

ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 3823

05 March 2025

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149A FOG LANE, BURNAGE
ENVIRONMENTAL NOISE IMPACT ASSESSMENT
ACOUSTIC CONSULTANCY REPORT ADT 3823/ENIA

Revision	Date	Issued By	Checked by	Revision Notes
-	05 March 2025	Jack Williamson	Andrew Lockwood	first issue

TABLE OF CONTENTS

1.0	SUMMARY	3
2.0	BASIS OF ASSESSMENT.....	4
2.1	Unit Location	4
2.2	Proposed Development.....	4
2.3	Assessment Criteria	4
3.0	ENVIRONMENTAL NOISE SURVEY	5
3.1	Introduction.....	5
3.2	Instrumentation.....	5
3.3	Procedure	5
3.4	Results	6
3.5	Weather Conditions.....	6
3.6	Description of Existing Acoustic Environment.....	7
4.0	Assessment of external noise intrusion.....	7
4.1	Incident Noise Levels	7
4.2	Single Event Noise Levels.....	8
4.3	External Noise Intrusion Limits.....	8
4.4	External Noise Intrusion with the Windows Open	9
4.5	Sound Insulation Requirements – Front Elevation.....	9
4.6	Sound Insulation Requirements – Rear Elevation	10
4.7	Glazing System Selection	10
4.8	Summary.....	10

1.0 SUMMARY

The proposal is to develop the 1st floor of the existing building for residential accommodation as shown on the planning application drawings.

Acoustic Design Technology Limited have undertaken an environmental noise survey to determine the existing ambient noise levels at the unit.

Preliminary analysis indicates that it should be possible to control external noise intrusion to the indoor levels required by condition 6 of planning permission with the implementation of the glazing performance recommendations within this report.

The unit should therefore be acoustically suitable for the proposed development with the noise mitigation measures described in this report.

2.0 BASIS OF ASSESSMENT

2.1 Unit Location

The unit is located at 149a Fog Lane and is the second storey flat within a building previously used for commercial purposes.

The surrounding area comprises residential housing in all directions except to the east, where the properties on Fog Lane have commercial units at ground floor level.

Immediately to the north of the unit is the outdoor amenity area of the property below.

The unit is located approximately 35 metres from the crossroads of Fog Lane and Parrs Wood Road to the west while the nearest major road is the A34, Kingsway, approximately 298 metres to the east of the unit.

Approximately 160 metres to the north east of the unit is Burnage railway station, with the railway tracks running roughly north and south.

2.2 Proposed Development

The proposal is to develop the unit for residential accommodation as shown on the planning application drawings.

2.3 Assessment Criteria

Condition 6 of the planning permission requires that noise levels inside the new dwellings do not exceed the following levels:-

Area	07:00 – 23:00	23:00 – 07:00
living rooms	35 dB $L_{Aeq,16hour}$	-
bedrooms	-	30 dB $L_{Aeq,8hour}$ / 45 dB $L_{Amax,F}$

3.0 **ENVIRONMENTAL NOISE SURVEY**

3.1 **Introduction**

An environmental noise survey was undertaken between 07:00 hours on Friday 10 January 2025 and 14:00 hours the following Wednesday to determine existing background levels and the impact of typical traffic noise from Fog Lane on the adjacent elevation of the unit.

3.2 **Instrumentation**

The instrumentation used, and the field calibration values before and after the survey are detailed in Appendix A of this report.

3.3 **Procedure**

Two measurement positions were selected, one at the front and one at the rear of the property as indicated on the attached site plan 3823/SP1.

The intention had been to continuously monitor the noise levels at both positions for the duration of the survey. However, the meter at position 1 malfunctioned soon after the start of the survey. In consequence, the levels were monitored from Wednesday 8th January till the following Tuesday at position 2. The meter was then moved to position 1 where the levels were monitored for a full 24 hours from Tuesday lunchtime through to Wednesday lunchtime.

At both positions, the microphone was mounted on a pole at first floor level (around 4.5 metres above ground), and projected out of a window approximately 1 metre in front of the existing building facade.

For each measurement, the noise levels were logged continuously using the Blue Solo sound level meter, storing the octave band and 'A' weighted 100s short-term L_{eq} for subsequent post processing.

3.4 Results

The logged data from the two positions has been post processed to determine $L_{Aeq,T}$, $L_{A90,T}$ and L_{Amax} levels for each 15 minute period, and these have been plotted on the attached time history graphs 3823/TH1 and 3823/TH2 for measurement positions 1 and 2 respectively.

Additionally, the logged nighttime noise levels have been post processed to determine the 1 minute $L_{Amax,F}$ levels, and these are presented on the attached time history graphs 3823/TH3 and 3823 /TH4 for measurement positions 1 and 2 respectively.

Octave band $L_{eq,T}$ for the surveyed portions of the day time and night time period are also provided in the attached tables 3823/T1 and 3823/T2 respectively.

Please refer to Appendix B for explanation of the noise units and the A-weighting term used in this report.

3.5 Weather Conditions

As the survey was unmanned it is not possible to provide a detailed description of the weather conditions throughout the entire survey period. However, at the start of the survey, conditions were damp and icy with temperatures of around freezing point.

As the survey progressed, the temperature gradually increased to around 9 degrees by the end.

Dry and calm conditions were forecast for the intervening period, apart from the evening of Tuesday 14 January 2025, where publicly available forecast data reports there was a period of rainfall.

3.6 Description of Existing Acoustic Environment

At the front of the site, the noise levels were primarily controlled by local and more distant road traffic.

At the rear, the levels were affected by road traffic, train noise, some low level plant noise from the rear of the commercial units on Fog Lane, and intermittent, but persistent dog barking. The latter came from two dogs currently kept in the area directly to the rear of the property, and directly below monitoring position 2.

4.0 ASSESSMENT OF EXTERNAL NOISE INTRUSION

4.1 Incident Noise Levels

When assessing external noise intrusion into new dwellings and noise levels in gardens it must be borne in mind that the noise climate may change in the future. The following discussion is by necessity based on the results of the environmental noise survey described in Section 3.0 above.

The noise levels were measured approximately 1 metre external to the building façade and therefore include reflections off the building facades, which typically increase the levels by 2 – 3 dB(A).

The typical incident noise levels have therefore been determined by subtracting 2 dB(A) from the measured levels, yielding the following results:-

Location	Incident $L_{Aeq,T}$ dB	
	Day (07:00 - 23:00)	Night (23:00 - 07:00)
Front Elevation (facing Fog Lane)	67	57
Rear Elevation	53	49

4.2 Single Event Noise Levels

Reference to the attached graphs 3823/TH3 and TH4 shows that at the front of the site, single event levels of around 75 to 80 $L_{Amax,F}$ occurred numerous times during the night. At the rear, the levels were higher, although periodic audio recordings reveal that the highest levels of between 80 and 90 $L_{Amax,F}$ were due to the dogs barking. Otherwise, the single event levels rarely exceeded 65 dB(A).

