Annexure 1

PLANNING PROPOSAL

Ian Street and Wilberforce Avenue Car Parks, Rose Bay

TRIM: 16/170453

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Part 1 – Introduction

1.1 Background

Woollahra Council has been investigating the future of the Wilberforce Avenue and Ian Street public car parks (the sites) in Rose Bay since 1999. The existing car parks are poorly laid out, visually unattractive and do not positively contribute to the image of the Rose Bay Commercial Centre.

Since that time there have been a number of reports and investigations into the future of the sites which have included:

- the *Rose Bay Centre Urban Design Study* (exhibited 1999) which recognised that the centre lacks sufficient short term parking and improvements to the layout of the Wilberforce Street parking area is required.
- the *Rose Bay Centre Development Control Plan 2000* (in force from 4 August 2000 – since repealed) which identified the preferred urban design envelopes for the sites. These building envelopes were translated into the *Woollahra Development Control Plan 2015* which came into effect on 23 May 2015 and repealed the *Rose Bay Centre Development Control Plan 2000*.
- the adoption of the *Woollahra Section 94 Contributions Plan 2002* which seeks to fund 100 additional spaces in the redevelopment of the Ian Street car park;

More recently, in 2010 the strategic importance of the Ian Street Car Park site was reinforced when staff investigated potential locations for increased residential capacity across the Woollahra Local Government Area (Woollahra LGA). These sites were known as 'opportunity sites'.

In 2011 Council commissioned AECOM to provide information and recommendations regarding the provision of community facilities throughout the Woollahra LGA. The Woollahra Community Facilities Study (2011) found demand for a multipurpose community facility in Rose Bay of between 500m^2 and 750m^2.

In 2013 Council's Property Assets Working Party (PAWP) which comprises Councillors and staff became responsible for managing the ongoing investigations into the future use of the car parks. The PAWP minutes are reported to Council's Corporate and Works Committee.

In 2014 Council commissioned Hill PDA to review development options for the sites and consider the future use of both car park sites as a combined commercially viable package. The objective of the review was to optimise site-usage with community space, car parking, and activated street frontages. Supplementary commercial and residential uses were also considered to improve the commercial viability of these redevelopment options. In 2015 the PAWP further refined the options.

On 18 April 2016 the Corporate and Works Committee considered a report on the outcomes of the PAWP work and recommendations on actions to progress the redevelopment of the Rose Bay car parks. After considering the report (**Annexure 1**) the Corporate and Works Committee recommended in part:

> F. That Council commences the planning proposal process to rezone Ian Street and amend the height restrictions on Ian Street and Wilberforce Avenue sites.

Council adopted this recommendation on 26 April 2016 **(Annexure 2)**.

On 18 July 2016 the Corporate and Works Committee considered a further report on the progress of the redevelopment of the sites. After considering the report **(Annexure 3)** the Corporate and Works Committee resolved, under its delegations:

A. That the progress report on the redevelopment of the Rose Bay Car Parks be noted.
B. That the planning proposal to facilitate the Rose Bay car park project provide for the following:
    i. Wilberforce Avenue – maximum building height of 17.2m.
    ii. Ian Street car park – maximum building height of 14.1m, FSR of 2:1 and rezoning from SP2 Infrastructure, Car Park to B2 Local Centre.

This planning proposal results from the long term investigations into options to redevelop the sites and would provide the opportunity to enhance the centre by providing:

- increased public car parking
- new retail and commercial space
- residential dwellings on part of the Ian Street Car Park
- public amenities, and
- a multi-purpose community centre.

1.2 Description of this planning proposal

The planning proposal is to change the, land use zoning, height and floor space ratio (FSR) controls in Woollahra Local Environmental Plan 2014 (Woollahra LEP 2014) as follows:

- Ian Street Car Park:
    - rezone the land from SP2 Infrastructure (Car Park) to B2 Local Centre,
    - amend Schedule 1 to include 'residential flat building' as an additional permitted use on the site to facilitate a residential development on the site, including on part of the ground floor,
    - increase the maximum building height from 10.5m (3 storeys) to 14.1m (4 storeys),
    - apply an FSR of 2:1 (no FSR currently applies).
- Wilberforce Avenue Car Park:
    - increase the maximum building height from 14.1m (4 storeys) to 17.2m (five storeys).

This planning proposal has been prepared in accordance with section 55 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the two documents prepared by the NSW Department of Planning and Infrastructure titled *A Guide to Preparing Planning Proposals* (August 2016) and *A Guide to Preparing Local Environmental Plans* (August 2016). To support this planning proposal the following documents have been prepared and are provided as annexures:

- Rose Bay Car Parks Urban Design Study **(Annexure 4)**
- Visual Impact Assessment **(Annexure 5)**
- Geotechnical Assessment **(Annexure 6)**
- Assessment of Traffic and Parking Impact **(Annexure 7)**

1.3 Building envelopes and concepts for the sites

Council proposes to amend the planning controls for the sites to facilitate increased public car parking, provide a new multi-purpose community space of between 500m^2 and 750m^2, create new retail space and provide residential development on the Ian Street site.

Council commissioned Allen Jack+Cottier Architects (AJ+C) to model building envelopes and produce photomontages of concept buildings that could be built under the proposed controls.

On the Ian Street site, the building envelope formed under the proposed controls can accommodate a four storey building. The concept buildings illustrate a mixed use development incorporating retail and residential uses on the ground floor with residential uses on all levels above.

On the Wilberforce Avenue site, the building envelope formed under the proposed controls can accommodate a five storey building. The concept buildings illustrate a mixed use four storey development with roof top parking. The potential mix of uses includes retail on the ground level, community and commercial uses above, and car parking behind. A new public square is illustrated at street level on the Wilberforce Avenue frontage.

Figures 1-4 illustrate the following:

- Photographs of the existing site conditions,
- Photomontages which identify the building envelopes created by the proposed controls and concept buildings that could be built within those envelopes.

The photographs and photomontages show the building in context with the Centre and surrounding residential land.

Figure 1: Existing perspective of the Ian Street Car Park (source AJ+C) taken from Dover Road facing east.

Figure 2: Photomontage of the building envelope (orange line) and concept under the proposed planning controls for the Ian Street Car Park (source AJ+C)

Figure 3: Existing perspective of the Wilberforce Avenue Car Park (source AJ+C) taken from Newcastle Street facing north

Figure 4: Photomontage of the building envelope (orange line) and concept for the Wilberforce Avenue Car Park (source AJ+C Architects)

Part 2 – Existing sites and surrounding context

2.1 The sites

The sites are part of the Rose Bay Commercial Centre (the Centre) which runs east to west along New South Head Road, Rose Bay, and extends into the surrounding streets of Norwich Road, Newcastle Street, Wilberforce Avenue, Dover Road and Ian Street. Located approximately 50m south east from the waters of Rose Bay, the Centre is zoned B2 Local Centre which permits a broad range of commercial uses and residential dwellings as shop top housing.

The Ian Street Car Park is located at 16-18 Dover Road and is legally described as Lots 7 and 8 in DP 976610. Located in the eastern corner of the Centre, it adjoins residential land to its north east and south east boundaries.

The Wilberforce Avenue Carpark is located between Wilberforce Avenue and Dover Road and is legally described as Lots 8, 70 and 71 Sec A in DP4244 and Lots A and B in DP 104986. The location of the centre and the sites is shown in Figure 5. The sites and their existing subdivision pattern is shown in Figure 7.

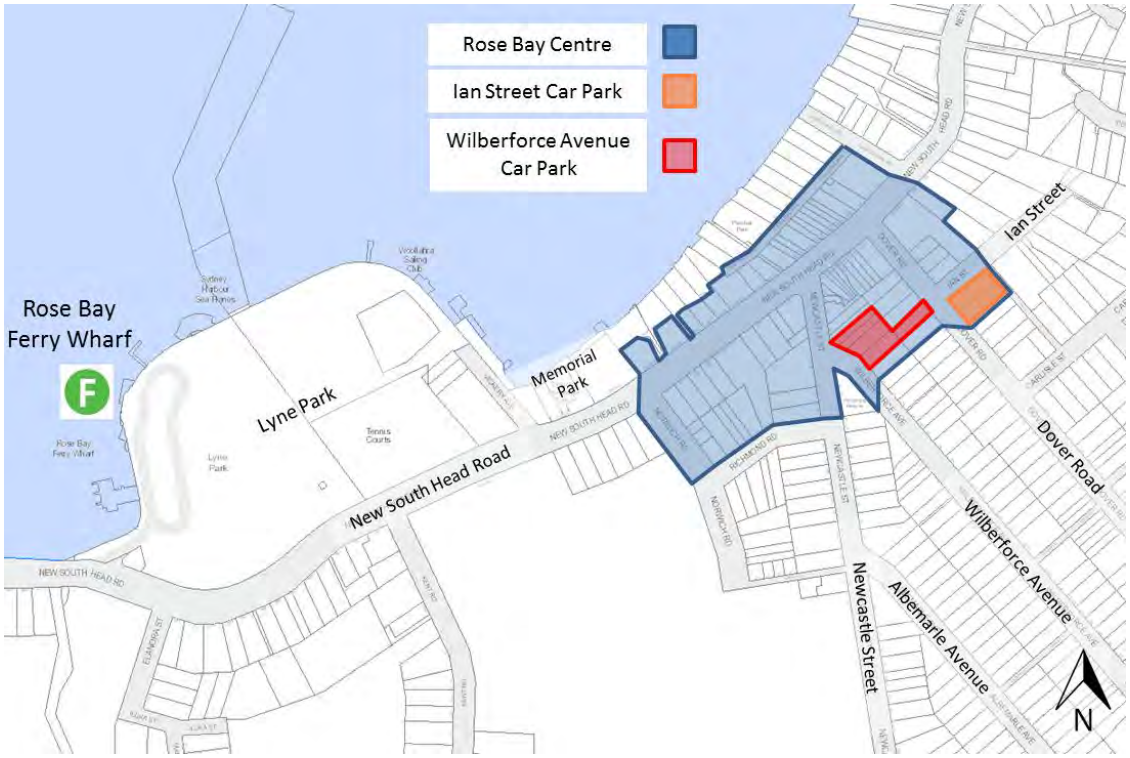


Figure 5: Local area map (refer to Figures 6 and 7 for site details)

The Ian Street Car Park is an at-grade, rectangular parking lot with capacity for 49 standard sized vehicles in two aisles. Access and egress is via Dover Road. The site is bounded by Dover Road to the west, Ian Street to the north, Ian Lane to the east and a two-storey dwelling house to the south east. Rising from west to east by approximately four metres the site contains eight mature Camphor Laurel trees around the north-west, north-east and south-east boundaries. A Jacaranda, Casuarina, Lophostemon and African Olive tree are located to the west on the Ian Street footpath adjoining the site.

The Wilberforce Avenue Car Park is a hatchet shaped at-grade car park with capacity for 95 vehicles in three aisles. The car park has three entrances, two on Wilberforce Avenue and one at Dover Road, and two exits on Wilberforce Avenue. The access to both streets creates an informal pedestrian route between through the car park. The site contains five small

Pyrus trees in between the southern and middle aisles and one established Tulipwood tree in the western corner. An aerial photograph of the sites is at Figure 6.

Figure 6: Aerial

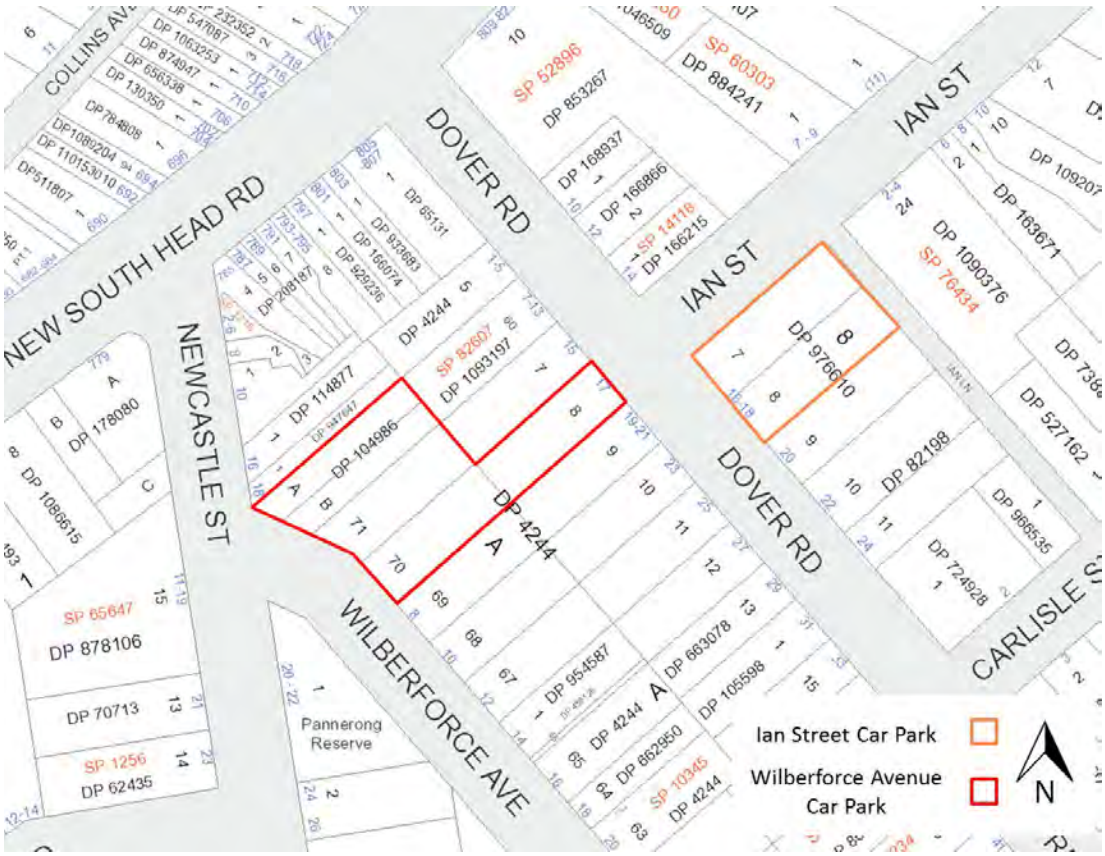


Figure 7: Sites map

The characteristics of each car park are summarised in Table 1.

	Ian Street	Wilberforce Avenue
Area	1,132m^2	2,360m^2
Number of parking spaces	49	95
Lot and DP numbers	Lots 7 and 8 in DP 976610	Lots 8, 70 and 71 Sec A DP4244, Lots A and B DP 104986

Table 1: Car park characteristics

2.2 Existing context

The surrounding built form varies considerably as shown in Figure 8.

Ian Street Car Park

To the north east of the Ian Street Car Park site across Ian Lane is a three/four storey residential flat building (RFB) containing four dwellings. On the opposite side of Ian Street is a four storey RFB and a one storey commercial dwelling at the corner of Dover Road. On the opposite side of Dover Road is Parisi's Food Hall which is two to three storeys, a one storey health consulting room in a dwelling house and a two storey dwelling house. Other notable nearby buildings include the Rose Bay Hotel which is three storeys and a mixed use commercial and residential building of four storeys which are on opposite corners of Dover Road and New South Head Road.

Figure 8: Oblique aerial of the two car parks in the Centre

Wilberforce Avenue Car Park

The Wilberforce Avenue Car Park is set between Parisi's to the south on Wilberforce Avenue and a row of two storey shops to the north on Newcastle Street. On the western side of Newcastle Street, there are two, two storey commercial buildings and a four storey mixed use building. Pannerong Reserve is to the south of the site which contains mature Camphor Laurel trees, lining the footpath adjoining Wilberforce Avenue.

2.3 Proximity to services, transport and recreation facilities

Key industries in the Centre include retail, health, accommodation and food services, and professional services[1]. The Centre has two supermarkets, three banks, chemists, a broad range of restaurants and cafes and other day-to-day services that contribute to making this local centre convenient and important for residents in the area.

The Centre is well serviced by public transport with five bus routes running along New South Head Road to the CBD, being route Nos. 323, 324, 325, and L24. Connections are available from these routes at the Edgecliff Bus and Rail Interchange to district centres such as Bondi Junction.

The Rose Bay Ferry Wharf is 550m from the Centre with services to Circular Quay. The first ferry at 6:38AM and last is at 9:19PM Monday to Thursday. The last ferry on Fridays and Saturdays is 11:15PM. Ferries also run to the nearby suburbs of Double Bay and Watsons Bay.

Council has recently improved cycling routes to and nearby the Centre. A shared path to the south along Newcastle Street has recently been completed and investigations are underway to provide a 2.4km shared path to Double Bay which would connect to other cycling routes to the CBD.

The sites are in walking distance (500m) of a number of parks and recreation facilities including Lyne Park (containing tennis courts, basketball courts and sports fields), Tingira Memorial Park, Sydney Harbour, Percival Park, Pannerong Reserve and the Royal Sydney Golf Club.

The proposed planning controls would support development concepts which would support the existing commercial and retail tenancies by increasing off-street car parking, adding a community centre, public space and additional dwellings for new residents.

Providing opportunities for medium density residential development on the Ian Street site is consistent with well-established best planning practice of increasing development potential near transport nodes and shopping centres to promote sustainable and public transport oriented development. Locating new dwellings in the Centre will provide the opportunity for new residents to work in the Centre or access other jobs via public transport reducing vehicle trips.

[1] Eastern Suburbs Economic Profile (2014)

Part 3 Existing planning controls

The existing zoning, maximum building height and floor space ratio controls that apply to the sites under Woollahra LEP 2014 are set out in Table 2.

	Zone	Maximum building height (m)	Floor space ratio
Ian Street	SP2 Infrastructure (Car park)	10.5 (3 storeys)	N/A
Wilberforce Avenue	B2 Local Centre	14.1 (4 storeys)	2:1

Table 2: Existing planning controls

The B2 Local Centre zone encourages a wide range of land uses, including commercial, residential, community and tourist and visitor accommodation. In this zone, residential development above active commercial and retail ground floor uses is important in providing a mix of uses to keep the centre lively. However, the SP2 zone over the Ian Street Car Park only permits car parking.

Under the Woollahra Development Control Plan 2015, Chapter D6 Rose Bay Centre applies to the sites. The planning proposal will not alter the Woollahra Development Control Plan 2015 (the DCP) and Chapter D6 will continue to apply.

The objectives of Chapter D6 are outlined in section D6.1.3 of the DCP. The objectives include:

O1 To retain and enhance the village atmosphere of the Rose Bay Centre.

O5 To foster the diverse mix of uses in the Rose Bay Centre.

O7 To improve traffic and parking management in the centre and reduce vehicle and pedestrian conflicts.

Part 4 – Objectives of planning proposal

In summary, the objectives of the planning proposal are to change the planning controls applying to the site to allow:

- Ian Street Car Park - a building up to four storeys containing a mix of commercial development, residential development and public car parking.
- Wilberforce Avenue Car Park - a building up to five storeys containing a mix of retail, community space and increased public car parking.

Part 5 – Explanation of provisions

The planning proposal is to change the, land use zoning, height and floor space ratio (FSR) controls in Woollahra Local Environmental Plan 2014 (Woollahra LEP 2014) as follows:

- Ian Street Car Park:
    - rezone the land from SP2 Infrastructure (Car Park) to B2 Local Centre,
    - amend Schedule 1 to include 'residential flat building' as an additional permitted use on the site to facilitate a mix of residential and retail uses on the ground floor
    - increase the maximum building height from 10.5m (3 storeys) to 14.1m (4 storeys),
    - apply an FSR of 2:1 (no FSR currently applies).
- Wilberforce Avenue Car Park:
    - increase the maximum building height from 14.1m (4 storeys) to 17.2m (five storeys).

A summary of the relevant Woollahra LEP 2014 existing and proposed controls are provided in Table 3.

	Ian Street Site		**Wilberforce Avenue Site**	
	Current	**Proposed**	**Current**	**Proposed**
Zoning	SP2 Infrastructure (Car Park)	B2 Local Centre	B2 Local Centre	B2 Local Centre
Additional uses	Nil	Residential flat building as part of a mixed use development	Nil	Nil
Height (m)	10.5 (3 storeys)	14.1 (4 storeys)	14.1 (4 storeys)	17.2 (5 storeys)
FSR	-	2:1	2:1	2:1

Table 3: Existing and proposed planning controls

Part 6 – Justification

The planning proposal has strategic merit and the key reasons to amend Woollahra LEP 2014 are that:

- Council has been investigating the co-ordinated redevelopment of the two car park sites since 1999.
- The planning proposal will facilitate the redevelopment of the sites as a package to deliver a new multipurpose community facility, the need for which was identified in 2011.
- The planning proposal will enable the redevelopment of the car parks to provide additional car parking, the need for which was identified in 1999.
- The Ian Street Car Park site was identified by staff for potential planning control changes as part of a previous study in 2010. Rezoning that site to B2 Local Centre would make the site consistent with, and formalise the site as part of the Centre.
- Providing opportunities for medium density residential development on the Ian Street site is consistent with well-established best planning practice of increasing development potential near transport nodes and shopping centres to promote sustainable and public transport oriented development.
- The planning proposal aligns with Council's *Community Strategic Plan, Woollahra 2025 – our community our place our plan.* In particular Goal 4 Well planned neighbourhoods, Goal 5 Liveable places and Goal 9 Community focused economic development as it will allow redevelopment that contributes to these goals.
- The proposal will apply an FSR of 2:1 on the Ian Street Car Park site, providing gross floor area which may be used to provide residential dwellings in accordance with the NSW Government's documents *A Plan for Growing Sydney* (2014) and the *Draft Central District Plan* (2016).

  Should additional residential dwellings be provided on the Ian Street Car Park site, it would assist Council to meet its dwelling target of an additional 300 dwellings by 2021 under the *Draft Central District Plan*.
- The envelopes created by the proposed maximum building height and the setbacks in Chapter D6 Rose Bay Centre of the Woollahra Development Control Plan 2015 will allow a building to be constructed on the site that can provide suitable amenity to surrounding buildings.
- The sites are well connected as they are:
  - in the Centre which is serviced by five bus routes
  - in walking distance of the Rose Bay Ferry Wharf
  - serviced by buses providing access to services and employment in the CBD, Double Bay and via connections to Bondi Junction.
  - in walking distance of recreational facilities such as parks, tennis courts, basketball courts and Sydney Harbour

These matters are further discussed below in part 6.1 to 6.3.

6.1 – Need for planning proposal

1. Is the planning proposal a result of any strategic study or report?

Yes. As identified in 1.1 Background, above, the planning proposal is the result of a number of strategic studies and reports.

Car parking

In 1999, the Rose Bay Centre Urban Design study identified that the Centre lacks sufficient short term parking, and the Woollahra Section 94 Contributions Plan (introduced in 2002) seeks to fund 100 additional public parking spaces.

AECOM Investigation into community facilities

In 2011 Council commissioned AECOM to undertake a study to provide information and recommendations regarding the provision of community facilities throughout the Woollahra Local Government Area (Woollahra LGA).

AECOM determined the need for community facilities across the LGA based on existing and future population and demographic profiles, assessing existing facilities against best practice standards and benchmarking supply against established community facility standards.

AECOM also reviewed best practice trends and models for the provision of multi-purpose community facilities in Sydney and considered the supply of community space provided by non-Council facilities in the local area and the coverage of services provided by the community sector. AECOM identified a need for a new community facility in Rose Bay between 500m^2 and 750m^2, which would provide for a range of activities including the following:

- Two or more activity rooms;
- Meeting rooms for different sized groups;
- Appropriate space for specific youth and seniors activities;
- Workshop space for art/craft activities;
- Activity room/s opening onto a fenced play area for children's activities;
- Community office space/s and reception area;
- Amenities including chair/table storage and group equipment storage;
- Universal access with reasonable compliance with Australian Standard AS 1428;
- Adequate car parking and parking/access for community bus;
- Signage and street presence highlighting the function of the facility; and
- Internal access for those with low mobility.

Council considered and noted the Woollahra Community Facilities Study 2011 at its meeting on 28 November 2011. A resolution from this meeting was that the Assets Working Party was to consider as a priority matter funding options for the provision of a community facility in Rose Bay.

Opportunity sites – Ian Street car park

In 2010, Woollahra Council responded to the NSW Government requirements to review the planning controls to increase dwelling capacity across the Woollahra LGA. Council staff identified 24 'opportunity sites' to assist in meeting housing targets set by the NSW Government in the Sydney Metropolitan Strategy and the Draft East Subregional Strategy[2].

[2] The Sydney Metropolitan Strategy City of Cities: A Plan for Sydney's Future (2005) set targets of 20,000 additional dwellings and 12,500 new jobs for the eastern region up to 2031.

These sites were focused around existing centres, including Bellevue Hill, Edgecliff, Vaucluse, Double Bay, Rose Bay, Paddington and Woollahra. Within the Centre, the Ian Street Car Park site was identified for potential redevelopment.

The proposed opportunity site planning controls and net dwelling yield of the Ian Street Car Park site are set out in Table 4.

Site Name	Zone	FSR	Height	Net Yield
Ian Street Car Park, 16-18 Dover Road, Rose Bay	B2 Local Centre	2:1	14.7m	22 dwellings

Table 4: Proposed opportunity site planning controls

The rationale for selecting the Ian Street Car Park site was that:

- The then Department of Planning required Council to review all special use zoned land and apply a Standard Instrument zone (usually a residential and or business zone).
- Rezoning the site to B2 Local Centre would have been consistent with the nearby sites that also present to the corners of the roundabout at the intersection of Ian Street and Dover Road. The B2 zone permits a range of uses on the site including public car parking and mixed use development.
- Council would ensure that any future redevelopment of the site made provision for public car parking within the site, or transferred it to another site within the Centre.

The proposed changes to the Ian Street Car Park site have strategic merit, as the site was originally identified for review in 2010 as part of the opportunity site process to increase dwelling capacity.

The proposed zoning, height and floor space ratio controls over the Ian Street Car Park are consistent with those consulted on in Council's opportunity site process. The merit of the controls is discussed further in the site specific merit Part 6.3 – *Environmental, social and economic impact* of this planning proposal.

2. Is the planning proposal the best means of achieving the objectives, or is there a better way?

Yes. This planning proposal is the best means of achieving the objectives. A planning proposal is needed to rezone, apply a maximum FSR and amend the height on the Ian Street Car Park site to facilitate a mixed use development. The planning proposal is also required to increase the maximum building height on the Wilberforce Avenue Car Park site to facilitate a 4 storey mixed use building with roof top parking.

Floor space ratio and height controls are development standards in Woollahra LEP 2014. Changes to these standards and zoning are made through a planning proposal and a draft local environmental plan.

The Council at its meeting of xxxx[3] has endorsed this approach. Accordingly, a planning proposal is the most appropriate way of achieving the intended outcome.

The Draft East Subregional Strategy took the Metropolitan Strategy and applied it to the Woollahra LGA. Two key elements of the Subregional Strategy were the provision of additional dwellings and increasing opportunities for new jobs. The Subregional Strategy set targets for the Woollahra LGA of 2,900 additional dwellings and 300 new jobs.

[3] Date to be inserted following the Council meeting

6.2 – Relationship to strategic planning framework

3. Is the planning proposal consistent with the objectives and actions contained within the applicable regional, subregional strategy or district plan or strategy (including exhibited draft plans or strategies)?

Yes. The planning proposal is consistent with the objectives of *A Plan for Growing Sydney* (2014) and the initiatives of the *Draft Central District Plan* (2016). These plans are discussed in detail in **Attachment 1**.

4. Is the planning proposal consistent with a council's local strategy or other local strategic plan?

Yes. The planning proposal is consistent with Woollahra 2025, which is Council's 15 year strategic plan for the LGA. Woollahra's future planning is based on the principle of sustainability. That is, meeting the needs of the present, without compromising the ability of future generations to meet their own social, economic, environmental and civic leadership needs.

Key themes of Woollahra 2025 are to:

- Enhance and revitalise the village atmosphere of our shopping areas, providing convenient and easy access to a range of shops and facilities.
- Provide quality places and spaces to meet the different needs of people living in the area and houses within easy distance of shopping areas, business precincts and local facilities.
- Maintain the diversity of our local economic base and encourage new business into the area that will enhance and positively impact on community life.

By changing the planning controls on the site the planning proposal will provide the opportunity to redevelop the two existing car parks and provide additional commercial, community space, public car parking and dwellings to support business in the Centre. These outcomes are consistent with themes of Woollahra 2025.

5. Is the planning proposal consistent with applicable State Environmental Planning Policies?

Yes. The planning proposal is consistent with the *Standard Instrument – Principal Local Environmental Plan* and all other applicable *State Environmental Planning Policies* (refer to **Attachment 2**).

6. Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

Yes. The planning proposal is consistent with applicable section 117 directions (refer to **Attachment 3**).

6.3 – Environmental, social and economic impact

7. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

No. There are no critical habitat areas, threatened species, populations or ecological communities or their habitats present on the subject land. Accordingly, the proposal will not have any impact in this regard.

8. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

The potential environmental effects of the planning proposal are discussed below. Other environmental effects that might arise through the redevelopment of the sites would be identified through the development application process. Good design and conditions of consent will limit these effects.

The UD Study and shadow modelling demonstrates that buildings can be constructed under the proposed controls that will fit within the context of Rose Bay and that the proposed maximum building heights and FSR are suitable. The shadow modelling included in the UD Study demonstrated that solar access to nearby residential areas could be provided in accordance with Chapter D6 Rose Bay Centre of the Woollahra DCP 2015.

The View Impact Assessment demonstrates that buildings can be constructed under the proposed controls whilst providing view sharing from the private and public domain.

The Assessment of Traffic and Parking Implications concludes that the concepts prepared under the proposed controls will not have any adverse traffic impacts, will provide opportunity for improved pedestrian and cyclist amenity, and will have satisfactory circulation arrangements.

These matters are addressed separately below.

Urban Design Study

AJ+C investigated the opportunities that could be captured by redeveloping the Wilberforce Avenue Car Park and Ian Street Car Park under the proposed planning controls. The car parks present an opportunity for improving the vibrancy within the Centre as well as fulfilling Council's key objectives of increasing public car parking spaces and providing new community spaces and amenities. Both sites are located centrally and have the potential to be catalysts for the area. AJ+C produced the Rose Bay Car Parks Urban Design Study (the Study) which is attached at **Annexure 4.** The study developed concepts under the proposed controls for the car parks that would:

- Comply with the proposed height and FSR controls
- Significantly increase the number of public car parking spaces across the two car parks by a minimum of 100 to 244 spaces;
- Provide a new community centre of approximately 750m^2 GFA and accessible public amenities;
- Provide income-generating opportunities for the Council such as retail, commercial and/or residential development on the Ian Street Car Park.

The study includes shadow diagrams for both sites and a SEPP 65 Statement for the Ian Street Car Park site based on a concept that includes residential apartments as part of a mixed used development.

Wilberforce Avenue Car Park site envelope

For the Wilberforce Avenue Car Park the only change is to the maximum building height. The maximum building height is proposed to be increased by 3.1m from 14.1m to 17.2m. A section comparing the two maximum building heights is provided in Figure 9.

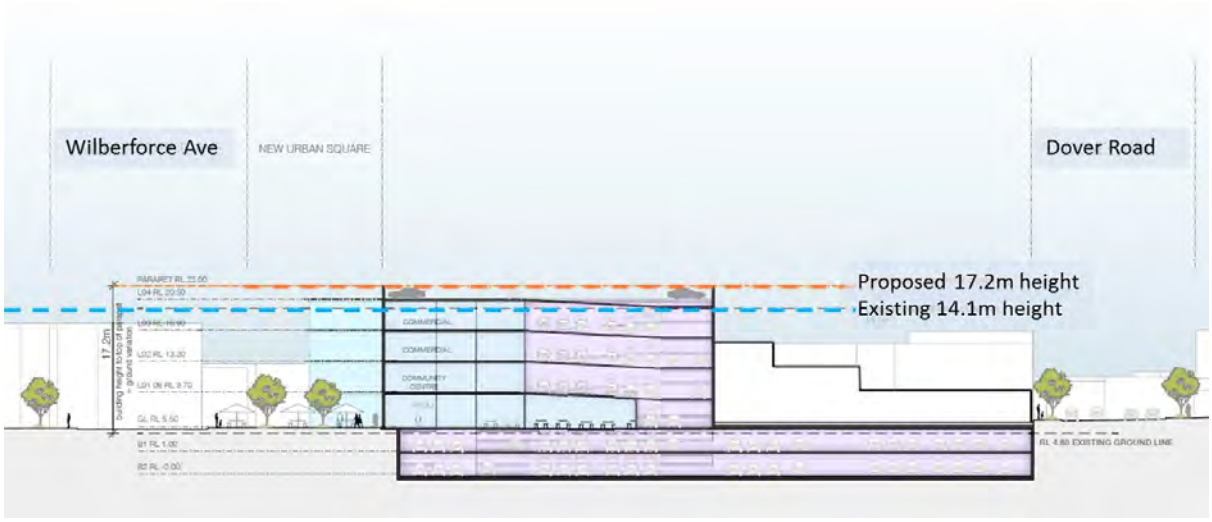


Figure 9: Section of maximum building heights between Wilberforce Avenue and Dover Road

The concept for the Wilberforce Avenue Car Park site is shown in 3D in the context of existing buildings in Figure 10.

Figure 10: 3D view of 3D massing facing north showing the concept for the site compared to existing buildings in the Centre

As identified in the figure above, the proposed increase in height on the Wilberforce Avenue Car Park site can accommodate a building of an acceptable scale and bulk in the site's central location in the Centre. The building envelope will allow a building to be constructed which is of comparable scale to other buildings in the Centre including the apartments at 11-19 Newcastle Street and Parisi's Food Hall at 19-21 Dover Road.

The minor increase to 17.2m is consistent with the maximum permissible height on Nos. 682-684 to 696 New South Head Road under clause 4.4C *Exceptions to height and floor space ratio (Area 4 – Rose Bay)* of Woollahra LEP 2014. Clause 4.4C permits a maximum building height of 17.2m (5 storeys) and FSR of 2.25:1 subject to the provision of

public domain improvements. Those improvements must include the provision of a public square.

The proposed increase in building height on the Wilberforce Avenue Car Park site which facilitates one additional storey is consistent with the village character of Rose Bay.

Ian Street Car Park site envelope

Over the Ian Street Car Park site the maximum building height is proposed to increase by 3.6m from 10.5m to 14.1m. A section comparing the two maximum building heights is provided in Figure 11.

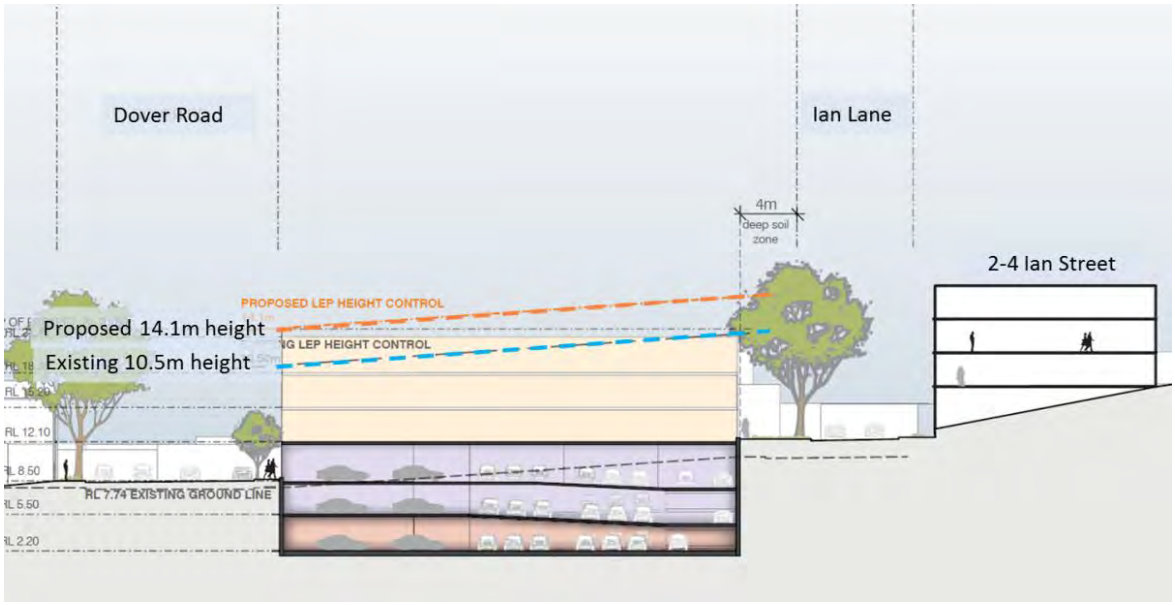


Figure 11: Section of maximum building heights between Dover Road and Ian Lane

The concept for the Ian Street Car Park site is shown in 3D in the context of existing buildings in Figure 12.

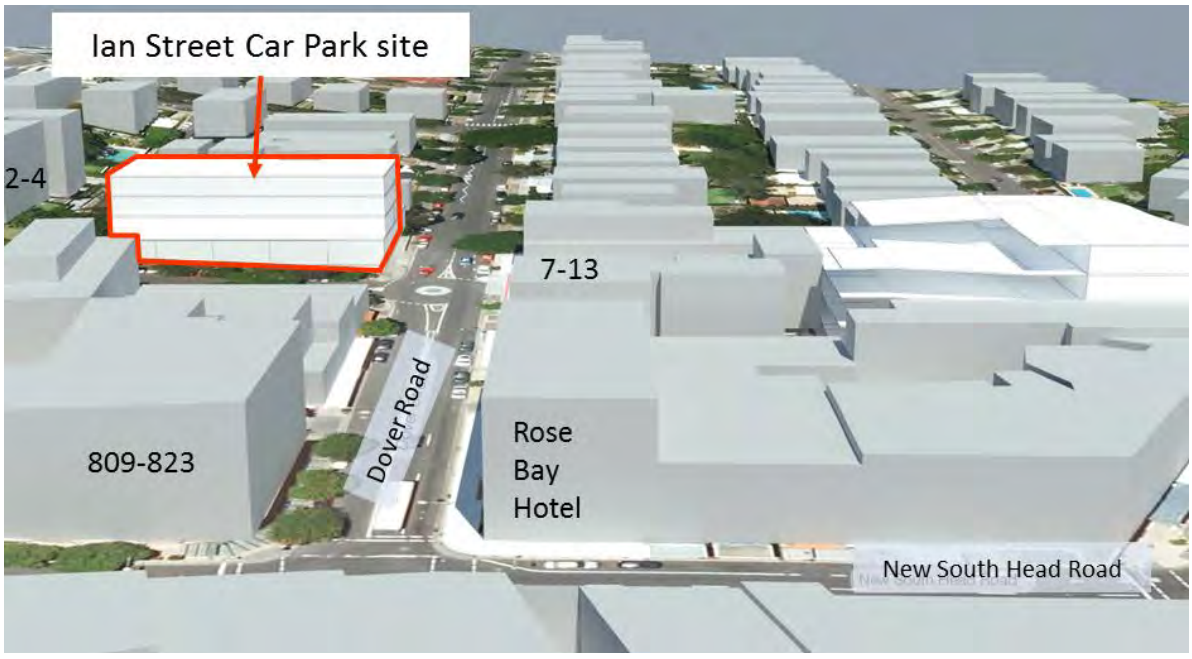


Figure 12: 3D view of the Ian Street Car Park site facing south east showing the concept for the site compared to existing buildings in the Centre

The proposed increase in building height on the Ian Street Car Park site will maintain the village character of the Centre, as it is consistent with the existing 14.1m (4 storeys) maximum building height applying to the majority of the Centre. By applying a 4m setback to Ian Lane, the mature Camphor Laurel trees can be retained.

The building envelope will allow a building to be constructed which is of comparable scale to the apartments at 2-4 Ian Street, No.7-13 Dover Road, No.809-823 New South Head Road and the Rose Bay Hotel.

Shadow assessment

AJ+C undertook shadow modelling of the concept buildings which is included in **Annexure 4** (pages 50-54).

On the Wilberforce Avenue Car Park site, at midday on 21 June the concept casts shadows on:

- the roadway between Dover Road and Wilberforce Avenue,
- Parisi's Food Hall, and
- part of Pannerong Reserve.

There is no shadowing to nearby residential properties at midday. The concept provides at least three hours of sunlight to residential properties to the south east between 9am and 3pm which is consistent with the requirements of Chapter D6 Rose Bay Centre of the Woollahra DCP 2015.

On the Ian Street Car Park Site, at midday on 21 June the concept casts shadows on Dover Road, and the garage of No.20 Dover Road.

The shadowing impacts of the building envelope created by the proposed planning controls are considered acceptable if setbacks similar to those shown in the concepts are applied. Those setbacks are consistent with the setbacks in Chapter D6 Rose Bay Centre of the Woollahra DCP 2015.

Privacy and State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development principles

Privacy

Any redevelopment on the Ian Street Car Park site containing apartments must be designed in accordance with *State Environmental Planning Policy 65 – Design Quality of Residential Apartment Development* (SEPP 65) and its companion document the Apartment Design Guide (ADG). Consistency with these guidelines ensures that distances and treatments of windows and balconies will protect the acoustic and visual privacy of surrounding residences.

Under SEPP 65, Clause 6A (*Development control plans cannot be inconsistent with the Apartment Design Guide)* sets out the relationship between certain provisions contained in Parts 3 and 4 of the ADG and provisions in a development control plan. Clause 6A makes the objectives, design criteria and guidelines for visual privacy in Part 3 of the ADG prevail over Woollahra Development Control Plan 2015 (Woollahra DCP 2015).

However, the provisions of the Woollahra DCP 2015 which require adequate acoustic privacy to be provided to occupants of neighbouring residential properties will continue to apply. For example, apartments must be designed to ensure adequate acoustic separation and privacy to new dwellings and mechanical or air conditioning equipment must not create offensive noise.

The proposed planning controls create building envelopes that can maintain the privacy of existing nearby dwellings by having regard to controls or guidance on privacy in SEPP 65, the ADG and the Woollahra DCP 2015. Privacy would be addressed as part of a future development application on the site.

SEPP 65 Principles

Based on the concept for the Ian Street Car Park site, AJ+C prepared a SEPP 65 Statement focusing on the nine Design Quality Principles:

- Principle 1: Context and Neighbourhood Character
- Principle 2: Built Form and Scale
- Principle 3: Density
- Principle 4: Sustainability
- Principle 5: Landscape
- Principle 6: Amenity
- Principle 7: Safety
- Principle 8: Housing Diversity and Social interaction
- Principle 9: Aesthetics

The Statement (page 50 of **Annexure 4**) suitably addresses the Design Quality Principles, demonstrating that it is possible to construct a building under the proposed controls that:

- is in context with surrounding development,
- has a scale and density suitable for the site,
- provides amenity to new dwellings in the development and surrounding buildings in terms of access to sunlight, natural ventilation, outlook, visual and acoustic privacy, and
- provides a mix of apartment sizes to increase housing diversity.

Visual impact assessment

As the proposed building envelopes have the potential to affect views, a visual impact assessment was prepared by Architectus modelling views from the private and public domain (**Annexure 5**). Particular attention has been given to views from:

- the apartments in the building at 2-4 Ian Street, Rose Bay,
- the public domain in Blake Street in Dover Heights,
- New South Head Road near Kambala School in Rose Bay, and
- Sydney Harbour.

The views were constructed using a 3D model of the terrain and buildings in and around the Centre provided by AAM Group, with significant vegetation inserted based on a survey prepared by S J Dixon Surveyors Pty Ltd. The proposed maximum building heights and concepts prepared by AJ+C were inserted into the model to examine views to and over these sites.

Views from the private domain

The analysis identifies that the proposed increase in maximum building height on the Ian Street Car Park Site and associated concept plans may affect views from No. 2-4 Ian Street which adjoins the site to the north, as shown in Figure 13.

Figure 13: The Ian Street Car Park site and 2-4 Ian Street.

In the residential flat building at 2-4 Ian Street (Strata Plan 76434) view sharing was assessed from the four locations shown in Figure 14.

Figure 14: View modelling locations in 2-4 Ian Street.

Location	Lot / Apartment Number	Location description
1	4	Terrace
2	7	Balcony
3	9	Balcony
4	8	Terrace

Table 5: Location and description of where views were modelled

The analysis of private views was conducted in accordance with the view sharing principles set out in *Tenacity v Warringah Council (1004) NSWLEC 140* which has established a four step assessment of view sharing. The steps are as follows:

1. The assessment of the views affected
2. Consideration from what part of the property the views are obtained
3. The extent of the impact
4. The reasonableness of the proposal that is causing the impact

Locations 1, 2 and 3

Locations 1, 2 and 3 have been considered together due to the similar nature of the views.

1. <u>The assessment of the views affected</u>

The first step is the assessment of views to be affected. Water views are valued more highly than land views. Iconic views (e.g. of the Opera House, the Harbour Bridge or North Head) are valued more highly than views without icons. Whole views are valued more highly than partial views, e.g. a water view in which the interface between land and water is visible is more valuable than one in which it is obscured.

The views from these apartments are partial views of the surrounding area which are obscured by the established camphor laurel trees on the Ian Street Car Park. These trees would obscure any view of the Sydney CBD or Harbour Bridge. Based on surveys and the 3D model it is possible, that there are some water views of Sydney Harbour from Lots 7 and 9. However, the existing mature trees between the harbour and the lots may obscure these views.

2. <u>Consideration from what part of the property the views are obtained</u>

The second step is to consider from what part of the property the views are obtained. For example, the protection of views across side boundaries is more difficult than the protection of views from front and rear boundaries. In addition, whether the view is enjoyed from standing or sitting position may also be relevant. Sitting views are more difficult to protect than standing views. The expectation to retain side views and sitting views is often unrealistic.

The views are over the side boundary of 2-4 Ian Street across the Ian Street Car Park to the west as shown in Figure 15 in red. The views were modelled from a standing position at 1.55m above the estimated height of the balcony or terrace of lots 4, 7 and 9.

Figure 15: Direction and location of views

3. The extent of the impact

The third step is to assess the extent of the impact. This should be done for the whole of the property, not just for the view that is affected. The impact on views from living areas is more significant than from bedrooms or service areas (though views from kitchens are highly valued because people spend so much time in them). The impact may be assessed quantitatively, but in many cases this can be meaningless. For example, it is unhelpful to say that the view loss is 20% if it includes one of the sails of the Opera House. It is usually more useful to assess the view loss qualitatively as negligible, minor, moderate, severe or devastating.

The extent of the impact is considered to be minor due to the:

- existing trees on the Ian Street Car Park which obscure the views from lots 4, 7 and 9 over the Ian Street Car Park
- current maximum building height permitting a 3 storey building to be constructed on the site which would affect views

4. The reasonableness of the proposal that is causing the impact

The fourth step is to assess the reasonableness of the proposal that is causing the impact. A development that complies with all planning controls would be considered more reasonable than one that breaches them. Where an impact on views arises as a result of non-compliance with one or more planning controls, even a moderate impact may be considered unreasonable. With a complying proposal, the question should be asked whether a more skilful design could provide the applicant with the same development potential and amenity and reduce the impact on the views of neighbours. If the answer to that question is no, then the view impact of a complying development would probably be considered acceptable and the view sharing reasonable.

The planning proposal is considered reasonable as the proposed increase of 3.6m over the Ian Street Car Park site will not result in significant additional view loss from lots 4, 7 and 9 and view sharing will be achieved towards Sydney Harbour. On the Ian Street Car Park site, the mature camphor laurels obscure views over the site and would obscure a building constructed under the existing and proposed controls. As the site is part of the Rose Bay Commercial Centre, it is reasonable to expect development on it at a scale that is consistent with the rest of the Centre.

Location 4 – Lot 8 of SP76434

1. The assessment of the views affected

The first step is the assessment of views to be affected. Water views are valued more highly than land views. Iconic views (e.g. of the Opera House, the Harbour Bridge or North Head) are valued more highly than views without icons. Whole views are valued more highly than partial views, e.g. a water view in which the interface between land and water is visible is more valuable than one in which it is obscured.

The views from the terrace of Lot 8 to the west would include a regional view toward Bellevue Hill and views to the northwest of the Sydney CBD, Sydney Harbour and the Sydney Harbour Bridge which is considered an iconic view. The view of the Harbour Bridge would be a partial view, as Point Piper would interrupt views of the southern pylons and approach to the bridge, although most of the main span of the bridge would be visible.

2. Consideration from what part of the property the views are obtained

The second step is to consider from what part of the property the views are obtained. For example, the protection of views across side boundaries is more difficult than the protection of views from front and rear boundaries. In addition, whether the view is enjoyed from

standing or sitting position may also be relevant. Sitting views are more difficult to protect than standing views. The expectation to retain side views and sitting views is often unrealistic.

The view is over Ian Street and the side boundary of 2-4 Ian Street across the Ian Street Car Park to the west as shown in Figure 16 in red. The view was modelled from a standing position at 1.55m above the estimated height of the terrace of lots 8. There would also be views from the inside the dwelling possibly from seated and standing positions.

Figure 16: Direction and location of view

3. <u>The extent of the impact</u>

The third step is to assess the extent of the impact. This should be done for the whole of the property, not just for the view that is affected. The impact on views from living areas is more significant than from bedrooms or service areas (though views from kitchens are highly valued because people spend so much time in them). The impact may be assessed quantitatively, but in many cases this can be meaningless. For example, it is unhelpful to say that the view loss is 20% if it includes one of the sails of the Opera House. It is usually more useful to assess the view loss qualitatively as negligible, minor, moderate, severe or devastating.

The extent of the impact is considered to be minor due to the:

- iconic views of the CBD and Harbour Bridge being uninterrupted by the building envelope created by the proposed maximum building height
- existing trees on the Ian Street Car Park obscuring part of the view over the Ian Street Car Park
- current maximum building height permitting a 3 storey building to be constructed on the site which would affect views

4. <u>The reasonableness of the proposal that is causing the impact</u>

The fourth step is to assess the reasonableness of the proposal that is causing the impact. A development that complies with all planning controls would be considered more reasonable than one that breaches them. Where an impact on views arises as a result of non-compliance with one or more planning controls, even a moderate impact may be considered unreasonable. With a complying proposal, the question should be asked whether a more skilful design could provide the applicant with the same development potential and amenity and reduce the impact on the views of neighbours. If the answer to that question is no, then the view impact of a complying development would probably be considered acceptable and the view sharing reasonable.

The planning proposal is considered reasonable as the proposed increase of 3.6m over the Ian Street Car Park site will not result in significant additional view loss from lot 8 and view sharing will be achieved towards Sydney Harbour. The Ian Street Car Park site is part of the Rose Bay Commercial Centre and it is reasonable to expect development and change in the Centre.

Views from the public domain

Views from the public domain were assessed by creating photomontages of views in three locations:

- Blake Street in Dover Heights,
- New South Head Road near Kambala in Rose Bay, and
- from 500m out in Rose Bay on Sydney Harbour.

The photomontages demonstrated that from all three locations the envelope created by the proposed planning controls and the concepts created by AJ+C were negligible or barely visible as shown in Figures 17, 18 and 19.

Figure 17: Extract of view from Blake Street, Dover Heights (Source Architectus)

Figure 18: Extract of view from New South Head Road near Kambala (Source Architectus)

Figure 19: Extract of view from Rose Bay (Source Architectus)

View impacts from the public domain are considered to be acceptable, as:

- The view of the proposed building envelopes retain views to Sydney Harbour from Blake Street, Dover Heights
- The proposed Ian Street envelope is hidden when viewed from New South Head Road near Kambala school and from Sydney Harbour
- The proposed envelopes do not project beyond the existing tree line when viewed from Sydney Harbour
- The proposed envelopes fit within the context of existing development in Rose Bay.

Assessment of Traffic and Parking Implications

Transport and Traffic Planning Associates prepared an Assessment of Traffic and Parking Implications **(Annexure 7)** based on the concept buildings prepared by AJ&C. They conclude that the proposed planning control changes and potential development will:

- not have any adverse traffic implications
- will have suitable and appropriate parking provisions

- will have satisfactory access and circulation arrangements
- will provide the opportunity for improved pedestrian and cyclist connectivity
- will not have any adverse impact on public transport services

9. Has the planning proposal adequately addressed any social and economic effects?

For the reasons discussed above, the planning proposal will have positive social and economic effects. In summary, these include:

- Increasing the development potential of the sites in a local centre near transport nodes which will promote sustainable and public transport oriented development.
- Facilitating the redevelopment of the Wilberforce Avenue Car Park which will provide more public parking to support the existing businesses in the Centre. The redevelopment will also facilitate a new community facility which will meet demand which has been identified in the Community Facilities Study (2011).
- Facilitating the redevelopment of the Ian Street Car Park site which will provide opportunities for additional dwellings which will assist with meeting the housing targets of the Draft Central District Strategy.
- Additional dwellings in this locality will increase the population and provide economic support to local businesses.
- The creation of job opportunities:
  - while a future building is being constructed,
  - in the commercial components of future development.
- Additional residential apartments will increase housing supply and potentially increase affordability.
- Greater housing choice in a development that can include a mix of apartment sizes.

Accordingly, for the reasons stated elsewhere in this report and summarised above, the planning proposal will have positive social and economic benefits and it is in the public interest.

6.4 – State and Commonwealth interests

10. Is there adequate public infrastructure for the planning proposal?

Yes. The site is connected to water, sewer, electricity and telephone services. The site is in proximity to regular and frequent public transport services which have capacity to accommodate increased demand.

There is no significant infrastructure demand that will result from the planning proposal. The existing services that are available to the subject sites are suitable for the proposal and appropriate for the requirements of a local centre.

Notwithstanding, we will consult with public utility companies, service providers and emergency services during the public exhibition.

11. What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

Transport for NSW and Roads and Maritime Services and any other government departments required by the Greater Sydney Commission and Department of Planning and Environment will be consulted during the public exhibition of the planning proposal.

Part 7 – Mapping

An extract of the current and proposed land use zoning, FSR and height controls are shown in figures 20- 25. The proposed Woollahra LEP 2014 maps are provided at **Attachment 3**.

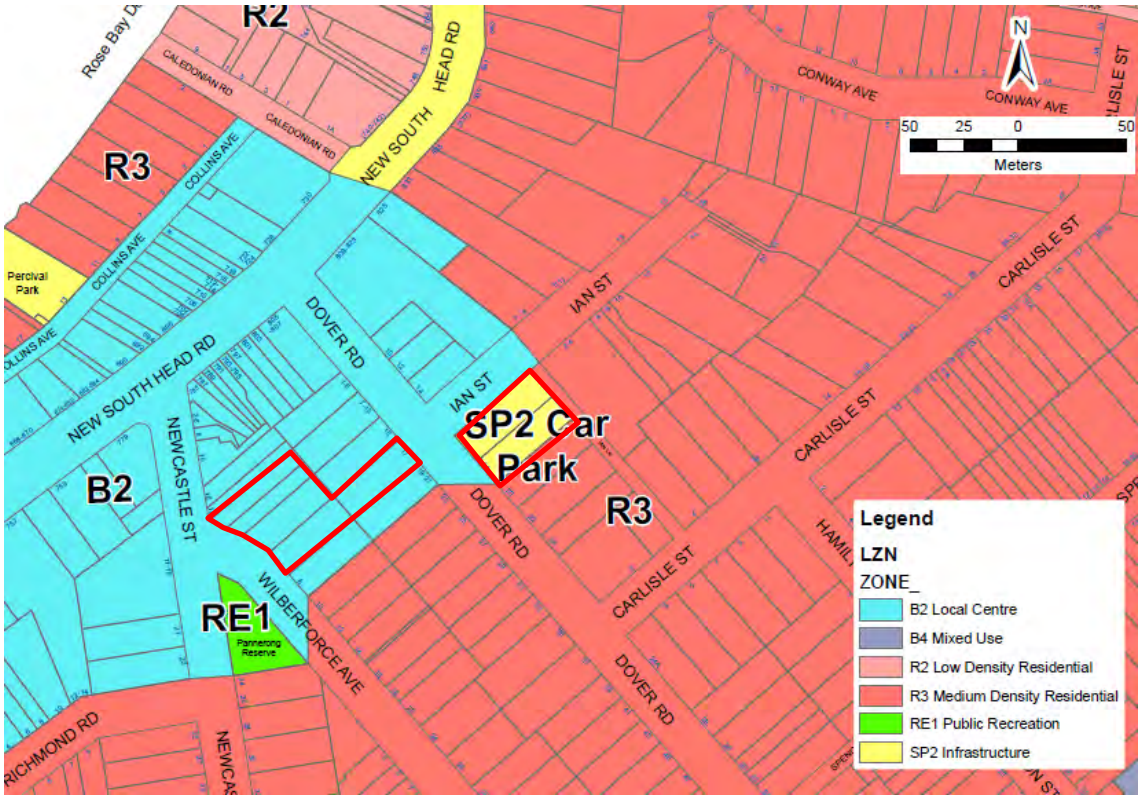


Figure 20: Current zoning Map

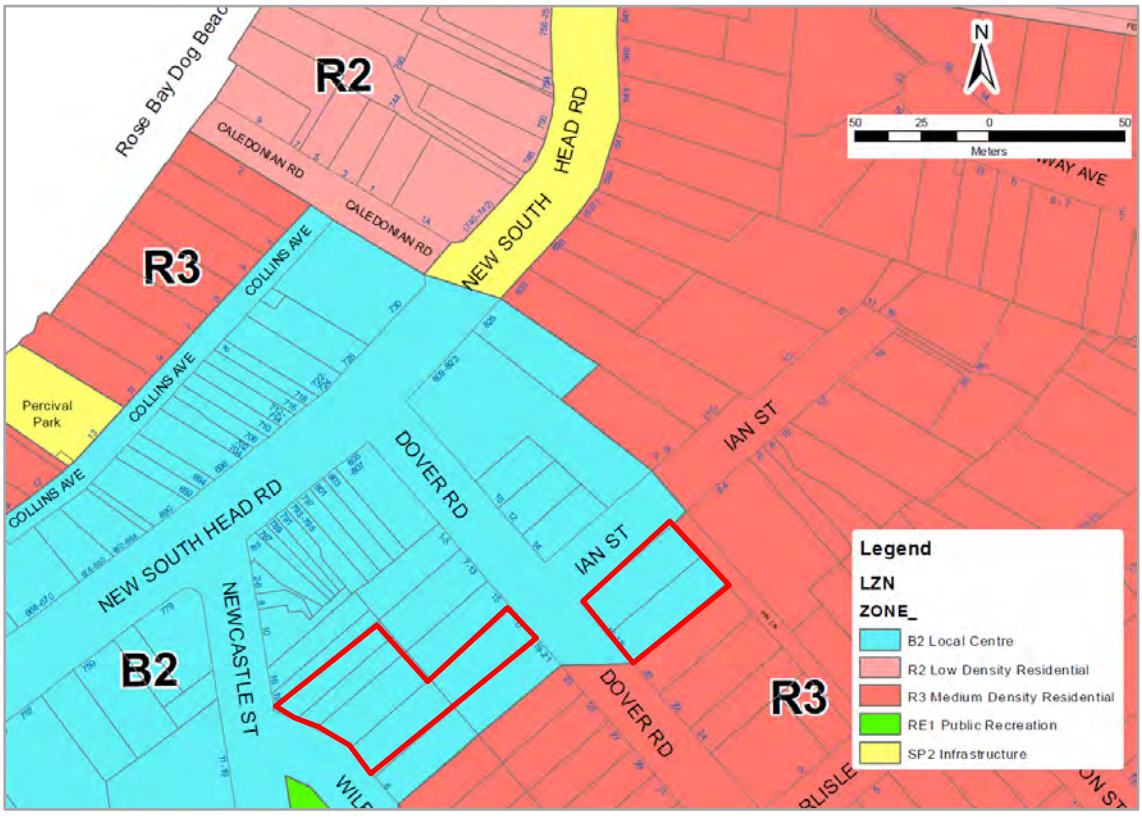


Figure 21: Proposed Zoning Map

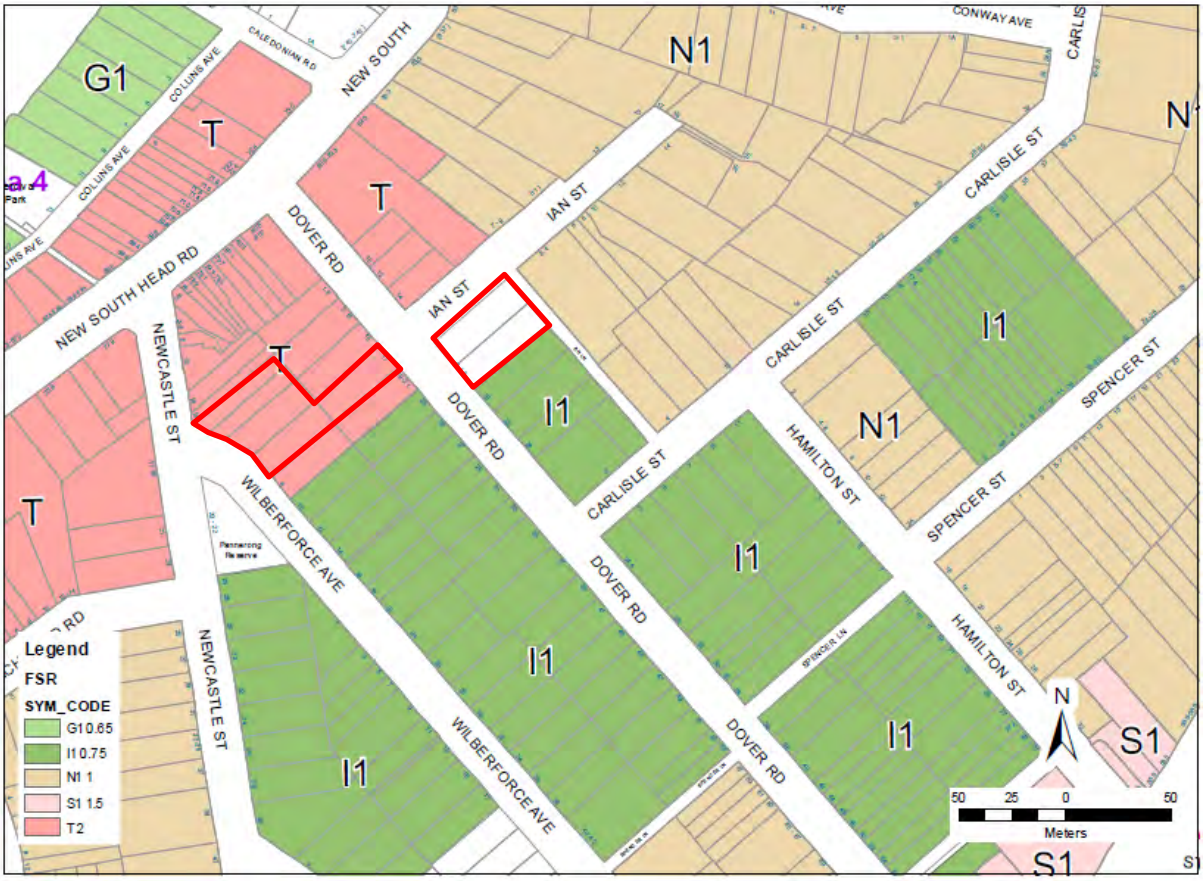


Figure 22: Current FSR Map

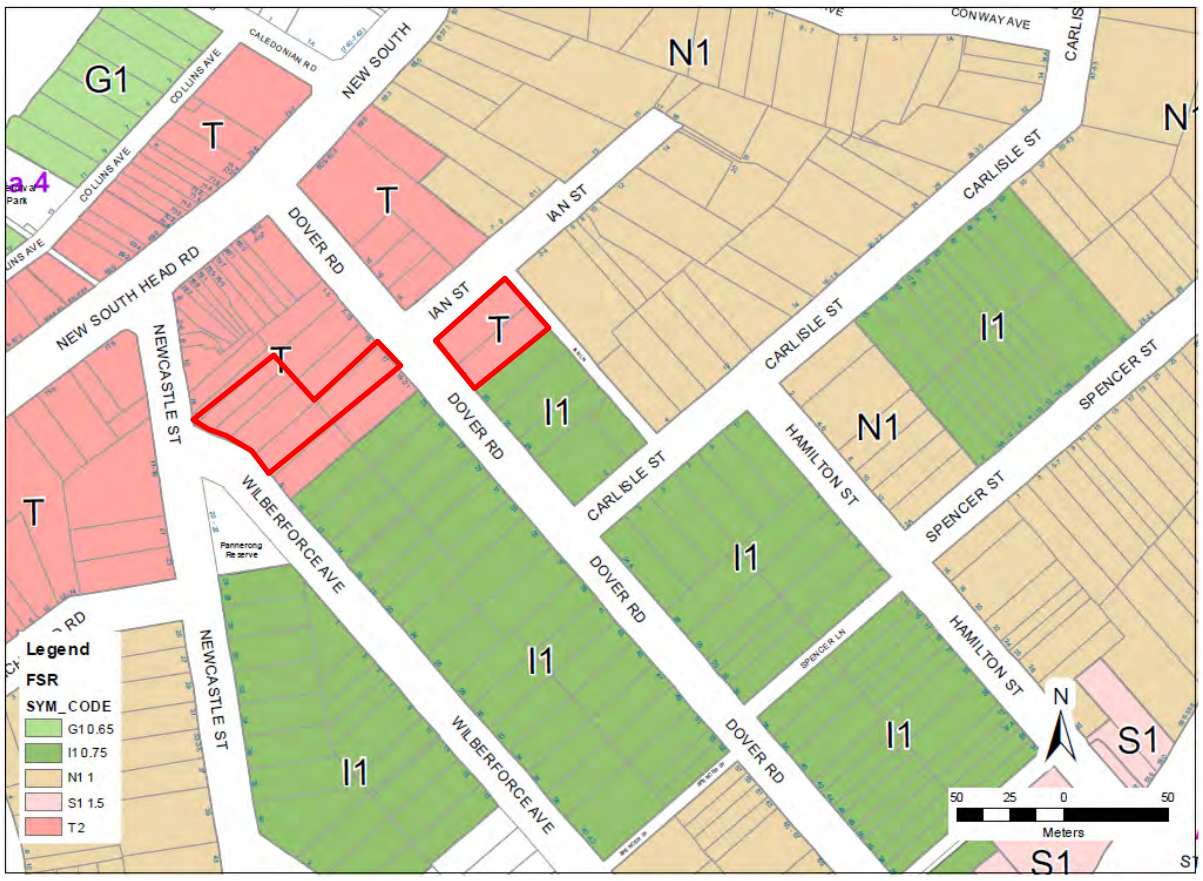


Figure 23: Proposed FSR Map

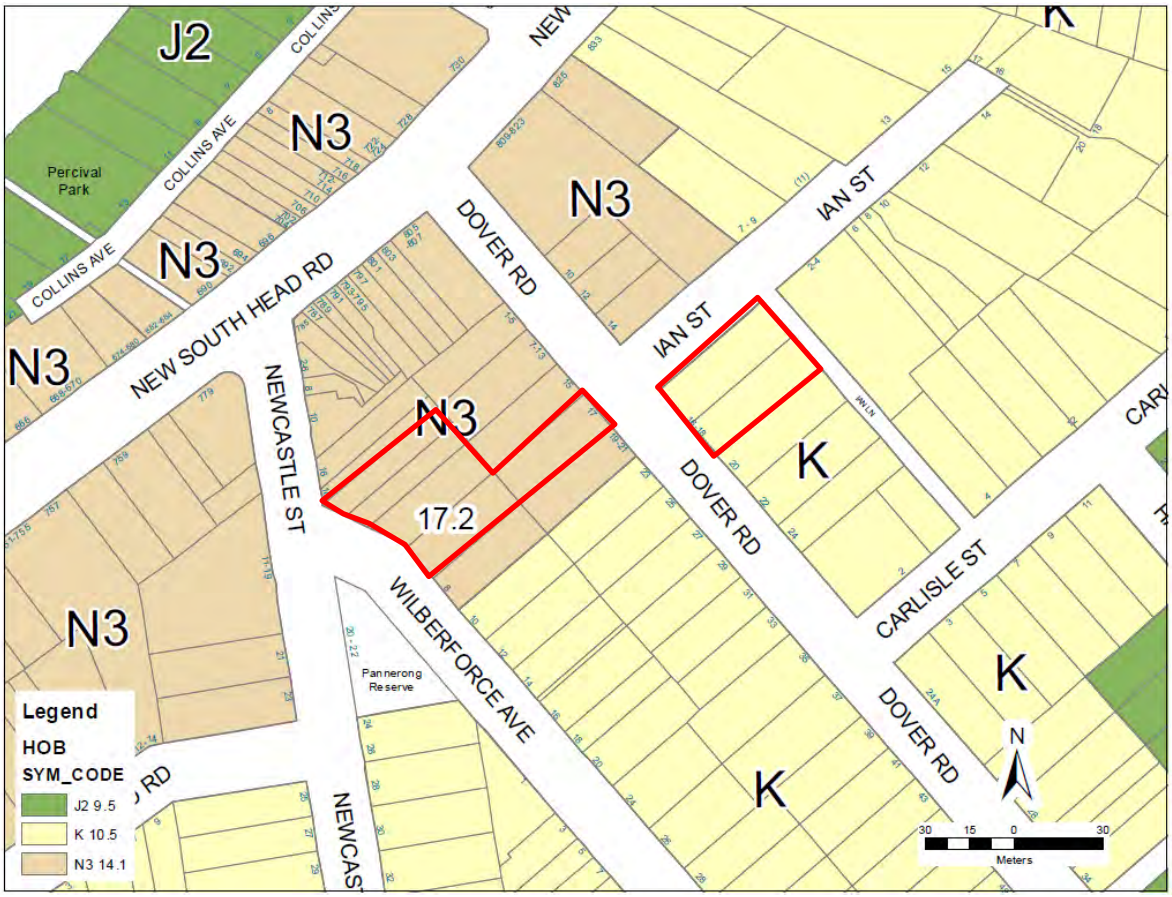


Figure 24: Current Height Map

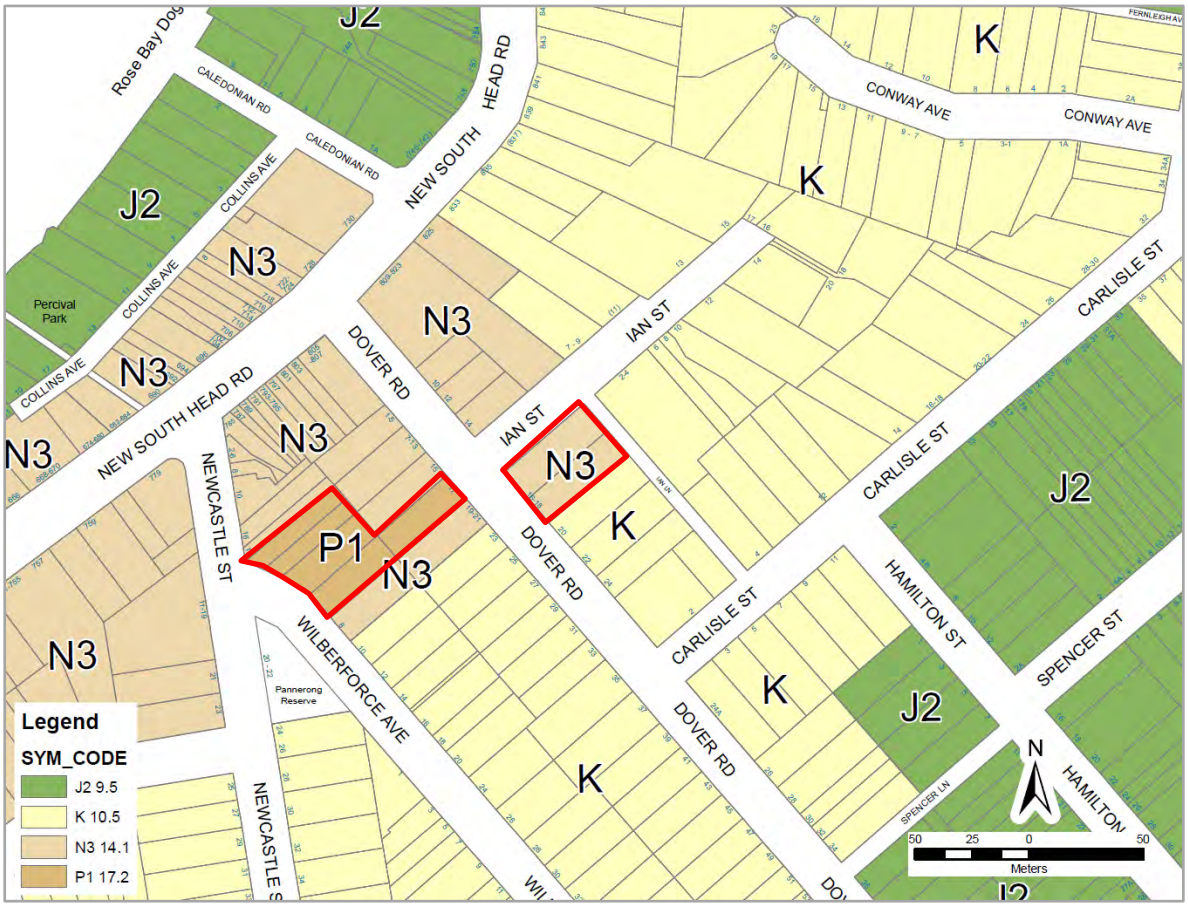


Figure 25: Proposed Height Map

Part 8 – Community consultation

The public exhibition will be undertaken in accordance with the requirements of the Act and the *Environmental Planning and Assessment Regulation 2000*.

