



HAWTHORN MEDICAL CENTRE, FALLOWFIELD

ENVIRONMENTAL NOISE SURVEY REPORT

Acoustics Report A2304 R01 RevB

17th December 2025

Report for: NHS Property Services

Issued to: Rebecca Marwood
NHS Property Services

Prepared by:
Jamie Ross BEng MSc MIOA
Principal Acoustic Consultant

Reviewed by:
Gavin Irvine BSc MIOA
Director

Issue/Revision number:
A2304 R01 RevB
~~A2304 R01 RevA~~
~~A2304 R01~~

Date:
17/12/2025
~~02/10/2025~~
~~27/08/2025~~

Contents

1	Introduction	1
2	Scheme Details.....	1
3	Planning Policy and Other Guidance on Noise	2
3.1	Manchester City Council Policies and Guidance	2
3.2	National Planning Policy Framework (NPPF)	3
3.3	Noise Policy Statement of England (NPSE)	4
3.4	Online Planning Policy Guidance	4
3.5	BS 4142:2014+A1:2019 – Assessment Principles.....	6
3.6	BS 8233:2014 and WHO criteria	7
3.7	BREEAM.....	7
3.7.1	Pol 05.....	7
3.7.2	Hea 05	8
3.7.3	Suitably Qualified Acoustic Consultant.....	8
3.8	Proposed Plant Noise Limits Criteria.....	9
3.9	Internal Ambient Noise Level Criteria (HTM-08).....	9
4	Environmental Noise Survey	9
4.1	Measurement Locations	10
5	Noise Survey Results.....	11
5.1	Background Noise Levels	11
5.2	Summary of Noise Levels	12
6	Proposed Plant Noise Limits.....	12
7	Plant Noise Assessment.....	13
7.1	Proposed Plant Items	13
7.2	Plant Noise Assessment	13
7.3	Plant Noise Mitigation	14
8	Environmental Noise Ingress	14
8.1	Road Traffic Noise	14
8.2	Other Noise Sources	15
9	Summary	15

Appendix A – Glossary of Acoustic Terms

Appendix B – Noise Survey Data

1 Introduction

Ion Acoustics is appointed by NHS Property Services to carry out an environmental noise survey for a proposed new medical centre in Fallowfield, Manchester. The new medical centre will be a new-build project and is proposed to replace an existing facility in a nearby location. It is proposed to install external building services plant items as part of the scheme.

This report documents a noise survey carried out at the site to quantify the existing baseline environmental noise levels. The survey is then used to derive plant noise emission limits in line with suitable British Standards and BREEAM requirements. The proposed external building services plant is then assessed against these limits.

A preliminary assessment of environmental noise ingress to the site is also provided to advise on the suitability of the proposed ventilation strategy for the scheme. A Glossary of Acoustic Terms is provided in Appendix A.

2 Scheme Details

A new medical centre is proposed on a parcel of land to the south-east of University of Manchester sports facilities in Fallowfield, Manchester. The site has a mix of leisure, commercial and residential properties in the area. The proposed centre is to be located towards the corner of Moseley Road and Birchfields Road but will front onto Moseley Road to the south. To the north and west of the site are existing sports pitches belonging to the University of Manchester. Immediately to the east of the site is a second-hand car dealership and further to the east are Birchfields Road, some commercial retail properties, the existing medical centre and an elevated railway line. There are residential properties along the western side of Birchfields Road north-east of the site, and along the south of Moseley Road to the south of the site. These form the nearest noise-sensitive receptors to the proposed centre.

An aerial image of the site is shown in Figure 1, with the noise-sensitive receptors surrounding the site shown in blue.



Figure 1: Aerial Photo showing Site Location and Surroundings (Google Earth)

New building services plant is to be installed externally to the rear of the building to the east. The proposed plant will be mainly located within an external plant compound to the south-east of the main building as shown on the proposed site plan in Figure 2. There is an existing brick wall running along the southern boundary of the site. Current site plan drawings indicate that this brick wall will be replaced with a new 675mm tall brick wall and railing infills above (in orange on Figure 2) with some openings for pedestrian and vehicle access to the site. To the north and western boundary of the site will be a new 2400mm high brick wall (in pink on Figure 2). The proposed arrangement has a car park on the western half of the site with the single story medical centre on the eastern half of the site, as shown in Figure 2:

