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Site Address: Lowry Park, Grimshaw Lane, Manchester,
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For: A & H Construction

Client Address: Coombs Road, Halesowen, West Midlands, B62
8AE,

Report no: T 2425-493

Date of Report: 19/07/2024

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Scope of Work: ACOUSTIC COMMISSIONING – BREEAM
HEA 05 & POL 05

This report has been prepared by REDFAN Solutions with all reasonable expertise, care and diligence. The survey and report have been undertaken in accordance with accepted acoustic consultancy principles, it takes account of the services and terms and conditions agreed verbally and in writing between REDFAN Solutions and our client. Any information provided by third parties and referenced is considered to have undergone suitably thorough third-party checks to ensure accuracy. We can accept no liability for errors with third- party data. This report is confidential to our client and therefore REDFAN Solutions accepts no responsibility whatsoever to third parties unless formally agreed in writing by REDFAN Solutions. Any such party relies upon the report at their own risk.

Executive Summary

- REDFAN Solutions have been instructed to undertake Acoustic Commissioning – BREEAM HEA 05 & POL 05 for the new Industrial buildings to be located at Lowry Park, Grimshaw Lane, Manchester, M40 2BA.
- 1 acoustic credit for HEA 05 and one noise pollution credit for POL 05 under the BREEAM (2018) New Construction, Non-domestic scheme is being targeted.
- **Internal Noise Levels for Industrial, Retail, Prisons and Other building types (BREEAM HEA 05)** Internal ambient noise level targets in tested spaces (with services running) were met in all cases. Therefore, we consider that the available BREEAM HEA 05 credit can be awarded.
- **External Plant Noise (BREEAM POL 05)**
Technical specification sound pressures for plant equipment installed have been calculated against the Baseline Noise Survey in report "T2324-203 Lowry Park Baseline Noise Survey". Using Institute of Acoustic recognised calculations, the plant equipment meets the required criteria. Therefore, the credit is to be awarded.

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1. Introduction

1.1 REDFAN Solutions were instructed to carry out acoustic commissioning of the BREEAM HEA 05 & POL 05 for the new Warehouse/Industrial buildings to be located at Lowry Park, Grimshaw Lane, Manchester, M40 2BA.

1.2 The development will be assessed within the category of Industrial, Retail, Prisons and Other building types sector under the BREEAM 2018 UK New Construction scheme. Two acoustic credits will be targeted, specifically HEA 05 'Internal Ambient Noise Levels' and POL 05 'Reduction of Noise Pollution'.

- 1.3 The construction of the warehouses at Lowry Park, Grimshaw Lane, Manchester, M40 2BA is being constructed on a large industrial area on the main A62 Oldham Road.
- 1.4 The work carried out was in accordance with BREEAM: 2018 HEA 05: Acoustic Performance and BREEAM: 2018 POL 05: Reduction of Noise Pollution. The scope of work is to be carried out upon completion of the building, in unoccupied conditions with all services running.

2. Suitably Qualified Acoustician

2.1 Andrew Hunt and Adrian Popplewell are suitably qualified acoustic consultants and engineers to undertake an assessment for BREEAM 2014/2018 purposes. Adrian Popplewell is a member of the Institute of Acoustics (IOA), Holds BEng (Hons) Acoustics Noise and Vibration degree from Institute of Sound and Vibration Research, University of Southampton, Chartered Engineer (CEng) in Acoustics since 2005 and has 5 years' experience in the last 5 years. Andrew Hunt has taken the relevant Institute of Acoustics Measurement in Environmental and Building Acoustic Measurement courses and has 4 years' experience in the last 5 years. Both their experience in acoustics has been 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.

2.2 BREEAM 2018 definition of a Suitably Qualified Acoustician (SQA):

- 2.2.1 An individual achieving all the following items can be considered to be 'suitably qualified' for the purposes of a BREEAM assessment:
- 2.2.2 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.
- 2.2.3 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.
- 2.2.4 The acoustic testing was carried out by a "compliant test body" as defined by KBCN1412 Compliant test body – alternative compliance route using a Suitably Qualified Acoustician. In accordance with this compliance route.
- 2.2.5 Where an SQA is verifying the acoustic measurements or calculations carried out by another acoustician who does not meet the SQA requirements, they must, as a minimum, have read and reviewed the report and confirm in writing that they have found it to:
- Represent sound industry practice

- Be appropriate given the building being assessed and scope of works proposed
- Avoid invalid, biased and exaggerated recommendations.

