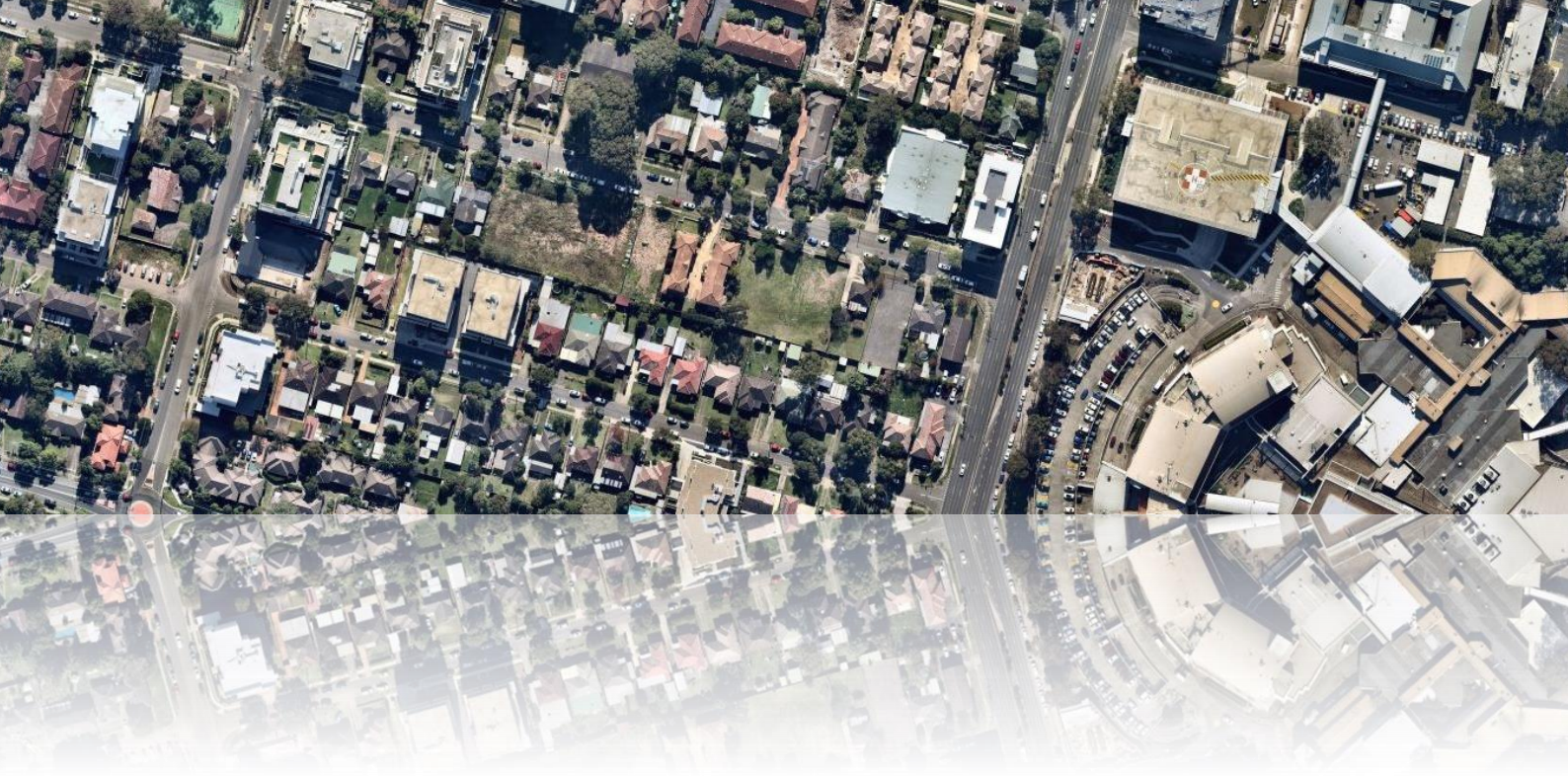

TRAFFIC AND PARKING IMPACT ASSESSMENT OF PROPOSED HIGH DENSITY RESIDENTIAL DEVELOPMENT AT 10 - 14 LETHBRIDGE STREET, PENRITH

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Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

200764.01FB - 3 December 2021

Development Type: **Proposed High Density Residential Development**

Site Address: **10 - 14 Lethbridge Street, Penrith**

Prepared for: **PBD Architects**

Document reference: **200764.01FB**

Status	Issue	Prepared By	Checked By	Date
Draft	A	TS		June 2021
Draft	B	TM	DF	4 November 2021
Final	A	TM		12 November 2021
Final	B	TM	DF	3 December 2021

TABLE OF CONTENTS

1 INTRODUCTION

M^CLaren Traffic Engineering was commissioned by *PBD Architects* to provide a Traffic and Parking Impact Assessment of the Proposed High Density Residential Development at 10 - 14 Lethbridge Street, Penrith as depicted in **Annexure A**.

1.1 Description and Scale of Development

The proposed development has the following characteristics relevant to traffic and parking, with the relevant plans reproduced in **Annexure A** for reference:

- A total of 36 units across six (6) storeys consisting of:
    - Nine (9) x one-bedroom apartments;
    - 19 x two-bedroom apartments;
    - Eight (8) x three-bedroom apartments;
- Two (2) basement parking levels with vehicular access via a proposed two-way driveway from Lethbridge Street, accommodating a total of 53 car spaces including:
    - 45 residential car spaces including four (4) disabled spaces;
    - Eight (8) visitor car spaces.

1.2 State Environmental Planning Policy (Infrastructure) 2007

The proposed development does not qualify as a traffic generating development with relevant size and/or capacity under *Clause 104* of the *SEPP (Infrastructure) 2007*. Accordingly, formal referral to Transport for New South Wales (TfNSW) is unnecessary, and the application can be assessed by Penrith City Council officers accordingly.

1.3 Site Description

The subject development involves the amalgamation of four (4) lots and is currently zoned *R4 – High Density Residential* under the Penrith Council LEP 2010. The site has a sole frontage to Lethbridge Street to the north.

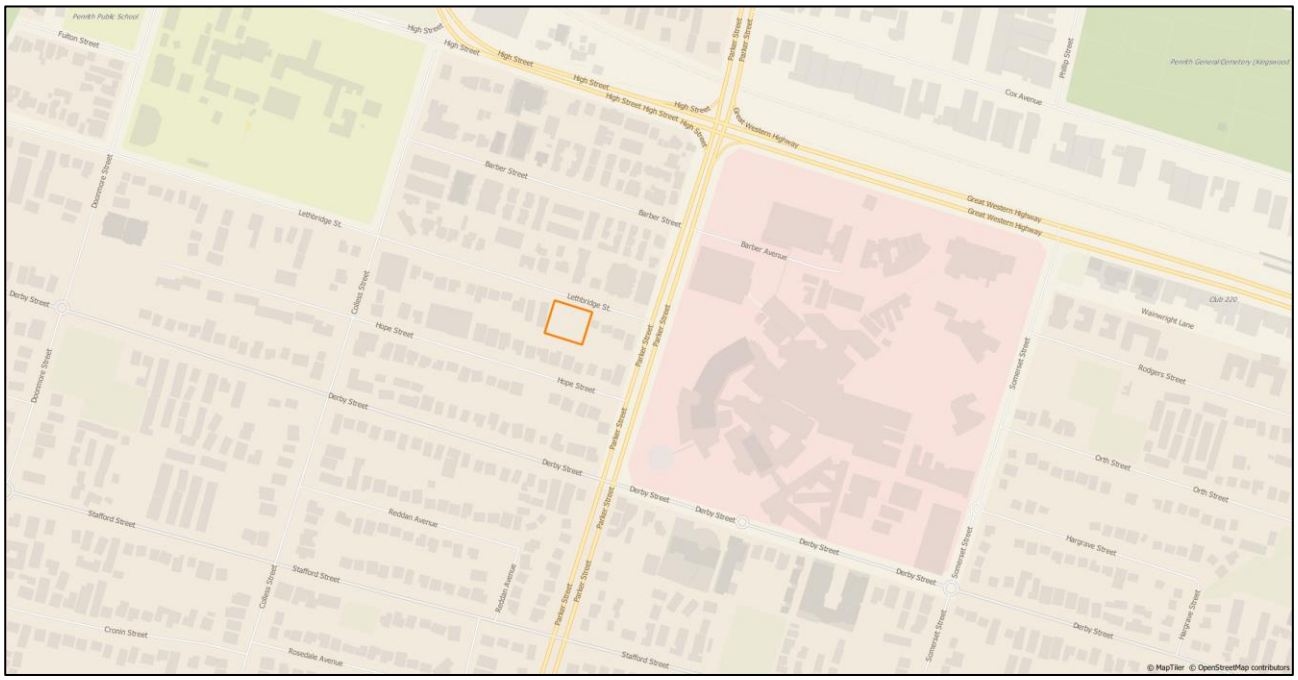
The site is generally surrounded by various development types with Nepean Hospital 100m to the east, Penrith Selective High School 300m to the west, Penrith Public School 500m to the west and Kingswood Train Station 1km walking distance to the north-east.

1.4 Site Context

The location of the site is shown on an aerial photo and a street map in **Figure 1** and **Figure 2** respectively.

Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

The road network servicing the site has characteristics as described in the following sub-sections.

2.1.1 Lethbridge Street

- Unclassified LOCAL Road;
- Approximately 10m wide two-way carriageway (one lane in each direction) and kerbside parking;
- Signposted 50km/h speed limit;
- 'No Stopping' restrictions for 30m along the northern side of the road;
- Unrestricted kerbside parking permitted along both sides of the road.

2.1.2 Parker Street

- TfNSW Classified STATE ARTERIAL Road (No. 154);
- Approximately 24m wide dual carriageway within near vicinity of the site facilitating three (3) lanes in each direction;
- Signposted 70km/h speed limit;
- 'No Stopping' restrictions on the western side of the road;
- Generally, unrestricted kerbside parking permitted on the eastern side of the road.

2.1.3 Colless Street

- Unclassified COLLECTOR Road;
- Approximately 11m wide two-way carriageway (one lane in each direction) and kerbside parking;
- Default 50km/h speed limit;
- 40km/h speed limit applies during school zone hours;
- Unrestricted kerbside parking permitted along both sides of the road.

2.1.4 Existing Traffic Management

- GIVE-WAY controlled intersection of Lethbridge Street / Parker Street;
- STOP SIGN controlled intersection of Colless Street / Lethbridge Street;

2.2 *Existing Traffic Environment*

Intersection traffic surveys were conducted at the intersections of Lethbridge Street / Parker Street and Lethbridge Street / Colless Street from 7:00am to 9:30am and 2:30pm to 6:30pm on Wednesday 2 June 2021 representing a typical operating weekday. The peak hourly volumes are illustrated in **Figure 3** below, with detailed results provided in **Annexure B** for reference.