We recommend that the planning proposal is exhibited for a minimum of 28 days.

Public notification of the exhibition will comprise:

- a weekly notice in the local newspaper (the Wentworth Courier) for the duration of the exhibition period.
- a notice on Council's website.
- a letter to land owners in the vicinity of each site, which will include every landowner in the Centre.
- local community groups such as the Rose Bay Chamber of Commerce and the Rose Bay Residents' Association.

During the exhibition period the following material will be available on Council's website and in the customer service area at Woollahra Council offices:

- the planning proposal, in the form approved by the gateway determination.
- the gateway determination.
- information relied upon by the planning proposal (such as the view analysis and relevant Council reports).

Part 9 – Project timeline

As Council is authorised to exercise the functions of the Minister for Planning under section 59 of the *Environmental Planning and Assessment Act 1979*, the proposed timeline for completion is as follows:

Plan-making step	Estimated completion
Urban Planning Committee recommends proceeding	February 2017
Council resolution to proceed	March 2017
Gateway determination	May 2017
Completion of technical assessment	None anticipated
Government agency consultation	June/July 2017
Public exhibition period	June/July 2017
Submissions assessment	August 2017
Council assessment of planning proposal post exhibition	August 2017
Council decision to make the LEP amendment	September 2017
Council to liaise with Parliamentary Counsel to prepare LEP amendment	October 2017
Forwarding of LEP amendment to Greater Sydney Commission and Department of Planning and Environment for notification	October/November2017
Notification of the approved LEP	November 2017

Attachments

Attachment 1
Consistency with *A Plan for Growing Sydney* and the *Draft Central District Plan*

A Plan for Growing Sydney (December 2014)	
This plan contains: ▪ A vision for Sydney ▪ 4 goals, 3 planning principles and 22 directions ▪ Priorities for Sydney's 6 subregions. The site is located in the Central Subregion.	
Goal	**Comment on consistency**
1. A competitive economy with world-class services and transport	The planning proposal will help meet this goal by facilitating the redevelopment of Council's car parks. This redevelopment will increase commercial and residential development in an established business centre, increasing parking supply and supporting existing businesses.
2. A city of housing choice, with homes that meet our needs and lifestyles	The planning proposal will help meet this goal by facilitating additional housing in an existing commercial centre which has access to multiple services, recreation facilities and bus and ferry transportation. Providing more dwellings in the Centre will increase housing supply and provide greater housing choice.
3. A great place to live with communities that are strong, healthy and well connected	The planning proposal will help meet this goal by providing capacity for residential development in an existing local centre which will encourage walking and reduce vehicle trips. The Centre is in proximity to a range of recreational areas and activities, with safer cycling facilities being planned and constructed. The changes to the Wilberforce Avenue Car Park site will facilitate the construction of a new community space in Rose Bay, where residents can come together and community services provided.
4. A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources	The planning proposal is consistent with this goal as the site is not located on land with conservation value and does not form part of a green corridor.

Planning principles	Comment on consistency
Principle 1: Increasing housing choice around all centres through urban renewal in established areas	The planning proposal is consistent with this principle as it provides potential for additional residential development in an existing centre.
Principle 2: Stronger economic development in strategic centres and transport gateways	The planning proposal is consistent with this principle as it will facilitate increased public car parking which will support existing businesses in the Centre. The sites are well located to take advantage of jobs in the Centre and have good public transport links to access jobs and services in other nearby strategic centres such as the CBD, Bondi Junction and the Randwick Health and Education Precinct.
Principle 3: Connecting centres with a networked transport system	The sites are located in an existing centre and have good connectively as they are in walking distance of: • five bus routes which provide direct access to services and employment in the CBD and Double Bay and via connections to Bondi Junction • the Rose Bay Ferry Wharf • recreational facilities such as parks, tennis courts, basketball courts and Sydney Harbour New employees or residents can use the existing public transport system to access the CBD, surrounding centres and other transport systems.
Directions A set of 22 directions is listed for the four goals of *A Plan for Growing Sydney*. Each direction has been considered, but many are not related to this planning proposal. The relevant planning directions are addressed below.	
Direction	**Comment on consistency**
Direction 2.1 Accelerate housing supply across Sydney	The planning proposal is consistent with this direction as it increases the development potential of the Ian Street Car Park site, enabling redevelopment which may provide additional housing.
Direction	**Comment on consistency**
Direction 2.2 Accelerate urban renewal across Sydney – Providing homes	The planning proposal is consistent with this direction as the sites are located in a centre which

close to jobs	has good public transport links to the Sydney Central Business District, Double Bay Commercial Centre, the Edgecliff Commercial Core and nearby specialised centres in Bondi Junction and Randwick. Jobs and services are available in all of these centres.
Direction 2.3: Improve housing choice to suit different needs and lifestyles Direction 3.1: Revitalise existing suburbs	The planning proposal is consistent with these directions as it proposes to increase the development potential of the Ian Street Car Park site enabling redevelopment. Should additional residential apartments be constructed on the site they would increase housing choice in an established urban area. The redevelopment of the Wilberforce Avenue Car Park can increase off-street parking, provide new retail areas and a new community space which was identified as a priority in the AECOM Community Facilities Study in 2011. The concept shown in this planning proposal includes a new outdoor public space which the Centre lacks. These investments will enhance and revitalise the existing centre.
Direction 3.3: Create healthy built environments	The planning proposal is consistent with this direction as the land is in a centre with access to numerous local services, shops, recreational spaces, cycleways and public transport. This promotes healthy activities such as walking or cycling to these locations as part of daily activities and promotes physical activity.
Direction 4.1 Protect our natural environment and biodiversity	The planning proposal is consistent with this direction as the subject sites are located in an existing urban environment and the planning proposal does not apply to sensitive land or land with high conservation values.

Central Subregion priorities	Comment on consistency
The priorities for the Central Subregion are: ▪ A competitive economy ▪ Accelerate housing supply, choice and affordability and build great places to live ▪ Protect the natural environment and promote its sustainability and resilience	The planning proposal is consistent with the priorities of the subregion as it: • will facilitate the redevelopment of the Wilberforce Avenue Car Park site to provide more public parking which will support the existing centre. • will increase the development potential of the Ian Street Car Park site allowing urban renewal. • does not apply to land with high conservation value.

Draft Central District Plan (November 2016)

The *Draft Central District Plan* (2016) [the District Plan] sets out a vision, priorities and actions for the development of the Central District of Greater Sydney. The District Plan gives effect to the four goals of *A plan for growing Sydney* through the priorities and actions expressed in the District Plan in three themes:

- A productive city (Goal 1)
- A liveable city (Goals 2 and 3)
- A sustainable city (Goals 3 and 4)

Each theme contains priorities which must be addressed during the preparation of a planning proposal. The consistency of this planning proposal with these priorities is addressed in this table.

A productive city

District priorities	Comment on consistency
Productivity Priority 1: **Creating opportunities for the growth of commercial floor space** Relevant planning authorities need to consider the mechanisms to protect and enhance opportunities for the growth of commercial floor space. When planning strategic and district centres, relevant planning authorities should consider Productivity Priority 3 (Section 3.5), as well as strategies to: • enhance the urban amenity and walkability of centres • promote the diversification of complementary commercial activities • maintain a commercial core for employment activities in targeted locations • support the economic viability of office development.	During the preparation of the planning proposal development concepts for each site have been prepared. The concepts show enhanced walkability of the centre by creating a shared-zone between Dover Road and Wilberforce Avenue. Urban amenity would be enhanced through the delivery of a new public space on Wilberforce Avenue. The redevelopment of the Wilberforce Avenue Car Park will facilitate increased commercial and community uses, whilst increasing car parking in the Centre which will service existing businesses. The rezoning of the Ian Street Car Park site would formalise the car park site as part of the existing centre, for which it currently provides parking. The proposed planning control amendments

	facilitate redevelopment of the sites to provide additional off-street public parking which will support existing and future commercial uses in the Centre. The planning proposal also seeks to apply an FSR of 2:1 over the Ian Street Car Park site which will provide new opportunities for commercial floor space.
Productivity Priority 2: **Support the growth of innovation and creative industries** The relevant planning authority should investigate opportunities to support the growth of innovation and creative industries. Consideration should be given to the full spectrum of activities from high-end global businesses to small start-ups. This may be achieved through a range of mechanisms and strategies including: • providing flexibility in appropriate zones for the co-location of creative industries in desirable locations with access to transport and ancillary uses such as retail, cafes and restaurants • incentivising opportunities for the provision of affordable space for creative and start-up businesses. Councils and State agencies should also consider opportunities to grow innovation and creative industries by: • providing affordable space for creative hubs on government-owned land and/or in large-scale government-led urban renewal projects • enhancing synergies and connectivity between health and education facilities • supporting increased opportunities for a diversity of housing choices including price points close to work opportunities.	The planning proposal will enable the redevelopment of the Wilberforce Avenue Car Park site and Ian Street Car Park site. On the Wilberforce Avenue Site, Council has identified that future development should provide a new community space of between 500m^2 and 750m^2. The concept for this site includes up to 811m^2 of internal space for community use which could be used for a range on activities, including a creative hub or for public health initiatives. The concept for the Ian Street Car Park site includes additional residential development which would increase housing choice within the Centre and give access to local employment opportunities. The concepts prepared for the Ian Street Car Park site include ground floor commercial space which can be used for a range of activities including small-scale innovation and creative industries.

Productivity Priority 3: **Manage growth and change in strategic and district centres and, as relevant, local centres** When undertaking planning for strategic, district and local centres, the relevant planning authority should consider: • opportunities for existing centres to grow and new centres to be planned to meet forecast demand across a range of retail business types, including: the need to reinforce the suitability of centres for retail and commercial, encouraging a competitive market • the commercial requirements of retailers and commercial operators such as servicing, location, visibility and accessibility • the use of B3 Commercial Core Zones in strategic centres, and where appropriate, in district centres to reinforce and support the operation and viability of non-residential uses, including local office markets. When preparing strategic plans, the relevant planning authority needs to demonstrate how its planning for centres has considered strategies to: • deliver on the strategic and district centre's job targets • meet the retail and service needs of the community • facilitate the reinforcement and/ or expansion of allied health and research activities • promote the use of walking, cycling and integrated public transport solutions • provide urban spaces such as meeting places and playgrounds • respond to the centre's heritage and history • promote community arts • reflect crime prevention through environmental design (CPTED) principles such as safety and management • manage the transition between higher intensity activity in and around a centre and lower intensity activity that frames the centre.	The Centre has a range of retail, business and community uses that serve the needs of people who live in Rose Bay, Vaucluse and Watsons Bay. Generally, the Centre's maximum FSR is 2:1 and maximum building height is 14.1 (4 storeys). Considering development potential under these controls, there are many underdeveloped sites containing one and two storeys buildings. For example, along the northern side of New South Head Road there are 18 one and two storey buildings and in Newcastle Street an additional seven underdeveloped two storey buildings. There is no specific job target for the Woollahra LGA, but the Centre has capacity to provide more jobs under the existing controls. The planning proposal would augment this capacity by changing the planning controls to provide an additional 2,265m^2 of gross floor area over the Ian Street Car Park site which may be used for a range of uses. The concept for the Wilberforce Avenue Car Park includes new commercial development a new shared zone which would improve walkability and circulation in the Centre and a new urban space. The transition to lower intensity uses is addressed in part 6.3 *Environmental, social and economic impact* of the planning proposal. The proposed controls ensure that buildings constructed on the sites will maintain the amenity of the surrounding residential and commercial areas consistent with the desired future character in Woollahra DCP 2015.

Productivity Priority 4: **Prioritise the provision of retail floor space in centres** When preparing retail and commercial strategies to inform local planning, the following matters should be considered: • existing and future supply and demand for retail floor space within the District, based on the Department of Planning and Environment's medium population growth scenario • the accessibility of different types of retail and commercial floor space to communities • opportunities to allow retail and commercial activities to innovate • the impacts of new retail and commercial proposals to enhance the viability and vitality of existing and planned centres • the need for new retail development to reinforce and enhance the public domain • the net social, economic and environmental implications of new supply within different locations	By changing the land use zone applying to the Ian Street Car Park site, the planning proposal will facilitate increased retail floor space in an existing centre. Chapter D6 Rose Bay Centre of Woollahra DCP 2015 identifies that the ground floor of development should contain a retail frontage to activate the street, provide vitality and enhance the urban quality of the Centre. The objectives of the planning proposal are to facilitate the redevelopment of the Council owned car parks, which will provide opportunities for commercial facilities whilst increased car parking will support existing and proposed retail activities. The planning proposal will maintain and enhance opportunities to provide retail and commercial services in the Centre.
Productivity Priority 5: **Protect and support employment and urban services land** Relevant planning authorities should take a precautionary approach to rezoning employment and urban services lands, or adding additional permissible uses that would hinder their role and function. The exception being where there is a clear direction in the regional plan (currently *A Plan for Growing Sydney*), the District Plan or an alternative strategy endorsed by the relevant planning authority. Any such alternative strategy should be based on a net community benefit assessment (i.e. analysis of the economic, environmental and social implications) of the proposed exception, taking account of a District-wide perspective in accordance with Action P5. How these matters are taken into account is to be demonstrated in any relevant planning proposal.	The planning proposal does not rezone commercial or industrial employment land. The planning proposal will provide the opportunity to redevelop two Council owned sites and increase public off-street parking supply to support commerce in the Centre.

A Liveable City	
District priorities	**Comment on consistency**
Liveability Priority 1: **Deliver Central District's five-year housing targets** To deliver these five-year housing targets, councils need to: • plan to provide sufficient capacity and monitor delivery of the five-year housing targets • liaise with the Commission to identify barriers to delivering additional housing in accordance with the targets.	The planning proposal applies to land in a business zone which can provide housing and jobs together and is near employment generating uses, local services and public transport. The concept for the Ian Street Car Park includes residential dwellings as shop-top housing which would contribute to Woollahra's five year dwelling target of 300.
Liveability Priority 2: **Deliver housing diversity** Relevant planning authorities should to consider the needs of the local population base in their local housing strategy and how to align local planning controls that: • address housing diversity that is relevant to the needs of the existing and future local housing market • deliver quality design outcomes for both buildings and places.	In the 2011 census, compared with Greater Sydney, the Woollahra LGA had a lower than average proportion of the population in the range of 0-24 years old and a higher than average proportion of the population in ages 60-85+. This demonstrates a need to provide more apartments to cater for older residents who wish to age in place as they downsize from family homes. The proposed planning control changes will provide the capacity for more apartments on the Ian Street Car Park site. Opportunities for quality design outcomes for both buildings and places are provided by: • The proposed building envelopes created by the maximum building height controls and Chapter D6 Rose Bay Centre of the Woollahra DCP 2015, • The guidelines within *State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development* and its supporting document the *Apartment Design Guide*.
Liveability Priority 3: **Implement the Affordable Rental Housing Target** Building on Action 2.3.3 of *A Plan for Growing Sydney,* when preparing planning proposals or strategic plans for new urban renewal or greenfield areas, the relevant planning authority will include an Affordable Rental Housing Target as a form of inclusionary zoning. A target of 5% to 10% of new floor space will be	Not applicable. The planning proposal does not apply to land in a new urban renewal or greenfields area.

applied at the rezoning stage so that it can factored into the development equation: • within areas that have been shown, via a local housing strategy, or another form of appropriate research, to have current or future need for affordable rental housing • to applicable land within new urban renewal or greenfield areas (government and private) subject to development feasibility assessed at a precinct scale • to all new floor space (above the existing permissible floor space) • in addition to local and State development contributions and cognisant of any public or private subsidy for affordable rental housing provision • to provide a range of dwelling types including one, two and three+ bedroom homes • in accordance with any relevant guidance developed by the Commission and Department of Planning and Environment. The Affordable Rental Housing dwellings will be secured by the relevant planning authority and passed onto a registered Community Housing Provider to manage, further developing this emerging sector of the economy. In this regard, we encourage the NSW Government to bring forward its own land to maximise affordable housing and Affordable Rental Housing.	
Liveability Priority 4: **Increase social housing provision** Relevant planning authorities and the Department of Family and Community Services (and the Land and Housing Corporation) should collaborate to optimise housing and community diversity outcomes on sites of social housing concentration. Subject to appropriate consultation, feasibility considerations and environmental assessment, relevant planning authorities should translate optimal outcomes for social housing sites into land use controls.	Not applicable. The sites do not contain any social housing.

Liveability Priority 5:
 	
Facilitate the delivery of safe and healthy places
 	
Relevant planning authorities should:
• facilitate the development of healthy and safe built environments
• consider the inclusion of planning mechanisms such as floor space bonuses to incentivise the provision of:
  ○ neighbourhoods with good walking and cycling connections particularly
  ○ to schools
  ○ social infrastructure such as public libraries or child care
  ○ urban agriculture, community and roof gardens for productive food systems.
	The proposed planning controls will facilitate redevelopment of the sites to enhance the Centre and provide new community facilities.

Liveability Priority 6: **Facilitate enhanced walking and cycling connections** Relevant planning authorities should facilitate enhanced walking and cycling outcomes by giving due consideration to the delivery of district and regional connections and walkable neighbourhoods.	As outlined in 2.3 above, the Centre will soon have a shared-path connecting it to the south via Newcastle Street and a new shared path is being investigated to connect to Double Bay and other cycling routes to the CBD.
Liveability Priority 7: **Conserve heritage and unique local characteristics** Relevant planning authorities should: • require the adaptive re-use of historic and heritage listed buildings and structures in a way that enhances and respects heritage values • protect Aboriginal, cultural and natural heritage and places, spaces and qualities valued by the local community.	The planning proposal does not affect land in a heritage conservation area or land that contains heritage items. The proposed building envelopes are consistent with the desired future character of the Centre and will not detract from the significance of the Rose Bay Hotel or other heritage items in or nearby the Centre.
Liveability Priority 8: **Foster the creative arts and culture** Relevant planning authorities should: • integrate arts and cultural outcomes into urban development through planning proposals that nurture a culture of art in everyday local spaces and enhance access to the arts in all communities • give due consideration to the inclusion of planning mechanisms that would incentivise the establishment and resourcing of creative hubs and incubators and accessible artist-run spaces.	The redevelopment of the Wilberforce Avenue Car Park site will provide a multi-purpose community centre with flexible spaces to enable the provision of artistic and cultural programs and activities. Council supports and encourages public art opportunities and this proposal presents an ideal opportunity to incorporate public art in the public domain/facility.

Liveability Priority 9: **Share resources and spaces** Relevant planning authorities should consider the delivery of shared local facilities such as community hubs, cultural facilities and public libraries as multifunctional shared spaces.	The planning proposal will facilitate the redevelopment of the Wilberforce Avenue Car Park site. The proposal aims to provide a multi-purpose community centre of up to 750m^2 in response to a need identified in the Community Facilities Study 2011. The community facility would provide accessible spaces for the provision of community and cultural programs/activities in response to the needs and aspirations of the community.

Liveability Priority 10:
 	
Support innovative school planning and delivery
 	
Relevant planning authorities should give due consideration to:
• innovative land use and development approaches, including:
  ○ using travel management plans, that identify travel options, to reduce car use
  ○ enabling the development and construction of schools as flexible spaces, so they can facilitate shared use and change over time to meet varying community need
• the inclusion of planning mechanisms that would incentivise the:
  ○ development of new schools as a part of good quality and appropriate mixed use developments
  ○ the shared use of facilities between schools and the local community including playing fields and indoor facilities, so they can meet wider community needs.
	The planning proposal does not apply to land which is currently used or proposed to be used for educational establishments.
	
	The Bellevue Hill Public School is currently completing a development which will increase capacity to 1000 students.
	
	The Department of Education has advised that they do not anticipate the need for any new schools in the Woollahra LGA in the foreseeable future.

Liveability Priority 11: Provide socially and culturally appropriate infrastructure and services Relevant planning authorities should: • collaborate with Federal and State agencies and service providers to integrate local and District social infrastructure for Aboriginal residents including preschools, child care and aged care services • include appropriate planning mechanisms to incentivise the provision of these services required by local communities where appropriate.	A need for additional services and facilities to service Woollahra's Aboriginal population has not been identified.

Liveability Priority 12: **Support planning for health infrastructure** Relevant planning authorities should give due consideration to the need to support the co-location of ancillary uses that complement health precincts, including: • residential aged care facilities • housing for health workers • visitor and short-term accommodation • health and medical research activities • child care • non-critical patient care • commercial uses that are complementary to and service the health precinct Consideration should also be given to the protection of health precincts and super precincts from residential encroachment into key employment areas.	The sites are not located in the vicinity of a major health precinct identified in the *Draft Central District Plan*. Co-locating ancillary services is not relevant to this planning proposal.
Liveability Priority 13: **Support planning for emergency services** Relevant planning authorities must consider the operational and locational requirements of emergency services.	Woollahra's target of 300 additional dwellings over five years identified in the *Draft Central District Plan* does not require additional emergency services. However, Council will consult with NSW State Emergency Services, NSW Police, NSW Ambulance and Fire & Rescue NSW as part of the public exhibition of the planning proposal.
Liveability Priority 14: **Support planning for cemeteries and crematoria** Relevant planning authorities should give consideration to the need and locational requirements of cemeteries and crematoria.	Cemeteries and crematoria are not permissible anywhere in the Woollahra LGA under Woollahra LEP 2014, nor does the planning proposal propose to permit them. Cemeteries and Crematoria NSW advise that due to land value, the provision of cemeteries in the Central District is unlikely and they do not object to the planning proposal proceeding.

A sustainable City	
District priorities	**Comment on consistency**
Sustainability Priority 1: **Maintain and improve water quality and waterway health** The Office of Environment and Heritage and the Environment Protection Authority have developed a risk-based framework to assist decisions that maintain, improve or restore water quality in the strategic planning process to help meet the NSW Water Quality and River Flow Objectives. Relevant planning authorities and managers of public land should: • adopt the Office of Environment and Heritage and the Environment Protection Authority's framework to determine the appropriate stormwater and wastewater management targets that contribute to maintaining or improving water quality and waterway health to meet the community's values • consider more water sensitive approaches to managing stormwater to meet the water quality and quantity targets, including harvesting and re-use of water and management of riparian corridors • develop mechanisms to allow offsetting between sub-catchments and facilitate cost-effective opportunities to meet the management targets for whole catchments and water quality objectives for receiving waters • while management targets are being established, ensure that the quality of stormwater and wastewater from public land and new development in established urban areas maintains or improves the health of waterways, in line with community values and expectations of how waterways will be used.	Woollahra Council has installed a range of initiatives across the LGA to improve water quality and waterway health. These include rainwater harvesting, stormwater harvesting, and water quality projects. Any development under the proposed planning controls will be subject to the following controls to improve water quality and waterway health. 1) Water Sensitive Design e.g. reusing rainwater, as required by Woollahra DCP 2015, 2) run-off particulate targets as required by Woollahra DCP 2015, In Rose Bay other measures to improve waterway health include: 1) Downstream gross pollutant trap to remove organic and inorganic waste from entering Rose Bay, 2) Regular monitoring of water quality at Rose Bay and reporting of results via a web-based portal (Beachwatch). 3) Regular beach cleaning by Council (and volunteers). 4) Regular street sweeping by Council to remove organic and inorganic waste from entering waterways.

Sustainability Priority 2: **Protect and conserve the values of Sydney Harbour** When preparing strategic plans, relevant planning authorities around Sydney Harbour should consider opportunities to: • conserve and interpret Aboriginal and European heritage • protect and enhance aquatic and terrestrial biodiversity (also see Section 5.5) • enhance access to and along the foreshore and provide connected green space around the foreshore (also see Section 5.6) • manage demand for and the design of essential maritime facilities within the natural and built environment.	Although the planning proposal is not on land adjoining Sydney Harbour, the potential impact of the proposed building envelope on views from the harbour has been consider and has been addressed in part 6.3 *Environmental, social and economic impact* of the planning proposal.
Sustainability Priority 3: **Enhance access to Sydney Harbour foreshore and waterways** Councils around Sydney Harbour should work with Roads and Maritime Services to revise foreshore and waterway access strategies for Sydney Harbour. These strategies should consider ways to manage competing demands placed on Sydney Harbour including: • protection of flora and fauna • public access to the foreshore and waterway • growth in boat ownership • changes in boat size • demand for moorings, marinas, dinghy storage and other boat support infrastructure • demand for on-street boat parking	The planning proposal does not apply to foreshore land.
Sustainability Priority 4: **Avoid and minimise impacts on biodiversity** Efforts to protect biodiversity values should be based on avoiding and minimising adverse impacts to biodiversity, as far as practicable. Only when impacts cannot be avoided or minimised, should consideration be given to offsetting those impacts.	The planning proposal applies to two existing car parks. There are no critical habitat areas, threatened species, populations or ecological communities or their habitats present on the subject land. Accordingly, the proposal will not have any impact in this regard.

Sustainability Priority 5: **Align strategic planning to the vision for the Green Grid** Consistent with Action 3.2.1 of *A Plan for Growing Sydney*, relevant planning authorities should consider opportunities to support the delivery of the Central District Green Grid. This could include consideration of how land use zones can be applied, how new development is designed, or where voluntary planning agreements and agreements for dual use of open space and recreational facilities could contribute to delivering the Green Grid.	The planning proposal applies to land in an existing commercial centre and will not affect the delivery of priority projects which support the long term vision for Sydney's Green Grid identified in the *Draft Central District Plan*. Part of the Wilberforce Avenue Car Park site has been identifies as a future cycling route as part of the Woollahra Council's Cycling Strategy (2009). The concept for the Wilberforce Avenue site would enhance the cycleway network in this area by providing a new share zone improving cycling in and around the Centre.
Sustainability Priority 6: **Maximise benefits to the public from the innovative use of golf courses** When new opportunities to examine the future use of golf courses arise, relevant planning authorities should consider how golf courses could be managed to provide greater public benefits to communities in a way that responds to local needs for green space and recreation.	Not applicable. The planning proposal does not apply to a golf course or propose any changes to the use of golf courses.
Sustainability Priority 7: **Protect, enhance and extend the urban canopy** When making strategic plans, relevant planning authorities should consider tree canopy cover in land release and established urban areas, with a focus on providing shade to streets. Councils should include green cover and shade tree planting along major transport corridors in local infrastructure investment planning, development control and urban design.	The planning proposal will facilitate the redevelopment of two at-grade car parking areas. The concept for the Ian Street Site includes a setback to retain mature camphor laurel trees on the north east of the site and street trees on the north west of the site which shade Ian Street and Ian Lane as shown in Figure 11 of the planning proposal. The Council's architectural consultants, Allen Jack + Cottier, applied the setback following Council completing a Preliminary Arboricultural Assessment for that site. In addition, a development under the proposed controls will need to address chapter E3 *Tree Management* in the Woollahra Development Control Plan 2015. One of the key objectives is to promote, maintain and conserve the leafy character of the Woollahra Municipality. Woollahra Council's Street Tree Master Plan (2014) also applies. One of the key objectives of the Street Tree Master Plan is to maintain, and increase the number of trees and overall canopy coverage and enhance key cultural and commercial centres, like the Centre.
Sustainability Priority 8: **Improve protection of ridgelines and scenic areas** The scenic qualities of landscapes are already	Not applicable. The planning proposal does not apply to land on a ridgeline or in a scenic area.

recognised and considered in some areas of Greater Sydney, as part of the strategic planning and development process. All councils should identify and map areas with high scenic value and develop strategies, planning and development controls that protect important scenic landscapes and vistas of them. Planning and development controls should prohibit opportunities for development on ridgelines that would diminish their scenic quality.	
Sustainability Priority 9: **Support opportunities for District waste management** When making plans, relevant planning authorities should: • use appropriate land use zones to minimise the potential for conflict with the operation and expansion of existing waste facilities • protect precincts that have functioning waste management facilities from encroachment by residential and other sensitive development • consider ways to encourage design measures such as fully enclosing waste facilities to minimise dust, odours and noise impacts to mitigate the risks and potential impacts on surrounding communities • consider opportunities to support co-location of waste management facilities with other activities that produce or reuse waste materials.	Not applicable. The planning proposal does not apply to land that is or will be used for district waste management.
Sustainability Priority 10: **Mitigate the urban heat island effect** Relevant planning authorities should consider where the urban heat island effect is experienced and the location of vulnerable communities and use strategic plans to reduce impacts from extreme heat.	The concepts that accompany the planning proposal for the Ian Street Car Park site include landscaping on part of the building and the retention of many established trees on that site. In addition, the selection of new trees will need to take into consideration the ability for each species to mitigate the urban heat island effect in accordance with Woollahra Council's Street Tree Master Plan (2014)
Sustainability Priority 11: **Integrate land use and transport planning to consider emergency evacuation needs** Relevant planning authorities should coordinate with Transport for NSW and the State Emergency Service to consider land use and local road planning, so that it is integrated with emergency evacuation planning and takes into account the cumulative impact of growth on road evacuation capacity.	Woollahra's target of 300 additional dwellings over five years identified in the *Draft Central District Plan* does not require additional emergency services. However, Council will consult with NSW State Emergency Services, NSW Police, NSW Ambulance and Fire & Rescue NSW as part of the public exhibition of the planning proposal.

Sustainability Priority 12: **Assist local communities develop a coordinated understanding of natural hazards and responses that reduce risk** The Commission, the NSW Government and local councils will continue to adopt a range of tools and resources and implement actions to adapt to climate change and reduce risks to public and private assets. We will also explore ways to coordinate, improve and communicate information about risks associated with climate change to local communities.	Woollahra Council's Rose Bay Floodplain Risk Management Study and Plan (2014) list new urban development as an opportunity to minimise risk of flooding along New South Head Road. Development under the proposed controls will need to consider designs that minimise the flood risk (e.g. water sensitive design).

Attachment 2
Consistency with state environmental planning policies

State environmental planning policy	Comment on consistency
SEPP No 1 – Development Standards	Not applicable
SEPP N0.14 – Coastal Wetlands	Not applicable
SEPP No 19 – Bushland in Urban Areas	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP No 21 – Caravan Parks	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP No 26 – Littoral Rainforests	Not applicable
SEPP No 30 – Intensive Agriculture	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP No 33 – Hazardous and Offensive Development	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP No 36 – Manufactured Home Estates	Not applicable
SEPP No 44 – Koala Habitat Protection	Not applicable
SEPP No 47 – Moore Park Showground	Not applicable
SEPP No 50 – Canal Estate Development	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP No 52 – Farm Dams and Other Works in Land and Water Management Plan Areas	Not applicable

State environmental planning policy	Comment on consistency
SEPP No 55 – Remediation of Land	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy. The planning proposal will facilitate development which is permissible under the existing zoning of the Wilberforce Avenue site. The rezoning of the Ian Street Car Park site will enable a broad range of uses including residential. A Preliminary Contamination and Acid Sulphate Soils Assessment has been prepared for the site. It notes that: 1. No contamination notices have been issued for the subject sites by the New South Wales Environment Protection Agency or for any adjoining land. 2. Prior to being car parks, the only other previous use identified for the sites was residential. Our preliminary investigation concludes that contamination is unlikely. Future development applications will be required to undertake appropriate investigations and, if necessary, remediation will occur.
SEPP No 62 – Sustainable Aquaculture	Not applicable
SEPP No 64 – Advertising and Signage	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP No 65 – Design Quality of Residential Apartment Development	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy. See section 6.3 of the planning proposal for more information.

State environmental planning policy	Comment on consistency
SEPP No 70 – Affordable Housing (Revised Schemes)	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP No 71 – Coastal Protection	Not applicable
SEPP (Affordable Rental Housing) 2009	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Building Sustainability Index: BASIX) 2004	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Exempt and Complying Development Codes) 2008	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Housing for Seniors or People with a Disability) 2004	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Infrastructure)	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Kosciuszko National Park - Alpine Resorts) 2007	Not applicable
SEPP (Kurnell Peninsula) 1989	Not applicable
SEPP (Major Development) 2005	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.

State environmental planning policy	Comment on consistency
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Miscellaneous Consent Provisions) 2007	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Penrith Lakes Scheme) 1989	Not applicable
SEPP (Rural Lands) 2008	Not applicable
SEPP (Transitional Provisions) 2011	Not applicable
SEPP (State and Regional Development) 2011	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy.
SEPP (Sydney Drinking Water Catchment) 2011	Not Applicable
SEPP (Sydney Region Growth Centres) 2006	Not applicable
SEPP (Three Ports) 2013	Not applicable
SEPP (Urban Renewal) 2010	Not applicable
SEPP (Western Sydney Employment Area) 2009	Not applicable
SEPP (Western Sydney Parklands) 2009	Not applicable

Sydney Regional Environmental Plans – now deemed State Environmental Planning Policies	Comment on consistency
SREP No 8 (Central Coast Plateau Areas)	Not applicable
SREP No 9 - Extractive Industry (No 2 - 1995)	Not applicable
SREP No 16 – Walsh Bay	Not applicable
SREP No 20 - Hawkesbury- Nepean River (No 2 - 1997)	Not applicable
SREP No 24 - Homebush Bay Area	Not applicable

Sydney Regional Environmental Plans – now deemed State Environmental Planning Policies	Comment on consistency
SREP No 26 – City West	Not applicable
SREP No 30 - St Marys	Not applicable
SREP No 33 - Cooks Cove	Not applicable
SREP (Sydney Harbour Catchment) 2005	Applicable Consistent. The planning proposal does not contain a provision which is contrary to the operation of this policy. The planning proposal applies to land within the Sydney Harbour Catchment. Therefore the planning principles under Part 2, clause 13 Sydney Harbour Catchment of the SREP have been considered during its preparation. The planning proposal is consistent with the principles. The sites are not land in the Foreshores and Waterways Area, therefore the principles of clause 13 Foreshores and Waterways Area are not applicable to this planning proposal.

Attachment 3
Compliance with section 117 directions

Planning proposal – Rose Bay Car Parks Compliance with section 117 directions		
Direction		**Applicable/comment**
1	**Employment and resources**	
1	Business and industrial zones	The planning proposal rezones the Ian Street Car Park site from SP2 Infrastructure (Car Park) to B2 Local Centre. This will encourage employment growth in the Centre by providing an opportunity for increased commercial development in the Centre. Enabling the redevelopment of the Wilberforce Avenue Car Park will increase public car parking supply and create a new community facility which will support the vitality and viability of the Centre.
1.2-1.5	Directions 1.2-1.5	Not applicable. These directions are not relevant to the Sydney metropolitan area.
2	**Environment and heritage**	
2.1	Environment protection zones	Not applicable. The planning proposal does not apply to land within an environmental protection zone or land identified for environmental protection.
2.2	Coastal protection	Not applicable. The planning proposal does not apply to land within the coastal zone.
2.3	Heritage conservation	The site does not contain a heritage item and is not within a heritage conservation area. The proposed building envelopes will provide a desired future character that will not detract from the significance of the Rose Bay Hotel or other heritage items in or nearby the Centre.
2.4	Recreation vehicle areas	Not applicable. The planning proposal does not apply to sensitive land or land with significant conservation values. It will not allow land to be developed for a recreation vehicle area.
2.5	Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEPs	Not applicable. The planning proposal does not apply to land in the Far North Coast.
3	**Housing, infrastructure and urban development**	
3.1	Residential zones	The planning proposal will create an opportunity to broaden the range of housing available in Rose Bay and the Woollahra LGA, through a mixed use development on the Ian Street Car Park site.

Planning proposal – Rose Bay Car Parks Compliance with section 117 directions		
Direction		**Applicable/comment**
		The subject site is well placed to efficiently use existing infrastructure and services as it is near public transport facilities that will support connections to employment and services, both within the Centre and further afield. The proposal will also facilitate the redevelopment of public parking to increase parking supply in the Centre. Should the planning proposal result in an amendment to Woollahra LEP 2014, the proposed controls can facilitate development that is consistent with the principles of SEPP 65 and the Apartment Design Guide. The concept buildings under the proposed controls will have minimal impact on the natural environment as the sites and are currently used as car parks and the surrounding land is already developed. The proposal is therefore consistent with this direction.
3.2	Caravan parks and manufactured home estates	Consistent. The planning proposal does not relate to caravan parks or manufactured home estates.
3.3	Home occupations	Not applicable. The planning proposal does not affect home occupations in dwelling houses.
3.4	Integrating land use and transport	Consistent. The planning proposal is consistent with the aims, objectives and principles of *Improving Transport Choice – Guidelines for planning and development* (DUAP 2001), and *The Right Place for Business and Services – Planning Policy* (DUAP 2001) as: • The sites are located in a centre which is accessible by public transport, walking and cycling and supported by many existing businesses and services. • The sites are located on two bus routes along Dover Road, with three more services available on New South Head Road, which is approximately 100m away. The sites are approximately 550 metres from the Rose Bay ferry wharf from which frequent public transport services provide ferry and bus connections within the Woollahra LGA and beyond. The proximity of these transport services will encourage public transport use. • The bulk and scale of the proposed controls is consistent with the context, and the site's location in a town centre
3.5	Development near licensed aerodromes	Not applicable. The planning proposal does not apply to land near a licensed aerodrome.
3.6	Shooting ranges	Not applicable. The planning proposal does not apply to land adjacent to or adjoining an existing shooting range.

Planning proposal – Rose Bay Car Parks Compliance with section 117 directions		
Direction		**Applicable/comment**
4	**Hazard and risk**	
4.1	Acid sulfate soils	Consistent. A preliminary site investigation included laboratory analysis of soil retrieved from boreholes. Upon completion of the onsite investigation and laboratory analysis it is concluded that acid sulphate soils are not present on the sites and an acid sulphate soils management plan is not required. Existing acid sulfate soils provisions in Woollahra LEP 2014 will not be altered by the planning proposal and will apply to any future development which might intensify the use of the land. A copy of the geotechnical assessment is provided at **Annexure 6**
4.2	Mine subsidence and unstable land	Not applicable. The planning proposal does not apply to land within a proclaimed Mine Subsidence District or to land identified as unstable.
4.3	Flood prone land	Consistent. The planning proposal applies to land within a flood prone area. The concepts for each site show that it is possible to have a ground floor level above the 100 year average recurrence interval level for each site.
4.4	Planning for bushfire protection	Not applicable. The planning proposal does not apply to land mapped as bushfire prone land.
5	**Regional planning**	
5.1 - 5.9	Strategies 5.1-5.9	Not applicable. These strategies do not apply to the Woollahra LGA.
5.10	Implementation of Regional Plans	Not applicable. No regional (or district) plan applies to the Woollahra LGA.

Planning proposal – Rose Bay Car Parks Compliance with section 117 directions		
Direction		**Applicable/comment**
6	**Local plan making**	
6.1	Approval and referral requirements	Consistent. The proposal does not include provisions that require development applications to be referred externally and is not related to designated development.
6.2	Reserving land for public purposes	Consistent. The planning proposal does not create, alter or reduce existing zonings or reservations of land for public purposes carried out by public authorities.
6.3	Site specific provisions	Consistent. The planning proposal proposes an additional permitted use on the Ian Street Car Park site to enable residential flat building development on the ground floor, but only as part of a mixed use development. This change does not impose any development standards or requirements in addition to those already contained in Woollahra LEP 2014.
7	**Metropolitan Planning**	
7.1	Implementation of *A Plan for Growing Sydney* (Dec 2014)	Consistent. The planning proposal will facilitate additional residential development in proximity to public transport, shops, services and employment.
7.2	Implementation of Greater Macarthur Land Release Investigation	Not applicable.
7.3	Parramatta Road Corridor Urban Transformation Strategy	Not applicable.

Woollahra Local Environmental Plan 2014

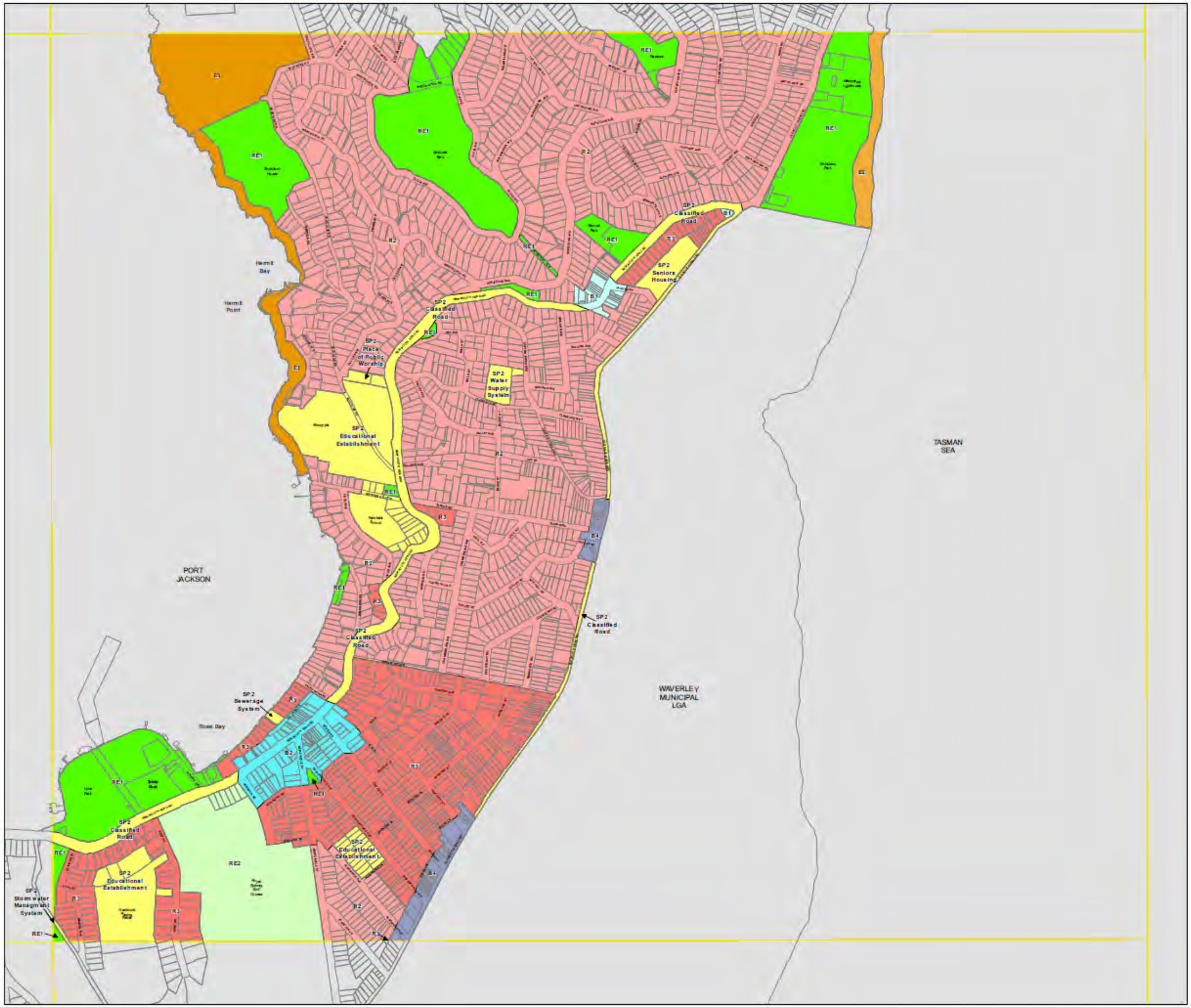
Land Zoning Map
Sheet LZN_005

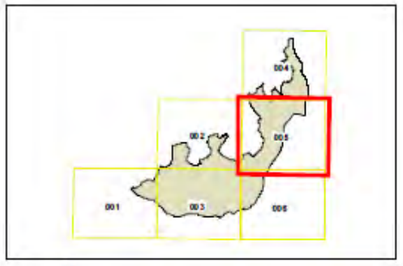
Zone

- B1 Neighbourhood Centre
- B2 Local Centre
- B4 Mixed Use
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- R2 Low Density Residential
- R3 Medium Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- SP2 Infrastructure
- SP3 Tourist
- SH Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

Cadastre

Cadastre 5/12/14 © Woollahra Municipal Council





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0 200 Metres

Scale: 1:10,000 @ A3

Projection: GDA 1994
MGA Zone 56

Map identification number:
8500_COM_LZN_005_010_20170105

Woollahra Local Environmental Plan 2014

Floor Space Ratio Map
Sheet FSR_005

Maximum Floor Space Ratio (n:1)

A1	0.21	N1	1
A2	0.37	N2	1.04
B1	0.4	O	1.1
B2	0.43	P	1.25
C	0.46	Q	1.3
D1	0.5	R1	1.4
D2	0.52	R2	1.42
D3	0.53	S1	1.5
F1	0.6	S2	1.55
F2	0.63	S3	1.68
G1	0.65	S4	1.7
G2	0.68	T	2
H	0.73	U	2.5
I1	0.75	V	3
I2	0.77	X	4
L	0.9		

Refer to Clause 4.4A
Refer to Clause 4.4B
Refer to Clause 4.4C
Refer to Clause 4.4D

Cadastre
Cadastre 5/12/14 © Woollahra Municipal Council

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0 200 Metres

Scale: 1:10,000 @ A3

Projection: GDA 1994
MGA Zone 56

Map identification number:
WBC_COM_FSR_005_010_20170105

Woollahra Local Environmental Plan 2014

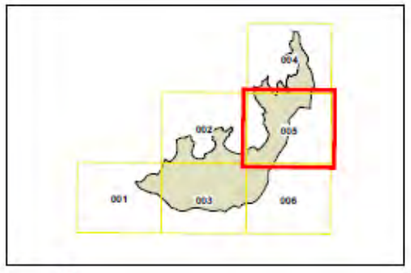
Height of Buildings Map
Sheet HOB_005

Maximum Building Height (m)

C	5	N4	14.5
E	6	N5	14.7
F	6.5	O1	15
G	7	O2	16.5
H	7.5	P1	17.2
I1	8	P2	17.5
I2	8.2	P3	18
J1	9	P4	18.1
J2	9.5	Q1	19
K	10.5	Q2	19.5
L1	11	Q3	20.5
L2	11.5	R1	21.5
M	12	R2	22.5
N1	13	T	26
N2	13.5	U	34
N3	14.1		

Refer to Clause 4.3A
Refer to Clause 4.3B
Refer to Clause 4.4C

Cadastre
Cadastre 5/12/14 © Woollahra Municipal Council



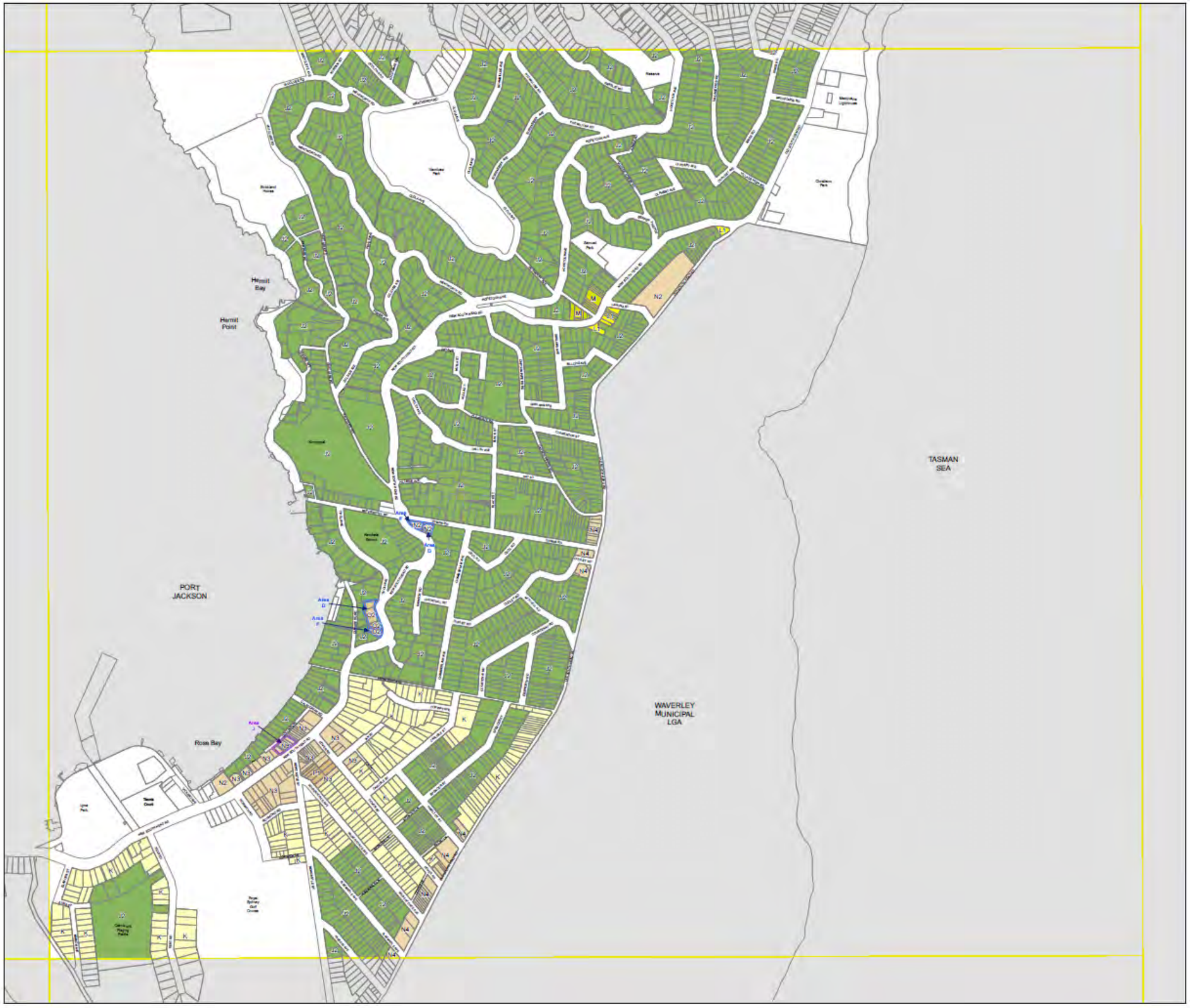
N

0 200 Metres

Scale: 1:10,000 @ A3

Projection: GDA 1994
MGA Zone 56

Map identification number:
8500_COM_HOB_005_010_20170106



Supplementary material

Annexure 1 – Report to the Corporate and Works of 18 April 2016

Annexure 2 – Council resolution of 26 April 2016

Annexure 3 – Report to Corporate and Works of 18 of July 2016

Annexure 4 – Rose Bay Car Parks Urban Design Study

Annexure 5 –Visual impact assessment

Annexure 6 – Geotechnical Assessment

Annexure 7 – Assessment of Traffic and Parking Impact report

Item No:	R2 Recommendation to Council
Subject:	**ROSE BAY CAR PARKS REDEVELOPMENT PROJECT**
Author:	Zubin Marolia, Manager - Property & Projects
Approver:	Tom O'Hanlon, Director - Technical Services
File No:	16/47652
Reason for Report:	To report on the outcomes of the Property Assets Working Party meeting held on 23 March 2016 to recommend further actions to progress the Rose Bay car parks redevelopment project

Recommendation:

A. That the minutes of the Property Assets Working Party meeting, held on 23 March 2016, be noted

B. That a design team be engaged to further refine Option 3 Ian St with Option 1 Wilberforce Avenue, Rose Bay

C. That ownership of the proposed retail and commercial office spaces be retained to ensure an on-going income stream for the Council

D. That the proposed residential stratums be sold to reduce the financial exposure

E. That ownership of proposed public parking and community space be retained by Council, to ensure service delivery is not compromised

F. That Council commences the Planning Proposal Process to re-zone Ian Street and amend the height restrictions on Ian Street and Wilberforce Avenue sites

G. That a further report be submitted to the Property Assets Working Party detailing options for the optimal procurement model and funding based on the preferred design.

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1. Background:

The Property Assets Working Party has considered the redevelopment of the Rose Bay Car parks at Wilberforce Avenue and Ian Street. Councillors through the Corporate and Works Committee have been kept informed of the developments to date. These developments have included design reviews and financial feasibility of the various options. Most of the design reviews have been undertaken and presented to the Working Party by specialist consultants including Hill PDA and Allen Jack & Cottier Architects (AJ&C), with assistance from Altus Page Kirkland, Environmental Investigations Australia and Northrops Engineering. Internal Planning, Trees Management and Community Services advice has also been sought by the Working Party as required from time to time. This internal involvement has been deemed necessary to ensure compliance with Town Planning regulations, as well as ensuring that the community needs are satisfied and protected.

The purpose of this report is to provide the Corporate & Works Committee with the minutes of the Property Assets Working Party meetings held on 23 March 2016 and to obtain Council approval to proceed with the selected option for the Wilberforce and Ian Street car parks. The minutes provide the Committee with an update on the outcomes, following a financial feasibility presentation by Hill PDA on the following shortlisted redevelopment options for the Rose Bay public car parks at Wilberforce Avenue and Ian Street:

- *Wilberforce Avenue option 1 with Ian Street options 2/3*
- *Wilberforce Avenue option 3B with Ian Street options 2/3*
- *Wilberforce Avenue option 4 with Ian Street options 2/3*

The key points raised are listed in the copy of the minutes attached as confidential Annexure 1. Following the Working Party meeting Hill PDA revised their advice, clarifying the options and minor amendments.

Description of the sites

Ian Street and Wilberforce Avenue car park sites are owned by Council and are presently used for at grade car parking (Annexure 3).

Table 1: Characteristics of Existing Car Park Sites

	Ian Street	**Wilberforce Avenue**
Size (sqm)	1,132	2,360
Existing Car Parking	49 (53 are marked with 4 being sub-standard)	95
Zoning	SP 2 Infrastructure – Car Parking, with neighbouring residential uses	B2 Local Centre With neighbouring retail / commercial uses
Construction Constraints	Trees on site, topography, sandy soils, groundwater	Groundwater table, depth of sandy soils, proximity to neighbouring development

The Wilberforce Avenue site fronts Wilberforce Avenue and has a narrower frontage to Dover Road. It consists of five lots with a site area of 2,360sqm and accommodates 95 cars. It also serves as a significant, but compromised, pedestrian and vehicle connection on the southern side of the centre. There is a slight fall to Wilberforce Avenue.

The Ian Street site is on the eastern edge of the centre at the junction of Dover Road and Ian Street. It consists of two lots with a site area of 1,132sqm and accommodates 49 cars. The site rises significantly in the eastern corner and has approximately eight mature trees along its boundaries.

2. Proposal:

Rose Bay Centre is heavily dependent on customers who arrive in private vehicles. More convenient car parking and greater capacity will mean increased retail activity. The current car parks are poorly laid out and visually unattractive. The council owned car park sites detract from the image of Rose Bay Centre.

Developing these sites as mixed use development, will provide increased public parking, retail frontage, commercial spaces, public amenities and multi-purpose community centre. Defining the street edges of these sites will intensify the activity within the centre and produce a greater sense of place.

Council resolved to pursue the redevelopment of these two car park sites and commissioned Hill PDA to undertake a feasibility study.

This study included investigation into the community space requirements, additional public car parking, retail, commercial and residential opportunities, financial and other elements surrounding the feasibility of redevelopment of the two car parks at Wilberforce Avenue and Ian Street, Rose Bay.

The results of this financial study and a site massing design review concluded in the production of additional development scenarios, which were tested for the financial viability of development. These models provided new advantageous options for consideration by Council, which would achieve the development objectives of the Ian Street and Wilberforce Avenue Sites.

These options demonstrated that they would meet the development objectives of:

- Increasing the number of public car parking spaces across the two car parks by a minimum of 100 spaces to at least 244;
- Incorporating a community centre of 750sqm Gross Floor Area;
- Incorporating accessible public amenities; and
- Finding further income-generating opportunities for the Council and ownership structures with which to deliver the development.

These desirable outcomes will result in Council retaining land ownership of both of the sites, as well as achieving a positive cash outcome. As mentioned in previous reports, subject to the final approval of Council, funding and delivery options will be reviewed, with a strong preference towards passing any development risk on to an experienced private developer.

Financial Modelling:

The shortlisted options were analysed by AJ&C and site massing concept designs prepared. These designs provided floor areas for each option, which Hill PDA adopted to test the financial viability of each option. The redevelopment options tested were as follows:

Ian Street

Option 2- This option would assume that Council redevelop the site into a mixed use development. The development would comprise 25 apartments over four storeys, 153sqm of retail space. Two levels of basement levels car parking will be provided. The 37 car spaces on ground and basement 1 levels will be dedicated for general public and 32 spaces will be provided for residential users.

Option 3- This option is the same as Option 2 except that development is funded by a private developer that hands over the public car spaces to Council on building completion.

Wilberforce Avenue

Option 1- This option would assume that Council redevelop the site for a 4 storey building above, with a roof top car park and 2 basement car parking levels. The development would comprise 359sqm of retail space, 782 sqm of commercial use and 811sqm community uses (includes ground lobby and lift access). A total of 268 car spaces are provided including roof top. All options include provision of 76sqm of public amenities on ground level.

Option 3B- This option is the same as Option 1 except that additional 2 levels of parking are provided on top of the building, resulting in 6 storeys and increasing the total number of car spaces to 283.

Option 4- This option is similar to Option 1 except that the roof level car park would now be enclosed and converted for Commercial use ie 6 levels above ground. The development would comprise 359sqm of retail space and significantly increase to1,574sqm of commercial use. The Community space remains the same. A total of 245 car spaces are provided in this option.

Each of the options for the Ian Street site and Wilberforce Avenue site were produced using software, which calculated the resulting Gross Development Profit/Loss at the completion of the development. The models were calculated based on utilising the retail and commercial premises as an annuity, with the rental income to be generated as revenue to council in perpetuity. The financial outcomes without this ongoing income stream have been provided.

Based on the financial modelling, Hill PDA has recommended Ian St Option 3 with Wilberforce Avenue Option 4. Ian St Option 3 is the same as Option 2, but with the developer taking the construction risk. However, this recommendation was reviewed by the Working Party in conjunction with the Planning advice and the Working Party concluded that the additional financial returns did not justify exceeding the Council's current planning controls at Wilberforce Avenue, to the extent represented. Accordingly, the Working Party felt that Wilberforce Option 1 provided the best outcome overall.

Planning considerations:

The shortlisted option designs prepared by Allen Jack and Cottier Architects were based on the Woollahra LEP 2014 commencing on 23 May 2015, but with incremental increased height limits. Council Planners reviewed the options and commented on the proposed heights of both car parks. They were comfortable with the heights proposed for Ian Street Options 2/3. However, they had significant concerns regarding the six (6) and seven (7) storey heights proposed in Wilberforce Avenue options 3B and 4.

They advised that under the current planning controls, Wilberforce Avenue Option 1 which is essentially a four (4) storey development with a roof-top car park would have a much more desired outcome in terms of bulk and scale in the current location. Hill PDA indicated that option 4 provides the highest financial benefit. Option 4 is a six (6) storey building with 2 levels of basement parking; four (4) levels for commercial use with areas for parking, one (1) complete level of parking and one (one) level for retail, some parking and public amenities on ground level, making it a six (6) storey option.

The following table illustrates how the two preferred options comply with the existing planning controls for the site.

Option	Current LEP	Proposed
Ian Street Options 3		
Zoning	SP2 Infrastructure – Car Park	Not permissible
Max Height	10.5m	12.6
Max FSR	No FSR	
Wilberforce Avenue Option 1		
Zoning	B2 Local Centre	Permissible
Max Height	14.1m	16.5
Max FSR	2:1	0.86:1

As the options selected for Wilberforce and Ian St sites do not meet the height development standards, a Planning Proposal will be required to be submitted to the Minister of Planning for approval. In addition, Ian Street car park needs to be rezoned as the current SP2 Infrastructure – Car Park zoning will need to be changed.

Preferred Option- Ian Street Option 3 & Wilberforce Avenue Option 1:

This option produces a Gross Development loss, whilst providing an annual cash flow for Council which results in a very respectable payback period. This option also produced a significant increase in car spaces, with 305 public car parking spaces, which will mean an additional 161 additional public parking spaces.

The minor non-compliance with building heights could be justified on the basis of broader public benefit i.e. by the provision of community centre, public amenities and a significant increase in public parking spaces.

However, the final design will have to be considered by Council's Planning staff on their merits, once a final design has been prepared and DA has been submitted.

Table 2: Ian Street Summary

	Building Height (Levels)	Basement Levels (no.)	Car Spaces (no.)	Public car park lift foyer (net sqm)	Retail Space (net sqm)	Commercial Office Space (net sqm)	Residential Space (net sqm)	Residential Apartments (no.)
Option 3 (Option 2 as Developer)	4	2	Public – 37 Residential – 32	70	153	-	2,376	25

Table 3: Wilberforce Avenue Summary

	Building Height including rooftop (Levels)	Basement Levels (no.)	Car Spaces (no.)	Community Centre including ground level lift entry foyer (net sqm)	Retail Space (net sqm)	Commercial Office Space (net sqm)	Residential Space (net sqm)	Residential Apartments (no.)
Option 1	5	2	Public – 268	811	359	782	0	0

3. Consultation:

As the project development occurs for this major initiative by Council, the community will have opportunities at various stages to comment on the proposals. The key stages will be during the Planning Proposal stage for both the sites and during the assessment of the Development Application.

4. Community Space

In addition to increasing the amount of available public parking spaces, an objective of this development is to incorporate accessible public amenities (including for use by the elderly and less mobile), and a facility for community uses, as identified in the Community Facilities Study 2011.

This Study found an undersupply of community facility floor space in the Rose Bay/Bellevue Hill area and recommended a staffed community facility of approximately 500-750m^2 with Council to conduct studies and investigations on potential sites including the Ian St and Wilberforce Ave carparks as an ideal location to provide an accessible community facility. The study found the centre would need to accommodate a variety of uses and age groups and that sites below 500m^2 are not suitable for multipurpose uses. It showcased single story multi-purpose community centres of between 700-760m^2 with flexible community spaces to satisfy a broad range of community uses

concurrently. The amount of space required for the proposed community centre would depend on the design, it's location within the building (including over how many floors) and the circulations space required. The space will be designed so that until the need arises, 250m^2 could initially be partitioned / separated, for commercial use. This would be determined as part of the design process.

5. Next steps:

If the recommendations of the Property Assets Working Party are adopted by Council, the next step will be to undertake detailed site investigations and prepare a procurement model.

Council will soon have to commence the Planning Proposal to re-zone Ian Street and amend the height development standards on both the Ian Street and Wilberforce Avenue sites to accommodate the chosen option. This is necessary, as Planning staff have advised us that the Planning Proposal process will take 6 to 9 months to complete.

Concurrent to this process, we will also be investigating if the project will be classified as a Public Private Partnership (PPP). This will depend on a number of factors including the final cost of the development. If the project is classified as a PPP we will need to notify the Department of Local Government and commence this process also.

6. Identification of Income & Expenditure:

The current capital budget for the financial year 2015/2016 has an allocation of $500,000 and an additional $750,000 has been included in the draft 2016/2017 budget to progress the project. The level of expenditure in 2016/17 will depend on the procurement model chosen. Any funds which are unspent in 2016/17 will be returned to reserves and allocated to the project in future years.

7. Conclusion:

The current project will provide important community facilities, public domain works, additional public car parking, residential and retail offerings. The new development will increase employment in the area during construction and full time positions on completion. On completion the new development will provide annual returns to Council.

The recommended options, Option 3 Ian St with Option 1 Wilberforce Avenue, Rose Bay, provides the best balance for the delivery of much needed Community facilities and economic return to Council, ensuring a good Planning outcome also.

