



ST JOHN STREET,
MANCHESTER

External Building Fabric Assessment

Reference: 13660.RP01.EBF.1

Prepared: 23 January 2025

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Enabl

16 Old Market Place
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0	First issue of report	20 June 2024	James Melville	Helen Sheldon
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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.



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1. INTRODUCTION

It is proposed to convert the existing office buildings at 8/8a St John Street back into residential premises. These properties are listed Georgian properties on the corner of St John Street and Longworth Street, close to Deansgate in Manchester City Centre. In addition to this, it is proposed to construct a new, detached, single family dwelling on land to the rear of the site.

An assessment has been carried out in relation to the noise levels likely to be incident on the proposed building façades and to provide acoustic performance specifications such that acceptable internal noise criteria can be achieved.

This report details the results of the noise survey and sets out the acoustic performance requirements of the external building fabric elements.

A summary of acoustic terminology is included in Appendix A.

2. SITE DESCRIPTION

The site is shown in relation to its surroundings in the site plan in Figure 1 (Appendix F).

The site is located within an existing office building on the corner of St John Street and Longworth Street. The area is mixed use and feature, offices, residential and commercial.

To the northeast of the site is the Royal Vida Nightclub. It is understood that the nightclub itself is accessed by patrons on Deansgate, however the glazed rear façade of the night club faces the proposed residential development on Longworth Street.

The noise climate is largely dominated by road traffic noise from the surrounding road network, with noise from the night club and other bar and pubs along Deansgate also contributing during the evening and night-time periods.

3. ENVIRONMENTAL NOISE SURVEY

3.1 Survey Methodology

Monitoring of the prevailing background noise was undertaken over the following period:

13:00 Thursday 6 June to 08:30 Tuesday 11 June 2024

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period. However, based on observations during the site visits and weather reports for the area, conditions were generally considered suitable for obtaining representative noise measurements, being predominantly dry with little wind.

Measurements were made of the L_{A90} , L_{Amax} and L_{Aeq} noise levels over sample periods of 5 and 15 minutes.

3.2 Measurement Location – Unattended

To determine the existing noise climate around the site measurements were undertaken at the following location:

Measurement Position 1 – The microphone was positioned outside of a north facing window overlooking Longworth Street at a second story level. The measurement was close to the façade and therefore measurements at this position are considered façade levels. The noise climate was largely dominated by road traffic noise from the surrounding road network. When the nearby Royal Vida Nightclub is in operation, music noise breakout from the venue is considered to be the most dominant noise source.

The measurement position is also illustrated on the site plan attached in Figure 1 (Appendix F).

Results

The noise levels measured are shown as time-histories on the attached Graphs 1-3 (Appendix F).

The typical L_{A90} and the period averaged L_{Aeq} noise levels measured are summarised in Table 1, along with typical L_{AFmax} levels measured during the night-time.

Table 1 – Measured Levels

Measurement Period	Typical Background Noise Level, $L_{A90,15min}$ [dB]	Time-Averaged Noise Level, L_{Aeq} [dB]	Typical Maximum Noise Level, $L_{AFmax,5min}$ [dB]
Daytime (07:00 – 23:00)	50	58	N/A
Night-time (23:00 – 07:00)	44	62	85

3.3 Measurement Location – Attended

In addition to the long-term unattended survey, an attended survey was undertaken during the night time period on Friday 7th June/ Saturday 8th June by an RBA Engineer.

The purpose of the attended measurements was to capture additional noise measurements during the night-time period and gain a subjective understanding of the noise climate affecting the development.

Attended measurements were undertaken at the following locations:

Measurement Position 2 – The microphone was attached to a tripod approximately 1.2m from the ground and positioned outside of No.8 St John Street approximately 3m from the St John Street carriageway and away from any reflective surfaces. This measurement position is therefore considered to be free field. The dominant noise source during the measurement period was music noise breakout from the Royal Vida Nightclub as well as road traffic noise.

