

35 Fountain Street Manchester

Acoustic Planning Report
1008/APR1

28 November 2022

For:

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Contents	Page
1.0 Introduction	1
2.0 Objectives	1
3.0 Site Description	1
4.0 Local Authority Requirements	2
5.0 Environmental Sound Survey	3
6.0 Environmental Sound Break-In	6
7.0 Building Services Sound Limits	7
8.0 Conclusion	7

Appendices

Time History Graph 1008/THG1

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1.0 Introduction

Lighthouse Acoustics has undertaken an environmental sound survey at the existing 35 Fountain Street, Manchester.

The proposed development comprises the refurbishment and reconfiguration of 35 Fountain Street to create a new office building (Use Class E), including replacement building facades, a 2 storey rooftop extension, servicing and cycle parking, access and associated works.

The survey methodology and results are presented in this report.

2.0 Objectives

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

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

To establish the typical representative daytime $L_{Aeq,8hour}$ sound levels at the proposed development for subsequent use in assessing the sound insulation performance requirements for the external façade.

To establish the lowest representative daytime, evening and night-time $L_{A90,15min}$ background sound levels at the proposed development.

To propose atmospheric plant sound emission limits at the nearest noise sensitive receptors for subsequent use in designing building services proposals in order to comply with the requirements of the Local Authority.

3.0 Site Description

The proposed development is situated at 35 Fountain Street, Manchester. The application site comprises an existing 7 storey contemporary office building which was granted planning permission in November 2000 (ref: 059090/FO/CITY1/00).

The existing building comprises 6,602 sq.m of office floorspace.

The application site is located in Manchester City Centre within the Deansgate ward.

The site is principally built of red facing brick in common stretcher bond with dark glazed panels which break up the massing, creating a fragmented 'floating' appearance of unequal proportions.

The site is bound by Marble Street to the north, West Mosley Street to the east, York Street to the south and Fountain Street to the west.

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 Office Developments

With regard to office developments, the Planning & Noise Technical Guidance document (dated October 2022) produced by Manchester City Council does not contain any specific requirements for internal noise levels.

As such, it is proposed that the requirements of BS 8233:2014, "Guidance on sound insulation and noise reduction for buildings" for office spaces are targeted in the first instance. Based on BS 8233:2014 guidance, the following indoor ambient noise levels should be achieved within each type of space when unoccupied.

Location	$L_{Aeq,T}$ Indoor Ambient Noise Level (dB)
Reception space	45-55
Open plan office	45-50
Meeting room	35-45

The indoor ambient noise levels include contributions from both environmental sound break-in and building services noise.

4.2 Building Services

With regard to building services, 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 Survey

5.1 Measurements

The site was attended between 14:00 to 15:30 hours on Wednesday 23 November 2022 and between 15:00 to 16:00 hours on Thursday 24 November 2022. During these periods, the location of the various sound sources was established.

Automated environmental sound measurements were undertaken at Position A from 15:00 hours on Wednesday 23 November 2022 to 15:00 hours on Thursday 24 November 2022. During this period the L_{Amax}, L_{Aeq} and L_{A90} sound pressure levels were measured continuously over 15 minute periods along with the corresponding octave band sound pressure levels.

Manned environmental sound measurements were undertaken at Positions B and C between 15:00 and 16:00 hours on Thursday 24 November 2022. During this period the L_{Amax}, L_{Aeq} and L_{A90} 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 southerly breeze (<3m/s) and the sky was overcast. There was no rainfall and road surfaces were damp. The temperature was approximately 8°C.

At the end of the survey period there was a light southerly breeze (<3m/s) and the sky was overcast. There was no rainfall and road surfaces were dry. The temperature was approximately 7°C.

