acousticworks)))

Proposed Residential Development
96-98 Lethbridge Street and 42-46 Evan Street
Penrith

ACOUSTIC REPORT




Client:
[redacted]
C/- Urban Link Pty Ltd

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Document Information

Contact Details

Acoustic Works
75/45 Huntley St
Alexandria NSW 2015
(02) 9666 5444
ABN: 35 607 558 707

Greg Pearce
Email: gpearce@acousticworks.com.au

Mark Enersen
Email: menersen@acousticworks.com.au

Report Register

Date	Revision	Author	Reviewer	Manager
17/11/20	R01A	Matthew Bechara	Greg Pearce	GP

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1. Introduction

This report is in response to a request by Urban Link Pty Ltd for an environmental noise assessment for a proposed residential development located at 96-98 Lethbridge Street and 42-46 Evan Street, Penrith. This environmental noise assessment was conducted in accordance with Penrith City Council's policies and the NSW EPA Noise Policy for Industry. To facilitate the assessment unattended noise monitoring was conducted for the proposal to determine the criteria and assess impacts to sensitive receivers in proximity to the development.

2. Site Description

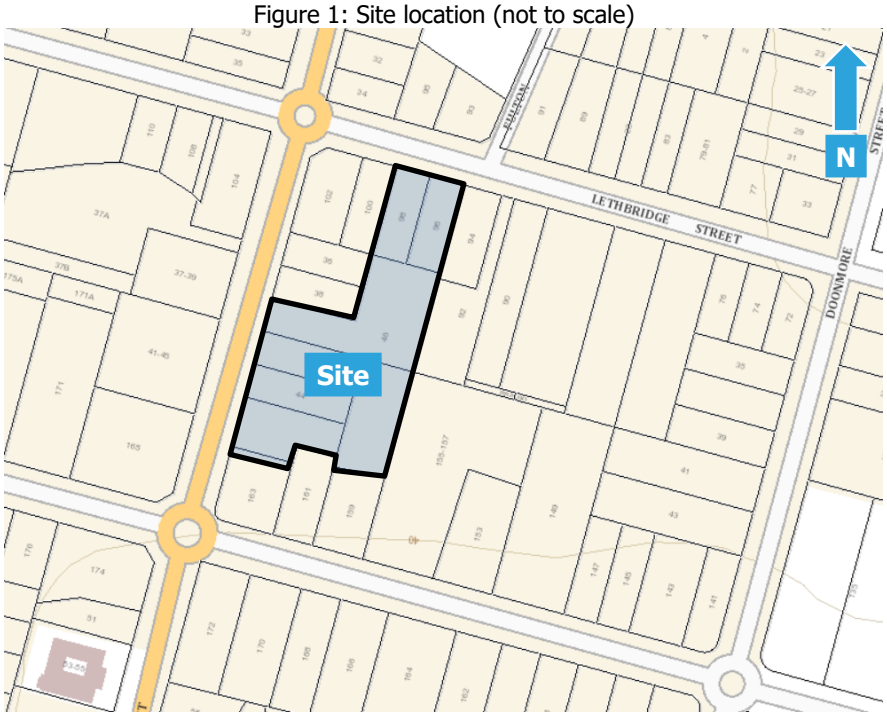
2.1 Site Location

The site is described by the following:

96-98 Lethbridge Street and 42-46 Evan Street Penrith
Lot 72 DP810706
Lot 6 DP519556
Lot 71 DP810706
Lot 1 DP18848
Lot 18B DP47961
Lot 2 DP18848
Lot A DP376772
Lot X DP389668

Refer to Figure 1 for site location.

Figure 1: Site location (not to scale)



A comprehensive site survey was conducted on the 22nd October 2020 and identified the following:

a) Residential dwellings occupy the site and will be demolished to make way for the development.
b) Evan Street separates the site from the residential apartment buildings to the west.
c) Lethbridge separates the site from medical and physiotherapy office suites to the north.
d) Residential dwellings are located adjacent the eastern site boundary.
e) A dentist and therapists are located adjacent the southern site boundary.

2.2 Proposal

The proposal is to demolish the existing residential dwellings and construct a six storey residential apartment building comprised of:

- 133 units from ground floor to level 5.
- Communal outdoor areas on level 4 and 5.
- 202 carspaces over the two basement levels with site access via Lethbridge Street.

2.3 Acoustic Environment

The surrounding area is primarily affected by noise from the surrounding road network.

3. Equipment

The following equipment was used to record noise levels:

- Rion NL42 Environmental Noise Monitor (SN# 0125207)
- Pulsar Model 105 Ltd Sound Calibrator (SN # 57417)

The Environmental Noise Monitor holds current NATA Laboratory Certification and was field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Receivers and Monitoring

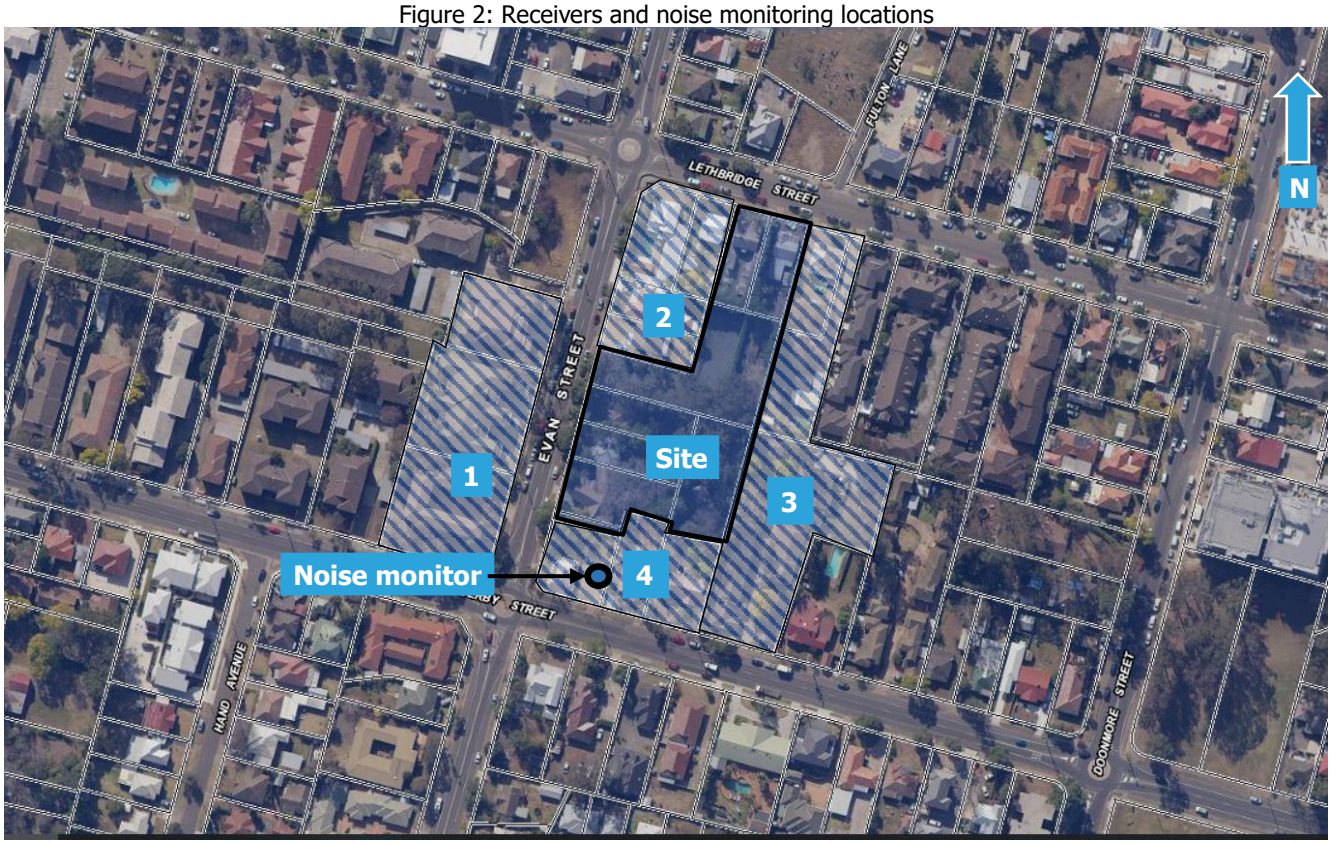
4.1 Receiver locations

The nearest sensitive receiver locations were identified as follows;

1. Residential apartment buildings are located on the western side of Evan Street at 165 Derby Street and 37 to 45 Evan Street.
2. Residential dwellings are located adjacent the north western site boundary at 36 to 38 Evan Street and 100 to 102 Lethbridge Street.
3. Residential dwellings are located adjacent the eastern site boundary at 92 to 94 Lethbridge Street and 157 Derby Street.
4. Commercial premises are located adjacent the southern site boundary at 159 to 163 Derby Street.

Refer to Figure 2 for these locations.

Figure 2: Receivers and noise monitoring locations



4.2 Unattended ambient noise measurement procedure

A Rion NL42 environmental noise monitor was at 163 Derby Street, Penrith to measure ambient noise levels. This monitoring location was chosen as it was considered representative of the ambient noise levels at the nearest residential receiver locations. The monitor was located in a free field position with the microphone approximately 1.4 metres above ground surface level. The noise monitor was set to record noise levels between 22nd and 29th September 2020.

The environmental noise monitor was set to record noise levels in "A" Weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted generally in accordance with Australian Standard AS1055:2018 *Acoustics – Description and measurement of environmental noise*.

5. Existing Ambient Noise Levels

The following tables present the measured existing ambient noise levels from the unattended noise survey. Any periods of inclement weather or extraneous noise are omitted from the measured data prior to determining the overall results.

5.1 Meteorological conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (http://www.bom.gov.au/climate/data), shown in Table 1 below.

Table 1: Meteorological conditions – Penrith

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Tuesday	22/09/2020	0.2	9	SW	20	WNW
Wednesday	23/09/2020	0	11	WNW	17	W
Thursday	24/09/2020	0	22	WNW	20	WNW
Friday	25/09/2020	0	22	NNE	26	NW
Saturday	26/09/2020	2.2	24	W	26	WSW
Sunday	27/09/2020	0	13	SW	15	ESE
Monday	28/09/2020	0	2	S	7	E
Tuesday	29/09/2020	0	6	NNW	11	NNE

5.2 Background noise levels

The measured rating background noise levels (RBL) in accordance with the NSW Noise Policy for Industry, are as follows;

Table 2: Measured L90 noise levels

Day	Date	Background L90 dBA		
		Day	Evening	Night
Tuesday	22/09/2020	x	35.6	28.4
Wednesday	23/09/2020	45.8	36.5	32.5
Thursday	24/09/2020	45.5	37.3	29.8
Friday	25/09/2020	47.1	40.1	41.5
Saturday	26/09/2020	44.3	36.9	31.1
Sunday	27/09/2020	42.0	30.0	27.4
Monday	28/09/2020	43.8	35.3	28.6
RBL		45	36	30

Graphical presentation of the measured noise levels is presented in the Appendices.

