



WHITEFIELD MEDICAL CENTRE
ENVIRONMENTAL NOISE SURVEY REPORT
Acoustics Report A2303 R01 RevB

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1 Introduction

Ion Acoustics is appointed by NHS Property Services to carry out an environmental noise survey and in respect of a planning application for a new medical centre in Whitefield, Bury. The medical centre is proposed to be provided within an existing building that was previously a community library. It is proposed to install external building services plant items at the rear of the building.

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 and (if required) outline noise mitigation measures specified.

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.

2 Scheme Details

A new medical centre is proposed within the existing Whitefield Library building on Pinfold Lane in Whitefield, M45 7NY.

The site is in a predominantly residential area positioned between two main roads: Bury New Road (A56) to the east and Higher Lane (A665) to the west. Immediately to the west of the site is another public building that is currently unoccupied. There are residential buildings immediately to the south and north-east of the building. The building is set back approximately 25 metres from Pinfold Lane with a car park in front of the building. There are also residential houses on the opposite side of Pinfold Lane to the north, also set back from the road.

An aerial image of the site is shown in Figure 1, which also shows the noise sensitive receptors surrounding the site.



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

As part of the fit out, new building services plant is to be installed externally to the rear of the building. The proposed plant will be mainly located within an external plant enclosure to the south of the building as shown in blue on the site plan in Figure 2:

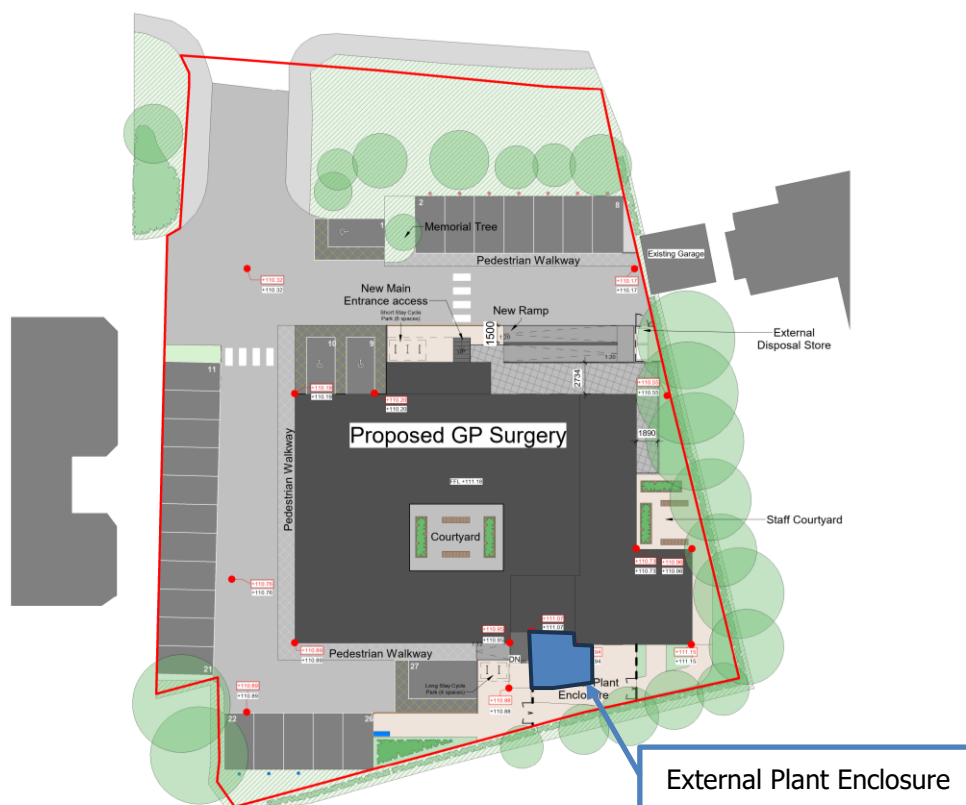


Figure 2: Proposed site plan (Gilling Dod)

3 Planning Policy and Other Guidance on Noise

Several pieces of guidance have been used to set noise emissions limits for the proposed plant, as described in the following sections.

3.1 Bury Council Guidance

Ion Acoustics are not aware of any specific planning policy or supplementary planning guidance from Bury Council with respect to assessing plant noise emissions. We have not been able to find any such guidance online.