Annexures

1. Meeting minutes of the Property Assets Working Party on 23 March 2016 *(circulated under separate cover)* - **Confidential**

2. Updated advice from Hill PDA following the Property Assets Working Party meeting on 23 March 2016 *(circulated under separate cover)* - **Confidential**

3. Rose Bay Car Parks Sites

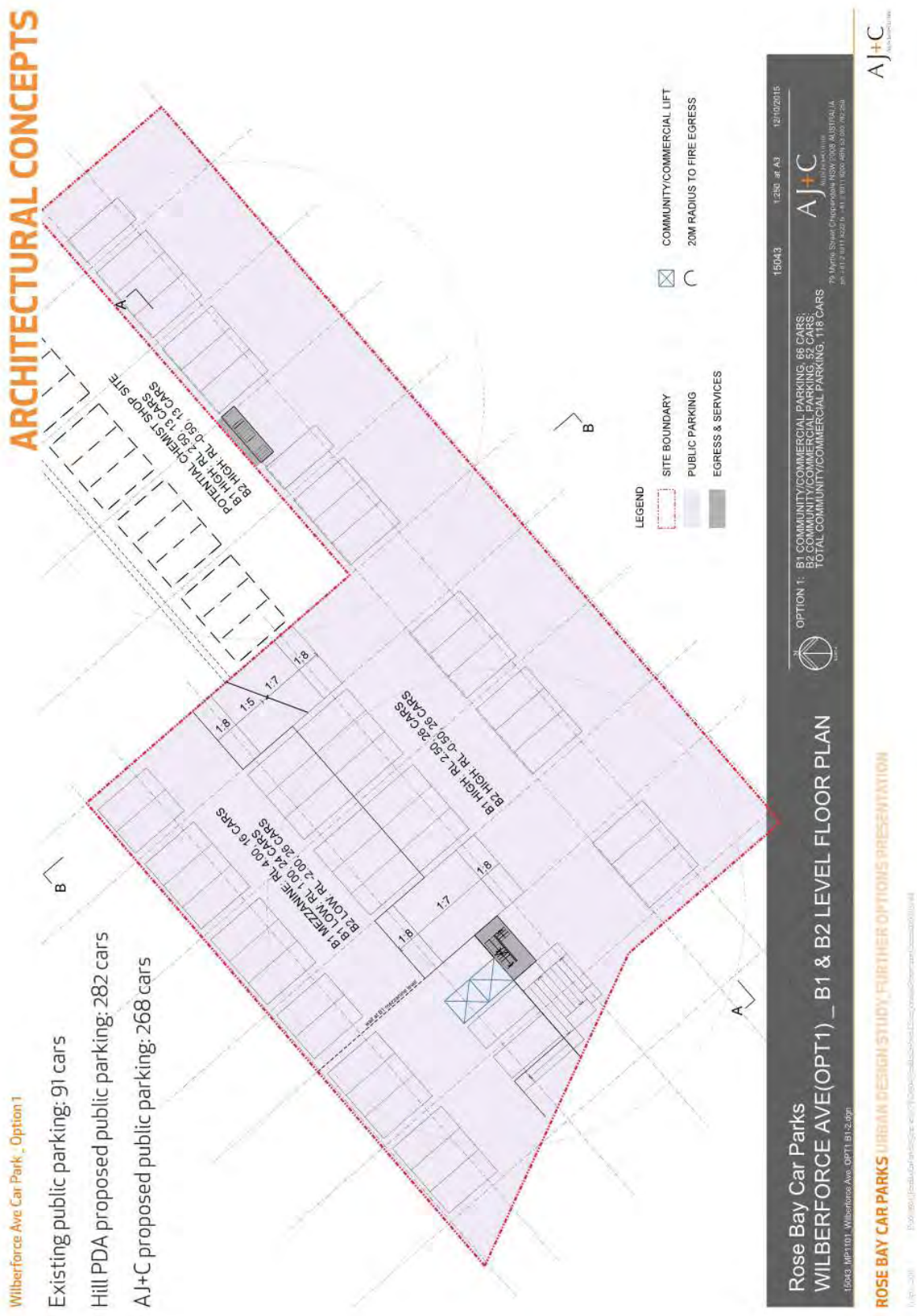
4. Wilberforce Avenue - Option 1

5. Ian Street - Option 3


Carlisle Street
Ian Lane
Ian Street Site
Ian Street
Dover Road
Wilberforce Avenue
Wilberforce Avenue Site
New South Head Road
Newcastle Street
Richmond Street
AJ+C
ROSE BAY CAR PARKS URBAN DESIGN STUDY FINAL PRESENTATION


ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park _ Option 1
LANE
IAN ST
DOVER RD
3-7 DOVER RD
PARISIS
AVE
WILBERFORCE
PANERONG RESERVE
NEWCASTLE ST
Rose Bay Car Parks
ROSE BAY CAR PARKS (OPT 1) _ SITE PLAN
15043_MP0100_Site Plan.dgn
15043
1:500 at A3
14/10/2015
AJ+C
ROSE BAY CAR PARKS URBAN DESIGN STUDY FURTHER OPTIONS PRESENTATION

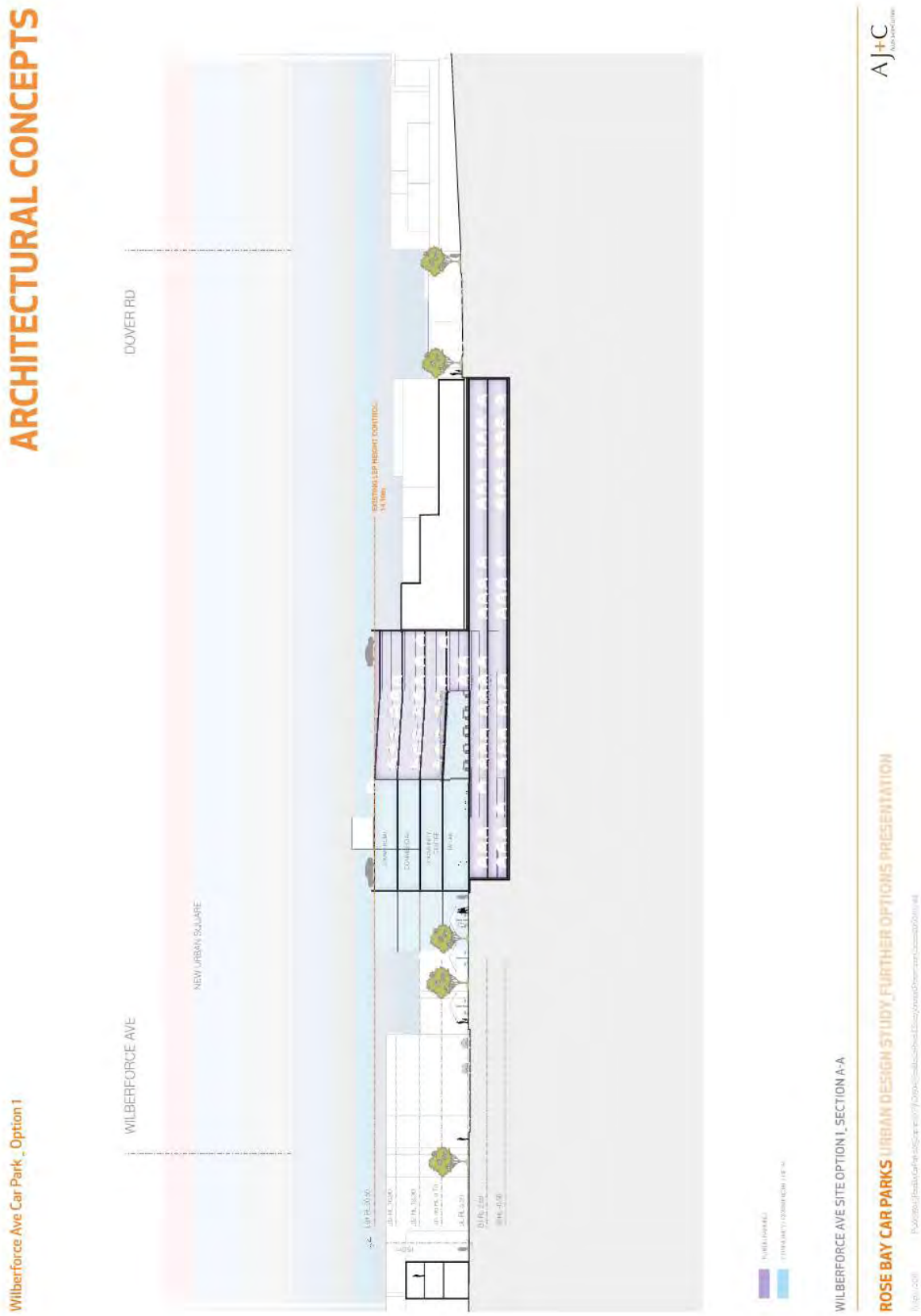

ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park _ Option 1
ROSE BAY CAR PARKS URBAN DESIGN STUDY FURTHER OPTIONS PRESENTATION
Rose Bay Car Parks
WILBERFORCE AVE(OPT1)_GROUND LEVEL FLOOR PLAN
OPTION 1- GL COMMUNITY/COMMERCIAL PARKING- 19 CARS
15043 1:250 at A3 14/10/2015
AJ+C
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
PUBLIC PARKING
EGRESS & SERVICES
NEW URBAN SQUARE
20M RADIUS TO FIRE EGRESS
COMMUNITY/COMMERCIAL LIFT
SHARED ZONE
UPGRADED PAVED AREA
EXISTING TREE TO BE REMOVED
DROP OFF
LOADING ZONE
SHARED ZONE
PEDESTRIAN CROSSING
RL 5.50
RL 7.00
RETAIL GFA: 195 m2 RL 5.50
COMMUNITY CENTRE GFA: 330m2
AMENITIES GFA: 76 m2 RL 5.20
RETAIL GFA: 164 m2 RL 5.20
NEW URBAN SQUARE
5.00


ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park _ Option 1
Existing public parking: 91 cars
Hill PDA proposed public parking: 282 cars
AJ+C proposed public parking: 268 cars
LEGEND
SITE BOUNDARY
PUBLIC PARKING
EGRESS & SERVICES
COMMUNITY/COMMERCIAL LIFT
20M RADIUS TO FIRE EGRESS
OPTION 1: B1 COMMUNITY/COMMERCIAL PARKING: 66 CARS;
B2 COMMUNITY/COMMERCIAL PARKING: 52 CARS;
TOTAL COMMUNITY/COMMERCIAL PARKING: 118 CARS
15043
1:250 at A3
12/10/2015
AJ+C
Rose Bay Car Parks
WILBERFORCE AVE(OPT1) _ B1 & B2 LEVEL FLOOR PLAN
ROSE BAY CAR PARKS URBAN DESIGN STUDY: FURTHER OPTIONS PRESENTATION


ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park _ Option 1
ROSE BAY CAR PARKS URBAN DESIGN STUDY FURTHER OPTIONS PRESENTATION
Rose Bay Car Parks
WILBERFORCE AVE(OPT1)_GROUND LEVEL FLOOR PLAN
OPTION 1- GL COMMUNITY/COMMERCIAL PARKING- 19 CARS
15043 1:250 at A3 14/10/2015
AJ+C
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
PUBLIC PARKING
EGRESS & SERVICES
NEW URBAN SQUARE
20M RADIUS TO FIRE EGRESS
COMMUNITY/COMMERCIAL LIFT
SHARED ZONE
UPGRADED PAVED AREA
EXISTING TREE TO BE REMOVED
DROP/OFF
LOADING ZONE
SHARED ZONE
PEDESTRIAN CROSSING
RL 5.50
RL 7.00
RETAIL GFA: 195 m2 RL 5.50
COMMUNITY CENTRE GFA: 330m2
AMENITIES GFA: 76 m2 RL 5.20
RETAIL GFA: 164 m2 RL 5.20
NEW URBAN SQUARE
5.00


ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park _ Option 1
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
PUBLIC PARKING
EGRESS & SERVICES
COMMUNITY/COMMERCIAL LIFT
20M RADIUS TO FIRE EGRESS
OPTION 1: L1-3 COMMUNITY/COMMERCIAL PARKING 29 CARS/LEVEL
TOTAL 87 CARS
15043
1:250 at A3
7/10/2015
AJ+C
Rose Bay Car Parks
WILBERFORCE AVE(OPT1)_ LEVEL 1-3 FLOOR PLAN
COMMUNITY CENTRE / COMMERCIAL
GFA: 510 m2
ROSE BAY CAR PARKS URBAN DESIGN STUDY FURTHER OPTIONS PRESENTATION


ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park _ Option 1
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
PUBLIC PARKING
EGRESS & SERVICES
COMMUNITY/COMMERCIAL LIFT
20M RADIUS TO FIRE EGRESS
L4 RL 19.65
L4 RL 20.50
L4 RL 20.50
1:20
OPTION 1: L4 (ROOF) COMMUNITY/COMMERCIAL PARKING: 44 CARS
15043
1:250 at A3
12/10/2015
AJ+C
Rose Bay Car Parks
WILBERFORCE AVE (OPTION 1)_ LEVEL 4 FLOOR PLAN
ROSE BAY CAR PARKS URBAN DESIGN STUDY FURTHER OPTIONS PRESENTATION


ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park_Option 1
DOVER RD
WILBERFORCE AVE
NEW URBAN SQUARE
WILBERFORCE AVE SITE OPTION 1_SECTION A-A
ROSE BAY CAR PARKS URBAN DESIGN STUDY_FURTHER OPTIONS PRESENTATION
AJ+C

ARCHITECTURAL CONCEPTS
Wilberforce Ave Car Park _ Option 1
NEW SOUTH HEAD ROAD
PROPOSED THROUGH SITE LINK
EXISTING LEP HEIGHT CONTROL
14.16m
PARKES PUBLIC HALL
WILBERFORCE AVE SITE OPTION 1_SECTION B-B
ROSE BAY CAR PARKS URBAN DESIGN STUDY_FURTHER OPTIONS PRESENTATION
AJ+C


ARCHITECTURAL CONCEPTS
Ian Street Car Park _ Option 2 & 3
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
RESIDENTIAL
EGRESS & SERVICES
PRIVATE OPEN SPACE
PUBLIC PARKING
COMMUNITY/COMMERCIAL LIFT
RESIDENTIAL LIFT
EXISTING TREE TO BE RETAINED
EXISTING TREE TO BE REMOVED
9M/20M RADIUS TO FIRE EGRESS
DEEP SOIL
STORAGE
RESI LOBBY
COMMUNITY PARKING 7 CARS
LOADING ZONE
RETAIL GFA 153 m2
COMMUNITY CAR PARK LOBBY GFA 70 m2
RL 7.92
RL 8.50
RL 9.00
RL 8.30
11.50
11.0
10.50
10.0
9.75
9.50
9.25
8.75
8.50
8.25
1.8
1.5
1.20
3B (F1)
Rose Bay Car Parks
IAN ST CAR PARK (OPT2 & 3) _ GROUND LEVEL FLOOR PLAN
OPTION 2 & 3: GL COMMUNITY PARKING, 7 CARS
15043 1:250 at A3 7/10/2015
AJ+C
ROSE BAY CAR PARKS URBAN DESIGN STUDY, FURTHER OPTIONS PRESENTATION

ARCHITECTURAL CONCEPTS
Ian Street Car Park _ Option 2 & 3
Existing public parking: 53 cars
Hill PDA proposed public parking: 49 cars
AJ+C proposed public parking: 37 cars
RL 6.02
1:8
1:5
1:8
RL 4.62
1:20
1:33
COMMUNITY PARKING 30 CARS
RL 5.50
C
D
D
C
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
PUBLIC PARKING
EGRESS & SERVICES
COMMUNITY/COMMERCIAL LIFT
RESIDENTIAL LIFT
20M RADIUS TO FIRE EGRESS
Rose Bay Car Parks
IAN ST CAR PARK (OPT2 & 3) _ B1 LEVEL FLOOR PLAN
OPTION 2 & 3: B1 COMMUNITY PARKING, 30 CARS
15043
1:250 at A3
7/09/2015
AJ+C
ROSE BAY CAR PARKS

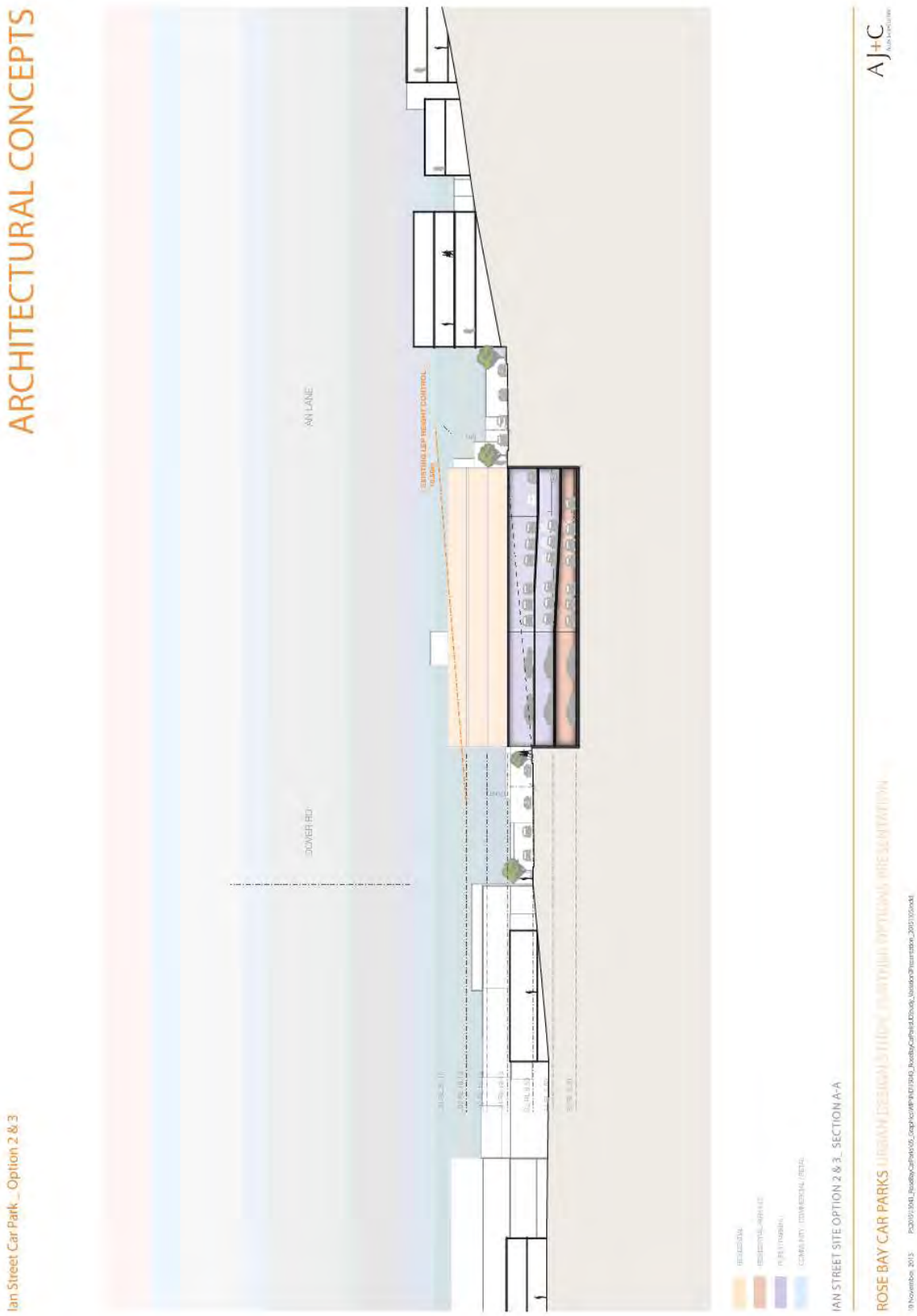
ARCHITECTURAL CONCEPTS
Ian Street Car Park _ Option 2 & 3
Hill PDA proposed residential parking: 27 cars
AJ+C proposed residential parking: 32 cars
RL 2.72
RL 2.20
RL 2.20
1:33
RESIDENTIAL PARKING 32 CARS
C
C
D
D
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
RESIDENTIAL PARKING
EGRESS & SERVICES
COMMUNITY/COMMERCIAL LIFT
RESIDENTIAL LIFT
20M RADIUS TO FIRE EGRESS
OPTION 2 & 3: B2 RESIDENTIAL PARKING, 32 CARS
15043
1:250 at A3
7/09/2015
Rose Bay Car Parks
IAN ST CAR PARK (OPT2 & 3) _ B2 LEVEL FLOOR PLAN
AJ+C
ROSE BAY CAR PARKS

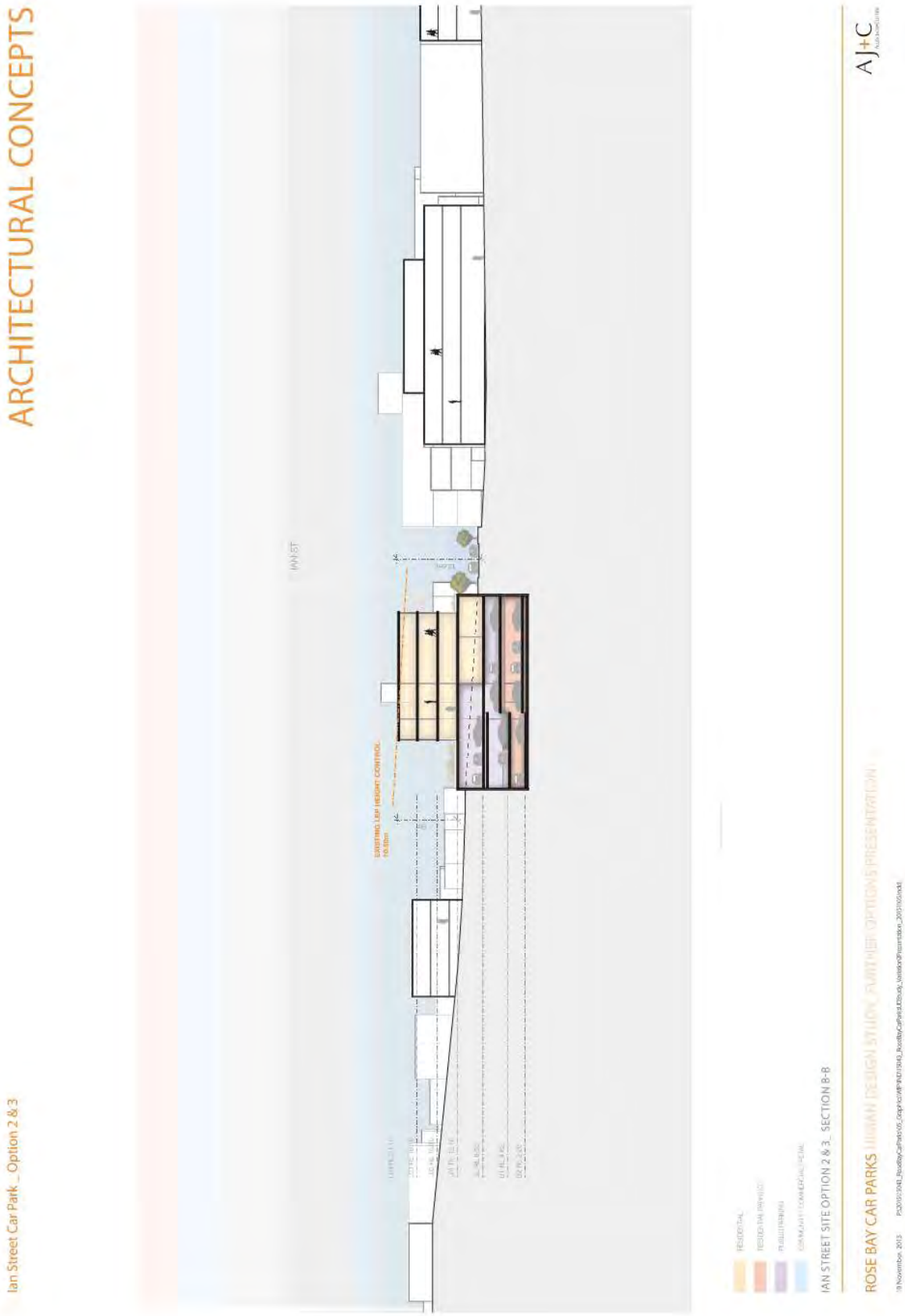

ARCHITECTURAL CONCEPTS
Ian Street Car Park _ Option 2 & 3
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
RESIDENTIAL
EGRESS & SERVICES
PRIVATE OPEN SPACE
PUBLIC PARKING
COMMUNITY/COMMERCIAL LIFT
RESIDENTIAL LIFT
EXISTING TREE TO BE RETAINED
EXISTING TREE TO BE REMOVED
9M/20M RADIUS TO FIRE EGRESS
DEEP SOIL
STORAGE
RESI-LOBBY
RETAIL GFA: 153 m2
COMMUNITY CAR PARK LOBBY GFA: 70 m2
COMMUNITY PARKING 7 CARS
LOADING ZONE
Rose Bay Car Parks
IAN ST CAR PARK (OPT2 & 3) _ GROUND LEVEL FLOOR PLAN
OPTION 2 & 3: GL COMMUNITY PARKING, 7 CARS
15043
1:250 at A3
7/10/2015
AJ+C
ROSE BAY CAR PARKS URBAN DESIGN STUDY_FURTHER OPTIONS PRESENTATION


ARCHITECTURAL CONCEPTS
Ian Street Car Park _ Option 2 & 3
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
RESIDENTIAL
EGRESS & SERVICES
LANDSCAPE SETBACK/ COMMUNAL OPEN SPACE
PRIVATE OPEN SPACE
COMMUNITY/COMMERCIAL LIFT
RESIDENTIAL LIFT
9M RADIUS TO FIRE EGRESS
EXISTING TREE TO BE RETAINED
DEEP SOIL
COMMUNAL OPEN SPACE
RL 12.10
OPTION 2 & 3: L1-3 RESIDENTIAL TOTAL: 25 ATPS, 1B x 11; 2B x 7; 3B x 7
SEPP 65 CHECKING:
SOLAR ACCESS: 68%, CAREFUL DESIGN TO ACHIEVE 70%
NATURAL VENTILATION: 68%, COMPLYING
15043
1:250 at A3
7/09/2015
AJ+C
Rose Bay Car Parks
IAN ST CAR PARK (OPT2 & 3) _ LEVEL 1 FLOOR PLAN
15043_MP2103_Ian St_L1.dgn
ROSE BAY CAR PARKS URBAN DESIGN STUDY_ FURTHER OPTIONS PRESENTATION


ARCHITECTURAL CONCEPTS
Ian Street Car Park _ Option 2 & 3
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
RESIDENTIAL
EGRESS & SERVICES
COMMUNITY/COMMERCIAL LIFT
RESIDENTIAL LIFT
9M RADIUS TO FIRE EGRESS
OPTION 2 & 3: L1-3 RESIDENTIAL TOTAL: 25 ATPS; 1B x 11; 2B x 7; 3B x 7
SEPP 65 CHECKING:
SOLAR ACCESS: 68%, CAREFUL DESIGN TO ACHIEVE 70%
NATURAL VENTILATION: 68%, COMPLYING
Rose Bay Car Parks
IAN ST CAR PARK (OPT2 & 3) _ LEVEL 2 FLOOR PLAN
15043
1:250 at A3
7/09/2015
AJ+C
RL 15.10
ROSE BAY CAR PARKS


ARCHITECTURAL CONCEPTS
Ian Street Car Park _ Option 2 & 3
LEGEND
SITE BOUNDARY
COMMUNITY/COMMERCIAL/RETAIL
RESIDENTIAL
EGRESS & SERVICES
COMMUNITY/COMMERCIAL LIFT
RESIDENTIAL LIFT
9M RADIUS TO FIRE EGRESS
1B
2B
3B
RL 18.10
C
D
Rose Bay Car Parks
IAN ST CAR PARK (OPT2 & 3) _ LEVEL 3 FLOOR PLAN
OPTION 2 & 3: L1-3 RESIDENTIAL TOTAL: 25 ATPS; 1B x 11; 2B x 7; 3B x 7
SEPP 65 CHECKING:
SOLAR ACCESS 70%; CAREFUL DESIGN TO ACHIEVE 70%
NATURAL VENTILATION 68%, COMPLYING
15043
1:250 at A3
7/09/2015
AJ+C
ROSE BAY CAR PARKS


ARCHITECTURAL CONCEPTS
Ian Street Car Park_Option 2 & 3
AJ+C
ROSE BAY CAR PARKS
IAN STREET SITE OPTION 2 & 3_ SECTION A-A
DOVER RD
AN LANE


ARCHITECTURAL CONCEPTS
Ian Street Car Park _Option 2 &3
IAN ST
EXISTING LEP HEIGHT CONTROL
AJ+C
ROSE BAY CAR PARKS
IAN STREET SITE OPTION 2 & 3_ SECTION B-B

Corporate & Works Committee

Items with Recommendations from the Committee Meeting of Monday 18 April 2016
Submitted to the Council for Determination

Item No:	R1 Recommendation to Council
Subject:	**DRAFT 2016/17 BUDGET (SC2660)**
Author:	Don Johnston, Chief Financial Officer
Approvers:	Stephen Dunshea, Director - Corporate Services Gary James, General Manager
File No:	16/42823
Reason for Report:	To present the draft 2016/17 Budget to the Committee.

(Cavanagh/Thomas)

68/16 Resolved without debate:

A. THAT the report on the Draft 2016/17 Budget be received and noted.
B. THAT the Draft Budget be incorporated into the Delivery Program 2013 to 2017 and 2016/17 Operational Plan for the purpose of public exhibition.

Item No:	R2 Recommendation to Council
Subject:	**ROSE BAY CAR PARKS REDEVELOPMENT PROJECT**
Author:	Zubin Marolia, Manager - Property & Projects
Approver:	Tom O'Hanlon, Director - Technical Services
File No:	16/47652
Reason for Report:	To report on the outcomes of the Property Assets Working Party meeting held on 23 March 2016 to recommend further actions to progress the Rose Bay car parks redevelopment project

(Cavanagh/Thomas)

69/16 Resolved without debate:

A. That the minutes of the Property Assets Working Party meeting, held on 23 March 2016, be noted
B. That a design team be engaged to further refine Option 3 Ian St with Option 1 Wilberforce Avenue, Rose Bay
C. That ownership of the proposed retail and commercial office spaces be retained to ensure an on-going income stream for the Council
D. That the proposed residential stratums be sold to reduce the financial exposure
E. That ownership of proposed public parking and community space be retained by Council, to ensure service delivery is not compromised
F. That Council commences the Planning Proposal Process to re-zone Ian Street and amend the height restrictions on Ian Street and Wilberforce Avenue sites
G. That a further report be submitted to the Property Assets Working Party detailing options for the optimal procurement model and funding based on the preferred design.

Item No: D5 Delegated to Committee

Subject: **ROSE BAY CAR PARKS REDEVELOPMENT PROJECT**

Author: Zubin Marolia, Manager - Property & Projects
Approver: Aurelio Lindaya, Manager - Engineering Services
File No: 16/96994
Reason for Report: To provide update on the progress of the Rose Bay car parks redevelopment project and to seek Council's agreement to amend the building height development standard to be specified in the planning proposal.

Recommendation:

A. That the progress report on the redevelopment of the Rose Bay Car Parks be noted.

B. That the planning proposal to facilitate the Rose Bay car park project provide for the following:
   i. Wilberforce Avenue – maximum building height of 17.2m
   ii. Ian Street car park – maximum building height of 14.1m, FSR of 2:1 and rezoning from SP2 Infrastructure, Car Park to B2 Local Centre.

---

1. Background:

On 26 April 2016, Council while considering this matter resolved as follows:

A. That the minutes of the Property Assets Working Party meeting, held on 23 March 2016, be noted
B. That a design team be engaged to further refine Option 3 Ian St with Option 1 Wilberforce Avenue, Rose Bay
C. That ownership of the proposed retail and commercial office spaces be retained to ensure an on-going income stream for the Council
D. That the proposed residential stratums be sold to reduce the financial exposure
E. That ownership of proposed public parking and community space be retained by Council, to ensure service delivery is not compromised
F. That Council commences the Planning Proposal Process to re-zone Ian Street and amend the height restrictions on Ian Street and Wilberforce Avenue sites
G. That a further report be submitted to the Property Assets Working Party detailing options for the optimal procurement model and funding based on the preferred design.

2. Progress update:

Since the above resolution, discussions with Planning staff have been undertaken in order to determine the best method of addressing all the issues prior to submitting the Planning Proposal to the Department of Planning & Environment, for a gateway determination. As only site massing designs have been prepared to date to undertake the options analysis, it has been deemed necessary to prepare more detailed drawings for the Planning Proposal. These drawings will be indicative concept drawings, with proposed entrances, setbacks, windows etc. shown, so that the members of the public are able to better visualise the project and judge its impact. Three dimensional (3D) rendering will also will also be prepared to better inform the process.

While reviewing the drawings we were advised that the heights previously referred to in our report of 18 April 2016 are not consistent with the building heights which apply for four (4) and five (5) storey buildings within the Rose Bay commercial precinct in Woollahra LEP 2014. The building heights in the LEP are applied as follows:

- 4 storey – 14.1m
- 5 storey – 17.2m

Council's planning staff have advised that this relationship between storeys and building heights should be maintained. For this reason, we ask the Council to agree to these building heights for the purpose of the planning proposal which is required to facilitate the Rose Bay car park project.

However, these building heights do not fully accommodate potential lift overruns which may be required. Council's planners have advised that it is the parapet/wall heights which are more critical and minor departures which may be required to accommodate lift overruns can be dealt with as clause 4.6 objections at the development application stage.

Council's planning staff have also raised the issue of floor space ratio (FSR). Currently the Wilberforce site has a FSR of 2:1 which is more than enough to accommodate the proposed public car park, retail, commercial and community facilities. However, the Ian Street car park which is zoned SP 2, Infrastructure, Car Park is not currently subject to a FSR control. Since this site will be rezoned to B2 Local Centre, it should also have a FSR control the same as otherwise applies for 4 storey developments within the centre. The corresponding FSR is 2:1.

Concurrent to the design preparation and the Planning Proposal process, we will be undertaking detailed geotechnical investigations, to better inform the design development process. These investigations will predominantly advise on water table levels, acid sulphate soils and any other subterranean observations, which may impact on the design and construction.

3. Identification of Income & Expenditure:

Council has approved funds of $750,000 in the 2016/2017 Capital works budget to progress this project.

4. Conclusion:

It is recommended that the change to the heights of Wilberforce Avenue and Ian Street car parks be accepted to ensure that accurate figures are submitted with the Planning Proposal. These amendments do not increase the number of storeys, previously approved by Council.

Annexures

1. Rose Bay Car Park sites


Carlisle Street
Ian Lane
Ian Street Site
Ian Street
Dover Road
Wilberforce Avenue
Wilberforce Avenue Site
New South Head Road
Newcastle Street
Richmond Street
AJ+C
ROSE BAY CAR PARKS URBAN DESIGN STUDY FURTHER OPTIONS PRESENTATION

Annexure 4

ROSE BAY CAR PARKS
URBAN DESIGN STUDY

WOOLLAHRA COUNCIL
DOCUMENT FOR PLANNING PROPOSAL

OCTOBER 11, 2016

AJ+C
ALLEN JACK+COTTIER

ROSE BAY CAR PARKS
URBAN DESIGN STUDY

WOOLLAHRA COUNCIL

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architectsajc.com

JANUARY 10, 2017 12:23 PM

ROSE BAY CAR PARKS
URBAN DESIGN STUDY

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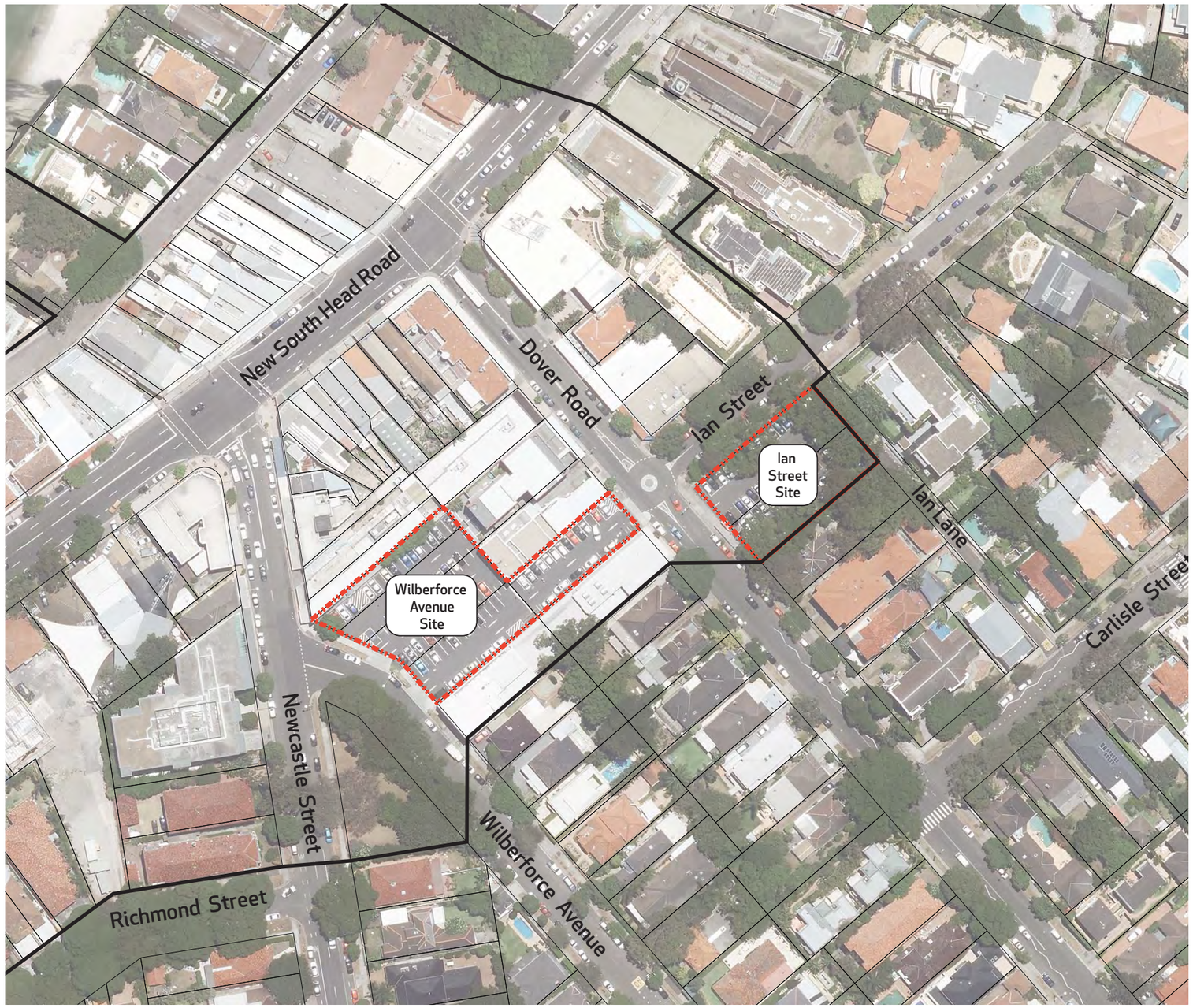


Location Plan with study areas highlighted

1.1 Purpose of the Report

Rose Bay Centre, located at the intersection of New South Head Road and Dover Road, is one of three centres within the Woollahra LGA. It is comprised of several key uses including retail, health, accommodation, food and a number of professional services. Since 2006, it has experienced a contraction in retail and amenity and a subsequent decline in employment with the exception of the real estate sector (SGS Economics, 2014).

Allen Jack+Cottier Architects investigated the opportunities that can be captured by redeveloping two car parks owned by Woollahra Municipal Council (Council) in Rose Bay:

- Wilberforce Avenue Car Park, and
- Ian Street Car Park.

These sites present a prime opportunity for improving the vibrancy within Rose Bay centre as well as fulfilling Council's key objectives of increasing public car parking spaces and providing new community spaces and amenities. Both the Wilberforce Avenue and the Ian Street sites are located centrally and have the potential to be catalysts for the area.

The objectives for development of the Rose Bay car parks outline that an ideal solution for this development would:

- Significantly increase the number of public car parking spaces across the two car parks by a minimum of 100 to 244 spaces;
- Provide a new Community Centre of approximately 750m2 GFA and accessible public amenities;
- Provide income-generating opportunities for the Council such as retail, commercial and/or residential development and explores ownership structures with which to deliver the development.

These objectives guided the design of the feasibility models, which are informed by the economic analysis (Hill PDA, 2014 for Council).

As part of the initial feasibility study, four options were developed for Wilberforce Ave and three options for Ian Street. The shortlisted options were based on the Woollahra LEP 2014 commencing on 23 May 2015, but with incremental increases in height limits.

Council Planners reviewed the options and commented on the proposed heights of both car parks. They were comfortable with the heights proposed for Ian Street Options 2/3. However, they had significant concerns regarding the six and seven storey heights proposed in Wilberforce Avenue options 3B and 4. They advised that under the current planning controls, Wilberforce Avenue Option 1 (a four-storey development with a roof-top car park) would present a more desirable outcome in terms of bulk and scale in the current location.

Therefore, this study presents the concept designs of Wilberforce Ave Option 1 and Ian street Option 3.

A Planning Proposal is required to be submitted to the Minister of Planning for approval to increase the maximum allowable height for both sites and to rezone the Ian St site.

This study undertakes further investigation into the potential for community uses, residential uses and car parking capacity. We believe that the brief and economic study provided by Council positively explores the opportunity to reinforce Rose Bay Centre as one of high convenience and amenity.

2 PLANNING CONTEXT

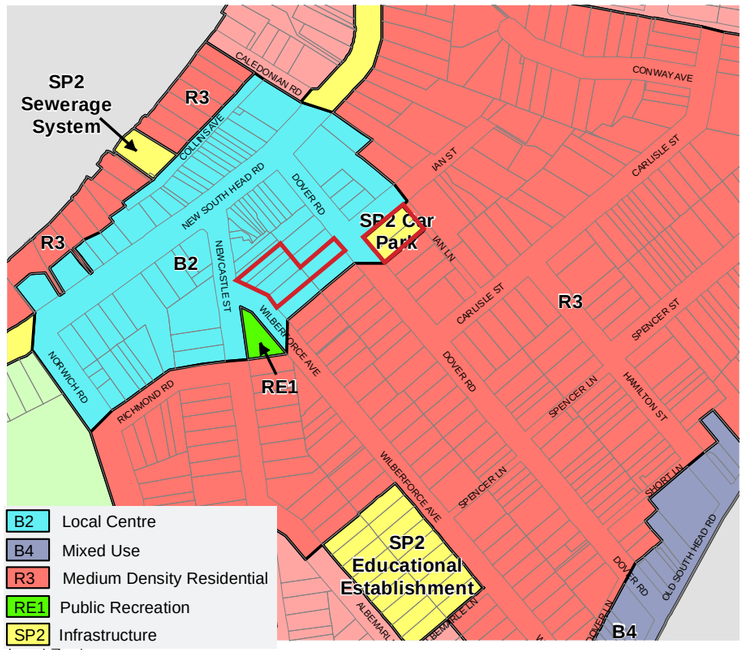
2 PLANNING CONTEXT

Local Environment Plan

Floor Space Ratio

Height of Buildings

Flood Map



Land Zoning

2.1 Local Environment Plan

The relevant planning instrument for the Rose Bay Town Centre (the location of the two Subject Sites) is currently the Woollahra Local Environmental Plan (WLEP) 2014.

Land Use Zoning

Under the WLEP the Wilberforce Street Car Park is zoned B2 Local Centre, while the Ian Street Car Park is zoned SP2 Special Uses (Infrastructure-Car Park).

Height of Buildings

Under the WLEP, the existing maximum height of buildings is 14.1m for the Wilberforce Street Car Park and 10.5m for the Ian Street Car Park.

Floor Space Ratio

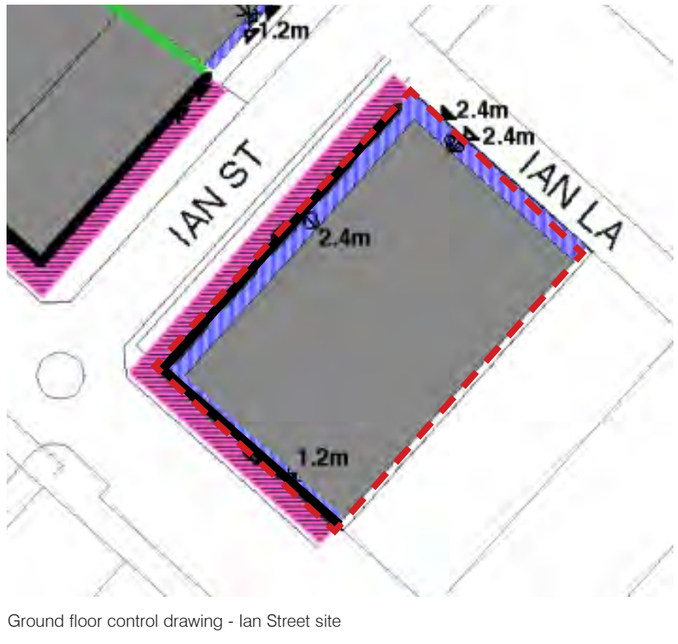
The allowable floor space ratio (FSR) for the Wilberforce Street Car Park is 2:1. The allowable FSR for the Ian Street Car Park under the LEP is contained in Clause 4.4 of the written instrument. Clause 4.4 states that the aim of the clause is “to ensure that buildings are compatible with the desired future character of the area in terms of bulk and scale”.

Wilberforce Ave Car Park

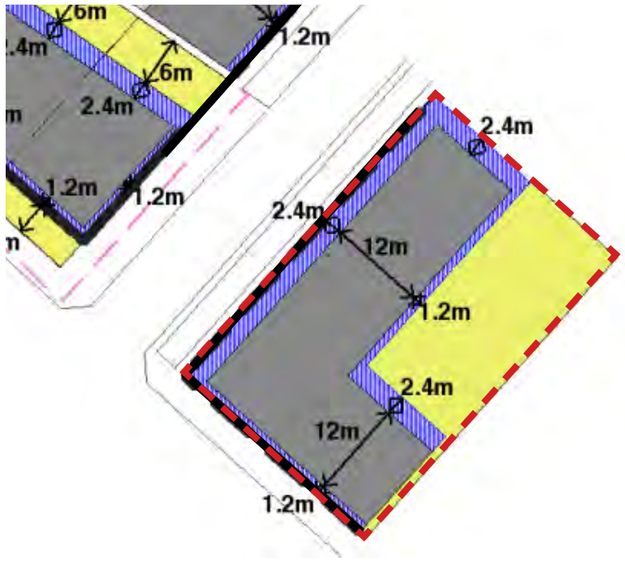
	Existing	Proposed
Zoning	B2	B2
Maximum Heights	14.1m	17.2m
FSR	2:1	0.86:1

Ian Street Car Park

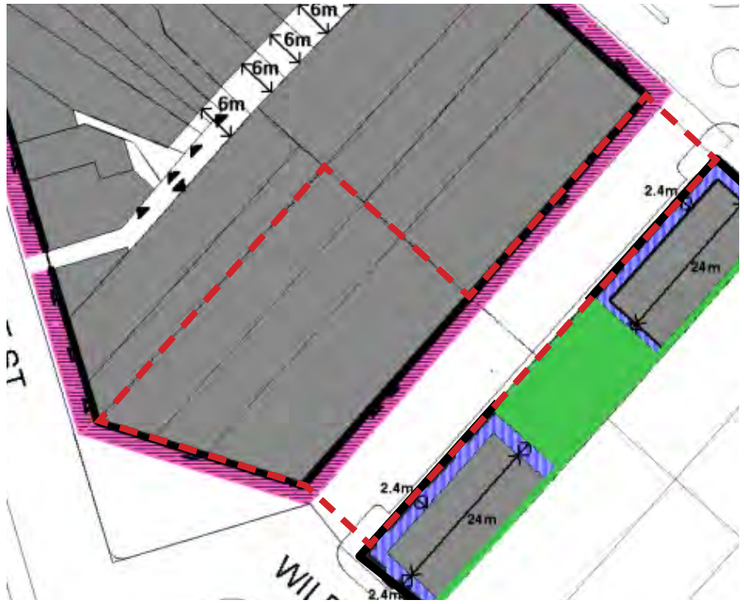
	Existing	Proposed
Zoning	SP2	B2
Maximum Heights	10.5m	14.1m
FSR	None applied	2 : 1



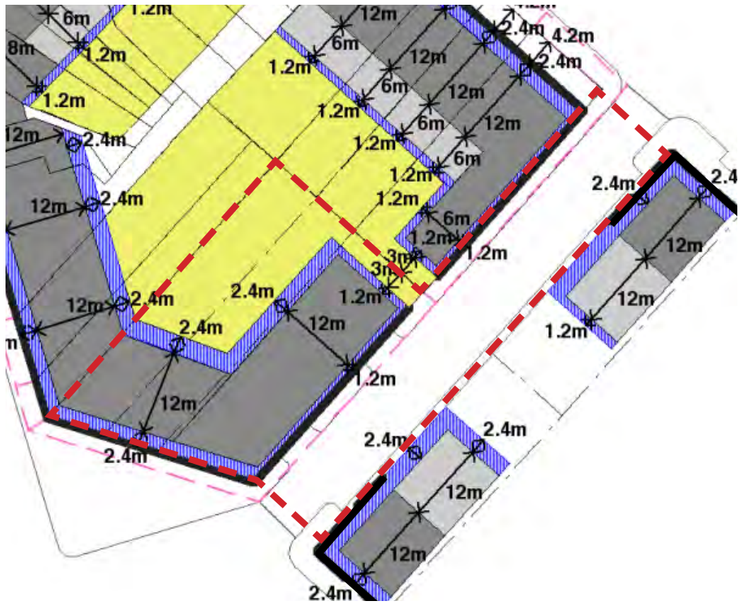
Ground floor control drawing - Ian Street site



Upper level control drawing - Ian Street site



Ground floor control drawing - Wilberforce Avenue site



Upper level control drawing - Wilberforce Avenue site

2.2 Development Control Plan

Chapter D6 of the Woollahra Development Control Plan (WDCP) contains controls which define the proposed planning and urban design guidelines for Rose Bay Centre. The objectives that will be addressed in this urban design study are as follows;

1. To retain and enhance the village atmosphere of the Rose Bay Centre;
2. To improve the Rose Bay Centre's public domain;
3. To foster the diverse mix of uses in the Rose Bay Centre;
4. To conserve and enhance the visual and environmental amenity of all buildings and places of heritage significance in the centre;
5. To improve traffic and parking management in the centre and reduce vehicle and pedestrian conflicts;
6. To introduce storm water management measures to control localised flooding, storm water quality and quantity, and improve the visual and environmental impact of storm water drainage, particularly at the harbour foreshore; and
7. To enhance the diverse character of streets in the Rose Bay Centre.

Section 6.3 of the DCP sets up an urban structure that reinforces the complexity of Rose Bay Centre, while providing opportunities for different building types and uses in various parts of the centre. The implications of this urban structure for the proposed sites are;

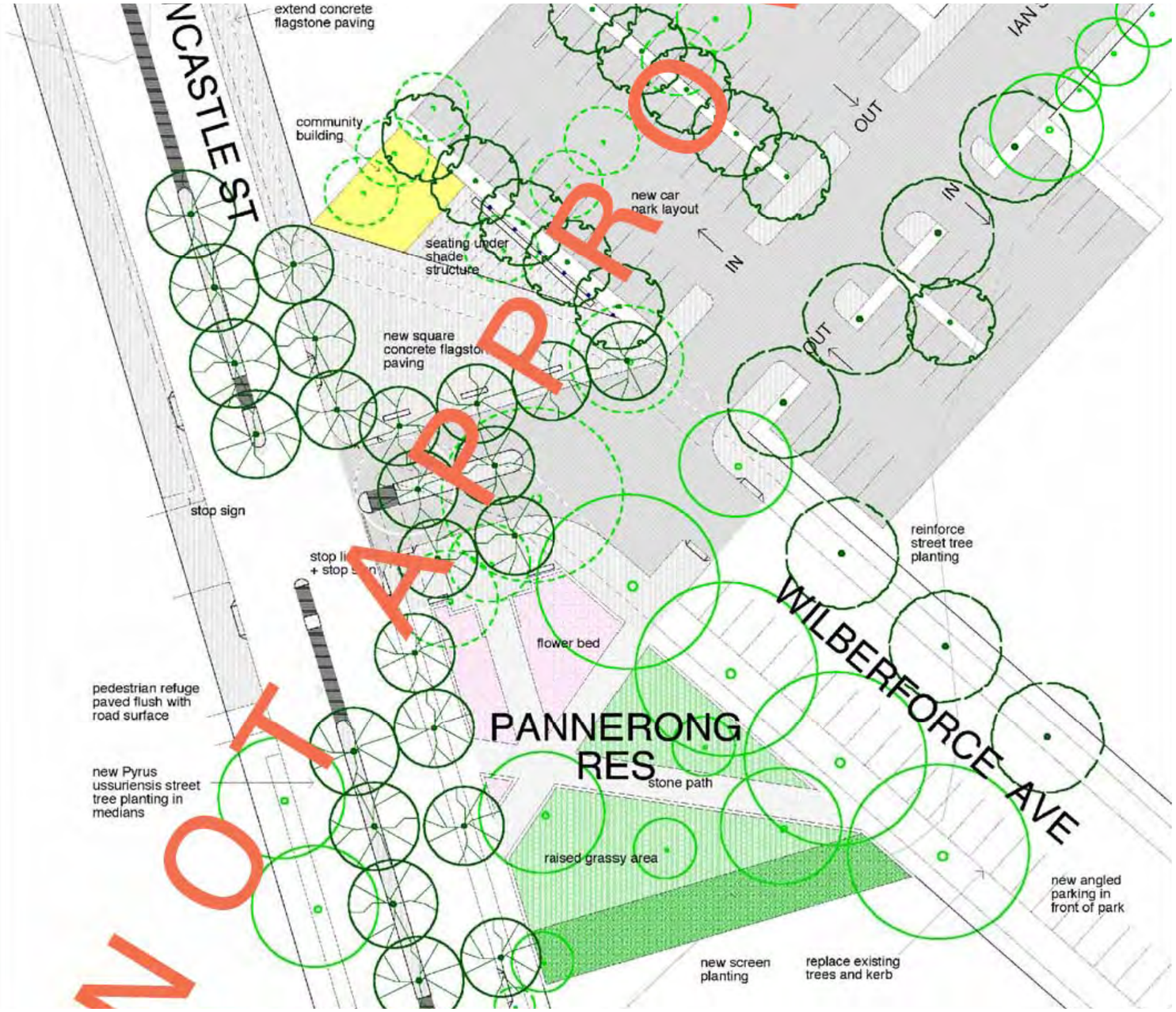
- The Wilberforce Car Park is in the Core Town Centre Zone (Core) whilst Ian Street Car Park is in the Transition Zone;
- The Transition Zone is considered to provide more residential and commercial rather than retail uses, and are characterised by a less continuous building frontage with a stronger landscape presence.
- The Core is considered the focus of retail activity, defined by buildings which reinforce its more urban quality. It is defined by buildings which abut the footpath and have awnings above.

Section 6.6.10.2 refers to the need for better vehicular and pedestrian circulation within the centre. Establishing a through block connection from Wilberforce Avenue to Dover Road has been encouraged by Council. This would facilitate rear site access and servicing to avoid vehicular crossings on principal streets by providing a new lane and right of way.

To contribute to a cohesive urban structure, there are significant controls for upper and lower levels for both sites in this urban design study. These controls are shown in the adjacent images, recognising the potential for a through site link.

2 PLANNING CONTEXT

Rose Bay Centre Public Domain Improvement Plan



Source: Rose Bay Centre Public Domain Improvement Plan, Woollahra Municipal Council, 1999

2.3 Rose Bay Centre Public Domain Improvement Plan

The Rose Bay Centre Public Domain Improvement Plan has identified an opportunity to re-align the intersection Wilberforce Avenue and Newcastle Street to provide:

- A new Civic Square with a primary frontage to Newcaste Street and co-located with the Wilberforce Ave carpark re-development
- Upgrade of Pannerong Reserve to improve opportunities for passive recreation and civic gathering spaces
- Adjusted road alignment that reduces traffic speed and improve pedestrian amenity and safety

AJ+C's investigation of the Wilberforce Avenue Car Park site will take into consideration Council's vision for Pannerong Reserve and a potential new Civic Square.

Table 12: Key Flood Levels

	Peak Water Level (mAHD)						
	1y ARI	2y ARI	5y ARI	10y ARI	20y ARI	100y ARI	PMF
cnr Powell & Balfour Rds	3.17	3.29	3.37	3.42	3.47	3.56	3.96
culvert u/s of New South Head Rd	1.37	1.60	1.88	2.03	2.15	2.35	3.41
entrance of Royal Sydney Golf Course carpark	2.32	2.33	2.33	2.33	2.33	2.44	3.66
Rose Bay shopping precinct	4.29	4.53	4.72	4.80	4.93	5.11	5.94
cnr Albermarle Ave & Newcastle St	10.02	10.09	10.11	10.12	10.17	10.23	10.35

Source: Rose Bay Catchment Flood Study, Woollahra Municipal Council, September 2010

2.4 Rose Bay Catchment Flood Study

The Rose Bay Catchment Flood Study was carried out by Woollahra Municipal Council in 2010.The peak flood levels at key locations including Rose Bay shopping precinct are identified the table on the left.

The 100 year ARI of 5.11m AHD has been adopted during the design process and the proposed ground floor level of each schemes on the subject sites, being the Wilberforce Avenue car park site and Ian Street car park site, is above 5.11m AHD.

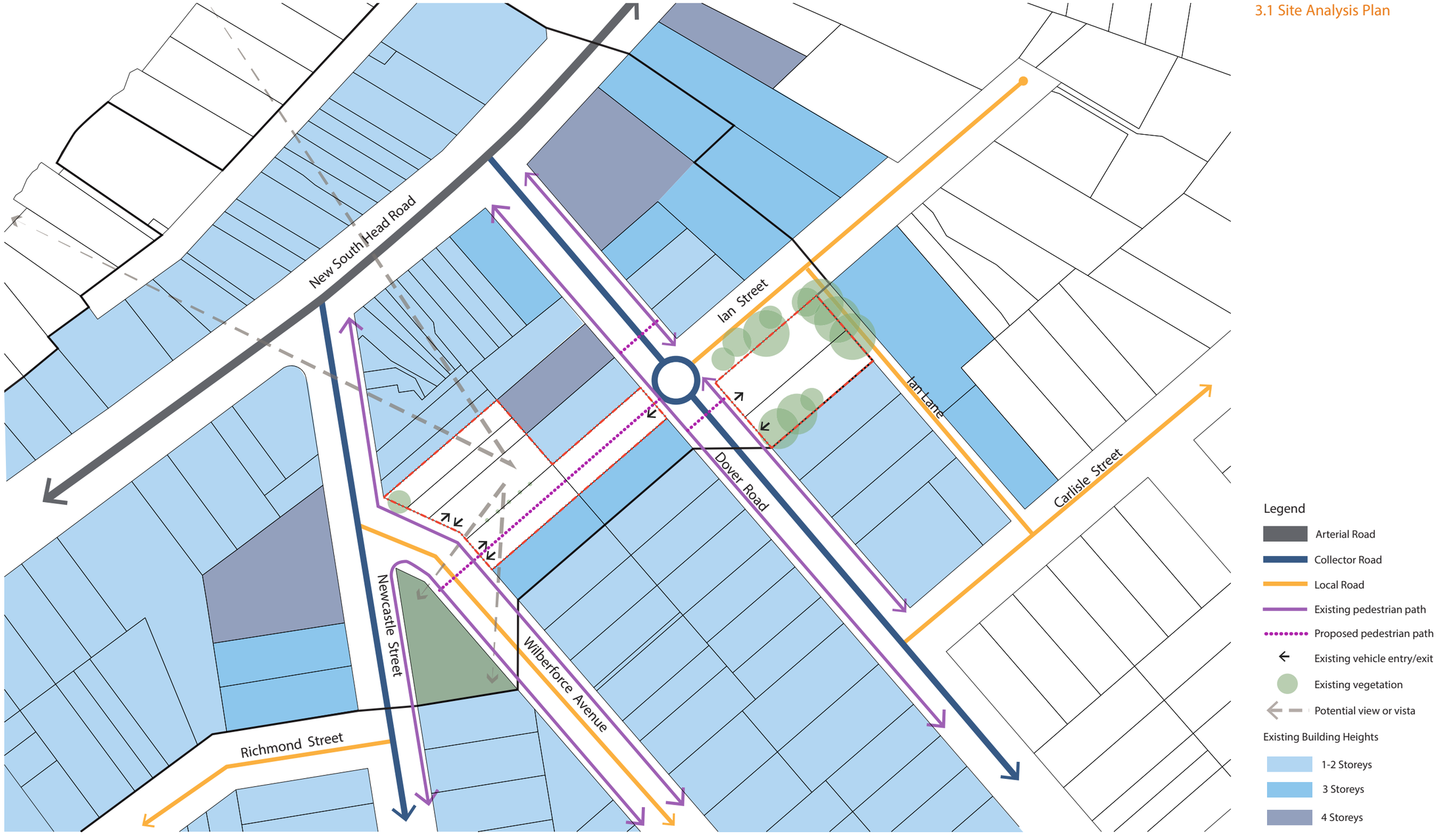
Therefore, the ground floor will have direct same level access from the street.

3 SITE ANALYSIS

3 SITE ANALYSIS

Site Analysis, Opportunities and Constraints

3.1 Site Analysis Plan



Summary of Site Analysis, Opportunities and Constraints

Opportunity for a potential through site link from Wilberforce Avenue to Dover Road. Direct view corridor would be maintained, and convenience added with a direct connection between the two car park sites.

The roundabout on Dover Road presents a constraint to access for the Wilberforce Avenue site.

The topography of the Ian Street carpark presents an opportunity for well located entry and exit points, which can minimise the need for costly excavation.

Photograph showing significant existing vegetation on the Ian Street carpark.

3.2 Opportunities

Parking Access

There is an opportunity to reduce the number of parking entry/exits throughout the Rose Bay Centre. This will improve the pedestrian amenity and safety of the Centre which will encourage retail activation and economic growth.

Community Facilities and Open Space

There is a potential opportunity to incorporate Pannerong Reserve into the public domain adjoining the Community Facility.

Existing Built Form

There is an opportunity for new development on both sites to enhance the existing streetscape charatcer by creating a well defined street edge and encouraging ground floor activation with retail, civic and/or communitiy uses.

Due to the location and size of both sites, there is potential for additional height that will capture views to Rose Bay and Sydney Harbour.

Topography

The current topography of the Ian Street site presents opportunities for efficient access to parking. By correctly locating the entry and exit points, the design can minimise the need for costly excavation.

Adjoining Development

There is an opportunity for the Parisi site to be adapted to address the laneway and provide an active edge with retail uses.

3.3 Constraints

Vehicular and Pedestrian Conflicts

The existing roundabout on Dover Road presents a constraint to potential site access and connectivity for both pedestrians and vehicles between the two sites.

Existing Vegetation

The location of the existing tree line adjacent Ian Street is significant in size and maturity. Design principles and testing will take these into consideration, though some may need to be assessed for removal subject to meeting the needs of the design brief. Refer also to site photographs.

Underground Water table

The underground water table could impose constraints on the basement construction (further geotechnical study required to assist next stage work).

Overland flows

The potential flooding of the below ground level areas from overland flows. This can be mitigated in the design and testing phase through the placement of entry and exits to the parking from the higher end of Dover Road.

Potential Sewer Main along Dover Road and Wilberforce Avenue

A sewer main runs along the rear of the properties fronting both Dover Road and Wilberforce Avenue and into and through the car park.

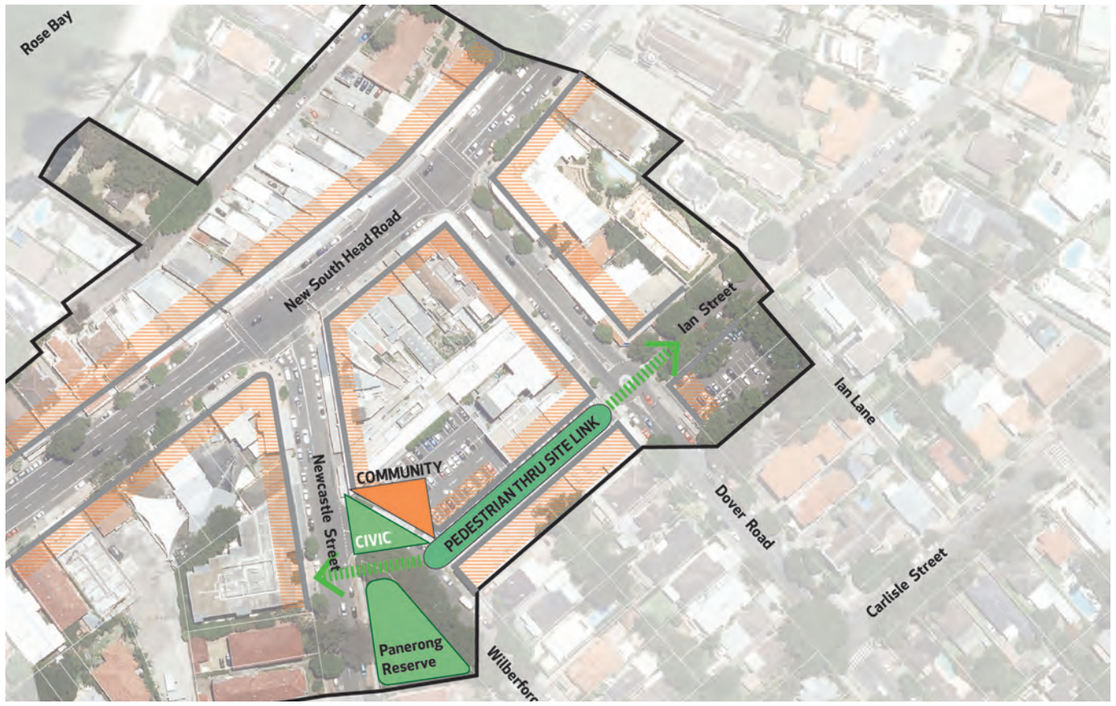
4 DESIGN PRINCIPLES

4 DESIGN PRINCIPLES

4.1 DP01_Improved connectivity for both pedestrians and vehicles

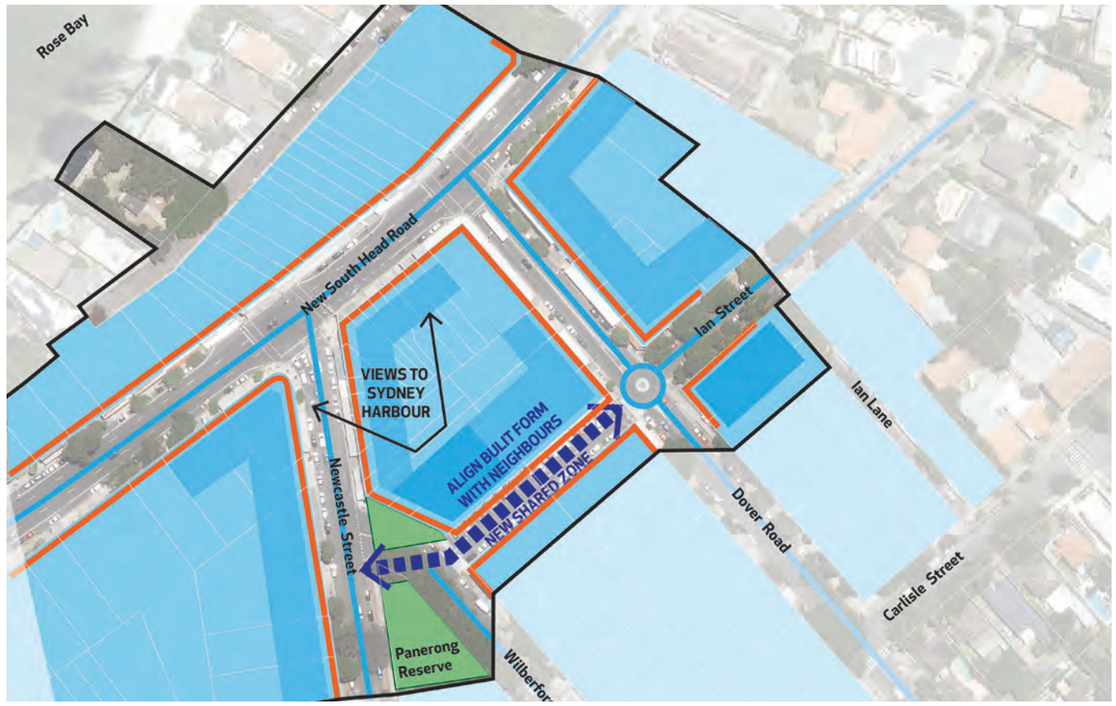
Access and connectivity for the Rose Bay carparks has been designed in consideration of the local road network and existing urban structure. The proposal intends to strengthen Dover Road and Newcastle Streets as main streets by facilitating a connection between the two which will result in the following urban design outcomes:

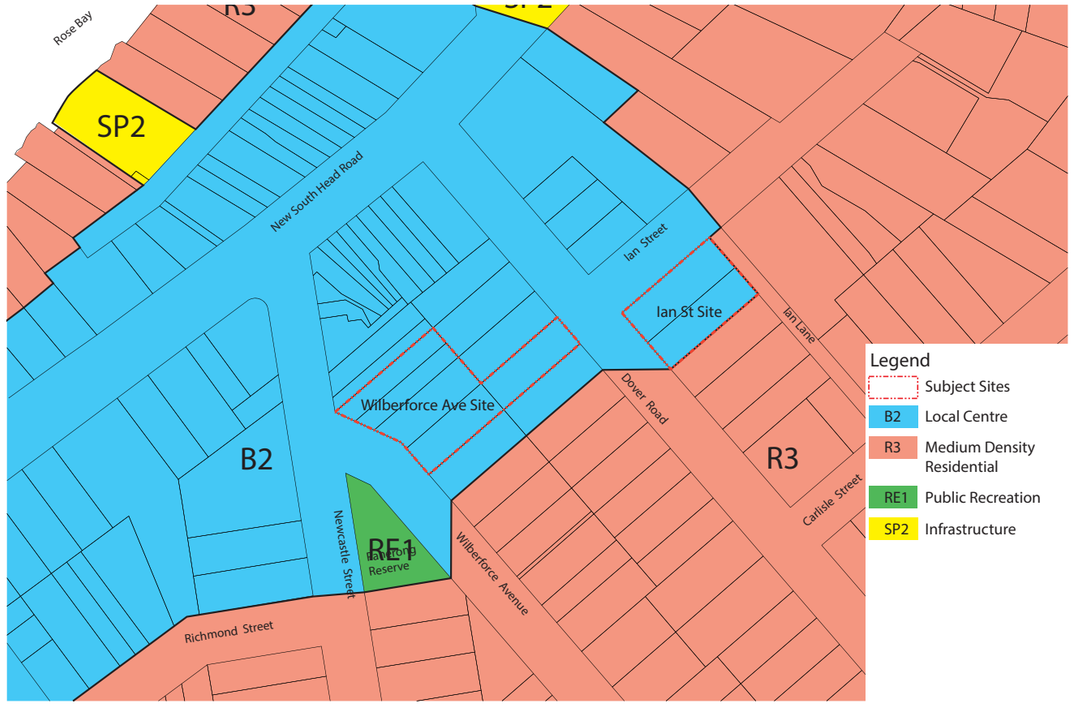
- Provision of a new shared zone/thru-site link from Wilberforce Avenue to Dover Road via the extension of Ian Street. This will improve connectivity between the two carparks and improve the pedestrian permeability of the Rose Bay Centre.
- The new shared zone/thru site link will also improve the vehicular circulation network of the Centre and provide opportunities to consolidate parking Entry/Exit points for both car park sites.
- The reduction and co-location of car parking entries will improve the pedestrian amenity and walkability of the Rose Bay Centre by reducing potential conflicts between vehicles and pedestrians.



