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Proposed Residential Subdivision
67 Mary Street
Blackstone

ACOUSTIC REPORT




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Petrie Projects

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Contact Details

Acoustic Works
Unit 2/8 Castlemaine Street
Coorparoo QLD 4151
(07) 3393 2222
ABN: 56 157 965 056

PO Box 1271
Coorparoo DC
QLD 4151

Greg Pearce
Email: gpearce@acousticworks.com.au

Mark Enersen
Email: menersen@acousticworks.com.au

Report Register

Date	Revision	Author	Reviewer	Manager
11/11/21	R01C	Andrew Hiscox	Michael Gunning	GP
15/11/21	R01D	Andrew Hiscox	Michael Gunning	GP
17/11/21	R01E	Andrew Hiscox	Michael Gunning	GP

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1. Introduction

This report is in response to a request by Petrie Projects for a road traffic noise assessment of a proposed residential subdivision to be located at 67 Mary Street, Blackstone. To facilitate the assessment, unattended noise monitoring was conducted to determine road traffic noise impacts to the proposed development. Based on the outcomes of the assessment, recommendations for acoustic treatments are specified.

2. Site Description

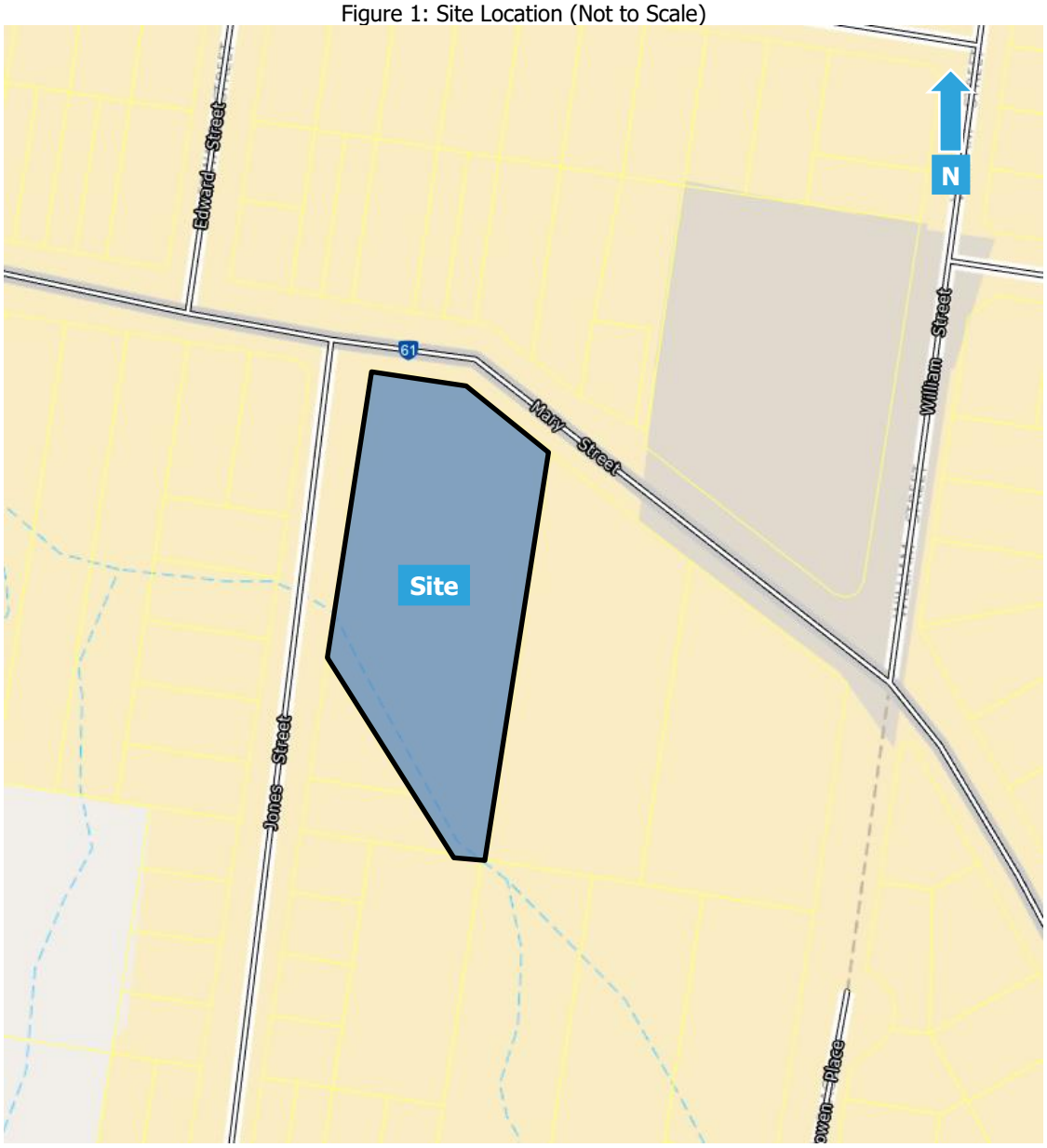
2.1 Site Location

The site is described by the following:

67 Mary Street, Blackstone
Lot 12 on RP209507

Refer to Figure 1 for site location.

Figure 1: Site Location (Not to Scale)



A comprehensive site survey was conducted on the 15th October 2021 and identified the following:

a) The site is currently occupied by a two storey residential dwelling which shall be retained and is located in a Low Density Residential zone.
b) The surrounding area consists of residential land uses.

2.2 Proposal

The proposal seeks to subdivide the existing 7,376m^2 lot into seven lots ranging in size from 450m^2 to 3,078m^2. Site access will be via Mary Street and Jones Street. Refer to the Appendices for development plans.

2.3 Acoustic Environment

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

3. Equipment

The following equipment was used to record noise levels:

- Rion NL42 Environmental Noise Monitor
- BSWA Technology Co. Ltd Sound Calibrator

The Rion NL42 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. Monitoring Location

4.1 Unattended Noise Monitoring

A Rion NL42 environmental noise monitor was placed at 69 Mary Street, approximately 8m from the nearest lane of Mary Street, to measure road traffic noise levels. The noise monitor was located in a free field position with the microphone approximately 1.4 metres above the road surface level. The noise monitor was set to record noise levels between the 15th and 28th October 2021.

The noise monitor was set to record noise levels in "A" Weighting, Fast response using 15 minute statistical intervals. Road traffic noise monitoring was conducted in accordance with Australian Standard *AS2702:1984 'Acoustics - Methods for the measurement of road traffic noise'*.

Refer to Figure 2 for noise monitoring location.

Figure 2: Noise Monitoring Location

5. Measured Noise Levels

The following tables present the measured ambient noise levels from the unattended noise survey and meteorological conditions. Any periods of inclement weather or extraneous noise were omitted from the measured data prior to determining the 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 – Amberley

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Monday	18/10/21	0	9	E	33	SW
Tuesday	19/10/21	15.0	9	NNE	6	SE
Wednesday	20/10/21	0.2	7	ESE	24	NE
Thursday	21/10/21	7.4	9	E	35	ENE
Friday	22/10/21	14.6	9	E	26	ENE
Monday	25/10/21	0	13	SSW	13	E
Tuesday	26/10/21	0.6	Calm	-	30	E
Wednesday	27/10/21	0.2	6	S	24	ENE

5.2 Road Traffic Noise Levels

The noise levels measured at the monitoring location are as follows;

Table 2: Measured Road Traffic Noise Levels - All Time Periods

Day	Date	LA10 (18h)	LAeq(1h) Day	LAeq(1h) Night
Monday	18/10/21	68.5	73.7	68.2
Tuesday	19/10/21	66.9	*75.3	66.0
Wednesday	20/10/21	66.6	68.1	67.5
Thursday	21/10/21	68.2	71.6	64.1
Friday	22/10/21	67.5	69.7	*70.8
Monday	25/10/21	67.6	69.1	63.6
Tuesday	26/10/21	67.2	*78.9	64.5
Wednesday	27/10/21	66.6	65.9	64.2
Overall value		67.4	71.6	67.5

*Note rainfall on the 19th and 22nd October and extraneous noise on the 26th October was found to affect the measurements, therefore the data was omitted for the affected time periods. Data for the weekends was not utilised as this was not considered relevant to the assessment. Refer to the appendix for graphical representation.

