Updated Traffic Impact Assessment

Section 75W Application, Proposed Mixed-Use Development – Kirrawee Brick Pit

Reference: 13.392r02v2 TRAFFIX Kirrawee Brick Pit, Updated S75W TIA, Issue II

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Contents

1. Introduction

TRAFFIX has been commissioned by South Village Pty Ltd to provide traffic, transport and parking advice with regard to the proposed mixed-use development at Kirrawee Brick Pit, Kirrawee, Sutherland. In this regard, TRAFFIX submitted a Traffic Impact Assessment, dated 22 November 2013 (TRAFFIX 2013 TIA) in support of a Section 75W application (MOD3) to modify the concept plan approval MP10-0076 for the Kirrawee Brick Pit site.

The modification sought a number of amendments to the approved concept plan. With regard to development yield, the original modified concept plan proposed:

- 14,190 m^2 of Gross Floor Area (GFA) of ground floor non-residential uses;
- 749 residential units;
- 1,566 parking spaces, consisting of:
  - 1,013 residential parking spaces;
  - 513 non-residential parking spaces; and
  - 40 parking spaces to replace Flora Street parking spaces lost to the development.

The overall conclusion of the TRAFFIX 2013 TIA was that the traffic volumes anticipated for the modified concept plan – based to a degree on the latest 2013 Roads and Maritime Service (RMS) residential trip rates – would be less than the traffic volumes modelled by the Updated Halcrow Traffic Management & Accessibility Plan dated October 2011 (Updated Halcrow TMAP) that supported the approved concept plan.

As a result, the TRAFFIX 2013 TIA concluded that the modified concept plan would reduce the traffic demand on the surrounding road network and therefore the agreed and approved concept plan, "*infrastructure and intersection improvements remain an appropriate infrastructure upgrade response to the traffic generating potential of the Kirrawee Brick Pit site*". Furthermore, the overall conclusion of the TRAFFIX 2013 TIA was that the modified concept plan – in terms of traffic generation, agreed

intersection upgrades, future network performance, parking, vehicular access and internal design – was generally consistent with the approved concept plan and therefore supportable on traffic planning grounds and would operate satisfactorily.

The exhibition period for the MOD3 ended on 11 April 2014 and since that time a number of submissions have been received from key stakeholders as well as local residents.

In this regard, the NSW Department of Planning & Environment (DPE) is the authority that is charged with determining the MOD3. DPE provided its comments on the MOD3 by way of the submission dated 8 May 2014. It is noteworthy that the DPE's submission can be assumed to be generally supportive of the MOD3 traffic study as it seeks no further clarification with regard to traffic, parking and access.

In addition, it can be assumed that Transport for NSW (TfNSW) and RMS are also generally supportive of the MOD3 as their joint submission of 18 March 2014 also seeks no further clarification with regard to traffic, parking and access. Furthermore, an objective of the MOD3 application was to modify two (2) conditions relating to car parking (B4 – Car Parking and 14 – Car Parking) that would effectively permit additional car parking on the site, commensurate to the proposed increase in residential development yield. In this regard, it is noteworthy that the joint TfNSW-RMS submission recommends that the proposed modifications to the conditions be adopted.

The remaining submissions of relevance are the submission of Sutherland Shire Council dated 17 April 2014 and the submission of Jannali resident James Maclachlan dated 11 April 2014.

In response to submissions, the modified concept plan has been amended. The following summarises the development yield of the current modified concept plan proposed:

- 14,191 m^2 of GFA of ground floor non-residential uses;
- 749 residential units;
- 1,521 parking spaces

- 1,013 residential parking spaces;
- 468 non-residential parking spaces; and
- 40 parking spaces to replace Flora Street parking spaces lost to the development.

Comparison of the yields for the original modified concept plan, with the current modified concept plan, indicates that the GFA of the non-residential uses remains practically the same as does the residential development, residential parking and Flora Street replacement parking. The only modification of significance is a reduction in the number of non-residential parking spaces has reduced by 45 spaces from 513 spaces to 468 spaces.

The reasons for this are a combination of two factors. Firstly, it should be noted that the approved concept plan is conditioned with detailed parking rates that have been stipulated by RMS. These conditions require parking to be provided at different rates for different types of retail uses and the rates refer to Gross Leasable Areas (GLA) as opposed to GFA. Secondly, whilst the GFA of the scheme has remained unchanged, the recent refinements to the indicative scheme have resulted in a reduction in GLA and a shift between different uses that require parking at different lower rates (i.e. specialty retail requires parking a 4.2 spaces per 100 m^2; however, showroom requires parking at just 2.3 spaces per 100 m^2). As a result of the reduction in GLA and shift between uses, the permissible parking provision on-site has dropped by 45 spaces and therefore to comply with the conditioned parking rates, the proposed on-site car parking provision has reduced to 1,521 parking spaces. Current on-site parking provisions – including commentary on the rates adopted – is provided at Section 7.

This updated Traffic Impact Assessment (TIA) report builds upon the original TRAFFIX 2013 TIA and (where necessary) incorporates amendments to the analysis in response to submissions received and relevant amendments that have been made to the modified concept plan. This updated TIA report effectively supersedes the original TRAFFIX 2013 TIA and includes – at Section 9 – a table that summarises all relevant issues raised in the submissions and provides a summary response to each of the issues and/or advises the location within this updated TIA report that the issue is addressed.

The remainder of this report is structured as follows:

- Section 2: Provides relevant details of the Concept Plan Approval MP10-0076;
- Section 3: Describes the site and its location;
- Section 4: Documents existing traffic conditions;
- Section 5: Describes the proposed development;
- Section 6: Assesses the traffic implications;
- Section 7: Assesses the parking implications;
- Section 8: Discusses access and internal design aspects
- Section 9: Summary of responses to key stakeholder issues; and
- Section 10: Presents the overall study conclusions.

2. MP10-0076 Concept Approval

2.1 Approved Concept Plan Development

On the 23 August 2012, the NSW Department of Planning and Infrastructure (DPI) issued the Instrument of Approval (IoA) for the Kirrawee Brick Pit concept plan approval. The following presents the development for which concept plan approval has been granted, as stated at Schedule 2 – Terms of Approval, Part A – Administrative Conditions:

- Use of the site for a mixed use development with associated public open space;
- Indicative building envelopes for 9 buildings to a maximum height of 14 Storeys;
- 60,735m^2 of Gross Floor Area, comprising:
  - 45,505m^2 of residential (432 dwellings);
  - 15,230m^2 of retail/commercial floor space (including 3,900m^2 supermarket and 1,470m^2 discount supermarket);
- Basement level, ground and above ground car parking;
- Road layout to support the development;
- Public pedestrian and cycle pathway;
- Public park with lake and surrounding forest; and
- Landscaping areas throughout the site.

The non-residential and residential floor areas above can be summarised as follows; it is noteworthy that the development schedule below draws upon information extracted from the Updated Halcrow TMAP:

- 15,230m^2 of non-residential floor space, consisting of:
  - 7,940m^2 of retail/commercial (exc. supermarket);

- 5,370m^2 of supermarket floor area;
- 1,920m^2 of internal mall, toilets/centre management, etc floor area.

- 45,505m^2 of residential (432 dwellings), consisting of:
  - 59 one bedroom units;
  - 277 two bedroom units;
  - 96 three bedroom units.
- 1,150 space basement car park, consisting of:
  - 603 residential parking spaces; and
  - 547 non-residential parking spaces.

2.2 Schedule 2 – Concept Plan Modifications

Schedule 2 of the IoA, Part B – Modifications provides the conditions that need to be adhered to should changes to the concept plan development be proposed as part of subsequent development applications. Of the four conditions stipulated, one relates to car parking. **Table 1** presents this condition (and related sub-conditions); Table 1 also states whether the condition requires modification or is maintained as part of this S75W application.

Table 1: Schedule 2, Part B – Modifications, Conditions of Consent

CONDITION	ITEM	ACTION
B4 **B4(a)**	**CAR PARKING** The maximum total number of car parking spaces shall not exceed 1,150 spaces	***Modified***
B4(b)	Maximum car parking to be allocated for residential purposes shall not exceed 603 parking spaces, inclusive of 54 residential visitor spaces.	***Modified***
B4(c)	Development must comply with the Concept Plan's non-residential car parking rates identified in the Updated Traffic Management and Accessibility Plan prepared by Halcrow Pacific Pty Ltd, dated 27 October, 2011 (Version 4), including the replacement of a minimum of 40 street car parking spaces displaced by the development.	Maintained

2.3 Schedule 3 – Future Environmental Assessment Requirements

Schedule 3 of the IoA, provides the conditions that need to be addressed as part of the future environmental assessments for the development. **Table 2** presents the relevant transport, traffic and parking conditions; Table 2 also states whether each condition is to be modified or maintained as part of this S75W application.

Table 2: Schedule 3 – Future EA Requirements, Conditions of Consent

CONDITION	ITEM	ACTION
3.	**TRAVEL ACCESS GUIDE (TAG) / GREEN TRAVEL PLAN** Future applications shall provide details of any Travel Access Guide (TAG) / Green Travel Plan. This should include an investigation of car sharing schemes.	Maintained
8.	**NSW TRANSPORT- ROADS & MARITIME SERVICES** Future development applications shall demonstrate that the RMS requirements have been met in relation to:	Maintained
8a.	**Princes Highway Intersection at Oak Road** The layout of the existing signalised intersection on Princes Highway at Oak Road shall be reconfigured as follows; a) Three northbound lanes shall be provided on oak Road on the southern leg of the intersection and each lane shall be a minimum of 90 metres in length. b) An 80 metre long left turn slip lane shall be provided on the westbound carriageway of Princes Highway into Oak Road. c) Two southbound lanes shall be provided on Oak Road on the southern leg of the intersection. d) Half closure of the Oak Road northern approach to the Princes Highway involving the discontinuation of southbound lanes with northbound lanes remaining open. e) A raised central concrete median island shall be installed on Oak Road in front of the proposed left in/left out driveway and the median shall extend from the stop line at the Princes Highway intersection to an appropriate point to the south of the proposed driveway. This median shall be a minimum of 900mm wide. The above requirements are subject to the outcomes of the Road Safety Audit at Condition 8h, and may be modified with the agreement of RMS and Council.	Maintained
8b.	**Traffic Signals on Princes Highway at Bath Road Intersection** Traffic control signals shall be provided at the intersection of Princes Highway and Bath Road and shall consist of the following works: a) Left in/left out only for the Bath Road southern approach. The left turn out would be signalised. b) No through movements across Princes Hwy (ie no north-south traffic from Bath Road) c) Signalised left and right turn out of Bath Road northern approach with the following lane configuration (L/R/R). d) No right turns permitted from Princes Highway from either direction to Bath Road. The above requirements are subject to the outcomes of the Road Safety Audit at Condition 8h, and may be modified with the agreement of RMS and Council.	Maintained

Table 2 (Cont'd): Schedule 3 – Future EA Requirements, Conditions of Consent

CONDITION	ITEM	ACTION
8c.	**Traffic Signals at Oak Road and Flora Street Intersection** The applicant shall upgrade Oak Road and Flora Street intersection to a signalised intersection generally in accordance with the attached sketch (Note that sketch is indicative only and subject to change upon development of a detailed signal design plan). The provision of traffic signals at this intersection shall be designed and constructed in accordance with Austroads and RMS supplements.	Maintained
8d.	**Traffic Management Plan** The redistribution of traffic associated with the closure of the Oak Road north approach to the Princes Highway will require a Traffic Management Plan, including a Green Travel Plan (GTP), to be submitted to Council and referred to RMS for review, prior to commencement of the roadworks. Further, this partial road closure will also require monitoring (post closure) to determine if any further remedial works are required. This monitoring period shall consist of a detailed traffic report, which examines the traffic impact on the local road network associated with the redistribution of the traffic caused by the road closure and shall be submitted to Council and referred to RMS for review 6 months after the road closure. Upon review of the traffic analysis, the applicant may be requested to undertake some further remedial works within reason.	Maintained
8f.	**Deceleration Lane on Princes Highway** The left turn deceleration lane into the subject site from Princes highway shall be a minimum of 60 metres in length (including taper) and shall be designed and constructed in accordance with Austroads and RMS requirements.	Maintained
8h.	**Road Safety Audit** Road safety concerns are raised with regard to the close proximity of the proposed left in/left out driveway on Oak Road to the proposed left turn slip lane on Princes Highway into Oak Road and the subsequent potential for rear end accidents. In this regard, prior to any 'Construction Certificate' being issued for any stage of the proposed development, an independent Road Safety Audit shall be undertaken that investigates this issue and is to be undertaken by a certified Road Safety Auditor. The Audit shall be completed in accordance with Austroads: *Guidelines for Road Safety Audits*. A Copy of the findings of the Audit shall be submitted to Council and the RMS for review. Should the Audit recommend any remedial measures, then the developer shall be required to implement such measures at no cost to the RMS, Council or DoP&I.	Maintained
8j.	**Construction Certificate** The Construction Certificate for any stage of the proposed development shall not be released until such time that the abovementioned WAD has been executed, the detailed design drawings and geotechnical reports for the excavation of the site and support structures have been assessed by the RMS and all the detailed signal and civil road design plans have been approved by the RMS construction approval. Further to the above, no Construction Certificate shall be approved for any stage of the development until such time that a detailed Construction Traffic Management Plan (CTMP) and associated Traffic Control Plan (TCP) is submitted to Council and the RMS for review and acceptance. The CTMP and TCP shall be undertaken in accordance with the RMS's Traffic Control at Worksites Manual and the author shall be certified.	Maintained
8p.	**Off-Street Parking** Off-Street parking shall be designed and constructed in accordance with AS 2890.1-2004 and AS 2890.2-2002.	Maintained

Table 2 (Cont'd): Schedule 3 – Future EA Requirements, Conditions of Consent

CONDITION	ITEM	ACTION
8q.	**Swept Path** The swept path of the longest vehicle entering and exiting the subject site shall be in accordance with Austroads.	Maintained
14.	**CAR PARKING** Future applications shall address the following:	Maintained
a)	The total amount of car parking to be provided as part of the development shall not exceed 1,150 spaces.	***Modified***
b)	An updated schedule of parking allocations shall be prepared and submitted with each subsequent application.	Maintained
c)	Parking facilities (public, commercial and bicycle) shall be designed in accordance with relevant Australian Standards.	Maintained
d)	The design of the parking and commercial vehicle facilities shall be designed so that all vehicles, including commercial vehicles, enter and exit the development in a forward direction.	Maintained
e)	The provision and implementation of a car share scheme.	Maintained
f)	All loading and unloading associated with the use of the development shall take place wholly within the site from designated loading bays as identified in the Concept Plan. Loadings bays shall not be used for storage or any other purpose that would restrict their use for the purposes of loading and unloading.	Maintained
g)	Henroth Investments Pty Ltd shall enter into an agreement with Sutherland Shire Council that will delegate powers to Council to enforce regulatory parking signs within the internal road network.	Maintained
h)	Relocation of the Flora Street community bus and taxi drop off to the main central Flora Street pedestrian entry, in a location and of a design that achieves reasonable accessibility for people with mobility restrictions between vehicles and the retail shops.	Maintained
17	**STAGING OF DEVELOPMENT** Future applications shall provide details of the final form of staging of the development are to be submitted with the first application to ensure the orderly and coordinated development of the site. The initial stages of the development should include the construction of the retail precinct and lake and neighbourhood park within the southwestern portion of the site. Each stage described shall provide full details of inclusions in respect of:	Maintained
a)	Demolition;	
b)	Earthworks;	
c)	Buildings and all other structures (including basements);	
d)	Any elements of the overall public domain plan to be dedicated or embellished;	
e)	Any site remediation works;	
f)	Stormwater management works;	
g)	Any vehicular or pedestrian access to the site;	
h)	Measures to mitigate and manage nuisance caused by stages under construction to completed stages and clashes between stages including vehicle access, noise, parking and safety; and	
i)	Waste and Construction Management.	
	An access application shall be made to Council to obtain footpath crossing and boundary alignment levels before commencing the detailed design of internal driveways, paths and car park area.	

3. Location and Site

The site is situated on the southern side of the Princes Highway and lies within the sector bounded by the Princes Highway to the north, Flora Street in the south, Oak Road to the west and existing industrial developments to the east. It is also due north of Kirrawee railway station and approximately 22 kilometres south of the Sydney CBD.