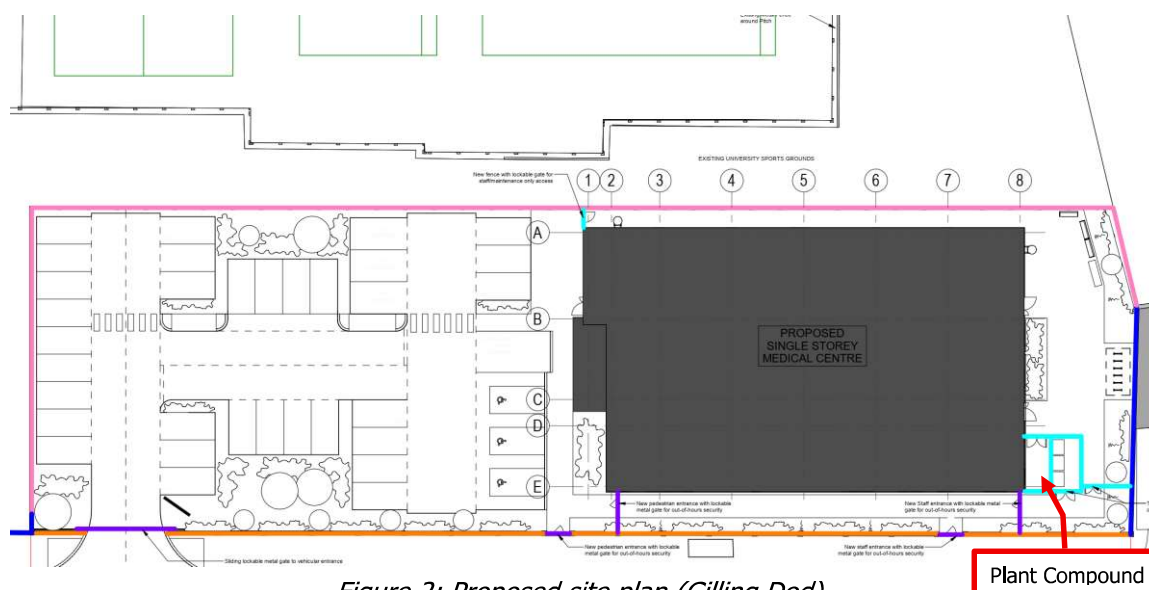


Figure 2: Proposed site plan (Gilling Dod)

3 Planning Policy and Other Guidance on Noise

The guidance and policy documents used to assess the environmental noise impact of the proposed scheme, are set out in the following sections:

3.1 Manchester City Council Policies and Guidance

The Manchester City Council ("MCC") policies and planning guidance with respect to environmental noise are set out in the technical guidance document 'Planning and Noise' (October 2022). The document sets out the following development control policies relating to noise:

'DC26.1 The Council intends to use the development control process to reduce the impact of noise on people living and working in, or visiting, the City. In giving effect to this intention, the Council will consider both:

a) the effect of new development proposals which are likely to be generators of noise;

and

b) the implications of new development being exposed to existing noise sources which are effectively outside planning control.

DC26.2 New noise-sensitive developments (including large-scale changes of use of existing land or buildings), such as housing, schools, hospitals or similar activities, will be permitted subject to their not being in locations which would expose them to high noise levels from existing uses

or operations, unless the effects of the noise can realistically be reduced. In giving effect to this policy, the Council will take account both of noise exposure at the time of receiving a planning application and of any increase that may reasonably be expected in the foreseeable future.

DC26.4 Where the Council believes that an existing noise source might result in an adverse impact upon a proposed new development, or where a new proposal might generate potentially unacceptable levels of noise, it will in either case require the applicant to provide an assessment of the likely impact and of the measures he proposes to deal satisfactorily with it. Such measures might include the following:

- a) engineering solutions, including reduction of noise at source, improving sound insulation of sensitive buildings or screening by purpose-built barriers;*
- b) layout solutions, including consideration of the distance between the source of the noise and the buildings or land affected by it and screening by natural barriers or other buildings or noncritical rooms within a building; and*
- c) administrative steps, including limiting the operating times of the noise source, restricting activities allowed on the site or specifying an acceptable noise limit. Any or all of these factors will be considered appropriate for inclusion in conditions on any planning permission.*

DC26.5 The Council will control noise levels by requiring, where necessary, high levels of noise insulation in new development as well as noise barriers where this is appropriate.'

The Council guidance document also provides specific guidance with respect to noise emissions from external plant and states the following:

'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'.

3.2 National Planning Policy Framework (NPPF)

In 2012 the National Planning Policy Framework (NPPF) replaced a number of Planning Policy Statements with a single document which is intended to promote sustainable development. The last major revision was in December 2024^[1] when certain aspects of the guidance changed.

The NPPF sets out the Government's planning policies for England. It is not prescriptive and does not provide noise criteria. Instead, it places the onus on local authorities to develop their own local plans and policies. Sections of the NPPF relating to noise are stated below:

'187. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;*

198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of

the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;'

3.3 Noise Policy Statement of England (NPSE)

The Noise Policy Statement for England (NPSE)¹ sets out the Government's environmental, neighbourhood and neighbour noise policy for England. The policy has three aims:

- *"avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impact on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life."*

The NPSE introduces the following terms, which are also used in the NPPF:

"NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur."

However, neither the NPSE nor the NPPF Planning Practice Guidance defines numeric bounds for NOEL, LOAEL or SOAEL. The boundary of each effect level should be defined for each situation and location.

3.4 Online Planning Policy Guidance

Further Government planning advice is available online². The online guidance refers to the NPPF and NPSE and presents a noise assessment hierarchy table to provide further information on the boundaries between NOEL, LOAEL and SOAEL; this is shown in Table 1.

¹ Noise Policy Statement for England (DEFRA) available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf

² See <https://www.gov.uk/guidance/noise--2>

Table 1: Noise Assessment Hierarchy Table

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude, or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

3.5 BS 4142:2014+A1:2019 – Assessment Principles

The standard method for assessing plant noise affecting noise sensitive premises is British Standard BS 4142 "Method for rating and assessing industrial and commercial sound". A BS 4142 assessment is made by determining the difference between the plant noise under consideration and the background sound level as represented by the L_{A90} parameter, determined in the absence of the intrusive noise. The L_{A90} statistical parameter is the level exceeded for 90% of the measurement time. Therefore, it represents the underlying noise in the absence of short-term events.