6. Road Traffic Noise Criteria

As the development is located near an arterial road, as detailed in the Ipswich Planning Scheme 2006, the following criteria applies:

6.1 Queensland Development Code MP4.4

To determine the minimum design requirements for any new buildings located within a transport corridor, the Queensland Development Code Part 4.4 may be applied if no alternative solutions are provided. In accordance with MP4.4, the noise categories are stated in Table 3.

Table 3: Queensland Development Code Part 4.4 Criteria

Queensland Development Code MP 4.4	
Category	$L_{10(18h)}$ dBA
4	≥ 73
3	68-72
2	63-67
1	58-62
0	≤ 57

The building treatment for any future development onsite shall be determined at Building Approval stage, in general accordance with the Queensland Development Code. Alternative solutions may be provided on request.

7. Road Traffic Assessment

Road traffic noise associated with Mary Street for the ten year planning horizon was assessed at the development to determine compliance with Ipswich City Council criteria (refer to Section 6.1) and requirements for any acoustic treatments.

Table 4: Traffic Volumes

Location	2018 AADT	Predicted 2021 AADT	Predicted 2031 AADT	Percentage of Heavy Vehicles	Predicted Annual Growth Rate
Mary Street	14,430	14,867	16,423	6.75%	1%

7.1 Road Traffic Noise Verification

To ensure the CoRTN noise model is accurate, a verification model of the predicted $L_{A10(18hr)}$ was created and compared to the measured noise level based on the data provided in Section 7.1. The CoRTN method allows a 2dBA variation from the predicted and measured level, if the variation exceeds 2dBA a correction to the predicted level is required.

Table 5: Comparison of Measured and Predicted Noise Levels

Location	Measured $L_{A10(18hr)}$ dB(A)	Predicted $L_{A10(18hr)}$ dB(A)	Correction
Mary Street	67.4	67.6	0

7.2 Predicted Road Traffic Noise Levels - 2031

Road traffic noise modelling for the proposed development was based on the following information:

- Site layout provided by Baird & Hayes, drawing no. P02-01, revision F, dated 11/11/2021.
- Receiver heights were based on 1.5m above finished floor levels for each floor.
- Mary Street speed limit of 60km/h.
- All predicted impacts include +2.5dB(A) façade correction.

Table 6 presents the predicted road traffic noise levels for the development.

Table 6: Predicted Road Traffic Noise Impacts

Location		Predicted Road Traffic Noise Impacts 2031	
Lot	Floor	$L_{A10(18hr)}$ dB(A)	QDC Noise Category
2	Ground	65.6	2
	First	69.0	3
3	Ground	61.6	1
	First	66.2	2
4	Ground	58.7	1
	First	63.1	2
5	Ground	58.8	1
	First	63.9	2
6	Ground	56.9	0
	First	62.2	1
7	Ground	55.6	0
	First	60.3	1

Table 7 presents the predicted road traffic noise levels for the development with a 2 metre acoustic barrier.

Table 7: Predicted Road Traffic Noise Impacts – With Acoustic Barrier

Location		Predicted Road Traffic Noise Impacts 2031	
Lot	Floor	$L_{A10(18hr)}$ dB(A)	QDC Noise Category
2	Ground	60.3	1
	First	65.0	2
3	Ground	58.9	1
	First	57.7	0
4	Ground	56.2	0
	First	54.5	0
5	Ground	55.6	0
	First	60.0	1
6	Ground	53.9	0
	First	59.3	1
7	Ground	52.6	0
	First	57.5	0

Based on the predicted noise impacts, further recommendations are necessary in accordance with QDC construction requirements. Refer to Section 8 for recommendations.

8. Recommendations

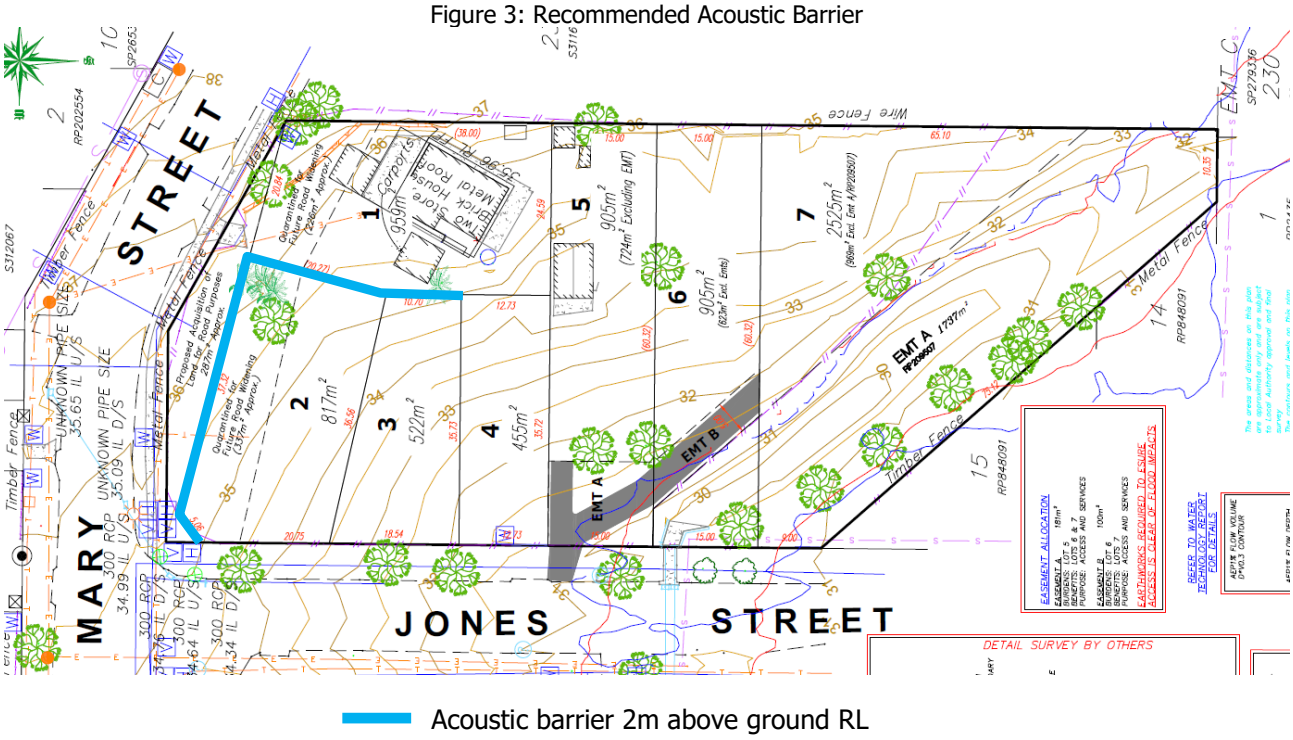
8.1 Road Traffic Noise

As the proposed development is at the subdivision stage only and no detailed design of the buildings were available at the time of writing of this report, it is recommended that all building treatments for residential units shall be determined at the Building Approval stage in accordance with the assessment requirements of the Queensland Development Code Part MP4.4. For reference, preliminary noise categories are nominated in Table 8.

