INVESCO ASSET MANAGEMENT AUSTRALIA
(HOLDINGS) LIMITED

TRAFFIC REPORT FOR PROPOSED AMENDED EXPANSION OF FORESTWAY SHOPPING CENTRE, FRENCHS FOREST

DECEMBER 2018
(MODIFIED OCTOBER 2019)

COLSTON BUDD ROGERS & KAFES PTY LTD
ACN 002 334 296
Level 18 Tower A
Zenith Centre
821 Pacific Highway
CHATSWOOD NSW 2067

Telephone: (02) 9411 2411
Facsimile: (02) 9411 2422
Email: cbrk@cbrk.com.au

REF: 10857/3

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by Invesco Asset Management Australia (Holdings) Limited to prepare an updated report examining the traffic implications of the proposed amended expansion of Forestway Shopping Centre, Frenchs Forest (the 'Site'). The Site location is shown in Figure 1.

1.2 The existing shopping centre comprises some 9577m^2 GLA with some 428 car parking spaces (including some 80 spaces within Sorlie Place). Access is provided from Forest Way, Russell Avenue, Grace Avenue and Sorlie Place. In December 2018 a development application was submitted to Northern Beaches Council which proposed to expand the shopping centre to some 21,593m^2 GLA and increase parking provision to some 841 spaces (including the 80 spaces in Sorlie Place). Access was to be provided from Forest Way (with modifications to the existing pedestrian signals to allow for left in, left out and right out) and Grace Avenue. We prepared the traffic report for the 2018 scheme (Traffic Report for Proposed Expansion of Forestway Shopping Centre, Frenches Forest, October 2018) and a review of traffic matters raised in submissions (March 2019).

1.3 Following discussion with RMS and Council an amended scheme has been prepared which will replace the 2018 scheme. With respect the main changes are:

- a minor increase in floor area of some 260m^2 GLA; and

- modifications to the proposed Forest Way access with left in/left out (the right turn out has been removed and no modifications are proposed to the existing pedestrian signals on Forest Way).

1.4 This updated report assesses the traffic effects of these changes as well as our review of traffic matters raised in submissions (for the 2018 scheme). The traffic assessment takes into account the upgrades to the adjacent road network along Forest Way and Warringah Road as part of the Northern Beaches Hospital project.

1.5 This report assesses the implications of the proposed redevelopment of Forestway Shopping Centre through the following chapters:

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - assessing the traffic implications of the proposed development.

2. EXISTING CONDITIONS

Site Location

2.1 Forestway Shopping Centre is located on the northern part of the block bounded by Forest Way to the east, Russell Avenue to the north and Grace Avenue to the west. Frenchs Forest Public School is located to the south of the Site. Surrounding land use is predominantly residential with some commercial development on the northern side of the Russell Avenue opposite the site. To the east of the Site are The Forest High School and the Northern Beaches Hospital.

2.2 The existing shopping centre comprises some 9,577m^2 GLA with some 428 car parking spaces (including some 80 spaces within Sorlie Place). Access is provided from Forest Way (left in only), Russell Avenue (all movements) and Grace Avenue (all movements). Service access to the centre is provided from Sorlie Place and Grace Avenue.

Road Location

2.3 The road network in the vicinity of the Site comprises Warringah Road, Forest Way, Grace Avenue, Russell Avenue, Naree Road and Sorlie Place. Warringah Road is an arterial road connecting the northern beaches with the lower north shore. In the vicinity of the Site it is a six lane divided road with additional turn lanes at major intersections. As part of the Northern Beaches Hospital project Warringah Road is being upgraded to improve traffic flow.

2.4 Forest Way is an arterial road connecting Warringah Road to the south with Mona Vale Road to the north. Adjacent to the Site, it is a six lane divided road. The intersection of Warringah Road and Forest Way is traffic signal controlled. Pedestrian signals are located on Forest Way, towards the southern frontage of the Site. These provide pedestrian access to the shopping centre and to the bus stops located either side of Forest Way. As part of the Northern Beaches Hospital project, Forest Way is being upgraded to improve traffic flow.

2.5 Russell Avenue is located along the northern boundary of the site and connects Forest Way to the east with Grace Avenue to the west. It provides for one traffic lane in each direction. With exception of the right turn out of Russell Avenue in the weekday morning peak period, all movements are permitted at the intersection of Russell Avenue and Forest Way. As part of the upgrade of Forest Way, a separate right turn bay into Russell Avenue has been provided on Forest Way. Due to the high traffic flows on Forest Way, there can be long delays in turning right out of Russell Avenue onto Forest Way.

2.6 Grace Avenue is located along the western boundary of the site and is a collector road providing access to development to the west of Forest Way. It provides for one traffic lane in each direction with kerb side parking located clear of intersections. The intersection of Grace Avenue and Russell Avenue is controlled by a single lane roundabout. To the south Fitzpatrick Street connects Grace Avenue to Warringah Road.

2.7 Sorlie Place is located to the south of Site's western frontage and provides an at-grade car park (some 80 spaces). Sorlie Place connects to Grace Avenue at two locations with one way traffic flow in a clockwise direction. Sorlie Place provides

service access to the existing shopping centre. During school set down and pick up periods the southern side of Sorlie Place is used as a school bus zone.

2.8 Naree Road is located to the north of the site and forms part of an east west road running parallel to Warringah Road. As part of the Northern Beaches Hospital Project, Naree Road is being upgraded from a two lane to a four lane road with traffic signals constructed at the intersection Naree Road and Forest Way.

Traffic Flows

2.9 Traffic generated by the proposed development will have its greatest effects during weekday afternoon and Saturday midday peak periods when it combines with other traffic on the surrounding road network. In order to gauge traffic conditions, traffic counts (in August 2018) were undertaken at these times at the following intersections:

- Warringah Road/Forest Way (traffic signals);
- Forest Way/Russell Avenue (unsignalised);
- Forest Way/Naree Road (traffic signals);
- Grace Avenue/Russell Avenue (roundabout);
- Grace Avenue/Sorlie Place (unsignalised);
- Pedestrian signals on Forest Way; and
- Shopping centre access points on Forest Way, Russell Avenue and Grace Avenue (all unsignalised)

2.10 The results of the surveys are summarised in Table 2.1 and displayed in Figures 2 and 3.

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows		
Road	**Weekday Afternoon**	**Saturday Midday**
Warringah Road		
– east of Forest Way	3705	3515
– west of Forest Way	3175	2775
Forest Way		
– north of Naree Road	3340	4165
– south of Naree Road	3120	4110
– south of Russell Avenue	2970	3815
– north of Warringah Road	3390	4020
Russell Avenue		
– west of Forest Way	510	465
– east of Grace Avenue	400	385
Grace Avenue		
– north of Russell Avenue	835	695
– south of Russell Avenue	835	650
– north of Sorlie Place (N)	845	610
– south of Sorlie Place (S)	830	595
Sorlie Place		
– entry	130	160
– exit	140	150
Naree Road		
– east of Forest Way	640	555
Site Accesses		
– Forest Way (entry only)	160	200
– Russell Avenue	285	355
– Grace Avenue	120	155

2.11 Table 2.1 reveals that:

- Warringah Road carried some 2,800 to 3,700 vehicles per hour two-way during the surveyed weekday afternoon and Saturday midday peak hours. Traffic flows were highest east of Forest Way. Traffic flows were highest during the weekday afternoon peak period;

- Forest Way carried some 3,000 to 4,200 vehicles per hour two-way during the surveyed weekday afternoon and Saturday midday peak hours. Traffic flows were highest during the Saturday peak hour;

- Russell Avenue carried some 400 to 500 vehicles per hour two-way during the surveyed weekday afternoon and Saturday midday peak hours. Traffic flows were highest west of Forest Way;

- Grace Avenue carried some 600 to 850 vehicles per hour two-way during the surveyed weekday afternoon and Saturday midday peak hours. Traffic flows were highest during the weekday afternoon peak hour;

- Sorlie Place carried some 150 vehicles per hour two-way during the surveyed weekday afternoon and Saturday midday peak hours;

- Naree Road carried some 550 to 650 vehicles per hour two-way during the surveyed weekday afternoon and Saturday midday peak hours. Traffic flows were highest during the weekday afternoon peak hour; and

- The existing shopping centre generated some 850 to 1020 vehicles per hour two-way during the surveyed weekday afternoon and Saturday midday peak hours. The highest traffic generation was during the Saturday peak hour.

2.12 Observations of traffic flows around the existing centre found that:

- traffic flows in Sorlie Place were generally associated with the shopping centre; and

- due to delays turning right out of Russell Avenue onto Forest Way, traffic departing the shopping centre and with a destination of Warringah Road (east) would use Grace Avenue (south) and Fitzpatrick Street to access Warringah Road.

Intersection Operations

2.13 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using the SIDRA 8 Network computer program for the traffic flows shown in Figures 2 and 3.

2.14 SIDRA 8 Network allows the analysis of a network of intersections and the interaction of traffic flows between intersections. It provides a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle.

2.15 Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity

43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.16 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.17 The analysis found that:

- The intersection of Warringah Road and Forest Way operates with average delays of less than 60 seconds per vehicle in the weekday afternoon peak

period. This represents level of service D/E at capacity. In the Saturday midday peak hour the intersection operates with average delays per vehicle of less than 35 seconds per vehicle. This represents level of service C, a satisfactory level of intersection operation;

- The intersection of Forest Way and Russell Avenue operates with average delays of less than 45 seconds per vehicle for the movements with the highest delay (right turn out of Russell Avenue) during the weekday afternoon and Saturday midday peak periods. This represents level of service C/D, satisfactory but near capacity. All other movements operate with average delays of less than 30 seconds per vehicle (level of service B/C or better). As noted previously, due to delays in turning right out of Russell Avenue in the peak periods, traffic from the shopping centre uses Grace Avenue/Fitzpatrick Street to access Warringah Road (eastbound);

- The intersection of Forest Way and Naree Road operates with average delays of less than 20 seconds per vehicle during the weekday afternoon and Saturday midday peak periods. This represents level of service B. a reasonable level of service with spare capacity; and

- The intersection of Grace Avenue and Russell Avenue operates with average delays of less than 15 seconds per during the weekday afternoon and Saturday midday peak periods. This represents level of service A/B. a good level of service.

Road Network Improvements

2.18 As part of the Northern Beaches Hospital project, a number of road network upgrades are under construction adjacent and in the vicinity of the Site. These include:

- Grade separation of the intersections of Warringah Road with Forest Way and Wakehurst Parkway;
- New pedestrian bridges over Warringah Road;
- Traffic signals at the intersection of Forest Way and Naree Road;
- Widening of Naree Road from two to four traffic lanes; and
- Improvements to the indented bus bays along Forest Way (both sides) adjacent to the shopping centre.

2.19 These works are at various stages of construction and will be completed prior to the opening of the redeveloped Shopping Centre. Thus the assessment of the traffic effects of the proposed redevelopment of the Shopping Centre takes into account these changes to the road network.

Public Transport

2.20 The site is adjacent to bus services which operate along Forest Way with bus stops located on Forest Way adjacent to the shopping centre. Bus services are provided by Forest Way Coaches. Services include:

- route 260: North Sydney to Terry Hills;
- route 270: City QVB to Terry Hills;

- route 271: City QVB to Belrose;
- route 274: City QVB to Davidson, via Frenchs Forest;
- route 278: Chatswood to Killarney Heights;
- route 279: Frenchs Forest to Chatswood;
- route 280: Chatswood to Warringah Mall;
- route 281: Chatswood to Davidson;
- route 282: Chatswood to Davidson and Belrose;
- route 283: Chatswood to Belrose
- route 284: Chatswood to Terry Hills and Duffys Forest; and
- route L70: City QVB to Terry Hills.

2.21 Pedestrian access to the bus services on the opposite side of Forest Way are provided by the existing pedestrian traffic signals on Forest Way.

2.22 In addition Sydney Buses operates a number of services along Warringah Road to the south with bus stops located to the east and west of Forest Way. Bus stops on the southern side of Warringah Road are accessible using the pedestrian bridge at the intersection with Forest Way. These services include:

- route 136: Manly to Chatswood (via Warringah Mall);
- route 169: City Wynyard to Manly, via Narraweena;

2.23 Thus the Site is highly accessible by public transport with numerous local and regional bus services connecting the Site with the local area and regional destinations such as Chatswood, Manly and the City.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 This chapter assesses the implications of the proposed development through the following sections.

- proposed development;
- public transport;
- pedestrians;
- parking provision;
- access and internal layout;
- servicing;
- traffic effects;
- consultation with RMS;
- review of traffic matters raised in submission; and
- summary

Proposed Development

3.2 It is proposed the existing shopping centre will be redeveloped to provide some 21,851m^2 GLA. Demolition of the existing car park will provide new retail area across two levels. Parking (some 743 spaces) will be provided across a rooftop and two basement levels below and above the new retail areas. This excludes the existing 80 spaces in Sorlie Place. These parking levels will be interconnected by internal ramps with access from Forest Way (left in and left out) and Grace Avenue (all movements).

Public Transport

3.3 As previously discussed, the Site is close to bus services on Forest Way which provide local and regional connections. The site therefore has good access to public transport.

3.4 The proposed development will increase retail and employment densities close to these public transport services. The proposal would therefore strengthen the existing demand for these services.

3.5 The proposed development is therefore consistent with government objectives and the planning principles of:

(a) improving accessibility to employment and services by walking, cycling, and public transport;

(b) improving the choice of transport and reducing dependence solely on cars for travel purposes;

(c) moderating growth in the demand for travel and the distances travelled, especially by car; and

(d) supporting the efficient and viable operation of public transport services.

Pedestrians

3.6 Pedestrian access will be provided to the redeveloped Shopping Centre from Forest Way, Russell Avenue and Sorlie Place. Pedestrian access will be maintained

across Forest Way via the existing pedestrian signals.

Parking Provision

3.7 The parking requirements for different development types are set out in Warringah DCP 2011. For shopping centres, the DCP suggest the following rates:

- centres less than 10,000m^2 GLA – 6.1 space per 100m^2 GLA;
- centres 10,000m^2 to 20,000m^2 GLA – 5.6 spaces per 100m^2 GLA;
- centres 20,000m^2 to 30,000m^2 GLA – 4.3 spaces per 100m^2 GLA; and
- centres over 30,000m^2 – 4.1 spaces per 100m^2 GLA.

3.8 Using these rates the existing shopping centre would require 585 spaces and the expanded shopping centre 939 spaces.

3.9 Surveys of parking demand for the existing shopping centre (including parking in Sorlie Place) found a peak parking demand of 85% occupancy on a weekday and 75% occupancy on a Saturday. Thus peak surveyed parking demand was found to be 3.8 spaces per 100m^2.

