PROPOSED
MIXED RESIDENTIAL DEVELOPMENT

3 – 5 ARNCLIFFE STREET, WOLLI CREEK

Assessment of Traffic and Parking Implications

July 2016
(Rev E)

Reference 15114

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LIST OF ILLUSTRATIONS

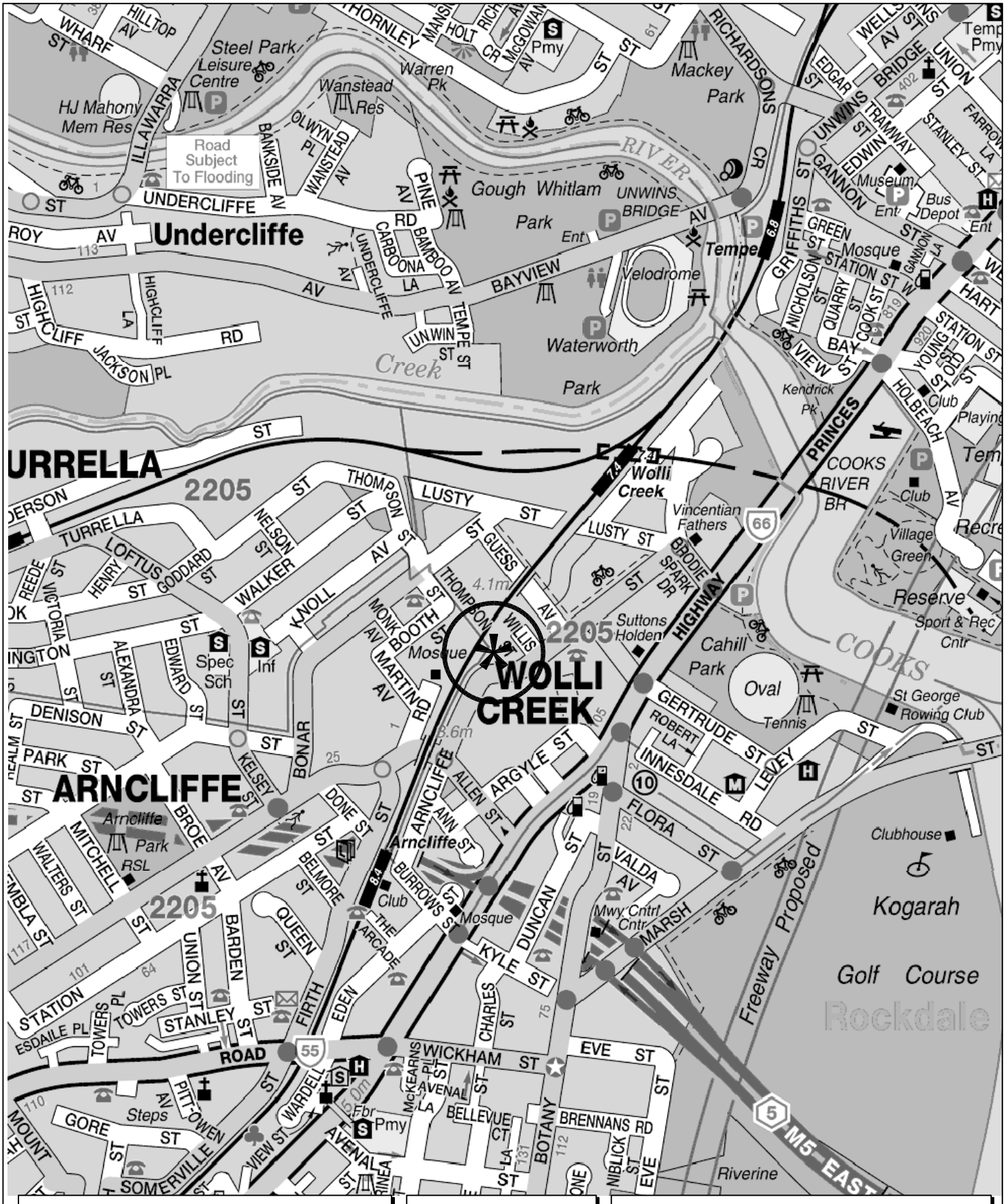
1. INTRODUCTION

This report has been prepared to accompany revised plans for a Development Application submitted to Rockdale City Council for a proposed mixed residential apartment/boarding house development on a site in Arncliffe Street at Arncliffe (Figure 1).

Construction of the 'Wolli Creek' railway station on the Southern Railway Link has acted as the catalyst for redevelopment of the former industrial lands at North Arncliffe as part of the Urban consolidation process.

The proposed development scheme comprises 27 residential apartments (1 SOHO) and 9 boarding rooms with ground/basement level carparking.

The purpose of this report is to provide an assessment of the potential traffic and parking implications of the proposed development scheme.



LEGEND

LOCATION

FIG 1

2. PROPOSED DEVELOPMENT

2.1 SITE, CONTEXT AND EXISTING USE

The development site (Figure 2), is a consolidation of lots 1 and 2 in DP319872 located midway between Arncliffe and Wolli Creek Railway Stations. The site is an irregular shaped area of some 803.8m² with a frontage of some 16.26 metres to the northern side of Arncliffe Street.

The immediate area formerly comprised a mixture of industrial uses, surrounded by largely older style single residential dwellings with some older medium density complexes. However the area which is developing into a new residential apartment based mixed use precinct around the Wolli Creek Railway Station.

The development site and is currently occupied by 2 older style semi-detached dwellings with vehicle accesses on Arncliffe Street.

2.2 PROPOSED DEVELOPMENT

It is proposed to demolish the existing structures and excavate the site to enable the construction of a new nine-level building with basement carparking. The proposed development will comprise:

2 x studio apartment
6 x one-bedroom apartments
17 x two-bedroom apartments
2 x three-bedroom apartments

Total 27 apartments (1 SOHO some 40m^2)

9 x boarding rooms

Basement carparking will provide a total of 31 spaces with vehicle access connection to Arncliffe Street at the western boundary.

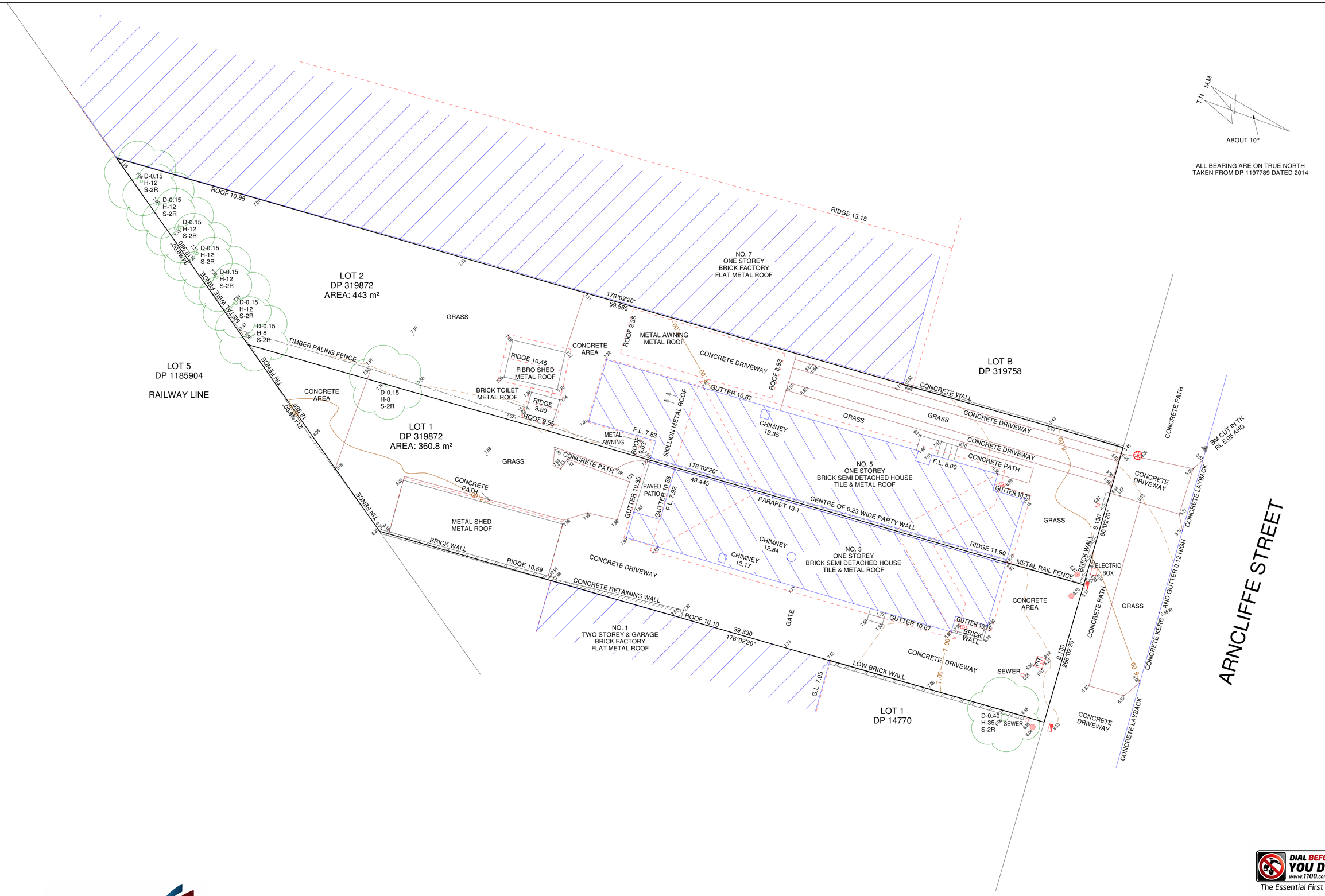
Architectural details of the development scheme are shown on the revised plans prepared by Baker Kavanagh Architects which are reproduced in Appendix A.

