

HANNAS GROUP

TRAFFIC REPORT FOR
PROPOSED INDUSTRIAL/WAREHOUSE
DEVELOPMENT AND STORAGE FACILITY
AT 101 – 105 OLD PITTWATER ROAD,
BROOKVALE

APRIL 2022

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

Email: cbrk@cbrk.com.au

REF: 11985/2

TABLE OF CONTENTS

1. INTRODUCTION	1
2. EXISTING CONDITIONS	2
3. IMPLICATIONS OF PROPOSED DEVELOPMENT	9

APPENDIX A – VEHICLE SWEPT PATHS

I. INTRODUCTION

- I.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by Hannas Group to prepare a report examining the traffic and parking implications of a proposed industrial/warehouse development and storage facility at 101 - 105 Old Pittwater Road, Brookvale. The site is located on the eastern side of Old Pittwater Road, between Condamine Street and Cross Street, as shown in Figure 1.
- I.2 The proposed development will comprise some 2,780m² of light industrial/warehouse units, some 1,099m² of mezzanine office space and some 1,901m² of self-storage units.
- I.3 This report assesses the traffic and parking implications of the proposed development through the following chapters:
- Chapter 2 - describing the existing conditions; and
 - Chapter 3 - assessing the traffic and parking implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

- 2.1 The site of the proposed development is on the eastern side of Old Pittwater Road in the Brookvale Industrial Area. It is located between Condamine Street and Cross Street, as shown on Figure 1. The site is currently occupied by an existing light industrial and commercial facility with access to and from Old Pittwater Road.
- 2.2 Surrounding land use comprises a mix of industrial and commercial uses. Warringah Mall shopping centre is located to the south-east and Northern Sydney TAFE is located to the south. The area is accessed via Old Pittwater Road and Cross Street to the north and Old Pittwater Road and Condamine Street to the south.
- 2.1. The road network in the vicinity of the site includes Pittwater Road, Condamine Street, Old Pittwater Road and Cross Street. Pittwater Road and Condamine Street are located to the east and combine to provide the main north-south arterial traffic route through the area. Pittwater Road and Condamine Street provide three traffic lanes in each direction with a central median and 60 kilometre per hour speed limit. The kerbside lanes are bus lanes which operate 24 hours in the southbound direction and 3.00pm to 7.00pm in the northbound direction.
- 2.2. Old Pittwater Road is located adjacent to the western boundary of the site and provides an alternative traffic route through the Brookvale industrial area. Old
-

Pittwater Road provides an undivided carriageway with one traffic lane and one parking lane in each direction, clear of intersections. It connects to Condamine Street in the south and to Beacon Hill Road and Pittwater Road in the north-east. The intersections of Old Pittwater Road with Condamine Street, Pittwater Road and Beacon Hill Road are controlled by traffic signals.

- 2.3. Cross Street is located to the north and intersects with Old Pittwater Road at an unsignalised intersection. It provides an east-west traffic route between Old Pittwater Road and Pittwater Road. in the vicinity of the site it provides an undivided carriageway with one-traffic lane and one parking lane in each direction, clear of intersections. The intersections of Cross Street with Green Street, Dale Street and Pittwater Road are controlled by traffic signals.

Traffic Flows

- 2.3 In order to gauge traffic conditions, traffic counts were undertaken during weekday morning and afternoon peak periods at the intersection of Old Pittwater Road/Condamine Street and Old Pittwater Road/Cross Street. In addition, traffic counts were undertaken at the site access driveway onto Old Pittwater Road to determine the traffic generation of the existing development.
- 2.4 The surveyed peak hour flows are set out on Figures 2 and 3 and summarised in Table 2.1. This table indicates the following:
- Condamine Street traffic flows are some 2,300 to 2,650 vehicles per hour two-way during the weekday morning and some 2,650 to 3,350 vehicles per hour two-way during the afternoon peak hour;

Table 2.1: Existing Peak Hour Two-Way (sum of both directions) Traffic Flows		
Road/Location	Morning	Afternoon
Condamine Street		
– north of Old Pittwater Road	2310	2660
– south of Old Pittwater Road	2615	3350
Old Pittwater Road		
– west of Condamine Street	775	1220
– south of site access	695	825
– north of site access	695	830
– south of Cross Street	740	920
– north of Cross Street	735	885
Cross Street		
– east of Old Pittwater Road	195	265
Site Access Driveway		
– east of Old Pittwater Road	20	15

- ❑ Old Pittwater Road traffic flows, west of Condamine Street, are some 780 to 1,220 vehicles per hour two-way during the weekday morning and afternoon peak hours. North of the site access driveway, traffic flows were lower at some 700 to 920 vehicles per hour two-way;
- ❑ Cross Street traffic flows are some 200 to 270 vehicles per hour two-way during the weekday morning and afternoon peak hours; and
- ❑ the site access driveway on Old Pittwater Road generated some 15 to 20 vehicles per hour two-way during the weekday morning and afternoon peak hours.

Intersection Operations

- 2.5 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The intersections of Old Pittwater Road/Condamine Street and Old Pittwater Road/Cross Street have been

analysed with SIDRA for the traffic flows shown in Figures 2 and 3.

2.6 SIDRA simulates the operations of intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle.

2.7 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

2.8 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.

2.9 The analysis found that;

- ❑ the signalised intersection of Old Pittwater Road and Condamine Street is operating with an average delay of less than 28 seconds per vehicle during the morning and afternoon peak periods. This represents level of B, a good level of intersection operation;
- ❑ the unsignalised intersection of Old Pittwater Road and Cross Street is operation with average delays for the movement with the highest average delay, of less than 15 seconds per vehicle during the morning and afternoon peak periods. This represents level of service A/B, a good level of intersection operation;

- ❑ the access driveway on Old Pittwater Road is operating with average delays for all turning movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of intersection operation.

Public Transport

- 2.10 Bus services through the area are provided by Transport NSW. These services operate along Condamine Street and Pittwater Road, to the east.
- 2.11 The most convenient bus stop to the site is the Warringah Mall bus interchange, located within the centre, some 10 minutes' walk from the site. Bus stops are also located on either side of Pittwater Road, adjacent to the shopping centre. An elevated pedestrian bridge over Pittwater Road at this location provides access to bus stops on either side of the road and to northbound and southbound bus services operating through the area.
- 2.12 There are numerous local and regional bus services, including:
- ❑ Route 145 - Warringah Mall to Seaforth;
 - ❑ Route 167 - Warringah Mall to Manly via South Curl Curl;
 - ❑ Route 178 - Cromer Heights to Warringah Mall;
 - ❑ Route 179 - Wheeler Heights to Warringah Mall;
 - ❑ Route 180 - Collaroy Plateau to Warringah Mall;
 - ❑ Route 193 - Warringah Mall to Austlink via Frenchs Forest;
 - ❑ Route 165x - Warringah Mall to City Wynyard via South Curl Curl;
 - ❑ Route 172x - Warringah Mall to City Wynyard via Seaforth;
 - ❑ Route 173x - Warringah Mall to City Wynyard;

- ❑ Route 180x - Collaroy Plateau to City Wynyard; and
- ❑ B-Line Bus - Mona Vale to City Wynyard.

2.13 These bus services combine to provide regular public transport services through the area, with connections to Mona Vale, Dee Why, Manly, Belrose, Spit Junction, Neutral Bay, North Sydney and City. Bus services to the City also provide links to rail service at North Sydney and Wynyard railway stations, providing access to the surrounding Sydney metropolitan area. The site is therefore accessible by public transport services.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 The proposed industrial/warehouse development and storage facility will comprise some 2,780m² of light industrial/warehouse units, some 1,099m² of mezzanine office space and some 1,901m² of self-storage units. The industrial/warehouse units will range in size from some 75m² to 200m². It is understood that the proposed industrial/warehouse units will be used for a range of uses including light industrial, warehouse and storage uses.