3.10 As the surveyed parking demand is much lower than the parking required using the suggested DCP rates, application of the DCP rate for the redeveloped centre is considered inappropriate. Using the surveyed parking rate provides a more accurate baseline for estimating parking requirements for the redeveloped centre. The use of the surveyed parking rate as a baseline is also considered more appropriate than determining parking requirements for the various components of centre. This is because the various components of the centre will have peak

parking demands at different times. The surveyed parking rate takes this into account with the existing centre providing range of different uses.

3.11 Applying the surveyed parking rate to the redeveloped shopping centre results in a requirement for 830 spaces. However the DCP rates for shopping centres notes that as the size of the centre increases, parking required per 100m^2 decreases. The rate for a shopping centre of 22,000m^2 is some 30% less than the rate for shopping centre of some 9,500m^2. Being conservative and applying a reduction in the parking rate of 15%, (3.3 spaces per 100m^2) the redeveloped shopping centre would require 721 spaces. This is satisfied by the provision of 743 spaces. In practice parking in Sorlie Place (80 spaces) and on Grace Avenue (some 20 spaces) is also used by shopping centre customers, thus increasing parking provision to some 843 spaces

3.12 Appropriate accessible, motorcycle and bicycle parking will be provided in accordance with Council requirements

Access and Internal Layout

3.13 Vehicular access to the redeveloped shopping centre is proposed from Forest Way and Grace Avenue. The Forest Way access will be modified to provide left in, left out to/from the shopping centre. A concept design of the proposed Forest Way access has been prepared by TTW and is provided in Attachment A.

3.14 Access will also be provided from Grace Avenue, south of Russell Avenue. This access will provide for all turning movements with single entry and two exit lanes.

3.15 Within the Site both accesses will provide connections to basement and rooftop car park levels via internal ramps. The new car parks will be designed to comply with the requirements of AS2890.1-2004 and AS2890.6-2009 with respect to parking space dimensions, provision of shared zones for accessible spaces, aisle widths, ramp grades and height clearances. A review of the plans has found that the car park layout generally complies with the requirements of AS2890.1-2004 (aisles 6.6 metres wide with parking spaces 2.6 metres wide by 5.4 metres long and 2.4 metre wide shared zones for accessible spaces).

3.16 Overall, subject to detailed design, the proposed access arrangements and car park layouts are considered appropriate and are generally in accordance with the requirements of AS2890.1-2004 and AS2890.6-2009. This is an improvement compared to the existing car park layout which is non-compliant with AS2890.1-2004 (narrow parking spaces and aisle widths).

Service Arrangements

3.17 The existing service area accessed from Grace Avenue (that services Aldi) will be modified and expanded to provide seven docks (including two compactors). This expanded service area will service Aldi, the specialised grocery and specialty shops. The service area has been designed to accommodate two 19 metre articulated trucks (for Aldi and the specialised grocery) plus rigid trucks. Management of the service area will be required as not all docks are accessible when a 19 metre articulated truck is parked in the Aldi dock. Deliveries to Aldi and the specialised grocery will be staggered during the day.

3.18 The modified Grace Avenue dock will be designed to comply with the requirements of AS2890.2-2002 with respect to grades, height clearances and

maneuvering areas. Entry and exit to/from the dock will be in a forward direction. Truck turn paths are provided in Attachment B.

3.19 The existing Woolworths dock accessed from Sorlie Place will be modified to allow a 19 metre articulated truck to reverse into the dock and park wholly within the building. This is an improvement over the existing situation where the truck either unloads from Sorlie Place or parks partially within the building. Both of these outcomes affect traffic and pedestrian flow in Sorlie Place. Deliveries to Woolworths will also be restricted so as not to occur in school set down and pick up periods.

3.20 To manage deliveries to the Site, a loading dock management plan will be prepared prior to the issue of a construction certificate. The loading dock management plan will address matters such as:

- truck arrival and departure routes;
- loading dock hours of operation;
- time restrictions for the Woolworths dock (no deliveries during school set down and pick up); and
- staggering of deliveries by large trucks to the Grace Avenue dock.

3.21 Subject to detailed design and implementation of an appropriate loading dock management plan, the proposed service arrangements for the expanded shopping centre are considered appropriate.

Traffic Effects

3.22 The existing shopping centre was found to generate some 850 and 1020 vehicles per hour (two way) in the weekday afternoon and Saturday midday peak hours respectively. RMS Guidelines suggest that as shopping centres get larger the generation rate per 100m^2 GLA decreases reflecting a higher proportion of linked trips from a more diverse development.

3.23 For shopping centres between 20,000m^2 and 30,000m^2, RMS Guidelines suggest a generation of 6 vehicles per 100m^2 GLA in the weekday afternoon peak hour and 7 vehicles per hour per 100m^2 in the Saturday midday peak hour. Applying these rates the redeveloped shopping centre, with some 21,851m^2 GLA, would generate some 1,310 vehicles per hour (two way) in the weekday afternoon peak hour and some 1,530 vehicles per hour (two way) in the Saturday midday peak hour. These are increases of 460 and 510 vehicles per hour (two way) in the weekday afternoon and Saturday midday peak hours respectively.

3.24 This additional traffic has been assigned to the road network based on existing travel patterns and adjustments for the changes in access arrangements. Existing traffic generated by the shopping centre has been redistributed to take into account the change in access arrangements. The results are summarized in Table 3.1 and displayed in Figures 2 and 3. It is expected that all additional traffic will use the on-site car park as surveys found that existing parking in Sorlie Place is at capacity during peak periods.

Table 3.1: Existing + Development Two-Way (Sum of Both Directions) Peak Hour Traffic Flows				
Road	**Weekday Afternoon**		**Saturday Midday**	
	Existing	+ Dev	Existing	+ Dev
Warringah Road				
– east of Forest Way	3705	+30	3515	+20
– west of Forest Way	3175	+65	2775	+120
Forest Way				
– north of Naree Road	3340	+100	4165	+145
– south of Naree Road	3120	+115	4110	+165
– south of Russell Avenue	2970	+180	3815	+220
– north of Warringah Road	3390	+95	4020	+140
Russell Avenue				
– east of Forest Way	510	-65	465	-55
– west of Grace Avenue	400	-10	385	+0
Grace Avenue				
– north of Russell Avenue	835	+170	695	+205
– south of Russell Avenue	835	+390	650	+505
– north of Sorlie Place (N)	845	+165	610	+180
– south of Sorlie Place (S)	830	+165	595	+180
Sorlie Place				
– entry	130	+0	160	+0
– exit	140	+0	150	+0
Naree Road				
– east of Forest Way	640	+15	555	+20
Site Accesses				
– Forest Way (entry only)	160	+165	200	+160
– Russell Avenue	285	-285	355	-355
– Grace Avenue	120	+555	155	+685

3.25 Table 3.1 reveals that:

- Traffic flows on Warringah Road would increase by some 20 to 120 vehicles per hour two-way during the weekday afternoon and Saturday midday peak hours;

- Traffic flows on Forest Way (north of the site access) would increase by some 100 to 220 vehicles per hour two-way during the weekday afternoon and Saturday midday peak hours. Between the Site access and Warringah Road,

the increase in traffic flows would be some 95 to 140 vehicles per hour two-way;

- Traffic flows on Russell Avenue would decrease by up to some 65 vehicles per hour two-way during the weekday afternoon and Saturday midday peak hours. This is due to the closure of the Russell Avenue access and provision of improved access onto Forest Way;

- Traffic flows on Grace Avenue, north of Russell Avenue and south of the Site access, would increase by some 165 to 205 vehicles per hour two-way during the weekday afternoon and Saturday midday peak hours. In the short section between the site access and Russell Avenue, the increase in traffic flows would be higher at some 390 to 505 vehicles per hour two-way. This is due to the closure of the Russell Avenue access;

- Traffic flows in Sorlie Place would be unchanged as existing parking in Sorlie Place is at capacity during peak periods;

- Traffic flows on Naree Road would increase by some 15 to 20 vehicles per hour two-way during the weekday afternoon and Saturday midday peak hours.

3.26 The intersections analysed in Chapter 2 were reanalysed with development traffic in place and the upgrades currently under construction completed using the SIDRA 8 network program. The results of the analyses are summarised below:

- The intersection of Warringah Road and Forest Way would operate with average delays of less than 32 seconds per vehicle in the weekday and

Saturday peak periods. This represents level of service B/C a satisfactory level of intersection operation;

- The intersection of Forest Way and the Site access would operate with average delays of less than 15 seconds per vehicle in the weekday and Saturday peak periods. This represents level of service A a good level of intersection operation.

- The right turn movement out of Russell Avenue at the intersection of Forest Way and Russell Avenue would operate at capacity. However, it should be noted that this right turn movement has low traffic flows of some 30 to 40 vehicles per hour. Thus, in practice these low flows would use gaps created by traffic signals either side of Russell Avenue to turn right onto Forest Way. All other movements would operate with average delays of less than 30 seconds per vehicle (level of service B/C or better);

- The intersection of Forest Way and Naree Road would operate with average delays of less than 20 seconds per during the weekday afternoon and Saturday midday peak periods. This represents level of service B. a reasonable level of service with spare capacity;

- The intersection of Grace Avenue and Russell Avenue would operate with average delays of less than 15 seconds per during the weekday afternoon and Saturday midday peak periods. This represents level of service A/B. a good level of service; and

- The Grace Avenue access would operate with average delays of less than 15 seconds per during the weekday afternoon and Saturday midday peak periods. This represents level of service A/B. a good level of service.

3.27 Thus, with the revised access arrangements and the road upgrades currently under construction completed, the surrounding road network can satisfactorily accommodate additional traffic generated by the redeveloped shopping centre.

3.28 In summary with development traffic in place, the road network (with the road upgrades completed) would continue to operate at the same level of service with only minor increases in average delays and queue lengths.

Consultation with RMS

3.29 In an email dated 9 August 2018, RMS provided the following advice with regards to the proposed modified access arrangements:

Thank you for your email. Roads and Maritime has reviewed the concept sketch submitted to Roads and Maritime dated 18 July 2019. The sketch proposes a left in/left out access to Forest Way adjoining the existing pedestrian signal. Roads and Maritime can advise that your concept sketch has improved, however further design reviews are required prior to Roads and Maritime providing "in principle" approval:

Roads and Maritime's comments are as follows:

1. *Proposed left in access*

   The left in access of Forest Way should be amended to incorporate a deceleration lane. The deceleration lane is to be an appropriate length for a design speed of 80km.

2. *Youth Centre Access*

   In relation to the southern driveway it is Roads and Maritimes requires that the driveway that provides access to the youth centre be removed. This access can be achieved via the proposed new access point and access can be provided internally to the youth centre.

3. *Internal car parking arrangements*

   Further information is required that demonstrations that the entry / exit onto Forest Way is designed in such a way that it will not impact on the functioning of the Classified Road. Specifically internal car parking movements and also details regarding boom gates/ticketing is required.

   Plans that are updated to reflect the above are to be submitted for review. The plans can either be resubmitted to Roads and Maritime for review or they can be submitted to Council for formal referral.

3.30 Our response to the above matters is set out below:

1. The Forest Way access has been amended to left in/left out. However only a short deceleration lane (some 37m long) can be provided along the frontage of the site with the access located south of the existing traffic signals (see attached plan). We note that the entry to the site should be located south of

signals as this would result in less impact to traffic flow on Forest Way and easier access to the centre. Relocating the signals to the north would only lengthen the deceleration lane by some 10m (as egress from the site should be located to the north of the signals (less impact to traffic flow on Forest Way and less delays for cars existing the centre) and the new bus bay limits the distance the access /signals could be relocated). Extending the deceleration lane to the south is possible, however it would require land from Council and result in the youth centre access being located within the deceleration lane. Given these constraints please RMS to confirm if the shortened deceleration lane is acceptable.

2. The Youth Centre on Forest Way is located on land owned by Council. As it is on land owned by another party, it is not possible for the applicant or the RMS to remove this access and require access be provided through the subject site without the agreement of Council. We understand that Council does not support access to the Youth Centre through the shopping centre and wants to maintain direct access from Forest Way.

3. As per the previous scheme, ramps from Forest Way will provide access to basement and roof top parking with ticketless entry/exit. The control points will be located well within the site so that queuing does not extend out onto Forest Way.

Review of Traffic Matters Raised in Submission

3.31 A number of traffic matters were raised in the submission with regards to the 2018 DA for the redevelopment of Forestway Shopping Centre. The traffic matters are summarised below.

- impact of proposed taxi zone on southern side of Russell Avenue
- provision of bigger parking spaces;
- increase in traffic on local streets to the south west of the centre;
- impact of the proposed shopping centre access on traffic flow on Forest Way;
- impact of increased traffic on Grace Avenue;
- pedestrian safety at proposed shopping centre access on Forest Way; and
- no provision for commuter parking.

3.32 Our response to these matters is set out below.

Taxi Zone on Southern Side of Russell Avenue

3.33 The proposed taxi zone on the southern side of Russell Avenue has been relocated to Sorlie Place following discussions with Council.

Provision of Bigger Parking Spaces

3.34 New parking areas within the redeveloped shopping centre will be designed to comply with the requirements of AS2890.1-2004 and AS2890.6-2009. We note that parking spaces provided to current Australian Standards are bigger those provided within the existing shopping centre.

Increase in Traffic on Local Streets to the Southwest of the Centre

3.35 As part of the proposed redevelopment of the shopping centre, a new access is proposed on Forest Way. This new access would allow right turns out of the shopping centre onto Forest Way. Provision of this access will improve access to Forest Way and Warringah Road, and hence minimise traffic from the shopping

centre onto the local streets south west of the shopping centre. Any increase in traffic on these streets would be local residents accessing the shopping centre.

Impact of Proposed Access on Forest Way

3.36 Access to the centre from Forestway has been restricted to left in/left out, removing the need for additional traffic signals along Forestway.

Impact of Increased Traffic on Grace Avenue

3.37 As noted previously the provision of the left in / left out access to Forest Way will improve access to Forest Way. We note that the car park access to Grace Avenue is located as close a practical to the intersection with Russell Avenue in order to minimise traffic increases in Grace Avenue. Any increase in traffic on Grace Avenue (south of the site access) would be local residents accessing the shopping centre.

Pedestrian Safety at Forest Way Access

3.38 Concern has been raised that the proposed access on Forest Way would require pedestrians to wait on a small concrete island before crossing Forest Way. For the DA, concept plans of the proposed the proposed Forest Way Access were provided. Post DA, detailed engineering plans will be prepared (in accordance with RMS and Austroad guidelines) including the provision appropriate pedestrian facilities across the site access and Forest Way. Notwithstanding this, given the existing traffic signals are proposed to be modified, the final design will require RMS approval

Commuter Parking

3.39 Concern has been raised that no commuter parking has been provided as part of the proposed redevelopment of the shopping centre. The proposed redevelopment provides appropriate parking for the shopping centre as required by Council's planning controls. There is no requirement to provide commuter parking.

