

32-34 Laystall Street Manchester

Acoustic Planning Report
1001/APR1

14 November 2022

For:

Great Places Housing Association
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1.0 Introduction

Lighthouse Acoustics has been appointed by Great Places Housing Association to undertake an environmental sound survey at 32-34 Laystall Street, Manchester and to undertake a detailed sound assessment for the proposed development.

The proposed development comprises the construction of a new 9 storey building containing 60No. residential flats.

The survey methodology, results and assessment for the proposed development are presented in this report.

2.0 Objectives

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

To visit site to undertake a detailed environmental sound survey in order to establish existing environmental sound levels at the proposed residential development.

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.

To propose representative background sound levels at the nearest noise sensitive receptors for subsequent use in assessing operational sound from the proposed building services in order to comply with the acoustic requirements of the Local Authority.

3.0 Site Description

The proposed development is at 32-34 Laystall Street, Manchester. The site is currently vacant with the former commercial building having been demolished.

The site is bound by Brock Street to the north east, commercial premises to the south east, Pigeon Street to the south west and retained building (future offices) to the north west. Great Ancoats Street (A665) is situated approximately 90m to the north east of the site.

Existing residential flats are situated to the north east of the site opposite Brock Street. It is understood that the large industrial building situated to the south east of the site opposite Ducie Street (former Presbar Diecastings) is no longer operational.

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 regards to internal noise levels within the proposed residential flats Manchester City Council (MCC) have imposed the following condition (128911/FO/2020).

"30) NEW BUILD- Before the development commences a scheme for acoustically insulating and mechanically ventilating the residential accommodation against noise from adjacent roads shall be submitted to and approved in writing by the City Council as local planning authority.

The approved noise insulation scheme and vibration and reradiated noise mitigation measures shall be completed before any of the dwelling units are occupied. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB L_{Aeq} (individual noise events shall not exceed 45 dB $L_{Amax,F}$ by more than 15 times)
Living Rooms (daytime - 07.00 - 23.00) 35 dB L_{Aeq}
Gardens and terraces (daytime) 55 dB L_{Aeq}

Prior to occupation a post completion report to verify that all of the recommended mitigation measures have been installed and effectively mitigate any potential adverse noise impacts in the residential accommodation shall be submitted and agreed in writing by the City Council as local planning authority. Prior to occupation any non compliance shall be suitably mitigated in accordance with an agreed scheme."

4.2 Building Services

With regards to atmospheric plant noise emissions from proposed plant items Manchester City Council (MCC) have imposed the following condition (128911/FO/2020).

"28) NEW BUILD- Prior to occupation of the residential accommodation a scheme for the acoustic insulation of any externally mounted ancillary equipment (including any Mechanical Ventilation Heat Recovery (MVHR) systems associated with the development to ensure that it achieves a background noise level of 5dB below the existing background (LA_{90}) at the nearest noise sensitive location shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment. The approved scheme shall be completed before the premises is occupied and a verification report submitted for approval by the City Council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation. The approved scheme shall remain operational thereafter."

5.0 Environmental Sound Survey

5.1 Measurements

Automated environmental sound measurements were undertaken from 15:00 hours on Friday 4 November 2022 to 07:00 hours on Monday 7 November 2022. During this period the L_{Amax} , L_{Aeq} and LA_{90} sound pressure levels were measured continuously over 15 minute periods along with the corresponding octave band sound pressure levels.

5.2 Weather Conditions

At the start of the survey period there was a light westerly breeze (<3m/s) and the sky was overcast. There was no rainfall and road surfaces were dry. The temperature was approximately 11°C.

At the end of the survey period there was a light southerly breeze (<3m/s) and the sky was scattered cloud. There was no rainfall and road surfaces were dry. The temperature was approximately 8°C.

