

**Proposed Retail Rezoning
Circa Business Centre**

Traffic & Parking Report

**FKP Commercial Developments
Pty Ltd**

**Gennaoui Consulting
Pty Ltd**

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J482 RevB

31 Duneba Drive
Westleigh NSW 2120
PO Box 372
Pennant Hills NSW 2120-
Australia
Telephone 02 9484 3564
Facsimile 02 9980 9384

Email: gennaoui@bigpond.net.au

ACN 089 721 568

ABN 14 089 721 568

Gennaoui Consulting Pty Ltd

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1. Introduction

1.1 Background

Norwest Land has been developing the Norwest Business Park, a unique urban plan and private enterprise land development, for more than a decade. Most of the land in the Business Park is zoned "Employment", a flexible zone permitting a wide range of land uses. The Baulkham Hills Development Control Plan (BHDCP) – Part E Section 14 – Norwest business Park provides the main urban development framework including the designation of land uses throughout the Business Park.

Existing developments in the business centre comprises the recently completed Woolworths Supermarket, Circa Boulevard, Entertainment Way. An approval has also been granted for the development of an Office Building situated on the corner of Circa Boulevard and Norbrik Drive. The approved development consists of a commercial office building with basement parking comprising a total of 11,927 m² GFA. This development was the subject of a previous traffic and parking report (Gennaoui, 2008).

The Circa Business centre has a current allowance of 3,890m² of retail space. This is generally taken up by the existing Woolworths Supermarket and specialties. The proposed rezoning seeks approval for a further 2500 m² of retail floor space within the Circa Business Centre.

Gennaoui Consulting Pty Ltd has been commissioned to investigate and report on the parking requirements and traffic implications of the proposed rezoning.

1.2 Site Location and Study Area

The site of the proposed development is within Circa Business Centre on the south-eastern corner of the intersection of Elizabeth Macarthur Drive and Norbrik Drive. The main vehicular access will be off Norbrik Drive and Circa Boulevard depending upon future detailed design at the development application stage. The purpose of this report is to examine the traffic implications of the proposal on Norbrik Drive, Circa Boulevard and approach intersections given that a specific site for any future retail development is yet to be determined. The study area and site of the proposed development is shown in **Appendix A**.

1.3 Study Approach

The Hills Shire Council and the RTA have agreed that the traffic impact of the proposed development on the ultimate road network could be dealt with by referencing the Master Plan report for the Norbrik Estate (Gennaoui, 2006). The Master Plan assumed that Elizabeth Macarthur Drive intersected with Norbrik Drive, that Norbrik Drive was extended to Old Windsor Road and that the Norbrik Drive loop road would be completed. These works have subsequently taken place and are completed.

1.4 Scope of Report

This report summarises the findings and conclusions with respect to the parking requirements of the development and associated traffic impacts in the context of the approved Master Plan and having regard to all completed road works. For the purposes of this report the future retail floor space is assumed to be located on the ground level of the approved Building A site.

In the event that another site within the Circa Business Centre is selected, a detailed traffic impact assessment will accompany any future development application. Nevertheless commentary is provided on the ability of the completed roads to handle the traffic associated with the proposed increase in retail floor space.

2. Access and Parking Layout

2.1 The Proposal

The proposed development will be situated on the south-eastern corner of the intersection of Elizabeth Macarthur Drive and Norbrik Drive as shown in **Appendix A**. Initially all vehicular access to the proposed development will be off Norbrik Drive to the east of the proposed signalised intersection. As indicated in Section 1.4 the proposed office development will have a total of 11,927 m² GFA, including 2,500 m² GFA of retail.

2.2 Parking Requirements

Some 485 parking spaces are required for the proposal as outlined above to comply with Council's Parking DCP (2007) as noted in **Table 1**. This is based on the following parking rates:

- Retail: - 1 space per 18.5 m² GLFA
- Office: - 4 spaces per 100 m² GFA

Table 1: DCP Parking Requirements

Land Use	GFA	GLFA*	Spaces Required	Parking Supply
Retail	2,500	2,000	108	
Office	9,427		377	
		5,207	485	510

*GLFA = 80% of GFA

Some 510 spaces were to be provided on-site as part of the previous commercial office approval. The surplus spaces would form part of the requirement for the next stage.