Summary

3.40 In summary, the main points relating to the traffic implications of the proposed expansion of Forestway Shopping Centre redevelopment are:

i) the proposed redevelopment has good access to public transport services with local and regional bus services operating along Forest Way adjacent to the Site;

ii) the proposed redevelopment is in accordance with government objectives and would increase retail and employment densities close to public transport services;

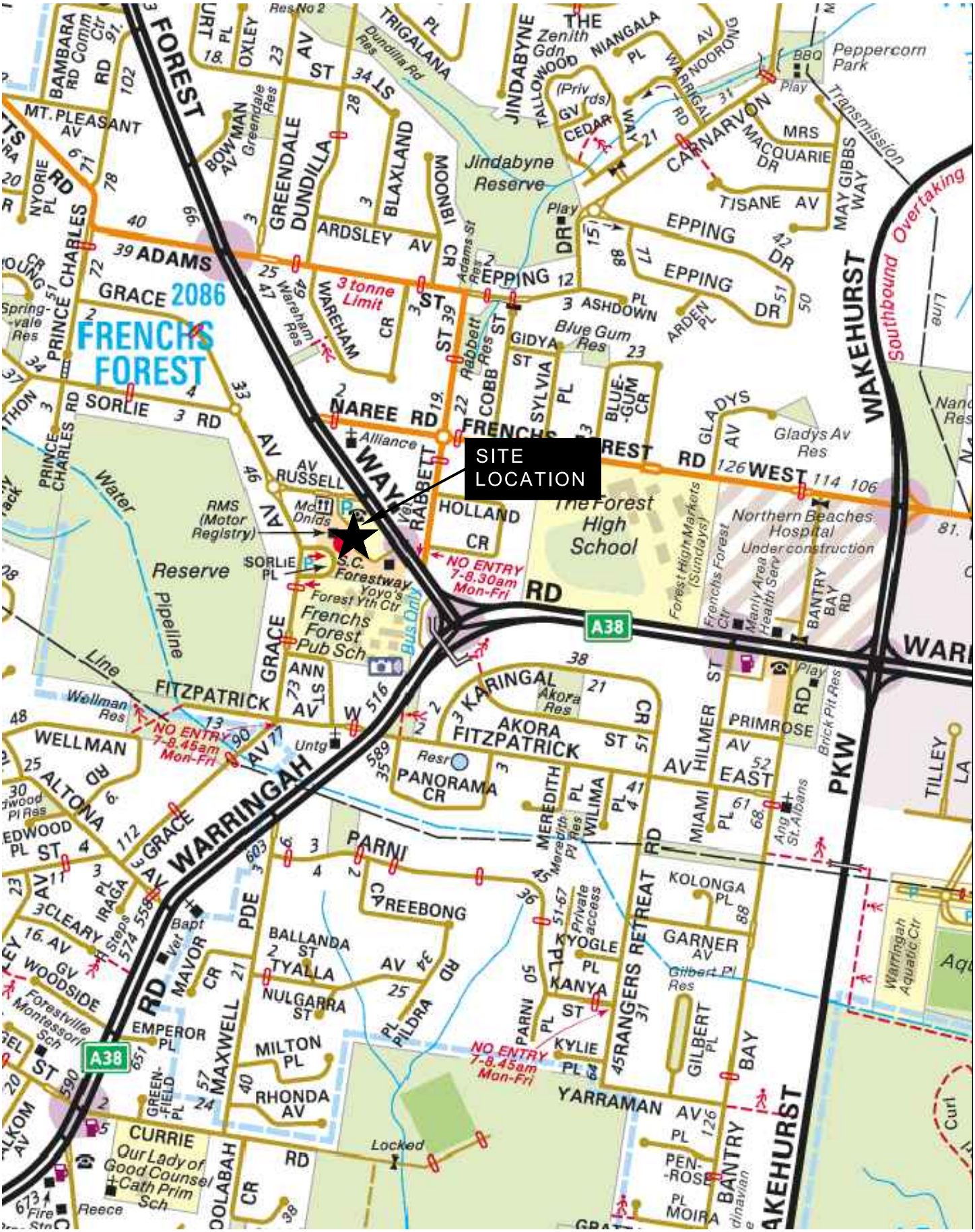
iii) the proposed parking provision is appropriate;

iv) access and internal layout are considered appropriate (subject to detailed design) in accordance with the requirements AS 2890.1-2004 and AS2890.6-2009;

v) proposed service arrangements are considered appropriate (subject to detailed design) in accordance with the requirements of AS2890.2-2002 and implementation of a loading dock management plan;

vi) with the proposed road upgrades under construction completed, the surrounding road network can satisfactorily accommodate the additional traffic generated by the proposed redevelopment;

vii) the Russell Avenue traffic signal option has been investigated. While a workable option, it is not favoured as it has a number of greater impacts compared to the signalised access option, including queuing extending closer to Warringah Road.