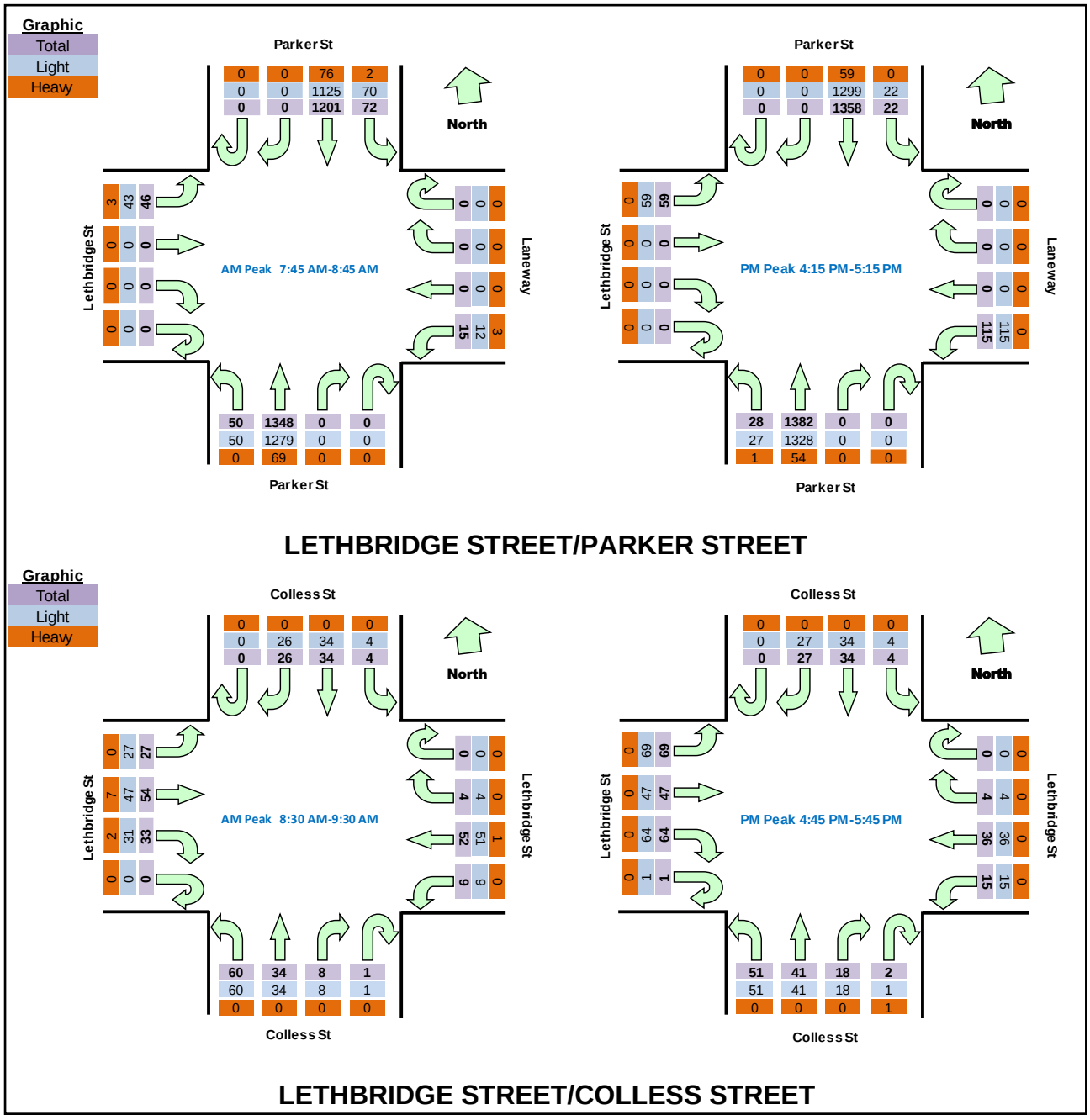


FIGURE 3: TRAFFIC SURVEY RESULTS

2.2.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 1** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Lethbridge Street /Parker Street	AM	0.26	0.5 (Worst: 6.4)	**NA** (Worst: A)	Give Way	LT from Parker Street	0.2 veh (1.3m) Lethbridge Street
	PM	0.26	0.4 (Worst: 6.5)	**NA** (Worst: A)		LT from Parker Street	0.2 veh (1.6m) Lethbridge Street
Colless Street /Lethbridge Street	AM	0.08	2.8 (Worst: 5.6)	**NA** (Worst: A)	Give Way	RT from Colless Street	0.3 veh (2.2m) Colless Street
	PM	0.10	3.3 (Worst: 5.6)	**NA** (Worst: A)		RT from Colless Street	0.4 veh (3m) Colless Street

NOTES:
(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) The 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.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown, the relevant intersections are currently performing at a high level of efficiency, with a level of service “A” or “B” conditions in both the AM & PM peak hour periods. The level of service “A” and “B” performance is characterised by low approach delays and spare capacity.

2.3 Public Transport

The subject site has access to existing bus stops (ID: 2747343) located approximately 350m walking distance to the south and (ID 2750440) located approximately 500m walking distance to the south west of site on Lethbridge Street. The bus stops services existing bus route 774 (Mount Druitt to Penrith via Nepean Hospital), 775 (Mount Druitt to Penrith via Erskine Park), 776 (Mount Druitt to Penrith via St Clair) and 789 (Luddenham to Penrith) provided by Busways Western Sydney.

Kingswood Train Station is located 1km walking distance to the north east of the subject site, servicing the T1 – Western Line. A train service is provided every 5 – 10 minutes in commuter peak periods and provides direct access between Emu Plains and Sydney CBD.

The location of the site subject to the surrounding public transport network is shown in **Figure 4**.

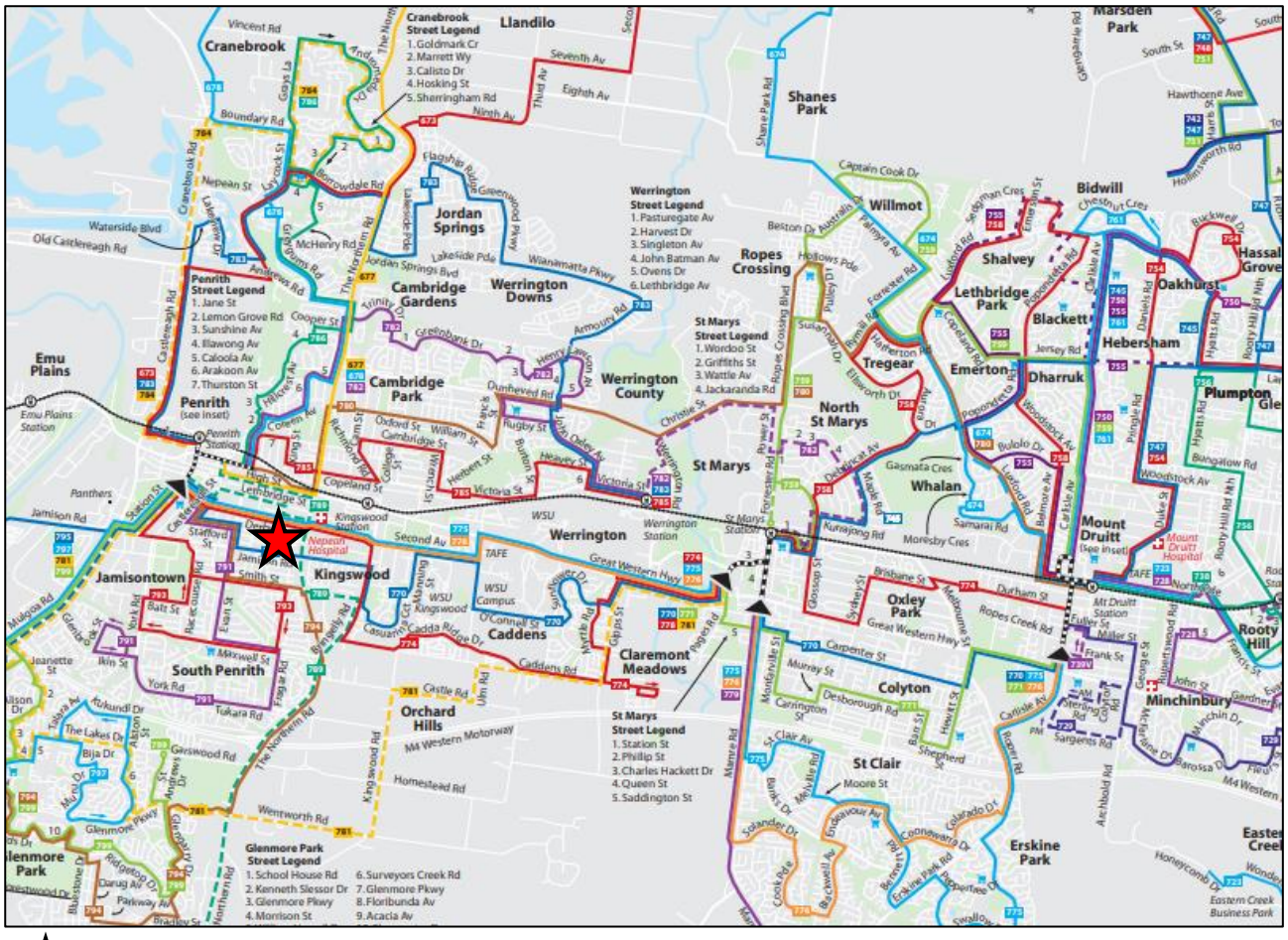


FIGURE 4: PUBLIC TRANSPORT NETWORK MAP

2.4 Future Road and Infrastructure Upgrades

From Penrith Council Development Application tracker and website, it appears that there are no future planned road or public transport changes that will affect traffic conditions within the immediate vicinity of the subject site.

3 PARKING ASSESSMENT

3.1 Council Parking Requirement

The Penrith Development Control Plan 2014 (PDCP 2014) Section 10.5.1 Parking provides the following requirements for the provision of car parking for residential flat building developments:

> *Residential Flat Buildings*
>
> *1 space per 1 or 2 bedrooms*
>
> *2 spaces per 3 or more bedrooms*
>
> *1 space per 40 units for service vehicles*
>
> *In addition, visitor parking is to be provided for developments that have 5 or more dwellings: 1 space per every 5 dwellings, or part thereof.*
>
> *1 space for car washing for every 50 units, up to a maximum of 4 spaces per building.*

Table 2 presents the parking requirements of the proposal according to the Council's above car parking rates.

TABLE 2: DCP PARKING RATES

Land Use	Type	Scale	Rate	Minimum Spaces Required	Parking provided
Residential Flat Building	1 Bed	9	1 per unit	9	9
	2 Bed	19	1 per unit	19	20
	3 Bed	8	2 per unit	16	16
	Visitor	36	0.2 per unit	7.2 (8)	8
TOTAL		**-**	**-**	**52**	**53**

As shown, strict application of the DCP requires the provision of **52** car parking spaces, (with **44** for resident use and **8** for visitor use). The proposed plans detail the provision of **53** car parking spaces, resulting in compliance with Council's DCP parking requirements.

3.2 Accessible / Disabled Parking

Penrith Council's DCP does not outline disabled car parking rates for residential flat building developments. As such, reference is made to *Table D3.5* of the *Building Code of Australia* (BCA) as part of the *National Construction Code 2019* (NCC) which categorises a child care centre as a Class 9b building and therefore requires the provision of disable car parking at a rate of:

> *Class 9b* *1 space for every 50 carparking spaces or part thereof.*

In accordance with the BCA requirements, one (**1**) disabled car parking space is to be provided. The proposed car parking layout details the provision of four (**4**) disabled car parking space as per with *AS2890.6:2009*, complying with BCA requirements.

3.3 Bicycle & Motorcycle Parking Requirements

The Penrith Council DCP 2014 does not require the provision of motorcycle parking, as such no motorcycle has been provided, satisfying Council requirements.

Council's DCP requires that bicycle parking be provided in accordance with the suggested bicycle parking provision rates outlined in *'Planning Guidelines for Walking and Cycling'* (NSW Government 2004) and compliant to *AS2890.3:1993 Bicycle Parking Facilities*. This requirement results in a required provision of nine (**9**) bicycle spaces, which have been provided within the proposed plans.

3.4 Servicing & Loading

The Penrith City Council DCP specifies the requirement of service facilities and parking at a rate of one (1) service space per 40 units, resulting in a requirement of one (**1**) delivery space. The proposed car parking layout details a 10m x 3.5m wide loading bay, satisfying Council's DCP.

Waste collection will take place off-street as per the waste management plan. The dedicated waste collection bay accessible from Lethbridge Street is of sufficient size to facilitate collection by Council's specified 9.7m Heavy Rigid Rear Load Waste Collection Vehicle, which can compliantly access and egress the site in a forward direction (swept paths provided in **Annexure D**). The ramp gradients which will be used by Council's 9.7m waste vehicle are compliant with *Penrith City Council's Residential Flat Building Waste Management Guidelines* (relevant page attached in **Annexure E**) and are therefore supported for access form this specified waste vehicle.

Council's DCP specifies the requirement of one (1) car washing bay for every 50 units, resulting in a requirement of one (**1**) car wash bay. The proposed car parking layout identifies *'V2'* as a car washing bay, satisfying Council's DCP.

3.5 Car Park Design & Compliance

The car parking layout as depicted in **Annexure A,** has been assessed to achieve the relevant clauses and objectives of *AS2890.1:2004*, *AS2890.2:2002* and *AS2890.6:2009*. Any variances from standards are addressed in the following subsections including required changes, if any. Swept path testing has been undertaken and are reproduced within **Annexure D** for reference.

The proposed car parking and vehicular access design achieves the following:

- 7.3m width two-way driveway facilitating access to Lethbridge Street;
- Pedestrian sight triangle of 2m by 2.5m at the property boundary;
- Minimum 5.8m width parking aisles;

- Compliant ramp grades not exceeding 25% and no grade change greater than 12.5% (no transitions travelled by the specified waste collection vehicle exceeding 8.3% over 4m);
- Minimum 5.4m length, 2.4m width spaces for staff / residents;
- Minimum 5.4m length, 2.6m width spaces for parents / visitors;
- Minimum 5.4m length, 2.4m width disabled spaces with adjacent associated 5.4m length, 2.4m width shared space;
- Minimum 0.3m clearance to high objects from trafficable areas;
- Minimum headroom of 2.2m for general circulation and 2.5m headroom clearance provided over disabled and adaptable parking areas;
- Minimum headroom of 3.5m for general circulation of waste collection vehicles.

4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

4.1 Traffic Generation

The TfNSW *Technical Direction 2013/04A 2013* provides the following rates of traffic generation for high density residential flat buildings:

AM Peak Hour

Average: 0.19 trips per unit

High Range: 0.32 trips per unit

PM Peak Hour

Average: 0.15 trips per unit

High Range: 0.41 trips per unit

Considering the location and context of the site, the "high range" rates have been adopted to provide for a conservative result. The resulting traffic generation is summarised in **Table 3**.

TABLE 3: ESTIMATED TRAFFIC GENERATION

Use	Scale	Peak	Generation Rate	Trips
Residential Flat Building	36 units	AM	0.32 trips per unit	11.52 (**12**) (2 in, 10 out)
		PM	0.41 trips per unit	14.76 (**15**) (12 in, 3 out)

Note: (1) Assumes 20% inbound, 80% outbound in the AM peak hour and 80% inbound, 20% outbound in the PM peak hour.

As shown, the expected traffic generation associated with the proposed development is in the order of **12** vehicle trips in the AM peak period (2 in, 10 out) and **15** vehicle trips in the PM peak period (12 in, 3 out).

4.2 Traffic Assignment

The road network, traffic surveys and locations of residential areas surrounding the site have been assessed and the following traffic assignment has been assumed for all traffic to and from the site:

- 50% to / from Colless Street;
- 50% to / from Parker Street;

4.3 Traffic Impact

The traffic generation outlined in **Section 4.1** & **4.2** above has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 4**.