8.1.1 Acoustic Barrier

An acoustic barrier shall be constructed to the height and extent shown in Figure 3. The barrier shall be constructed using materials that achieve a minimum surface density of 10kg/m². Suitable materials may include 16mm thick lapped timber (minimum 40% overlap), 6mm laminate glazing, masonry, 9mm fibre cement sheeting, Hebel, 8mm Perspex, 17mm plywood, or other material which satisfy the minimum surface density requirement. The barrier shall be free of gaps and holes.

Figure 3: Recommended Acoustic Barrier



8.1.2 QDC Noise Categories & Glazing Requirements

The minimum glazing treatments presented in Table 8 are required to comply with the following:

- The minimum glass thickness specified shall not be reduced regardless of the R_w performance of the glass unless the glazier can provide a specific (non generic) NATA Test report proving the proposed glazing system complies (the test report must be based on the same configuration proposed for the development). Note an estimation or calculated performance will not accepted.
- If compliance cannot be achieved with the minimum R_w ratings for the glass thickness nominated, then the glazing system shall be upgraded until compliance is achieved.
- Glazing specified with acoustic seals requires a seal that has been tested with a glazing system or door to achieve an Rw in accordance with AS/NZS ISO 717.1, mohair seals are not acceptable.
- The glazier shall provide NATA test reports on request to verify compliance with the minimum R_w ratings. Generic reports are not acceptable.

Table 8: QDC Noise Categories – Road Traffic Noise

Lot	Floor	QDC Category	Rw Ratings				QDC Glazing	Acoustic seals
			Wall	Roof	Glazing	Entry door	Glazing*	
2	Ground	1	35	-	27	28	4mm float	yes
	First	2	41	38	35	-	10.38 lam	yes
3	Ground	1	35	-	27	28	4mm float	yes
	First	0	-	-	-	-	standard	no
4	Ground	0	-	-	-	-	standard	no
	First	0	-	-	-	-	standard	no
5	Ground	0	-	-	-	-	standard	no
	First	1	35	35	27	-	4mm float	yes
6	Ground	0	-	-	-	-	standard	no
	First	1	35	35	27	-	4mm float	yes
7	Ground	0	-	-	-	-	standard	no
	First	0	-	-	-	-	standard	no

*If the total glazing area of a habitable room (living areas/bedrooms) is less than 1.8m^2, glazing with minimum Rw 32 (6.38mm laminate glass with acoustic seals) can be used for QDC Noise Category 0-2 and glazing with minimum Rw 35 (10.38mm laminate glass with acoustic seals) can be used for QDC Noise Category 3.

8.1.3 Alternative Ventilation

We recommend that all locations nominated in Table 8 as QDC Noise Category 1-3 have the provision for an alternative ventilation system similar to air-conditioning or mechanical ventilation to allow windows and doors to be closed.

8.1.4 Wall Construction

The wall construction recommendations from QDC MP4.4 are included in the table below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided. QDC Noise Categories are nominated in Table 8.

Table 9: QDC Typical Wall Construction

QDC Noise Category	Wall R_w	Minimum Wall Treatments
3	47	Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) 50mm thick mineral insulation or 50mm thick glass wool insulation with a density of 11kg/m^3 or 50mm thick polyester insulation with a density of 20kg/m^3 in the cavity. OR Two leaves of clay brick masonry at last 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) at least 13mm thick cement render on each face OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m3 positioned between studs; and (iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs. OR Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging. OR 6mm fibre cement sheeting external, furring channel with resilient mounts, 90mm timber stud at 600mm maximum centres, 75mm glasswool insulation (11kg/m^3), two layers of 10mm plasterboard internal.
1	35	Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Minimum 6mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90mm deep timber stud or 92mm metal stud, standard plasterboard at least 13mm thick internally.
0	N/A	Standard construction.

8.1.5 Roof Construction

The roof construction recommendations from QDC MP4.4 are included in the table below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided. QDC Noise Categories are nominated in Table 8.

Table 10: QDC Typical Roof Construction

QDC Noise Category	Roof R_w	Minimum Roof Treatments
3	41	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m^3 or polyester insulation at least 50mm thick with a density of at least 20kg/m^3 in the cavity. OR Concrete suspended slab at least 100mm thick.
1	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.
0	N/A	Standard construction.

8.1.6 Entry Door Construction

The entry door construction recommendations from QDC MP4.4 are included in the table below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided. QDC Noise Categories are nominated in Table 8.

Table 11: QDC Typical Entry Door Construction

QDC Noise Category	Entry Door R_w	Minimum Entry Door Treatments
2/3	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with full perimeter acoustically rated seals and constructed of - (i) solid core, wood, particleboard or blockboard not less than 45mm thick; and/or (ii) acoustically laminated glass not less than 10.38mm thick.
1	28	Fixed so as to overlap the frame or rebate of the frame, constructed of - (i) Wood, particleboard or blockboard not less than 33mm thick; or (ii) Compressed fibre reinforced sheeting not less than 9mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4kg/m^2; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter acoustically rated seals.

9. Conclusion

A road traffic noise assessment was conducted for the residential subdivision located at 67 Mary Street, Blackstone. On the condition the recommendations detailed in Section 8 are implemented, compliance is predicted with Ipswich City Council assessment criteria.

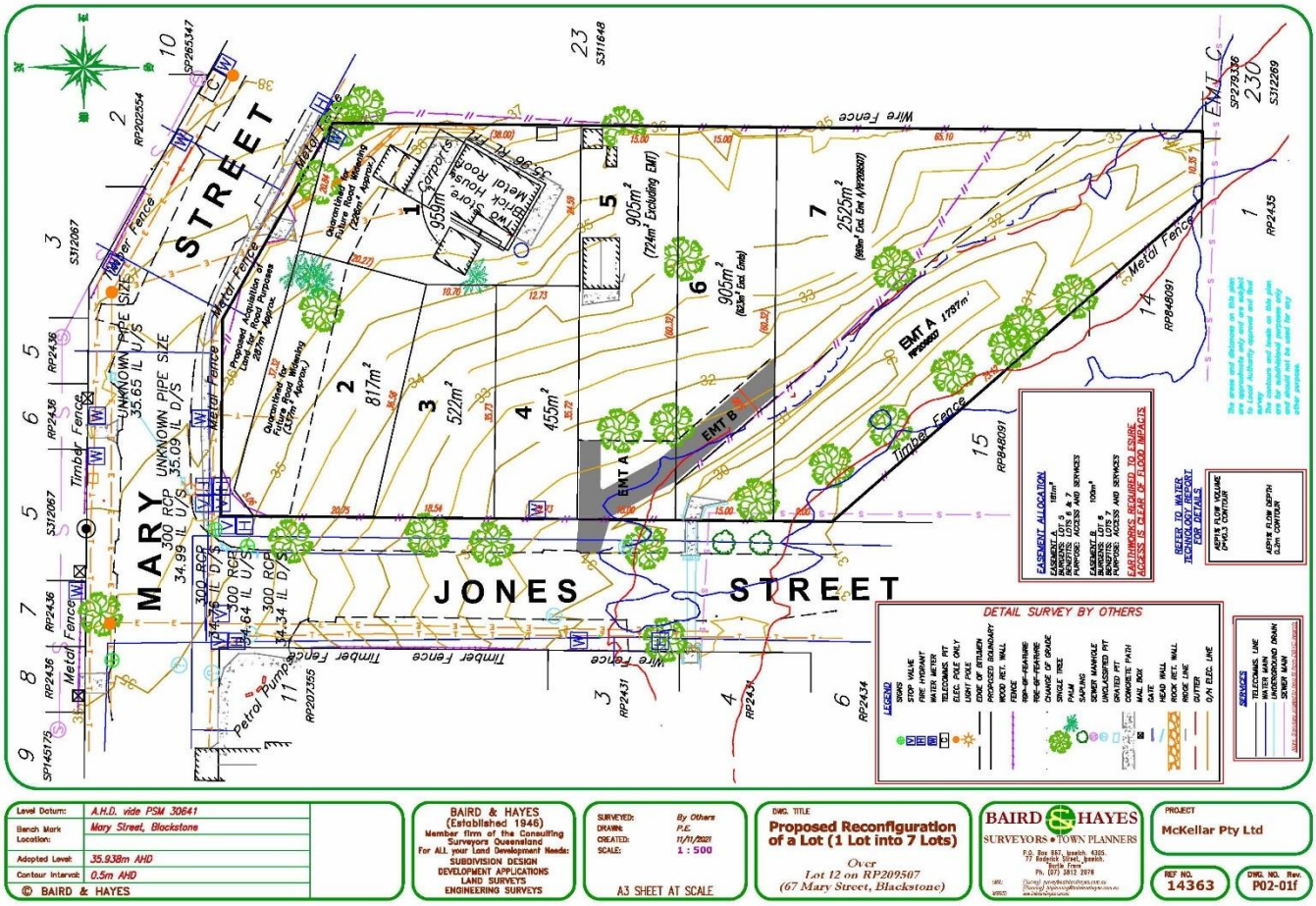
If you should have any queries, please do not hesitate to contact us.