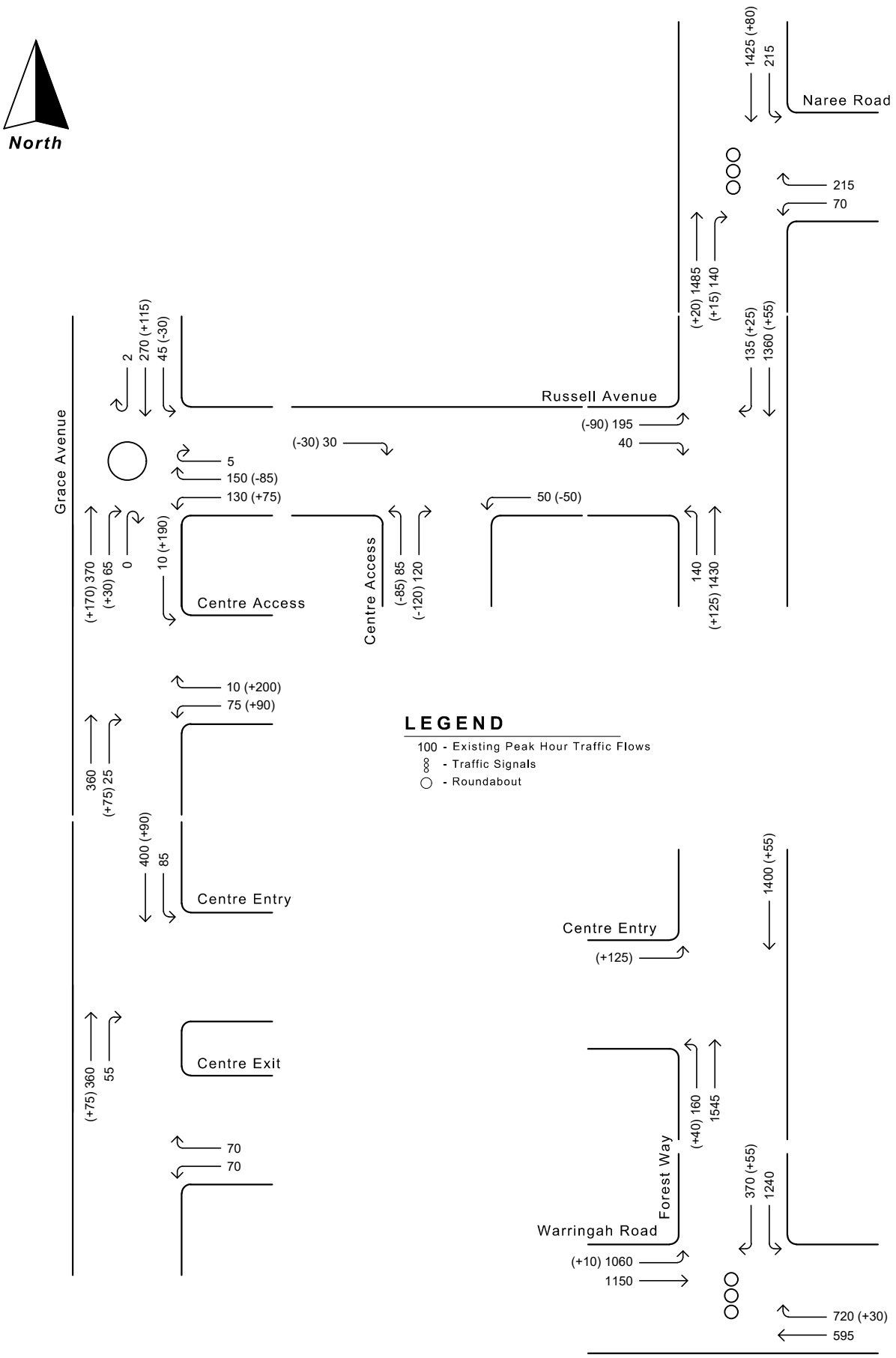


Location Plan

Colston Budd Rogers & Kafes Pty Ltd

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 16.10.2019

Figure 1

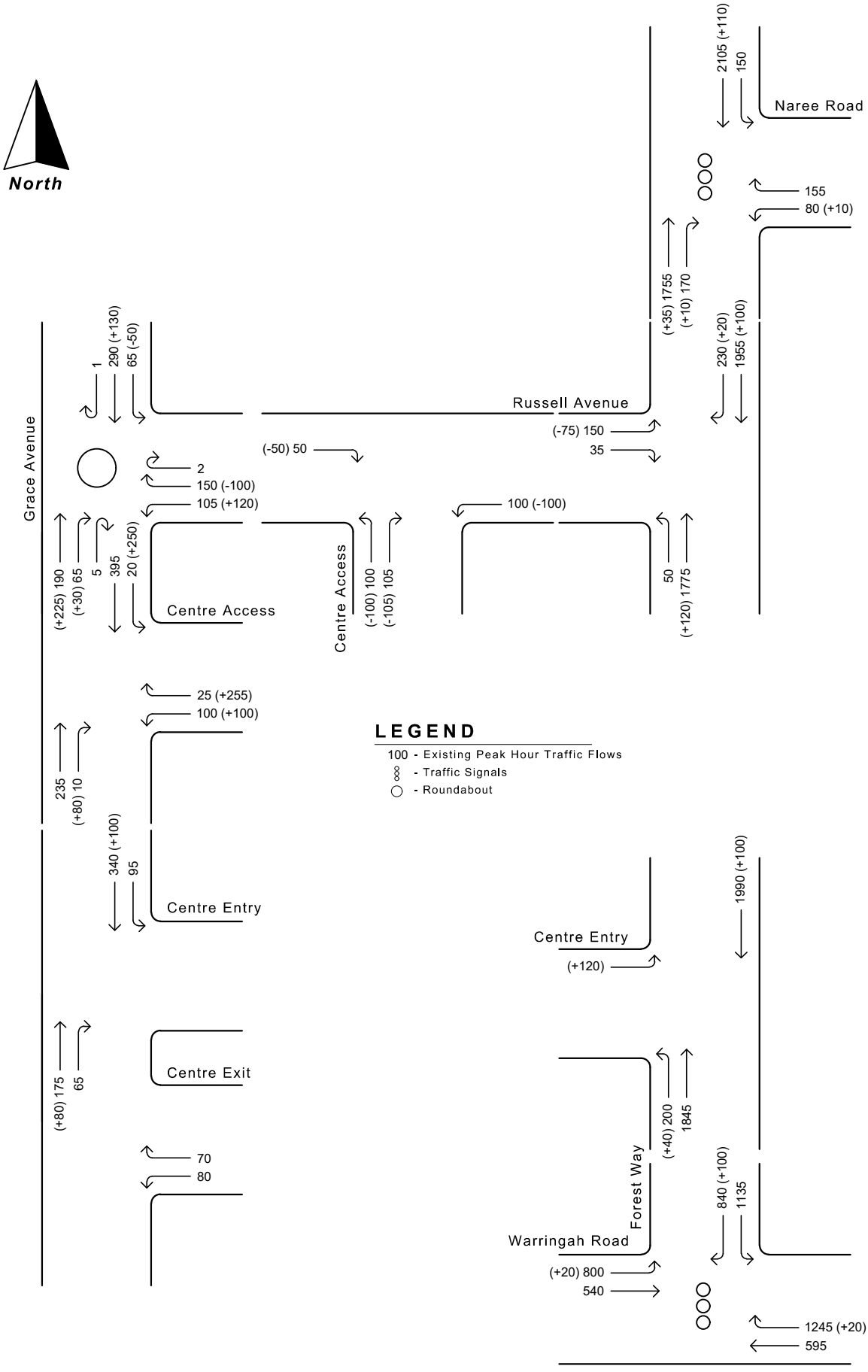


Existing weekday afternoon peak hour traffic flows plus development traffic

Figure 2

Colston Budd Rogers & Kafes Pty Ltd

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 16.10.2019



Existing Saturday Midday peak hour traffic flows plus development traffic

Figure 3

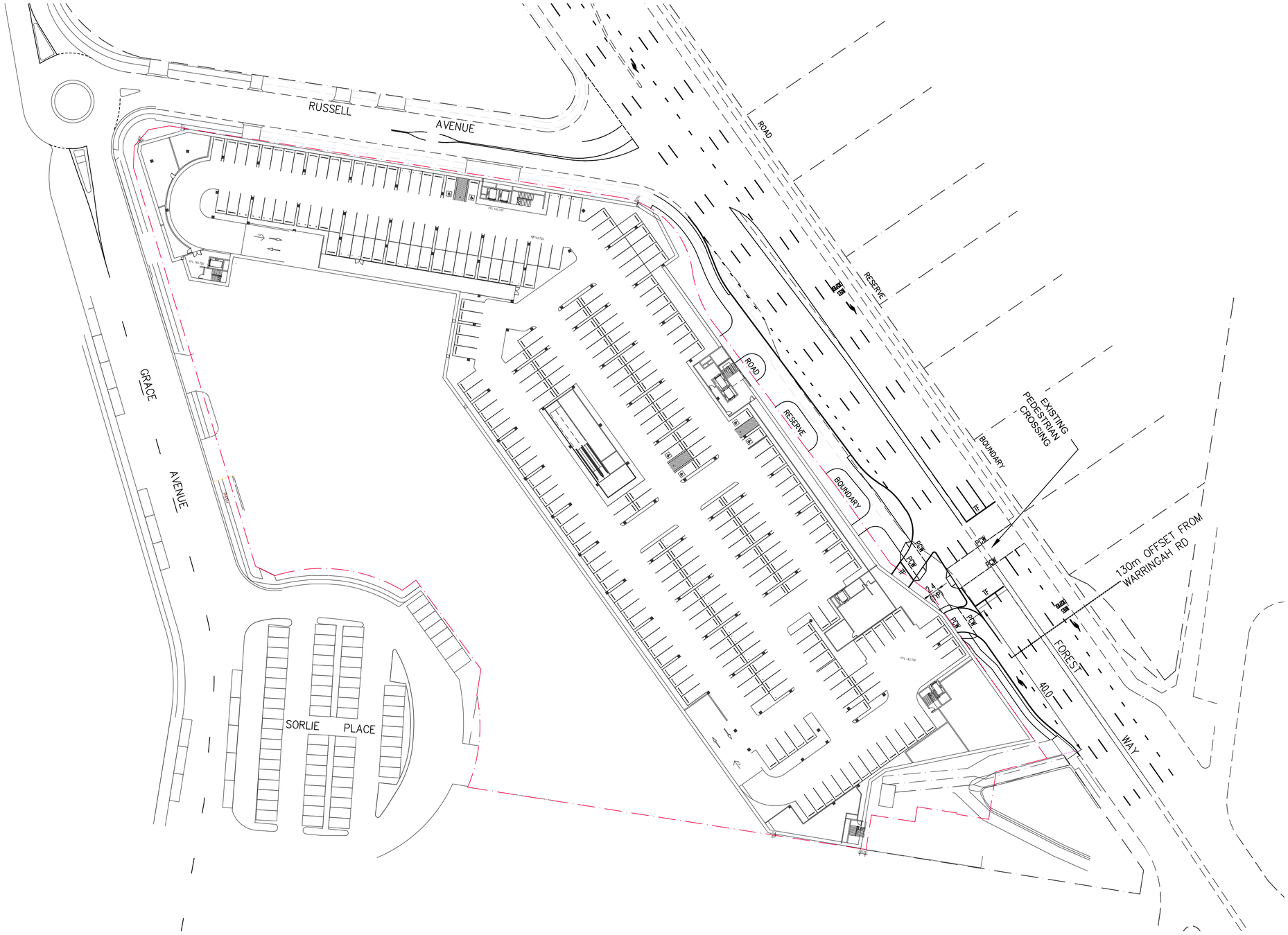
Colston Budd Rogers & Kafes Pty Ltd

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 16.10.2019

ATTACHMENT A

PROPOSED FOREST WAY ACCESS

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING SKC01



SCALE 1:500 0 5 10 15 20 25 m
AT ORIGINAL SIZE

FileName: SKC05.dwg - USER: Gregg - Plot File Created: Oct 22, 2019 - 2:30pm

SECTION 4.55 DA SUBMISSION

Rev	Description	Eng	Draft	Date
P3	PRELIMINARY	SB	GG	22.10.19
P2	PRELIMINARY	SB	AI	15.10.19
P1	PRELIMINARY	SB	GG	17.08.18

Architect
THE BUCHAN GROUP
LEVEL 1, 7 KELLY STREET, ULTIMO, NSW, 2007

Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
FORESTWAY SHOPPING CENTRE REDEVELOPMENT

Sheet Subject
SITEWORKS PLAN LEVEL B2

Scale : A1
1:500

Drawn
AS

Authorised

Job No
181210

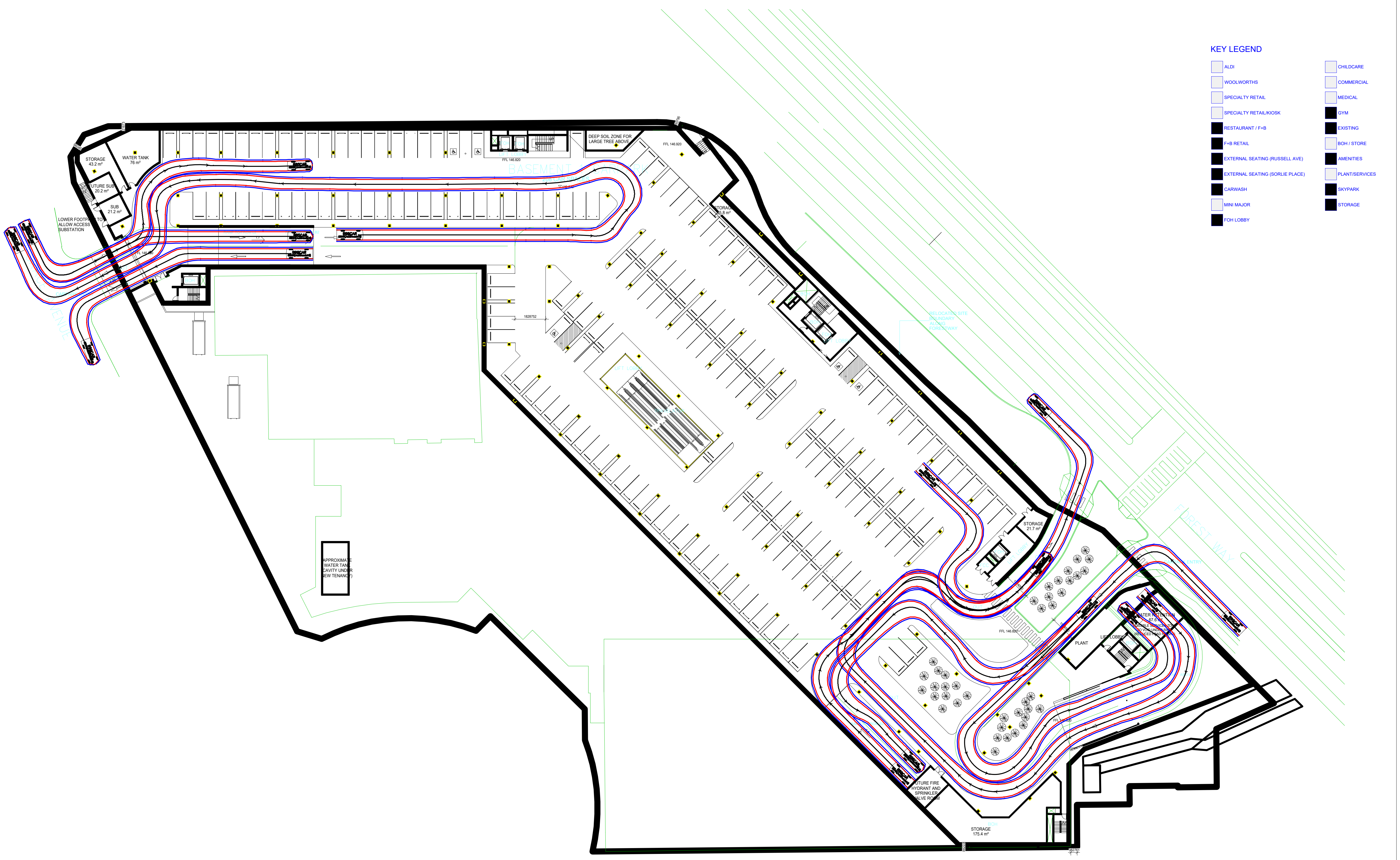
Drawing No
SKC05

Revision
P3

Plot File Created: Oct 22, 2019 - 2:30pm

ATTACHMENT B

VEHICLE TURN PATHS



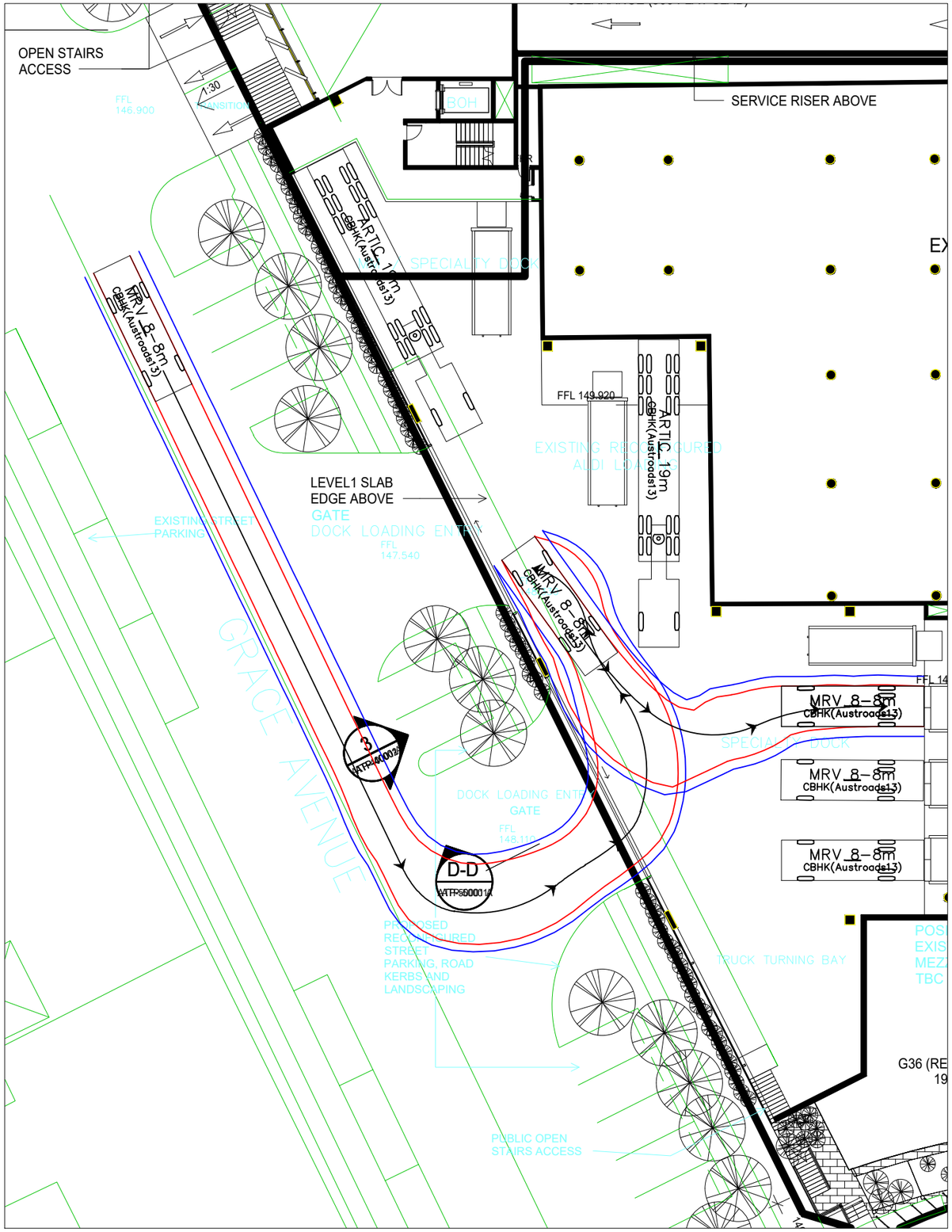
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

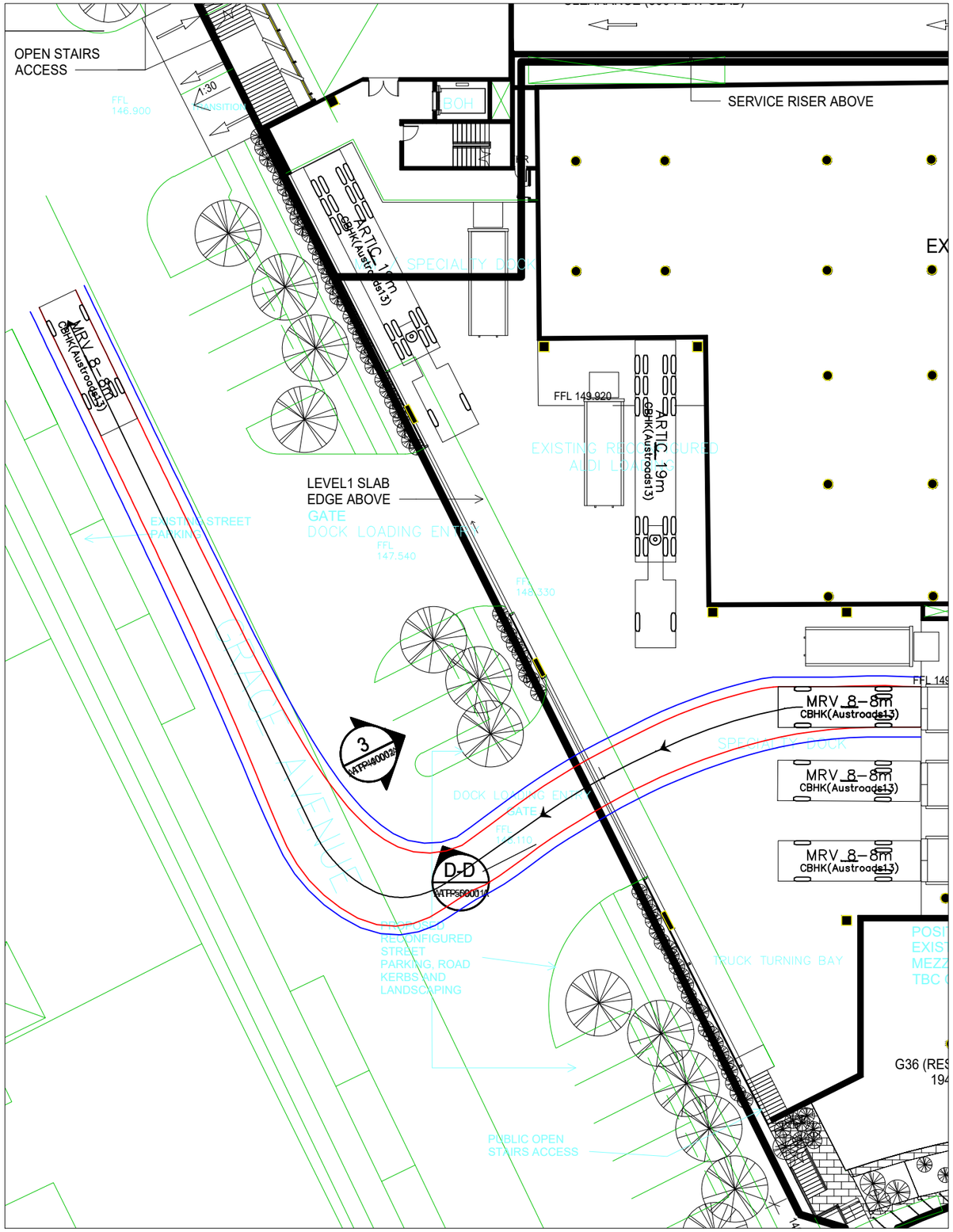
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