2.3 Access and Parking Layout

2.3.1 Access Driveways and Circulation

Major approaches to the site will be via Norbrik Drive, from Old Windsor Road and Elizabeth Macarthur Drive from Norwest Boulevard.

The main access to the development was previously proposed off Norbrik Drive via a combined 10.0 metres wide entry exit driveway situated about 65 m east of the intersection with Elizabeth McArthur Drive. The width of the driveway then reduced to 6.5m. Direct entry into the basement car park was situated about 55 m from Norbrik Drive. A one-way circulation was proposed within the car park.

All vehicles enter and leave the site in a forward direction.

2.3.2 Parking Layout

The car parking layout was designed to comply with the Australian Standards for off-street parking (2004) and Baulkham Hills Council Development Control Plan (2007).

Some 25 bicycle spaces are required to comply with Council's DCP which requires the provision of 2 spaces plus 5% of total number of required car spaces. Furthermore, a minimum of 10 spaces suitable for motorcycles are to be provided to comply with Council's requirement of 1 space for every 50 required parking spaces.

2.4 Loading Facilities

Four (4) loading bays are required for the office component in accordance with Council's DCP which stipulates for commercial premises a requirement of 1 space for first 1,860m², 1 for next 3,720 m², 1 for next 3,720 m² and 1 for next 9,250 m². In addition, two (2) loading bays would be required to meet the demand of a small supermarket.

Loading bays to accommodate at least one Large Rigid and one Medium Rigid vehicles should be provided. The remaining spaces should be suitable for courier and small vans.

The loading bays and reversing areas should comply with the Australian Standard (AS 2002). All vehicles should be able to enter and exit the site in a forward direction.

3. Traffic Impact of Proposed Development

3.1 Basis of Assessment

The Hills Shire Council has advised that the traffic impact of the proposed development on the ultimate road network could be dealt with by referencing to the Master Plan report for the Norbrik Estate (Gennaoui, 2006). The Master Plan, included as **Appendix B**, includes the extension of Elizabeth Macarthur Drive to Old Windsor Road via Norbrik Drive and the completed loop road.

3.1.1 Internal Road Layout

Elizabeth McArthur Drive provides access from Norwest Boulevard. It has recently been extended to connect with Old Windsor Road via Norbrik Drive. The extension of Elizabeth McArthur Drive includes the provision of the following new roads, illustrated in **Appendix B**:

- Norbrik Drive (Road N°1) east of Old Windsor Road is a six lane divided carriageway.
- Norbrik Drive (Road N°2) has a four lane divided carriageway with right turning lanes at the two signalised intersections;
- Elizabeth Macarthur Drive (Road N°3), between the existing roundabout at Resmed and Norbrik Drive has a four lane undivided carriageway.

Furthermore to provide access to most of the subdivision east of Elizabeth Macarthur Drive, Norbrik Drive has been constructed with the following characteristics:

- The eastbound section of the Loop Road between Road N°1 and the access to Zone N°9 would have two lanes; north of Zone N°9, one (1) exclusive left turning lane and one (1) through/right turn lane would access Roads N° 1 and 2 respectively. No on-street parking should be permitted in this section.
- About 100m section of the Loop Road east of Road N°3 would be wide enough to accommodate two eastbound and two westbound lanes at the intersection with Roads N° 2 and 3. On-street parking would should be permanently prohibited in this section of road.
- The remaining section of the Loop Road would have an 11m wide pavement between kerbs. On-street parking may only be permitted on one side of the roadway.

3.1.2 Developments in Circa Precinct in Master Plan

The Circa Precinct has been divided in fourteen (14) zones as shown in **Appendix B**. The proposed retail is located in Building A situated within Zone 12. The Master Plan was based on the following planning scenario summarised in **Table 2** (Gennaoui, 2006).