However, the Bury Draft Local Plan (2025) Policy LP-BE8 'Amenity' does state the following with regard to protection of amenity of nearby uses and residents (our emphasis added):

'Policy LP-BE8: Amenity

*The Council will ensure that new development would not lead to unacceptable adverse impacts on the amenity of the surrounding area or users and occupants of the development, particularly in terms of: a. Overshadowing and loss of light; b. Dominance and loss of privacy by virtue of separation distances, height, depth, mass, location of a building/extension and window positions; c. Pollution and general disturbance arising from **noise**, vibration, smell, litter, artificial light and opening hours; and d. Parking and servicing provision associated with the proposed development and its effects in terms of road safety, traffic generation and movement.*

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. Key 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;

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.

¹ Noise Policy Statement for England (DEFRA) available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/695333/pb13750-noise-policy.pdf

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.

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

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

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 4142:2104 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	23:00 to 07:00
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} .

Where the background noise levels are low and, in such circumstances, BS4142 states that absolute noise limits can be more relevant as a discussed in Section 3.3. In this case, an appropriate limit can be derived from the WHO Community Noise 1999 Guidance. To prevent sleep disturbance, a limit of L_{Aeq} 42dB (free-field) is advised. To ensure that the new development cannot be a factor in the limit being exceeded, plant noise levels would need to be 10dB below L_{Aeq} 42dB i.e. L_{Aeq} 32dB.

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 Hea 05 ‘acoustic performance’ under BREEAM 2014 Refurbishment and Fit Out (Healthcare).

3.7.1 Pol 05

Pol 05 ‘Reduction of Noise Pollution’ states that a single credit is available where:

1. *There are, or will be, no noise-sensitive areas or buildings within 800m radius of the assessed site.*

Or

2. *Alternatively, where the building does have noise-sensitive areas or buildings within 800m radius of the site, one credit can be awarded as follows:*

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

- a. *Where a noise impact assessment in compliance with BS 7445-1 has been carried out and the following noise levels measured/determined:*
 - i. *Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background conditions can be argued to be similar. The existing background noise levels shall not include existing plant associated with the assessed building.*
 - ii. *The rating noise level resulting from the new noise source.*
3. *The noise impact assessment must be carried out by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body.*
4. *The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise sensitive development, is a difference no greater than +5dB during the day (07:00 to 23:00) and +3dB at night (23:00 to 07:00) compared to the background noise level.*
5. *Where the noise source(s) from the proposed site/building is 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 criterion 4.*

BREEAM Technical Manual SD216 2.0 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 Hea05

Credits are also being targeted under Hea 05 'acoustic performance'. The credit that is pertinent to environmental noise impact is related to indoor ambient noise levels. The requirements for this credit 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 SD5076: 1.0 – 2014 defines a Suitably Qualified Acoustic Consultant (SQA) as:

'An individual who holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acousticians 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 therefore qualifying as an SQA.

3.8 Proposed Plant Noise Limits Criteria

Based on the guidance above, and particularly BS4142:2014, it is proposed that the appropriate noise limits for this scheme which would be derived as a rating limit *at parity with the representative background noise level* generally, which is an indication of 'low impact' in BS 4142.

Where this is achieved, the requirements of BREEAM Pol 05, which are less onerous, *would be achieved by default*.

3.9 Internal Ambient Noise Level Criteria (HTM-08)

Health Technical Memorandum 08-01 ("HTM 08-01") sets noise limit for external noise intrusion is set 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 the NR rating for internal noise from mechanical and electrical services. The 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.

4 Environmental Noise Survey

An environmental noise survey was carried out from Tuesday 8th to Wednesday 9th July 2025 in accordance with BS 7445-2. Measurements were taken at two positions: a logging noise monitor was set up at the rear of the existing building protruding from a ground floor window with additional short-term attended measurements taken at the front of the site.

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.

Weather conditions on set up were sunny, the temperature was 15°C with light winds and approximately 50% cloud cover. On collection, the weather conditions were dry, the temperature was c.15°C, with light winds, and c.80% cloud cover.

4.1 Measurement Locations

Measurements were made between 11:30hrs on Tuesday 8th July and 09:00hrs on Wednesday 9th July 2025. The measurement locations are shown on Figure 3.