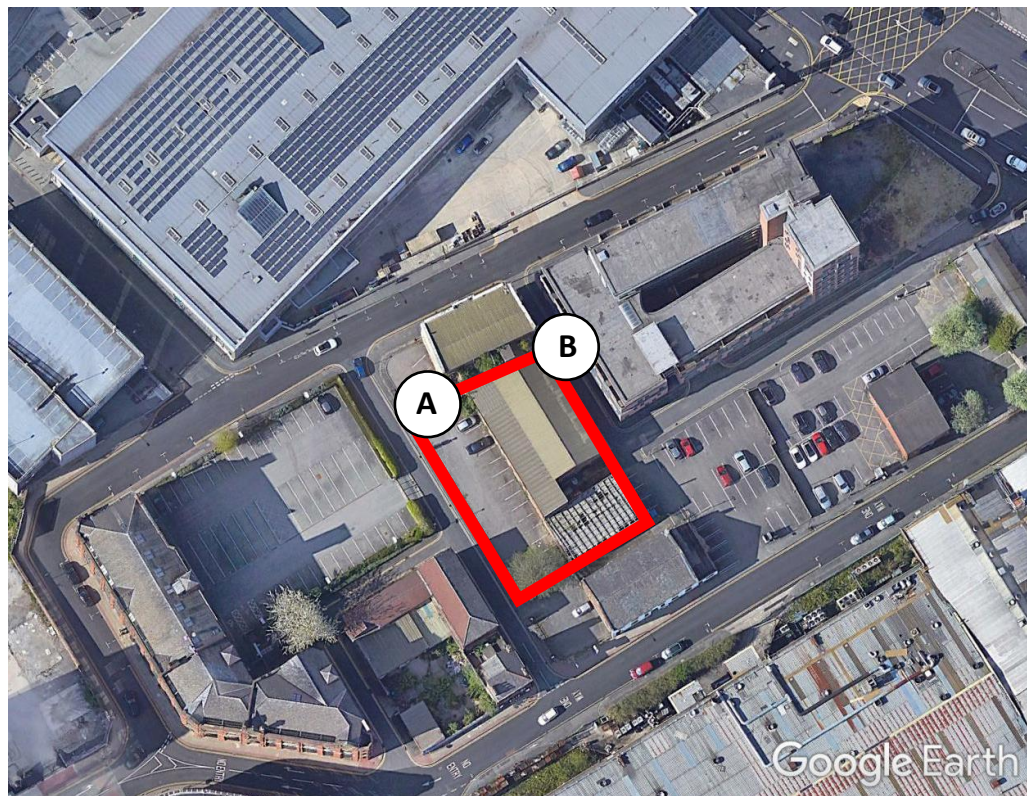
Based on publicly available weather data for the survey period we understand that weather conditions remained similar for the duration of the survey with no significant periods of rainfall or strong breezes. The weather conditions during the survey period are therefore considered to be suitable for undertaking measurements of sound levels.

5.3 Measurement Positions

Environmental sound levels were measured at 2No. positions on-site as described in the table below.

Position	Description
A	Microphone fixed to the scaffolding of the retained building situated to the north of the site at 5m above ground level overlooking Laystall Street and Pigeon Street.
B	Microphone fixed to the scaffolding of the retained building situated to the north of the site at 5m above ground level overlooking Brock Street.

The measurement positions are shown on the site plan below.



Site plan showing measurement positions

The measurement positions were selected in order to assess typical environmental sound levels incident upon the facades of the proposed development.

5.4 Equipment

The following equipment was used to undertake the environmental sound survey.

Equipment	Manufacturer	Model	Serial No.	Calibration Date
Class 1 Sound Level Meter	Casella	633C	0721320	28/09/2021
Preamplifier	Casella	495	001414	28/09/2021
Microphone	Casella	251	1025	28/09/2021
Class 1 Sound Level Meter	Casella	633C	0721319	28/09/2021
Preamplifier	Casella	495	001446	28/09/2021
Microphone	Casella	251	1996	28/09/2021
Class 1 Sound Calibrator	Casella	120/1	3864878	27/10/2022

Field calibration checks were performed on the sound level meters prior to and on completion of the survey and were found to be within acceptable tolerance limits.

