



TRAFFIC IMPACT AND PARKING ASSESSMENT

**MIXED-USE DEVELOPMENT AT
38-40 ORTH ST & 1-5 HARGRAVE ST,
KINGSWOOD NSW**

**PREPARED FOR
PAMADA**

**IN COORDINATION WITH
EELES TRELEASE ARCHITECTS**

DATE: 8TH AUGUST 2016

OUR REFERENCE: 160510

BY: ANDY WIERSMA

Author	Andy Wiersma	
Approved by	Alistair McKerron	
REVISION	DATE	DESCRIPTION
A	8 th August 2016	For comment
<p>This report has been prepared in accordance with the terms and conditions of appointment. Greenview Consulting Pty Ltd (ABN 32600067338) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.</p>		

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1 INTRODUCTION

1.1 GENERAL

Greenview Consulting has been engaged by the client to undertake a review of traffic and parking at the subject site. This report must be read in conjunction with the other Development Application documents and other relevant information, including:

- Architectural Drawings by Eeles Trelease (Project 1609)
- Penrith Council's DCP 2014 Part C10 "Transport, Access & Parking"
- RTA Guide to Traffic Generating Developments (October 2002)

This purpose of this report is to:

- Describe the site and the proposed development scheme;
- Describe the road network serving the site and the prevailing traffic conditions;
- Assess the adequacy of the proposed parking provision;
- Assess the potential traffic implications;
- Assess the suitability of the proposed vehicles access, internal circulation and servicing arrangements.

2 EXISTING CONDITIONS

2.1 SITE DESCRIPTION

The subject site is located between Orth St and Hargrave St, refer **Figure 2.1**. The site is currently occupied by five residential dwellings.

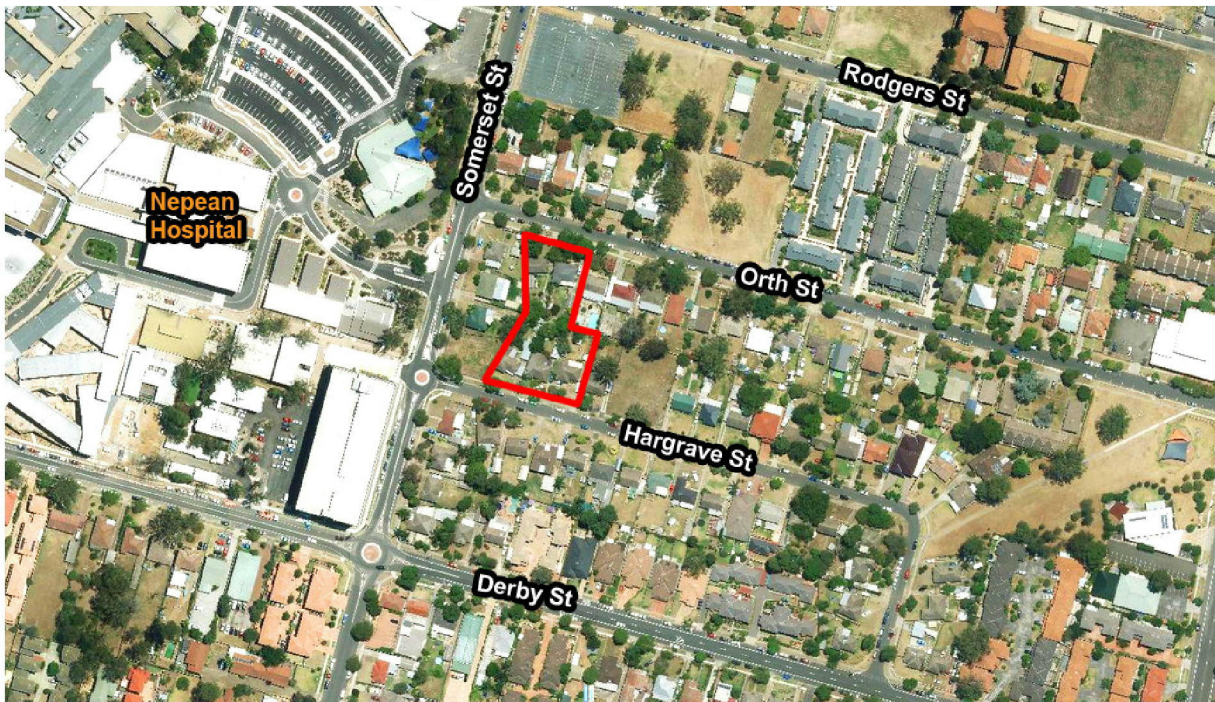


Figure 2.1: Site Location

The site includes the following lots: Lots 61 & 62 DP 36728 and Lots 54-56 DP 215146. The total area occupied by the subject site is approximately 3000m². The site approximately grades west to east.



Photo 2.1: Looking East along Hargrave St
Image courtesy of Google Maps (Streetview, capture date March 2014)



Photo 2.2: Looking West along Hargrave St
Image courtesy of Google Maps (Streetview, capture date March 2014)



Photo 2.3: Looking West along Orth St
Image courtesy of Google Maps (Streetview, capture date March 2014)

2.2 EXISTING ROAD CONDITIONS

The Roads & Maritime Services (RMS, formally RTA) broadly classifies all roads into three administrative classes: state, regional and local. A detailed description of each administrative class is provided in “NSW Road Management Arrangements” (December 2008), however in general:

State Roads are the major arterial links throughout NSW and within major urban areas. They are the principle traffic carrying and linking routes for the movement of people and goods within the Sydney, Newcastle, Wollongong and Central Coast urban areas and which connect between these urban centres, the major regional towns, the major regions of the State and the major connections interstate.