For measurement position **MP1** the microphone was positioned on a tripod and was approximately 1.5 metres above local ground level and approximately 20 metres from the nearside edge of Pinfold Lane. Measurements were made at this position between 11:53 hours and 12:53 hours on 8th July 2025 and between 08:00 and 09:00 hours on 9th July 2025.

For measurement position **MP2** the microphone was fixed to a boom and protruded from a ground floor window at the rear of the existing library building. The microphone was approximately 1 metre from the rear façade of the building and approximately 2 metres above local ground level.

Position MP1 was selected in order to establish typical road traffic noise levels impacting the site for future use when designing the external building fabric. Position MP2 is used to represent the prevailing background noise level within the vicinity of the rear of the site for the purposes of setting appropriate plant noise limits at worst-impacted noise sensitive receptors to the south.



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

5 Noise Survey Results

Full noise levels measured at the measurement position 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 the measurement position was road traffic noise mainly from Higher Lane and Pinfold Lane. Road traffic on Higher Lane was noted to be consistent with a continuous flow of traffic whereas Pinfold Lane had more intermittent passing vehicles. There was also contribution from other surrounding roads, as well as from air traffic noise including passing helicopters.

5.1 Summary Noise Levels

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

Table 4: Summary of Measured Noise Levels at MP1

Date	Time Period	$L_{Aeq,15mins}$ dB	$L_{A90,15mins}$ dB
08/07/2025	11:53 – 12:07	54	49
	12:08 – 12:22	56	50
	12:23 – 12:37	54	49
	12:38 – 12:52	54	50
	12:53 – 13:07	57	50
09/07/2025	08:01 – 08:15	53	49
	08:16 – 08:30	55	49
	08:31 – 08:45	53	49
	08:46 – 09:00	54	53

Table 5: Summary of Measured Noise Levels at MP2

Period	$L_{Aeq,T}$ dB	Typical $L_{A90,15mins}$ dB
Daytime (07:00 to 23:00 hrs)	51	44
Night Time (23:00 to 07:00 hrs)	49*	30
* Impacted by dawn chorus birdsong		

5.2 Typical Background Noise Levels

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

The typical background sound levels measured at position MP2 summarised in Table 5 above 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.

The typical background sound level, L_{A90} , has been taken as the integer $L_{A90,15\text{mins}}$ value exceeded approximately 40% of the time period. This method of determining the typical background noise level in this case is equal to or below the modal value (the most commonly occurring value) and ensures a conservative assessment as, based on this data, the background sound level will be higher 60% of the time.

