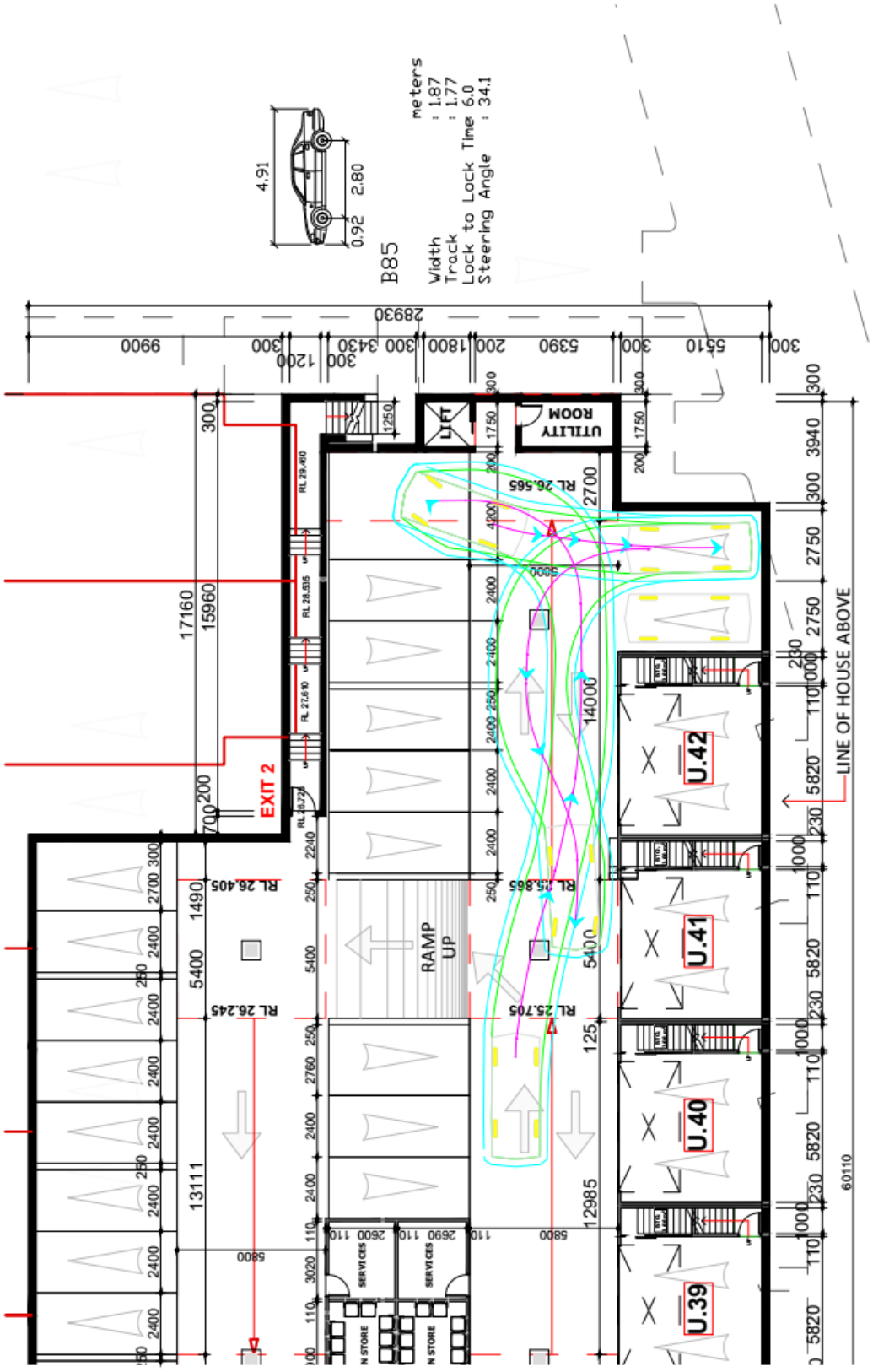

U.40
U.39
U.38
U.37
U.36
LINE OF HOUSE ABOVE
RAMP DN
EXIT 1
RL 26.245
RL 25.705
RL 25.590
RL 25.050
RL 24.890
RL 24.350
RL 24.200
B99
B85
meters
Width : 1.94
Track : 1.84
Lock to Lock Time 6.0
Steering Angle : 33.9
Width : 1.87
Track : 1.77
Lock to Lock Time 6.0
Steering Angle : 34.1
5.20
4.91
2.80
CLAD COTTAGE
TILE ROOF
No. 8
GUT. 28.92
HEAD RL 25.50 BOUNDARY 34 360
SILL RL 27.30
SILL RL 26.89
BOUNDARY 35 675