Regional Roads are routes of secondary importance between State Roads and Local Roads which together with the State Roads, provide the main connections to and between smaller towns and districts and perform a sub arterial function in major urban areas.

Local Roads comprise the remaining Council controlled roads which provide for local circulation and access.

Orth St is a local road; in the site vicinity it has 1 lane of traffic in each direction, no median divider and on-street parking is typically allowed along both side of the street. The default local speed limit is 50km/hr.

Hargrave St is a local road and similar to Orth St; that is, in the site vicinity it has 1 lane of traffic in each direction, no median divider, sections of on-street parking and the default local speed limit is 50km/hr.

Somerset St is a local road which functions as one of the access points to Nepean Hospital; in the site vicinity it has 1 lane of traffic in each direction, a line marked median divider and some sections of on-street parking. The posted speed limit is 50km/hr.

2.3 EXISTING ROAD FEATURES

The existing road features which apply to the road network in the vicinity of the site are illustrated in **Figure 2.3**. These include:

- **Somerset Street** has a 50km/h speed limit. Intersection of Greater Western Highway and Somerset Street has no lights. Eastbound and Westbound commuters on the highway are able to turn onto Somerset Street. Commuters from Somerset Street can only turn left onto the Greater Western Highway.
- **Somerset Street** Parking:
 - Southbound has 4 Hour Parking from Greater Western Highway to Rodgers Street, and then unlimited parking to Derby Street.
 - Northbound has 2 Hour Parking from Nepean Hospital to the end of the street.
- **Bringelly Road** has a 50km/h speed limit with Pedestrian Crossing (Speed Bump) adjacent to Kingswood Post Office. Intersection of Bringelly Road and Greater Western Highway has a set

of lights which allows eastbound and westbound commuters to turn onto Bringelly Road. Commuters from Bringelly Road are able to turn left or right onto Greater Western Highway.

- **Bringelly Road Parking:**
 - Southbound has Half Hour Parking from Greater Western Highway to Santley Crescent, 1 Hour Parking from Santley Crescent to south of the shops, then unlimited parking south to Derby Street.
 - Northbound has unlimited parking from Derby Street to corner of Orth Street, then Half Hour Parking from north of the Pedestrian crossing to just north of Rodgers Street.
- **Wainwright Lane** has a default 50km/h speed limit with two speed bumps. Unlimited parking along the Eastbound side. No parking along the Westbound side.
- **Rodgers Street** has a default 50km/h speed limit. Restricted parking on both Eastbound and Westbound sides, cars must park within designated bays.
- **Orth Street** has a default 50km/h speed limit. Restricted parking on both Eastbound and Westbound sides, cars must park within designated bays. Half Hour Parking at eastern end of Orth Street.
- **Hargrave Street** has a default 50km/h speed limit. Restricted parking on both Eastbound and Westbound sides, cars must park within designated bays.
- **Derby Street** has a default 50km/h speed limit and contains 2 eastbound and 2 westbound bus stops. Restricted parking on both Eastbound and Westbound sides, cars must park within designated bays.