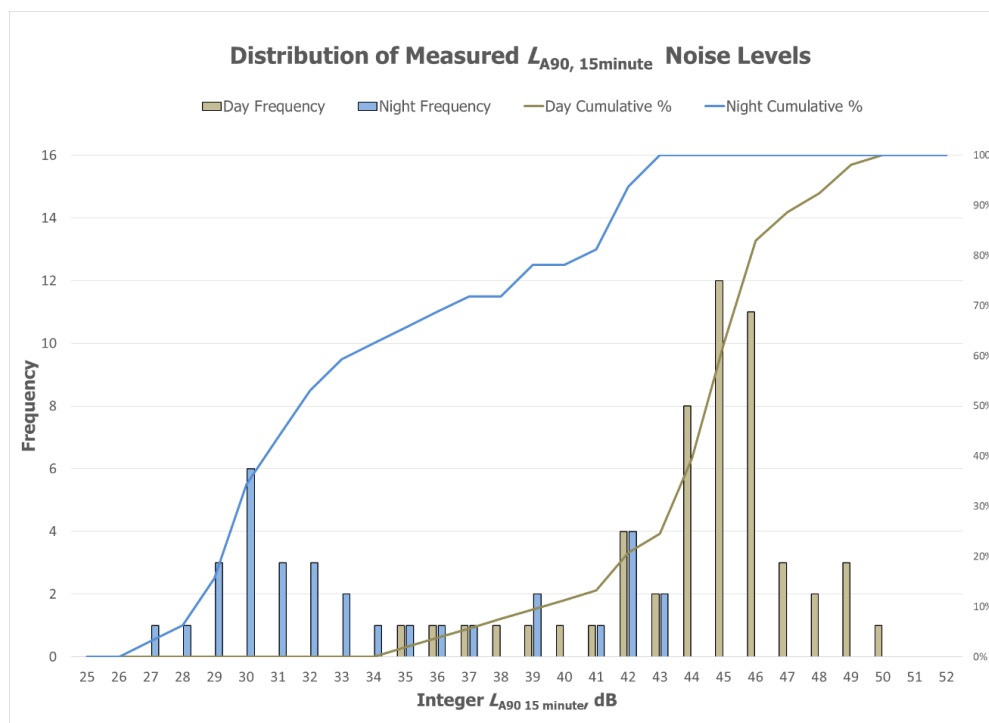


Figure 4 – Frequency distribution of L_{A90} background sound levels (MP1, entire survey period)

6 Proposed Plant Noise Limits

Proposed plant noise emissions limits 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 MP2.

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 and therefore a -3dB correction has applied to the measured façade levels. Therefore, the plant rating level is assessed and calculated without adding in a façade reflection at the receptor.

The daytime limit is based on the cumulative plant noise levels not exceeding the typical background noise level when rated in line with BS 4142. According to the standard (as discussed in Section 3) this is indication that the sound source should have a “low impact” depending on the context.

As nighttime noise levels are very low (27dB L_{A90} “free-field”), a fixed or “absolute” limit of 30 dBA has been deemed more appropriate in line with BS 4142 and WHO guidance as presented in Section 3.5 and the requirements of BREEAM Pol 05 (3dB above the typical background) as presented in Section 3.6.

Table 6: Proposed Preliminary Plant Noise Emission Limits ("Free-Field")

Period	Proposed Limit L_{Ar} dB
Daytime (07:00 – 23:00 hrs)	41
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 "Heat Recovery Units"
- 2no. Daikin RZAG35A condensers

The units are to be located within the external plant compound at the south of the building as shown on Figure 5:

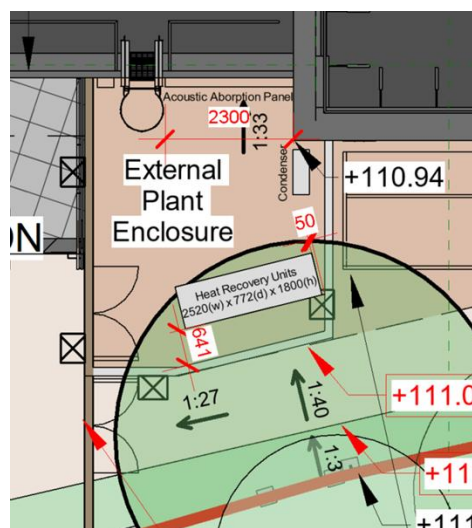


Figure 5 – External Plant Compound Layout (Gilling Dod)

The worst-impacted noise sensitive receptors are deemed to be the residential apartments directly to the south of the site (see Figure 1). This is a 4-storey residential apartment building and is approximately 15 metres from the proposed plant location.

Based on information provided to Ion Acoustics the proposed plant items have the following sound power emissions:

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	88	83	81	81	74	70	70	81
Daikin RZAG35A	-	65	62	61	57	50	45	62

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 during the winter to maintain a “set back” temperature to maintain a minimum temperature within the building during the night.

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 compared with the manufacturer-stated noise emissions.

7.2 Plant Noise Assessment

Noise emissions from the proposed condensers have been predicted at the worst-impacted noise sensitive receptors which are deemed to be windows to the residential dwellings to the south of the site.

A BS 4142 rating penalty is not deemed to be applicable as no acoustic characteristics are likely to be readily perceptible against the daytime ambient environmental noise level at the receptors which contains road traffic noise from the A665. The units are also likely to run continuously when in operation and therefore would not be considered intermittent.

On this basis, based on distance losses alone, noise emissions from the condensers is predicted to exceed the proposed plant noise limit by 4dB and 11dB for the daytime and night time operation respectively. Plant noise calculation are provided in Appendix C for reference purposes.