Table 2: Existing and Potential Floor Space in Circa (Norbrik) Precinct

Norwest zones	Zone	Site Area m ²	Potential Floor Area m ² GFA			
			Office	Warehouses	Retail	Total
Integral	24b	5,500				0
NeMMCO	25a	14,500	2,530	330		2,860
Reserve Bank	25b	14,890	3,320	250		3,570
1 to 6, 13 & 14	25c	97,750	69,950	7,500		77,450
12	26a	48,300	44,410		3,890	48,300
7 & 8	27a	31,000	31,000			31,000
9	27b	39,100	39,100			39,100
11	28a	30,000	30,000			30,000
10	28b	17,000	17,000			17,000
TOTAL		298,040	237,310	8,080	3,890	249,280

3.1.3 Trip Generation of Circa Precinct in Master Plan

The generation rates derived from actual surveys (refer **Table 3**) were applied to the gross floor area of the potential developments as noted in **Table 2**.

Table 3: Trip Generation for Existing Commercial Developments in Norwest
(trips/100 m² GFA)*

	Office		Warehousing/Showrooms		Retail	
	Arr	Dep	Arr	Dep	Arr	Dep
AM Peak	1.30	0.38	0.32	0.10	3.28	1.40
PM Peak	0.41	1.01	0.10	0.25	4.53	4.53

* source: Gennaoui Consulting (2002a & b, 2003a)

At ultimate completion of Circa Precinct, about 4,200 and 3,750 trips would have been generated by developments within the subdivision during the morning and afternoon peak hours respectively as noted in **Table 4** (Gennaoui, 2006). The proposed retail development would form part of Zone 12.

Table 4: Trip Generation of Circa Estate (Norbrik Precinct 6) *

Zones	AM Peak			PM Peak		
	Arr	Dep	Total	Arr	Dep	Total
12	715	213	928	285	699	984
Other Zones	2,522	754	3,276	804	1,967	2,771
TOTAL	3,237	967	4,204	1,089	2,666	3,755

source: Gennaoui Consulting (2006)

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The resultant traffic volumes on the road network at ultimate completion of the Precinct are presented in Figures 2a & 2b, included as **Appendix C**, for the morning and afternoon peak hours respectively.

3.2 Changes to Master Plan Planning Assumptions

3.2.1 Overall Floor Area in Circa Precinct

Since the completion of the Master Plan Report (Gennaoui, 2006), a number of new developments have either been approved or currently seeking approval from Council. These include

- A data recovery centre at the corner of Elizabeth MacArthur Drive with Norbrik Drive (Traffic Zone 17);
- Woolworths Shopping Village and specialities at the corner of Norbrik Drive with Circa Boulevard;
- The Hills Private Hospital east of the Shopping Village (Traffic Zone 14)
- Three proposed secure buildings on Lot 6050 (Traffic Zone 5) to which would be used as blue chip data centre facilities accommodating a total of 3,735 m² GFA of office. Most of the buildings will mainly include racked servers, plant and storage.
- Commercial Office Building – medical centre (Traffic Zone 16) of about 8,000 m² GFA.

Overall and including the proposed development in the Neighbourhood Precinct discussed above, a net decrease of about 12,500 m² GFA would result from these proposals as noted in **Table 5**.