TABLE 4: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Lethbridge Street /Parker Street	AM	0.26	0.5 (Worst: 6.4)	**NA** (Worst: A)	Give Way	LT from Parker Street	0.2 veh (1.3m) Lethbridge Street
	PM	0.26	0.4 (Worst: 6.5)	**NA** (Worst: A)		LT from Parker Street	0.2 veh (1.6m) Lethbridge Street
Colless Street /Lethbridge Street	AM	0.08	2.8 (Worst: 5.6)	**NA** (Worst: A)	Give Way	RT from Colless Street	0.3 veh (2.2m) Colless Street
	PM	0.10	3.3 (Worst: 5.6)	**NA** (Worst: A)		RT from Colless Street	0.4 veh (3m) Colless Street
FUTURE PERFORMANCE							
Lethbridge Street /Parker Street	AM	0.26	0.5 (Worst: 6.4)	**NA** (Worst: A)	Give Way	LT from Parker Street	0.2 veh (1.5m) Lethbridge Street
	PM	0.262	0.5 (Worst: 6.5)	**NA** (Worst: A)		LT from Parker Street	0.2 veh (1.6m) Lethbridge Street
Colless Street /Lethbridge Street	AM	0.083	2.9 (Worst: 5.6)	**NA** (Worst: A)	Give Way	RT from Colless Street	0.3 veh (2.3m) Colless Street
	PM	0.104	3.4 (Worst: 5.7)	**NA** (Worst: A)		RT from Colless Street	0.4 veh (3m) Colless Street

Notes: Refer to **Table 1**

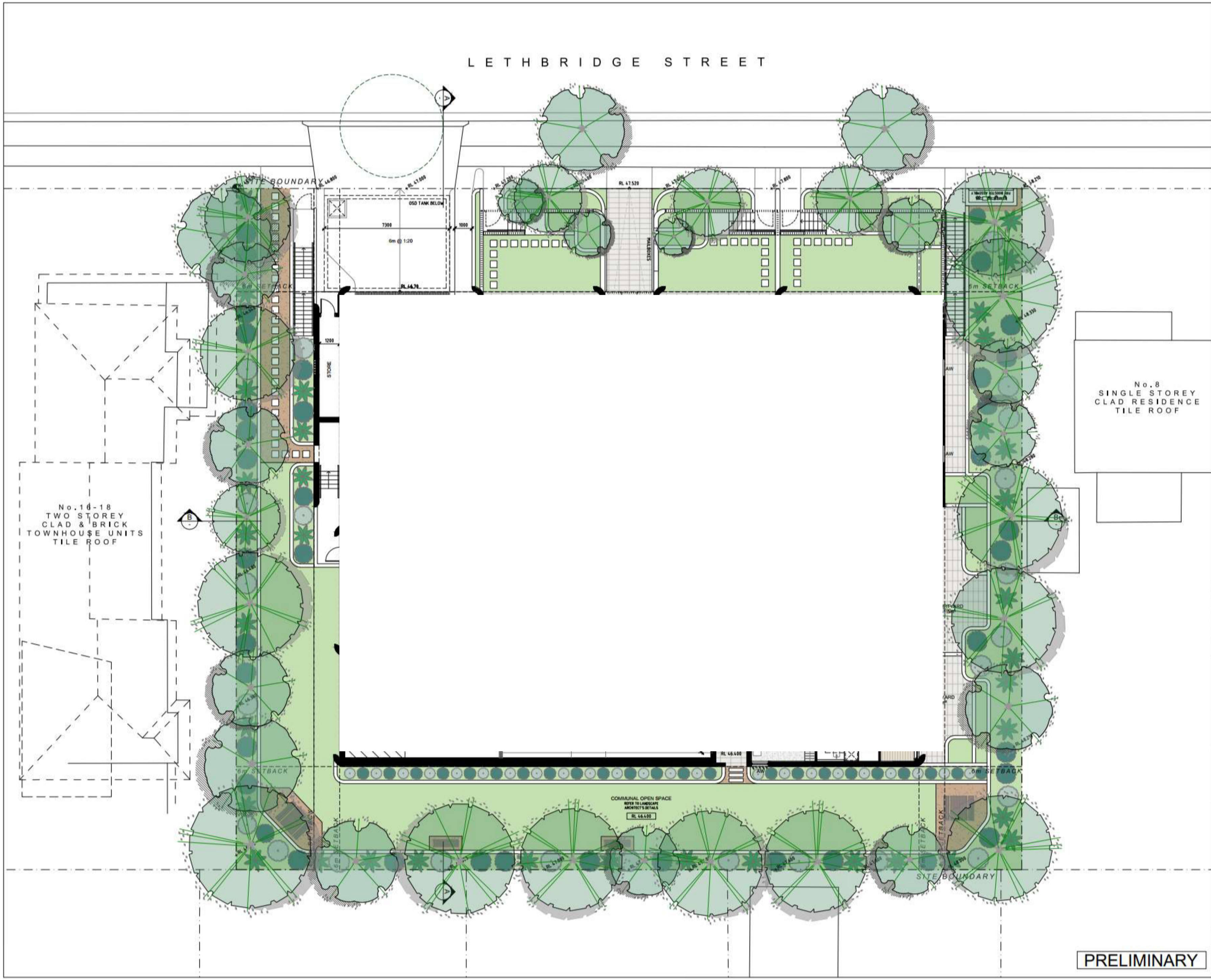
As shown, the intersection of Lethbridge Street / Parker Street and Colless Street / Lethbridge Street all retain the same overall level of service under future conditions with minimal delays and additional capacity, indicating that there will be negligible impact on the existing road network as a result of the proposed development.

5 CONCLUSION

In view of the foregoing, the subject proposed high density residential development proposal at 10 - 14 Lethbridge Street, Penrith (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic impact assessment are relevant to note:

- The proposal includes the provision of **53** car parking spaces within a proposed carpark, comprised of **44** for residential use and **8** for visitor use, satisfying the relevant controls applicable to the development, including Council's DCP requirements.
- Council's DCP requires the provision of nine (**9**) bicycle parking spaces which have been provided onsite resulting in compliance with Council's requirements.
- Council's DCP does not require the provision of motorcycle parking facilities.
- The parking areas of the site have been assessed against the relevant sections of *AS2890.1:2004*, *AS2890.2:2018* and *AS2890.6:2009* and have been found to satisfy the objectives of each standard. Swept path testing has been undertaken and is reproduced within **Annexure D**.
- The traffic generation of the proposed development has been estimated to be some **12** trips in the AM peak period (2 in, 10 out) and **15** trips in the PM peak period (12 in, 3 out). The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.0, indicating that there will be no detrimental impact to the performance of the intersections as a result of the generated traffic.

ANNEXURE A: PROPOSED PLANS
(3 SHEETS)



GENERAL NOTES:

- ALL WORKS TO COMPLY WITH BUILDING CODE OF AUSTRALIA, REQUIREMENTS OF RELEVANT STATUTORY AUTHORITIES/ LOCAL GOVERNMENT & RELEVANT AUSTRALIAN BUILDING STANDARDS
- DRAWINGS FOR THE PURPOSES OF DA ONLY - FURTHER CONSULTANT/ AUTHORITY COORDINATION WILL BE REQUIRED AT CC STAGE WHICH MAY IMPACT ON DESIGN AND PLANNING LAYOUTS
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LEGEND:

AG	ALUMINIUM FRAME GLAZING
AW	ALUMINIUM FRAME WINDOW
AT	ACCESSIBLE TOILET
B	BOLLARD
BT	ALUMINIUM BATTEN
CL	CLEAR
CO	CONCRETE
CU	A/C CONDENSER UNITS
EF	EXTERNAL FINISH
FCE	FENCE
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
FW	FLUTED CONCRETE WALL
GB	GLASS BALUSTRADE
HW	HIGHLIGHT WINDOW
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MV	MECHANICAL RISER TO FUTURE DETAIL
GC	GARBAGE CHUTE
MB	MAILBOX TO FUTURE DETAIL
MG	METAL GATE
P	RENDER AND PAINT FINISH
PB	PLANTERBOX
R	240L RECYCLING BIN
SC	SCREEN
SL	SKYLIGHT
ST	STORAGE
SW	SLIDING WINDOW
WT	HOT WATER UNITS

ISSUE	DATE	DESCRIPTION
A	21.11.10	DA LODGEMENT

N

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CLIENT:
FOBUPU PTY LTD

ARCHITECT:
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Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
PROPOSED RESIDENTIAL FLAT BUILDING
10 - 14 LETHBRIDGE STREET,
PENRITH

DRAWING TITLE:
GROUND FLOOR PLAN

DRAWN BY:	CHECKED BY:	
OR		
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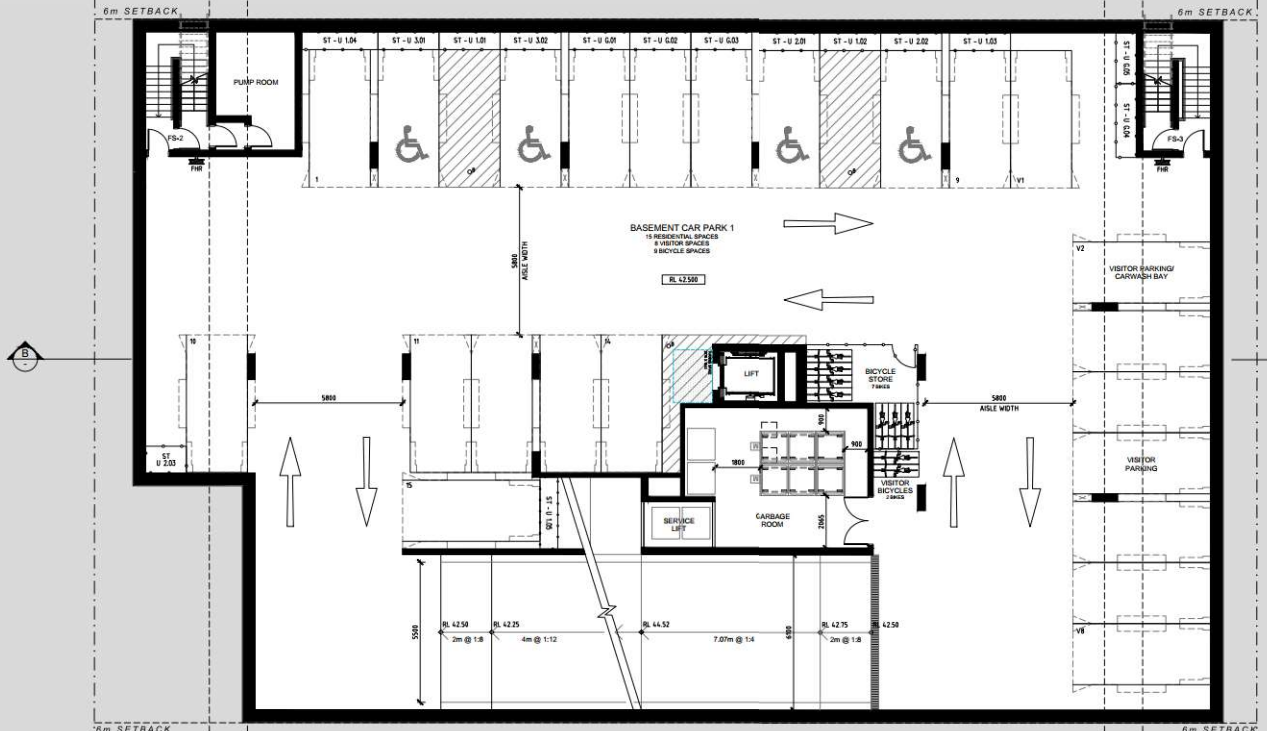
PROJECT NO: 2026		

PRELIMINARY



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SCALE 1:200 @ A3

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ARCHITECT:
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Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

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PROPOSED RESIDENTIAL FLAT BUILDING
10 - 14 LETHBRIDGE STREET,
PENRITH