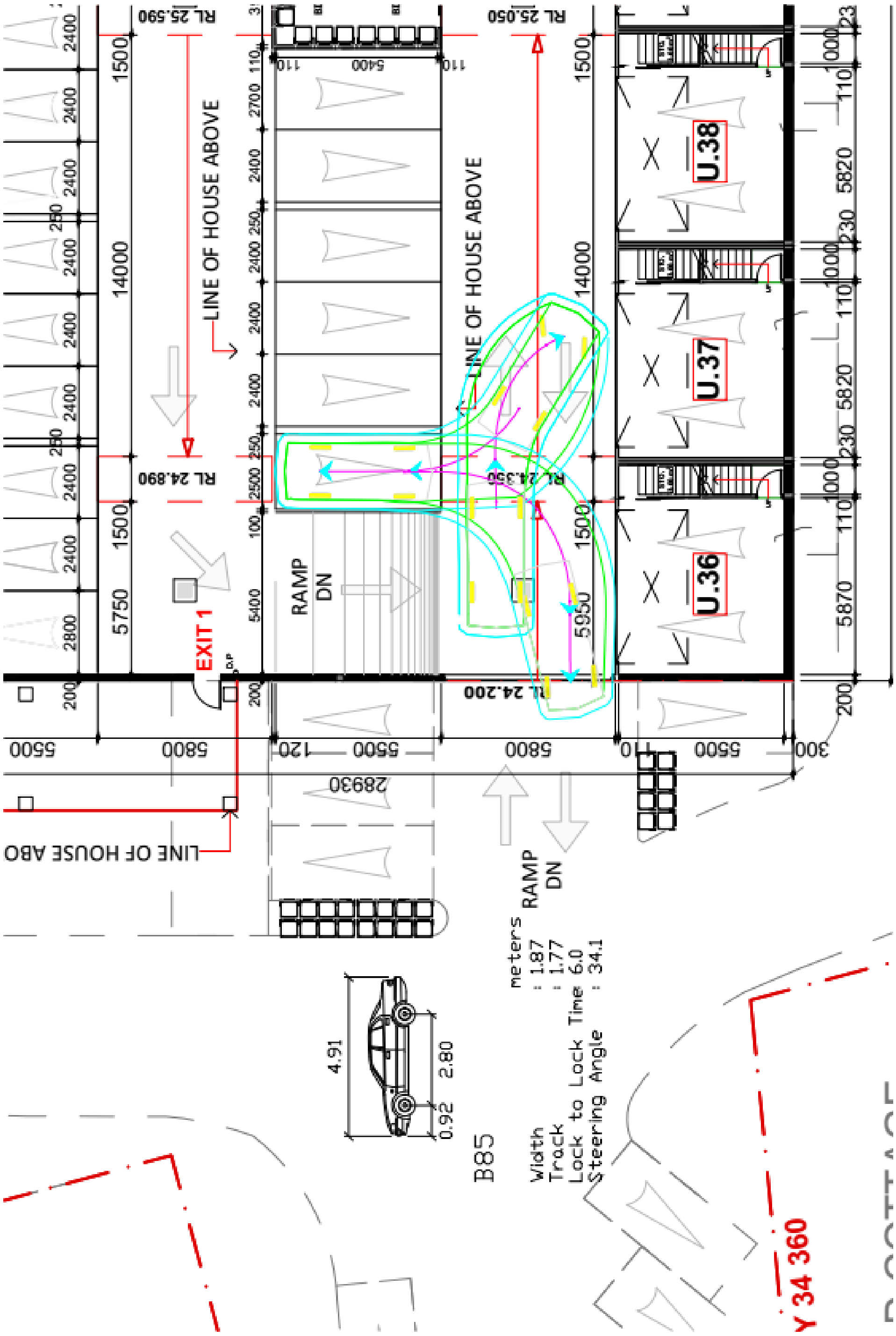

LINE OF HOUSE ABOVE
EXIT 2
EXIT 1
RAMP UP
RAMP DN
UTILITY ROOM
U.42
U.41
U.40
U.39
U.38
U.37
U.36
RL 26.565
RL 25.865
RL 25.705
RL 25.050
RL 24.360
RL 24.200
B99
Width : 1.94
Track : 1.84
Lock to Lock Time 6.0
Steering Angle : 33.9
RY 34 360
AD COTTAGE
TILE ROOF