5.5 Results

5.5.1 Time History Graphs

The results of the environmental sound survey are presented on Time History Graphs 1001/THG1 and 1001/THG2 enclosed at the rear of the report.

5.5.2 $L_{Aeq,T}$ Ambient Sound Levels

In order to compare the results of the environmental sound survey with the internal noise level requirements it is necessary to convert the $L_{Aeq,15min}$ sound levels into single figure daytime $L_{Aeq,16hour}$ and night-time $L_{Aeq,8hour}$ sound levels. This has been calculated using the following formula:

$$L_{Aeq,T} = 10 \log_{10} \left(\frac{1}{N} \sum_i^N 10^{L_{Aeq,15min}^i/10} \right)$$

The calculated daytime $L_{Aeq,16hour}$ and night-time $L_{Aeq,8hour}$ sound levels at each measurement position are presented in the table below.

Day	Position A		Position B	
	Daytime $L_{Aeq,16hour}$ (dB)	Night-time $L_{Aeq,8hour}$ (dB)	Daytime $L_{Aeq,16hour}$ (dB)	Night-time $L_{Aeq,8hour}$ (dB)
Friday	-	51	-	51
Saturday	59*	53	58*	53
Sunday	57	52	55	51

*Excluding atypical noise (see Section 5.6).

The highest daytime $L_{Aeq,16hour}$ and night-time $L_{Aeq,8hour}$ sound levels at each measurement position are presented in the table below along with the corresponding octave band sound pressure levels.

Position	Period	Leq Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
A	Daytime (16 hour)	62	59	58	57	55	49	43	35	59*
	Night-time (8 hour)	59	54	53	51	50	43	35	29	53
B	Daytime (16 hour)	61	58	58	55	53	52	45	37	58*
	Night-time (8 hour)	57	54	53	50	49	43	36	33	53

*Excluding atypical noise (see Section 5.6).

5.5.3 L_{Amax,F} Sound Level Events

The highest 15No. individual L_{Amax,F} sound level events measured during the night-time period (23:00 to 07:00 hours) over the survey period at each measurement position are detailed in the tables below along with the corresponding octave band sound pressure levels.

Position	L _{max,F} Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
A	78	78	86	81	79	66	55	53	83
	83	88	79	82	76	69	64	63	81
	83	82	85	80	74	67	55	41	78
	77	80	83	76	66	61	50	43	77
	75	72	77	77	72	61	51	43	76
	77	78	81	77	67	61	53	45	75
	82	82	79	73	70	61	60	53	75
	79	78	81	77	73	63	51	45	75
	78	76	75	77	69	72	69	65	75
	77	72	81	74	66	60	54	47	75
	73	73	72	71	66	65	63	73	74
	73	70	63	76	67	59	54	47	73
	78	72	67	67	69	69	65	62	73
	75	70	68	74	73	61	53	44	72
	75	69	75	75	68	62	60	56	72

Position	L _{max,F} Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
B	72	79	87	84	79	68	57	44	83
	71	70	69	71	75	76	76	71	82
	77	78	70	73	74	75	75	69	81
	81	78	82	80	74	68	56	41	79
	75	67	66	71	72	72	73	66	78
	75	72	64	71	72	72	72	66	78
	73	65	70	71	71	72	73	68	78
	80	79	83	79	71	66	57	41	78
	74	76	81	80	73	66	49	42	77
	74	82	79	79	71	63	51	41	77
	79	78	80	75	68	65	57	57	76
	73	75	78	71	67	61	55	47	74
	79	74	71	68	68	67	66	61	74
	72	66	68	68	68	68	66	61	73
	73	74	73	65	68	68	67	66	73

5.5.4 $L_{A90,T}$ Background Sound Levels

The lowest representative daytime and night-time $L_{A90,15min}$ background sound levels measured at each position during the survey period are detailed in the table below.