LEGEND

N

SITE

FIG 2



Sydney Surveyors

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NOTE: *NO BOUNDARY SURVEY HAS BEEN CARRIED OUT*
IMPROVEMENTS ON OR NEAR THE BOUNDARIES ARE SHOWN DIAGRAMMATICALLY ONLY
THE EXACT LOCATION OF UNDERGROUND SERVICES ARE UNKNOWN

BENCH MARK · TELSTRA PIT · WATER METER · SEWER MANHOLE · STOP VALVE
TREES · HYDRANT · GAS METER · POWER POLE · DRAIN / GRATE

SHEET 01 OF 01

REGISTERED SURVEYOR

REF:	*13908*
SCALE:	*1:100 @A1*
GRID:	
DATUM:	*AHD*
DATE:	*13/03/2015*

PLAN SHOWING DETAIL AND LEVELS AT
3-5 ARNCLIFFE STREET, WOLLI CREEK
LOT 1 IN D.P. 319872 & LOT 2 IN D.P. 319872

3. ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 ROAD NETWORK

The existing road network serving the area (Figure 3) comprises:

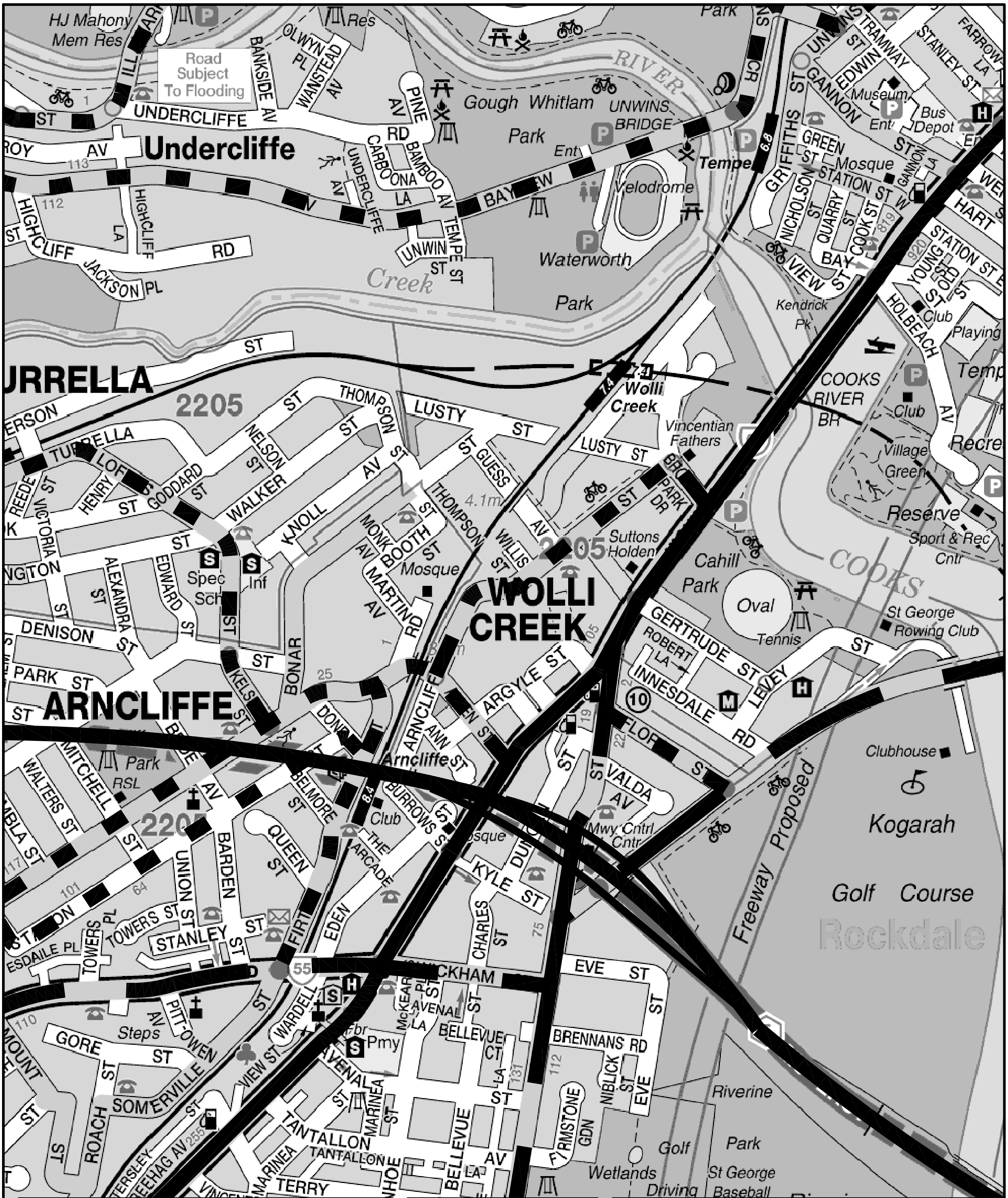
- the *M5 East* Motorway which passes in tunnel beneath Arncliffe with portals located to the east of West Botany Street and an off-load ramp to the Princes Highway
- the *Princes Highway* arterial route which crosses Cooks River just to the east of Discovery Point
- the State Road and arterial route of *Forest Road, Wickham Street and Marsh Street*
- the Regional Road and sub-arterial route of *West Botany Street*
- the Regional Road and collector route of *Wollongong Road, Arncliffe Street and Brodie Spark Drive* between *Forest Road and Princes Highway*
- the minor collector road route linking through Turrella and connecting to *Wollongong Road*
- the short local access road of *Willis Street*

The access road system is constrained to some extent by the railway lines as well as the Cooks River and Wolli Creek systems.

3.2 TRAFFIC CONTROLS

The existing traffic controls which have been applied to the road system in the vicinity of the site (Figure 4) comprise:

- the traffic signals at the Princes Highway and Brodie Spark Drive intersection



Legend

- **ARTERIAL** (solid line)
- **SUB-ARTERIAL** (long dashed line)
- **COLLECTOR** (short dashed line)

N

ROAD NETWORK

FIG 3

- the other traffic signals along the Highway at the Gertrude Street, West Botany Street, M5 Ramp, Burrows Street and Forest Road intersections
- the large roundabout at the Brodie Spark Drive/Arncliffe Street/Magdalene Terrace intersection
- the roundabouts at the Allen Street/Arncliffe Street and Wollongong Road/Firth Street intersections
- the traffic signals at the Wollongong Road/Kelsey Street intersection
- the CLEARWAY and NO STOPPING restrictions along the Highway
- the NO STOPPING restrictions along Brodie Spark Drive
- the 60 kmph speed restriction on the Highway and 50 kmph restriction on the local and collector roads
- the central median islands along the Highway and Brodie Spark Drive

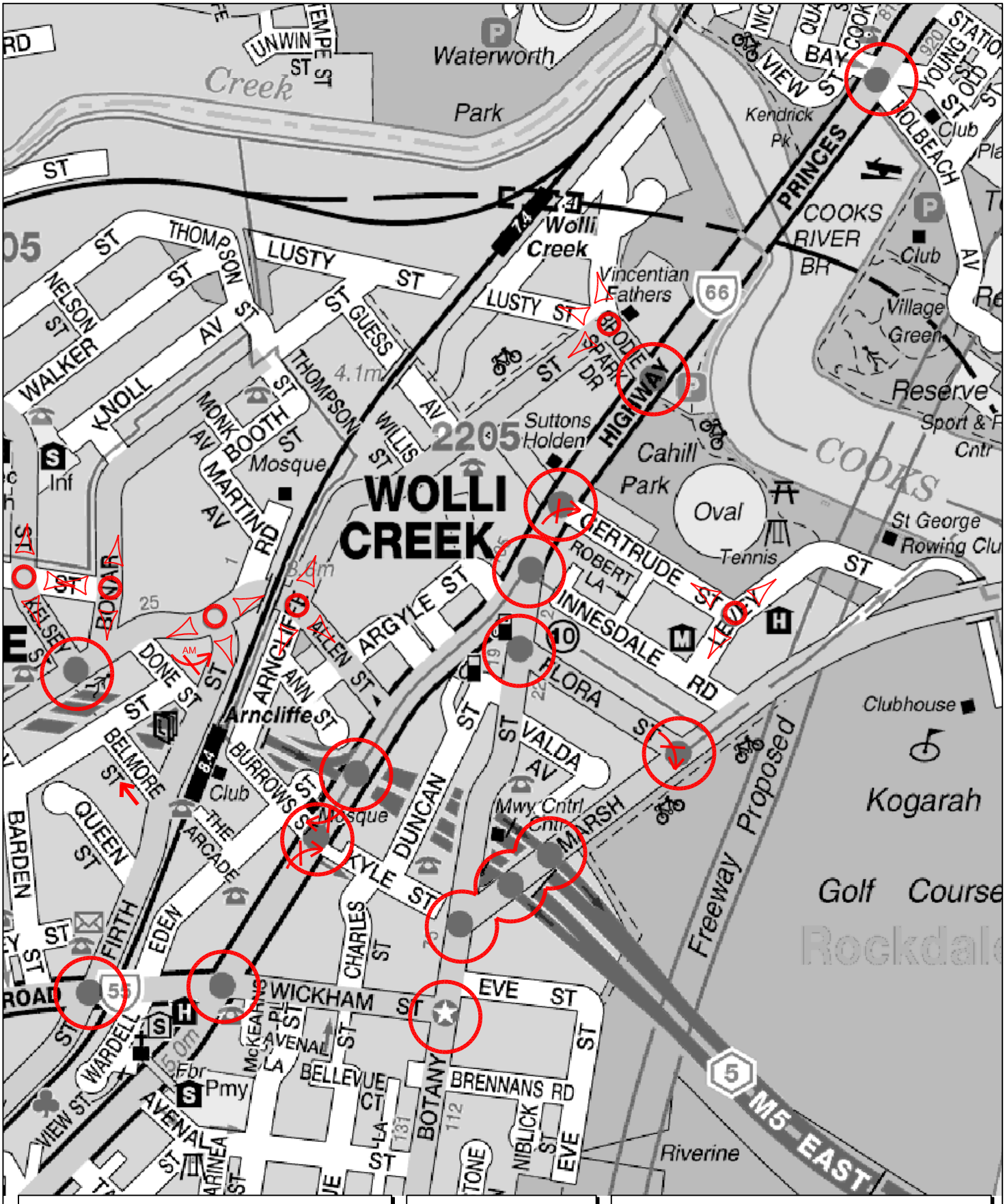
3.3 TRAFFIC CONDITIONS

An indication of the existing traffic conditions on the road system in the vicinity of the site provided in data[1] published by the RMS and other available traffic survey results.