6. Noise Criteria

To determine the appropriate noise criteria to be applied, a review of Penrith City Council's planning policies and the NSW Noise Policy for Industry was conducted.

6.1 Penrith City Council

Section 2.2.19 of the Penrith Development Control Plan (DCP) 2014 outlines the following requirements for residential development;

> *"2.2.19 Visual and Acoustic Privacy and Outlook*
>
> *A. Objective*
>
> *a. Provide an outlook from dwellings and their private open space, and achieve levels of acoustic and visual privacy that are reasonable for a residential neighbourhood.*
>
> *b. The recommended night-time internal noise levels in living and sleeping areas is 35- 40 dB(A). – WHO.*
>
> *c. To provide a high level of visual and acoustic privacy for residents and neighbours in dwellings and private open space. d. To ensure that building design minimises overlooking problems"*

6.2 Noise Policy for Industry

Assessment of noise in accordance with NSW EPA Noise Policy for Industry (2017) has two main components: intrusiveness and amenity criteria. These are compared to each other (after conversion of amenity noise level to LAeq,15min equivalent level) to determine the overall project noise trigger level.

6.2.1 Intrusiveness noise level

The intrusiveness noise level is based on the $L_{Aeq\ (15\ min)}$ associated with commercial activity being less than or equal to the measured L_{A90} Rating Background Level + 5dB as per section 2.3 of the policy. A modifying factor should also be added where appropriate to allow for tonality, impulsiveness, and intermittency or low frequency effects.

6.2.2 Amenity noise level

The amenity noise level is determined in accordance with Section 2.4 of the policy based on the land use and relevant noise criteria specified in Tables 2.2 and 2.3.

The Noise Policy for Industry sets out acceptable noise levels for various locations. Determination of which residential receiver category applies is described in Table 2.3 of the policy.

Table 3: Receiver category (Table 2.3 of the Noise Policy for Industry)

Receiver category	**Typical planning zoning – standard instrument**	**Typical existing background noise levels**	**Description**
Rural residential	RU1 – primary production RU2 – rural landscape RU4 – primary production small lots R5 – large lot residential E4 – environmental living	Daytime RBL <40 dB(A) Evening RBL <35 dB(A) Night RBL <30 dB(A)	**Rural** – an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse. Note: Where background noise levels are higher than those presented in column 3 due

Receiver category	Typical planning zoning – standard instrument	Typical existing background noise levels	Description
			to existing industry or intensive agricultural activities, the selection of a higher noise amenity area should be considered.
Suburban residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime RBL<45 dB(A) Evening RBL<40 dB(A) Night RBL <35dB(A)	**Suburban** – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.
Urban residential	R1 – general residential R4 – high density residential B1 – neighbourhood centre (boarding houses and shop-top housing) B2 – local centre (boarding houses) B4 – mixed use	Daytime RBL> 45 dB(A) Evening RBL> 40 dB(A) Night RBL >35 dB(A)	**Urban** – an area with an acoustical environment that: • is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources • has through-traffic with characteristically heavy and continuous traffic flows during peak periods • is near commercial districts or industrial districts • has any combination of the above.

To determine the appropriate receiver category, the following observations were made:

- The nearby residential receivers are zoned R4 - High Density Residential which corresponds with typical planning zoning of the urban category.
- The measured RBL values presented in Section 5.2 corresponds with the typical existing background noise levels of the suburban category.
- The acoustic environment of the surrounding area has local traffic with characteristically intermittent traffic flows, which corresponds with the description of the suburban category.

Therefore, the nearest residential receivers would be assessed against the 'suburban' criteria.

6.2.3 Modifying factors

The Noise Policy for Industry includes correction factors such as tonal noise, low-frequency noise, intermittent noise and duration. Where two or more modifying factors are present, the maximum adjustment to a noise source level is 10dBA (excluding duration correction).

6.3 Project noise trigger level

To determine the project trigger noise level, the amenity noise level must first be standardised to and equivalent LAeq 15min in order to compare to the intrusiveness noise level. This is done in accordance with section 2.2 of the policy as follows;

$$L_{Aeq,15min} = L_{Aeq,\ period} - 5dB + 3dB$$

Therefore, based on the measured data presented in Section 5, the project specific noise limits are determined.

6.3.1 Sleep disturbance noise level

Sleep disturbance is based on the maximum noise level of events from premises during the night-time period. The Noise Policy for Industry defines sleep disturbance as a noise from a premise at a residential location that exceeds:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

6.3.2 Intrusiveness noise criteria

The intrusiveness noise levels are as follows;

Table 4: Intrusiveness noise levels

Time period	Criteria $L_{eq\ (15min)}$ dBA	
	Receivers 1 to 3	*Receiver 4
Day (7am-6pm Mon-Sat; 8am-6pm Sun)	50	N/A
Evening (6pm-10pm)	41	N/A
Night (10pm-7am Sun-Fri, 10pm-8am Sat)	35	N/A

*Note that the intrusiveness noise criteria only applies to residential receivers.

6.3.3 Amenity criteria

Based on Section 2.4 of the policy, the amenity noise levels are as follows;

Table 5: Amenity noise levels

Time period	Criteria $L_{eq\ (15min)}$ dBA	
	Receivers 1 to 3	Receiver 4
Day	53	65
Evening	43	65
Night	38	65

6.3.4 Project specific noise criteria

The project noise trigger level is the lower (that is, the most stringent) value of the intrusiveness and amenity noise levels. Therefore the project noise trigger levels are as follows:

Table 6: Project criteria

Time period	Criteria $L_{eq\ (15min)}$ dBA	
	Receivers 1 to 3	Receiver 4
Day	50	65
Evening	41	65
Night	35	65

6.3.5 Sleep disturbance

The sleep disturbance noise level limits for residential receivers are as follows;

Table 7: Sleep disturbance criteria

Time period	Criteria $L_{eq(15min)}$ dBA	Criteria L_{AFmax} dBA
Night	40	52

7. Environmental Assessment

7.1 Onsite activities

Noise associated with the development was assessed based on previous measurements of similar activities. The calculations assume that the nominated activities are located at a representative distance within the development site to each receiver location. Any relevant shielding or building transmission loss is taken into account for these activities.

7.2 Project specific criteria

The noise source levels at the receiver locations are shown in Table 8. LAeq results are not shown where the calculated total is less than 0dBA.

Table 8: Project specific noise levels

Receiver	Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	LAeq adj,T ext. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T ext. dB(A) Night	LAeq 15 min Compliance Day	Eve	Night
	Receivers: 1. 165 Derby St & 37 to 45 Evan St (W); 2. 36 to 38 Evan St & 100 to 102 Lethbridge St (NW); 3. 92 to 94 Lethbridge St & 157 Derby St (E); 4. 159 to 163 Derby Street (S)									
	Criteria							50	41	35
	Car door closure	75	2	77	8	5	2	Yes	Yes	Yes
1	Car start	74	2	76	7	4		Yes	Yes	Yes
	Car passby	69		69	25	22	19	Yes	Yes	Yes
	Communal Open Space (Level 4)	75		75	39	39		Yes	Yes	n/a
	Communal Open Space (Level 5)	75		75	31	31		Yes	Yes	n/a
	Total				40	40	19	**Yes**	**Yes**	**Yes**
	Criteria							50	41	35
	Car door closure	75	2	77	27	24	21	Yes	Yes	Yes
2	Car start	74	2	76	26	23	20	Yes	Yes	Yes
	Car passby	69		69	40	37	34	Yes	Yes	Yes
	Communal Open Space (Level 4)	75		75	32	32		Yes	Yes	n/a
	Communal Open Space (Level 5)	75		75	32	32		Yes	Yes	n/a
	Total				42	39	35	**Yes**	**Yes**	**Yes**
	Criteria							50	41	35
	Car door closure	75	2	77	26	23	19	Yes	Yes	Yes
3	Car start	74	2	76	25	22	18	Yes	Yes	Yes
	Car passby	69		69	39	36	33	Yes	Yes	Yes
	Communal Open Space (Level 4)	75		75	34	34		Yes	Yes	n/a
	Communal Open Space (Level 5)	75		75	37	37		Yes	Yes	n/a
	Total				42	41	33	**Yes**	**Yes**	**Yes**
	Criteria							65	65	65
	Car door closure	75	2	77	9	6	3	Yes	Yes	Yes
4	Car start	74	2	76	8	5	2	Yes	Yes	Yes
	Car passby	69		69	10	7	4	Yes	Yes	Yes
	Communal Open Space (Level 4)	75		75	38	38		Yes	Yes	n/a
	Communal Open Space (Level 5)	75		75	34	34		Yes	Yes	n/a
	Total				39	39	13	**Yes**	**Yes**	**Yes**

Compliance is predicted for onsite activities on the condition the recommendations detailed in Section 8 are implemented.

7.3 Noise impacts – Sleep disturbance

The noise source levels and predicted levels of noise at the receiver locations are shown in Table 9.

Table 9: Predicted noise impacts – sleep disturbance

Receiver	Receivers 1. 165 Derby St & 37 to 45 Evan St (W) 2. 36 to 38 Evan St & 100 to 102 Lethbridge St (NW) 3. 92 to 94 Lethbridge St & 157 Derby St (E) 4. 159 to 163 Derby Street (S) Description	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	LAmax adj,T ext.. dB(A)	Complies Lmax dB(A)
	Criteria					52
	Car door closure	81	2	83	27	Yes
1	Car start	80	2	82	26	Yes
	Car passby	74		74	34	Yes
	Communal Open Space (Level 4)	75		75	39	Yes
	Communal Open Space (Level 5)	75		75	31	Yes
	Criteria					52
	Car door closure	81	2	83	47	Yes
2	Car start	80	2	82	46	Yes
	Car passby	74		74	50	Yes
	Communal Open Space (Level 4)	75		75	32	Yes
	Communal Open Space (Level 5)	75		75	32	Yes
	Criteria					52
	Car door closure	81	2	83	45	Yes
3	Car start	80	2	82	44	Yes
	Car passby	74		74	48	Yes
	Communal Open Space (Level 4)	75		75	34	Yes
	Communal Open Space (Level 5)	75		75	37	Yes
	Criteria					52
	Car door closure	81	2	83	28	Yes
4	Car start	80	2	82	27	Yes
	Car passby	74		74	19	Yes
	Communal Open Space (Level 4)	75		75	38	Yes
	Communal Open Space (Level 5)	75		75	34	Yes

Compliance is predicted for all onsite activities at the receiver locations for the proposed operating hours on the condition the recommendations detailed in Section 8 are implemented.

8. Recommendations

8.1 Onsite Activities

Noise impacts at the receiver locations are predicted to comply for all time periods on the condition the following treatments are implemented:

- The communal open spaces shall be limited to the day and evening time periods. (7am to 10pm weekdays, 8am to 10pm weekends)
- A 1.39m high solid balustrade shall be constructed around the perimeter of the level 4 and 5 communal open spaces as nominated in Figure 3 to Figure 4 and should be constructed using either masonry, 9mm fibre cement sheet, Hebel, Perspex, plywood, or other materials with a minimum surface density of 9kg/m^2 and shall be free of gaps and holes.

