



4th December 2015

Reference: 15514.01FA

City of Canterbury Council
137 Beamish Street
Campsie NSW 2194
Attention: Tom Foster

**TRAFFIC ENGINEERING REVIEW
RESIDENTIAL PLANNING PROPOSAL
MILTON STREET, ASHBURY NSW**

Dear Tom,

Reference is made to your request to provide a review of the traffic engineering and transport planning assessments submitted to City of Canterbury Council as part of a planning proposal for a residential rezoning across two sites at No. 149-163 Milton Street and No. 165 Milton Street, Ashbury NSW.

The two planning proposals were submitted separately, however both sites need to be master planned concurrently with investigation of shared vehicular access. "Traffic Impact Assessments" were prepared by TRAFFIX individually for each site, dated 15 July 2014 for the southern site (No. 165) and May 2015 for the northern site (No. 149-163).

Deficiencies of TRAFFIX Assessments

M^CLaren Traffic Engineering has identified a number of deficiencies of the Traffic Impact Assessments prepared by TRAFFIX for the two sites which have been outlined below.

1. No council consultation was undertaken by TRAFFIX with respect to vehicular access, visitor parking, servicing and emergency vehicle access planning. No justification is provided by TRAFFIX for departure from Council's vision for the consolidated sites. Concerns are raised with respect to the ability of multiple basement car parks serving in the order of 400 units each to operationally accommodate:
 - a. the associated high volume of visitor parking that is freely and visually available / attractive for use so as to avoid on-street parking usage within Milton Street;
 - b. adequate servicing including removalist vans, tradesmen vehicles and garbage collection; and
 - c. emergency access by fire appliance vehicles (aerial pumpers) and ambulance.

2. Based on a car parking requirement of approx. 600 spaces, TRAFFIX identified the northern site would require a “Category 3” driveway as per AS2890.1:2004. The need to consolidate the 4 existing driveways on Milton Street was also noted, with the assessment outlining that the existing driveways are to be consolidated into two access roads servicing the site, with a Category 3 driveway mid-frontage on Milton Street and a Category 2 driveway at the southern border of the site. However, no justification was provided as to why two driveways were proposed and not the single Category 3 driveway as required by AS2890.1:2004.

The assessment of the southern site noted the similar requirement of a Category 3 driveway and outlined it would be achievable to provide a Category 3 driveway due to the site's wide frontage. No reference to the need for two driveways was stated, as was done for the northern site.

Additionally, no further details were provided regarding the proposed driveways or any internal access arrangements. The assessments also did not evaluate whether or not any on-street treatments would be required including right turn bays or the like and associated impacts in terms of reduced kerbside parking provision. This outcome of reducing on-street car parking supply is contrary to an objective of Council's DCP 2012.

3. Both assessments use trip generation rates of 0.19 trips / unit in the AM and 0.15 trips / unit in PM, as per the updated data presented in the RMS Technical Direction TDT 2013/04a dated August 2013. These rates are not reflective of the anticipated vehicle traffic generated by the residential development since the site has relatively poor access to public transport options. The reduced trip rates published by the RMS were based on surveys undertaken for sites within high density areas including Chatswood, Rockdale and Parramatta with all sites surveyed located “close to public transport”.

Reference can be made to *Department of Planning & Infrastructure* “Apartment Design Guide” and other planning documents that defines a site as being located within “close proximity to public transport” if it is located within 800m of a railway station. However, the nearest railway stations of Ashfield and Canterbury are situated well outside of the 800m walking distance from the site, therefore indicating that the site does not possess adequate proximity to high frequency public transport services. The TRAFFIX reports do not provide an adequate assessment in terms of the level of service provided by the prevailing local public transport service nor what measures are needed to improve public transport in order to achieve the lower levels of private vehicle generation during the sensitive weekday AM & PM peak commuter periods.

With a combined residential yield of 850 units, the TRAFFIX assessments outlined an expected traffic generation in the order of 162 trips in the AM peak hour and 128 trips in the PM peak. Using the more appropriate 0.3 trips per unit specified in the *RMS Guide to Traffic Generating Developments 2002*, the estimated traffic generation is calculated as 255 trips in both the AM and PM peak hour, an increase of 93-127 trips above the numbers calculated in the TRAFFIX assessments.

Nevertheless, both Traffic Impact Assessments also failed to provide evidence on any SIDRA Intersection analyses to determine the performance of the proposed driveways on Milton Street and any other major intersections in the surrounding road network which would have to accommodate the additional traffic volumes. A traffic assignment for the additional vehicle trips was also not specified in the assessments.

Vehicular Access Concept

To reduce the number of vehicle access points to the site along Milton Street, *McLaren Traffic Engineering* has prepared a roundabout concept (**Annexure A**) which is recommended as the preferred option for a single access road into the site. It should be noted that the location, whether on the northern or southern lot, and dimensions of the concept drawing are subject to final design by Council. The roundabout will ensure traffic flow efficiency is maintained along Milton Street with the increased traffic load and will remove the need to provide multiple driveways along Milton Street, as well as lessening to the greatest extent possible the loss of on-street parking. The proposed development yield and existing volumes along Milton Street do not warrant the need for traffic signals, however a roundabout can accommodate the increased traffic volumes and will improve the safety of right turning vehicles.