7.3 Plant Noise Mitigation

To mitigate the plant noise emissions, to comply with the proposed daytime and night-time plant noise limits, a mitigation strategy has been developed with Gilling Dod and Silcock Leedham as follows:

- The plant enclosure will be formed of an acoustic louvre to the east and the south which extends from ground level up to 900mm above the top of the REYQ “heat recovery” units.
- The east of the compound will be formed of a solid timber fence which extends 2.6m above ground level.
- The REYQ units will not be greater than 600mm from the louvre barrier.
- An acoustically absorptive finish shall be applied to the building façade within the plant compound to reduce sound reflections off the building. The absorption should be a Class A absorptive finish, most likely panels formed of mineral fibre in a perforated metal casing, and extend from ground up to roof level (as high as practicably possible).
- The acoustic louvres should have blades going from high-to-low going from inside-to-outside of the plant enclosure. The louvre should achieve the following minimum static insertion losses which would typically be provided by a higher performance 150mm deep acoustic louvre:

Table 8: Acoustic Louvre Minimum Insertion Loss

Minimum Static IL (dB) at Octave Band Centre Frequency, Hz						
63	125	250	500	1000	2000	4000
3	5	7	11	11	11	11

The plant noise mitigation is summarised in Figure 6:

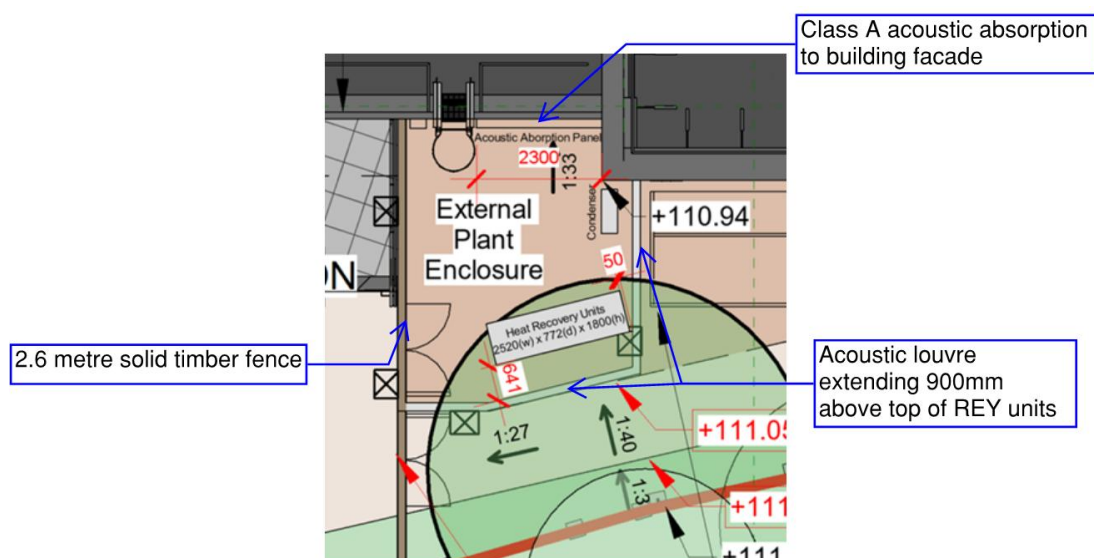


Figure 6 – Summary of Plant Noise Mitigation Measures

8 Environmental Noise Ingress

It is also important to consider the impact of environmental noise on the proposed medical centre from environmental sources. It is proposed to naturally ventilate the medical centre using openable windows, however openable windows will not be relied upon for overheating mitigation as air conditioning is proposed to be installed.

As set out in Section 3.9 for spaces to be provided within the scheme the most onerous environmental noise intrusion limit is $L_{Aeq,1hr}$ 40 dB for consulting and examination rooms etc.

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 MP1 during the survey. The assessment assumes a 13dB outside-to-inside sound reduction from a partially open window in line with IOA/ANC guidance⁴. This would typically be suitable for background ventilation purposes for small cellular spaces however open area requirements should be confirmed during detailed design development.

Based on the results of the survey incident noise levels at the façade of the building are predicted to be up to $L_{Aeq,1hr}$ 53 dB. On this basis, the assessment indicates that an open window ventilation strategy should be suitable for ventilation.

⁴ Acoustic Ventilation and Overheating, Residential Design Guide ANC & IOA (January 2020)

However, it is important to note that some windows may be impacted by other noise sources introduced as part of the scheme such as the external building services plant at the rear or noise from people/cars within the car park at the front of the building. These sources are considered “non-anonymous” noise sources within acoustic characteristics that occupants of the building may find more distracting. The proposed plant at the rear will cause this limit to be exceeded for any windows with a view of the plant.