The plant noise under consideration is assessed in terms of the specific noise level, L_{Aeq} , with a character correction applied where appropriate accounting for certain characteristics such as distinguishable tones, impulsiveness or, if the noise is distinctively intermittent. The plant noise level (L_{Aeq}) with the character correction (if necessary) is known as the rating level, L_{Ar} , and the difference between the background noise and the rating level is determined to make the BS 4142 assessment.

The standard then states:

- *"Typically, the greater the difference, the greater the magnitude of the impact."*
- *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*
- *A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context"*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

BS 4142: 2014 states: *'In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods'.*

The standard outlines a number of methods for defining appropriate 'character corrections' to determine the rating level to account for tonal qualities, impulsive qualities, other sound characteristics and/or intermittency.

The standard also highlights the importance of considering the context in which a sound occurs including the absolute sound level, the character of the sound, the sensitivity of the receptor and the existing acoustic character of the area. All of this context should be considered when assessing the noise impact.

The standard states that the objective of a noise survey *"is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"*. A typical background sound level is usually derived by means of statistical analysis as opposed to, for example, simply selecting a mean average or the lowest. This is typically achieved by creating a frequency distribution graph of the background sound levels measured, rounded to the nearest whole number.

BS 4142:2014 also states in Section 11 "where background sound levels and rating levels are low, absolute levels might be as or more relevant than the margin by which the rating levels exceeds the background. This is especially true at night".

3.6 BS 8233:2014 and WHO criteria

British Standard BS 8233:2014³ and the World Health Organisation (WHO) also provide external noise criteria to protect residential amenities. These are detailed in Table 2 below.

Table 2: WHO / BS 8233: 2014 Guideline Noise Levels

Location	Critical Health Effect	07:00 to 23:00 hrs	23:00 to 07:00 hrs
Outside Bedroom Windows	Sleep Disturbance (Windows Open)	--	45dB $L_{Aeq, 8\text{hours}}$ ⁽¹⁾
Amenity Spaces (Gardens / Patios)	Moderate Annoyance Serious Annoyance	50dB $L_{Aeq, 16\text{ hours}}$ ⁽²⁾ 55dB $L_{Aeq, 16\text{ hours}}$ ⁽²⁾	--
Notes: (1) From WHO Community Noise Guidelines (1999) (2) BS 8233: 2014 and WHO Community Noise Guidelines			

The WHO guideline of 45 dB $L_{Aeq, 8\text{hr}}$ represents an 8-hour L_{Aeq} outside noise-sensitive rooms to prevent sleep disturbance. The WHO limit is a level of 1m from the façade. Therefore, the equivalent free field level would be approximately 3dB lower, 42 dB L_{Aeq} .

The daytime limits apply to relatively anonymous noises without character, commonly applied to road traffic noise.

3.7 BREEAM

The scheme is targeting BREEAM "excellent" accreditation and is therefore targeting available credits under Pol 05 'reduction of noise pollution' and Hea05 'acoustic performance'. The available credits are described below.

3.7.1 Pol 05

Pol 05 'Reduction of Noise Pollution' under BREEAM 2023 New Construction (Healthcare) states that a single credit is available where:

'1 - There are no noise-sensitive areas within the assessed building or within 800 m radius of the assessed site.

OR

2 - Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS 4142:2014 is commissioned.

Noise levels must be measured or determined for:

2.a Existing background noise levels:

2.a.i at the nearest or most exposed noise-sensitive development to the proposed assessed site

³ British Standards Institution (2014) BS 8233:2014: Guidance on sound insulation and noise reduction for buildings

2.a.ii including existing plant on a building, where the assessed development is an extension to the building

2.b Noise rating level from the assessed building.

3 - The noise impact assessment must be carried out by a suitably qualified acoustic consultant.

4 - The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise-sensitive development, must be at least 5 dB lower than the background noise throughout the day and night.

If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion'.

In this case, the BREEAM requirement to be 5 dB with the background noise is the same standard as the Manchester Council requirement which would likely be imposed as a planning condition. Therefore, meeting the Manchester Council requirements should allow the BREEAM credit to be awarded by default.

BREEAM Technical Manual SD5079 states that compliance with Pol05 can be demonstrated at the design stage through the use of acousticians' calculations or by scale model investigations.

3.7.2 Hea 05

Credits are also being targeted under Hea05 'acoustic performance' and would relate to: sound insulation between rooms; internal ambient noise levels; and, room acoustic conditions. In this case, the indoor ambient noise levels are affected by the external environment. The requirements in this respect are as follows:

'The indoor ambient noise requirements for noise intrusion from external sources in Table 1 of HTM 08-01 are not exceeded. The values for internal noise from mechanical and electrical services in Table 2 of HTM 08-01 are not exceeded.'

Compliance is demonstrated by a programme of pre-completion testing. The specific criteria are set out in Section 3.9.

3.7.3 Suitably Qualified Acoustic Consultant

The BREEAM Technical Manual SD5079: 6.1 2023 defines a Suitably Qualified Acoustic Consultant (SQA) as follows:

'An individual achieving all the following items can be considered to be 'suitably qualified' for the purposes of a BREEAM assessment:

- 1. Has a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting acoustics in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures.*
- 2. An individual who holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.'*

Jamie Ross has a Master's degree in Acoustics from the University of Salford and is a full member of the Institute of Acoustics and complies with the requirements of item one above, therefore qualifying as an SQA.

3.8 Proposed Plant Noise Limits Criteria

Based on the requirements of Manchester City Council and BREEAM Pol05, it is proposed that the appropriate noise limits for this scheme which would be derived as a rating limit *5dB below the representative background noise level*.

