Traffic Impact Assessment

Montefiore Aged Care Facility
30-36 Dangar Street Street, Randwick NSW 2031

Part 3A – Revised Concept Application

Reference: 15.216r01v03 - October 2015

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Document Verification

Job Number:	15.061
Project:	Montefiore Aged Care Facility - 30-36 Dangar Street, Randwick
Client:	Sir Moses Montefiore Jewish Home

Revision		Initials	Date	Signature
15.216r01v01 - Montefiore Aged Care Facility	Prepared by:	GH	19/08/2015	
	Approved by:	GH	19/08/2015	
15.216r01v02 - Montefiore Aged Care Facility	Approved by:	GH	03/09/2015	
15.216r01v03 - Montefiore Aged Care Facility	Approved by:	GH	13/10/2015	

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1. Introduction

TRAFFIX has been instructed by Jackson Teece on behalf of Sir Moses Montefiore Jewish Home to undertake a traffic impact assessment in support of an alteration to an existing concept approval to enable an addition to an existing aged care facility at 30-36 Dangar Street Street, Randwick.

The existing site provides for an aged care facility with 276 beds in addition to, an aged day care centre, known as “The Burger Centre’ and a child care centre with approval for up to 80 children.

The previously approved “’Part 3A Preferred Project Concept Application’ provided for an additional 232 aged care beds (to a total of 508), a retail component of 350m^2 and 36 independent care units.

This scheme revises the approved concept and proposes a reduction to the existing child care centre, an addition of 104 independent living units, an addition of 117 aged care beds to the site (a total of 393), and a retail component of 350m^2.

The development is located within Randwick Council LGA and has been assessed under that council’s controls and the prevailing State Environmental Planning Policy (SEPP). This report documents the findings of our investigations and should be read in the context of the concept application prepared separately.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts

- Section 7: Discusses access and internal design aspects
- Section 8: Presents the overall study conclusions.

2. Location and Site

The site is situated on the corner of Dangar Street and King Street and lies within the sector bounded by Darley Road to the north and west and King Street and Dangar Street to the south and east respectively. The site is located 300m to the south of Centennial Park and approximately 5 kilometres south east of the Sydney CBD.

The site has a total area of approximately 30,000m^2 with an eastern frontage of approximately 160 metres to Dangar Street, a northern boundary of 180 metres to Govett Lane, a western boundary of 160m to an adjacent residential property and a southern boundary of 180m to King Street.

There are five access driveways serving the facility. These are located as follows:

- A 4.25 metre wide driveway providing entry only from Dengar Street;
- A pair of access driveways 6 metres wide providing access to a porte-cochere for pick up and set down to the Aged Care Centre on King Street;
- An 4 metre wide entry and a 4 metre wide exit driveway to King Street separated by a 1 metre median; and
- A 6 metre wide combined entry exit driveway to the childcare facility located on site.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the Photographic Record presented in **Appendix A**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