Measurement Position 3 – The microphone was attached to a tripod approximately 1.2m from the ground and positioned outside of along Longworth Street and away from any reflective surfaces. This measurement position is therefore considered to be free field. The dominant noise source during the measurement period was music noise breakout from the Royal Vida Nightclub as well as road traffic noise.

The measurement positions are also illustrated on the site plan attached in Figure 1 (Appendix F).

The period averaged L_{Aeq} noise levels measured are summarised in Table 2, along with L_{AFmax} levels measured during the attended measurements period.

Table 2 – Measured Levels

Position	Measurement Period	Time-Averaged Noise Level, $L_{Aeq,T}$ (dB)	Typical Maximum Noise Level, $L_{AFmax,5min}$ (dB)
2 – St John Street	03:05hrs - 04:14hrs 08/06/2024	59	76
3 - Longworth Street	02:30hrs - 03:00hrs 08/06/2024	61	76

Subjectively, at both measurement positions music noise was the dominant noise source during our attendance at the site. The music noise breakout was noted to be predominantly low frequency noise from bass heavy music.

3.4 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix D.

The sound level meters were calibrated both prior to and on completion of the survey with no significant calibration drifts observed.

4. EXTERNAL BUILDING FABRIC CRITERIA

Manchester City Council have specific criteria defined in the guidance in relation to internal noise levels, including low frequency noise limits from entertainment premises. These criteria are summarised below and have been used as the basis of the assessment presented in this report.

Table 3 – MCC Residential Criteria

Room	07:00 to 23:00	23:00 to 07:00
Living Rooms	35 dB $L_{Aeq,16hour}$	--
Bedrooms	--	30 dB $L_{Aeq,8hour}$ 45 dB L_{AFmax} (not normally exceeded more than 15 times)

In addition to this, Manchester City Council states the following low frequency noise limits in all habitable rooms where a proposed residence is affected by entertainment noise:

“Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB ($L_{eq,5min}$), respectively”

These criteria have been used as the basis of the assessment presented in this report.

5. EXTERNAL BUILDING FABRIC ASSESSMENT

5.1 Background

Analyses of the external building fabric have been undertaken in order to ascertain the required acoustic performance of the glazing and other external fabric elements to achieve the project criteria.

5.2 Assumptions

Our external building fabric analyses have assumed the following:

(a) Drawings

The assessment has been based on the information provided in the site drawings provided by Tim Groom Architects.

(b) Noise Levels

The assessment has been based on the measured noise levels as detailed in Section 3.

(c) Room Absorption

The calculations assume that bedrooms are acoustically 'soft' with carpets, curtains and other soft furnishings. The living rooms are assumed to be less acoustically absorptive (with a hard floor finish, although with furnishings).

Details of the absorption coefficients assumed in the calculations are provided in Appendix B.

(d) External Wall

External non-glazed areas are to comprise the existing blockwork wall construction. RBA have assumed the following sound reduction indices (equating to an overall R_w of 52 dB) for all non-glazed façade areas:

Table 4 – Sound Reduction Indices of Non-Glazed Elements

Assumed Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
36	41	45	45	54	58	58	58

Should the proposals for non-glazed areas change, it is critical RBA are informed at the earliest opportunity as this could have a significant impact on the sound insulation performance requirements of the glazing systems.

(e) Ventilation

It is understood the chosen strategy is background ventilation provided by MVHR.

Given the very high low frequency external noise levels (63Hz and 125Hz) allowance should be made for attenuators for MVHR connections to the façade in order to control noise break in via MVHR ducts to flats. Further review will be undertaken at a later stage in the design once details of these systems are made available.

5.3 Specification & Guidance Constructions

Appendix C details the sound reduction performance specification for glazed elements of the external building fabric.

The glazing performance specifications apply to the glazing package as a whole - inclusive of glazing, louvres, spandrel panels, framing, opening lights, doors, seals, etc. The performance of the glazing system will depend on many factors such as the glazing configuration, size of window panels, quality of framing, quality of sealing, etc.

