# PROPOSED MIXED USE DEVELOPMENT

134 – 144 PITT STREET, REDFERN

Assessment of Traffic and Parking Implications

October 2016 (Rev C)

Reference 16079

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#### 1. Introduction

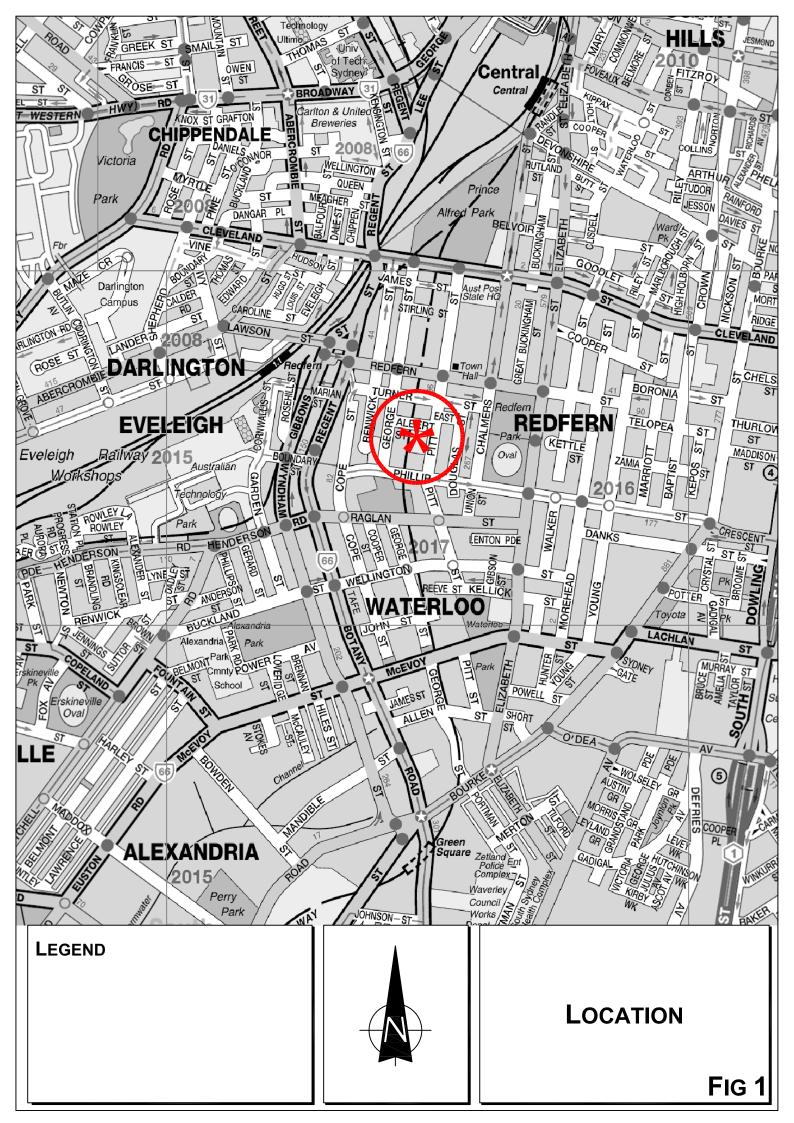
This report has been prepared for Kaymet Pty Ltd to accompany an application to the Department of Planning and Environment for a proposed mixed use development on the former Rachel Forster Hospital site at 134-144 Pitt Street in Redfern (Figure 1).

The hospital was closed in 2000 and apart from a Community Health facility, which operated from the building fronting Albert Street and the site has largely remained disused.

The large site occupies an area of some 6,923m<sup>2</sup> and the proposal will involve a group of 4 buildings accommodating a total of 218 apartments, with neighbourhood retail and café elements together with basement parking.

The 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 vehicle access, internal circulation and servicing arrangements



#### 2. Proposed Development Scheme

#### 2.1 SITE, CONTEXT AND EXISTING USE

The site (Figure 2) has frontages to western side of Pitt Street and southern side of Albert Street whilst vehicular access is provided by 3 driveways located on the Pitt Street frontage and one on Albert Street.

The surrounding landuses comprise of a mix of contemporary medium/high density residential and older terrace style housing. Other notable landuses in the vicinity of the site include:

- \* the retail/commercial strip along Redfern Street (to the north) and Regent Street (to the west)
- \* the former Redfern Public School, which occupies a large parcel of land on the corner of George Street, Phillip Street and Cope Street
- the high rise Public Housing towers on the southern side of Phillip Street
- \* Redfern Railway Station which is located some 500 600 metres north-west of the site
- \* the South Sydney Rugby League Club and large Redfern Park a short distance to the east



LEGEND



SITE

FIG 2

#### 2.2 PROPOSED DEVELOPMENT

The development scheme involves the demolition of existing buildings and excavation of the greater part of the site to provide for basement parking and level building platforms. The proposed development comprises:

4 x Studio apartments102 x one-bedroom apartments92 x two-bedroom apartments20 x three-bedroom apartments

**Total: 218 apartments** 

Retail 411m<sup>2</sup> 2 Cafés 217.2m<sup>2</sup>

A total of 171 parking spaces will be provided in two basement levels with vehicular access on Pitt Street.