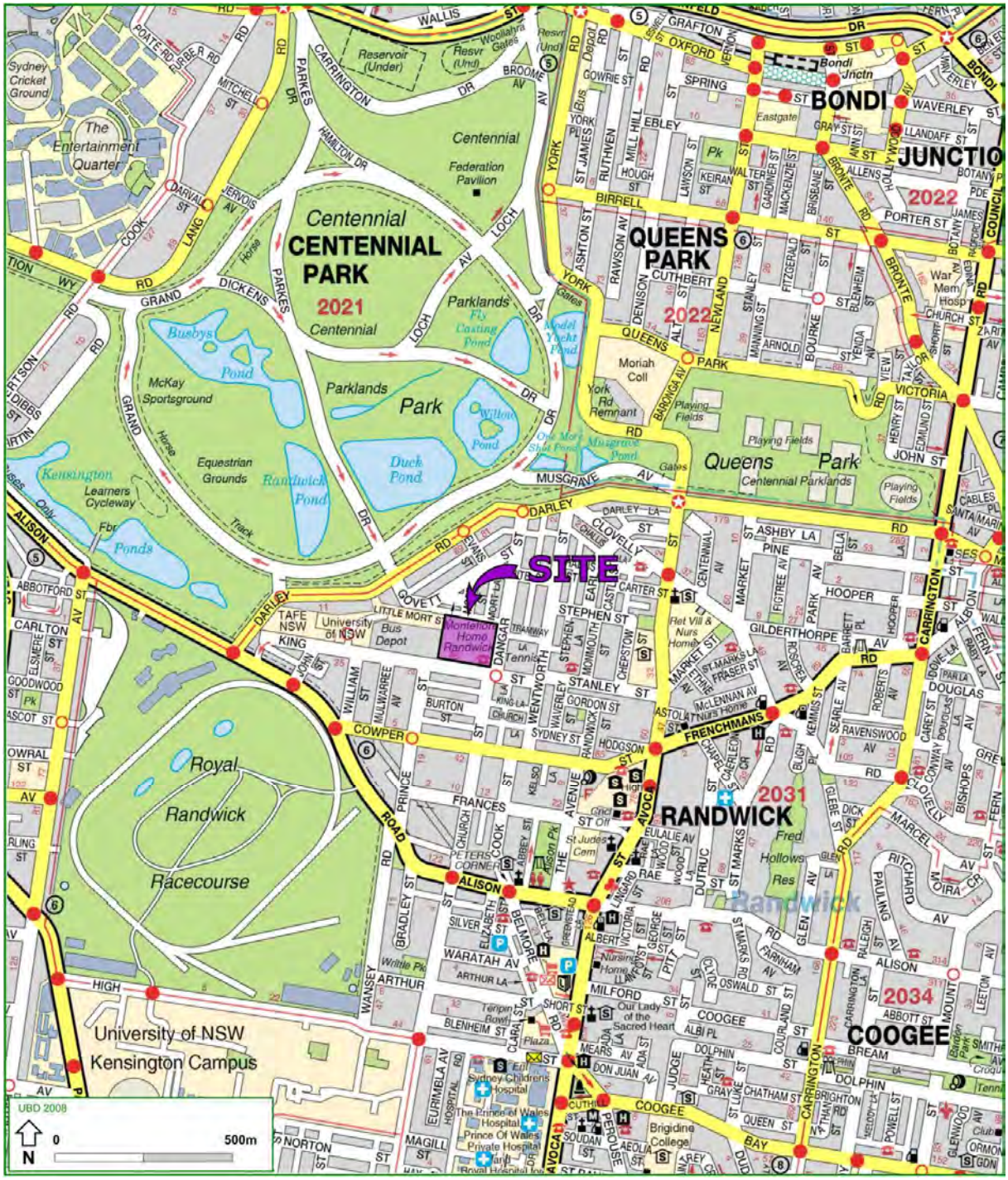


Figure 1: Location Plan

Figure 2: Site Plan

3. Existing Traffic Conditions

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Alison Road: a sub arterial road (MR327) that lies to the south west of the site and traverses a north-south direction, commencing at Avoca Street to the south and terminating at Anzac Parade to the north. It has six lanes accommodating two way flow over a 19 metre carriageway separated by a median with parking restrictions during peak hours and a 60km/h speed restriction.
- King Street: a local road running in an east west direction commencing at Alison Road to the west and terminating at Wentworth Street to the east. It carries two way flow on a carriageway of 12.5 metres, with one lane in either direction, a 50km/h speed restriction and parking permitted on street.
- Dangar Street: a local road that runs in a north south direction connecting from Darley Road in the north and terminating at King Street in the south. It carries two way flow on a carriageway of 12.5 metres, with one lane in either direction, a 50km/h speed restriction and parking permitted on street.
- Darley Road: a local collector road that runs in an east west direction commencing at Alison Road in the west and terminating at Carrington Road in the east. It carries two way flow on a carriageway of 12.5 metres, with one lane in either direction, a 60km/h speed restriction and parking permitted on street.

It can be seen from **Figure 3** that the site is conveniently located with respect to the arterial and local road systems serving the region. It is therefore able to effectively distribute traffic onto the wider road network via a number of possible routes, minimising traffic impacts on any single intersection.

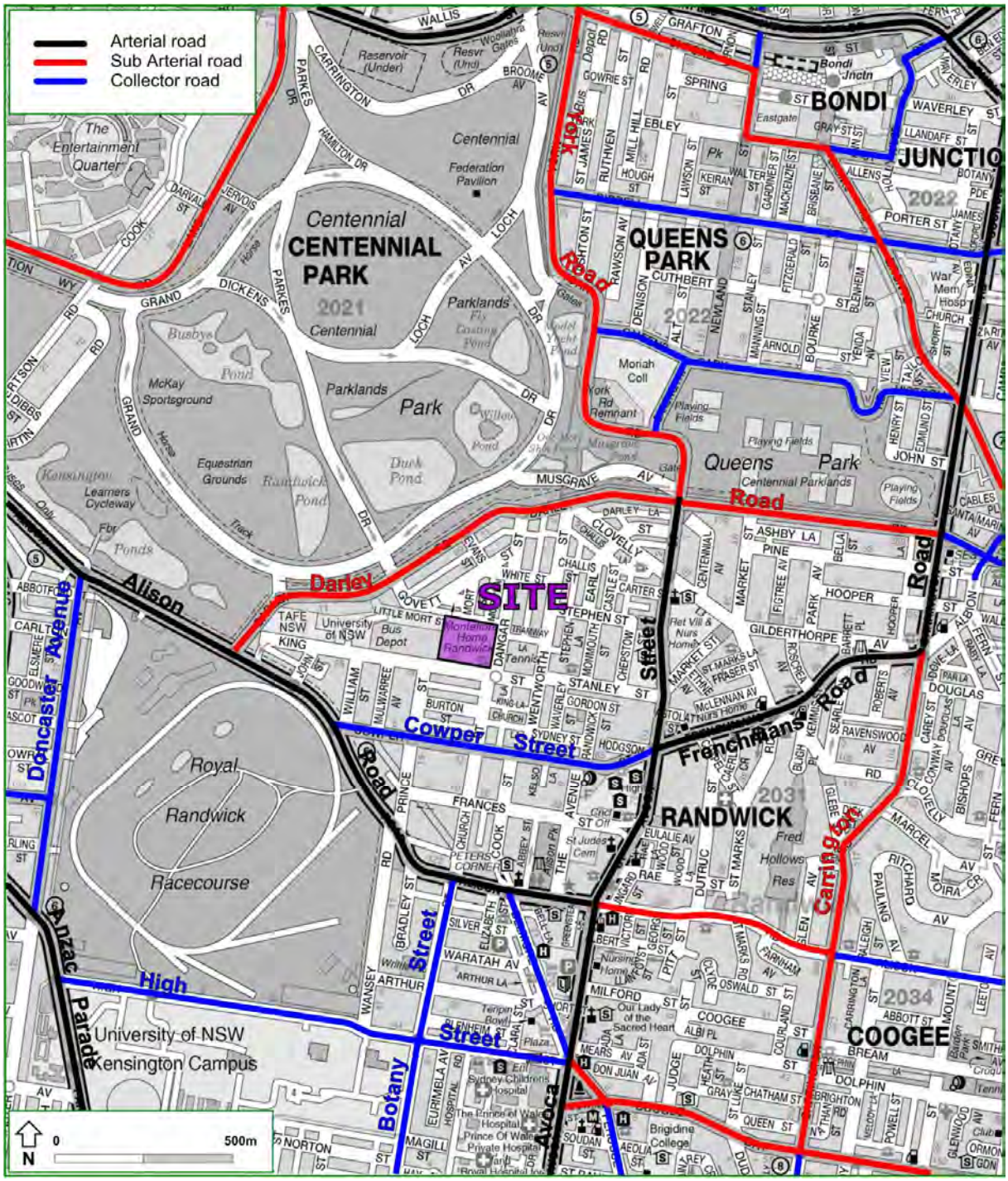


Figure 3: Road Hierarchy

3.2 Public Transport

The existing bus services that operate in the locality are shown in **Figure 5**. It is evident that the site has excellent connectivity to public transport being served by numerous bus services providing connections to the City, Bondi Junction, Randwick and Eastgardens.