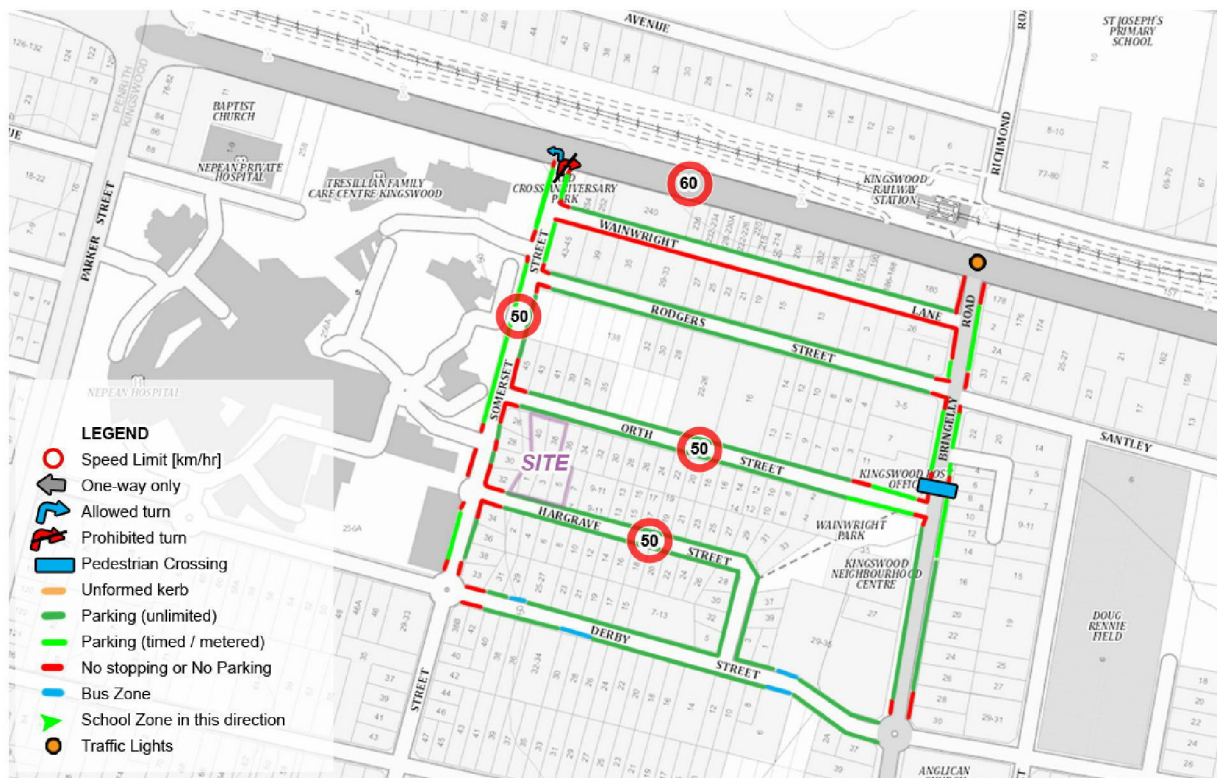


Figure 2.3: Existing Road Features

2.4 TRAFFIC DATA

There are no nearby RMS AADT mapping stations; the nearest counter on Parker St (parallel street to Somerset) indicated 2016 daily traffic (northbound only) of approximately 17,000 vehicles.

A review of adjacent Traffic Impact reports (refer also Section 4.2 following) suggested the following traffic volumes in nearby streets:

- Somerset St: 6000-7000 vehicles per day
- Somerset St: 300-600 peak hour vehicles
- Hargrave St: less than 50 peak hour vehicles

2.5 PUBLIC TRANSPORT

The nearest train station to the subject site is Kingswood (approximately 600m walking distance to the north) located on the T1 North Shore and T5 Cumberland lines; this station provides direct access for commuters to the Sydney CBD. The estimated walking time for a commuter from the site to Kingswood station is 5-10 minutes.

The closest bus stations are along Derby St to the south (300m) which services several routes:

- Route 774 (Penrith to Mt Druitt via Nepean Hospital and UWS, and vice versa)
- Route 775 (Penrith to Mt Druitt via Erskine Park and St Marys, and vice versa)
- Route 776 (Penrith to Mt Druitt via St Marys and UWS, and vice versa)

Additionally Kingswood station has a bus station for Route N70 (City to Penrith and vice versa). These services run relatively regularly.

2.6 SOCIAL & DEMOGRAPHIC INFORMATION

2011 Census Data (refer www.censusdata.abs.gov.au) was used to construct a community profile of the suburb of Kingswood. The most relevant census data categories are reproduced in **Table 2.1**; we have also provided values for NSW to allow general comparisons to be made.

As a whole, Kingswood has a slightly greater proportion of public transport users but slightly more car-ownership than NSW as a whole.

Table 2.1: Demographic Information

Category	Kingswood%	NSW%
Employment		
Worked Full-time	59.9	60.2
Worked Part-time	24.6	28.2
Unemployed	8.7	5.9
Travel to Work		
By car (as driver or passenger)	63.3	62.8
By public transport	16.5	13.8
Number of registered motor vehicles per dwelling		
0	15.5	10.4
1	43.7	37.8
2	26.9	34.0
3+	10.0	14.6

3 PROPOSED DEVELOPMENT

3.1 PROPOSED DEVELOPMENT DESCRIPTION

The development as currently proposed consists of a mixed use building with 121 unit dwellings and 75m² of ground floor commercial space. The proposal incorporates 6 above-ground levels and 3 levels for basement parking. The 121 dwellings incorporate the following:

- 58 x 1-bedroom dwelling
- 62 x 2-bedroom dwellings
- 1 x 3-bedroom dwelling

3.2 SITE ACCESS

It is currently proposed that the development will have one entry point from Hargrave Ave and one exit point to Orth St, refer **Figure 3.1**.

The access ramp into and the exit ramp from the basement parking are both 1-way and is sized as per AS2890.1 requirements.



Figure 3.1: Proposed Entry / Exit Point

3.3 ONSITE PARKING PROVISIONS

Onsite parking is to be provided in accord with Council’s DCP 2014 Part C10 “Transport, Access & Parking”. The relevant parking rates are as follows:

- 1.0 spaces per 1 or 2 bed unit
- 2.0 spaces per 3 bed unit
- Visitor parking 1 per 5 dwellings
- Retail spaces: 1 space per 30m² of GFA
- Service vehicles: 1 space per 40 units
- Car washing: 1 space per 50 units (4 max)

Table 3.1: Parking Requirements

Type	Number	Rate	Spaces Required
METHOD A: RTA			
1-bed	58	1.0 sp / dwelling	58
2-bed	62	1.0 sp / dwelling	62
3-bed	1	2.0 sp / dwelling	2
Visitors	121	1 / 5 dwellings	24.2
Retail	75m ²	1sp / 30m ² GFA	2.5
Service	121	1 per 40 units	3.03
Car-washing	121	1 per 50 units	2.4
		Subtotal	154.1
		TOTAL REQUIRED	155

The basement parking levels incorporate a total of **156 car spaces [122 residential, 25 visitor, 3 commercial, 3 service, 3 car-washing]**. Hence, there is adequate car parking available for this particular residential development.

3.4 PEDESTRIAN ISSUES

There are formal pedestrian footpaths along both the Orth St and Hargrave St site frontages, and these will be maintained under proposed conditions. Provided that adequate site distances are provided at the site entrance as per AS2890.1, we generally do not foresee problematic pedestrian issues at the subject site.