3. Criteria

BREEAM 2018 HEA 05 acoustic criteria for Industrial, Retail, Prisons and Other building types and Pol 05 Reduction of noise pollution

3.1 The BREEAM 2018 requirements detailed in Industrial Building types indicates 3 credits are available under HEA 05, sound insulation, internal ambient noise levels and room acoustics. Only internal ambient noise levels are being targeted.

3.2 Noise within buildings can come from various sources, including building systems, occupants, equipment, and external sources. Excessive noise can have a range of adverse effects on building users such as inconvenience and annoyance, loss of concentration and decreased productivity. Therefore, the management of noise within a building is important to maximise occupant comfort, occupant efficiency, and to provide privacy. As a result, building acoustics are an important consideration in the design, operation, and construction of buildings.

3.3 Building acoustics should allow rooms to be used as intended, without compromising sound sensitive spaces or activities. Designing to building type specific acoustic performance standards for sound insulation, indoor ambient noise levels and reverberation times, supports acoustic comfort for building occupants.

Internal ambient noise levels

3.4 Indoor ambient noise levels comply with the design ranges given in BS 8233: 2014 unless otherwise stated. Where the room types below are present, the appropriate criteria for ambient noise levels, sound insulation and acoustic privacy must also be achieved.

3.5 The credit is relating to the internal indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014.

3.6 The following internal noise limits have been proposed as:

Table 1

Rooms	Indoor Ambient Noise Level
Open Plan Office	45-50dB $L_{Aeq,T}$
Entrance Lobby	45-55dB $L_{Aeq,T}$
Maximum noise levels to offices	55dB $L_{AF\ max}$ (typical)
Meeting Rooms / Offices	35-45dB $L_{Aeq,T}$
Warehouse Spaces	45-55dB $L_{Aeq,T}$

3.7 BREEAM HEA 05 states that for measurements of internal ambient noise levels should include both external noise sources and also noise from internal sources, including mechanical ventilation systems, plant noise, and noise masking systems.

3.8 Advice is sought from British Council of Offices (BCO) 'Guide to Specification' 2014. Building services noise levels should be specified to the following maximum noise levels in the relevant spaces when operating at the typical duty.

Table 2

Room	NR
Offices / Meeting Rooms	≤ 30
Manager's Office	≤ 30
Reception	≤ 40

3.9 The above building services noise limits are suggested for furnished but unoccupied conditions and are to be met during operational hours.

POL 05 Reduction of noise pollution

3.10 BREEAM Pol 5 (2018) states:

Where there are or will be noise-sensitive areas or buildings within 800m radius of the assessed development a noise impact assessment compliant with 4142: 2014 + A1:2019 is commissioned. Noise levels must be measured or determined for:

- *Existing background noise level at the nearest or most exposed noise-sensitive development to the proposed assessed site.*
- *including existing plant on a building, where the assessed development is an extension to the building.*
- *The rating noise level resulting from the assessed building.*

3.11 The noise impact assessment must be carried out by a suitably qualified Acoustic Consultant. Confirmation of the author being a suitably qualified person to undertake this assessment is detailed in section 2 of this report.

3.12 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 5dB lower than the background noise level throughout the day and night.

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

3.14 The nearest Noise Sensitive Receptor are properties at 93 Ten Acres Lane.

4. Testing

4.1 Internal noise measurements were recorded between 11:00hrs and 14:00hrs on 17/07/2024.

4.2 Specified manufacturers sound pressure levels will be calculated and then compared to the levels outlined in "T2324-203 Lowry Park Baseline Noise Survey" to determine the awarding of the POL 05 credit.

Internal Noise Level Measurements

4.3 Noise levels were measured for 5-minute periods (due to the consistent noise from the mechanical services) within all office, warehouse, reception, and open plan areas to determine compliance with BREEAM HEA 05 internal noise criteria. No Mechanical ventilation was installed for this construction. Several positions were measured in the open plan areas and offices and then logarithmically averaged to determine the final single dB rating.

4.4 Calibrated equipment used for the survey.

Item	Make/Model	Serial no	Calibration Cert no
Calibrator	Norsonic 1255	125525488	U45621
Sound Level Meter	Norsonic 145	14529308	U42077

4.5 The noise survey and measurements were conducted, BS4142:2014 Methods for rating and assessing industrial and commercial sound. BS 4142:2014 gives a method for rating sound from industrial and commercial sources and BS 7445:2003 establishes guidelines to quantities and procedures for environmental noise measurements.