3.9 Internal Ambient Noise Level Criteria (HTM-08)

Health Technical Memorandum 08-01 ("HTM 08-01") sets noise limits for external noise intrusion in terms of an $L_{Aeq,1hr}$ value, which is effectively an average noise level taken over an hour.

The internal noise limits for rooms associated with this scheme are shown in Table 3, in terms of the L_{Aeq} criteria for noise intrusion from external sources and for the NR rating for internal noise from mechanical and electrical services. Any mechanical services for the scheme must meet the NR noise limits at the required design duty.

Table 3: Internal Noise Limits from HTM 08-01

Room Type	$L_{Aeq, 1hr}$ (dB) Criteria for noise intrusion from external sources	NR (L_{90} , dB) Noise Limit for internal noise from services
Toilet & Change Facilities	55 dB	NR45
Open Clinical Area	45 dB	NR40
Circulation	55 dB	NR40
Clinical Support Facilities/Utility	45 dB	NR40
Consult/Exam Rooms	40 dB	NR35
Entrance and Waiting, Staff Rest	50 dB	NR45
Office/Staff Room	40 dB	NR40

For this scheme the most onerous environmental noise ingress criterion is 40 dB $L_{Aeq,1hr}$ to be achieved in office and consultation/treatment rooms. This will therefore form the assessment criterion for environmental noise ingress at this stage.

BREEAM credits relating to sound insulation and room acoustics will be discussed in a separate acoustic design report for the building.

4 Environmental Noise Survey

An environmental noise survey was carried out from Tuesday 12th to Wednesday 13th August 2025 in accordance with BS 7445-2. Measurements were taken at two positions: a logging noise monitor was set up at the north-east of the site near to the residential properties Birchfields Road and additional short-term attended measurements were made on Moseley Road at the front of the site to determine noise levels incident on the site and the residential properties on Moseley Road.

Rion NL52 sound level meters with Type WS15 windshields were used and calibrated with a Brüel & Kjær Type 4231 calibrator at the start and end of the survey. No significant drift in calibration was noted on collection. The meters were set up to log various noise indices (L_{Aeq} , $L_{Amax,F}$, L_{A90} , L_{A01} , L_{A10}) in consecutive 15-minute periods. The meters were also set to record samples of audio to determine the source of the noise logged by the meters.

Weather conditions on set up were sunny, the temperature was 27°C with light winds and no cloud cover. On collection, the weather conditions were dry, the temperature was 22°C, with light winds, and no cloud cover.

4.1 Measurement Locations

The measurement locations are shown on Figure 3 and are described below.

For measurement position **MP1** the microphone was positioned on a tripod and was approximately 1.5 metres above local ground level, approximately 44 metres from the nearside edge of Moseley Road, and approximately 50 metres from the nearside edge of Birchfields Road. However, the microphone was screened from both roads (i.e. no direct line of sight). This position was selected to represent the environmental noise climate at the rear of the site including the rear facades of the residential properties on Birchfields Road.

For measurement position **MP2** the microphone was positioned on a tripod and was approximately 1.5 metres above local ground level, approximately 2.5 metres from the nearside edge of Moseley Road and 1 metre in front of the brick wall at the site boundary. This position was selected to establish typical road traffic noise levels impacting the site and the residential properties on the other side of Moseley Road.



Figure 3: Environmental Noise Survey Measurement Position (Google Maps)

5 Noise Survey Results

Full noise levels measured at the measurement positions over the survey period are shown graphically and tabulated in Appendix B.

Whilst at site, it was noted that the principal source of environmental noise at both measurement positions was road traffic noise mainly from Moseley Road but with some contribution from Birchfields Road. Road traffic on Moseley Road was fairly consistent with a continuous flow of traffic except for when the traffic lights for the pedestrian crossing were red. Buses also pass the site on Moseley Road and some stop at the bus stop at the site's southern boundary.

There was also contribution from train passbys on the elevated railway line further to the east. No significant noise generation was noted from the car dealership or other commercial properties.

Analysis of audio recorded at MP1 during the survey indicates that noise levels were impacted by a dog barking, assumed to be within the rear gardens of the residential properties on Birchfields Road. This has impacted measured noise levels between 23:00 and 00:45 hours as indicated on the graph in Appendix B.

5.1 Background Noise Levels

BS 4142 requires an assessment by comparing the noise emissions from the operational plant against the typical background sound levels.

The typical background sound levels measured at position MP1 have been determined by plotting the frequency distribution of the integer L_{A90} values. The frequency distribution histogram for the entire survey period is presented in Figure 4.

For this case, the typical background sound level, L_{A90} , has been taken the modal value (the most commonly occurring value) but it can be seen from cumulative line that this represents approximately 40% of the samples for the day and night-time. This ensures a conservative assessment as, based on this data, the background sound level will be higher approximately 60% of the time.