The site was formerly used for brick manufacture; however, the site has remained vacant for a number of years since its previous use ceased. The site has a rectangular configuration a site area of approximately 4.25 hectares. It has a northern frontage of approximately 250 metres to the Princes Highway, a southern frontage of approximately 250 metres to Flora Street, a western frontage of approximately 160 metres to Oak Road and an eastern boundary of approximately 180 metres to neighbouring industrial developments.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**.

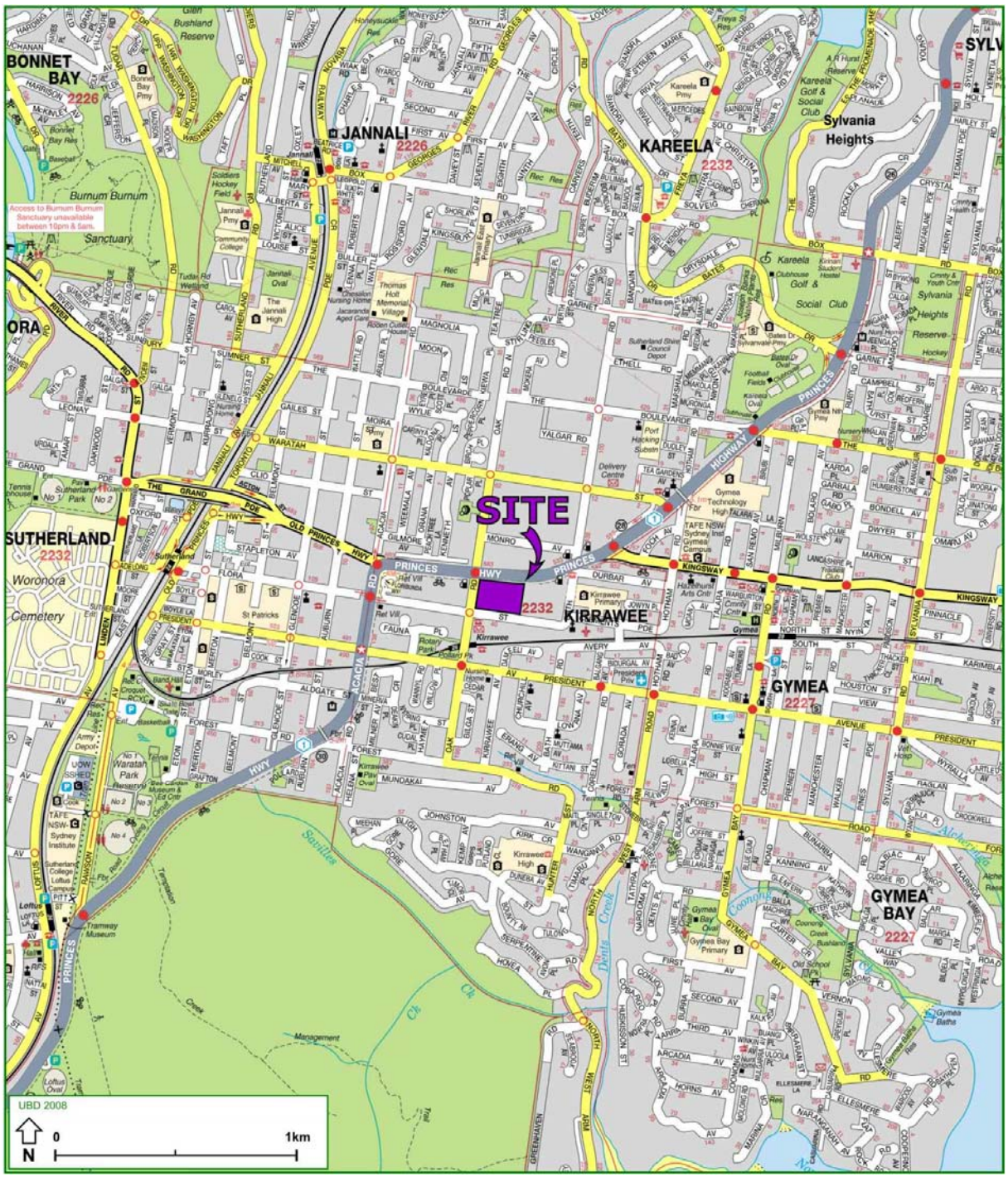


Figure 1: Location Plan

Figure 2: Site Plan

4. Existing Traffic Conditions

4.1 Road Network

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

- Princes Highway: a Roads and Maritime Services (RMS) State Road (MR 1) that generally runs in an east-west direction in vicinity of the site and forms part of an interstate link between Sydney in the north and Melbourne in the south. The Princes Highway carries about 70,000 vpd (vehicles per day) in the vicinity of the site. The Princes Highway is subject to a 70km/h speed zoning in the vicinity of the site and generally carries three lanes of traffic in either direction, with 'no stopping' restrictions, within a separated carriageway of about 20 metres width.

- Oak Road: a local unclassified road that runs in a north-south direction in the vicinity of the site and provides the function of a sub-arterial or busy collector route. Parking is permitted along certain sections. Oak Road is subject to a 50km/h speed zoning and generally carries a single lane of traffic in either direction along an undivided carriageway.

- Flora Street: a local unclassified road that runs in an east-west direction in the vicinity of the site and provides the function of a sub-arterial or busy collector route. Parking is generally provided on both sides of Flora Street, including 40 perpendicular (90 degree angle, rear to kerb) parking spaces located adjacent to the site. Flora Street is subject to a 50km/h speed zoning and generally carries a single lane of traffic in either direction along an undivided carriageway.

- Bath Road: a local unclassified road that runs in a north-south direction between the Princes Highway in the north and Flora Street in the south. Bath Road permits unrestricted kerbside parallel parking on both sides and is subject to a 50km/h speed zoning. Bath Road carries a single lane of traffic in either direction along an undivided carriageway.

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, minimising traffic impacts.

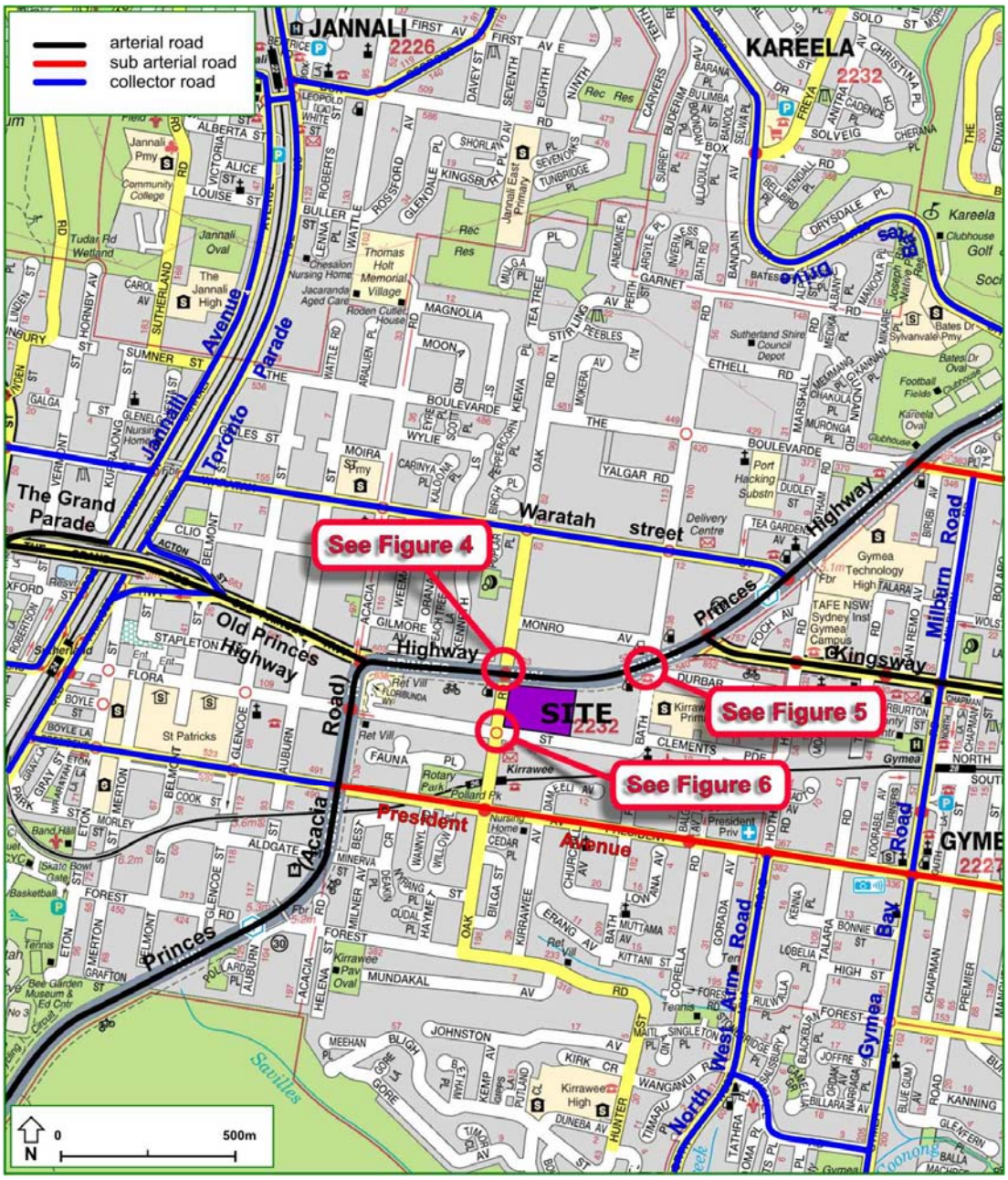


Figure 3: Road Hierarchy

4.2 Key Intersections

The key intersections in the vicinity of the site are shown below and provide an understanding of the existing road geometry and alignment.

Source: Near Map

Figure 4: Intersection of Princes Hwy and Oak Rd

It can be seen from **Figure 4** that Princes Highway intersects with Oak Road in the form of a traffic signal crossroads intersection adjacent to the northwest corner of the site. Footpaths are provided on all approaches with pedestrian crossings on both Oak Road approaches and the west approach of Princes Highway.

Source: Near Map

Figure 5: Intersection of Princes Hwy and Bath Rd

It can be seen from **Figure 5** that Princes Highway is divided by a raised median in this location. Accordingly, Princes Highway intersects separately with Bath Road North and Bath Road South in the form of two priority controlled, left-in & left-out accesses.

Source: Near Map

Figure 6: Intersection of Princes Hwy and Bath Rd

It can be seen from **Figure 6** that Oak Road intersects with Flora Street in the form of a roundabout adjacent to the southwest corner of the site. Footpaths are provided on all approaches with a pedestrian zebra crossing on the south approach of Oak Road.

4.3 Study Network

The following summarises the relevant study road network (including the key intersections above) for the subject development site; these accord with the study network assessed by the Updated Halcrow TMAP:

- Princes Highway intersections, comprising:
  - Princes Highway signalised intersection with Kingsway;
  - Princes Highway priority intersections with Bath Road (north and south);
  - Princes Highway signalised intersection with Oak Road;
  - Princes Highway signalised intersection with Acacia Road North;
- South of Princes Highway Network, comprising:
  - Oak Road roundabout intersection with Flora Street;
  - Oak Road signalised intersection with President Avenue;
- North of Princes Highway Network, comprising:
  - Oak Road priority intersection with Monro Avenue;
  - Oak Road roundabout intersection with Waratah Street;
  - Bath Road priority intersection with Monro Avenue; and
  - Bath Road roundabout intersection with Waratah Street.

The 2010 and 2011 surveyed traffic flows have been extracted from the Updated Halcrow TMAP and are attached at **Appendix A**. It is noteworthy that these traffic flows provided the baseline traffic conditions that informed the traffic modelling and analysis within the Updated Halcrow TMAP that supported the approved concept plan submission.

4.4 Public Transport

4.4.1 Rail Services

The existing train services that operate in the locality are shown in **Figure 7**. The subject site is located approximately 150m (walking distance) from Kirrawee train station, on the Eastern Suburbs & Illawarra Line. It is noteworthy that Kirrawee train station was recently rebuilt as part of the duplication of the remaining single track sections of the Cronulla line, under the CityRail Clearways Project. The duplication was completed in 2010 which increased the capacity of the rail network. Kirrawee station provides direct services to Redfern, Central, Town Hall and Bondi Junction train stations. At Redfern and Central stations, connections are available to other services on the CityRail Network as well as to Intercity train services.

The Brick Pit site is also located approximately 1.4 kilometres from Sutherland train station, the next citybound stop past Kirrawee train station. Sutherland station is also a stop on the South Coast Intercity train line. **Table 3** summarises the peak hour train frequencies for these two stations.

Table 3: Train Frequencies

Station / Line	To City	From City	Total
KIRRAWEE STATION - via Eastern suburbs & Illawarra line			
Morning Peak Hour (7-8AM)	6	4	10
Off Peak Hour	4	5	9
Afternoon Peak Hour (5-6PM)	4	5	9
SUTHERLAND STATION - via Eastern suburbs & Illawarra and South Coast lines			
Morning Peak Hour (7-8AM)	10	7	17
Off Peak Hour	7	7	14
Afternoon Peak Hour (5-6PM)	8	8	16

As can be seen, the Brick Pit site is within easy walking distance of Kirrawee train station at which frequent train services would provide access for future residents, employees and visitors.

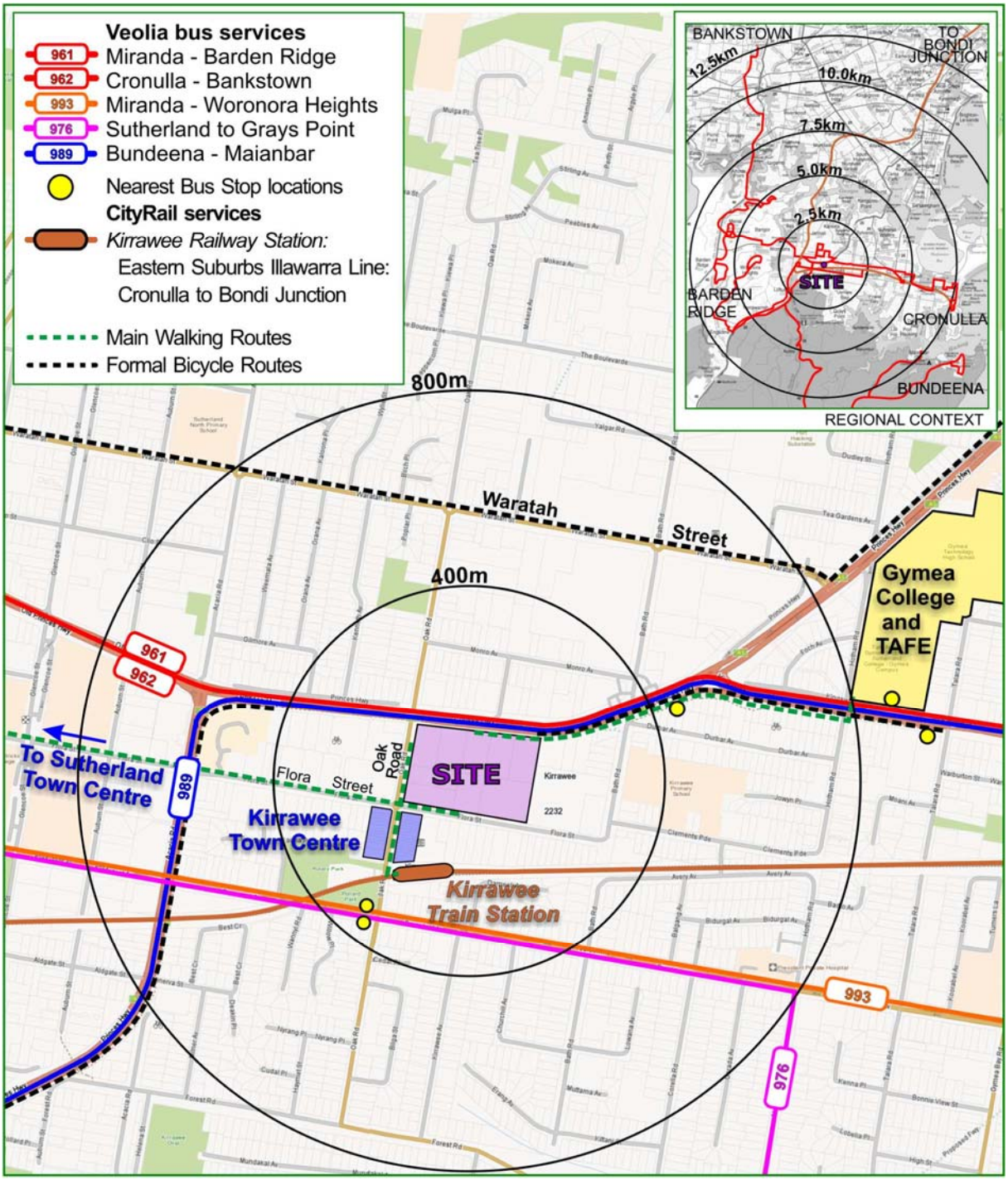


Figure 7: Alternative Transport Facilities

4.4.2 Bus Services

Kirrawee is located in 'Region 10' and is serviced by Veolia Transport NSW. Bus routes servicing the area (as shown on Figure 7) are:

- 961 Miranda – Barden Ridge;
- 962 Cronulla – Bankstown;
- 976 Sutherland – Grays Point;
- 989 Maianbar – Bundeena; and
- 993 Woronora Heights – Miranda.