Figure 3: Level 4 communal open space treatment

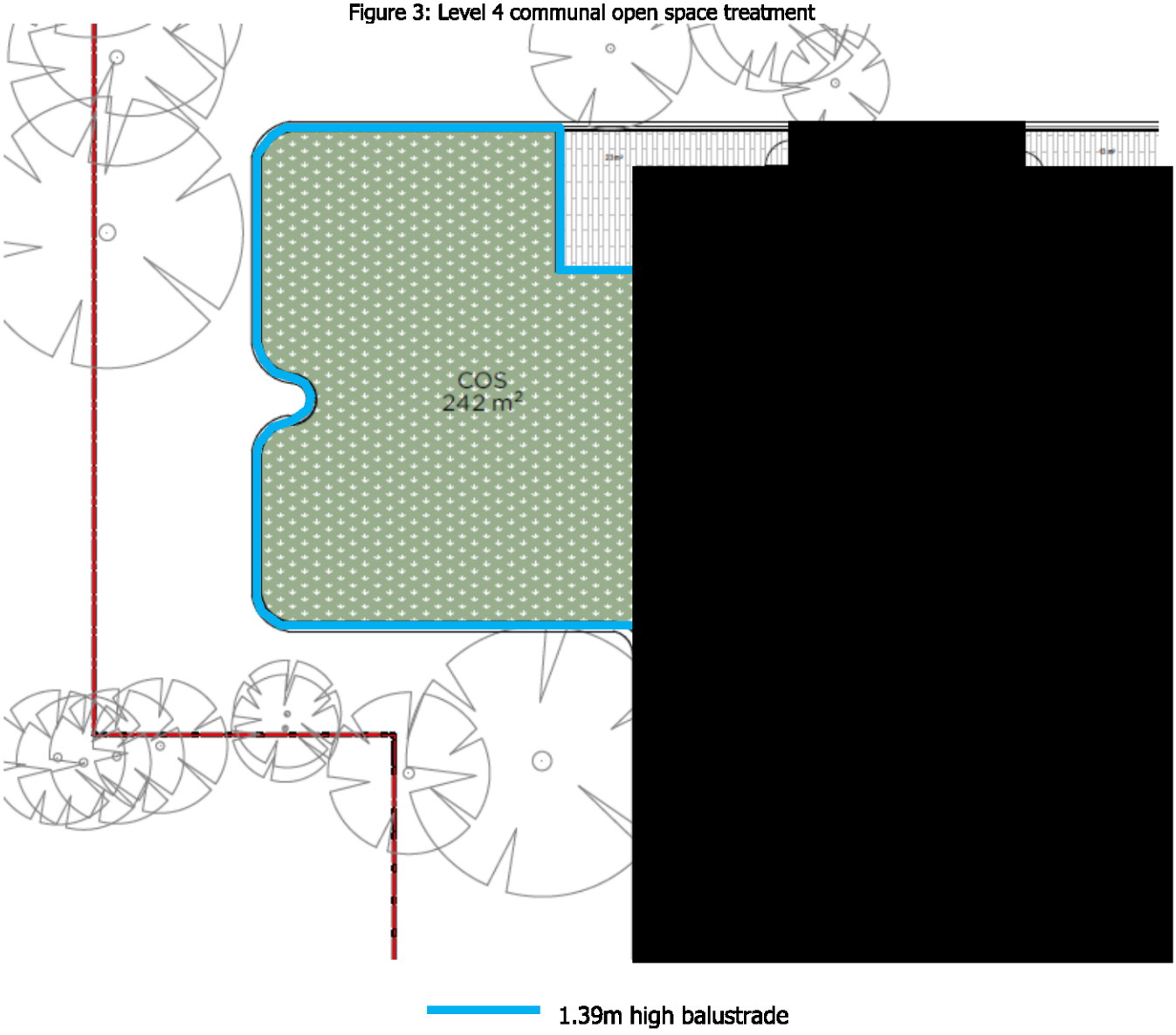
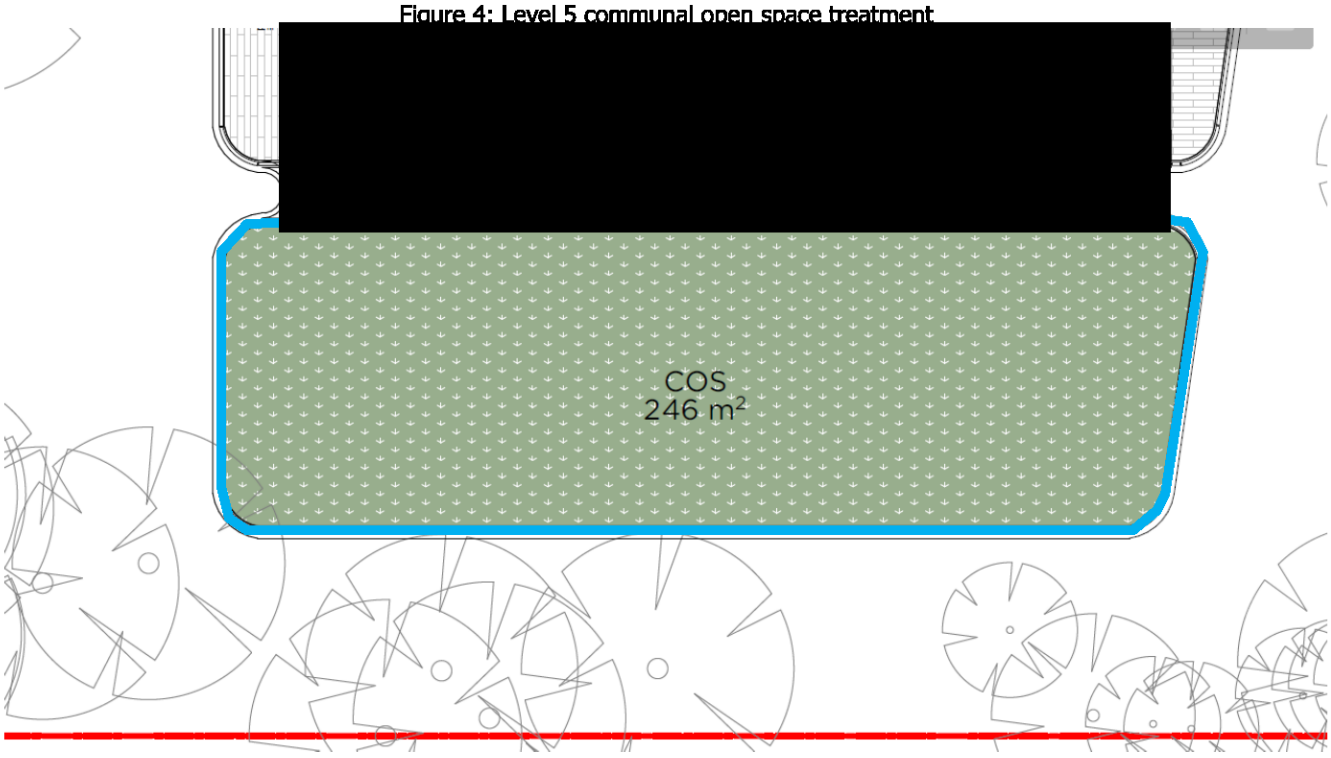


Figure 4: Level 5 communal open space treatment



8.2 Waste collection

We recommend that waste collection be conducted in accordance with the surrounding residential properties with recommended hours of 7am to 6pm weekdays and 8am to 6pm weekends.

8.3 Onsite mechanical plant

No information regarding mechanical services was available at the time of the assessment. We recommend that any new mechanical plant is designed to comply with the criteria stated in Section 6 with an assessment undertaken by qualified acoustic consultant to be conducted prior to installation.

9. Conclusion

An environmental noise assessment was conducted for the proposed residential development located at 96-98 Lethbridge Street and 42-46 Evan Street, Penrith. Based on the current site plans and layout, compliance is predicted with NSW Noise Policy for Industry and Penrith City Council's assessment requirements on the condition the recommendations detailed in Section 8 are implemented.

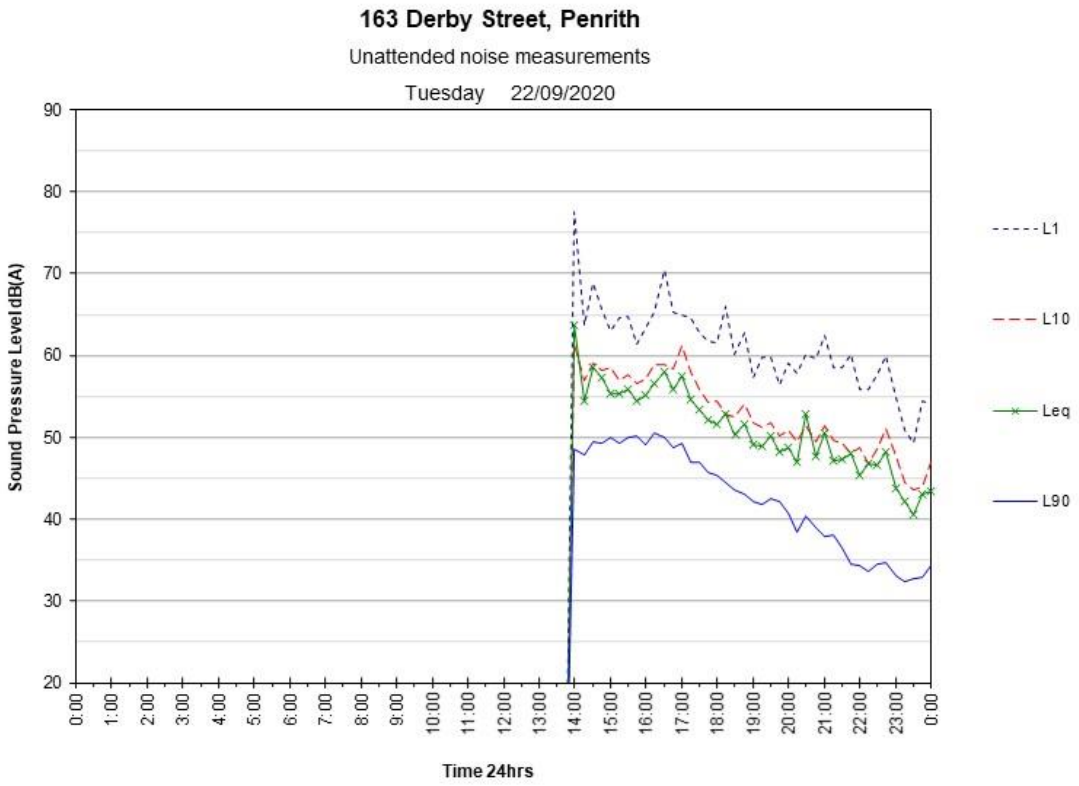
Should you have any queries please do not hesitate to contact us.