Report Prepared By

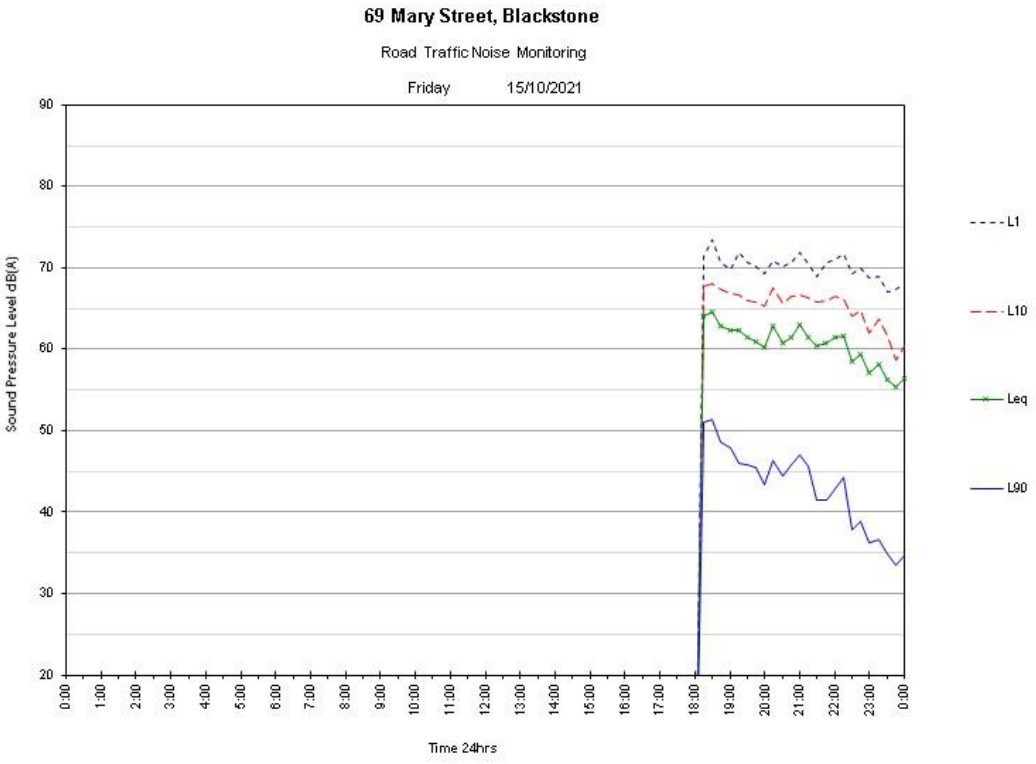
Andrew Hiscox
Acoustic Consultant
acousticworks)))