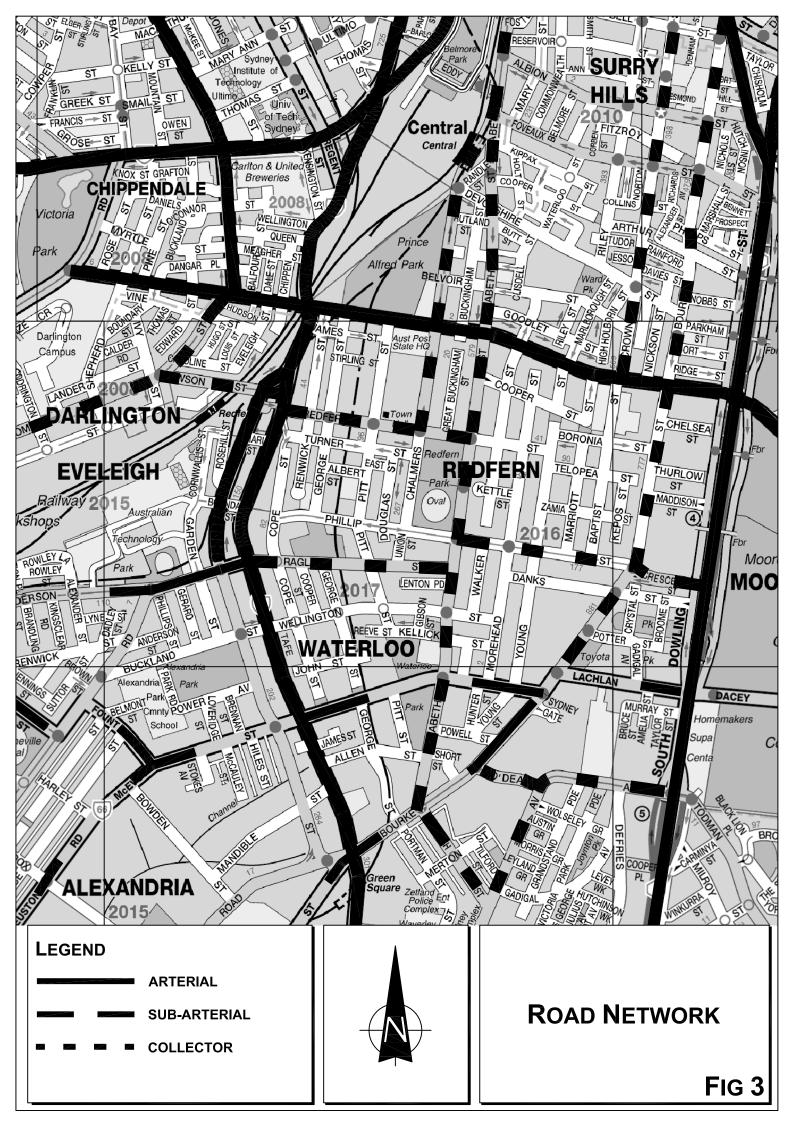
Details of the development scheme are provided on the plans prepared by Tony Owen Partners which accompany the Development Application and are reproduced in part in Appendix A.

#### 3. ROAD NETWORK AND TRAFFIC CONDITIONS

#### 3.1 ROAD NETWORK

The road network serving the site (Figure 3) comprises:

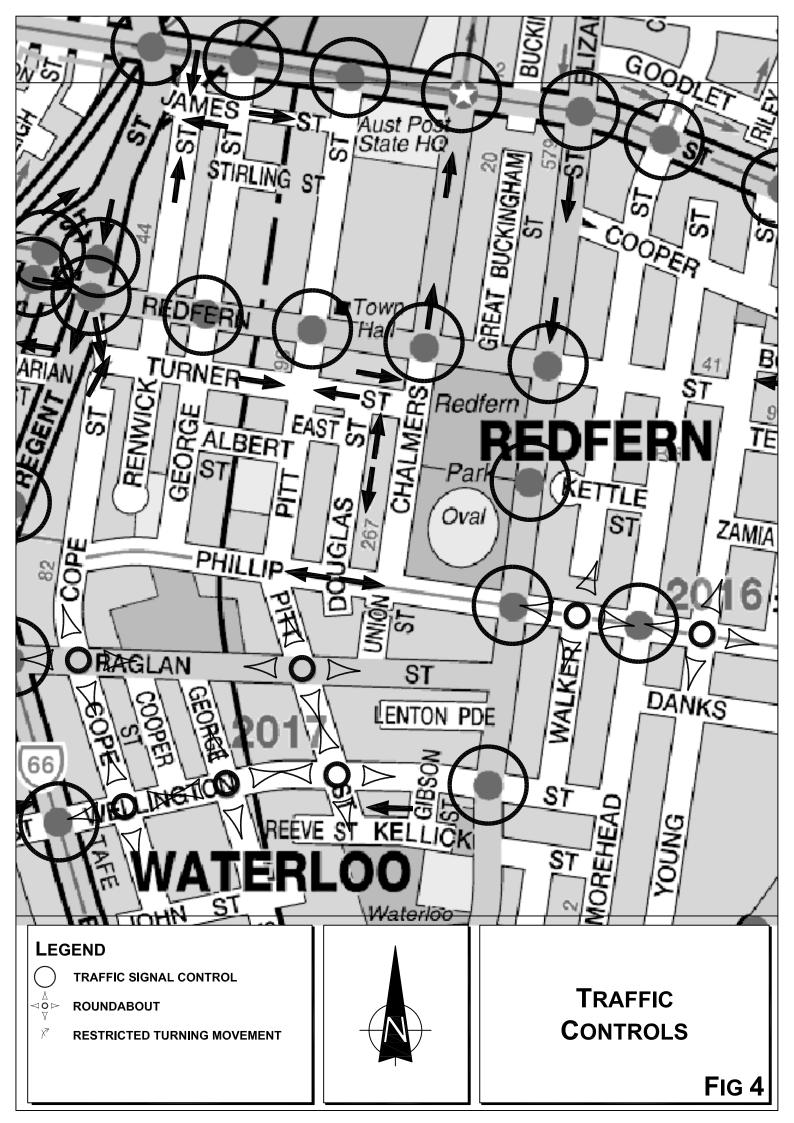
- ★ Cleveland Street a State Road and east/west arterial route linking with Anzac Parade in the east and City Road in the west
- \* Regent Street / Botany Road a State Road and north/south arterial route which provides connection to/from the City
- ★ Elizabeth Street a Regional Road and north/south collector route which provides connection to and from the City
- Chalmers Street Regional Road and one-way (northbound) collector route between Redfern Street and Eddy Avenue while to the south of Redfern Street it is a local access road
- \* Redfern Street a Regional Road and collector route between Elizabeth Street and Regent Street
- \* Pitt Street a local access road
- ★ Phillip Street a local access road
- Albert Street a local access road



#### 3.2 TRAFFIC CONTROLS

The traffic controls which have been introduced to the road network both within and in the immediate vicinity of the Study Area are detailed in Figure 4 overleaf and comprise:

- \* the traffic signal control at the intersections of:
  - Redfern Street and Regent Street
  - Regent Street and Lawson Street
  - Redfern Street and George Street
  - Redfern Street and Pitt Street
- \* the ONE WAY traffic restrictions in:
  - Chalmers Street north of Redfern Street (northbound)
  - Phillip Street (westbound) between Chalmers Street and Pitt Street
  - Wells Street (eastbound) between Regent Street and Pitt Street
  - Wells Street (westbound) between Pitt Street and Chalmers Street
  - Turner Street (eastbound) between Cope Street and Pitt Street
  - Turner Street (westbound) between Douglas Street and Pitt Street
- \* the roundabouts at the intersections of Raglan Street and Cope Street and Raglan Street and Pitt Street
- \* the GIVE WAY and STOP sign control in:
  - Renwick Street at Redfern and Turner Streets
  - Turner Street at George and Pitt Streets
  - Wells Street at Pitt Street
  - Renwick Street at Redfern and Turner Streets
  - Turner Street at George and Pitt Streets
  - Phillip Street at Pitt Street
- the marked foot crossings in:
  - George Street north of Phillip Street
  - Phillip Street east of George Street
  - Pitt Street north of Phillip Street



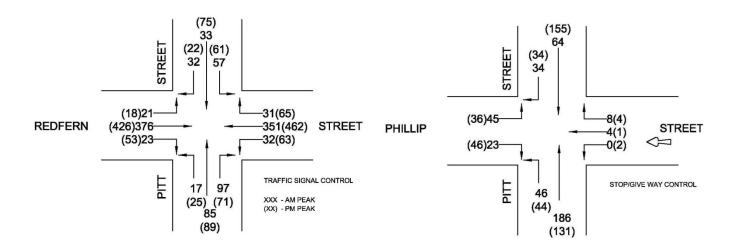
#### 3.3 TRAFFIC CONDITIONS

An indication of the prevailing traffic conditions on the road network in the vicinity of the site is provided by traffic volume data published by the Roads and Maritime Services and traffic surveys undertaken as part of this study.

The Roads and Maritime Services data is expressed in the form of Average Annual Daily Traffic (AADT) and relevant to the site are the following:

Location	AADT
Botany Road, south of Raglan Street	25,331
Regent Street, South of Cleveland Street	48,856

Traffic surveys have been undertaken at the intersections of Pitt Street/Redfern Street and Pitt Street/Phillip Street during the AM and PM peak periods, and the results are summarised in the following diagrams:



An assessment of the operational performance of the Pitt Street and Redfern Street intersection was modelled using the computer software model SIDRA. The result of this assessment is summarised in the table overleaf whilst the criteria for interpreting the results is shown overleaf.

# 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				
ʻD'	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
Α	Less than 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	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**<sup>1</sup> 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.

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

Location	AM				PM	PM		
	LOS	DS	AVD	LOS	DS	AVD		
Pitt Street at Redfern Street	В	0.55	11.5	В	0.77	13.0		

The analysis indicates that this intersection is operating with a good level of service and with negligible congestion or delay apparent on any vehicle approach.

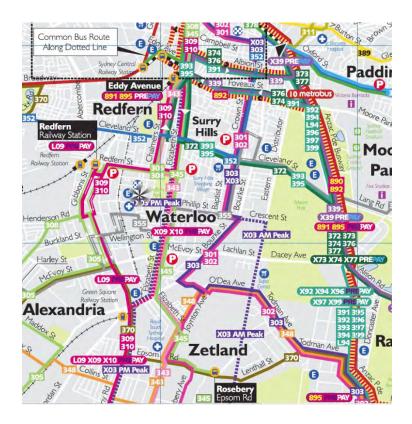
#### 3.4 TRANSPORT SERVICES

The development site is highly accessible to both road and rail based public transport services being less than 400 metres from high frequency bus services on nearby Redfern Street and Regent Street and approximately 500-600 metres from Redfern Railway Station.

Details of the bus routes which operate in the vicinity of the site are outlined in the table below.

Route №	Service Frequency	Route Description
305	Mon-Fri	Railway Square to Mascot via Redfern,
	(Peak Hour Services)	Alexandria and Beaconsfield
308	Daily Daytime	Marrickville to City via St Peters, Alexandria
	Services	and Redfern
309	Daily Full Time	Port Botany to City via Broadmeadow, Botany,
	Service	Mascot and Redfern
310	Eastgardens to City via East Botany, Mascot	
	Service	and Redfern
355	Daily Daytime	Marrickville to Bondi Junction via Enmore,
	Service	Newtown, Waterloo, Redfern, Surry Hills and
		Moore Park.

An extract from the overall route map is presented below, while the route maps for each service are presented in Appendix B.



Nearby Redfern Station provides access to 10 of the 11 lines on the City Rail network as well as convenient connection to Central Station and the extensive network of inter urban and country link services which operate to/from this station.



#### TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

Due to the site's high level of accessibility to public transport, residents and visitors are expected to make good use of the services provided particularly for journey to work purposes.

#### 4. PARKING

The appropriate level of carparking to be provided for the development is indicated by Council's LEP and DCP documents which specify a maximum provision as follows:

#### **Residential Apartments**

Studio 0.2 space
One-bedroom 0.4 space
Two-bedroom 0.8 space
Three-bedroom 1.1 spaces

Visitors <30 - 0.167 space,

30-70 - 0.1>70 - 0.05

Retail / Café 1 space per 60m² GFA
Car Share 1 space per 60 spaces

**Service** 

Residential 1 space per 50 apartments and

0.5 space per every 50 apartments after

Retail 1 space per 350m<sup>2</sup>

Application of these rates to the proposed development scheme indicates the following:

#### **Residential Apartments**

4 x studio0.8 space102 x one-bedroom40.8 spaces92 x two-bedroom73.6 spaces20 x three-bedroom22 spaces

Total: 137 spaces

Visitors (218) 16 spaces

Retail 628.2m<sup>2</sup> 10.4 spaces (10)

Total: 163 spaces

Car Share 3 spaces
Service 5 spaces

Grand Total: 171 spaces

#### TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

It is proposed to provide a total of 171 parking spaces including 36 'accessible' spaces in the development reflecting the Council criteria.

The DCP also specified a requirement for bicycle and motorcycle parking of:

#### **Bicycles**

#### **Residential Apartments**

1 space per apartment for residents

1 space per 10 apartments for visitors

#### Retail/Café

Staff - 1 per 250m<sup>2</sup>

Customers - 2 plus 1 per 100m<sup>2</sup>>100m<sup>2</sup>

#### **Motorcycles**

1 space per 12 car spaces

Accordingly, provision will be made to accommodate 250 bicycles (218 resident, 22 res. visitors and 10 for retail) and 14 motorcycle spaces.