Table 5: Potential and Approved Floor Space in Norbrik

Master Plan Zones	Traffic Zone	Site Area	Potential Floor Area m ² GFA				Total
Appendix A	Appendix D	M ²	Office	Warehouses	Retail	Other	
Integral	3*	5,500					
NeMMCO	3*	14,500	2,530	330			2,860
Reserve Bank	3*	14,890	3,320	250			3,570
10	3*	17,000	17,000				17,000
9	4	41,000	33,200				33,200
Pt7 & Pt 8	5	24,170	3,735				3,735
Part 3 & 4,5,6	6	23,085	17,314	2,717			20,031
Part 3 & 4,5,6	7	23,085	17,314	2,720			20,034
11	8	30,000	30,000				30,000
12 Shopping Centre	9		1,317		3,890		5,207
12 Building A	10	48,300	11,927				11,927
12 office	10 to 12		31,166				31,166
Pt 8 & 9	13		8,000				8,000
13 & 14 Hospital	14	24,000				21,600	21,600
Pt3	15	8,000	6,000				6,000
Pt2 & Pt3	16	8,000	8,000				8,000
1 & Pt2	17	16,000	11,740	2,760			14,500
Total		297,530	202,563	8,777	3,890	21,600	236,830

* about 50% of traffic exit area via Elizabeth Macarthur at Norwest Boulevard

3.2.2 Trip Generation after Changes to Master Plan

The changes to the approved Master Plan for the Circa Precinct are expected to generate about 3,691 and 3,445 trips by developments within the subdivision during the morning and afternoon peak hours respectively. The trip generation by area is detailed in **Table 6**. Thus the changes which have taken place since the approval of the Master plan would effectively result in an overall decrease of about 510 and 310 vehicles during the morning and afternoon peak hours respectively.

The trip generation of all developments within Circa Precinct were derived as follows:

- Use the more appropriate trip generation of the following land uses:
 - The trip generation of the Woolworths Shopping Village was based on the floor of the approved development of 204 and 370 trips during the morning and afternoon peak hours respectively (Gennaoui 2007a).
 - The Takhral Data Centre (Zone 5) from the traffic report prepared in conjunction the Development Application (Gennaoui, 2007b) of about 80 and 75 trips during the morning and afternoon peak hours respectively.
 - The Hills Private Hospital (Zone 14) from the traffic report prepared in conjunction the Development Application (TEF, 2007) of 213 and 288 trips during the morning and afternoon peak hours respectively.
 - The data recovery centre (Zone 17) was assumed to generate a conservative 50 trips during both the morning and afternoon peak hours.
 - The trip generation of all remaining developments within Circa Precinct were derived by the application of the average trip generation rates included in **Table 3**.

Table 6: Trip Generation of Proposed Master Plan for Norbrik Precinct 6

Master Plan Zones Appendix A	Traffic Zone Appendix C	AM Peak		PM Peak	
		Arr	Dep	Arr	Dep
Integral	3*	0	0	0	0
NeMMCO	3*	34	10	11	26
Reserve Bank	3*	44	13	14	34
10	3*	220	66	70	172
9	4	430	128	137	335
Part7 & Part 8	5	47	31	32	42
Part 3 & 4, 5, 6	6	233	69	74	182
Part 3 & 4, 5, 6	7	233	69	74	182
11	8	388	116	124	302
12 Shopping Centre	9	157	47	108	263
12 Building A	10	154	46	49	121
12 office	10 to 12 & 18	403	121	128	315
Pt 8 & 9	13	103	31	33	81
13 & 14 Hospital	14	154	59	102	185
Part 13	15	78	23	25	60
Part2 & Part3	16	103	31	33	81
1 & Part2	17	25	25	25	25
Total		2,806	885	1,039	2,406

3.3 Traffic Impact of Proposed Development

3.3.1 Trip Generation of Proposed Development

For trip generation purposes it is assumed that a proposed development on the site will have a total floor area of 11,927 m² GFA. The generation rates derived from actual surveys (refer Table 3) were applied to the gross floor area of the office and proposed retail component of the proposed development. Trip generations of about 275 and 360 vehicle trips are expected during the morning and afternoon on-street peak hour respectively as noted in Table 7.