Routes servicing the area include:

- 339 Clovelly to City;
- 372 & 373 Coogee to City via Randwick;
- 374 Coogee to City via Bream Street;
- 376 & 377 Maroubra Beach to City vis Randwick; and
- 400 & 410 Burwood to Bondi Junction

In addition, the proposed Randwick branch of the Sydney to South East light rail network can be seen in **Figure 6**. A station is planned for the new line, 750 metres to the west of site at the corner of Alison Road and Darley Road, known as 'Royal Randwick Racecourse'. When completed in 2020 this rail line will provide frequent and reliable connections to Sydney CBD, University of NSW and Prince of Wales Hospital, further reducing the need for private vehicle use in this precinct.

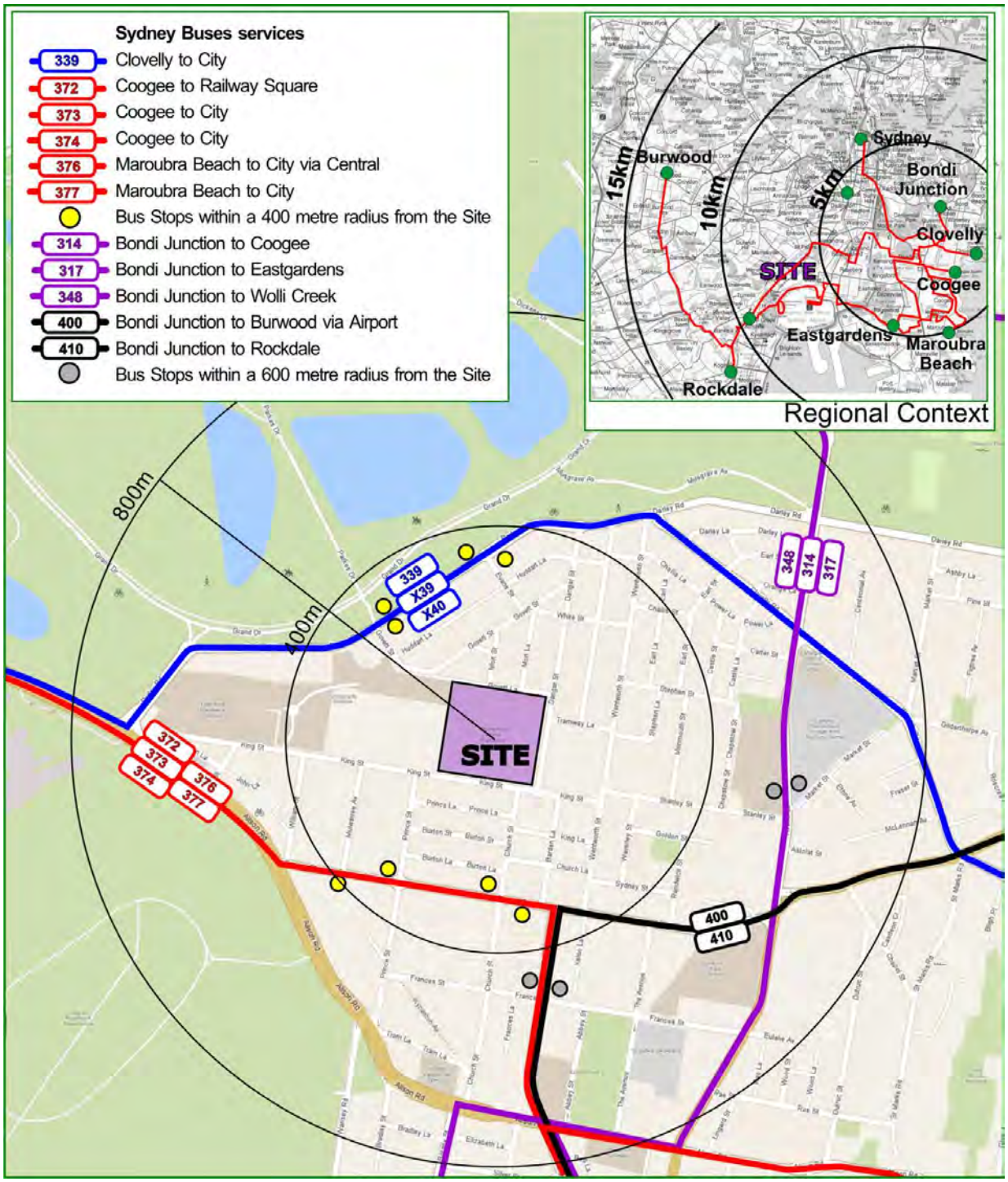


Figure 5: Existing Public Transport

Figure 6: Proposed Light Rail Network

4. Description of Proposed Development

The proposed development seeks to amend the existing approved concept scheme by reducing the approved child care centre and the approved provision of beds in the aged care facility in order to provide an increased provision of independent living units. A detailed description of the proposed development is provided in the Concept Application prepared separately by Jackson Teece. In summary, **Table 1** shows the comparison between the existing provision on site, the approved concept and the new revised concept.