DRAWING TITLE:
BASEMENT 1

DRAWN BY:	CHECKED BY:	
OR		
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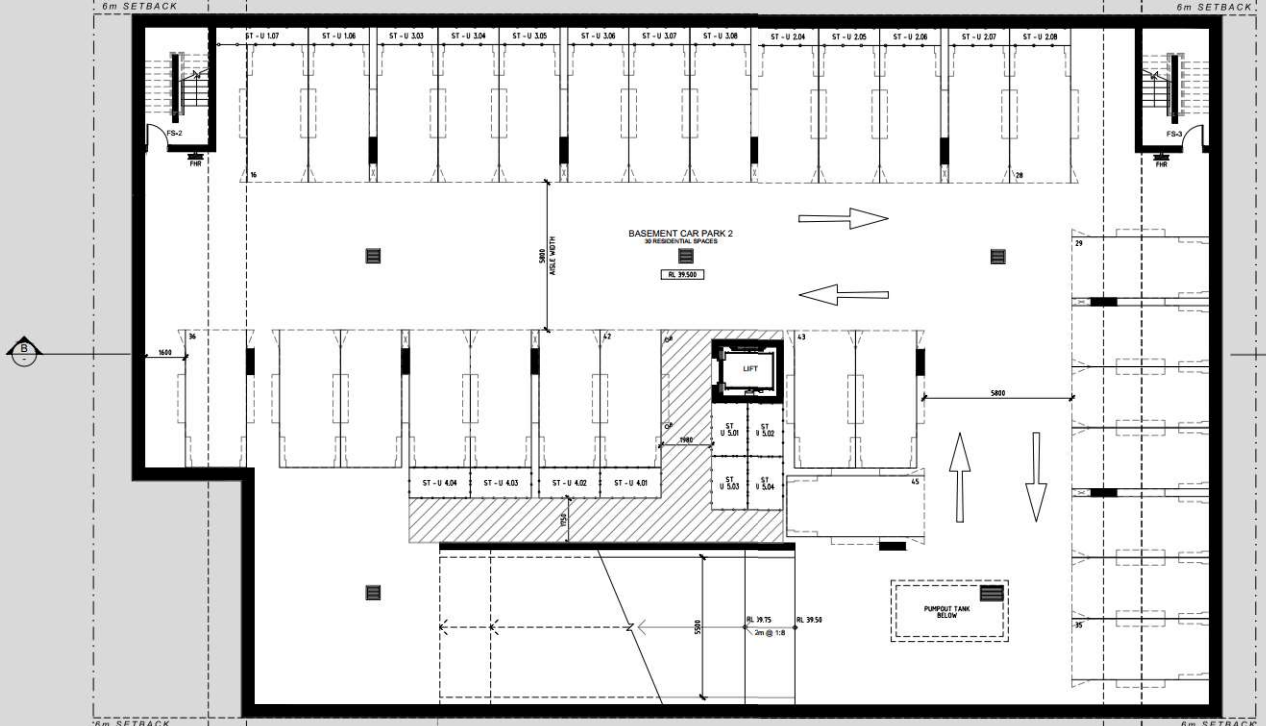
PROJECT NO: 2026		

PRELIMINARY



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ARCHITECT:
PBD | ARCHITECTS
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Level 2, 52 Albion Street, Surry Hills NSW 2010
Nominated Architect: Paul Buljevic NSW 7768

PROJECT:
PROPOSED RESIDENTIAL FLAT BUILDING
10 - 14 LETHBRIDGE STREET,
PENRITH

DRAWING TITLE:
BASEMENT 2

DRAWN BY:	CHECKED BY:	
OR		
SCALE: 1:100@A1 / 1:200@A3	DRAWING NO: DA100	ISSUE: A
PROJECT NO: 2026		

PRELIMINARY

ANNEXURE B: TRAFFIC SURVEY DATA
(2 SHEETS)

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Laneway and Parker St, Penrith

GPS -33.758933,150.771437

Date:	Wed 02/06/21
Weather:	Fine
Suburban:	Penrith
Customer:	McLaren

North:	Parker St
East:	Laneway
South:	Parker St
West:	Lethbridge St

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:30 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	4:15 PM-5:15 PM

All Vehicles

Time		North Approach Parker St				East Approach Laneway				South Approach Parker St				West Approach Lethbridge St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	0	211	16	0	0	0	5	0	0	184	6	0	0	0	8	2380	
7:15	7:30	0	0	306	21	0	0	0	9	0	0	281	8	0	0	0	21	2647	
7:30	7:45	0	0	280	19	0	0	0	13	0	0	285	11	0	0	0	11	2652	
7:45	8:00	0	0	271	25	0	0	0	4	0	0	366	7	0	0	0	12	2732	Peak
8:00	8:15	0	0	302	20	0	0	0	3	0	0	341	15	0	0	0	16	2678	
8:15	8:30	0	0	310	12	0	0	0	2	0	0	311	8	0	0	0	8	2624	
8:30	8:45	0	0	318	15	0	0	0	6	0	0	330	20	0	0	0	10	2477	
8:45	9:00	0	0	261	13	0	0	0	4	0	0	316	20	0	0	0	17		
9:00	9:15	0	0	323	9	0	0	0	9	0	0	278	7	0	0	0	17		
9:15	9:30	0	0	248	11	0	0	0	3	0	0	220	9	0	0	0	13		
14:30	14:45	0	0	318	9	0	0	0	14	0	0	275	8	0	0	0	13	2574	
14:45	15:00	0	0	302	9	0	0	0	16	0	0	302	3	0	0	0	13	2725	
15:00	15:15	0	0	324	1	0	0	0	16	0	0	266	10	0	0	0	18	2771	
15:15	15:30	0	0	307	5	0	0	0	23	0	0	301	6	0	0	0	15	2748	
15:30	15:45	0	0	349	7	0	0	0	24	0	0	388	5	0	0	0	15	2874	
15:45	16:00	0	0	338	11	0	0	0	19	0	0	304	4	0	0	0	15	2771	
16:00	16:15	0	0	318	7	0	0	0	18	0	0	249	3	0	0	0	17	2829	
16:15	16:30	0	0	339	9	0	0	0	19	0	0	391	8	0	0	0	17	2964	Peak
16:30	16:45	0	0	349	4	0	0	0	32	0	0	276	5	0	0	0	19	2854	
16:45	17:00	0	0	335	5	0	0	0	38	0	0	348	8	0	0	0	15	2820	
17:00	17:15	0	0	335	4	0	0	0	26	0	0	367	7	0	0	0	8	2725	
17:15	17:30	0	0	330	5	1	0	0	20	0	0	301	7	0	0	0	9	2602	
17:30	17:45	0	0	343	4	0	0	0	11	0	0	270	10	0	0	0	13	2467	
17:45	18:00	0	0	311	4	0	0	0	22	0	0	299	11	0	0	0	7		
18:00	18:15	0	0	278	4	0	0	0	13	0	0	317	4	0	0	0	8		
18:15	18:30	0	0	304	4	0	0	0	7	0	0	210	1	0	0	0	12		

Peak Time		North Approach Parker St				East Approach Laneway				South Approach Parker St				West Approach Lethbridge St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
7:45	8:45	0	0	1201	72	0	0	0	0	0	0	1348	50	0	0	0	46	2732
16:15	17:15	0	0	1358	22	0	0	0	115	0	0	1382	28	0	0	0	59	2964

Pedestrians Crossing

Time		North Approach Parker St		East Approach Laneway		South Approach Parker St		West Approach Lethbridge St		Hourly Total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	
7:00	7:15	0	7	1	5	0	0	0	2	76
7:15	7:30	0	6	2	0	0	0	0	3	88
7:30	7:45	0	12	2	2	0	0	0	5	91
7:45	8:00	1	14	2	5	0	0	0	7	80
8:00	8:15	4	12	2	4	0	0	1	4	56
8:15	8:30	0	6	1	2	0	0	0	5	31
8:30	8:45	1	1	2	4	0	0	0	2	22
8:45	9:00	1	2	0	1	0	0	0	1	12
9:00	9:15	0	0	0	1	0	0	0	1	7
9:15	9:30	0	0	0	2	0	0	1	2	5
14:30	14:45	4	6	6	1	0	0	1	3	74
14:45	15:00	2	0	8	4	0	0	6	1	68
15:00	15:15	4	0	6	0	0	0	5	2	52
15:15	15:30	6	0	1	1	0	0	4	3	46
15:30	15:45	4	0	5	1	0	0	5	0	43
15:45	16:00	0	0	0	2	0	0	2	1	48
16:00	16:15	3	0	5	0	0	0	1	2	47
16:15	16:30	5	0	2	3	0	0	1	1	43
16:30	16:45	11	0	2	1	0	0	6	0	35
16:45	17:00	0	0	0	3	0	0	1	0	17
17:00	17:15	2	0	0	3	0	0	2	0	16
17:15	17:30	0	0	0	2	0	0	2	0	15
17:30	17:45	0	0	0	0	0	0	0	2	17
17:45	18:00	1	0	0	0	0	0	0	2	15
18:00	18:15	5	0	0	0	0	0	1	0	12
18:15	18:30	4	0	1	0	0	0	1	0	6

Peak Time		North Approach Parker St		East Approach Laneway		South Approach Parker St		West Approach Lethbridge St		Peak hour total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	
7:45	8:45	6	33	7	15	0	0	1	18	80
16:15	17:15	18	0	4	10	0	0	10	1	43

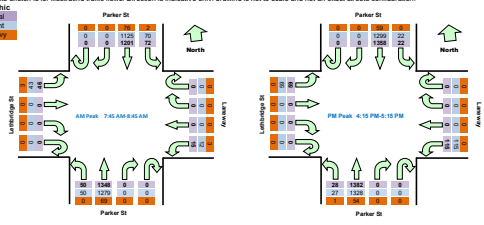
Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

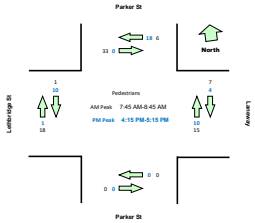
Graphic

Total

Light

Heavy





Light Vehicles

Time		North Approach Parker St				East Approach Laneway				South Approach Parker St				West Approach Lethbridge St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	193	15	0	0	0	4	0	0	168	6	0	0	0	8
7:15	7:30	0	0	283	21	0	0	0	9	0	0	263	8	0	0	0	21
7:30	7:45	0	0	254	18	0	0	0	12	0	0	268	11	0	0	0	11
7:45	8:00	0	0	253	24	0	0	0	4	0	0	353	7	0	0	0	12
8:00	8:15	0	0	281	19	0	0	0	2	0	0	322	15	0	0	0	15
8:15	8:30	0	0	293	12	0	0	0	2	0	0	292	8	0	0	0	8
8:30	8:45	0	0	298	15	0	0	0	4	0	0	312	20	0	0	0	8
8:45	9:00	0	0	247	12	0	0	0	3	0	0	295	20	0	0	0	13
9:00	9:15	0	0	284	9	0	0	0	8	0	0	262	7	0	0	0	17
9:15	9:30	0	0	225	11	0	0	0	3	0	0	195	9	0	0	0	13
14:30	14:45	0	0	306	9	0	0	0	13	0	0	257	8	0	0	0	10
14:45	15:00	0	0	287	9	0	0	0	15	0	0	276	3	0	0	0	11
15:00	15:15	0	0	304	1	0	0	0	16	0	0	246	10	0	0	0	18
15:15	15:30	0	0	290	4	0	0	0	22	0	0	277	6	0	0	0	15
15:30	15:45	0	0	330	7	0	0	0	24	0	0	364	5	0	0	0	12
15:45	16:00	0	0	312	11	0	0	0	19	0	0	288	4	0	0	0	12
16:00	16:15	0	0	305	7	0	0	0	18	0	0	227	3	0	0	0	16
16:15	16:30	0	0	325	9	0	0	0	19	0	0	370	7	0	0	0	17
16:30	16:45	0	0	335	4	0	0	0	32	0	0	266	5	0	0	0	19
16:45	17:00	0	0	326	5	0	0	0	38	0	0	335	8	0	0	0	15
17:00	17:15	0	0	313	4	0	0	0	26	0	0	357	7	0	0	0	8
17:15	17:30	0	0	319	5	1	0	0	20	0	0	292	7	0	0	0	9
17:30	17:45	0	0	337	4	0	0	0	11	0	0	258	10	0	0	0	13
17:45	18:00	0	0	305	4	0	0	0	22	0	0	293	11	0	0	0	7
18:00	18:15	0	0	272	4	0	0	0	13	0	0	300	4	0	0	0	8
18:15	18:30	0	0	301	4	0	0	0	7	0	0	202	1	0	0	0	12

Peak Time		North Approach Parker St				East Approach Laneway				South Approach Parker St				West Approach Lethbridge St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
7:45	8:45	0	0	1125	70	0	0	0	12	0	0	1279	50	0	0	0	43	2579
16:15	17:15	0	0	1299	22	0	0	0	115	0	0	1328	27	0	0	0	59	2850

Heavy Vehicles

Time		North Approach Parker St				East Approach Laneway				South Approach Parker St				West Approach Lethbridge St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	18	1	0	0	0	1	0	0	16	0	0	0	0	0
7:15	7:30	0	0	23	0	0	0	0	0	0	0	18	0	0	0	0	0
7:30	7:45	0	0	26	1	0	0	0	1	0	0	17	0	0	0	0	0
7:45	8:00	0	0	18	1	0	0	0	0	0	0	13	0	0	0	0	0
8:00	8:15	0	0	21	1	0	0	0	1	0	0	19	0	0	0	0	1
8:15	8:30	0	0	17	0	0	0	0	0	0	0	19	0	0	0	0	0
8:30	8:45	0	0	20	0	0	0	0	2	0	0	18	0	0	0	0	2
8:45	9:00	0	0	14	1	0	0	0	1	0	0	21	0	0	0	0	4
9:00	9:15	0	0	39	0	0	0	0	1	0	0	16	0	0	0	0	0
9:15	9:30	0	0	23	0	0	0	0	0	0	0	25	0	0	0	0	0
14:30	14:45	0	0	12	0	0	0	0	1	0	0	18	0	0	0	0	3
14:45	15:00	0	0	15	0	0	0	0	1	0	0	26	0	0	0	0	2
15:00	15:15	0	0	20	0	0	0	0	0	0	0	20	0	0	0	0	0
15:15	15:30	0	0	17	1	0	0	0	1	0	0	24	0	0	0	0	0
15:30	15:45	0	0	19	0	0	0	0	0	0	0	24	0	0	0	0	3
15:45	16:00	0	0	26	0	0	0	0	0	0	0	16	0	0	0	0	3
16:00	16:15	0	0	13	0	0	0	0	0	0	0	22	0	0	0	0	1
16:15	16:30	0	0	14	0	0	0	0	0	0	0	21	1	0	0	0	0
16:30	16:45	0	0	14	0	0	0	0	0	0	0	10	0	0	0	0	0
16:45	17:00	0	0	9	0	0	0	0	0	0	0	13	0	0	0	0	0
17:00	17:15	0	0	22	0	0	0	0	0	0	0	10	0	0	0	0	0
17:15	17:30	0	0	11	0	0	0	0	0	0	0	9	0	0	0	0	0
17:30	17:45	0	0	6	0	0	0	0	0	0	0	12	0	0	0	0	0
17:45	18:00	0	0	6	0	0	0	0	0	0	0	6	0	0	0	0	0
18:00	18:15	0	0	6	0	0	0	0	0	0	0	17	0	0	0	0	0
18:15	18:30	0	0	3	0	0	0	0	0	0	0	8	0	0	0	0	0