4.2 DP02_Improved public domain and civic spaces

- By establishing a thru-site link between Wilberforce Avenue and Dover Road, there is an opportunity for Council to investigate the opportunity to create a Shared Zone and/or pedestrian priority street as part of the Wilberforce Avenue redevelopent. This connection would be an opportunity for Council to improve the streetscape and public domain quality of the Rose Bay Centre as part of a larger project that would deliver improved parking, community facilities, amenities and open space upgrades.
- The design of the Wilberforce Avenue Car Park will explore opportunities for a new public square and an upgraded Panerong Reserve via the realignment of the intersection of Wilberforce Avenue and Newcastle Street. Co-located with a new Community Centre, this precinct has the potential to become a distinctive and innovative civic public gathering space which Rose Bay lacks.
- There is currently a high level of pedestrian activity along Dover Road due to the number of retail/food tenancies in the vincinity. This results in continuous street activity throughout the day. The proposals will explore the potential to improve footpaths and pedestrian crossings across Dover Road. This will assist in reducing the number of potential conflicts between pedstrians and vehicles in the Rose Bay Centre.





4.3 DP03_Urban Form

- The proposals will seek to strengthen and define the core of the Rose Bay Town Centre by creating consistent streetscapes and continuous building alignments activated with non-residential uses.
- All proposals will consider the outcomes, desired future character and envisioned built form as contained within the Rose Bay Town Centre DCP.
- Align proposed built form envelopes on the Wilberforce Avenue site with the ‘core’ structure, reinforcing a dense urban quality with footpaths and awnings for permeability.
- Set back buildings on Dover Road to reinforce and enhance a distinctive framed urban shopping street.
- The location, size and layout of the Wilberforce Avenue Site presents an opportunity for taller development with upper level setbacks to be orientated to capture views to Rose Bay and Sydney Harbour without impacting significantly on the existing scale and character of the Rose Bay Centre.

4.4 DP04_Complementary Land Uses

- The re-development of the Ian Street and Wilberforce Ave car parks will provide an opportunity to strengthen the core of the Rose Bay Centre.
- Explore ways of improving the amenity of Pannerong Park, identified in the DCP as underutilised due to its poor visibility and amenity. This has the potential to provide an accessible outdoor space in the centre that will attract visitors and compliment the community facility.
- The commercial and community component has the potential to help protect the employment of the existing commercial centre. With the supply of new residential developments limited by the geography of the outlying areas, sites such as this should be the focus of intensification, bringing residents close to services, jobs and civic infrastructure.

5 ARCHITECTURAL CONCEPTS

5.1 Wilberforce Ave Car Park
- a. Design Concept
- b. Site plan
- c. B1 & B2 Level Floor Plan
- d. Ground Level Floor Plan
- e. Level 1-3 Floor Plan
- f. Level 4 Floor Plan
- g. Section A-A
- h. Section B-B
- i. Table

5.2 Ian Street Car Park
- a. Design Concept
- b. Ground Level Plan
- c. B1 Level Floor Plan
- d. B2 Level Floor Plan
- e. Level 1 Floor Plan
- f. Level 2 Floor Plan
- g. Level 3 Floor Plan
- h. Section C-C
- i. Section D-D
- j. Table
- k. Residential Yield & SEPP65 Checking

5.3 Key Views From 3D Massing Model

5.4 Solar Study

5 ARCHITECTURAL CONCEPTS

Architectural Concepts

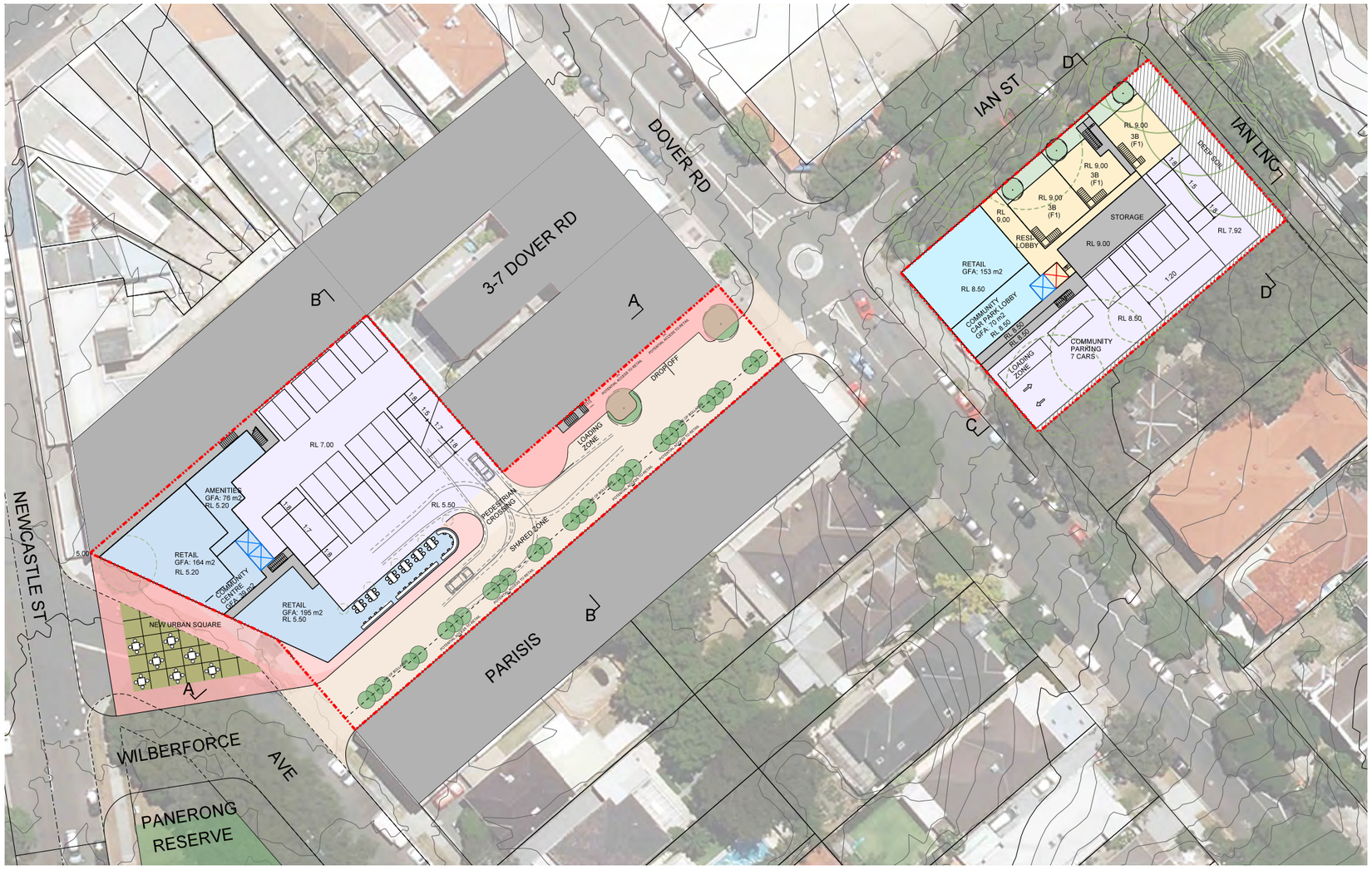
The following architectural concepts show a possible layout for each of the preferred options:

+ Wilberfoce Ave - Option 1,
+ Ian St - Option 3.

5.1 Wilberforce Avenue Car Park Site

Design Concept:

+ Provision of a new thru-site site via the extension of Ian Street between Dover Road and Newcastle Streets. This will aim to reinforce the vehicular and pedestrian access and conectivity, which is consistent with the Woollahra Council DCP 2015 .
+ Improved public domain by creating a new public square at corner of Wilberforce Avenue and Newcastle Street, which is in line with Woollahra Council PDIP 1999.
+ Realign the intersection of Wilberforce Avenue Newcastle Streets to mitigate potential traffic hazards for pedestrians.
+ Provide opportunities for retail activation at ground level.
+ Provide a new community centre and amenities for Woollahra Council.
+ Ensure that all above ground parking with an address to a primary road or civic space is 'sleeved' with community + commercial uses.
+ Provide increased public and community parking capacity for the Rose Bay Town Centre.



Existing public parking: 91 cars

AJ+C proposed public parking: 268 cars

Rose Bay Car Parks
WILBERFORCE AVE

B1 & B2 LEVEL FLOOR PLAN

15043 1:250 at A3 12/10/2015

N
NORTH

B1 COMMUNITY/COMMERCIAL PARKING, 66 CARS;
B2 COMMUNITY/COMMERCIAL PARKING, 52 CARS;
TOTAL COMMUNITY/COMMERCIAL PARKING, 118 CARS

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Allen Jack+Cottier
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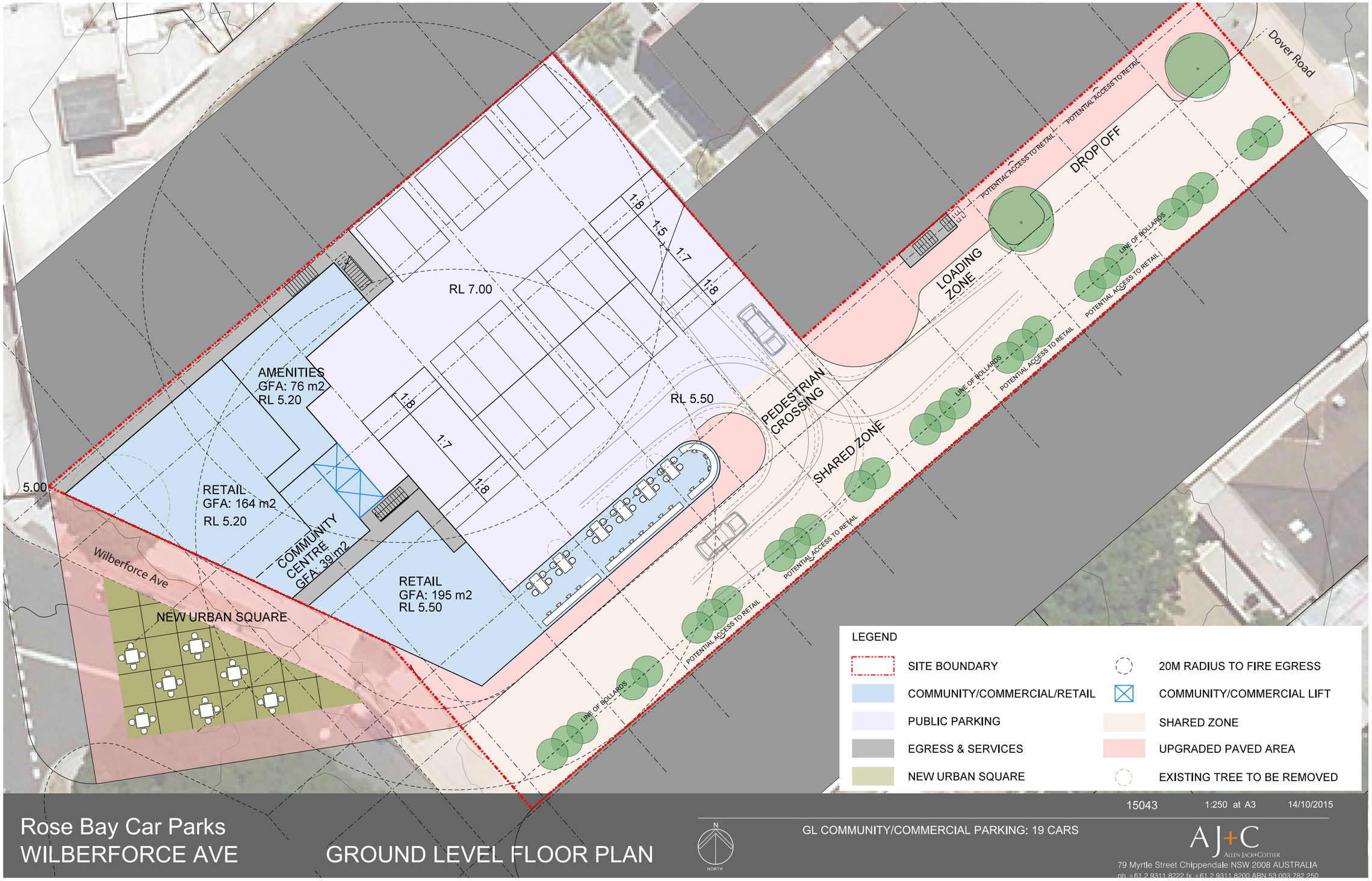
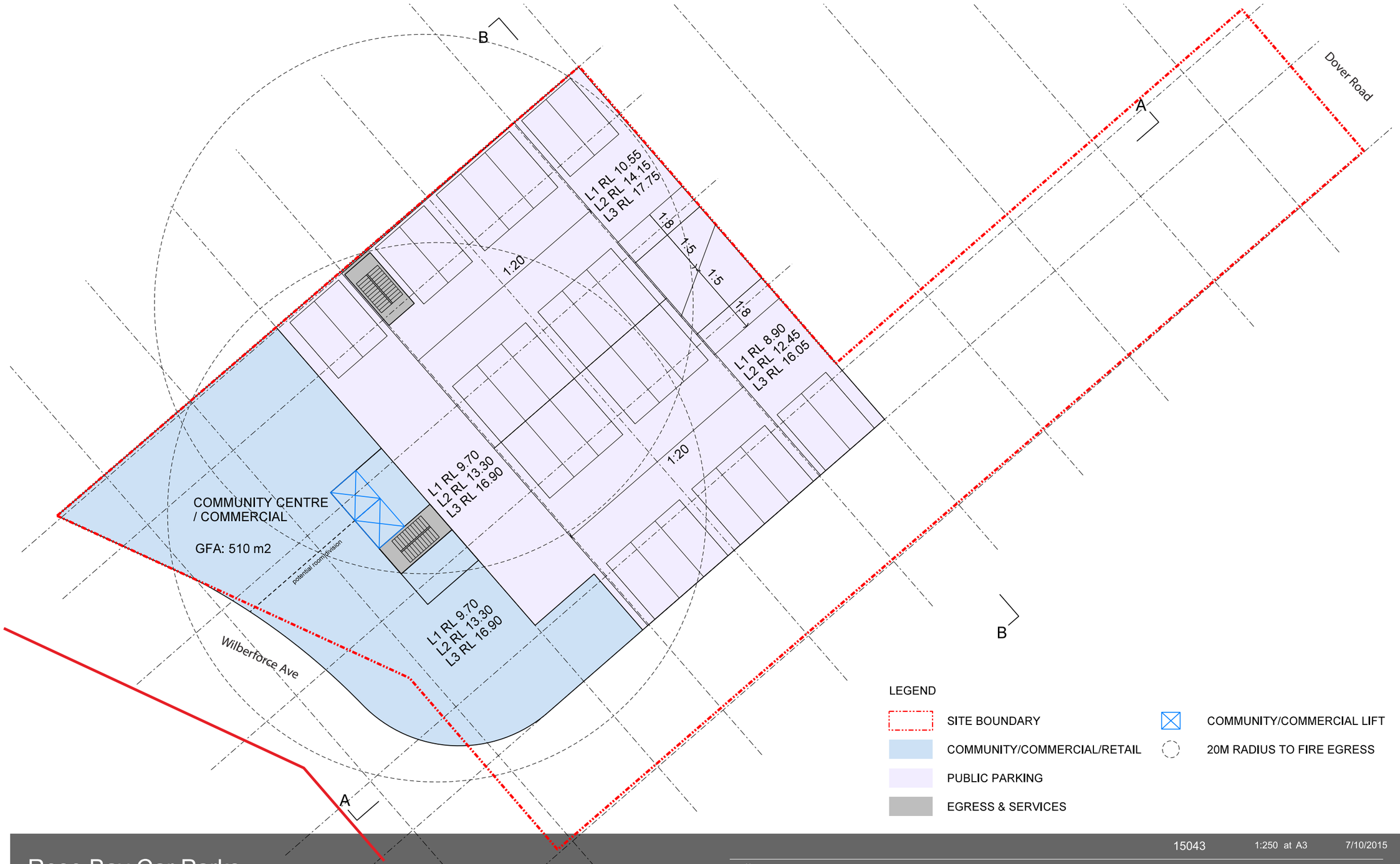
5 ARCHITECTURAL CONCEPTS

5.1 Wilberforce Ave Car Park





Rose Bay Car Parks
WILBERFORCE AVE

LEVEL 1-3 FLOOR PLAN

15043 1:250 at A3 7/10/2015

N
NORTH

L1-3 COMMUNITY/COMMERCIAL PARKING: 29 CARS/LEVEL
TOTAL 87 CARS

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5 ARCHITECTURAL CONCEPTS

5.1 Wilberforce Ave Car Park

Rose Bay Car Parks
WILBERFORCE AVE

LEVEL 4 FLOOR PLAN

15043 1:250 at A3 12/10/2015

N NORTH

L4 (ROOF) COMMUNITY/COMMERCIAL PARKING: 44 CARS

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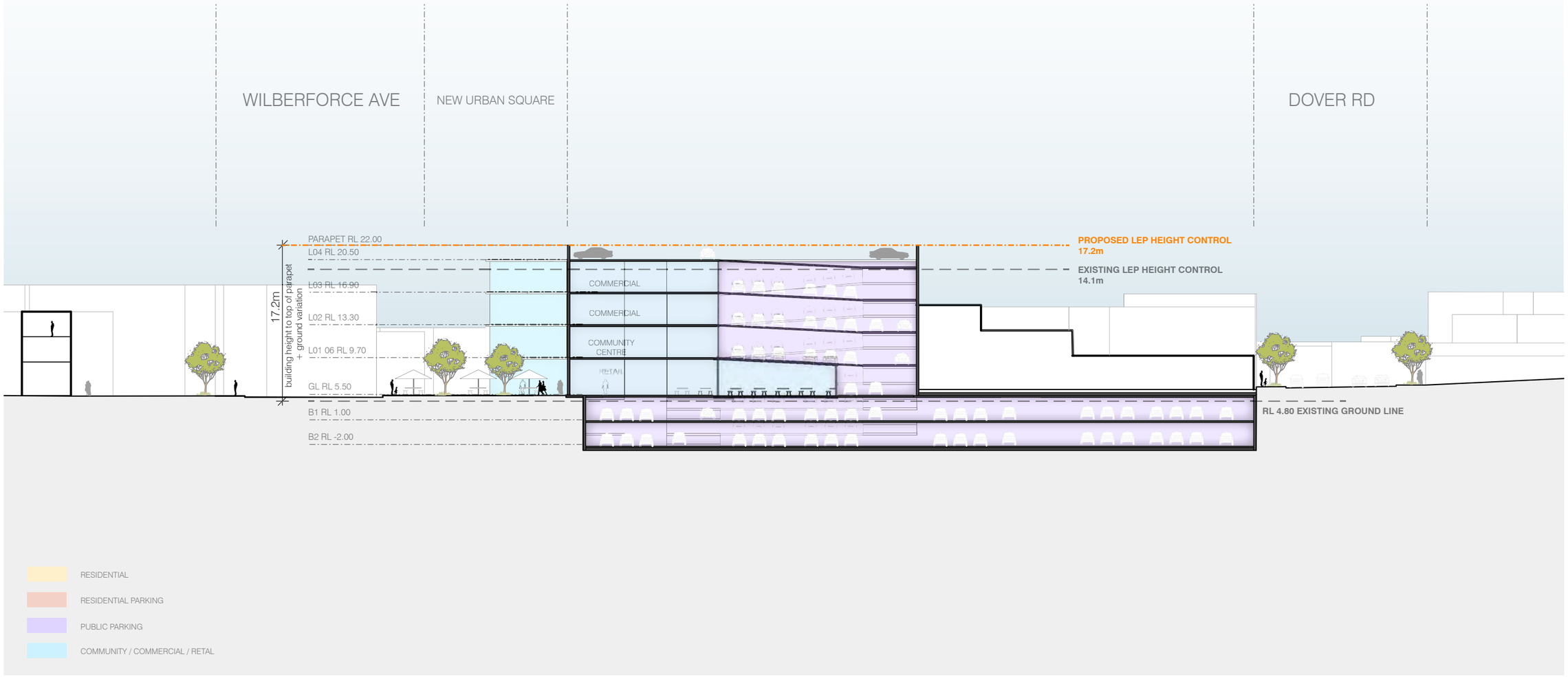
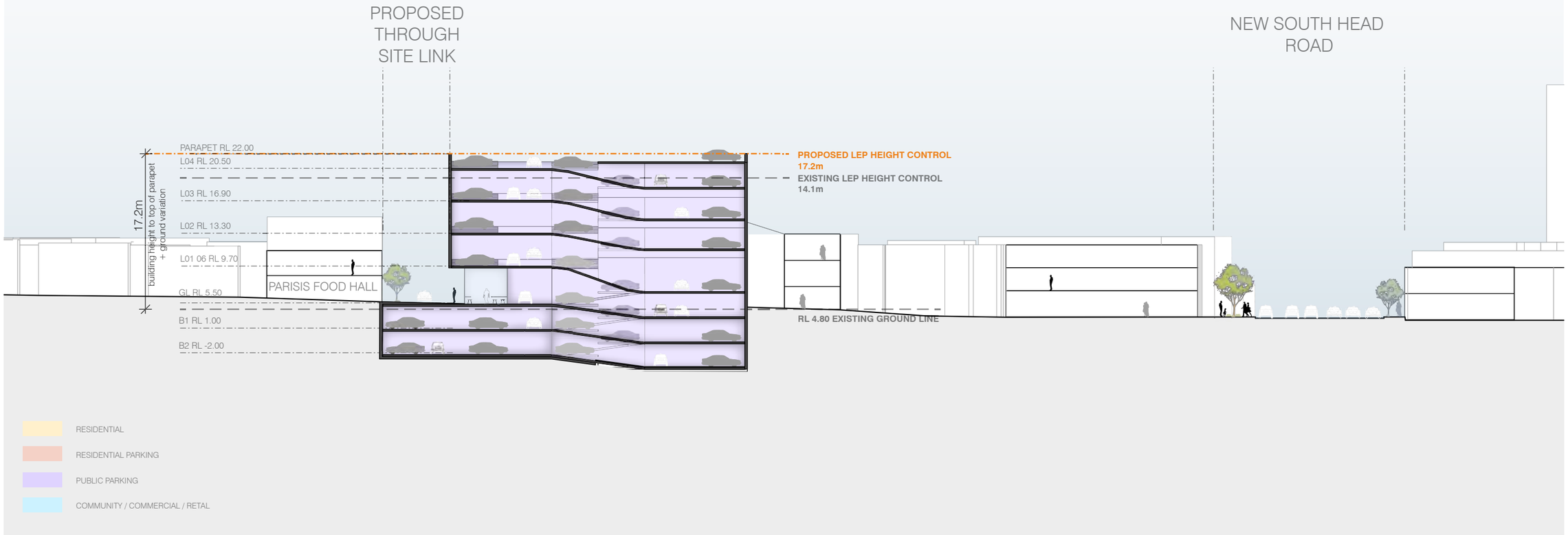

WILBERFORCE AVE
NEW URBAN SQUARE
DOVER RD
PARAPET RL 22.00
L04 RL 20.50
L03 RL 16.90
L02 RL 13.30
L01 06 RL 9.70
GL RL 5.50
B1 RL 1.00
B2 RL -2.00
17.2m
building height to top of parapet + ground variation
COMMERCIAL
COMMERCIAL
COMMUNITY CENTRE
RETAIL
PROPOSED LEP HEIGHT CONTROL
17.2m
EXISTING LEP HEIGHT CONTROL
14.1m
RL 4.80 EXISTING GROUND LINE
RESIDENTIAL
RESIDENTIAL PARKING
PUBLIC PARKING
COMMUNITY / COMMERCIAL / RETAL

Section A-A

5 ARCHITECTURAL CONCEPTS

5.1 Wilberforce Ave Car Park



Section B-B

Wilberforce Avenue Site

		AJ+C Proposal	
	Use	GFA (m²)	Public Parking
Level 4_Roof (5 storeys)	Public Parking		44
	Sub-total		**44**
Level 3 (4 storeys)	Commercial	518	
	Public Parking		29
	Sub-total	**518**	**29**
Level 2 (3 storeys)	Community Centre	254	
	Commercial	264	
	Public Parking		29
	Sub-total	**518**	**29**
Leve 1 (2 storeys)	Community Centre	518	
	Public Parking		29
	Sub-total	**518**	**29**
Ground Level (1 storey)	Amenities	76	
	Community Centre	39	
	Retail	359	
	Public Parking		19
	Sub-total	**474**	**19**
Basement 1	Public Parking		66
	Sub-total		**66**
Basement 2	Public Parking		52
	Sub-total		**52**
Total	Amenities	76	
	Comunity Centre	811	
	Retail	359	
	Commercial	782	
	Total	**2028**	**268**

	AJ+C Proposal
Site Area:	2360 m²
Proposed Total GFA:	2082 m²
Exisiting FSR Control:	2 :1
FSR of Proposed Concept:	0.86 :1
Recommended FSR:	**2 :1**
Existing Building Height Control:	
Recommended Building Height:	**17.2 m**
Existing Land Zoning:	B2
Proposed Land Zoning:	B2
Recommended Land Zoning:	**B2**

Assumptions:
Ground level variation: 0.7m
Ground level floor to floor height: 4.2m
Commercial level floor to floor height: 3.6m
Roof parapet height: 1.5m

5 ARCHITECTURAL CONCEPTS

5.2 Ian Street Car Park

Design Concept:

+ Built Form outcomes that are generally consistent with the outcomes of the B2 Local Centre.
+ Provide retail activation to corner of Dover Road and Ian Street
+ Clear seperation of residential lobby and community car park lobby.
+ Two storey 'townhouse' style apartments with an address to Ian Street.
+ Retain significant vegetation along Ian Lane.
+ Provision of additional community/public car parking facilities on 1 consolidated basement level
+ Significant side setbacks (6m) to south-eastern boundary and adjoining single detached dwelling.

Rose Bay Car Parks
IAN ST CAR PARK

GROUND LEVEL FLOOR PLAN

N
NORTH

GL COMMUNITY PARKING, 7 CARS

15043 1:250 at A3 7/10/2015

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Existing public parking: 53 cars

AJ+C proposed public parking: 37 cars

Rose Bay Car Parks
IAN ST CAR PARK

15043_MP2101_Ian St_B1.dgn

B1 LEVEL FLOOR PLAN

N
NORTH

B1 COMMUNITY PARKING, 30 CARS

15043 1:250 at A3 7/09/2015

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Allen Jack+Cottier
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AJ+C proposed residential parking: 32 cars

Rose Bay Car Parks
IAN ST CAR PARK

B2 LEVEL FLOOR PLAN

15043_MP2100_Ian St_B2.dgn

N
NORTH

B2 RESIDENTIAL PARKING, 32 CARS

15043 1:250 at A3 7/09/2015

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Allen Jack+Cottier
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Rose Bay Car Parks
IAN ST CAR PARK

LEVEL 1 FLOOR PLAN

15043 1:250 at A3 7/09/2015

N
NORTH

L1-3 RESIDENTIAL TOTAL: 25 ATPS, 1B x 11; 2B x 7; 3B x 7

SEPP 65 CHECKING:
SOLAR ACCESS: 68%, CAREFUL DESIGN TO ACHIEVE 70%
NATURAL VENTILATION: 68%, COMPLYING

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5 ARCHITECTURAL CONCEPTS

5.2 Ian Street Car Park

Rose Bay Car Parks
IAN ST CAR PARK

LEVEL 2 FLOOR PLAN

15043_MP2104_Ian St_L2.dgn

15043 1:250 at A3 16/08/2016

L1-3 RESIDENTIAL TOTAL: 25 ATPS, 1B x 11; 2B x 7; 3B x 7

SEPP 65 CHECKING:
SOLAR ACCESS: 68%, CAREFUL DESIGN TO ACHIEVE 70%
NATURAL VENTILATION: 68%, COMPLYING

N NORTH

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Rose Bay Car Parks
IAN ST CAR PARK

LEVEL 3 FLOOR PLAN

15043_MP2105_Ian St_L3.dgn

15043 1:250 at A3 16/08/2016

N NORTH

L1-3 RESIDENTIAL TOTAL: 25 ATPS, 1B x 11; 2B x 7; 3B x 7

SEPP 65 CHECKING:
SOLAR ACCESS: 68%, CAREFUL DESIGN TO ACHIEVE 70%
NATURAL VENTILATION: 68%, COMPLYING

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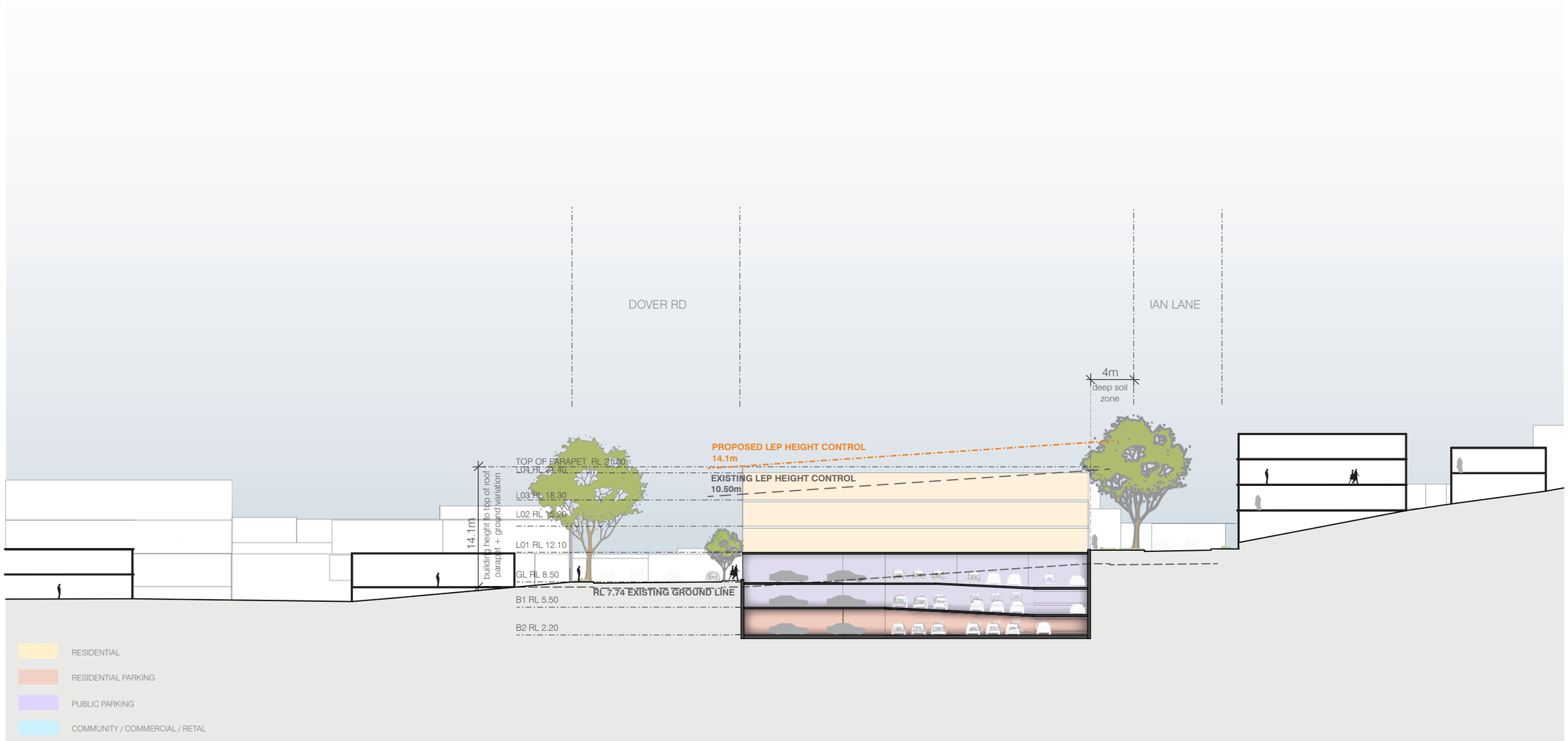
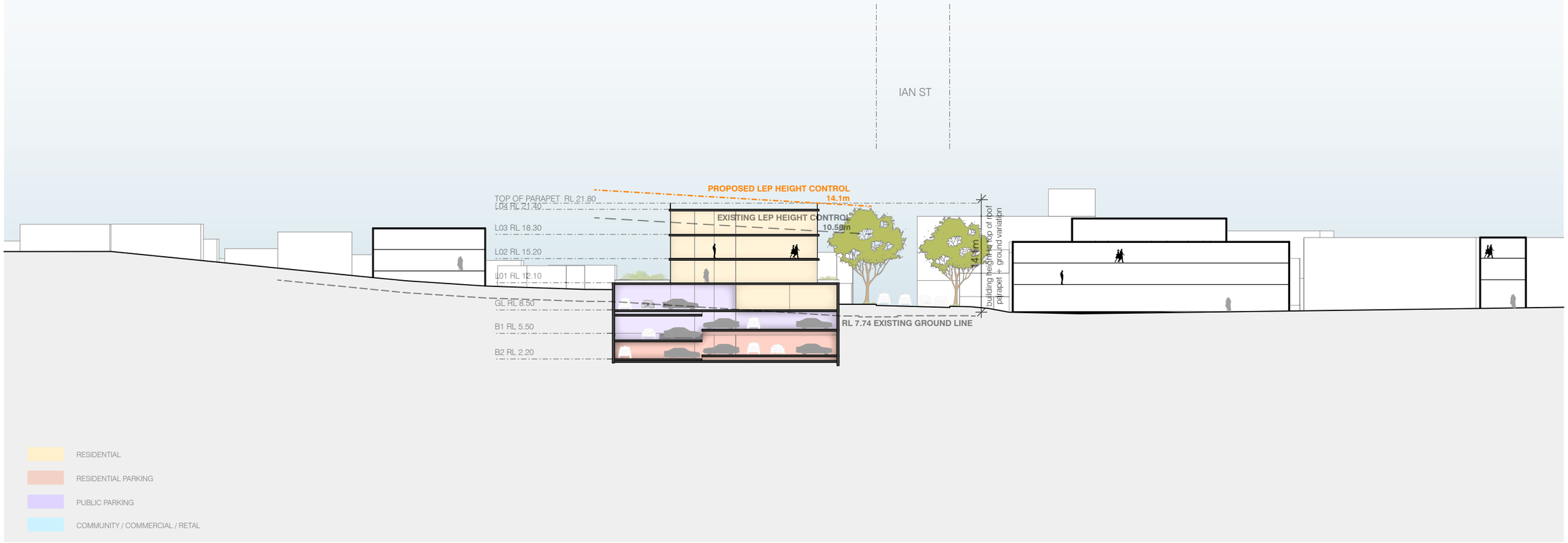

DOVER RD
IAN LANE
4m
deep soil
zone
PROPOSED LEP HEIGHT CONTROL
14.1m
EXISTING LEP HEIGHT CONTROL
10.50m
TOP OF PARAPET RL 21.80
L04 RL 21.40
L03 RL 18.30
L02 RL 15.20
L01 RL 12.10
GL RL 8.50
B1 RL 5.50
B2 RL 2.20
14.1m
building height to top of roof parapet + ground variation
RL 7.74 EXISTING GROUND LINE
RESIDENTIAL
RESIDENTIAL PARKING
PUBLIC PARKING
COMMUNITY / COMMERCIAL / RETAL

Section C-C


IAN ST
PROPOSED LEP HEIGHT CONTROL
14.1m
EXISTING LEP HEIGHT CONTROL
10.5m
TOP OF PARAPET RL 21.80
L04 RL 21.40
L03 RL 18.30
L02 RL 15.20
L01 RL 12.10
GL RL 8.50
B1 RL 5.50
B2 RL 2.20
14.1m
Building height is top of roof parapet + ground variation
RL 7.74 EXISTING GROUND LINE
RESIDENTIAL
RESIDENTIAL PARKING
PUBLIC PARKING
COMMUNITY / COMMERCIAL / RETAL

Section D-D

Summary: Ian Street Site

Site area: 1132 m²

YIELDS	AJ+C Proposal
Residential GFA	2080 m²
Retail GFA	220 m²
Total GFA	**2280 m²**
Residential Apartments	**25 apts**
Public Parking	37 cars
Residential Parking	32 cars
Total Parking	**69 cars**

PLANNING CONTROLS	AJ+C Proposal
Exisiting FSR Control	none applied
Proposed FSR	**2 :1**
Existing Building Height Control	10.5 m
Proposed Building Height	**14.1 m**
Existing Land Zoning	SP2
Proposed Land Zoning	**B2**

Assumptions:
Ground level variation: 0.6-0.8m
Ground level floor to floor height: 3.6m
Residential level floor to floor height: 3.1m
Roof parapet height: 0.4m (Non trafficable roof, access for maintenace only)
Average apartment size of 80m² used on Hill PDA brief

Residential Yields and SEPP 65 Checking

Ian Street Site _ Option 2 & 3

	1B (min. 50m²)	2B (min. 70m²)	3B (min. 90m²)	Vistor Parking Required	Total	Solar Access	Natural Ventilation
Level 3	4	3	1		8	6	5
Level 2	5	2	1		8	5	4
Level 1	2	2	2		6	3	4
Ground Level			3		3	3	3
Total	11	7	7		25	17	16
Residential Mix	44%	28%	28%		100%		
DCP 2015 Residential Parking Rate	*0.5*	*1*	*1.5*	0.2			
Residential Parking Required	6	7	11	5	28		
AJ+C Proposed Residential Parking					30		
SEPP 65 Requirement						*70%*	*60%*
SEPP 65 checking						68%	64%

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HERITAGE
INTERIORS
GRAPHICS

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01 November 2016

Woollahra Municipal Council
536 New South Head Road,
Double Bay,
NSW 2028

Attn: Marine Roujon

Dear Marine

RE: SEPP 65 STATEMENT FOR IAN STREET CAR PARK SITE

This *State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development* (SEPP 65) Statement is provided to assist Woollahra Municipal Council in its Planning Proposal of Rose Bay Car Park Sites, being Wilberforce Avenue car park site and Ian Street car park site.

SEPP 65 is applicable on Ian Street car park site only, which is proposed for mixed uses, including residential, public parking and ground level retail.

The statement is focused on the nine Design Quality Principles set out in SEPP 65, while the detailed design could be checked against the Apartment Design Guide (ADG) at DA stage. These comments are based on the concept that has been submitted to support the planning proposal for the site which proposes to rezone the site to B2 Local Centre, and apply floor space ratio of 2:1 and height of 14.1m.

Principle 1: Context and Neighbourhood Character

Rose Bay car parks are located within Rose Bay Centre, an established urban area, which is comprised of several key uses including retail, health, accommodation, food and a number of professional services. The existing streetscape is characterized by ground level activation as well as mature trees along street edges.

i. The design acknowledges the scale, texture and colours of the neighbours across Dover Road, Ian Street and Ian Lane.

ii. The presentation to Dover Road and Ian Street is a freestanding four storey mixed use building with ground level activation and residential above, and it appears to Ian Lane as a 3-storey residential building.

iii. The design has responded to the existing streetscape and neighbourhood characters by:
- Proposing ground level retail activation at the corner of Dover Road and Ian Street, directly opposite Parasi's Food Hall across Dover Road and Fish At The Bay across Ian Street;
- Keeping four existing mature trees in a setback along the east boundary which adjoins a residential zone.

Principle 2: Built Form and Scale

There are a variety of architectural forms with general heights of 1-2 storeys and maximum 4 storeys in the area. The immediate context to Ian Street car park site includes:
- 1-2 storey pitch roofed residential buildings right against the south boundary;
- 1-2 storey pitch roofed residential buildings and a 3-storey modern built form to the west across Dover Road;
- 1 storey pitch roofed buildings and a 3-storey residential flat to the north across Ian Street;
- 4-storey modern residential flat to the east across Ian Lane.

i. The proposal has a four storey modern built form to respond to the existing bulk and scale in the surrounding building context.

ii. The proposed building is setback:
- 4m from the eastern boundary, which is against Ian Lane, a narrow street, to allow for a comfortable scale between the proposed and the existing built forms;
- 6m from the southern boundary to give good separation and respect to the existing 1-2 storey residential blocks to the south.

Principle 3: Density

i. The proposed density is appropriate to the site, which is consistent with the density of Rose Bay Centre area.

ii. The proposed density supports the steady population growth in the area. Refer NSW population projections Sydney Metro LGA data 2016 on Department of Planning and Environment website.

iii. Increasing residential density in and around commercial centres is good planning practice as it encourages walking and can reduce vehicle use.

iv. The proposed density can be well sustained by existing infrastructure, public transport, community facilities and the environment.

Principle 4: Sustainability

i. Design to achieve a high percentage of apartments with natural cross ventilation and sunlight for the amenity and liveability of residents.

ii. Opportunities to increase natural light and ventilation are encouraged on the upper level, through the roof.

iii. Natural light and ventilation to the central corridor.

iv. Passive thermal design for ventilation, heating and cooling to reduce the reliance on technology and operation costs.

v. Solar panels mounted on roof.

vi. Water efficient fittings to be used.

vii. Deep soil zone for ground water recharge and vegetation.

Principle 5: Landscape

i. The existing mature trees along east boundary are retained within the proposed deep soil zone, which contribute to the local context, micro-climate, habitat values and residents amenities.

ii. Communal open space is proposed within the 6m setback zone along the south boundary. The design optimises useability, privacy for both residents and neighbours, and opportunities for social interaction, quiet contemplation and high amenity. It also provides for practical establishment and long term management.

Principle 6: Amenity

The design provides good amenities for both the residents and the neighbours, including appropriate room sizes, access to sunlight, natural ventilation, outlook, visual and acoustic privacy and easy accessibility for different age groups and degrees of mobility.

Principle 7: Safety

i. Each use within this mixed use building has its own address and frontage, which provides clear entry point.

ii. The public and private spaces are clearly defined and fit for the intended purpose.

iii. A positive relationship between public and private spaces can be achieved through clearly defined secure access points, which are carefully located at the appropriate location for the intended purpose, well-lit and easily maintained.

iv. Passive surveillance of public and communal areas are maximised to promote safety.

Principle 8: Housing Diversity and Social interaction

i. A mix of apartment sizes relating to the future demographic of the area have been considered in the design.
ii. Communal space and facilities are provided to provide opportunities for social interaction among residents.

Principle 9: Aesthetics

i. The design achieves a built form that has good proportions and a balanced composition of materials, elements, colours and textures.
ii. The built form design reflects the internal layout and structure.
iii. The visual appearance of the building responds to the existing local context, particularly the building textures and colours and the repetitions of the streetscape.

Yours faithfully
ALLEN JACK + COTTIER

Michael Heenan
CEO, Principal Design

5 ARCHITECTURAL CONCEPTS

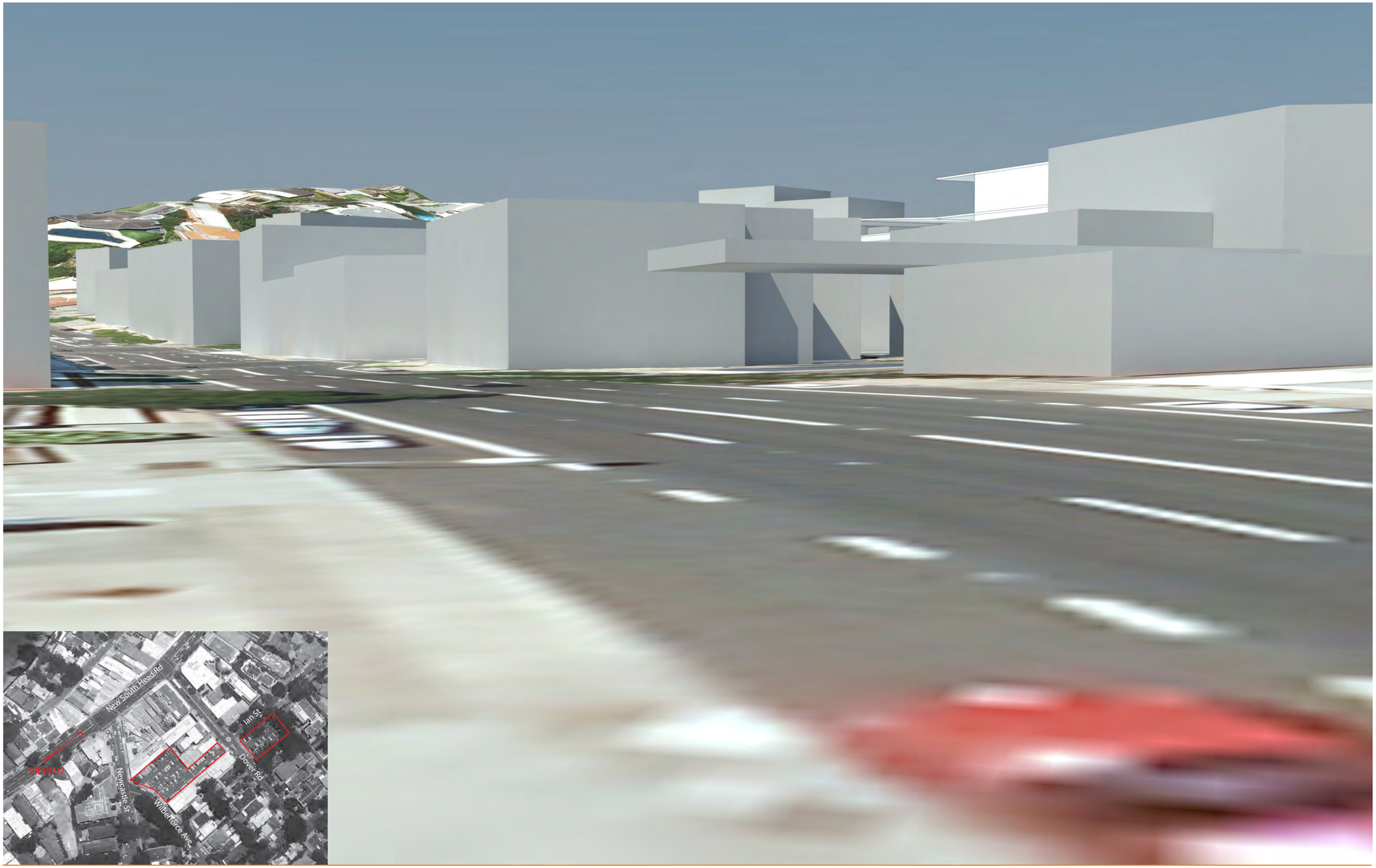
5.3 Key Views From 3D Massing Model _Aerial View Toward North

5.3 Key Views From 3D Massing Model _ Aerial View Toward Southeast

5 ARCHITECTURAL CONCEPTS

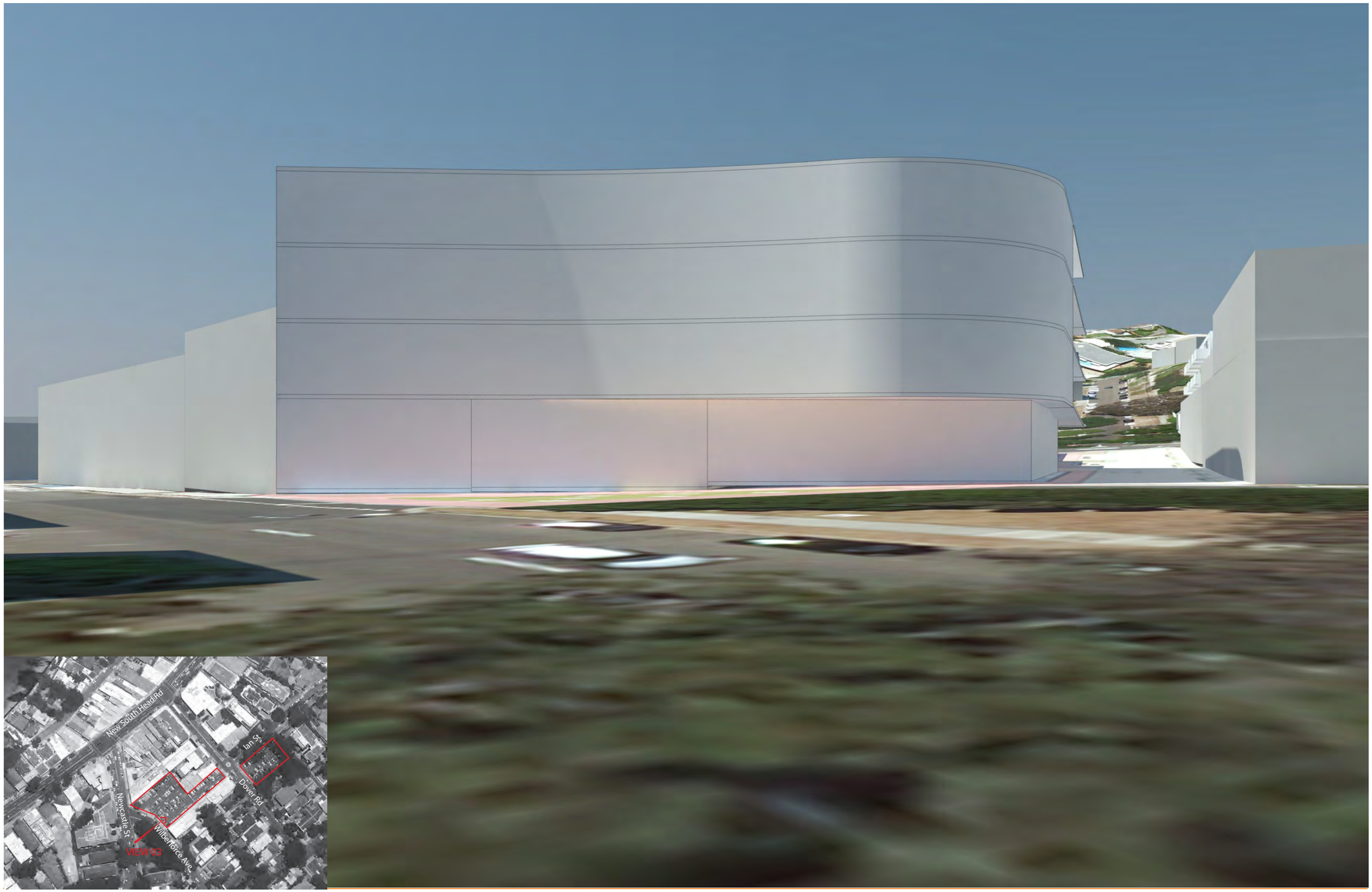
5.3 Key Views From 3D Massing Model _ Street View01 from New South Head Road Toward Wilberforce Avenue Site

5.3 Key Views From 3D Massing Model _ Street View02 from New South Head Road toward Northeast

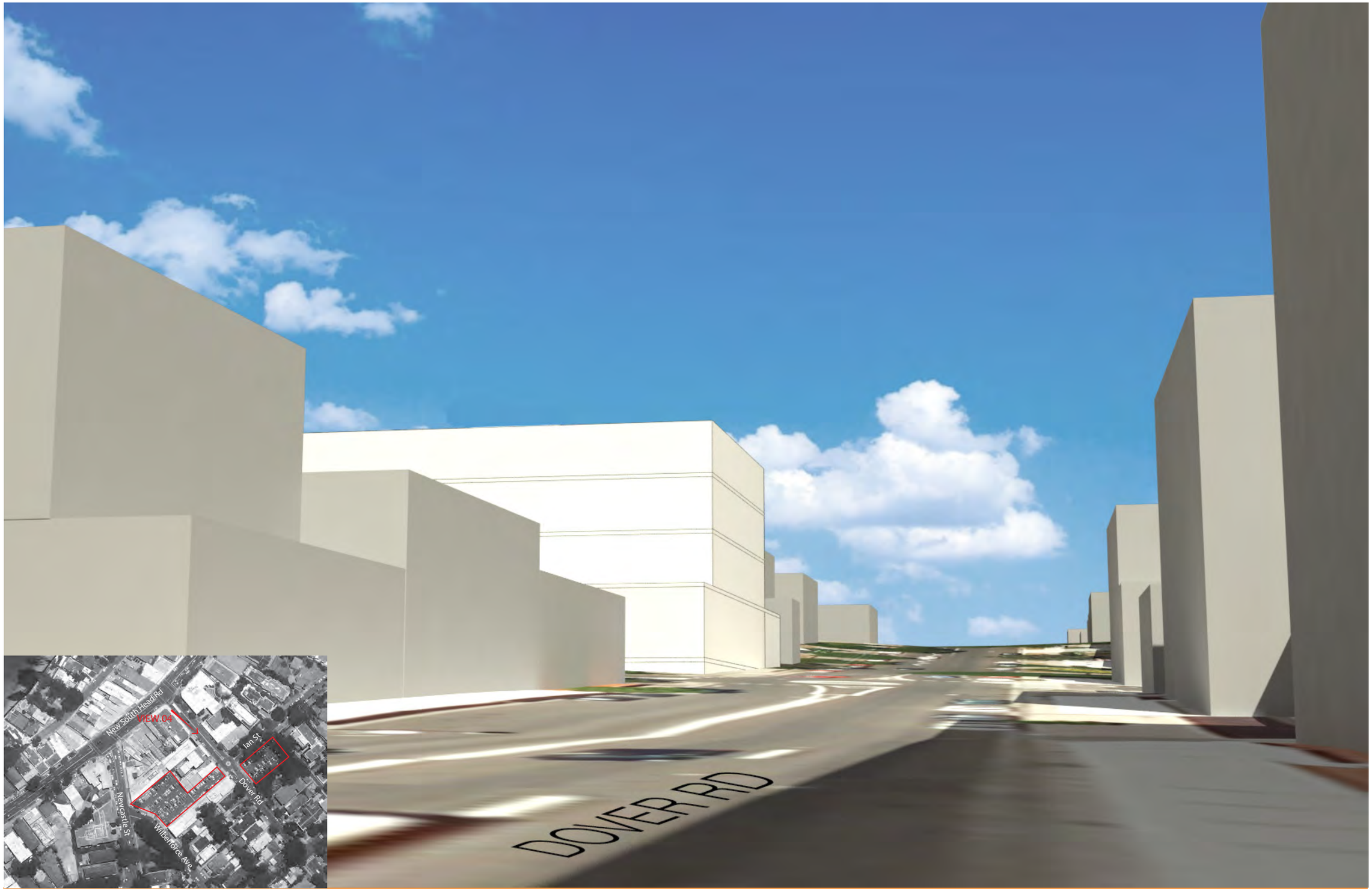


5 ARCHITECTURAL CONCEPTS

5.3 Key Views From 3D Massing Model _ Street View03 From Panerong Reserve Toward Wilberforce Avenue Site

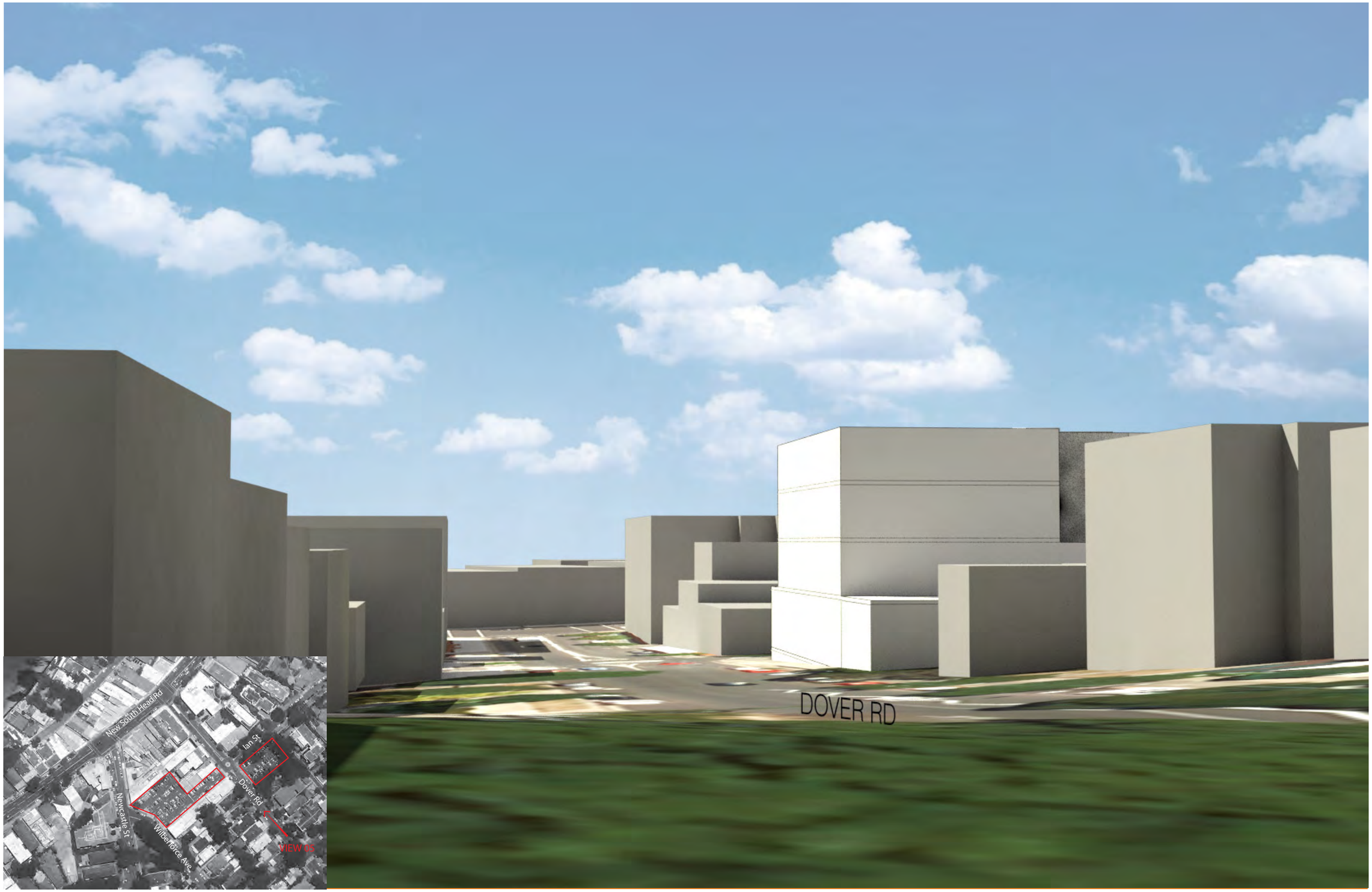


5.3 Key Views From 3D Massing Model _ Street View04 From Dover Road Toward Ian Street Site On Southeast



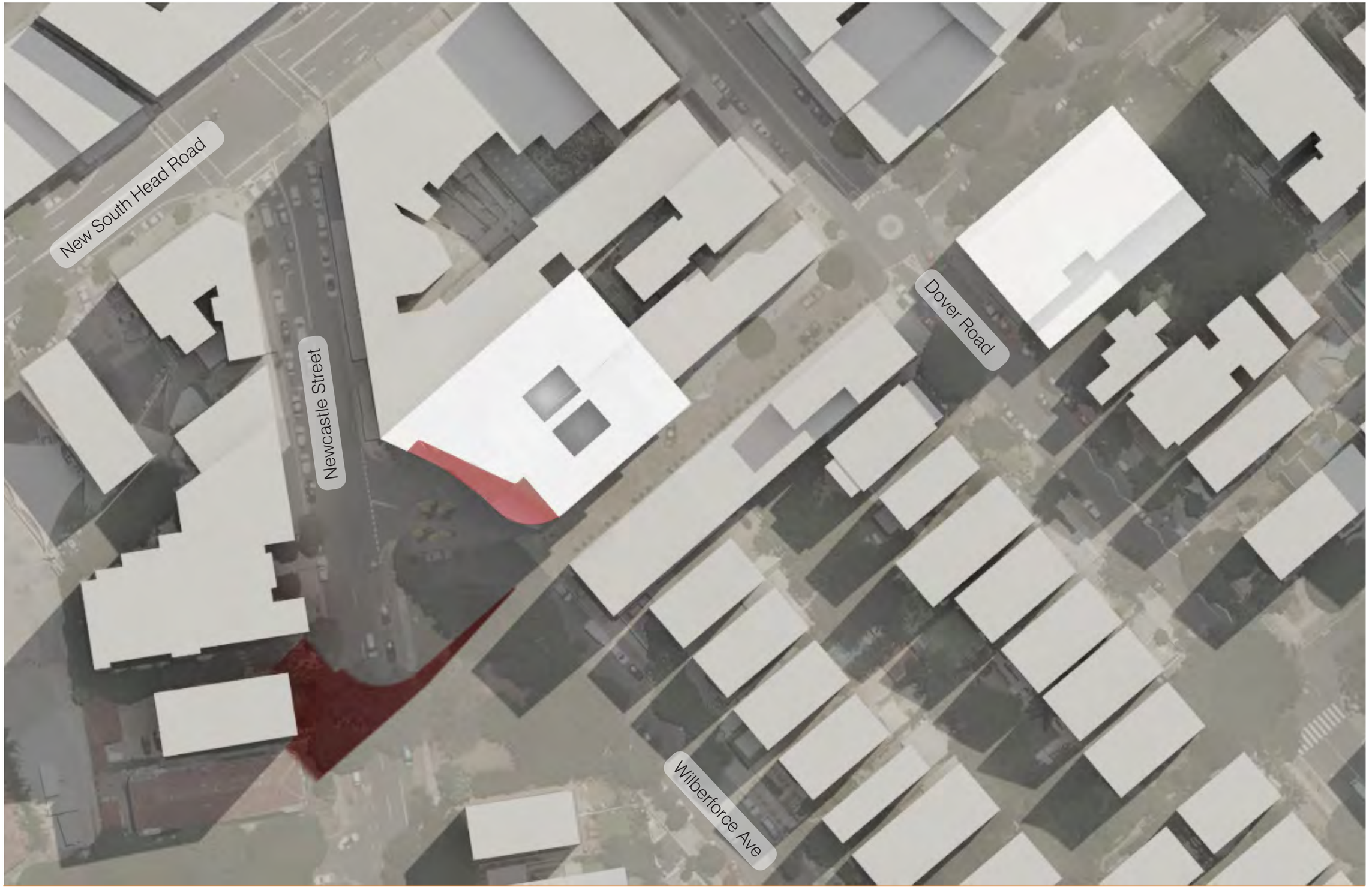
5 ARCHITECTURAL CONCEPTS

5.3 Key Views From 3D Massing Model _ Street View05 From Dover Road Toward Ian Street Site On Northeast



5 ARCHITECTURAL CONCEPTS

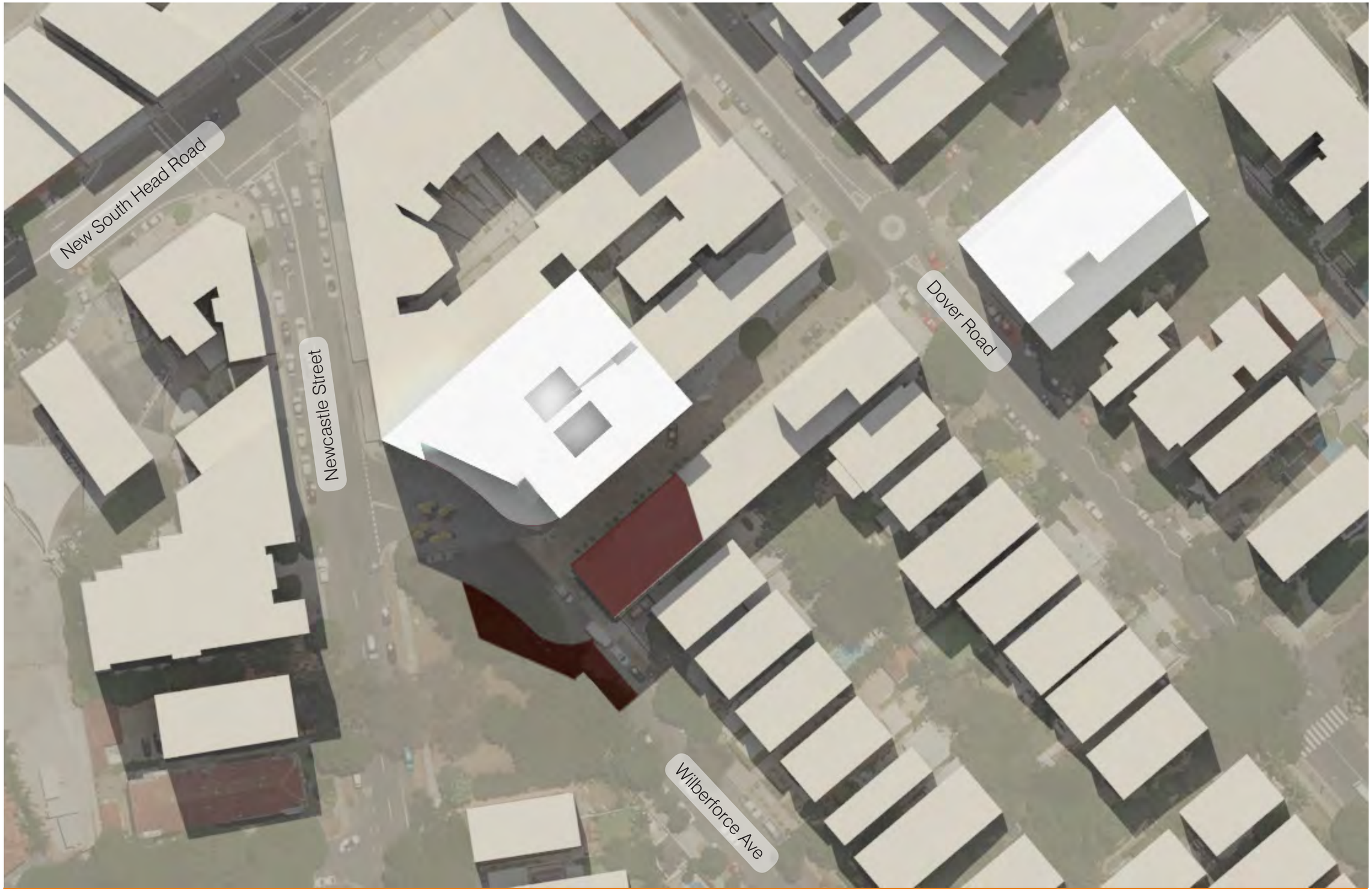
5.4 Solar Study _ 9am Mid-Winter



5.4 Solar Study _ 12pm Mid-Winter

5 ARCHITECTURAL CONCEPTS

5.4 Solar Study _ 1pm Mid-Winter



5.4 Solar Study _ 2pm Mid-Winter

5 ARCHITECTURAL CONCEPTS

5.4 Solar Study _ 3pm Mid-Winter

ROSE BAY CAR PARKS
URBAN DESIGN STUDY

WOOLLAHRA COUNCIL

AJ+C
ALLEN JACK+COTTIER

Allen Jack+Cottier Architects Pty Ltd
ABN 53 003 782 250

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Annexure 5

Rose Bay Car Parks

Visual Impact Assessment

Prepared for:
Woollahra Municipal Council

Date:
January 2017

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Contents

1 Introduction

Purpose of this report

This Visual Impact Assessment (VIA) has been prepared by Architectus to inform the proposed planning controls for the two (2) Council car parks, Wilberforce Avenue Car Park and Ian Street Car Park, located at the intersection of New South Head Road and Dover Road in Rose Bay.

Site location and context

The site is located in Rose Bay, a suburb strategically placed 7km east from the Sydney CBD. Rose Bay has beautiful harbour views of the city, a predominately residential character, and a number of federal and state significant heritage buildings, with good ferry connections to both Central Sydney and the Eastern suburbs.

The site occupies seven (7) lots over two blocks situated in the south-eastern part of the main town centre area. The two sites have street frontages to Wilberforce Ave, Dover Road, Ian Street and Ian Lane.

Description of the project

Key features of the concepts that would be permissible through the planning proposal are:

- Four (4) storeys with a community centre, commercial space, and 268 public parking spaces on the Wilberforce Ave site car park; and,
- Four (4) storeys with retail/commercial uses, residential apartments, and 37 public parking spaces on the Ian Street site car park.

2 View Selection and Methodology

Viewpoints

Viewpoints were initially nominated for visual impact assessment based on their relative importance and likelihood to be of value to the community for a variety of leisure, recreation, residential or employment activities. They typically represent locations in the public domain where a relatively significant number of people are likely to congregate or pass, and potentially, experience a view of the proposal. In addition, some viewpoints were chosen because of their public prominence and to assess whether the site can be seen from the viewpoint location.

View 1 specifically was chosen to test private view sharing from the adjacent residential flat building to the proposed development, with comparison to what views are impacted by the subject site.