Table 1: Existing, Approved and Revised Schemes

Type	Existing	Approved Scheme	Revised Scheme	Net Change Approved to Revised
Residential Care	276 Beds	508 Beds	393 Beds	- 115 Beds
Independent Living Units	N/A	36 Units	104 Units	+68 Units
Child Care	60 children	80 children	40 children	-40 children
Auxiliary Retail	N/A	350m2	350m2	n/a

The traffic and parking impacts arising from this revised conceptual development are discussed in Sections 5 and 6. Reference should be made to the conceptual plans which are presented at reduced scale in **Appendix B.**

5. Parking Requirements

5.1 Council Controls

Randwick Council DCP 2013 (specifically Section B7 - Table 1), in line with the SEPP, requires parking for self-contained dwellings for seniors to be determined at the rate of 0.5 spaces for per bedroom, where the development application is made by a person other than a social housing provider. In addition these spaces are to be designed to be suitable for people with a disability.

For a residential care facility the DCP requires parking at a rate1 space per 2 staff, including 1 space suitable for an ambulance in addition to 1 space for each 10 beds or 1 space per 15 beds if the facility includes care for persons with dementia. The care facility at Montefiore cares for patients with dementia and as such the latter rate may apply, however in order to ensure enough capacity for all components of the facility the rate of 1 space per 10 beds has been applied.

For a childcare centre the DCP requires 1 space per 8 children for pick-up and drop-off and 1 space per 2 staff. For a retail component the DCP requires 1 space per 40m^2. These parking requirements have been summarised in **Table 2**.

Table 2: DCP/SEPP Parking Rates

Type	Number	Minimum Parking Rates	Spaces Required
Seniors Housing	208 Bedrooms	0.5 spaces per bedroom	104
Residential Care	393 Beds 183 peak staff	1 space per 2 staff and 1 space per 10 beds	131
Childcare Centre	40 Children and 8 Staff	1 space per 8 children for pick up/drop off and 1 space per 2 staff	4 (plus 5 for pick-up/set down)
Retail	350m2	1 space per 40m2	9
		Total	248

It can be seen from **Table 2** that the application of the Council DCP rates to the subject development gives a requirement of 248 car spaces on site and 5 spaces for pick up and set down at the childcare centre.

In response, the development proposes a total of 280 car spaces on site, 111 spaces in the basement parking under Blocks A and B and 169 spaces under Blocks C – F with a further 7 spaces on site, provided at grade around the grounds. This provision provides a surplus of 32 spaces over the DCP requirement. The additional provision will ensure parking is available during the staff shift changeover period, typically occurring around 2.30pm, avoiding a need for arriving staff to wait for departing staff to vacate a space.

In addition to onsite parking the DCP requires 5 spaces for childcare pick–up and set-down. The existing site provides 5 spaces for childcare pick-up and set down in the form of 5 on street parking bays restricted to 15min parking during peak periods. The proposed scheme proposes to improve on the existing arrangement by reducing the number of children from 60 to 40 and providing a dedicated pick-up set down bay accommodating up to 3 spaces on site, in addition to the on street bays.

In total the proposal will provide 7 pick-up and set-down bays, exceeding the requirements of the DCP and significantly improving the existing pick-up/set-down arrangement.

5.2 Servicing

The development is served by an existing loading dock located in Block A. The approved concept plan utilised the existing loading dock to service the expanded development. This arrangement is to continue under the subject proposal, with the existing loading dock servicing needs of the expanded aged care facility. Pick up / set down bays in the internal road are proposed to service the requirements of the independent living units. The proposed bays are large enough to accommodate up to an 8.8m Medium Rigid Vehicle (MRV), representing a typical large removal van. In this regard the loading arrangements will operate satisfactorily.

Garbage collection for the aged care facility is to continue to be undertaken by private contractor, with garbage collection occurring in the existing loading dock. For the independent living units garbage collection is to be undertaken by private contactor with bins presented for collection adjacent to the internal service road.

6. Traffic Impacts

6.1 Trip Generation

Proposed Seniors Living Units

The RMS Guide to Traffic Generating Developments provides guidance on a number of matters that relate to traffic impacts and in particular, advice on traffic generation and parking demand.

In August 2013, RMS released Technical Direction TDT 2013/04a, which provides revised trip generation advice for a number of land uses based on survey data obtained since 2009. The guide provides survey results in Appendix C21 for trip generation rates relating to Seniors Living developments.

The guide states that the seniors living units surveyed in the Sydney Metropolitan area generated a negligible amount of traffic in the AM peak. The peak traffic generation for the surveyed sites occurred outside the network AM and PM peaks with an average peak generation rate of 0.3 vehicles per unit recorded. In the PM peak the surveyed results show an average trip generation per unit of 0.26 vehicles per unit. These rates reflect the fact that independent living units for seniors are very low generators of traffic, particularly during the commuter peak hours.

In order to undertake a conservative assessment, the maximum peak generation rate of 0.3 vehicles per unit shall be used to assess the wider network impact, with this value applied during the network PM peak.

The application of these rates to the 104 units proposed predicts the following additional peak traffic generation:

- 31 trips (25 in and 6 out) in the network PM peak hour

Proposed Resident Aged Care

For the additional residential care beds the trip generation rates relate to the staff numbers working on site. In this regard a survey of the generation of the existing site gives the best guide for the expected generation of the expanded facility. Traffic generation surveys of the existing site were undertaken during the transport assessment for the approved scheme (reference: Part 3A Concept Application and Stage 1 Project Application – Traffic and Transport Assessment – Halcrow 23 July 2010)

The surveys indicate the existing Montefiore Aged Care facility generates the following trip rate per staff member during the peak hour shift changeover periods of 6AM to 7AM and 2PM to 3PM:

- 0.37 vehicles per hour in the AM peak; and
- 0.46 vehicles per hour in the PM peak.

The application of these rates to the 31 additional staff expected on site during the AM shift changeover and the 41 additional staff on site during the afternoon shift changeover predicts the following additional peak traffic generation:

- 12 vehicles per hour in the AM peak (10 in and 2 out)
- 19 vehicles per hour in the PM peak (5 in and 14 out)

Revised Childcare Centre

The existing Childcare Centre currently has 60 children with approval for up to 80. Under the proposed scheme the centre will accommodate up to 40 children. In this regard the traffic generation of the childcare centre is expected to reduce.