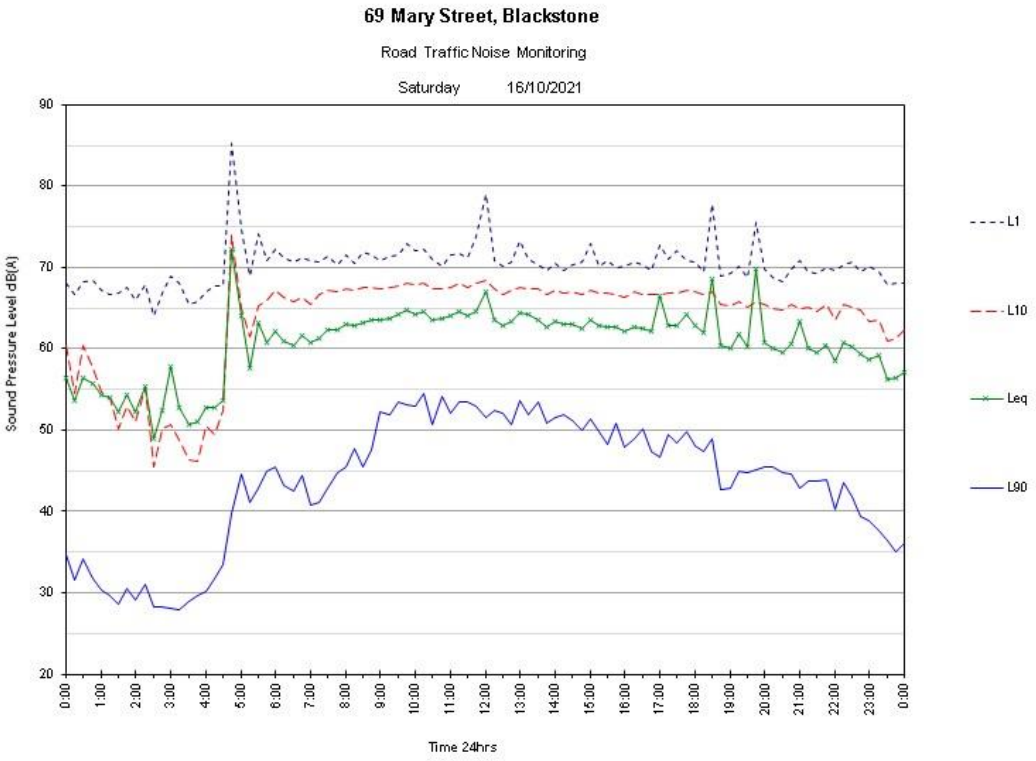
10. Appendices

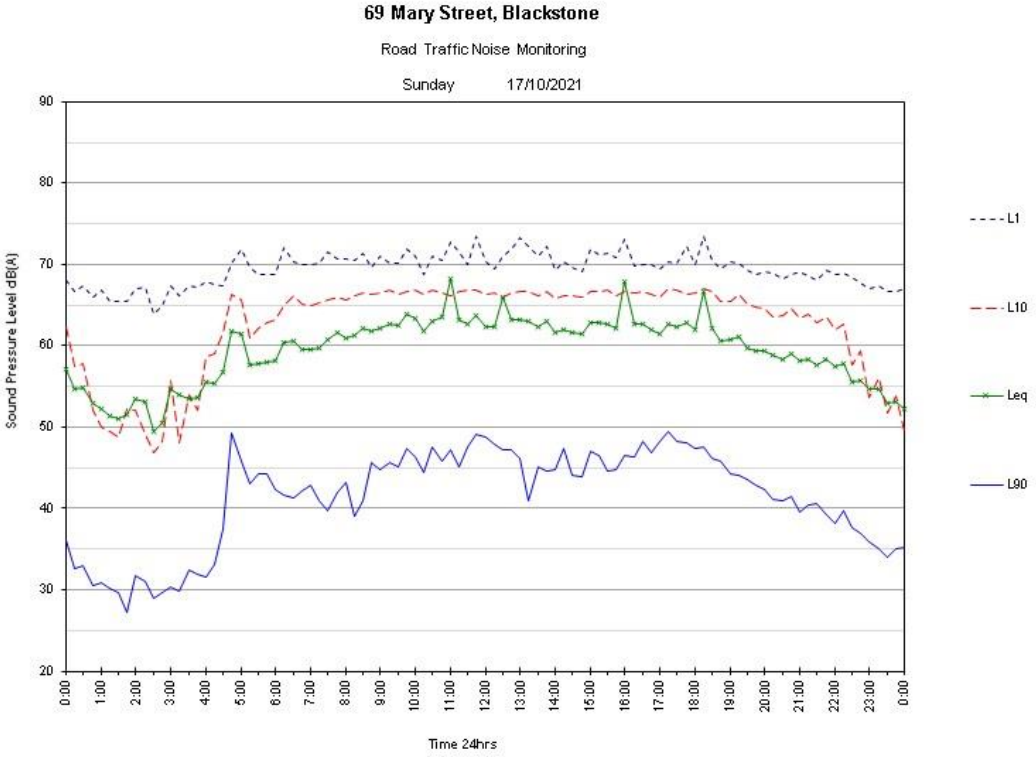
10.1 Development Plans



10.2 Noise Monitoring Charts



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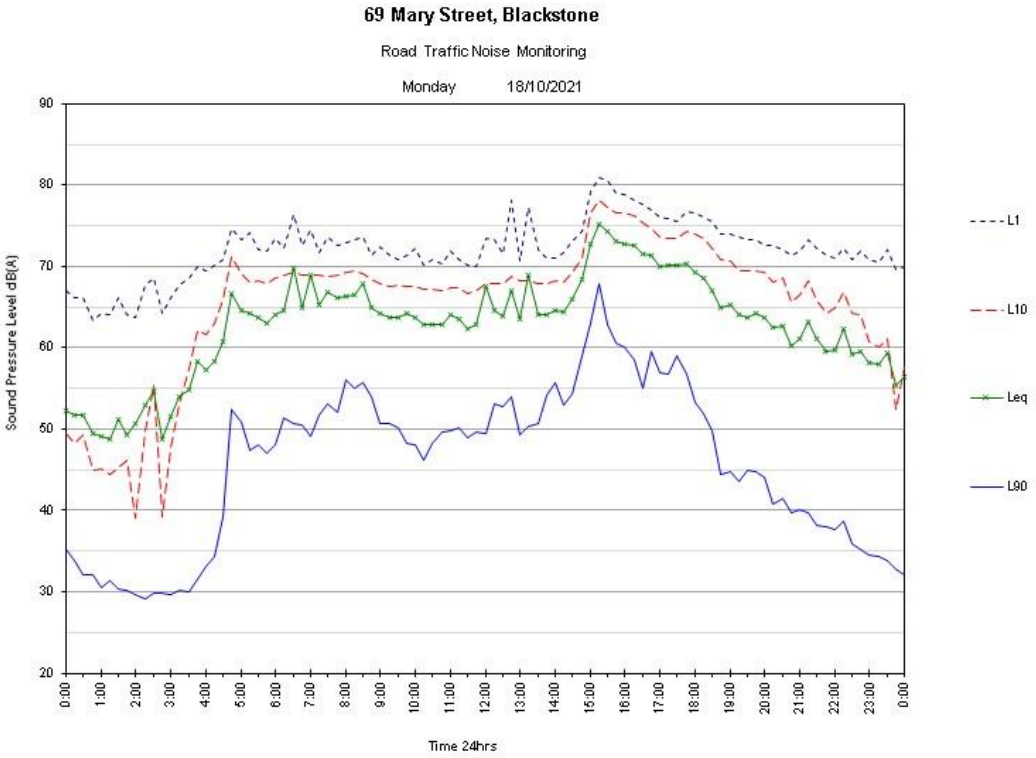
Road Traffic Noise Monitoring
Sunday 17/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90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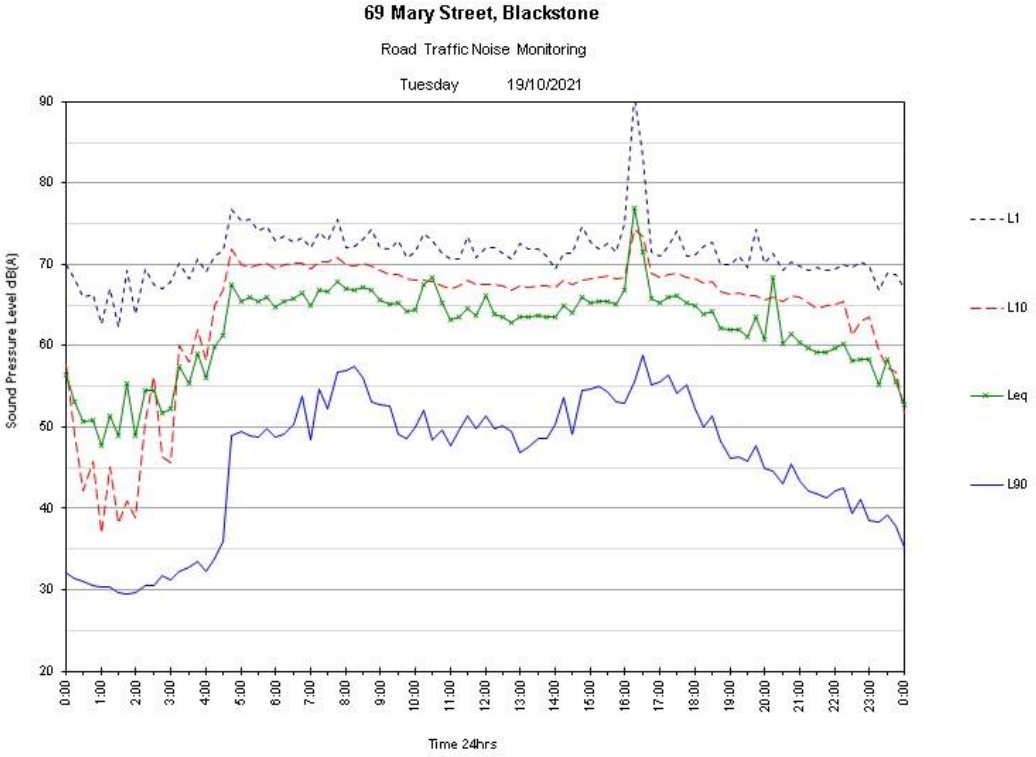