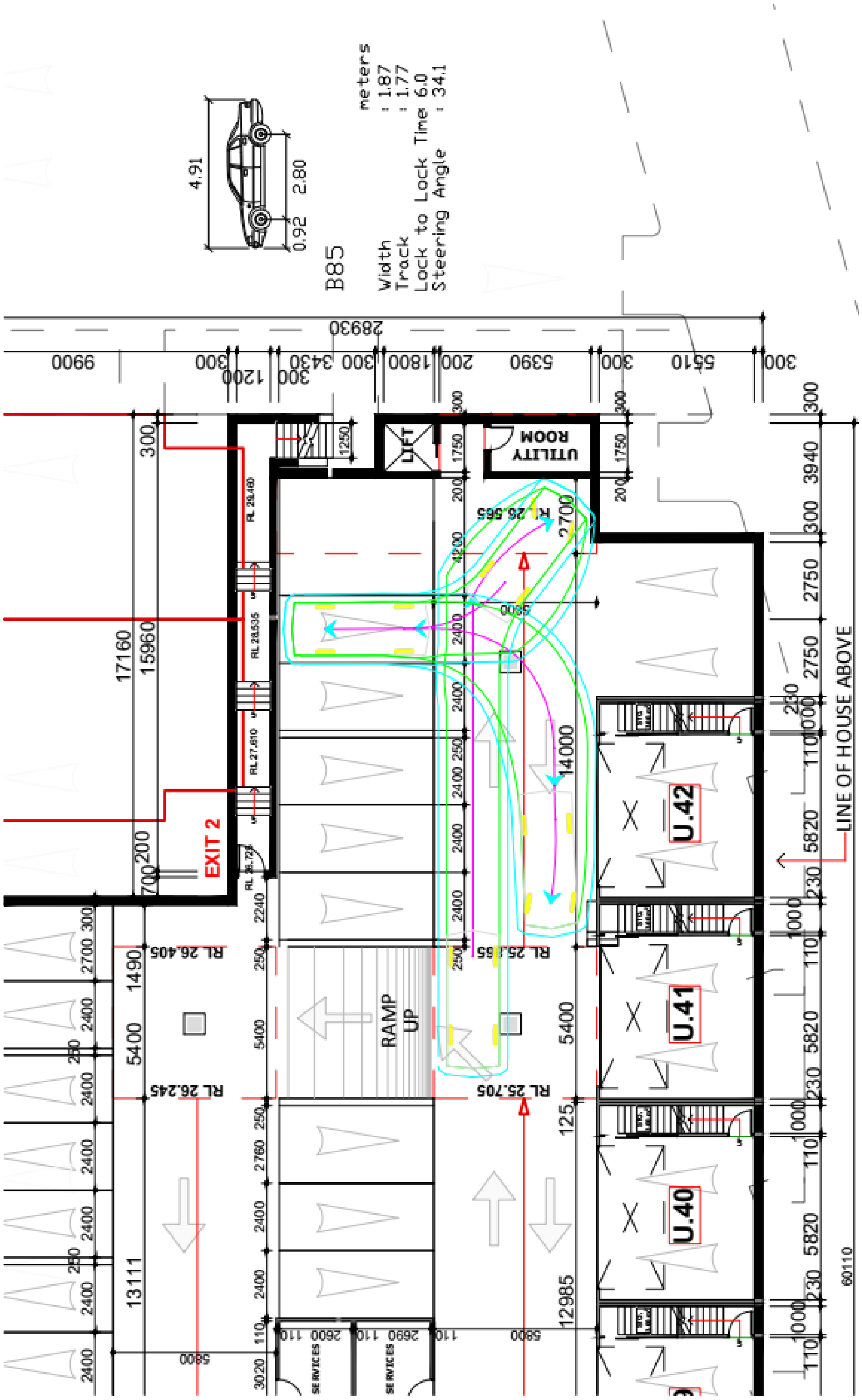

B85
LINE OF HOUSE ABOVE
EXIT 2
EXIT 1
RAMP UP
RAMP DN
U.42
U.41
U.40
U.39
U.38
U.37
U.36
BOUNDARY 37 950
BOUNDARY 34 360
CLAD COTTAGE
TILE ROOF


B85
meters
Width : 1.87
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 34.1
4.91
0.92
2.80
LINE OF HOUSE ABOVE
EXIT 2
RAMP UP
LIFT
UTILITY ROOM
SERVICES
BIN STORE
RL 26.565
RL 25.865
RL 26.405
RL 25.705
RL 25.590
RL 25.050
17160
15960
13111
60410
14000
5400
5800
12985


LINE OF HOUSE ABOVE
LINE OF HOUSE ABOVE
LINE OF HOUSE ABOVE
RAMP DN
RAMP DN
EXIT 1
RL 24.890
RL 24.350
RL 24.200
U.36
U.37
U.38
60410
28930
14000
14000
B85
meters
Width : 1.87
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 34.1
4.91
2.80
0.92


B85
Width : 1.87
Track : 1.77
Lock to Lock Time 6.0
Steering Angle : 34.1
meters
4.91
2.80
0.92
28930
9900
300
1200
300
3430
300
1800
200
5390
300
5510
300
UTILITY ROOM
LIFT
RL 26.565
RL 25.865
RL 26.405
RL 26.245
RL 25.705
EXIT 2
RAMP UP
SERVICES
SERVICES
N STORE
N STORE
U.42
U.41
U.40
U.39
LINE OF HOUSE ABOVE
17160
15960
14000
13111
12985
5400
60110


LINE OF HOUSE ABOVE
LINE OF HOUSE ABOVE
RAMP
DN
EXIT 1
U.38
U.37
U.36
RL 25.590
RL 25.050
RL 24.890
RL 24.350
RL 24.200
28930
RAMP
DN
B85
meters
Width : 1.87
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 34.1
4.91
2.80
0.92
LINE OF HOUSE ABO



B85
meters
Width : 1.87
Track : 1.77
Lock to Lock Time 6.0
Steering Angle : 34.1
4.91
0.92 2.80
LIFT
UTILITY ROOM
EXIT 2
RAMP UP
U.42
U.41
U.40
LINE OF HOUSE ABOVE
SERVICES
SERVICES