As the dogs are to be evicted, the associated noise has been excluded from the following assessment.

The sound insulation properties of a building façade vary with frequency so it cannot be assumed that the highest single event noise levels (L_{Amax}) inside a building will result from the highest single event noise levels outside.

It is therefore a complex procedure to predict how many single events may generate an internal noise level higher than the 45 $L_{Amax,F}$ limit stipulated in the planning condition. Whilst every effort has been made to make the predictions as accurate as possible, there is still an element of uncertainty in the analysis.

4.3 External Noise Intrusion Limits

Condition 6 of the planning permission requires that external noise intrusion into the new dwellings be controlled to the levels presented in Section 2.3 above.

4.4 External Noise Intrusion with the Windows Open

It is generally accepted that for buildings affected by general environmental noise, the level inside a room with an open window will be between 10 and 12 dB(A) lower than the level outside the window.

The practical implication of this is that the levels stipulated in the planning permission would only be achieved with windows open if the external noise levels were lower than:-

Area	07:00 – 23:00	23:00 – 07:00
living rooms	45 - 47 dB $L_{Aeq, 16 \text{ hour}}$	-
bedrooms	-	40 - 42 dB $L_{Aeq, 8 \text{ hour}}$ / 55 - 57 L_{Amax}

Comparison of these figures with the ones summarised in Section 4.1 shows that the indoor noise levels cannot be achieved with the windows open. This does not mean that the windows cannot be openable, but merely than an alternative means of background ventilation should be provided to obviate the need to open the windows.

4.5 Sound Insulation Requirements – Front Elevation

The attached calculations 3823/C1 and C2 show that external noise intrusion into the front facing rooms can be controlled to the levels required by the Council by means of Pilkington R_w40 glazing and up to 2 Greenwood EAQ42W trickle vents.

Further analysis shows that with this level of sound insulation, there should be no more than 10 single event noise levels above 45 dB $L_{Amax,F}$ over the course of the night (23:00 to 07:00 hours) in the bedroom.

4.6 Sound Insulation Requirements – Rear Elevation

The noise levels at the rear of the property are much lower, but still too high for MCC's requirements to be achieved with the windows open.

However, the attached calculation 3823/C3 shows standard hermetically sealed double glazing units (4 / 16 / 4) and up to 2 standard acoustic trickle vents should provide more than sufficient sound insulation. Please note that the figures used for the acoustic trickle ventilator are generic, taken from BS 8233. The Greenwood EAQ42W would again be suitable, but there may be other, lower performance units on the market which would also provide acceptable performance.

4.7 Glazing System Selection

Most glazing system manufacturers and suppliers have a rudimentary grasp of R_w as a descriptor for acoustic performance. However, this is akin to an average; it is a single figure derived from 1/1 octave band or 1/3 octave band sound reduction indices. It does not provide a complete description of performance, and is not adequate for use in situations such as this, where the performance at different frequencies is important.

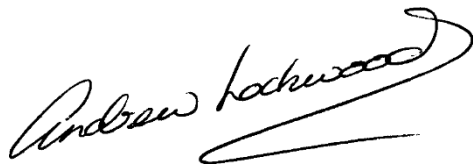
The supplier should therefore be required to provide 1/1 octave band and / or 1/3 octave band sound reduction indices for their proposed glazing systems. These should then be review by an acoustic specialist prior to their procurement and installation.

4.8 Summary

The foregoing discussion has demonstrated that external noise intrusion can readily be controlled to MCC's normal requirements.

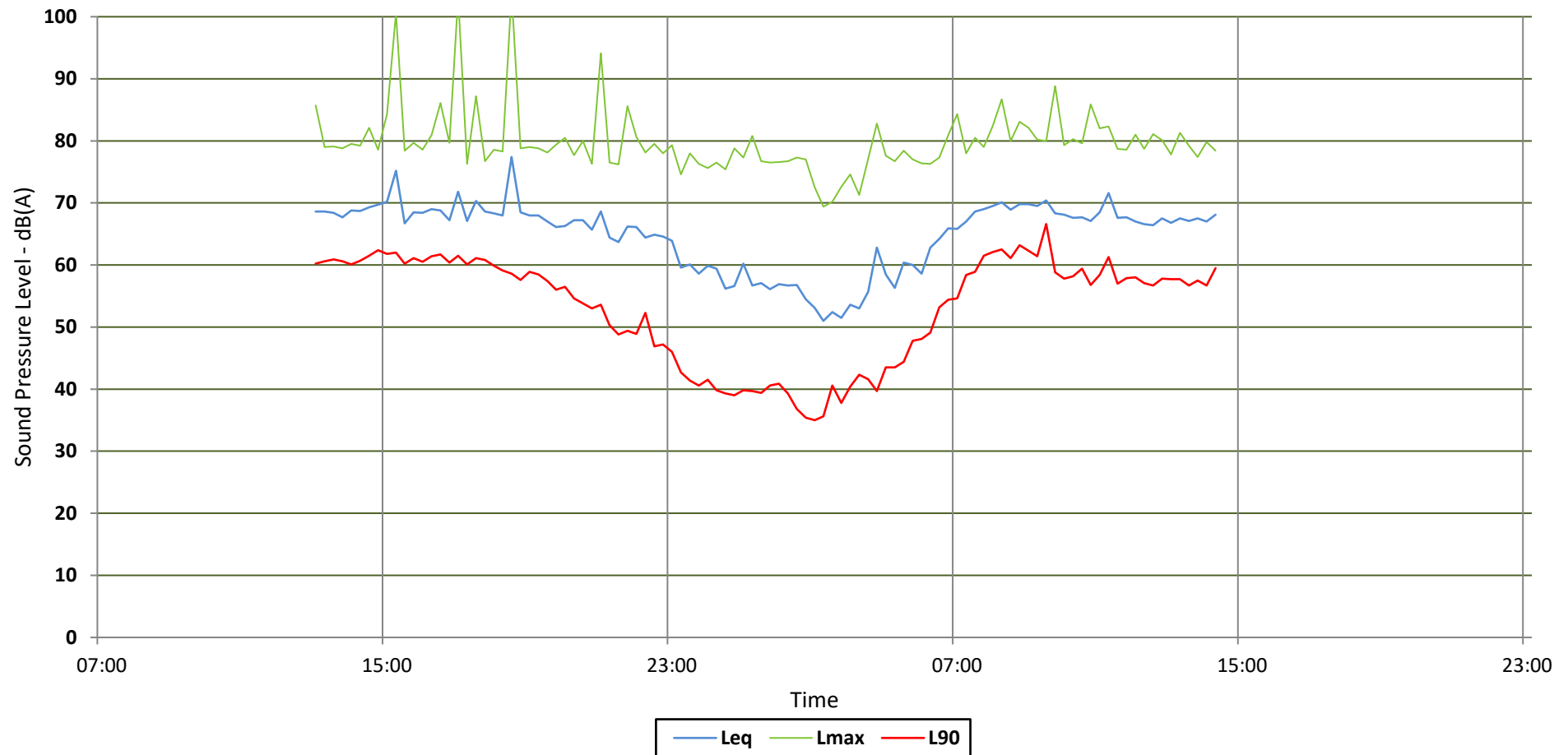
Whilst examples of suitable products have been provided, it does not mean that those specific products must be used. Any glazing systems and trickle vents achieving the minimum performance specifications set out in tables 3823/T1 and T2 should be acoustically suitable.