The data provided by the RMS is expressed in terms of Annual Average Daily Traffic (AADT) and the latest recordings in the vicinity of the site are provided in the following:

	AADT
Princes Highway south of Allen Street	37,901
Forest Road west of Princes Highway	20,186
Wollongong Road east of Wolli Creek Road	7,535

[1] *Traffic Volumes for Sydney Region*
Roads and Maritime Services



LEGEND

- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT
- RESTRICTED TURNING MOVEMENT

TRAFFIC CONTROLS

FIG 4

A number of traffic surveys were undertaken at intersections in the vicinity of the site during the peak weekday morning and afternoon. The results of those surveys are summarised in the following:

		AM	**PM**
Princes Highway	Northbound	4,186	1,315
	Left-turn	56	214
	Southbound	1,048	2,935
	Right-turn	89	556
Brodie Spark Drive	Right-turn	146	90
	Left-turn	509	163
Brodie Spark Drive	Westbound	31	208
	Right-turn	2	8
	Left-turn	107	523
	Southbound	-	2
	Right-turn	-	2
	Left-turn	6	2
Arncliffe Street	Northbound	4	2
	Right-turn	596	174
	Left-turn	17	19
Magdalene Terrace	Eastbound	205	67
	Right-turn	3	13
	Left-turn	1	1

The operational performance of these intersections under the prevailing peak traffic demands has been assessed using the SIDRA program. The results of that assessment indicating a satisfactory situation are provided in the following while criteria for interpretation of the modelling output is provided overleaf.

	AM			PM		
	LOS	**DS**	**AVD**	**LOS**	**DS**	**AVD**
Princes Highway/Brodie Spark	C	0.86	24.3	C	0.88	27.4
Brodie Spark/Arncliffe	A	0.35	9.2	A	0.20	6.8

3.4 TRANSPORT SERVICES

The area is well served by the public transport services comprising:

* the Wolli Creek Railway Station which accesses the East Hills, Illawarra and New Southern rail lines

* the State Transit Route 348 bus service which runs between Wolli Creek Railway Station and Bondi Junction with a 30 minute frequency between 7.00am and 7.00pm Monday - Friday

* the State Transit Route 473 bus service which runs along Wollongong Road, Bonar Street/Loftus Street and the Princes Highway connecting between Rockdale and Five Dock

* the State Transit Route 422 service which runs along the Highway connecting between Rockdale and Dulwich Hill via Sydenham

3.5 FUTURE CIRCUMSTANCES

The prescribed upgrading of the road network and traffic controls to suitably accommodate the ultimate redevelopment of Wolli Creek are identified in the diagram overleaf reproduced form Rockdale Road Network and Vehicular Access DCP 2011 which applies to the Wolli Creek Special Precinct.

The construction of Magdalene Terrace and part of Brodie Spark Drive have already been completed, however major elements which are unlikely to be achieved for many years (due to reliance on redevelopment of sites) include:

- construction of Gertrude Street between Princes Highway and Arncliffe Street (New Road 2)

- construction of a new access road parallel to and between the Highway and Arncliffe Street (New Roads 5 and 6)

- widening of the Highway and Arncliffe Street

Criteria for Interpreting Results of SIDRA Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and Accident Study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below, which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

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

3. Degree of Saturation (DS)

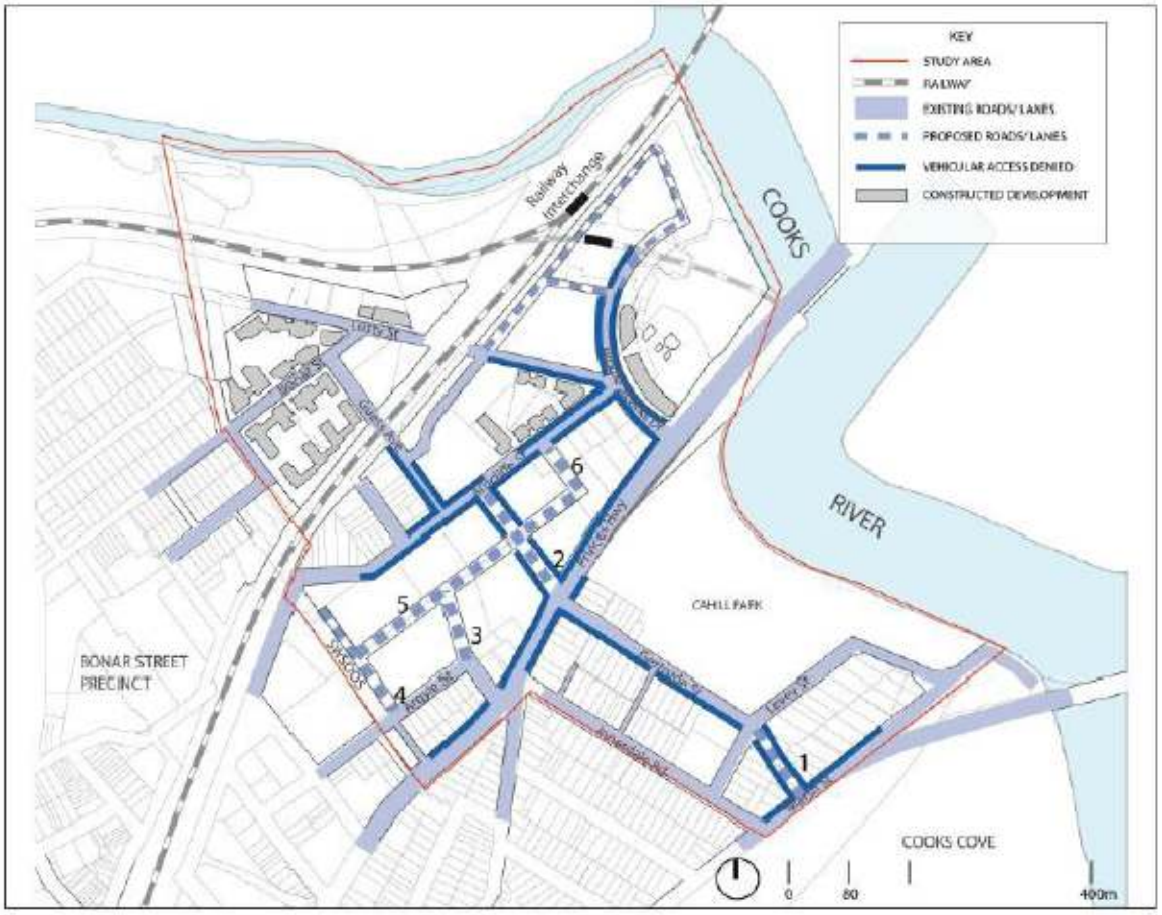
The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

[1] *the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs*

7.1.5 - Road Network and Vehicular Access



Road Network and Vehicular Access

A series of well integrated new streets are proposed to facilitate movement and access around the precinct. Wolli Creek is to be unified with a legible district link road running east-west between Marsh Street, along Gertrude Street and through to Arncliffe Street. The new road will provide a direct connection between Arncliffe and the proposed Cooks Cove development. Gateways to Wolli Creek will be located at Marsh Street and on the Princes Highway to assist in orientation and way finding.

To assist vehicular movement, vehicular access to development sites will be restricted on main traffic routes.

Objectives

A. To create a permeable road network that facilitates efficient vehicular access to and circulation within the area which can be conveniently used by all modes of transport
B. To encourage use of public transport and alternative transport modes to help prevent further congestion of the regional road system

4. TRAFFIC

An indication of the traffic generation potential of the proposed development is provided by the recent RMS Technical Direction (TDT 2013/04) for high density residential (6 or more levels) which specify a peak generation of 0.19 vtph per apartment in the morning peak and 0.15 vtph in the afternoon peak. Application of this criteria to the proposal would indicate:

27 Apartments	AM – 6 vtph PM – 4 vtph
Boarding Rooms (2 parking spaces)	1 vtph (say)
Total:	**7 vtph in AM and** **5 vtph in PM**

This generation would be discounted by that of the existing use on the site of some 1-2 vtph (RMS generation criteria for residential dwellings 0.85 vtph). Therefore the very minor additional movements will be entirely compatible with the planning outcome for the area and will not contribute to any perceptible change to the existing satisfactory traffic circumstances.