Appendix C – Traffic Volume Counts

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph. Mob.0418-239019

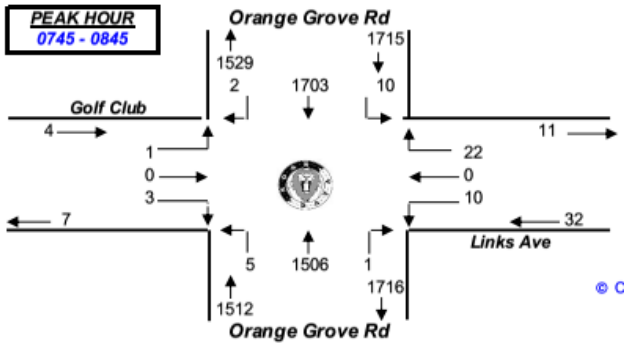
Client : Hemanote Consultants
Job No/Name : 7730 CABRAMATTA Links Ave
Day/Date : Tuesday 9th August 2022

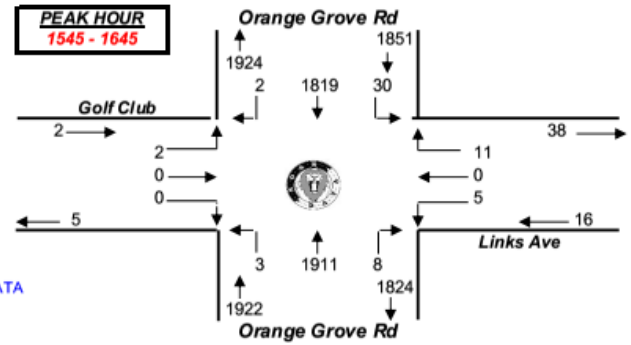
All Vehicles	NORTH Orange Grove Rd			WEST Golf Club			SOUTH Orange Grove Rd			EAST Links Ave			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	1	321	0	0	0	0	2	356	1	3	0	4	**688**
0715 - 0730	3	354	1	0	0	0	1	357	0	0	0	3	**719**
0730 - 0745	5	369	0	0	0	0	4	401	0	1	0	2	**782**
0745 - 0800	1	421	1	0	0	1	3	383	1	2	0	4	**817**
0800 - 0815	1	462	0	1	0	1	0	401	0	1	0	3	**870**
0815 - 0830	3	367	1	0	0	0	1	375	0	2	0	9	**758**
0830 - 0845	5	453	0	0	0	1	1	347	0	5	0	6	**818**
0845 - 0900	3	401	1	1	0	1	1	338	0	2	0	4	**752**
Period End	22	3148	4	2	0	4	13	2958	2	16	0	35	**6204**

All Vehicles	NORTH Orange Grove Rd			WEST Golf Club			SOUTH Orange Grove Rd			EAST Links Ave			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1515	3	410	1	1	0	0	5	468	1	3	0	8	**900**
1515 - 1530	6	356	0	1	0	2	0	383	1	1	0	1	**751**
1530 - 1545	4	450	0	2	0	0	3	401	4	2	0	4	**870**
1545 - 1600	11	475	0	0	0	0	2	455	1	0	0	2	**946**
1600 - 1615	4	459	0	0	0	0	1	459	3	2	0	3	**931**
1615 - 1630	7	463	1	2	0	0	0	479	1	1	0	3	**957**
1630 - 1645	8	422	1	0	0	0	0	518	3	2	0	3	**957**
1645 - 1700	3	441	1	0	0	1	2	457	1	2	0	4	**912**
1700 - 1715	2	387	0	1	1	0	1	460	2	4	0	6	**864**
1715 - 1730	10	397	0	3	0	1	0	455	0	1	0	3	**870**
1730 - 1745	6	440	2	1	0	1	0	482	4	1	0	3	**940**
1745 - 1800	3	387	1	1	0	1	0	464	3	0	0	3	**863**
Period End	67	5087	7	12	1	6	14	5481	24	19	0	43	**10761**

Peak Time	NORTH Orange Grove Rd			WEST Golf Club			SOUTH Orange Grove Rd			EAST Links Ave			
	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	10	1465	2	0	0	1	10	1497	2	6	0	13	**3006**
0715 - 0815	10	1606	2	1	0	2	8	1542	1	4	0	12	**3188**
0730 - 0830	10	1619	2	1	0	2	8	1560	1	6	0	18	**3227**
0745 - 0845	10	1703	2	1	0	3	5	1506	1	10	0	22	**3263**
0800 - 0900	12	1683	2	2	0	3	3	1461	0	10	0	22	**3198**
PEAK HOUR	10	1703	2	1	0	3	5	1506	1	10	0	22	**3263**

Peak Time	NORTH Orange Grove Rd			WEST Golf Club			SOUTH Orange Grove Rd			EAST Links Ave			
	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1500 - 1600	24	1691	1	4	0	2	10	1707	7	6	0	15	**3467**
1515 - 1615	25	1740	0	3	0	2	6	1698	9	5	0	10	**3498**
1530 - 1630	26	1847	1	4	0	0	6	1794	9	5	0	12	**3704**
1545 - 1645	30	1819	2	2	0	0	3	1911	8	5	0	11	**3791**
1600 - 1700	22	1785	3	2	0	1	3	1913	8	7	0	13	**3757**
1615 - 1715	20	1713	3	3	1	1	3	1914	7	9	0	16	**3690**
1630 - 1730	23	1647	2	4	1	2	3	1890	6	9	0	16	**3603**
1645 - 1745	21	1665	3	5	1	3	3	1854	7	8	0	16	**3586**
1700 - 1800	21	1611	3	6	1	3	1	1861	9	6	0	15	**3537**
PEAK HOUR	30	1819	2	2	0	0	3	1911	8	5	0	11	**3791**