The RMS Guide to traffic generating developments predicts a trip rate of 0.8 vehicle trips per child in the AM peak and 0.3 trips per child in the PM peak. The application of these rates to the reduction of 20 children gives the following expected net change in trip generation for the childcare centre:

- -16 vehicles per hour in the AM peak (-8 in and -8 out)
- -6 vehicles per hour in the PM peak (-3 in and -3 out)

Proposed Auxiliary Retail Unit

The retail unit proposed for the development is expected to primarily serve residents and staff on the Montefiore site, as opposed to being a retail destination for customers from the wider neighbourhood. Nevertheless, in order to undertake a conservative assessment the RMS trip generation rate of 4.6 vehicles per 100m^2 has been applied. This generation rate represents the RMS peak hour Thursday evening generation rate for secondary retail, typically applying between 4.30pm and 5.30pm.

The application of this rate to the proposed 350m^2 unit yields the following expected traffic generation:

- 16 vehicles per hour in the PM peak (8 in and 8 out)

Net Traffic Generation

Having regard for all components in the proposal the net total additional traffic generation of the scheme is as follows:

- A negligible change in the AM Peak (The reduction in the childcare facilities is expected to offset the traffic generated by an increase in staff numbers and addition of independent living units).

- An additional 60 vehicles per hour in the PM peak (39 in and 21 out).

Comparison with Approved Scheme

By way of comparison, according to the Traffic and Transport Assessment accompanying the previously approved scheme the approved expansion was predicted to generate the following additional trips:

- 56 trips in the AM peak (37 in and 19 out)

- 62 trips in the PM peak (22 in and 40 out)

It can be seen that the revised scheme represents a significant improvement in the AM peak over the approved scheme, largely due to the proposed reduction in childcare size and reduced staff numbers required on site for the shift changeover periods.

In the PM peak the additional generation associated with the revised scheme demonstrates a comparable trip generation rate to the additional traffic predicted from the approved expansion. As such the traffic generation of the revised scheme can also be considered acceptable. Nevertheless an up dated assessment has been undertaken and presented in **Section 6.2** for confirmation.

6.2 External Traffic Impacts

The predicted traffic generation of 60 trips represents approximately one car per minute during the peak hour, with vehicles utilising two potential site accesses for ingress and one access for egress.

These trips will be distributed across the intersections of King Street / Prince Street, King Street / Church Street and King Street / Dangar Street to access the wider network. In this regard, the net

increase in vehicular trips is expected to have no quantifiable impact on the operation of any one of the abovementioned intersections.

In order to confirm this assertion SIDRA modelling has been undertaken on the key intersection of King Street / Dangar Street adjacent to site. Extensive traffic surveys were undertaken during the Stage 1 Project Application for the Montefiore Care Home, presented in the 'Halcrow Traffic and Transport Assessment'. These surveys identified the critical network PM peak occurs between 3pm and 4pm in this precinct, coinciding with the afternoon school run at the local schools.

Updated traffic surveys were conducted on the 22nd of July 2015 at the intersection of King Street / Dangar Street during a typical school day, whilst SIDRA modelling has been used to determine the performance characteristics of this key intersection under the existing and future (existing + development) traffic conditions with the additional 30 vehicle trips distributed in accordance with the distribution of traffic recorded at the existing site.

The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LOS) criteria. These performance measures can be interpreted using the following explanations:

DOS - the DOS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DOS approaches 1, it is usual to attempt to keep DOS to less than 0.9. When DOS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DOS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LOS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown in **Table 3**:

Table 3: Intersection Performance Indicators

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

A summary of the modelled results are provided below. Reference should also be made to the SIDRA outputs provided in **Appendix B** which provide detailed results for individual lanes and approaches. For priority intersections, the highest delays are reported for the most disadvantaged movement in **Table 4**, which is not representative of the overall intersection performance.

Table 4: Intersection Performance: Network PM Peak Hour

Intersection Description	Control Type	Period	Scenario	Degree of Saturation	Intersection Delay	Level of Service
King Street / Dangar Street	Roundabout	PM Peak	Existing	0.152	5.2	A
			Future	0.170	5.2	A

It can be seen from **Table 4** that the development traffic has a negligible impact on the performance of this intersection with only a slight increase in the degree of saturation recorded. No increase in the overall intersection delays are recorded during the peak period and the intersection is predicted to continue to operate with a level of service 'A' in the future network peak period.

Accordingly, the traffic impacts of the proposed development are considered negligible and can be comfortably accommodated with no external improvements to the local network required.

This analysis underlines the fact that independent living units for seniors are comparatively low generators of external traffic, particularly in the commuter peak periods.

7. Access & Internal Design Aspects

7.1 Access

As with the existing development, the proposed development relies on a two-way access driveway to King Street. The access driveway provides a four metre entry and four metre exit driveway separated by a 1 metre median in compliance with AS 2890.1 (2004). In addition to the 4.25 metre entry driveway on Dangar Street.

An additional pick up set down area has been proposed for the childcare centre, accessed by a 4 metre entry and separate 4 metre exit driveway, replacing the existing 6m driveway in this location.

7.2 Internal Design

The internal car park for the proposal are to comply with the requirements of AS 2890.1 (2004) and the following characteristics are noteworthy:

7.2.1 Parking Modules

- The proposed design shows all resident parking spaces have been designed in accordance with a AS2890.6, meeting the requirements for accessible spaces in accordance with Council's DCP and the SEPP. They are provided with a minimum space length of 5.4m a minimum width of 2.4m and an aisle width of 5.8m. All spaces have been provided with a shared space of 2.4m by 5.4m alongside, in accordance with the requirements of AS2890.6.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Blind aisles are to extend a minimum of 1.0m beyond the last parking space.