The concept plan of the roundabout shown in **Annexure A** has been based off dimensions of similar roundabouts within Ashbury and is adequate for Heavy Rigid Vehicle (HRV) access.

To provide equal access to both the northern and southern portions of the site, an internal access road layout in the form of a “T-road” from the roundabout is shown in **Annexure B**, consistent with Council’s vision for the site. The access roads will measure 8.0m wide with 10m radius turning bulbs or 20m diameter, 5m wide one-way loop roads on either end of the “T-road”, adequate for a Heavy Rigid Vehicle to circulate.

Intersection Performances

The TRAFFIX assessments failed to provide any information on driveway and intersection performances under future scenarios of increased traffic volumes. Traffic counts were provided in the assessment of the northern site however no SIDRA analysis was undertaken to support the conclusions made in the assessments.

McLaren Traffic Engineering has undertaken intersection analyses using SIDRA Intersection 6.1 under a number of scenarios. An existing condition of the combined driveways was modelled as a single give-way T-junction with the roundabout concept discussed above also modelled. A summary of the results is shown in **Table 1**, with detailed outputs reproduced in **Annexure C** for reference.

TABLE 1: INTERSECTION PERFORMANCES (SIDRA INTERSECTION 6.1)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/vehicle)	Level of Service ⁽³⁾	Control Type	Worst Movement
EXISTING INTERSECTION (Combined Driveways) – Traffic Generation Rates						
Site / Milton Street	AM	0.315	1.3 (11.4)	N/A (Worst: A)	Give Way	RT from Site
	PM	0.278	1.1 (12.3)	N/A (Worst: A)		RT from Site
EXISTING INTERSECTION (Combined Driveways) – Using rate of 0.3 / unit						
Site / Milton Street	AM	0.335	2.1 (12.4)	N/A (Worst: A)	Give Way	RT from Site
	PM	0.385	2.2 (14.3)	N/A (Worst: A)		RT from Site
ROUNABOUT CONCEPT – Using rate of 0.3 / unit						
Site / Milton Street	AM	0.408	4.7 (9.7)	A (Worst: A)	Roundabout	RT from Site
	PM	0.490	4.3 (9.9)	A (Worst: A)		RT from Site
ROUNABOUT CONCEPT – Using rate of 0.3 / unit + 10yr growth @ 2% p.a						
Site / Milton Street	AM	0.511	5.0 (10.7)	A (Worst: A)	Roundabout	RT from Site
	PM	0.610	4.6 (10.8)	A (Worst: A)		RT from Site

NOTES:

- (1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
- (2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
- (3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

As shown above, the intersections perform at a Level of Service A with reduced delays to the right turn movement from the site with the implementation of the roundabout concept.

Emergency Vehicle Access, Convenient Visitor Parking Access & Waste Collection

The proposed plans of the development outline a large level change of 8.0m between Milton Street and the ground level of the proposed buildings. As such, the design grades of the access road connecting to Milton Street need to comply with the NSW Fire Brigade *Guidelines for Emergency Vehicle Access – Policy No. 4* as well as the Austroads *Guide to Road Design Part 4B: Roundabouts*. The emergency vehicle access guidelines specify a maximum grade of 1:8 with 1:15 transitions at 4.0m long to ensure that bottoming out of vehicles does not occur.

Provision of emergency access via an internal roadway with close proximity to the proposed high rise buildings for the subject site is consistent with Council's vision for the site and reflects best practice. Fire-fighting appliance vehicles including aerial pumpers require specific design standards that will need to be further detailed in close consultation with NSW Fire Brigade. The surface roadway also assists in ambulance / police access to the proposed individual high rise buildings as well as accommodating visitor parking (via a combination of on-street and select basement locations off the internal road). Visitor parking needs to be convenient and easily accessible / visual for it to be used effectively.

In terms of waste collection, Council have a policy that restricts the length that a Council vehicle may enter a private site for collection of waste. The internal design road vision achieves a far superior outcome compared to that provided in the current plans from the applicant for the purpose of waste collection. The internal road provides an efficient corridor within which waste collection can occur without the need for these vehicles to enter into basement service / loading docks which would be less efficient. The internal road design element can also assist in provision of on-street parking areas for large removalist vans to conduct their activity without having to park within Milton Street. Some smaller car size vehicles could still enter the basement car parks for delivery / collection of smaller household items.

The internal access road concept plans shown in **Annexure B** provide an elevation plan of the east-west access road connecting directly to Milton Street with all grades compliant with the NSW emergency vehicles access guidelines.