3.5 INTERNAL DESIGN COMPLIANCE

We have checked the internal basement and external ground-floor carparking complies with AS/NZ2890.1:2004- “Off-street Car Parking” and highlight that the following items were checked:

- Parking spaces have the minimum dimensions required under the standards;
- An additional 0.3m has been provided for spaces adjacent to a wall or obstruction as required;
- The access/manoeuvring aisles satisfies the minimum width requirements of the standards;
- Blind aisle extensions 1.0m wide have been provided as per Figure 2.3 of AS2890.1;

- Structural columns have been set back from the access aisle in accordance with Clause 5.2 of A2890.1;
- Pavement cross-falls at parking spaces do not exceed 5% (1 in 20) in any direction;
- The design of the circulation roadways is adequate as per Section 2.5 of AS2890.1;
- The access car ramp(s) from the street into the basement level meets the requirements in terms of maximum grades, transition lengths and other relevant criteria;
- The internal car ramps meet the requirements in terms of maximum grades, transition lengths and other relevant criteria.

4 TRAFFIC GENERATION

4.1 TRAFFIC GENERATION

The traffic to be generated by the new residential development has been estimated using the RTA *Guide to Traffic Generating Developments*, October 2002, Section 3 - Land Use Generation (Section 3.3.1). The proposed development consists of a 121 unit mixed-use development with 75m² of retail / commercial floor space. The relevant traffic generation rates are as follows:

- High Density (Metro / Sub-regional) 0.29 peak hour trips per unit
- Office / commercial: 2 peak hr trips per 100 m² GFA

The traffic calculated to be generated by the proposed development is shown in the **Table 4.1** below based upon a weekday peak hour vehicle trip rate of 0.29 per unit and 2 / 100m² for the retail/commercial floor area, and a daily vehicle trip rate of 3 for each unit and 10 / 100m² for the retail/commercial floor areas.

In order to calculate the net impact of the development, we have calculated the traffic generated by the existing five dwellings using the Section 3 guidelines and assumed generation rates of 9 daily vehicle trips per dwelling and 0.85 peak hour trips per dwelling.

Table 4.1: Traffic Generated under Proposed Conditions

	Daily vehicle trips	Weekday Peak hour vehicle trips
Existing	5 x 9 vt = 45 vt	5 x 0.85 = 4.3 vt
Proposed	<i>Units (121 total) = 121 x 3 = 363 vt</i> <i>Commercial (75m² total)</i> = 10 x 0.75 = 7.5 vt TOTAL = 371 vt	<i>Units (121 total) = 121 x 0.29 = 35.1 vt</i> <i>Commercial (75m² total)</i> = 2 x 0.75 = 1.5 vt TOTAL = 37 vt
Net change	371 – 45 = +326 vt	37 – 4 = +33 vt

vt = vehicle trips

We do not believe the above calculations indicate a significant additional burden on the existing traffic network, and as such, we do not believe the development as proposed will have a significant effect on traffic in terms of the traffic efficiency, amenity, safety, or road pavement life.

4.2 ADJACENT DEVELOPMENTS

Council indicated that any traffic calculations should consider the impact of adjacent developments, and as such we have reviewed the following developments:

- A. Mixed use development [115 apartments and approximately 2400m² of retail / medical centre] @ 29-33 Derby St, 34- 38 Somerset St & 2 Hargrave St;
- B. Mixed use development [54 apartments and approximately 200m² of retail] @ 28 - 32 Somerset Street, Kingswood.

The traffic impact for Development A concluded that the proposal would generate approximately +230 vehicle trips during the peak hour (with the majority of trips coming from the medical centre), however the nearby intersections would continue to operate satisfactorily.

The traffic impact for Development B concluded that the proposal would generate approximately +15 vehicle trips during the peak hour, and the nearby intersections would continue to operate satisfactorily with spare capacity.

Compared to the above, we highlight that the traffic generation for the subject site (+33 peak hour trips) is minor compared to the large amount of traffic generated by Development A. A cumulative impact study of the surrounding developments is well beyond the scope of this study, however it is likely that the surrounding intersections will continue to operate satisfactorily once Development A, B and the subject site development are completed.

5 CONCLUSIONS

We conclude that:

- We do not believe that the proposed development will have a significant impact on traffic in the local network.
- We do not believe the development will have a significant effect on traffic in terms of the traffic efficiency, amenity, safety, or road pavement life.
- The proposed development achieves the required number of parking spaces as per the parking requirements outlined in Table 3.1.
- A construction traffic management plan (CTMP) and traffic control plans (TCPs) will be prepared at construction stage following the development approval process.

Yours faithfully,
For & on behalf of Greenview,



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Senior Design Engineer



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Senior Project Engineer
NPER no. 2220277