#### 5. TRAFFIC

The traffic generation associated with the proposed development has been determined with reference to the Roads and Maritime Services Technical Direction TDT 2013-4b.

For residential developments with access to rail and bus services document specifies the following peak hour generation rate per dwelling:

AM	PM
0.19 vtph	0.15 vtph

Application of this rate to a development of 218 apartments indicates a peak period traffic generation of some 42 and 33 vtph respectively. The 10 retail/café spaces will essentially be utilised by tenants arriving in the morning and departing in the evening with overall traffic distribution being as follows:

		AM		PM
	IN	OUT	IN	OUT
Residents	10	32	26	7
Retail / Café	4	-	-	4
Total	14	32	26	11

This level of activity is not only unlikely to result in any adverse capacity or environmental impacts on the surrounding road network and will also be less than that which would have been generated when the site was occupied by the former hospital.

In order to access the likely traffic activity associated with the former Hospital, reference is made to the RMS Guidelines, which contain the following formulae for calculating the traffic associated with Hospital, based on bed and staffing numbers:

```
Peak (PVT) = -14.69 + (0.69 \text{ x beds}) + (0.31 \text{ x peak staff})

Morning (MVT) = -10.21 + (0.47 \text{ x beds}) + (0.06 \text{ x peak staff})

Evening (EVT) = -2.84 + (0.25 \text{ x beds}) + (0.40 \text{ x peak staff})
```

#### TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

It is understood that the Rachel Forster Hospital operated as an 89 bed specialist hospital for arthritic and orthopaedic patients with some 178 staff (maximum day shift).

On this basis the assessed traffic generation was as follows:

```
Peak (PVT) = -14.69 + (0.69 \times 89 \text{ beds}) + (0.31 \times 178 \text{ staff}) = 102 \text{ vtph}

Morning (MVT) = -10.21 + (0.47 \times 89 \text{ beds}) + (0.06 \times 178 \text{ staff}) = 42 \text{ vtph}

Evening (EVT) = -2.84 + (0.25 \times 89 \text{ beds}) + (0.40 \times 178 \text{ staff}) = 91 \text{ vtph}
```

It is apparent that the proposed residential development will generate vehicle movements which are significantly less than that of the former hospital use during the evening commuter peak and peak arrival/departure period, but similar to the morning peak generation.

### 6. Access, Internal Circulation and Servicing

#### **Access**

Vehicle access for the basement car park will be provided by a 6.0m wide combined ingress/egress driveway located on Pitt Street at the southern site boundary. This driveway will accord with the design requirements of AS2890.1 and there will be good sight distances available at this location.

#### **INTERNAL CIRCULATION**

The design of the carpark will provide generous aisles and maneuvering areas with flexible two way circulation arrangements. The ramps, aisles, bays, head room etc will comply with the requirements of AS2890.1 and 6.

#### **SERVICING**

Refuse will be collected from the Building A Storage room on Pitt Street by Council's Collection vehicle as indicated in the Waste Consultant report and as shown on the plan in Appendix A. There will be 5 service vehicle spaces provided in the basement which can be used by delivery vans and small furniture vans, while service personnel will also be able to use the visitor spaces. Occasional larger service vehicles (e.g. furniture movements) will be reliant on the available kerbside parking in the area.