Table 7: Trip Generation (veh/hr) of Proposed Development

Developments	Area m² GFA	AM Peak			PM Peak		
		Arr	Dep	Total	Arr	Dep	Total
Proposed Building							
Office	9,427	122	36	158	39	95	134
Retail	2,500	90	27	117	66	161	227
	TOTAL	212	63	275	105	256	361
Approved Building							
Office	11,927	154	46	200	49	121	170
Increased Traffic		58	17	75	56	135	191

The proposed conversion of 2,500 m² GFA of office to retail would result in traffic generation of 75 and about 190 trips during the morning and afternoon peak hours respectively in excess of the approved building.

3.3.2 Overall impact of Proposed Development

The likely trip generation of the proposal would account for about 40 percent of all trips likely to be generated by all developments in Zone 12. It would also represent about nine (9) percent of all trips generated by all development within the Circa Precinct during the morning and afternoon peak hours respectively.

Table 8: Trip Generation (veh/hr) of Circa Precinct with Proposed Retail

Developments	AM Peak			PM Peak		
	Arr	Dep	Total	Arr	Dep	Total
Proposed Building A	212	63	275	105	256	361
Other zone 12	560	168	728	236	578	814
Other Circa Precinct*	2,092	671	2,763	754	1,707	2,461
TOTAL *	2,864	902	3,766	1,095	2,541	3,636

The proposed rezoning of 2,500 m² GFA to retail would result in an overall generation about 3,770 and 3,640 trips during the morning and afternoon peak hours respectively by developments within Circa Precinct. These volumes of traffic are below the volumes generated by the approved Master Plan included in Table 4. All major approach roads and intersections would therefore operate as per the approved master plan (Gennaoui, 2006).

4. Summary

4.1 Parking Requirements

The proposed development (commercial office and retail) will be situated on the south-eastern corner of the intersection of Elizabeth Macarthur Drive and Norbrik Drive. Initially all vehicular access to the proposed development would be off Norbrik Drive to the east of the proposed signalised intersection. The proposed development will have a total of 11,927 m² GFA including 2,500 m² GFA of retail.

As some 510 spaces will be provided on-site, this parking supply exceeds Council's requirements for 485 spaces. It is envisaged that the surplus spaces would form part of the requirement for the next stage.

4.2 Traffic Impact of Proposed Development

Council has advised that the traffic impact of the proposed development on the ultimate Road network could be dealt with by referencing to the Master Plan report for the Circa Precinct. The proposed development would generate about 275 and 360 vehicle trips during the morning and afternoon on-street peak hour respectively.

The proposed rezoning of 2,500 m² GFA to retail would result in an overall generation about 3,770 and 3,640 trips during the morning and afternoon peak hours respectively by developments within Circa Precinct. These total volumes of traffic are below the volumes generated by the approved Master Plan as noted below.

	PM Peak					
	Arr	Dep	Total	Arr	Dep	Total
Master Plan Volumes	3,237	967	4,204	1,089	2,666	3,755
With Retail Rezoning	2,864	902	3,766	1095	2,541	3,636
Decrease	373	65	438	-6	125	119

4.3 Conclusions and Recommendations

The proposed rezoning of 2,500 m² GFA from office to retail will have little effect on the overall traffic conditions within the Norwest Business Park. All major approach roads and intersections would continue to operate as per the master plan.

Furthermore, the overall parking provision in the development can be made to comply with Council requirements. Car parks will be designed to meet Council's and Australian Standard requirements. Provisions for bicycles, motorcycle and loading facilities can also be made to comply with Council's DCP.