5. PARKING

The Department of Plannings Apartment Design Guide provides parking criteria for the proposed development (< 800m from Railway Station) as follows:

		RMS Criteria
Studio	-	not stated (say 0.5)
One bedroom	-	0.6 space
Two bedroom	-	0.9 space
Three bedroom	-	1.4 spaces
Visitors	-	1 space per 5 apartments
Commercial	-	1 space per 40m^2

The SEPP for Affordable Housing specifies the following:

Boarding House	-	1 space per 5 rooms

Application of this criteria to the proposed development indicates the following provision:

2 x Studio	1.0 spaces
6 x One-bedroom	3.6 spaces
17 x Two-bedroom	15.3 spaces
2 x Three-bedroom	2.8 spaces
Visitors (27 apartments)	5.4 spaces
SOHO 40m^2	1.0 spaces
9 Boarding rooms	1.8 spaces
Total:	**30.9 spaces**

It is proposed to provide a total of 31 spaces for the development scheme in the ground and basement level, including 4 accessible/disabled spaces (AS2890.6) in compliance with the relevant criteria.

In relation to the provision for bicycles and motor bikes the DCP and SEPP documents specify the following:

	Bicycle	**Motor Bikes**
Residential apartments	1 space per 10 apts	1 space per 15 apts
Boarding Rooms	1 space per 5 rooms	1 space per 5 rooms

It is proposed to provide 7 bicycle spaces and 6 motor bike spaces.

6. ACCESS, INTERNAL CIRCULATION AND SERVICING

ACCESS

The proposed vehicle access provisions for the basement carpark will involve a 5.5 metre wide combined ingress/egress driveway connecting to the Arncliffe Street. The design of this driveway will accord with the requirements of AS 2890.1 and there will be suitable sight distances available being well removed from any intersection.

INTERNAL CIRCULATION

The system of single lane 2 way ramps will be controlled by traffic signals with the following operational mode:

- Automatically revert to and dwell on green for incoming
- Outgoing driver actives push button
- Signals change to red for incoming and green for outgoing
- After a pre-set clearance time signals revert to red for outgoing and green for incoming

Connection to the basement levels and the design of the carpark complies with the requirements of AS 2890.1 particularly in relation to aisle/bay dimensions ramp width/grades and height clearance. Details of a turning path assessment indicating a satisfactory design outcome are provided in Appendix B.

SERVICING

Refuse will be removed from the street by Council's collection vehicle while small service vehicles (service personnel etc) will be able to use the service bay provided or the visitor spaces. The occasional large service/delivery vehicles will be reliant on the available on-street parking as is normal for residential apartment buildings of this nature.

7. CONSTRUCTION TRAFFIC MANAGEMENT

A detailed Traffic Management Plan will be prepared for the Construction Certificate process, having regard for the Consent Conditions issued. However, the principals of this plan will be as follows:

* vehicle access to be located on Arncliffe Street frontage
* an on-street WORKS ZONE
* worker parking to be provided in basement (when constructed)
* materials to be unloaded from truck standing Works Zone by crane and stored on-site
* truck route to be to/from the Princes Highway via Allen Street and Brodie Spark Drive
* permit to be obtained for any temporary use of mobile crane
* traffic controller/s to be engaged to assist truck movements (as required)
* Type A fencing to be installed along boundary with B class hoarding on Arncliffe Street frontage
* Working hours as per Consent Condition

8. ISSUES

In response to the submitted Development Application Council raised a number of Traffic and Parking issues and these are responded to in the following:

(i) **Wash Bay**

The wash bay to be provided will be 3500 x 5400 and compliant with the DCP requirements.

(ii) **Bicycles**

The bicycle spaces will be provided in secure lockers.

(iii) **Access Arrangements**

Residents will have remote control (magic button) access.

Visitors will normally obtain access by contacting the relevant resident by mobile phone. An intercom will be provided on the eastern wall of the driveway entrance as a contingency.

The provision of a median island in the driveway is unnecessary and would be restrictive on this narrow frontage site.

(iv) **Driveway**

The design of the driveway will comply with Council's Technical Specification Traffic Parking and Access.

(v) **Entry Gate / Queuing**

Section 3.4 in AS2890.1 (Queuing) only relates to "*a car park with boom gates and ticket issuing machine*".

The revised design provides for a car to stand on the driveway entirely within the site and allow for another car to egress.

(vi) **Visitor Parking**

The wording of the issue seems to reflect a generic issue for a large development (i.e. “each building”). This is a very small development and there is no requirement specified in AS2890.1 or Council’s DCP for visitor parking to be physically separated from resident parking.

Visitors will only be able to access by contacting a resident to open the access gate.

It is simply not practical or feasible to physically separate the parking in this small carpark. One visitor space is provided 3500 x 5400 which can also be used for van loading/unloading in compliance with Council’s requirement.

(vii) Provision is made for an SRV to stand temporarily in the driveway and there is a 3.5m height clearance at this location.

(viii) **Hydrant Booster Location**

This has been relocated.

(ix) **Headroom**

2.3m height clearance is provided (2.5m over accessible parking spaces).

(x) **Traffic Signals**

A traffic signal system will be provided for the basement ramps and the operation of this system is described in Section 6.

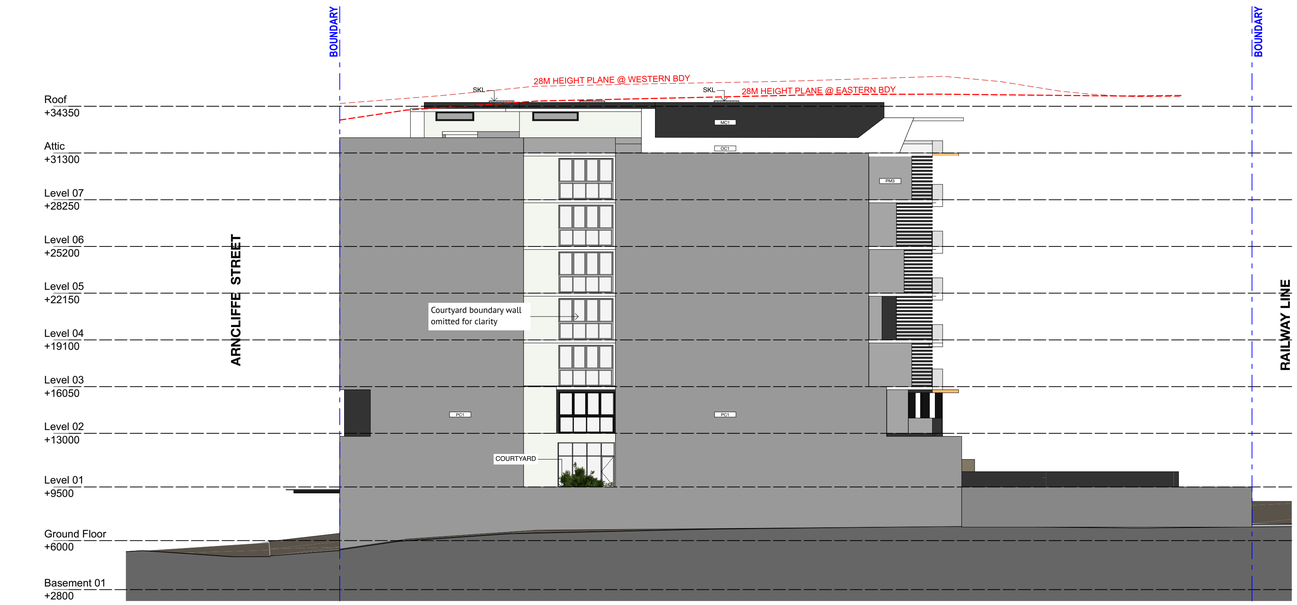
9. CONCLUSION

Redevelopment of the North Arncliffe Precinct reflects the desirability of residential apartment development which has regard for the close proximity of Arncliffe Railway Station and the small commercial area. Assessment of the revised plans for the proposed development scheme has concluded that:

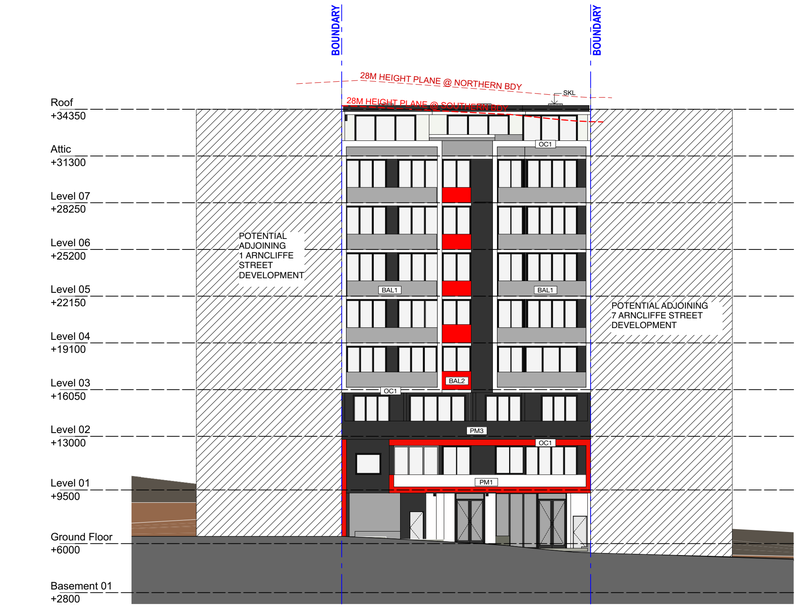
* the proposed vehicle access arrangements will not have any adverse safety or operational implications
* the projected traffic generation and will not have any unsatisfactory implications
* the proposed parking provision will be appropriate and will accord to the code requirements
* the provisions for pedestrians are cyclists will be suitable and appropriate
* the Council issues have been suitably addressed and responded to