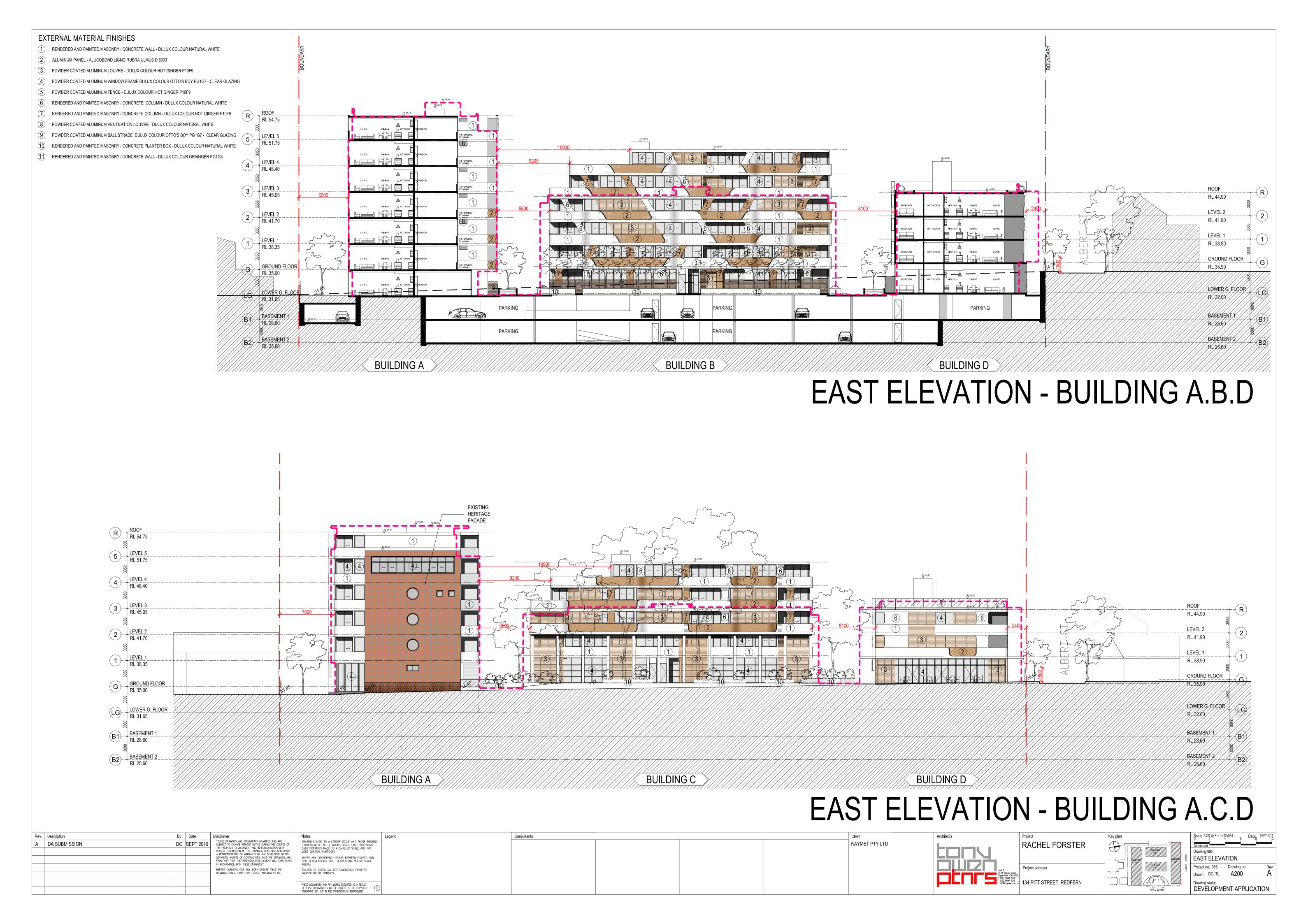
#### 7. CONCLUSION

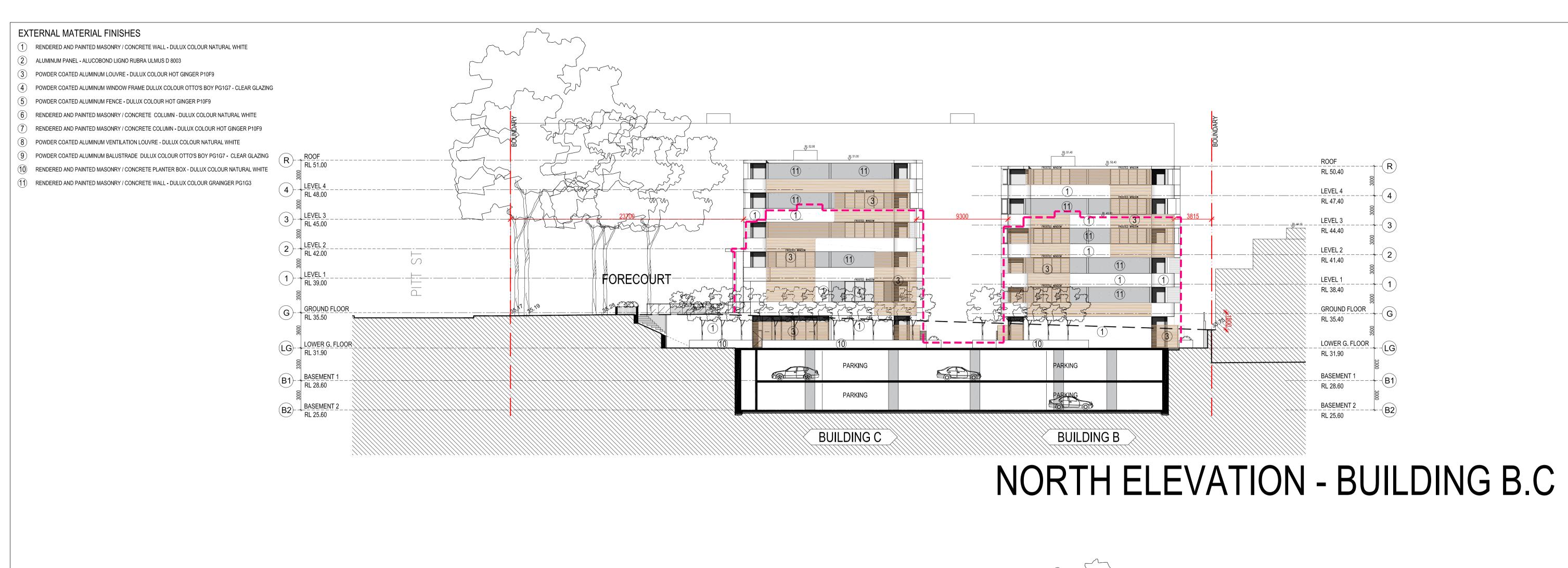
The traffic and parking assessment undertaken for the proposed mixed use development on the site of the former Rachel Faster Hospital at 134-144 Pitt Street has concluded that:

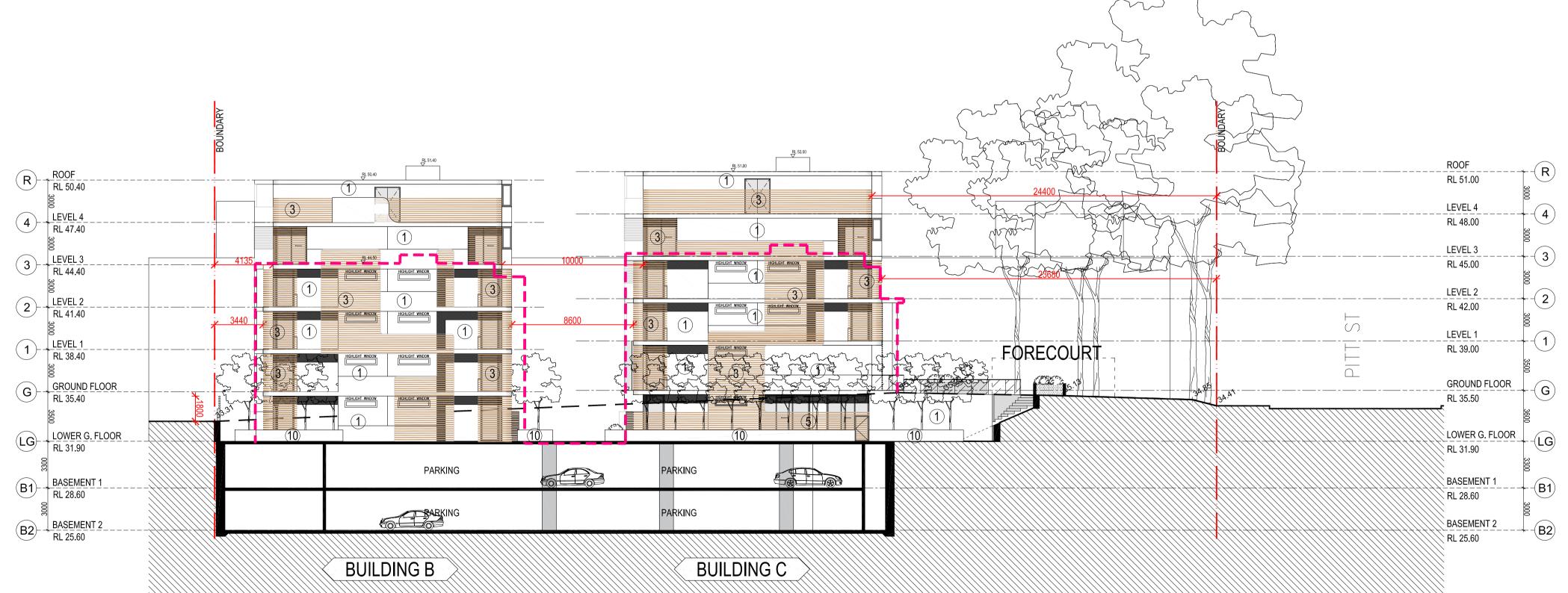
- \* the traffic generation of the proposed development will be less than that associated with the former use and will not present any adverse traffic implications
- \* the proposed parking provision will comply with Council's LEP and DCP criteria
- \* the proposed access, internal circulation and parking arrangements will be suitable and appropriate