8.2 External Building Fabric

Acoustic Requirements for the external building fabric will depend on the finalised ventilation strategy. However, for initial guidance, on the north, east and west facades, typical external wall build ups and “standard” double glazed windows (e.g. 4 / 16 / 4 mm double glazing) should be suitable. An enhanced performance may be required for façade elements on the southern façade impacted by the plant area to the rear.

This should be assessed during detailed design development it is recommended that plant noise does not exceed a level 10 dB *below* the HTM-08 internal ambient noise level target for that space (e.g. 30 dBA if the internal ambient noise levels criteria is 40 dB $L_{Aeq,1hr}$). This could be relaxed to 5dB below if building services are to provide a form of consistent “masking noise” to these spaces (e.g. some form of mechanical ventilation).

9 Summary

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

The proposed external plant items have been assessed and, provided suitable noise mitigation measures are installed as set out in this report, plant noise emissions should not exceed the proposed limits at noise sensitive receptors.

An initial assessment of road traffic noise ingress has been undertaken based on the proposed natural ventilation strategy via openable windows. The assessment concludes that, based on the results of the noise survey an openable window ventilation strategy is likely to be suitable with respect to road traffic noise. However, alternative ventilation provision is recommended for some rooms likely to be impacted by other noise sources, in particular external building services plant to the rear.

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} .

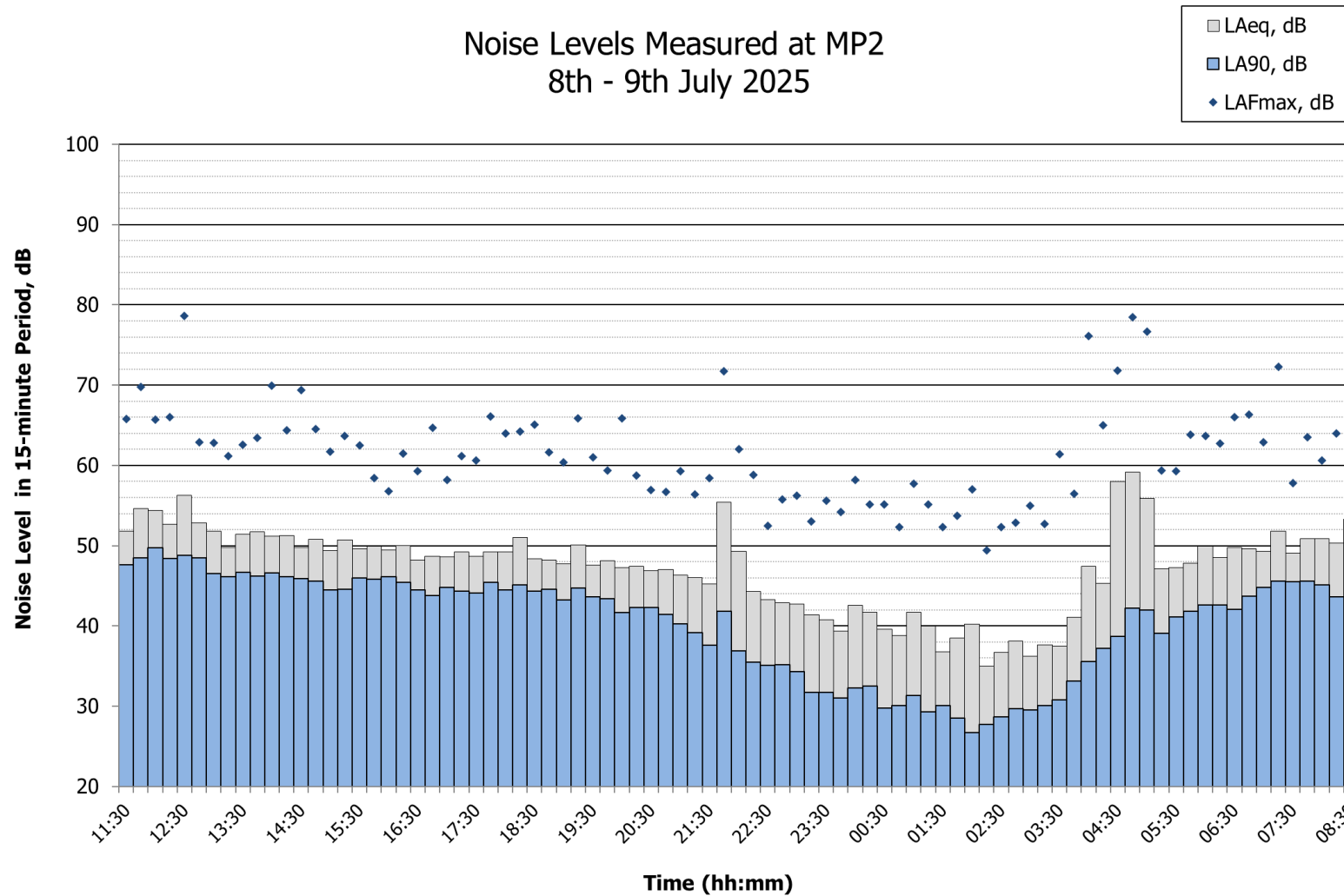
L_{01} – This is the level exceeded for 1% of the measurement time. This is used to indicate more typical maxima. The L_{max} is the highest level during a measurement period, but can often be a very short-term single event (and is not always representative of the typical maxima).