Peak Time		North Approach Parker St				East Approach Laneway				South Approach Parker St				West Approach Lethbridge St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
7:45	8:45	0	0	76	2	0	0	0	3	0	0	69	0	0	0	0	3	153
16:15	17:15	0	0	59	0	0	0	0	0	0	0	54	1	0	0	0	0	114

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Lethbridge St and Colless St, Penrith

GPS -33.758141, 150.707844

Date:	Wed 02/06/21
Weather:	Fine
Suburban:	Penrith
Customer:	McLaren

North:	Colless St
East:	Lethbridge St
South:	Colless St
West:	Lethbridge St

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:30 PM
Traffic Peak	AM:	8:30 AM-9:30 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Colless St				East Approach Lethbridge St				South Approach Colless St				West Approach Lethbridge St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	3	6	1	0	1	4	3	0	2	3	4	0	1	5	2	227	
7:15	7:30	0	1	7	6	0	1	10	1	0	9	3	8	0	5	7	5	264	
7:30	7:45	0	7	8	5	0	1	8	10	0	2	4	8	0	1	8	3	270	
7:45	8:00	0	4	14	1	0	2	5	2	0	7	6	7	0	3	10	3	304	
8:00	8:15	0	9	8	3	0	2	10	1	0	5	6	16	0	4	4	4	341	
8:15	8:30	0	5	8	0	0	1	7	4	0	4	8	12	0	12	3	5	342	
8:30	8:45	0	5	11	1	0	1	17	0	0	2	8	29	0	12	10	3	346	Peak
8:45	9:00	0	7	12	1	0	1	18	5	0	3	8	13	0	12	15	6		
9:00	9:15	0	6	3	1	0	1	8	3	0	1	8	10	0	5	18	9		
9:15	9:30	0	8	8	1	0	1	9	1	1	2	10	8	0	4	11	9		
14:30	14:45	0	6	4	1	0	1	4	4	0	3	7	15	0	5	15	7	347	
14:45	15:00	0	6	15	1	0	1	5	3	0	5	10	15	0	15	10	6	395	
15:00	15:15	0	8	9	2	0	2	9	4	1	7	9	12	0	7	12	6	386	
15:15	15:30	0	7	8	3	0	0	4	4	0	3	11	15	0	16	11	13	400	
15:30	15:45	0	11	12	3	0	1	14	8	0	6	10	23	0	14	11	7	399	
15:45	16:00	0	8	8	0	0	0	5	3	0	5	7	8	1	11	14	13	383	
16:00	16:15	0	8	14	3	0	0	5	3	0	2	8	21	0	12	12	14	405	
16:15	16:30	0	10	9	1	0	4	4	6	0	10	11	13	0	8	11	7	408	
16:30	16:45	0	4	7	3	0	0	9	7	0	2	7	16	0	14	21	14	399	
16:45	17:00	0	10	8	0	0	0	9	1	0	5	9	15	1	11	18	18	413	Peak
17:00	17:15	0	7	6	2	0	2	10	6	1	6	12	13	0	18	4	18	397	
17:15	17:30	0	4	8	1	0	1	7	6	0	3	5	12	0	11	13	14	376	
17:30	17:45	0	6	12	1	0	1	10	2	1	4	15	11	0	24	12	19	358	
17:45	18:00	0	9	9	0	0	1	9	4	0	2	11	17	0	9	7	11		
18:00	18:15	0	10	8	0	0	0	8	1	0	1	11	16	0	14	8	7		
18:15	18:30	0	12	5	0	0	0	1	0	1	4	9	4	0	11	12	8		

Peak Time		North Approach Colless St				East Approach Lethbridge St				South Approach Colless St				West Approach Lethbridge St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
8:30	9:30	0	26	34	4	0	4	52	15	2	18	34	60	0	33	54	27	346
16:45	17:45	0	27	34	4	0	4	36	15	2	18	41	51	1	64	47	69	413

Pedestrians Crossing

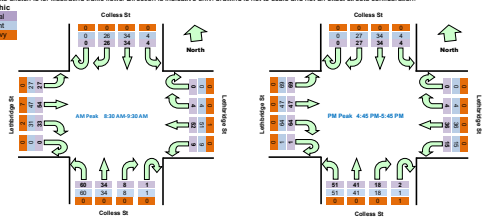
Time		North Approach Colless St		East Approach Lethbridge St		South Approach Colless St		West Approach Lethbridge St		Hourly Total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	Northbound	Southbound	
7:00	7:15	1	3	4	1	0	1	0	0	28
7:15	7:30	1	0	0	0	0	1	1	0	27
7:30	7:45	1	0	0	0	5	0	0	4	31
7:45	8:00	2	1	0	0	0	0	2	0	30
8:00	8:15	2	1	2	0	1	0	1	2	49
8:15	8:30	4	0	1	0	2	0	0	0	53
8:30	8:45	0	4	0	2	1	0	2	0	50
8:45	9:00	1	10	6	0	1	1	5	0	41
9:00	9:15	0	0	1	2	1	5	4	0	17
9:15	9:30	1	2	0	0	0	0	1	0	4
14:30	14:45	1	1	0	1	1	1	1	2	73
14:45	15:00	0	0	2	1	3	2	2	13	74
15:00	15:15	0	3	5	0	3	2	1	1	61
15:15	15:30	8	1	1	7	7	2	0	1	58
15:30	15:45	3	2	0	2	0	0	1	1	37
15:45	16:00	0	1	0	1	1	2	2	3	41
16:00	16:15	1	2	0	0	0	3	1	5	34
16:15	16:30	0	2	0	0	0	0	1	3	26
16:30	16:45	0	5	0	1	1	0	2	4	24
16:45	17:00	0	1	0	1	0	0	0	1	17
17:00	17:15	0	2	0	0	0	2	0	0	23
17:15	17:30	1	0	0	2	0	0	0	1	20
17:30	17:45	0	0	0	1	2	2	0	1	17
17:45	18:00	1	4	1	0	0	1	1	1	11
18:00	18:15	0	1	0	0	0	0	0	0	2
18:15	18:30	0	1	0	0	0	0	0	0	1

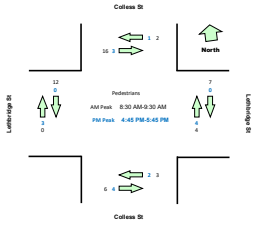
Peak Time		North Approach Colless St		East Approach Lethbridge St		South Approach Colless St		West Approach Lethbridge St		Peak hour total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	Northbound	Southbound	
8:30	9:30	2	16	7	4	3	6	12	0	50
16:45	17:45	1	3	0	4	2	4	0	3	17

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Colless St				East Approach Lethbridge St				South Approach Colless St				West Approach Lethbridge St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	3	6	1	0	1	4	3	0	2	3	4	0	1	5	2
7:15	7:30	0	1	7	6	0	1	10	1	0	9	3	8	0	5	7	5
7:30	7:45	0	7	8	5	0	1	8	10	0	2	4	8	0	1	8	3
7:45	8:00	0	4	13	1	0	2	5	2	0	7	6	7	0	3	9	3
8:00	8:15	0	9	8	3	0	2	10	1	0	5	6	16	0	4	4	4
8:15	8:30	0	5	8	0	0	1	7	4	0	4	7	12	0	11	3	5
8:30	8:45	0	5	11	1	0	1	16	0	0	2	8	29	0	11	7	3
8:45	9:00	0	7	12	1	0	1	18	5	0	3	8	13	0	11	11	6
9:00	9:15	0	6	3	1	0	1	8	3	0	1	8	10	0	5	18	9
9:15	9:30	0	8	8	1	0	1	9	1	1	2	10	8	0	4	11	9
14:30	14:45	0	6	4	1	0	1	4	4	0	2	7	15	0	3	12	7
14:45	15:00	0	6	15	1	0	1	4	2	0	5	10	15	0	14	8	6
15:00	15:15	0	8	9	2	0	2	9	4	1	7	9	12	0	7	12	6
15:15	15:30	0	6	8	3	0	0	4	4	0	3	11	15	0	14	11	12
15:30	15:45	0	11	12	3	0	0	14	8	0	5	10	23	0	9	6	7
15:45	16:00	0	8	7	0	0	0	5	2	0	5	7	8	1	8	11	13
16:00	16:15	0	7	14	3	0	0	5	3	0	2	7	20	0	12	12	14
16:15	16:30	0	10	9	1	0	4	3	6	0	10	11	13	0	8	11	7
16:30	16:45	0	4	6	3	0	0	9	7	0	2	7	16	0	14	21	13
16:45	17:00	0	10	8	0	0	0	9	1	0	5	9	15	1	11	18	18
17:00	17:15	0	7	6	2	0	2	10	6	1	6	12	13	0	18	4	18
17:15	17:30	0	4	8	1	0	1	7	6	0	3	5	12	0	11	13	14
17:30	17:45	0	6	12	1	0	1	10	2	0	4	15	11	0	24	12	19
17:45	18:00	0	9	9	0	0	1	9	4	0	2	11	16	0	9	7	11
18:00	18:15	0	10	8	0	0	0	8	1	0	1	11	16	0	14	8	7
18:15	18:30	0	12	5	0	0	0	1	0	1	4	9	4	0	11	12	8

Peak Time		North Approach Colless St				East Approach Lethbridge St				South Approach Colless St				West Approach Lethbridge St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
8:30	9:30	0	26	34	4	0	4	51	9	1	8	34	60	0	31	47	27	336
16:45	17:45	0	27	34	4	0	4	36	15	1	18	41	51	1	64	47	69	412

Heavy Vehicles

Time		North Approach Colless St				East Approach Lethbridge St				South Approach Colless St				West Approach Lethbridge St			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	8:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00	8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	8:30	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
8:30	8:45	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	0
8:45	9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0
9:00	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3	0
14:45	15:00	0	0	0	0	0	0	1	1	0	0	0	0	0	1	2	0
15:00	15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	15:30	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	1
15:30	15:45	0	0	0	0	0	1	0	0	0	1	0	0	0	5	5	0
15:45	16:00	0	0	1	0	0	0	0	1	0	0	0	0	0	3	3	0
16:00	16:15	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
16:15	16:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Colless St				East Approach Lethbridge St				South Approach Colless St				West Approach Lethbridge St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
8:30	9:30	0	0	0	0	0	0	1	0	0	0	0	0	0	2	7	0	10
16:45	17:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1

ANNEXURE C: SIDRA RESULTS
(8 SHEETS)