Significant vegetation has been included in views based on the survey prepared by S J Dixon Surveyors Pty Ltd.

The proportions have been assumed from site visits and modelling by AJC.

This report has not included a visitation to individual properties and documentation of actual existing views.

Standards for photography

All individual photographs have been taken at a 35mm format (lens) at a 35mm and 50mm focal length. This is the accepted standard of the New South Wales Land and Environment Court for approximating the normal human depth of field, so that the size of the image approximates the size of the object as seen by the eye from the same location.

All the views have a 35mm focal length as the base, with a 50mm focal length overlayed on top.

Preparation of the masked outline overlays involved the following steps:

- Digital photographs were taken from each of the selected viewpoints in the direction of the proposed development;
- Each viewpoint was surveyed for a precise location and reduced level (RL) by a surveyor;
- A computer generated 3D model of the proposed building was prepared;
- The 3D model was inserted into the photographs from the key vantage points using the same 50mm or 35mm focal length;
- The precise RL of the location (plus 1.55m to represent eye height), and;
- A mask is placed over the location of the 3D model, illustrating its extent in the view.

Legend

- 3D model terrain
- Site areas
- Key locations and view direction

TABLE OF PHOTOGRAPHIC CONTROL

No.	DESCRIPTION	EASTING	NORTHING	R.L.
1	OUTSIDE APARTMENT "2 IAN STREET" LOCATED ON IAN LANE	340104.2	6250882.5	13.1
2	ON THE PEDESTRIAN PATH OPPOSITE 54 BLAKE STREET	340823.8	6250666.6	62.3
3	NEW SOUTH HAD ROAD, FOOTPATH OVERLOOKING THE KAMBALA COLLEGE FIELD	340194.2	6251527.3	49.8
4	500m OFFSHORE, ROSE BAY	339639.8	6251470.5	0

Private view sharing
Visual Impact Assessment views

View 1: 2-4 Ian Street, Rose Bay,
Private view sharing

Private views
This diagram represents the views towards the city and harbour from 2-4 Ian Street, Rose Bay (see image on page 19).

The landmark building indicated by the red asterisk is one of the taller buildings (8 storeys) within the immediate area, and is clearly visible within the skyline.

This building acts as a frame for the private views of 2-4 Ian Street, with the significant harbour and city view corridor situated north of the landmark building.


2-4 Ian Street
Landmark building
N

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View 1: 2-4 Ian Street, Rose Bay,
Private view sharing

Location key View

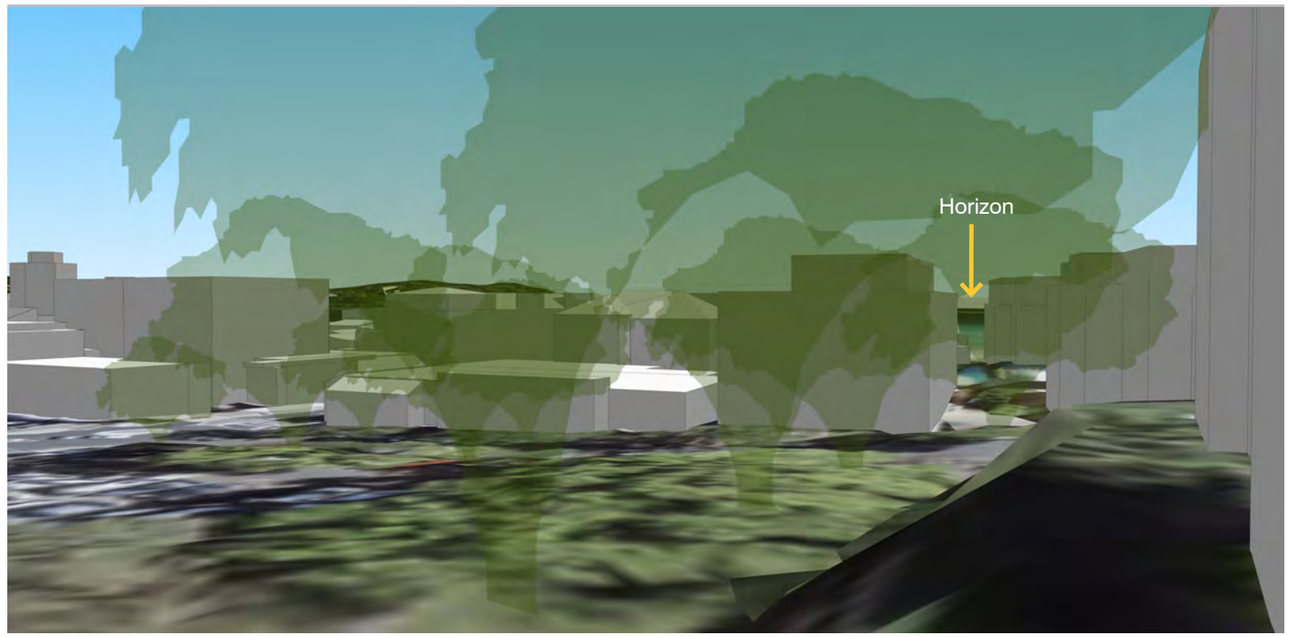
View 1 section from 2-4 Ian Street shows private primary living spaces (indicated green) and of secondary living spaces (indicated orange) facing the Ian Street car park development. Views have been obtained from key balconies in the development which potentially could be impacted by the proposed development (Locations indicated by red dots).

Legend

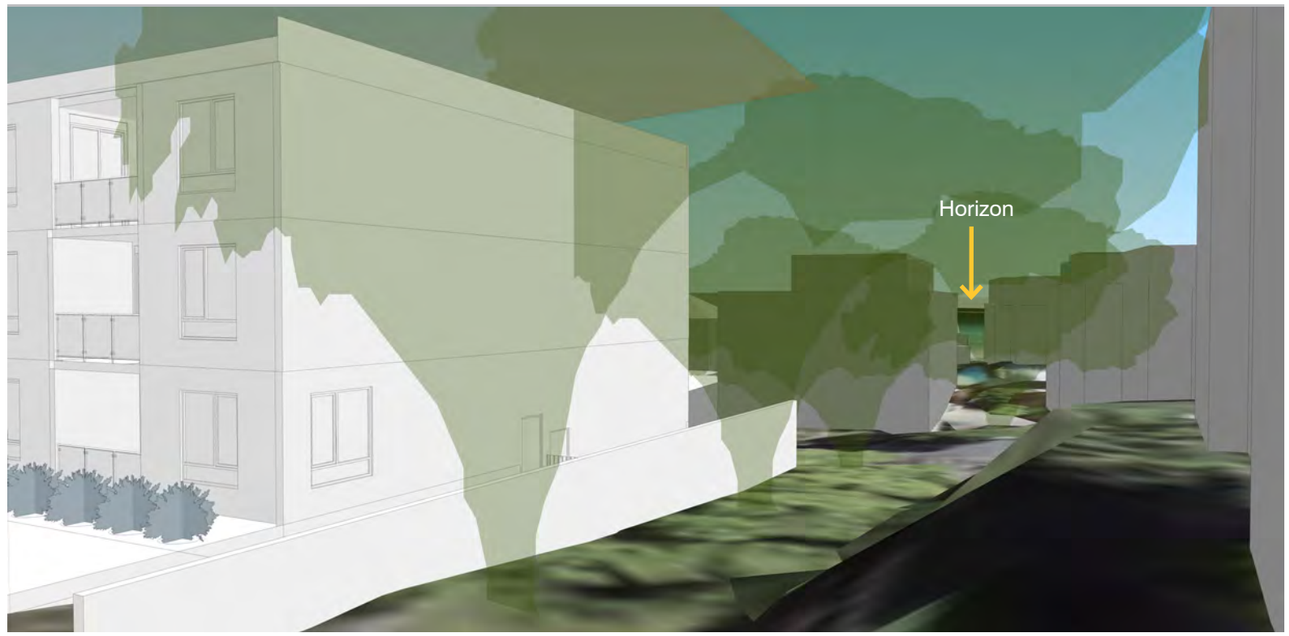
- Primary living space
- Secondary living space
- Non- habitable/ wall
- Proposed height controls

View 1: 2-4 Ian Street, Rose Bay,
Private view sharing

Key plan



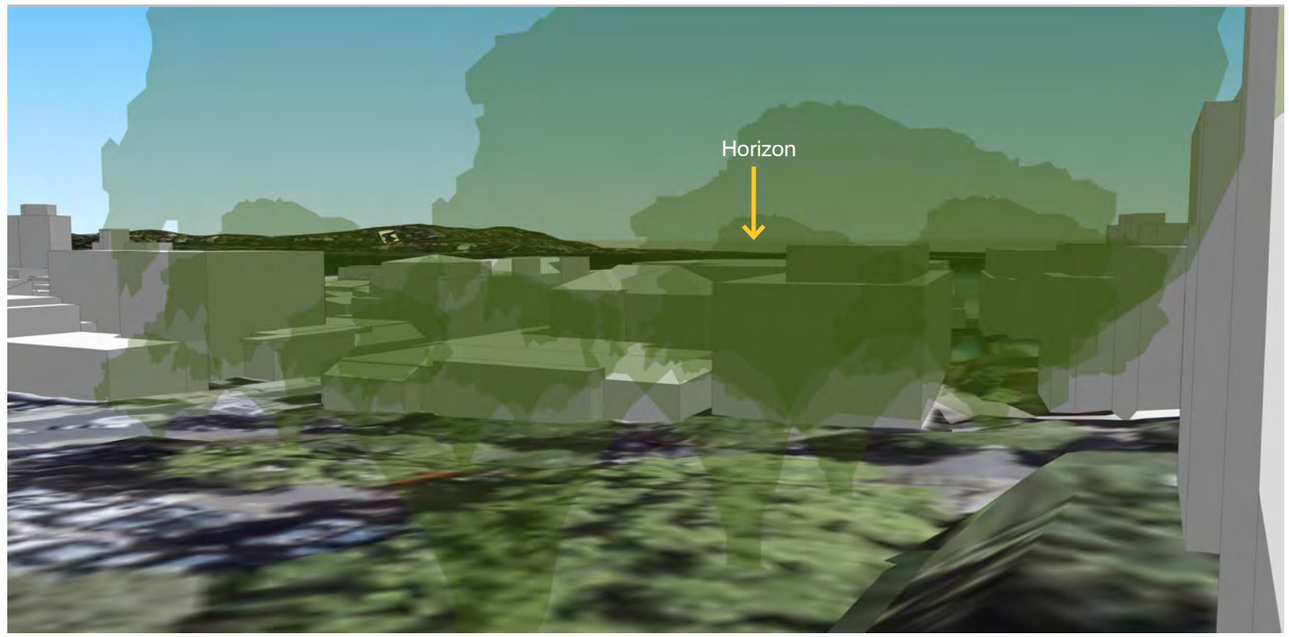
Location 1 - Existing
(Ground level)



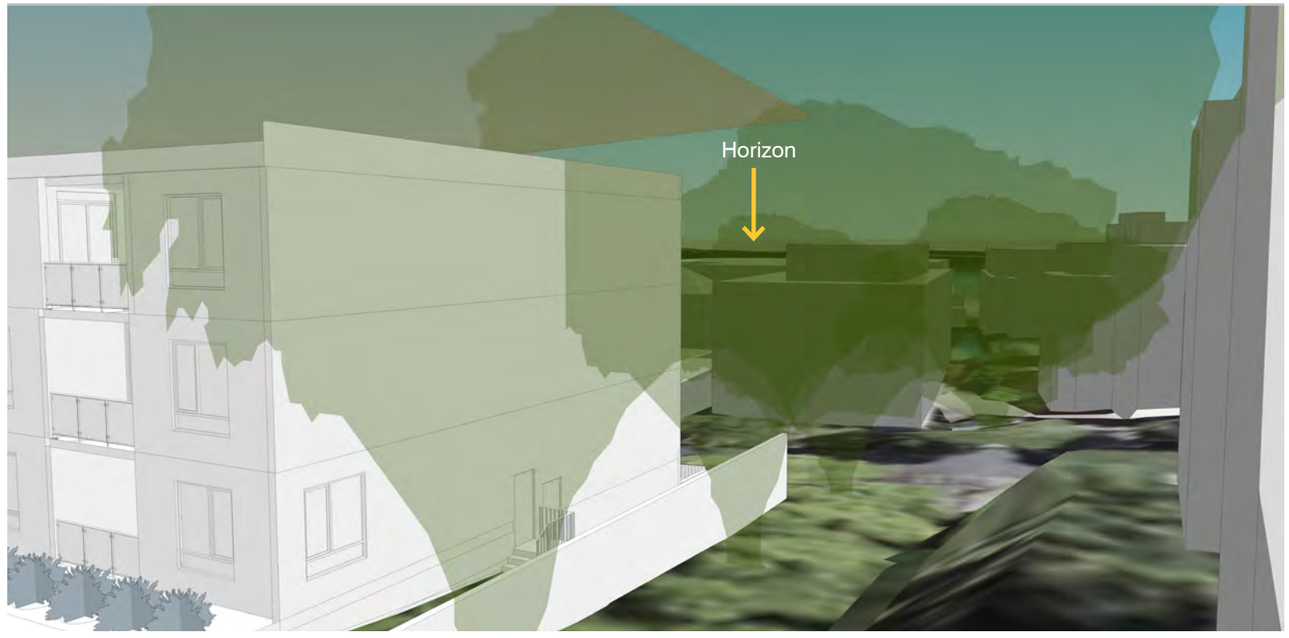
Location 1 - Proposed

View 1: 2-4 Ian Street, Rose Bay,
Private view sharing

Key plan



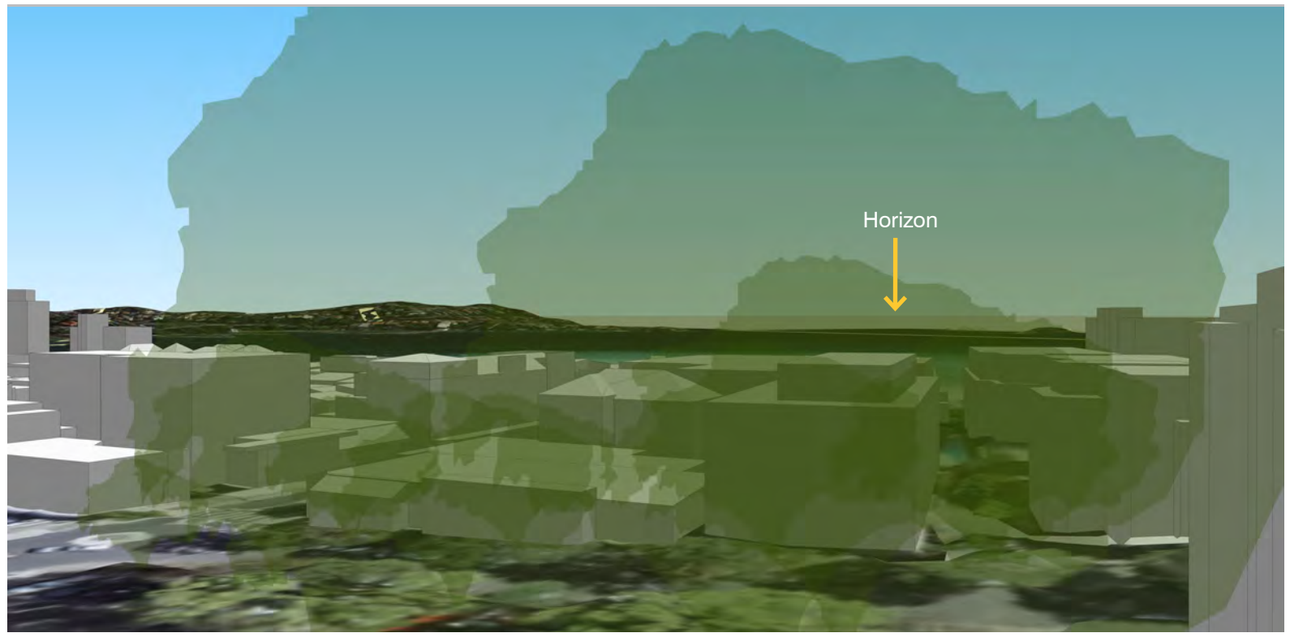
Location 2 - Existing
(Level 1)



Location 2 - Proposed

View 1: 2-4 Ian Street, Rose Bay,
Private view sharing

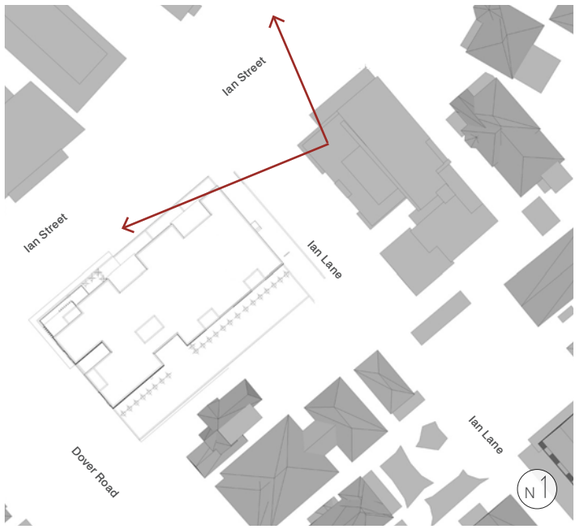
Key plan



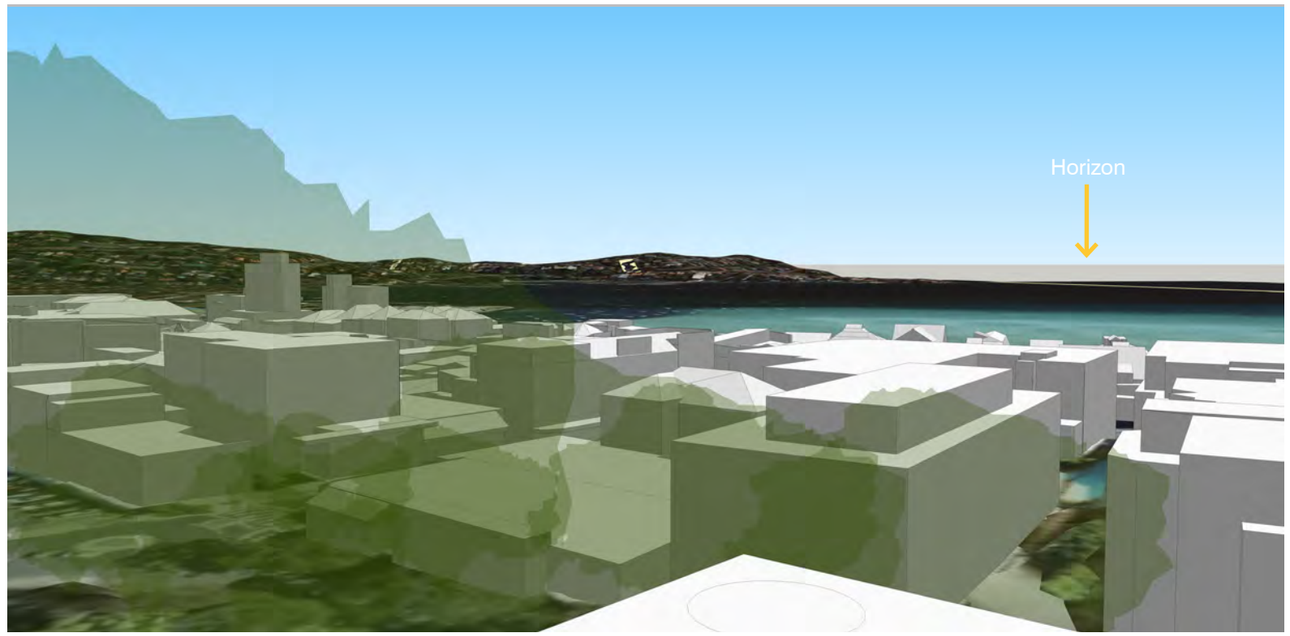
Location 3 - Existing
(level 2)

Location 3 - Proposed

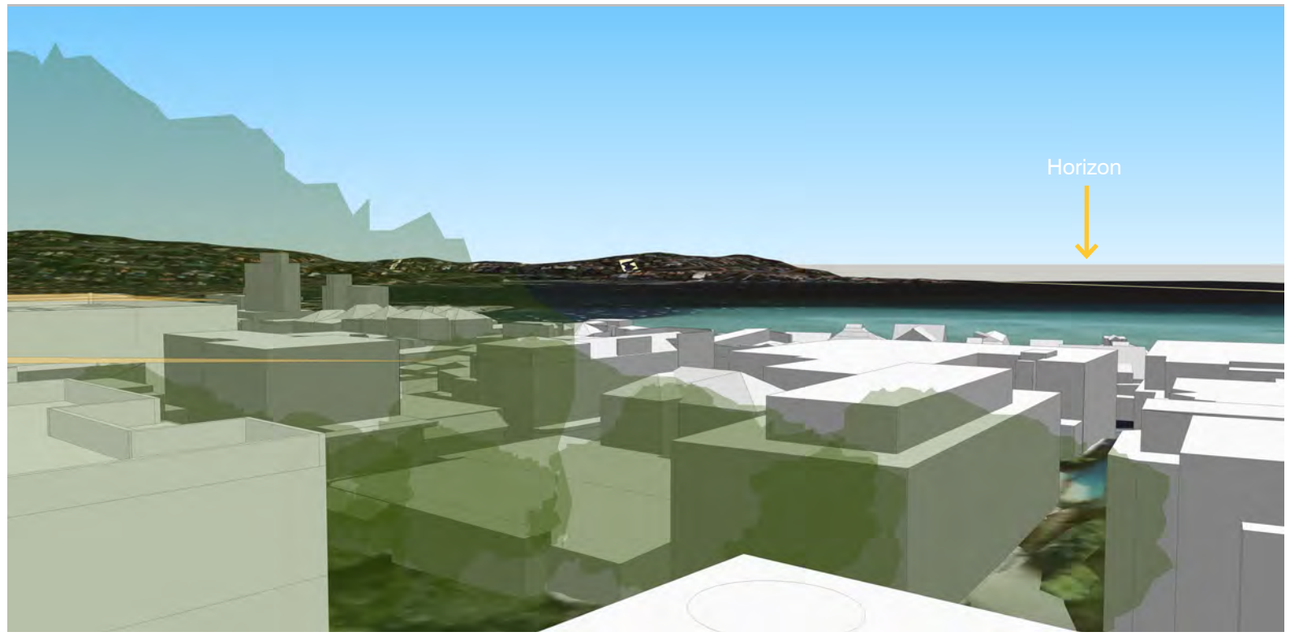
View 1: 2-4 Ian Street, Rose Bay,
Private view sharing



Key plan



Location 4 - Existing
(Rooftop level)



Location 4 - Proposed

Public Domain
Visual Impact Assessment views

View 2: Blake Street, Dover Heights, looking towards the centre

Existing view

Proposed building envelope and development concept view

View 3: The public domain on New South Head Road, to the centre over Kambala

Existing view

Proposed building envelope and development concept view

View 4: Sydney Harbour, 500m out, looking towards the centre

Existing view

Proposed building envelope and development concept view

architectus™

Annexure 6

idealgeotech
a division of idealcorp

Report on

Geotechnical Assessment

Prepared for: Woollahra Municipal Council

Address: Wilberforce Avenue & Ian Street Car Parks, Rose Bay

Job No: 23921

Date: October 2016

Accredited for compliance
With ISO/IEC 17025
NATA Accreditation No. 19226

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TABLES

APPENDICES

1.0 INTRODUCTION

Ideal Geotech has prepared this report to discuss the results of the geotechnical investigation undertaken for the two proposed multi storey car parks located at Ian Street and Wilberforce Avenue, Rose Bay.

Investigation was required to provide information on subsurface conditions for the purpose of:

> Earthworks procedures and guidelines including site preparation, soil profiles and excavation conditions;

> Founding conditions and allowable bearing capacities;

> Retaining wall design parameters;

> Pile design parameters;

> Comment on groundwater levels;

> Assessment of soil aggressivity to concrete and steel; and

> Special requirements for construction procedures and/or site drainage.

A Preliminary Geotechnical Assessment has been undertaken by Environmental Investigations, Report No. E22135 GA, dated 1 May 2014, and should be read in conjunction with this report.

The proposed development indicated on the architectural drawings supplied by the client comprises construction of two multi storey car parks development. Excavations for the basement portion of The Wilberforce Avenue carpark are expected to extend up to 6m And for the Ian Street Carpark is understood that up to 10m of cut will be required for the basement portion of the carpark.

2.0 SITE DETAILS

The following information, presented in Table 1, describes the site.

Table 1: Summary of Site Details

Site Address	Ian Street and Wilberforce Avenue Car Parks, Rose Bay
Client	Woollahra Municipal Council
Council Area	Woollahra Municipal Council

2.1 Geology

The 1:100,000 scale Geological Series Map of the Sydney region indicates that the subject site is underlain by Quaternary Deposits comprising of medium to fine grained marine sand with podsols. The site is close to the boundary of known Hawkesbury Sandstone and the marine sands are expected to be underlain by sandstone.

2.2 Site Description

The subject site at Ian Street is rectangular in shape and measures approximately 30m wide along the Dover Road frontage, approximately 40m deep and covers an area of approximately 1200m^2. The site is currently a Woollahra Municipal Council car park covered in asphalt with mature trees along the north, south and east boundaries. Slopes fall from north east to south west at gradients of approximately 4-5º.

The subject site at Wilberforce Avenue is irregular in shape and covers an area of approximately 2030m^2. The site is bound by Wilberforce Avenue to the west, Dover Road to the east and by commercial and residential buildings to the south, north and north east. The site is currently a Woollahra Municipal Council car park covered in asphalt with slopes falling towards the south west at gradients of approximately 1-2º.

3.0 GEOTECHNICAL INVESTIGATION

3.1 Field Work

Fieldwork was undertaken on 26 to 28 September 2016 and included drilling six boreholes (BH1-BH4 within the Wilberforce Avenue car park and BH5-BH6 within the Ian Street car park) using a purpose built hydraulic track mounted drill rig. The drilling methods used included solid flight augers with a TC-Bit, wash boring and NMLC coring techniques within BH5. Standard Penetration Testing (SPT) was undertaken at varying intervals within the boreholes.

Water monitoring wells were installed in BH2 and BH5.

Disturbed samples of selected materials and rock core was retrieved for laboratory assessment and testing.

All fieldwork including logging of subsurface profiles and collecting of samples was carried out by and in the presence of a Geotechnical Engineer from Ideal Geotech. The borehole locations were set out by reference to the supplied drawing and site features. The approximate locations are shown on Figure 1, attached in Appendix A.

Subsurface conditions encountered during the fieldwork are summarised in Section 4.1 and detailed in engineering logs attached in Appendix B, together with explanatory notes.

3.2 Laboratory Testing

Laboratory testing on selected samples comprised:

> Particle Size Distribution (PSD) on the sand soils;

> Soil Aggressivity to Buried structures; and

> Point Load Strength Index testing of rock core.

Results of laboratory testing are detailed in the reports sheets attached as Appendix C and summarised in Section 4.2 below.

4.0 INVESTIGATION FINDINGS

4.1 Subsurface Conditions

The subsurface conditions encountered in the borehole are detailed on the report log sheets, attached in Appendix B together with explanatory notes. The soil profile is summarised in Table 2 below.

Table 2: Summary of Subsurface Conditions

Borehole	Depth of fill (m)	Depth to rock (m)	Depth to water (m)	Summary of subsurface profiles
BH1	0.4	27.5	3.0	FILL-Asphalt overlying Gravelly Sand/ SAND / SANDSTONE
BH2	0.3	NE	2.8	FILL-Asphalt overlying Gravelly Sand / SAND /
BH3	0.4	NE	2.9	FILL-Asphalt overlying Gravelly Sand / SAND /
BH4	0.4	NE	3.0	FILL-Asphalt overlying Gravelly Sand / SAND /
BH5	0.3	11.0	5.8	FILL-Asphalt overlying Gravelly Sand / SAND / SANDSTONE
BH6	0.3	9.9	9.0	FILL-Asphalt overlying Gravelly Sand / SAND / SANDSTONE

NE Not Encountered

During drilling ground water was encountered in all boreholes. The piezometers installed in BH2 and Bh5 were backfilled with a 5 mm sand filter pack to a level above the screened section and then sealed with bentonite to a depth of approximately 0.5m from natural surface levels with the remaining backfill comprising sand spoil. The Piezos were covered with gattic covers cemented in place.

4.2 Laboratory Test Results

The laboratory test results are detailed in report sheets attached in Appendix C and summarised in the tables below.

Table 3: Summary of PSD Test Results

Borehole	Depth (m)	Soil Type	% Passing		
			1.18mm	0.425mm	0.075mm
BH1	6.0	SAND	100	64	7
BH2	7.5	SAND	100	70	4
BH2	12.0	SAND	100	66	2
BH2	18.0	SAND	100	100	15
BH5	9.0	SAND	100	75	5
BH6	7.0	SAND	100	62	4

Table 4: Summary of Aggressivity Test Results

Borehole	Depth (m)	Soil Type	Cl (mg/kg)	SO_4 (mg/kg)	pH	EC (µS/cm)
BH2	9.0	SAND	20	29	5.2	60
BH2	15.0	SAND	9.5	21	7.3	110
BH3	9.0	SAND	9.8	50	5.4	72
BH4	6.0	SAND	30	15	4.9	62
BH4	12.0	SAND	14	35	4.7	63
BH5	9.0	SAND	8.5	32	5.3	50
BH6	6.0	SAND	9.6	13	5.4	36

Table 5: Summary of Point Load Index Test Results

Borehole	Depth (m)	Rock Type	Range of $I_s(50)$	Strength
BH5	11.7	Sandstone	0.7 – 0.9	Medium
BH5	12.0	Sandstone	0.8 – 0.8	Medium
BH5	12.7	Sandstone	0.5 – 0.8	Medium

5.0 COMMENTS AND RECOMMENDATIONS

5.1 Summary of Ground Conditons

The subsurface profile encountered at the Wilberforce carpark comprised marine sands to a depth of 27.5m below ground level, overlying sandstone at the western part of the site. Based on a previous report the depth to rock is expected to decrease towards the east to depths of approximately 21m.

The subsurface profile encountered at the Ian Street carpark comprised Aeolian sands overlying marine sands to varying depths, and underlain by sandstone. Sandstone rock was encountered at a depth of 11m in BH5 and 9.9m in BH6. The depth to sandstone rock decreases from west to east due to the site topography.

5.2 Site Classificaton

This site is classified as **Class A** in accordance with AS2870 – 2011:

As defined in AS 2870-2011, Table 2.1 and section 2.2.3, this site will be classified as **Class A**

based on geology and natural soil profile as encountered on this investigation. The site is expected to have some movement due to settlement.

5.3 Earthworks

In the event fill is to be placed IdealGeotech recommends the placement of engineered fill be carried out in accordance with AS3798-2007 "Guidelines on Earthworks for commercial and residential developments".

In summary, engineered fill should comprise the following:

> Prior to filling, any soft material and vegetation should be removed down to a firm base.

> Suitable fill material shall be placed in loose horizontal layers not exceeding 250mm in thickness.

> The fill shall be compacted to a Dry Density Ratio of at least 98% Standard (AS1289: 5.1.1, 5.4.1 or 5.7.1);

> The fill should be compacted to within +/-2% of the soils optimum moisture content

> The fill material shall not contain greater than 20%, by volume, of particles coarser than 37.5mm and no particle over 200mm in any dimension.

> Under no circumstances should any additional fill contain significant amount of organic matter or be a mixture of greatly different particle sizes.

5.4 Excavation Conditions and Retaining Walls

As the subsurface material mainly consists of stiff silty and sandy clays overlying medium dense sand and sandy gravel, excavation can be achieved using conventional earthmoving equipment such as backhoes and excavators.

Excavations in the sand could not be expected to stand for any significant length of time, especially below the groundwater level, and should be appropriately supported. Excavations require dewatering as the groundwater table is higher than the proposed excavation depths.

All structural retaining walls should be engineer designed. Design of retaining walls should:

> Consider surcharge loading from slopes and structures above the wall;

> Take into account loading from any proposed compaction of fill behind the wall;

> Provide adequate surface and subsurface drainage behind retaining walls;

> Utilise materials that are not susceptible to deterioration;

> Ensure walls are founded in materials appropriate for the loading conditions.

Table 6: Geotechnical Design Parameters

Material	Bulk Unit Weight (kN/m³)	Angle of Friction (°)	Young's Modulus (MPa)
Loose Sand	16	27	15
Medium Dense Sand	18	30	30
Dense Sand	19	34	50
Sandstone	22	32	10,000

It is anticipated that a fully tanked secant pile wall or diaphragm walls will be required to support the basement excavations.

5.5 Groundwater

Groundwater was encountered during the fieldwork in all boreholes up to depths of at depths of 2.8m to 3m within the Wilberforce car park area and 5.8m to 9m below ground level within the Ian Street car park area. It is anticipated that dewatering and support of excavations will be required at excavation beyond this depth.

The best option for the control of groundwater during construction would be the installation of spear points prior to construction. Drawdown effects of the surrounding area will need to be considered during the planning of the dewatering method to be used.

It should be noted that prior to the construction a licence will be required for dewatering. Prior to the commencement of construction the groundwater wells should be sampled to determine base line conditions of the groundwater.

5.6 Footings - Allowable Bearing Capacity

All footings should be founded below any uncontrolled fill or deleterious materials. All footings for the same structure should be founded on strata of similar stiffness and reactivity to minimise the risk of differential movements.

All footing excavations should be inspected prior to installation of structural steel by Ideal Geotech or a suitably experienced engineer or geotechnical consultant to confirm that the founding conditions are as described in this report. All loose material should be cleared from the footing excavations before concrete is poured.

5.6.1 High Level Footings

High-level footing alternatives could be expected to comprise slabs-on-ground with edge beams or pad footings for the support of concentrated loads. Such footings designed in accordance with engineering principles and founded in medium dense sands may be proportioned on an allowable bearing capacity of 100kPa and founded in the slightly weathered sandstone in the Ian Street car park may be proportioned on an allowable bearing capacity of 1000kPa. The founding conditions should be assessed by a geotechnical consultant or experienced engineer to confirm suitable conditions.

5.62 Piered Footings

Piered footings are considered as an alternative to deep edge beams or high level footings. Piered footings, founded in the medium dense to dense sand could be proportioned on an end bearing pressure of 200kPa and founded in the sandstone in the Ian Street car park could be proportioned on an end bearing pressure of 1000kPa.

The potential for volume change in the subsurface profile should be considered by the designer as the piered footing may move with the soil and undergo differential settlement or heaving.

Options for piered footings include:

> CFA and cased bored piles;

> Franki Piles;

> Screw Piers; and

> Driven Piles.

5.7 Aggressivenes to Steel and Concrete

The aggressiveness or erosion potential of an environment in building materials, particularly concrete and steel is dependent on the levels of pH and types of salts present. In order to determine the degree of aggressiveness, the test values obtained are compared to tables 6.4.2 (C) and 6.5.2 (C) in AS2159 Piling - Design and Installation and tables 5.1 to 5.4 in AS2870-2011 “Residential Slabs and Footings”. The following testing suite was undertaken with results summarised within table 4 below;

> pH;

> Electrical Conductivity (EC µS/cm);

> Chloride (Cl);

> Sulphate (SO_4); and

> Resistivity (ohm.cm).

Based on test results detailed in Table 4 the soil conditions are considered to be mild to moderately aggressive to concrete and mild to moderately aggressive to steel in high permeability soils. An exposure classification of B1 for concrete has been determined.

6.0 LIMITATIONS

This type of investigation (as per our commission) is not designed or capable of locating all ground conditions, which can vary even over short distances. The advice given in this report is based on the assumption that the test results are representative of the overall ground conditions. However, it should be noted that actual conditions in some parts of the site might differ from those found. If excavations reveal ground conditions significantly different from those shown in our findings, Ideal Geotech must be consulted.

The scope and the period of Ideal Geotech services are described in the report and are subject to restrictions and limitations. Ideal Geotech did not perform a complete assessment of all possible conditions or circumstances that may exist at the Site. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Ideal Geotech in regards to it.

Where data has been supplied by the client or a third party, it is assumed that the information is correct unless otherwise stated. No responsibility is accepted by Ideal Geotech for incomplete or inaccurate data supplied by others.

Any drawings or figures presented in this report should be considered only as pictorial evidence of our work. Therefore, unless otherwise stated, any dimensions should not be used for accurate calculations or dimensioning.

6.0 REFERENCES

- *Geological Series Sheet 9130, Map of the Sydney region, scale 1:100,000*
- *AS 2870-2011 Residential Slabs and Footings*
- *AS 2159-2009 Piling Design and Installation*
- *AS 3798-2007 Guidelines on Earthworks for Commercial and Residential Developments*

For and on behalf of
Ideal Geotech

Dane Dwyer
Geotechnical Engineer

Murali Pamu
Geotechnical Engineer

APPENDIX A

FIGURES

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a division of idealcorp

DRAWING TITLE:	BOREHOLE LOCATION PLAN	CLIENT:	Woollahra Municipal Council	DRAWN BY:	DD
PROJECT NAME:	GEOTECHNICAL INVESTIGATION	PROJECT NO:	23921	CHECKED BY:	MP
SITE LOCATION:	WILBERFORCE AVENUE & IAN STREET CAR PARKS, ROSE BAY	DRAWING NO:	1	DATE:	October 2016
		FILE REF:	Figure 1	OFFICE:	

NORTH

APPENDIX B

BOREHOLE LOGS

idealgeotech
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SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 1

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
ADT	▼			0		Fill, Gravelly SAND, fine to medium grained, brown, fine to medium gravel	M		0.1m of asphalt overlying fill
						SAND, fine to medium grained, yellow	M	L	
				1		pale grey			
				2					
				3			W		
WB		SPT 3.0m 2,3,4 N=7		4		pale brown			
				5					
						SAND, trace silt, fine to medium grained, pale grey-pale brown	W	L-MD	
				6					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

Consistency
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

Moisture
PL - Plastic Limit
D - Dry
M - Moist
W - Wet

BORE HOLE NO. 1

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 6.0m 6,9,11 N=20		6		*Continued* - SAND, trace silt, fine to medium grained, pale grey-pale brown	W	MD	
				7		SAND, fine to medium grained, pale brown-yellow	W	MD	
		SPT 9.0m 6,11,15 N=25		9		pale grey-pale brown			
				12					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

BORE HOLE NO. 1

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 12.0m 11,18,20 N=38		12		*Continued* - SAND, fine to medium grained, pale grey-white	W	D	
				13					
				14					
				15					
				16		pale grey-yellow			
				17					
				18					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

BORE HOLE NO. 1

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 18.0m 9,13,18 N=31		18		*Continued* - SAND, fine to medium grained, pale grey-white	W	D	
				19		dark grey			
				20					
				21					
				22					
				23					
				24					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

Consistency
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

Moisture
PL - Plastic Limit
D - Dry
M - Moist
W - Wet

BORE HOLE NO. 1

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 24.0m 9,16,22 N=38		24		*Continued* - SAND, fine to medium grained, dark grey	W	D	
				25					
				26					
				27					
				28		Borehole terminated at 27.5m due to refusal on sandstone			
				29					
				30					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

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SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 2

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
ADT				0		Fill, Gravelly SAND, fine to medium grained, brown, fine to medium gravel	M		0.08m of asphalt overlying fill
						SAND, fine to medium grained, yellow	M	L	
				1		white-pale grey			
		SPT 1.5m 2,3,3 N=6							
				2					
	▼						W		
WB		SPT 3.0m 3,3,3 N=6		3					
				4		grey-pale brown			
		SPT 4.5m 1,3,5 N=8							
				5		Silty SAND, fine to medium grained, grey-pale brown	W	L-MD	
				6					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

Consistency
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

Moisture
PL - Plastic Limit
D - Dry
M - Moist
W - Wet

SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 2

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 6.0m 2,4,5 N=9		6		SAND, fine to coarse grained, pale brown	W	MD	
				7					
		SPT 7.5m 3,7,7 N=14				SAND, trace silt, fine to medium grained, pale brown-pale grey	W	MD	
				8					
		SPT 9.0m 6,10,14 N=24		9		SAND, fine to medium grained, pale grey	W	MD	
				10					
				11					
				12					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

BORE HOLE NO. 2

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 12.0m 9,16,18 N=34		12		*Continued* - SAND, fine to medium grained, pale grey-white	W	D	
				13					
				14					
		SPT 15.0m 6,10,14 N=24		15		yellow-pale grey			
				16					
				17					
				18					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

BORE HOLE NO. 2

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 18.0m 7,10,10 N=20		18		*Continued* - SAND, fine to medium grained, grey	W	MD	
						Borehole terminated at 18.5m			
				19					
				20					
				21					
				22					
				23					
				24					

Equipment: Track mounted drilling rig
Date of Drilling: 26/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

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SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 3

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
ADT				0		Fill, Gravelly SAND, fine to coarse grained, brown, fine to medium gravel	M		0.1m of asphalt overlying fill
						SAND, fine to medium grained, yellow		L	
				1		pale brown-pale grey			
				2					
	▼						W		
WB		SPT 3.0m 1,2,3 N=5		3					
				4					
		SPT 4.5m 2,3,5 N=8		5					
				6					

Equipment: Track mounted drilling rig
Date of Drilling: 27/9/2016
Logged by: *DD*

Density
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

Consistency
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

Moisture
PL - Plastic Limit
D - Dry
M - Moist
W - Wet

SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 3

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 6.0m 3,6,8 N=14		6		*Continued* - SAND, fine to medium grained, yellow	W	D	
				7					
		SPT 7.5m 3,8,7 N=17		8					
		SPT 9.0m 9,16,21 N=37		9		pale grey			
				10					
				11					
				12					

Equipment: Track mounted drilling rig
Date of Drilling: 27/9/2016
Logged by: *DD*

Density
- VL - Very loose
- L - Loose
- MD - Medium dense
- D - Dense
- VD - Very dense

Consistency
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

Moisture
- PL - Plastic Limit
- D - Dry
- M - Moist
- W - Wet

BORE HOLE NO. 3

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 12.0m 8,15,22 N=39		12		*Continued* - SAND, fine to medium grained, pale grey-pale yellow	W	D	
				13					
				14					
		SPT 15.0m 14,26,30R N=>50		15				VD	
						Borehole terminated at 15.45m			
				16					
				17					
				18					

Equipment: Track mounted drilling rig
Date of Drilling: 27/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

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SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 4

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
ADT	▼			0		Fill, Gravelly SAND, fine to medium grained, brown, fine to medium gravel	M		0.1m of asphalt overlying fill
				1		SAND, fine to medium grained, yellow			
				2					
				3			W		
WB		SPT 3.0m 3,3,3 N=6				white-pale grey			
				4					
		SPT 4.5m 1,3,4 N=7							
				5		Silty SAND, fine to medium grained, grey-pale brown	W	L	
				6					

Equipment: Track mounted drilling rig
Date of Drilling: 27/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 4

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 6.0m 2,3,3 N=6		6		*Continued* - SAND, fine to medium grained, pale grey	W	L	
		SPT 7.5m 4,7,8 N=15		7				MD	
		SPT 9.0m 6,9,14 N=23		8					
				9					
				10					
				11		pale brown-pale grey			
				12					

Equipment: Track mounted drilling rig
Date of Drilling: 27/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

BORE HOLE NO. 4

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 12.0m 5,9,9 N=18		12		*Continued* - SAND, fine to medium grained, pale brown-pale grey	W	D	
				13					
				14					
		SPT 15.0m 6,9,15 N=25		15					
				16					
				17					
				18					

Equipment: Track mounted drilling rig
Date of Drilling: 27/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 4

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 18.0m 4,13,14 N=27		18		*Continued* - SAND, fine to medium grained, pale grey	W	MD	
						Borehole terminated at 18.5m			
				19					
				20					
				21					
				22					
				23					
				24					

Equipment: Track mounted drilling rig
Date of Drilling: 27/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

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SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 5

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
ADT						Fill, Gravelly SAND, fine to medium grained, brown, fine to medium gravel	M		0.05m of asphalt overlying fill
						SAND, fine to medium grained, yellow-pale brown	M	L	
				1					
				2					
		SPT 3.0m 2,3,3 N=6		3					
				4					
				5					
						Clayey SAND, fine to coarse grained, grey-orange	W	MD	
				6					

Equipment: Track mounted drilling rig
Date of Drilling: 28/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

BORE HOLE NO. 5

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 6.0m 3,7,8 N=15		6		*Continued* - Clayey SAND, fine to coarse grained, pale brown-yellow	W	MD	
				7					
				8					
		SPT 9.0m 9,13,14 N=27		9		pale brown-orange			
				10					
				11		Continued as cored borehole			
				12					

Equipment: Track mounted drilling rig
Date of Drilling: 28/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 5

Method	WATER	Tests	RQD	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Rock Strength	REMARKS and DEFECT DESCRIPTION
				11		Start coring at 11.0m			
NMLC			100%	11.5		Quartz SANDSTONE, fine to medium grained, pale orange-pale grey	DW	H	
				12		pale grey	FR	H	
				12.5		Borehole terminated at 12.11m			
				13					
				13.5					
				14					

Equipment: Track mounted drilling rig
Date of Drilling: 28/01/2016
Logged by: DD

Consistency	Rock strength	Rock Weathering
S - Soft	VL - Very Low	XW - Extremely Weathered
F - Firm	L - Low	DW - Distinctly Weathered
St - Stiff	M - Medium	SW - Slightly Weathered
VSt - Very Stiff	H - High	FR - Fresh
H - Hard	VH - Very High	

Core Photograph: 23921 – Ian Street Car Park, Rose Bay

BH5 11.0m – 12.11m

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SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 6

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
ADT	▼	SPT 3.0m 2,2,2 N=4		1 2 3 4 5 6		Fill, Gravelly SAND, fine to medium grained, brown, fine to medium gravel	M-D		0.08m of asphalt overlying fill
						SAND, fine to medium grained, yellow- pale brown	M-D	L	

Equipment: Track mounted drilling rig
Date of Drilling: 28/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

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SITE LOCATION: Wilberforce Avenue Carpark, Rose Bay

BORE HOLE NO. 6

Method	WATER	Tests/ Samples	PP	DEPTH (m)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION (*SOIL TYPE, COLOUR, MOISTURE, CONSISTENCY*)	Moisture/ Weathering	Consistency/ Density	REMARKS and OBSERVATIONS
WB		SPT 6.0m 2,3,3 N=6		6		*tinued* - SAND, fine to medium grained, yellow-brown	M-D	L	
				7					
				8					
	▼	SPT 9.0m 3,9,12 N=21		9			W	MD	
				10		Borehole terminated at 9.9m due to refusal on sandstone			
				11					
				12					

Equipment: Track mounted drilling rig
Date of Drilling: 28/9/2016
Logged by: *DD*

Density	Consistency	Moisture
VL - Very loose	S - Soft	PL - Plastic Limit
L - Loose	F - Firm	D - Dry
MD - Medium dense	St - Stiff	M - Moist
D - Dense	VSt - Very Stiff	W - Wet
VD - Very dense	H - Hard	

APPENDIX C

LABORATORY TEST RESULTS

Ideal Corp Pty Ltd t/as
Ideal Geotech
ABN 15 132 337 190
14 Cooper Street Smithfield NSW 2164
PO Box 6147 Wetherill Park NSW 2164
Ph: (02) 9725 5522 Fax: (02) 9756 5724

POINT LOAD INDEX TEST RESULTS

Test Method AS 4133.4.1
Client: Ideal Geotech
Project: Residential Development

Sampling Date: Supplied by Client
Storage History: NA
Moisture Condition NA
Loading Rate: NA

Job No: DE-153
Testing Date: 27-10-16
Report No: DE-153_1

Rock Type	Location	Depth (m)	Diametral Tests					Axial, Block, and Irregular Lump Tests							Strength Classification
			D (mm)	L (mm)	P (kN)	$I_{s(50)}$ (MPa)	Failure Mode	W (mm)	D (mm)	L (mm)	P (kN)	I_s (MPa)	$I_{s(50)}$ (MPa)	Failure Mode	
Sandstone	Unknown	11.7	52.5	122	1.8	0.7	PP	-	52.5	88	4.1	0.7	0.9	PP	Medium
Sandstone	Unknown	12.0	51.2	115	2.0	0.8	PP	-	51.2	92	3.8	0.6	0.8	PP	Medium
Sandstone	Unknown	12.7	52.6	109	1.3	0.5	PP	-	52.6	101	4.4	0.7	0.8	PP	Medium

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Accreditation Number: 19788

Accredited for compliance with ISO/IEC 17025

N smith

Signatory: N.Smith
Date:28-10-2016

RPS16
Rev 1 Aug 15

Ideal Corp Pty Ltd t/as
Ideal Geotech
ABN 15 132 337 190
14 Cooper Street Smithfield NSW 2164
PO Box 6147 Wetherill Park NSW 2164
Ph: (02) 9725 5522 Fax: (02) 9756 5724

Sieve Analysis Report

Project: Residential Development
Client: Ideal Geotech
Address: Supplied by Client
Test Method: AS1289.3.6.1

Project No.: DE-153
Report No.: DE-153_1
Report Date: 28/10/16
Page: 1 of 1

Sampling Proceedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)

Sample No.	L1	L2	L3	L4	L5	L6
Sample Location	BH1	BH2	BH2	BH2	BH5	BH6
Material Description	Brown Sand trace of Silt/Clay	Brown Sand trace of Silt/Clay	Brown Sand trace of Silt/Clay	Brown Sand some of Silt/Clay	Brown Sand trace of Silt/Clay	Brown Sand trace of Silt/Clay
Depth (m)	6.0m	7.5m	12.0m	18.0m	9.0m	7.0m
Sample Date	Supplied by Client	Supplied by Client	Supplied by Client	Supplied by Client	Supplied by Client	Supplied by Client
Test Type	wash	wash	wash	wash	wash	wash
Sieve Size	Percent Passing (%)					
100						
75						
53						
37.5						
26.5						
19						
13.2						
9.5						
6.7						
4.75						
2.36						
1.18					100	
0.6	100	100	100		98	100
0.425	64	70	66	100	75	62
0.3	33	40	45	66	50	38
0.15	10	15	28	41	18	10
0.075	7	4	2	15	5	4

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025

Accreditation No. 19788

Signatory: N.Smith

N smith

Date: 28-10-2016

RPS3 rev 1 AUG-15

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Dane Dwyer	Manager	Huong Crawford
Client	IDEALCORP PTY LTD	Laboratory	SGS Alexandria Environmental
Address	PO BOX 2270 SMITHFIELD NSW 2164	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	61 2 97255522	Telephone	+61 2 8594 0400
Facsimile	61 2 87866300	Facsimile	+61 2 8594 0499
Email	orders@idealfoundations.com.au	Email	au.environmental.sydney@sgs.com
Project	**23921**	SGS Reference	**SE157667 R0**
Order Number	(Not specified)	Date Received	30 Sep 2016
Samples	11	Date Reported	07 Oct 2016

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Dong Liang
Metals/Inorganics Team Leader

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE157667.001 Soil 26 Sep 2016 BH2 - 1.5m	SE157667.002 Soil 26 Sep 2016 BH2 - 3.0m	SE157667.003 Soil 26 Sep 2016 BH2 - 9.0m	SE157667.004 Soil 26 Sep 2016 BH2 - 15.0m
Field pH for Acid Sulphate Soil Method: AN104 Tested: 6/10/2016						
pHf	pH Units	-	**6.9**	**6.6**	**6.1**	-
pHfox	pH Units	-	**6.8**	**6.3**	**4.5**	-
Reaction*	No unit	-	x	x	x	-
pH Difference*	pH Units	-10	**0.2**	**0.3**	**1.6**	-
pH in soil (1:2) Method: AN101 Tested: 4/10/2016						
pH (1:2)	pH Units	-	-	-	**5.2**	**7.3**
Conductivity (1:2) in soil Method: AN106 Tested: 4/10/2016						
Conductivity (1:2) @25 C*	µS/cm	1	-	-	**60**	**110**
Resistivity (1:2)*	ohm cm	-	-	-	**17000**	**9300**
Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography Method: AN245 Tested: 5/10/2016						
Chloride	mg/kg	0.25	-	-	**20**	**9.5**
Sulphate	mg/kg	0.5	-	-	**29**	**21**
Moisture Content Method: AN002 Tested: 5/10/2016						
% Moisture	%w/w	0.5	-	-	**20.4**	**20.6**

Parameter	Units	LOR	Sample Number: SE157667.005 Sample Matrix: Soil Sample Date: 27 Sep 2016 Sample Name: BH3 - 9.0m	SE157667.006 Soil 27 Sep 2016 BH4 - 6.0	SE157667.007 Soil 27 Sep 2016 BH4 - 12.0m	SE157667.008 Soil 28 Sep 2016 BH5 - 1.5m
Field pH for Acid Sulphate Soil Method: AN104 Tested: 6/10/2016						
pHf	pH Units	-	-	**5.1**	-	**7.5**
pHfox	pH Units	-	-	**4.9**	-	**6.9**
Reaction*	No unit	-	-	x	-	x x x x
pH Difference*	pH Units	-10	-	**0.2**	-	**0.5**
pH in soil (1:2) Method: AN101 Tested: 4/10/2016						
pH (1:2)	pH Units	-	**5.4**	**4.9**	**4.7**	-
Conductivity (1:2) in soil Method: AN106 Tested: 4/10/2016						
Conductivity (1:2) @25 C*	µS/cm	1	**72**	**62**	**63**	-
Resistivity (1:2)*	ohm cm	-	**14000**	**16000**	**16000**	-
Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography Method: AN245 Tested: 5/10/2016						
Chloride	mg/kg	0.25	**9.8**	**30**	**14**	-
Sulphate	mg/kg	0.5	**50**	**15**	**35**	-
Moisture Content Method: AN002 Tested: 5/10/2016						
% Moisture	%w/w	0.5	**17.7**	**17.5**	**17.5**	-

Parameter	Units	LOR	Sample Number: SE157667.009 Sample Matrix: Soil Sample Date: 28 Sep 2016 Sample Name: BH5 - 6.0m	SE157667.010 Soil 28 Sep 2016 BH5 - 9.0m	SE157667.011 Soil 28 Sep 2016 BH6 - 6.0m
Field pH for Acid Sulphate Soil Method: AN104 Tested: 6/10/2016					
pHf	pH Units	-	**5.3**	-	-
pHfox	pH Units	-	**4.7**	-	-
Reaction*	No unit	-	x	-	-
pH Difference*	pH Units	-10	**0.6**	-	-
pH in soil (1:2) Method: AN101 Tested: 4/10/2016					
pH (1:2)	pH Units	-	-	**5.3**	**5.4**
Conductivity (1:2) in soil Method: AN106 Tested: 4/10/2016					
Conductivity (1:2) @25 C*	µS/cm	1	-	**50**	**36**
Resistivity (1:2)*	ohm cm	-	-	**20000**	**28000**
Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography Method: AN245 Tested: 5/10/2016					
Chloride	mg/kg	0.25	-	**8.5**	**9.6**
Sulphate	mg/kg	0.5	-	**32**	**13**
Moisture Content Method: AN002 Tested: 5/10/2016					
% Moisture	%w/w	0.5	-	**19.9**	**2.5**

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Conductivity (1:2) in soil Method: ME-(AU)-[ENV]AN106

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Conductivity (1:2) @25 C*	LB110974	µS/cm	1	<1	9%	99%
Resistivity (1:2)*	LB110974	ohm cm	-		9%	NA

Field pH for Acid Sulphate Soil Method: ME-(AU)-[ENV]AN104

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
pHf	LB111100	pH Units	-	0%	NA
pHfox	LB111100	pH Units	-	1 - 2%	NA

Moisture Content Method: ME-(AU)-[ENV]AN002

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB111089	%w/w	0.5	0 - 4%

pH in soil (1:2) Method: ME-(AU)-[ENV]AN101

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
pH (1:2)	LB110974	pH Units	-	1%	99%

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography Method: ME-(AU)-[ENV]AN245

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Chloride	LB110984	mg/kg	0.25	<0.25	22%	100%
Sulphate	LB110984	mg/kg	0.5	<0.5	24%	99%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:2 and the pH determined and reported on the extract after 1 hour extraction (pH 1:2) or after 1 hour extraction and overnight aging (pH (1:2) aged). Reference APHA 4500-H+.
AN104	pHF is determined on an extract of approximately 2g of as received sample in approximately 10 mL of deionised water with pH determined after standing 30 minutes.
AN104	pHFox is determined on an extract of approximately 2g of as received sample with a few mLs of 30% hydrogen peroxide (adjusted to pH 4.5 to 5.5) with the extract reaction being rated from slight to extreme, with pH determined after reaction is complete and extract has cooled. Referenced to ASS Laboratory Methods Guidelines, method 23Af-Bf, 2004. X Slight Reaction XX Moderate Reaction XXX Strong/High Reaction XXXX Extreme/Vigorous Reaction (gas evolution and heat generation)
AN106	Conductivity : Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:2 and the EC determined and reported on the extract basis after the 1 hour extraction (EC(1:2)) or after the 1 hour extraction and overnight aging (EC(1:2) aged). Reference APHA 2510 B.
AN106	Resistivity of the extract is reported on the extract basis and is the reciprocal of conductivity. Salinity and TDS can be calculated from the extract conductivity and is reported back to the soil basis.
AN245	Anions by Ion Chromatography: A water sample or extract is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

Annexure 7

WOOLLAHRA MUNCIPAL COUNCIL

PLANNING PROPOSAL TO PERMIT MIXED USE DEVELOPMENT

ROSE BAY CARPARK SITES

Assessment of Traffic and Parking Implications

October 2016
(Rev D)

Reference 147/2016

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

This report has been prepared to accompany a Planning Proposal to Woollahra Municipal Council for an amendment to Woollahra Local Environment Plan 2014 (WLEP2014) to facilitate development on the Wilberforce Avenue and Ian Street car park sites at Rose Bay (Figure 1).

The Rose Bay Centre has experienced a decline in retail and business activity over the past decade and the lack of amenity and car parking are considered to be prime factors contributing to this circumstance. Council, being concerned to arrest this decline and to improve the vibrancy of the centre, commissioned an Urban Design Study which is focused on potential redevelopment of the two Council owned car park sites. The objectives of the envisaged redevelopment are to:

- Provide increased public parking
- Provide a new Community Centre and accessible public amenities
- Provide income generating opportunities for Council
- Provide improved connectivity and public domain/civic spaces

The Urban Design Study, supported by an earlier economic analysis by Hill PDA, identifies:

* Redevelopment of the Wilberforce Avenue site to provide public parking, Community Centre, retail and commercial elements
* Redevelopment of the Ian Street site to provide public parking, residential apartments and retail elements

The purpose of this report is to:

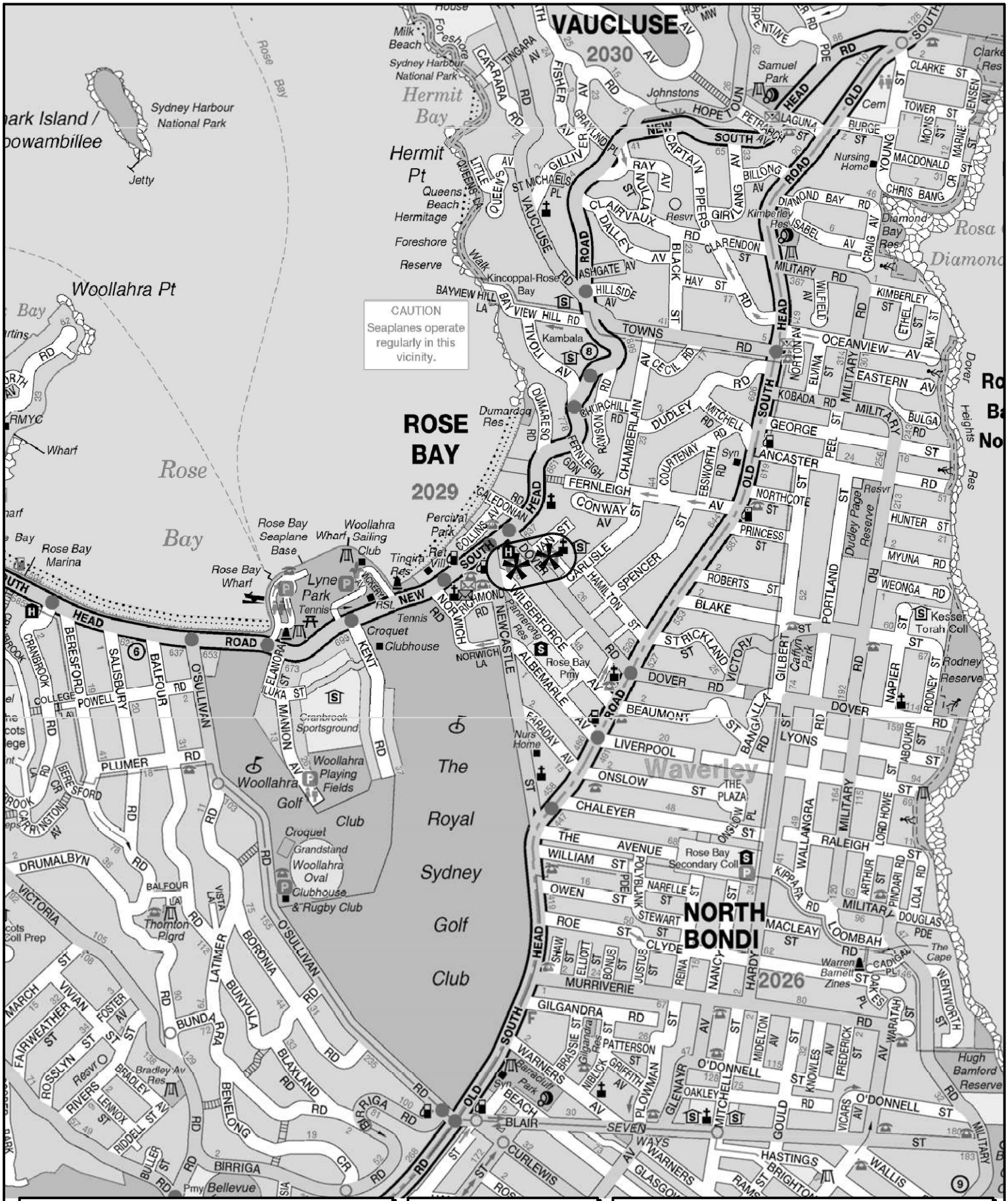
* describe the sites, their context and the envisaged development outcomes

* describe the existing road network, traffic and transport circumstances in the vicinity of the sites

* assess the potential traffic implications of the envisaged development

* assess the appropriateness of the envisaged parking provisions

* assess the envisaged access, circulation and servicing arrangements



LEGEND

LOCATION

FIG 1

2. ENVISAGED DEVELOPMENT SCHEME

2.1 SITE, CONTEXT AND EXISTING CIRCUMSTANCES

The sites are shown in their context on Figure 2 and comprise:

* **Wilberforce Avenue Site**
  This is a consolidation of 5 lots occupying an irregular shaped area of 2,555.7m^2 with frontages to Wilberforce Avenue and Dover Road. The existing open car park on the site comprises a total of 87 spaces with ingress/egress on Wilberforce Avenue and ingress on Dover Road.

* **Ian Street Site**
  This is a consolidation of 2 lots occupying an area of 1,132m^2 with frontages to Ian Street, Ian Lane and Dover Road. The existing open car park on the site comprises 53 spaces with ingress and egress on the Dover Road frontage.

The sites form the southern edge of the Rose Bay commercial/retail strip with residential uses extending to the south and to the east and west. The car parks have signpost parking restrictions of 2 HOUR period parking 8.30am – 6.00pm Monday to Friday and 8.30am – 12.30pm Saturday.

2.2 ENVISAGED DEVELOPMENT

The Urban Design Study recommendations require the LEP to be amended to provide for the following changes:

Zoning	-	Change the existing SP2 Infrastructure zoning for the Ian Street site to B2 Local Centre
FSR	-	apply an FSR of 2:1 for the Ian Street site (currently none applies)
Height Control	-	Change the Ian Street site height control from 10.5m to 14.1m and the Wilberforce Avenue site height control from 14.1m to 17.2m

LEGEND

N

SITE

FIG 2

The envisaged development outcomes under the Planning Proposal are as follows:

Wilberforce Avenue Site	
Retail	359m^2
Commercial	782m^2
Community Centre	811m^2 (557m^2 + 254m^2 possible extension)
Amenities	
Public Parking	268 spaces
Ian Street Site	
Residential apartments	
1 Bed	11
2 Bed	7
3 Bed	7
Total:	**25 apartments**
Retail	223m^2
Residential Parking	32 spaces
Public Parking	37 spaces

Besides identifying appropriate design principles the Urban Design Study also identifies improved public domain and connectivity including:

* a pedestrian through site link (Shared Zone) connecting between Dover Road and Wilberforce Avenue/Newcastle Street

* a new Civic Square at the corner of Wilberforce Avenue and Newcastle Street with the upgrading of Pannerong Reserve

Details of the envisaged development scheme are shown on the plans prepared by Allen Jack + Cottier which accompany the Planning Proposal 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:

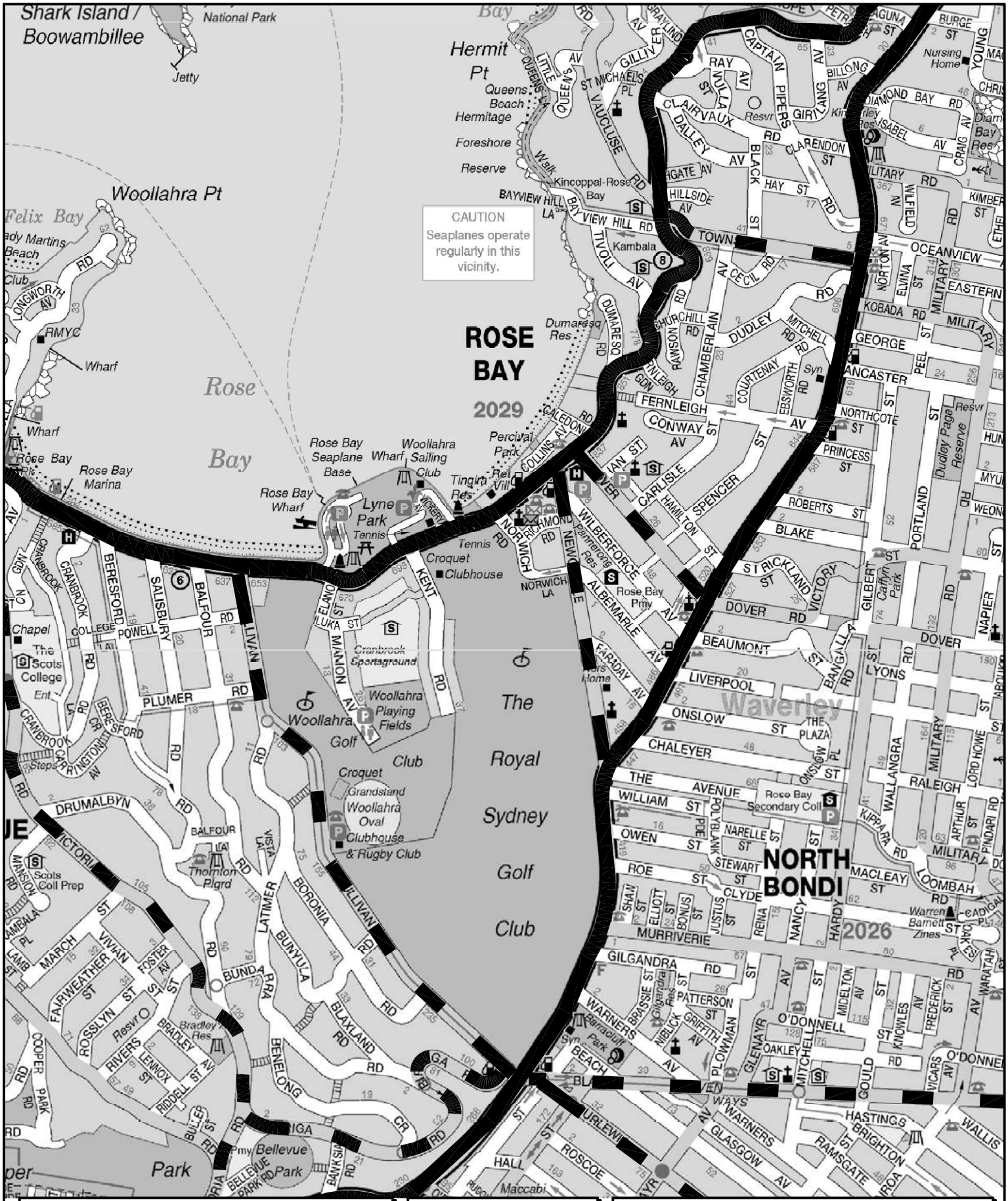
* *New South Head Road* – a State Road and arterial route being part of the principal link between the Sydney CBD and Vaucluse
* *Old South Head Road* – a State Road and arterial route connecting between Bondi Junction and South Head
* *O'Sullivan Road* – Regional Road and collector road route connecting between New South Head Road and Old South Head Road
* *Dover Road* – a collector road route connecting between New South Head Road and Old South Head Road
* *Newcastle Street* – a collector road connecting between the New South Head Road and Old South Head Road
* *Wilberforce Avenue, Ian Street and Ian Lane* – local access roads

Dover Road and Wilberforce Avenue in the vicinity of the site are some 12.8m wide with relatively straight and level alignments.