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.



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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
08/07/2025 11:45	52	66	48	09/07/2025 00:15	43	58	32
08/07/2025 12:00	55	70	49	09/07/2025 00:30	42	55	33
08/07/2025 12:15	54	66	50	09/07/2025 00:45	40	55	30
08/07/2025 12:30	53	66	48	09/07/2025 01:00	39	52	30
08/07/2025 12:45	56	79	49	09/07/2025 01:15	42	58	31
08/07/2025 13:00	53	63	49	09/07/2025 01:30	40	55	29
08/07/2025 13:15	52	63	47	09/07/2025 01:45	37	52	30
08/07/2025 13:30	50	61	46	09/07/2025 02:00	39	54	29
08/07/2025 13:45	51	63	47	09/07/2025 02:15	40	57	27
08/07/2025 14:00	52	63	46	09/07/2025 02:30	35	49	28
08/07/2025 14:15	51	70	47	09/07/2025 02:45	37	52	29
08/07/2025 14:30	51	64	46	09/07/2025 03:00	38	53	30
08/07/2025 14:45	50	69	46	09/07/2025 03:15	36	55	30
08/07/2025 15:00	51	65	46	09/07/2025 03:30	38	53	30
08/07/2025 15:15	49	62	45	09/07/2025 03:45	38	61	31
08/07/2025 15:30	51	64	45	09/07/2025 04:00	41	57	33
08/07/2025 15:45	50	63	46	09/07/2025 04:15	47	76	36
08/07/2025 16:00	50	58	46	09/07/2025 04:30	45	65	37
08/07/2025 16:15	50	57	46	09/07/2025 04:45	58	72	39
08/07/2025 16:30	50	62	45	09/07/2025 05:00	59	79	42
08/07/2025 16:45	48	59	45	09/07/2025 05:15	56	77	42
08/07/2025 17:00	49	65	44	09/07/2025 05:30	47	59	39
08/07/2025 17:15	49	58	45	09/07/2025 05:45	47	59	41
08/07/2025 17:30	49	61	44	09/07/2025 06:00	48	64	42
08/07/2025 17:45	49	61	44	09/07/2025 06:15	50	64	43
08/07/2025 18:00	49	66	45	09/07/2025 06:30	49	63	43
08/07/2025 18:15	49	64	45	09/07/2025 06:45	50	66	42
08/07/2025 18:30	51	64	45	09/07/2025 07:00	50	66	44
08/07/2025 18:45	48	65	44	09/07/2025 07:15	49	63	45
08/07/2025 19:00	48	62	45	09/07/2025 07:30	52	72	46
08/07/2025 19:15	48	60	43	09/07/2025 07:45	49	58	46
08/07/2025 19:30	50	66	45	09/07/2025 08:00	51	64	46
08/07/2025 19:45	48	61	44	09/07/2025 08:15	51	61	45
08/07/2025 20:00	48	59	43	09/07/2025 08:30	50	64	44
08/07/2025 20:15	47	66	42	09/07/2025 08:45	53	76	44
08/07/2025 20:30	47	59	42				
08/07/2025 20:45	47	57	42				
08/07/2025 21:00	47	57	41				
08/07/2025 21:15	46	59	40				
08/07/2025 21:30	46	56	39				
08/07/2025 21:45	45	58	38				
08/07/2025 22:00	55	72	42				
08/07/2025 22:15	49	62	37				
08/07/2025 22:30	44	59	36				
08/07/2025 22:45	43	53	35				
08/07/2025 23:00	43	56	35				
08/07/2025 23:15	43	56	34				
08/07/2025 23:30	41	53	32				
08/07/2025 23:45	41	56	32				
09/07/2025 00:00	39	54	31				