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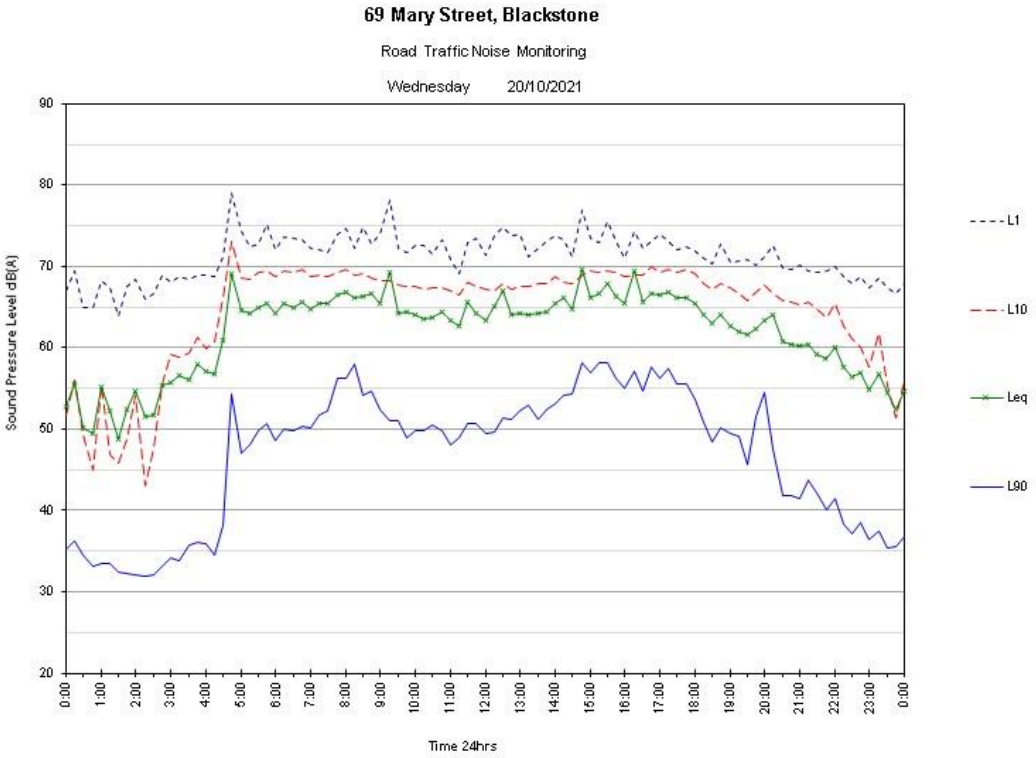
L10
Leq
L90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Road Traffic Noise Monitoring
Wednesday 20/10/2021
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Time 24hrs
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L10
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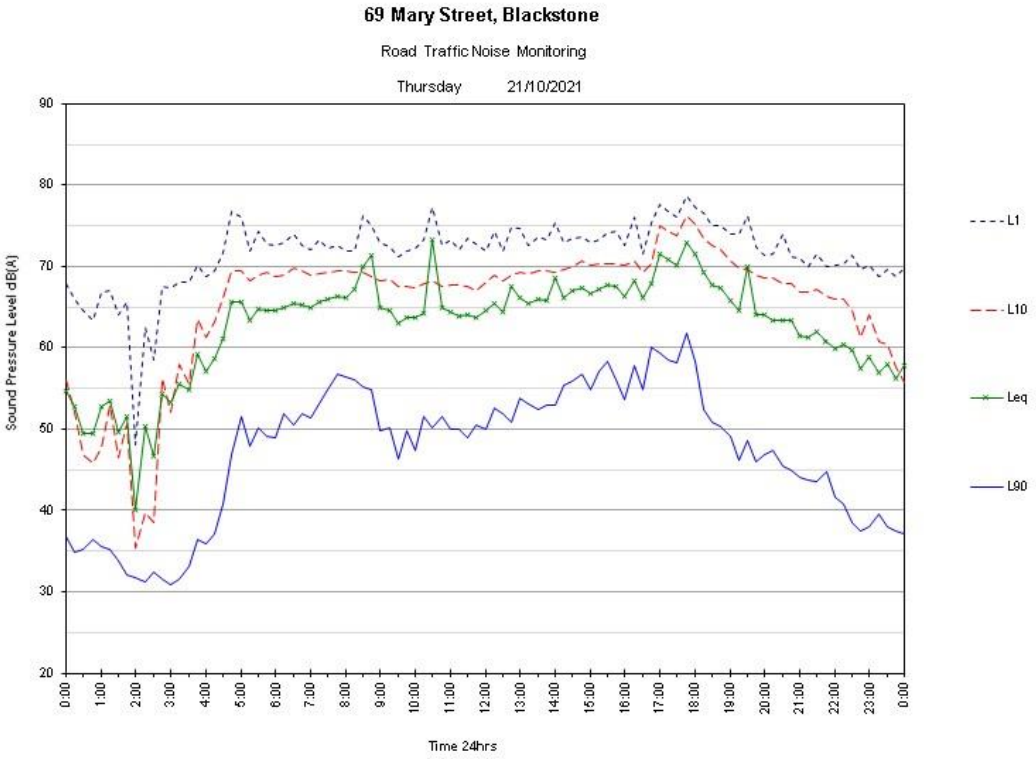
L90