The frequencies of these services are summarised in **Table 4**.

Table 4: Bus Service Frequencies

Route Number	via	Weekday			Saturday	Sunday
		AM Peak Hour	Off-Peak Hour	PM Peak Hour		
961/962	Princes Hwy	7	8	8	6	3
976	President Ave	2	-	1	-	-
989	Princes Hwy	Only limited services				
993	President Ave	3	2	3	2	1

Table 4 shows that the area is well serviced by buses along Princes Highway between Miranda and Sutherland during the weekday peak and off-peak periods. The frequency of buses during the Saturday is about one every 15 minutes and one every 30 minutes on Sundays and public holidays.

4.4.3 Pedestrians and Cyclists

Surrounding the site, pedestrian footpaths are provided on both sides of Princes Highway and Oak Road and along the southern side of Flora Street. Footpaths in the Kirrawee area vary in quality and width and generally all local roads provide footpaths on at least one side of the road, if not both sides.

Figure 7 identifies three significant pedestrian routes from the site which provide access to the following:

- Gymea College and South Sydney Institute of TAFE in the northeast;
- Kirrawee town centre and train station in the south; and
- Sutherland town centre and train station in the west.

Figure 7 also shows the formal bicycle routes serving the area. These routes form part of a network that connects Sutherland in the west with Cronulla in the east and all suburbs between. The network also extends to the Botany Bay cycleway which links to other parts of Sydney.

5. Description of Proposed Development

A detailed description of the modified concept plan development is provided in the S75W report prepared separately. In summary, the concept plan development for which approval is currently sought comprises the following components:

- Demolition of all existing structures;
- Construction of 14,191m^2 of Gross Floor Area (GFA) of ground floor non-residential uses, consisting of:
  - 7,768m^2 of retail/commercial (exc. supermarket);
  - 6,191m^2 of supermarket floor area (inc. discount supermarket);
  - 232m^2 of 'other' mall GFA.
- Construction 749 residential units consisting of:
  - 127 one-bed units;
  - 562 two-bed units;
  - 60 three-bed units.
- The provision of ground and basement level car parking with a total of 1,521 spaces, consisting of:
  - 1,013 residential parking spaces;
  - 468 non-residential parking spaces; and
  - 40 parking spaces to replace Flora Street parking spaces lost to the development.

The traffic and parking implications arising from the modified concept plan development are discussed in Sections 6 and 7, respectively. Reference should be made to the plans submitted with this application which are presented at reduced scale in **Appendix B**.

6. Traffic Analysis

6.1 Traffic Methodology

This section assesses the traffic implications of the changes in changes in non-residential floor area and residential units as a result of the modifications to the approved concept plan. In order to do this, the following sections firstly set the 'agreed' forecast future traffic demand flows and corresponding network performance, based on the Updated Halcrow TMAP analysis that supported the approved concept plan submission. The analysis then identifies the forecast future traffic demand flows anticipated for the modified concept plan and compares this with the agreed traffic demand flows.

It is noteworthy that the Updated Halcrow TMAP developed a number of road infrastructure and intersection improvements that were assessed as suitable for accommodating the traffic generation forecast for the approved concept plan. In summary, these improvements can be summarised as follows (refer to Conditions 8a, 8b, 8c and 8f in Table 2, Section 2.3 for further details):

- Improvements and modifications to the intersection Princes Highway with Oak Road;
- Improvements and modifications to the intersection Princes Highway with Bath Road;
- Signalisation of the existing Oak Road / Flora Street roundabout; and
- A left-in entry only deceleration lane access on Princes Highway.

The main objective of this traffic analysis is to demonstrate that the approved concept plan improvements summarised above remain acceptable for accommodating the future traffic demand flows anticipated for the modified concept plan.

6.2 Approved Concept Plan Traffic – Updated Halcrow TMAP Report

6.2.1 Approved Traffic Generation Volumes

Table 5 presents the development schedule of the approved concept plan as assessed by the Updated Halcrow TMAP. Table 5 also presents the trip rates that were adopted and agreed with RMS, in particular the RMS individual category shopping centre rates. The table also presents the corresponding traffic generation forecasts calculated by the Updated Halcrow TMAP.

Table 5: Approved Concept Plan, Updated Halcrow TMAP Traffic Generation Forecast

Land Use	GLA / Units	Thursday Evening Peak		Saturday Peak	
		Rate	Trips	Rate	Trips
Supermarket	5,370	14.00	752	13.20	709
Mini-Major	1,280	4.60	59	1.17	15
Specialty	2,940	4.14	122	9.60	282
Showroom	2,860	1.46	42	2.88	82
Office	860	2.00	17	0.00	0
Residential	432	0.29	125	0.29	125
TOTAL			**1117**		**1213**

NOTE: All rates are in trips / 100m^2 of GLA, except for the office which is GFA and residential which is in trips / unit

In summary, Table 5 shows that for the critical Thursday evening and Saturday midday peak hours, the Updated Halcrow TMAP study forecasted:

- 1,117 trips during the Thursday evening peak hour; and
- 1,213 trips during the Saturday peak hour.

In addition, a 20% 'pass-by' trip discount was applied to the relevant retail uses. Based on these traffic generation assumptions and the traffic distribution assumptions adopted for earlier Brick Pit proposals, future traffic demand flows were developed for the study network. These have been extracted from the Updated Halcrow TMAP and are also attached at Appendix A.

6.2.2 Anticipated Network Performance Measures

These future network traffic flows were assessed using both SCATES and SIDRA Intersection modelling software. Based on this modelling, the Updated Halcrow TMAP made the following network performance conclusions:

- With regard to the Princes Highway intersections, the proposed infrastructure and intersection improvements would assist the flow of traffic along the Princes Highway corridor, such that the road network would operate similarly to current operating conditions post-opening of the Brick Pit development;
- With regard to the study network south of Princes Highway, all intersections would operate satisfactorily (LoS C or better) during the peak periods including the proposed site accesses on Flora Street and Oak Road and the proposed signalised intersection of Oak Road with Flora Street; and
- With regard to the study network north of Princes Highway, the operation of the Waratah Street / Oak Road roundabout would effectively remain the same as the amount of traffic diverted away from the roundabout as a result of the proposed infrastructure and intersection improvements, offsets the impact of the development traffic associated with the Brick Pit development; the Waratah Street / Bath Road roundabout is predicted to operate satisfactorily with a LoS C.

6.3 Updated Traffic Generation Rates

6.3.1 RMS Trip Rates – Updated Traffic Surveys (TDT 2013/04a)

The RMS *Guide to Traffic Generating Developments* was first released in 1991. It provides guidance on a number of matters that relate to traffic impacts, in particular, advice on traffic generation and parking demand. The guide was revised in 2001 and it is currently in the process of further revisions with a view to providing advice that reflects current travel characteristics.

As part of this latest revision process, in August 2013 RMS released Technical Direction TDT 2013/04a, which provided revised trip generation advice for a number of land uses based on survey

data obtained since 2009. TDT 2013/04a consists of two parts: an initial summary of the results presenting average trip rates and tables summarising the raw survey data.

TDT 2013/04a provides revised trip rates for all the uses proposed at the subject site; however, the revised retail rates are aggregate rates for shopping centres as opposed to the individual category shopping centre rates that were adopted by Halcrow and RMS for the Kirrawee Brick Pit concept plan assessment. Recognising that the 'individual' category shopping centre rates provide a higher traffic generation assessment, the traffic analysis within this report retains the retail rates adopted by the Updated Halcrow TMAP with a view to providing a conservatively high estimate of the future traffic generation of the modified concept plan.

In light of the above, the only trip rates that have been revised as a result of TDT 2013/04a are the trip rates relating to residential and office development. The following presents the relevant trip rate information from TDT 2013/04a:

- High density residential
  - Weekday morning peak hour – 0.19 trips per unit
  - Weekday evening peak hour – 0.15 trips per unit
  - Weekend peak hour – 0.25 trips per unit (extracted from raw data)
- Office
  - Weekday morning peak hour – 1.6 trips per 100m^2 of GFA
  - Weekday evening peak hour – 1.2 trips per 100m^2 of GFA
  - Weekend peak hour – no rate provided (consistent with Halcrow TMAP)

6.3.2 Medical Use and Discount Supermarket Use

The latest concept plan introduces a new land use – medical centre. Within the context of a shopping centre, medical centre falls under the following category definition:

A(OM): Office, medical GLA: includes medical centres and general business offices

RMS guidance provides the following rates for A(OM) uses:

- Thursday evening peak hour – 2.2 trips per 100 m^2 of GLA
- Friday evening peak hour – 0.5 trips per 100 m^2 of GLA
- Saturday peak hour – no rate provided (assume 2.2 trips per 100 m^2 of GLA)

In addition, discount supermarket trip rates have been developed and adopted to appropriately assess the traffic demands associated with this component of the development, recognising that discount supermarkets do not generate the same volume of traffic as full-line supermarkets. The adopted trip rates are as follows:

- 11.93 trips per 100 m^2 during the Thursday evening peak hour – based on Institute of Transportation Engineers (ITE) trip generation advice that indicates a discount supermarket generates 85% of the trips of a full-line supermarket during this peak hour; and
- 10.84 trips per 100 m^2 during the Saturday peak hour – based on ITE trip generation advice that indicates a discount supermarket generates 82% of the trips of a full-line supermarket during this peak hour.

6.4 Approved Concept Plan Traffic – Updated Trip Rates

Table 6 provides updated traffic generation assumptions for the approved concept plan development based on the updated trip rates set out above. Table 6 recognises that the approved concept plan included a proposed discount supermarket of 1,470 m^2 of GLA. Furthermore for completeness, the

medical centre rates are shown below despite this use not being proposed by the approved concept plan.

Table 6: Approved Concept Plan, Updated Traffic Generation Forecast

Land Use	GLA / Units	Thursday Evening Peak		Saturday Peak	
		Rate	Trips	Rate	Trips
Supermarket	3,900	14.00	546	13.20	515
Disc. supermarket	1,470	11.93	175	10.84	159
Mini-Major	1,280	4.60	59	1.17	15
Specialty	2,940	4.14	122	9.60	282
Showroom	2,860	1.46	42	2.88	82
Office	860	1.20	10	0.00	0
Medical Centre	0	2.20	0	2.20	0
Residential	432	0.15	65	0.25	108
TOTAL			**1019**		**1161**

NOTE: All rates are in trips / 100m^2 of GLA, except for the office which is GFA and residential which is in trips / unit

Table 6 shows that for the critical Thursday evening and Saturday peak hours, the approved concept plan is now forecast to generate:

- 1,019 trips during the Thursday evening peak hour; and
- 1,161 trips during the Saturday peak hour.

In comparison with the approved concept plan traffic generation levels (Table 5) assessed by the Updated Halcrow TMAP, the analysis demonstrates that the approved concept plan would generate:

- 98 fewer trips during the Thursday evening peak hour; and
- 52 fewer trips during the Saturday peak hour.

In summary, the latest analysis – based upon up-to-date / current trip rate data – demonstrates that the traffic generation analysis presented in the Updated Halcrow TMAP over-estimated the volume of traffic that would be generated by the approved concept plan. Accordingly, the proposed

infrastructure and intersection improvements associated with the approved concept plan could support additional traffic generating development on the brick pit site.

6.5 Modified Concept Plan Traffic Generation

6.5.1 Net Traffic Generation Implications

Table 7 presents (in GLA) the development schedule of the approved concept plan, the proposed modified concept plan and the net changes in each use as a result of the concept plan. In addition, Table 7 presents the net change in traffic generation resulting in the 'shift' in development uses.

Table 7: Approved vs Modified Concept Plan, Net Traffic Generation Forecast

Land Use	APPROVED GLA / Units	MODIFIED GLA / Units	NET CHANGE GLA / Units	Thursday Evening Peak		Saturday Peak	
				Rate	Trips	Rate	Trips
Supermarket	3,900	4,266	+ 366	14.00	+ 51	13.20	+ 48
Disc. supermarket	1,470	1,306	(-) 164	11.93	(-) 20	10.84	(-) 18
Mini-Major	1,280	1,210	(-) 70	4.60	(-) 3	1.17	(-) 1
Specialty	2,940	1,824	(-) 1116	4.14	(-) 46	9.60	(-) 107
Showroom	2,860	3,755	+ 895	1.46	+ 13	2.88	+ 26
Office	860	0	(-) 860	1.20	(-) 10	0.00	+ 0
Medical Centre	0	203	+ 203	2.20	+ 4	2.20	+ 4
Residential	432	749	+ 317	0.15	+ 48	0.25	+ 79
TOTAL					+ 37		+ 31

NOTE: All rates are in trips / 100m^2 of GLA, except for the office which is GFA and residential which is in trips / unit

Table 7 shows that for the critical Thursday evening and Saturday peak hours, the modified concept plan is forecast to generate:

- 37 additional trips (3.6% increase) during the Thursday evening peak hour compared with the updated forecast for the approved concept plan (refer to Table 6); and
- 31 additional trips (2.7% increase) during the Saturday peak hour compared with the updated forecast for the approved concept plan.

It is noteworthy that these traffic volumes are in the order of just one (1) additional trip on the surrounding road network every two (2) minutes. Traffic volume increases of such a low order would have no material impact on the operation of the future road network (subject to the proposed infrastructure and intersection improvements) compared with the network performance anticipated for the approved concept plan.

More importantly, the analysis in Section 6.4 demonstrates that the proposed infrastructure and intersection improvements were developed on the basis of traffic generation volumes that have now been assessed to be 52 – 98 trips in excess of what the approved concept plan would generate based on current trip rate data. Within this context it is clear that the proposed modifications to the concept plan, which will result in 31 – 37 additional trips, can be accommodated on the future road network and the performance of the future road network would be materially the same as the performance measures reported in the Updated Halcrow TMAP and previously summarised in Section 6.2.2 of this report.

6.5.2 Total Traffic Generation Implications

For completeness, **Table 8** provides the traffic generation assumptions for the entire modified concept plan development. It is noteworthy that the office rates are shown below despite the modified concept plan no longer proposing this use.

Table 8: Modified Concept Plan, Traffic Generation Forecast

Land Use	GLA / Units	Thursday Evening Peak		Saturday Peak	
		Rate	Trips	Rate	Trips
Supermarket	4,266	14.00	597	13.20	563
Disc. supermarket	1,306	11.93	156	10.84	142
Mini-Major	1,210	4.60	56	1.17	14
Specialty	1,824	4.14	76	9.60	175
Showroom	3,755	1.46	55	2.88	108
Office	0	1.20	0	0.00	0
Medical Centre	203	2.20	4	2.20	4
Residential	749	0.15	112	0.25	187
TOTAL			**1056**		**1193**

NOTE: All rates are in trips / 100m^2 of GLA, except for the office which is GFA and residential which is in trips / unit

Table 8 shows that for the critical Thursday evening and Saturday peak hours, the modified concept plan is forecast to generate:

- 1,056 trips during the Thursday evening peak hour; and
- 1,193 trips during the Saturday peak hour.

In comparison with the 'approved' traffic generation levels assessed by the 2011 Updated Halcrow TMAP for the approved concept plan (Table 5), the analysis demonstrates that the modified concept plan would generate:

- 61 fewer trips (a reduction of 5.5%) during the Thursday evening peak hour; and
- 20 fewer trips (a reduction of 1.6%) during the Saturday peak hour.

