

30 Mason Street Manchester

Acoustic Planning Report
0960/APR1

30 November 2022

For:

Sigma Property Ltd
2a Tweedale Street
Rochdale
OL11 1HH



2nd Floor 3 Hardman Square
Spinningfields Manchester M3 3EB

☎ 0161 457 0515 ■ 07415 151 901
✉ Enquiry@LighthouseAcoustics.co.uk
🌐 www.LighthouseAcoustics.co.uk

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Registered Office: 2nd Floor 3 Hardman Square Spinningfields Manchester M3 3EB
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1.0 Introduction

Lighthouse Acoustics has been appointed by Sigma Property Ltd to undertake a detailed environmental sound assessment for the proposed development.

The proposed development comprises the refurbishment of the existing 4 storey building (plus basement) to form 4No. apartments at Ground, 1st, 2nd and 3rd floor levels with retail space at Basement level.

It is not currently possible to determine representative sound levels at the development site due to Marshall Street being closed to road traffic between Mason Street and Chadderton Street and construction works at the adjacent Addington Street site.

As such, it is proposed to review existing sound survey data (undertaken by others) from surrounding developments in order to estimate environmental sound levels representative of those upon the development site.

The environmental sound assessment for the proposed development is presented in this report.

2.0 Objectives

To establish the Local Authority's acoustic requirements for the proposed residential development.

To review existing sound survey data (undertaken by others) from surrounding developments in order to estimate environmental sound levels representative of those upon the development site.

To undertake a detailed environmental sound assessment for the proposed residential development to establish the acoustic specification for glazing/ventilation elements in order to achieve the acoustic requirements of the Local Authority.