Position	Lowest Representative $L_{A90,15min}$ Background Sound Levels (dB)	
	Daytime	Night-time
A	49	45
B	49	46

The above levels will be used in subsequent assessments of any proposed building services sound in order to comply with the acoustic requirements of the Local Authority.

5.6 Discussion of Sound Climate

At the start and end of the survey period the dominant sound source at Positions A and B was noted to be distant road traffic from the surrounding road network. Occasional road traffic along Laystall Street and Ducie Street also contributed towards the measured sound climate.

The following measurement periods were affected by firework noise and have been excluded from the assessment since the sound sources are considered to be atypical: 19:00-19:15 and 21:45-22:00 on Friday 4 November 2022, 18:15-18:45 and 19:15-19:30 on Saturday 5 November 2022.

Whilst we are unable to comment on dominant sound sources or individual sound events during the survey period, based on the surrounding environment it is likely that road traffic remained the dominant sound source.

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 $L_{Amax,F}$ 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
OMI Architects	1383-OMI-XX-LG-DR-A-L1110	P01	04/11/2022
	1383-OMI-XX-ZZ-DR-A-L1101	P01	04/11/2022
	1383-OMI-XX-ZZ-DR-A-L1104	P01	04/11/2022
	1383-OMI-XX-08-DR-A-L1108	P01	04/11/2022
	1383-OMI-XX-ZZ-DR-A-L1600	D	17/05/2022
	1383-OMI-XX-ZZ-DR-A-L1601	D	17/05/2022
	1383-OMI-XX-ZZ-DR-A-L1602	D	17/05/2022
	1383-OMI-XX-ZZ-DR-A-L1603	D	17/05/2022
	1383-OMI-XX-ZZ-DR-A-L1604	D	17/05/2022

The proposals include the construction of a new 9 storey building containing 60No. residential flats.

6.3 Acoustic Requirements

The proposed residential flats 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 15 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	6m x 4m x 2.4m	6m ²	Wood/vinyl floor, curtains, sofa, table, chairs
Bedroom	4m x 3m x 2.4m	4m 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
All	Living Room/ Kitchen	21	25	22	33	40	43	44	48
	Bedroom	21	25	22	33	40	43	44	48

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
All	Living Room/ Kitchen	35	10mm/16mm/4mm
	Bedroom	35	10mm/16mm/4mm

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
All	Living Room/ Kitchen	27	33	39	39	43	50	50	50
	Bedroom	27	33	39	39	43	50	50	50

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
All	Living Room/ Kitchen	40	Acoustic Window Ventilators (e.g. Greenwood EAR42W)
	Bedroom	40	Acoustic Window Ventilators (e.g. Greenwood EAR42W)

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.

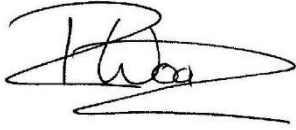
7.0 Conclusions

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

A detailed environmental sound survey has been undertaken in order to establish existing environmental sound levels at the proposed residential development.