Please note – The glazing configurations described in Table 5 are given for costing purposes only. All window systems should be capable of meeting the performance specifications shown in **Appendix C**, with laboratory test certificates being made available in support of the quoted performance. Glazing proposals which simply reflect the guidance constructions indicated in this report will not, in isolation, be sufficient evidence that a window configuration will meet the performance specification.

For guidance purposes RBA would typically expect the following glazing configurations to prove commensurate with achieving the sound insulation performance specifications detailed within Appendix C.

Table 5 – Guidance on Glazing Construction

Glazing Type	Example Glazing Configuration
G1	Double Glazing with High acoustic performance secondary glazing (6mm/10mm/6mm/200mm/6mm)
G2	Existing Glazing with High Performance Secondary Glazing (with maximized airgap, ideally 200mm)

It should be noted that due to the non-acoustic reasons (security, thermal or structural purposes), the specifications may exceed those stated above in some locations.

5.4 Applicable Zoning

The proposed glazing zones are indicated on the façade zoning plan provided in Figure 2 in Appendix F.

6. CONCLUSION

RBA Acoustics have undertaken noise monitoring at the proposed development site at St John Street, Manchester. The measured noise levels are presented within this report. The resultant noise levels have been used in the assessment of the glazing requirements to ensure suitable internal noise levels are achieved at the proposed development with reference to the Local Authority requirements.

Target specifications for glazing are included in Appendix C to this report.

Based on the results of our assessment we have determined that Double Glazing with High acoustic performance secondary glazing will be required for all facades of the development, this is primarily to ensure that the MCC low frequency criteria is met during the night-time period.

Appendix A – Acoustic Terminology

A-weighting (e.g. dB(A))	A correction applied across the frequency bands to take into account the response of the human ear, and therefore considered to be more representative of the sound levels people hear.
DeciBel (dB)	Unit used for many different acoustic parameters. It is the logarithmic ratio of the level being assessed to a standard reference level.
$L_{eq,T}$	The level of a notional steady sound which, over a stated period of time, T , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
$L_{Aeq,T}$	The A-weighted level of a notional steady sound which, over a stated period of time, T , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
L_{An} (e.g. L_{A10} , L_{A90})	The sound level exceeded for n% of the time. E.g. L_{A10} is the A-weighted level exceeded for 10% of the time and as such can be used to represent a typical maximum level. Similarly, L_{A90} is the level exceeded for 90% of the measurement period, and is often used to describe the underlying background noise.
$L_{Amax,T}$	The instantaneous maximum A-weighted sound pressure level which occurred during the measurement period, T . It is commonly used to measure the effect of very short duration bursts of noise, e.g. sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the ambient level.
Octave band	A frequency band in which the upper limit of the band is twice the frequency of the lower limit.
1/3 Octave band	A frequency band which is one-third of an octave band.
R_w	A single number quantity which characterises the airborne sound insulation of a material or building element in a laboratory test.

Appendix B – Room Absorption Coefficients

For the purposes of the analyses RBA have assumed the absorption coefficients detailed in Table B1 for bedrooms and Table B2 for living rooms.

Table B1 – Bedroom Absorption Coefficients

Absorption Coefficient (α) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.25	0.27	0.31	0.32	0.32	0.32

Table B2 – Living Room Absorption Coefficients

Absorption Coefficient (α) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.20	0.22	0.22	0.22	0.23	0.27

Appendix C – External Building Fabric Acoustic Specification

External facade constructions and components, such as brise soleil, grilles, ventilators, curtain walling systems or other architectural features, are not to give rise to intrusive whistling, creaking, rattling or other noises as a result of wind or other climatic effects.

The Contractor shall take reasonable precautions to avoid unwanted noise including creaking, rattling and whistling being generated by the Contractors works when subject to environmental conditions (including wind) and thermal expansion over the life of the façade.