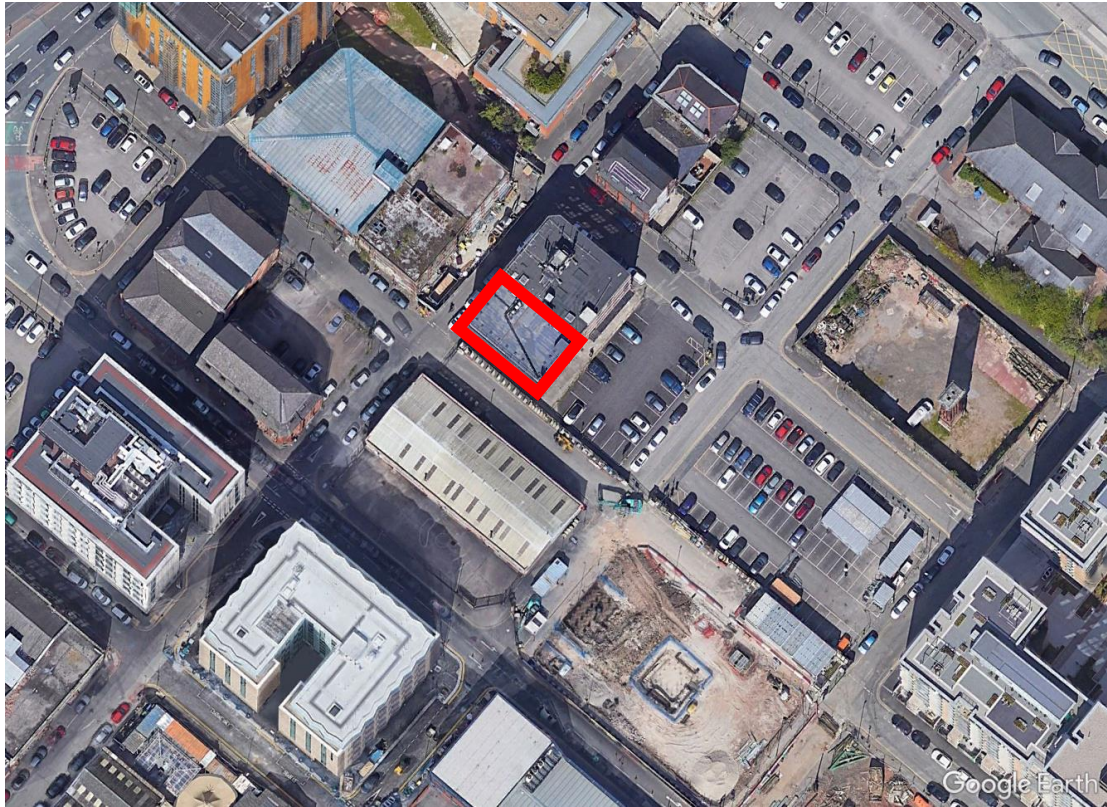
3.0 Site Description

The proposed development is at 30 Mason Street, Manchester. The site comprises an existing 4 storey (plus basement) semi-detached former commercial building.

The site is bound by adjoining building to the north east, ground level car park to the south east, Marshall Street to the south west and Mason Street to the north west. Addington Street (A665) is situated approximately 40m to the south west of the site.

Existing residential flats are situated to the north of the site opposite Mason Street, to the north east of the site in the adjoining building and to the south of the site opposite Marshall Street.

The site plan below indicates the extent of the site and the surrounding environment.



Site plan indicating the extent of the site and the surrounding environment

4.0 Local Authority Requirements

4.1 Residential Developments

With regard to residential developments, Section 3.7.1.1 of the Planning & Noise Technical Guidance document (dated October 2022) produced by Manchester City Council states the following:

“The Council has adopted the following internal noise limits for residential properties:

- **Bedrooms (night time - 23.00 - 07.00) 30dB L_{Aeq} (individual noise events should not normally exceed 45dB $L_{Amax,F}$ by more than 10 times)**
- **Living Rooms (daytime - 07.00 - 23.00) 35dB L_{Aeq}**
- **Gardens and terraces (daytime) 55dB L_{Aeq} ”**

4.2 Building Services

With regard to noise and vibration from fixed plant/equipment, Section 3.7.1.5 of the Planning & Noise Technical Guidance document (dated October 2022) produced by Manchester City Council states the following:

“The noise assessment should be based on BS 4142: 2014 and any application for fixed plant, equipment or machinery must demonstrate that:

‘Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.’

5.0 Environmental Sound Levels

5.1 Discussion

It is not currently possible to determine representative sound levels at the site due to Marshall Street being closed to road traffic between Mason Street and Chadderton Street and construction works at the adjacent Addington Street site.

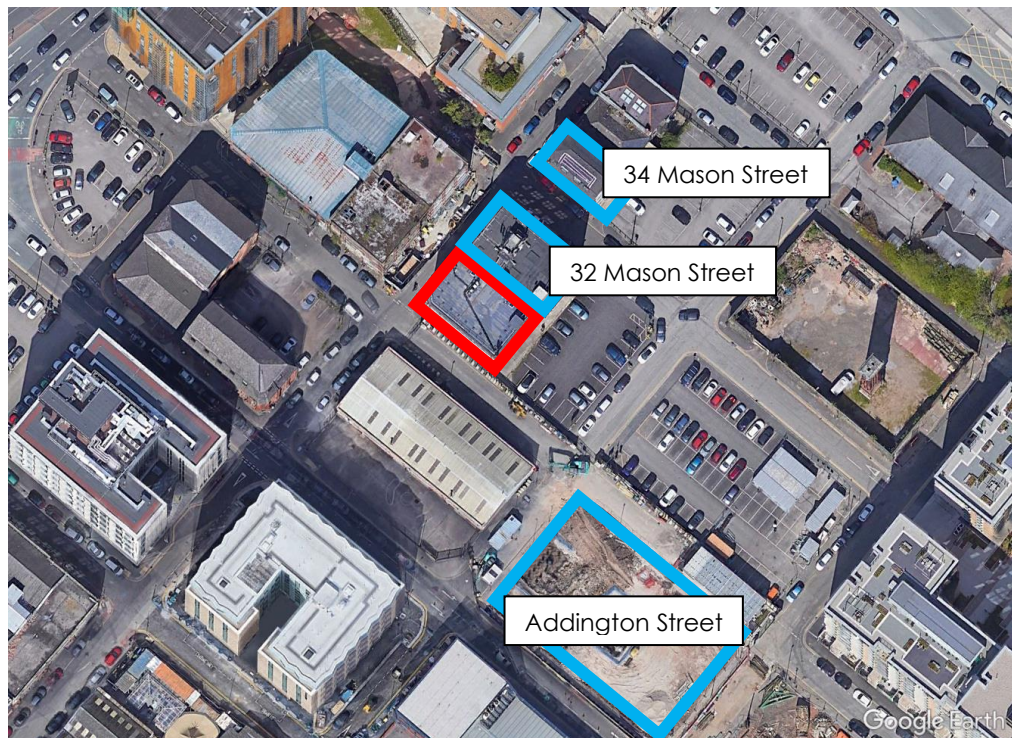
As such, it is proposed to review existing sound survey data (undertaken by others) from surrounding developments in order to estimate environmental sound levels representative of those upon the development site.