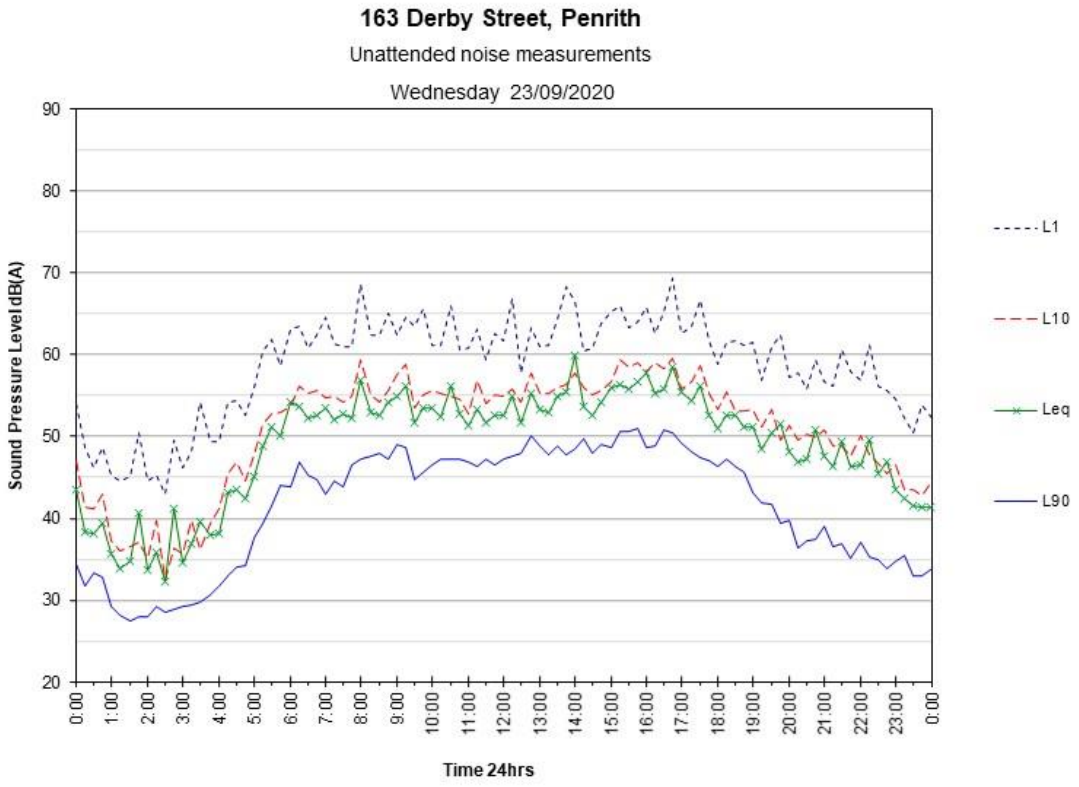
Report Prepared By

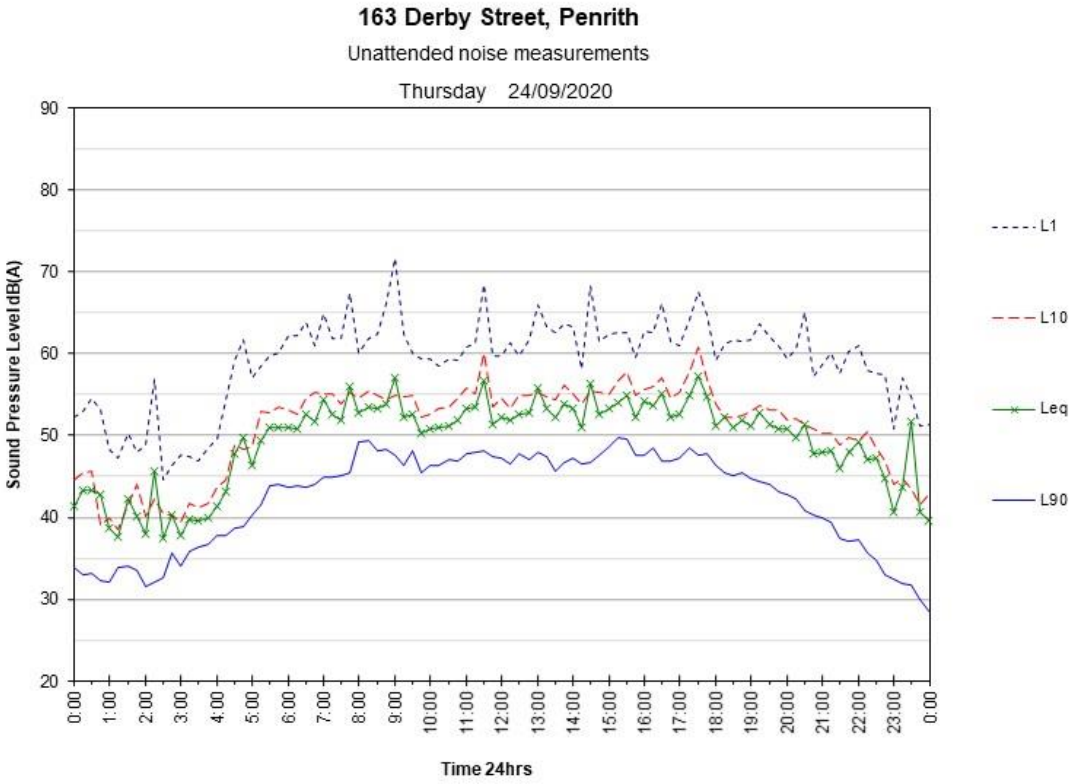
Matthew Bechara
Acoustic Consultant
acousticworks)))