Pedestrian Access

Pedestrian access within the site is afforded by the central spine corridor linking Milton Street to the rear open space on the adjoining land parcel. This vision can be achieved via a combination of ramps, stairs (with handrails) and pathways that branch out to individual building blocks along an appropriate contour level. It should be noted that for locations where ramp / footpaths are greater than 12.5%, stairs and handrails will be required in accordance with AS1428.1, see elevation in **Annexure B**. Considering the 8m change of level from Milton Street to the proposed ground floor level, it is best practice to provide ramps of maximum 1:14 grades with appropriate landings or a public lift to facilitate access for disabled persons.

Equally important is provision for access across Milton Street, which can be accommodated by one or more pedestrian refuges either at the proposed roundabout access point (via appropriately designed splitter islands) or at some other location(s) in consultation with Council's local traffic committee. Safe pedestrian crossing points have not been addressed in the TRAFFIX reports and are required due to the high population envisaged on the site including families, children, mothers with prams, school children on pushbikes and the elderly.

Please contact the undersigned should you require further information or assistance.

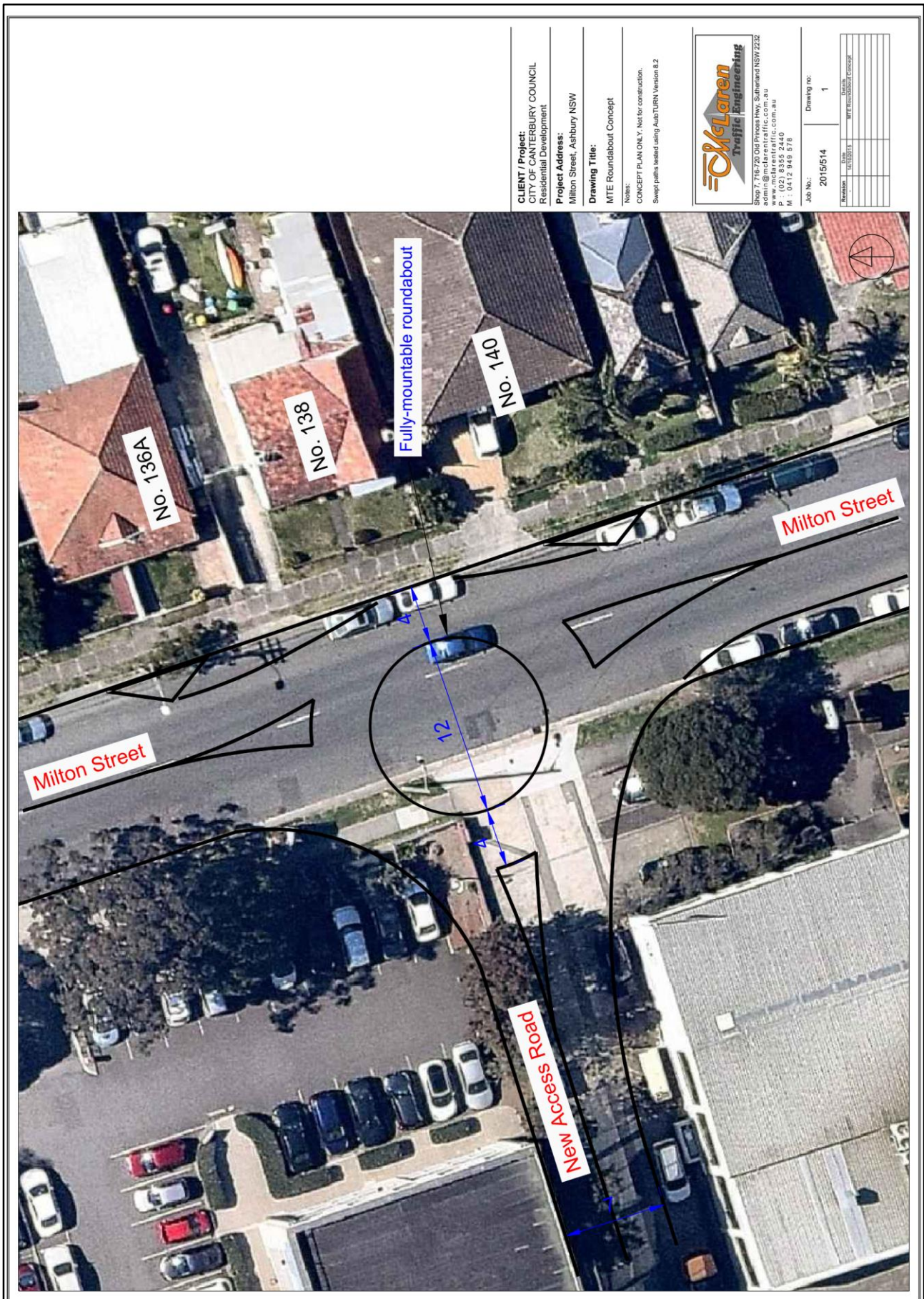
Yours faithfully
M^cLaren Traffic Engineering

A handwritten signature in black ink, appearing to read 'CMcLaren'.