69 Mary Street, Blackstone
Road Traffic Noise Monitoring
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80
70
60
50
40
30
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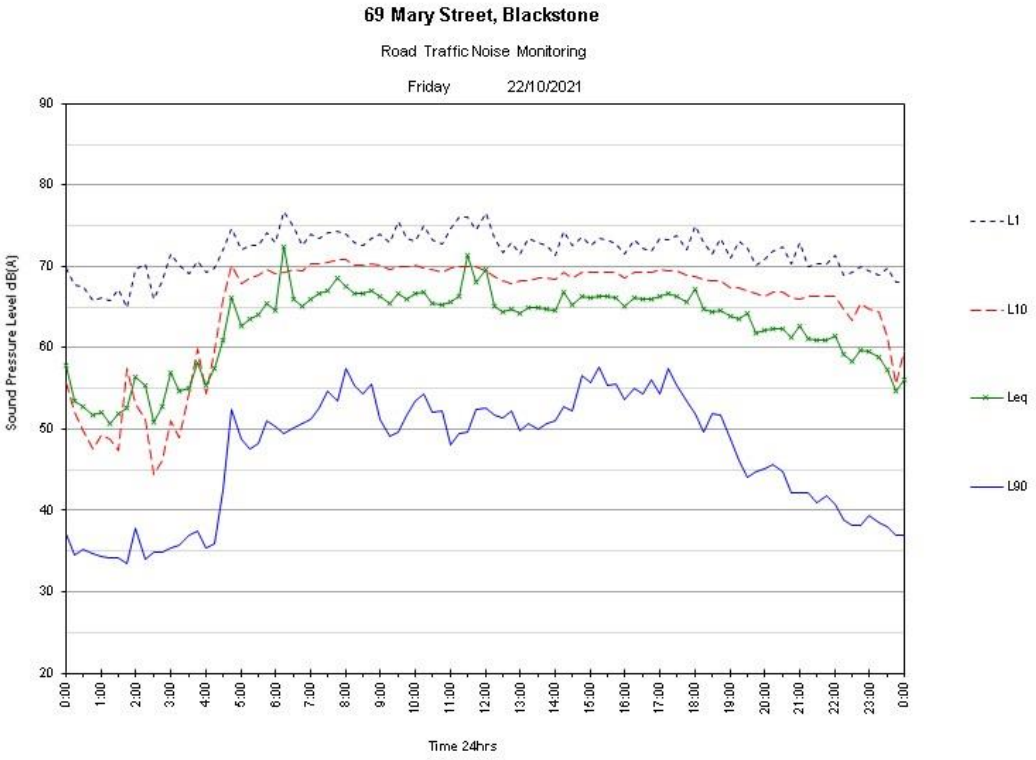
Time 24hrs
L1
L10
Leq
L90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Road Traffic Noise Monitoring
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60
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40
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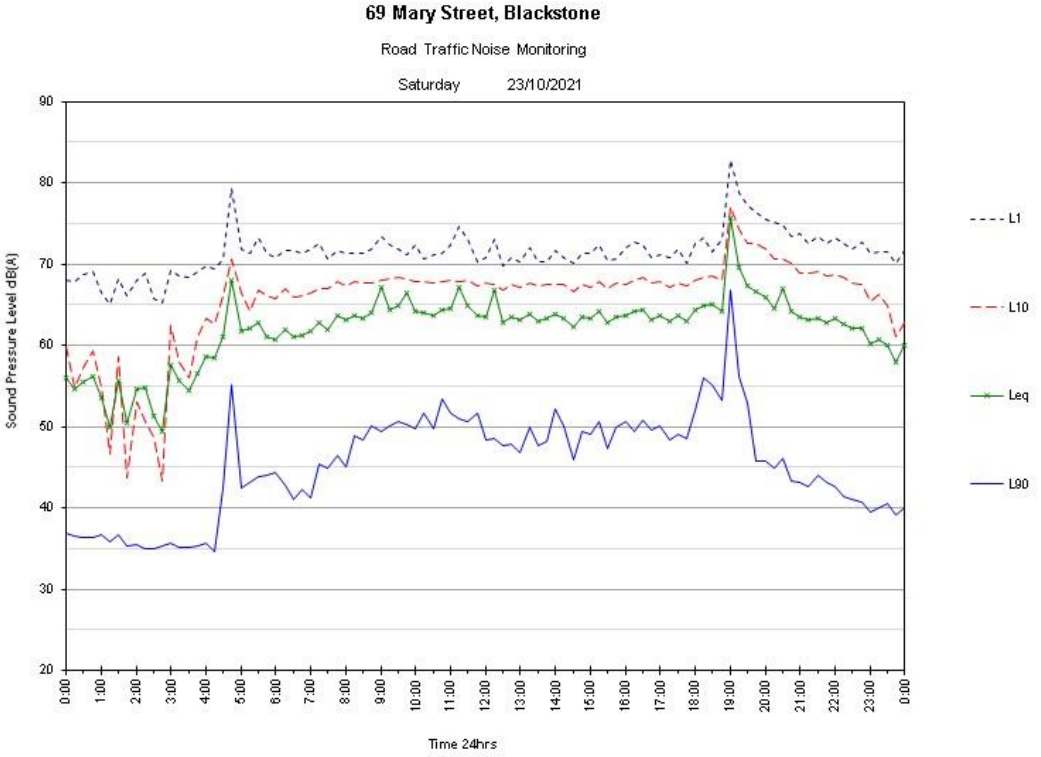
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Leq
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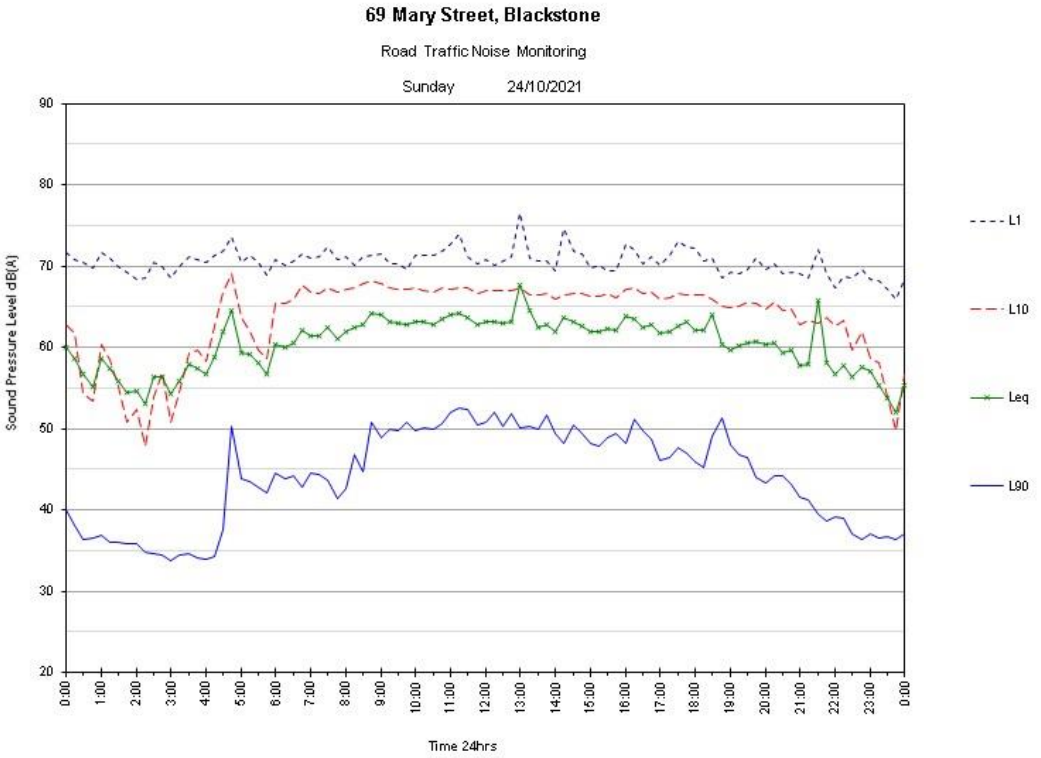
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Road Traffic Noise Monitoring