3.2 This chapter assesses the implications of the proposed development through the following sections:

- ❑ public transport, walking and cycling;
- ❑ parking provision;
- ❑ access, servicing and internal layout;
- ❑ traffic effects;
- ❑ draft construction traffic management plan; and
- ❑ summary.

Public Transport, Walking and Cycling

3.4 As discussed in Chapter 2, the site is accessible by public transport, with regular bus services operating from Warringah Mall providing access to the surrounding area and connections to rail service at North Sydney and Wynyard railway stations. These services offer alternative travel modes to and from the site, other than by private vehicle.

- 3.5 Northern Beaches Council is investigating proposed future shared cycle paths through the area, including Pittwater Road, Old Pittwater Road, Cross Street, Green Street, Roger Street, Beacon Hill Road and Winbourne Road, as shown on Figure 4. To provide accessibility for cyclists, appropriate bicycle parking will be provided within the development.
- 3.6 The proposed development will therefore be accessible by public transport, walking and cycling. It will increase employment close to existing public transport, strengthening the demand for these services and supporting the efficient and viable operation of the services.
- 3.7 The proposed development is therefore consistent with government policy and the planning principles of:
- (a) providing development that is accessible by walking, cycling, and public transport;
 - (b) providing appropriate on-site parking to encourage greater public transport use and increasing the proportion of trips by public transport;
 - (c) improving the choice of transport and reducing dependence solely on cars for travel purposes;
 - (d) moderating growth in the demand for travel and the distances travelled, especially by car; and
 - (e) supporting the efficient and viable operation of public transport services.
-

Parking Provision

- 3.8 Northern Beaches Council's 'Warringah DCP 2011' includes the following parking requirements for industrial/warehouse developments:
- Industrial/Warehouse
 - 1.3 spaces per 100m² GFA (including up to 20% of floor area as office space component. Office space component above 20% determined at office rate); and
 - Office premises
 - 1 space per 40m² GFA.
- 3.9 Application of the above rates to the industrial/warehouse units, comprising some 2,780m² of light/industrial/warehouse units and 695m² of office space (20% of the unit floor area for office space), results in a parking requirement of some 45 spaces. The balance of the 404m² office component (1,099m² – 695m²), at a rate of one space per 40m² GFA, results in a requirement for a further 10 spaces.
- 3.10 With regards to the self-storage component of the development, Council's DCP does not provide a specific parking rate. The DCP suggests that, for development uses not included in the DCP, the parking requirement should be based on surveys of other similar facilities. Surveys undertaken on behalf of the Self-Storage Association of Australia Pty Ltd (SSAA) found the peak parking demand for self-storage facilities up to 3,000m² was some 6 parking spaces. The proposed self-storage facility of some 1,901m² would therefore require some 4 parking spaces.
- 3.11 Thus, the total parking requirement for the proposed development is some 59 parking spaces. The proposed development will provide 66 parking spaces,
-
-

satisfying this requirement. In addition to the self-storage parking spaces, vehicles associated with the storage units will also be able to park within the circulation aisles adjacent to the self-storage units. Appropriate passing area has been provided within the self-storage circulation aisles for vehicles to pass.

Access, Servicing and Internal Layout

- 3.12 Vehicular access to the site will be provided via two access driveways onto Old Pittwater Road. The northern driveway will provide access to the ground floor and basement level of the proposed development, and the southern driveway located adjacent to the southern site boundary will provide access to Level I.
- 3.13 The proposed access driveways, in terms of size, location and design (including provision of appropriate sight lines), will be provided in accordance with the Australian Standard for Parking Facilities (Part 1: Off-street car parking and Part 2: Off-street commercial vehicle facilities), AS2890.1-2004 and AS2890.2-2018.
- 3.14 The industrial/warehouse units will be provided on ground floor and Level I of the development and the self-storage units will be provided on the basement level. On-site car parking will be provided adjacent to the internal access aisle circulating through the three levels of the development and service vehicles will be accommodated within the various industrial/warehouse units.
- 3.15 Car parking spaces and service vehicle areas will be designed to comply with the Australian Standards AS2890.1-2004 and AS2890.2-2018, with regards to parking bay dimensions, aisle widths, loading areas and height clearances. Parking bays will be a minimum of 2.4 metres wide by 5.4 metres long and aisle widths will be a minimum of 6.1 metres wide. Parking spaces located adjacent to structure will be an additional 300mm wider to provide an appropriate door opening clearance.
-
-

Spaces at the end of dead end aisles will have one metre extensions or a widened circulation aisle for appropriate accessibility. Columns and structure will be set back 750mm from the front edge of the spaces.

- 3.16 Disabled parking spaces will be provided on ground floor and Level 1 of the development. Disabled parking spaces will be provided in accordance with the Australian Standard AS2890.6-2009 and will be 2.4 metres wide, with an adjacent 2.4 metre wide shared zone for wheelchair access. Height clearance above parking spaces will be 2.2 metres generally, with 2.5 metres above disabled spaces. These dimensions are considered appropriate, being in accordance with the Australian Standards AS2890.1-2004 and AS2890.6-2009.
- 3.17 Internal circulation aisles and vehicular ramps within the development will be provided in accordance the Australian Standards AS2890.1-2004 and AS2890.2-2018. Vehicular ramps will include appropriate transitions at the top and bottom of the ramps to prevent vehicles scraping.
- 3.18 Service vehicle access to the site will be designed to cater for service vehicles ranging from small commercial vehicles to medium rigid trucks up to 8.8 metres in length. A 3.5 metre height clearance strike bar will be located at the top of the basement ramp, restricting vehicles access the basement level to cars and small rigid trucks. Internal circulation aisles, manoeuvring areas and loading areas, will be provided in accordance with the Australian Standards AS2890.2-2018. Vehicle swept paths are shown in Appendix A.
- 3.19 Overall, subject to detailed design, the proposed access, parking layout, internal circulation and servicing arrangements are appropriate.
-

-
-
- 3.20 Following DA approval, access arrangements, parking layout, servicing and vehicular swept paths should be reviewed and confirmed for compliance certification.

Traffic Effects

- 3.21 Traffic generated by the proposed development will have its greatest effects during the morning and afternoon peak periods when it combines with commuter traffic on the surrounding road network. Surveys undertaken by TfNSW found the following two-way peak hour traffic generation rates for industrial/warehouse developments with ancillary office area:

- Industrial
 - one vehicle per hour two-way per 100m² GFA;
- Warehouse
 - 0.5 vehicles per hour two-way per 100m² GFA; and
- Ancillary office
 - 2 vehicles per hour two-way per 100m² GFA.

- 3.22 Application of these rates to the industrial/warehouse units, plus 2 to 3 additional vehicles per hour two-way for the self-storage units, would result in a traffic generation ranging from some 40 to 55 vehicles per hour two-way during the morning and afternoon peak periods.

- 3.23 As noted in chapter 2, the site currently generates traffic. Therefore, the proposed development would generate an additional some 20 to 40 vehicles per hour two-way during the morning and afternoon peak periods. We have been
-
-

conservative and adopted the higher traffic generation of 40 vehicles per hour two-way during the morning and afternoon peak periods. This would be split 80% in/20% out in the morning and the reverse in the afternoon.

- 3.24 The additional traffic has been assigned to the road network as shown on Figures 2 and 3, with the results summarised in Table 3.2.