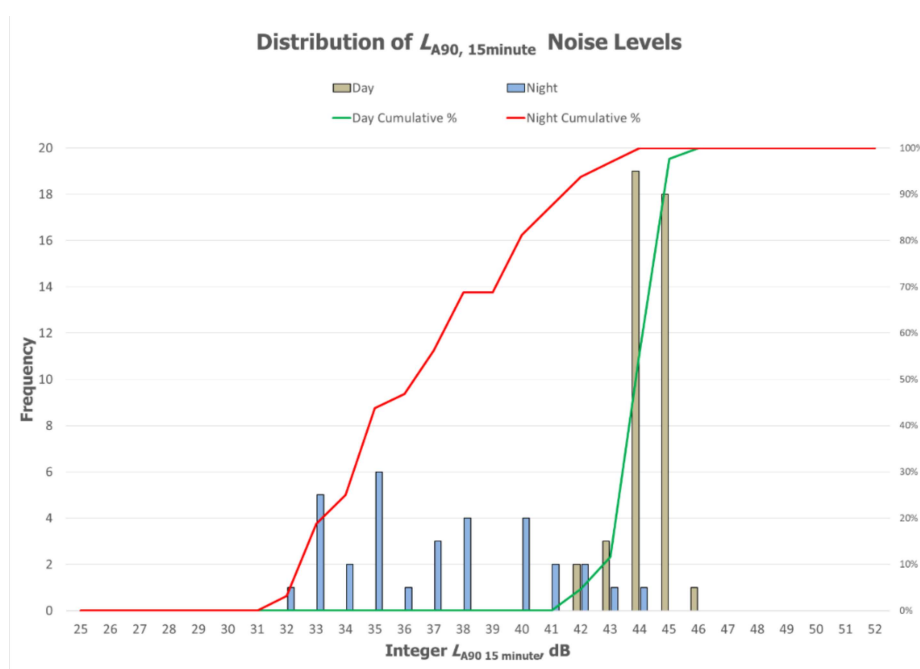


Figure 4 – Frequency distribution of L_{A90} background sound levels (MP1, entire survey period)

5.2 Summary of Noise Levels

A summary of measured noise levels has been provided in Table 4 and Table 5 below to show the measured $L_{Aeq,7}$ and $L_{A90,15mins}$.

Table 4: Summary of Measured Noise Levels at MP1

Period	$L_{Aeq,7}$ dB	Typical $L_{A90,15mins}$ dB
Daytime (07:00 to 23:00 hrs)	50	44
Night Time (23:00 to 07:00 hrs)	54*	35
* Impacted by dog barking nearby		

Table 5: Summary of Measured Noise Levels at MP2

Date	Time Period	$L_{Aeq,15mins}$ dB	$L_{A90,15mins}$ dB
12/08/2025	14:38 – 14:53 hrs	69	58
	14:53 – 15:08 hrs	68	58
	17:48 – 18:03 hrs	69	58
13/08/2025	08:22 – 08:37 hrs	68	55
	08:37 – 08:52 hrs	67	57

6 Proposed Plant Noise Limits

Proposed plant noise emissions limits for the worst-affected noise sensitive receptors have been set out in terms of daytime (07:00 – 23:00) and night time (23:00 – 07:00) periods, based on the baseline noise levels measured at position MP1.

The proposed plant noise emissions limits are presented in Table 6. The limits are “free-field” limits to be achieved at the location of a noise sensitive receptors.

The limits are set 5dB below the typical background level in line with MCC and BREEAM Pol 05 requirements.

Table 6: Proposed Plant Noise Emission Limits

Period	Proposed Limit L_{Ar} dB
Daytime (07:00 – 23:00 hrs)	39
Night Time (23:00 – 07:00 hrs)	30

7 Plant Noise Assessment

7.1 Proposed Plant Items

The following plant items are proposed to be installed as part of the scheme:

- 2no. Daikin REYQ14U condensers
- 2no. Daikin RZAG35A condensers

The units are to be located within the external plant compound at the south-east of the main building as indicated on Figure 2.

It is understood that the units will normally run during daytime hours only (07:00 – 23:00 hrs) as they will only operate to serve the spaces when they are occupied. However, it is understood that the units may run occasionally at night time during the winter to maintain a "set back" temperature during the night time to maintain a minimum temperature within the building.

Based on correspondence with Silcock Leedham Consulting Engineers Ltd it is understood that the larger "REYQ" units can operate in "Low Noise 2" mode during normal (daytime) operation and "Low Noise 3" mode when required to operate at night time in the winter. This corresponds to a 9 dB and a 14 dB noise emission reduction respectively as compared to the manufacturer-stated noise emissions.

It is also understood that fence around the compound, which also includes a bin store, cannot be a solid (non-perforate) construction due to airflow requirements to the condenser units.

Based on information provided to Ion Acoustics the following noise emissions in sound power level terms have been used for the assessment. The levels for the REYQ units are based on the manufacturer stated sound power levels with the relevant reduction applied to account for the low noise modes.

Table 7: Proposed Plant Sound Power Levels

Plant Item	Sound Power Level, dB at Octave Band Centre Frequency, Hz							
	63	125	250	500	1k	2k	4k	dBA
Daikin REYQ14U <i>Low Noise 2</i>	79	74	72	72	65	61	61	72
Daikin REYQ14U <i>Low Noise 3</i>	74	69	67	67	60	56	56	67
Daikin RZAG35A	-	65	62	61	57	50	45	62

7.2 Plant Noise Assessment

Noise emissions from the proposed plant have been predicted at the worst-impacted noise sensitive receptors, which are deemed to be the rear windows of the houses fronting on to Birchfields Road. Windows on the front of properties to the south of Moseley Road may be c.5 metres closer to the plant compound however background noise levels are significantly higher for these receptors due to the proximity and full view of the road, therefore these are not considered the worst affected receptors. No allowance for screening losses as the fencing must allow for airflow and therefore would not be an effective acoustic screen.