5.2 Surrounding Developments

Recent residential developments in close proximity to the site include the following:

- 34 Mason Street – conversion to 10No. apartments;
- 32 Mason Street – conversion to 13No. apartments;
- Addington Street – new build 80No. dwellings.

The site plan below indicates the location of the recent residential developments.



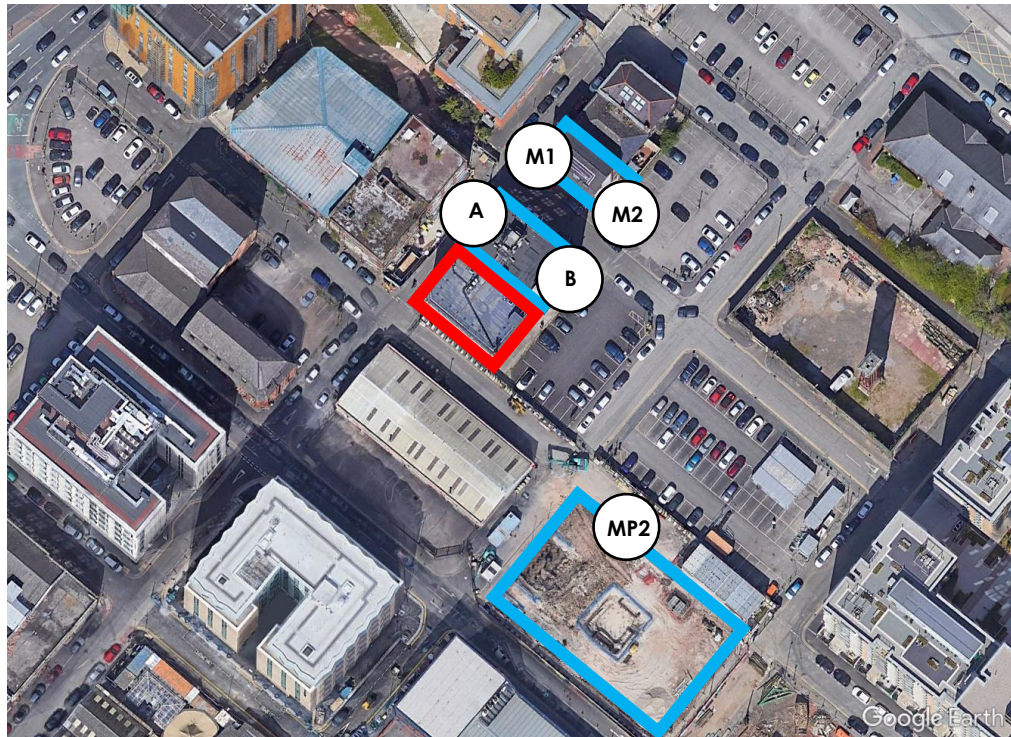
Site plan indicating the location of the recent residential developments

The table below provides further details of the recent residential developments.