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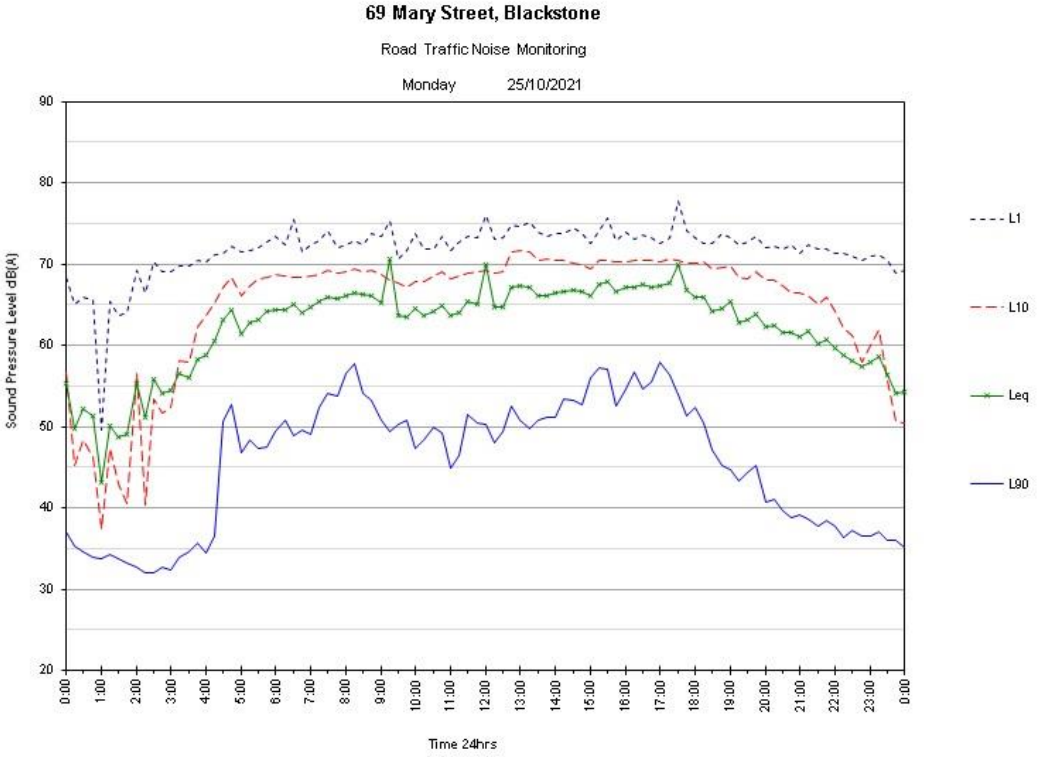
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Road Traffic Noise Monitoring
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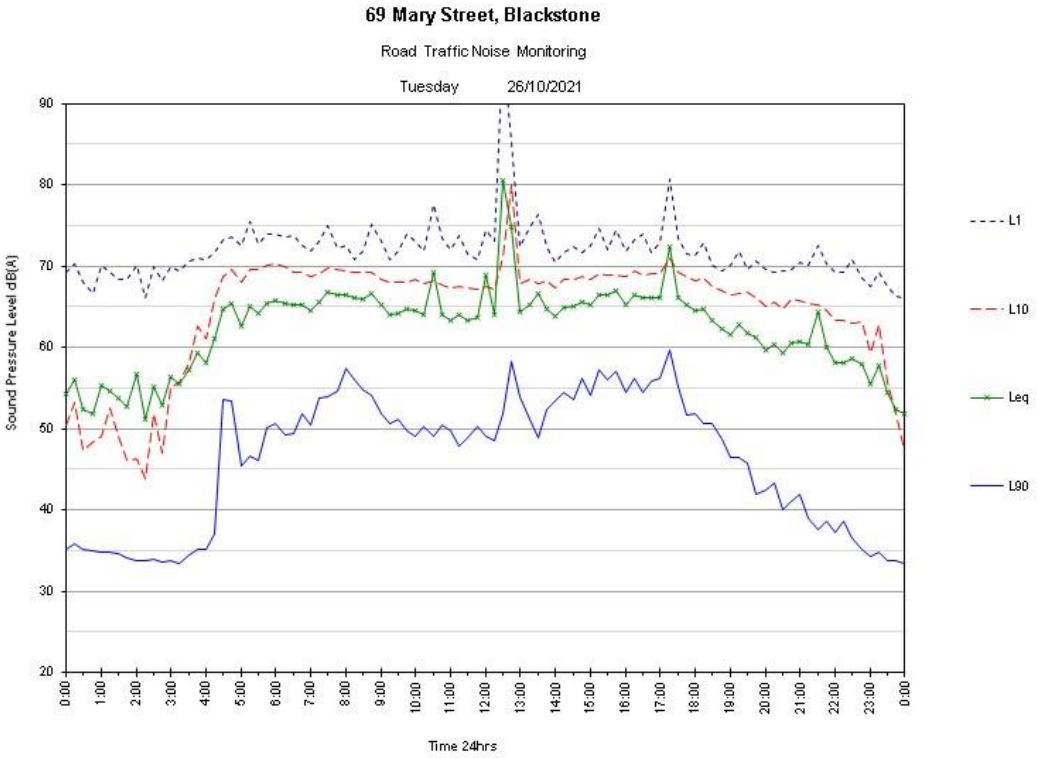
L10
Leq
L90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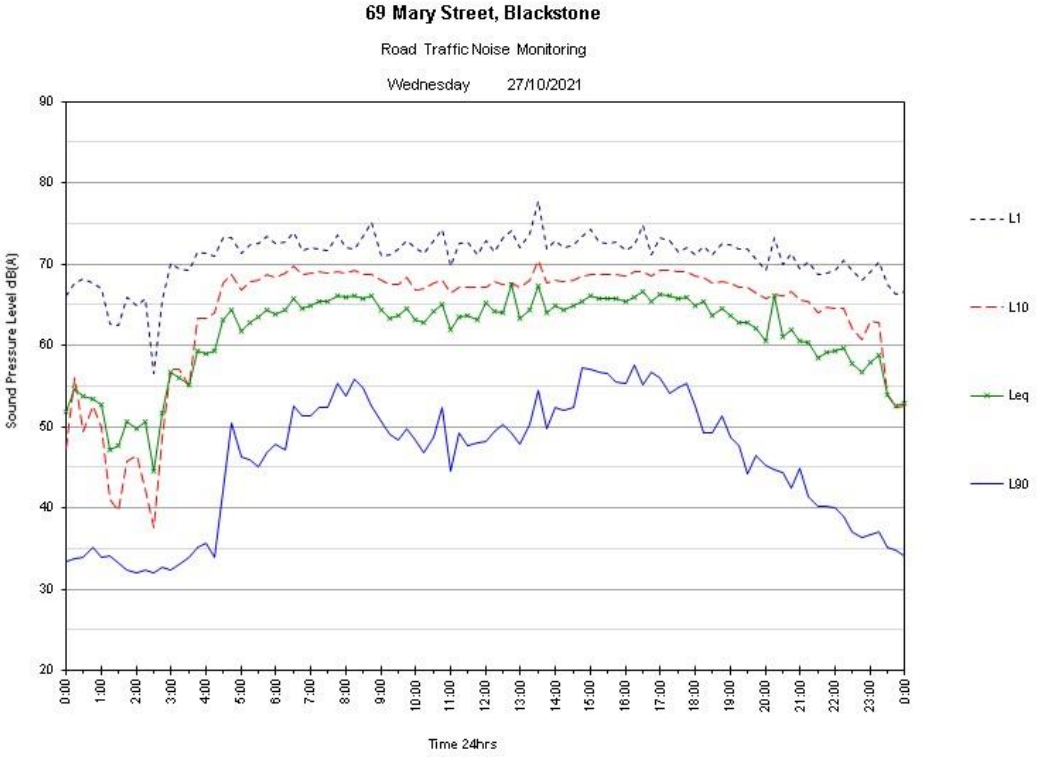
Road Traffic Noise Monitoring
Tuesday 26/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90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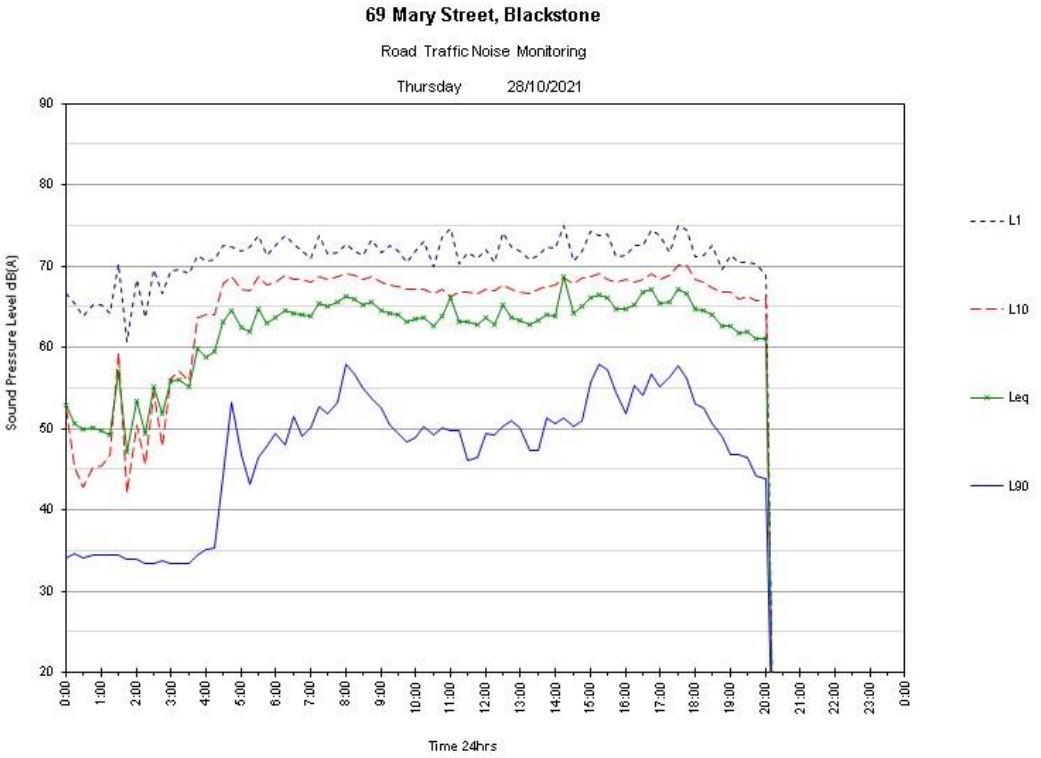
Road Traffic Noise Monitoring
Wednesday 27/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


69 Mary Street, Blackstone
Road Traffic Noise Monitoring
Thursday 28/10/2021
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90