1.0 Window Sound Insulation Performance

Glazed units (inclusive of glazing, louvres, timber panels, spandrel panels, infill panels, framing, opening lights, balcony/terrace doors, seals, etc. as appropriate) should achieve the following minimum sound reduction indices as tested in general accordance with BS EN ISO 10140-2:2021:

Table C1 – Window Sound Insulation Performance Specification

Type	Minimum Recommended Sound Reduction Index [dB] at Octave Band Centre Frequency (Hz)								<i>R_w</i> (dB)
	63	125	250	500	1k	2k	4k	8k	
G1	32	39	47	49	55	57	62	62	54
G2	32	39	47	49	55	57	62	62	54

Note: *R_w* is the “overall weighted sound reduction index” tested in a laboratory.

N.B. as the internal noise criteria are expressed in overall terms, other frequency-specific performance levels may ultimately prove acoustically acceptable. Test data for representative samples of all glazing systems shall be submitted to RBA Acoustics for approval to demonstrate compliance with the above performance specifications.

2.0 Ventilator Sound Insulation Performance

Mechanical ventilation is proposed for the scheme, and therefore no specific acoustic performance requirements are applied in order to maintain the performance of the external building fabric.

Given the very high low frequency external noise levels (63Hz and 125Hz) allowance should be made for attenuators for MVHR connections to the façade in order to control noise break in via MVHR ducts to flats. Further review will be undertaken at a later stage in the design once details of these systems are made available.

Appendix D – Instrumentation

The following equipment was used for the measurements.

Table D1 – Equipment Calibration Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1406007	U41328	22 June 2024
Norsonic Pre Amplifier	1209	20043		
Norsonic ½” Microphone	1225	208146	41327	22 June 2024
Norsonic Sound Calibrator	1251	34127	U41326	22 June 2024
Norsonic Type 1 Sound Level Meter	Nor140	1405945	U44502	15 June 2025
Norsonic Pre Amplifier	1209	15314		
Norsonic ½” Microphone	1225	208218	44501	15 June 2025
Norsonic Sound Calibrator	1251	34057	U44500	15 June 2025

Appendix E – CDM Considerations

The likelihood the harm will occur can be assessed by applying an indicative score (from 1 to 5) as follows:

- 1 – Remote (almost never)
- 2 – Unlikely (occurs rarely)
- 3 – Possible (could occur, but uncommon)
- 4 – Likely (recurrent but not frequent)
- 5 – Very likely (occurs frequently)

The severity of harm can be assessed by applying an indicative score (from 1 to 5) as follows:

- 1 – Trivial (e.g. discomfort, slight bruising, self-help recovery)
- 2 – Minor (e.g. small cut, abrasion, basic first aid need)
- 3 – Moderate (e.g. strain, sprain, incapacitation for more than 3 days)
- 4 – Serious (e.g. fracture, hospitalisation for more than 24 hours, incapacitation for more than 4 weeks)
- 5 – Fatal (single or multiple)

The rating value is obtained by multiplying the two scores and is then used to determine the course of action.

Table E1 – Risk Ratings

Rating Bands (Severity x Likelihood)		
Low Risk (1 – 8)	Medium Risk (9 -12)	High Risk (15 – 25)
May be ignored but ensure controls remain effective	Continue, but implement additional reasonable practicable controls where possible	Avoidance action is required; therefore alternative design solutions must be examined. Activity must not proceed until risks are reduced to a low or medium level

The following hazards pertinent to our design input have been identified and control measures suggested:

Table E2 – Risk Assessment

Hazard	Risk Of	At Risk	Rating			Control Measures	Controlled		
			L	S	R		L	S	R
Mineral wool within drywalls and linings	Skin and respiratory irritation	Contractors	4	3	12	Wear gloves and mask	1	3	3
Acoustic glazing - weight	Strain of neck, limbs or back. Fall from height.	Contractors	3	5	15	Provide sufficient manpower, lifting gear and structural support	1	5	5