MOVEMENT SUMMARY

Site: 101 [AM Lethbridge/Parker (Site Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parker Street (S)														
1	L2	50	0	53	0.0	0.260	6.4	LOS A	0.0	0.0	0.00	0.07	0.00	65.7
2	T1	1348	69	1419	5.1	0.260	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	69.5
Approach		1398	69	1472	4.9	0.260	0.3	NA	0.0	0.0	0.00	0.02	0.00	69.4
West: Lethbridge Street (W)														
10	L2	46	3	48	6.5	0.048	6.4	LOS A	0.2	1.3	0.45	0.62	0.45	49.5
Approach		46	3	48	6.5	0.048	6.4	LOS A	0.2	1.3	0.45	0.62	0.45	49.5
All Vehicles		1444	72	1520	5.0	0.260	0.5	NA	0.2	1.3	0.01	0.04	0.01	68.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Lethbridge/Parker (Site Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parker Street (S)														
1	L2	28	1	29	3.6	0.260	6.5	LOS A	0.0	0.0	0.00	0.04	0.00	64.8
2	T1	1382	54	1455	3.9	0.260	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	69.7
Approach		1410	55	1484	3.9	0.260	0.2	NA	0.0	0.0	0.00	0.01	0.00	69.6
West: Lethbridge Street (W)														
10	L2	59	0	62	0.0	0.060	6.4	LOS A	0.2	1.6	0.46	0.64	0.46	50.8
Approach		59	0	62	0.0	0.060	6.4	LOS A	0.2	1.6	0.46	0.64	0.46	50.8
All Vehicles		1469	55	1546	3.7	0.260	0.4	NA	0.2	1.6	0.02	0.04	0.02	68.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Lethbridge/Colless (Site Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Colless Street (S)														
1	L2	60	0	63	0.0	0.081	4.7	LOS A	0.3	2.2	0.15	0.50	0.15	46.6
2	T1	34	0	36	0.0	0.081	3.9	LOS A	0.3	2.2	0.15	0.50	0.15	46.6
3	R2	8	0	8	0.0	0.081	5.6	LOS A	0.3	2.2	0.15	0.50	0.15	46.1
Approach		102	0	107	0.0	0.081	4.5	LOS A	0.3	2.2	0.15	0.50	0.15	46.5
East: Lethbridge Street (E)														
4	L2	6	0	6	0.0	0.034	4.7	LOS A	0.0	0.2	0.03	0.09	0.03	48.9
5	T1	52	1	55	1.9	0.034	0.0	LOS A	0.0	0.2	0.03	0.09	0.03	49.4
6	R2	4	0	4	0.0	0.034	4.8	LOS A	0.0	0.2	0.03	0.09	0.03	48.4
Approach		62	1	65	1.6	0.034	0.8	NA	0.0	0.2	0.03	0.09	0.03	49.3
North: Colless Street (N)														
7	L2	4	0	4	0.0	0.066	3.6	LOS A	0.2	1.6	0.26	0.47	0.26	42.1
8	T1	34	0	36	0.0	0.066	2.8	LOS A	0.2	1.6	0.26	0.47	0.26	42.2
9	R2	26	0	27	0.0	0.066	4.9	LOS A	0.2	1.6	0.26	0.47	0.26	38.2
Approach		64	0	67	0.0	0.066	3.7	LOS A	0.2	1.6	0.26	0.47	0.26	40.5
West: Lethbridge Street (W)														
10	L2	27	0	28	0.0	0.068	3.5	LOS A	0.2	1.8	0.11	0.24	0.11	39.1
11	T1	54	7	57	13.0	0.068	0.1	LOS A	0.2	1.8	0.11	0.24	0.11	43.4
12	R2	33	2	35	6.1	0.068	3.8	LOS A	0.2	1.8	0.11	0.24	0.11	42.3
Approach		114	9	120	7.9	0.068	2.0	NA	0.2	1.8	0.11	0.24	0.11	42.0
All Vehicles		342	10	360	2.9	0.081	2.8	NA	0.3	2.2	0.14	0.33	0.14	44.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Lethbridge/Colless (Site Folder: Existing)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Colless Street (S)														
1	L2	51	0	54	0.0	0.095	4.7	LOS A	0.4	2.6	0.12	0.51	0.12	46.6
2	T1	41	0	43	0.0	0.095	4.2	LOS A	0.4	2.6	0.12	0.51	0.12	46.6
3	R2	18	0	19	0.0	0.095	5.6	LOS A	0.4	2.6	0.12	0.51	0.12	46.1
Approach		110	0	116	0.0	0.095	4.7	LOS A	0.4	2.6	0.12	0.51	0.12	46.5
East: Lethbridge Street (E)														
4	L2	15	0	16	0.0	0.031	4.6	LOS A	0.0	0.2	0.05	0.18	0.05	48.3
5	T1	36	0	38	0.0	0.031	0.0	LOS A	0.0	0.2	0.05	0.18	0.05	48.8
6	R2	4	0	4	0.0	0.031	4.9	LOS A	0.0	0.2	0.05	0.18	0.05	47.9
Approach		55	0	58	0.0	0.031	1.7	NA	0.0	0.2	0.05	0.18	0.05	48.6
North: Colless Street (N)														
7	L2	4	0	4	0.0	0.069	3.5	LOS A	0.2	1.7	0.27	0.48	0.27	42.1
8	T1	34	0	36	0.0	0.069	2.9	LOS A	0.2	1.7	0.27	0.48	0.27	42.1
9	R2	27	0	28	0.0	0.069	5.1	LOS A	0.2	1.7	0.27	0.48	0.27	38.2
Approach		65	0	68	0.0	0.069	3.8	LOS A	0.2	1.7	0.27	0.48	0.27	40.4
West: Lethbridge Street (W)														
10	L2	69	0	73	0.0	0.104	3.5	LOS A	0.4	3.0	0.12	0.33	0.12	38.9
11	T1	47	0	49	0.0	0.104	0.1	LOS A	0.4	3.0	0.12	0.33	0.12	43.1
12	R2	64	0	67	0.0	0.104	3.7	LOS A	0.4	3.0	0.12	0.33	0.12	42.1
Approach		180	0	189	0.0	0.104	2.7	NA	0.4	3.0	0.12	0.33	0.12	41.0
All Vehicles		410	0	432	0.0	0.104	3.3	NA	0.4	3.0	0.14	0.38	0.14	43.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [FU AM Lethbridge/Parker (Site Folder: Future)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parker Street (S)														
1	L2	51	0	54	0.0	0.260	6.4	LOS A	0.0	0.0	0.00	0.07	0.00	65.6
2	T1	1348	69	1419	5.1	0.260	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	69.5
Approach		1399	69	1473	4.9	0.260	0.3	NA	0.0	0.0	0.00	0.02	0.00	69.4
West: Lethbridge Street (W)														
10	L2	51	3	54	5.9	0.052	6.4	LOS A	0.2	1.5	0.45	0.63	0.45	49.6
Approach		51	3	54	5.9	0.052	6.4	LOS A	0.2	1.5	0.45	0.63	0.45	49.6
All Vehicles		1450	72	1526	5.0	0.260	0.5	NA	0.2	1.5	0.02	0.04	0.02	68.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [FU PM Lethbridge/Parker (Site Folder: Future)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Parker Street (S)														
1	L2	35	1	37	2.9	0.262	6.5	LOS A	0.0	0.0	0.00	0.05	0.00	64.9
2	T1	1382	54	1455	3.9	0.262	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	69.6
Approach		1417	55	1492	3.9	0.262	0.2	NA	0.0	0.0	0.00	0.02	0.00	69.5
West: Lethbridge Street (W)														
10	L2	60	0	63	0.0	0.061	6.3	LOS A	0.2	1.6	0.46	0.64	0.46	50.9
Approach		60	0	63	0.0	0.061	6.3	LOS A	0.2	1.6	0.46	0.64	0.46	50.9
All Vehicles		1477	55	1555	3.7	0.262	0.5	NA	0.2	1.6	0.02	0.04	0.02	68.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [FU AM Lethbridge/Colless (Site Folder: Future)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Colless Street (S)														
1	L2	60	0	63	0.0	0.083	4.7	LOS A	0.3	2.3	0.15	0.50	0.15	46.6
2	T1	34	0	36	0.0	0.083	4.0	LOS A	0.3	2.3	0.15	0.50	0.15	46.6
3	R2	9	0	9	0.0	0.083	5.6	LOS A	0.3	2.3	0.15	0.50	0.15	46.1
Approach		103	0	108	0.0	0.083	4.5	LOS A	0.3	2.3	0.15	0.50	0.15	46.5
East: Lethbridge Street (E)														
4	L2	8	0	8	0.0	0.037	4.7	LOS A	0.1	0.4	0.05	0.12	0.05	48.7
5	T1	52	1	55	1.9	0.037	0.0	LOS A	0.1	0.4	0.05	0.12	0.05	49.1
6	R2	7	0	7	0.0	0.037	4.8	LOS A	0.1	0.4	0.05	0.12	0.05	48.2
Approach		67	1	71	1.5	0.037	1.1	NA	0.1	0.4	0.05	0.12	0.05	49.0
North: Colless Street (N)														
7	L2	4	0	4	0.0	0.066	3.6	LOS A	0.2	1.6	0.27	0.47	0.27	42.1
8	T1	34	0	36	0.0	0.066	2.8	LOS A	0.2	1.6	0.27	0.47	0.27	42.2
9	R2	26	0	27	0.0	0.066	4.9	LOS A	0.2	1.6	0.27	0.47	0.27	38.2
Approach		64	0	67	0.0	0.066	3.7	LOS A	0.2	1.6	0.27	0.47	0.27	40.5
West: Lethbridge Street (W)														
10	L2	27	0	28	0.0	0.068	3.5	LOS A	0.2	1.8	0.11	0.24	0.11	39.1
11	T1	54	7	57	13.0	0.068	0.1	LOS A	0.2	1.8	0.11	0.24	0.11	43.4
12	R2	33	2	35	6.1	0.068	3.8	LOS A	0.2	1.8	0.11	0.24	0.11	42.3
Approach		114	9	120	7.9	0.068	2.0	NA	0.2	1.8	0.11	0.24	0.11	42.0
All Vehicles		348	10	366	2.9	0.083	2.9	NA	0.3	2.3	0.14	0.34	0.14	44.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [FU PM Lethbridge/Colless (Site Folder: Future)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Colless Street (S)														
1	L2	51	0	54	0.0	0.098	4.7	LOS A	0.4	2.6	0.13	0.51	0.13	46.5
2	T1	41	0	43	0.0	0.098	4.3	LOS A	0.4	2.6	0.13	0.51	0.13	46.6
3	R2	20	0	21	0.0	0.098	5.7	LOS A	0.4	2.6	0.13	0.51	0.13	46.1
Approach		112	0	118	0.0	0.098	4.7	LOS A	0.4	2.6	0.13	0.51	0.13	46.5
East: Lethbridge Street (E)														
4	L2	22	0	23	0.0	0.039	4.7	LOS A	0.1	0.6	0.10	0.24	0.10	47.8
5	T1	36	0	38	0.0	0.039	0.1	LOS A	0.1	0.6	0.10	0.24	0.10	48.3
6	R2	11	0	12	0.0	0.039	4.9	LOS A	0.1	0.6	0.10	0.24	0.10	47.4
Approach		69	0	73	0.0	0.039	2.3	NA	0.1	0.6	0.10	0.24	0.10	48.0
North: Colless Street (N)														
7	L2	7	0	7	0.0	0.072	3.5	LOS A	0.3	1.8	0.26	0.48	0.26	42.0
8	T1	34	0	36	0.0	0.072	3.0	LOS A	0.3	1.8	0.26	0.48	0.26	42.1
9	R2	27	0	28	0.0	0.072	5.1	LOS A	0.3	1.8	0.26	0.48	0.26	38.2
Approach		68	0	72	0.0	0.072	3.9	LOS A	0.3	1.8	0.26	0.48	0.26	40.4
West: Lethbridge Street (W)														
10	L2	69	0	73	0.0	0.104	3.5	LOS A	0.4	3.0	0.13	0.32	0.13	38.8
11	T1	47	0	49	0.0	0.104	0.1	LOS A	0.4	3.0	0.13	0.32	0.13	43.0
12	R2	64	0	67	0.0	0.104	3.7	LOS A	0.4	3.0	0.13	0.32	0.13	42.1
Approach		180	0	189	0.0	0.104	2.7	NA	0.4	3.0	0.13	0.32	0.13	41.0
All Vehicles		429	0	452	0.0	0.104	3.4	NA	0.4	3.0	0.14	0.38	0.14	43.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

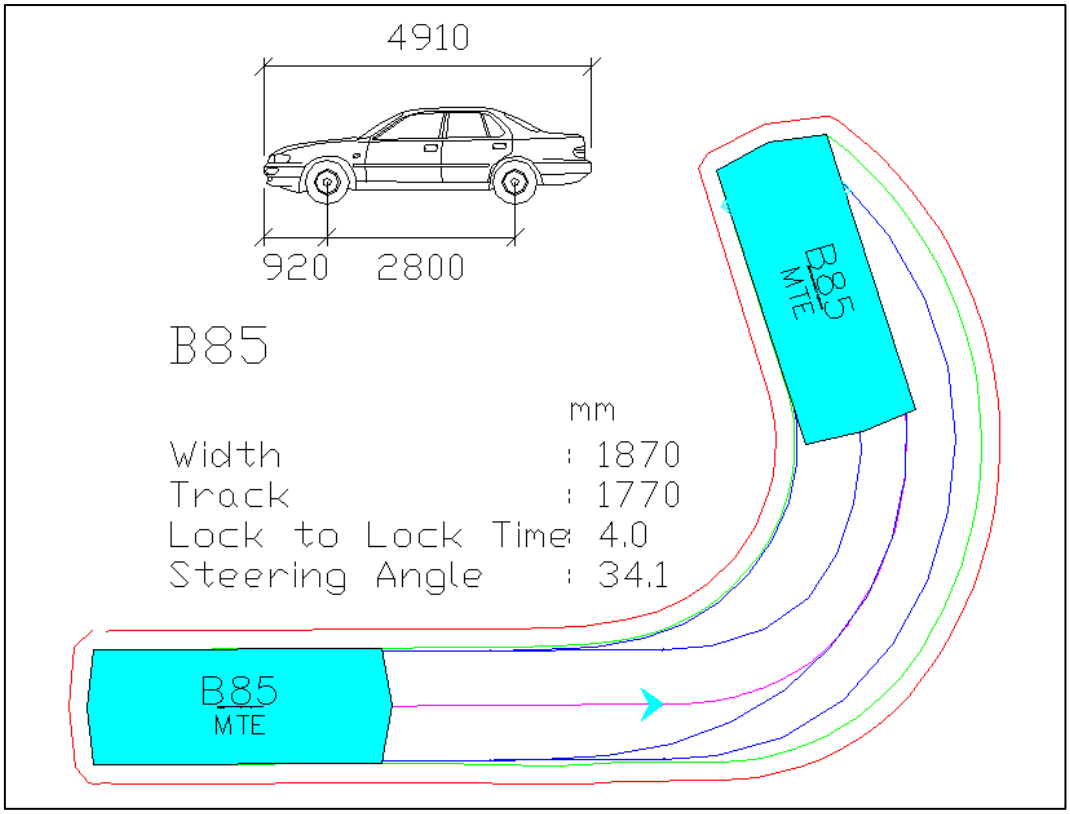
Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