Hemanote Consultants

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph. Mob.0418-239019
Client : Hemanote Consultants
Job No/Name : 7730 CABRAMATTA Links Ave
Day/Date : Tuesday 9th August 2022
Intersection Details
Obtained via satellite
May be incorrect
AM PEAK HOUR
0745 - 0845
PM PEAK HOUR
1545 - 1645
Weather >>>
Orange Grove Rd
Links Ave
Golf Club
Orange Grove Rd
N
R T L
2 1703 10 AM
2 1819 30 PM
R T L
11 22 AM
0 0
5 10 PM
L T R
1 0 3 AM
2 0 0 PM
L T R
3 1911 8 PM
5 1506 1 AM

Appendix D – SIDRA Intersection Results

MOVEMENT SUMMARY – 7.45am – 8.45am – Base Year 2022 – Orange Grove Road / Links Avenue

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	5	0.0	5	0.0	0.494	15.3	LOS B	12.2	90.2	0.64	0.56	0.64	42.7
2	T1	1506	7.0	1585	7.0	*0.494	9.0	LOS A	12.2	90.3	0.64	0.56	0.64	58.8
3	R2	1	0.0	1	0.0	0.002	36.4	LOS C	0.0	0.3	0.71	0.61	0.71	37.4
Approach		1512	7.0	1592	7.0	0.494	9.0	LOS A	12.2	90.3	0.64	0.56	0.64	58.7
East: Links Avenue														
4	L2	10	0.0	11	0.0	0.125	50.0	LOS D	1.7	12.2	0.88	0.72	0.88	31.8
5	T1	1	0.0	1	0.0	*0.125	45.5	LOS D	1.7	12.2	0.88	0.72	0.88	14.3
6	R2	22	0.0	23	0.0	0.125	50.0	LOS D	1.7	12.2	0.88	0.72	0.88	21.7
Approach		33	0.0	35	0.0	0.125	49.9	LOS D	1.7	12.2	0.88	0.72	0.88	25.2
North: Orange Grove Avenue														
7	L2	10	0.0	11	0.0	0.880	54.3	LOS D	37.5	278.2	1.00	1.01	1.15	22.5
8	T1	1703	7.0	1793	7.0	*0.880	48.0	LOS D	37.5	278.4	1.00	1.01	1.15	34.7
9	R2	2	0.0	2	0.0	*0.023	66.9	LOS E	0.1	0.9	0.97	0.61	0.97	12.3
Approach		1715	7.0	1805	7.0	0.880	48.0	LOS D	37.5	278.4	1.00	1.01	1.15	34.6
West: Golf Club Private Road														
10	L2	1	0.0	1	0.0	0.019	47.2	LOS D	0.3	1.8	0.85	0.63	0.85	16.0
11	T1	1	0.0	1	0.0	0.019	44.0	LOS D	0.3	1.8	0.85	0.63	0.85	17.5
12	R2	3	0.0	3	0.0	0.019	47.3	LOS D	0.3	1.8	0.85	0.63	0.85	30.0
Approach		5	0.0	5	0.0	0.019	46.6	LOS D	0.3	1.8	0.85	0.63	0.85	25.6
All Vehicles		3265	6.9	3437	6.9	0.880	30.0	LOS C	37.5	278.4	0.83	0.80	0.91	42.6

Post-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	5	0.0	5	0.0	0.494	15.3	LOS B	12.2	90.2	0.64	0.56	0.64	42.7
2	T1	1506	7.0	1585	7.0	*0.494	9.0	LOS A	12.2	90.3	0.64	0.56	0.64	58.8
3	R2	11	0.0	12	0.0	0.020	36.9	LOS C	0.5	3.2	0.72	0.68	0.72	37.2
Approach		1522	6.9	1602	6.9	0.494	9.2	LOS A	12.2	90.3	0.64	0.56	0.64	58.5
East: Links Avenue														
4	L2	25	0.0	26	0.0	0.318	52.1	LOS D	4.6	32.3	0.92	0.77	0.92	31.2
5	T1	1	0.0	1	0.0	*0.318	47.5	LOS D	4.6	32.3	0.92	0.77	0.92	13.9
6	R2	58	0.0	61	0.0	0.318	52.0	LOS D	4.6	32.3	0.92	0.77	0.92	21.2
Approach		84	0.0	88	0.0	0.318	52.0	LOS D	4.6	32.3	0.92	0.77	0.92	24.6
North: Orange Grove Avenue														
7	L2	51	0.0	54	0.0	0.901	58.4	LOS E	40.3	297.4	1.00	1.04	1.19	21.3
8	T1	1703	7.0	1793	7.0	*0.901	52.0	LOS D	40.3	298.9	1.00	1.04	1.19	33.2
9	R2	2	0.0	2	0.0	*0.023	66.9	LOS E	0.1	0.9	0.97	0.61	0.97	12.3
Approach		1756	6.8	1848	6.8	0.901	52.2	LOS D	40.3	298.9	1.00	1.04	1.19	32.9
West: Golf Club Private Road														
10	L2	1	0.0	1	0.0	0.019	47.3	LOS D	0.3	1.8	0.85	0.63	0.85	16.0
11	T1	1	0.0	1	0.0	0.019	44.1	LOS D	0.3	1.8	0.85	0.63	0.85	17.5
12	R2	3	0.0	3	0.0	0.019	47.3	LOS D	0.3	1.8	0.85	0.63	0.85	30.0
Approach		5	0.0	5	0.0	0.019	46.6	LOS D	0.3	1.8	0.85	0.63	0.85	25.6
All Vehicles		3367	6.7	3544	6.7	0.901	32.8	LOS C	40.3	298.9	0.83	0.82	0.93	40.9