L: Likelihood S: Severity R: Rating

Appendix F – Graphs and Site Plans

St John Street, Manchester

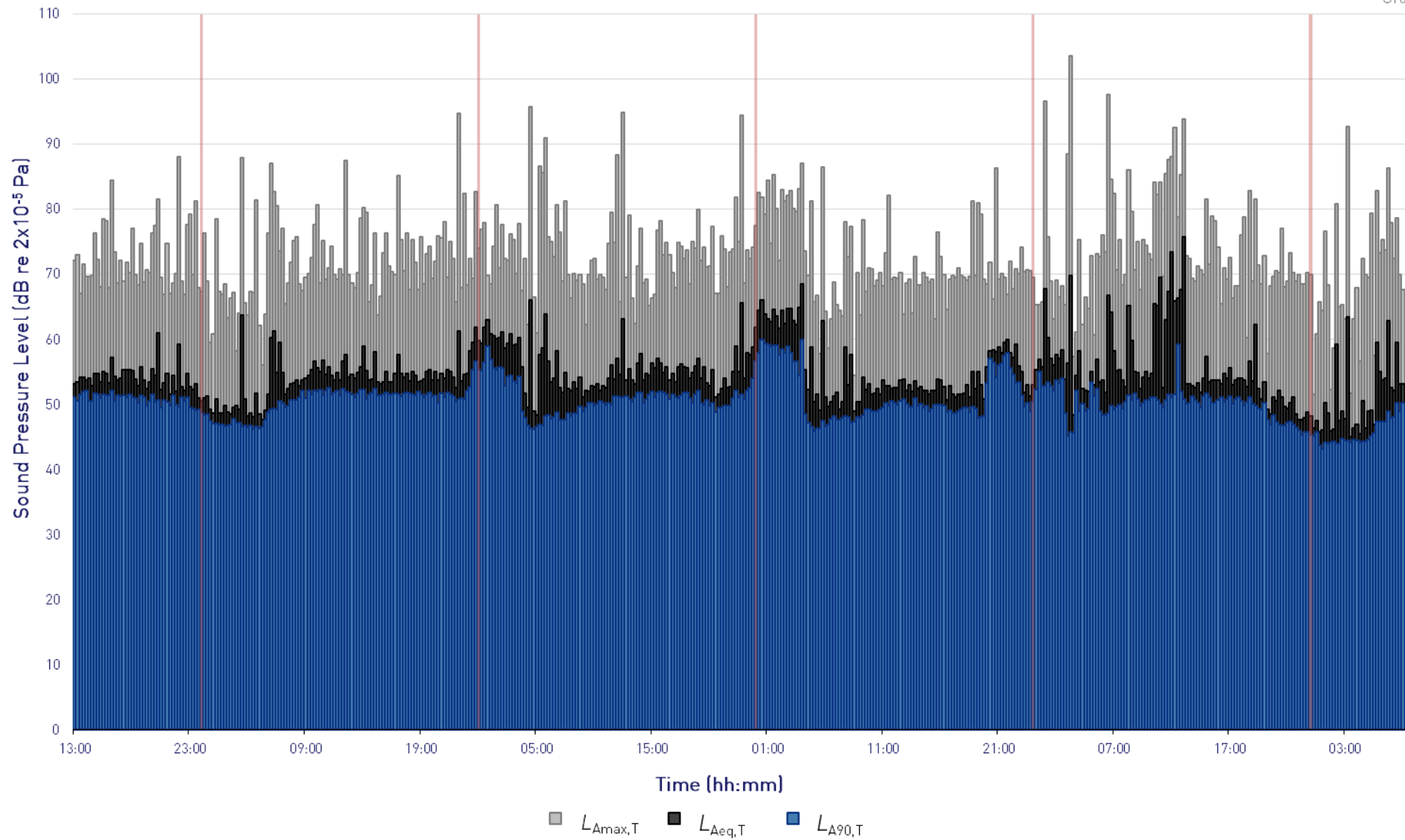
Measured Levels (15min Sample Periods)