If background ventilation were to be provided by a mechanical ventilation heat recovery system (MVHR), trickle vents would not be required. This would improve the sound insulation properties of the facades, so the same glazing systems would still be acoustically suitable. Indeed, there might even be scope for some reduction of the acoustic requirements for the windows on the front elevation.

A handwritten signature in black ink, reading "Andrew Lockwood". The signature is fluid and cursive, with a long horizontal stroke extending from the end of the name.

FOR ACOUSTIC DESIGN TECHNOLOGY





Notes

Description

Time History Graph – Front Measurement Position

Project

149A Fog Lane, Burnage

Survey Date

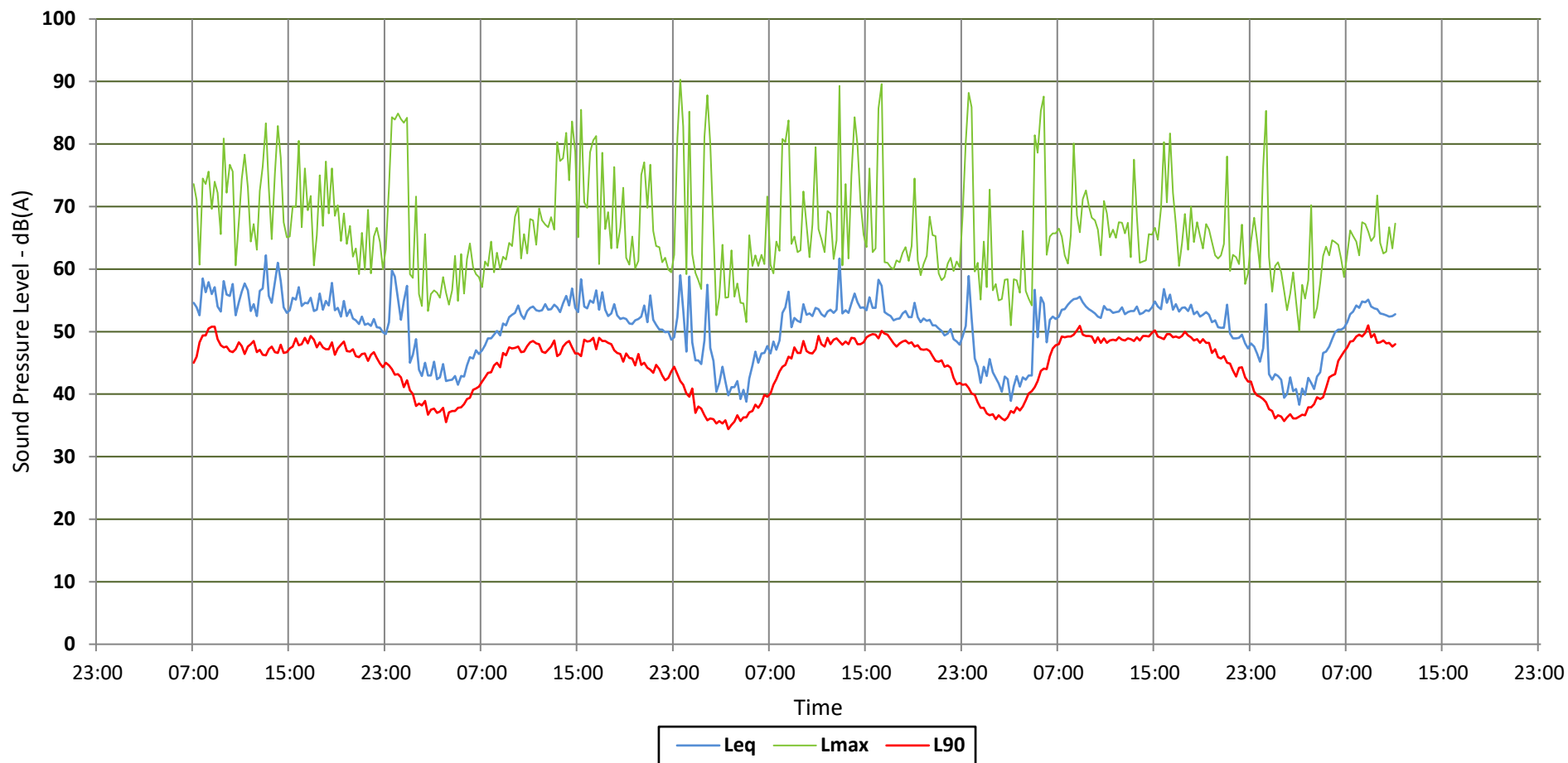
14 - 15 January 2025

Drawing No.