APPENDIX A

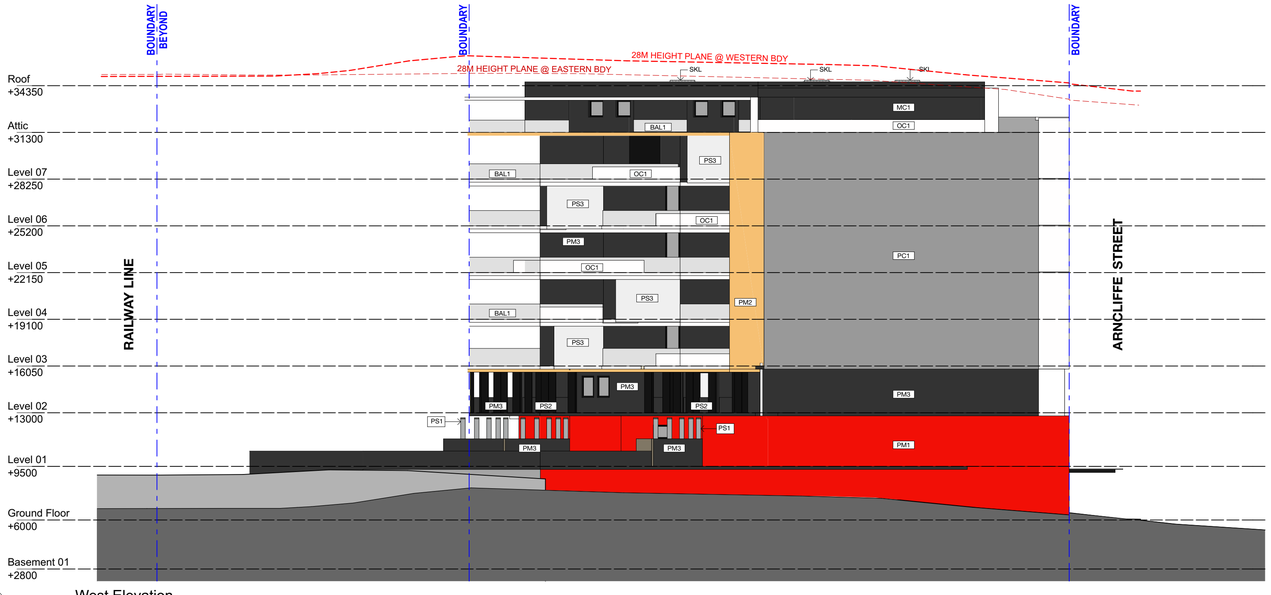
DEVELOPMENT PLANS



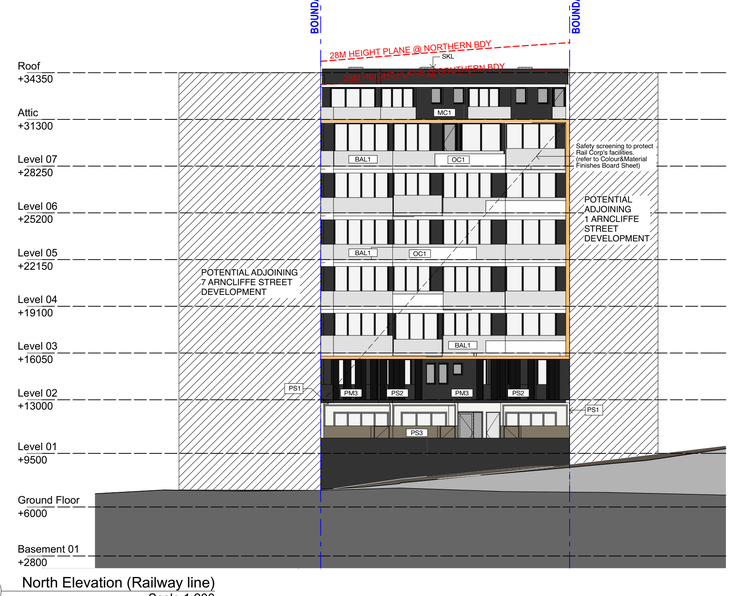
1 East Elevation
Scale 1:200



2 South Elevation (Arncliffe st)
Scale 1:200



3 West Elevation
Scale 1:200



4 North Elevation (Railway line)
Scale 1:200

REVISED ISSUE FOR DA

0 2 4 8 12 16 20m

LEGEND

MC1	METAL CLADDING
PM1	PAINTED MASONRY TYPE 1
PM2	PAINTED MASONRY TYPE 2
PM3	PAINTED MASONRY TYPE 3
BAL1	BALUSTRADE TYPE 1
BAL2	BALUSTRADE TYPE 2
PER	PERGOLA
PS3	POWDER COATING TYPE 3
SKL	SKYLIGHT

NORTH

BKA architecture
Baker Kavanagh Architects
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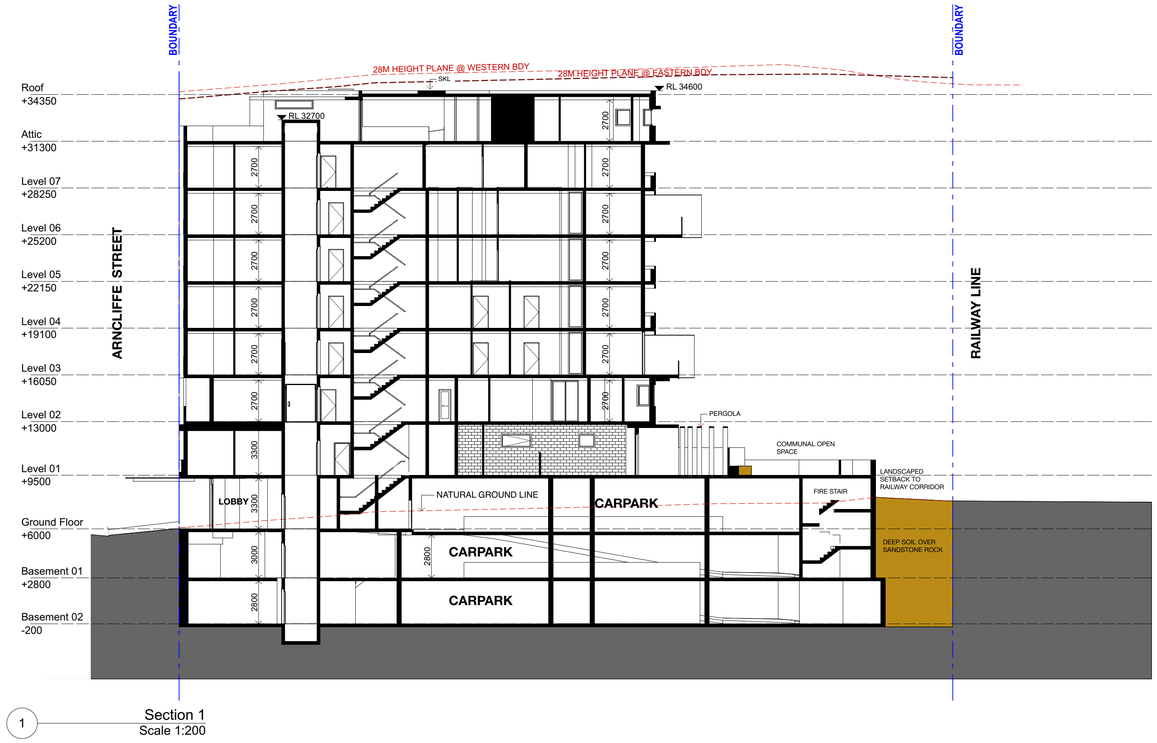
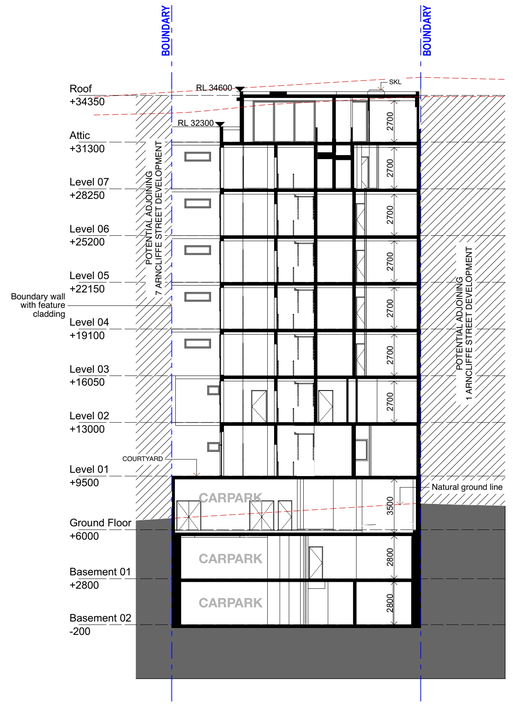
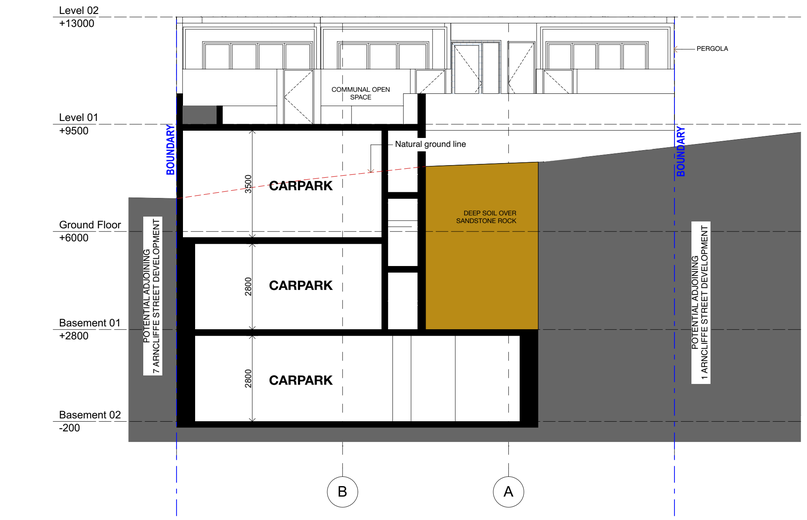
ISSUE	C	DATE	05.07.2016
REVISION	REVISED ISSUE FOR DA		
PROJECT	Mixed Use Developement		
ADDRESS	3-5 Arncliffe St Wolli Creek NSW 2205	PROJECT #	14004
CLIENT	KASAF P/L ATF KASS	DATE	05.07.2016
		SCALE @ A1	1:200
DWG	ELEVATIONS	DRAWN	LS
		CHKD	JK
		DWG #	DA210
		REVISION	C