A BS 4142 rating penalty is not deemed to be applicable as no acoustic characteristics are likely to be readily perceptible against the ambient environmental noise level at the receptors which contains significant road traffic and railway noise. The units are also likely to run continuously throughout the day and there is a significant distance between the proposed plant location and the receptors.

7.3 Plant Noise Mitigation

In order for noise emissions from the plant to meet the proposed plant noise limits it is recommended that the plant enclosure around the units is formed of an acoustic louvre.

The acoustic louvres shall provide the minimum insertion losses in Table 8. Maximum pressure drop across the louvre shall not exceed 40 Pa and airflow velocity shall not exceed 2.5 m/s. The louvres must extend at least 500mm above the highest part of the plant, and be no greater than 1500mm from the plant horizontally, as installed at site. Louvre blades should be oriented high-to-low going inside-to-outside.

Table 8: Acoustic Louvre Minimum Insertion Losses

Minimum Insertion Losses, dB at Octave Band Centre Frequency, Hz						
63	125	250	500	1k	2k	4k
3	4	6	8	10	10	10

For guidance, the louvre specification could typically be achieved using a 150mm deep acoustic louvre. Noise mitigation measures should be reviewed and approved by Ion Acoustics.

8 Environmental Noise Ingress

It is also important to consider the impact of environmental noise on the proposed medical centre from existing sources.

It is proposed to mechanically ventilate the rooms facing Moseley Road on the southern façade of the building but naturally ventilate the rooms on the northern façade using openable windows. However all rooms will have wall-mounted fan coil units and therefore openable windows will not be relied upon for overheating mitigation for any space.

As set out in Section 3.8 for rooms to be provided within the centre, the most onerous environmental noise intrusion limit is $L_{Aeq,1hr}$ 40 dB inside consulting and examination rooms and other offices / staff rooms.

8.1 Road Traffic Noise

A preliminary road traffic noise ingress assessment has been undertaken based on the typical worst-case road traffic noise levels measured at measurement position MP2 during the survey.

Calculations have been undertaken considering distance loss and screening to the proposed façade locations and predicted internal noise levels based on BS 12354-3 calculation methodology and glazing which achieves a minimum sound reduction of $R_w + C_{tr}$ 27dB should be suitable control noise ingress to the criteria in Table 3. For guidance this can typically be achieved by standard thermal double glazing such as 6 / 16 / 4 mm double glazing.

8.2 Other Noise Sources

It should also be noted that the site is near sports pitches to the rear of the site. Although it is likely that these will mainly be used during evenings and weekends, as a university facility, use during the opening hours of the medical facility may also occur. Noise from sports pitches such as shouting and balls striking fences may be considered more distracting than “anonymous noise” such as transportation noise sources.

The consulting rooms along the north of the building are to rely on openable windows for ventilation. The brick wall being constructed along the northern side of the site will provide partial screening to the windows which should reduce sports noise ingress somewhat. It is understood that the windows are required to be side hung in order to provide the required free area to provide sufficient airflow, therefore top hung windows, which would be preferred from a noise ingress perspective, cannot be used.

With only partial screening provided by the brick wall, it is expected that noise from the sports pitches is likely to be clearly audible at times. However, the acceptability of this will also depend on the frequency and intensity of the sports use. It is likely that occupants could temporarily close windows if high sports noise is being generated during more noise sensitive periods (e.g. whilst talking to a patient). It is expected that the room occupants will manage this themselves. Cooling will be provided by the fan coil units and therefore windows can be kept closed for long periods.

This noise impact could be further de-risked by making provision (i.e. structural provision) for the height of the perimeter wall to be increased to a level above the top of the windows to fully screen the consulting rooms should this be found to be an issue for occupants once the health centre is operational. This could be using a lightweight screening element e.g. timber or glazing (where natural light is a consideration).

9 Summary

This report presents details of an environmental noise survey conducted at the proposed location of the new Hawthorne Medical Centre. Using published guidance, noise emissions limits have been derived from measured background noise levels in accordance with BS 4142 and Manchester City Council and BREEAM Pol05 requirements.

The proposed external plant items have been assessed against the derived noise limits. Provided that the plant compound comprises an acoustic louvre screen which encloses the compound and meets the specification herein, plant noise emissions should not exceed the proposed limits at noise sensitive receptors.

An initial assessment of road traffic noise ingress has been undertaken. The assessment concludes that for the façade overlooking Moseley Road the proposed mechanical ventilation strategy is suitable and standard thermal double glazing configurations should suitably control road traffic noise ingress.

For the façade facing the existing sports pitches where openable windows are to be relied on for ventilation, the proposed boundary wall should provide some protection from noise from the sports pitches. It is also considered likely that occupants could manage noise ingress by temporarily closing the windows for short periods when required, particularly as open windows are not required for summertime cooling.

Appendix A - Glossary of Acoustic Terms

dB – Decibel. The unit used to describe noise levels. It is a logarithmic ratio of the sound pressure.

A Weighting – A frequency weighting applied to the measured sound spectrum which corrects the level to simulate the frequency response of the hearing system to sound levels of varying frequencies. A weighted sound level is referred to as dBA.

L_{ea} – This is a quasi-average noise level which includes all the sound energy during the measurement period averaged out across the period. It is typically used to describe the ambient noise level. The A weighted value is the L_{Aeq} .

L_{90} – This is the level exceeded for 90% of the measurement period and indicates the steady underlying background noise level. The A weighted Level is the L_{A90} .