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5. References

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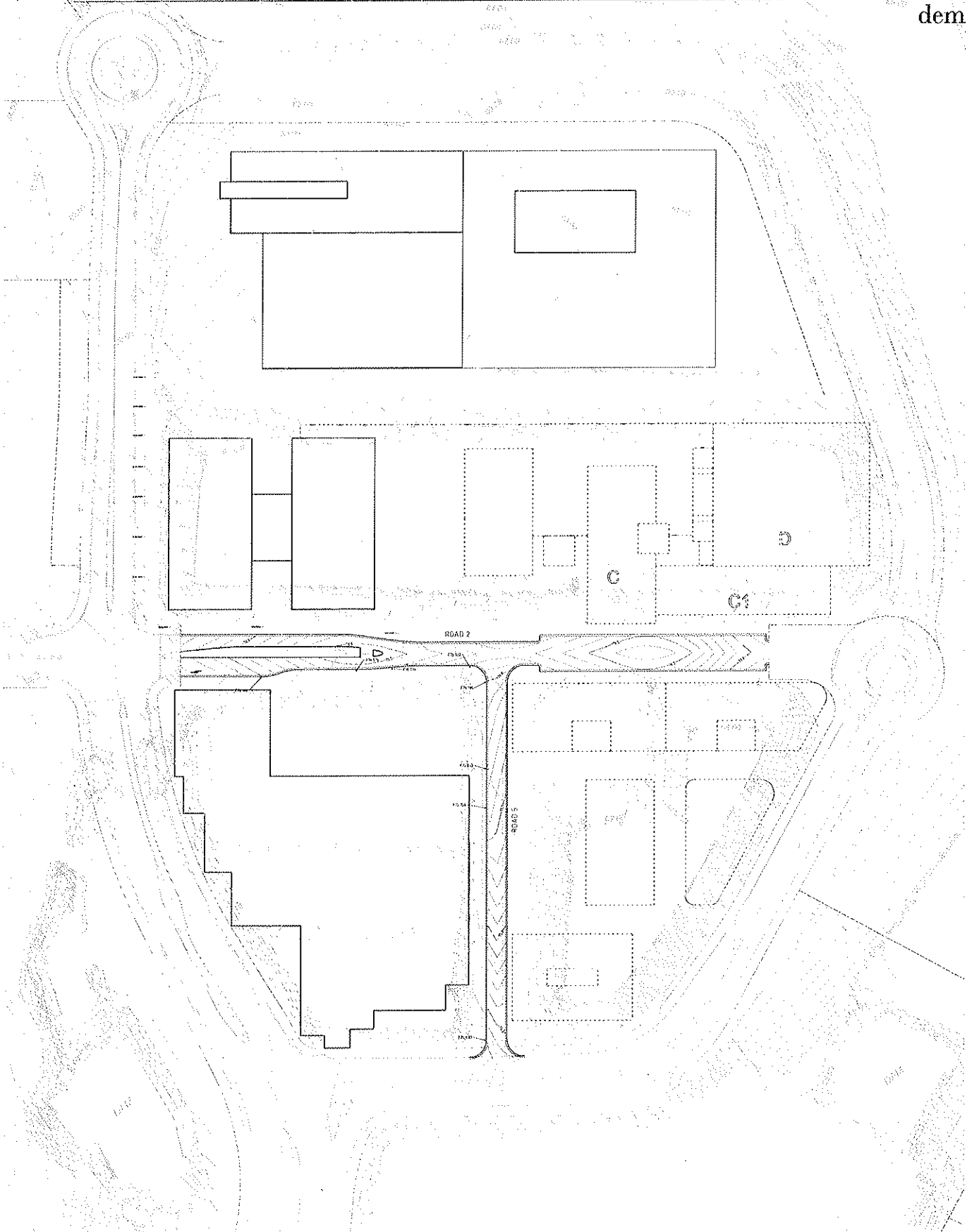
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Appendix A

Site Location & Proposed Road
Network



norbrick town centre - precinct 2

site plan

1:5000

arsk0101

-06

planning, urban design, architecture,
landscape architecture, interior design
level 6 (8800) street view 2022
c. (03) 4300 6000 f. (03) 4300 6111
e. aycm@cam.com.au