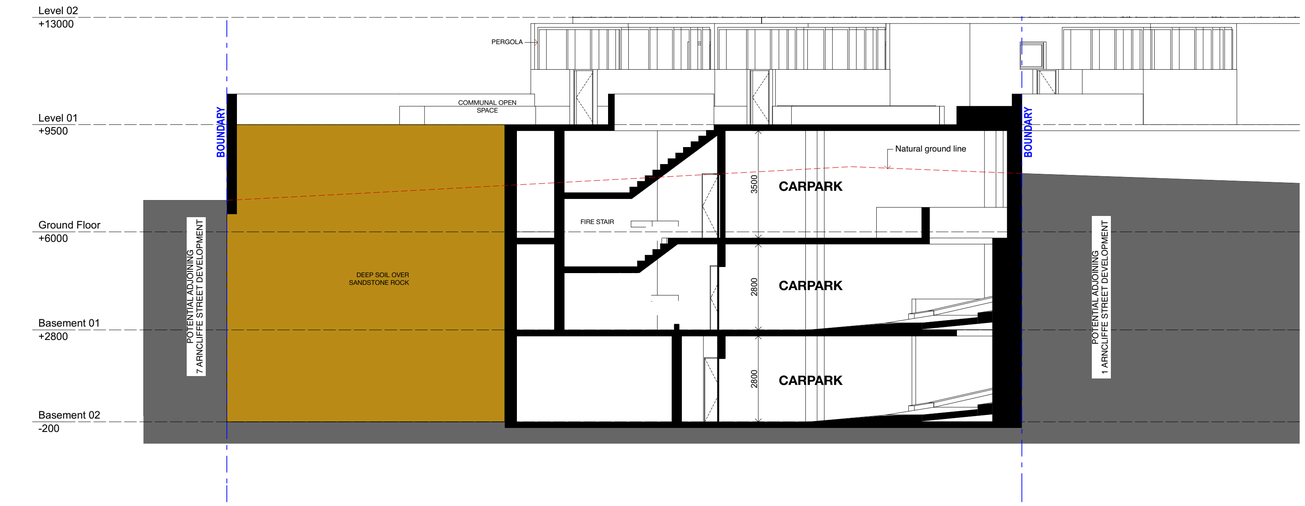
1 Section 1
Scale 1:200



2 Section 2
Scale 1:200



3 Section 3
Scale 1:100



4 Section 4
1:100

REVISED ISSUE FOR DA

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ISSUE	C	DATE	05.07.2016
REVISION	REVISED ISSUE FOR DA		
PROJECT	Mixed Use Developement		
ADDRESS	3-5 Arncliffe St Wolli Creek NSW 2205	PROJECT #	14004
CLIENT	KASAF P/L ATF KASS	DATE	05.07.2016
		SCALE @ A1	1:200, 1:100
DWG	SECTIONS	DRAWN	LS
		CHKD	JK
		DWG #	DA310
		REVISION	C

Ext. Walls:	Construction	Insulation	Colour	Details
	Concrete Lined	R1.5 added	Medium	Where external - as per plans
	Concrete Lined	R1.5 added	Medium	To lifts and stairs
	Concrete	None	Medium	Intertenancy & to common areas

Int. Walls:	Construction	Insulation	Details
	Plasterboard on stud	None	As per plans

Floors:	Construction	Insulation	Details
	Concrete	R2.0 added	Above carpark/open below G.01 1.01 1.02
	Concrete	R1.4 added	Above carpark 1.03 and 1.04

Ceilings:	Construction	Insulation	Details
	Plasterboard	None	As per plans

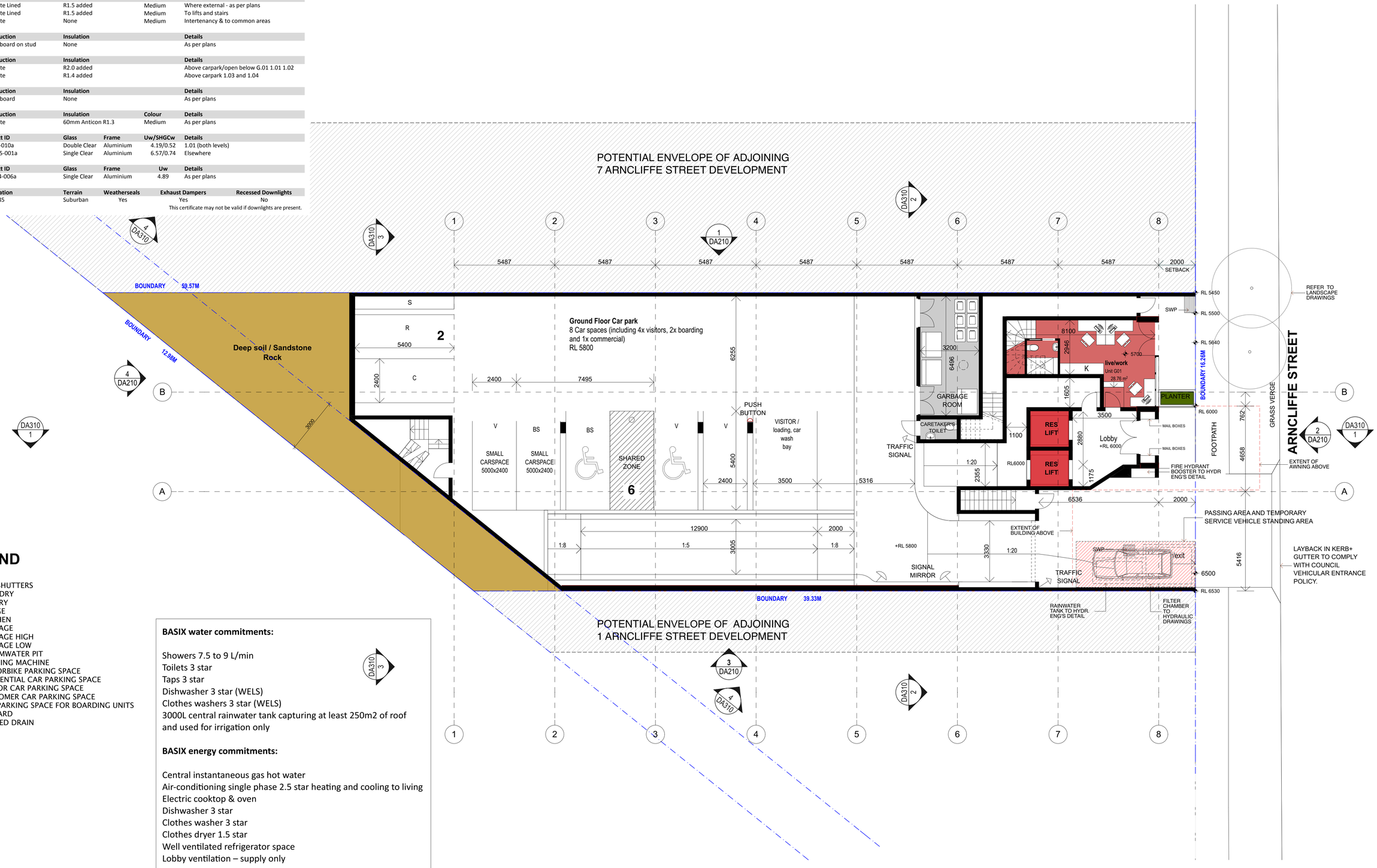
Roof:	Construction	Insulation	Colour	Details
	Concrete	60mm Anticon R1.3	Medium	As per plans

Windows:	Product ID	Glass	Frame	Uw/SHGCw	Details
	AIR-05-010a	Double Clear	Aluminium	4.19/0.52	1.01 (both levels)
	GGG-05-001a	Single Clear	Aluminium	6.57/0.74	Elsewhere

Skylights:	Product ID	Glass	Frame	Uw	Details
	GEN-04-006a	Single Clear	Aluminium	4.89	As per plans

Other:	Orientation	Terrain	Weatherseals	Exhaust Dampers	Recessed Downlights
	85	Suburban	Yes	Yes	No

This certificate may not be valid if downlights are present.