3823/TH1



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Notes

Description

Time History Graph – Rear Measurement Position

Project

149A Fog Lane, Burnage

Survey Date

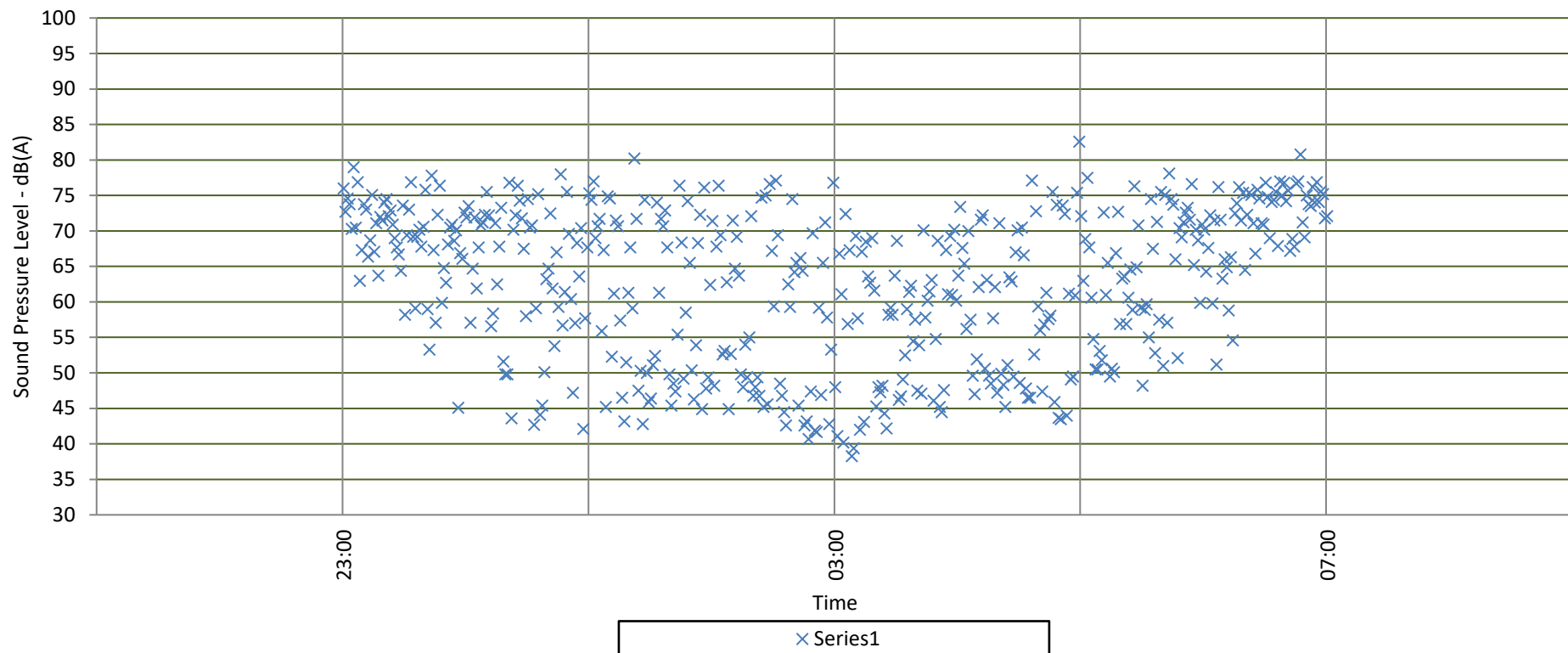
10 - 14 January 2025

Drawing No.

3823/TH2



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Notes

Description

Single Event Levels – Measurement Position 1

Project

149A Fog Lane, Burnage

Survey Date

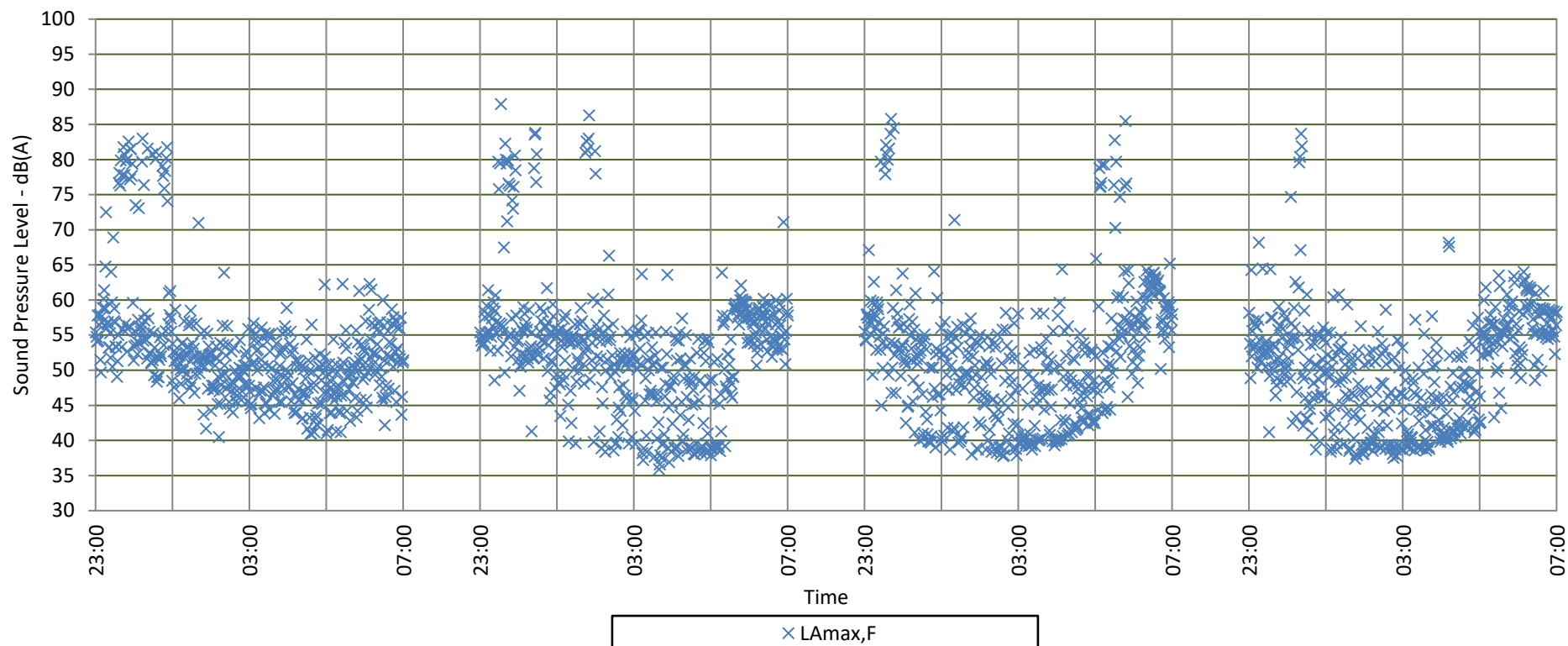
14 – 15 January 2025

Drawing No.

3823/TH3



ACOUSTIC DESIGN TECHNOLOGY
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Notes

Description

Single Event Levels – Measurement Position 1

Project

149A Fog Lane, Burnage

Survey Date

10 – 14 January 2025

Drawing No.