Position 1, Measurement Position 1 - Thursday 6 June to Tuesday 11 June, 2024



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Graph 1



St John Street, Manchester

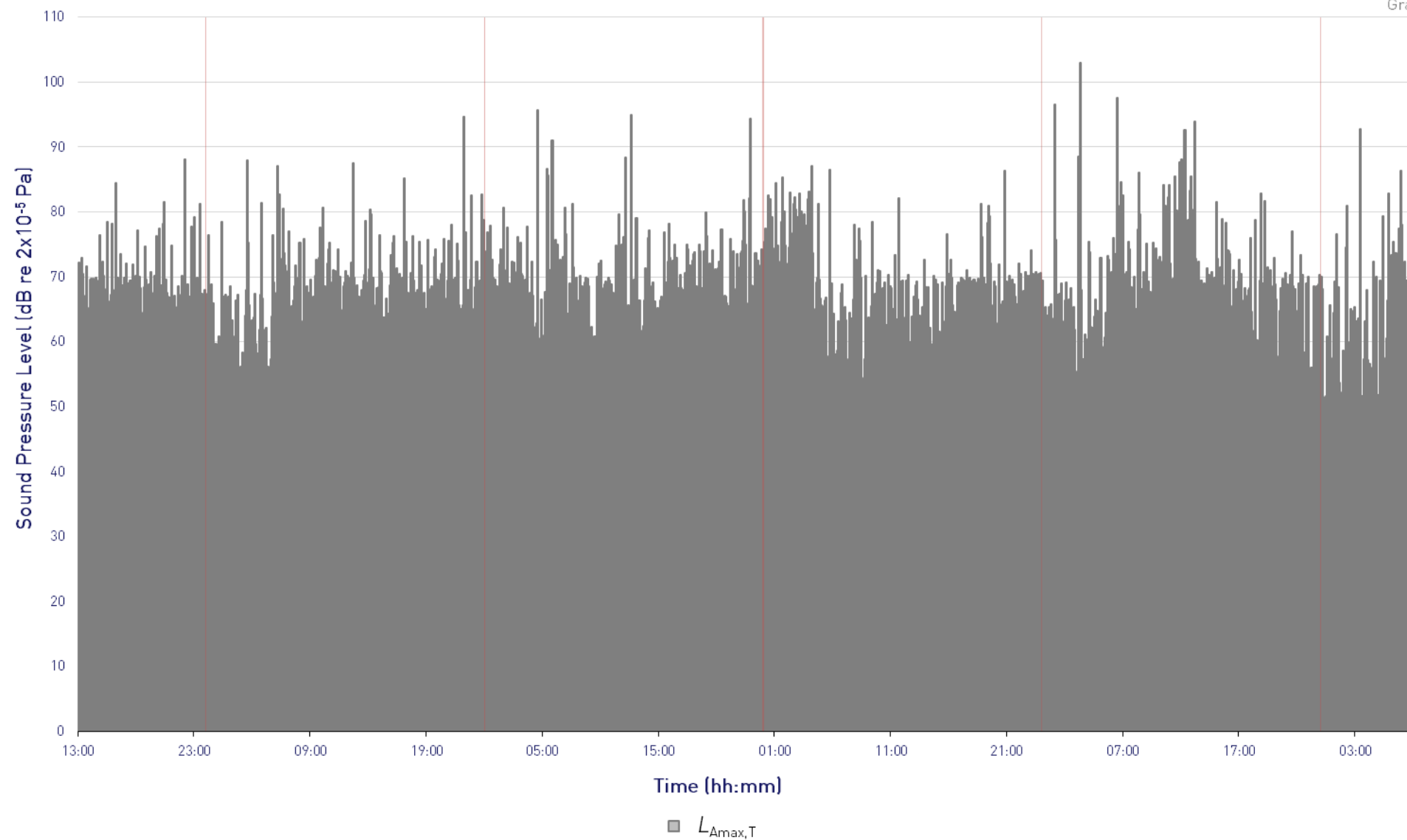
$L_{Amax,5\text{ min}}$ Time History