Site Address	Planning Application No.	Report	Noise Survey Date
34 Mason Street	107351/FO/2014/N1	Peak Acoustics LH0412171NR Rev.1 dated 1 February 2018	January 2018
32 Mason Street	117059/FO/2017	AEC P3574/L04/PJK dated 16 May 2019	August 2018
Addington Street	1242888/FO/2019	Cundall 1021864-RPT- AS-001 Revision B dated 19 August 2019	March 2019

5.3 Measurement Positions

The measurement positions from the existing sound surveys (undertaken by others) are shown on the site plan below.



Site plan showing measurement positions from the existing sound surveys

5.4 Results

5.4.1 $L_{Aeq,T}$ Ambient Sound Levels

Based on the results of the existing sound surveys (undertaken by others) the estimated representative daytime $L_{Aeq,16hour}$ and night-time $L_{Aeq,8hour}$ sound levels incident upon each facade are presented in the table below.

Façade	Daytime $L_{Aeq,16hour}$ (dB)	Night-time $L_{Aeq,8hour}$ (dB)
Mason Street (north west)	58	52
Marshall Street (south west)	63	63
Car Park (south east)	57	54

The normalised road traffic noise spectrum from BS 8233:1999 has been shifted to achieve the daytime $L_{Aeq,16hour}$ and night-time $L_{Aeq,8hour}$ sound levels detailed above and are presented in the table below.

Position	Period	Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)						dBA
		125	250	500	1k	2k	4k	
Mason Street (north west)	Daytime Leq,16hour	60	56	54	54	51	45	58
	Night-time Leq,8hour	54	50	48	48	45	39	52
Marshall Street (south west)	Daytime Leq,16hour	65	61	59	59	56	50	63
	Night-time Leq,8hour	65	61	59	59	56	50	63
Car Park (south east)	Daytime Leq,16hour	59	55	53	53	50	44	57
	Night-time Leq,8hour	56	52	50	50	47	41	54

5.4.2 $L_{Amax,F}$ Sound Level Events

Based on the results of the existing sound surveys the estimated representative night-time L_{Amax} sound levels incident upon each facade are presented in the table below.

Façade	Night-time $L_{Amax,F}$ (dB)
Mason Street (north west)	≤80
Marshall Street (south west)	≤73
Car Park (south east)	≤79

Typical road traffic noise $L_{max,F}$ spectrum from previous projects has been shifted to achieve up to the night-time $L_{Amax,F}$ sound levels detailed above and are presented in the tables below.

Position	Night-time $L_{max,F}$ Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)						dBA
	125	250	500	1k	2k	4k	
Mason Street (north west)	79	80	77	77	80	67	80
	82	81	76	70	72	72	74
	80	78	71	71	70	64	70
	77	69	69	69	67	60	69
	72	77	70	64	57	47	69
	69	72	75	65	56	56	68
	80	71	65	69	64	52	67
	64	63	60	64	64	65	66
	65	64	61	67	62	50	66
	65	64	63	67	62	53	66

Position	Night-time $L_{max,F}$ Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)						dBA
	125	250	500	1k	2k	4k	
Marshall Street (south west)	72	73	70	70	73	60	73
	75	74	69	63	65	65	67
	73	71	64	64	63	57	63
	70	62	62	62	60	53	62
	65	70	63	57	50	40	62
	62	65	68	58	49	49	61
	73	64	58	62	57	45	60
	57	56	53	57	57	58	59
	58	57	54	60	55	43	59
	58	57	56	60	55	46	59

Position	Night-time $L_{max,F}$ Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)						dBA
	125	250	500	1k	2k	4k	
Car Park (south east)	78	79	76	76	79	66	79
	81	80	75	69	71	71	73
	79	77	70	70	69	63	69
	76	68	68	68	66	59	68
	71	76	69	63	56	46	68
	68	71	74	64	55	55	67
	79	70	64	68	63	51	66
	63	62	59	63	63	64	65
	64	63	60	66	61	49	65
	64	63	62	66	61	52	65

6.0 Detailed Sound Assessment

6.1 Assessment Method

In order to establish the acoustic specification for glazing/ventilation elements required to achieve the internal daytime $L_{Aeq,16hour}$, night-time $L_{Aeq,8hour}$ and night-time $L_{max,F}$ requirements an assessment has been undertaken in accordance with the more rigorous calculation method detailed in BS 8233:2014, "Guidance on sound insulation and noise reduction for buildings".