3.2 TRAFFIC CONTROLS

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

* the roundabout at the Dover Road and Ian Street intersection with an ingress connection into the Wilberforce Avenue car park and a pedestrian crossing across Dover Road on the north-west side



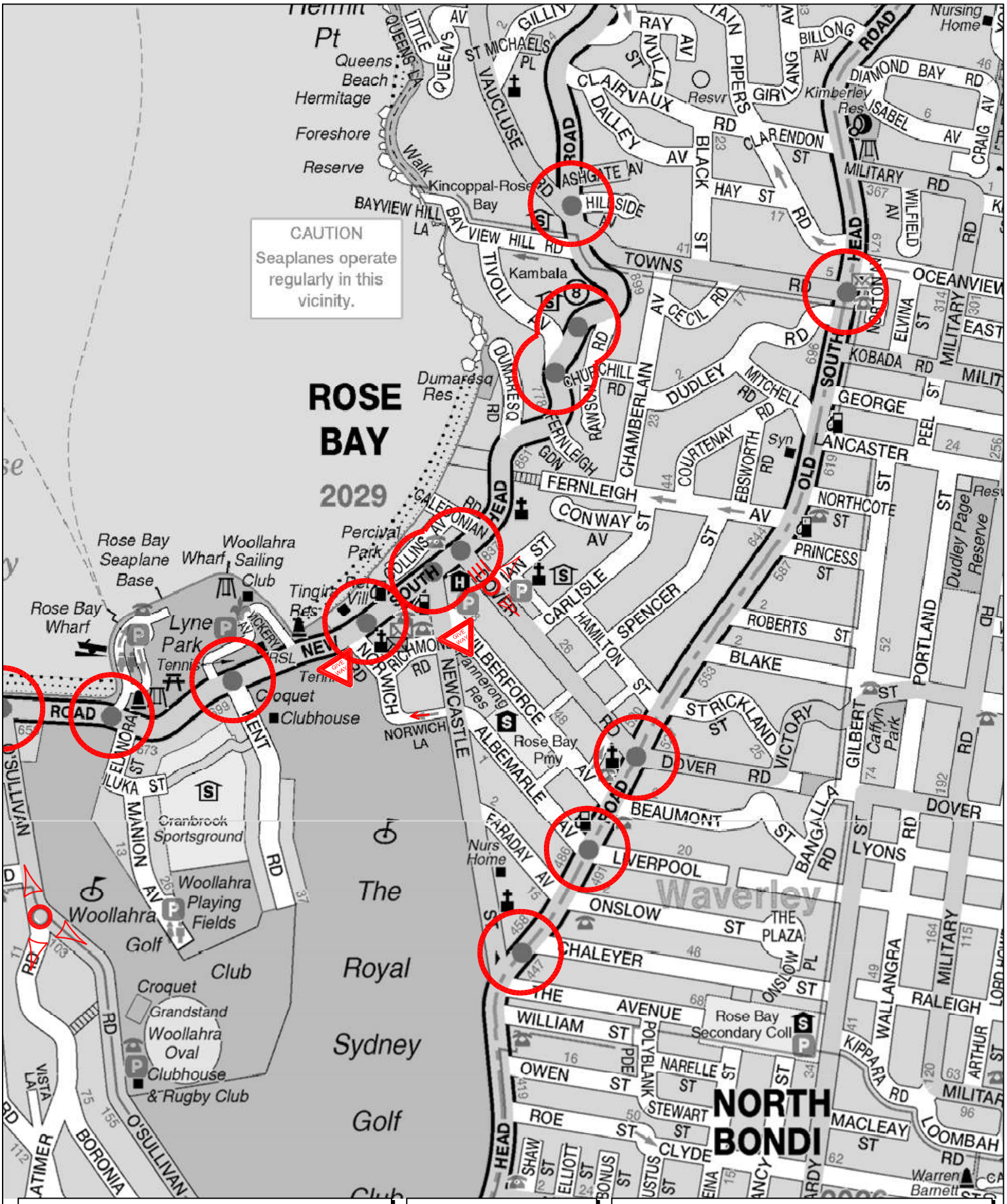
LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR

N

ROAD NETWORK

FIG 3



LEGEND

- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT
- RESTRICTED TURNING MOVEMENT
- GIVE AWAY

N

TRAFFIC CONTROLS

FIG 4

* the traffic signals at the New South Head Road and Dover Road intersection. Details are provided on the design plan reproduced in Appendix B and include:
    - 2 through lanes each way on New South Head Road
    - green arrow for the right turn into Dover Road
    - signal controlled pedestrian crossings

* the traffic signals at the New South Head Road and Newcastle Street intersection. Details are provided on the design plan reproduced in Appendix B

* the pedestrian (mid-block) traffic signals on New South Head Road just to the east of Norwich Road

* the traffic control signals at the Old South Head Road and Dover Road intersection

* the 60kmph speed restriction on New South Head Road and 50kmph on the local and collector road system with 40kmph School speed zones on part of Wilberforce Avenue

* the sections of NO STOPPING restrictions along New South Head Road, Dover Road and Newcastle Street

* the various period parking restrictions (30min and 1 hour) on the roads in the centre

3.3 WALKING AND CYCLING

Pedestrian movements in the Rose Bay Centre are facilitated by:

* the pedestrian crossing facilities incorporated into the traffic signals at:
    - New South Head Road and Dover Road intersection
    - New South Head Road and Newcastle Street intersection
    - Mid-block signals at New South Head Road east of Norwich Road

* the pedestrian crossing across Dover Road on the north-west side of Ian Street with raised platform

Cycling in **Waverley & Woollahra**

Getting the most out of this map

The bicycle routes on this map offer comfortable and direct ways of getting around Sydney's East by bicycle using existing roads and paths. Some roads have bicycle lanes while others don't. Roads have to be shared with motor vehicles and paths with walkers. Busy roads are shown in a different colour. Road conditions vary according to time of day and day of week. Some roads may only be busy in peak hours and in one direction so pick your route to suit conditions.

Though the area is hilly, the routes can be easily managed on most modern bikes with gears. The most heavily trafficked roads usually follow ridgelines and the easiest grades, so short steep sections are often necessary to avoid the traffic.

Your bicycle is the ideal short distance vehicle. On the flat you can easily ride 2.5 kilometres in 10 minutes - add more time for up hills. Of course you will get there even quicker if your route is mostly downhill. Bondi Junction to the City is less than 5km. It's almost all downhill, so, depending on your route, you can usually ride there in under half an hour door-to-door.

Ride carefully

The routes on this map use some off-road paths shared with pedestrians, but mostly you will be riding on roads shared with other vehicles, so please always take care. The legend above shows you which roads are likely to be busy, particularly at peak times. Waverley and Woollahra Councils are committed to developing a comprehensive bicycle network to make it easier to get around Sydney's East.

This map contains incorrect information showing a route around the perimeter of the Royal Botanic Gardens. Please dismount from your bicycle while in the Royal Botanic Gardens as cycling is prohibited in this area. Cycling is permitted on Art Gallery Rd and Mrs Macquaries Rd.

Legend

LEP Zoning

- Residential
- Business
- School
- Park/ Open Space
- Community Facility
- Hospital
- Rail Station/ Interchange

Bike Route

- Existing Off-Road
- Existing On-Road
- Proposed Off-Road
- Proposed On-Road
- Connecting Bike Routes

Issue	Date	By	Chkd	Appd
P7	26-08-09	BDM	BDM	DVD

Client: **Woollahra Municipal Council**

Job Title: **Woollahra Bike Strategy**

Drawing Title: **Existing and Proposed Bike Network**

Metres: 0 150 300 600

GTAconsultants
www.gta.com.au

Scale at A3: **1:12,000**

Drawing Status: **Final Draft**

Job No	Drawing No	Issue
GS11920	Figure E1-2	P7

* the paved footpaths and kerb ramps

* the street lighting

Cyclist movements are provided for along New South Head Road, Newcastle Street and Wilberforce Avenue “on street”. There are no off-road or shared paths in the area as indicated on the Waverley and Woollahra Bicycle Map and Woollahra Bike Strategy extract reproduced overleaf.

3.4 TRAFFIC CONDITIONS

An indication of the prevailing traffic conditions on the road system serving the site is provided by the results of traffic surveys undertaken during the weekday morning and afternoon peak periods which are provided in Appendix C and summarised in the following:

		AM	**PM**
New South Head Road	Eastbound	740	776
	Right turn	174	326
	Westbound	886	560
	Left turn	35	89
Dover Road	Right turn	94	73
	Left turn	296	166
New South Head Road	Eastbound	739	633
	Right turn	90	176
	Westbound	1,142	708
	Left turn	42	75
Newcastle Street	Right turn	142	118
	Left turn	106	92

Dover Road	Northbound	319	246
	Right turn	5	6
	Left turn	54	37
	Southbound	193	419
	Right turn	37	39
	Left turn	11	13
Ian Street	Westbound	2	-
	Right turn	16	8
	Left turn	5	8
Wilberforce Avenue Carpark	IN	31	62
	OUT	94	123
	IN (Dover Road)	93	76
Ian Street Carpark	IN	74	72
	OUT	40	72

It is evident that:

* there are some eastbound bypass movements through the Wilberforce Avenue car park (i.e. avoiding the New South Head Road/Dover Road intersection or circulating due to the extremely long “block”)

* there are significant circulation movements by drivers entering the car parks looking for a parking space and departing because the car parks are fully occupied

The operational performance of the intersections in the area during the morning and afternoon peak periods is relatively satisfactory although traffic flows in are at times disrupted by the parking and turning manoeuvres on the arterial and collector roads.

3.5 TRANSPORT SERVICES

Bus Services

The Rose Bay Centre has good access for public transport services (buses) comprising:

* Routes 324, 325 and L24 which run along New South Head Road to/from Sydney CBD

* Routes 323 and 386 which run along New South Head Road and Dover Road to/from Edgecliff and Bondi Junction respectively

Details of these routes are provided overleaf while the start/finish and frequency details of these services are provided in Appendix D. These services provide connection to railway stations and the Metropolitan transport network.

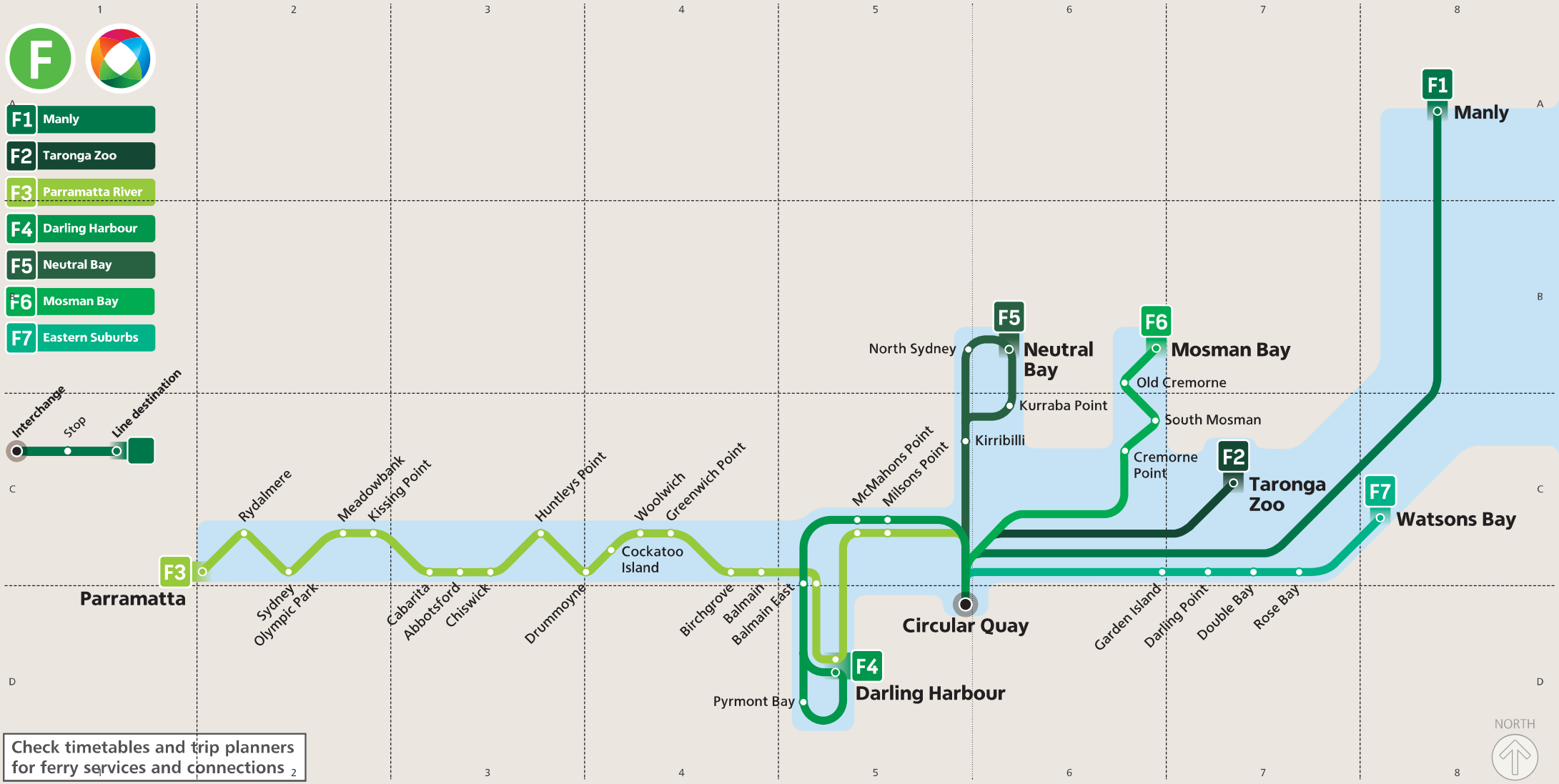
Ferry Services

Sydney Ferries operate Route F7 between Watsons Bay and Circular Quay with a stop at Rose Bay Wharf with frequent services in the weekday morning and afternoon peak periods. Details of the ferry network are provided overleaf while time table details are provided in Appendix D.

Vaucluse
New South Head Rd
386
South Head Cemetery
387
Dover Heights
Military Rd
323
Vaucluse
Rose Bay
Point Piper
Darling Point
Double Bay
Bellevue Hill
Bondi Junction
Woollahra
North Bondi
Dover Heights
Street Legend
1. Birriga Rd
2. Bundarra Rd
3. Blaxland Rd
4. Bunyula Rd
Oxford St PREPAY 7am - 7pm weekdays
Royal Sydney Golf Course
Nielsen Park
Christison Park
Diamond Bay
Felix Bay
Rose Bay
Rose Bay Wharf
Blackburn Cove
Double Bay
Double Bay Wharf
Watsons Bay Ferry
Old South Head Rd
New South Head Rd
Vaucluse Rd
Wentworth Rd
William Rd
Towns Rd
Military Rd
Peel St
Lancaster Rd
Portland St
Victory St
Dover Rd
Newcastle St
Chaleyer St
Wallangra Rd
Hardy St
Mitchell St
Murriverie Rd
Wairoa Ave
Blair St
Glenayr Ave
Curlewis St
O'Brien St
Birriga Rd
Victoria Rd
Balfour Rd
Plumer Rd
Salisbury Rd
Drumalbyn Rd
Kambala Rd
Ginahgulla Rd
Wunulla Rd
Ocean Ave
William St
Etham Ave
Edgecliffe Rd
Manning Rd
Arthur St
Suttie Rd
Bellevue Rd
Edgecliff Rd
Syd Einfeld Dr
Ocean St
325
324
386
387
380
323
L24 PREPAY
326
327
389
X84 PREPAY
X89 PREPAY
X84 X89 PREPAY
200
328
380
352
440
381
382

Sydney Ferries Network

Transport Sydney Ferries



Check timetables and trip planners for ferry services and connections

It's easy to travel with us

Plan your trip

Visit **transportnsw.info**

Opal is your ticket to travel

Get it before you travel from a shop nearby or visit **opal.com.au**

1512FMS-E-MWT-A4L

4. ACCESS, INTERNAL CIRCULATION, ROAD GEOMETRY AND SERVICING

ACCESS

The envisaged vehicle access arrangements are as follows:

Ian Street Site
Combined ingress/egress driveway on the Dover Road frontage located at the southern side boundary.

Wilberforce Avenue Site
Combined ingress/egress driveways on the Dover Road and Wilberforce Avenue frontages for the Shared Zone corridor running along the southern side of the site.

The design of the envisaged driveways would comply with the requirements of AS2890 and adequate sight line splays and sight distances would be achieved.

INTERNAL CIRCULATION

The envisaged design of the car park areas employs simple flexible two-way circulation arrangements and the parking bay dimensions would accord with the "user requirements" of AS2890.1 & 6.

The design of the Shared Zone will need to comply with RMS Technical Direction TTD 2016/001 with continuous foot path treatment complying with TDT 2013/05. The Shared Zone arrangement shown in the Urban Design Study diagram is only conceptual and detail design development will have regard for the RMS design principles which are reproduced in Appendix E particularly in relation to:

- regulatory signage
- absence of kerb and gutter
- vehicle speed constraint

In order to minimise "through" traffic it may be necessary to only permit egress to Dover Road (i.e. no ingress) or prohibit the left turn ingress on Dover Road. Ultimately RMS approval will be required for the Shared Zone to be implemented.

SERVICING

The envisaged access corridors will include Loading Zone provisions for small delivery and refuse removal vehicles while small service vehicles (e.g. service personnel) will be able to use the public parking spaces. The occasional needs for larger service vehicles will be satisfied by the available kerbside parking (including some Loading Zone provisions) in the area as is normal for small developments of the nature envisaged.

ROAD GEOMETRY

Changes to the existing road geometry are envisaged with:

* modification of the Dover Road/Ian Street intersection roundabout to provide for egress from the Wilberforce Avenue site

* closure of the existing section of Wilberforce Avenue connecting to Newcastle Street to provide the envisaged new Urban Square with a new road connection through the northern part of Pannerong Reserve

It is apparent that both of these changes can be made appropriately and in the case of the latter would present a preferable intersection geometry although consideration could be given to the provision of a roundabout at the new intersection with kerb extensions and splitter islands to assist pedestrian crossings.

5. PARKING

An indication of the appropriate parking provision of the envisaged development is provided in Council's DCP as follows:

Residential Apartments (Mixed Use Developments)	
One-bedroom	0.5 space
Two-bedroom	1.0 spaces
Three-bedroom	1.5 spaces
Visitors	0.2 space
Retail	3.3 spaces per 100m^2 (0.7)*
Food and Drink	7.0 spaces per 100m^2 (0.6)*
Office	2.5 spaces per 100m^2 (0.5)*
Community Facility	2.0 spaces per 100m^2 (0.5)*

**( ) Rose Bay Centre Multiplier*

Application of this criteria to the envisaged development outcome would indicate the following:

Ian Street Site

Residential Apartments	
11 x One-bedroom	5.5 spaces
7 x Two-bedroom	7.0 spaces
7 x Three-bedroom	10.5 spaces
Visitors (25)	5 spaces
Total:	**28 spaces**
Retail 223m^2	7.4 spaces (5)
Total:	**33 spaces**

Wilberforce Avenue Site

Retail 359m^2	11.8 spaces (8)
Office 782m^2	19.5 spaces (10)
Community 881m^2	16.2 spaces (8)
Total:	**26 spaces**

The envisaged parking provision is as follows:

Ian Street Site	
Residents and Visitors	32 spaces
Public	37 spaces
Total:	**69 spaces**
Wilberforce Avenue Site	
Public	268 spaces

It is proposed to provide 32 spaces in the Ian Street site for residents and visitors while the parking for retail, food & drink, office and community (i.e. 31 spaces) will be provided as part of the public parking provision. It is envisaged that there will be a total of 305 public parking spaces compared to the existing 140 spaces although it is not indicated in the concept plans how the required provision of accessible spaces, services or structure will impact on this outcome.

It is apparent that the proposed parking provision will be adequate and appropriate in relation to the envisaged development elements. It is also apparent that the design development process will need to address the issue of “managing” the public parking spaces to ensure appropriate use and availability (and potential income). This could have some influence on the design of the ingresses and egresses if boom gates and ticket machines are ultimately required or that “number of spaces available” technology is to be included to avoid unnecessary entry circulation and congestion.

6. TRAFFIC

The survey results of the existing car park access movements cannot be used to assess the potential traffic generation of the envisaged development due to:

- the significant bypass movement through the existing Wilberforce Avenue carpark
- the significant existing entry and exit of drivers seeking and not being able to obtain a parking space

Reference to the RMS Working Paper (Halcrow) for Shopping Centres in the Sydney Metropolitan Area provides data relative to “Number of Parking Spaces” and “Peak Traffic Generation” for AM and PM peaks. Aggregation of this data reveals the following traffic generation (vtph) per parking space:

AM	**PM**
0.4 vtph	0.8 vtph

Application of this to the envisaged 305 public parking spaces would indicate the following:

	AM	**PM**
Ian Street (37 spaces)	15 vtph	30 vtph
Wilberforce Avenue (268 spaces)	108 vtph	216 vtph

The RMS traffic generation rate for residential apartments (no easy access to rail services) is 0.29 vtph per apartment and application to the envisaged 25 apartments on the Ian Street site would indicate:

AM		**PM**	
IN	**OUT**	**IN**	**OUT**
2	8	8	2

Assessment of the overall traffic outcome is as follows:

Ian Street Site

	AM		PM	
	IN	**OUT**	**IN**	**OUT**
	10	15	23	17

Wilberforce Avenue Site

	AM		PM	
	IN	**OUT**	**IN**	**OUT**
Dover Road	27	27	54	54
Wilberforce Avenue	27	27	54	54

It is apparent that the traffic outcome of the envisaged development scheme will be satisfactory even if:

- the peak traffic generation per public parking space is somewhat greater (i.e. than the RMS surveyed rate)
- there is some constraint imposed on ingress to the Wilberforce Avenue site from Dover Road to prevent bypass traffic movements through the Shared Zone

7. PEDESTRIAN, BICYCLES AND PUBLIC TRANSPORT

PEDESTRIANS

It is evident with the envisaged development plans that pedestrians will be provided with improved connectivity along with upgraded public domain and civic spaces. Consideration could however be given to improved provision for pedestrians at the new Newcastle Street/Wilberforce Avenue intersection and careful design consideration will need to be given to the envisaged Shared Zone.

BICYCLES

Council's Draft DCP contains the following requirements for bicycles and motorcycles in new developments:

	Residents	**Visitors**
Residential Apartments	1 per 4 apartments	1 per 10 apartments
	Staff	**Customers**
Office	1 per 150m^2	1 per 400m^2
Shop / Café	1 per 250m^2	2 + 1 per 100m^2 over 100m^2
Community Facility	1 per 10 staff	2 + 1 per 200m^2

The DCP also specifies the provision of 1 motorcycle per 10 car spaces for all types of development.

Application of this to the envisaged development would indicate:

	Bicycles		**Motorcycles**
Ian Street Site	**Residents**	**Visitors**	
25 apartments	7 spaces	3 spaces	
	Total: 10 spaces		**7 spaces**

Wilberforce Avenue Site		**Bicycles**		**Motorcycles**
Office	782m^2	5 spaces	2 spaces	
Retail	359m^2	1 space	5 spaces	
Community	811m^2	1 space	6 spaces	
		Total: 20 spaces		**27 spaces**

PUBLIC TRANSPORT

The envisaged development will not have any implications for public transport services. The existing bus movements along Dover Road and the bus stops will not be impacted in anyway.

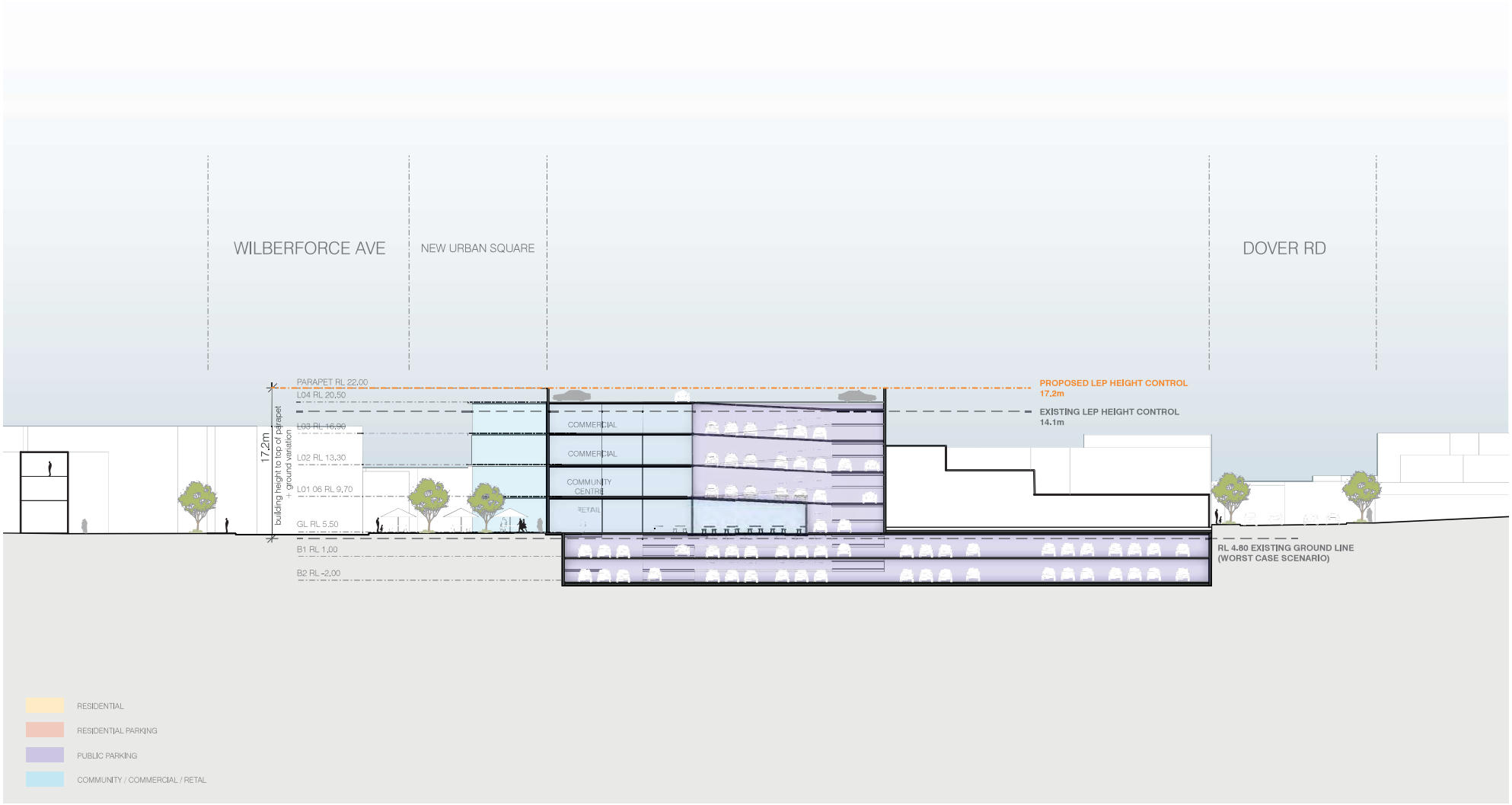
8. CONCLUSION

Council is concerned to arrest the decline in retail and business activity in the Rose Bay Centre and to achieve the objectives of the envisaged development on the two existing car park sites. This supplementary assessment has concluded that the proposed planning control changes and envisaged development will:

* not have any adverse traffic implications
* will have suitable and appropriate parking provisions
* will have satisfactory access and circulation arrangements
* will provide the opportunity for improved pedestrian and cyclist connectivity
* will not have any adverse impact on public transport services

APPENDIX A

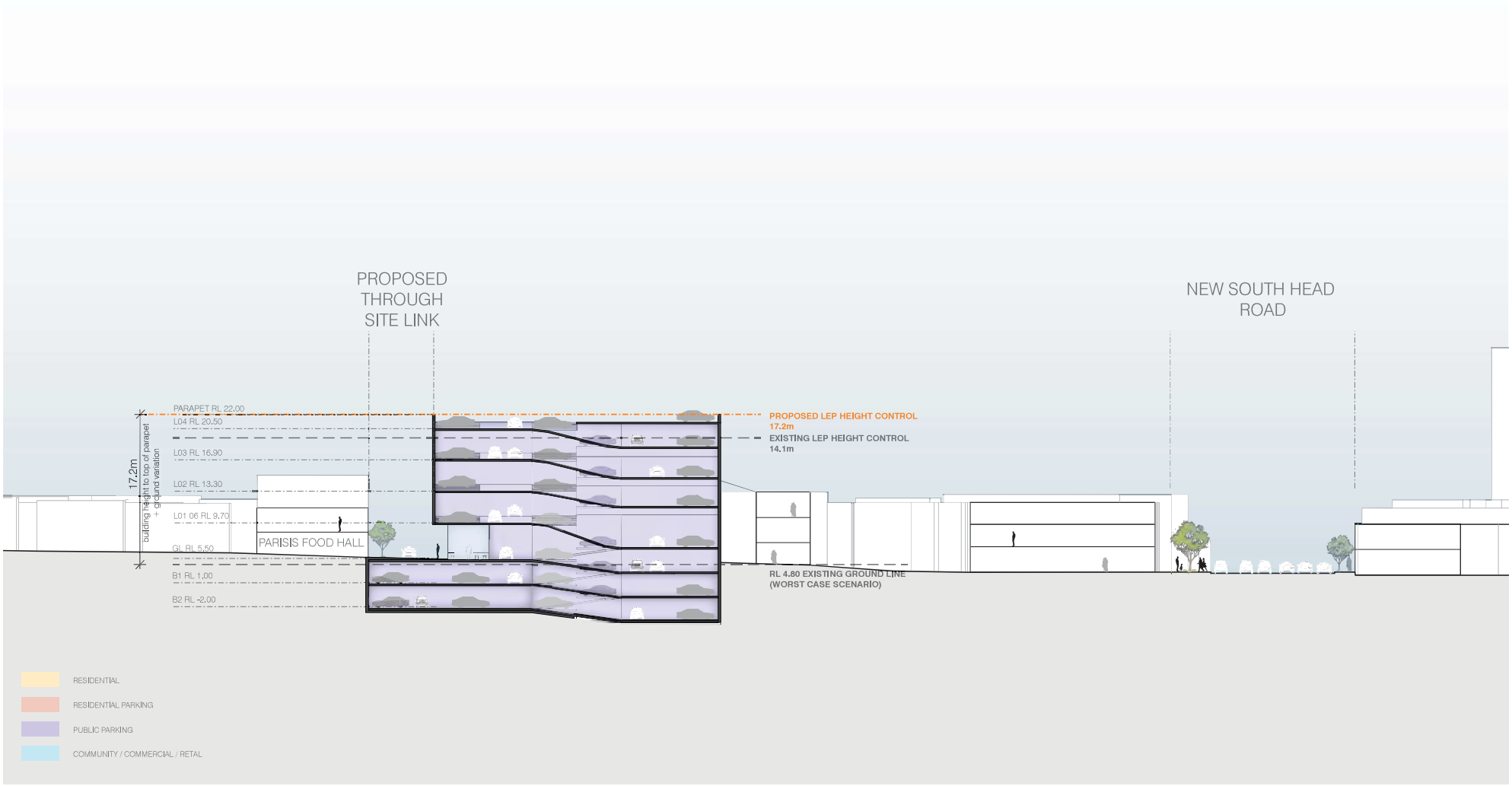
CONCEPT DEVELOPMENT PLANS


WILBERFORCE AVE
NEW URBAN SQUARE
DOVER RD
PARAPET RL 22.00
L04 RL 20.50
L03 RL 16.90
L02 RL 13.30
L01 06 RL 9.70
GL RL 5.50
B1 RL 1.00
B2 RL -2.00
17.2m
building height to top of parapet + ground variation
COMMERCIAL
COMMERCIAL
COMMUNITY CENTRE
RETAIL
PROPOSED LEP HEIGHT CONTROL
17.2m
EXISTING LEP HEIGHT CONTROL
14.1m
RL 4.80 EXISTING GROUND LINE
(WORST CASE SCENARIO)
RESIDENTIAL
RESIDENTIAL PARKING
PUBLIC PARKING
COMMUNITY / COMMERCIAL / RETAL

Section A-A

5 ARCHITECTURAL CONCEPTS

5.1 Wilberforce Ave Car Park



Section B-B

Existing public parking: 91 cars

AJ+C proposed public parking: 268 cars

Rose Bay Car Parks
WILBERFORCE AVE

B1 & B2 LEVEL FLOOR PLAN

15043 1:250 at A3 12/10/2015

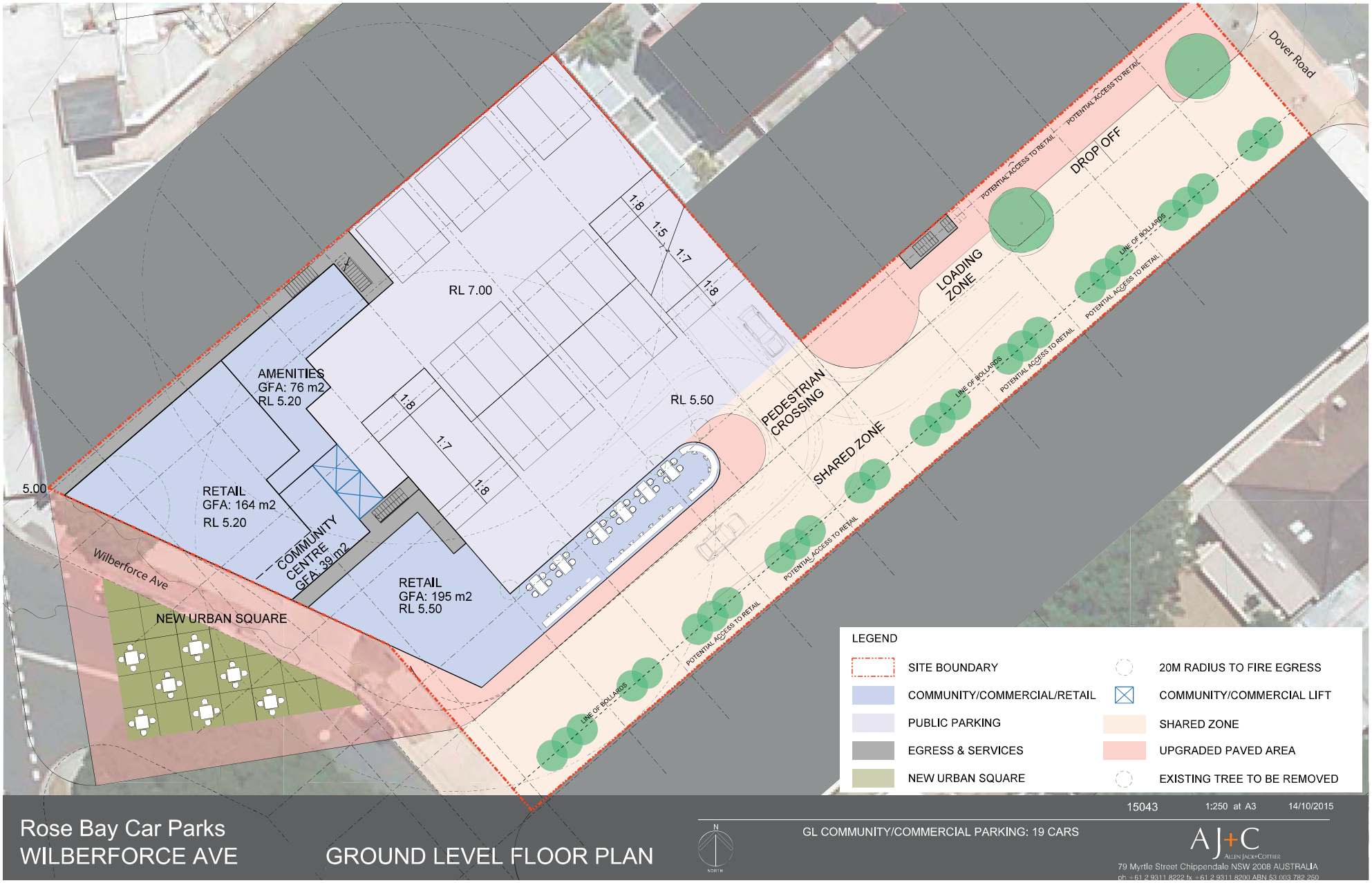
N

B1 COMMUNITY/COMMERCIAL PARKING, 66 CARS;
B2 COMMUNITY/COMMERCIAL PARKING, 52 CARS;
TOTAL COMMUNITY/COMMERCIAL PARKING, 118 CARS

AJ+C Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

5 ARCHITECTURAL CONCEPTS

5.1 Wilberforce Ave Car Park



Rose Bay Car Parks
WILBERFORCE AVE

GROUND LEVEL FLOOR PLAN

15043 1:250 at A3 14/10/2015

GL COMMUNITY/COMMERCIAL PARKING: 19 CARS

AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Rose Bay Car Parks
WILBERFORCE AVE

LEVEL 1-3 FLOOR PLAN

15043 1:250 at A3 7/10/2015

N
NORTH

L1-3 COMMUNITY/COMMERCIAL PARKING: 29 CARS/LEVEL
TOTAL 87 CARS

AJ+C
ALLEN JACK+COTTIER
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Rose Bay Car Parks
WILBERFORCE AVE

LEVEL 4 FLOOR PLAN

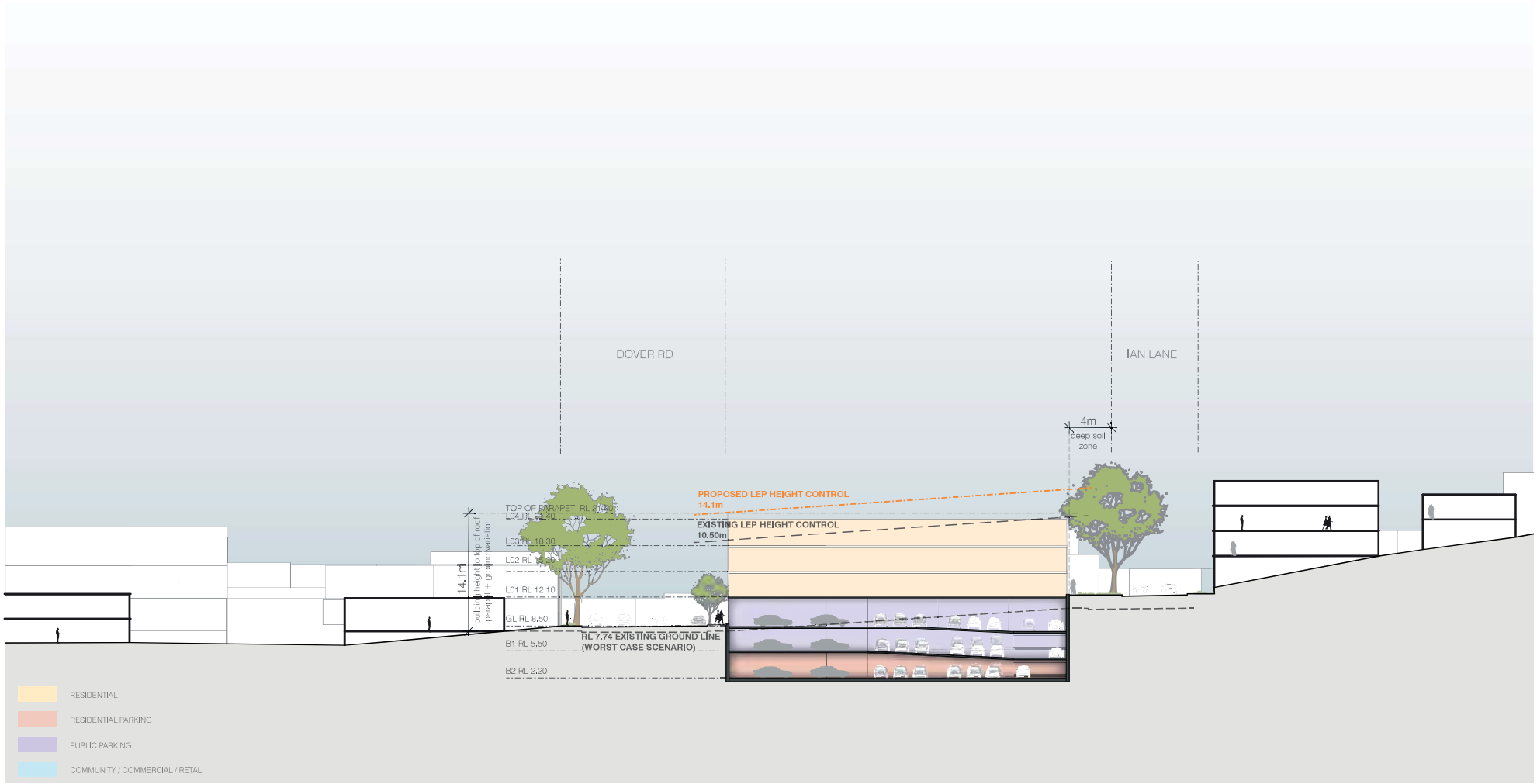
15043 1:250 at A3 12/10/2015

L4 (ROOF) COMMUNITY/COMMERCIAL PARKING: 44 CARS

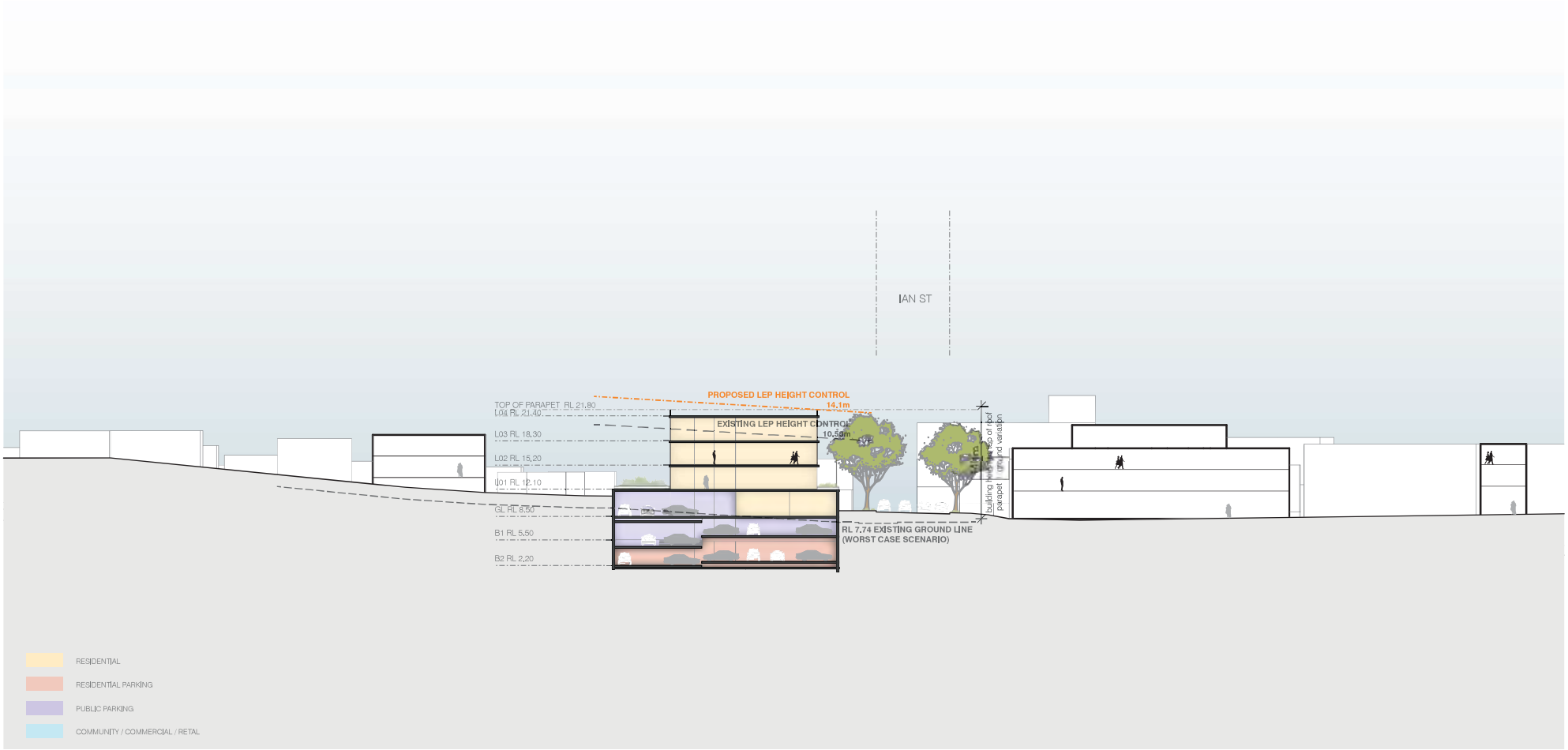
AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

5 ARCHITECTURAL CONCEPTS

5.2 Ian Street Car Park



Section C-C


IAN ST
PROPOSED LEP HEIGHT CONTROL
14.1m
EXISTING LEP HEIGHT CONTROL
10.5m
TOP OF PARAPET RL 21.80
L04 RL 21.40
L03 RL 18.30
L02 RL 15.20
L01 RL 12.10
GL RL 8.50
B1 RL 5.50
B2 RL 2.20
RL 7.74 EXISTING GROUND LINE
(WORST CASE SCENARIO)
building height to top of roof parapet
ground variation
RESIDENTIAL
RESIDENTIAL PARKING
PUBLIC PARKING
COMMUNITY / COMMERCIAL / RETAL

Section D-D

5 ARCHITECTURAL CONCEPTS

5.2 Ian Street Car Park

Design Concept:

+ Built Form outcomes that are generally consistent with the outcomes of the B2 Local Centre.
+ Provide retail activation to corner of Dover Road and Ian Street
+ Clear seperation of residential lobby and community car park lobby.
+ Two storey 'townhouse' style apartments with an address to Ian Street.
+ Retain significant vegetation along Ian Lane.
+ Provision of additional community/public car parking facilities on 1 consolidated basement level
+ Significant side setbacks (6m) to south-eastern boundary and adjoining single detached dwelling.

Rose Bay Car Parks
IAN ST CAR PARK

GROUND LEVEL FLOOR PLAN

GL COMMUNITY PARKING, 7 CARS

15043 1:250 at A3 7/10/2015

AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Existing public parking: 53 cars

AJ+C proposed public parking: 37 cars

Rose Bay Car Parks
IAN ST CAR PARK

B1 LEVEL FLOOR PLAN

15043_MP2101_Ian St_B1.dgn

N
NORTH

15043 1:250 at A3 7/09/2015

B1 COMMUNITY PARKING, 30 CARS

AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

AJ+C proposed residential parking: 32 cars

Rose Bay Car Parks
IAN ST CAR PARK

15043_MP2100_Ian St_B2.dgn

B2 LEVEL FLOOR PLAN

N
NORTH

15043 1:250 at A3 7/09/2015

B2 RESIDENTIAL PARKING, 32 CARS

AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

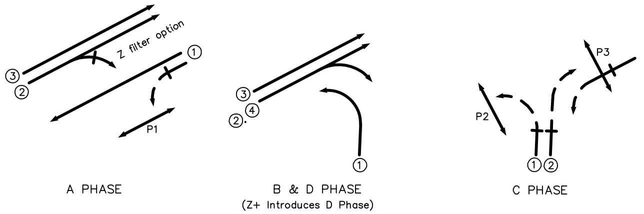
APPENDIX B

INTERSECTION PLANS

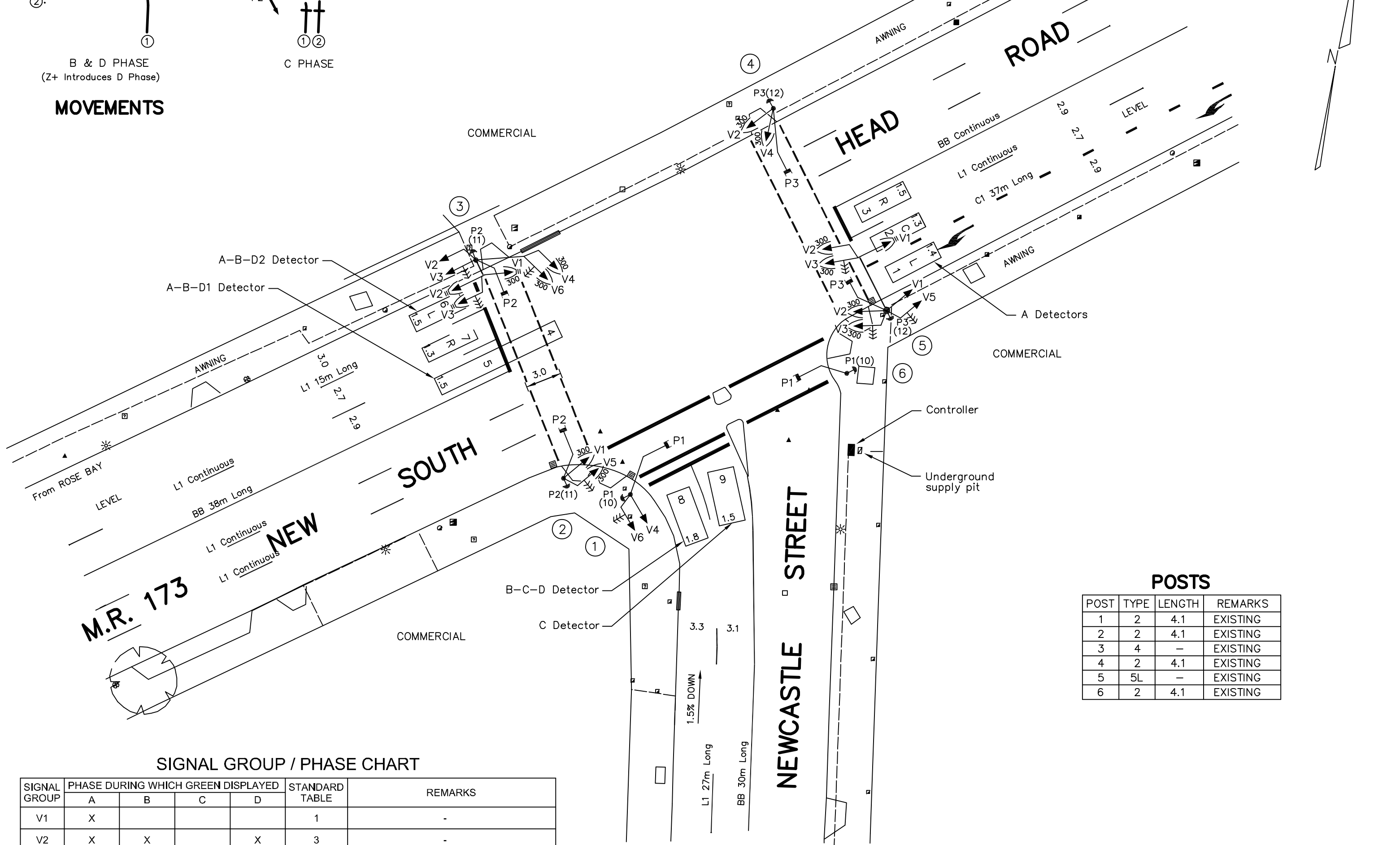
DRAWN BY USING CAD
DO NOT AMEND MANUALLY

DATE IN SERVICE : 22/4/94

Transport
Roads & Maritime
Services



MOVEMENTS



POSTS

POST	TYPE	LENGTH	REMARKS
1	2	4.1	EXISTING
2	2	4.1	EXISTING
3	4	–	EXISTING
4	2	4.1	EXISTING
5	5L	–	EXISTING
6	2	4.1	EXISTING

DETECTOR SPECIFICATION

Detector		Specifications			
A	FN	A(L)	A(E1)		
	SG/PS	$\overline{A}$	A		
	DS	–	–		
A–B–D1 Depart. & Approach	FN	B(PR)	D(PR)	B(E4)	D(E4)
	SG/PS	A	A	B	D
	DS	–	Z+	A(NEXT)	A(NEXT)
A–B–D1 Approach	FN	A(L).B(L)	D(L)	A(E2)	
	SG/PS	$\overline{V2}$	$\overline{V2}$	A	
	DS	–	Z+	$\overline{A-B-D1(PR).B(NEXT).D(NEXT)}$	
cont. A–B–D1 Approach	FN	B(E2)		D(E2)	
	SG/PS	B		D	
	DS	$\overline{A(NEXT).D(NEXT)}$		$\overline{A(NEXT).B(NEXT)}$	
A–B–D2	FN	A(L)		A(E3)	
	SG/PS	$\overline{V2}$		A	
	DS	–		$\overline{B(NEXT).D(NEXT)}$	
cont. A–B–D2	FN	B(E3)		D(E3)	
	SG/PS	B		D	
	DS	$\overline{A(NEXT).D(NEXT)}$		$\overline{A(NEXT).B(NEXT)}$	
B–C–D	FN	B(PR)	D(PR)	B(E1)	
	SG/PS	$\overline{B.C.D}$	$\overline{B.C.D}$	B	
	DS	$\overline{C}$	Z+.$\overline{C}$	$\overline{C(NEXT).D(NEXT)}$	
cont. B–C–D	FN	C(E1)		D(E1)	
	SG/PS	C		D	
	DS	$\overline{B(NEXT).D(NEXT)}$		$\overline{B(NEXT).C(NEXT)}$	
C	FN	C(L)	C(E2)		
	SG/PS	$\overline{C}$	C		
	DS	–	–		
P1 P.B.	FN	A(PB)	C(L)		
	SG/PS	$\overline{P1(WALK)}$	$\overline{A.P1(WALK)}$		
	DS	–	$\overline{B.C.D}$		
P2 P.B.	FN	C(PB)	A(L)		
	SG/PS	$\overline{P2(WALK)}$	$\overline{C.P2(WALK)}$		
	DS	–	$\overline{A.B.D}$		
P3 P.B.	FN	C(PB)	A(L)		
	SG/PS	$\overline{P3(WALK)}$	$\overline{C.P3(WALK)}$		
	DS	–	$\overline{A.B.D}$		

SIGNAL GROUP / PHASE CHART

SIGNAL GROUP	PHASE DURING WHICH GREEN DISPLAYED A	B	C	D	STANDARD TABLE	REMARKS
V1	X				1	-
V2	X	X		X	3	-
V3		X		X	39	Timed R.A. protection for P1 pedestrians. Z- filter option.
V4			C		73	Timed red protection for P3 pedestrians.
V5	C		C		87	Timed R.A. protection for P1 pedestrians.
V6		X	C	X	77	Timed R.A. protection for P2 pedestrians. Walk and part clearance subject to timer.
P1	X				2	-
P2			X		2	-
P3			X		2	-

NOTES

1. This site is SCATS linked.
2. Special STOP sign (R1–4) is placed on post 1.
3. Audio–tactile push buttons are provided on all posts.
4. (i) V2 and V3 overhead lanterns on Post 3 are to have horizontal louvres in the green aspect and to be lowered to minimise visibility from TCS 2150.
   (ii) V1 overhead lanterns on Posts 3 and 5 are to have horizontal louvres in the green aspect and to be lowered to minimise visibility from TCS 619.

DESIGN LAYOUT

A ORIGINAL ISSUE J/I CSB 2620 New Signal Site.
'B' Issue 10.01.00 Altered : Eastern kerb line in Newcastle St. Added : Traffic island in Newcastle St. 10.01.00 J.J.Z.
C Issue Office Instruction Updated WAE Added: Hor. Louvres – Posts 3 and 5. Added: Note 6 M.A.C. 20.5.98
D ISSUE J SCI739 23/8/12 ADDED: V3 R/T LANTS, V5 & V6 L/T LANTS, R/T FILTER OPT. DETECTOR SPECS & SG/PC. AMENDED: SITE TO 4 PHASE, MOVEMENTS, LANTERN LABELS, DETECTOR NUMBERS & NOTES. REMOVED: SSDCS. S.H. 1/11/12
'E' ISSUE:– W.A.E. AMENDED POST CHART & P2, P3 PED LINES. JJ KD 12-09-2013

PUBLIC UTILITY LEGEND		REFERENCE PLANS	
HYDRANT	□	SYMBOLS/ABBS.	VD003–6
STOP VALVE	▲	STD POST	VD001–5
GAS VALVE	#	PRES. DETECT	VC005–17
SEWER MANHOLE	⊕	VEH. GROUP OP	TS–TN–019
TELECOM PIT	◪	DET. LOGIC OP	TS–TN–020
ELECT LIGHT POLE	♂	PED. MOVEMNT OP	TS–TN–021
POWER POLE	○	CABLE INSTALL	SHEET 4
STAY POLE	⊘	CABLE CHART	SHEET 5
TELEPHONE BOX	⊡	SURVEYOR : W. CHO	
TELECOM PILLAR	◕	DATE :	

U.B.D. Ref. MAP 237 M10
I.S.G. CO–ORDS E: 324 790 N: 1 250 750
DESIGNED JUSTINE HOPKINS
CHECKED J.ZOUTENDYK
JUSTINE HOPKINS SITE CHECKED
J.ZOUTENDYK RECOMMENDED

APPROVED
A.J. WESLEY DESIGN ENGINEER 21–9–1993 DATE
ACCEPTED
21–9–1993 DATE

ROADS AND MARITIME SERVICES

WOOLLAHRA COUNCIL AREA
NEW SOUTH HEAD ROAD (MR173) AND
NEWCASTLE STREET
ROSE BAY

DESIGN LAYOUT TCS No 0698

EXISTING ☒ PROPOSED ☐
CADD FILE: VV0698_1E.dgn
SCALE 5 0 (1:200) 5 10
ISSUE E
FILE 499 TS 268
SUPERSEDES SHEET/ISSUE 1/D
REGN. 0173.499.VV.0698
SHEET 1

$DATE$ $TIME$ $FILE$

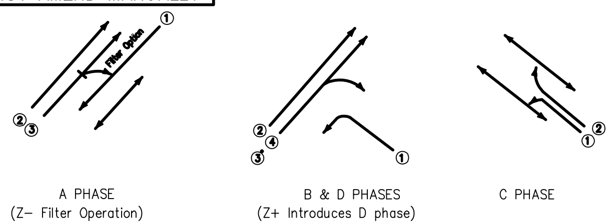
0173.499.VV.0698

DRAWN BY CADD
DO NOT AMEND MANUALLY

DATE IN SERVICE : 26/05/70

RTA

0173.499.VV.0619



MOVEMENT DIAGRAMS

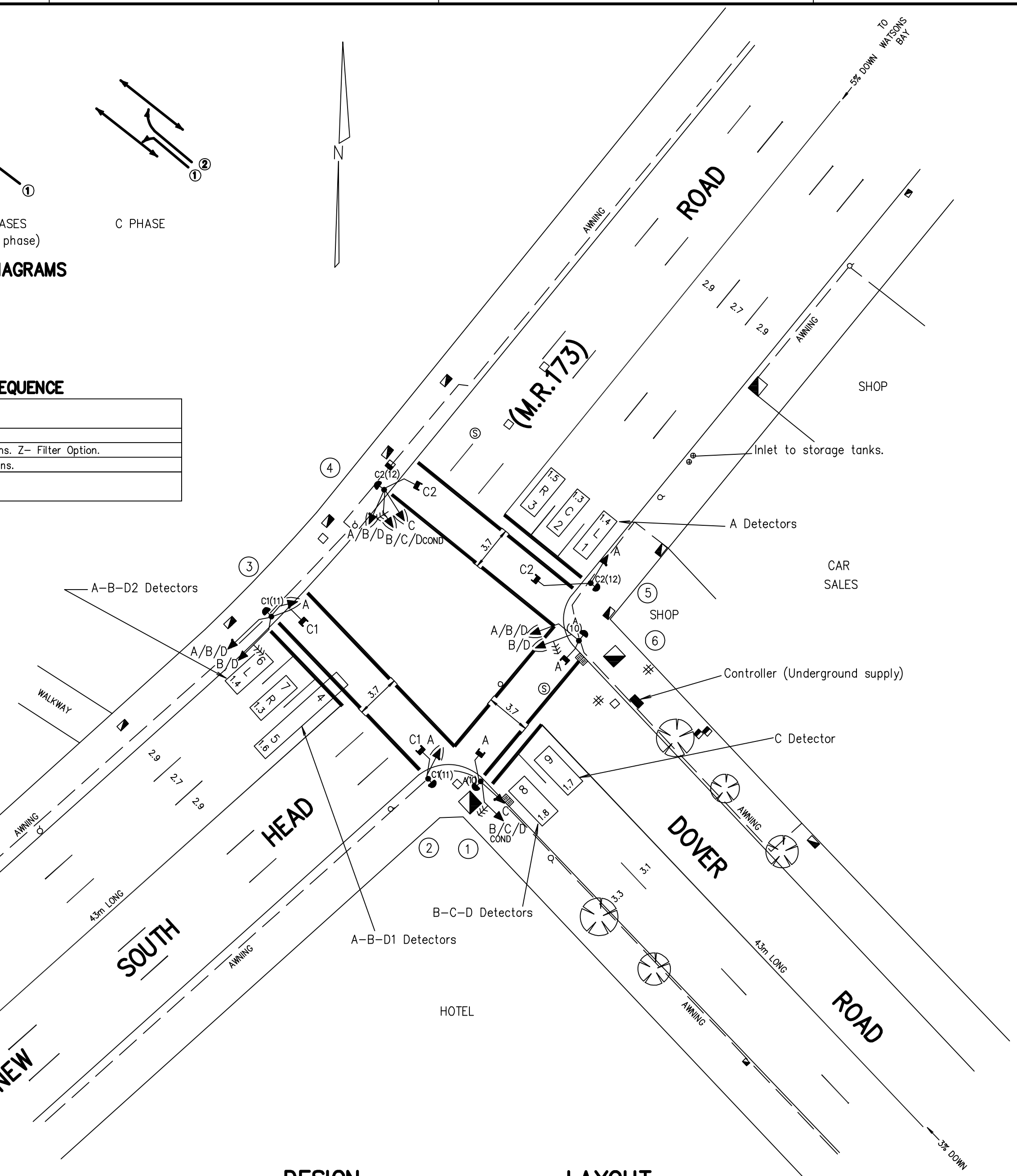
POST CHART

POST	TYPE	LENGTH	REMARKS
1	2	3.0	EXISTING
2	2	3.0	EXISTING
3	2	3.0	EXISTING
4	2	4.1	EXISTING
5	2	2.8	EXISTING
6	2	3.2	EXISTING

Z BRACKET

SPECIAL SIGNAL GROUP DISPLAY SEQUENCE

SIGNAL GROUP	TABLE TYPE	REMARKS
A/B/D	3	—
B/D (RT)	39	Timed R.A. protection for A pedestrians. Z– Filter Option.
B/C COND/D (LT)	14	Red arrow protection for C1 pedestrians.
A	PED	Automatic Introduction subject to presence of XSF1



DETECTOR SPECIFICATION

Detector		Specifications				
A	FN	A(L)	A(E1)			
	SG/PS	$\overline{A}$	A			
	DS	—	—			
A–B–D1 Depart. & Approach	FN	B(PR)	D(PR)	B(E 4)	D(E 4)	
	SG/PS	A	A	B	D	
	DS	—	Z+	A(NEXT)	A(NEXT)	
A–B–D1 Approach	FN	A(L).B(L)	D(L)	A(E 3)		
	SG/PS	$\overline{A/B/D}$	$\overline{A/B/D}$	A		
	DS	—	Z+	$\overline{A–B–D1(PR)}.\overline{B(NEXT)}.\overline{D(NEXT)}$		
cont. A–B–D1 Approach	FN	B(E 3)		D(E 3)		
	SG/PS	B		D		
	DS	$\overline{A(NEXT)}.\overline{D(NEXT)}$		$\overline{A(NEXT)}.\overline{B(NEXT)}$		
A–B–D2	FN	A(L)	A(E 2)		B(E 2)	
	SG/PS	$\overline{A/B/D}$	A		B	
	DS	$\overline{B}.\overline{D}$	$\overline{B(NEXT)}.\overline{D(NEXT)}$		$\overline{A(NEXT)}.\overline{D(NEXT)}$	
cont. A–B–D2	FN	D(E 2)				
	SG/PS	D				
	DS	$\overline{A(NEXT)}.\overline{B(NEXT)}$				
B–C–D	FN	B(PR)	B(CL)	D(PR)	D(CL)	B(E 1)
	SG/PS	$\overline{B}.\overline{C}.\overline{D}$	C	$\overline{B}.\overline{C}.\overline{D}$	C	B
	DS	$\overline{C}$+C(PB)	B–C–D(NG)	Z+.[$\overline{C}$+C(PB)]	Z+.B–C–D(NG)	[$\overline{C(NEXT)}$+C(PB)].$\overline{D(NEXT)}$
cont. B–C–D	FN	C(E1)		D(E1)		
	SG/PS	C		D		
	DS	$\overline{B(NEXT)}.\overline{D(NEXT)}$		$\overline{B(NEXT)}$.[$\overline{C(NEXT)}$+C(PB)]		
C	FN	C(L)	C(E2)			
	SG/PS	$\overline{C}$	C			
	DS	—	—			
A P.B.	FN	A(PB)	C(L)			
	SG/PS	$\overline{A(WALK)}$	A.$\overline{A(WALK)}$			
	DS	—	$\overline{B}.\overline{C}.\overline{D}$			
C1 P.B.	FN	C(PB)	A(L)			
	SG/PS	$\overline{C1(WALK)}$	C.$\overline{C1(WALK)}$			
	DS	—	$\overline{A}.\overline{B}.\overline{D}$			
C2 P.B.	FN	C(PB)	A(L)			
	SG/PS	$\overline{C2(WALK)}$	C.$\overline{C2(WALK)}$			
	DS	—	$\overline{A}.\overline{B}.\overline{D}$			

NOTES:

1. This site is SCATS linked.
2. Special STOP sign (R1–4) is placed on post 1.
3. For details of the Automatic Network Travel Time System (ANTTS) installed at this site, refer to plan No.VE542–13. The ANTTS antenna is mounted on post No.4.
4. Audio tactile push buttons provided on posts 1,2,3,4 & 6.