LEGEND

FS	FIRE SHUTTERS
L	LAUNDRY
P	PANTRY
F	FRIDGE
K	KITCHEN
S	STORAGE
SH	STORAGE HIGH
SL	STORAGE LOW
SWP	STORMWATER PIT
WM	WASHING MACHINE
MBP	MOTORBIKE PARKING SPACE
R	RESIDENTIAL CAR PARKING SPACE
V	VISITOR CAR PARKING SPACE
C	CUSTOMER CAR PARKING SPACE
BS	CAR PARKING SPACE FOR BOARDING UNITS
B	BOLLARD
GTD	GRATED DRAIN

BASIX water commitments:

Showers 7.5 to 9 L/min
Toilets 3 star
Taps 3 star
Dishwasher 3 star (WELS)
Clothes washers 3 star (WELS)
3000L central rainwater tank capturing at least 250m2 of roof and used for irrigation only

BASIX energy commitments:

Central instantaneous gas hot water
Air-conditioning single phase 2.5 star heating and cooling to living
Electric cooktop & oven
Dishwasher 3 star
Clothes washer 3 star
Clothes dryer 1.5 star
Well ventilated refrigerator space
Lobby ventilation – supply only

REVISED ISSUE FOR DA

0 1 2 4 6 8 10m

NORTH

BKA architecture
Baker Kavanagh Architects
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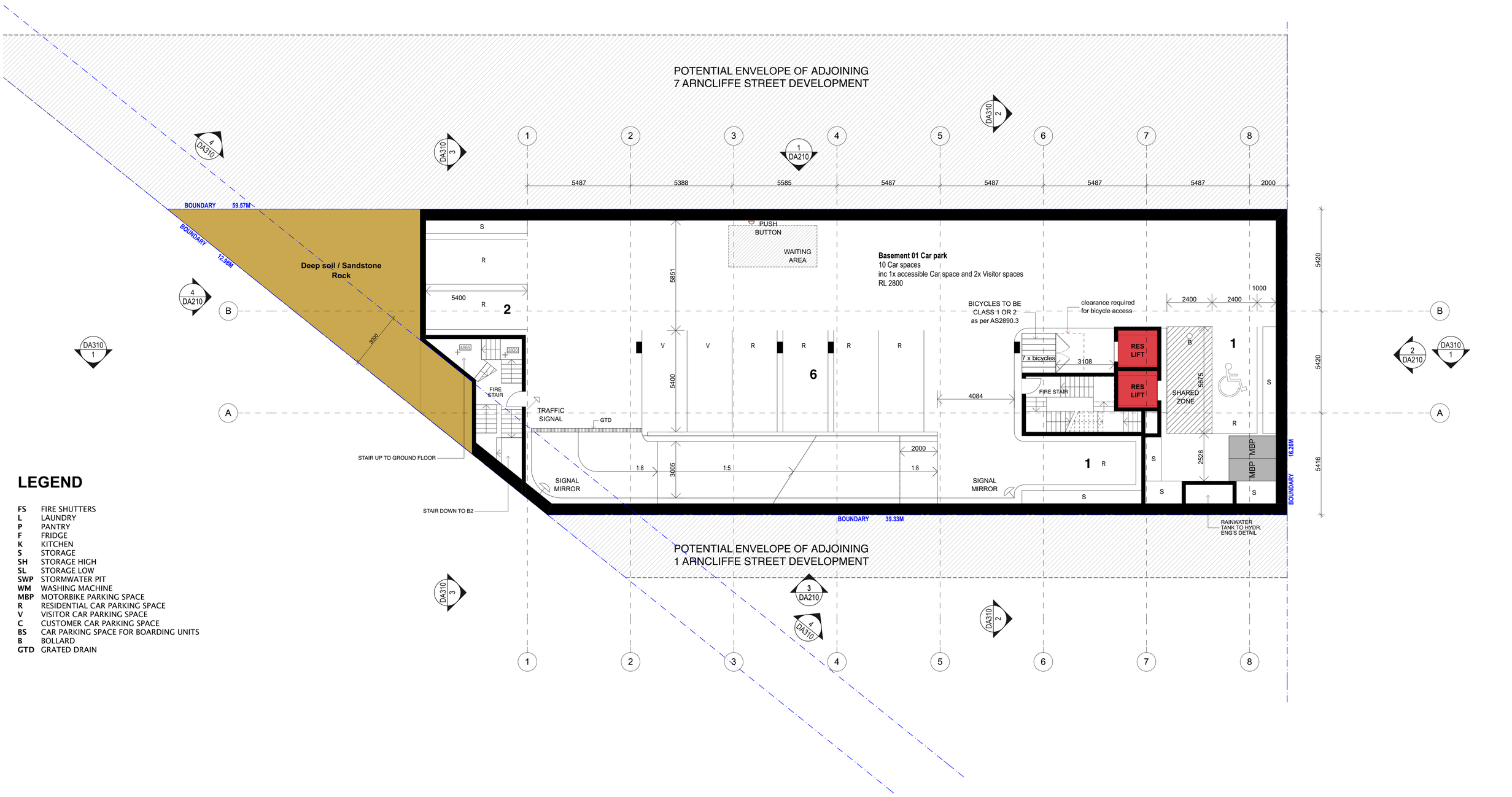
ISSUE	C	DATE 05.07.2016	REVISION REVISED ISSUE FOR DA
PROJECT	Mixed Use Developement		
ADDRESS	3-5 Arncliffe St Wolli Creek NSW 2205		PROJECT # 14004
CLIENT	KASAF P/L ATF KASS	DATE 05.07.2016	DWG # DA112
DWG	GROUND FLOOR PLAN	SCALE @ A1 1:100	
		DRAWN LS	
		CHKD JK	REVISION C



LEGEND

FS	FIRE SHUTTERS
L	LAUNDRY
P	PANTRY
F	FRIDGE
K	KITCHEN
S	STORAGE
SH	STORAGE HIGH
SL	STORAGE LOW
SWP	STORMWATER PIT
WM	WASHING MACHINE
MBP	MOTORBIKE PARKING SPACE
R	RESIDENTIAL CAR PARKING SPACE
V	VISITOR CAR PARKING SPACE
C	CUSTOMER CAR PARKING SPACE
BS	CAR PARKING SPACE FOR BOARDING UNITS
B	BOLLARD
GTD	GRATED DRAIN

REVISED ISSUE FOR DA

0 1 2 4 6 8 10m

NORTH

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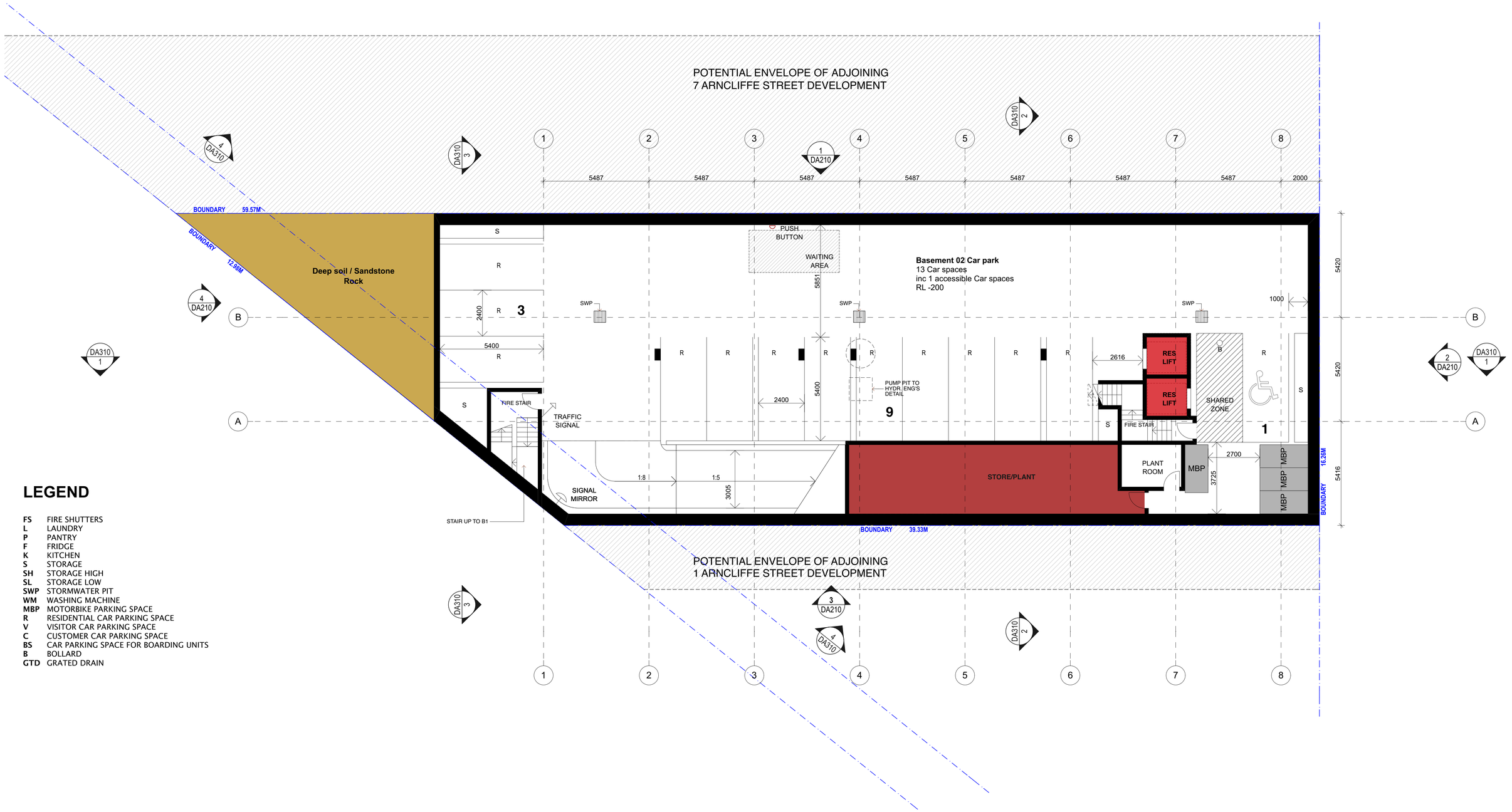
ADDRESS	3-5 Arncliffe St Wolli Creek NSW 2205		PROJECT # 14004
CLIENT	KASAF P/L ATF KASS	DATE 05.07.2016	DWG # DA111
DWG	BASEMENT 01 FLOOR PLAN	SCALE @ A1 1:100	
		DRAWN LS	
		CHKD JK	REVISION C