3823/TH4



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SAMPLE FAÇADE CALCULATION

Living Room On Front Elevation

	Area	Octave Band Centre Frequency - Hz								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Incident noise level		68	61	59	60	64	61	54	46	67
Direct Field										
Composite SRI of structure (from below)		-25	-29	-32	-32	-37	-40	-36	-35	
Direct L _p		43	32	27	28	27	21	18	11	31
Reverberant Field										
Composite SRI of structure (from below)		-25	-29	-32	-32	-37	-40	-36	-35	
10 log (S / A)		0	0	0	-1	-3	-4	-4	-4	
Constant (for line source)		1	1	1	1	1	1	1	1	
Reverberant L _p		44	33	28	28	25	18	15	8	30
Total L _p		47	36	31	31	29	23	20	13	33
Composite SRI Calculation										
10/12/6.4 R _w 40 (Pilk 1988)	2.3	22	27	29	36	41	42	49	58	
103 mm brick + 100 mm block with ties	4.4	28	34	40	45	50	55	55	55	
Greenwood EAQ42W	10	40	40	42	37	43	46	41	40	
Greenwood EAQ42W	10	40	40	42	37	43	46	41	40	
Composite SRI		25	29	32	32	37	40	36	35	

CALCULATION 3823 /C1

SAMPLE FAÇADE CALCULATION

Bedroom On Front Elevation

	Area	Octave Band Centre Frequency - Hz								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Incident noise level		56	51	50	51	54	49	43	37	57
Direct Field										
Composite SRI of structure (from below)		-25	-29	-32	-32	-37	-40	-36	-35	
Direct L _p		31	22	18	19	17	9	7	2	21
Reverberant Field										
Composite SRI of structure (from below)		-25	-29	-32	-32	-37	-40	-36	-35	
10 log (S / A)		1	1	1	0	-2	-3	-3	-3	
Constant (for line source)		1	1	1	1	1	1	1	1	
Reverberant L _p		33	24	20	20	16	7	5	0	21
Total L _p		35	26	22	23	20	11	9	4	24
Composite SRI Calculation										
10/12/6.4 R _w 40 (Pilk 1988)	2.4	22	27	29	36	41	42	49	58	
103 mm brick + 100 mm block with ties	4.4	28	34	40	45	50	55	55	55	
Greenwood EAQ42W	10	40	40	42	37	43	46	41	40	
Greenwood EAQ42W	10	40	40	42	37	43	46	41	40	
Composite SRI		25	29	32	32	37	40	36	35	

CALCULATION 3823 /C2

SAMPLE FAÇADE CALCULATION

Bedroom On Rear Elevation

	Area	Octave Band Centre Frequency - Hz								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Incident noise level		52	47	51	48	42	36	33	25	49
Direct Field										
Composite SRI of structure (from below)		-22	-27	-24	-27	-31	-30	-29	-29	
Direct L _p		30	20	27	21	11	6	4	-4	22
Reverberant Field										
Composite SRI of structure (from below)		-22	-27	-24	-27	-31	-30	-29	-29	
10 log (S / A)		3	3	3	2	0	-1	-1	-1	
Constant (for line source)		1	1	1	1	1	1	1	1	
Reverberant L _p		34	24	31	24	12	6	4	-4	25
Total L _p		36	26	33	26	15	9	7	-1	27
Composite SRI Calculation										
4/12/4 sealed (Pilkington)	2.4	18	24	20	25	35	38	35	35	
103 mm brick + 100 mm block with ties	5.1	28	34	40	45	50	55	55	55	
Acoustic Trickle Vent (BS 8233)	10	37	37	36	35	36	34	34	34	
Acoustic Trickle Vent (BS 8233)	10	37	37	36	35	36	34	34	34	
Composite SRI		22	27	24	27	31	30	29	29	

CALCULATION 3823 /C3

ACOUSTIC SPECIFICATIONS FOR GLAZING SYSTEM

Minimum Required Sound Reduction Indices (R) for Glazing Systems dB

Location	Octave Band Centre Frequency - Hz								Possible Glazing Configuration
	63	125	250	500	1k	2k	4k	8k	
Front Elevation	22	27	29	36	41	42	45	45	6.4 lam. / 16 / 10
Rear Elevation	18	24	20	25	35	38	35	35	4 / 16 / 4

TABLE 3823/T1

ACOUSTIC SPECIFICATIONS FOR TRICKLE VENTILATORS

Minimum Required Element Normalised Level Differences (Dne) for Acoustic Trickle Vents

Rooms	Octave Band Centre Frequency - Hz								Possible Trickle Ventilator
	63	125	250	500	1k	2k	4k	8k	
Front Elevation	40	40	42	37	43	46	41	40	Greenwood EAR42W
Rear Elevation	37	37	36	35	36	34	34	34	Greenwood EAR42W

TABLE 3823/T2

APPENDIX A

Instrumentation

Manufacturer	Type and / or Model	Serial Number	Last Laboratory Calibration	Calibrator Output (dB)	Free Field Correction (dB)	Initial Reading (dB)	Final Reading (dB)
01dB	(Blue) Solo Class 1 Sound Level Meter	60320	March 2023		-0.10	113.9	114.0
01dB	PRE 21 S Pre-Amplifier	16866					
01dB	MCE 212 ½ inch Microphone	90549					
Norsonic	Nor1251 Calibrator (Cal 5)	34220	February 2024	113.98			

APPENDIX B

Acoustic Terminology

The annoyance produced by noise is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and any variations in its level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

A-weighting The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the A-weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average person. It is also possible to calculate the A-weighted noise level by applying certain corrections to an un-weighted spectrum.

When the noise being measured has variable amplitude, such as traffic noise, it is necessary to qualify the basic dB unit. This may be done using a statistical index L_n dB, where n is any value between 0 and 100, and is the percentage of the sample time for which the stated level is exceeded. In defining the use of the index, both the value of n and the length of the sample period must be stated.