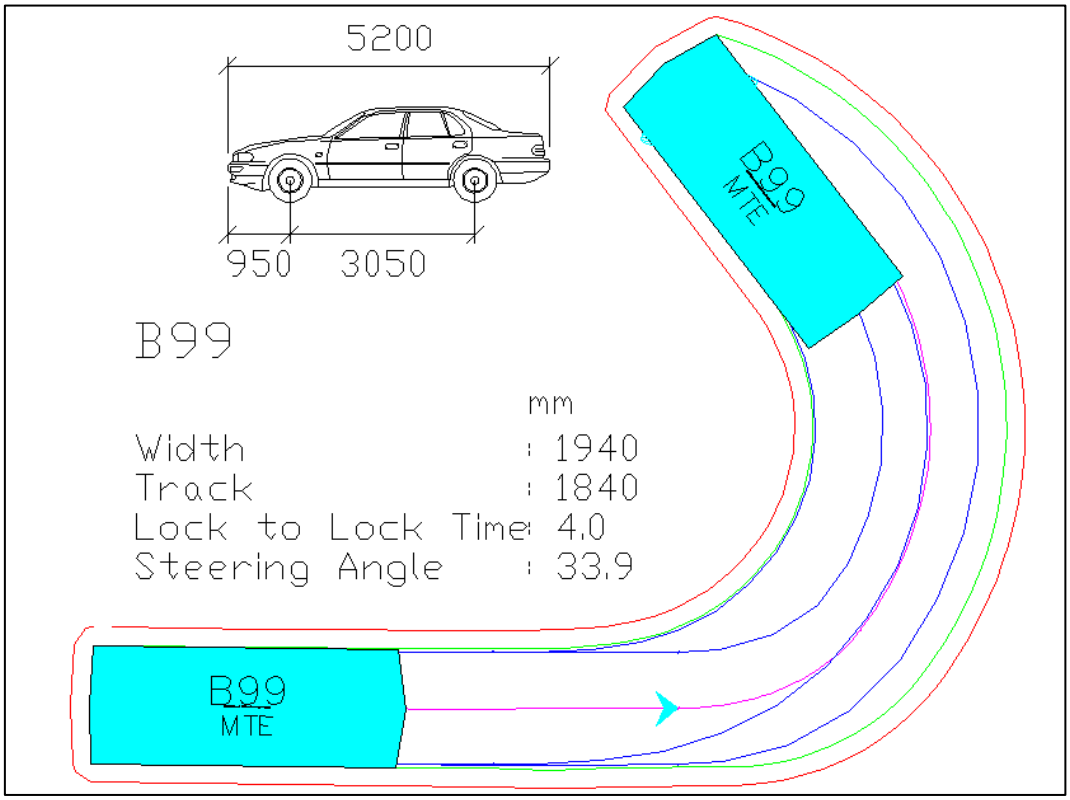
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

ANNEXURE D: SWEPT PATH TESTING
(7 SHEETS)



AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)

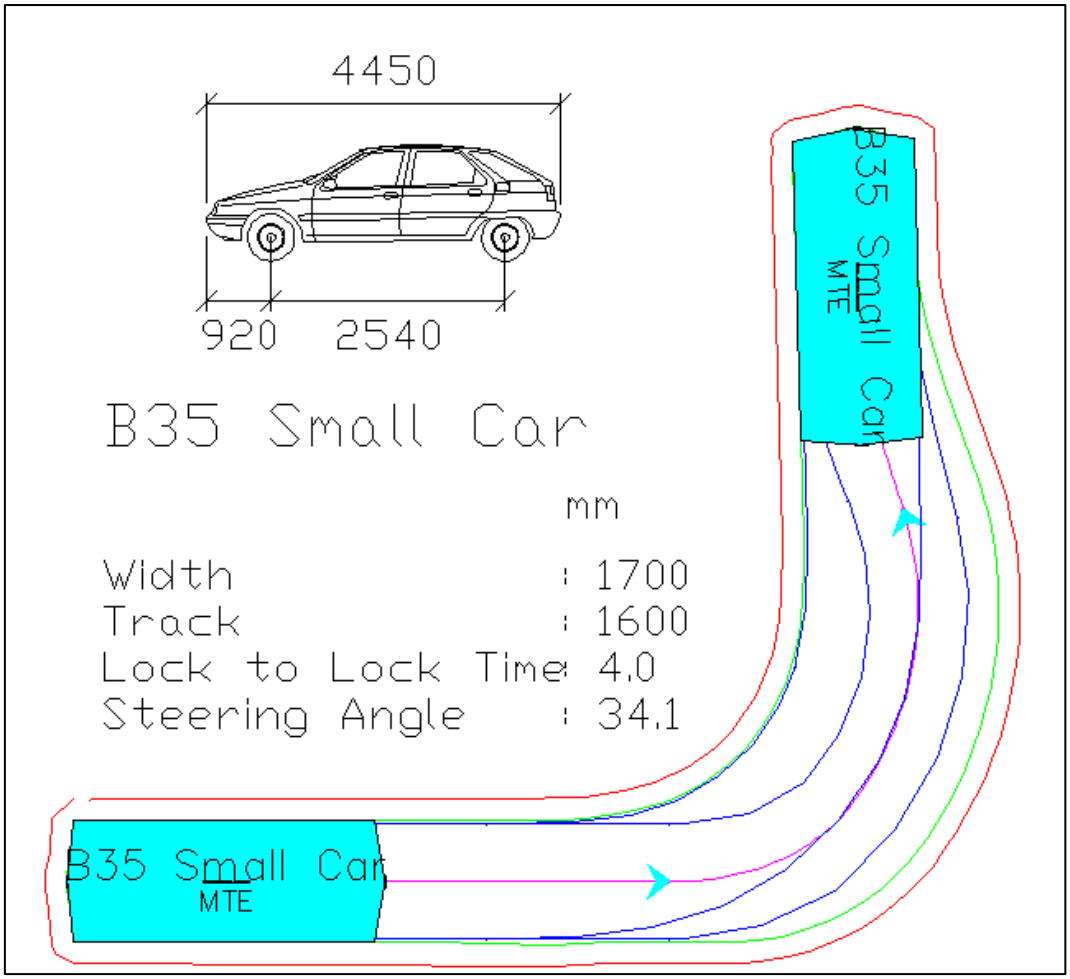


AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

Blue – Tyre Path

Green – Vehicle Body

Red – 300mm Clearance

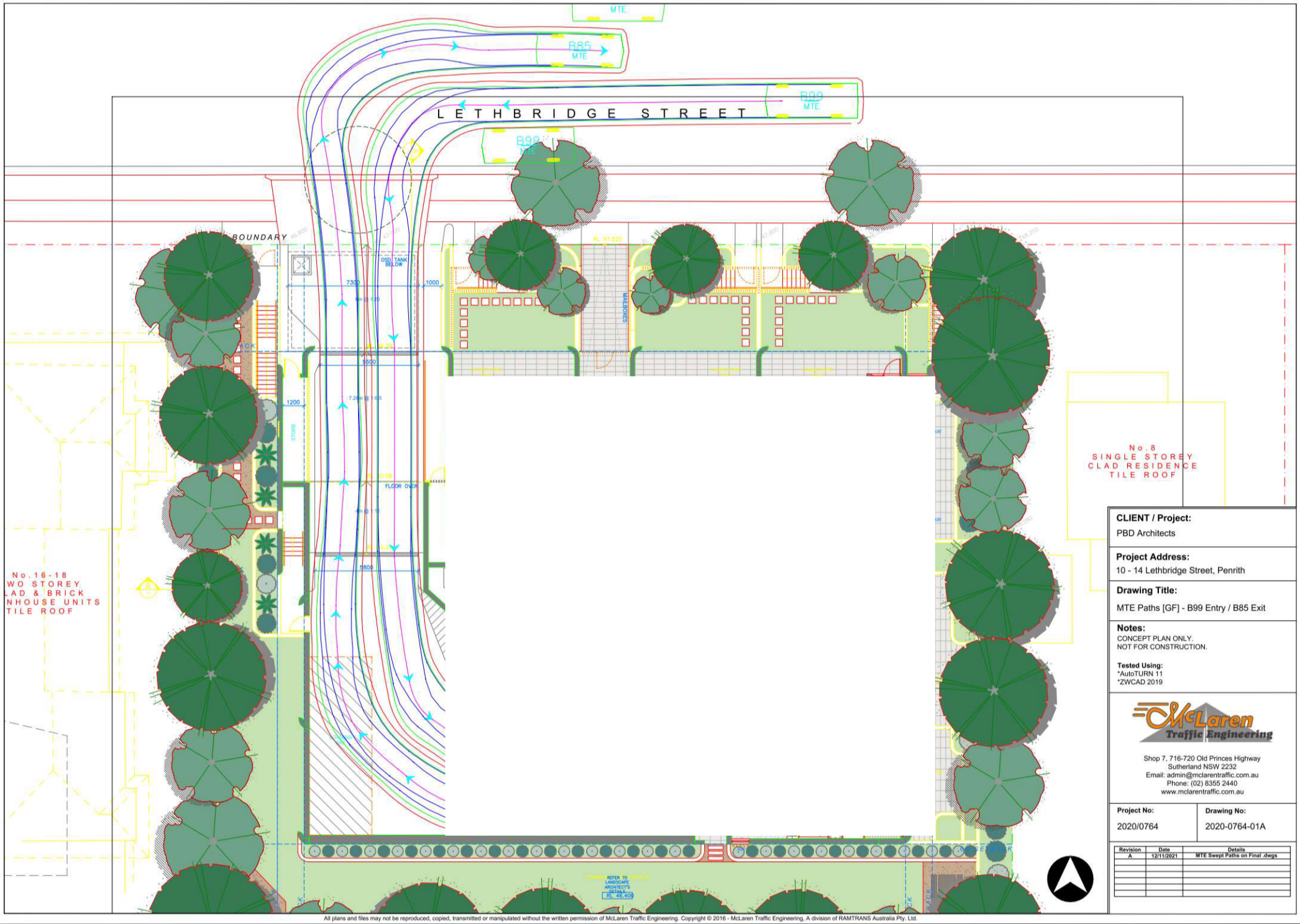


AUSTRALIAN STANDARD 35TH PERCENTILE SIZE VEHICLE (B35) SMALL CAR

Blue – Tyre Path

Green – Vehicle Body

Red – 300mm Clearance



CLIENT / Project:
PBD Architects

Project Address:
10 - 14 Lethbridge Street, Penrith

Drawing Title:
MTE Paths [GF] - B99 Entry / B85 Exit

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

McLaren Traffic Engineering
Shop 7, 716-720 Old Princes Highway
Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone: (02) 8355 2440
www.mclarentraffic.com.au

Project No:	Drawing No:
2020/0764	2020-0764-01A

Revision	Date	Details
A	12/11/2021	MTE Swept Paths on Final .dwgs

CLIENT / Project:
PBD Architects

Project Address:
10 - 14 Lethbridge Street, Penrith

Drawing Title:
MTE Paths [GF] - Waste Collection Circulation

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

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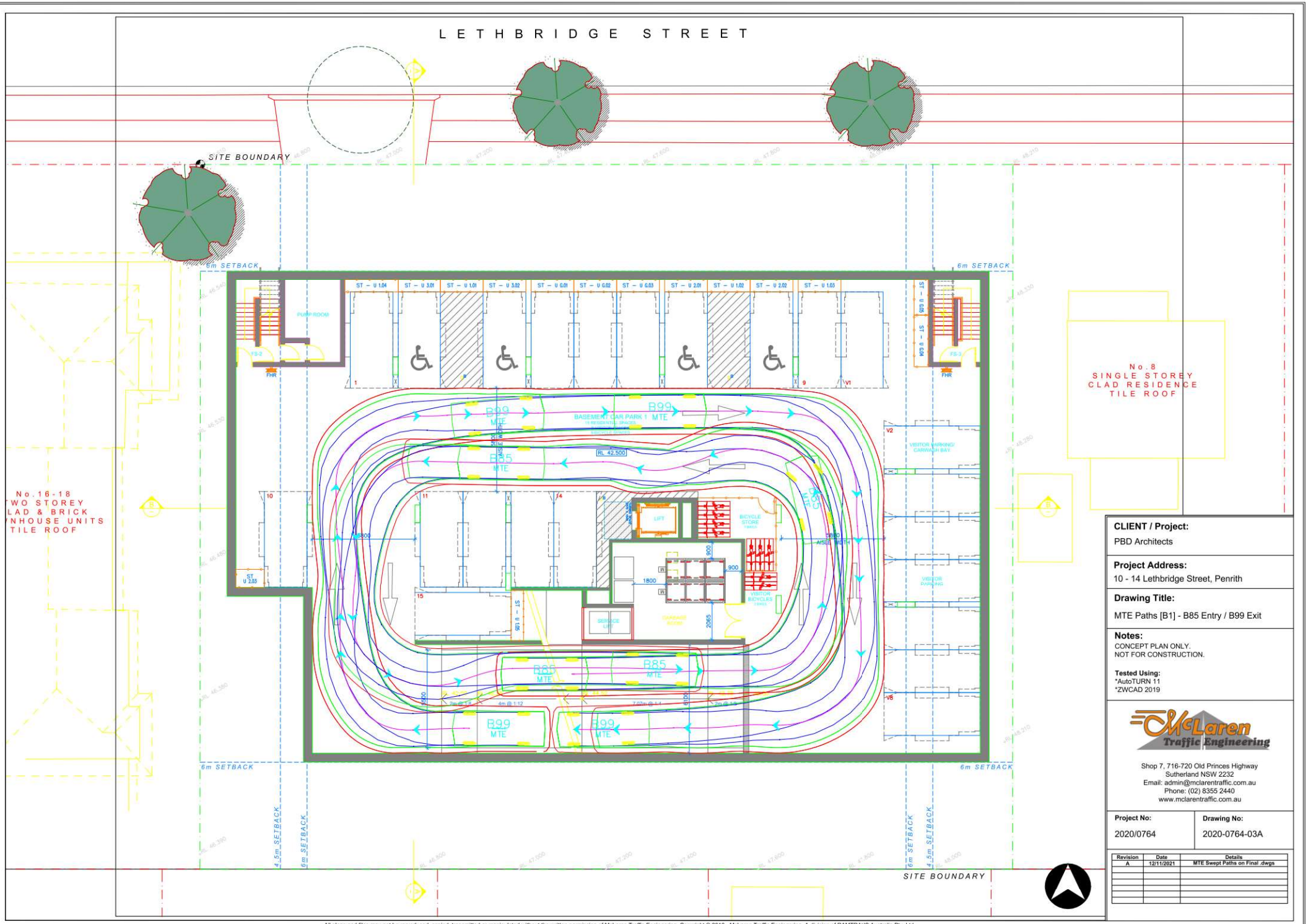
Project No:	Drawing No:
2020/0764	2020-0764-02A