B85 & B99 VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019

1





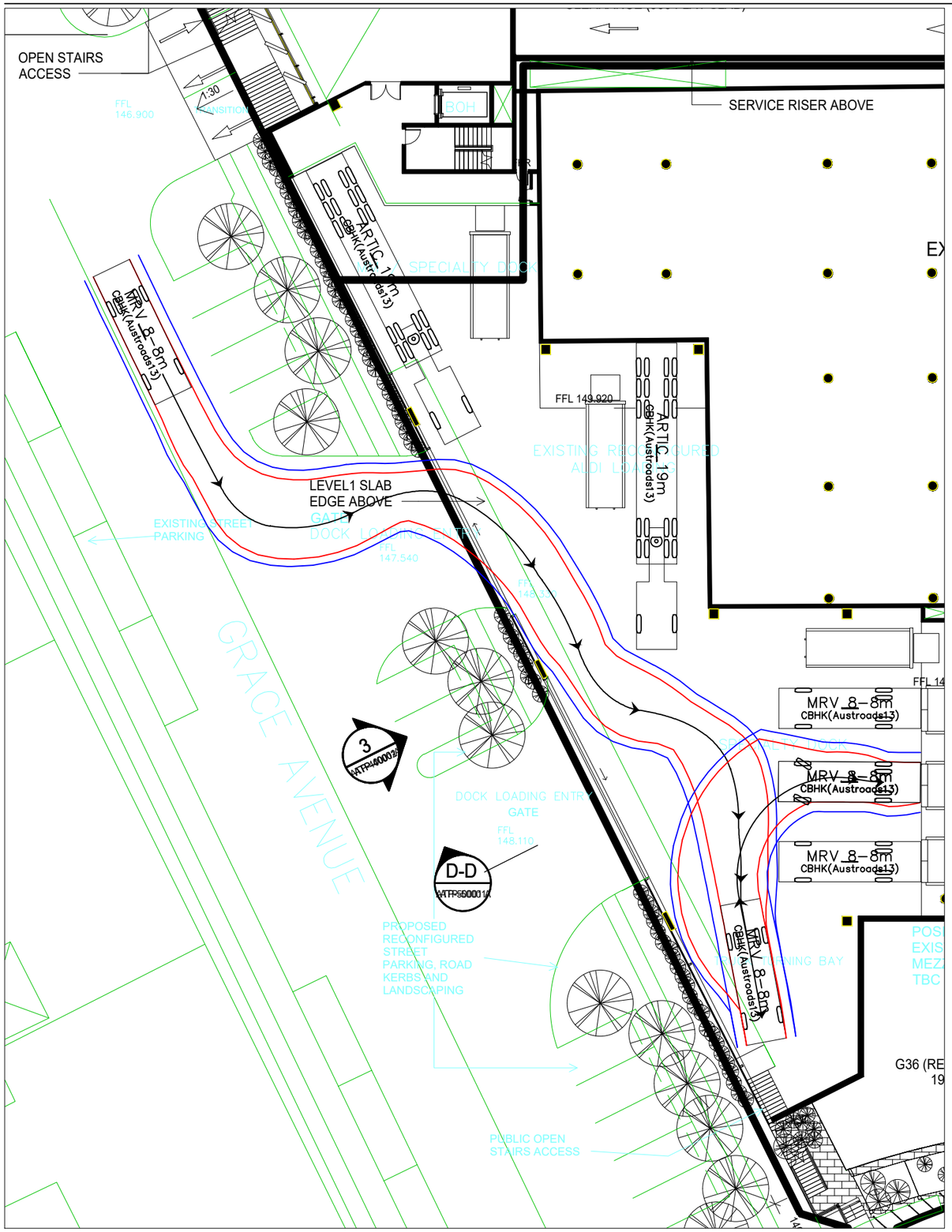
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

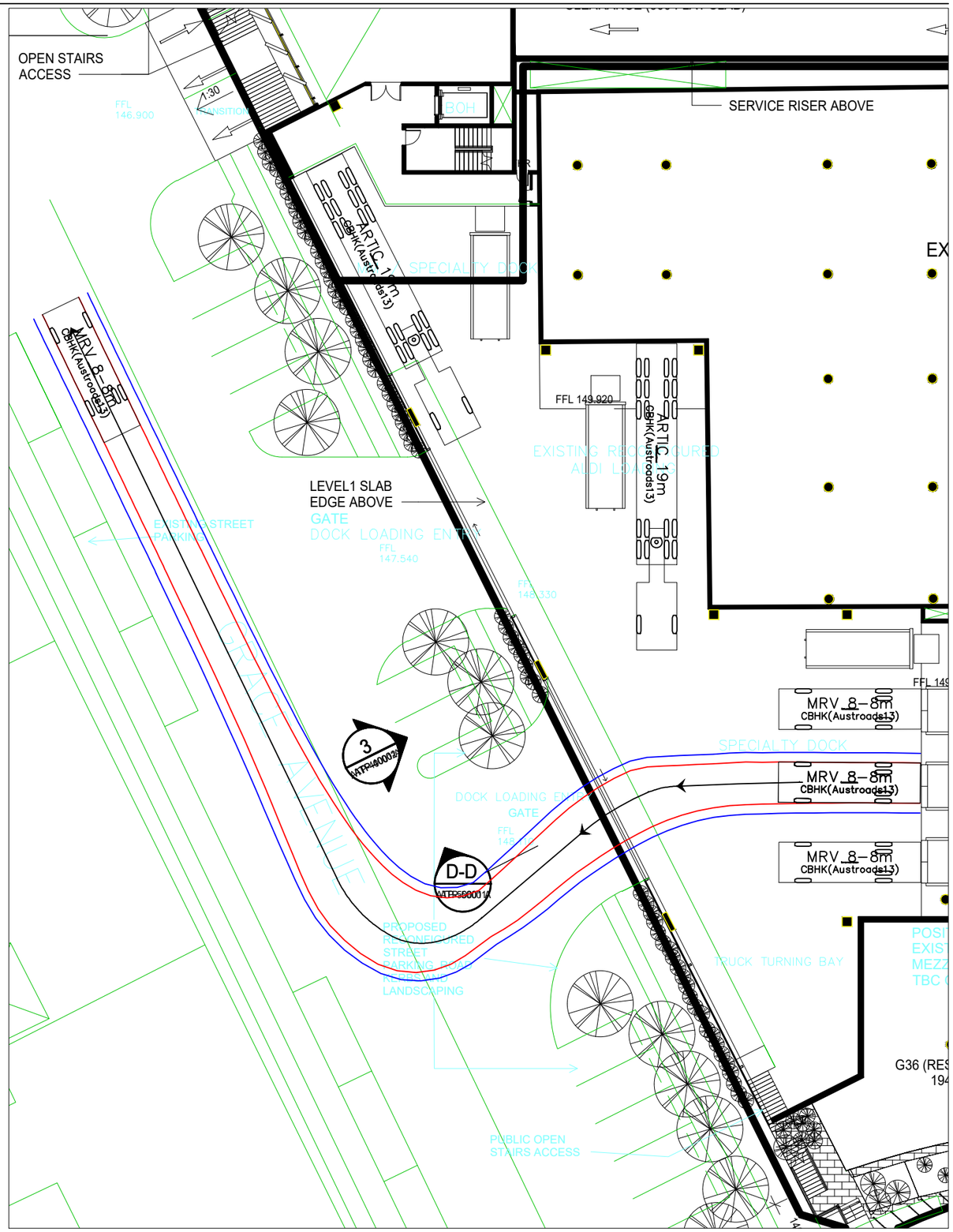
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

8.8m MEDIUM RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019

2





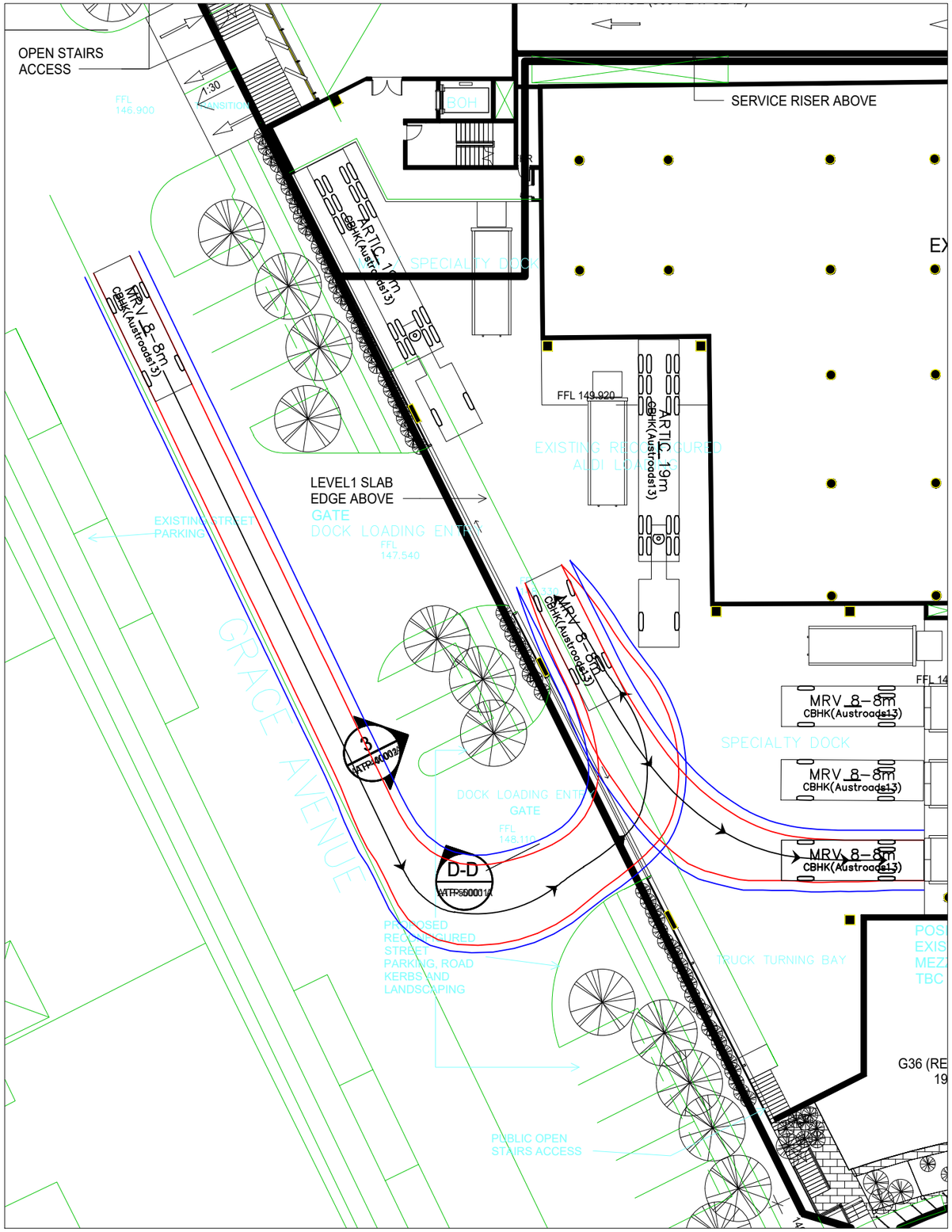
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

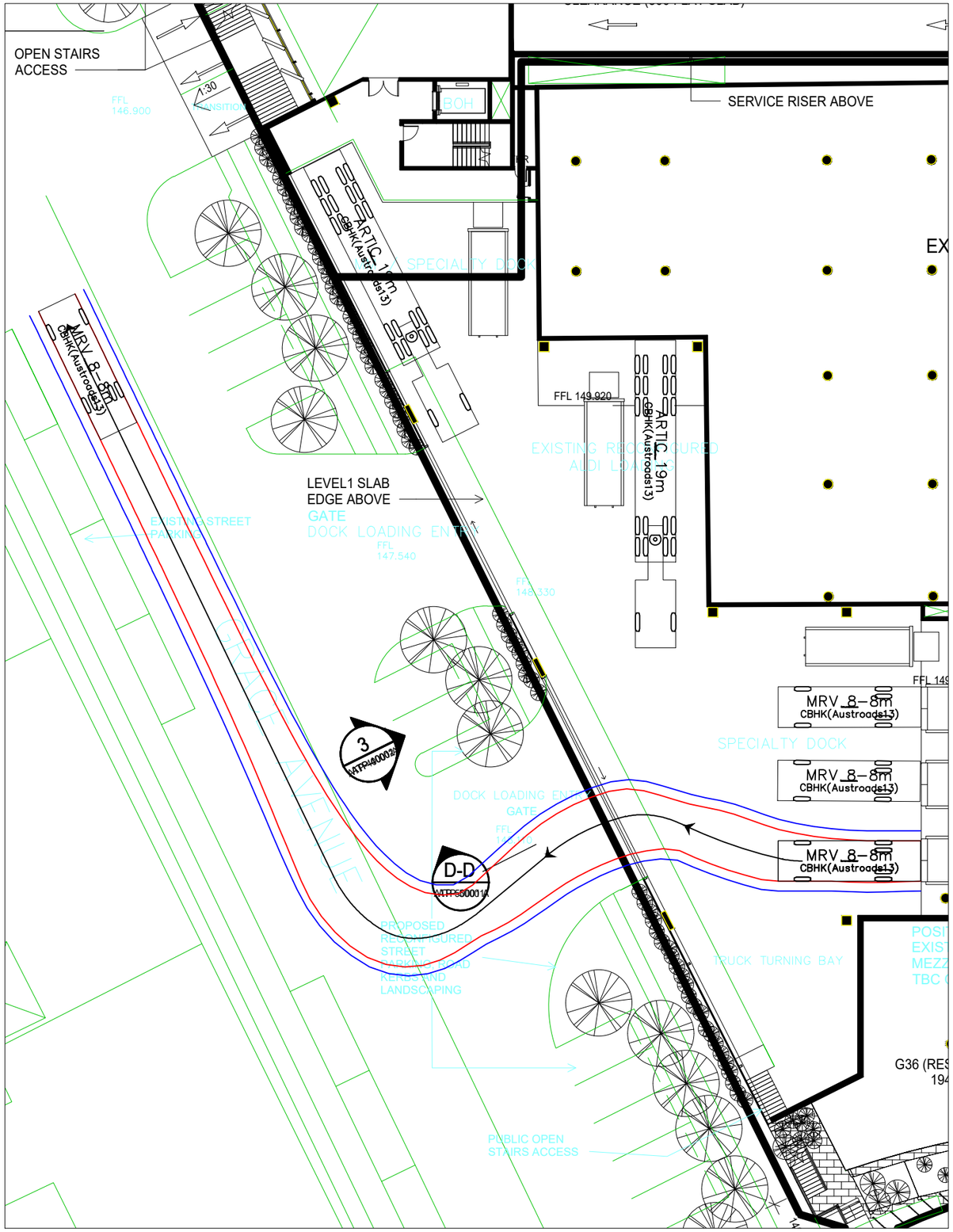
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