BOUNDARY

BOUNDARY

BOUNDARY

BOUNDARY

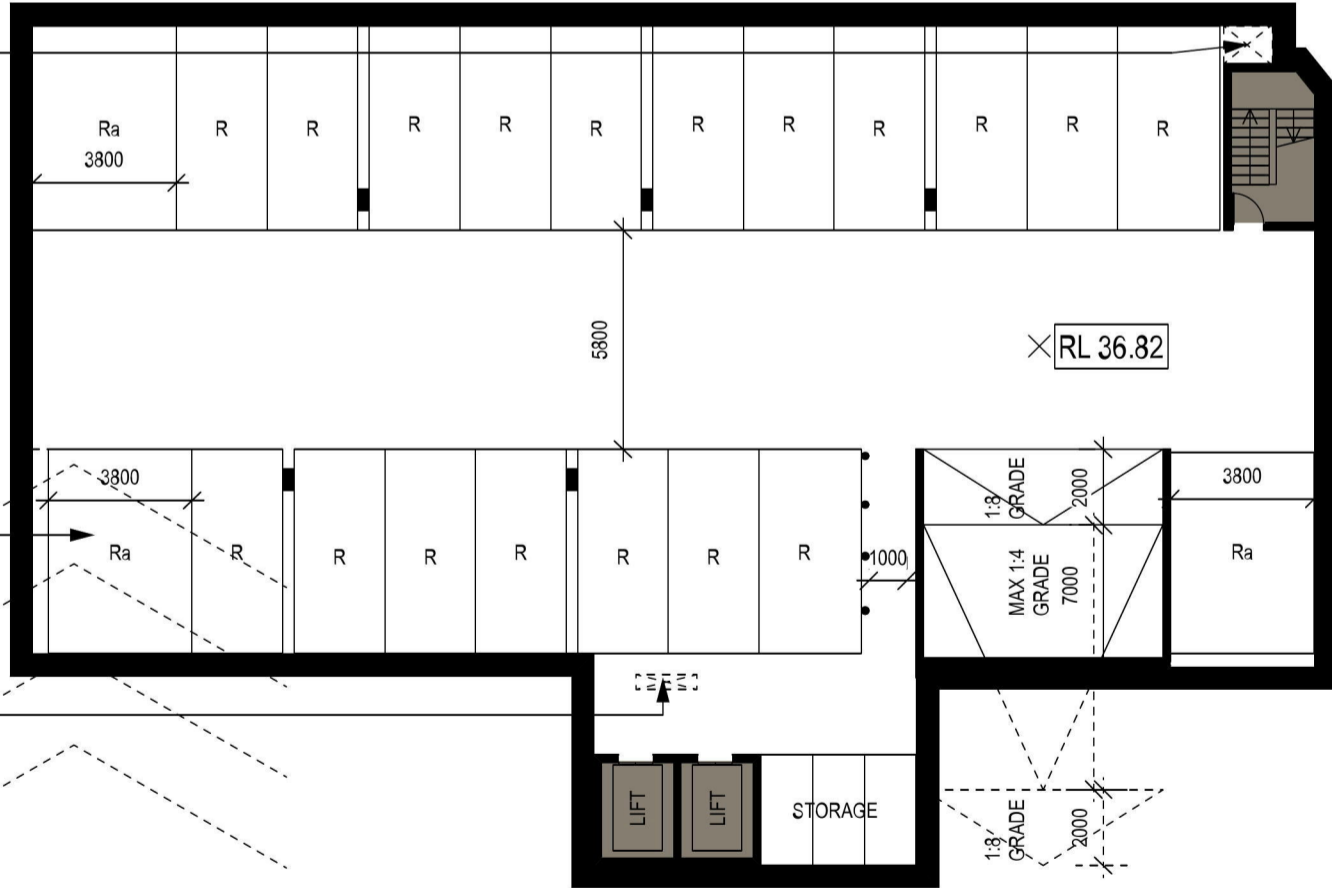
BOUNDARY

BOUNDARY

CARPARK EXHAUST DAHSED OVER

2100MM HEIGHT CLEARANCE

CARPARK SUPPLY DASHED OVER



B03

21 RESIDENTIAL (R) SPACES - INCLUDES 3 ADAPTABLE (Ra)

TOTAL CARPARK NUMBERS
 -122 RESIDENTIAL (INCLUDES 13 ADAPTABLE AND DISABLED SPACES)
 -25 VISITOR SPACES (INCLUDES 1 DISABLED SPACE)
 -3 COMMERCIAL SPACES
 -3 SERVICE SPACES
 -31 BICYCLE SPACES

Project No. 1609
 Drawing No. DA-100 H
 Revision#

HARGRAVE APARTMENTS
 1-5 HARGRAVE STREET AND 38-40 ORTH STREET, KINGSWOOD
 CLIENT : **pamada**
 BASEMENT LEVEL THREE PLAN
 SCALE 1:100 @ A1 1:200 @ A3

Drawn By: AA
 Reviewed By: RYBE
 Date: 22/09/16
 CAD File Name:

DESIGN ARCHITECT & URBAN DESIGN:
Eeles Trelease Pty Ltd architects
 PLANNING
Boston Blyth Fleming Partners
 LANDSCAPE DESIGN
 DLLA