Table 3.1: Existing Plus Additional Development Peak Hour Two-Way Traffic Flows				
Road/Location	Morning		Afternoon	
	Existing	Plus Development	Existing	Plus Development
Condamine Street				
– north of Old Pittwater Road	2310	-	2660	-
– south of Old Pittwater Road	2615	+25	3350	+25
Old Pittwater Road				
– west of Condamine Street	775	+25	1220	+25
– south of site access	695	+25	825	+25
– north of site access	695	+15	830	+15
– south of Cross Street	740	+15	920	+15
– north of Cross Street	735	+15	885	+15
Cross Street				
– east of Old Pittwater Road	195	-	265	-

- 3.25 Examination of Table 3.1 reveals that traffic flows on Condamine Street, south of Old Pittwater Road, would increase by some 25 vehicles per hour two-way during the morning and afternoon peak periods. Traffic flows on Old Pittwater Road, west of Condamine Street, would increase by some 25 vehicles per hour two-way during the morning and afternoon peak periods. North of Cross Street, traffic flows would increase by some 15 vehicles per hour two-way during peak periods.
- 3.26 The surveyed intersections were reanalysed using SIDRA with additional development traffic in place. The analysis found that the signalised intersection of Old Pittwater Road and Condamine Street will continue to operating with an average delay of less than 28 seconds per vehicle during the morning and

afternoon peak periods. This represents level of B, a good level of intersection operation.

- 3.27 The unsignalised intersection of Old Pittwater Road and Cross Street will continue to operate with average delays for the movement with the highest average delays of less than 15 seconds per vehicle during the morning and afternoon peak periods. This represents level of service A/B, a good level of intersection operation.
- 3.28 The site access driveways on Old Pittwater Road with the additional development traffic will operate with average delays for all turning movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of intersection operation.
- 3.29 Therefore the road network will be able to cater for the additional development traffic.

Draft Construction Traffic Management Plan

- 3.30 The construction methodology, process and staging will be finalised when a builder has been appointed. The CTMP will be prepared in accordance with Council's requirements. It will be prepared prior to the commencement of work, taking into account relevant consent conditions.
- 3.31 The overall principles for traffic management during construction of the development are:
- ❑ provide a convenient and appropriate environment for pedestrians;

- ❑ minimise effects on pedestrian movements and amenity;
- ❑ maintain traffic capacity at intersections and mid-block around the site;
- ❑ maintain access to other properties adjacent to the site;
- ❑ restriction construction activity to the approved construction hours;
- ❑ restrict construction vehicle activity to designated truck routes through the area;
- ❑ maintain safety for workers;
- ❑ provide appropriate construction fencing and hoarding along Old Pittwater Road and adjacent to northern and southern site boundaries;
- ❑ provide appropriate access to the site for construction traffic;
- ❑ construction vehicles to enter and exit the site in a forward direction;
- ❑ manage and control construction vehicles on and off the site and pedestrian movements adjacent to the construction access driveway; and
- ❑ manage and control construction vehicle activity in the vicinity of the site.

3.32 All construction activity will be staged and managed from the on-site construction compound. During the latter stages of excavation and during construction of the development, an on-street works zone will be required adjacent to the site on

Old Pittwater Road. The on-street works zone will require application to and approval from Northern Beaches Council.

- 3.33 During demolition and excavation, all construction vehicles and materials handling, including the removal of spoil and delivery of construction material, will be accommodated on-site. Construction hoarding and containment fencing will be erected around the perimeter of the site, with scaffolding, containment fencing and overhead protection provided where required.
- 3.34 Once construction of the building has commenced, construction material deliveries will be managed from the on-street works zone.
- 3.35 Access to and from the site will be provided onto Old Pittwater Road, via a temporary construction access driveway. The temporary construction access driveway will be managed and controlled by appropriately qualified traffic controllers. All trucks accessing the site will be required to enter and exit in a forward direction.
- 3.36 Construction vehicles will generally include single unit dump trucks, concrete trucks and large rigid trucks. Trucks will not be permitted to queue on-street. An appropriate on-site truck queuing area will be provided during demolition, excavation and construction.
- 3.37 Traffic controllers will be located within the site and will manage construction vehicle access and pedestrian movements across the temporary construction access driveway. They will ensure that the driveway is kept clear at all times, to allow trucks unobstructed access to the site and ensure that trucks do not queue on-street. They will not enter the public road reserve or attempt to stop traffic within Old Pittwater Road. Trucks exiting the site will give way to traffic and
-

pedestrians and will wait for appropriate gaps in the traffic in order to enter the surrounding road network.

- 3.38 The construction access driveway will be located to provide appropriate sight lines for construction vehicle access, with regards to the number, type and size of construction vehicles. Traffic and pedestrian warning signs will be erected adjacent to the driveway and on the pedestrian footpath adjacent to the construction activity, in accordance with SafeWork NSW requirements.
- 3.39 Truck drivers will be advised of the designated truck routes to and from the site and of the presence of traffic controllers at the construction access driveways. Truck drivers will be required to observe the traffic controllers direction at all times. All traffic controllers will be fully qualified with the relevant TfNSW Traffic Controllers qualifications.
- 3.40 The appointed builder/contractor will be responsible for the preparation of the CTMP, which will be prepared prior to the commencement of work, incorporating the conditions of consent.
- 3.41 Site operations, signage, construction fencing/hoarding, overhead protection, safety barriers and line marking detail will be provided in accordance with the Australian Standards and the TfNSW Manual for Traffic Control at Work Sites. A copy of the final CTMP will be kept on site at all times. Signage detail, traffic management, the control of pedestrians in the vicinity of the site, and control of construction vehicles entering and exiting the site will be the responsibility of the site contractor.
-

3.42 The final CTMP will include the following:

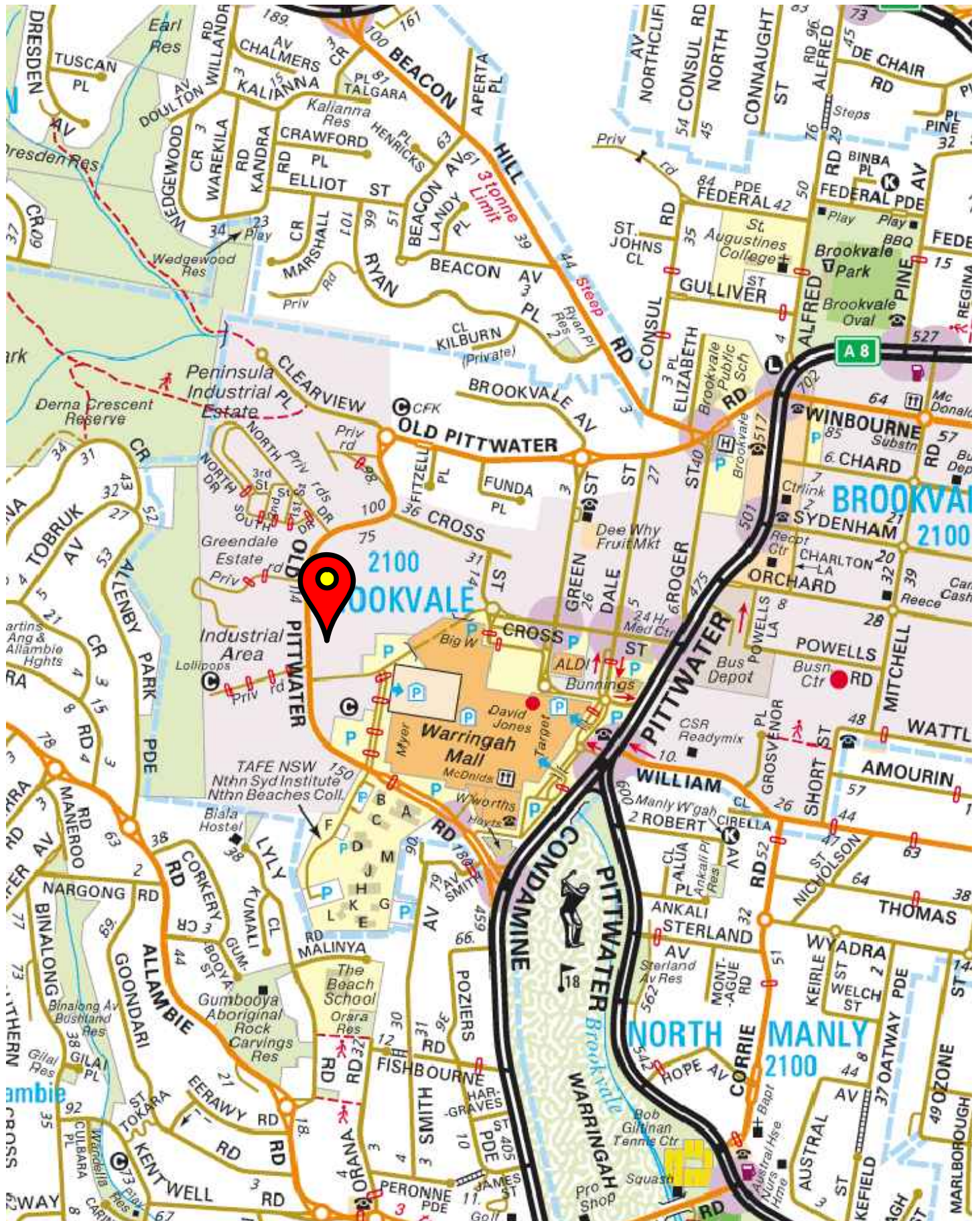
- ❑ all construction activity to be provided on-site;
- ❑ construction vehicle access to be provided onto Old Pittwater Road, via a temporary construction access driveway;
- ❑ construction activity to be staged in order to minimise traffic effects on the operation of other properties in the vicinity of the site;
- ❑ construction hoarding/fencing and scaffolding to be erected around the construction site, with overhead protection provided where required;
- ❑ construction work to be restricted to approved hours of construction. Any work outside the approved hours would be subject to prior approval from Northern Beaches Council;
- ❑ the on-site construction compound and the adjacent on-street works zone will be utilised for the delivery of construction material;
- ❑ the movement of trucks on and off the site and the use of the on-street works zone will be managed and controlled by traffic controllers in accordance with a safe work method statement and appropriate traffic control plans;
- ❑ trucks to be restricted to designated truck routes to and from the site;
- ❑ trucks to enter and exit the site in a forward direction;