Based on publicly available weather data for the survey period we understand that weather conditions remained similar for the duration of

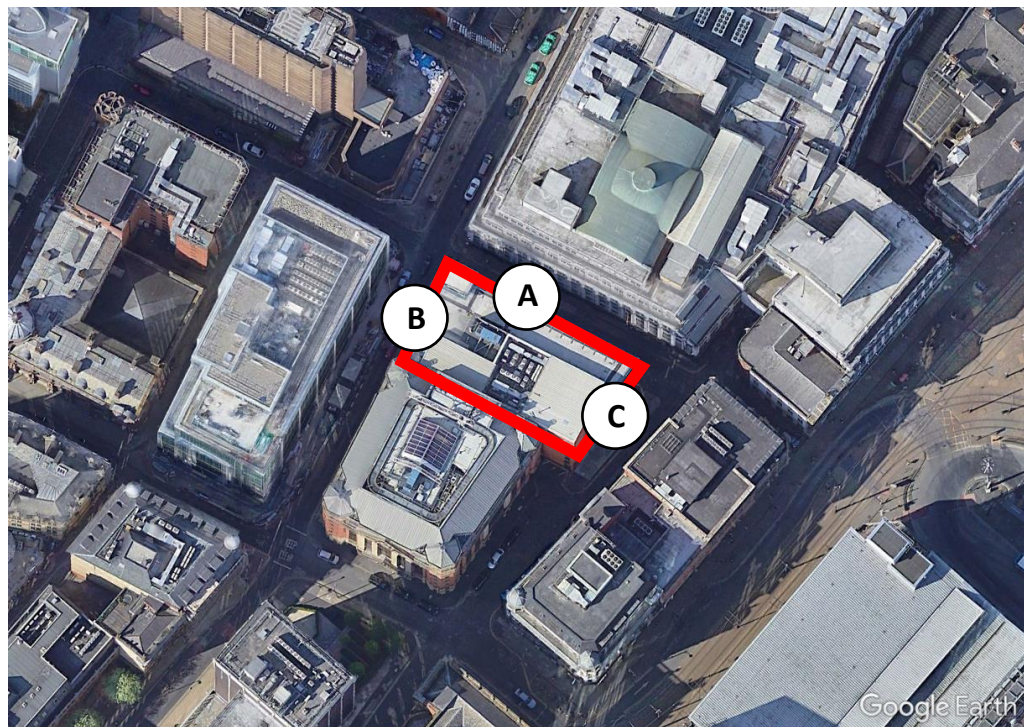
the survey with no significant periods of rainfall or strong breezes. The weather conditions during the survey period are therefore considered to be suitable for undertaking measurements of sound levels.

5.3 Measurement Positions

Environmental sound levels were measured at 3No. positions on-site as described in the table below.

Position	Description
A	Microphone situated at 1.2m above 7 th floor roof level midway along the northern façade overlooking Marble Street.
B	Microphone situated at 1.2m above street level midway along the western façade overlooking Fountain Street.
C	Microphone situated at 1.2m above street level midway along the eastern façade overlooking West Mosley Street.

The measurement positions are shown on the site plan below.



Site plan showing measurement positions

Measurement Position A was selected in order to assess typical environmental sound levels at the site at roof level whilst measurement Positions B and C were selected in order to assess typical environmental sound levels at the site at street level.

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	2811231	21/06/2021
Preamplifier	Casella	495	001239	21/06/2021
Microphone	Casella	251	1841	21/06/2021
Environmental Noise Kits	Casella	6847	-	-
Microphone Extension Cables	Casella	C6717/5	-	-
Weather Protection Systems	Casella	6737	-	-
Class 1 Sound Level Meter	Bruel & Kjaer	2250	2626230	27/10/2022
Preamplifier	Bruel & Kjaer	ZC-0032	21309	27/10/2022
Microphone	Bruel & Kjaer	4189	2621208	27/10/2022
Windscreen	Bruel & Kjaer	UA-1650	-	-
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 Automated Survey

The results of the automated environmental sound survey at Position A are presented on Time History Graph 1008/THG1 enclosed at the rear of the report.

5.5.2 Manned Survey

The results of the environmental sound survey are presented below.