# APPENDIX A

# **DEVELOPMENT PLANS**

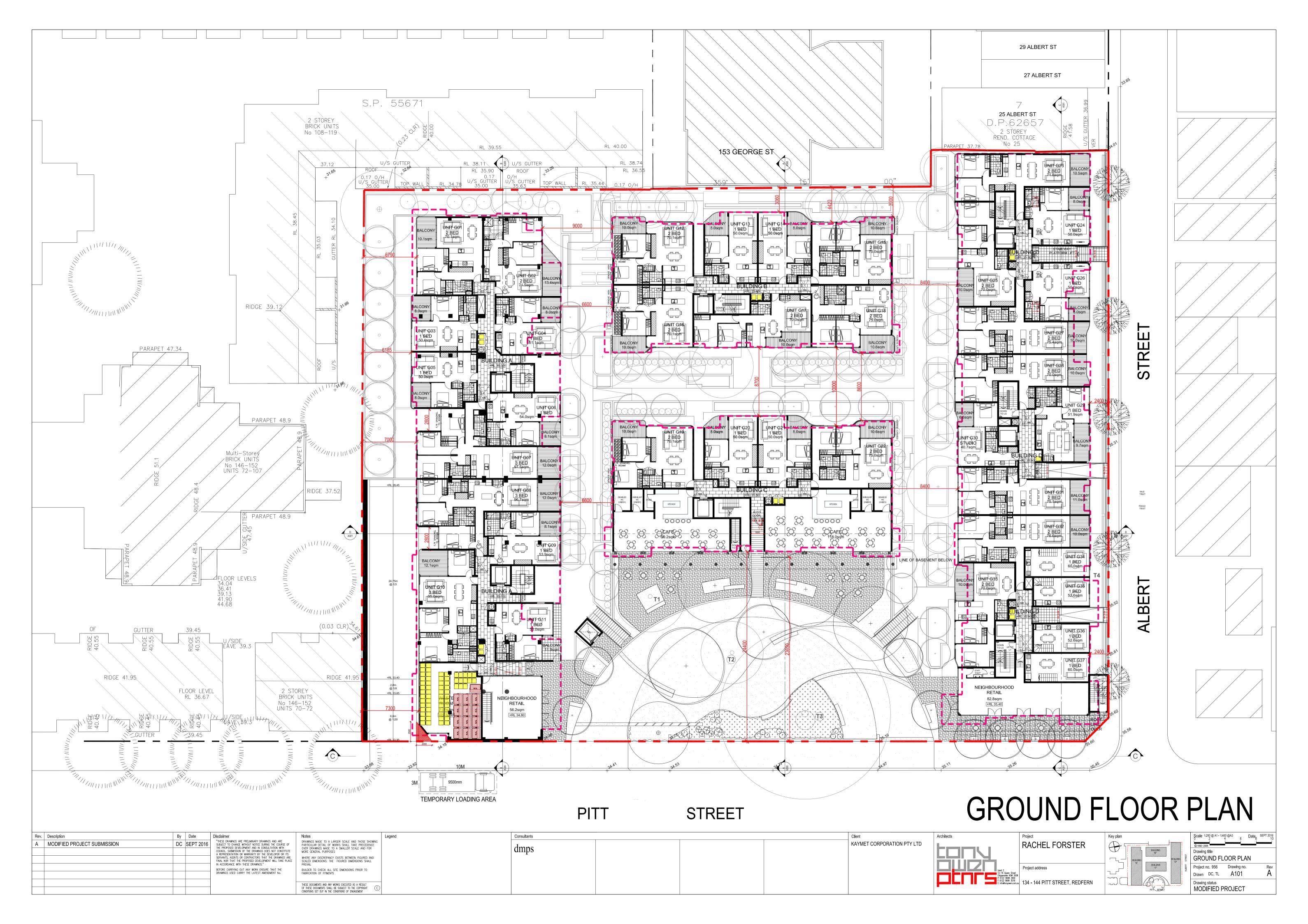


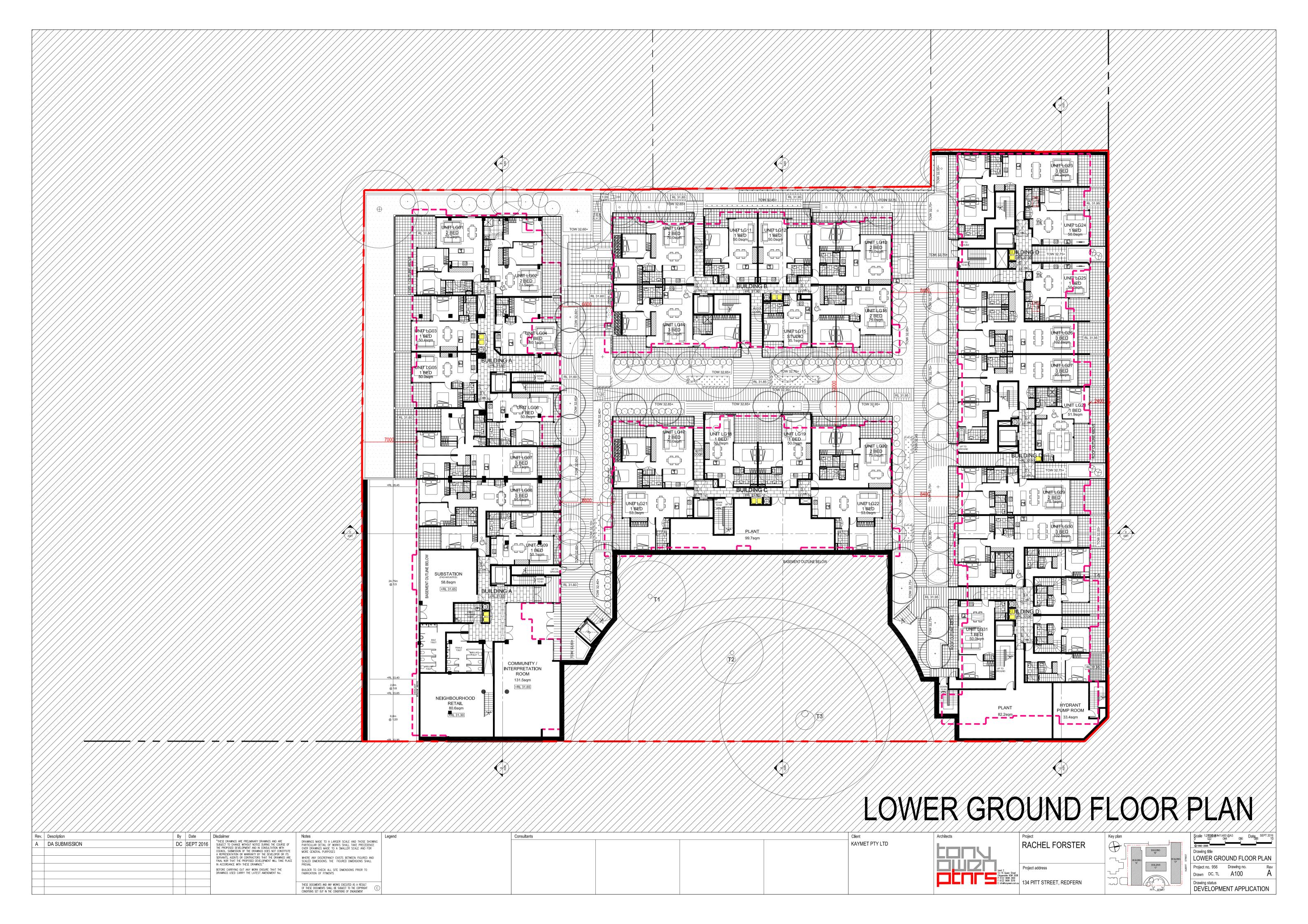


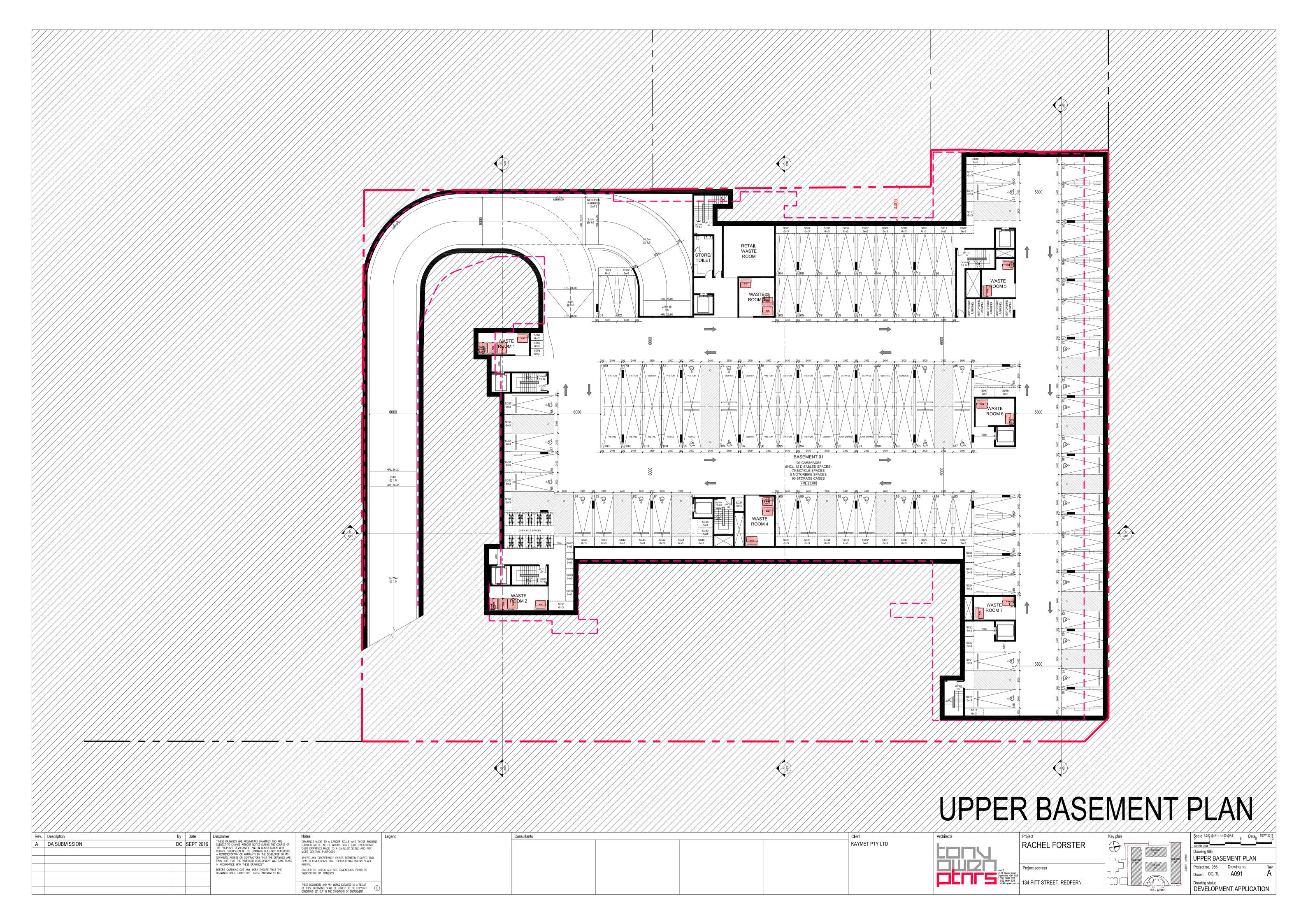


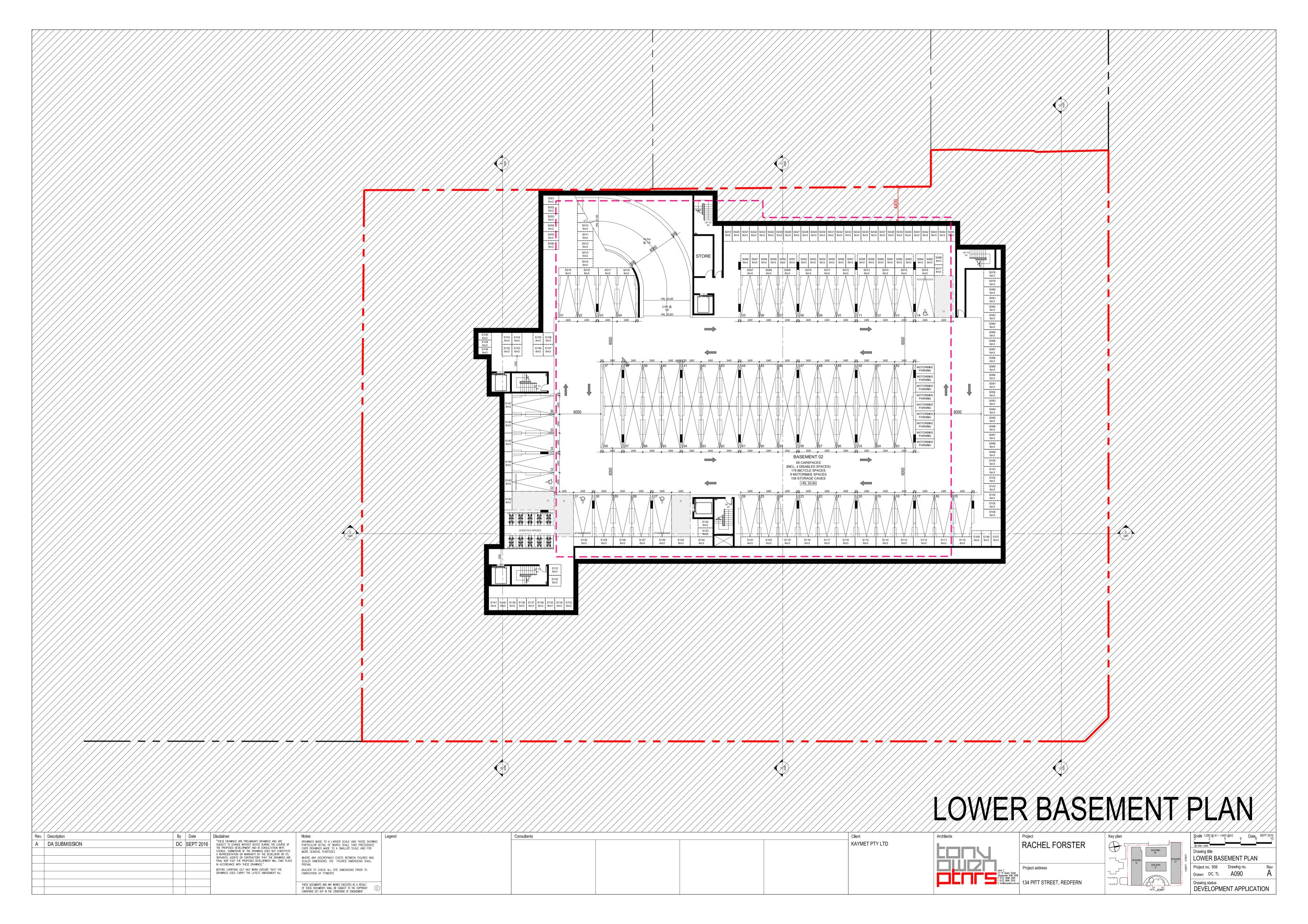
# SOUTH ELEVATION - BUILDING B.C

Rev. Description	By Date	Disclaimer	Notes	Legend	Consultants	Client	Architects	Project	Key plan	Scale 1:200 @ A1 - 1:400 @A3 Date SEPT 2016
A DA SUBMISSION	DC SEPT 2016	"THESE DRAWINGS ARE PRELIMINARY DRAWINGS AND ARE SUBJECT TO CHANGE WITHOUT NOTICE DURING THE COURSE OF THE PROPOSED DEVELOPMENT AND IN CONSULTATION WITH COUNCIL. SUBMISSION OF