- ❑ maintain access to other adjacent properties in the vicinity of the site at all times during construction;
- ❑ the construction access driveway and the on-street works zone will be managed and controlled by qualified traffic controllers;
- ❑ traffic controllers to ensure that the construction access driveway is kept clear at all times, to allow trucks unobstructed access to the site;
- ❑ the management of the site works will be the responsibility of the site contractor/builder;
- ❑ pedestrian activity across the site access driveway will be managed and controlled by qualified traffic controllers;
- ❑ pedestrian arrangements, construction activity and erection of safety fencing will be provided in accordance with SafeWork NSW requirements;
- ❑ the site contractor/builder will be responsible for the management of the site, the movement of trucks on and off the site, signage detail, traffic management and the control of pedestrians; and
- ❑ construction signage to be provided in accordance with Australian Standards and TfNSW Manual for Traffic Control at Work Sites.

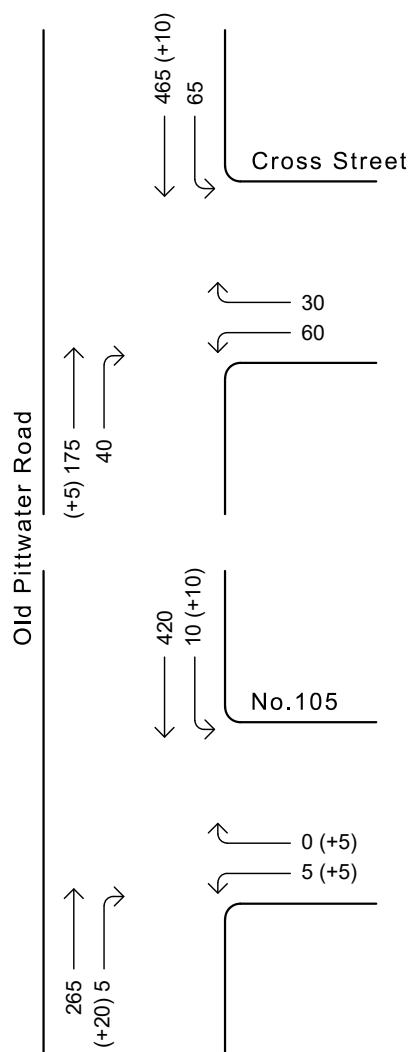
Summary

3.43 In summary, the main points relating to the implications of the proposed development are as follows:

- i) the site is accessible by existing public transport services;
- ii) the site is accessible by active transport, including walking and cycling;
- iii) the proposed parking provision is appropriate;
- iv) access, car parking layout and servicing will be provided in accordance with the Australian Standards AS2890.1-2004, AS2890.2-2018 and AS2890.6-2009;
- v) the surrounding road network and intersections will be able to cater for the proposed development.

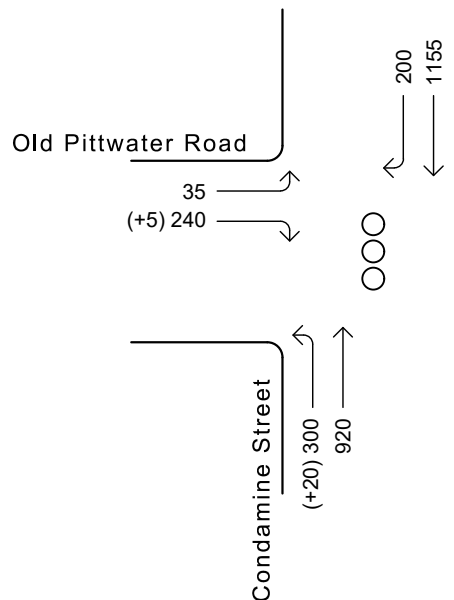


Location Plan



LEGEND

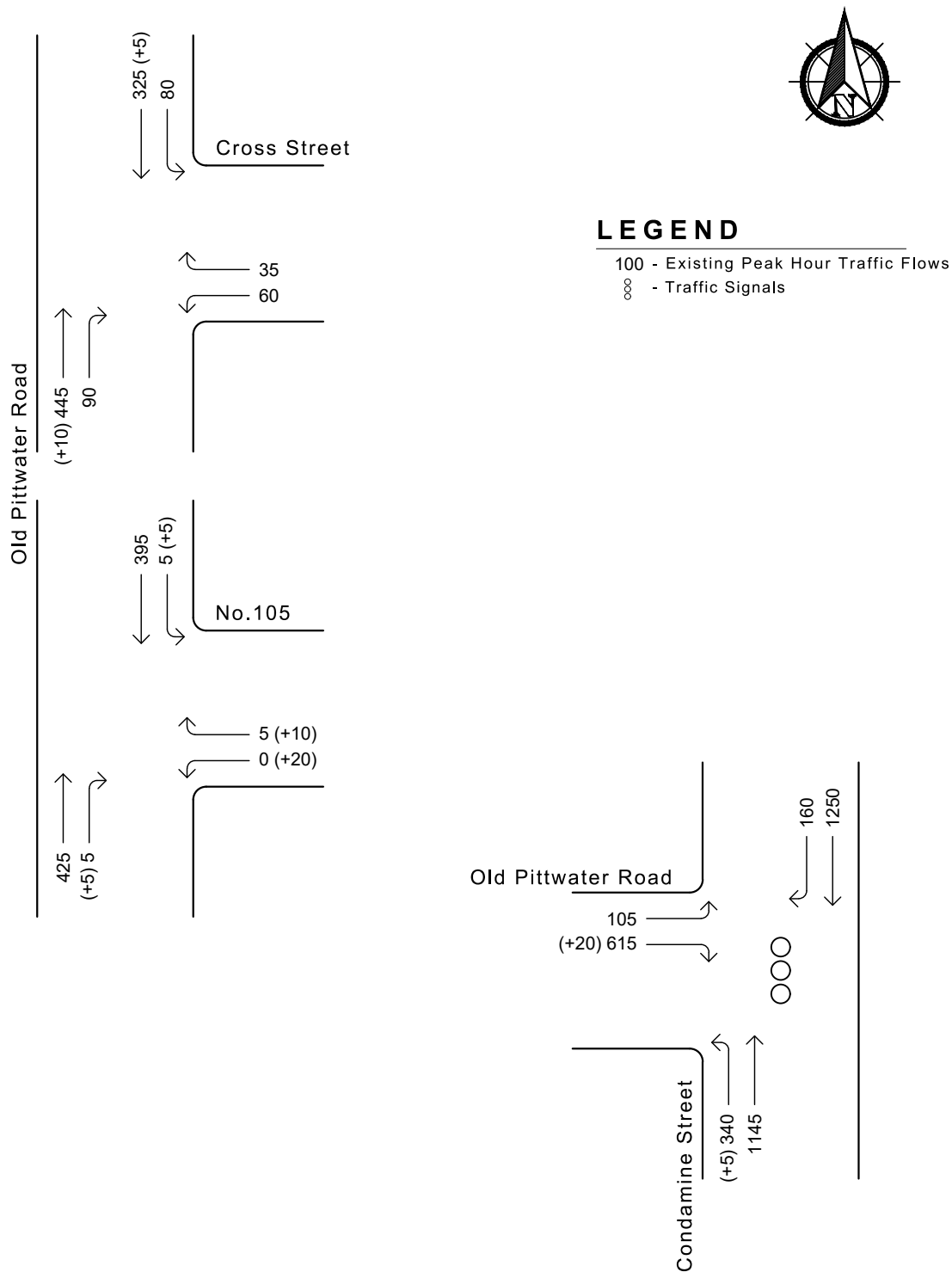
- 100 - Existing Peak Hour Traffic Flows
- ⊗ - Traffic Signals



LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic
- ⊗ - Traffic Signals

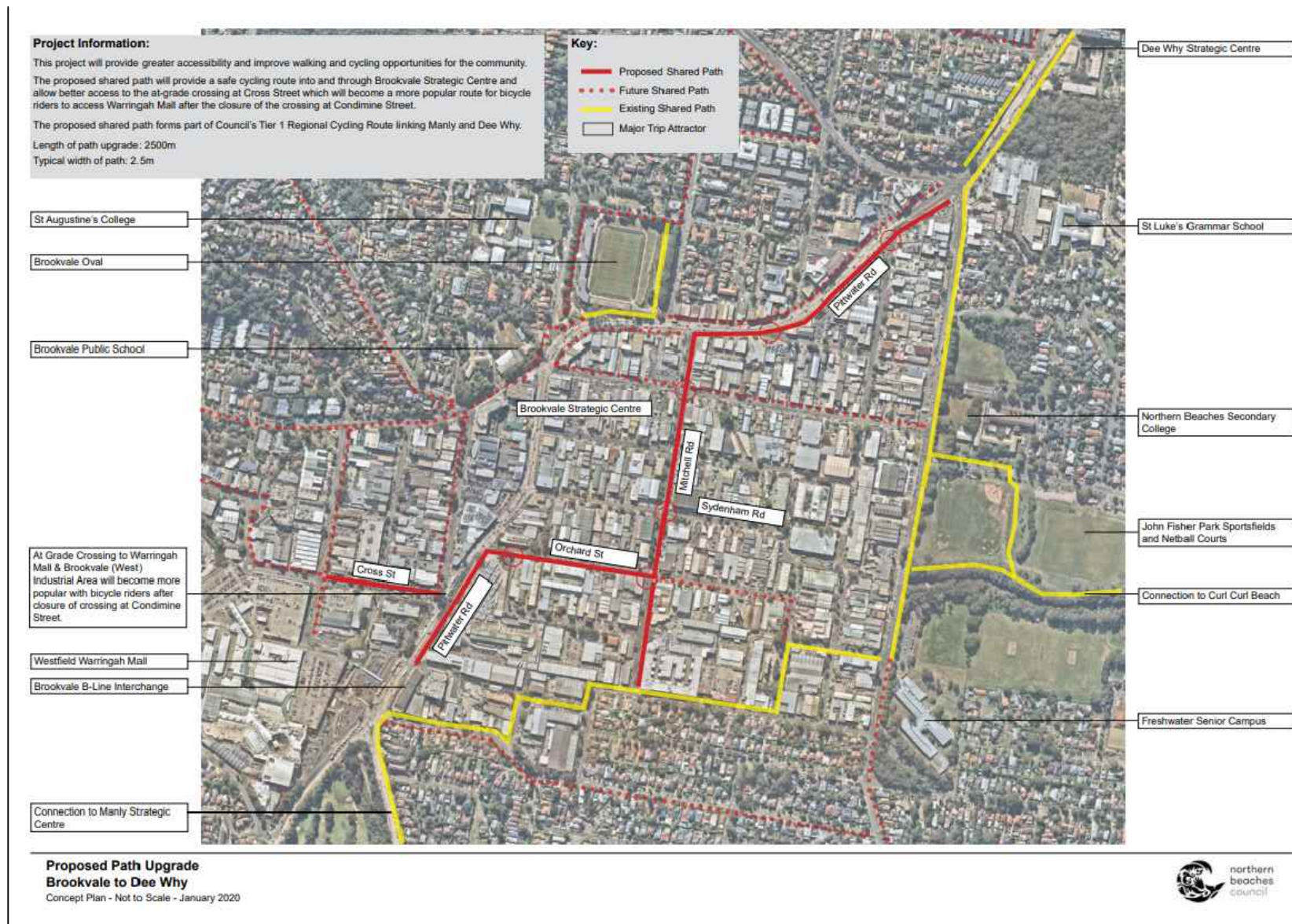
**Existing weekday morning
peak hour traffic flows plus
development traffic
Figure 2**



LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic
- ⊗ - Traffic Signals

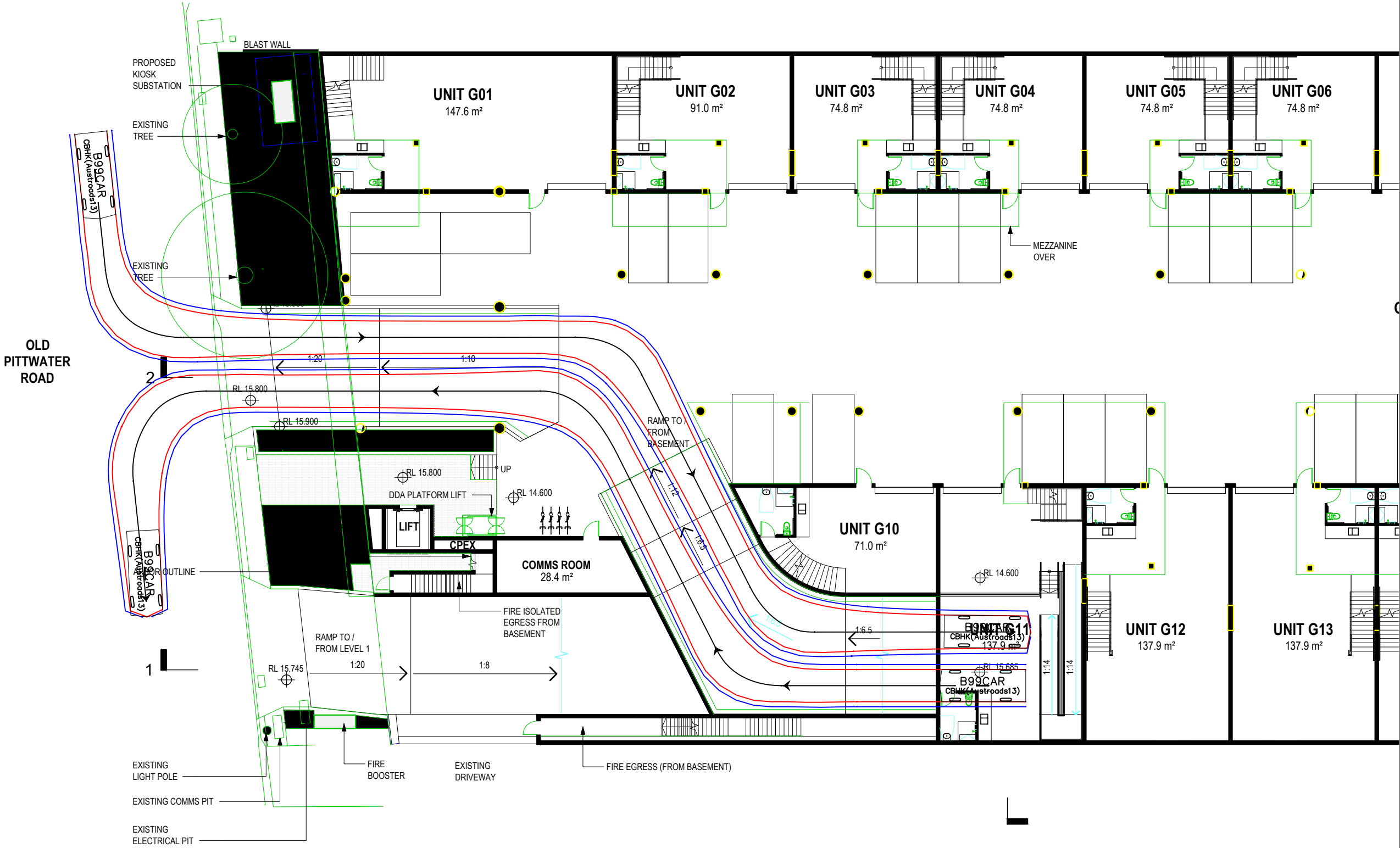
**Existing weekday afternoon
peak hour traffic flows plus
development traffic
Figure 3**