This calculation method takes into account the external sound pressure level, the sound reduction indices of the façade elements, the area of the facade and the absorption within the room at octave band centre frequencies.

6.2 Proposed Development

The assessment has been based on the following drawings.

Author	Drawing No.	Revision	Date
CJ Partnership	3634 07	A	Nov 2022
	3634 08	A	Nov 2022
	3634 09	A	Nov 2022
	3634 10	A	Nov 2022
	3634 11	A	Nov 2022

The proposals include the refurbishment of the existing 4 storey building (plus basement) to form 4No. apartments at Ground, 1st, 2nd and 3rd floor levels with retail space at Basement level.

6.3 Acoustic Requirements

The proposed residential apartments comprise living room/kitchen and bedroom spaces. Based on the requirements of the Local Authority detailed in Section 4.1, the following internal sound limits have been assessed to.

Room Type	07:00 to 23:00	23:00 to 07:00
Living Room/Kitchen	35dB LAeq,16hour	-
Bedroom	35dB LAeq,16hour	30dB LAeq,8hour 45dB LAmax*

* should not be exceeded more than 10 times per night.

6.4 Room Assumptions

The following typical dimensions and finishes/furnishings have been assumed for the purpose of the assessment.

Room Type	Typical Room Dimensions	Typical Window Area	Typical Room Finishes / Furnishings
Living Room/ Kitchen	8m x 5m x 2.4m	18m ²	Wood/vinyl floor, curtains, sofa, table, chairs
Bedroom	4m x 4m x 2.4m	6m ²	Carpet, curtains, bed

Should the proposed dimensions/finishes/furnishings differ from those detailed above a re-assessment may be required.

6.5 Construction Proposals

It is understood that the external walls and roof of the dwellings will comprise the following typical constructions.

Element	Typical Construction
External Walls	Brickwork with cavity, insulation and internal plasterboard lining
Roof	Concrete slab with insulation in void and plasterboard ceiling

The following typical Sound Reduction Indices have been assumed for the various elements.

Element	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
External Walls	32	40	44	45	51	56	56	56
Roof	35	38	42	49	53	55	55	55

6.6 Glazing Specifications

In order to achieve the internal daytime and night-time requirements the glazing system as a whole including glass, frame, seals and openings shall provide the following minimum sound insulation performance when tested in accordance with BS EN ISO 10140-2: 2010.

Facade	Room Type	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Mason Street (north west)	Living Room/ Kitchen	21	25	22	33	40	43	44	48
	Bedroom	23	27	29	36	41	42	52	56
Marshall Street (south west)	Living Room/ Kitchen	23	27	29	36	41	42	52	56
	Bedroom	23	27	29	36	41	42	52	56
Car Park (south east)	Living Room/ Kitchen	21	25	22	33	40	43	44	48
	Bedroom	Not Applicable							

The table below presents typical configurations and R_w sound insulation values which may be expected to achieve the sound insulation performance specified above.

Facade	Room Type	Typical R_w Sound Insulation Value (dB)	Typical Configuration
Mason Street (north west)	Living Room/ Kitchen	35	10mm/16mm/4mm
	Bedroom	40	10mm/16mm/6.4mm
Marshall Street (south west)	Living Room/ Kitchen	40	10mm/16mm/6.4mm
	Bedroom	40	10mm/16mm/6.4mm
Car Park (south east)	Living Room/ Kitchen	35	10mm/16mm/4mm
	Bedroom	Not Applicable	

Acoustic test data for the proposed glazing systems should be forwarded for review.

6.7 Ventilation Provision

6.7.1 Background Ventilation

In order to achieve the internal daytime and night-time requirements openable windows must remain closed. Background ventilation shall therefore be provided by ventilators in the building façade and shall provide the following minimum element normalised level differences in the open position when tested in accordance with BS EN ISO 10140-2: 2010.