Position 1, Measurement Position 1 - Thursday 6 June to Tuesday 11 June, 2024



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Graph 2



St John Street, Manchester

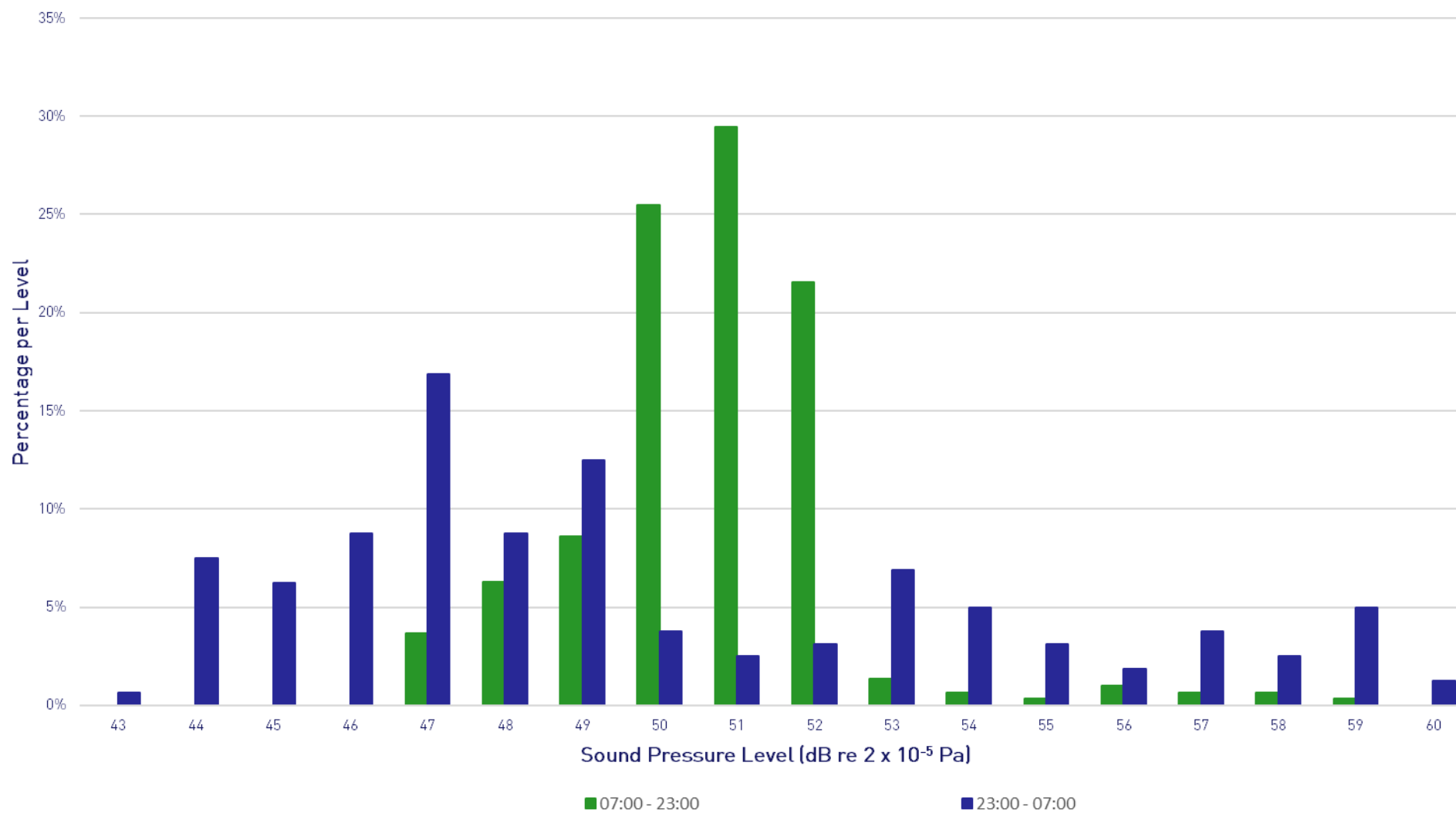
$L_{A90,15 \text{ min}}$ Histogram

Position 1, Measurement Position 1 - Thursday 6 June to Tuesday 11 June, 2024