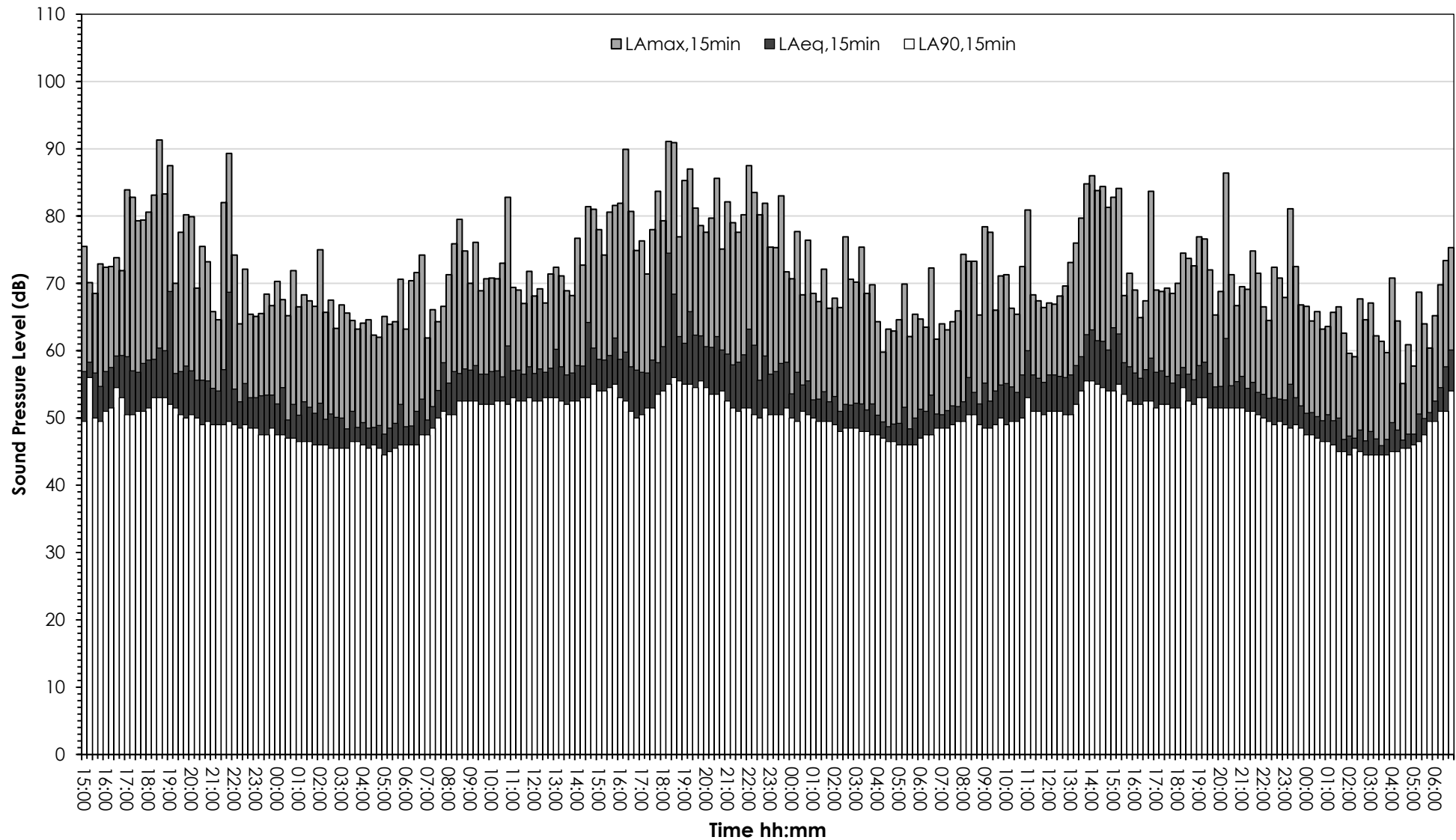
A detailed environmental sound assessment for the proposed residential development has been undertaken and acoustic specifications for glazing/ventilation elements have been provided in order to achieve the requirements of the Local Authority.

Representative background sound levels have been proposed at the nearest noise sensitive receptors for subsequent use in assessing operational sound from the proposed building services in order to comply with the acoustic requirements of the Local Authority.

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

Robin Wood
LIGHTHOUSE ACOUSTICS

32-34 Laystall Street, Manchester
Time History Graph - Friday 4 November 2022 to Monday 7 November 2022
 $L_{Amax,15min}$, $L_{Aeq,15min}$ & $L_{A90,15min}$ Noise Levels at Position A



32-34 Laystall Street, Manchester
Time History Graph - Friday 4 November 2022 to Monday 7 November 2022
 $L_{Amax,15min}$, $L_{Aeq,15min}$ & $L_{A90,15min}$ Noise Levels at Position B