L_{01} – This is the level exceeded for 1% of the measurement time. This is used to indicate more typical maxima. The L_{max} is the highest level during a measurement period, but can often be a very short-term single event (and is not always representative of the typical maxima).

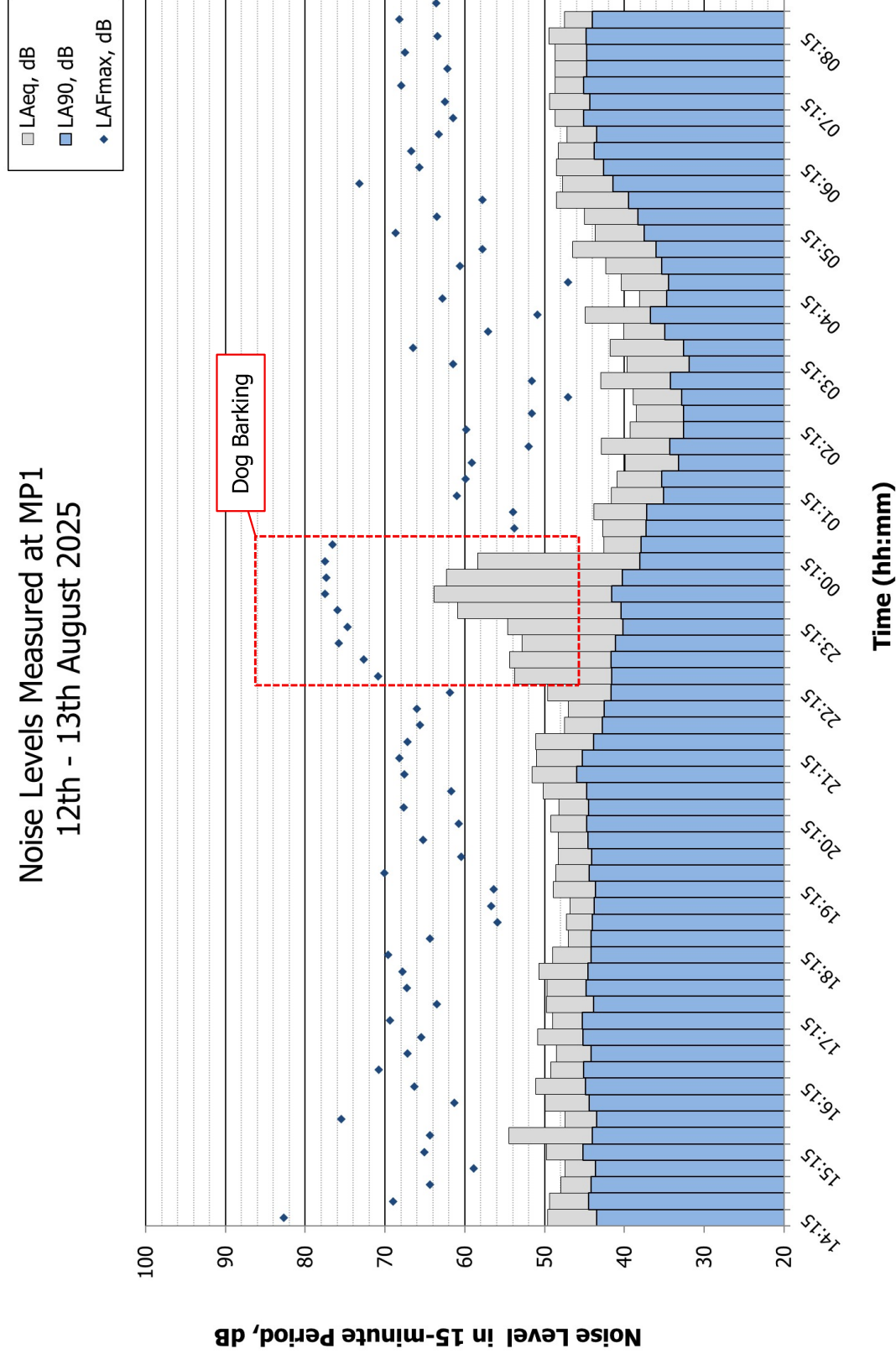
R_w - Weighted sound reduction index of a single element only: dB. This is generally tested in a laboratory and does not account for any flanking or other sound paths.

D_w - Weighted level difference: dB. This is the sound level difference between two rooms and also includes the effect of flanking, other sound paths, workmanship, on site construction and absorption in the receiver room.

RT - Reverberation Time: seconds. This is the time taken for reverberant sound in the room to decay by 60 dB. A dead space with many soft finishes would have a short RT whereas a lively space, comprising mainly hard surfaces, would have a long RT.

NR - The Noise Rating, NR, is used to describe steady noise levels such as mechanical services noise. A family of curves is defined in octave frequency bands and the NR rating for a particular noise is the lowest NR curve which is entirely above the spectrum of the noise under consideration.