PROJECT DEVELOPER
pamada

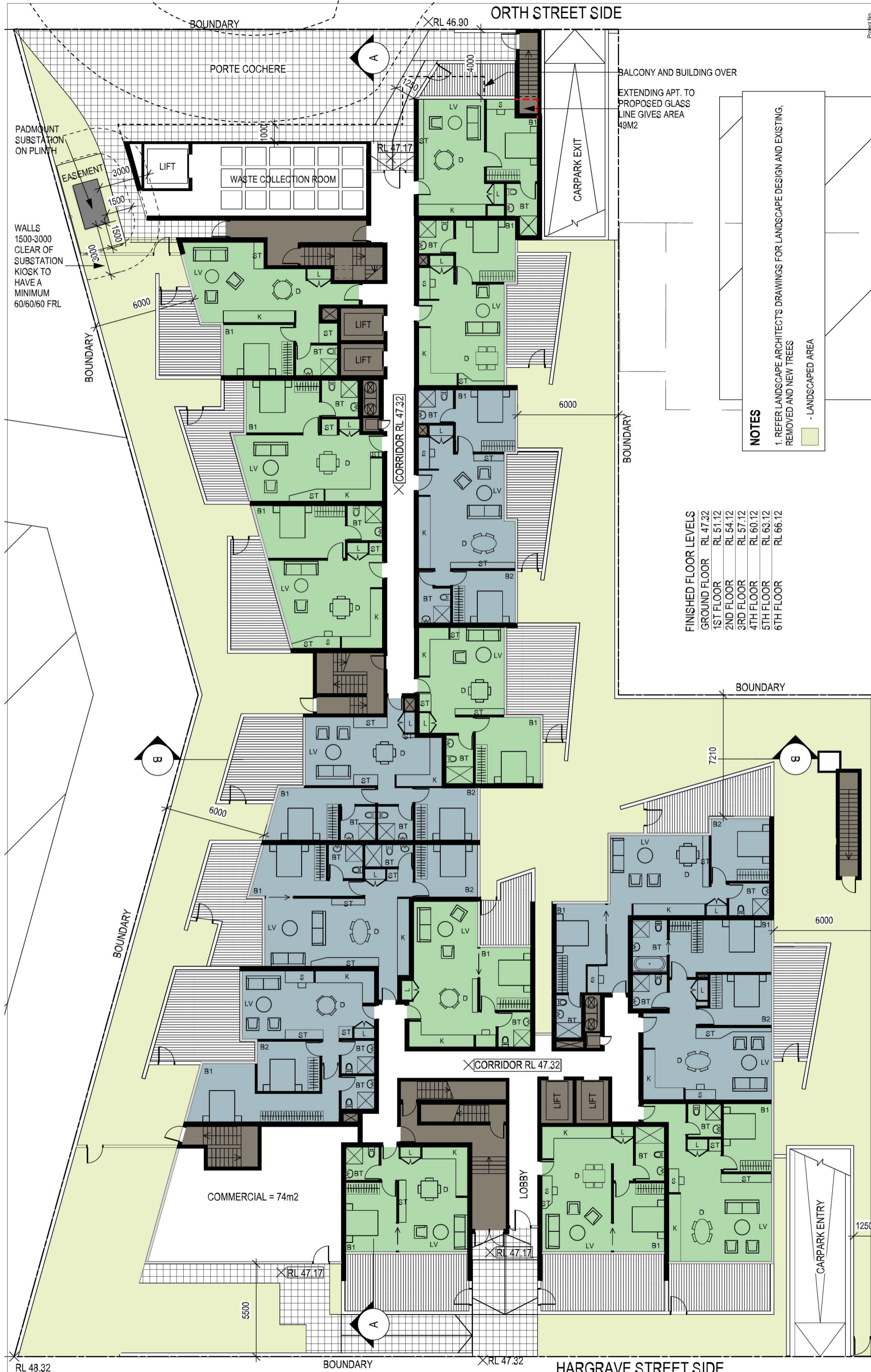
No.	Date	Issue	By
H	30/16	PROGRESS ISSUE	AA
G	27/16	PROGRESS ISSUE	AA
F	22/16	PROGRESS ISSUE	AA
E	10/16	PROGRESS ISSUE	AA
D	10/16	ISSUE TO TRAFFIC CONSULTANT	AA
C	31/8/16	PROGRESS ISSUE	AA
B	29/8/16	PROGRESS ISSUE	AA

LEGEND
 TRUE NORTH
 -1 BED APARTMENT
 -2 BED APARTMENT

PRELIMINARY

Document Set ID: 7343830
 Version: 1, Version Date: 22/09/2016

9/9/16 Plot Date:



ORTH STREET SIDE

HARGRAVE STREET SIDE

BALCONY AND BUILDING OVER
EXTENDING APT. TO PROPOSED GLASS LINE GIVES AREA 49M2

NOTES
1. REFER LANDSCAPE ARCHITECT'S DRAWINGS FOR LANDSCAPE DESIGN AND EXISTING, REMOVED AND NEW TREES
- LANDSCAPED AREA

FINISHED FLOOR LEVELS

GROUND FLOOR	RL 47.32
1ST FLOOR	RL 51.12
2ND FLOOR	RL 54.12
3RD FLOOR	RL 57.12
4TH FLOOR	RL 60.12
5TH FLOOR	RL 63.12
6TH FLOOR	RL 66.12