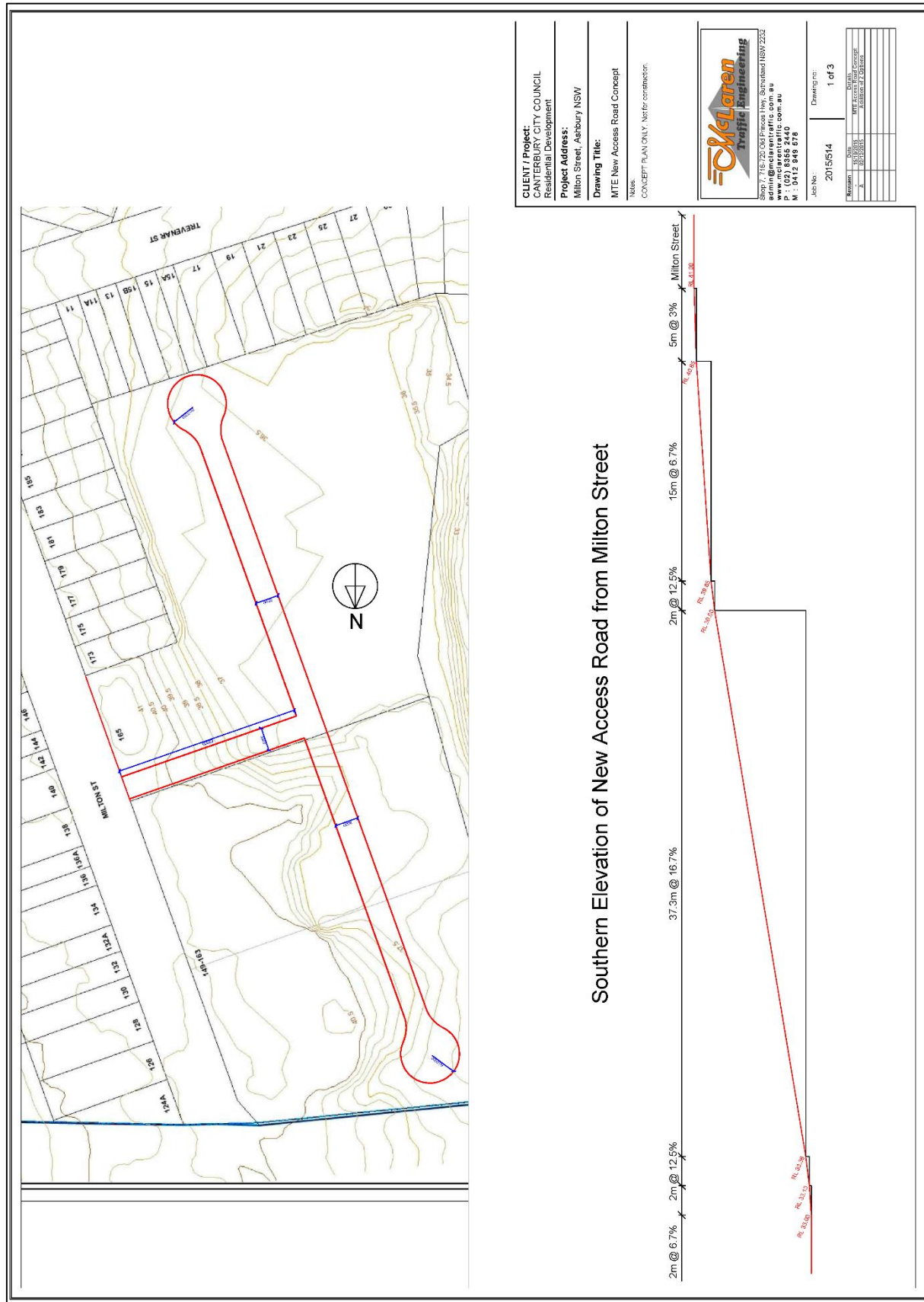
Craig M^cLaren
Director

BE Civil. Graduate Diploma (Transport Eng) MAITPM MITE [1985]
RMS Accredited Level 3 Road Safety Auditor
RMS Accredited Traffic Control Planner, Auditor & Certifier (Orange Card)