6.6 Traffic Analysis Summary

The analysis above demonstrates that based upon up-to-date / current trip rate data, the traffic generation analysis presented in the Updated Halcrow TMAP over-estimated the volume of traffic that would be generated by the approved concept plan. Accordingly, the proposed infrastructure and intersection improvements associated with the approved concept plan could support additional traffic generating development on the brick pit site that would generate up to 52 additional peak hour trips. Therefore, the proposed modifications to the concept plan, which will result in 31 – 37 additional peak hour trips, can be accommodated on the future road network.

Furthermore, in total traffic generation terms, the modified concept plan is anticipated to generate traffic demand volumes that are in the order of 20 – 61 peak hour trips below the volumes that were assessed (modelled) by the Updated Halcrow TMAP study. Accordingly, the proposed infrastructure and intersection improvements remain an appropriate infrastructure upgrade response to the traffic generating potential of the Kirrawee Brick Pit site. It is therefore concluded that in terms of traffic generation, agreed intersection upgrades and future network performance, the modified concept plan has less impact on the future road network than previously assessed for the currently approved concept plan and should therefore be supported.

7. Parking Analysis

7.1 Approved Concept Plan Parking Rates

7.1.1 Non-Residential Parking Rates

The following presents the Updated Halcrow TMAP rates that were adopted by the approved concept plan proposal for the non-residential uses that were proposed. The rates were based on guidance within the RMS *Guide to Traffic Generating Developments* and the retail rates were based primarily on the individual shopping centre category rates:

- Supermarket (inc. discount supermarket) – 4.5 spaces per 100m^2
- Mini-Major (faster trade retail) – 4.0 spaces per 100m^2
- Specialty Retail (inc. secondary retail, kiosks) – 4.2 spaces per 100m^2
- Showroom – 2.4 spaces per 100m^2
- Office – 2.5 spaces per 100m^2

It is noteworthy that Condition B4(c) (see Section 2.2) specifically refers to these rates and stipulates that all non-residential parking be provided in accordance with these rates. In addition, the condition requires the replacement of 40 Flora Street parking spaces displaced by the development.

7.1.2 Residential Parking Rates

The following presents the Updated Halcrow TMAP rates that were adopted by the approved concept plan proposal for the residential development proposed:

- One bedroom – 1.00 spaces per unit
- Two bedroom – 1.25 spaces per unit

- Three bedroom – 1.50 spaces per unit
- Visitor – 0.125 spaces per unit (1 space per 8 units)

It is noteworthy that the volume of residential parking stipulated in Condition B4(b) (see Section 2.2) was based upon the application of these rates to the approved concept plan's residential development schedule. Furthermore, the total volume of off-street parking stipulated in Condition B4(a) was based upon the application of the above non-residential and residential rates to the approved concept plans full development schedule.

7.2 Modified Concept Plan Parking Provision

As previously mentioned, the modified concept plan introduces a new land use – medical centre – which falls under the individual shopping centre category of *A(OM)*. The RMS *Guide to Traffic Generating Developments* recommends that parking for this component of shopping centre use be provided at the following rate:

- Medical – 0.9 spaces per 100m^2

The modified concept plan adopts the approved concept plan parking rates identified in the Updated Halcrow TMAP and the medical parking rate above. Application of these rates results in a parking provision of 1,521 parking spaces consisting of:

- Non-Residential 468 spaces
  - Supermarket – 250.7 spaces
  - Mini-Major – 48.4 spaces
  - Specialty Retail – 76.6 spaces
  - Showroom – 90.1 spaces
  - Medical – 1.8 spaces

- Residential 1,013 spaces
  - One bedroom – 127.0 spaces
  - Two bedroom – 702.5 spaces
  - Three bedroom – 90.0 spaces
  - Visitor – 93.6 spaces
- Flora Street replacement 40 spaces

7.3 Commentary on Parking Implications

The above demonstrates that the modified concept plan is generally in accordance with the approved concept plan parking rates adopted by in the Updated Halcrow TMAP report. However, it is recognised that the Schedule 2 condition B4 and Schedule 3 condition 14 set upper parking thresholds, particularly for the residential development, that will now be exceeded.

It is understood that the upper parking thresholds for the site and the residential development were intended to manage the traffic demand generated by the development. In this regard, it should be noted that RMS guidance does not reflect a relationship between parking provision in high density residential developments and traffic generation. Rather, it is the proximity of good public transport and good local facilities that best moderates traffic generation.

To provide evidence for this, the Updated Halcrow TMAP referred to Halcrow studies based on the surveys of two residential apartment blocks close to Circular Quay station; one with an over provision of parking (with respect to RMS guidance) and the other with an under provision of parking. The survey data indicated that both developments generated the same level of vehicular traffic. This concurs with the accepted view that parking restraint at trip 'origin' (i.e. place of residence) does not discourage vehicle use as much as at trip destination ('destination' parking).

Importantly, it should be noted that the traffic demand analysis in Section 6 clearly demonstrates that traffic generation will reduce as a result of the proposed development of the modified concept plan.

Furthermore, the approved concept plan proposed 547 non-residential ('destination') parking spaces; however, the modified concept plan provides 468 non-residential parking spaces. As mentioned above, constraining destination parking can work towards discouraging car use and managing traffic demand; therefore, the reduction in non-residential parking enforces the position that the modified concept plan would generate fewer trips compared with the approved concept plan despite residential (and therefore overall parking) increasing above the levels proposed by the approved concept plan.

It should also be also be noted that some owners, tenants and investors, who have a demonstrated willingness to use public transport, will not locate or invest in a transport friendly centre if they do not have adequate car parking. This in turn can reduce the amenity, saleability and attractiveness of a residential development because residents living in such areas still wish to own cars, even if they do not use them for their regular commute or to the same extent as other persons for social/recreation trips. It would be a pity if such persons with a low propensity for car use, were obliged to live in less transport friendly areas because they wished to own a car.

Finally, RMS generally defers judgement and advice on parking to the local Council. As such, it is important to note comments from Sutherland Shire (received during the determination process for the approved concept plan) indicating that Council considered the proposed parking to be an under provision, with the report submitted by Council's Traffic Consultant (McLaren Traffic Engineering) stating that the on-site parking provision is, "*insufficient in terms of residential parking provision*". It is understood that subsequent to approval, this is still a position that is held by Council.

7.4 Parking Analysis Summary

In summary, the modified concept plan intends to provide parking generally in accordance with the parking rates that were issued in the Updated Halcrow TMAP that supported the approved concept plan.

It is recognised that due to modifications to the concept plan development for the site, the modified concept plan provides parking, particularly residential parking, in excess of the thresholds specified in the Schedule 2 condition B4 and Schedule 3 condition 14. These thresholds were set with the

intention to manage traffic demand generated by the development; however, the analysis above and in Section 6 clearly demonstrates that the modified concept plan would generate fewer trips compared with the approved concept plan despite residential and overall parking increasing above the levels proposed by the approved concept plan.

It is therefore concluded that in terms of car parking, the proposed provision will ensure that the development accommodates all parking demands on site without increasing the traffic demand generation of the site and the modified concept plan should therefore be supported.

The above position on parking remains generally consistent with the analysis that was presented in the TRAFFIX 2013 TIA. Therefore, with reference to the joint submission of TfNSW and RMS (dated 18 March 2014) it can be concluded that both departments agree with this position due to their joint recommendation that the proposed modifications to Schedule 2 condition B4 and Schedule 3 condition 14 on parking be adopted.

8. Access & Internal Design Aspects

8.1 Vehicular Access

The modified vehicular access arrangement accords with the principles of the access arrangement of the approved concept plan. The following characteristics are noteworthy:

- The left-in deceleration lane access for westbound traffic on Princes Highway is retained;
- The left-in, left-out access for southbound traffic on Oak Road (with raised median island) is retained;
- The approved concept plan proposed a single Flora Street access that would be shared by cars accessing the basement parking and trucks accessing the loading dock. A beneficial aspect of the modified concept plan is to provide separate access driveways on Flora Street for standard car traffic and truck traffic. It is noted that Council (in its submission of 17 April 2014) supports this modification insofar as it separates car traffic from truck traffic; and
- All car parking areas within the site can be accessed from all driveway locations on Princes Highway, Oak Road and Flora Street.

In summary, the proposed vehicular access arrangement will provide safe access and effectively distribute traffic on to the surrounding road network. Importantly, the access arrangement provides a level of vehicle accessibility to/from the surrounding road network that is consistent with the level of accessibility provided by the approved concept plan.

8.2 Internal Road Design

8.2.1 Design Standards

The internal basement car park generally complies with the Australian Standard requirements of AS2890.1 (2004) *Part 1: Off-street car parking*, AS2890.2 (2002) *Part 2: Off-street commercial vehicle*

facilities and AS2890.6 (2009) *Part 6: Off-street parking for people with disabilities*. The following characteristics are noteworthy:

8.2.2 Parking Modules

- All non-residential parking spaces have been designed in accordance with a Class 3A user and are provided with a minimum space length of 5.4m a minimum width of 2.7m and a minimum aisle width of 6.2m;
- All residential parking spaces have been designed in accordance with a Class 1A user and are provided with a minimum space length of 5.4m a minimum width of 2.4m and a minimum aisle width of 5.8m;
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm;
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1;
- All disabled parking spaces are designed in accordance with AS2890.6. Spaces are provided with a clear width of 2.4m and located adjacent to a minimum shared area of 2.4m;

8.2.3 Ramps

- All ramps accessing the non-residential basement car park have a maximum gradient of 20% (1 in 5) with transitions of 10% (1 in 10);
- Ramps associated with the residential basement car park have a maximum gradient of 25% (1 in 4) with transitions of 12.5% (1 in 8). These provisions satisfy the requirements of AS2890.1 for the car park;

8.2.4 Clear Head heights

- A minimum clear head height of 2.2m is provided for all areas within the basement car park as required by AS2890.1. A clear head height of 2.5m is provided above all disabled spaces as required by AS2890.6;

8.2.5 Other Considerations

- All columns are required to be located outside of the parking space design envelope shown in Figure 5.2 of AS2890.1;
- Appropriate visual splays are to be provided in accordance with the requirements of Figure 3.3 of AS2890.1 at all accesses;
- The internal design complies with the Section 3.4 of AS2890.1 with appropriate queuing areas provided. Furthermore the max gradient of 1:10 for not less than 80% of the queuing length has also been achieved;

8.2.6 Service Area Design

- The internal design of the service area has been undertaken in accordance with the requirements of AS28090.2 for the maximum length vehicle permissible on-site being a 19.0m Articulated Truck (AV);
- A minimum clear head height of 4.5m is provided within the service area;
- All ramps have been designed in accordance with Table 3.2 of AS2890.2 with a maximum grade not in excess of 1:6.5 (15.4%) and maximum rate of change of 1:16 (6.25%) in 10 metres of travel;
- A minimum bay width of 3.5m is provided for all service bays.

In summary, the internal configuration of the basement car park and loading areas has been designed in accordance with AS2890.1, AS2890.2 and AS2890.6. It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with at subsequent DA stages and/or prior to the release of a Construction Certificate.

9. Response to Submissions

Table 9 summarises the main issues raised by each of the four key respondents and provides a summary response to each issue and/or the location within this report of analysis that responds to the issue.

Table 9: Summary of Responses to Key Stakeholder Issues

NO.	RESPONDENT	ISSUE	RESPONSE
01	DPE	*- none raised -*	n/a
02	TfNSW - RMS	Requests that Condition No. B4 – Car Parking is replaced with: **B4 — Car Parking** a) Total number of car parking spaces for the residential component of the development shall be provided without exceeding the following car parking rates. • One bedroom — 1 space per unit • Two bedroom — 1.25 spaces per unit • Three bedroom — 1.5 spaces per unit • Visitor— 0.125 space per unit (1 space per 8 units) b) Development must comply with the modified concept plan's (mod 3) non-residential car parking rates identified in the Traffic Impact Assessment report prepared by Traffix dated 22 November 2013 (Version 2) including the replacement of 40 street car parking spaces displaced by the development.	No objection is raised in relation to this amended condition. However, noting that the rates within this report are consistent with the rates presented in the TRAFFIX 2013 TIA, it is recommended that the amended Condition No. B4 reference, "the Updated Traffic Impact Assessment report prepared by TRAFFIX dated 11 July 2014 (version 2)".
03	TfNSW - RMS	Requests that Condition No. 14(a) – Car Parking is replaced with: **14 – Car Parking** Future applications shall address the following: a) Total number of car parking spaces for the proposed development shall be provided without exceeding the car parking rates identified in the Traffic Impact Assessment report prepared by Traffix dated 22 November 2013.	No objection is raised in relation to this amended condition. However, noting that the rates within this report are consistent with the rates presented in the TRAFFIX 2013 TIA, it is recommended that the amended Condition No. 14 reference, "the Updated Traffic Impact Assessment report prepared by TRAFFIX dated 11 July 2014 (version 2)".
04	TfNSW - RMS	Recommends that the proponent liaise with Council and the local bus operator to identify new locations for corresponding bus stops in close proximity to the main entrance of the development on the Princes Highway. Furthermore, safe and efficient pedestrian connectivity to bus stops in the vicinity of the development should be provided.	No objection is raised in relation to this request and the opportunity to make such provisions will be investigated as part of subsequent development applications.

Table 9 (Cont'd): Summary of Responses to Key Stakeholder Issues

NO.	STAKEHOLDER	ISSUE	RESPONSE
05	TfNSW - RMS	A Construction Management Plan should specify any potential impacts to regular bus services operating on roads within the vicinity of the site from construction vehicles during construction of the proposed works. Potential impacts on pedestrian access to public transport infrastructure including bus stops must also be specified.	No objection is raised in relation to this request. It is noted that existing Condition 8j (refer Table 2, Section 2) sets out the previous requirements of RMS regarding a CTMP. It is recommended that this condition be amended to include these additional pedestrian and public transport related requirements.
06	Sutherland Shire Council	PARKING PROVISION Parking provision for the additional dwellings within the residential component has been increased at the same rate as that accepted in the approved concept DA to a total of 1013 spaces. The applicant justifies the increase on the basis that unconstrained parking at origin will not result in an increase in traffic generation. This is based on surveys undertaken at high density housing in the proximity of Circular Quay railway station. The comparison between the Sydney CBD and the Kirrawee Brick Pit location is not considered valid and should be rejected unless other supporting data can be provided from surveys undertaken nearby, higher density developments in similar proximity to a railway station.	The Circular Quay surveys referred to demonstrate that residential trip generation is directly linked to unit numbers and that 'origin' parking provision (whether it is over-provision or under-provision) has a limited impact of traffic generation. This is a generally accepted position with regard to origin parking provisions, a fact supported by TfNSW and RMS recommending that the car parking conditions B4 and 14 be modified, in particular the removal of the conditioned thresholds that prohibited the maximum total number of car parking spaces from exceeding 1,150 spaces (refer Issue No's 02 & 03 above).
07	Sutherland Shire Council	It is also evident from existing developments in similar locations that parking demand (and traffic generation therein) is not governed by the number of off street parking spaces provided per unit and that the demand is transferred to surrounding on street areas. As such, it is considered that regardless of the off street parking quota, the increase in the number of units will increase traffic generation to and from the site.	With reference to Table 7, Section 6 of this report, the traffic analysis demonstrates that the increase in unit numbers from 432 units to 749 units will result in 48 additional Thursday PM peak hour trips and 79 additional Saturday peak hour trips. However, these additional trips can be accommodated on the future road network because the traffic analysis in the Updated Halcrow TMAP (upon which the proposed infrastructure and intersection improvements associated with the approved concept plan were based) over-estimated the traffic generation of the approved concept plan.
08	Sutherland Shire Council	TRAFFIC GENERATION In general, it cannot be accepted that the new proposal with an increase in FSR of approximately 40%, 317 additional dwellings (73% increase) and 416 additional car spaces (36% increase) can report that there will be a 9% reduction in overall traffic generation.	With reference to Table 7, Section 6 of this report, the traffic analysis demonstrates that the increase FSR across the whole site (largely associated with the residential development) will result in 37 additional Thursday PM peak hour trips and 31 additional Saturday peak hour trips. However, these additional trips can be accommodated on the future road network because the traffic analysis in the Updated Halcrow TMAP over-estimated the traffic generation of the approved concept plan (refer Issue No. 07 above).