8.8m MEDIUM RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019

3





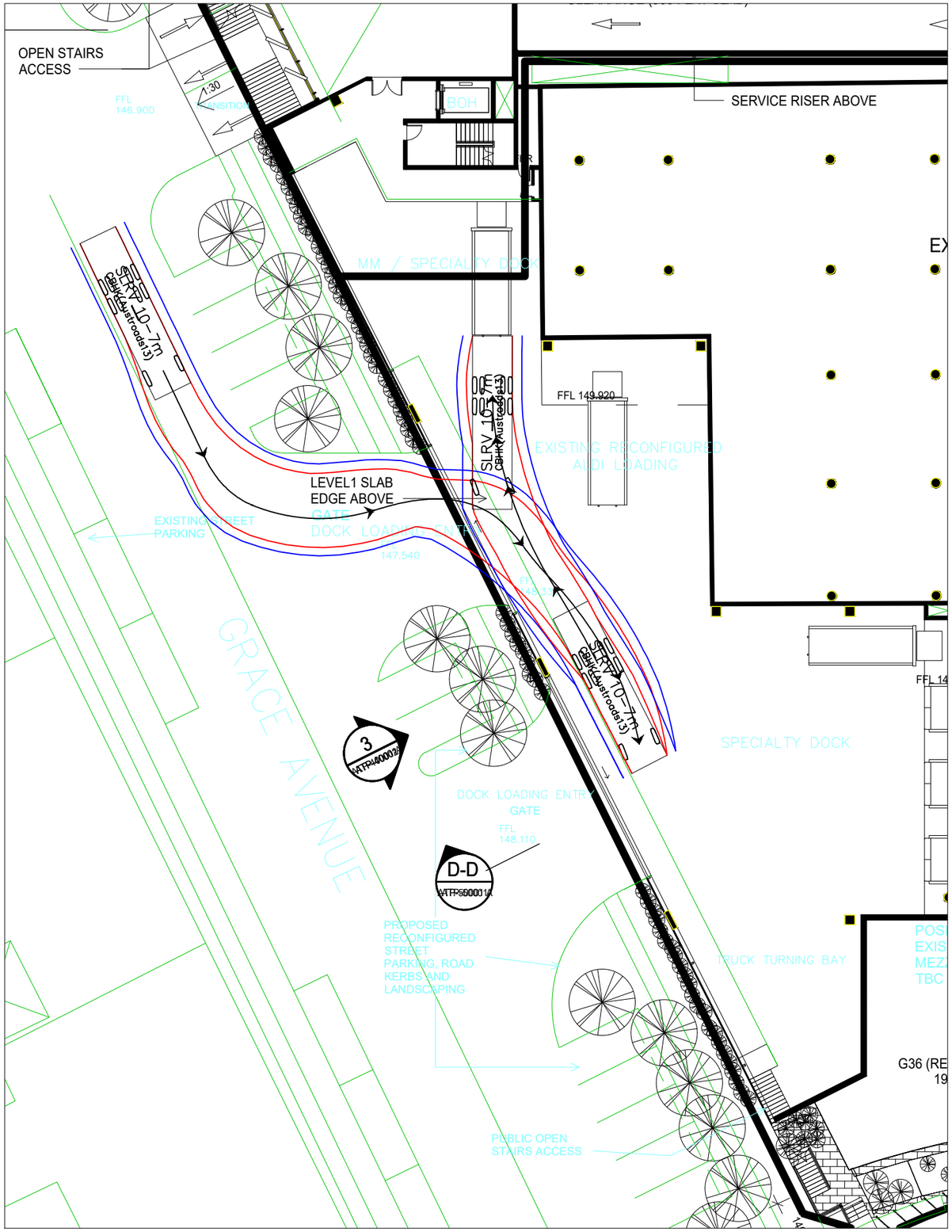
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

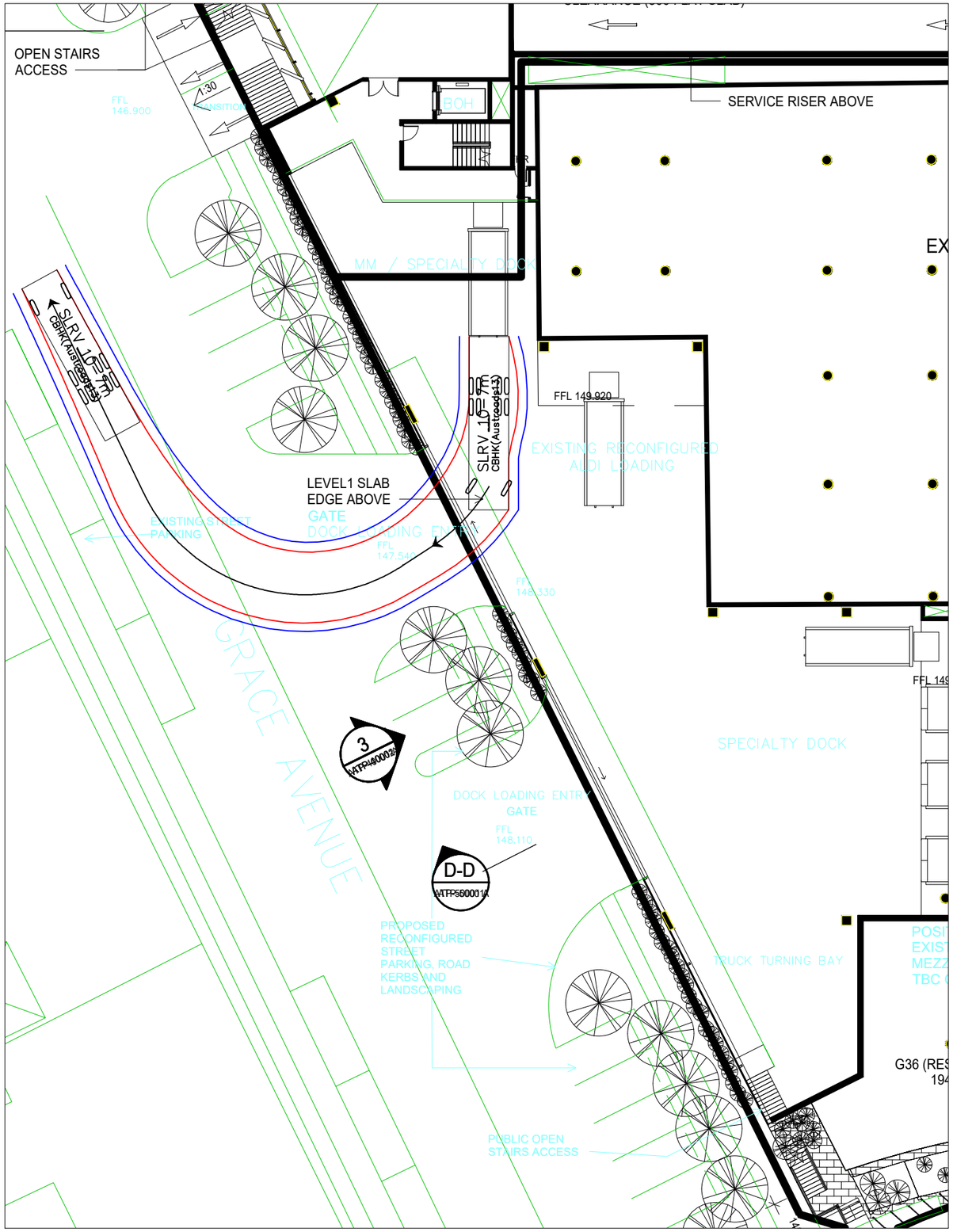
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

8.8m MEDIUM RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019

4





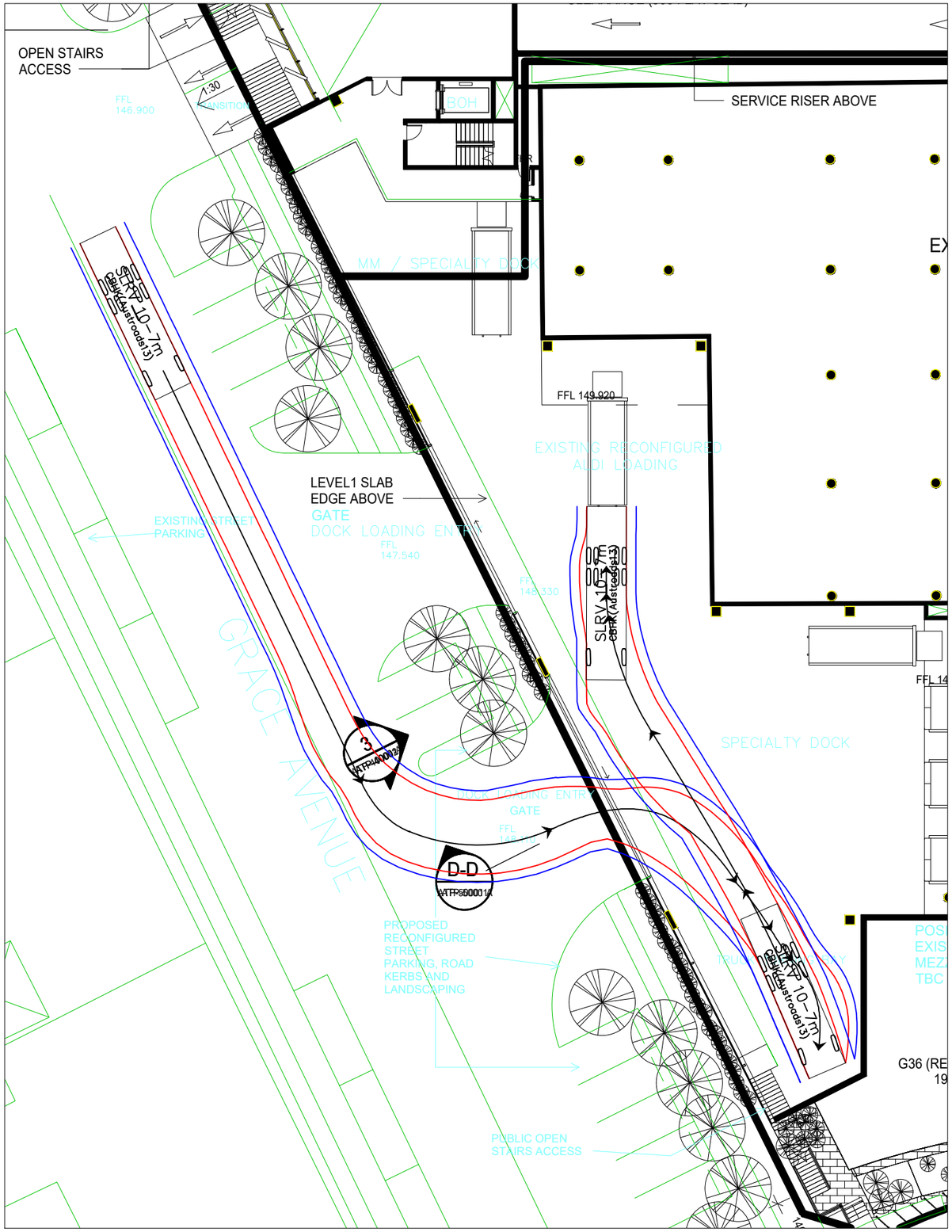
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

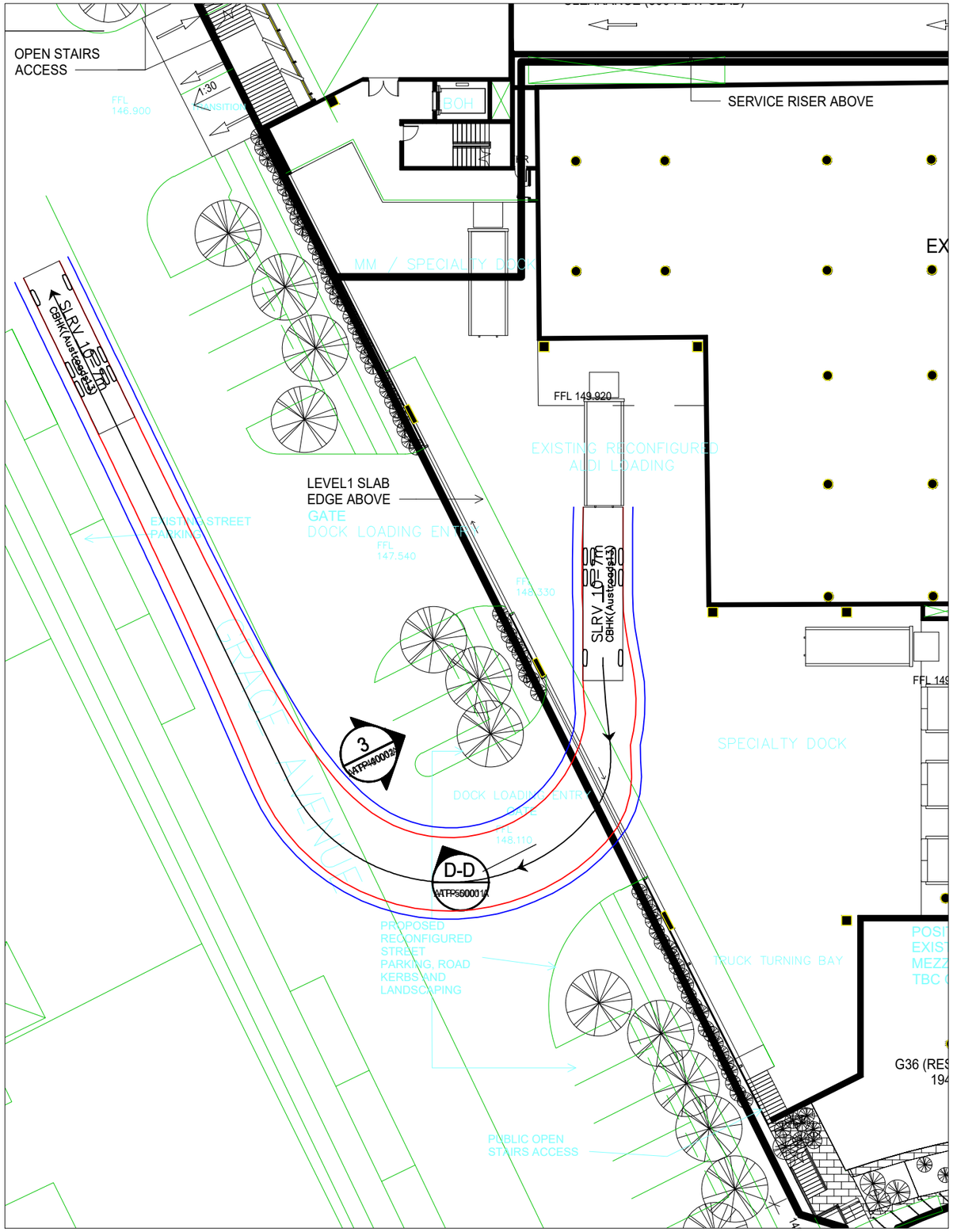
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