MOVEMENT SUMMARY – 3.45pm – 4.45pm – Base Year 2022 – Orange Grove Road / Links Avenue

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	3	0.0	3	0.0	0.557	15.1	LOS B	18.0	133.5	0.60	0.54	0.60	42.9
2	T1	1911	7.0	2012	7.0	*0.557	8.7	LOS A	18.0	133.6	0.60	0.54	0.60	59.1
3	R2	8	0.0	8	0.0	0.013	40.7	LOS C	0.4	2.8	0.68	0.67	0.68	35.7
Approach		1922	7.0	2023	7.0	0.557	8.8	LOS A	18.0	133.6	0.60	0.54	0.60	58.9
East: Links Avenue														
4	L2	5	0.0	5	0.0	0.074	63.3	LOS E	1.1	7.9	0.89	0.69	0.89	28.3
5	T1	1	0.0	1	0.0	*0.074	58.7	LOS E	1.1	7.9	0.89	0.69	0.89	12.2
6	R2	11	0.0	12	0.0	0.074	63.3	LOS E	1.1	7.9	0.89	0.69	0.89	18.8
Approach		17	0.0	18	0.0	0.074	63.0	LOS E	1.1	7.9	0.89	0.69	0.89	21.7
North: Orange Grove Avenue														
7	L2	30	0.0	32	0.0	0.900	64.5	LOS E	50.4	372.8	1.00	1.00	1.13	19.9
8	T1	1819	7.0	1915	7.0	*0.900	58.1	LOS E	50.4	373.9	1.00	1.01	1.13	31.3
9	R2	2	0.0	2	0.0	*0.028	83.6	LOS F	0.2	1.1	0.98	0.61	0.98	10.3
Approach		1851	6.9	1948	6.9	0.900	58.2	LOS E	50.4	373.9	1.00	1.01	1.13	31.2
West: Golf Club Private Road														
10	L2	2	0.0	2	0.0	0.016	60.7	LOS E	0.3	1.8	0.87	0.62	0.87	13.3
11	T1	1	0.0	1	0.0	0.016	57.5	LOS E	0.3	1.8	0.87	0.62	0.87	14.4
12	R2	1	0.0	1	0.0	0.016	60.7	LOS E	0.3	1.8	0.87	0.62	0.87	26.0
Approach		4	0.0	4	0.0	0.016	59.9	LOS E	0.3	1.8	0.87	0.62	0.87	17.4
All Vehicles		3794	6.9	3994	6.9	0.900	33.2	LOS C	50.4	373.9	0.79	0.77	0.86	40.9

Post-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	3	0.0	3	0.0	0.557	15.1	LOS B	18.0	133.6	0.60	0.54	0.60	42.9
2	T1	1911	7.0	2012	7.0	*0.557	8.7	LOS A	18.0	133.6	0.60	0.54	0.60	59.1
3	R2	18	0.0	19	0.0	0.030	41.0	LOS C	0.9	6.3	0.69	0.69	0.69	35.5
Approach		1932	6.9	2034	6.9	0.557	9.0	LOS A	18.0	133.6	0.60	0.54	0.60	58.7
East: Links Avenue														
4	L2	19	0.0	20	0.0	0.283	65.9	LOS E	4.5	31.5	0.93	0.76	0.93	27.7
5	T1	1	0.0	1	0.0	*0.283	61.4	LOS E	4.5	31.5	0.93	0.76	0.93	11.8
6	R2	45	0.0	47	0.0	0.283	65.9	LOS E	4.5	31.5	0.93	0.76	0.93	18.3
Approach		65	0.0	68	0.0	0.283	65.9	LOS E	4.5	31.5	0.93	0.76	0.93	21.3
North: Orange Grove Avenue														
7	L2	68	0.0	72	0.0	0.919	69.3	LOS E	53.8	396.5	1.00	1.03	1.17	18.8
8	T1	1819	7.0	1915	7.0	*0.919	62.9	LOS E	53.8	399.1	1.00	1.03	1.17	29.9
9	R2	2	0.0	2	0.0	*0.028	83.6	LOS F	0.2	1.1	0.98	0.61	0.98	10.3
Approach		1889	6.7	1988	6.7	0.919	63.2	LOS E	53.8	399.1	1.00	1.03	1.17	29.6
West: Golf Club Private Road														
10	L2	2	0.0	2	0.0	0.016	60.7	LOS E	0.3	1.8	0.87	0.62	0.87	13.3
11	T1	1	0.0	1	0.0	0.016	57.5	LOS E	0.3	1.8	0.87	0.62	0.87	14.4
12	R2	1	0.0	1	0.0	0.016	60.7	LOS E	0.3	1.8	0.87	0.62	0.87	26.0
Approach		4	0.0	4	0.0	0.016	59.9	LOS E	0.3	1.8	0.87	0.62	0.87	17.4
All Vehicles		3890	6.7	4095	6.7	0.919	36.3	LOS C	53.8	399.1	0.80	0.78	0.88	39.2