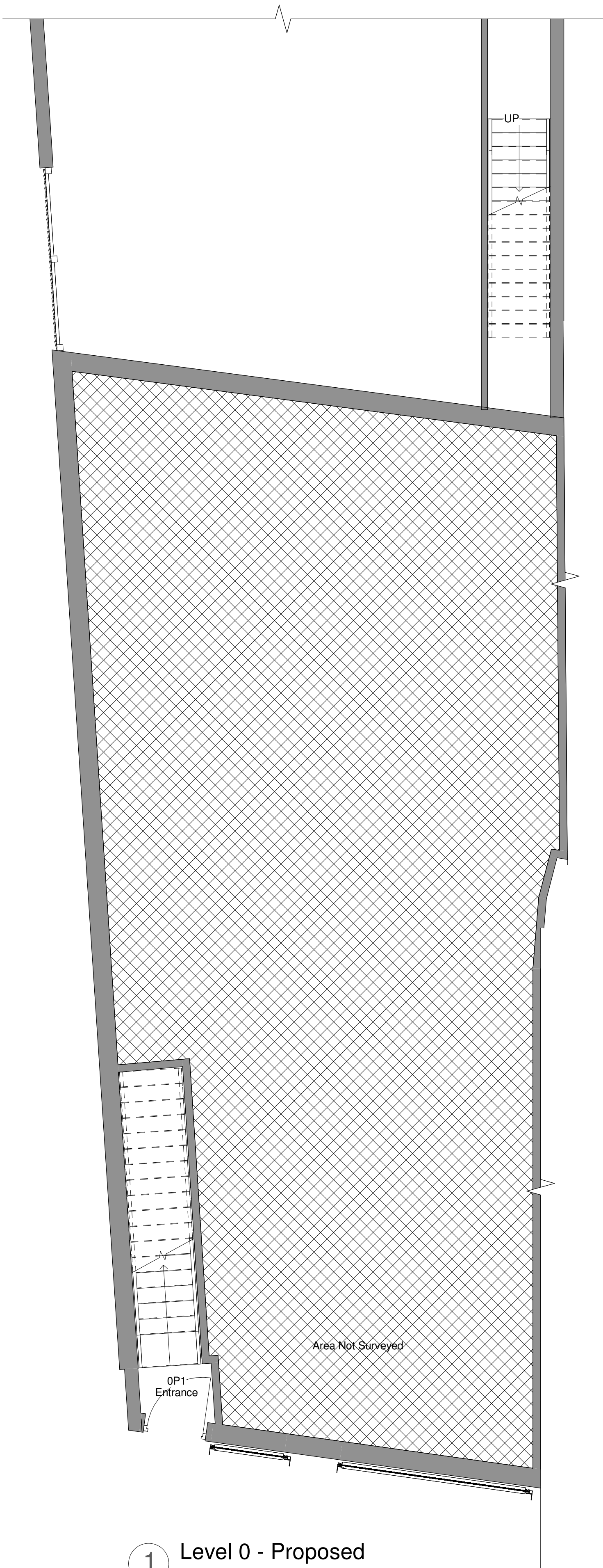
L_{10} L_{10} , being the level exceeded for 10% of the time, has been shown to be a good indicator for traffic noise intrusion, and is used in assessing the effect of traffic noise on residential or commercial premises.

L_{90} L_{90} is the level exceeded for 90% of the time, and is used as a measure of background noise level, as it excludes the effects of occasional transient levels, such as individual passing cars or aircraft.

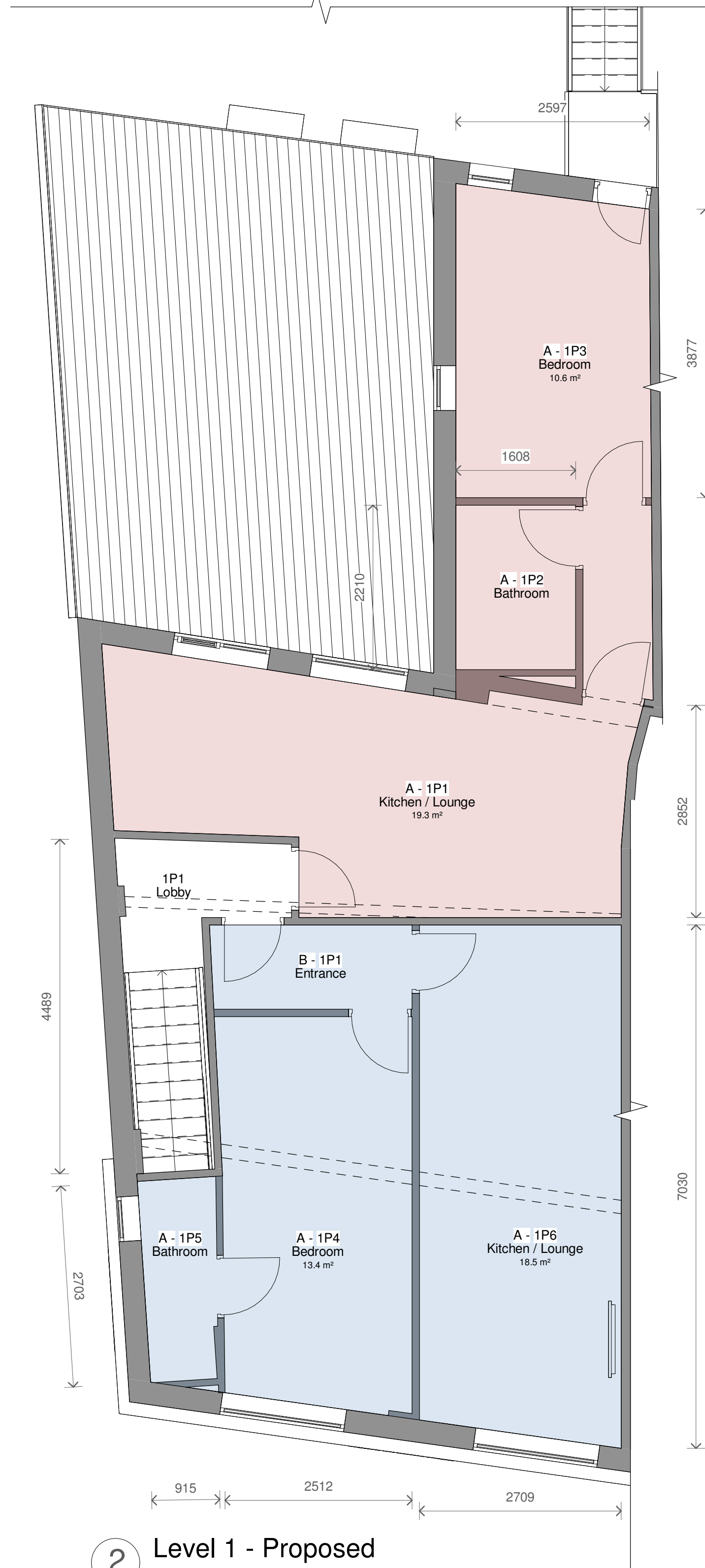
In addition to the statistical noise indices defined above, the following noise units are also used to define variable amplitude noise sources:

$L_{eq,T}$ $L_{eq,T}$ is defined as the notional steady sound pressure level which, over a stated period of time, would contain the same amount of acoustical energy as the actual fluctuating sound measured over the same period. In other words, it is a measure of the "average" noise level

L_{max} L_{max} is the maximum time-weighted sound pressure level recorded over the stated time period