10.7m LARGE RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019

5



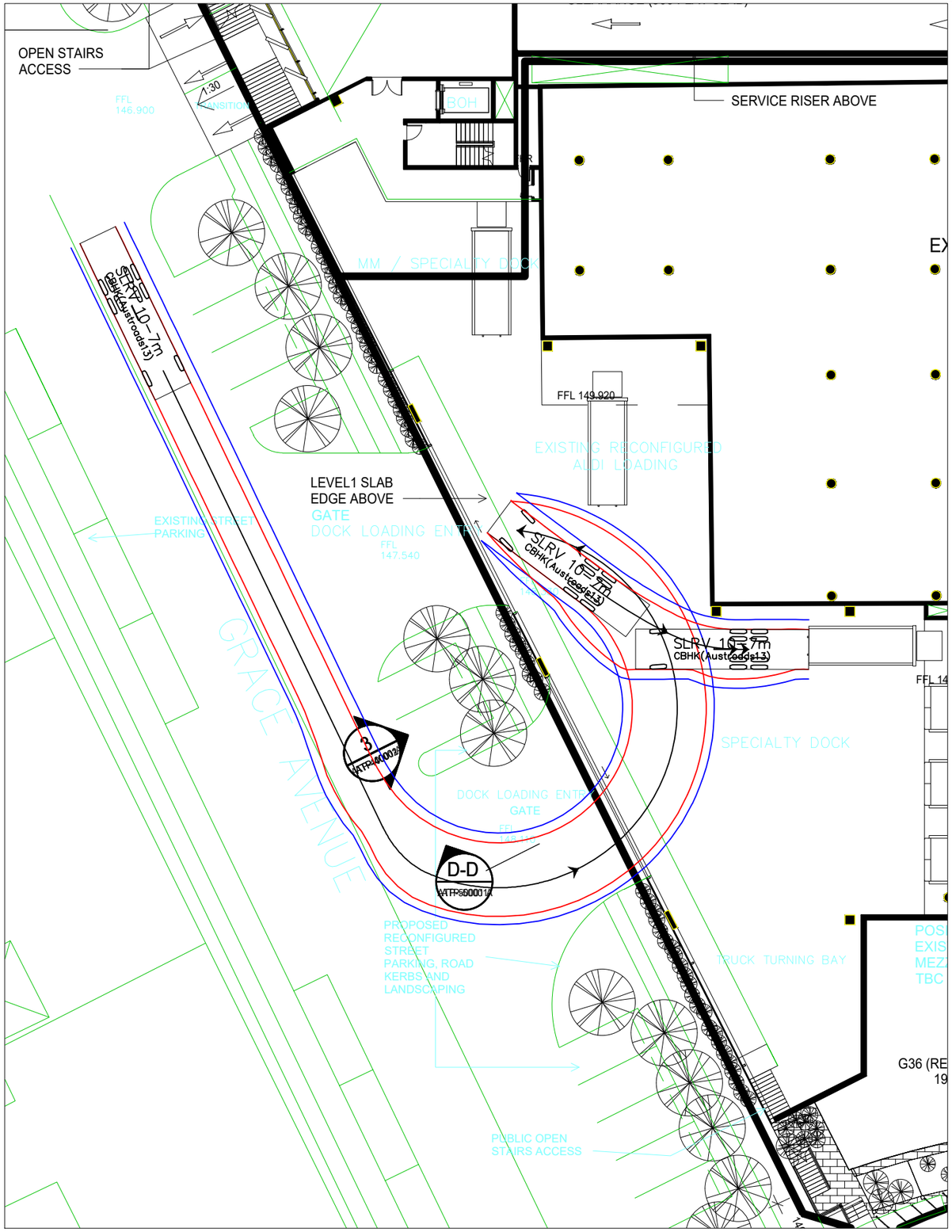


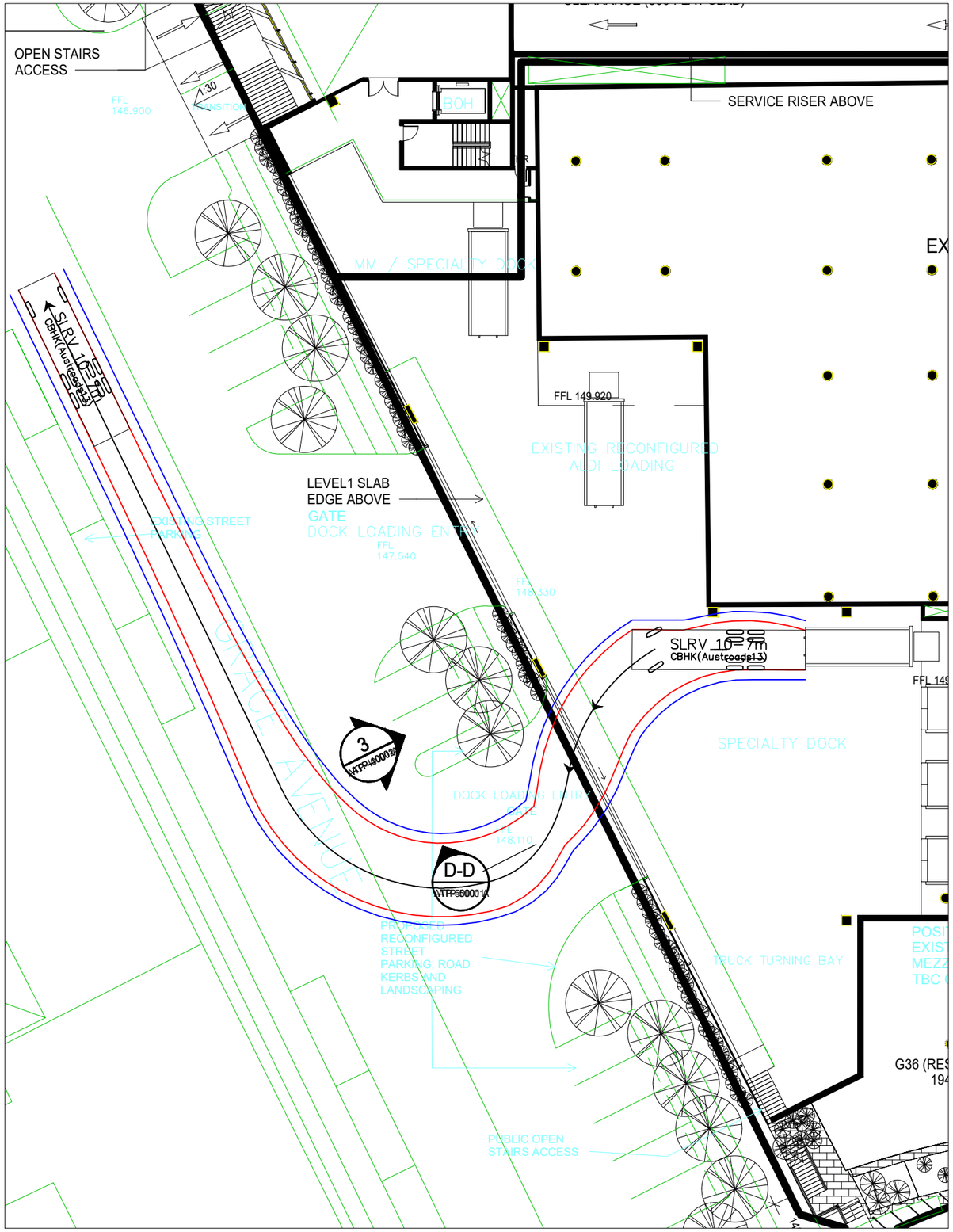
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

10.7m LARGE RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019





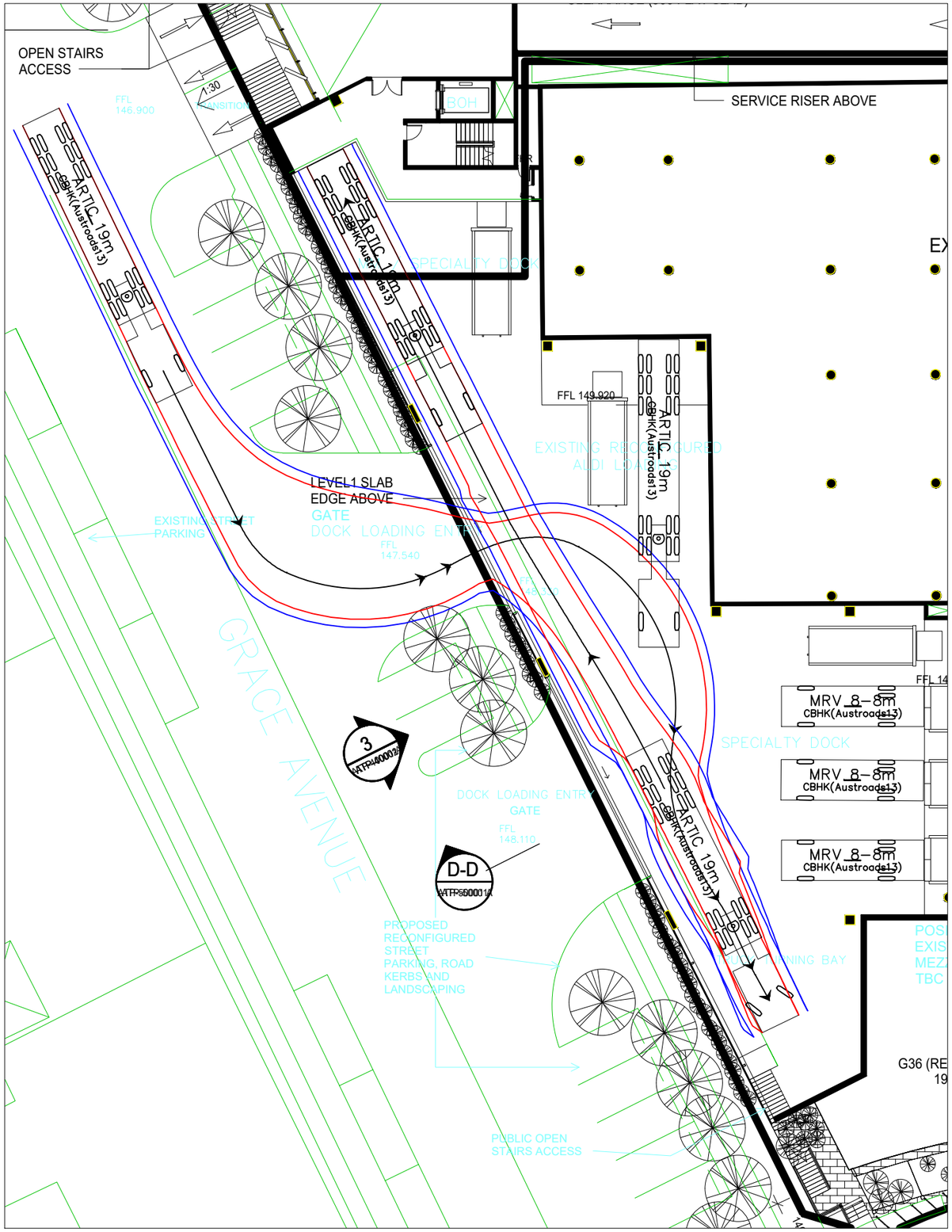
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

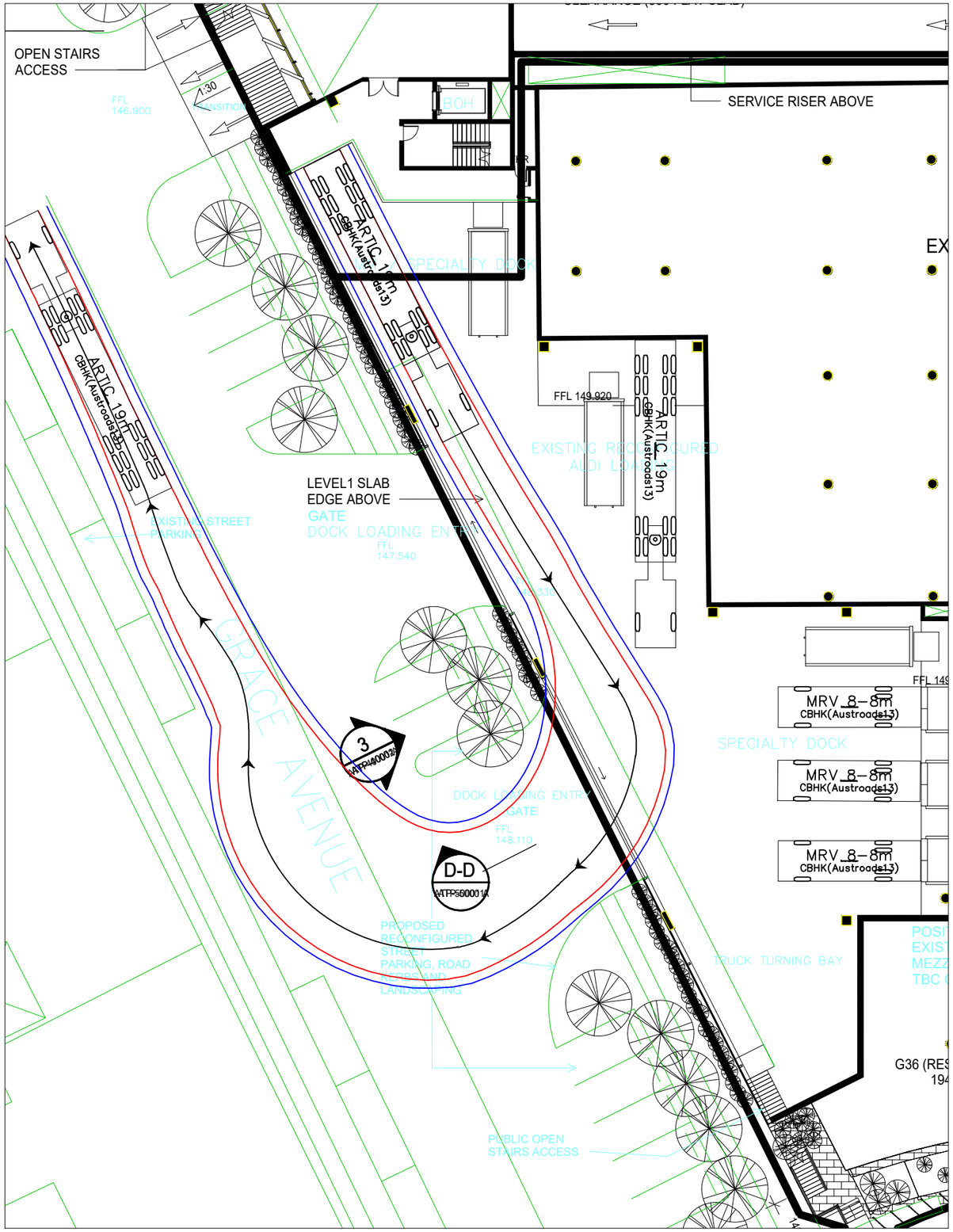
Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