Hemanote Consultants

MOVEMENT SUMMARY – 7.45am – 8.45am – Future Year 2032 – Orange Grove Road / Links Avenue

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	5	0.0	6	0.0	0.533	15.2	LOS B	17.1	126.6	0.59	0.53	0.59	42.8
2	T1	1506	7.0	1902	7.0	*0.533	8.8	LOS A	17.1	126.7	0.59	0.53	0.59	58.9
3	R2	1	0.0	1	0.0	0.002	42.4	LOS C	0.1	0.4	0.70	0.62	0.70	35.0
Approach		1512	7.0	1910	7.0	0.533	8.9	LOS A	17.1	126.7	0.59	0.53	0.59	58.8
East: Links Avenue														
4	L2	10	0.0	13	0.0	0.165	63.6	LOS E	2.7	18.6	0.90	0.73	0.90	28.2
5	T1	1	0.0	1	0.0	*0.165	59.0	LOS E	2.7	18.6	0.90	0.73	0.90	12.1
6	R2	22	0.0	28	0.0	0.165	63.5	LOS E	2.7	18.6	0.90	0.73	0.90	18.7
Approach		33	0.0	42	0.0	0.165	63.4	LOS E	2.7	18.6	0.90	0.73	0.90	21.9
North: Orange Grove Avenue														
7	L2	10	0.0	13	0.0	0.968	86.8	LOS F	66.9	495.8	1.00	1.14	1.29	16.0
8	T1	1703	7.0	2151	7.0	*0.968	80.4	LOS F	66.9	496.4	1.00	1.14	1.29	25.9
9	R2	2	0.0	3	0.0	*0.034	83.7	LOS F	0.2	1.3	0.98	0.62	0.98	10.3
Approach		1715	7.0	2166	7.0	0.968	80.4	LOS F	66.9	496.4	1.00	1.14	1.29	25.8
West: Golf Club Private Road														
10	L2	1	0.0	1	0.0	0.025	60.1	LOS E	0.4	2.7	0.87	0.64	0.87	13.4
11	T1	1	0.0	1	0.0	0.025	56.9	LOS E	0.4	2.7	0.87	0.64	0.87	14.5
12	R2	3	0.0	4	0.0	0.025	60.2	LOS E	0.4	2.7	0.87	0.64	0.87	26.1
Approach		5	0.0	6	0.0	0.025	59.5	LOS E	0.4	2.7	0.87	0.64	0.87	22.0
All Vehicles		3265	6.9	4124	6.9	0.968	47.1	LOS D	66.9	496.4	0.81	0.85	0.96	34.9

Post-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	5	0.0	6	0.0	0.533	15.2	LOS B	17.1	126.8	0.59	0.53	0.59	42.8
2	T1	1506	7.0	1902	7.0	*0.533	8.9	LOS A	17.1	126.9	0.59	0.53	0.59	58.9
3	R2	11	0.0	14	0.0	0.024	43.8	LOS D	0.7	4.8	0.72	0.68	0.72	34.5
Approach		1522	6.9	1923	6.9	0.533	9.1	LOS A	17.1	126.9	0.59	0.53	0.59	58.6
East: Links Avenue														
4	L2	25	0.0	32	0.0	0.418	66.6	LOS E	7.1	49.7	0.95	0.79	0.95	27.5
5	T1	1	0.0	1	0.0	*0.418	62.0	LOS E	7.1	49.7	0.95	0.79	0.95	11.7
6	R2	58	0.0	73	0.0	0.418	66.6	LOS E	7.1	49.7	0.95	0.79	0.95	18.1
Approach		84	0.0	106	0.0	0.418	66.5	LOS E	7.1	49.7	0.95	0.79	0.95	21.3
North: Orange Grove Avenue														
7	L2	51	0.0	64	0.0	0.975	89.7	LOS F	69.9	516.0	1.00	1.14	1.30	15.5
8	T1	1703	7.0	2151	7.0	*0.975	83.4	LOS F	69.9	518.8	1.00	1.15	1.30	25.3
9	R2	2	0.0	3	0.0	*0.034	83.7	LOS F	0.2	1.3	0.98	0.62	0.98	10.3
Approach		1756	6.8	2218	6.8	0.975	83.5	LOS F	69.9	518.8	1.00	1.15	1.30	25.0
West: Golf Club Private Road														
10	L2	1	0.0	1	0.0	0.026	61.1	LOS E	0.4	2.7	0.87	0.64	0.87	13.2
11	T1	1	0.0	1	0.0	0.026	57.9	LOS E	0.4	2.7	0.87	0.64	0.87	14.3
12	R2	3	0.0	4	0.0	0.026	61.1	LOS E	0.4	2.7	0.87	0.64	0.87	25.9
Approach		5	0.0	6	0.0	0.026	60.5	LOS E	0.4	2.7	0.87	0.64	0.87	21.8
All Vehicles		3367	6.7	4253	6.7	0.975	49.4	LOS D	69.9	518.8	0.81	0.86	0.97	33.8