Appendix B

Master Plan for Circa Precinct

Appendix C

Master Plan Traffic Volumes within
Circa

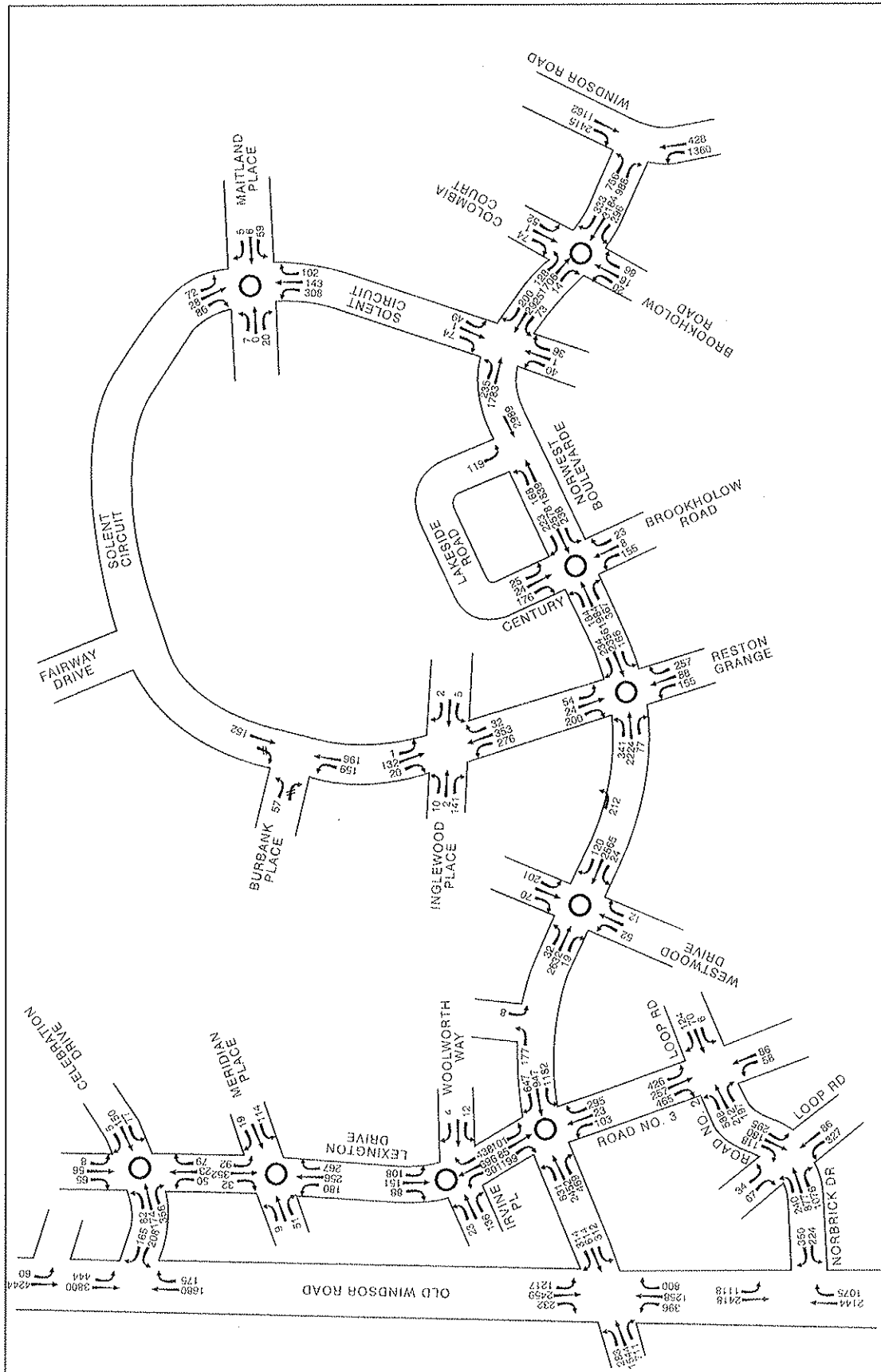
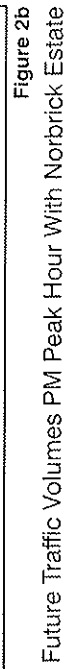


Figure 2a
Future Traffic Volumes AM Peak Hour With Norbrick Estate



Appendix D

Traffic Zones