10.7m LARGE RIGID VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019

7



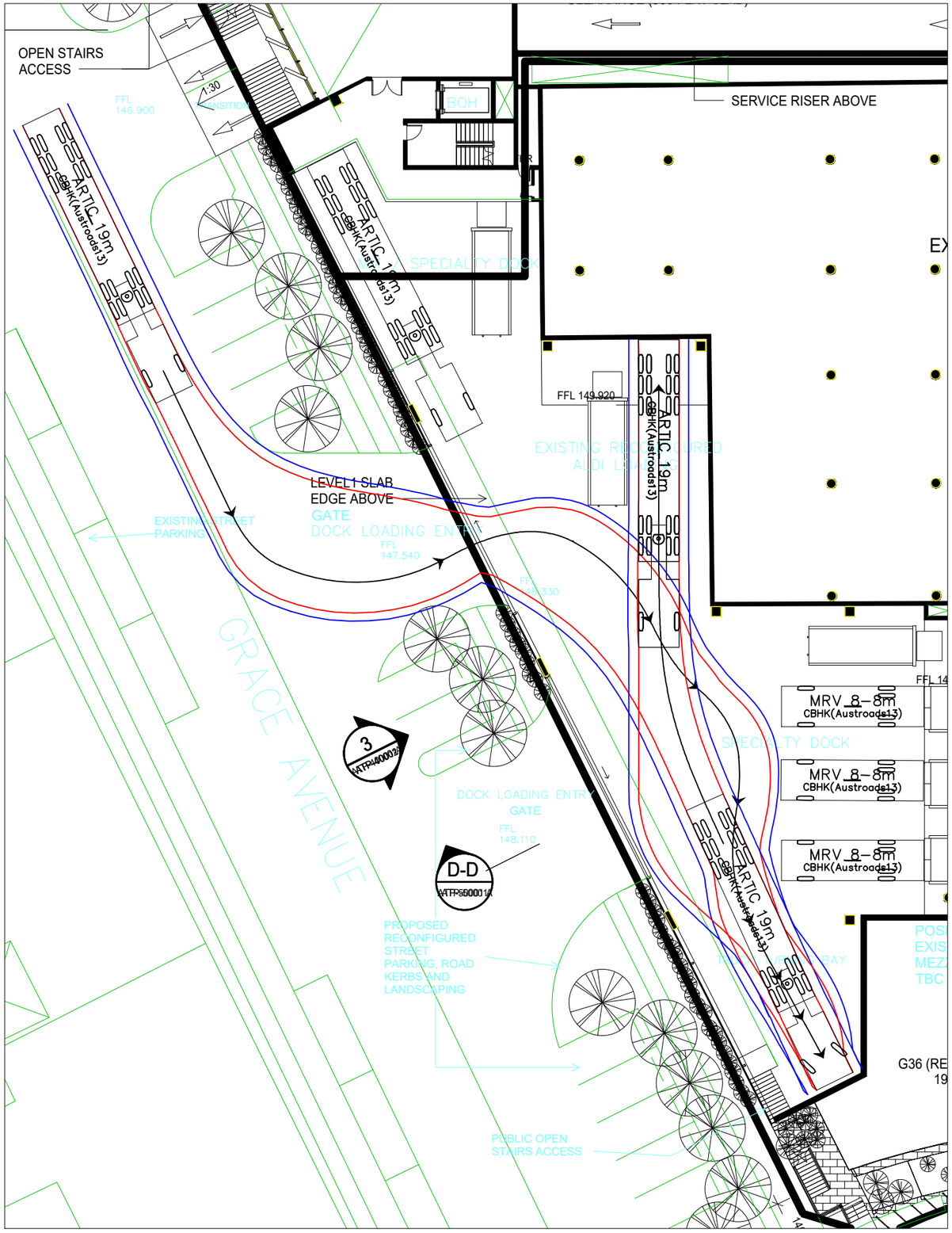


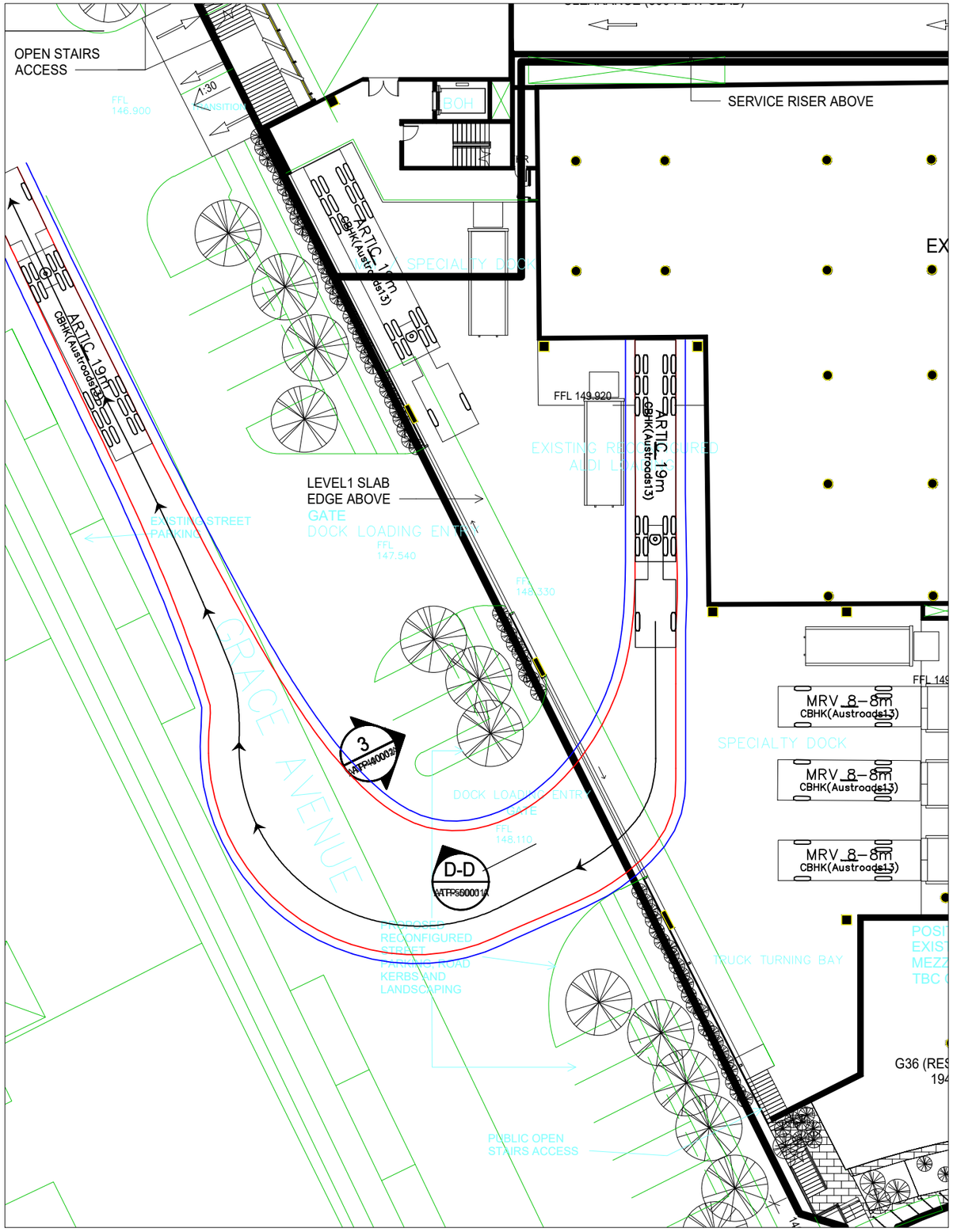
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

19.0m ARTICULATED VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019



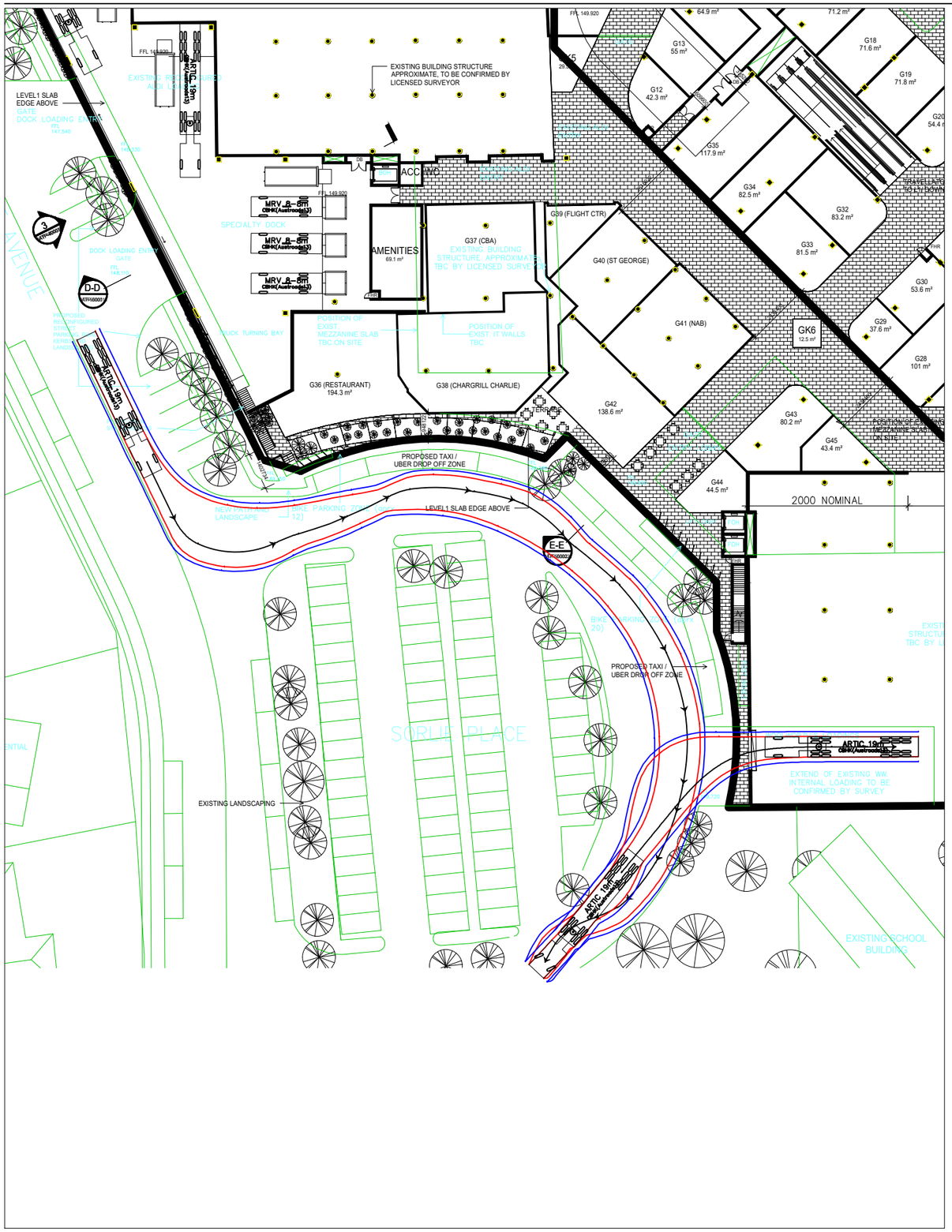


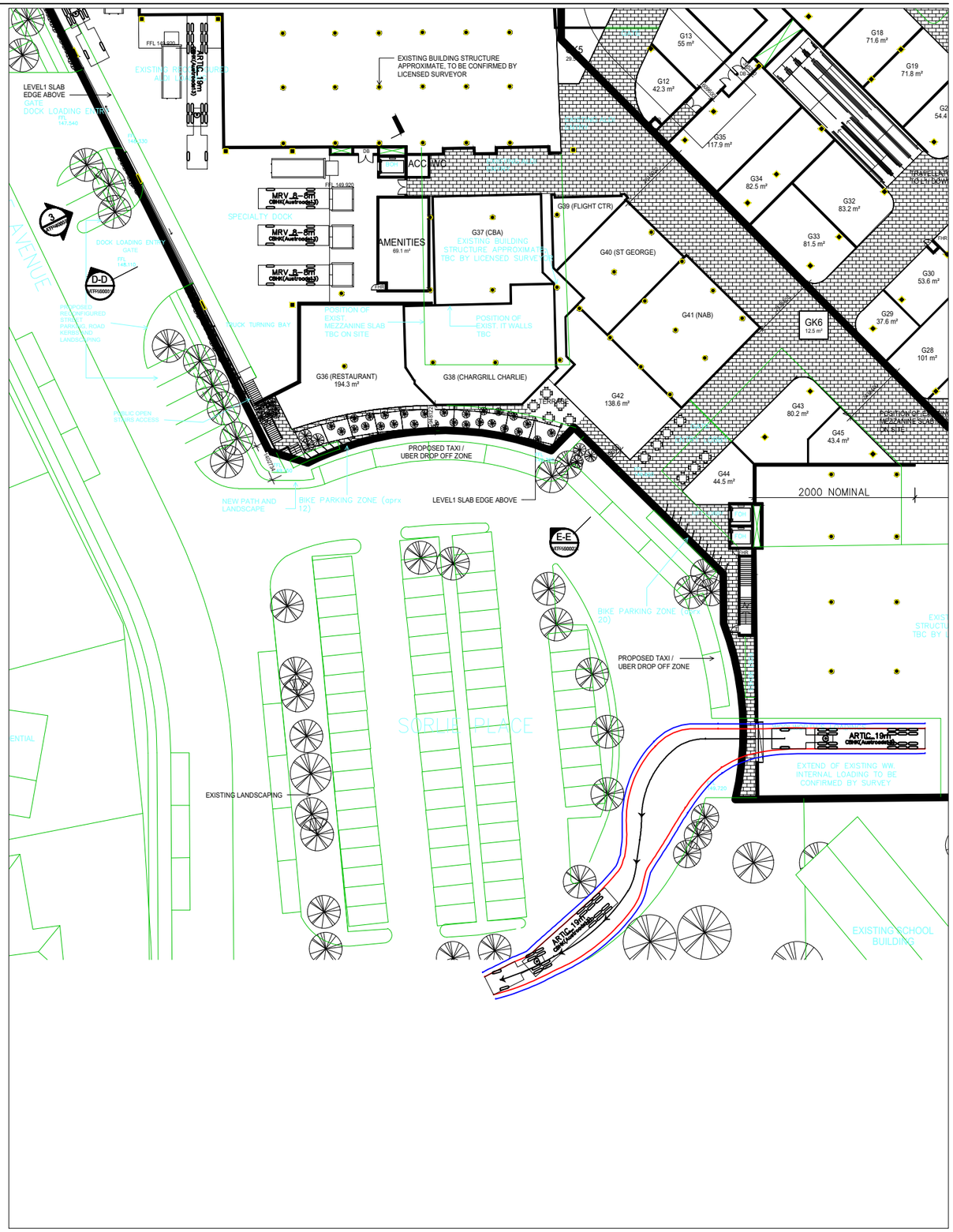
NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

19.0m ARTICULATED VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019





NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

Swept Path of Vehicle Body
Swept Path of Clearance to Vehicle Body

19.0m ARTICULATED VEHICLE SWEPT PATHS

DRAWN BY CBRK Pty Ltd_mc Ref: 10857 24 OCTOBER 2019

10