Project No. 1609
Revision # DA-103 F

Client: pamada
Drawing No. 1609

DESIGN ARCHITECT & URBAN DESIGN:
Eeles Trelease Pty Ltd architects

PLANNING
Boston Blyth Fleming Partners

PLANNING
David Loudon Landscape Architect

PROJECT DEVELOPER
pamada

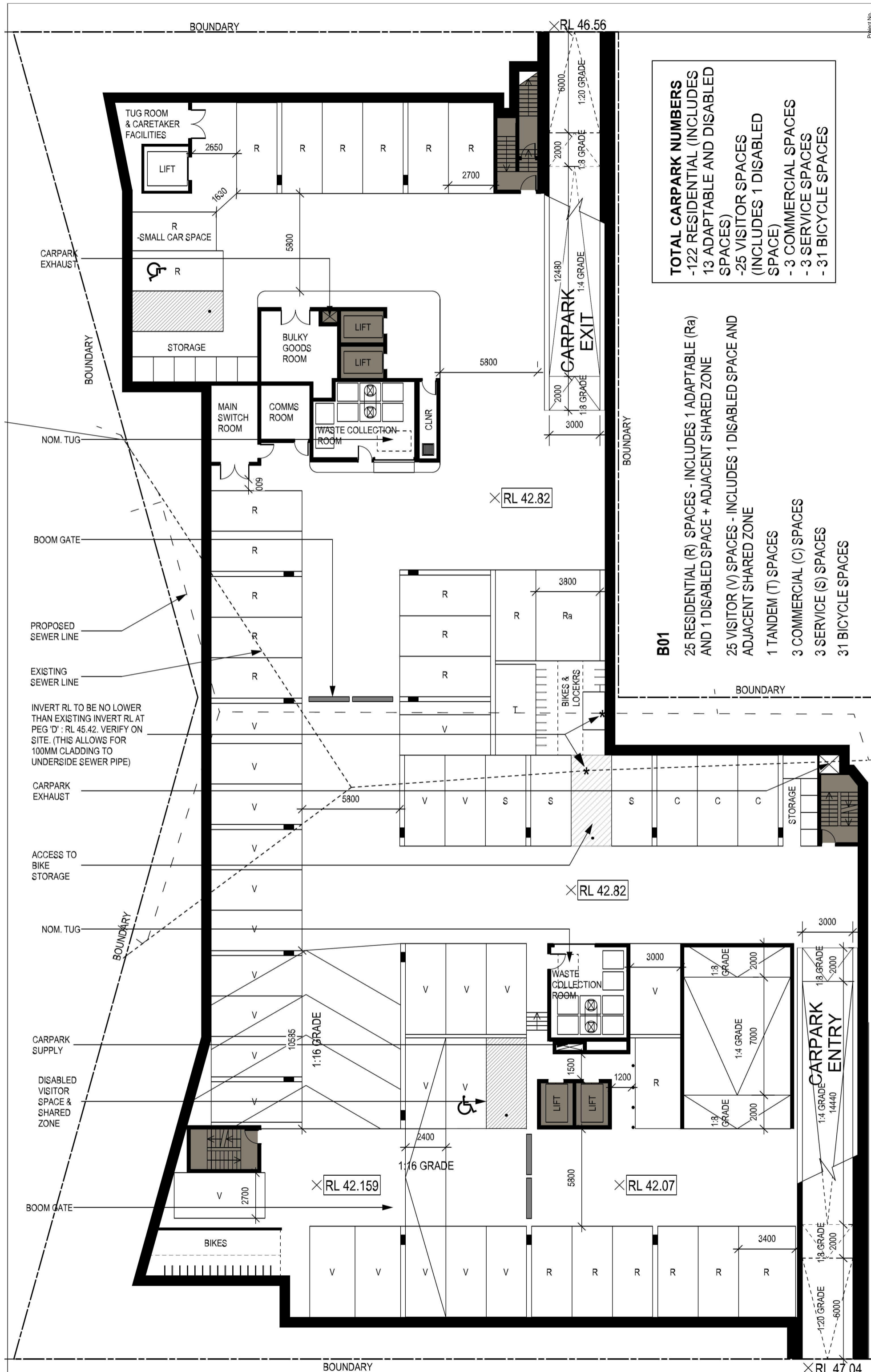
LEGEND
- 1 BED APARTMENT
- 2 BED APARTMENT

TRUE NORTH

PRELIMINARY

No.	Date	Revisions	By
F	8/1/16	PROGRESS ISSUE	AA
E	7/2/16	PROGRESS ISSUE	AA
D	31/8/16	PROGRESS ISSUE	AA
C	25/8/16	PROGRESS ISSUE	AA
B	19/8/16	PROGRESS ISSUE	AA
A	10/8/16	PROGRESS ISSUE	AA

Drawn By: AA
Reviewed By: RYBE
Date: 22/09/16
CAD File Name:



TOTAL CARPARK NUMBERS
 -122 RESIDENTIAL (INCLUDES 13 ADAPTABLE AND DISABLED SPACES)
 -25 VISITOR SPACES (INCLUDES 1 DISABLED SPACE)
 -3 COMMERCIAL SPACES
 -3 SERVICE SPACES
 -31 BICYCLE SPACES

B01
 25 RESIDENTIAL (R) SPACES - INCLUDES 1 ADAPTABLE (Ra) AND 1 DISABLED SPACE + ADJACENT SHARED ZONE
 25 VISITOR (V) SPACES - INCLUDES 1 DISABLED SPACE AND ADJACENT SHARED ZONE
 1 TANDEM (T) SPACES
 3 COMMERCIAL (C) SPACES
 3 SERVICE (S) SPACES
 31 BICYCLE SPACES

INVERT RL TO BE NO LOWER THAN EXISTING INVERT RL AT PEG 'D' : RL 45.42. VERIFY ON SITE. (THIS ALLOWS FOR 100MM CLADDING TO UNDERSIDE SEWER PIPE)

DISABLED VISITOR SPACE & SHARED ZONE

Project No. 1609
 Drawing No. DA-102 I
 Client: pamada
 Scale: 1:100 @ A1 1:200 @ A3

DESIGN ARCHITECT & URBAN DESIGN:
Eeles Trelease Pty Ltd architects
 PLANNING
 Boston Blyth Fleming Partners
 LANDSCAPE DESIGN
 DLLA