Table 9 (Cont'd): Summary of Responses to Key Stakeholder Issues

NO.	STAKEHOLDER	ISSUE	RESPONSE
09	Sutherland Shire Council	Retail – The report is somewhat misleading with regard to its assertion that the new proposal will result in a less intensive retail use, thereby resulting in a decrease in traffic generation. The Traffic report indicates that the overall Gross Leasable Area (GLA) for the retail areas has actually increased. The claimed reduction in traffic generation is only attributable to the change in the breakdown of the retail area whereby Supermarket GLA has been decreased by 1050 m^2 and replaced with an increase of Mini-Major GLA of 1220 m^2. Applying a much lower traffic generation rate to the mini major is the reason that a lower overall generation is claimed. However, there is no clear definition within the RMS Guide to traffic generating developments as to what type of retail constitutes a mini-major and it is possible that the particular tenant (possibly a smaller supermarket), could have a traffic generation similar to a supermarket as was allowed for in the approved concept. It is Councils view that the total traffic generation accepted for the retail area for the Approved Concept is unlikely to change under the modified proposal.	Firstly, the latest modified concept plan development schedule presented in this report is consistent with the latest plans, and provides the correct development areas, including those relating to proposed supermarket and discount supermarket uses. Secondly, with reference to Table 7, Section 6 of this report, the traffic analysis demonstrates that: • During the Thursday PM peak, net traffic generation is anticipated to increase (compared with the approved concept plan) by 37 trips, consisting of (+)48 residential trips and (-)11 non-residential trips; and • During the Saturday peak, net traffic generation is anticipated to increase by 31 trips, consisting of (+)79 residential trips and (-)48 non-residential trips. In summary, the analysis demonstrates that the traffic generation associated with just the non-residential uses (largely retail) is anticipated to reduce by 11 – 48 peak hour trips as a result of the proposed modifications to the concept plan. This reduction in turn offsets some of the residential traffic increases.

Table 9 (Cont'd): Summary of Responses to Key Stakeholder Issues

NO.	STAKEHOLDER	ISSUE	RESPONSE
10	Sutherland Shire Council	Residential – Whilst it is correct that RMS have issued new traffic generation rates for high density residential living, these vary significantly in range between surveyed sites. The Traffix report has adopted the average rate for the Sydney Metropolitan area which is approximately half the previously used residential generation rate. It is questionable whether this is an appropriate rate for this facility. In this regard it is noted that there is a significant range in the new RMS rates which needs to be considered and simply adopting the average may not be truly representative for this location.	Firstly, it should be noted that the RMS Technical Direction TDT 2013/04a, which presents the updated RMS trip rate data, includes the following Action: *This Technical Direction must be followed when RMS is undertaking trip generation and/or parking demand assessments.* Therefore, the adoption of rates presented within TDT 2013/04a (as is the case with this traffic study) is clearly appropriate. Secondly, it is recognised that the 10 surveys that inform the TDT 2013/04a include areas such as Chatswood and Parramatta, which it could be argued have better public transport accessibility and access to local amenities than the subject site. However, it also includes areas such as Rockdale and Liberty Grove, which it could be conversely argued have poorer public transport accessibility and access to local amenities. The most comparable site of the 10 would most likely be the Cronulla site (noting it would be serviced by the same train line); however, the trip rates for that specific site are: • 0.11 trips per unit during the Thursday evening peak hour, 27% lower than the 10-survey average of 0.15 trips per unit; and • 0.18 trips per unit during the Saturday peak hour, 28% lower than the 10-survey average of 0.25 trips per unit. Therefore, in light of the above, adoption of the 10-site average trip rate is considered appropriate and provides a reasonable representation of the future residential development's traffic generating potential.
11	Sutherland Shire Council	It should also be noted that calculating the trip generation using the new RMS average rates per car space results in an increase in trip generation to that of the approved concept. To determine a more robust rate, surveys should be undertaken of more recently constructed, nearby, higher density developments in similar proximity to a railway station. An example would be in Sutherland on the corner of Gray Street and President Avenue. The surveys should determine rates per unit and rates per car space.	It is agreed that basing trip generation assumptions on actual survey data of a similar type development in a similar local area does have advantages. In response to this issue, the area referred to by Council surrounding Gray Street and President Avenue was extensively investigated to find a suitable candidate site to survey. However, none of the existing sites in the area provide the same mix of high density residential development and quality retail uses as that proposed at the brick pit site. Furthermore, none of the sites had dedicated residential only car park accesses which made determining residential traffic – from non-residential – problematic, thereby reducing the confidence that one could have in the accuracy of the trip rates that would be calculated from the surveys. In summary, the potential to obtain site specific survey based trip rates was investigated; however, it was not pursued due to the lack of a reliable candidate site in the area suggested by Council.

Table 9 (Cont'd): Summary of Responses to Key Stakeholder Issues

NO.	STAKEHOLDER	ISSUE	RESPONSE
12	Sutherland Shire Council	Furthermore, the newly released RMS rates do not include the critical Saturday morning peak period, yet the report adopts the same rate as the weekday PM peak. Again, this needs to be validated by undertaking further surveys of existing housing.	The new RMS rates do include raw Saturday data from which a peak hour trip rate of 0.25 trips per unit can be calculated and which is adopted by this updated TIA study (refer Section 6.3.1).
13	Sutherland Shire Council	In summary it is the view that the increase in the number of units will result in an increase in traffic generation from what was accepted in the concept approval.	The analysis within this report agrees that the residential traffic generation associated with the proposed 749 units would be greater than the traffic associated with the approved 439 units. However, these additional trips can be accommodated on the future road network because the traffic analysis in the Updated Halcrow TMAP (upon which the proposed infrastructure and intersection improvements associated with the approved concept plan were based) over-estimated the traffic generation of the approved concept plan (refer Issue No. 07 above).
14	Sutherland Shire Council	<u>Proposed Traffic Signals at Flora Street and Oak Road</u> The proposed traffic signals will result in the loss of significant existing on street parking fronting the existing retail shops in Oak Road, the details of which should be communicated to the affected shop owners by the applicant	Firstly, the proposed traffic signal arrangement at this intersection remains consistent with Condition 8c. (refer Table 2, Section 2). There is no desire at this stage to modify this condition and communicating these potential parking changes is therefore not a requirement of this MOD3. Notwithstanding the above, opportunities to reduce the impact to on-street parking are being investigated and if an appropriate alternative design is developed, it will be issued to RMS for approval as part of the Traffic Management Plan that is required by the existing Condition 8d. (refer Table 2, Section 2).
15	Sutherland Shire Council	<u>Access and Egress</u> All entry/exit points to the site (including the surface roads) shall be access driveways with laybacks and meet the requirements of Section 3 and APPENDIX D of AS/NZS 2890.1. In this regard all entry/exit points must be analysed with regard to capacity and level of service.	It is agreed that these access driveways will need to be assessed in terms of capacity and level of service. At this concept plan stage the form and location of the accesses are still in a state of 'flux'. Therefore, it is recommended that this level of detailed assessment be provided at a subsequent detailed DA stage.

Table 9 (Cont'd): Summary of Responses to Key Stakeholder Issues

NO.	STAKEHOLDER	ISSUE	RESPONSE
16	Sutherland Shire Council	<u>Servicing & Internal Layout</u> The segregation of the service entry from the general public and residential entries is supported. The following concerns are raised regarding the overall capacity and design of the service and loading dock arrangement: • The close proximity of the service, public and residential entries along Flora Street. • Servicing of all retail areas will only be via service elevators between the loading dock on basement 2 and ground floor retail. • The sweep paths indicate that vehicles cannot enter or leave the dock without crossing into the opposing traffic lane in Flora Street. • The grade of the ramp for heavy vehicles may be undesirable for on-going use. • Service and loading shortfalls are identified for the showroom component.	The servicing and internal layout now proposed is a marked improvement upon the layout of the approved concept plan, a clear indication of this improvement being the segregation of car and truck traffic, which is supported by Council. With regard to the other points raised that have traffic relevance: • In accordance with AS2890.6 (Figure 3.1) for an access onto a minor (local) road (Flora Street), it is permissible for articulated semi-trailer trucks to use the full width of the minor road (that is, cross the centreline) when turning left into our out of a service driveway and 12.5m rigid trucks when left turning out of a service driveway. The alternative to avoid trucks crossing the centreline is to widen the driveway. However, this is not recommended as wide commercial vehicle driveways raise safety issues for pedestrians that need to cross them. • All gradients will be in accordance with the permissible gradients of AS2890.2 (2002) *Part 2: Off-street commercial vehicle facilities*. As is standard practise, compliance with Australian Standards will be confirmed (in the very least) at subsequent Construction Certification stage. • There are no servicing and loading shortfalls for the showroom component.
17	Sutherland Shire Council	<u>Internal Layout</u> Council is generally supportive of an additional roadway on the eastern side of the parkland and the provision of at grade parking within the roadways. The revised basement plan (20 March 2014) provides for continuous parking levels and removes the various internal ramps and level changes.	Noted.

Table 9 (Cont'd): Summary of Responses to Key Stakeholder Issues

NO.	STAKEHOLDER	ISSUE	RESPONSE
18	Sutherland Shire Council	Certain detail and design analysis is required to ascertain whether there are fundamental issues with the function of the basement levels and ability to accommodate the full number (of) vehicles specified. This includes, turning paths, aisle widths and provision of adaptable / accessible parking spaces. The actual parking provision may be understated, or the full extent of proposed parking may be unable to be accommodated within the development. Concerns are raised regarding the manoeuvring and blind spots created at the location of the ramps given the location of parking spaces and potential for queuing given the limited entry / exit points. The configuration to Oak Road could also be further improved.	With reference to Section 8 of this report, the internal configuration of the basement car park and loading areas has been assessed and generally complies with the Australian Standard requirements of AS2890.1 (2004) *Part 1: Off-street car parking*, AS2890.2 (2002) *Part 2: Off-street commercial vehicle facilities* and AS2890.6 (2009) *Part 6: Off-street parking for people with disabilities*. The design analysis confirms at this concept plan stage, that there are no obvious fundamental issues that will prohibit the ability to provide an access and internal layout that accord with relevant Australian Standards or adhere with the required volume of car parking (including accessible parking). The level of detail referred to (such as swept path analysis) will be provided at detailed DA stage.
19	Sutherland Shire Council	<u>Public Transport</u> The increase in residential population and apartments (317) within the development is anticipated to place further loading, and stress on public transport modes within the proximity to the site including Kirrawee Train Station and bus services. The absence of supportive documentation and detailed analysis addressing these issues provides uncertainty as to the adequacy and capacity of this network, or the need to place additional services to avoid congestion.	With reference to Section 4.4 of this report, the Kirrawee train station was recently (completed 2010) upgraded as part of the duplication works for the Cronulla line. The upgrades were designed to greatly improve the capacity of the Cronulla line and there is no evidence to suggest that has not occurred. Furthermore, funding to improve public transport services is generally budgeted in a reactionary manner; that is, services only receive funding for improvements in response to demonstrated high demand so that the funding costs can be offset by ticket revenue. In this regard, not only is the site extremely well located to take advantage of existing public transport networks (both rail and bus) the increased population density and potential revenue earnings improve the cost-benefit ratio of future potential service improvements.

Table 9 (Cont'd): Summary of Responses to Key Stakeholder Issues

NO.	STAKEHOLDER	ISSUE	RESPONSE
20	James Maclachlan (Jannali resident)	In summary, James Maclachlan (JM) raised concerns with regard to potential traffic impacts arising (mainly) from perceived development yield, trip rate and traffic generation inconsistencies in the TRAFFIX 2013 TIA. Based on his alternative analysis, JM predicted that the modified concept plan would generate peak hour traffic volumes in excess of the acceptable threshold volumes assessed by the Updated Halcrow TMAP study, which supported the approved concept plan. On this basis, JM (effectively) questioned the reliability of TRAFFIX 2013 TIA and its overall conclusion that the modified concept plan is generally consistent with the approved concept plan and is therefore supportable on traffic planning grounds and would operate satisfactorily. JM also questioned the supportability of the approved concept plan based on perceived errors/inconsistencies in the Updated Halcrow TMAP.	With reference to Section 5 of this report, the development yield assessed is wholly consistent with the proposed future uses of the modified concept plan. With reference to Section 6 of this report (and responses within this table to Issue No's 08-13), the latest trip rate assumptions are appropriate and the subsequent traffic generation based upon those assumptions are also considered an appropriate assessment of the likely traffic demand that will be generate by the modified concept plan. The analysis within this report demonstrates that the modified concept plan will generate traffic volumes in excess of the volumes that would be expected for the approved concept plan, largely due to the increase in residential traffic generation associated with the proposed increase in residential development from 439 units to 749 units. However, these additional trips can be accommodated on the future road network because the traffic analysis in the Updated Halcrow TMAP (upon which the proposed infrastructure and intersection improvements associated with the approved concept plan were based) over-estimated the traffic generation of the approved concept plan (refer Issue No. 07 above). Having consideration for the analysis of all other aspects within this updated TIA report (not just traffic generation), this report demonstrates that in terms of traffic generation, agreed intersection upgrades, future network performance, parking, vehicular access and internal design, the modified concept plan is consistent with – or improves upon – the approved concept plan and therefore remains supportable on traffic planning grounds and would operate satisfactorily. Finally, from a summary review it is disagreed that the Updated Halcrow TMAP contains errors/inconsistencies that questions its reliability. Regardless, the concept plan it supported is now approved and therefore provides the baseline against which this MOD3 should be assessed.

10. Conclusions

In summary:

- TRAFFIX has been commissioned by South Village Pty Ltd to provide traffic, transport and parking advice with regard to the proposed mixed-use development at Kirrawee Brick Pit, Kirrawee, Sutherland. In this regard, TRAFFIX submitted a TRAFFIX 2013 TIA in support of a Section 75W application to modify the concept plan approval MP10-0076 for the Kirrawee Brick Pit site. One of the main objectives of this updated TIA report is to respond to key submissions received following the exhibition period for the MOD3, which ended on 11 April 2014 ;

- With regard to traffic and parking, the main conditions to be modified are:

  - B4(a) The maximum total number of car parking spaces shall not exceed 1,150 spaces;

  - B4(b) Maximum car parking to be allocated for residential purposes shall not exceed 603 parking spaces, inclusive of 54 residential visitors spaces;

- The Updated Halcrow TMAP – that supported the approved concept plan – developed a number of road infrastructure and intersection improvements that were assessed as suitable for accommodating the traffic generation forecast for the approved concept plan. These improvements can be summarised as follows:

  - Improvements and modifications to the intersection Princes Highway with Oak Road;

  - Improvements and modifications to the intersection Princes Highway with Bath Road;

  - Signalisation of the existing Oak Road / Flora Street roundabout;

  - A left-in entry only deceleration lane access on Princes Highway;

- The traffic analysis within this updated TIA report demonstrates that the modified concept plan development is anticipated to generate traffic demand volumes below that which were assessed (modelled) by the Updated Halcrow TMAP study. Accordingly, the proposed infrastructure and intersection improvements remain an appropriate infrastructure upgrade response to the traffic generating potential of the Kirrawee Brick Pit site;

- The modified concept plan intends to provide parking generally in accordance with the parking rates that were issued in the Updated Halcrow TMAP that supported the approved concept plan. It is recognised that the modified concept plan provides parking, particularly residential parking, in excess of the thresholds specified in the Schedule 2 condition B4 and Schedule 3 condition 14. These thresholds were set with the intention to manage traffic demand generated by the development. However, the parking analysis within this report clearly demonstrates that parking restraint at trip 'origin' has limited success in discouraging vehicle use; rather, it is the proximity of good public transport and good local facilities that best moderates traffic generation, as is the case for the subject site. This position on parking remains generally consistent with the analysis that was presented in the TRAFFIX 2013 TIA. Therefore, with reference to the joint submission of TfNSW and RMS (dated 18 March 2014) it can be concluded that both departments agree with this position due to their joint recommendation that the proposed modifications to Schedule 2 condition B4 and Schedule 3 condition 14 on parking be adopted;

- The modified vehicular access arrangement will provide safe access and effectively distribute traffic on to the surrounding road network. Importantly, the access arrangement provides a level of vehicle accessibility to/from the surrounding road network that is consistent with the level of accessibility provided by the approved concept plan;

- The internal configuration of the basement car park and loading areas has been designed in accordance with AS2890.1, AS2890.2 and AS2890.6. It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with at subsequent DA stages and/or prior to the release of a Construction Certificate; and

- This updated TIA report adequately responds to all issues raised in submissions from key stakeholders and the public.