Brookvale Shared Bicycle Paths

Figure 4

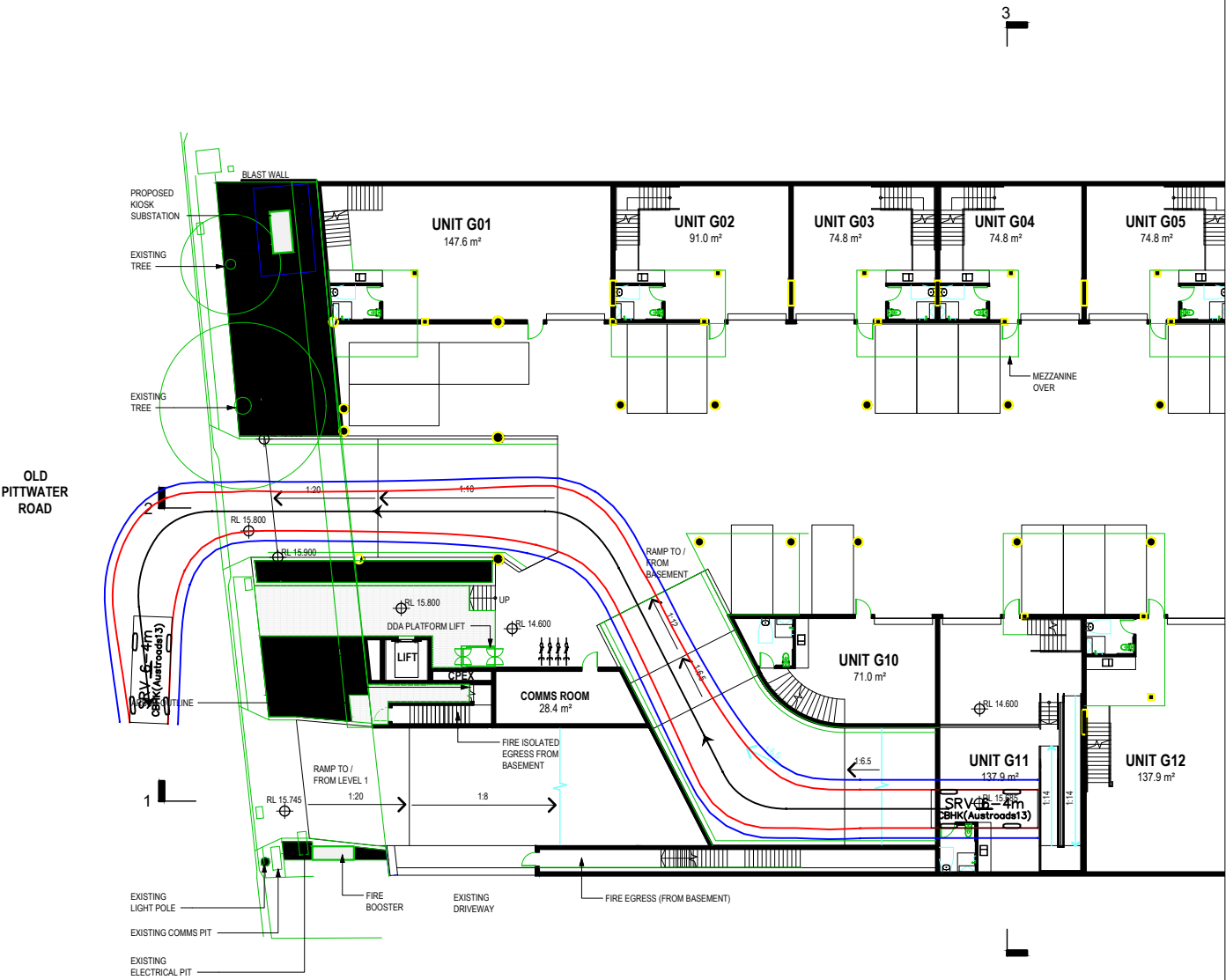
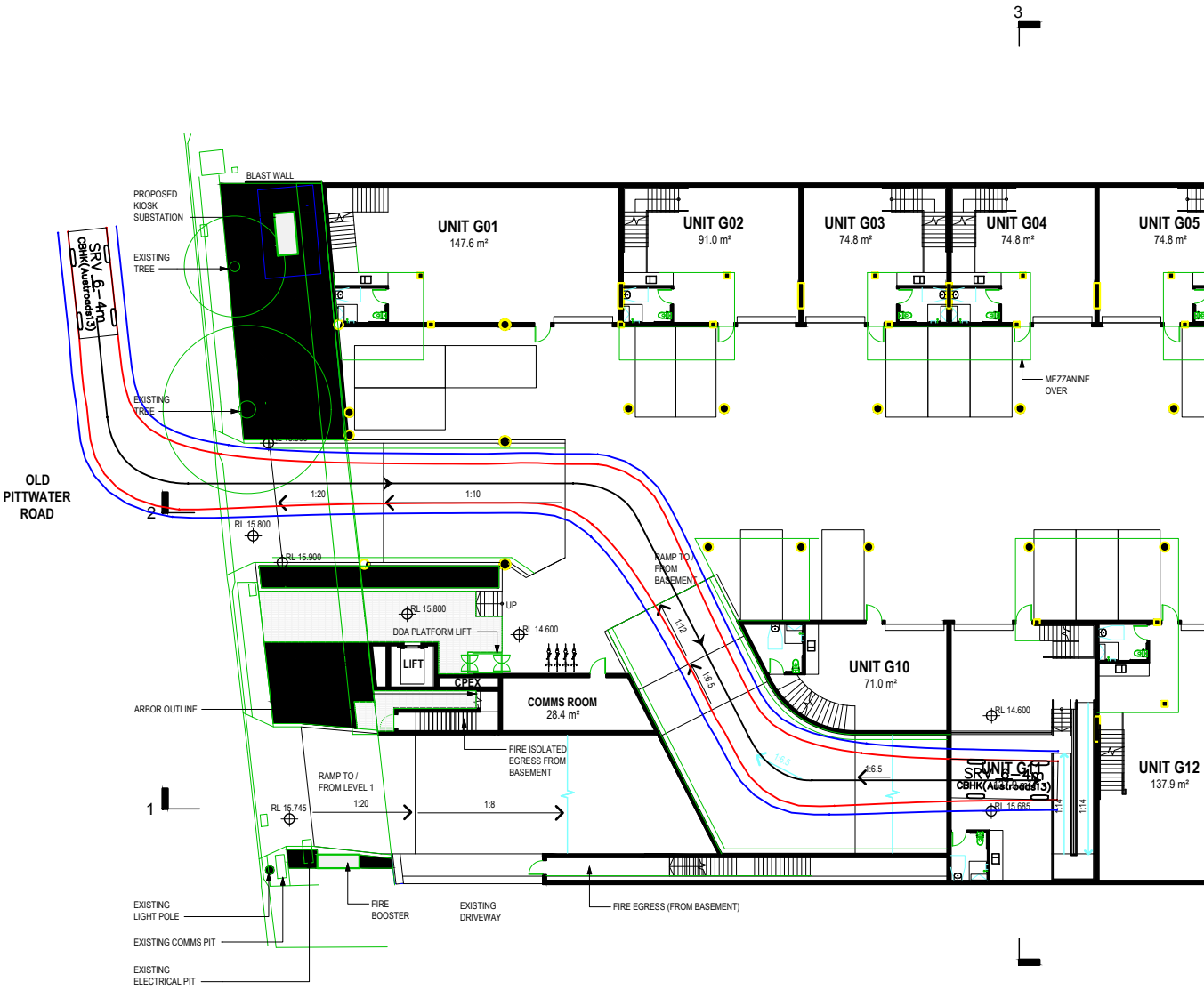
APPENDIX A
Vehicle Swept Paths