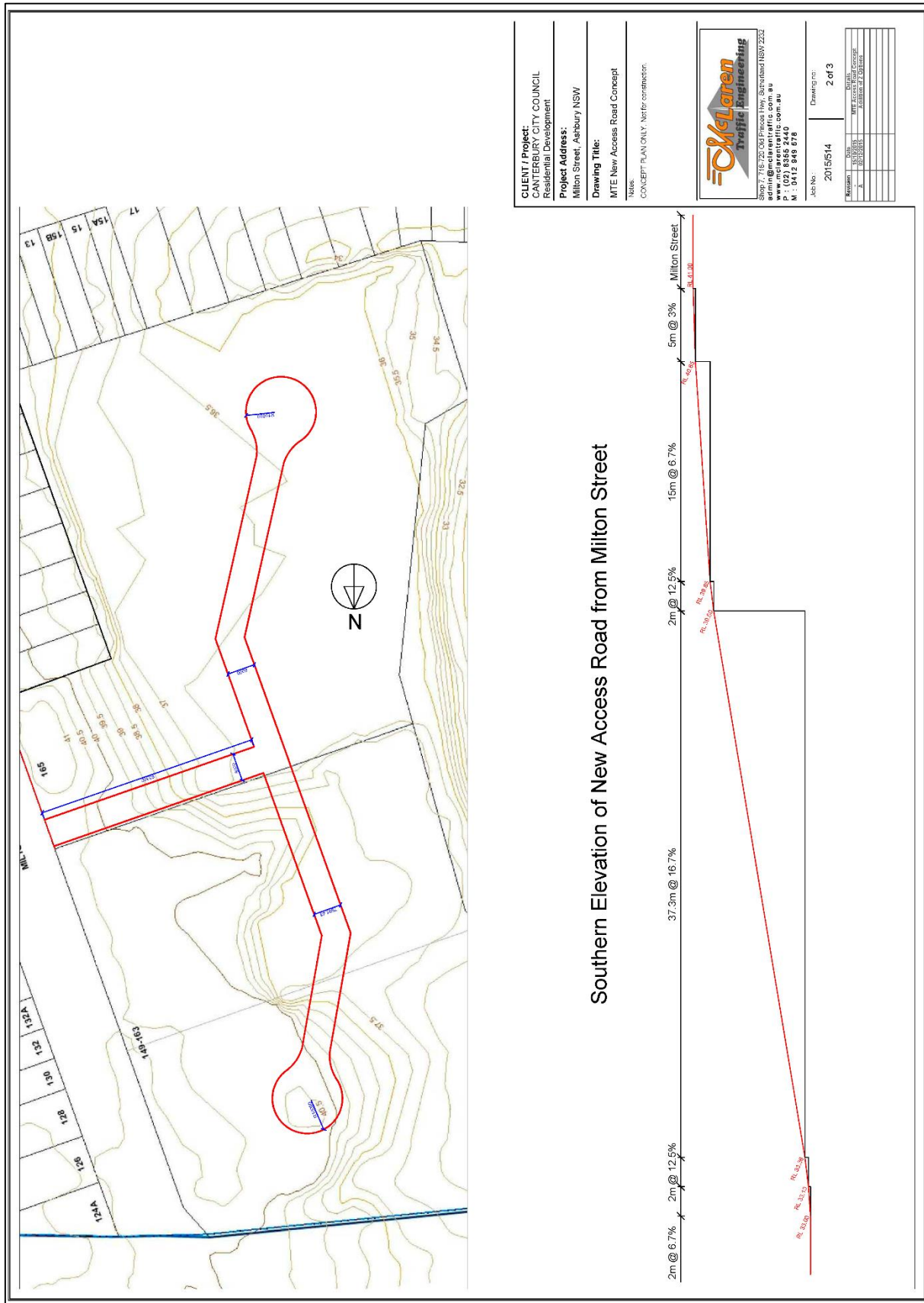
ANNEXURE A: ROUNDABOUT CONCEPT PLAN



ANNEXURE B: INTERNAL ACCESS ROAD CONCEPT PLAN
(SHEET 1 OF 3)