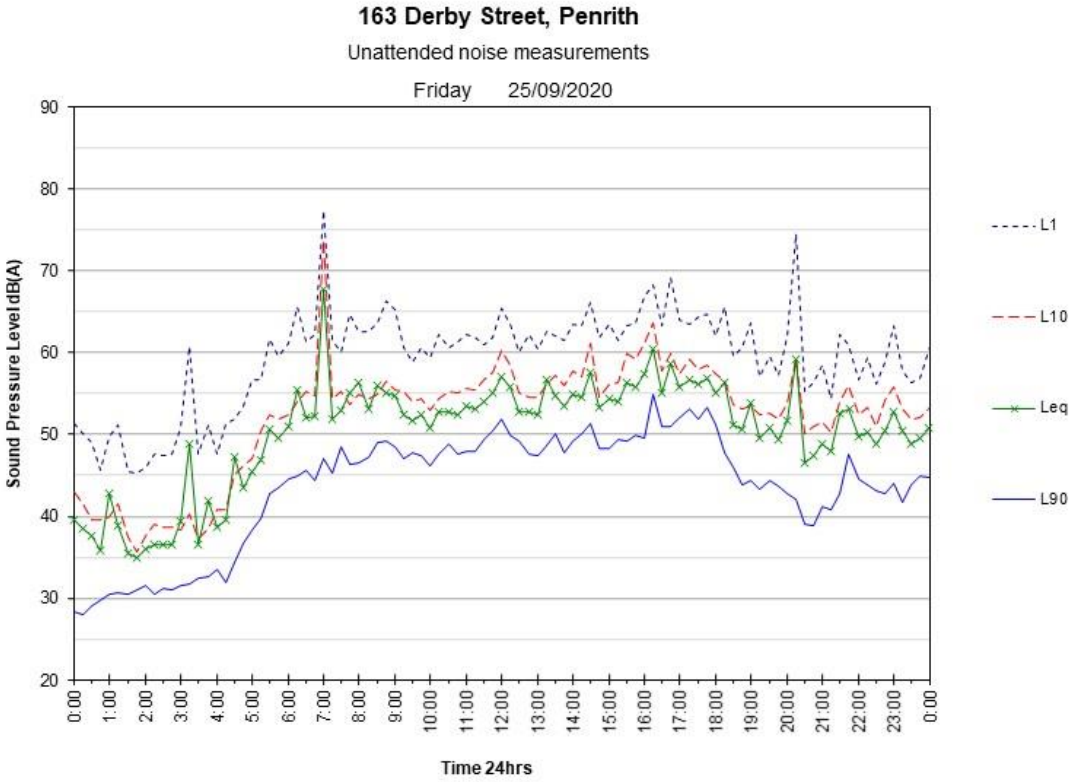
10. Appendices

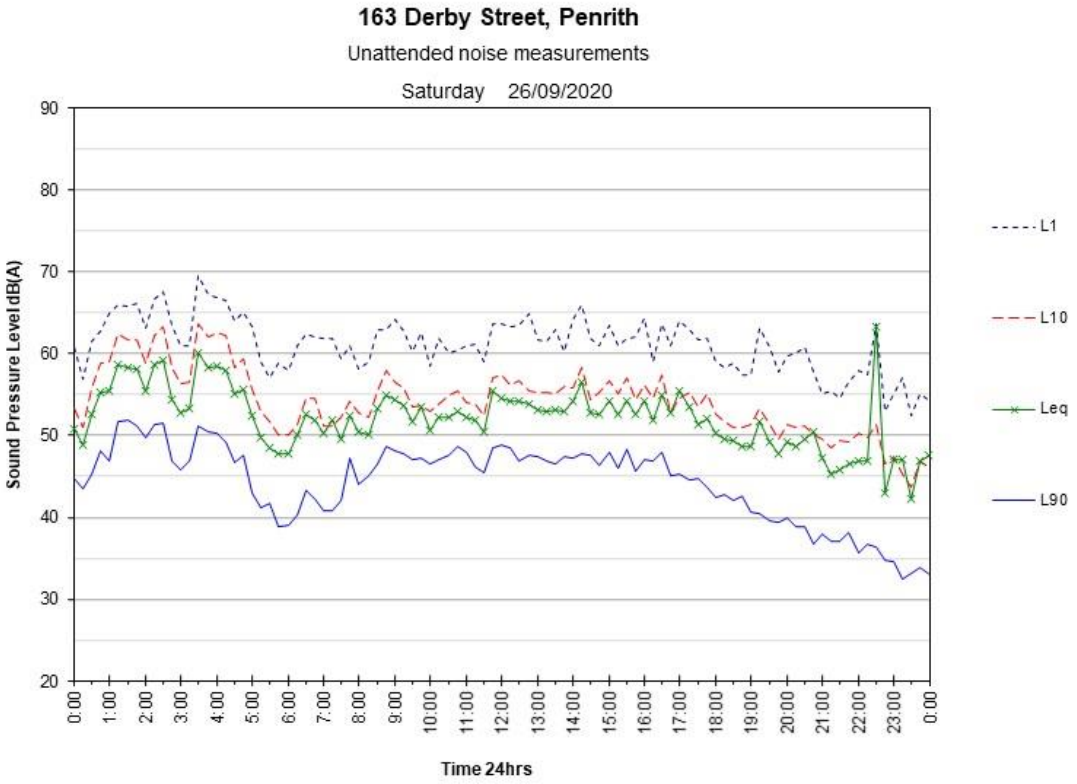
10.1 Noise monitoring charts

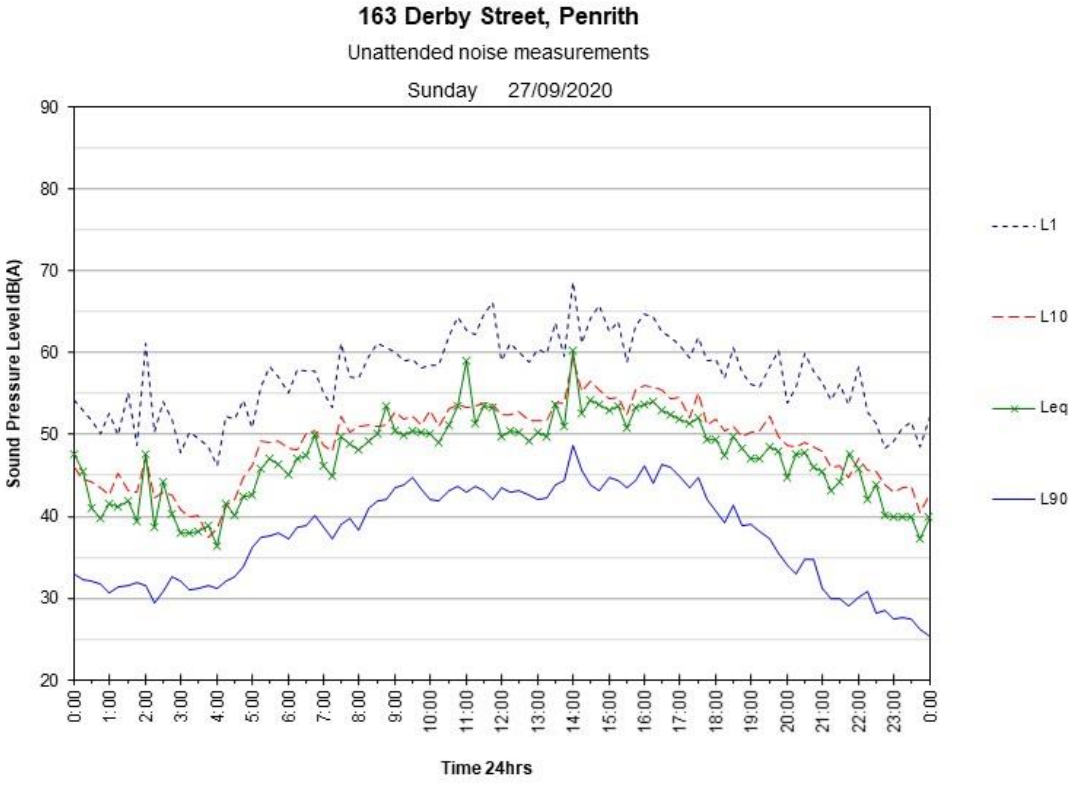


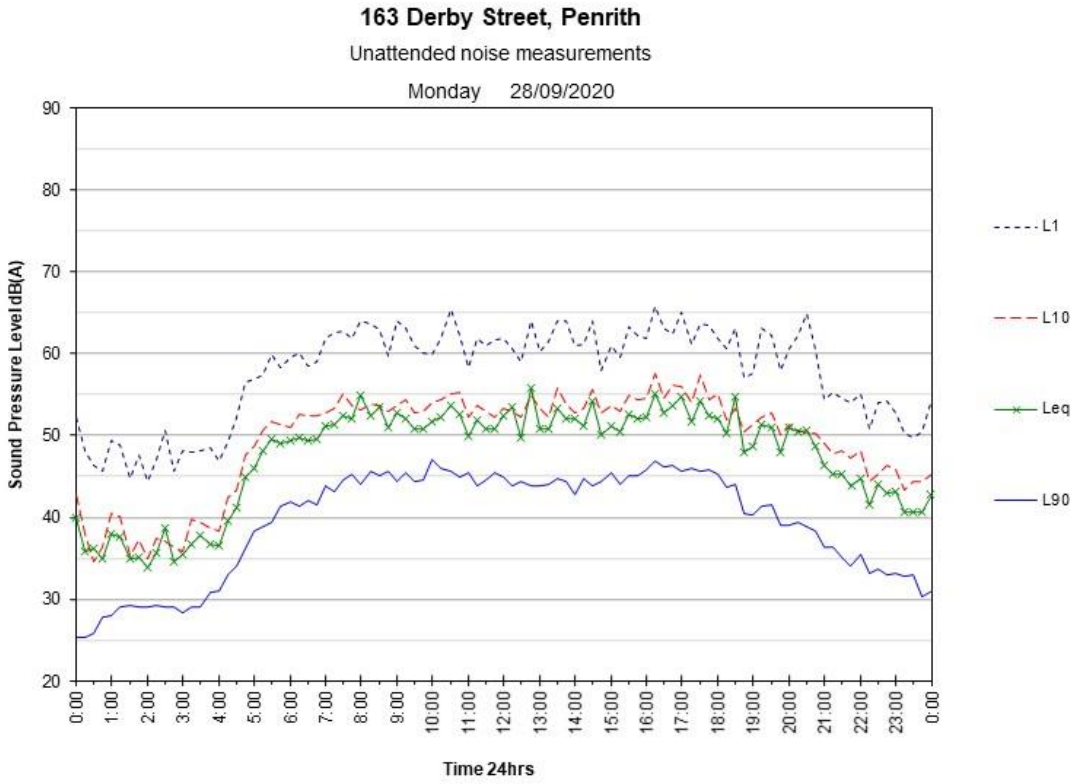


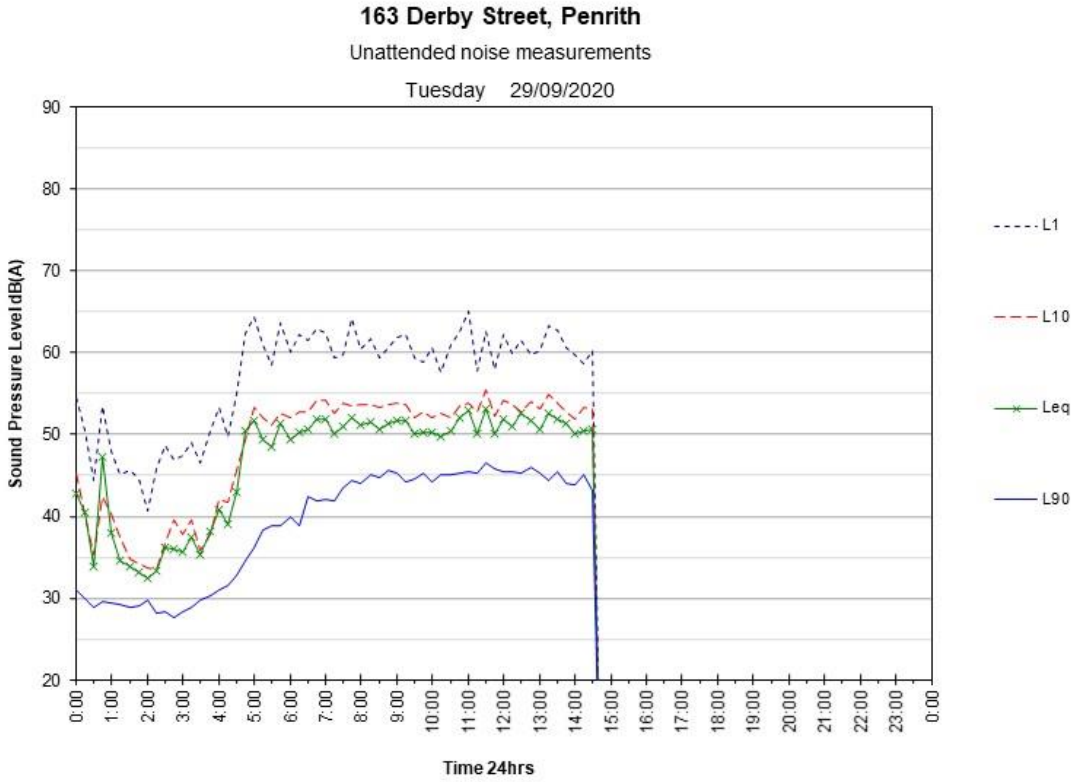












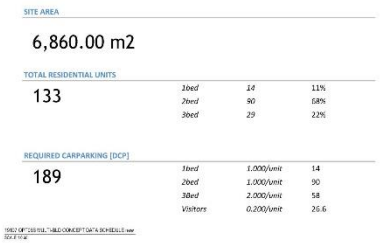
10.2 Development plans

MULTI RESIDENTIAL

96-98 LETHBRIDGE ST & 42-46 EVANS ST PENRITH NSW 2750 AUSTRALIA

DA APPLICATION
NOVEMBER 2020

URBAN LINK
ARCHITECTS



SITE AREA

6,860.00 m2

TOTAL RESIDENTIAL UNITS

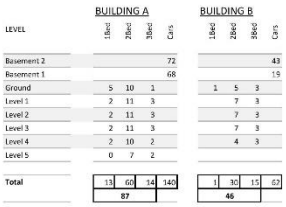
133

1bed	14	11%
2bed	90	68%
3bed	29	22%

REQUIRED CARPARKING [DCP]

189

1bed	1.000/unit	14
2bed	1.000/unit	90
3Bed	2.000/unit	58
Visitors	0.200/unit	26.6



LEVEL	BUILDING A 1Bed	2Bed	3Bed	Cars	BUILDING B 1Bed	2Bed	3Bed	Cars
Basement 2				72				43
Basement 1				68				19
Ground	5	10	1		1	5	3	
Level 1	2	11	3			7	3	
Level 2	2	11	3			7	3	
Level 3	2	11	3			7	3	
Level 4	2	10	2			4	3	
Level 5	0	7	2					
Total	13	60	14	140	1	30	15	67
	87				46			

BASIX & NATHERS

CONSULTANTS

DEVELOPMENT APPLICATION

		TITLE
SITE		
DA-000	A	COVER
DA-001	A	SITE LOCALITY
DA-002	A	SITE ANALYSIS
DA-003	A	DEMOLITION PLAN
DA-004	A	TREE PLAN
DA-005		TREE PROTECTION ZONES
DA-006	A	SITE PLAN
FLOOR PLANS		
DA-101	A	GROUND 1:250
DA-102		GROUND
DA-103	A	LEVEL 01-03
DA-104	A	LEVEL 04
DA-105	A	LEVEL 05
DA-106		ROOF
DA-107	A	BASEMENT 01
DA-108	A	BASEMENT 02
ELEVATIONS		
DA-201	A	BLDG A NORTH & SOUTH
DA-202	A	BLDG A EAST & WEST
DA-203	A	BLDG B NORTH & SOUTH
DA-204	A	BLDG B EAST & WEST
DA-205	A	STREETSCAPE LETHBRIDGE
DA-206	A	STREETSCAPE EVANS ST
SECTIONS		
DA-301	A	AA
DA-302	A	BB
DA-303	A	CC
DA-304	A	DD
DA-305	A	RAMP DETAILS
EXTERNAL FINISHES		
DA-901	A	FINISHES SCHEDULE
DA-902	A	BUILDING A RENDER
DA-903	A	BUILDING B RENDER
COMPLIANCE		
DA-1401	A	GFA DIAGRAMS
DA-1402	A	SHADOW DIAGRAMS MARCH
DA-1403	A	SHADOW DIAGRAMS JUNE
DA-1404	A	VIEWS FROM THE SUN JUNE
DA-1405	A	VIEWS FROM THE SUN 9-12
DA-1406	A	VIEWS FROM THE SUN 1-3
DA-1407	A	SOLAR ACCESS DIAGRAMS
DA-1408	A	CROSS FLOW DIAGRAMS
DA-1409	A	DEEP SOIL & LANDSCAPE
DA-1410	A	ADAPTABLE UNITS
DA-1411	A	CALCULATIONS