DESIGN LAYOUT

A ORIGINAL ISSUE In accordance with J.I. SYE 3167, 2/12/85
B ISSUE 20–5–91 J.I.CR03784. Note 5 added re ANTTS facs. CNJ
ISSUE C. JISE0336 28–2–94 REMOVE LTOR ON POSTS 5 & 6 TH 3–3–94
'D' ISSUE NOTE 4 REMOVED DETECTOR LOGIC ALTERED. A/B AND BRT LANTERNS RELOCATED FROM POST 5–6 CNJ 4/94 WAE
E ISSUE JISC1782 13/1/14 WORKS AS EXECUTED. ADDED: REPEAT 'D' R/T PHASE SUBJECT TO Z+. AMENDED: DET. SPECS & LABELLING, MOVEMENTS, SSGDS, NOTES. REMOVED: CIVIL SET-OUT. AN 26/02/14

PUBLIC UTILITY LEGEND	
HYDRANT	
STOP VALVE	
GAS VALVE	
SEWER MANHOLE	
TELECOM PIT	
ELECT LIGHT POLE	
POWER POLE	
STAY POLE	
TELEPHONE BOX	
TELECOM PILLAR	

REFERENCE PLANS	
SYMBOLS/ABBS.	VD003–6
STD POSIT	VD001–5
DET SCHED EXP	VD018–10
PRES. DETECT	VC005–17
SSG DIS. SEQ.	VD018–8
SURVEYOR : N/A	
DATE : N/A	

U.B.D. Ref. Map 237 M10
I.S.G. CO–ORDS E: 324 870 N: 1 250 789
DESIGNED B. LENTON
CHECKED A. KRUSE
SITE CHECKED
RECOMMENDED

APPROVED
A. Kennedy
NAME A.KENNEDY
DIVISIONAL ENGINEER
DATE 10.6.87

THIS DRAWING IS RECOMMENDED FOR ACCEPTANCE
A. J. Wesley
SUPERVISING ENGINEER
DATE 10.6.87
ACCEPTED
DATE

Roads and Traffic Authority,N.S.W

WOOLLAHRA COUNCIL AREA
TRAFFIC SIGNALS AT
NEW SOUTH HEAD ROAD AND DOVER ROAD
ROSE BAY

DESIGN LAYOUT
TCS No 0619

EXISTING ☐ PROPOSED ☒
CADD FILE: VV0619_7E.dgn
SCALE (1:200)
ISSUE E
FILE 499 TS 144
SUPERSEDES SHEET/ISSUE 7/D
REGN. 01730.499.VV.0619
SHEET 7

$DATE$ $TIME$ $FILE$

APPENDIX C

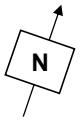
TRAFFIC SURVEY RESULTS

Location	-	Duration	0700 - 0900
	NEW SOUTH HEAD ROAD		1600 -1800
	DOVER ROAD		-
	NEW SOUTH HEAD ROAD	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE

All Vehicles Time Per 15 Mins			NORTH -				EAST NEW SOUTH HEAD ROAD				SOUTH DOVER ROAD				WEST NEW SOUTH HEAD ROAD				
			L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00	-	7:15	0	0	0	0	14	177	0	191	77	0	12	89	0	176	25	201	481
7:15	-	7:30	0	0	0	0	11	171	0	182	84	0	7	91	0	147	38	185	458
7:30	-	7:45	0	0	0	0	7	223	0	230	84	0	14	98	0	159	45	204	532
7:45	-	8:00	0	0	0	0	9	209	0	218	64	0	23	87	0	198	35	233	538
8:00	-	8:15	0	0	0	0	6	203	0	209	87	0	28	115	0	178	50	228	552
8:15	-	8:30	0	0	0	0	13	251	0	264	61	0	29	90	0	205	44	249	603
8:30	-	8:45	0	0	0	0	18	206	0	224	61	0	19	80	0	128	42	170	474
8:45	-	9:00	0	0	0	0	15	209	0	224	78	0	23	101	0	130	37	167	492
Period End			0	0	0	0	93	1649	0	1742	596	0	155	751	0	1321	316	1637	4130
16:00	-	16:15	0	0	0	0	26	167	0	193	40	0	16	56	0	160	65	225	474
16:15	-	16:30	0	0	0	0	24	192	0	216	42	0	15	57	0	165	64	229	502
16:30	-	16:45	0	0	0	0	31	161	0	192	49	0	17	66	0	169	72	241	499
16:45	-	17:00	0	0	0	0	25	167	0	192	49	0	11	60	0	158	56	214	466
17:00	-	17:15	0	0	0	0	23	165	0	188	35	0	18	53	0	186	63	249	490
17:15	-	17:30	0	0	0	0	28	160	0	188	43	0	18	61	0	179	83	262	511
17:30	-	17:45	0	0	0	0	18	118	0	136	45	0	23	68	0	215	100	315	519
17:45	-	18:00	0	0	0	0	20	117	0	137	43	0	14	57	0	196	80	276	470
Period End			0	0	0	0	195	1247	0	1442	346	0	132	478	0	1428	583	2011	3931

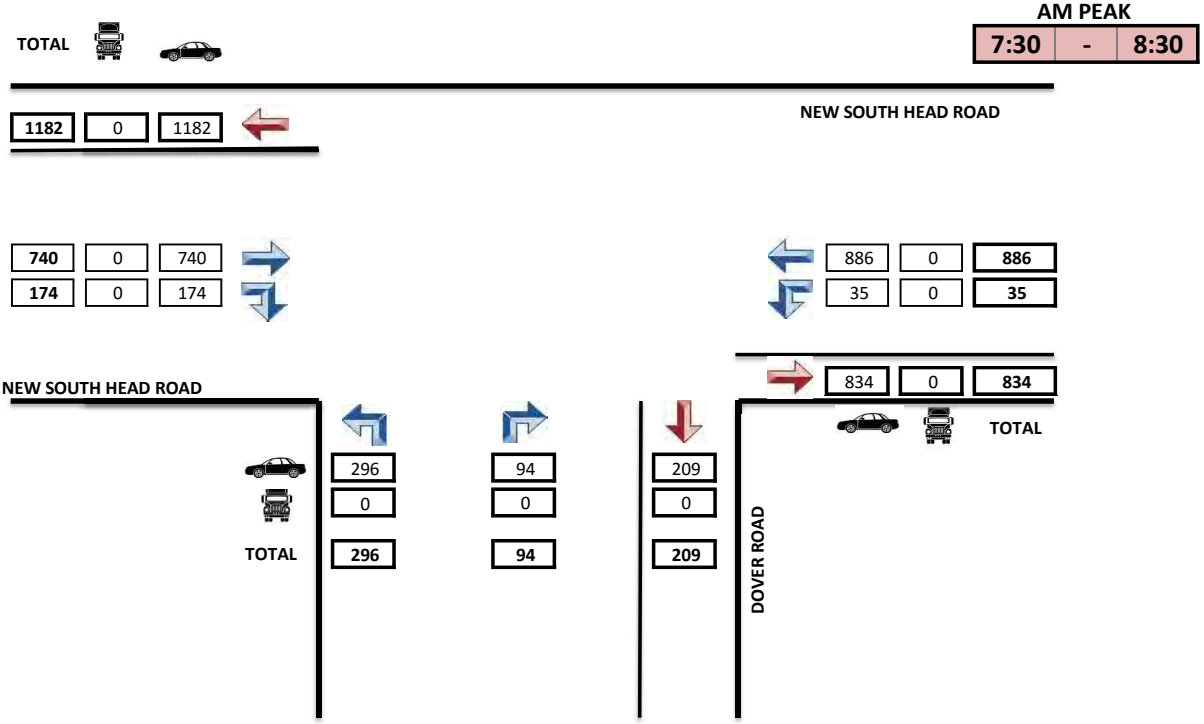
All Vehicles Time Per 15 Mins			NORTH -				EAST NEW SOUTH HEAD ROAD				SOUTH DOVER ROAD				WEST NEW SOUTH HEAD ROAD				
			L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00	-	8:00	0	0	0	0	41	780	0	821	309	0	56	365	0	680	143	823	2009
7:15	-	8:15	0	0	0	0	33	806	0	839	319	0	72	391	0	682	168	850	2080
7:30	-	8:30	0	0	0	0	35	886	0	921	296	0	94	390	0	740	174	914	2225
7:45	-	8:45	0	0	0	0	46	869	0	915	273	0	99	372	0	709	171	880	2167
8:00	-	9:00	0	0	0	0	52	869	0	921	287	0	99	386	0	641	173	814	2121
Period End			0	0	0	0	207	4210	0	4417	1484	0	420	1904	0	3452	829	4281	10602
16:00	-	17:00	0	0	0	0	106	687	0	793	180	0	59	239	0	652	257	909	1941
16:15	-	17:15	0	0	0	0	103	685	0	788	175	0	61	236	0	678	255	933	1957
16:30	-	17:30	0	0	0	0	107	653	0	760	176	0	64	240	0	692	274	966	1966
16:45	-	17:45	0	0	0	0	94	610	0	704	172	0	70	242	0	738	302	1040	1986
17:00	-	18:00	0	0	0	0	89	560	0	649	166	0	73	239	0	776	326	1102	1990
Period End			0	0	0	0	499	3195	0	3694	869	0	327	1196	0	3536	1414	4950	9840

Location	-	Duration	0700 - 0900
	NEW SOUTH HEAD ROAD		1600 -1800
	DOVER ROAD		0
	NEW SOUTH HEAD ROAD	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE



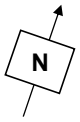
AM PEAK

7:30	-	8:30



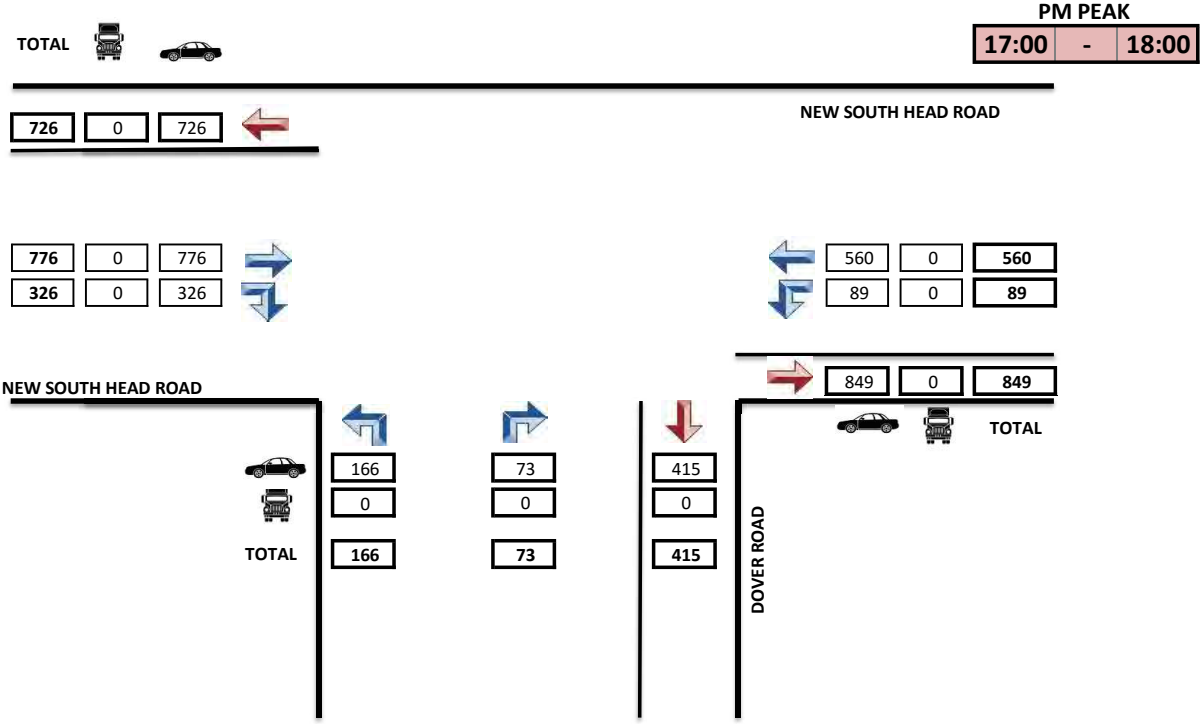
Traffic Information Specialist

Location	-	Duration	0700 - 0900
	NEW SOUTH HEAD ROAD		1600 -1800
	DOVER ROAD		0
	NEW SOUTH HEAD ROAD	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE



PM PEAK

17:00	-	18:00



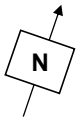
Traffic Information Specialist

Location	-	Duration	0700 - 0900
	NEW SOUTH HEAD ROAD		1600 -1800
	NEWCASTLE STREET		-
	NEW SOUTH HEAD ROAD	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE

All Vehicles Time Per 15 Mins	NORTH -				EAST NEW SOUTH HEAD ROAD				SOUTH NEWCASTLE STREET				WEST NEW SOUTH HEAD ROAD				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 7:15	0	0	0	0	6	248	0	254	15	0	22	37	0	165	21	186	477
7:15 - 7:30	0	0	0	0	7	250	0	257	24	0	24	48	0	137	15	152	457
7:30 - 7:45	0	0	0	0	7	300	0	307	20	0	37	57	0	147	26	173	537
7:45 - 8:00	0	0	0	0	6	267	0	273	22	0	40	62	0	193	26	219	554
8:00 - 8:15	0	0	0	0	9	282	0	291	31	0	35	66	0	187	19	206	563
8:15 - 8:30	0	0	0	0	20	293	0	313	33	0	30	63	0	212	19	231	607
8:30 - 8:45	0	0	0	0	21	246	0	267	14	0	26	40	0	123	24	147	454
8:45 - 9:00	0	0	0	0	21	266	0	287	29	0	30	59	0	131	22	153	499
Period End	0	0	0	0	97	2152	0	2249	188	0	244	432	0	1295	172	1467	4148
16:00 - 16:15	0	0	0	0	13	194	0	207	18	0	18	36	0	138	38	176	419
16:15 - 16:30	0	0	0	0	9	225	0	234	23	0	22	45	0	146	32	178	457
16:30 - 16:45	0	0	0	0	12	198	0	210	25	0	21	46	0	154	32	186	442
16:45 - 17:00	0	0	0	0	25	192	0	217	23	0	26	49	0	121	49	170	436
17:00 - 17:15	0	0	0	0	13	187	0	200	28	0	31	59	0	158	46	204	463
17:15 - 17:30	0	0	0	0	18	185	0	203	12	0	31	43	0	156	41	197	443
17:30 - 17:45	0	0	0	0	19	144	0	163	29	0	30	59	0	198	40	238	460
17:45 - 18:00	0	0	0	0	17	143	0	160	19	0	23	42	0	166	43	209	411
Period End	0	0	0	0	126	1468	0	1594	177	0	202	379	0	1237	321	1558	3531

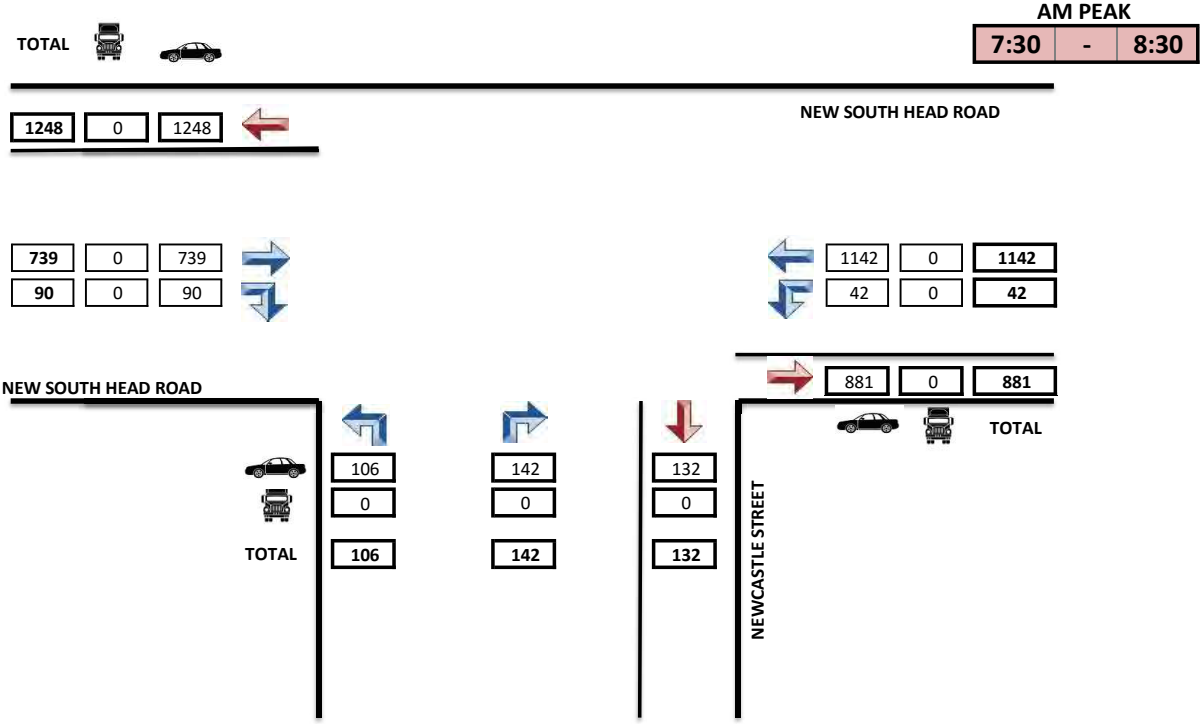
All Vehicles Time Per 15 Mins	NORTH -				EAST NEW SOUTH HEAD ROAD				SOUTH NEWCASTLE STREET				WEST NEW SOUTH HEAD ROAD				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 8:00	0	0	0	0	26	1065	0	1091	81	0	123	204	0	642	88	730	2025
7:15 - 8:15	0	0	0	0	29	1099	0	1128	97	0	136	233	0	664	86	750	2111
7:30 - 8:30	0	0	0	0	42	1142	0	1184	106	0	142	248	0	739	90	829	2261
7:45 - 8:45	0	0	0	0	56	1088	0	1144	100	0	131	231	0	715	88	803	2178
8:00 - 9:00	0	0	0	0	71	1087	0	1158	107	0	121	228	0	653	84	737	2123
Period End	0	0	0	0	224	5481	0	5705	491	0	653	1144	0	3413	436	3849	10698
16:00 - 17:00	0	0	0	0	59	809	0	868	89	0	87	176	0	559	151	710	1754
16:15 - 17:15	0	0	0	0	59	802	0	861	99	0	100	199	0	579	159	738	1798
16:30 - 17:30	0	0	0	0	68	762	0	830	88	0	109	197	0	589	168	757	1784
16:45 - 17:45	0	0	0	0	75	708	0	783	92	0	118	210	0	633	176	809	1802
17:00 - 18:00	0	0	0	0	67	659	0	726	88	0	115	203	0	678	170	848	1777
Period End	0	0	0	0	328	3740	0	4068	456	0	529	985	0	3038	824	3862	8915

Location	-	Duration	0700 - 0900
	NEW SOUTH HEAD ROAD		1600 -1800
	NEWCASTLE STREET		0
	NEW SOUTH HEAD ROAD	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE

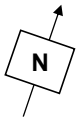


AM PEAK

7:30	-	8:30

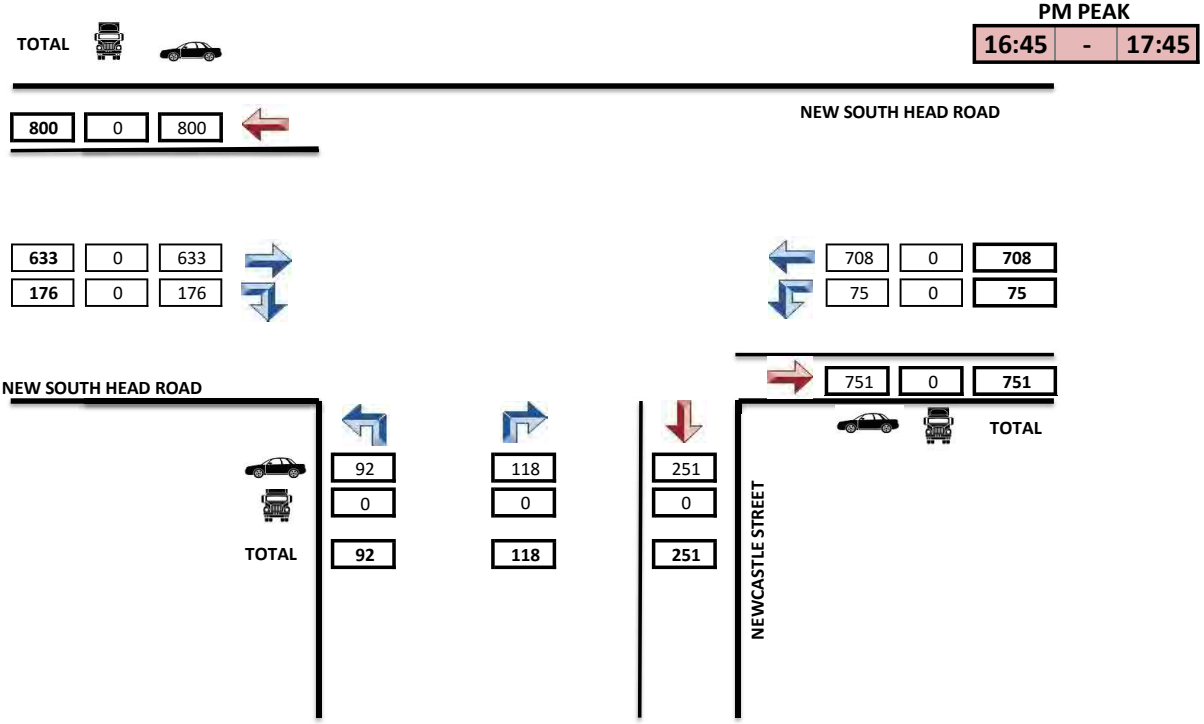


Location	-	Duration	0700 - 0900
	NEW SOUTH HEAD ROAD		1600 -1800
	NEWCASTLE STREET		0
	NEW SOUTH HEAD ROAD	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE



PM PEAK

16:45	-	17:45



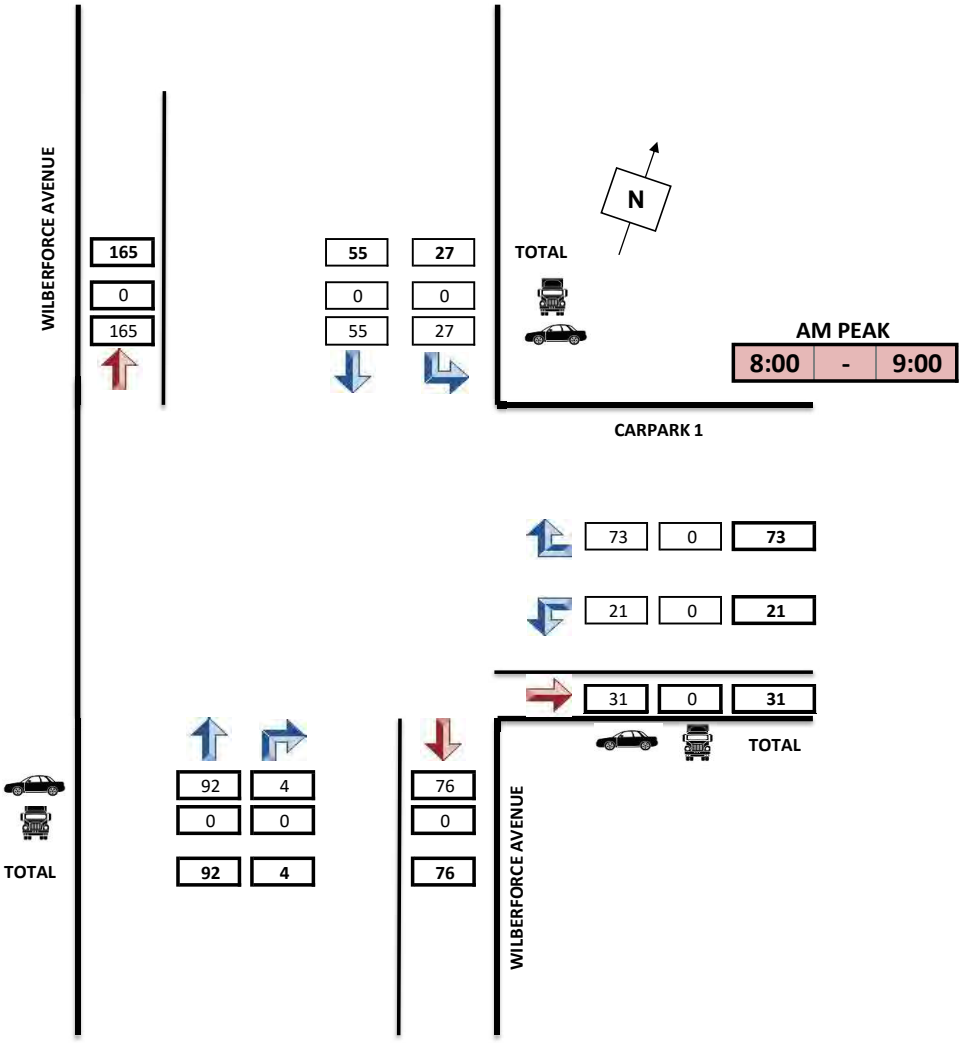
Traffic Information Specialist

Location	WILBERFORCE AVENUE	Duration	0700 - 0900
	CARPARK 1		1600 -1800
	WILBERFORCE AVENUE		-
	-	Day/Date	Monday, August 22, 2016
Suburb	ROSE BAY	Weather	FINE

All Vehicles Time Per 15 Mins	NORTH WILBERFORCE AVENUE				EAST CARPARK 1				SOUTH WILBERFORCE AVENUE				WEST -				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 7:15	2	11	0	**2**	2	0	8	**10**	0	8	1	**9**	0	0	0	**0**	**21**
7:15 - 7:30	8	11	0	**8**	2	0	12	**14**	0	21	0	**21**	0	0	0	**0**	**43**
7:30 - 7:45	6	4	0	**6**	2	0	8	**10**	0	24	0	**24**	0	0	0	**0**	**40**
7:45 - 8:00	3	11	0	**3**	1	0	7	**8**	0	34	0	**34**	0	0	0	**0**	**45**
8:00 - 8:15	4	14	0	**4**	1	0	23	**24**	0	23	2	**25**	0	0	0	**0**	**53**
8:15 - 8:30	4	15	0	**4**	5	0	14	**19**	0	26	0	**26**	0	0	0	**0**	**49**
8:30 - 8:45	9	12	0	**9**	3	0	19	**22**	0	18	1	**19**	0	0	0	**0**	**50**
8:45 - 9:00	10	14	0	**10**	12	0	17	**29**	0	25	1	**26**	0	0	0	**0**	**65**
Period End	**46**	**92**	**0**	**46**	**28**	**0**	**108**	**136**	**0**	**179**	**5**	**184**	**0**	**0**	**0**	**0**	**366**
16:00 - 16:15	13	25	0	**13**	19	0	13	**32**	0	16	2	**18**	0	0	0	**0**	**63**
16:15 - 16:30	14	22	0	**14**	10	0	18	**28**	0	15	2	**17**	0	0	0	**0**	**59**
16:30 - 16:45	14	32	0	**14**	14	0	19	**33**	0	18	2	**20**	0	0	0	**0**	**67**
16:45 - 17:00	14	31	0	**14**	14	0	16	**30**	0	13	1	**14**	0	0	0	**0**	**58**
17:00 - 17:15	14	30	0	**14**	10	0	12	**22**	0	10	1	**11**	0	0	0	**0**	**47**
17:15 - 17:30	6	38	0	**6**	15	0	19	**34**	0	14	1	**15**	0	0	0	**0**	**55**
17:30 - 17:45	16	40	0	**16**	13	0	14	**27**	0	13	3	**16**	0	0	0	**0**	**59**
17:45 - 18:00	7	31	0	**7**	12	0	17	**29**	0	13	2	**15**	0	0	0	**0**	**51**
Period End	**98**	**249**	**0**	**98**	**107**	**0**	**128**	**235**	**0**	**112**	**14**	**126**	**0**	**0**	**0**	**0**	**459**

All Vehicles Time Per 15 Mins	NORTH WILBERFORCE AVENUE				EAST CARPARK 1				SOUTH WILBERFORCE AVENUE				WEST -				
	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00 - 8:00	19	37	0	**19**	7	0	35	**42**	0	87	1	**88**	0	0	0	**0**	**149**
7:15 - 8:15	21	40	0	**21**	6	0	50	**56**	0	102	2	**104**	0	0	0	**0**	**181**
7:30 - 8:30	17	44	0	**17**	9	0	52	**61**	0	107	2	**109**	0	0	0	**0**	**187**
7:45 - 8:45	20	52	0	**20**	10	0	63	**73**	0	101	3	**104**	0	0	0	**0**	**197**
8:00 - 9:00	27	55	0	**27**	21	0	73	**94**	0	92	4	**96**	0	0	0	**0**	**217**
Period End	**104**	**228**	**0**	**104**	**53**	**0**	**273**	**326**	**0**	**489**	**12**	**501**	**0**	**0**	**0**	**0**	**931**
16:00 - 17:00	55	110	0	**55**	57	0	66	**123**	0	62	7	**69**	0	0	0	**0**	**247**
16:15 - 17:15	56	115	0	**56**	48	0	65	**113**	0	56	6	**62**	0	0	0	**0**	**231**
16:30 - 17:30	48	131	0	**48**	53	0	66	**119**	0	55	5	**60**	0	0	0	**0**	**227**
16:45 - 17:45	50	139	0	**50**	52	0	61	**113**	0	50	6	**56**	0	0	0	**0**	**219**
17:00 - 18:00	43	139	0	**43**	50	0	62	**112**	0	50	7	**57**	0	0	0	**0**	**212**
Period End	**252**	**634**	**0**	**252**	**260**	**0**	**320**	**580**	**0**	**273**	**31**	**304**	**0**	**0**	**0**	**0**	**1136**

Location	WILBERFORCE AVENUE	Duration	0700 - 0900
	CARPARK 1		1600 -1800
	WILBERFORCE AVENUE		0
	-	Day/Date	Monday, August 22, 2016
Suburb	ROSE BAY	Weather	FINE



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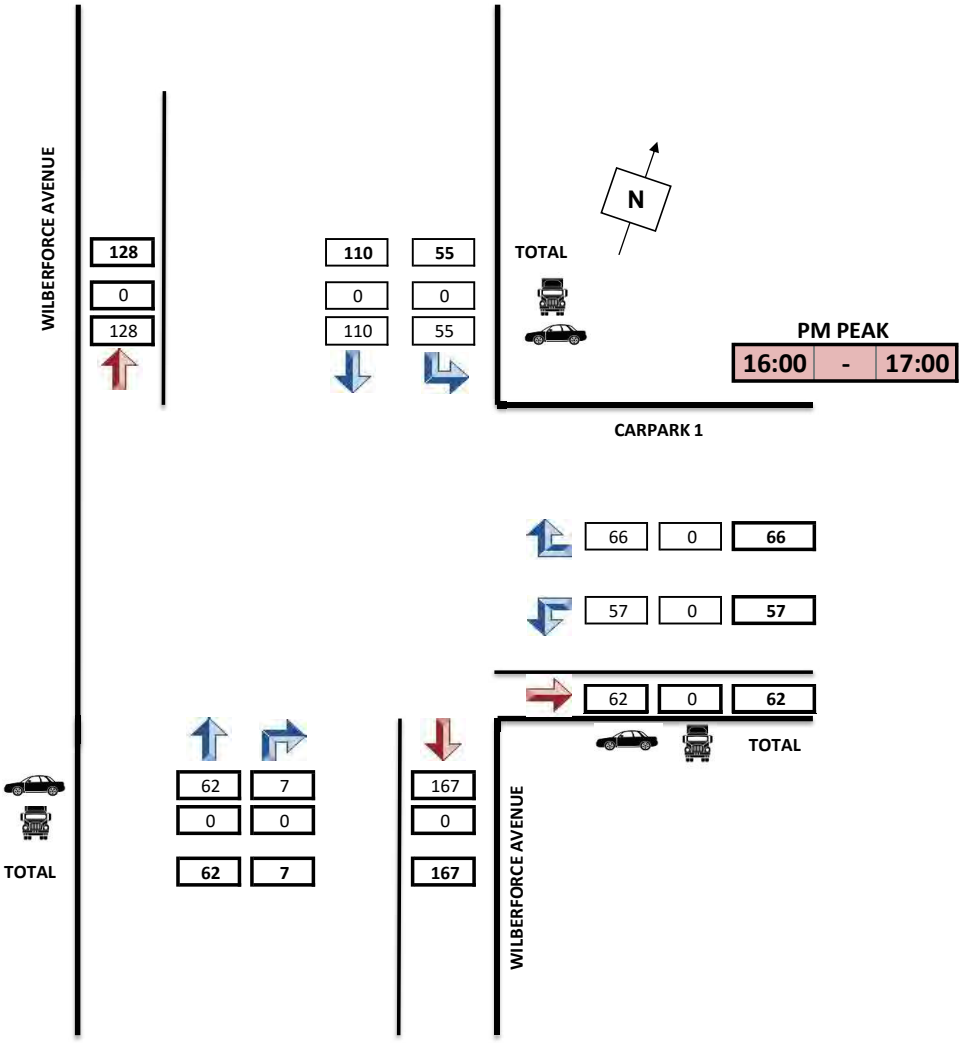
Location	WILBERFORCE AVENUE	Duration	0700 - 0900
	CARPARK 1		1600 -1800
	WILBERFORCE AVENUE		0
	-	Day/Date	Monday, August 22, 2016
Suburb	ROSE BAY	Weather	FINE



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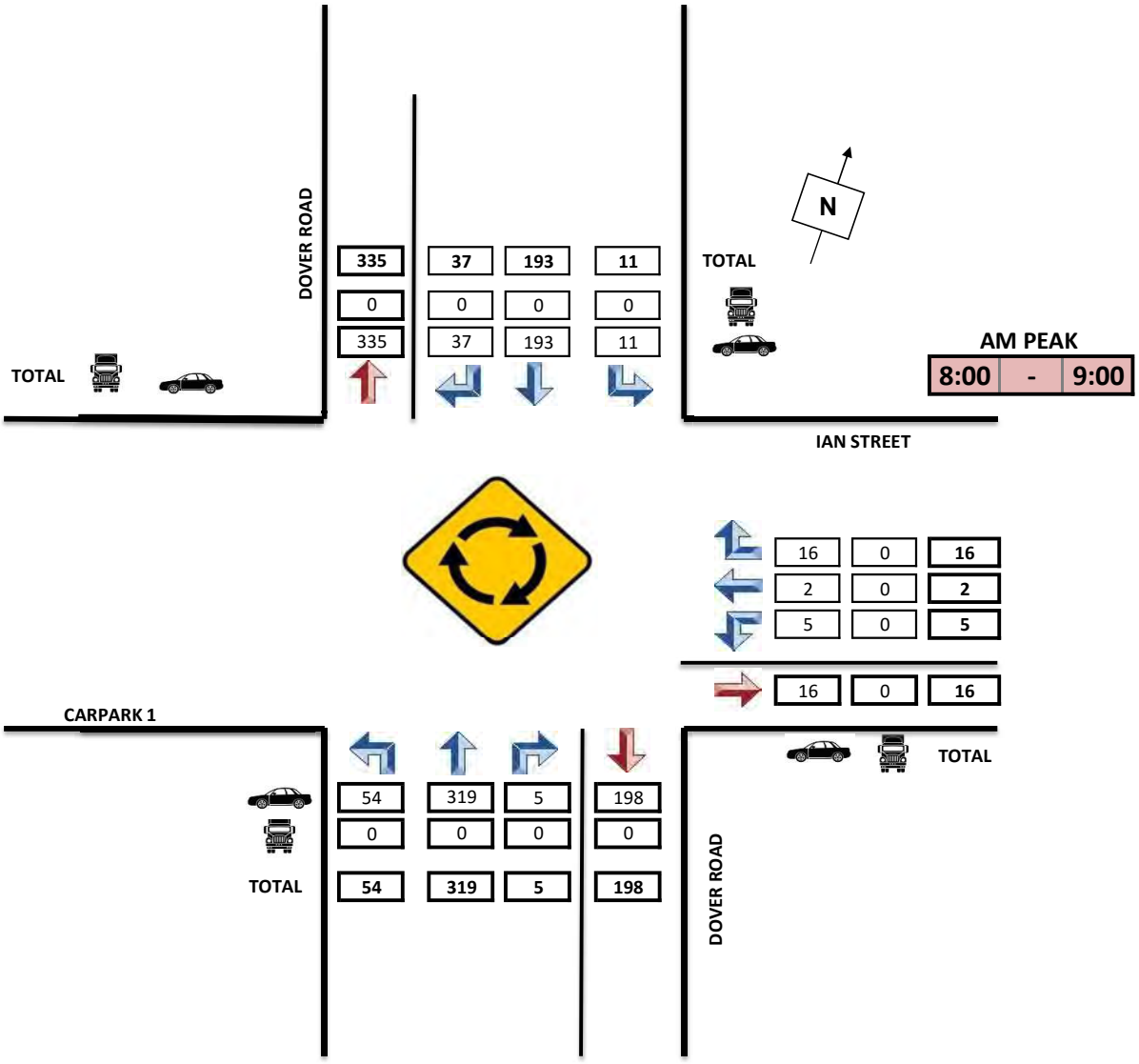
Location	DOVER ROAD	Duration	0700 - 0900
	IAN STREET		1600 -1800
	DOVER ROAD		-
	CARPARK 1	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE

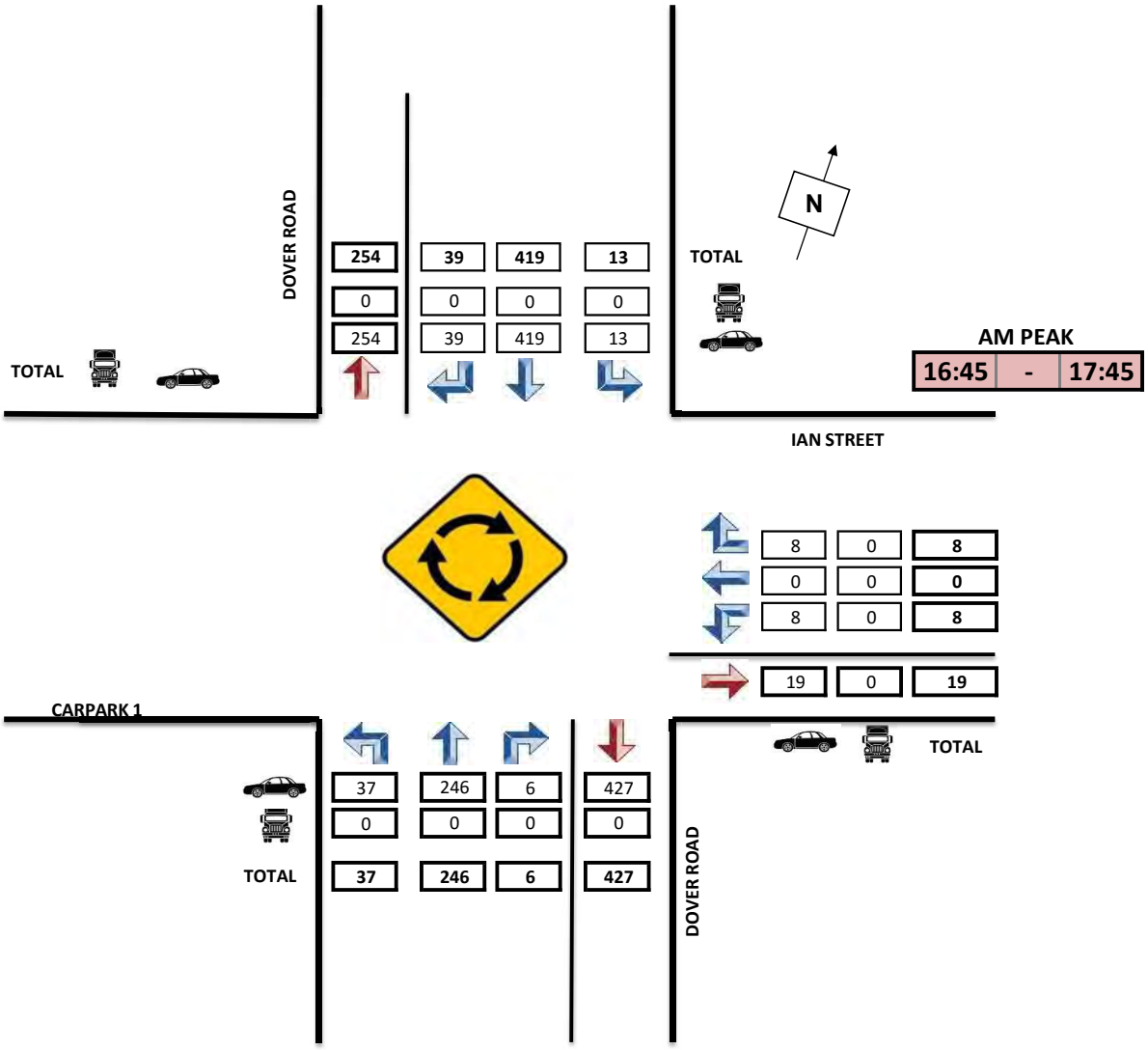
All Vehicles Time Per 15 Mins			NORTH *DOVER ROAD*				EAST *IAN STREET*				SOUTH *DOVER ROAD*				WEST *CARPARK 1*				
			L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00	-	7:15	1	36	1	38	0	0	0	0	5	75	0	80	0	0	0	0	118
7:15	-	7:30	1	40	2	43	0	0	0	0	8	89	1	98	0	0	0	0	141
7:30	-	7:45	5	53	4	62	0	1	0	1	6	88	1	95	0	0	0	0	158
7:45	-	8:00	1	42	5	48	1	1	5	7	6	83	3	92	0	0	0	0	147
8:00	-	8:15	1	38	14	53	2	2	4	8	16	98	2	116	0	0	0	0	177
8:15	-	8:30	5	55	7	67	1	0	5	6	12	69	2	83	0	0	0	0	156
8:30	-	8:45	2	55	10	67	0	0	1	1	13	70	0	83	0	0	0	0	151
8:45	-	9:00	3	45	6	54	2	0	6	8	13	82	1	96	0	0	0	0	158
Period End			19	364	49	432	6	4	21	31	79	654	10	743	0	0	0	0	1206
16:00	-	16:15	2	74	2	78	1	0	1	2	14	47	1	62	0	0	0	0	142
16:15	-	16:30	1	85	5	91	2	0	2	4	10	51	0	61	0	0	0	0	156
16:30	-	16:45	0	82	13	95	1	1	1	3	7	53	2	62	0	0	0	0	160
16:45	-	17:00	3	70	6	79	2	0	1	3	5	42	0	47	0	0	0	0	129
17:00	-	17:15	4	68	9	81	2	0	2	4	8	46	2	56	0	0	0	0	141
17:15	-	17:30	1	89	11	101	2	0	2	4	7	51	2	60	0	0	0	0	165
17:30	-	17:45	3	102	4	109	1	0	3	4	12	56	2	70	0	0	0	0	183
17:45	-	18:00	2	90	9	101	1	0	0	1	5	51	0	56	0	0	0	0	158
Period End			16	660	59	735	12	1	12	25	68	397	9	474	0	0	0	0	1234

All Vehicles Time Per 15 Mins			NORTH *DOVER ROAD*				EAST *IAN STREET*				SOUTH *DOVER ROAD*				WEST *CARPARK 1*				
			L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	L	T	R	TOTAL	TOTAL
7:00	-	8:00	8	171	12	191	1	2	5	8	25	335	5	365	0	0	0	0	564
7:15	-	8:15	8	173	25	206	3	4	9	16	36	358	7	401	0	0	0	0	623
7:30	-	8:30	12	188	30	230	4	4	14	22	40	338	8	386	0	0	0	0	638
7:45	-	8:45	9	190	36	235	4	3	15	22	47	320	7	374	0	0	0	0	631
8:00	-	9:00	11	193	37	241	5	2	16	23	54	319	5	378	0	0	0	0	642
Period End			48	915	140	1103	17	15	59	91	202	1670	32	1904	0	0	0	0	3098
16:00	-	17:00	6	311	26	343	6	1	5	12	36	193	3	232	0	0	0	0	587
16:15	-	17:15	8	305	33	346	7	1	6	14	30	192	4	226	0	0	0	0	586
16:30	-	17:30	8	309	39	356	7	1	6	14	27	192	6	225	0	0	0	0	595
16:45	-	17:45	13	419	39	471	8	0	8	16	37	246	6	289	0	0	0	0	776
17:00	-	18:00	10	349	33	392	6	0	7	13	32	204	6	242	0	0	0	0	647
Period End			45	1693	170	1908	34	3	32	69	162	1027	25	1214	0	0	0	0	3191

Location	DOVER ROAD	Duration	0700 - 0900
	IAN STREET		1600 -1800
	DOVER ROAD		-
	CARPARK 1	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE



Location	DOVER ROAD	Duration	0700 - 0900
	IAN STREET		1600 -1800
	DOVER ROAD		-
	CARPARK 1	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE

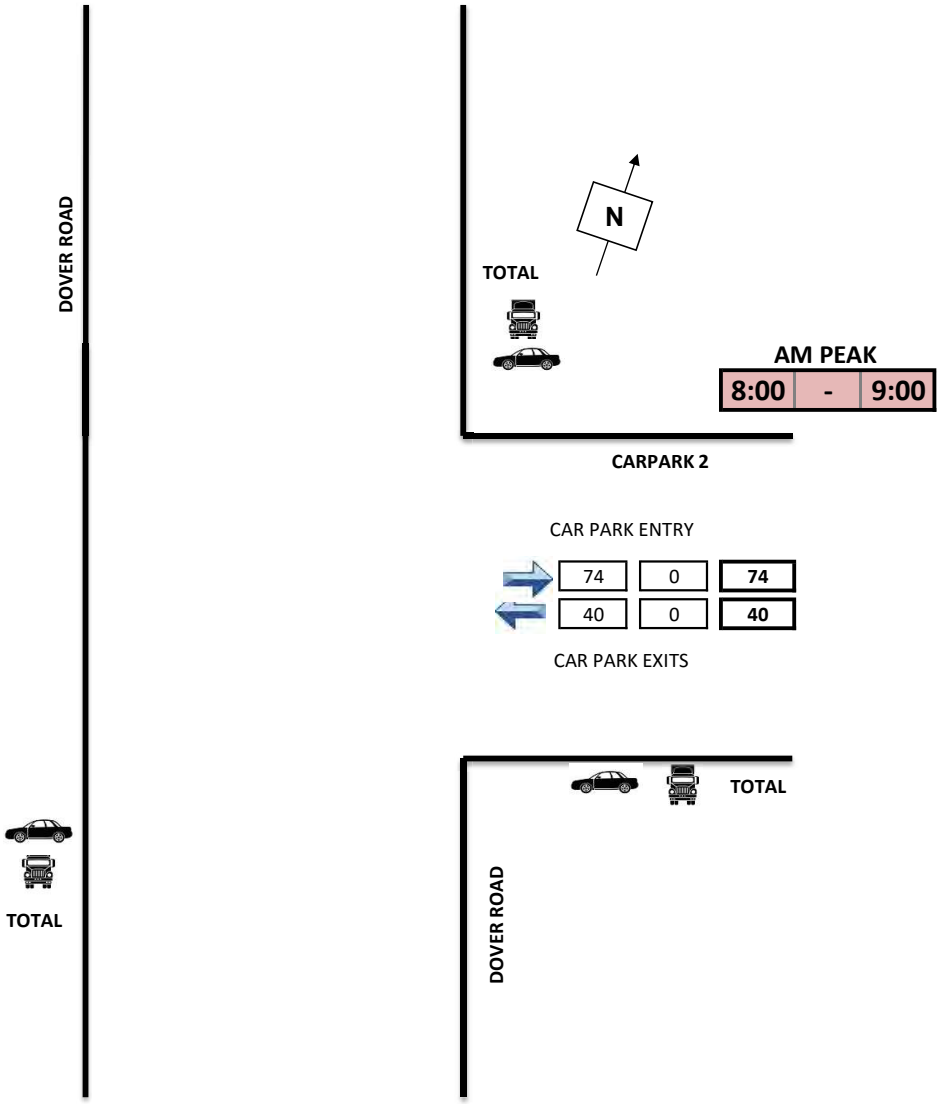


Location	DOVER ROAD	Duration	0700 - 0900
	CARPARK 2		1600 -1800
	DOVER ROAD		-
	CARPARK 2	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE

All Vehicles Time Per 15 Mins			CARPARK 2		
			IN	OUT	TOTAL
7:00	-	7:15	11	6	17
7:15	-	7:30	1	8	9
7:30	-	7:45	5	9	14
7:45	-	8:00	10	16	26
8:00	-	8:15	12	16	28
8:15	-	8:30	3	18	21
8:30	-	8:45	14	16	30
8:45	-	9:00	11	24	35
Period End			67	113	180
16:00	-	16:15	20	14	34
16:15	-	16:30	15	16	31
16:30	-	16:45	20	19	39
16:45	-	17:00	18	20	38
17:00	-	17:15	19	17	36
17:15	-	17:30	16	11	27
17:30	-	17:45	10	11	21
17:45	-	18:00	13	8	21
Period End			131	116	247

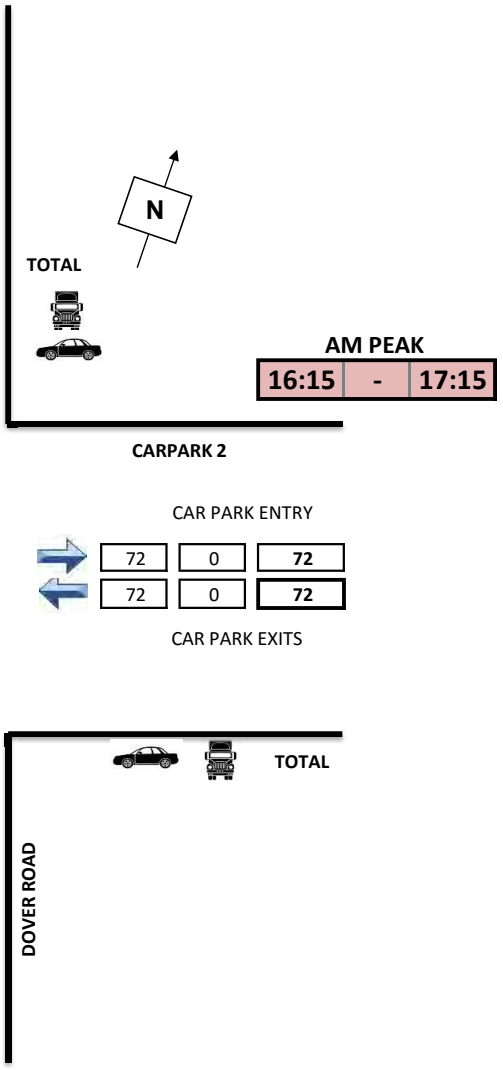
All Vehicles Time Per 15 Mins			CARPARK 2		
			IN	OUT	TOTAL
7:00	-	8:00	27	39	66
7:15	-	8:15	28	49	77
7:30	-	8:30	30	59	89
7:45	-	8:45	39	66	105
8:00	-	9:00	40	74	114
Period End			164	287	451
16:00	-	17:00	73	69	142
16:15	-	17:15	72	72	144
16:30	-	17:30	73	67	140
16:45	-	17:45	76	67	143
17:00	-	18:00	58	47	105
Period End			352	322	674

Location	DOVER ROAD	Duration	0700 - 0900
	CARPARK 2		1600 -1800
	DOVER ROAD		-
	-	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE



Location	DOVER ROAD	Duration	0700 - 0900
	CARPARK 2		1600 -1800
	DOVER ROAD		-
	-	Day/Date	Tuesday, September 20, 2016
Suburb	ROSE BAY	Weather	FINE

-

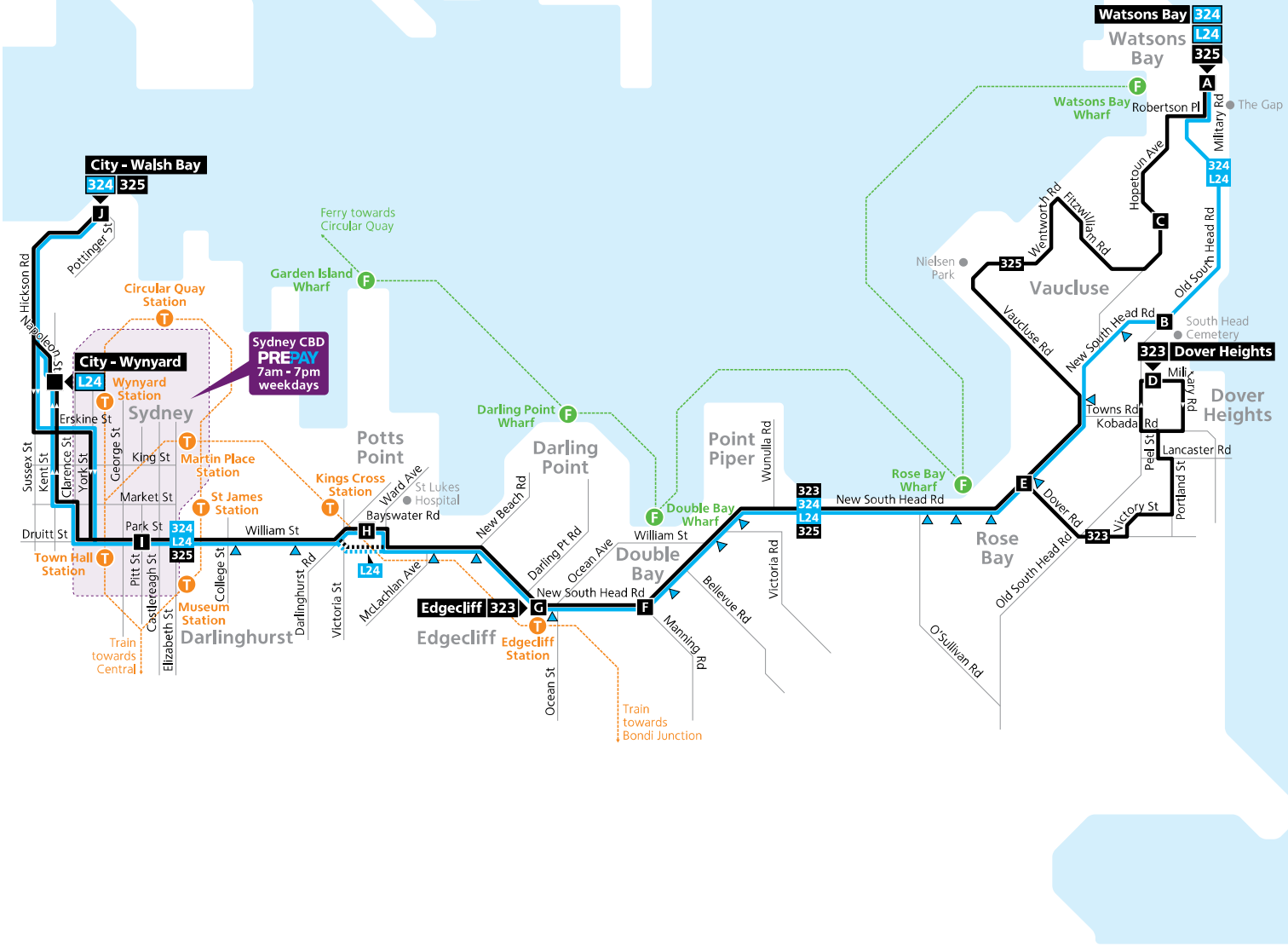


APPENDIX D

TRANSPORT SERVICES

Bus route map

323, 324, L24, 325



Legend

- Bus route
- Diversion/extended route
- 324 Bus route number
- A Timing point
- Stops for limited stops services
- Train line/station
- Ferry route/wharf

North — Diagrammatic Map Not to Scale

Transport Buses


Continues on Western Region Guide
Continues on Northern Region Guide
Continues on Southern Region Guide
For route information in this area, refer to Northern Region Guide.
For route information in this area, refer to Southern Region Guide.
For more details on City bus routes see Sydney CBD Inset (below)
Common Bus Route Along Dotted Line
Street Legend
1. Greenknowe Ave
2. Elizabeth Bay Rd
Street Legend
1. Birriga Rd
2. Bundarra Rd
3. Bladland Rd
4. Bunyula Rd
Street Legend
1. Tamarama Marine Dr
2. Dellview St
3. Sandridge St
4. Alexander St
5. Pacific Ave
6. Ducley St
7. Denham St
8. Gaerloch Ave
Route 362 only operates on Weekends & Public Holidays between October and April. For exact dates, check timetable.
Watsons Bay
Vaucluse
Rose Bay
Dover Heights
North Bondi
Bondi
Bondi Beach
Bondi Junction
Double Bay
Point Piper
Darling Point
Garden Island
The Rocks
Millers Point
Pyrmont
Ultimo
Glebe
Newtown
Erskineville
Alexandria
St Peters
Sydenham
Tempe
Marrickville
Enmore
Stanmore
Petersham
Lewisham
Summer Hill
Ashfield
Haberfield
Leichhardt
Rozelle
Balmain
Birchgrove
Waterloo
Zetland
Redfern
Surry Hills
Darlinghurst
Elizabeth Bay
Edgecliff
Paddington
Woollahra
Moore Park
Centennial Park
Queens Park
Randwick
Kensington
Kingsford
Daceyville
Eastlakes
Pagewood
Botany
Mascot
Airport
Banksmeadow
Hillsdale
Matraville
Chifley
Malabar
Maroubra
South Coogee
Coogee
Clovelly
Bronte
Waverley
Port Botany
Phillip Bay
Little Bay
La Perouse
Sydney CBD
Eastern Region Bus Service Inset
Sydenham & Wolli Creek
Eastern Region Bus Service Inset
Legend
Police Station
Hospital
Shopping Centres
Railway Station
Educational Institutions
Sporting Facility
Local Icons
Bus Route
Bus Route Terminus
As at 1 August 2016
Cartography by TransitGraphics
kilometres
approximate distance
Limit of Area Serviced by Sydney Buses
State Transit Eastern Suburbs

	Monday to Friday	♿		♿			♿	♿			♿	♿
map ref	Route Number	324	324	324	324	323	325	324	324	323	325	324	325
A	**Watsons Bay** Military Road	04:40	05:10	05:40	05:59	...	06:12	06:25	...	...	06:45	06:57	07:04
B	**Vaucluse Heights** Old South Head Rd	04:45	05:15	05:45	06:04	...	...	06:31	...	...	...	07:03	...
C	**Vaucluse** Hopetoun Avenue	...	...	...	...	...	06:16	...	...	...	06:50	...	07:09
D	**Dover Heights** Military Road	...	...	...	...	06:10	...	...	...	06:46	...	...	...
E	**Rose Bay** Dover Road	04:50	05:20	05:50	06:09	06:19	06:25	06:37	06:49	06:55	06:59	07:09	07:18
F	**Double Bay** Manning Road	04:58	05:28	05:58	06:18	06:29	06:35	06:47	06:59	07:05	07:09	07:19	07:28
G	**Edgecliff** New South Head Road	05:00	05:30	06:00	06:21	e06:32	06:38	06:50	07:02	e07:08	07:12	07:22	07:31
H	**Kings Cross** Bayswater Road	05:04	05:34	06:04	06:26	...	06:43	06:55	07:07	...	07:17	07:27	07:38
I	**City - Town Hall** Park Street	05:11	05:41	06:11	06:34	...	06:51	p07:03	p07:16	...	p07:26	p07:37	p07:48
J	**City - Walsh Bay** Hickson Road	05:20	05:50	06:20	06:43	...	07:00	07:12	07:25	...	07:35	07:46	07:57

	Monday to Friday (continued...)	♿		♿	♿	♿	♿	♿				♿	♿
map ref	Route Number	323	324	325	L24	323	324	325	L24	324	323	325	324
A	**Watsons Bay** Military Road	...	07:13	07:18	p07:24	...	07:26	07:30	p07:39	07:41	...	07:48	08:02
B	**Vaucluse Heights** Old South Head Rd	...	07:19	...	p07:30	...	07:32	...	p07:45	07:47	...	...	08:08
C	**Vaucluse** Hopetoun Avenue	...	...	07:23	...	...	...	07:35	...	...	...	07:53	...
D	**Dover Heights** Military Road	07:14	...	...	...	07:27	...	...	...	...	07:50	...	...
E	**Rose Bay** Dover Road	07:23	07:25	07:32	p07:36	07:37	07:39	07:46	p07:51	07:54	08:00	08:04	08:15
F	**Double Bay** Manning Road	07:35	07:38	07:47	p07:49	07:52	07:54	08:01	p08:04	08:09	08:15	08:19	08:30
G	**Edgecliff** New South Head Road	e07:39	07:42	07:51	p07:53	e07:56	07:58	08:05	p08:08	08:13	e08:19	08:23	08:33
H	**Kings Cross** Bayswater Road	...	07:49	07:58	...	...	08:05	08:12	...	08:20	...	08:30	08:39
I	**City - Town Hall** Park Street	...	p07:59	p08:08	q08:09	...	p08:15	p08:22	q08:24	p08:30	...	p08:40	p08:49
J	**City - Walsh Bay** Hickson Road	...	08:08	08:17	...	...	08:24	08:31	...	08:39	...	08:49	08:58

	Monday to Friday (continued...)		♿		♿	♿	♿			♿	♿	♿	♿
map ref	Route Number	324	323	325	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	08:14	...	08:19	08:34	08:49	09:07	09:19	09:37	09:49	10:07	10:19	10:37
B	**Vaucluse Heights** Old South Head Rd	08:20	...	...	08:40	...	09:13	...	09:43	...	10:13	...	10:43
C	**Vaucluse** Hopetoun Avenue	...	...	08:24	...	08:54	...	09:24	...	09:54	...	10:24	...
D	**Dover Heights** Military Road	...	08:20	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	08:27	08:30	08:35	08:47	09:04	09:19	09:34	09:49	10:04	10:19	10:34	10:49
F	**Double Bay** Manning Road	08:40	08:43	08:48	09:00	09:15	09:30	09:45	10:00	10:15	10:30	10:45	11:00
G	**Edgecliff** New South Head Road	08:43	e08:46	08:51	09:03	09:18	09:33	09:48	10:03	10:18	10:33	10:48	11:03
H	**Kings Cross** Bayswater Road	08:49	...	08:57	09:08	09:23	09:38	09:53	10:08	10:23	10:38	10:53	11:08
I	**City - Town Hall** Park Street	p08:59	...	p09:07	p09:18	p09:33	p09:48	p10:03	p10:18	p10:33	p10:48	p11:03	p11:18
J	**City - Walsh Bay** Hickson Road	09:08	...	09:16	09:27	09:42	09:57	10:12	10:27	10:42	10:57	11:12	11:27

	Monday to Friday (continued...)	♿	♿	♿		♿	♿	♿	♿	♿	♿	♿	♿
map ref	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	10:49	11:07	11:19	11:37	11:49	12:07	12:19	12:37	12:49	13:07	13:19	13:37
B	**Vaucluse Heights** Old South Head Rd	...	11:13	...	11:43	...	12:13	...	12:43	...	13:13	...	13:43
C	**Vaucluse** Hopetoun Avenue	10:54	...	11:24	...	11:54	...	12:24	...	12:54	...	13:24	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	11:04	11:19	11:34	11:49	12:04	12:19	12:34	12:49	13:04	13:19	13:34	13:49
F	**Double Bay** Manning Road	11:15	11:30	11:45	12:00	12:15	12:30	12:45	13:00	13:15	13:30	13:45	14:00
G	**Edgecliff** New South Head Road	11:18	11:33	11:48	12:03	12:18	12:33	12:48	13:03	13:18	13:33	13:48	14:03
H	**Kings Cross** Bayswater Road	11:23	11:38	11:53	12:08	12:23	12:38	12:53	13:08	13:23	13:38	13:53	14:08
I	**City - Town Hall** Park Street	p11:33	p11:48	p12:03	p12:18	p12:33	p12:48	p13:03	p13:18	p13:33	p13:48	p14:03	p14:18
J	**City - Walsh Bay** Hickson Road	11:42	11:57	12:12	12:27	12:42	12:57	13:12	13:27	13:42	13:57	14:12	14:27

	Monday to Friday (continued...)	♿	♿	♿	♿	♿		♿			♿	♿	♿
map ref	Route Number	325	324	325	324	324	324	325	324	324	324	324	324
A	**Watsons Bay** Military Road	13:49	14:07	14:19	14:32	14:41	...	14:49	...	...	15:02	...	15:12
B	**Vaucluse Heights** Old South Head Rd	...	14:13	...	14:38	14:47	14:52	...	15:02	15:05	15:08	15:13	15:18
C	**Vaucluse** Hopetoun Avenue	13:54	...	14:24	...	...	...	14:54	...	...	...	...	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	14:04	14:19	14:34	14:44	14:53	14:58	15:04	15:08	15:11	15:14	15:19	15:24
F	**Double Bay** Manning Road	14:15	14:30	14:45	14:55	15:04	15:08	15:14	15:18	15:21	15:24	15:29	15:34
G	**Edgecliff** New South Head Road	14:18	14:33	14:48	14:58	15:08	e15:10	15:18	e15:20	e15:23	15:28	e15:31	15:38
H	**Kings Cross** Bayswater Road	14:23	14:38	14:53	15:03	15:13	...	15:23	...	...	15:33	...	15:43
I	**City - Town Hall** Park Street	p14:33	p14:48	p15:03	p15:13	p15:23	...	p15:33	...	...	p15:43	...	p15:53
J	**City - Walsh Bay** Hickson Road	14:42	14:57	15:12	15:22	15:32	...	15:42	...	...	15:52	...	16:02

	Monday to Friday (continued...)	♿		♿	♿	♿			♿			♿	
map ref	Route Number	325	324	324	325	324	324	325	324	324	325	324	324
A	**Watsons Bay** Military Road	15:19	...	15:32	15:39	15:52	...	16:19	16:32	...	16:49	17:07	...
B	**Vaucluse Heights** Old South Head Rd	...	15:33	15:38	...	15:58	16:14	...	16:38	16:48	...	17:13	17:28
C	**Vaucluse** Hopetoun Avenue	15:24	...	...	15:44	...	...	16:24	...	...	16:54	...	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	15:34	15:39	15:44	15:54	16:04	16:20	16:34	16:44	16:54	17:04	17:19	17:34
F	**Double Bay** Manning Road	15:44	15:49	15:54	16:04	16:14	16:30	16:44	16:54	17:04	17:14	17:29	17:44
G	**Edgecliff** New South Head Road	15:48	e15:51	15:58	16:08	16:18	16:34	16:48	16:58	17:08	17:18	17:33	17:48
H	**Kings Cross** Bayswater Road	15:53	...	16:03	16:13	16:23	16:39	16:53	17:03	17:13	17:23	17:38	17:53
I	**City - Town Hall** Park Street	p16:03	...	p16:13	p16:22	p16:33	p16:48	p17:02	p17:12	p17:22	p17:32	p17:47	p18:02
J	**City - Walsh Bay** Hickson Road	16:12	...	16:22	16:31	16:43	16:58	17:12	17:22	17:32	17:42	17:57	18:11

	Monday to Friday (continued...)	♿	♿	♿			♿	♿	♿	♿	♿	♿	♿
map ref	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	17:34	17:52	18:06	18:29	18:46	19:19	19:46	20:19	20:47	21:21	21:49	22:21
B	**Vaucluse Heights** Old South Head Rd	...	17:58	...	18:35	...	19:25	...	20:25	...	21:26	...	22:26
C	**Vaucluse** Hopetoun Avenue	17:39	...	18:11	...	18:51	...	19:50	...	20:51	...	21:53	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	17:49	18:04	18:21	18:41	19:01	19:29	19:59	20:29	21:00	21:30	22:00	22:30
F	**Double Bay** Manning Road	17:59	18:14	18:31	18:51	19:10	19:38	20:08	20:38	21:08	21:38	22:08	22:38
G	**Edgecliff** New South Head Road	18:03	18:18	18:35	18:55	19:12	19:40	20:10	20:40	21:10	21:40	22:10	22:40
H	**Kings Cross** Bayswater Road	18:08	18:23	18:40	19:00	19:16	19:44	20:14	20:44	21:13	21:43	22:13	22:43
I	**City - Town Hall** Park Street	p18:17	p18:32	p18:49	19:08	19:24	19:51	20:21	20:51	21:20	21:50	22:20	22:50
J	**City - Walsh Bay** Hickson Road	18:26	18:41	18:58	19:17	19:33	20:00	20:30	21:00	21:29	21:59	22:29	22:59

	Monday to Friday (continued...)	♿	♿	♿	♿	♿
map ref	Route Number	325	324	324	324	324
A	**Watsons Bay** Military Road	22:49	23:21	23:51	00:22	f01:15
B	**Vaucluse Heights** Old South Head Rd	...	23:26	23:56	00:27	f01:20
C	**Vaucluse** Hopetoun Avenue	22:53	...	...	...	...
D	**Dover Heights** Military Road	...	...	...	...	...
E	**Rose Bay** Dover Road	23:00	23:30	00:00	00:31	f01:24
F	**Double Bay** Manning Road	23:08	23:38	00:08	00:38	f01:31
G	**Edgecliff** New South Head Road	23:10	23:40	00:10	00:40	f01:33
H	**Kings Cross** Bayswater Road	23:13	23:43	00:13	00:43	f01:36
I	**City - Town Hall** Park Street	23:20	23:50	00:20	00:50	f01:43
J	**City - Walsh Bay** Hickson Road	23:29	23:59	00:29	00:59	f01:52

Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref Route Number	324	324	324	324	324	324	325	324	325	324	325	324
A **Watsons Bay** Military Road	04:31	05:01	05:31	06:01	06:31	07:01	07:25	07:45	07:55	08:15	08:25	08:44
B **Vaucluse Heights** Old South Head Rd	04:36	05:06	05:36	06:06	06:36	07:06	...	07:50	...	08:20	...	08:49
C **Vaucluse** Hopetoun Avenue	...	...	...	...	...	...	07:29	...	08:00	...	08:30	...
D **Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E **Rose Bay** Dover Road	04:40	05:10	05:40	06:10	06:40	07:10	07:38	07:54	08:09	08:24	08:39	08:53
F **Double Bay** Manning Road	04:47	05:18	05:48	06:18	06:48	07:18	07:47	08:03	08:18	08:33	08:48	09:03
G **Edgecliff** New South Head Road	04:49	05:20	05:50	06:20	06:50	07:20	07:49	08:05	08:20	08:35	08:50	09:05
H **Kings Cross** Bayswater Road	04:53	05:24	05:54	06:24	06:54	07:24	07:53	08:09	08:24	08:39	08:54	09:10
I **City - Town Hall** Park Street	04:59	05:30	06:00	06:30	07:00	07:30	08:00	08:16	08:31	08:47	09:02	09:18
J **City - Walsh Bay** Hickson Road	05:08	05:39	06:09	06:39	07:09	07:39	08:09	08:25	08:41	08:57	09:12	09:28

Saturday (continued...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A **Watsons Bay** Military Road	08:51	09:13	09:20	09:43	09:50	10:13	10:20	10:43	10:50	11:13	11:20	11:43
B **Vaucluse Heights** Old South Head Rd	...	09:18	...	09:48	...	10:18	...	10:48	...	11:18	...	11:48
C **Vaucluse** Hopetoun Avenue	08:56	...	09:25	...	09:55	...	10:25	...	10:55	...	11:25	...
D **Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E **Rose Bay** Dover Road	09:07	09:22	09:37	09:52	10:07	10:22	10:37	10:52	11:07	11:22	11:37	11:52
F **Double Bay** Manning Road	09:18	09:33	09:48	10:03	10:18	10:33	10:48	11:03	11:18	11:33	11:48	12:03
G **Edgecliff** New South Head Road	09:20	09:35	09:50	10:05	10:20	10:35	10:50	11:05	11:20	11:35	11:50	12:05
H **Kings Cross** Bayswater Road	09:25	09:40	09:55	10:10	10:25	10:40	10:55	11:10	11:25	11:40	11:55	12:10
I **City - Town Hall** Park Street	09:33	09:48	10:03	10:18	10:33	10:48	11:03	11:18	11:33	11:48	12:03	12:18
J **City - Walsh Bay** Hickson Road	09:45	10:00	10:15	10:30	10:45	11:00	11:16	11:31	11:46	12:01	12:16	12:31