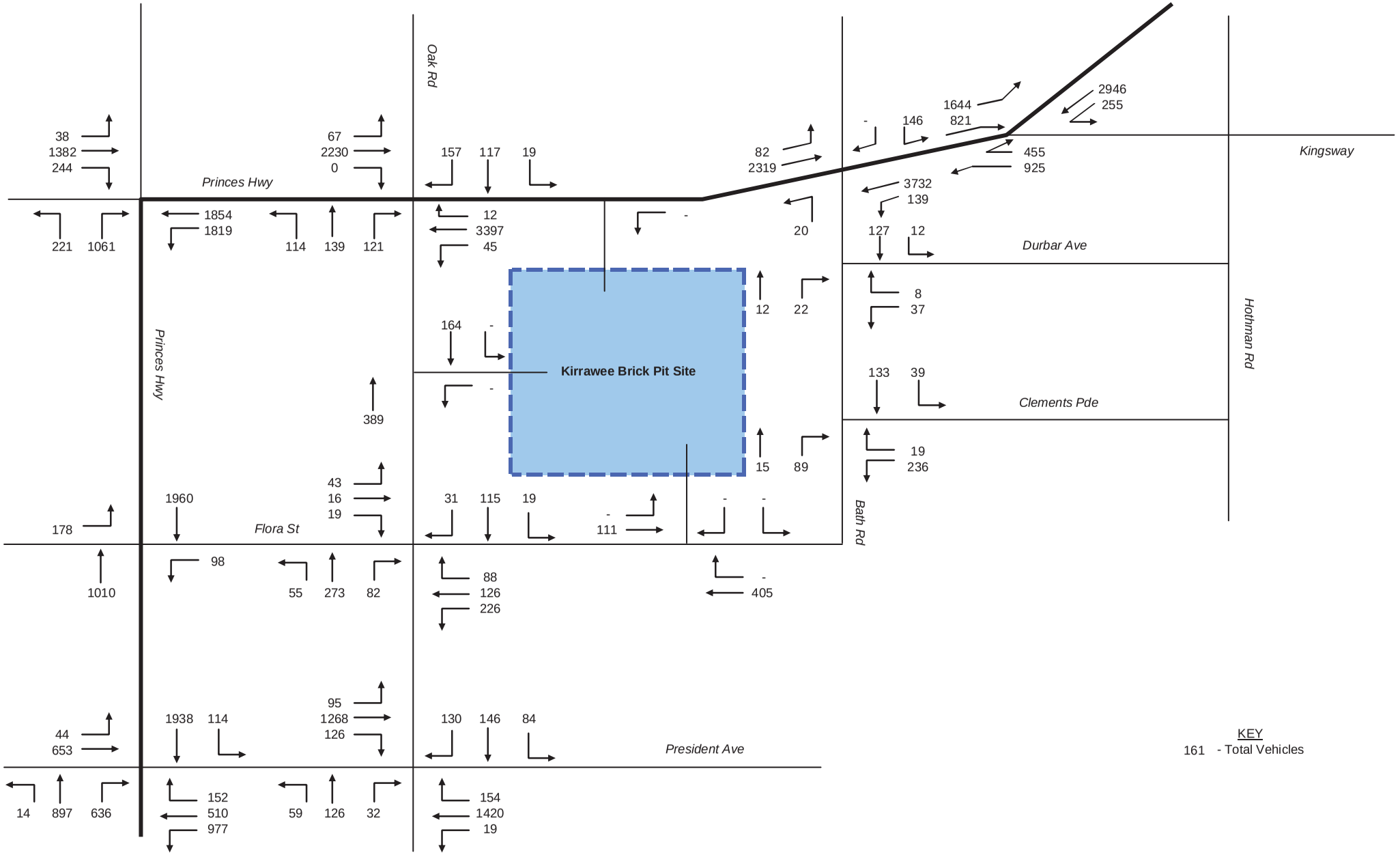
It is therefore concluded that modified concept plan – in terms of traffic generation, agreed intersection upgrades, future network performance, parking, vehicular access and internal design – is consistent with (and in areas improves upon) the approved concept plan and therefore remains supportable on traffic planning grounds and would operate satisfactorily.

Appendix A

Network Traffic Flow Diagrams (Updated Halcrow TMAP)

2010 Surveyed, Existing Network Traffic Flows, Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



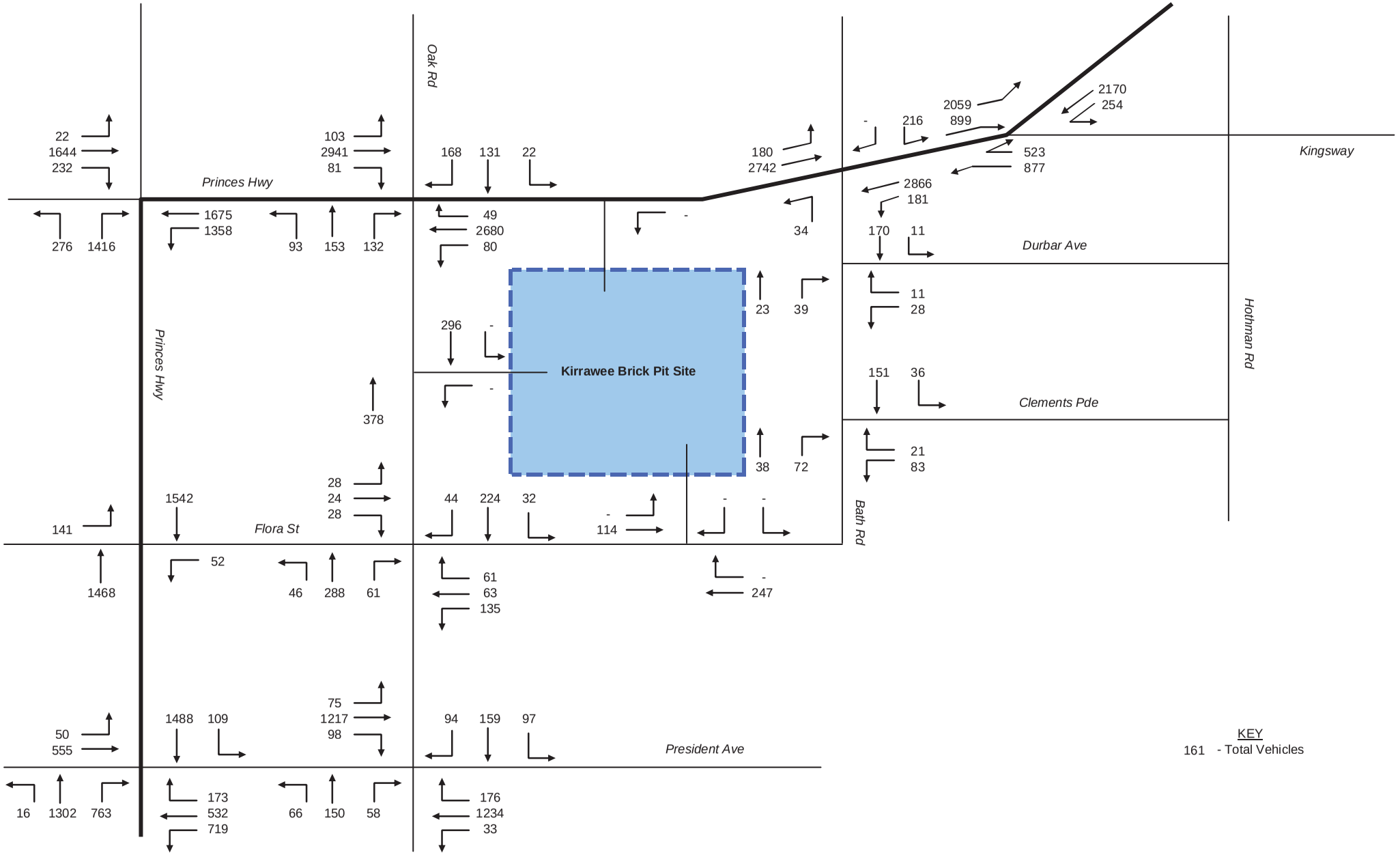
Halcrow

Figure E.1

X:\CTLRLQ - Kirrawee Part 3a\67 - Calculations\CTLRLQx03 Network Kirrawee_v10.xls - 6/05/2011

2010 Surveyed, Existing Network Traffic Flows, Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Figure E.6

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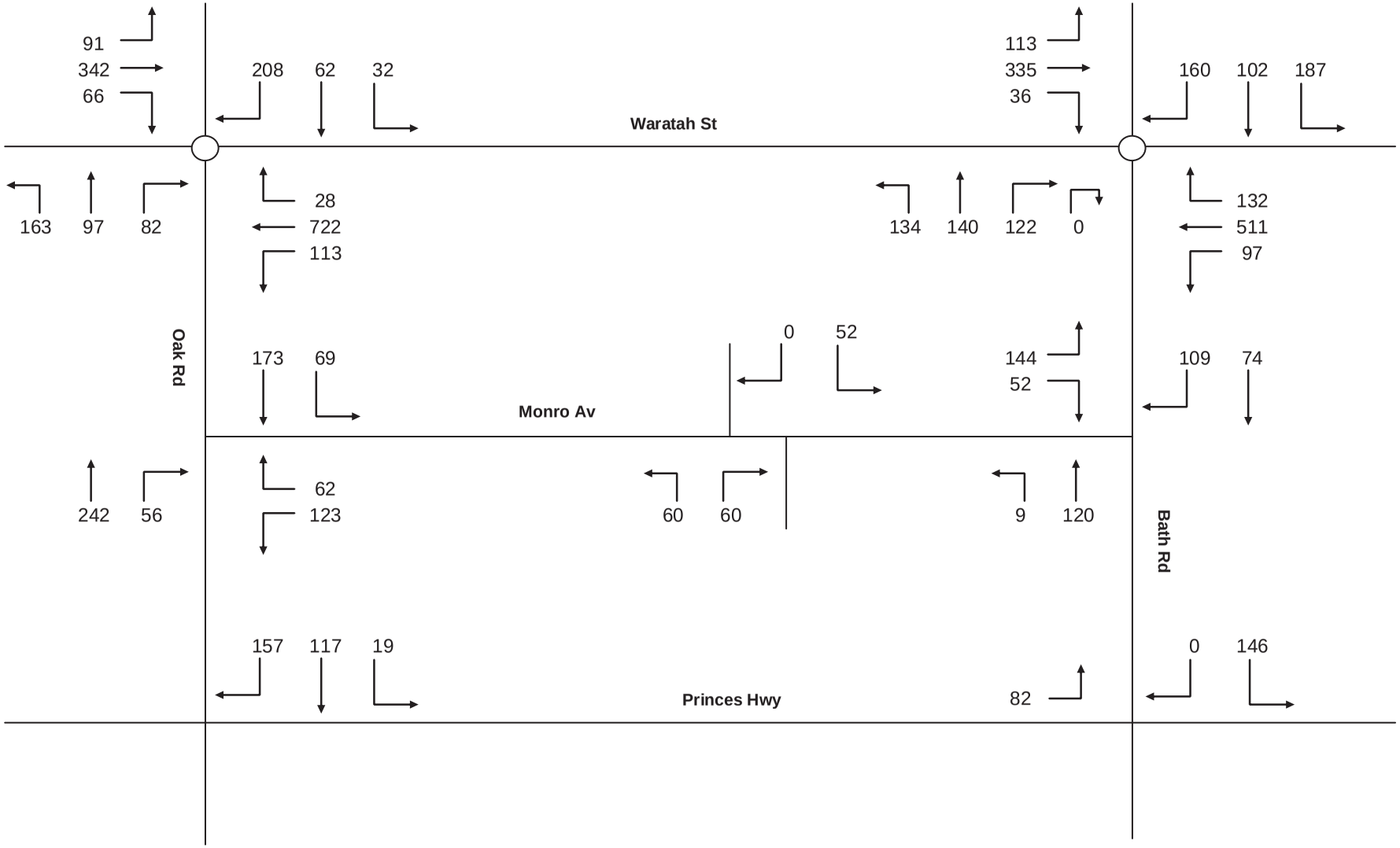
Surveyed Traffic Flows - Thursday Evening Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