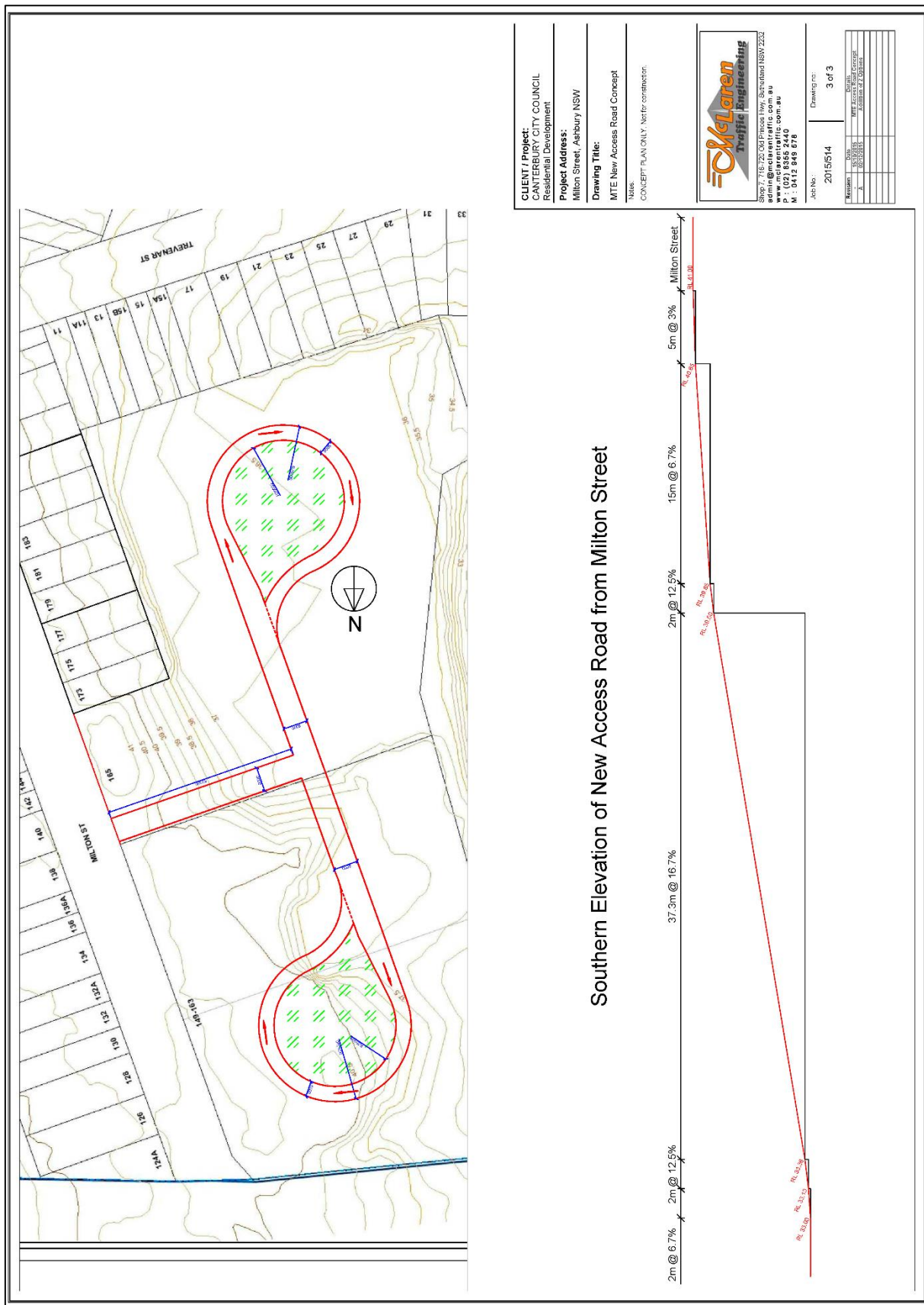


ANNEXURE B: INTERNAL ACCESS ROAD CONCEPT PLAN **(SHEET 2 OF 3)**



CLIENT / Project: CANTERBURY CITY COUNCIL Residential Development	
Project Address: Milton Street, Ashbury NSW	
Drawing Title: MTE New Access Road Concept	
Notes: CONCEPT PLAN ONLY. Not for construction.	
Shop 7, 716-720 Old Prices Hwy, Sutherland NSW 2232 GPO Box 1111, Sutherland NSW 2232 P : (02) 8355 2440 M : 0412 949 678 www.mclarentraffic.com.au	
Job No: 2015/514	Drawing no: 2 of 3
Revision:	Scale:
Author:	Check:
Drawn:	Approved:
Date:	Location:

ANNEXURE B: INTERNAL ACCESS ROAD CONCEPT PLAN
(SHEET 3 OF 3)



ANNEXURE C: SIDRA MOVEMENT SUMMARIES (SHEET 1 OF 4)

MOVEMENT SUMMARY

▽ Site: FU AM - MIL/SITE (Traffix rate)

Milton Street / Site Access (Combined Driveways No.149-163)
AM Peak Period
Existing w/ Traffix rate
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
South: Milton Street (S)											
1	L2	68	0.0	0.262	4.6	LOS A	0.0	0.00	0.07	49.1	
2	T1	439	0.0	0.262	0.0	LOS A	0.0	0.00	0.07	49.5	
Approach		507	0.0	0.262	0.6	NA	0.0	0.00	0.07	49.5	
North: Milton Street (N)											
8	T1	486	0.0	0.315	0.7	LOS A	0.9	6.6	0.20	0.08	49.0
9	R2	68	0.0	0.315	7.5	LOS A	0.9	6.6	0.20	0.08	48.0
Approach		555	0.0	0.315	1.5	NA	0.9	6.6	0.20	0.08	48.9
West: Combined Sites											
10	L2	17	0.0	0.056	6.1	LOS A	0.2	1.3	0.53	0.72	44.3
12	R2	17	0.0	0.056	11.4	LOS A	0.2	1.3	0.53	0.72	43.9
Approach		34	0.0	0.056	8.7	LOS A	0.2	1.3	0.53	0.72	44.1
All Vehicles		1096	0.0	0.315	1.3	NA	0.9	6.6	0.12	0.10	49.0

MOVEMENT SUMMARY

▽ Site: FU PM - MIL/SITE (Traffix rate)