Saturday (continued...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A **Watsons Bay** Military Road	11:50	12:13	12:20	12:43	12:50	13:13	13:20	13:43	13:50	14:13	14:20	14:43
B **Vaucluse Heights** Old South Head Rd	...	12:18	...	12:48	...	13:18	...	13:48	...	14:18	...	14:48
C **Vaucluse** Hopetoun Avenue	11:55	...	12:25	...	12:55	...	13:25	...	13:55	...	14:25	...
D **Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E **Rose Bay** Dover Road	12:07	12:22	12:37	12:52	13:07	13:22	13:37	13:52	14:07	14:22	14:37	14:52
F **Double Bay** Manning Road	12:18	12:33	12:48	13:03	13:18	13:33	13:48	14:03	14:18	14:33	14:48	15:03
G **Edgecliff** New South Head Road	12:20	12:35	12:50	13:05	13:20	13:35	13:50	14:05	14:20	14:35	14:50	15:05
H **Kings Cross** Bayswater Road	12:25	12:40	12:55	13:10	13:25	13:40	13:55	14:10	14:25	14:40	14:55	15:10
I **City - Town Hall** Park Street	12:33	12:48	13:03	13:18	13:33	13:48	14:03	14:18	14:33	14:48	15:03	15:18
J **City - Walsh Bay** Hickson Road	12:46	13:01	13:16	13:31	13:46	14:01	14:16	14:31	14:46	15:01	15:16	15:31

map ref	Saturday (continued...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	14:50	15:13	15:20	15:43	15:50	16:13	16:20	16:44	16:52	17:15	17:23	17:45
B	**Vaucluse Heights** Old South Head Rd	...	15:18	...	15:48	...	16:18	...	16:49	...	17:20	...	17:50
C	**Vaucluse** Hopetoun Avenue	14:55	...	15:25	...	15:55	...	16:25	...	16:57	...	17:27	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	15:07	15:22	15:37	15:52	16:07	16:22	16:37	16:53	17:09	17:24	17:39	17:54
F	**Double Bay** Manning Road	15:18	15:33	15:48	16:03	16:18	16:33	16:48	17:04	17:19	17:34	17:49	18:04
G	**Edgecliff** New South Head Road	15:20	15:35	15:50	16:05	16:20	16:35	16:50	17:06	17:21	17:36	17:51	18:06
H	**Kings Cross** Bayswater Road	15:25	15:40	15:55	16:10	16:25	16:40	16:55	17:11	17:26	17:41	17:56	18:11
I	**City - Town Hall** Park Street	15:33	15:48	16:03	16:18	16:33	16:48	17:03	17:18	17:33	17:48	18:03	18:18
J	**City - Walsh Bay** Hickson Road	15:46	16:01	16:16	16:31	16:46	17:01	17:16	17:31	17:46	18:01	18:16	18:31

map ref	Saturday (continued...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	17:53	18:20	18:37	19:14	19:37	20:14	20:41	21:11	21:39	22:11	22:39	23:11
B	**Vaucluse Heights** Old South Head Rd	...	18:25	...	19:19	...	20:19	...	21:16	...	22:16	...	23:16
C	**Vaucluse** Hopetoun Avenue	17:57	...	18:41	...	19:41	...	20:45	...	21:43	...	22:43	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	18:09	18:29	18:53	19:23	19:53	20:23	20:57	21:20	21:50	22:20	22:50	23:20
F	**Double Bay** Manning Road	18:19	18:39	19:03	19:33	20:03	20:33	21:05	21:28	21:58	22:28	22:58	23:28
G	**Edgecliff** New South Head Road	18:21	18:41	19:05	19:35	20:05	20:35	21:07	21:30	22:00	22:30	23:00	23:30
H	**Kings Cross** Bayswater Road	18:26	18:46	19:10	19:40	20:10	20:40	21:10	21:33	22:03	22:33	23:03	23:33
I	**City - Town Hall** Park Street	18:33	18:53	19:16	19:46	20:16	20:46	21:16	21:39	22:09	22:39	23:09	23:39
J	**City - Walsh Bay** Hickson Road	18:46	19:05	19:26	19:56	20:26	20:56	21:26	21:49	22:19	22:49	23:19	23:49

map ref	Saturday (continued...)	♿	♿	♿	♿	♿
	Route Number	324	324	324	324	324
A	**Watsons Bay** Military Road	23:41	00:11	00:41	01:11	02:11
B	**Vaucluse Heights** Old South Head Rd	23:46	00:16	00:46	01:16	02:16
C	**Vaucluse** Hopetoun Avenue	...	...	...	...	...
D	**Dover Heights** Military Road	...	...	...	...	...
E	**Rose Bay** Dover Road	23:50	00:20	00:50	01:20	02:20
F	**Double Bay** Manning Road	23:58	00:28	00:57	01:27	02:27
G	**Edgecliff** New South Head Road	00:00	00:30	00:59	01:29	02:29
H	**Kings Cross** Bayswater Road	00:03	00:33	01:02	01:32	02:32
I	**City - Town Hall** Park Street	00:09	00:39	01:08	01:38	02:38
J	**City - Walsh Bay** Hickson Road	00:19	00:48	01:17	01:47	02:47

map ref	Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	324	324	324	324	324	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	...	...	07:01	07:31	08:01	08:16	08:28	08:45	08:54	09:11	09:22	09:41
B	**Vaucluse Heights** Old South Head Rd	...	...	07:06	07:36	08:06	08:21	...	08:50	...	09:17	...	09:47
C	**Vaucluse** Hopetoun Avenue	...	...	...	...	...	...	08:32	...	08:58	...	09:28	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	06:08	06:38	07:10	07:40	08:10	08:25	08:40	08:54	09:08	09:23	09:38	09:53
F	**Double Bay** Manning Road	06:16	06:46	07:18	07:48	08:18	08:33	08:48	09:03	09:18	09:33	09:48	10:03
G	**Edgecliff** New South Head Road	06:18	06:48	07:20	07:50	08:20	08:35	08:50	09:05	09:20	09:35	09:50	10:05
H	**Kings Cross** Bayswater Road	06:22	06:52	07:24	07:54	08:24	08:39	08:54	09:09	09:24	09:39	09:54	10:09
I	**City - Town Hall** Park Street	06:28	06:58	07:30	08:00	08:30	08:45	09:00	09:16	09:31	09:46	10:01	10:16
J	**City - Walsh Bay** Hickson Road	06:36	07:06	07:38	08:08	08:38	08:53	09:10	09:26	09:41	09:56	10:11	10:26

map ref	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	09:52	10:11	10:22	10:41	10:52	11:11	11:22	11:41	11:52	12:11	12:22	12:41
B	**Vaucluse Heights** Old South Head Rd	...	10:17	...	10:47	...	11:17	...	11:47	...	12:17	...	12:47
C	**Vaucluse** Hopetoun Avenue	09:58	...	10:28	...	10:58	...	11:28	...	11:58	...	12:28	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	10:08	10:23	10:38	10:53	11:08	11:23	11:38	11:53	12:08	12:23	12:38	12:53
F	**Double Bay** Manning Road	10:18	10:33	10:48	11:03	11:18	11:33	11:48	12:03	12:18	12:33	12:48	13:03
G	**Edgecliff** New South Head Road	10:20	10:35	10:50	11:05	11:20	11:35	11:50	12:05	12:20	12:35	12:50	13:05
H	**Kings Cross** Bayswater Road	10:24	10:39	10:54	11:09	11:24	11:39	11:54	12:09	12:24	12:39	12:54	13:09
I	**City - Town Hall** Park Street	10:31	10:47	11:02	11:17	11:32	11:47	12:02	12:17	12:32	12:47	13:02	13:17
J	**City - Walsh Bay** Hickson Road	10:41	10:59	11:14	11:29	11:44	11:59	12:14	12:29	12:44	12:59	13:14	13:29

map ref	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	12:52	13:11	13:22	13:41	13:52	14:11	14:22	14:41	14:52	15:11	15:22	15:41
B	**Vaucluse Heights** Old South Head Rd	...	13:17	...	13:47	...	14:17	...	14:47	...	15:17	...	15:47
C	**Vaucluse** Hopetoun Avenue	12:58	...	13:28	...	13:58	...	14:28	...	14:58	...	15:28	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	13:08	13:23	13:38	13:53	14:08	14:23	14:38	14:53	15:08	15:23	15:38	15:53
F	**Double Bay** Manning Road	13:18	13:33	13:48	14:03	14:18	14:33	14:48	15:03	15:18	15:33	15:48	16:03
G	**Edgecliff** New South Head Road	13:20	13:35	13:50	14:05	14:20	14:35	14:50	15:05	15:20	15:35	15:50	16:05
H	**Kings Cross** Bayswater Road	13:24	13:39	13:54	14:09	14:24	14:39	14:54	15:09	15:24	15:39	15:54	16:09
I	**City - Town Hall** Park Street	13:32	13:47	14:02	14:17	14:32	14:47	15:02	15:17	15:32	15:47	16:02	16:17
J	**City - Walsh Bay** Hickson Road	13:44	13:59	14:14	14:29	14:44	14:59	15:14	15:29	15:44	15:59	16:14	16:29

map ref	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	325	324	325	324	325	324	325	324	325	324	324	325
A	**Watsons Bay** Military Road	15:52	16:11	16:22	16:42	16:53	17:12	17:23	17:43	17:58	18:13	18:28	18:43
B	**Vaucluse Heights** Old South Head Rd	...	16:17	...	16:48	...	17:18	...	17:49	...	18:19	18:34	...
C	**Vaucluse** Hopetoun Avenue	15:58	...	16:28	...	16:59	...	17:29	...	18:03	...	...	18:47
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	16:08	16:23	16:38	16:54	17:09	17:24	17:39	17:55	18:11	18:24	18:39	18:55
F	**Double Bay** Manning Road	16:18	16:33	16:48	17:04	17:19	17:34	17:49	18:04	18:19	18:32	18:47	19:03
G	**Edgecliff** New South Head Road	16:20	16:35	16:50	17:06	17:21	17:36	17:51	18:06	18:21	18:34	18:49	19:05
H	**Kings Cross** Bayswater Road	16:24	16:39	16:54	17:10	17:25	17:40	17:55	18:10	18:25	18:38	18:53	19:09
I	**City - Town Hall** Park Street	16:32	16:47	17:02	17:18	17:33	17:48	18:02	18:16	18:31	18:44	18:59	19:15
J	**City - Walsh Bay** Hickson Road	16:44	16:59	17:14	17:30	17:45	18:00	18:12	18:26	18:41	18:54	19:09	19:25

map ref	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	324	325	324	325	324	325	324	325	324
A	**Watsons Bay** Military Road	19:14	19:43	20:14	20:43	21:11	21:39	22:11	22:39	23:11
B	**Vaucluse Heights** Old South Head Rd	19:20	...	20:20	...	21:16	...	22:16	...	23:16
C	**Vaucluse** Hopetoun Avenue	...	19:47	...	20:47	...	21:43	...	22:43	...
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...
E	**Rose Bay** Dover Road	19:25	19:55	20:25	20:55	21:20	21:50	22:20	22:50	23:20
F	**Double Bay** Manning Road	19:33	20:03	20:33	21:03	21:28	21:58	22:28	22:58	23:28
G	**Edgecliff** New South Head Road	19:35	20:05	20:35	21:05	21:30	22:00	22:30	23:00	23:30
H	**Kings Cross** Bayswater Road	19:39	20:09	20:39	21:08	21:33	22:03	22:33	23:03	23:33
I	**City - Town Hall** Park Street	19:45	20:15	20:45	21:14	21:39	22:09	22:39	23:09	23:39
J	**City - Walsh Bay** Hickson Road	19:54	20:24	20:54	21:22	21:47	22:17	22:47	23:17	23:47

	Monday to Friday	♿						♿	♿		♿	
map ref	Route Number	324	324	324	324	324	325	324	324	324	324	324	324
J	**City - Walsh Bay** Hickson Road	05:35	06:05	...	06:30	...	...	06:54	...	07:14	...	07:29	07:36
I	**City - Town Hall** Park Street	05:44	06:14	...	06:39	...	...	p07:03	...	p07:23	...	p07:38	p07:45
H	**Kings Cross** Bayswater Road	05:51	06:21	...	06:48	...	...	07:13	...	07:33	...	07:48	07:55
G	**Edgecliff Interchange**	05:56	06:26	06:43	06:56	07:00	07:06	07:21	07:31	07:41	07:49	07:56	08:03
F	**Double Bay** Manning Road	05:58	06:28	06:46	06:59	07:03	07:09	07:24	07:34	07:44	07:52	07:59	08:06
E	**Rose Bay** Dover Road	06:05	06:36	06:54	07:07	07:11	07:17	07:32	07:42	07:52	08:00	08:07	08:14
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	...	...	...	...	07:25	...	...	...	...	...	...
B	**Vaucluse Heights** Old South Head Rd	06:09	06:40	06:58	07:11	07:15	...	07:38	07:48	07:58	08:06	08:13	08:20
A	**Watsons Bay** Military Road	06:14	06:46	...	07:17	...	07:30	07:44	07:54	08:04	...	08:19	...

	Monday to Friday (continued...)		♿	♿		♿	♿	♿	♿	♿	♿		
map ref	Route Number	324	325	324	324	325	324	325	324	325	324	325	324
J	**City - Walsh Bay** Hickson Road	...	07:48	07:58	...	08:18	08:28	08:42	08:57	09:12	09:27	09:42	09:57
I	**City - Town Hall** Park Street	...	p07:57	p08:07	...	p08:27	p08:37	p08:51	p09:06	p09:21	p09:36	p09:51	p10:06
H	**Kings Cross** Bayswater Road	...	08:08	08:18	...	08:38	08:48	09:02	09:17	09:32	09:47	10:02	10:17
G	**Edgecliff Interchange**	08:11	08:16	08:26	08:36	08:46	08:56	09:11	09:26	09:41	09:56	10:11	10:26
F	**Double Bay** Manning Road	08:14	08:19	08:29	08:39	08:49	08:59	09:14	09:29	09:44	09:59	10:14	10:29
E	**Rose Bay** Dover Road	08:22	08:27	08:37	08:47	08:57	09:08	09:23	09:38	09:53	10:08	10:23	10:38
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	08:35	...	...	09:06	...	09:32	...	10:02	...	10:32	...
B	**Vaucluse Heights** Old South Head Rd	08:28	...	08:43	08:53	...	09:14	...	09:44	...	10:14	...	10:44
A	**Watsons Bay** Military Road	...	08:41	08:49	...	09:11	09:20	09:37	09:50	10:07	10:20	10:37	10:50

	Monday to Friday (continued...)	♿	♿		♿	♿	♿	♿	♿	♿	♿		♿
map ref	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
J	**City - Walsh Bay** Hickson Road	10:12	10:27	10:42	10:57	11:12	11:27	11:42	11:57	12:12	12:27	12:42	12:57
I	**City - Town Hall** Park Street	p10:21	p10:36	p10:51	p11:06	p11:21	p11:36	p11:51	p12:06	p12:21	p12:36	p12:51	p13:06
H	**Kings Cross** Bayswater Road	10:32	10:47	11:02	11:17	11:32	11:47	12:02	12:17	12:32	12:47	13:02	13:17
G	**Edgecliff Interchange**	10:41	10:56	11:11	11:26	11:41	11:56	12:11	12:26	12:41	12:56	13:11	13:26
F	**Double Bay** Manning Road	10:44	10:59	11:14	11:29	11:44	11:59	12:14	12:29	12:44	12:59	13:14	13:29
E	**Rose Bay** Dover Road	10:53	11:08	11:23	11:38	11:53	12:08	12:23	12:38	12:53	13:08	13:23	13:38
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	11:02	...	11:32	...	12:02	...	12:32	...	13:02	...	13:32	...
B	**Vaucluse Heights** Old South Head Rd	...	11:14	...	11:44	...	12:14	...	12:44	...	13:14	...	13:44
A	**Watsons Bay** Military Road	11:07	11:20	11:37	11:50	12:07	12:20	12:37	12:50	13:07	13:20	13:37	13:50

Monday to Friday (continued...)												
map ref	Route Number	325	324	325	324	325	324	325	324	324	325	324	324
J	**City - Walsh Bay** Hickson Road	13:12	13:27	13:42	13:57	14:12	14:27	14:42	14:57	15:07	15:17	15:27	15:37
I	**City - Town Hall** Park Street	p13:21	p13:36	p13:51	p14:06	p14:21	p14:36	p14:51	p15:06	p15:16	p15:26	p15:36	p15:46
H	**Kings Cross** Bayswater Road	13:32	13:47	14:02	14:17	14:32	14:47	15:02	15:17	15:27	15:37	15:47	15:57
G	**Edgecliff Interchange**	13:41	13:56	14:11	14:26	14:41	14:56	15:10	15:25	15:35	15:45	15:55	16:05
F	**Double Bay** Manning Road	13:44	13:59	14:14	14:29	14:44	14:59	15:13	15:28	15:38	15:48	15:58	16:08
E	**Rose Bay** Dover Road	13:53	14:08	14:23	14:38	14:53	15:09	15:23	15:38	15:48	15:58	16:08	16:18
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	14:02	...	14:32	...	15:02	...	15:32	...	...	16:06	...	...
B	**Vaucluse Heights** Old South Head Rd	...	14:14	...	14:44	...	15:15	...	15:44	15:54	...	16:13	16:23
A	**Watsons Bay** Military Road	14:07	14:20	14:37	14:50	15:08	15:21	15:38	15:50	...	16:11	16:19	16:29

Monday to Friday (continued...)													
map ref	Route Number	323	325	324	325	323	324	324	325	323	324	324	325
J	**City - Walsh Bay** Hickson Road	...	15:47	15:57	16:07	...	16:17	16:27	16:36	...	16:43	16:53	17:03
I	**City - Town Hall** Park Street	...	p15:56	p16:06	p16:16	...	p16:26	p16:36	p16:45	...	p16:55	p17:05	p17:15
H	**Kings Cross** Bayswater Road	...	16:08	16:18	16:28	...	16:38	16:48	16:58	...	17:08	17:18	17:28
G	**Edgecliff Interchange**	16:10	16:16	16:26	16:36	16:40	16:46	16:56	17:06	17:10	17:16	17:26	17:36
F	**Double Bay** Manning Road	16:13	16:19	16:29	16:39	16:43	16:49	16:59	17:09	17:13	17:19	17:29	17:39
E	**Rose Bay** Dover Road	...	16:29	16:39	16:49	...	16:59	17:09	17:19	...	17:29	17:39	17:49
D	**Dover Heights** Military Road	16:34	...	...	...	17:04	...	...	...	17:34	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	16:37	...	16:57	...	...	...	17:27	...	...	...	17:57
B	**Vaucluse Heights** Old South Head Rd	...	...	16:44	...	...	17:04	17:14	...	...	17:34	17:44	...
A	**Watsons Bay** Military Road	...	16:42	16:50	17:02	...	17:10	17:20	17:32	...	17:40	17:50	18:02

Monday to Friday (continued...)													
map ref	Route Number	323	324	325	324	323	324	325	324	324	324	323	325
J	**City - Walsh Bay** Hickson Road	...	17:13	17:23	17:33	...	17:39	17:45	17:55	...	18:07	...	18:15
I	**City - Town Hall** Park Street	...	p17:25	p17:35	p17:45	...	p17:51	p17:57	p18:07	...	p18:19	...	p18:27
H	**Kings Cross** Bayswater Road	...	17:38	17:48	17:58	...	18:03	18:08	18:18	...	18:30	...	18:38
G	**Edgecliff Interchange**	17:40	17:46	17:56	18:06	18:08	18:11	18:16	18:26	18:31	18:38	18:41	18:46
F	**Double Bay** Manning Road	17:43	17:49	17:59	18:09	18:11	18:14	18:19	18:29	18:34	18:41	18:44	18:49
E	**Rose Bay** Dover Road	...	17:59	18:09	18:19	...	18:24	18:29	18:39	18:44	18:51	...	18:59
D	**Dover Heights** Military Road	18:04	...	...	...	18:32	...	...	...	...	...	19:05	...
C	**Vaucluse** Hopetoun Avenue	...	...	18:17	...	...	...	18:37	...	...	...	...	19:07
B	**Vaucluse Heights** Old South Head Rd	...	18:04	...	18:24	...	18:29	...	18:44	18:49	18:56	...	...
A	**Watsons Bay** Military Road	...	18:10	18:22	18:30	...	18:35	18:42	18:50	...	19:02	...	19:12

Monday to Friday (continued...)												
map ref	Route Number	324	324	325	324	325	324	325	324	324	325	324	325
J	**City - Walsh Bay** Hickson Road	18:28	18:38	18:48	18:58	19:11	19:28	19:43	19:58	20:13	20:43	21:13	21:43
I	**City - Town Hall** Park Street	p18:37	p18:47	p18:57	19:07	19:20	19:37	19:52	20:07	20:22	20:52	21:22	21:52
H	**Kings Cross** Bayswater Road	18:48	18:58	19:08	19:18	19:31	19:46	20:01	20:16	20:31	b21:01	b21:31	b22:01
G	**Edgecliff Interchange**	18:56	19:06	19:16	19:26	19:36	19:51	20:06	20:21	20:36	21:06	21:36	22:06
F	**Double Bay** Manning Road	18:59	19:09	19:19	19:29	19:39	19:54	20:09	20:24	20:39	21:08	21:38	22:08
E	**Rose Bay** Dover Road	19:09	19:19	19:29	19:39	19:49	20:04	20:19	20:34	20:49	21:16	21:46	22:16
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	...	19:36	...	19:56	...	20:26	...	...	21:23	...	22:23
B	**Vaucluse Heights** Old South Head Rd	19:14	19:24	...	19:43	...	20:08	...	20:38	20:53	...	21:50	...
A	**Watsons Bay** Military Road	19:20	19:30	19:40	19:48	20:00	20:13	20:30	...	20:58	21:27	21:54	22:27

Monday to Friday (continued...)									
map ref	Route Number	324	325	324	325	324	324	324	324
J	**City - Walsh Bay** Hickson Road	22:13	22:43	23:13	23:43	00:13	00:45	01:15	f02:15
I	**City - Town Hall** Park Street	22:22	22:52	23:22	23:52	00:22	00:54	01:24	f02:24
H	**Kings Cross** Bayswater Road	b22:31	b23:01	b23:31	b00:01	b00:31	b01:01	b01:31	...
G	**Edgecliff Interchange**	22:36	23:06	23:36	00:06	00:36	01:06	01:36	f02:36
F	**Double Bay** Manning Road	22:38	23:08	23:38	00:08	00:38	01:08	01:38	f02:38
E	**Rose Bay** Dover Road	22:46	23:16	23:46	00:16	00:44	01:14	01:44	f02:44
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	23:23	...	00:23	...	...	...	...
B	**Vaucluse Heights** Old South Head Rd	22:50	...	23:50	...	00:48	01:18	01:48	f02:48
A	**Watsons Bay** Military Road	22:54	23:27	23:54	00:27	00:52	01:22	01:52	f02:52

	Saturday	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref	Route Number	324	324	324	324	325	324	324	325	324	325	324	325
J	**City - Walsh Bay** Hickson Road	05:28	05:58	06:28	06:58	...	07:19	07:46	08:08	08:23	08:40	08:55	09:11
I	**City - Town Hall** Park Street	05:37	06:07	06:37	07:07	...	07:28	07:56	08:18	08:33	08:50	09:05	09:22
H	**Kings Cross** Bayswater Road	05:43	06:13	06:43	07:13	...	07:35	08:03	08:25	08:40	08:57	09:15	09:32
G	**Edgecliff Interchange**	05:48	06:18	06:48	07:18	07:25	07:40	08:08	08:30	08:45	09:04	09:24	09:41
F	**Double Bay** Manning Road	05:50	06:20	06:50	07:20	07:27	07:42	08:10	08:32	08:47	09:07	09:27	09:44
E	**Rose Bay** Dover Road	05:56	06:26	06:56	07:26	07:33	07:49	08:17	08:39	08:54	09:16	09:36	09:53
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	...	...	...	07:42	...	...	08:48	...	09:24	...	10:01
B	**Vaucluse Heights** Old South Head Rd	06:00	06:30	07:00	07:30	...	07:53	08:21	...	08:58	...	09:40	...
A	**Watsons Bay** Military Road	06:05	06:35	07:05	07:35	07:47	07:58	08:26	08:53	09:03	09:29	09:45	10:06

	Saturday (continued...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref	Route Number	324	325	324	325	324	325	324	325	324	325	324	325
J	**City - Walsh Bay** Hickson Road	09:25	09:41	09:55	10:11	10:25	10:41	10:56	11:11	11:26	11:41	11:56	12:11
I	**City - Town Hall** Park Street	09:36	09:52	10:06	10:22	10:36	10:52	11:08	11:24	11:39	11:54	12:09	12:24
H	**Kings Cross** Bayswater Road	09:46	10:02	10:16	10:32	10:46	11:02	11:18	11:34	11:49	12:04	12:19	12:34
G	**Edgecliff Interchange**	09:55	10:11	10:25	10:41	10:55	11:11	11:27	11:43	11:58	12:13	12:28	12:43
F	**Double Bay** Manning Road	09:58	10:14	10:28	10:44	10:58	11:14	11:30	11:46	12:01	12:16	12:31	12:46
E	**Rose Bay** Dover Road	10:07	10:23	10:37	10:53	11:07	11:23	11:39	11:55	12:10	12:25	12:40	12:55
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	10:31	...	11:01	...	11:31	...	12:03	...	12:33	...	13:03
B	**Vaucluse Heights** Old South Head Rd	10:11	...	10:41	...	11:11	...	11:43	...	12:14	...	12:44	...
A	**Watsons Bay** Military Road	10:16	10:36	10:46	11:06	11:16	11:36	11:48	12:08	12:19	12:38	12:49	13:08

	Saturday (continued...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref	Route Number	324	325	324	325	324	325	324	325	324	325	324	325
J	**City - Walsh Bay** Hickson Road	12:27	12:42	12:57	13:12	13:27	13:42	13:57	14:12	14:27	14:42	14:57	15:12
I	**City - Town Hall** Park Street	12:40	12:55	13:10	13:25	13:40	13:55	14:10	14:25	14:40	14:55	15:10	15:25
H	**Kings Cross** Bayswater Road	12:50	13:05	13:20	13:35	13:50	14:05	14:20	14:35	14:50	15:05	15:20	15:35
G	**Edgecliff Interchange**	12:59	13:14	13:29	13:44	13:59	14:14	14:29	14:44	14:59	15:14	15:29	15:44
F	**Double Bay** Manning Road	13:02	13:17	13:32	13:47	14:02	14:17	14:32	14:47	15:02	15:17	15:32	15:47
E	**Rose Bay** Dover Road	13:11	13:26	13:41	13:56	14:11	14:26	14:41	14:56	15:11	15:26	15:41	15:56
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	13:34	...	14:04	...	14:34	...	15:04	...	15:34	...	16:04
B	**Vaucluse Heights** Old South Head Rd	13:15	...	13:45	...	14:15	...	14:45	...	15:15	...	15:45	...
A	**Watsons Bay** Military Road	13:20	13:39	13:50	14:09	14:20	14:39	14:50	15:09	15:20	15:39	15:50	16:09

Saturday (continued...)												
map ref	Route Number	324	325	324	325	324	325	324	325	324	325	324	325
J	**City - Walsh Bay** Hickson Road	15:27	15:42	15:57	16:12	16:27	16:42	16:57	17:12	17:27	17:42	17:58	18:13
I	**City - Town Hall** Park Street	15:40	15:55	16:10	16:25	16:40	16:55	17:10	17:25	17:40	17:55	18:10	18:25
H	**Kings Cross** Bayswater Road	15:50	16:05	16:20	16:35	16:50	17:05	17:20	17:35	17:50	18:05	18:20	18:35
G	**Edgecliff Interchange**	15:59	16:14	16:29	16:44	16:59	17:14	17:29	17:44	17:59	18:14	18:29	18:44
F	**Double Bay** Manning Road	16:02	16:17	16:32	16:47	17:02	17:17	17:32	17:47	18:02	18:17	18:32	18:47
E	**Rose Bay** Dover Road	16:11	16:26	16:41	16:56	17:11	17:26	17:41	17:56	18:11	18:26	18:41	18:56
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	16:34	...	17:04	...	17:34	...	18:04	...	18:34	...	19:04
B	**Vaucluse Heights** Old South Head Rd	16:15	...	16:45	...	17:15	...	17:45	...	18:15	...	18:45	...
A	**Watsons Bay** Military Road	16:20	16:39	16:50	17:09	17:20	17:39	17:50	18:09	18:20	18:39	18:50	19:09

Saturday (continued...)												
map ref	Route Number	324	325	324	325	324	325	324	325	324	325	324	325
J	**City - Walsh Bay** Hickson Road	18:28	18:43	18:58	19:13	19:28	19:43	20:10	20:37	21:07	21:37	22:07	22:37
I	**City - Town Hall** Park Street	18:40	18:55	19:10	19:25	19:40	19:55	20:21	20:48	b21:17	b21:47	b22:17	b22:47
H	**Kings Cross** Bayswater Road	18:50	19:05	19:20	19:35	19:50	20:05	20:30	20:57	...	...	...	...
G	**Edgecliff Interchange**	18:59	19:14	19:29	19:44	19:59	20:10	20:35	21:02	21:31	22:01	22:31	23:01
F	**Double Bay** Manning Road	19:02	19:17	19:32	19:47	20:01	20:12	20:37	21:04	21:33	22:03	22:33	23:03
E	**Rose Bay** Dover Road	19:11	19:26	19:41	19:56	20:09	20:20	20:45	21:12	21:41	22:11	22:41	23:11
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	19:34	...	20:04	...	20:28	...	21:19	...	22:18	...	23:18
B	**Vaucluse Heights** Old South Head Rd	19:15	...	19:45	...	20:13	...	20:49	...	21:45	...	22:45	...
A	**Watsons Bay** Military Road	19:20	19:39	19:50	20:09	20:18	20:33	20:54	21:23	21:49	22:22	22:49	23:22

Saturday (continued...)									
map ref	Route Number	324	325	324	324	324	324	324	324
J	**City - Walsh Bay** Hickson Road	23:07	23:37	00:07	00:45	01:11	01:31	02:01	03:01
I	**City - Town Hall** Park Street	b23:17	b23:47	b00:17	b00:54	b01:20	b01:40	b02:10	b03:10
H	**Kings Cross** Bayswater Road	...	...	...	...	...	...	...	...
G	**Edgecliff Interchange**	23:31	00:01	00:31	01:05	01:31	01:51	02:21	03:21
F	**Double Bay** Manning Road	23:33	00:03	00:33	01:07	01:33	01:53	02:23	03:23
E	**Rose Bay** Dover Road	23:41	00:11	00:39	01:13	01:39	01:59	02:29	03:29
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	00:18	...	...	...	...	...	...
B	**Vaucluse Heights** Old South Head Rd	23:45	...	00:43	01:17	01:43	02:03	02:33	...
A	**Watsons Bay** Military Road	23:49	00:22	00:47	01:21	01:47	02:07	02:37	...

map ref	Sunday & Public Holidays	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	324	324	324	324	324	324	325	324	325	324	325	324
J	**City - Walsh Bay** Hickson Road	06:58	07:18	07:48	08:18	08:48	09:15	09:30	09:43	09:58	10:13	10:28	10:43
I	**City - Town Hall** Park Street	07:06	07:26	07:56	08:26	08:56	09:24	09:39	09:54	10:09	10:24	10:39	10:54
H	**Kings Cross** Bayswater Road	07:13	07:33	08:03	08:33	09:04	09:33	09:48	10:03	10:18	10:33	10:48	11:03
G	**Edgecliff Interchange**	07:18	07:38	08:08	08:38	09:09	09:38	09:53	10:08	10:23	10:38	10:53	11:08
F	**Double Bay** Manning Road	07:20	07:40	08:10	08:40	09:12	09:41	09:56	10:11	10:26	10:41	10:56	11:11
E	**Rose Bay** Dover Road	07:27	07:47	08:17	08:47	09:22	09:51	10:07	10:21	10:37	10:51	11:07	11:21
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	...	...	...	...	...	10:16	...	10:46	...	11:16	...
B	**Vaucluse Heights** Old South Head Rd	07:31	07:51	08:21	08:51	09:26	09:55	...	10:25	...	10:55	...	11:25
A	**Watsons Bay** Military Road	07:36	07:56	08:26	08:56	09:32	10:01	10:20	10:31	10:50	11:01	11:20	11:31

map ref	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
J	**City - Walsh Bay** Hickson Road	10:58	11:13	11:28	11:43	11:57	12:12	12:27	12:42	12:57	13:12	13:27	13:42
I	**City - Town Hall** Park Street	11:09	11:24	11:39	11:54	12:09	12:24	12:39	12:54	13:09	13:24	13:39	13:54
H	**Kings Cross** Bayswater Road	11:18	11:33	11:48	12:03	12:18	12:33	12:48	13:03	13:18	13:33	13:48	14:03
G	**Edgecliff Interchange**	11:23	11:38	11:53	12:08	12:23	12:38	12:53	13:08	13:23	13:38	13:53	14:08
F	**Double Bay** Manning Road	11:26	11:41	11:56	12:11	12:26	12:41	12:56	13:11	13:26	13:41	13:56	14:11
E	**Rose Bay** Dover Road	11:37	11:51	12:08	12:23	12:38	12:53	13:08	13:23	13:38	13:53	14:08	14:23
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	11:46	...	12:17	...	12:47	...	13:17	...	13:47	...	14:17	...
B	**Vaucluse Heights** Old South Head Rd	...	11:55	...	12:27	...	12:57	...	13:27	...	13:57	...	14:27
A	**Watsons Bay** Military Road	11:50	12:01	12:21	12:33	12:51	13:03	13:21	13:33	13:51	14:03	14:21	14:33

map ref	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
J	**City - Walsh Bay** Hickson Road	13:57	14:12	14:27	14:42	14:57	15:12	15:27	15:42	15:57	16:12	16:27	16:42
I	**City - Town Hall** Park Street	14:09	14:24	14:39	14:54	15:09	15:24	15:39	15:54	16:09	16:24	16:39	16:54
H	**Kings Cross** Bayswater Road	14:18	14:33	14:48	15:03	15:18	15:33	15:48	16:03	16:18	16:33	16:48	17:03
G	**Edgecliff Interchange**	14:23	14:38	14:53	15:08	15:23	15:38	15:53	16:08	16:23	16:38	16:53	17:08
F	**Double Bay** Manning Road	14:26	14:41	14:56	15:11	15:26	15:41	15:56	16:11	16:26	16:41	16:56	17:11
E	**Rose Bay** Dover Road	14:38	14:53	15:08	15:23	15:38	15:53	16:08	16:23	16:38	16:53	17:08	17:23
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	14:47	...	15:17	...	15:47	...	16:17	...	16:47	...	17:17	...
B	**Vaucluse Heights** Old South Head Rd	...	14:57	...	15:27	...	15:57	...	16:27	...	16:57	...	17:27
A	**Watsons Bay** Military Road	14:51	15:03	15:21	15:33	15:51	16:03	16:21	16:33	16:51	17:03	17:21	17:33

	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref	Route Number	325	324	325	324	325	324	325	324	325	324	325	324
J	**City - Walsh Bay** Hickson Road	16:57	17:12	17:27	17:42	17:57	18:12	18:27	18:42	18:57	19:12	19:27	19:42
I	**City - Town Hall** Park Street	17:09	17:24	17:39	17:54	18:09	18:24	18:39	18:54	19:08	19:22	19:37	19:52
H	**Kings Cross** Bayswater Road	17:18	17:33	17:48	18:03	18:18	18:33	18:48	19:03	19:17	19:31	19:46	20:01
G	**Edgecliff Interchange**	17:23	17:38	17:53	18:08	18:23	18:38	18:53	19:08	19:22	19:36	19:51	20:06
F	**Double Bay** Manning Road	17:26	17:41	17:56	18:11	18:26	18:41	18:56	19:11	19:25	19:39	19:54	20:08
E	**Rose Bay** Dover Road	17:38	17:53	18:07	18:21	18:36	18:51	19:06	19:21	19:35	19:49	20:03	20:16
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	17:47	...	18:14	...	18:43	...	19:13	...	19:42	...	20:10	...
B	**Vaucluse Heights** Old South Head Rd	...	17:57	...	18:25	...	18:55	...	19:25	...	19:53	...	20:20
A	**Watsons Bay** Military Road	17:51	18:03	18:18	18:30	18:47	19:00	19:17	19:30	19:46	19:58	20:14	20:24

	Sunday & Public Holidays (cont...)	♿	♿	♿	♿	♿	♿	♿	♿	♿
map ref	Route Number	324	325	324	325	324	325	324	325	324
J	**City - Walsh Bay** Hickson Road	20:12	20:38	21:08	21:38	22:08	22:38	23:08	23:38	00:08
I	**City - Town Hall** Park Street	20:21	20:47	21:17	21:47	22:17	22:47	23:17	23:47	00:17
H	**Kings Cross** Bayswater Road	20:30	20:56	21:26	21:56	22:26	22:56	23:26	23:56	00:26
G	**Edgecliff Interchange**	20:35	21:01	21:31	22:01	22:31	23:01	23:31	00:01	00:31
F	**Double Bay** Manning Road	20:37	21:03	21:33	22:03	22:33	23:03	23:33	00:03	00:33
E	**Rose Bay** Dover Road	20:45	21:11	21:41	22:11	22:41	23:11	23:41	00:11	00:39
D	**Dover Heights** Military Road	...	...	...	...	...	...	...	...	...
C	**Vaucluse** Hopetoun Avenue	...	21:18	...	22:18	...	23:18	...	00:18	...
B	**Vaucluse Heights** Old South Head Rd	20:49	...	21:45	...	22:45	...	23:45	...	...
A	**Watsons Bay** Military Road	20:53	21:22	21:49	22:22	22:49	23:22	23:49	00:22	...

Monday to Friday

Service	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7
Circular Quay	06:22	06:46	06:59	07:05	07:19	07:29	07:39	07:55	07:59	08:19	08:29	08:55	09:20	10:05	10:40	11:10	11:40	12:10	13:10	13:40	14:10	15:10	16:10	16:40
Garden Island	...	...	...	...	...	...	...	...	...	...	...	...	09:26	10:11	10:46	11:16	11:46	12:16	13:16	13:46	14:16	15:16	...	...
Darling Point	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16:46
Double Bay	...	...	07:14	...	...	07:44	...	...	08:14	...	08:44	...	09:32	...	...	...	...	...	13:22	...	14:22	15:22	16:19	16:51
Rose Bay	06:35	06:57	...	07:16	07:30	...	07:50	08:06	...	08:30	...	09:06	09:39	...	...	...	...	...	13:29	...	14:29	15:29	16:27	16:59
Watsons Bay *arr*	...	...	...	...	...	...	...	...	...	...	...	...	...	10:22	10:57	11:27	11:57	12:27	13:35	13:55	14:35	15:35	16:35	...
Watsons Bay *dep*	...	...	...	...	...	...	...	...	...	...	...	...	...	10:35	11:05	11:35	12:07	12:35	13:45	14:15	14:45	15:45	16:45	...
Rose Bay	06:38	07:00	...	07:20	07:40	...	08:00	08:20	...	08:40	...	09:10	09:43	10:43	11:13	11:43	...	...	...	...	14:55	15:55	...	17:09
Double Bay	06:48	...	07:18	...	...	07:48	...	...	08:18	...	08:48	...	09:51	10:51	11:21	11:51	...	...	...	...	...	...	...	...
Darling Point	06:54	...	07:24	...	...	07:54	...	...	08:24	...	08:54	...	09:56	...	...	...	...	...	...	...	...	...	...	...
Garden Island	...	...	...	...	...	...	...	...	...	...	...	...	10:02	10:57	11:27	11:57	12:18	12:46	13:56	14:26	15:01	16:01	...	...
Circular Quay	07:01	07:11	07:37	07:31	07:51	08:07	08:11	08:31	08:37	08:51	09:07	09:21	10:07	11:02	11:32	12:02	12:23	12:51	14:01	14:31	15:06	16:06	17:00	17:20

Monday to Friday

Service	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7
Circular Quay	17:10	17:27	17:30	17:50	17:57	18:10	18:27	18:30	18:57	19:00	19:55	20:55	21:55F	22:55F
Garden Island	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darling Point	...	17:40	...	...	18:10	...	18:40	...	19:10	...	...	...	...	...
Double Bay	...	17:46	...	...	18:16	...	18:46	...	19:16	...	20:06	21:06	22:06F	23:06F
Rose Bay	17:21	...	17:43	18:03	...	18:23	...	18:43	...	19:13	20:16	21:16	22:16F	23:16F
Watsons Bay *arr*	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Watsons Bay *dep*	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rose Bay	17:29	...	17:49	18:09	...	18:26	...	18:46	...	19:16	20:19	21:19	22:19F	23:19F
Double Bay	...	17:49	...	...	18:19	...	18:49	...	19:19	...	...	...	...	...
Darling Point	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Garden Island	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Circular Quay	17:40	18:04	18:02	18:22	18:34	18:39	19:04	18:59	19:34	19:29	20:32	21:32	22:32F	23:32F

F7 Eastern Suburbs

Saturday, Sunday & Public Holidays – **Circular Quay to Watsons Bay and return**

Saturday, Sunday & Public Holidays																								
Service	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7	F7
Circular Quay	08:35	09:35	09:55	10:05	10:35	10:55	11:05	11:35	11:55	12:05	12:35	12:55	13:05	13:35	13:55	14:05	14:35	14:55	15:05	15:35	15:55	16:05	16:35	16:55
Garden Island	...	...	10:02	...	...	11:02	...	...	12:02	...	...	13:02	...	...	14:02	...	...	15:02	...	...	16:02	...	...	...
Darling Point	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Double Bay	...	...	10:11	...	...	11:11	...	...	12:11	...	...	13:11	...	...	14:11	...	...	15:11	...	...	16:11	...	...	17:10
Rose Bay	...	09:46	...	10:16	10:46	...	11:16	11:46	...	12:16	12:46	...	13:16	13:46	...	14:16	14:46	...	15:16	15:46	...	16:16	16:46	...
Watsons Bay *arr*	08:50	09:54	...	10:24	10:54	...	11:24	11:54	...	12:24	12:54	...	13:24	13:54	...	14:24	14:54	...	15:24	15:54	...	16:24	16:54	...
Watsons Bay *dep*	09:00	10:00	...	10:30	11:00	...	11:30	12:00	...	12:30	13:00	...	13:30	14:00	...	14:30	15:00	...	15:30	16:00	...	16:30	17:00	...
Rose Bay	09:08	10:08	...	10:38	11:08	...	11:38	12:08	...	12:38	13:08	...	13:38	14:08	...	14:38	15:08	...	15:38	16:08	...	16:38	17:08	...
Double Bay	09:16	...	10:14	...	...	11:14	...	...	12:14	...	...	13:14	...	...	14:14	...	...	15:14	...	...	16:14	...	...	17:14
Darling Point	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Garden Island	09:22	...	10:23	...	...	11:23	...	...	12:23	...	...	13:23	...	...	14:23	...	...	15:23	...	...	16:23	...	...	...
Circular Quay	09:28	10:19	10:30	10:49	11:19	11:30	11:49	12:19	12:30	12:49	13:19	13:30	13:49	14:19	14:30	14:49	15:19	15:30	15:49	16:19	16:30	16:49	17:19	17:29

Saturday, Sunday & Public Holidays								
Service	F7	F7	F7	F7	F7	F7	F7	F7
Circular Quay	17:05	17:35	17:55	18:55	19:55	20:55	21:55S	22:55S
Garden Island	...	...	...	...	...	...	...	...
Darling Point	...	...	...	...	...	...	...	...
Double Bay	...	...	18:06	19:06	20:06	21:06	22:06S	23:06S
Rose Bay	17:16	17:46	18:16	19:16	20:16	21:16	22:16S	23:16S
Watsons Bay *arr*	17:24	17:54	18:26	19:26	20:26	21:26	...	...
Watsons Bay *dep*	17:30	18:00	18:30	19:30	20:30	21:30	...	...
Rose Bay	17:38	18:08	...	...	...	...	22:19S	23:19S
Double Bay	...	...	...	...	...	...	...	...
Darling Point	...	...	...	...	...	...	...	...
Garden Island	...	...	...	...	...	...	...	...
Circular Quay	17:49	18:19	18:48	19:48	20:48	21:48	22:32S	23:32S

APPENDIX E

SHARED ZONE GUIDELINES

Technical Direction

Traffic management and road safety practice

Transport Roads & Maritime Services

TTD 2016/001 February 2016

Supersedes TTD 2014/003

Design and implementation of shared zones including provision for parking

Summary:	**Audience:**
This Technical Direction provides guidelines for the design and implementation of shared zones in a road or road related area (Category 1) and for shared zones in a road with footpath parking (Category 2).	• Traffic management staff • Road safety staff • Councils

Definitions

Shared zones are defined under Rule 24 in the NSW Road Rules (2008). A shared zone is a road or network of roads or a road related area where space is shared safely by vehicles and pedestrians and where pedestrian priority and quality of life take precedence over ease of vehicle movement.

Shared zones employ a range of regulatory and non-regulatory treatments to indicate a change in environment and priority. Where parking is provided in a shared zone, it is only allowed in marked bays and must have the relevant signage provided.

Using this Technical Direction:

- A ***Category 1*** (Cat 1) shared zone is provided on a road related area, has clearly different coloured and textured surface treatments from the surrounding roads, and typically does not have kerbs.
- *A* ***Category 2*** (Cat 2) shared zone is provided on a road which includes footpath parking and has substandard footpath widths, retains kerbs and has traffic calming devices and treatments to regulate traffic speeds to 10km/h.

Practice/General

The NSW Government is committed to improving pedestrian safety and amenity. The implementation of applicable shared zones will assist in reducing the incidence of pedestrian death and serious injury. One of the key requirements of shared zones is that they are attractive and interesting public places that reflect local needs and activities.

Shared zones are specifically designed for pedestrian priority and may be appropriate for a road, a network of roads or road related areas where there are comparatively high pedestrian volumes, where the road is narrow and pedestrian access along existing substandard (less than 1.2 metres) footpaths is limited, and/or where on-road parking on one or both sides of the road restricts the free movement of vehicles along the road (especially emergency and service vehicles).

Approvals:

The safest place for pedestrians is on a specific pedestrian facility. A shared zone will only be considered where adequate footpaths cannot be retained within the road reserve and where there are very low numbers of slow moving vehicles. Footpaths can be retained in a shared zone where footway parking is in place.

A shared zone should not look like a normal road environment and requires a self enforcing road environment. Kerbs should generally not be provided in a shared zone to ensure a discernible change in the environment from the surrounding roads, and to facilitate the ease of movement and indicate the priority for pedestrians, especially disabled pedestrians. Existing 'brownfield' roads may be suitable for conversion to Category 1 or 2 shared zones without the removal of existing kerbs if approved by Roads and Maritime Services.

Traffic control devices (ie signs and markings) referred to in this Technical Direction shall meet RMS specifications. Traffic control devices, other than the *Shared zone* (R4-4), *End shared zone* (R4-5), and *Give Way to Pedestrian*s (R2-10) signs, will still require council approval through the usual Local Traffic Committee process.

The NSW road rules (Rule 188) permit parking in designated shared zones. A driver can stop in a marked parking bay or designated parking area if the driver is permitted to do so by the road rules and where indicated by a parking bay or sign.

The maximum speed limit in shared zones is always 10 km/h. All speed zones and shared zone schemes must be authorised by RMS as per the delegations under the Roads Act.

Implementation of these guidelines must include community involvement and participation. Shared zones are designed and constructed by local councils in consultation with the local community.

This Technical Direction provides guidelines for all aspects of shared zones, including design and implementation, and for the provision of parking within designated shared zones, and supports the Transport for NSW SS/12/01 shared zone policy.

Guidelines

General

- All new shared zones (Cat 1) must be constructed without kerbs.
- In special circumstances existing roads can be converted to shared zones, without the removal of the existing kerbs. Potential reasons for not removing kerbs may include heritage or cost-prohibitive constraints. However where existing kerbs are being retained traffic calming devices and a visibly changed road environment may need to be used to address vehicle speed. The retention of kerbs requires RMS approval.
- All shared zones must display the required regulatory signage and should include pavement markers at each entry point to the area and at each exit point from the area. The entry signage is to be duplicated on both sides of the road, where possible.
- Drivers must give way to pedestrians at all times in shared zones (NSW Road Rule 83). A *Give Way to Pedestrian*s (R2-10) sign must be installed below each *Shared zone* (R4-4) sign. A *Give Way to Pedestrian*s pavement marking must be installed at each entry to a Category 2 shared zone.
- All shared zones in NSW must display a speed limit of 10 km/h. No other speed limit is allowed. All shared zones in NSW must be authorised by RMS as they are a speed zone.
- Where parking is to be provided in shared zones, *Park In Bays Only* (R5-65) signs must be provided under the shared zone (R4-4) signs at each entry into the shared zone.

- The parking bays must be marked within the shared zone. The length and width of any parking space must comply with AS2890.5 *Parking Facilities.*
- To ensure compliance with on-street parking for people with disabilities please refer to AS 2890.6-2009 *Parking Facilities*.
- As shared zones are a pedestrian priority environment there should not be any requirement for pedestrian crossings and pedestrian fencing.
- Continuous footpath treatments should be considered. Refer to TD 2013/05.
- All shared zone proposals on existing roads must have consultation with the local community by Council to provide an opportunity for feedback prior to implementation.

Design Principles

The design principles for shared zones need to be defined to ensure the proposed scheme incorporates the necessary features to provide an appropriately safe environment. In particular, the design needs to have an impact which clearly highlights to drivers that there is a change in the road environment and traffic conditions and that the priority is for pedestrians. The design features are required to be implemented in accordance with the Austroads Guide to Traffic Management Part 8: Local Area Traffic Management and the relevant RMS Austroads Guide Supplement. The following table presents the design principles for shared zones.

Features	**Information**
Street space/ kerb & gutter/ delineation	The road environment in a shared zone must be changed to ensure that it does not look like a normal road • Any delineation and kerbs shall be removed to enhance the sense of pedestrian priority (Cat 1). • Where it is not possible to remove the kerbs then the shared zone must be treated to a level where drivers can clearly identify that they are in a different driving environment. • Traffic calming or suitable pedestrian friendly treatments must be provided to reduce speeds within the zone where kerbs have been retained.
Entrance/exit points	• Prominent features such as signs, architectural or landscape features must be provided to indicate a change in the street environment and highlight the start/end of the shared zone (Cat 2). • A *Give Way to Pedestrians* pavement marking must be installed (Cat 2 only). • Continuous footpath treatments should be considered as entry/exit treatments to assist traffic calming. Refer to TD 2013/05.
Traffic signs	• Regulatory traffic signs as per the requirements of the NSW Road Rules 2008 are required. • All entry signs must be provided on both sides of the road, for one or two-way shared zones, to further enhance the changes in environment and priority.
Pavement surface	• The pavement surface shall be changed to highlight the difference in the street environment from the surrounding road network. It must be clearly distinguishable by colour, texture and/or materials. Any exceptions require RMS approval.
Traffic calming features/ treatments	• Traffic calming or suitable treatments must be provided to reduce speeds within the zone where kerbs have been retained to encourage consistently slow driving and ensure compliance with the 10 km/h speed limit. • Advisory speed plates are not required to supplement speed hump advisory signs.
Forward visibility	• To encourage drivers to drive with care and comply with the 10km/h speed limit, it is not desirable to have unlimited forward visibility in a shared zone. • In locations where it is considered necessary to maintain visibility, a minimum stopping sight distance of 12 metres shall be applied.

Features	Information
Vehicle mix and accessibility requirements	• Alternative access for large vehicles such as buses needs to be planned. • Access must be designed to safely accommodate emergency vehicles, delivery and garbage trucks. • Emergency services and Police are to be consulted during the design process.
Car parking	• Car parking provisions may need to be altered to suit the scheme. • Car parking bays must be marked along the scheme and in accordance with the prescribed lengths and widths in AS 2890.5 and AS 2890.6-2009 *Parking Facilities*. • Car parking spaces that straddle existing kerb and gutter are to be provided in Cat 2 shared zones.
Bicycles	• Cyclists must be able to safely traverse the features provided in the scheme to encourage lower vehicle speeds. • Traffic calming measures must incorporate features to make them cycle friendly. • In one way shared zones, consideration should be given to contra-flow bicycle movements. This provision will increase access for non-motorised transport and must include *Bicycles Excepted* (R9-3) signs. • Cyclists need to be aware that they must give way to pedestrians.
Mobility and vision impaired requirements	• Designs must include provision to safely accommodate the needs of the mobility and vision impaired. • Refer to AS 1428.4.1 *Design for Access and Mobility* for detailed design requirements.
Lighting and drainage grates	• Appropriate lighting should be installed for safety and security purposes. • Appropriate drainage grates should be installed to cater for pedestrian and cyclist use.

Traffic signs

Traffic signs to be used in a shared zone are described in the NSW Road Rules and are illustrated below.

Any traffic calming must display the appropriate warning signage (eg W5-10 *Speed hump*). However the supplementary advisory speed plate is not required on speed hump signage.

Entry signposting is to be duplicated on each side of the road, where possible

In shared zones, signs may be provided on both sides of the road, for one or two-way shared zones, to further enhance the changes in environment and priority.

R4-4 SHARED ZONE
- Must be displayed at the start of a shared zone.
- R4-4 may be repeated in combination with R2-10 at additional locations within a shared zone.

R2-10 GIVE WAY TO PEDESTRIANS
- Must be displayed at the start of a shared zone and below the R4-4 sign.
- R2-10 may be repeated in combination with R4-4

R4-5 END SHARED ZONE
Must be displayed at the end of the shared zone.

at additional locations within a shared zone.

R5-65 PARK IN BAYS ONLY

- Must be displayed at the start of a shared zone, below the R2-10 sign, when parking is provided.
- May be repeated in isolation at additional locations within a shared zone.

Traffic calming

Traffic calming features or treatments are required within Category 1 and 2 shared zones to reduce vehicle speeds, where a change in the road environment will not work alone. Where kerb and gutter are retained, traffic calming should be used to reduce vehicle speeds and are described in detail in the Austroads Guide to Traffic Management Part 8: Local Area Traffic Management.

There is no requirement to provide pedestrian fencing in shared zones.

Continuous footpath treatments should be considered as entry/exit treatments to assist traffic calming. Refer to TD 2013/05.

Landscaping and street furniture

Carefully located landscape features and street furniture can encourage lower speeds and enhance the experience for pedestrians. Examples of such features are bollards, architectural decorations, seating and lighting. These features can be repeated through the shared zone.

Provision for mobility and vision impaired people

The design for shared zones must safely accommodate the needs of those who are mobility restricted and vision impaired. Features such as tactile paving, hand rails and the careful placement of landscaping and street furniture must be considered during the design process. In shared zones, mobility and vision impaired access to the existing road must be provided and the ability to negotiate traffic calming must also be accommodated. AS 1428.4.1 *Design for Access and Mobility* contains detailed design requirements and must be referred to during the design process.

Shared Zones retaining kerb and gutter (Category 1 and 2)

The following table describes options for non-regulatory features used to help define shared zones to ensure pedestrian safety in shared zones that retain kerb and gutter.

Features	**Description**
Road narrowing/ kerb extension	• Encourages drivers and cyclists to reduce their speeds • Highlights to motorists and cyclists that they are in an area with changed traffic conditions such as lower speeds.

Features	Description
Raised threshold	• Encourages lower speeds. • Can also be used to indicate the entry/exit to the zone. • There is no requirement to provide pedestrian fencing in shared zones. • Continuous footpath treatments should be considered to assist traffic calming. Refer to TD 2013/05.
Change in carriageway surface and texture	• Provides characteristics that distinguish the scheme from other roads. Shared zones require a different road surface along the entire length of the road. Alternate treatments may be considered with Roads and Maritime approval. This must be provided where the existing kerb and gutter is to be retained.
Architectural and landscaping	• Assists in creating a visible change in the street environment. • Helps to enhance the quality of the scheme. • Creates a prominent feature that clearly highlights the start / end of the scheme. • Can be repeated through the shared zone.
Pavement markings	• A *Give Way to Pedestrians* pavement marking must be provided at each entry.

- Traffic calming features or suitable treatments must be provided to reduce speeds (in zones where kerbs have been retained). There is no requirement to provide pedestrian fencing in shared zones. Continuous footpath treatments should be considered to assist traffic calming. Refer to TD 2013/05.
- In a shared zone with two-way traffic movement where the available travel width is less than 6.0 metres, storage gaps should be provided to allow moving vehicles to pass each other. A convenient position for storage gaps is adjacent to driveways where the loss of parking spaces is minimised. Storage gaps may not be necessary where the street is short and a driver entering at one end of the street is able to see a vehicle entering at the opposite end of that street.
- *Give Way to Pedestrians* pavement markings must be provided at entry points.
- Enhancements to shared zones may also be considered and include pavement markings such as the pedestrian symbol and the numerals 10 at regular intervals along the existing road length, with traffic calming devices or a changed road environment to maintain a self enforcing 10km/h speed limit.

Parking

- Parking bays that straddle existing kerbs are to be provided only in Category 2 shared zones, subject to approval. Where this is the case:
  - Retaining barrier kerb (Type SA) is acceptable adjacent to parking spaces that have direct access via a driveway from one end. This would limit parking to a maximum of two parallel parking spaces in series between driveways. This will discourage people from driving illegally along the footway to access or leave parking spaces.
  - Providing roll-top kerb (Type RT) is the ideal treatment where parking spaces are not directly accessible from a driveway, or where there are long lengths between driveways. This treatment will facilitate the provision of three or more parallel parking spaces in series. Alternating short lengths of different kerb types along a kerb line should be avoided. This practice may be acceptable if the kerb types were separated by driveways.

  - Provisions for pedestrian access must be provided for essential services, including property access and letterboxes.

- Utility poles could restrict positioning and access to and from parking bays. The location of parking bays in relation to utility poles needs to be defined to suit the relevant Authority.
- If parking bays are located on each side of the road the width between them must not be less than 3.0 metres to allow vehicles to travel safely along the road or road related area.
- The location of the parking spaces or areas must not compromise sight distances at a shared zone entry point. There are existing mandatory (statutory) restrictions at intersections, road crossings, and traffic signals contained in the NSW Road Rules 2008 and RMS Technical Directions (signposted restrictions). These are applied to ensure that minimum sight distances are provided for road safety purposes.
- The parking spaces, including vehicle access to and from the spaces, are not to affect access to utilities. Utility covers may not be trafficable, so it is important to ensure that car parking does not damage them. Parking spaces and areas should be carefully located so this problem is eliminated or the devices protected.
- It is illegal to drive on the footpath, therefore parking spaces are to be located so they can be accessed without driving on the footpath.
- Trees and shrubs planted in the shared zone could affect positioning and access to and from parking bays, depending on the location and size of the tree or shrub. For safety, it is important to consider whether driver sight distance may be obstructed.
- Parking bays should not restrict access to property entrances.
- Parking bays must be provided in accordance with AS2890.5 and AS 2890.6-2009 *Parking Facilities*. The minimum width must be 2.1 metres and the minimum length must be 6.0 metres for parallel parking spaces.

90 and 45 degrees parking are not considered appropriate in a shared zone. The minimum carriage way widths required for 90 and 45 degrees parking does not adhere to the requirements for a self-enforcing road environment. In addition it is undesirable to have vehicles reversing within a shared zone.

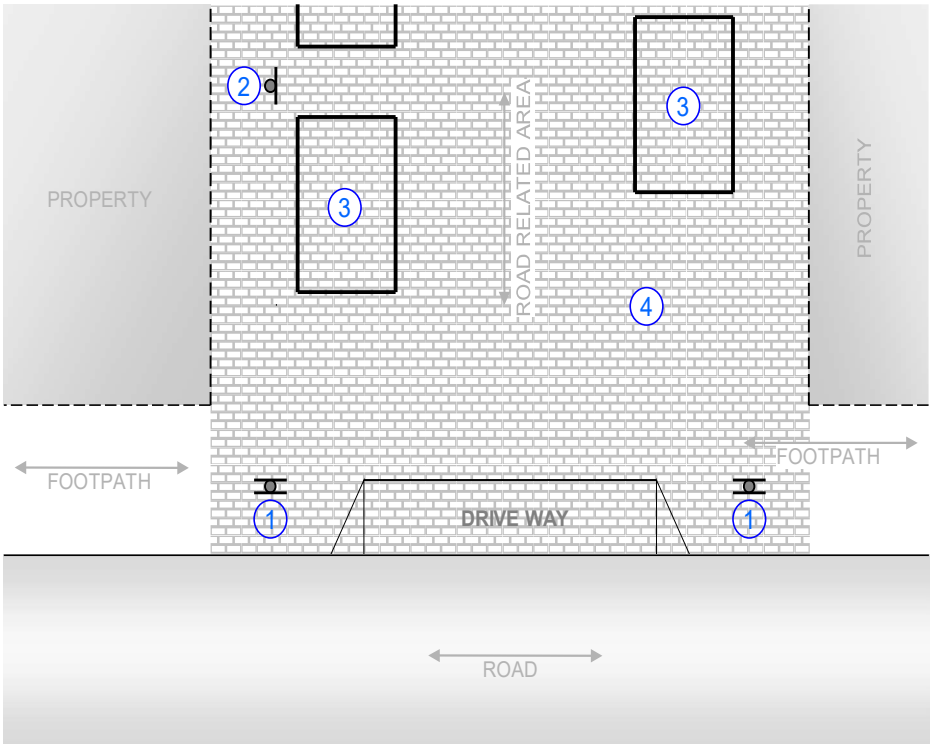
Road safety audits

Road safety audits provide a means of identifying and managing road safety risks in a shared zone scheme.

The features provided in shared zones must be safe for all road users. In particular the road safety audit is required to identify issues pertaining to vehicle speeds, movements and pedestrian safety and disability use.

Road safety audits are to be conducted at a number of points during a project, including at the design stage. The project manager must address all the identified deficiencies, prior to construction. A road safety audit is also to be conducted after implementation.

Road safety audits must be completed in accordance with the Austroads Guide to Road Safety Part 6: Road Safety Audits and the relevant RMS Austroads Guide Supplements.



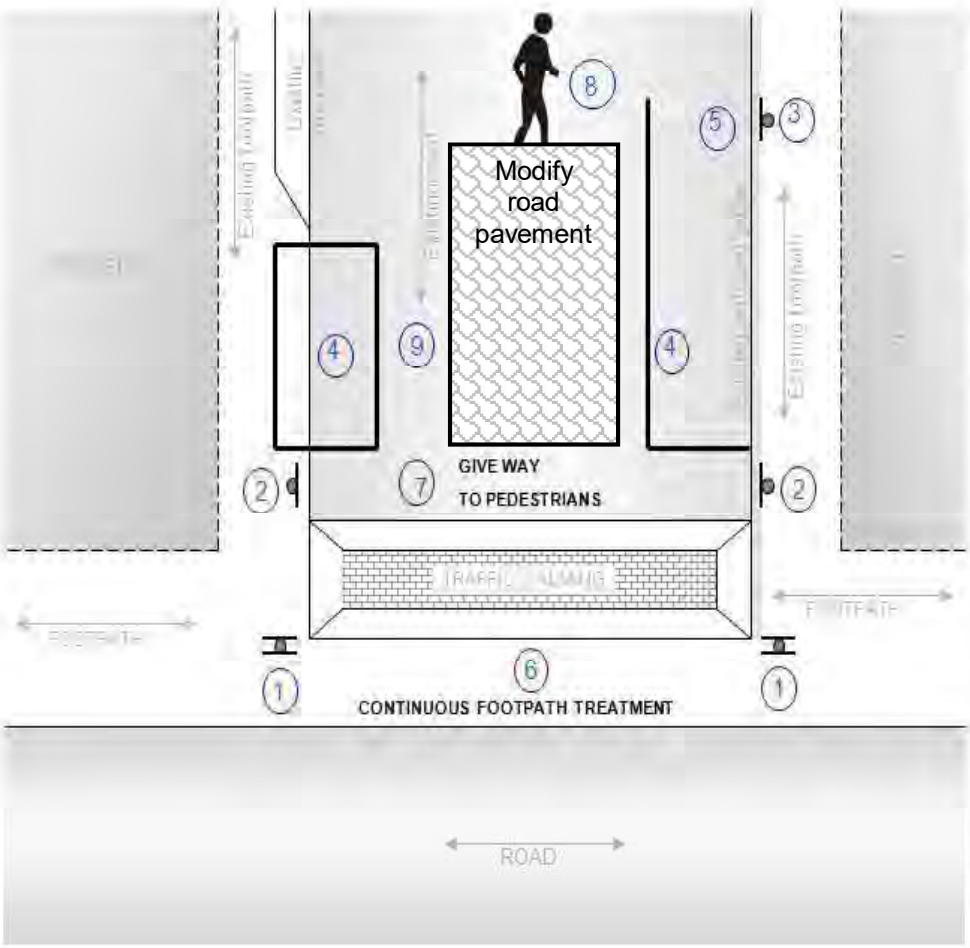
NOTES:

1. **Regulatory traffic signage per the requirements of Road Rules 2008 must be provided at each entry and exit to the shared zone. Signs must be installed on both sides of the road at each entry. These include: R4-4, R2-10, R5-65 and R4-5.**
2. **Traffic signs may be repeated at additional locations in the Shared Zone (R4-4, R2-10 and R5-65).**
3. **Parking bays may be provided. Parking is only allowed in marked bays and should not restrict property / driveway access. All parking spaces must be provided in accordance with AS 2890.5.**
4. **Pavement surface (colour, texture and materials) are used to highlight the difference in the environment from the surrounding street network.**
5. **This diagram is not to scale.**

Category 1 shared zone Indicative layout and treatments

Figure 1. Photo and diagram of a Category 1 shared zone showing regulatory signage, typical layout and treatments. [Note: The No Entry sign is site specific]
The photo may have been modified to demonstrate essential elements.

Figure 2. Photo and diagram of a Category 1 shared zone retaining kerb and gutter showing treatments, parking provision, and typical layout.
The photo may have been modified to demonstrate essential elements.



Category 2 shared zone typical layout and treatments

NOTES:

1. Regulatory traffic signage per the requirements of Road Rules 2008 must be provided at each entry and exit to the shared zone. Signs must be installed on both sides of the road at each entry. These include: R4-4, R2-10, R5-65 and R4-5.
2. No Stopping sign. Must be placed in accordance with the regulations and to ensure parking does not compromise sight distance.
3. Traffic signs may be repeated at additional locations in the Shared Zone (R4-4, R2-10 and R5-65).
4. Parking bays may be provided over existing kerbs or on road. Parking is only allowed in marked bays and should not restrict property / driveway access. All parking spaces must be provided in accordance with AS 2890.5.
5. The retention of kerb and gutter requires RMS approval.
6. Traffic calming treatments must be provided at regular intervals to maintain vehicle travel speed at no more than 10 km/h. There should not be any general requirement to provide pedestrian fencing in shared zones. Continuous Footpath Treatments should be considered as entry treatments and traffic calming (TD 2013/05).
7. A Give Way to Pedestrians pavement marking is to be provided at the entry to the shared zone. (Refer to the Delineation Manual Section 9.)
8. Optional PS-4 pedestrian logos may be repeated at intervals.
9. Pavement surface (colour, texture and materials) are used along the vehicle path to highlight the difference in the environment from the surrounding street network.
10. This diagram is not to scale.

Figure 2. Photo and diagram of a Category 2 shared zone showing treatments, traffic calming, parking provision, and typical layout. 'Give Way' to Pedestrian' pavement marking is optional.

The photo may have been modified to demonstrate essential elements.

Stakeholder consultation

To gain support for the implementation of a shared zone, to ensure compliance with the road rules, and to mitigate any potential conflicts and problems prior to the operation of the scheme, the concept and detailed design of a shared zone must be developed with the participation of the local community. Inclusive in this process is the need to liaise with disability groups.

Consultation with stakeholders such as the Police, emergency services, public transport companies, delivery/ garbage truck operators and local businesses is needed prior to the implementation of the scheme.

It is the responsibility of the local council to deliver an appropriate public awareness campaign and should include a variety of communication channels (eg door knocking, media coverage, placement of posters and signs, distribution of brochures, and public exhibitions). This campaign should advise residents on issues such as where to place garbage bins, and the need to remove them from the shared zone promptly once emptied.

Approval by RMS

The authorisation of a shared zone is not delegated to councils. Shared zones are speed zones and approval to install them must be obtained from RMS in accordance with this policy.

Implementation

The final stage involves implementing the approved scheme on site. Monitoring the implementation by the design team is recommended to ensure consistency with the design objectives and principles.

Post implementation monitoring

A road safety audit is to be conducted after implementation. Local council should also periodically monitor the scheme to assess the effectiveness of the operation of a shared zone.

Action

This Technical Direction must be followed when councils are designing and implementing shared zones.

Updates

To ensure that this Technical Direction and any related guidelines remain current and relevant, minor updates may be made from time to time. Any updates may be obtained from the RMS website using the Traffic & Transport Policies & Guidelines Register which can be found at:

www.rms.nsw.gov.au/doingbusinesswithus/guidelines/documentregister/index.html

Printed copies of this Technical Direction are uncontrolled; therefore the Register should always be checked prior to using this Technical Direction or any related guidelines.