LEGEND

FS	FIRE SHUTTERS
L	LAUNDRY
P	PANTRY
F	FRIDGE
K	KITCHEN
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REVISED ISSUE FOR DA

0 1 2 4 6 8 10m

NORTH

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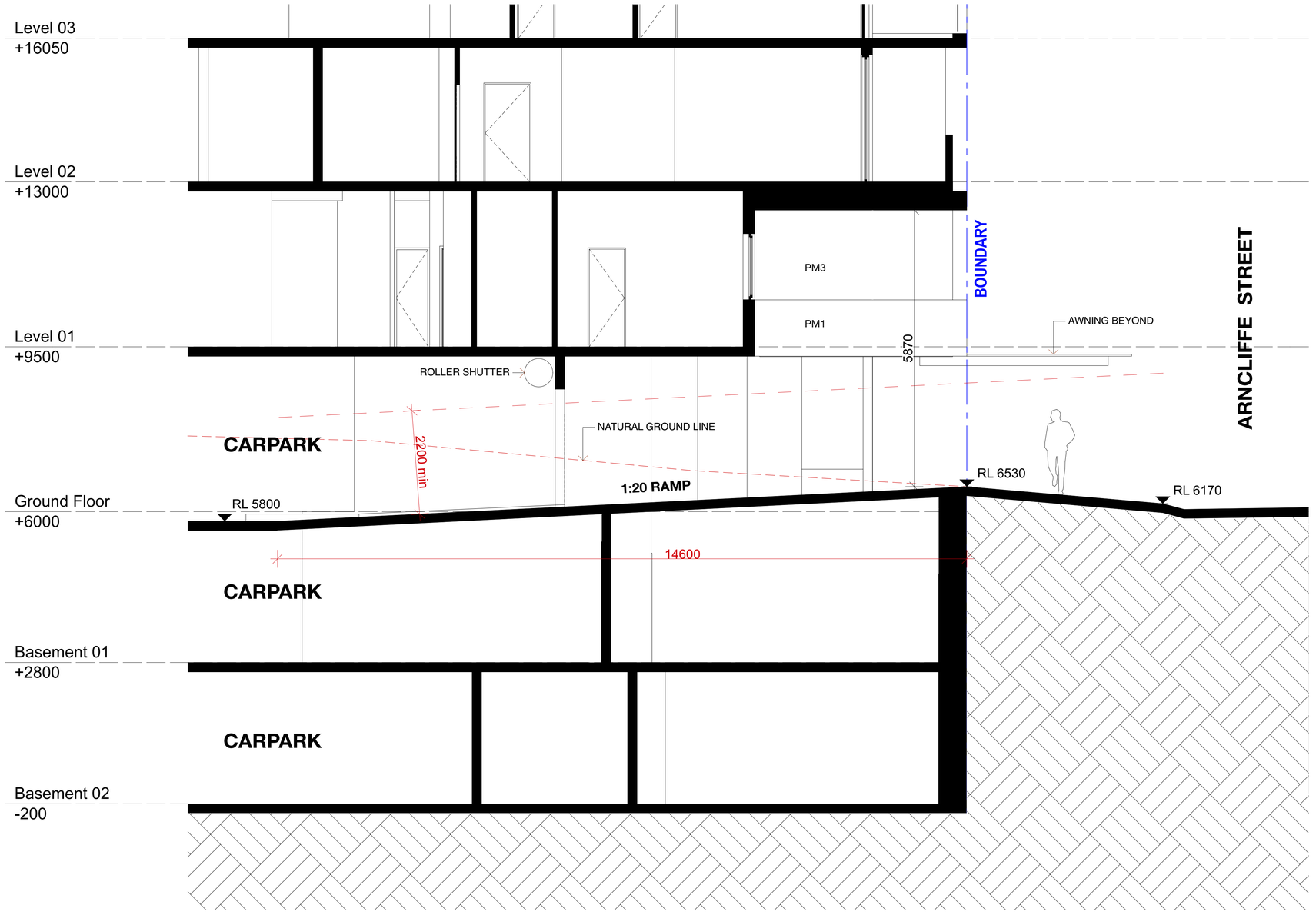
REVISION	REVISED ISSUE FOR DA		
PROJECT	Mixed Use Developement		
ADDRESS	3-5 Arncliffe St Wolli Creek NSW 2205	PROJECT #	14004
CLIENT	KASAF P/L ATF KASS	DATE	05.07.2016
		SCALE @ A1	1:100
DWG	BASEMENT 02 FLOOR PLAN	DRAWN	LS
		CHKD	JK
		DWG #	DA110
		REVISION	C



REVISED ISSUE FOR DA

0 0.5 1 2 3 4 5m

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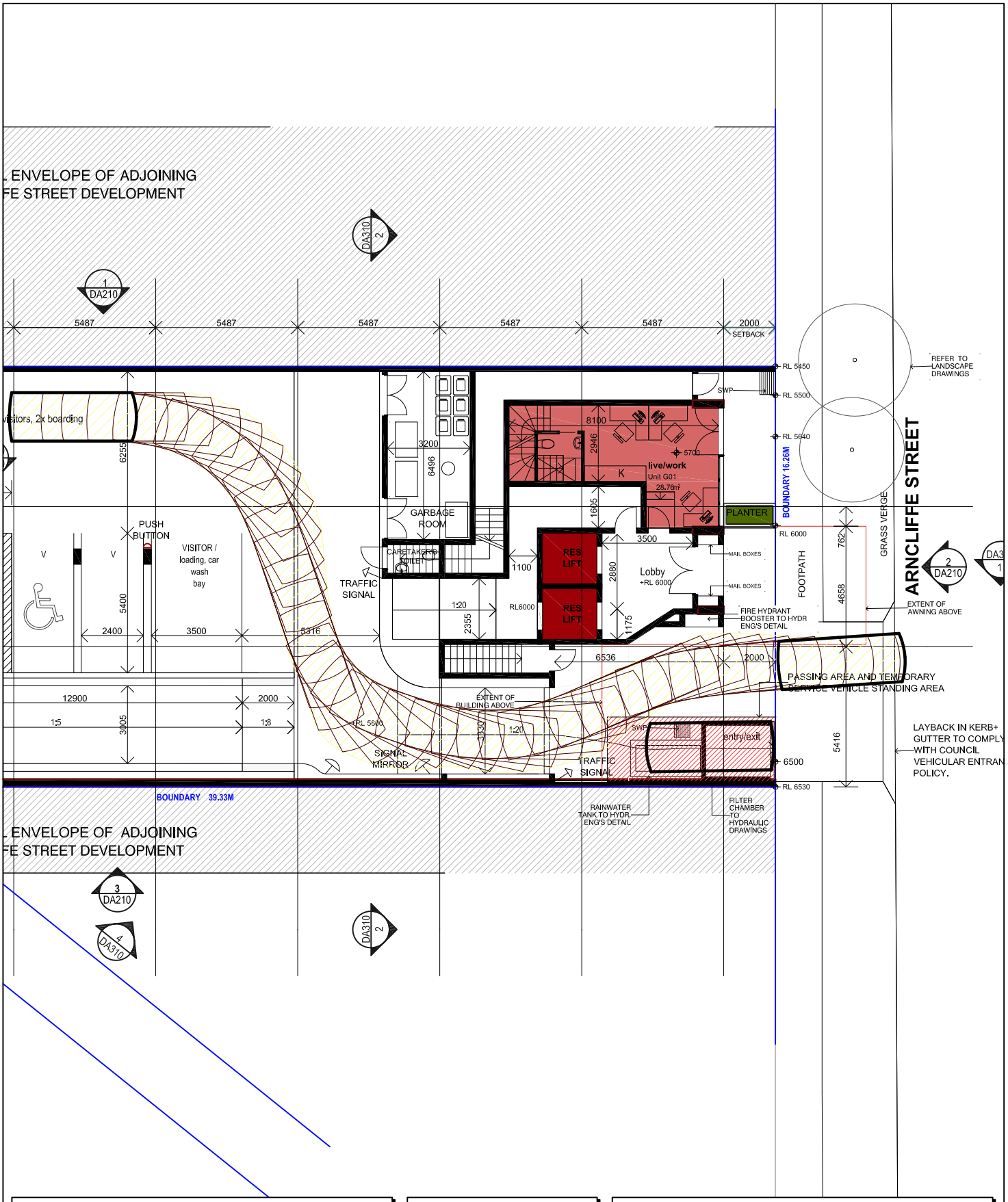
ISSUE	C	DATE	05.07.2016
REVISION	REVISED ISSUE FOR DA		
PROJECT	**Mixed Use Developement**		
ADDRESS	**3-5 Arncliffe St Wolli Creek NSW 2205**	PROJECT #	14004
CLIENT	**KASAF P/L ATF KASS**	DATE	05.07.2016
		SCALE @ A1	1:50
DWG	**DRIVEWAY PROFILE**	DRAWN	LS
		CHKD	JK
		DWG #	**DA311**
		REVISION	C

APPENDIX B

TURNING PATH ASSESSMENT



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 85th PERCENTILE VEHICLE EXITING THE SITE

SP 1