Milton Street / Site Access (Combined Driveways No.149-163)
PM Peak Period
Existing w/ Traffix rate
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
South: Milton Street (S)											
1	L2	14	0.0	0.277	4.6	LOS A	0.0	0.00	0.01	49.4	
2	T1	526	0.0	0.277	0.0	LOS A	0.0	0.00	0.01	49.9	
Approach		540	0.0	0.277	0.1	NA	0.0	0.00	0.01	49.9	
North: Milton Street (N)											
8	T1	515	0.0	0.278	0.1	LOS A	0.2	1.4	0.05	0.02	49.8
9	R2	14	0.0	0.278	7.7	LOS A	0.2	1.4	0.05	0.02	48.8
Approach		528	0.0	0.278	0.3	NA	0.2	1.4	0.05	0.02	49.7
West: Combined Sites											
10	L2	54	0.0	0.189	6.8	LOS A	0.6	4.5	0.60	0.79	43.8
12	R2	54	0.0	0.189	12.3	LOS A	0.6	4.5	0.60	0.79	43.4
Approach		107	0.0	0.189	9.6	LOS A	0.6	4.5	0.60	0.79	43.6
All Vehicles		1176	0.0	0.278	1.1	NA	0.6	4.5	0.08	0.09	49.2

ANNEXURE C: SIDRA MOVEMENT SUMMARIES (SHEET 2 OF 4)

MOVEMENT SUMMARY

▽ Site: FU AM - MIL/SITE (0.3 rate)

Milton Street / Site Access (Combined Driveways No.149-163)
AM Peak Period
Existing w/ 0.3 rate
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles										
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec	veh	m		per veh	km/h
South: Milton Street (S)										
1	L2	26	0.0	0.239	4.6	LOS A	0.0	0.00	0.03	49.3
2	T1	439	0.0	0.239	0.0	LOS A	0.0	0.00	0.03	49.8
Approach		465	0.0	0.239	0.3	NA	0.0	0.00	0.03	49.8
North: Milton Street (N)										
8	T1	486	0.0	0.274	0.2	LOS A	0.3	0.08	0.03	49.6
9	R2	27	0.0	0.274	7.0	LOS A	0.3	0.08	0.03	48.6
Approach		514	0.0	0.274	0.6	NA	0.3	0.08	0.03	49.5
West: Combined Sites										
10	L2	107	0.0	0.335	7.1	LOS A	1.4	0.58	0.83	43.7
12	R2	107	0.0	0.335	12.4	LOS A	1.4	0.58	0.83	43.3
Approach		215	0.0	0.335	9.8	LOS A	1.4	0.58	0.83	43.5
All Vehicles		1194	0.0	0.335	2.1	NA	1.4	0.14	0.18	48.4

MOVEMENT SUMMARY

▽ Site: FU PM - MIL/SITE (0.3 rate)

Milton Street / Site Access (Combined Driveways No.149-163)
PM Peak Period
Existing w/ 0.3 rate
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles										
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec	veh	m		per veh	km/h
South: Milton Street (S)										
1	L2	107	0.0	0.328	4.6	LOS A	0.0	0.00	0.09	48.9
2	T1	526	0.0	0.328	0.0	LOS A	0.0	0.00	0.09	49.4
Approach		634	0.0	0.328	0.8	NA	0.0	0.00	0.09	49.3
North: Milton Street (N)										
8	T1	515	0.0	0.385	1.7	LOS A	2.0	0.33	0.13	48.0
9	R2	107	0.0	0.385	9.1	LOS A	2.0	0.33	0.13	47.1
Approach		622	0.0	0.385	3.0	NA	2.0	0.33	0.13	47.9
West: Combined Sites										
10	L2	27	0.0	0.110	6.7	LOS A	0.4	0.62	0.78	43.4
12	R2	26	0.0	0.110	14.3	LOS A	0.4	0.62	0.78	43.0
Approach		54	0.0	0.110	10.4	LOS A	0.4	0.62	0.78	43.2
All Vehicles		1309	0.0	0.385	2.2	NA	2.0	0.18	0.14	48.4

ANNEXURE C: SIDRA MOVEMENT SUMMARIES (SHEET 3 OF 4)

MOVEMENT SUMMARY



Site: FU AM - MIL/SITE (0.3 rate)

Milton Street / Site Access (Roundabout Concept)
AM Peak Period
Existing w/ 0.3 rate
Roundabout

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
South: Milton Street (S)											
1	L2	26	0.0	0.313	3.7	LOS A	2.2	15.1	0.16	0.39	46.8
2	T1	439	0.0	0.313	3.5	LOS A	2.2	15.1	0.16	0.39	47.6
Approach		465	0.0	0.313	3.5	LOS A	2.2	15.1	0.16	0.39	47.5
North: Milton Street (N)											
8	T1	486	0.0	0.408	4.1	LOS A	3.1	21.9	0.39	0.47	46.8
9	R2	27	0.0	0.408	7.6	LOS A	3.1	21.9	0.39	0.47	46.7
Approach		514	0.0	0.408	4.3	LOS A	3.1	21.9	0.39	0.47	46.8
West: New Site Access											
10	L2	107	0.0	0.242	6.3	LOS A	1.4	9.5	0.59	0.72	44.6
12	R2	107	0.0	0.242	9.7	LOS A	1.4	9.5	0.59	0.72	45.2
Approach		215	0.0	0.242	8.0	LOS A	1.4	9.5	0.59	0.72	44.9
All Vehicles		1194	0.0	0.408	4.7	LOS A	3.1	21.9	0.34	0.48	46.7