7.2.2 Other Considerations

- All columns are required to be located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).
- Appropriate visual splays are to be provided in accordance with the requirements of Figure 3.3 of AS2890.1 at all accesses.

In summary the internal configuration of the proposed car park has been designed in accordance with design standards AS2890 and will operate satisfactorily.

8. Conclusions

In summary:

- The revised concept application proposes an alteration to the existing approved design. This concept application provides an expansion the existing aged care facility to provide a net additional 117 beds, an addition of 104 independent living units for seniors, an auxiliary retail component of 350m^2 and a reduction in the size of the existing childcare centre on site;
- The estimated traffic generation increase associated with the development concept will be 60 veh/hr during the PM peak period with a negligible net increase in the AM peak. These trips are split into both directions on King Street and can be readily accommodated, with minimal impacts on the surrounding road system.
- The parking requirement for the concept development under Council's DCP and the SEPP is for a total of 248 car spaces plus 5 spaces for pick up and set down. In response a total of 280 spaces has been proposed on site with 7 pick-up and set-down spaces provided adjacent to the childcare centre, meeting the requirements of council and the SEPP.
- The concept plans demonstrate that the access and internal design aspects will be able to comply with AS 2890.1 (2004);

It is therefore concluded that the proposed development is supportable on traffic planning grounds and will not cause a significant impact on the local traffic network.

Appendix A

Photographic Record

Montefiore existing King Street access

Montefiore existing Dangar Street access

‘The Burger Centre’ porte-cochere.

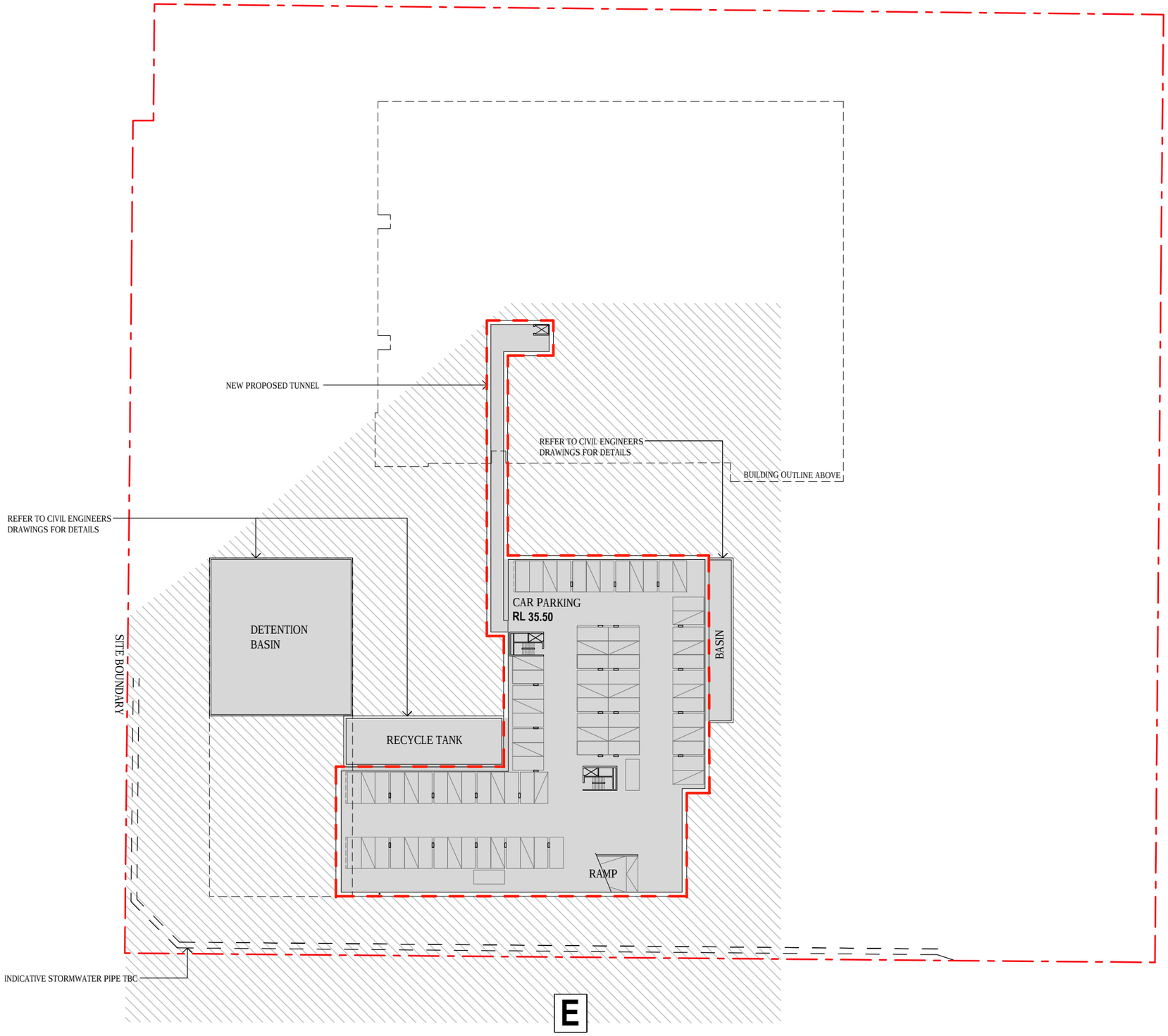
Intersection of King Street and Dangar Street

Dangar Street looking south.