Position	Time	L _{Amax,15min} (dB)	L _{Aeq,15min} (dB)	L _{A90,15min} (dB)
B	15:00	80	64	58
	15:15	76	63	57
C	15:30	66	58	56
	15:45	63	57	56

5.5.3 L_{Aeq,T} Ambient Sound Levels

In order to compare the results of the environmental sound survey with the internal noise limits it is necessary to convert the L_{Aeq,15min} sound levels measured at Position A into a single figure daytime L_{Aeq,8hour} (09:00 to 17:00 hours for typical office hours) sound level. 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 typical representative daytime L_{Aeq,8hour} sound levels at each measurement position are presented in the table below.

Position	Typical Representative Daytime $L_{Aeq,8hour}$ (dB)
A	57
B	64
C	58

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

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

Position	Lowest Representative $L_{A90,15min}$ Background Sound Levels (dB)		
	Daytime (07:00–19:00)	Evening (19:00–23:00)	Night-time (23:00–07:00)
A	54	52	49

5.6 Discussion of Sound Climate

At the start and end of the survey period the dominant sound sources at Position A were noted to be frequent road traffic along the surrounding road network and building services from the surrounding buildings.

Whilst we are unable to comment on dominant sound sources or individual sound events throughout the survey period, based on the surrounding environment it is likely that road traffic and building services contributed towards the measured sound climate at Position A.

During the manned survey period at Position B the dominant sound sources were noted to be frequent road traffic and passing pedestrians along Fountain Street.

During the manned survey period at Position C the dominant sound source was noted to be building services from the surrounding buildings. Occasional road traffic along West Mosley Street also contributed towards the measured sound climate.

6.0 Environmental Sound Break-In

In order to achieve acceptable environmental sound break-in levels to office spaces, the replacement external facade of the building will need to achieve a minimum level of sound insulation performance.

It is understood that ventilation to internal spaces will be provided via mechanical ventilation systems and that openable windows are not proposed for this development.

A detailed assessment to determine the sound insulation performance requirements for the replacement external façade will be undertaken during the detailed design stage.

7.0 Building Services Sound Limits

Plant selections have not been made at this stage of the development. As such, it is not possible to assess atmospheric building services sound to the nearest noise sensitive receptors.

Based on the requirements of Manchester City Council detailed in Section 4.2 and the lowest representative L_{A90} sound levels measured during the environmental sound survey detailed in Section 5.5.4, it is proposed that cumulative atmospheric plant sound emissions should be designed to achieve the following limits at the nearest noise sensitive receptors.

Nearest Noise Sensitive Receptor	L_{Aeq} Cumulative Atmospheric Plant Sound Emission Limits at Nearest Noise Sensitive Receptor (dB)		
	Daytime (07:00–19:00)	Evening (19:00–23:00)	Night-time (23:00–07:00)
All Directions	49	47	44

Plant sound emissions should be assessed in accordance with BS 4142:2014.

Plant sound limits for individual plant items will be dependent on the total number of plant items, the location of plant items in relation to nearest noise sensitive receptors and the proposed operational hours.

Once detailed design proposals are developed an assessment of atmospheric plant sound emissions from the proposed plant items to the nearest noise sensitive receptors should be undertaken. This will determine whether any attenuation measures are required in order to achieve the proposed limits.

8.0 Conclusion

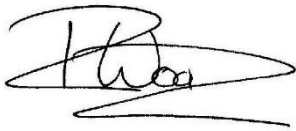
The Local Authority's acoustic requirements for the proposed development have been established.

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

The typical representative daytime $L_{Aeq,8hour}$ sound levels at the proposed development have been established for subsequent use in assessing the sound insulation performance requirements for the external façade.

The lowest representative daytime, evening and night-time $L_{A90,15min}$ background sound levels at the proposed development have been established.

Atmospheric plant sound emission limits have been proposed at the nearest noise sensitive receptors for subsequent use in designing building services proposals in order to comply with the 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

35 Fountain Street, Manchester
Time History Graph - Wednesday 23 November 2022 to Thursday 24 November 2022
 $L_{Amax,15min}$, $L_{Aeq,15min}$ & $L_{A90,15min}$ Noise Levels at Position A