MOVEMENT SUMMARY



Site: FU PM - MIL/SITE (0.3 rate)

Milton Street / Site Access (Roundabout Concept)
PM Peak Period
Existing w/ 0.3 rate
Roundabout

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
South: Milton Street (S)											
1	L2	107	0.0	0.490	4.3	LOS A	3.8	26.6	0.39	0.47	46.2
2	T1	526	0.0	0.490	4.2	LOS A	3.8	26.6	0.39	0.47	46.9
Approach		634	0.0	0.490	4.2	LOS A	3.8	26.6	0.39	0.47	46.8
North: Milton Street (N)											
8	T1	515	0.0	0.411	3.5	LOS A	3.4	24.0	0.18	0.43	47.2
9	R2	107	0.0	0.411	7.0	LOS A	3.4	24.0	0.18	0.43	47.1
Approach		622	0.0	0.411	4.1	LOS A	3.4	24.0	0.18	0.43	47.2
West: New Site Access											
10	L2	27	0.0	0.067	6.5	LOS A	0.4	2.5	0.61	0.68	44.6
12	R2	26	0.0	0.067	9.9	LOS A	0.4	2.5	0.61	0.68	45.1
Approach		54	0.0	0.067	8.1	LOS A	0.4	2.5	0.61	0.68	44.8
All Vehicles		1309	0.0	0.490	4.3	LOS A	3.8	26.6	0.30	0.46	46.9

ANNEXURE C: SIDRA MOVEMENT SUMMARIES (SHEET 4 OF 4)

MOVEMENT SUMMARY



Site: FU AM - MIL/SITE (0.3 rate + 2% for 10yrs)

Milton Street / Site Access (Roundabout Concept)

AM Peak Period

Existing w/ 0.3 rate + 10yr growth @ 2%

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
South: Milton Street (S)											
1	L2	32	0.0	0.384	3.7	LOS A	3.0	20.8	0.20	0.39	46.7
2	T1	535	0.0	0.384	3.6	LOS A	3.0	20.8	0.20	0.39	47.5
Approach		566	0.0	0.384	3.6	LOS A	3.0	20.8	0.20	0.39	47.4
North: Milton Street (N)											
8	T1	593	0.0	0.511	4.4	LOS A	4.5	31.2	0.50	0.50	46.5
9	R2	34	0.0	0.511	7.9	LOS A	4.5	31.2	0.50	0.50	46.4
Approach		626	0.0	0.511	4.6	LOS A	4.5	31.2	0.50	0.50	46.5
West: New Site Access											
10	L2	131	0.0	0.320	7.3	LOS A	1.9	13.4	0.68	0.78	44.1
12	R2	131	0.0	0.320	10.7	LOS A	1.9	13.4	0.68	0.78	44.7
Approach		261	0.0	0.320	9.0	LOS A	1.9	13.4	0.68	0.78	44.4
All Vehicles		1454	0.0	0.511	5.0	LOS A	4.5	31.2	0.41	0.51	46.4

MOVEMENT SUMMARY



Site: FU PM - MIL/SITE (0.3 rate + 2% for 10yrs)

Milton Street / Site Access (Roundabout Concept)

PM Peak Period

Existing w/ 0.3 rate + 10yr growth @ 2%

Roundabout

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
South: Milton Street (S)											
1	L2	131	0.0	0.610	4.7	LOS A	5.6	39.5	0.52	0.51	45.8
2	T1	641	0.0	0.610	4.6	LOS A	5.6	39.5	0.52	0.51	46.6
Approach		772	0.0	0.610	4.6	LOS A	5.6	39.5	0.52	0.51	46.4
North: Milton Street (N)											
8	T1	627	0.0	0.503	3.6	LOS A	4.9	34.4	0.24	0.43	47.0
9	R2	131	0.0	0.503	7.1	LOS A	4.9	34.4	0.24	0.43	46.9
Approach		758	0.0	0.503	4.2	LOS A	4.9	34.4	0.24	0.43	47.0
West: New Site Access											
10	L2	34	0.0	0.093	7.5	LOS A	0.5	3.8	0.69	0.74	44.1
12	R2	32	0.0	0.093	10.8	LOS A	0.5	3.8	0.69	0.74	44.6
Approach		65	0.0	0.093	9.1	LOS A	0.5	3.8	0.69	0.74	44.3
All Vehicles		1595	0.0	0.610	4.6	LOS A	5.6	39.5	0.39	0.48	46.6