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

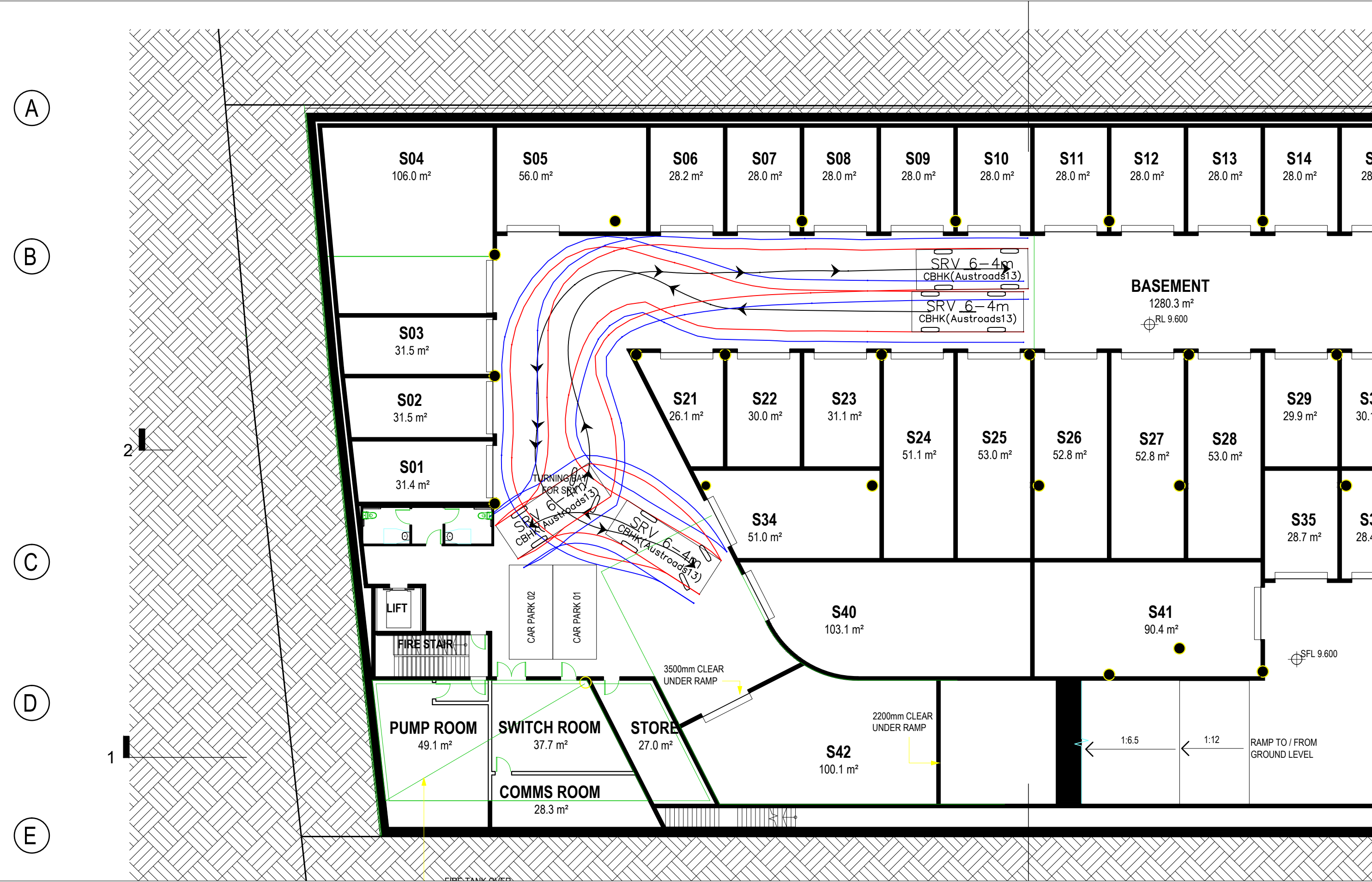
B99 VEHICLE SWEEP PATHS



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

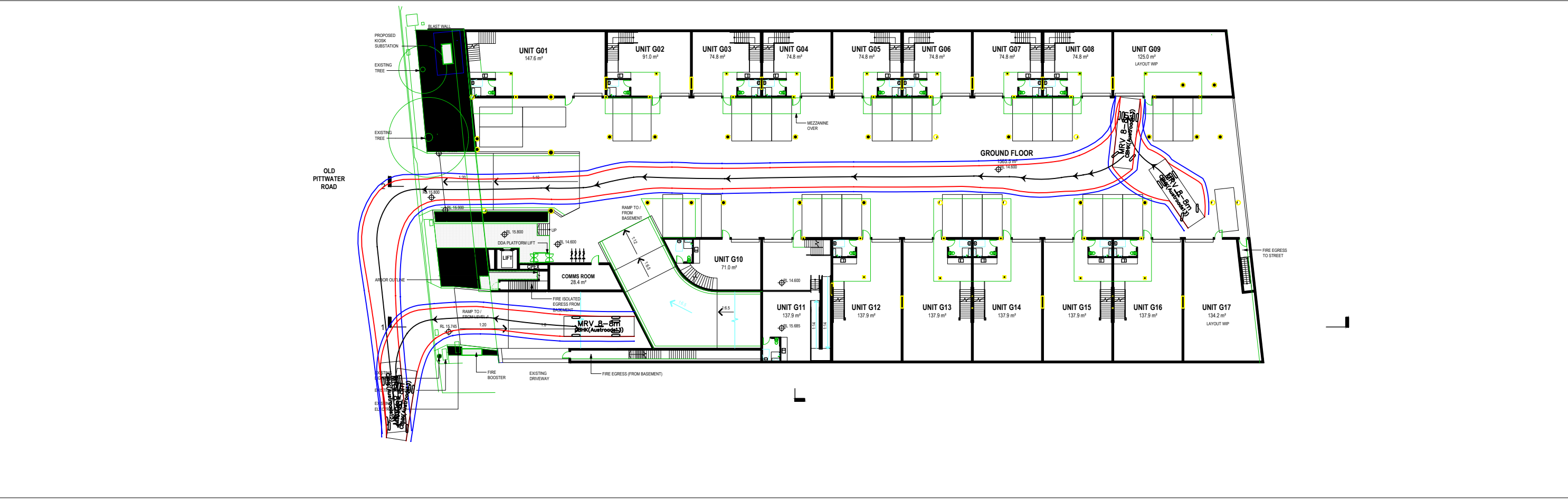
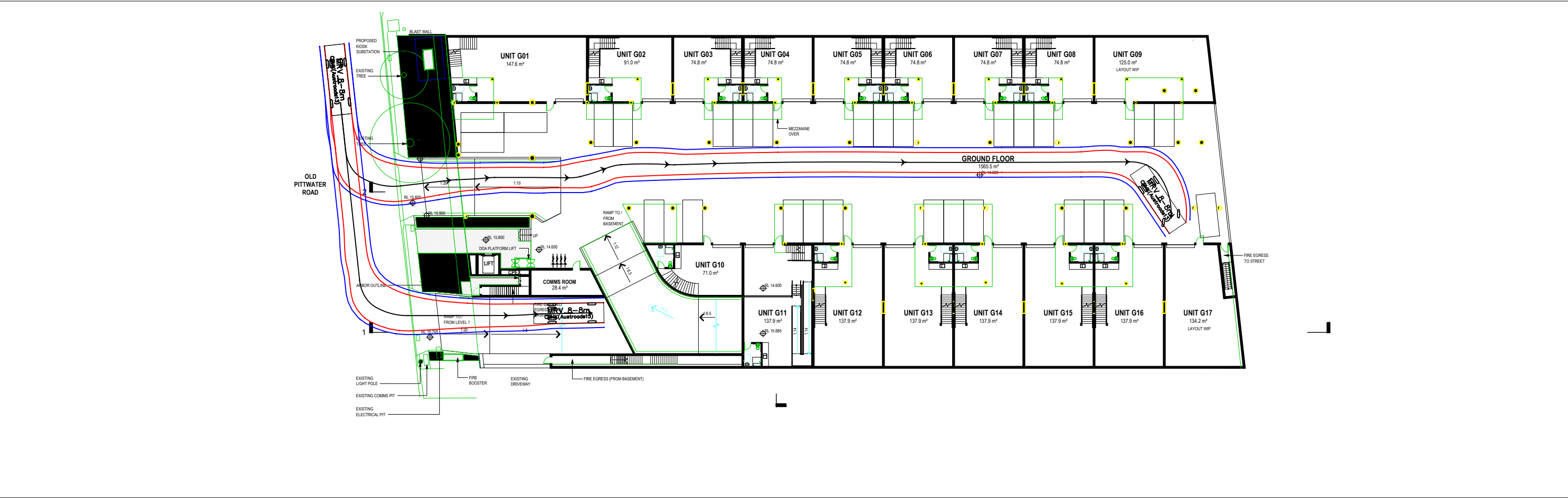
6.4m SMALL RIGID VEHICLE
SWEPT PATHS



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