Noise Levels Measured at MP1
12th - 13th August 2025



Hawthorn Medical Centre, Fallowfield
Environmental Noise Survey Report
Appendix B – Noise Survey Data



Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB	Time	L _{Aeq} dB	L _{Amax,F} dB	L _{AF90} dB
12/08/2025 14:30	50	69	44	13/08/2025 03:00	39	52	33
12/08/2025 14:45	49	64	45	13/08/2025 03:15	43	62	34
12/08/2025 15:00	48	59	44	13/08/2025 03:30	40	67	32
12/08/2025 15:15	47	65	44	13/08/2025 03:45	42	57	33
12/08/2025 15:30	50	64	45	13/08/2025 04:00	40	51	35
12/08/2025 15:45	55	76	44	13/08/2025 04:15	45	63	37
12/08/2025 16:00	47	61	44	13/08/2025 04:30	38	47	35
12/08/2025 16:15	50	66	44	13/08/2025 04:45	40	61	35
12/08/2025 16:30	51	71	45	13/08/2025 05:00	42	58	35
12/08/2025 16:45	49	67	45	13/08/2025 05:15	47	69	36
12/08/2025 17:00	49	66	44	13/08/2025 05:30	44	64	38
12/08/2025 17:15	51	69	45	13/08/2025 05:45	45	58	38
12/08/2025 17:30	49	64	45	13/08/2025 06:00	49	73	40
12/08/2025 17:45	50	67	44	13/08/2025 06:15	48	66	41
12/08/2025 18:00	50	68	45	13/08/2025 06:30	49	67	43
12/08/2025 18:15	51	70	45	13/08/2025 06:45	48	63	44
12/08/2025 18:30	49	64	44	13/08/2025 07:00	47	62	44
12/08/2025 18:45	47	56	44	13/08/2025 07:15	49	63	45
12/08/2025 19:00	47	57	44	13/08/2025 07:30	49	68	44
12/08/2025 19:15	47	56	44	13/08/2025 07:45	49	62	45
12/08/2025 19:30	49	70	44	13/08/2025 08:00	49	68	45
12/08/2025 19:45	49	61	44	13/08/2025 08:15	49	63	45
12/08/2025 20:00	48	65	44	13/08/2025 08:30	50	68	45
12/08/2025 20:15	48	61	45	13/08/2025 08:45	48	64	44
12/08/2025 20:30	49	68	45				
12/08/2025 20:45	48	62	45				
12/08/2025 21:00	50	68	45				
12/08/2025 21:15	52	68	46				
12/08/2025 21:30	51	67	45				
12/08/2025 21:45	51	66	44				
12/08/2025 22:00	48	66	43				
12/08/2025 22:15	47	62	43				
12/08/2025 22:30	50	71	42				
12/08/2025 22:45	54	73	42				
12/08/2025 23:00	54	76	42				
12/08/2025 23:15	53	75	41				
12/08/2025 23:30	55	76	40				
12/08/2025 23:45	61	78	40				
13/08/2025 00:00	64	77	42				
13/08/2025 00:15	62	78	40				
13/08/2025 00:30	58	77	38				
13/08/2025 00:45	43	54	38				
13/08/2025 01:00	43	54	37				
13/08/2025 01:15	44	61	37				
13/08/2025 01:30	42	60	35				
13/08/2025 01:45	41	59	35				
13/08/2025 02:00	40	52	33				
13/08/2025 02:15	43	60	34				
13/08/2025 02:30	39	52	33				
13/08/2025 02:45	39	47	33				

Daytime

	Octave Band Centre Frequency, Hz							dBA
	63	125	250	500	1000	2000	4000	
REYQ14U SWL	88.0	83.0	81.0	81.0	74.0	70.0	70.0	81
Low noise mode reduction	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
REYQ14U SWL (Low noise 2)	79.0	74.0	72.0	72.0	65.0	61.0	61.0	72
RZAG35A SWL		65.0	62.0	61.0	57.0	50.0	45.0	62
2no. of each unit	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
2 no REYQ12U	82.0	77.0	75.0	75.0	68.0	64.0	64.0	
2no. RZAG35A		68.0	65.0	64.0	60.0	53.0	48.0	
Total SWL	82.0	77.5	75.4	75.3	68.6	64.3	64.1	76
Semi-spherical distance loss (37m)	39.4	39.4	39.4	39.4	39.4	39.4	39.4	
At receptor	42.6	38.1	36.0	35.9	29.2	24.9	24.7	36.3
Rating Correction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Rating level at receptor	42.6	38.1	36.0	35.9	29.2	24.9	24.7	36
Limit (daytime)								39
Exceedance								-3
Louvre Insertion Losses	3	4	6	8	10	10	10	
Rating level at receptor	39.6	34.1	30.0	27.9	19.2	14.9	14.7	28
Exceedance								-11

Night Time

	Octave Band Centre Frequency, Hz							dBA
	63	125	250	500	1000	2000	4000	
REYQ14U SWL	88.0	83.0	81.0	81.0	74.0	70.0	70.0	81
	14.0	14.0	14.0	14.0	14.0	14.0	14.0	
REYQ14U SWL (Low noise 3)	74	69	67	67	60	56	56	67
RZAG35A SWL		65.0	62.0	61.0	57.0	50.0	45.0	62
2no. of each unit	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
2 no REYQ12U	77.0	72.0	70.0	70.0	63.0	59.0	59.0	
2no. RZAG35A		68.0	65.0	64.0	60.0	53.0	48.0	
Total SWL	77.0	73.5	71.2	71.0	64.8	60.0	59.3	71
Semi-spherical distance loss (37m)	39.4	39.4	39.4	39.4	39.4	39.4	39.4	
At receptor	37.6	34.1	31.8	31.6	25.4	20.6	19.9	32.1
Rating Correction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Rating level at receptor	37.6	34.1	31.8	31.6	25.4	20.6	19.9	32
Limit (night)								30
Exceedance								2
Louvre Insertion Losses	3	4	6	8	10	10	10	
Rating level at receptor	34.6	30.1	25.8	23.6	15.4	10.6	9.9	24
Exceedance								-6