Hemanote Consultants

MOVEMENT SUMMARY – 3.45pm – 4.45pm – Future Year 2032 – Orange Grove Road / Links Avenue

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	3	0.0	4	0.0	0.676	16.6	LOS B	25.1	186.1	0.69	0.63	0.69	41.8
2	T1	1911	7.0	2414	7.0	*0.676	10.3	LOS A	25.1	186.1	0.69	0.62	0.69	57.5
3	R2	8	0.0	10	0.0	0.016	40.8	LOS C	0.5	3.3	0.69	0.67	0.69	35.6
Approach		1922	7.0	2428	7.0	0.676	10.4	LOS A	25.1	186.1	0.69	0.62	0.69	57.3
East: Links Avenue														
4	L2	5	0.0	6	0.0	0.085	62.5	LOS E	1.3	9.4	0.88	0.70	0.88	28.5
5	T1	1	0.0	1	0.0	*0.085	57.9	LOS E	1.3	9.4	0.88	0.70	0.88	12.3
6	R2	11	0.0	14	0.0	0.085	62.5	LOS E	1.3	9.4	0.88	0.70	0.88	19.0
Approach		17	0.0	21	0.0	0.085	62.2	LOS E	1.3	9.4	0.88	0.70	0.88	21.9
North: Orange Grove Avenue														
7	L2	30	0.0	38	0.0	1.099	174.7	LOS F	101.2	748.8	1.00	1.53	1.80	8.7
8	T1	1819	7.0	2298	7.0	*1.099	168.3	LOS F	101.2	751.0	1.00	1.54	1.80	15.0
9	R2	2	0.0	3	0.0	*0.034	83.7	LOS F	0.2	1.3	0.98	0.62	0.98	10.3
Approach		1851	6.9	2338	6.9	1.099	168.3	LOS F	101.2	751.0	1.00	1.54	1.80	14.9
West: Golf Club Private Road														
10	L2	2	0.0	3	0.0	0.018	59.8	LOS E	0.3	2.2	0.87	0.63	0.87	13.5
11	T1	1	0.0	1	0.0	0.018	56.6	LOS E	0.3	2.2	0.87	0.63	0.87	14.6
12	R2	1	0.0	1	0.0	0.018	59.8	LOS E	0.3	2.2	0.87	0.63	0.87	26.2
Approach		4	0.0	5	0.0	0.018	59.0	LOS E	0.3	2.2	0.87	0.63	0.87	17.6
All Vehicles		3794	6.9	4792	6.9	1.099	87.7	LOS F	101.2	751.0	0.84	1.07	1.23	24.0

Post-Development

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Orange Grove Avenue														
1	L2	3	0.0	4	0.0	0.676	16.6	LOS B	25.1	186.4	0.69	0.63	0.69	41.8
2	T1	1911	7.0	2414	7.0	*0.676	10.3	LOS A	25.1	186.4	0.69	0.62	0.69	57.5
3	R2	18	0.0	23	0.0	0.036	41.1	LOS C	1.1	7.6	0.70	0.70	0.70	35.5
Approach		1932	6.9	2440	6.9	0.676	10.6	LOS A	25.1	186.4	0.69	0.63	0.69	57.1
East: Links Avenue														
4	L2	19	0.0	24	0.0	0.327	65.5	LOS E	5.4	37.8	0.93	0.77	0.93	27.8
5	T1	1	0.0	1	0.0	*0.327	61.0	LOS E	5.4	37.8	0.93	0.77	0.93	11.9
6	R2	45	0.0	57	0.0	0.327	65.5	LOS E	5.4	37.8	0.93	0.77	0.93	18.3
Approach		65	0.0	82	0.0	0.327	65.5	LOS E	5.4	37.8	0.93	0.77	0.93	21.4
North: Orange Grove Avenue														
7	L2	68	0.0	86	0.0	1.122	192.5	LOS F	108.3	798.9	1.00	1.58	1.89	8.0
8	T1	1819	7.0	2298	7.0	*1.122	186.1	LOS F	108.4	804.1	1.00	1.61	1.89	13.8
9	R2	2	0.0	3	0.0	*0.034	83.7	LOS F	0.2	1.3	0.98	0.62	0.98	10.3
Approach		1889	6.7	2386	6.7	1.122	186.2	LOS F	108.4	804.1	1.00	1.61	1.89	13.6
West: Golf Club Private Road														
10	L2	2	0.0	3	0.0	0.019	59.8	LOS E	0.3	2.2	0.87	0.63	0.87	13.5
11	T1	1	0.0	1	0.0	0.019	56.6	LOS E	0.3	2.2	0.87	0.63	0.87	14.6
12	R2	1	0.0	1	0.0	0.019	59.8	LOS E	0.3	2.2	0.87	0.63	0.87	26.2
Approach		4	0.0	5	0.0	0.019	59.0	LOS E	0.3	2.2	0.87	0.63	0.87	17.6
All Vehicles		3890	6.7	4914	6.7	1.122	96.8	LOS F	108.4	804.1	0.84	1.10	1.27	22.3

Hemanote Consultants