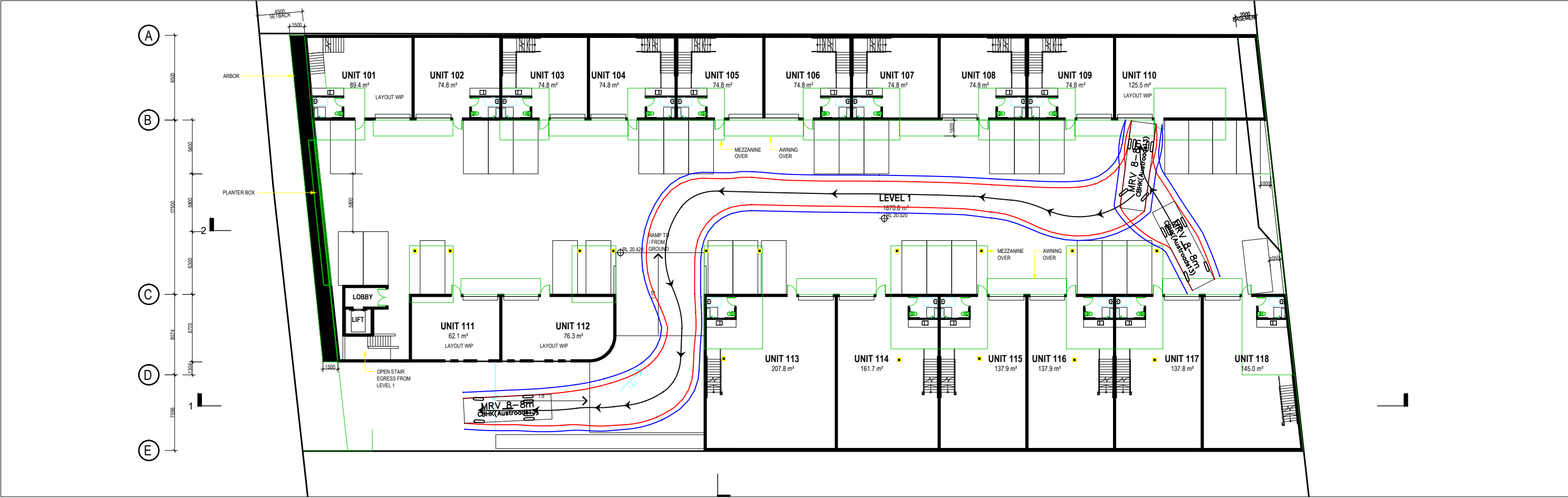
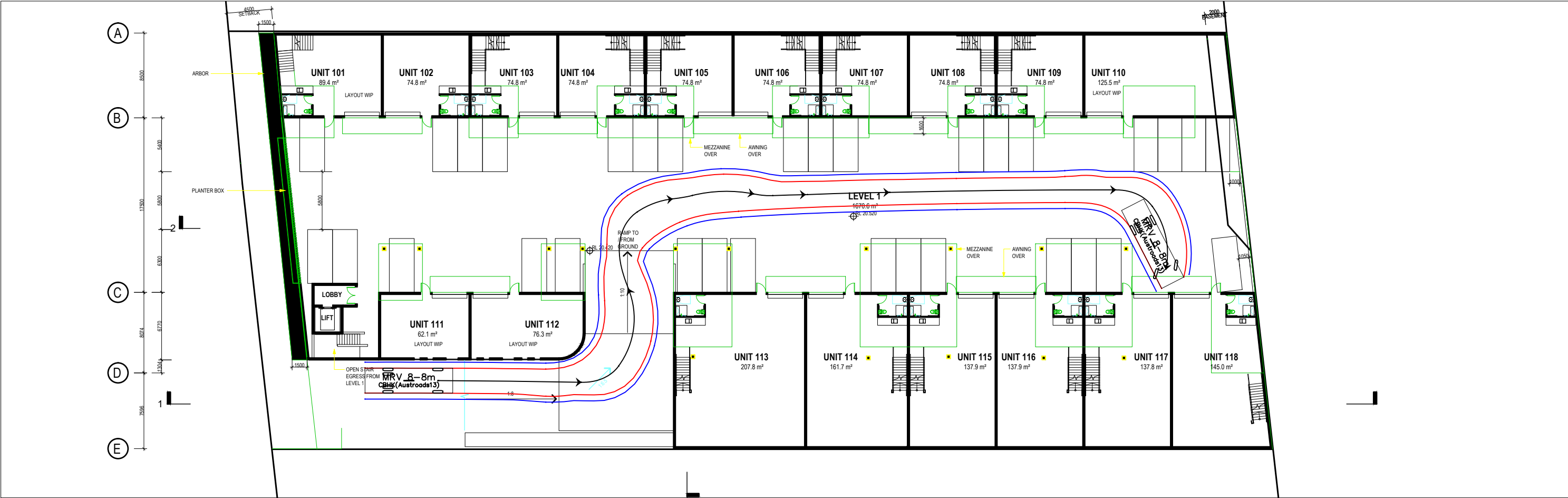
6.4m SMALL RIGID VEHICLE
SWEPT PATHS



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

8.8m MEDIUM RIGID VEHICLE
SWEPT 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

8.8m MEDIUM RIGID VEHICLE
SWEPT PATHS