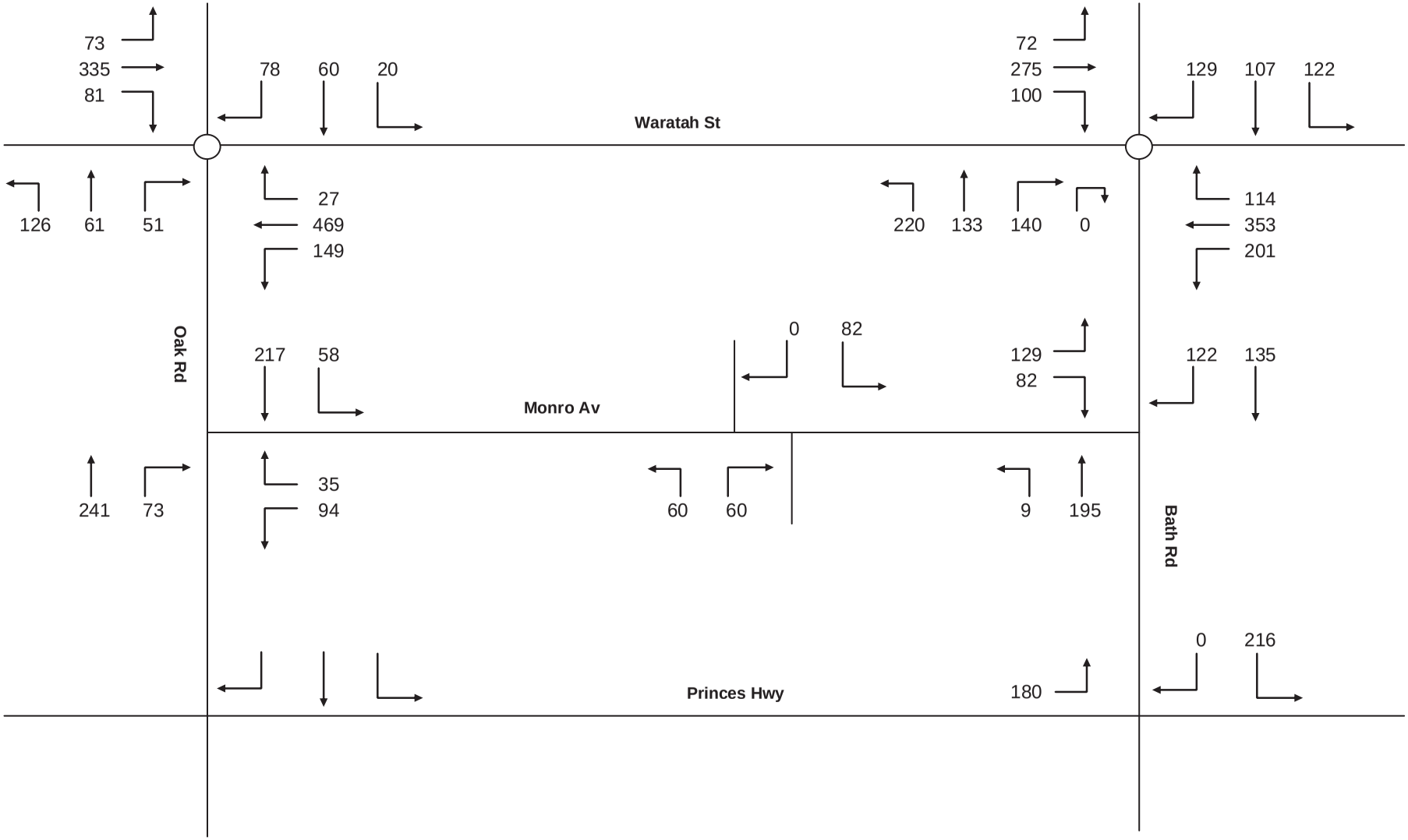
Halcrow

Halcrow Pacific Pty Ltd

FIGURE F.1
February 2011
CTLRLQx07Av6 Network North Princes Hwy_Thu PM.xls

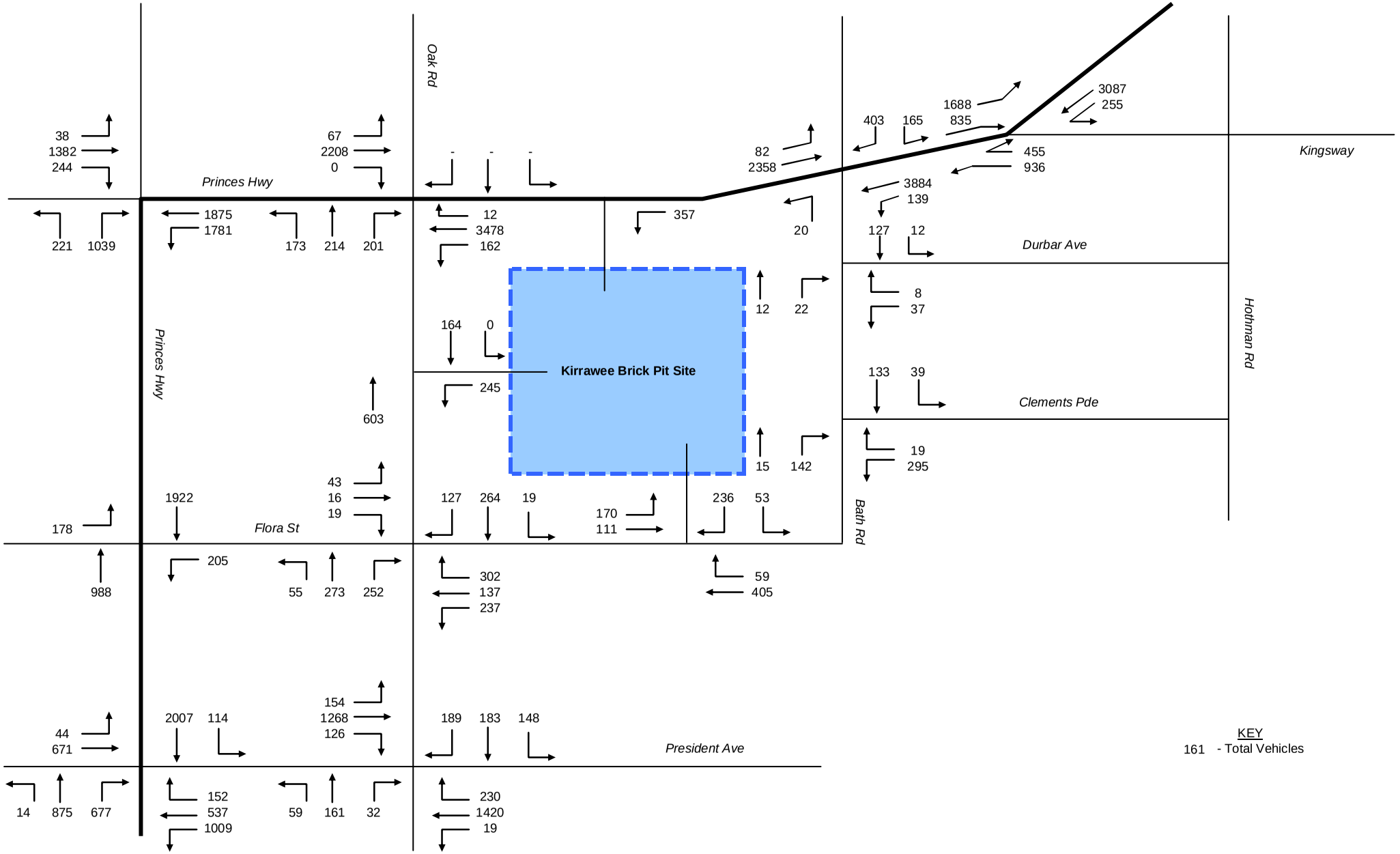
Updated TMAP, Oct. 2011 - Part 1 of 2

Surveyed Traffic Flows - Saturday Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Future Network Traffic Flows (under Stage 2 works), Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Figure 1

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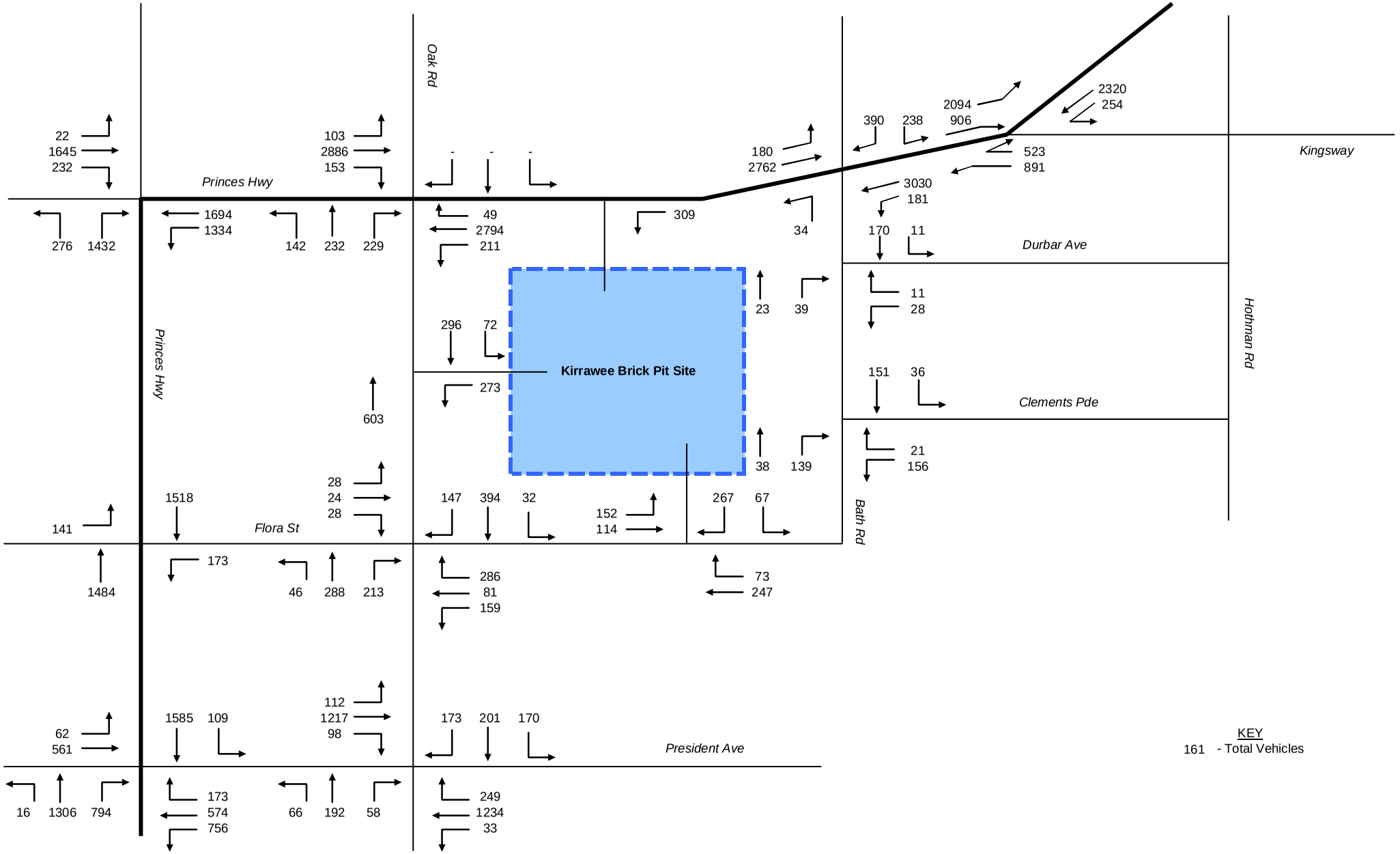
Updated TMAP, Oct. 2011 - Part 1 of 2

Future Network Traffic Flows (under Stage 2 works), Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



KEY

161 - Total Vehicles

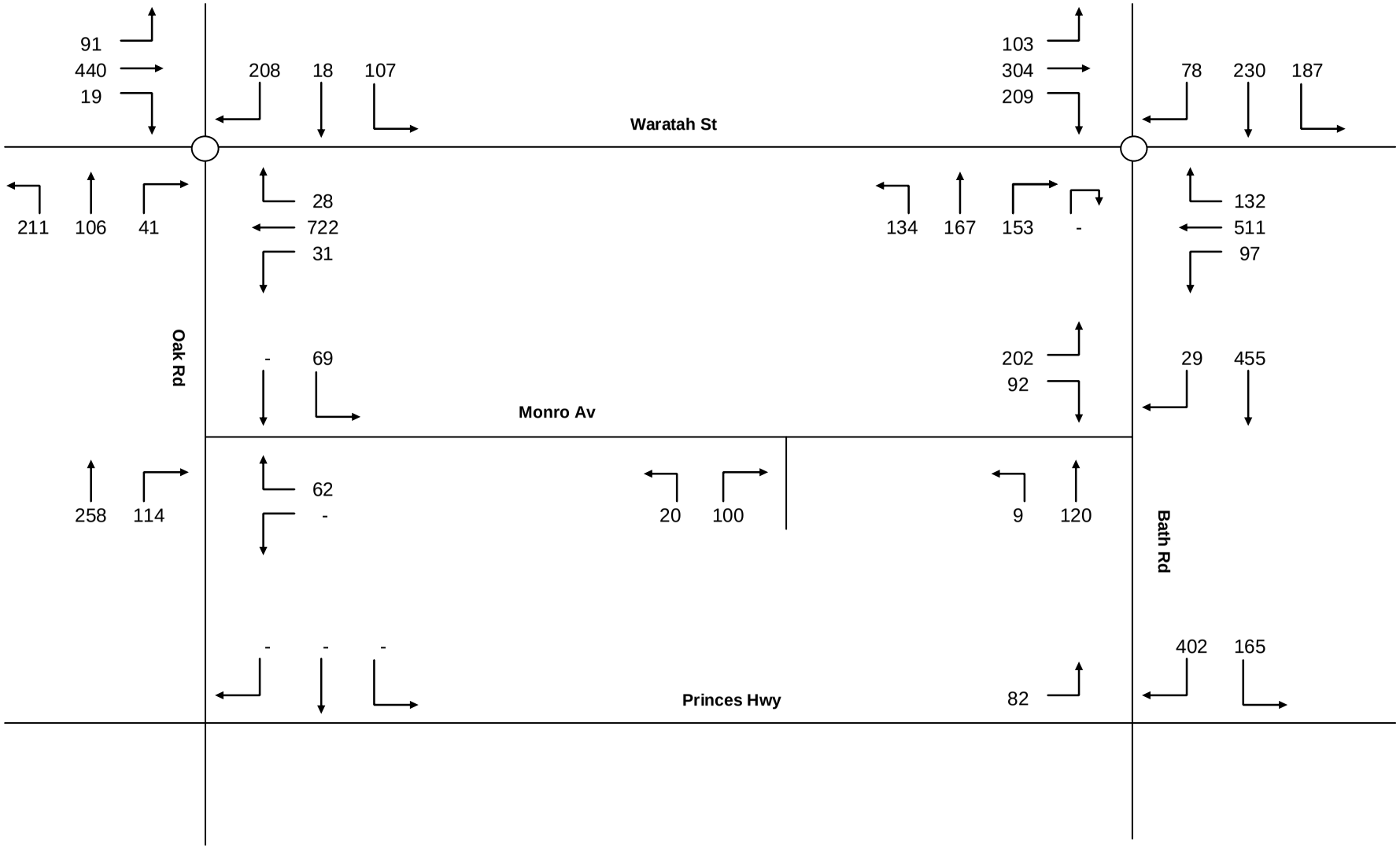
Halcrow

Figure 2

X:\CTLRLQ - Kirrawee Part 3a\67 - Calculations\CTLRLQx03 Network Kirrawee_v12.xls - 14/10/2011

Updated TMAP, Oct. 2011 - Part 1 of 2

Future (with Development) Traffic Flows - Thursday Evening Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Halcrow Pacific Pty Ltd

FIGURE 3

October 2011

CTLRLQx07Av7 Network North Princes Hwy_Thu PM.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Future (with Development) Traffic Flows - Saturday Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

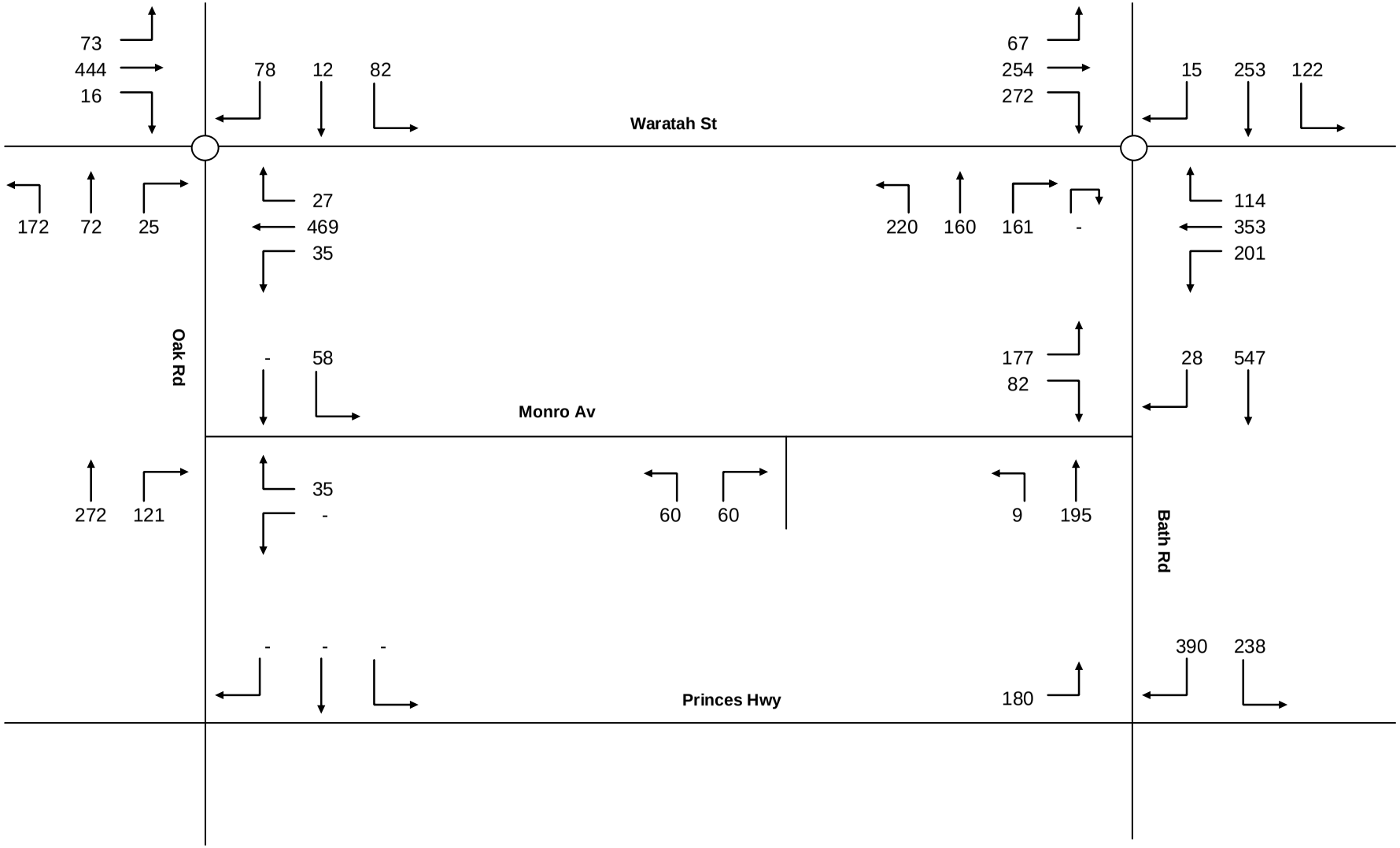


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FIGURE 4
October 2011
CTLRLQx07Bv7 Network North Princes Hwy_SAT.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Appendix B

Reduced Plans

NOTES

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DLCS Quality Endorsed Company ISO 9001:2008, Licence Number 4168
Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

CLIENT
PAYCE
Level 37, Chifley Tower 2 Chifley Square
Sydney NSW 2000 Australia

Project Title
KIRRAWEE BRICK PIT
KIRRAWEE

Drawing Title
GA Plans
Context Plan

PLANNING DETAIL INDICATIVE ONLY

Rev.	Date	Approved by	Revision Notes
J	10.07.14	SC	MOD3 Amended Proposal

Scale: 1:2000@A1, 50%@A3
Project No.: 13040
Drawn by: AL
North
Status: For Information
Dwg No.: A-SK-100-001
Rev: J

Level 1, 410 Crown Street
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Australia
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F +61 2 8668 0088
turnerstudio.com.au

PARKING NUMBERS	
RETAIL	468
RESIDENTIAL	959
RESIDENTIAL VISITORS	94
TOTAL	1,521

NOTES:

CLIENT
PAYCE
Level 37, Chifley Tower 2 Chifley Square
Sydney NSW 2000 Australia

LEGEND
RESIDENTIAL LIFT
RETAIL LIFT

Project Title
KIRRAWEE BRICK PIT
KIRRAWEE

Drawing Title
GA Plans
Illustrative Ground Level Plan

PLANNING DETAIL INDICATIVE ONLY

Rev.	Date	Approved by	Revision Notes
J	10.07.14	SC	MOD3 Amended Proposal

Scale: 1:500 @A1, 50%@A3
Status: For Information
Project No.: 13040
Dwg No.: A-SK-110-000
Drawn by: CH
Rev: J
North

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LEGEND
RESIDENTIAL LIFT
RETAIL LIFT

Project Title
KIRRAWEE BRICK PIT
KIRRAWEE

Drawing Title
GA Plans
Illustrative Level 1 Building B-C & G Podium Plan

PLANNING DETAIL INDICATIVE ONLY

Rev.	Date	Approved by	Revision Notes
J	10.07.14	SC	MOD3 Amended Proposal

Scale: 1:500 @A1, 50%@A3
Project No.: 13040
Drawn by: CH
North
Status: For Information
Dwg No.: A-SK-110-001
Rev: J

turner
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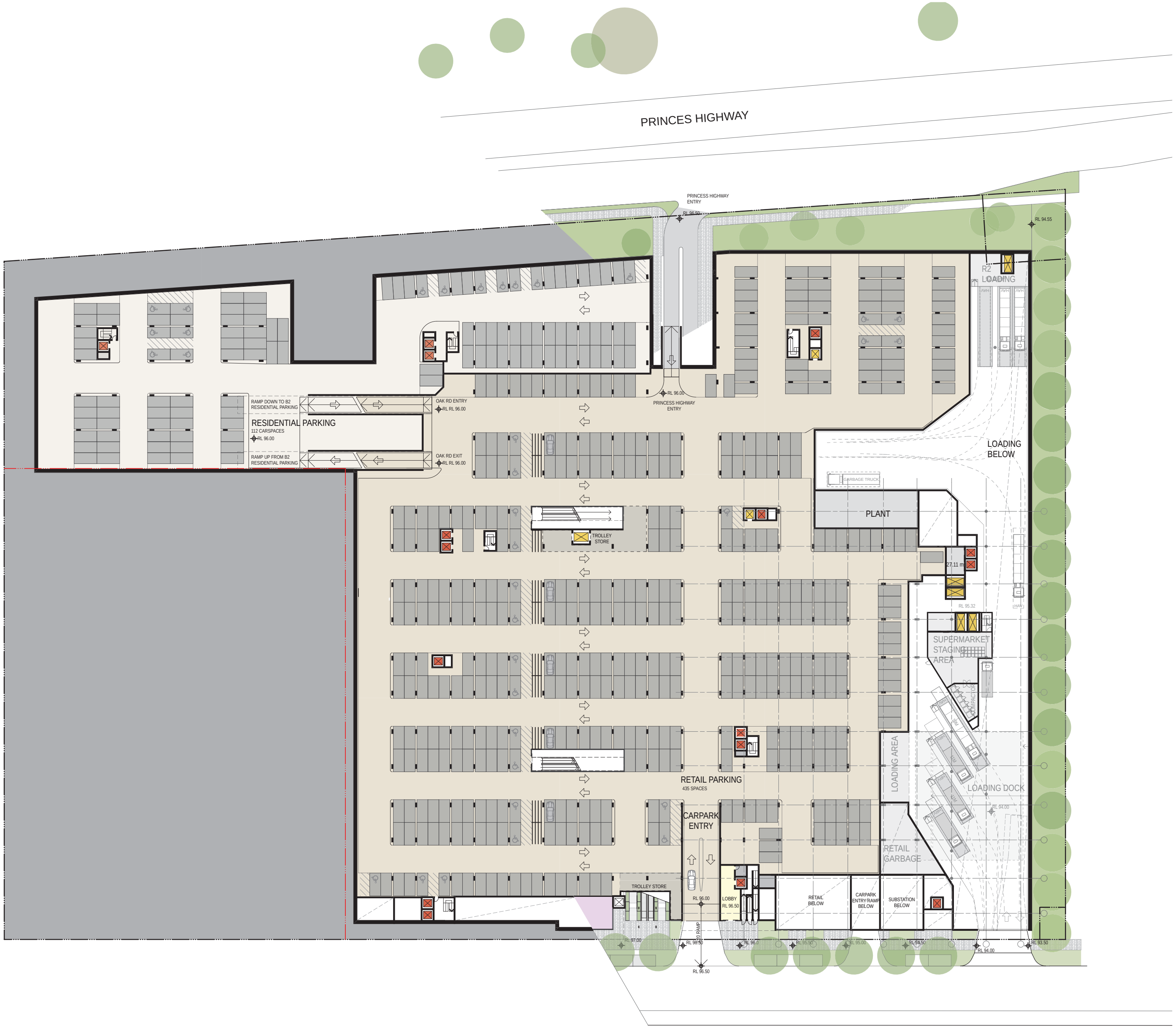

CLIENT
PAYCE
Level 37, Chifley Tower 2 Chifley Square
Sydney NSW 2000 Australia

LEGEND
RESIDENTIAL LIFT
RETAIL LIFT

Project Title
KIRRAWEE BRICK PIT
KIRRAWEE

Drawing Title
GA Plans
Illustrative Basement 1 Plan

PLANNING DETAIL INDICATIVE ONLY

Rev.	Date	Approved by	Revision Notes
J	10.07.14	SC	MOD3 Amended Proposal

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Project No.: 13040
Drawn by: CH
North
Status: For Information
Dwg No.: A-SK-110-B01
Rev: J

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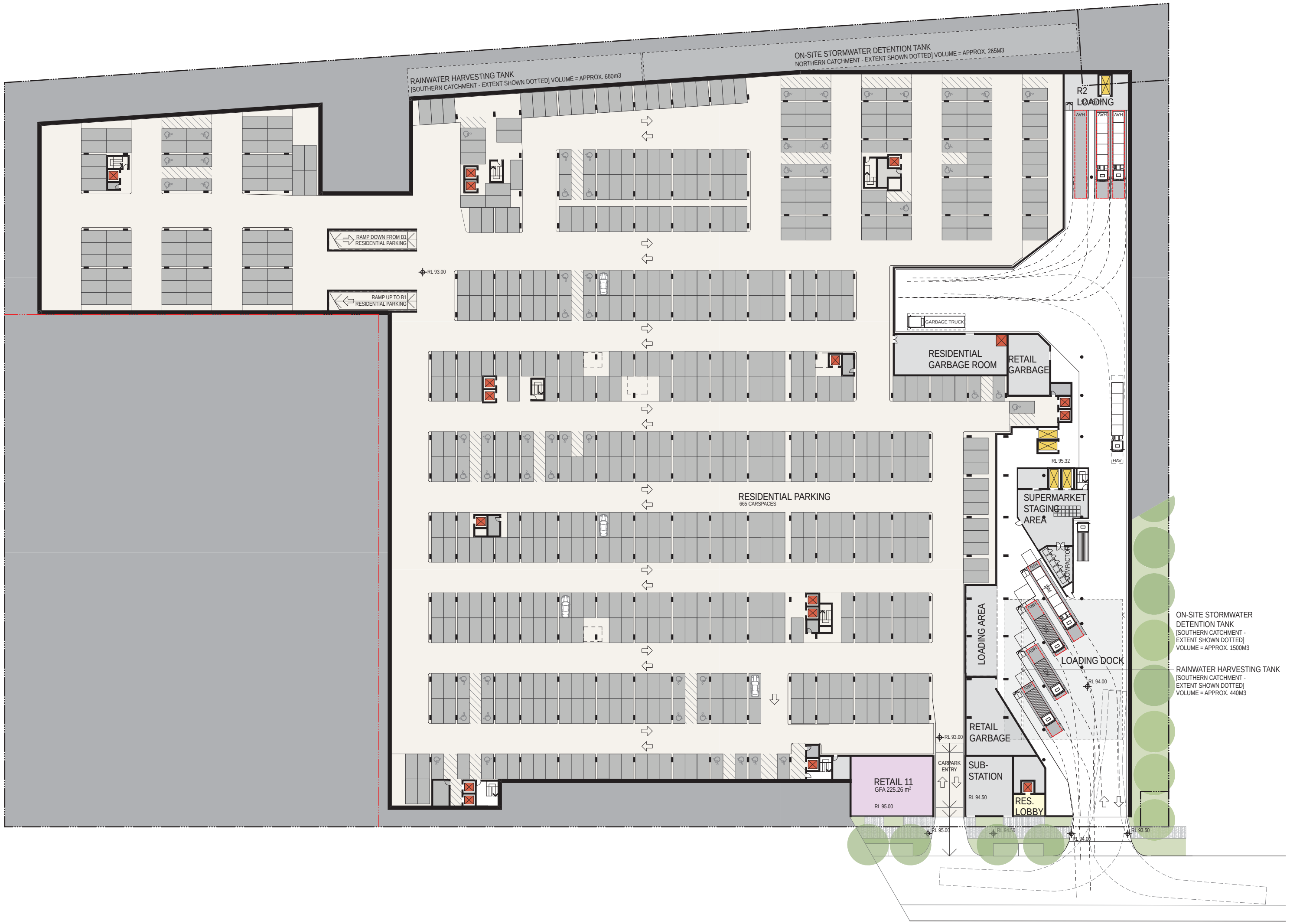

PLANNING DETAIL INDICATIVE ONLY

Rev.	Date	Approved by	Revision Notes
J	10.07.14	SC	MOD3 Amended Proposal

NOTES

DLCS Quality Endorsed Company ISO 9001:2008, Licence Number 4168
Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

CLIENT
PAYCE
Level 37, Chifley Tower 2 Chifley Square
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LEGEND
RESIDENTIAL LIFT
RETAIL LIFT

Project Title
KIRRAWEE BRICK PIT
KIRRAWEE

Drawing Title
GA Plans
Illustrative Basement 2 Plan

Scale: 1:500 @A1, 50%@A3
Project No.: 13040
Drawn by: CH
North
Status: For Information
Dwg No.: A-SK-110-B02
Rev: J

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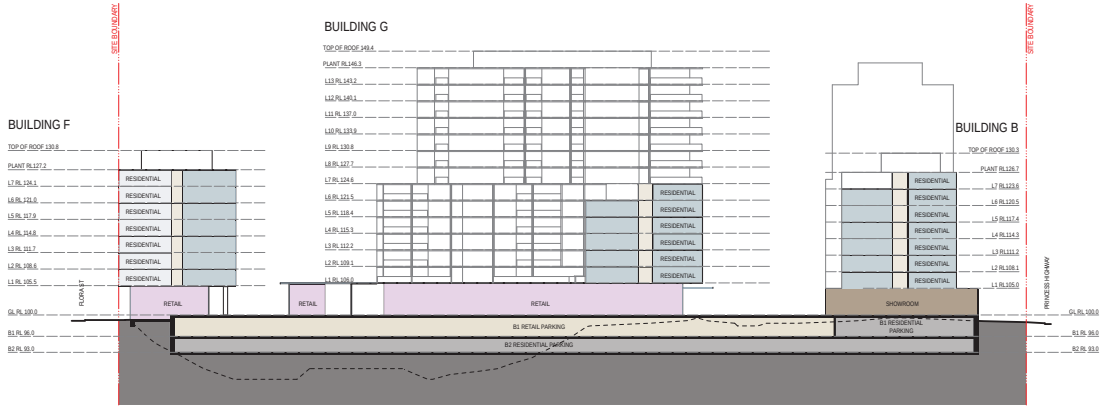

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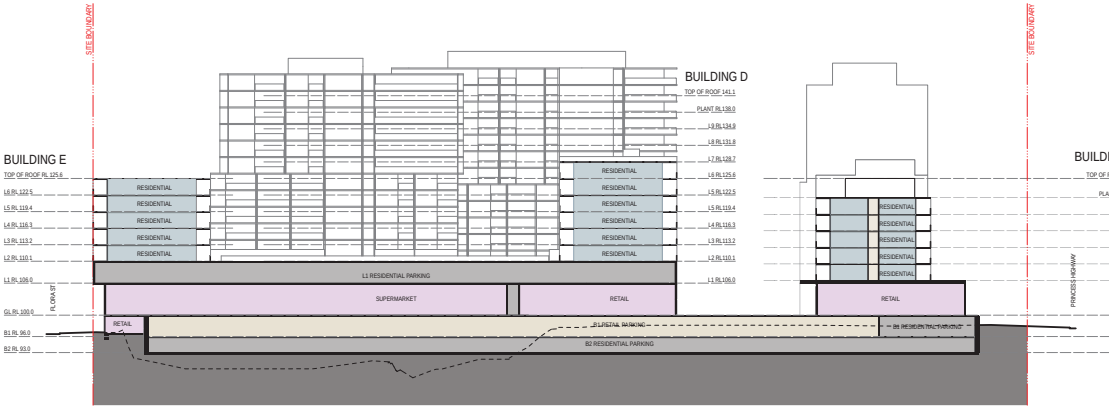

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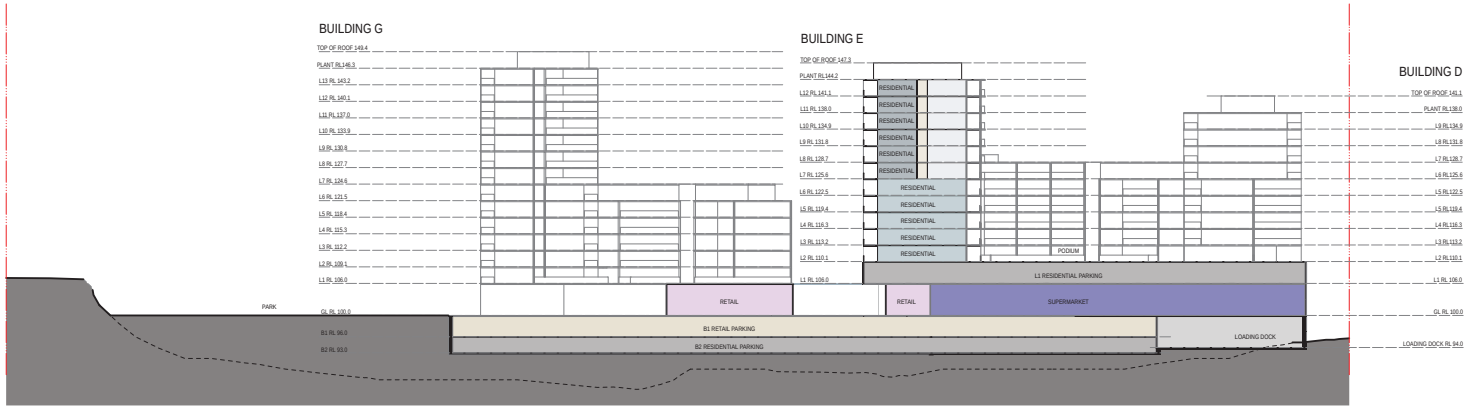

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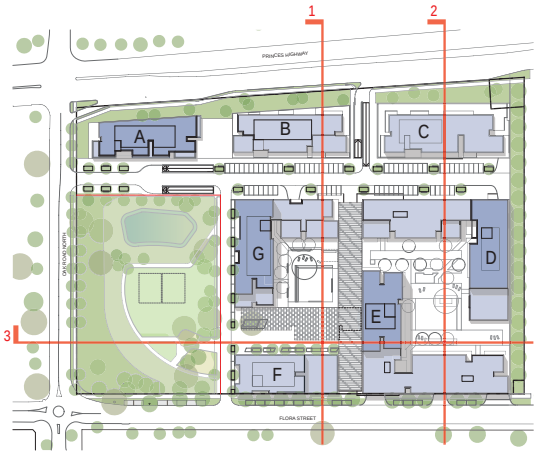

PLANNING DETAIL INDICATIVE ONLY

Rev.	Date	Approved by	Revision Notes
J	10.07.14	SC	MOD3 Amended Proposal

CLIENT
PAYCE
Level 37, Chifley Tower 2 Chifley Square
Sydney NSW 2000 Australia

Project Title
KIRRAWEE BRICK PIT
KIRRAWEE

Drawing Title
GA Plans
Illustrative Sections

Scale	Project No.	Drawn by	North
1:500, 1:1500 @A1, 50%@A3	13040	CH	
Status	Dwg No.	Rev	
For Information	A-SK-300-001	J	

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F +61 2 9668 0080
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