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Graph 3

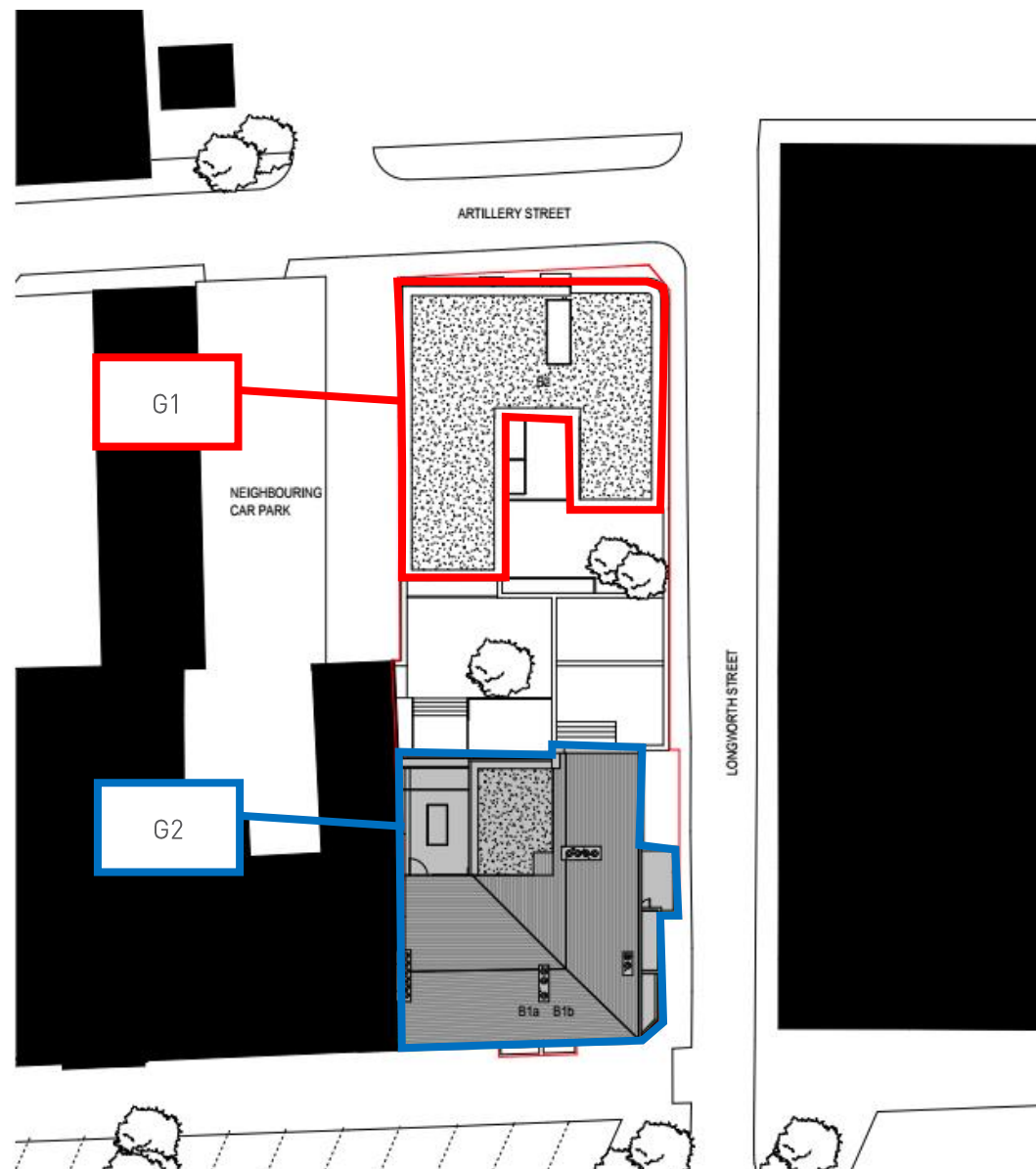




St John Street, Manchester
Site Plan
Project 13660

Figure 1
23 January 2025
Not to Scale





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