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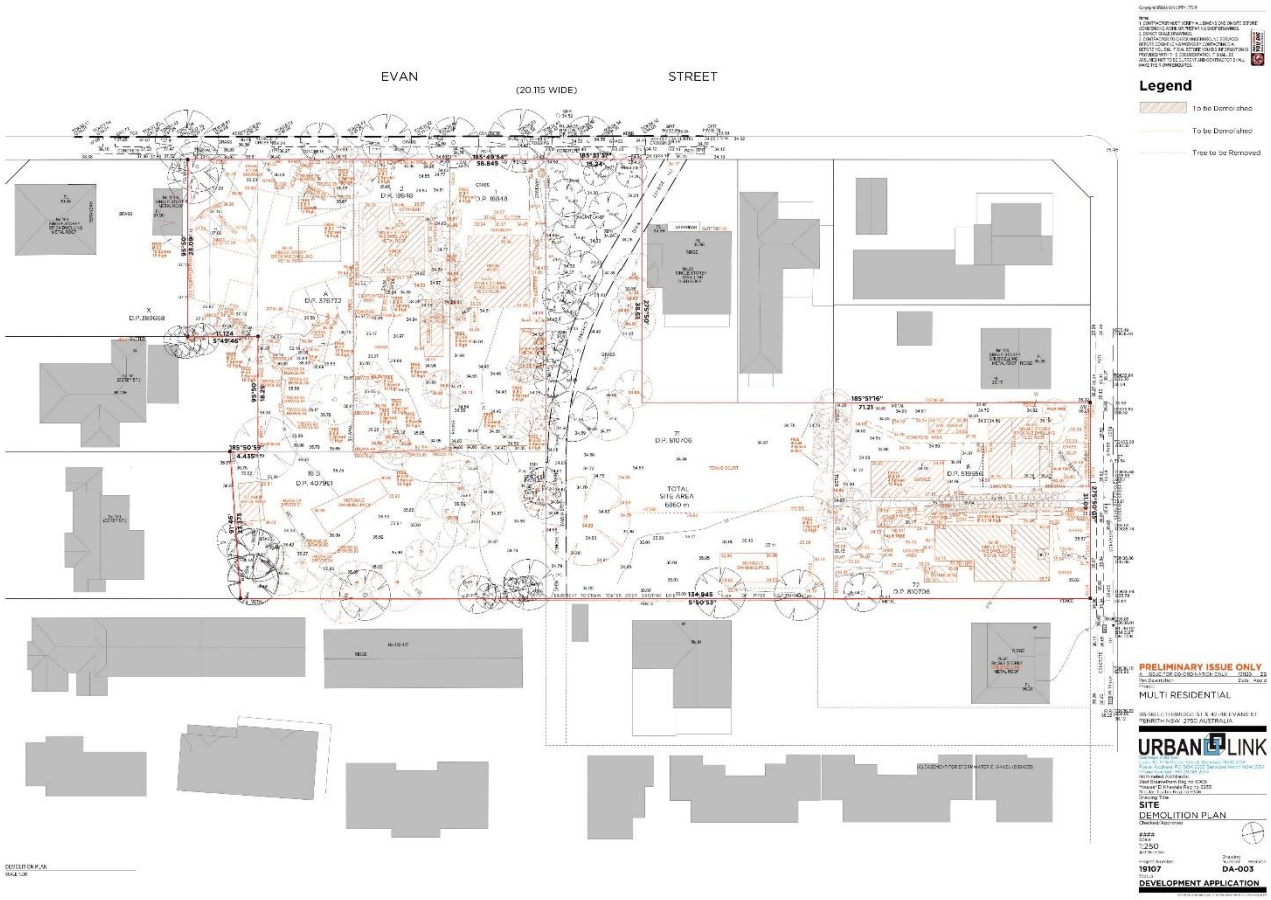
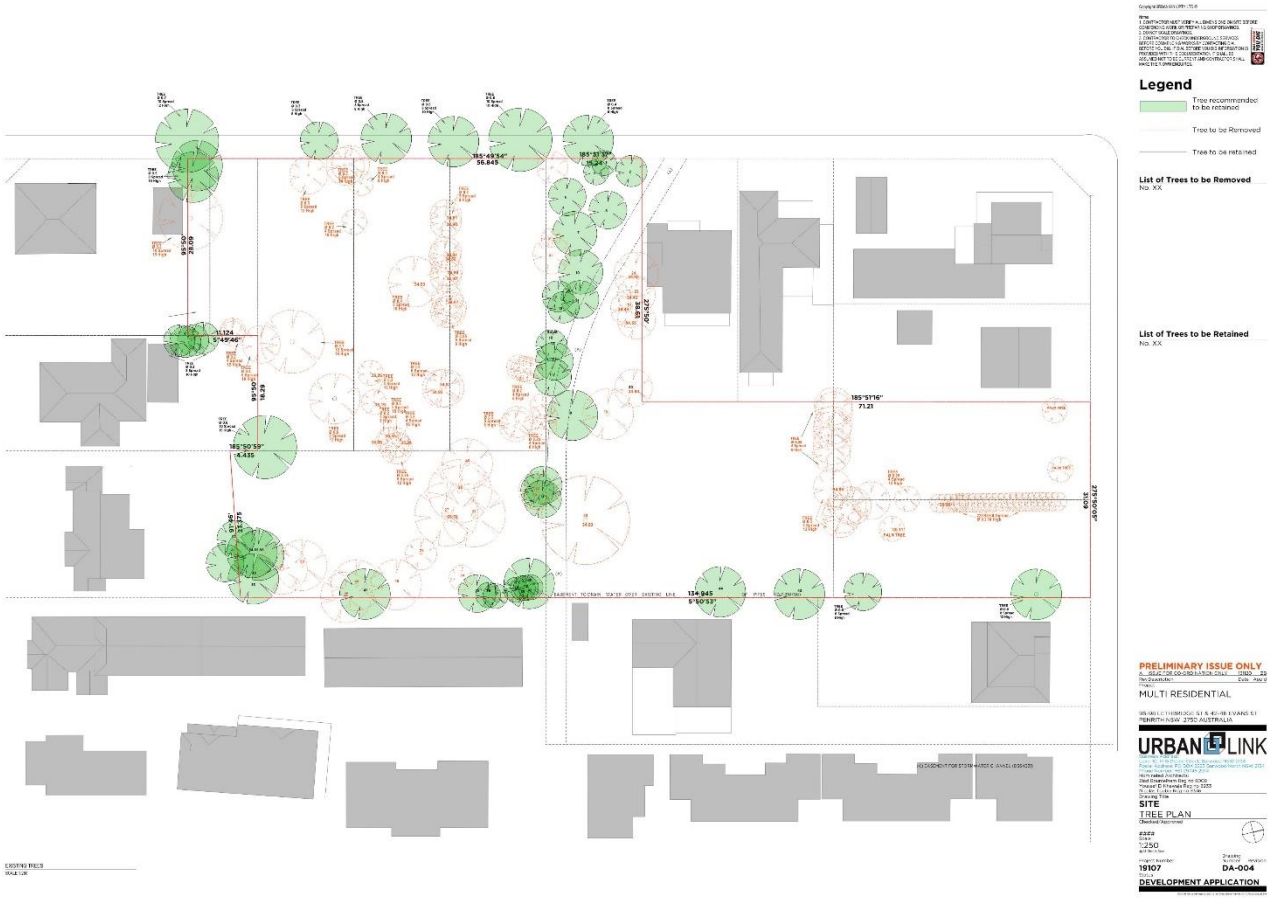
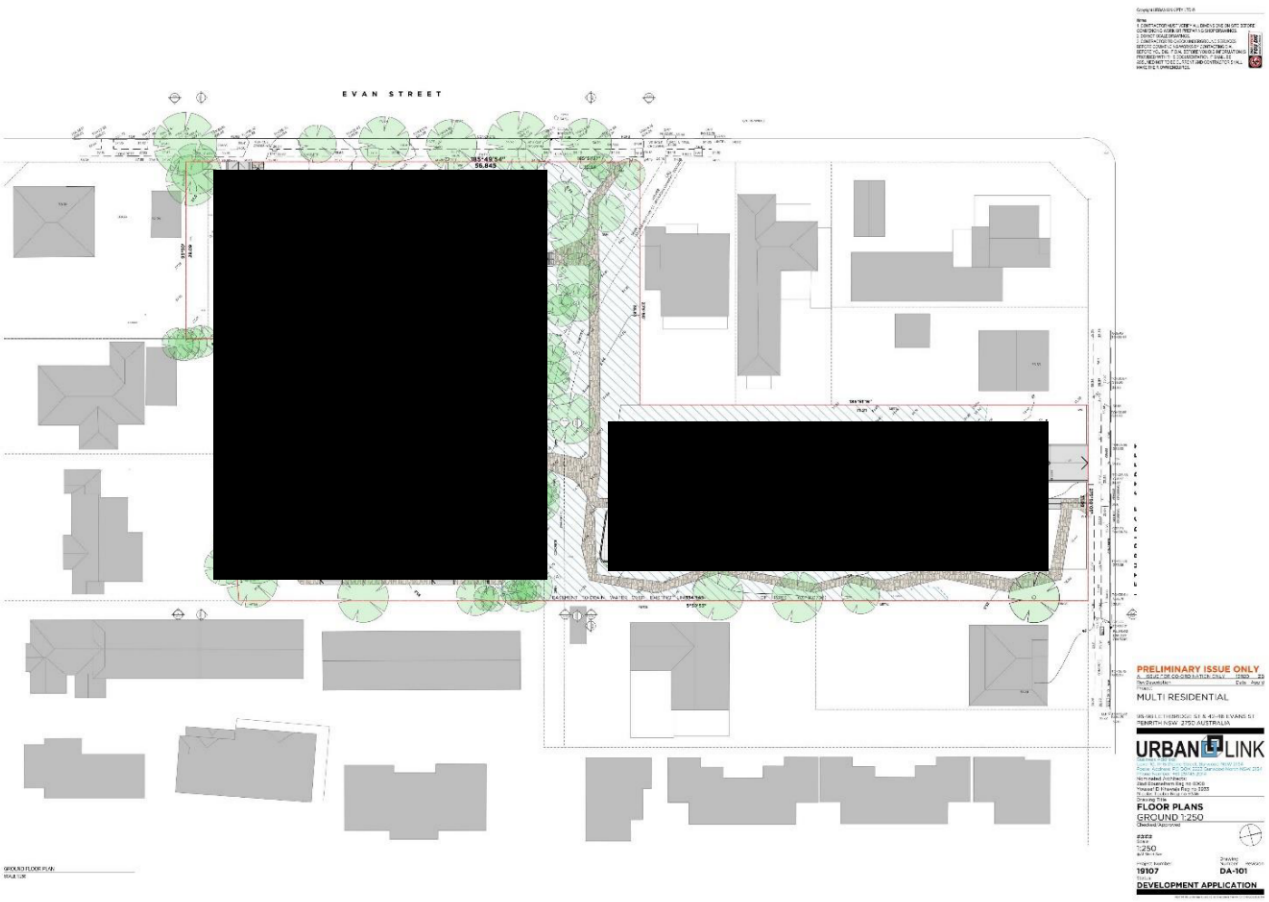
96-98 LETHBRIDGE ST & 42-46 EVANS ST
PENRITH NSW 2750 AUSTRALIA