THE DRAWINGS DOES NOT CONSTITUTE A REPRESENTATION OF WARRANTY BY THE DEVELOPER OR ITS SERVANTS, AGENTS OR CONTRACTORS THAT THE DRAWINGS ARE FINAL NOR THE PROPOSED DEVELOPMENT WILL TAKE PLACE IN ACCORDANCE WITH THESE DRAWINGS."  BEFORE CARRYING OUT ANY WORK ENSURE THAT THE DRAWINGS USED CARRY THE LATEST AMENDMENT No.	DRAWINGS MADE TO A LARGER SCALE AND THOSE SHOWING PARTICULAR DETAIL OF WORKS SHALL TAKE PRECEDENCE OVER DRAWINGS MADE TO A SMALLER SCALE AND FOR MORE GENERAL PURPOSES  WHERE ANY DISCREPANCY EXISTS BETWEEN FIGURED AND SCALED DIMENSIONS. THE FIGURED DIMENSIONS SHALL PREVAIL  BUILDER TO CHECK ALL SITE DIMENSIONS PRIOR TO FABRICATION OF FITMENTS  THESE DOCUMENTS AND ANY WORKS EXECUTED AS A RESULT OF THESE DOCUMENTS SHALL BE SUBJECT TO THE COPYRIGHT CONDITIONS SET OUT IN THE CONDITIONS OF ENDAGEMENT			KAYMET PTY LT		RACHEL FORSTER  Project address  12-16 Queen Street Chippendole ISW 2008 P 6122 9998 2900 F 6122 9998 2018 E info@toryowen.com.ou  134 PITT STREET, REDFERN	WIREAT STREET	Drawing title NORTH & SOUTH ELEVATION  Project no. 956 Drawing no. Rev Drawn DC, TL A204 A  Drawing status DEVELOPMENT APPLICATION









# APPENDIX B

# **BUS ROUTES**