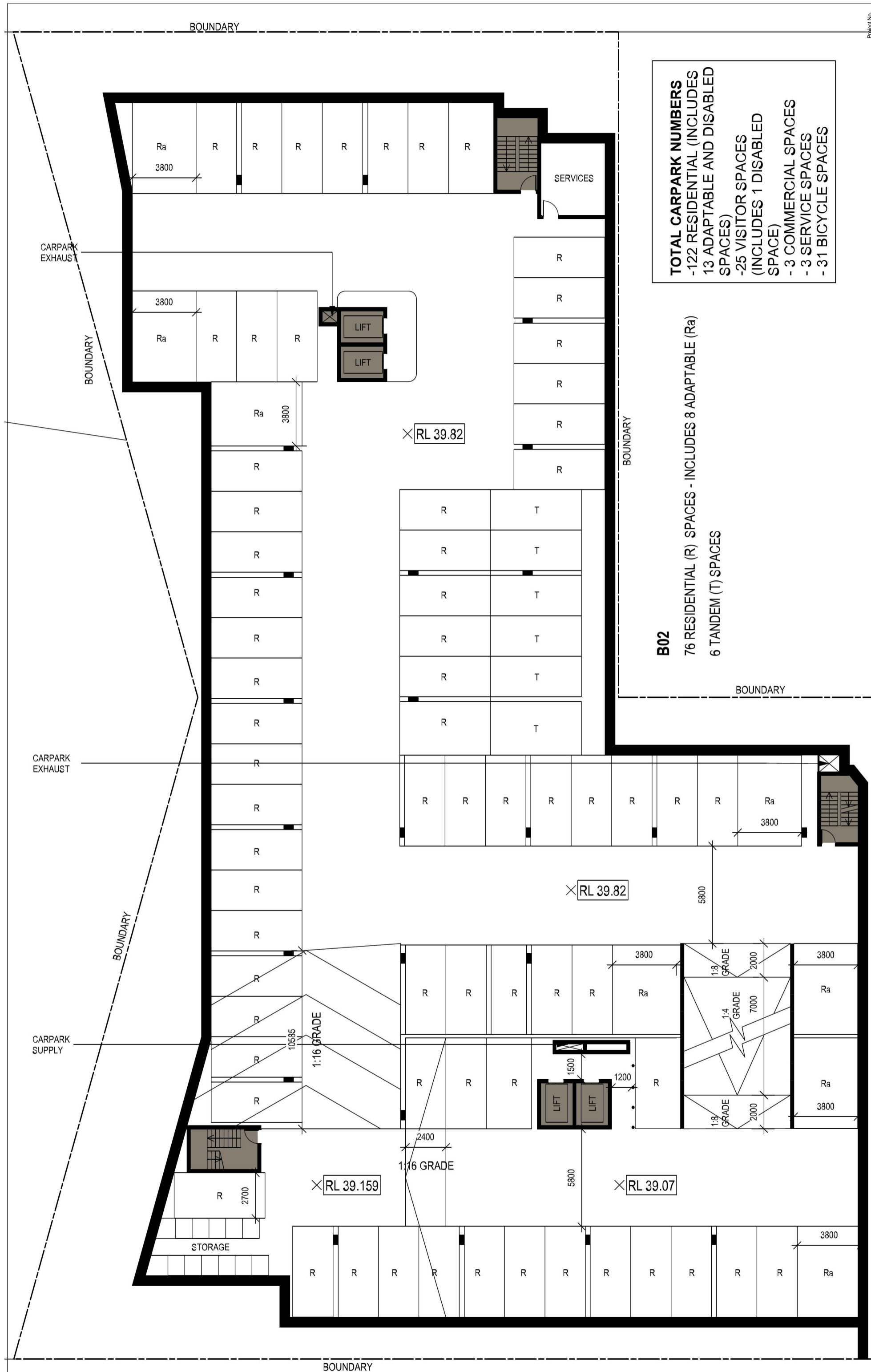
PROJECT DEVELOPER
pamada

No.	Date	Issue	By
1	19/16	PROGRESS ISSUE	AA
2	20/16	PROGRESS ISSUE	AA
3	20/16	PROGRESS ISSUE	AA
4	20/16	ISSUE TO TRAFFIC CONSULTANT	AA
5	31/16	PROGRESS ISSUE	AA
6	29/16	PROGRESS ISSUE	AA
7	28/16	ISSUE TO PAMADA / TRAFFIC CONSULTANT	AA

LEGEND
 TRUE NORTH
 PRELIMINARY

Legend:
 -1 BED APARTMENT (Green)
 -2 BED APARTMENT (Blue)

Document Set ID: 7343830
 Version: 1, Version Date: 22/09/2016
 8/9/16 Plot Date



TOTAL CARPARK NUMBERS
 -122 RESIDENTIAL (INCLUDES 13 ADAPTABLE AND DISABLED SPACES)
 -25 VISITOR SPACES (INCLUDES 1 DISABLED SPACE)
 -3 COMMERCIAL SPACES
 -3 SERVICE SPACES
 -31 BICYCLE SPACES

B02
 76 RESIDENTIAL (R) SPACES - INCLUDES 8 ADAPTABLE (Ra)
 6 TANDEM (T) SPACES

Project No. 1609
 Drawing No. DA-101 I
 Client: pamada
 Scale: 1:100 @ A1 1:200 @ A3

DESIGN ARCHITECT & URBAN DESIGN:
Eeles Trelease Pty Ltd architects
 PLANNING
 Boston Blyth Fleming Partners
 LANDSCAPE DESIGN
 DLLA

PROJECT DEVELOPER
pamada

No.	Date	Issue	By
I	09/16	PROGRESS ISSUE	AA
H	09/16	PROGRESS ISSUE	AA
G	09/16	PROGRESS ISSUE	AA
F	10/16	ISSUE TO TRAFFIC CONSULTANT	AA
E	31/07/16	PROGRESS ISSUE	AA
D	29/07/16	PROGRESS ISSUE	AA
C	26/07/16	ISSUE TO PAMADA / TRAFFIC CONSULTANT	AA

LEGEND
 -1 BED APARTMENT
 -2 BED APARTMENT

TRUE NORTH

PRELIMINARY

Document Set ID: 7343830
 Version: 1, Version Date: 22/09/2016