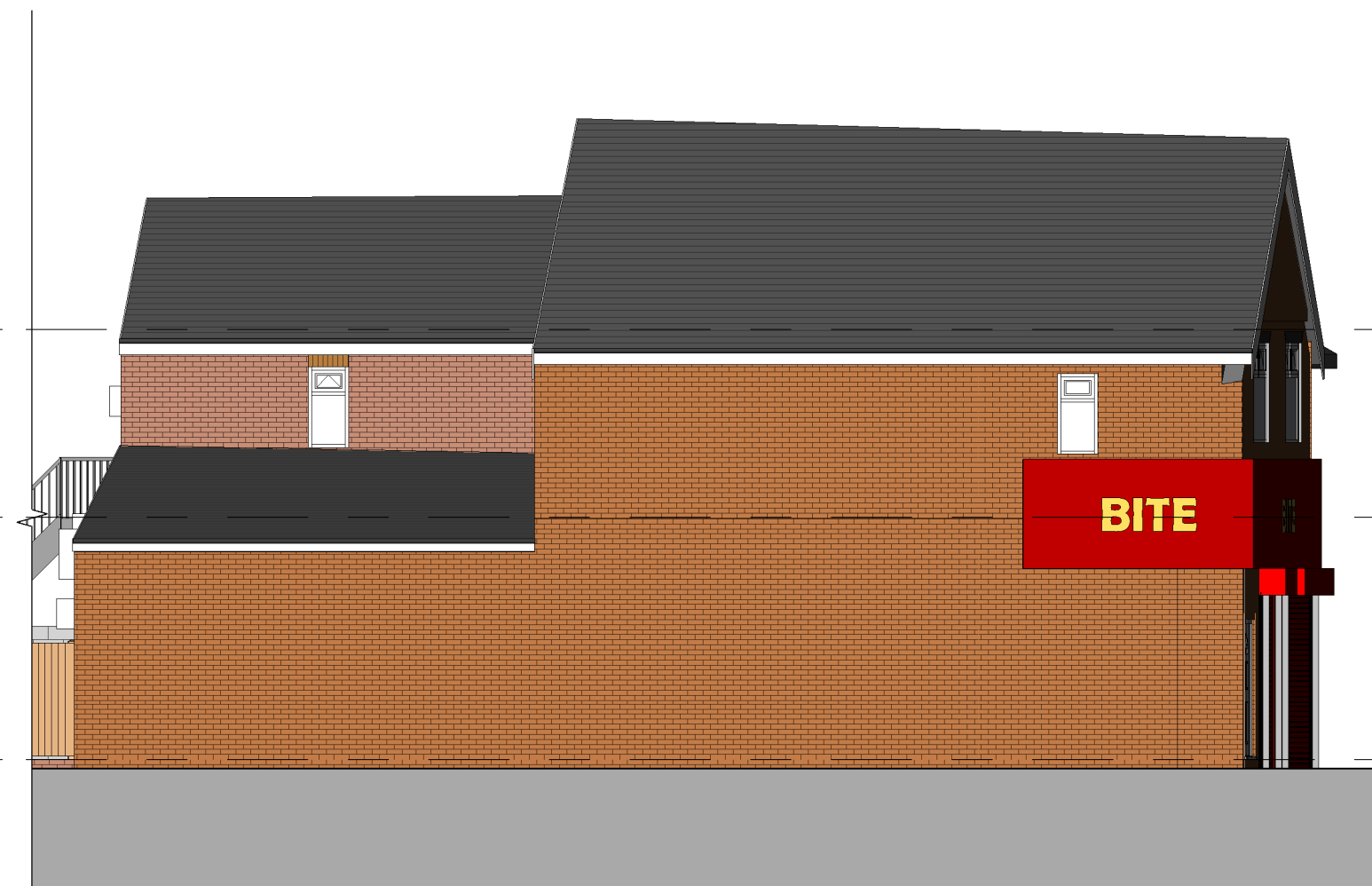
1 Level 0 - Proposed
1 : 50



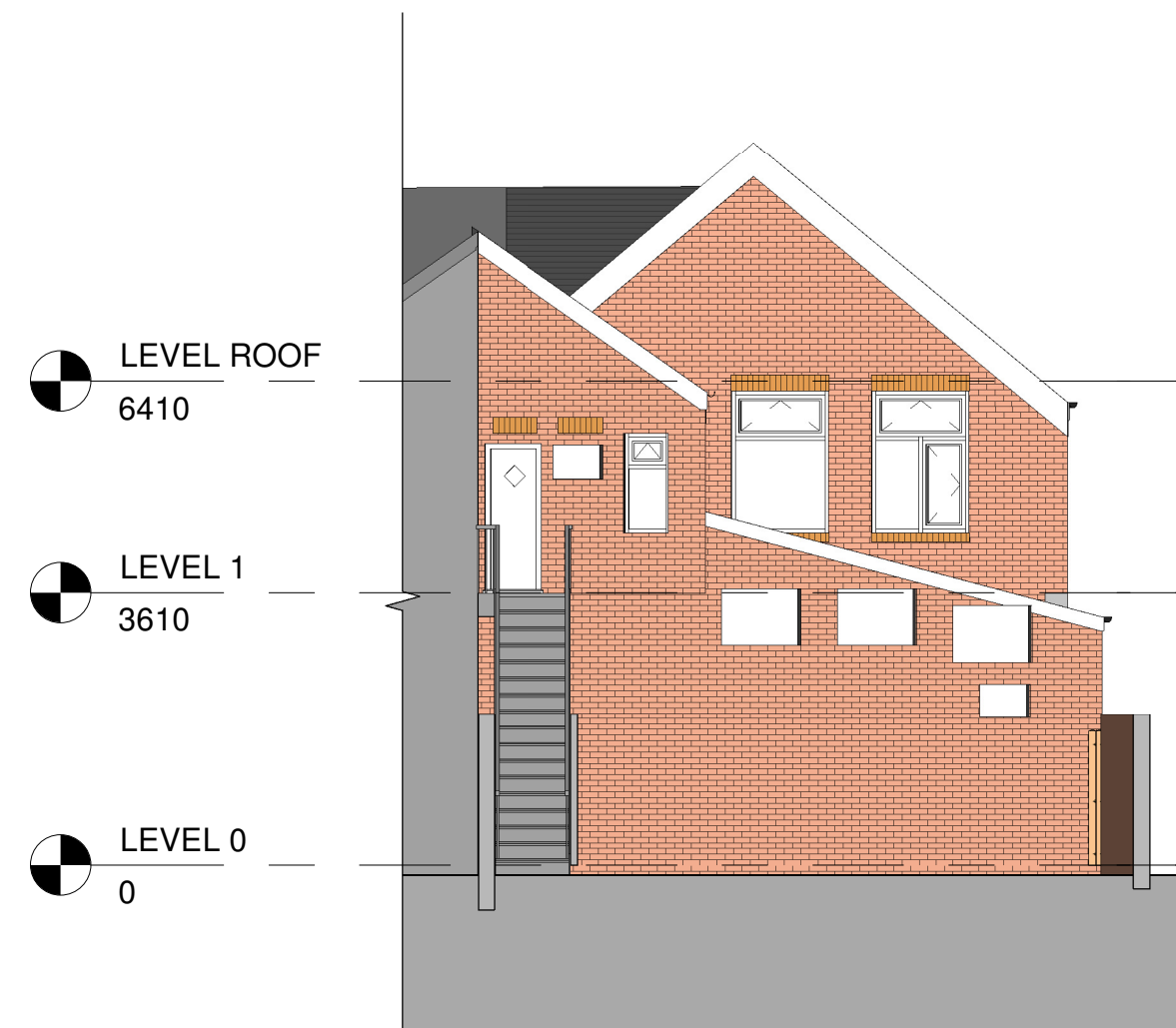
2 Level 1 - Proposed
1 : 50



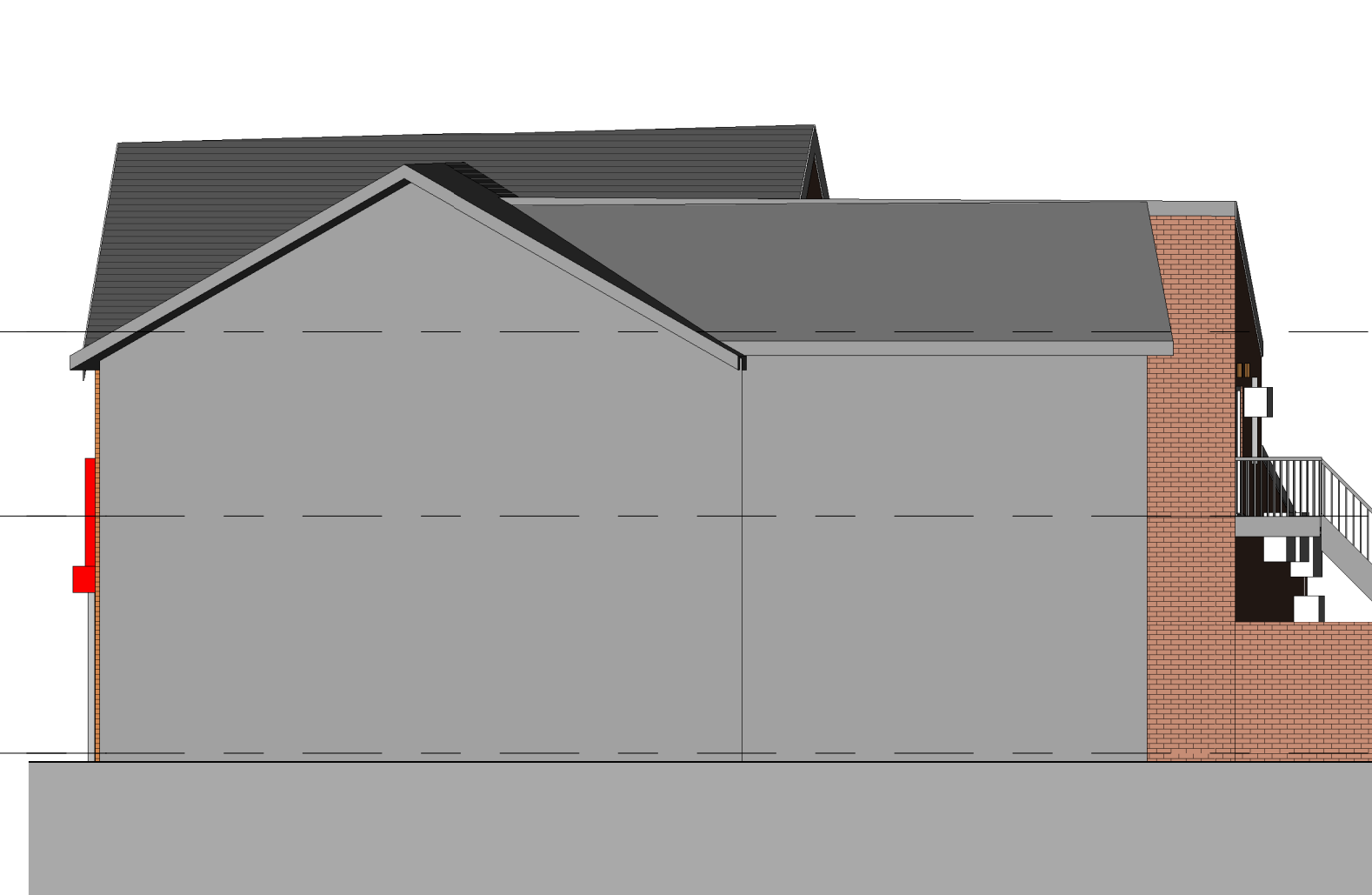
3 Front - Proposed
1 : 100



4 Left Side - Proposed
1 : 100

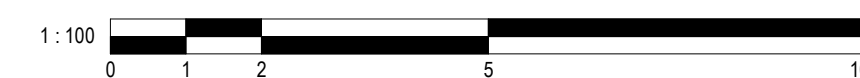
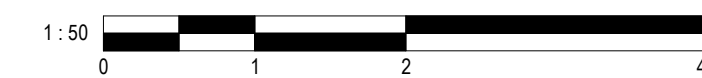
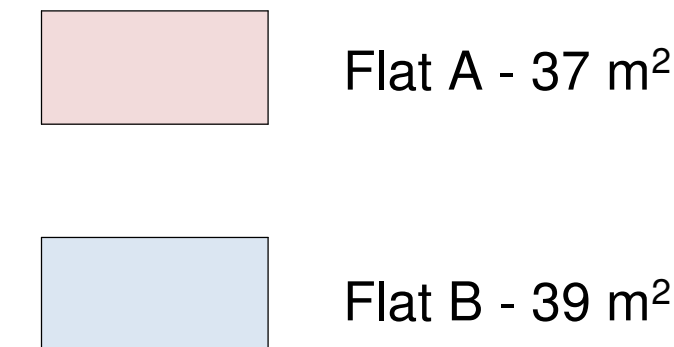


5 Rear - Proposed
1 : 100



6 Right Side - Proposed
1 : 100

Area Key



2	Revised Proposed	02/10/202	CB
1	Revised Plans	21/08/2024	SG
No.	Description	Date	Initial

PROJECT		
149a Fog Lane		
TITLE		
Proposed Plans and Elevations		
STATUS		
DESIGN		
DRAWN BY	DATE	SCALE (@ A1)
CB	19/08/2024	As indicated
PROJECT NUMBER	DRAWING NUMBER	REV
GSS24115	003	2
GOLD SKETCH		
S T U D I O S		
www.goldsketch.co.uk info@goldsketch.co.uk 0161 792 9595		
NOTES		
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