Facade	Room Type	Element Normalised Level Difference, $D_{n,e}$ (dB) in Open Position at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Mason Street (north west)	Living Room/ Kitchen	27	33	39	39	43	50	50	50
	Bedroom	27	33	39	39	43	50	50	50
Marshall Street (south west)	Living Room/ Kitchen	27	33	39	39	43	50	50	50
	Bedroom	42	48	46	49	54	65	65	65
Car Park (south east)	Living Room/ Kitchen	27	33	39	39	43	50	50	50
	Bedroom	Not Applicable							

Should more than one ventilator be required per room the above element normalised level differences shall be increased by the following values:

Number of Ventilators Required Per Room	Additional Performance Required Per Ventilator (dB)
1	0
2	+3
3	+5
4	+6

The table below presents typical configurations and $D_{n,e,w}$ sound insulation values which may be expected to achieve the sound insulation performance specified above.

Facade	Room Type	Typical Open $D_{n,e,w}$ Sound Insulation Value (dB)	Typical Configuration
Mason Street (north west)	Living Room/ Kitchen	40	Acoustic Window Ventilators (e.g. Greenwood EAR42W)
	Bedroom	40	Acoustic Window Ventilators (e.g. Greenwood EAR42W)
Marshall Street (south west)	Living Room/ Kitchen	40	Acoustic Window Ventilators (e.g. Greenwood EAR42W)
	Bedroom	50	Acoustic Wall Ventilator (e.g. Greenwood MA3051) Or Acoustically Treated Mechanical Ventilation
Car Park (south east)	Living Room/ Kitchen	40	Acoustic Window Ventilators (e.g. Greenwood EAR42W)
	Bedroom	Not Applicable	

Should acoustically treated mechanical ventilation be considered to provide continuous background ventilation, the system should achieve noise levels of $L_{Aeq} \leq 30\text{dB}$ in living rooms and bedrooms and $L_{Aeq} \leq 35\text{dB}$ in kitchens and bathrooms where providing continuous background ventilation.

A ventilation engineer should be consulted to ensure that a suitable system is proposed that satisfies the requirements of Approved Document F, "Ventilation". Acoustic test data for the proposed ventilators (or other means) should be forwarded for review acoustically.

6.7.2 Summer Cooling Ventilation

In addition to background ventilation summer cooling ventilation is required in order to minimize the need for occupants to open windows during hot summer days/nights.

In order to provide this, mechanical ventilation featuring a user controllable 'boost' function which delivers increased air flow at the occupants discretion (or other means) should be considered.

Where providing continuous background ventilation also, the system should achieve noise levels of $L_{Aeq} \leq 30\text{dB}$ in living rooms and bedrooms and $L_{Aeq} \leq 35\text{dB}$ in dining rooms, kitchens and bathrooms.

A ventilation engineer should be consulted to ensure that a suitable system is proposed that satisfies the requirements of Approved Document O, "Overheating". Detailed proposals should be forwarded for review acoustically.

6.7.3 Purge Ventilation

Purge ventilation (to aid removal of high concentrations of pollutants and water vapour released from occasional activities such as painting and decorating or accidental releases such as smoke from burnt food or spillage of water) may be provided via openable windows at the occupants discretion. As such, the internal daytime and night-time requirements may potentially be exceeded during purge ventilation conditions.

A ventilation engineer should be consulted to ensure that a suitable system is proposed that satisfies the requirements of Approved Document F, "Ventilation". Detailed proposals should be forwarded for review acoustically.

7.0 Conclusions

The Local Authority's acoustic requirements for the proposed residential development have been established.

Existing sound survey data (undertaken by others) from surrounding developments has been reviewed in order to estimate environmental sound levels representative of those upon the development site.

A detailed environmental sound assessment for the proposed residential development has been undertaken and acoustic specifications for glazing/ventilation elements have been provided in order to achieve the requirements of the Local Authority.

A handwritten signature in black ink, appearing to read 'Robin Wood', with a stylized flourish underneath.

Robin Wood
LIGHTHOUSE ACOUSTICS