Revision	Date	Details
A	12/11/2021	MTE Swept Paths on Final .dwgs



CLIENT / Project:
PBD Architects

Project Address:
10 - 14 Lethbridge Street, Penrith

Drawing Title:
MTE Paths [B1] - B85 Entry / B99 Exit

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

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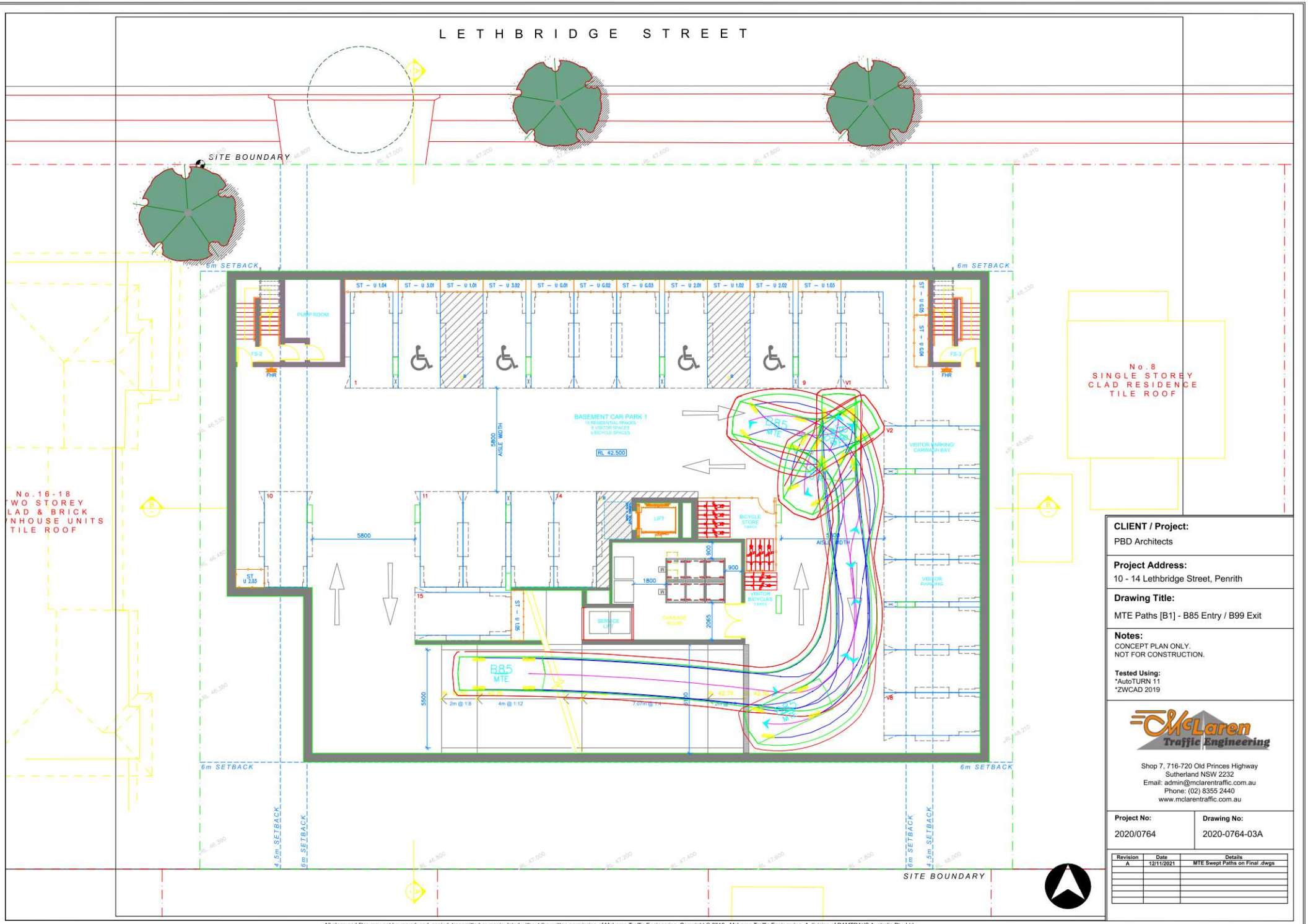
Project No:	Drawing No:
2020/0764	2020-0764-03A

Revision	Date	Details
A	12/11/2021	MTE Swept Paths on Final .dwgs



CLIENT / Project:
PBD Architects

Project Address:
10 - 14 Lethbridge Street, Penrith

Drawing Title:
MTE Paths [B1] - B85 Entry / B99 Exit

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

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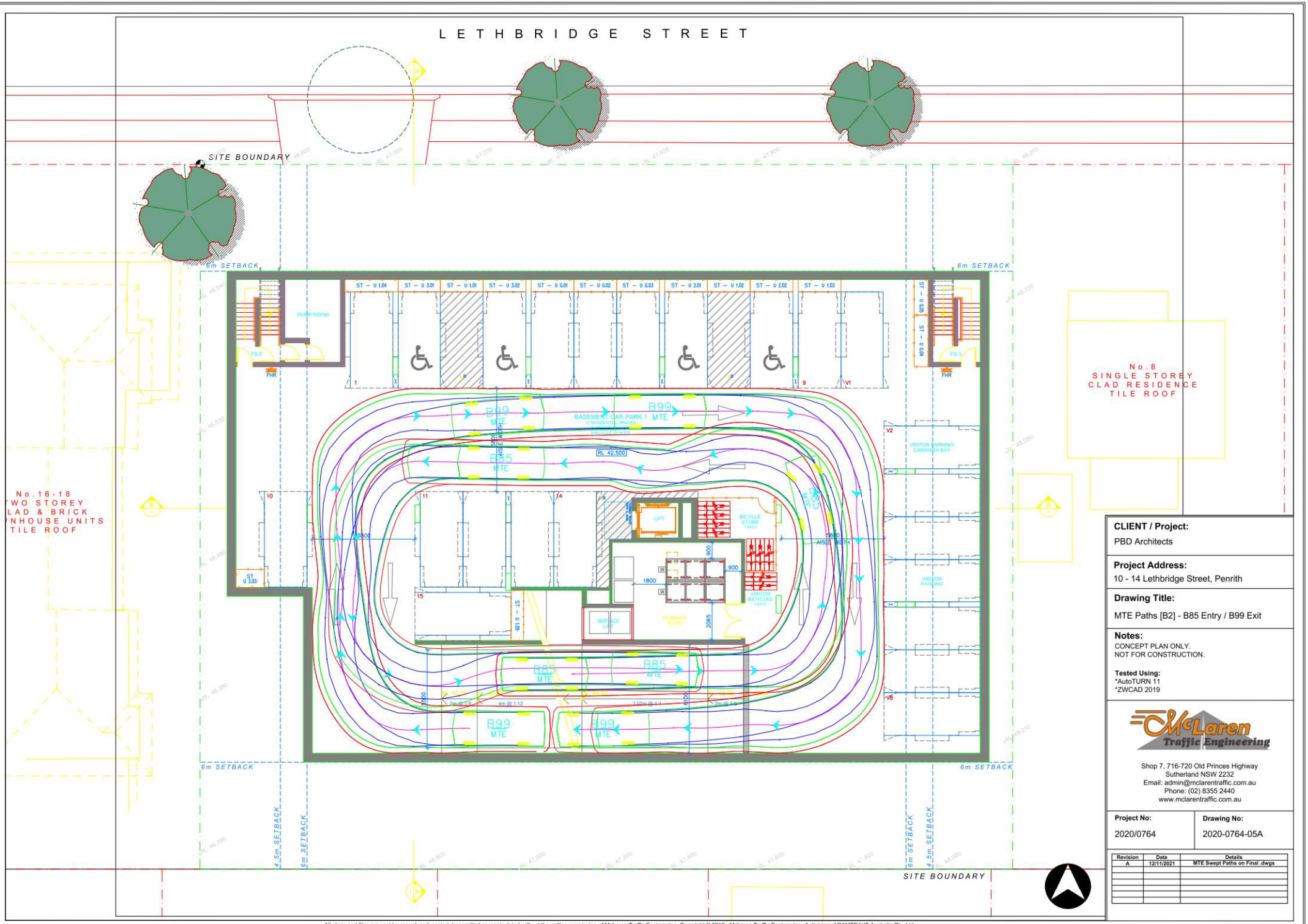
Project No:	Drawing No:
2020/0764	2020-0764-03A

Revision	Date	Details
A	12/11/2021	MTE Swept Paths on Final .dwgs



CLIENT / Project:
PBD Architects

Project Address:
10 - 14 Lethbridge Street, Penrith

Drawing Title:
MTE Paths [B2] - B85 Entry / B99 Exit

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

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Project No:	Drawing No:
2020/0764	2020-0764-05A

Revision	Date	Details
A	12/11/2021	MTE Swept Paths on Final .dwgs

ANNEXURE E: PENRITH CITY COUNCILS RESIDENTIAL FLAT BUILDING WASTE MANAGEMENT GUIDELINES (1 SHEET)

2.3 DESIGN SPECIFICATIONS REAR LOAD WASTE COLLECTION VEHICLES

The following dimensions are provided for a standard heavy rigid vehicle as identified in Australian Standard 2890.2:

2.3.1 Low Entry Heavy Rigid Waste Collection Vehicle

Vehicle Classifications	Heavy Rigid Vehicle Dimensions
Overall Length (m)	9.7
Operational Length (m)	11.7
Design Width (m)	2.8
Design Height (m)	3.1
Swept Circle (m)	17.0
Clearance (travel height) (m)	3.5
Roadway/ramp grade (max)	1:6.5 (15.4%)
Rate of change of grade (max)	1:12 (8.3%) in 4.0m of travel
Gross Weight (max tonnes)	28.0
Front Chassis Clearance	13º
Rear Chassis Clearance	16º

Table 1: Standard dimensions in accordance with AS 2890.2

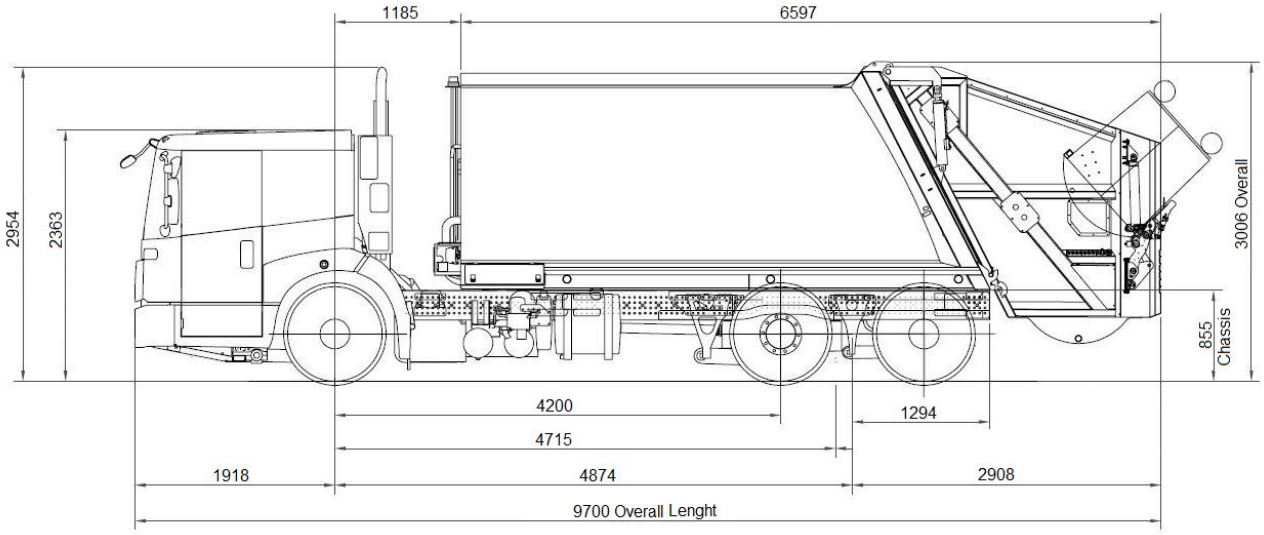

Figure 1: 9.7m Heavy Rigid Rear Load Waste Collection Vehicle specifications

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