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Appendix C – Plant Noise Calculations



DAYTIME OPERATION				Octave Band Centre Frequency, Hz							
				63	125	250	500	1000	2000	4000	dBA
REYQ14U Units				88	83	81	81	74	70	70	81
Low noise mode				9.0	9.0	9.0	9.0	9.0	9.0	9.0	
REYQ14U low noise mode 2				79.0	74.0	72.0	72.0	65.0	61.0	61.0	72
RZAG35A					65.0	62.0	61.0	57.0	50.0	45.0	62
2no. Units				3.0	3.0	3.0	3.0	3.0	3.0	3.0	
2 no REY				82.0	77.0	75.0	75.0	68.0	64.0	64.0	75
2no. RZA					68.0	65.0	64.0	60.0	53.0	48.0	65
Total SWL				82.0	77.5	75.4	75.3	68.6	64.3	64.1	76
Semi-spherical distance loss			19 m	33.6	33.6	33.6	33.6	33.6	33.6	33.6	
Facde reflections from medical centre				3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Rating correction				0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Rating level at receptor				51.4	46.9	44.8	44.7	38.0	33.7	33.5	45
Limit (daytime)											41
Exceedance											4
Barrier loss for REY Path diff 0.1 m				6	6	7	10	11	14	17	
At receptor over louvre				46	40	37	34	26	20	17	35
Barrier loss for RZA path diff 0.2 m				6	7	10	11	14	17	20	
At receptor over louvre					30	24	22	16	6	-2	23
Louvre loss				3	5	7	11	11	11	11	
At receptor though louvre (REY units)				48	41	37	33	26	22	22	35
Sum				50	44	40	37	30	24	24	38
Without refelctions from building (-3dB)				47	41	37	34	27	21	21	35
At receptor with mitigation				47	41	37	34	27	21	21	35
Limit (day)											41
Exceedance											-6

NIGHT TIME OPERATION (occasional, in winter only)				Octave Band Centre Frequency, Hz							
				63	125	250	500	1000	2000	4000	dBA
REYQ14U SWL				88	83	81	81	74	70	70	81
Low noise mode				14	14	14	14	14	14	14	
REYQ14U low noise mode 3				74	69	67	67	60	56	56	67
RZAG35A					65	62	61	57	50	45	62
2no. Units				3	3	3	3	3	3	3	
2 no REY				77	72	70	70	63	59	59	70
2no. RZA					68	65	64	60	53	48	65
Total SWL				77	74	71	71	65	60	59	71
Semi-spherical distance loss			19 m	34	34	34	34	34	34	34	
Facde reflections from medical centre				3	3	3	3	3	3	3	
Rating correction				0	0	0	0	0	0	0	
Rating level at receptor				46	43	41	40	34	29	29	41
Limit (night)											30
Exceedance											11
Barrier loss for REY Path diff 0.1 m				6	6	7	10	11	14	17	
At receptor over louvre				41	35	32	29	21	15	12	30
Barrier loss for RZA path diff 0.2 m				6	7	10	11	14	17	20	
At receptor over louvre					30	24	22	16	6	-2	23
Louvre loss				3	5	7	11	11	11	11	
At receptor though louvre (REY units)				43	36	32	28	21	17	17	30
Sum				45	39	36	32	25	20	19	33
Without refelctions from building (-3dB)				42	36	33	29	22	17	16	30
At receptor with mitigation				42	36	33	29	22	17	16	30
Limit (night)											30
Exceedance											0