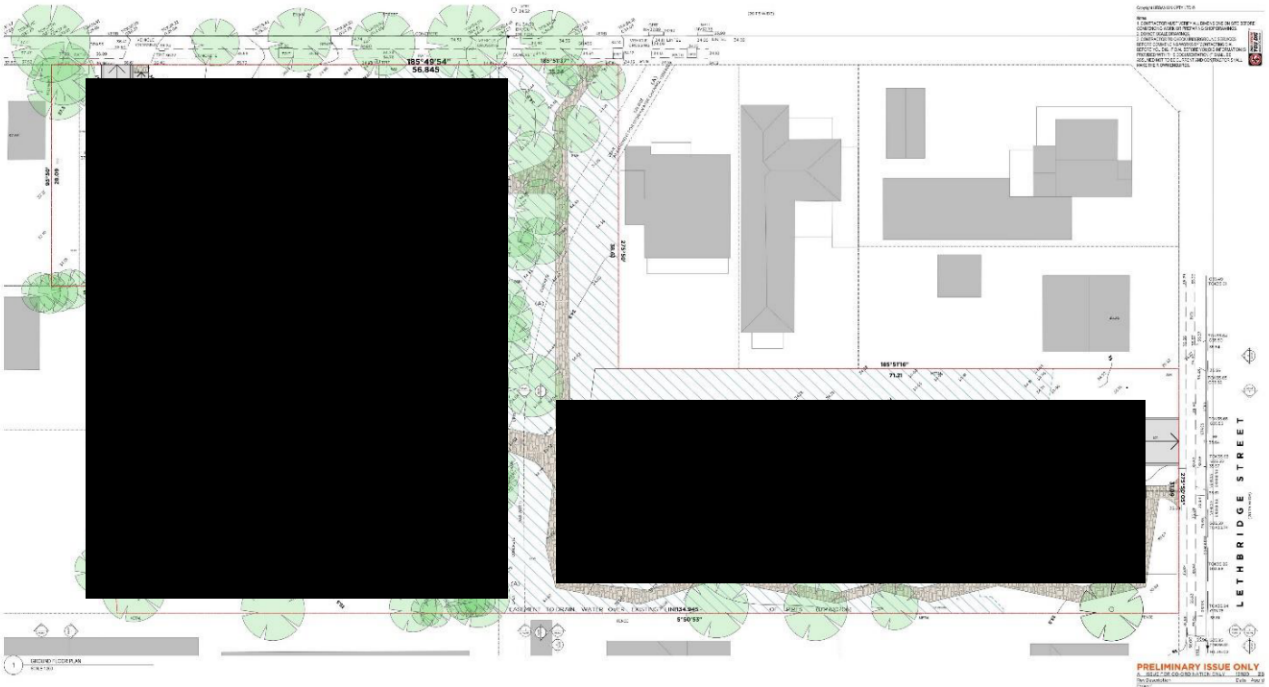
19107

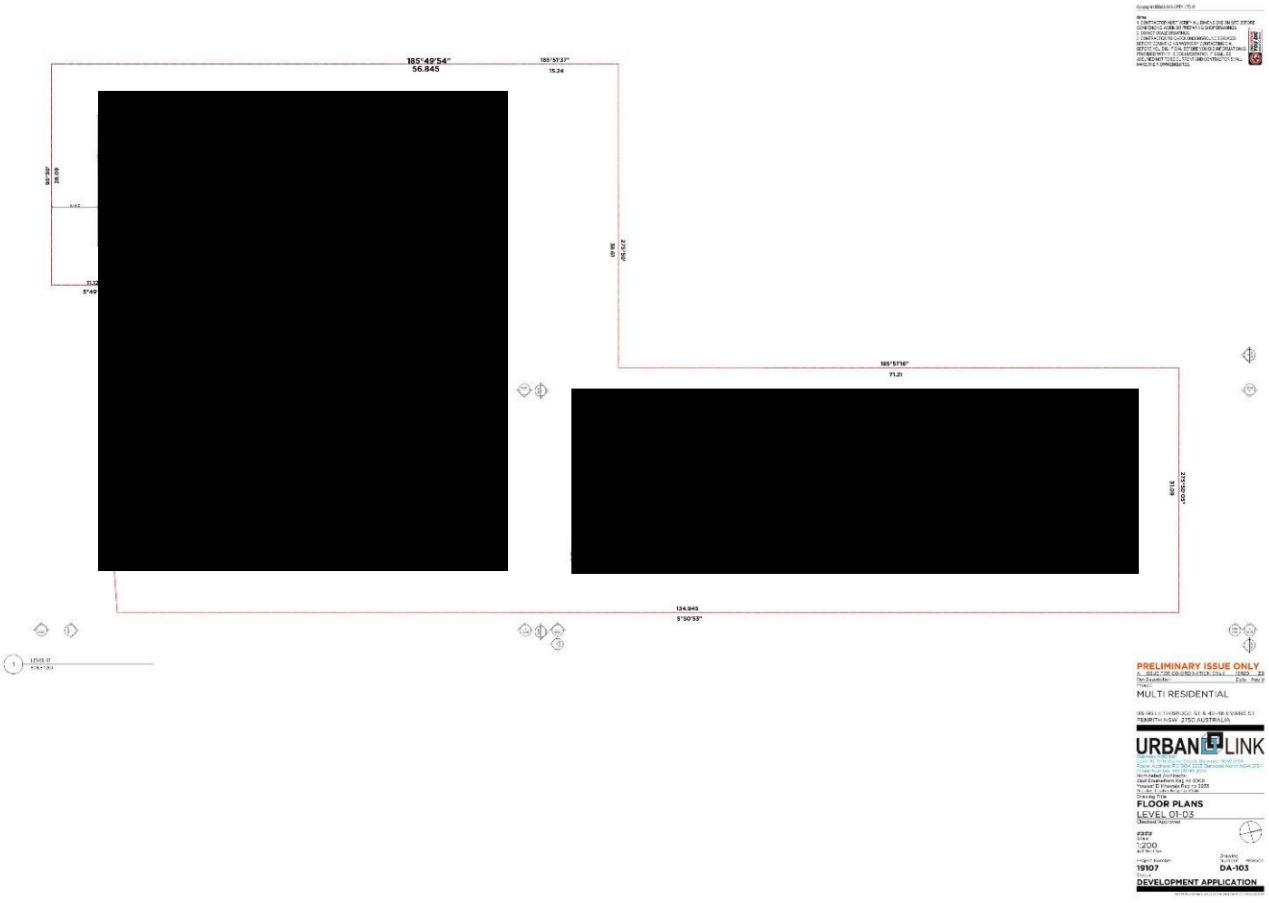
DEVELOPMENT APPLICATION

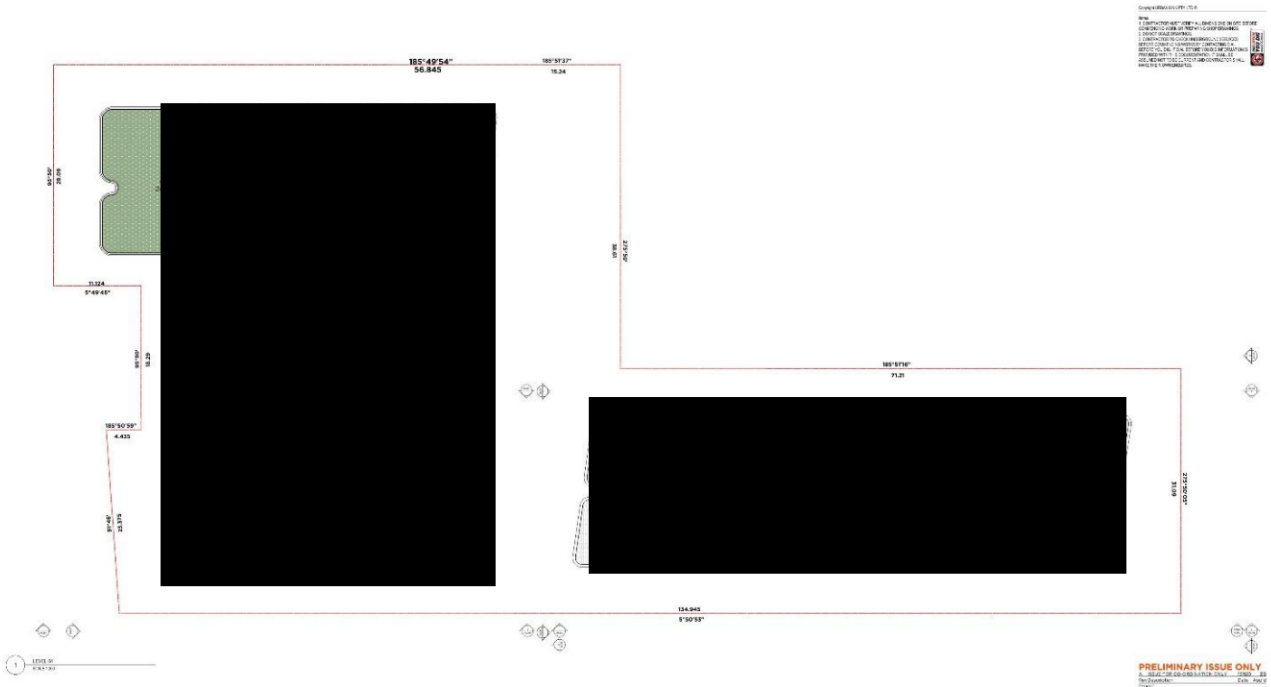


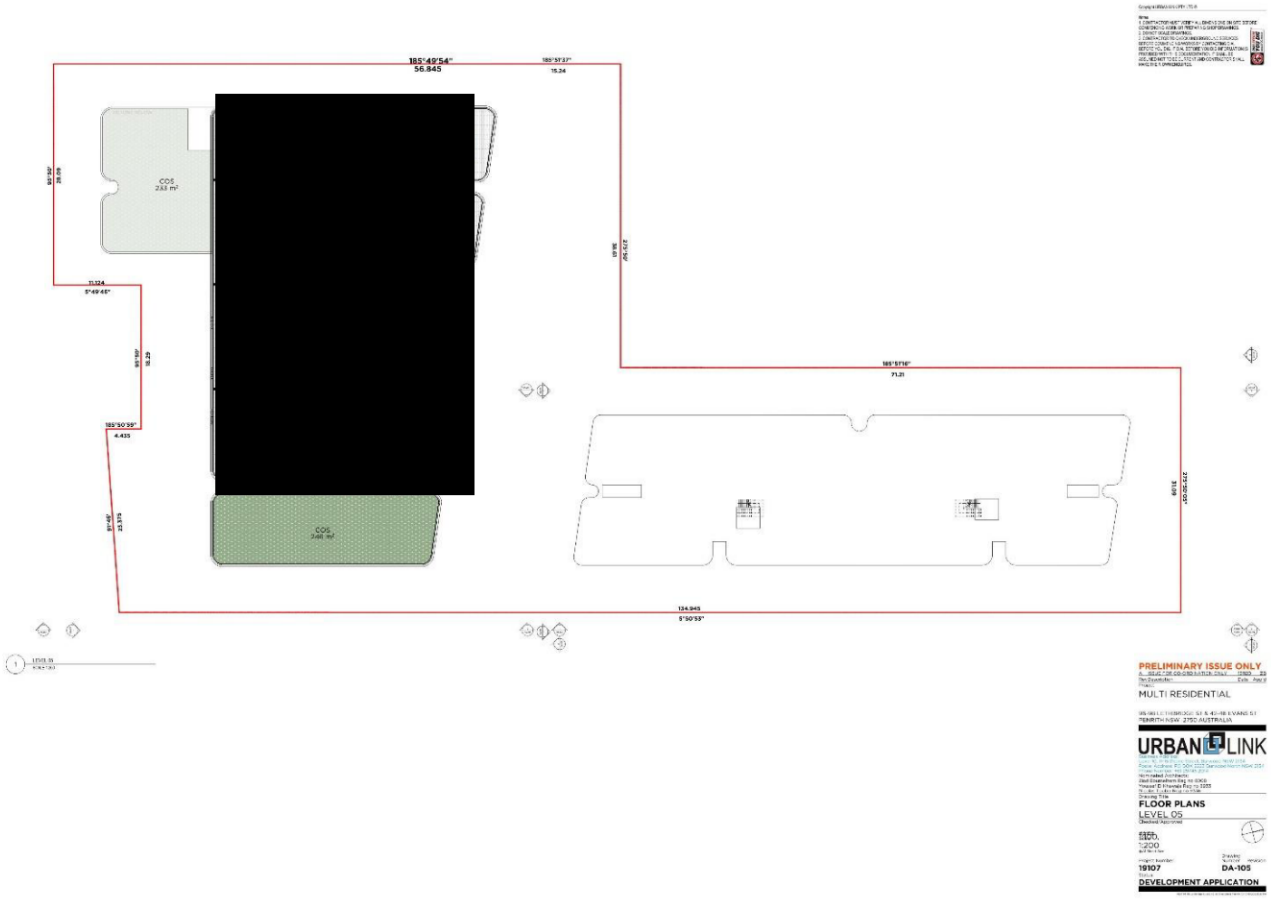


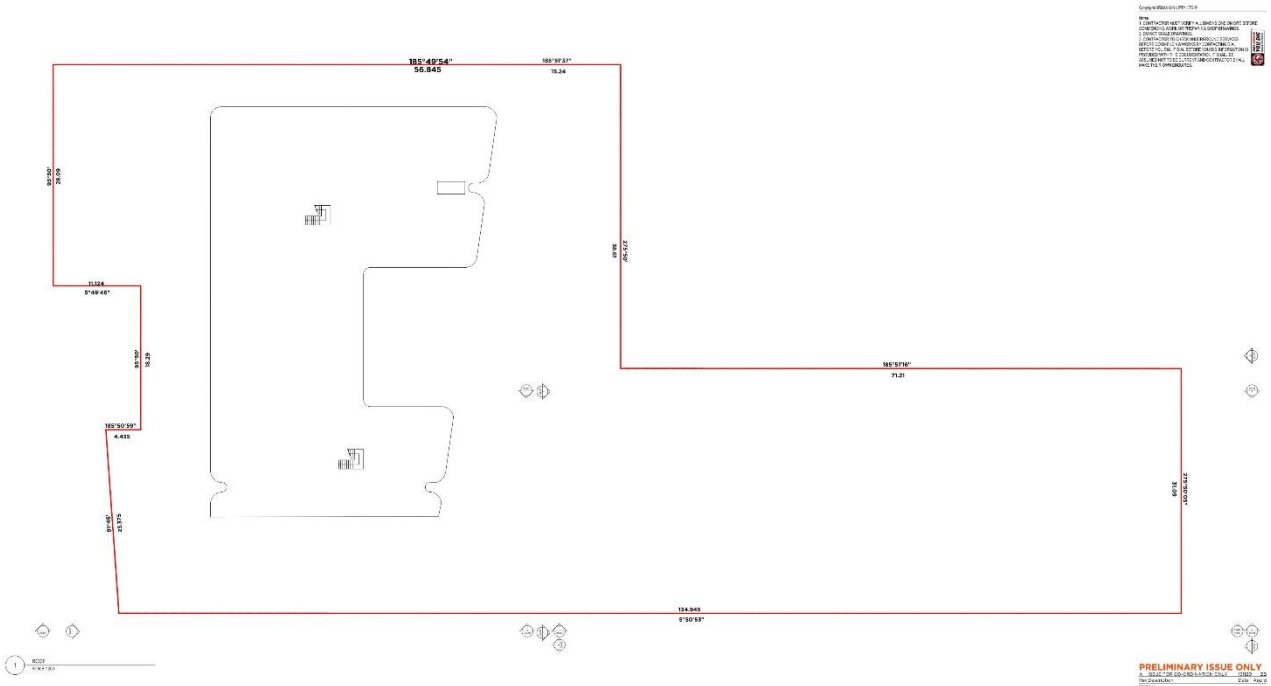












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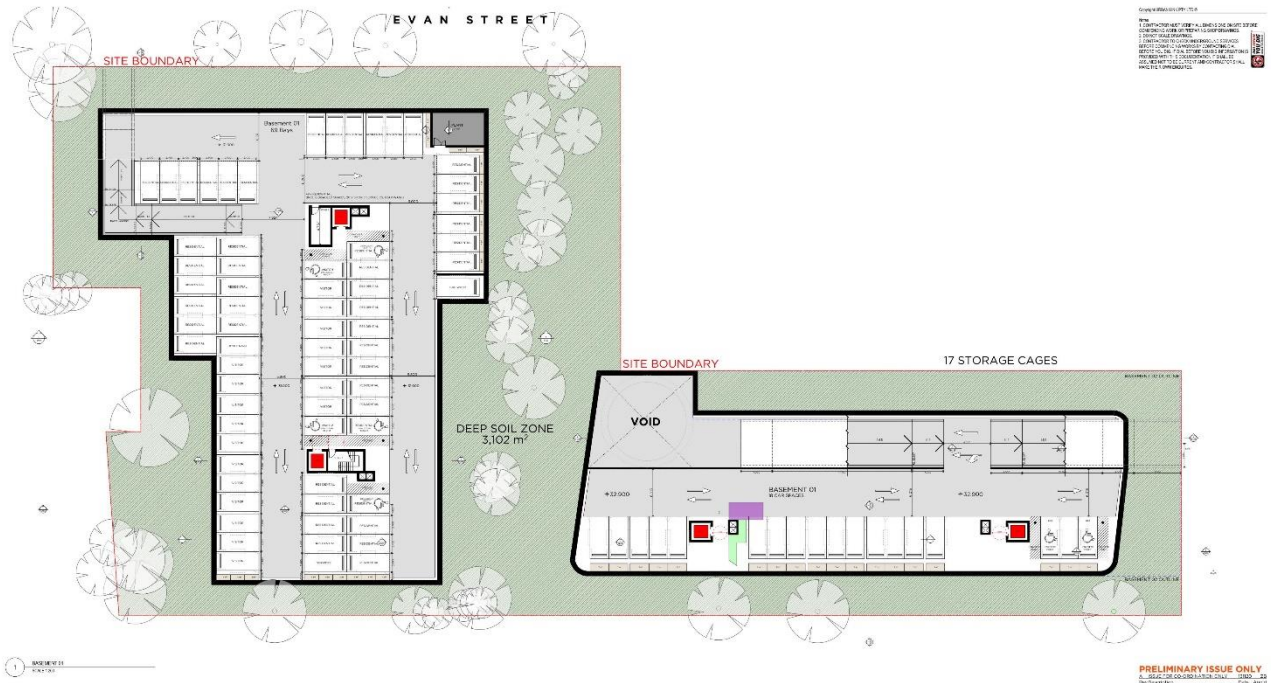
FLOOR PLANS
ROOF

1:200

19107 DA-106

DEVELOPMENT APPLICATION



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URBAN LINK

FLOOR PLANS
BASEMENT 01

1:200

19107 DA-107

DEVELOPMENT APPLICATION

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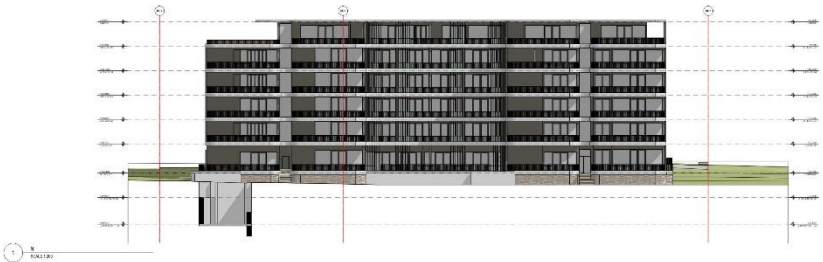
URBAN LINK

FLOOR PLANS
BASEMENT 02

1:200

19107 DA-108

DEVELOPMENT APPLICATION



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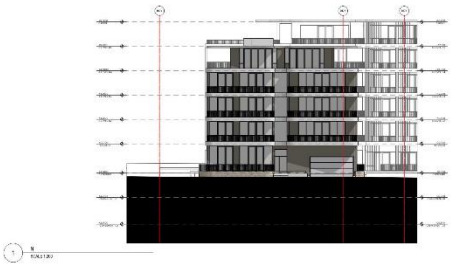
URBAN LINK

ELEVATIONS
BLDG A NORTH & SOUTH

1:200

19107 DA-201

DEVELOPMENT APPLICATION



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MULTI RESIDENTIAL

URBAN LINK

ELEVATIONS

BLDG B EAST & WEST

1:200

19107 DA-204

DEVELOPMENT APPLICATION

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URBAN LINK

COMPLIANCE

SHADOW DIAGRAMS JUNE

1:500

19107 DA-1403

DEVELOPMENT APPLICATION