Childcare Centre existing staff parking and on street pick-up / set-down

Appendix B

Reduced Plans



LEGEND

- RESIDENTIAL AGED CARE
- RESIDENTIAL HEALTH/WELLBEING
- ADULT DAYCARE
- CHILDCARE
- RETAIL / COMMERCIAL
- FOYER / ADMINISTRATION
- STAFF FACILITIES
- SELF-CARE APARTMENTS
- EXISTING AGED CARE FACILITY
- CARPARK / PLANT / STORE ROOM
- PUBLIC OPEN SPACE
- RESIDENTIAL AGED CARE RE-USE OF EXISTING BUILDING
- RESIDENTIAL HEALTH / WELL-BEING RE-USE OF EXISTING BUILDING
- ADULT DAYCARE RE-USE OF EXISTING BUILDING
- SL SKYLIGHT
- APPROVED SCHEME ENVELOPE
- BUILDING FLOOR SPACE ENVELOPE SOUGHT FOR APPROVAL

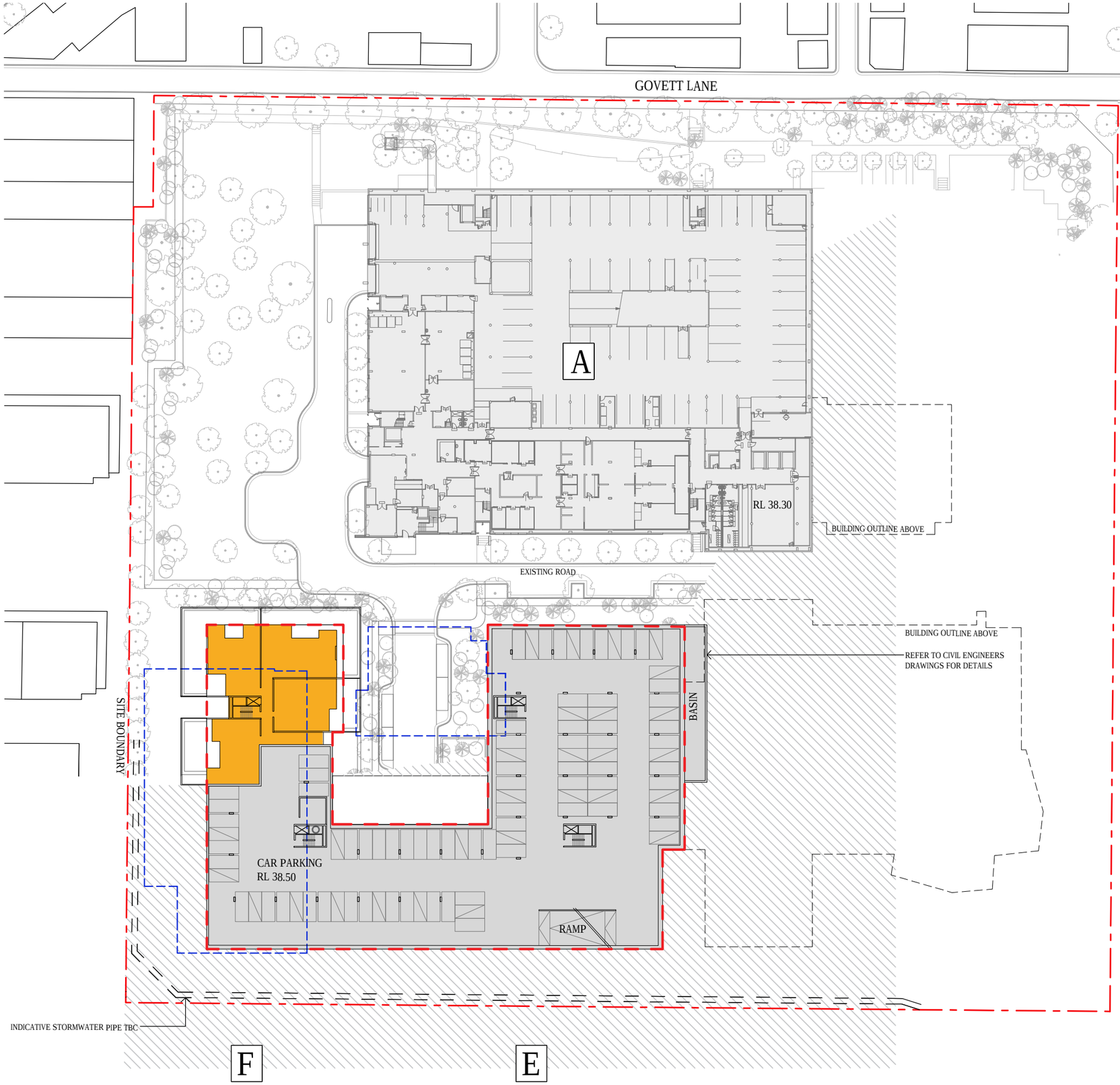
0 10 20 30metres

SCALE 1:750

BASEMENT LEVEL 2 CARPARK

JACKSON TEECE

Nominated Architect Ian Brodie (4275)



LEGEND

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- APPROVED SCHEME ENVELOPE
- BUILDING FLOOR SPACE ENVELOPE SOUGHT FOR APPROVAL

0 10 20 30metres

SCALE 1:750

BASEMENT LEVEL 1 CARPARK

JACKSON TEECE

Nominated Architect Ian Brodie (4275)

LEGEND

- RESIDENTIAL AGED CARE
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- APPROVED SCHEME ENVELOPE
- BUILDING FLOOR SPACE ENVELOPE SOUGHT FOR APPROVAL

0 10 20 30metres

SCALE 1:750

LOWER GROUND LEVEL FLOOR PLAN

JACKSON TEECE

Nominated Architect Ian Brodie (4275)

Appendix C

Network Flow Diagrams

Dangar Street / King Street Surveyed Existing Traffic Flows

22/07/2015

(PM Peak: 3:00pm - 4:00pm)

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PERIOD:

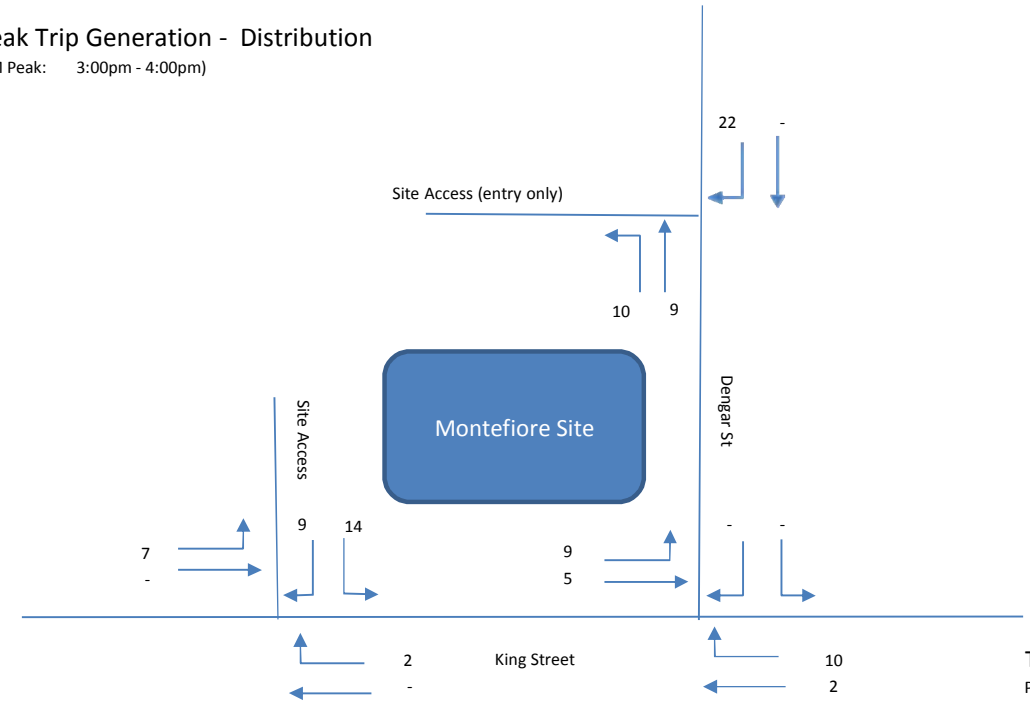
Evening Peak

SCENARIO:

Existing Base (TOTALS)

Peak Trip Generation - Distribution

(PM Peak: 3:00pm - 4:00pm)



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PERIOD:

Evening Peak

SCENARIO:

TOTAL Additional Trips (vph)

Trip Generation Calculations:

Peak generation = 64 Trips (41 in & 23 out) in the PM peak

Additional trips are distributed onto network as per existing trip distribution

Appendix D

Sidra Results

MOVEMENT SUMMARY

Site: King Street / Dangar Street - PM Existing + Development

King Street / Dangar Street - PM Weekday Peak Hour
Scenario: Existing + Development
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: King Street											
5	T1	111	0.0	0.128	4.6	LOS A	0.7	5.2	0.34	0.51	44.2
6	R2	31	0.0	0.128	7.5	LOS A	0.7	5.2	0.34	0.51	43.8
6u	U	1	0.0	0.128	8.9	LOS A	0.7	5.2	0.34	0.51	37.0
Approach		142	0.0	0.128	5.3	LOS A	0.7	5.2	0.34	0.51	44.1
North: Dangar Street											
7	L2	18	0.0	0.124	4.6	LOS A	0.7	4.9	0.29	0.59	42.1
9	R2	125	0.0	0.124	7.3	LOS A	0.7	4.9	0.29	0.59	45.2
9u	U	1	0.0	0.124	8.7	LOS A	0.7	4.9	0.29	0.59	45.6
Approach		144	0.0	0.124	7.0	LOS A	0.7	4.9	0.29	0.59	45.0
West: King Street											
10	L2	139	0.0	0.170	4.1	LOS A	1.1	7.5	0.17	0.46	46.4
11	T1	95	0.0	0.170	3.9	LOS A	1.1	7.5	0.17	0.46	45.3
12u	U	1	0.0	0.170	8.3	LOS A	1.1	7.5	0.17	0.46	47.3
Approach		235	0.0	0.170	4.1	LOS A	1.1	7.5	0.17	0.46	46.1
All Vehicles		521	0.0	0.170	5.2	LOS A	1.1	7.5	0.25	0.51	45.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: King Street / Dangar Street - PM Existing

King Street / Dangar Street - PM Weekday Peak Hour
Scenario: Existing
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: King Street											
5	T1	107	0.0	0.115	4.6	LOS A	0.7	4.6	0.34	0.50	44.3
6	R2	19	0.0	0.115	7.5	LOS A	0.7	4.6	0.34	0.50	43.9
6u	U	1	0.0	0.115	8.9	LOS A	0.7	4.6	0.34	0.50	37.2
Approach		127	0.0	0.115	5.1	LOS A	0.7	4.6	0.34	0.50	44.2
North: Dangar Street											
7	L2	18	0.0	0.121	4.5	LOS A	0.7	4.7	0.28	0.59	42.1
9	R2	124	0.0	0.121	7.2	LOS A	0.7	4.7	0.28	0.59	45.3
9u	U	1	0.0	0.121	8.7	LOS A	0.7	4.7	0.28	0.59	45.7
Approach		143	0.0	0.121	6.9	LOS A	0.7	4.7	0.28	0.59	45.0
West: King Street											
10	L2	128	0.0	0.152	4.0	LOS A	0.9	6.6	0.12	0.46	46.4
11	T1	83	0.0	0.152	3.9	LOS A	0.9	6.6	0.12	0.46	45.4
12u	U	6	0.0	0.152	8.2	LOS A	0.9	6.6	0.12	0.46	47.3
Approach		218	0.0	0.152	4.1	LOS A	0.9	6.6	0.12	0.46	46.2
All Vehicles		488	0.0	0.152	5.2	LOS A	0.9	6.6	0.23	0.51	45.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.