4.6 Weather conditions throughout the survey were classed as dry and sunny with a light breeze, 16-18°C, northerly wind (<5m/s) with 20% -40% cloud cover.

4.7 The noise monitoring equipment used was calibrated before and after the noise survey period. No significant drift was recorded. Equipment calibration certificates can be provided upon request.

4.8 All testing carried out has been in accordance with the requirements detailed for BREEAM and HQM.

4.9 No plant equipment is installed in units A-F and therefore not taken into consideration with this assessment.

4.10 As per the BREEAM testing and measuring requirements for ambient noise, when no specific guidance is available, the following procedures have been used:

- 4.10.1 Noise from both internal sources (e.g. mechanical ventilation systems when installed, plant noise, noise-making systems) and external sources (e.g. traffic noise transmitted via the building façade) have been included. Openable windows are present but do not form part of the background or permanent ventilation strategy, therefore these are closed for the purposes of calculations and measurements.
- 4.10.2 Noise from occupants and office equipment (e.g. computers) have not been included in the measurements.
- 4.10.3 A rate of testing of at least one in ten rooms or spaces of each performance level have been subject to on-site performance testing.
- 4.10.4 Measurements have been made in at least four rooms in which noise levels can be expected to be greatest because they are on the noisiest façade.
- 4.10.5 T in LAeq,T is taken as the duration of the normal working day (typically 8 hours between 09.00 and 17.00).
- 4.10.6 Measurements need not be made over a period of 8 hours if a shorter measurement period would be suitably representative. In this case, measurements were taken from 10:00hrs and 14:00hrs and external noise levels were representative of normal conditions throughout the day.
- 4.10.7 Measurement periods less than 30 minutes may give representative values for indoor ambient noise levels, 5-minute periods were utilised when testing Lowry Park, Grimshaw Lane, Manchester, M40 2BA given the constant background noise.
- 4.10.8 Measurements were taken in a minimum of three locations in rooms at a height of 1.2m above the floor level and at least 1m away from any surface.
- 4.10.9 The measured level of ambient noise should be used to determine compliance with the criteria for acoustically sensitive rooms. At the time of testing all acoustically sensitive rooms were able to be tested, there was no construction or other extraneous noise sources that will not be present when the building is complete.

5. Results

5.1 HEA 05 Single Credit – Internal ambient noise levels:

5.2 Internal noise level results

Room tested	Required sound pressure level dB ($L_{Aeq, 5m}$)	Sound pressure level dB ($L_{Aeq, 5m}$)	Complies Y/N
Unit A Reception	45-55dB	42dB	Y
Unit A Office	45-55dB	40dB	Y
Unit B Reception	45-55dB	43dB	Y
Unit B Office	45-55dB	41dB	Y
Unit C Reception	45-55dB	44dB	Y
Unit C Office	45-55dB	41dB	Y
Unit D Reception	45-55dB	40dB	Y
Unit D Office	45-50dB	40dB	Y
Unit E Reception	45-55dB	41dB	Y
Unit E Office	45-50dB	40dB	Y
Unit F Reception	45-55dB	41dB	Y
Unit F Office	45-50dB	39dB	Y
Unit 1 Reception	45-55dB	42dB	Y
Unit 1 Office	45-55dB	40dB	Y
Unit 2 Reception	45-55dB	41dB	Y
Unit 2 Office	45-50dB	40dB	Y
Unit 3 Reception	45-55dB	39dB	Y
Unit 3 Office	45-50dB	38dB	Y
Unit 6 Reception	45-55dB	40dB	Y
Unit 6 Office	45-50dB	41dB	Y

5.3 All the rooms have met the criteria required and therefore the credit can be awarded.

POL 05 reduction of noise pollution:

5.4 The site plant equipment positions are shown below and are marked in red.



5.5 Noise levels recorded at nearest noise sensitive receptors.

93 Ten Acres

Time Period 1hr	Sound pressure level dB (L_{Aeq})1hr	Background level (L_{A90})1hr
Daytime (07:00-23:00hrs)	52dB	47dB
Nighttime (23:00-07:00hrs)	49dB	44dB

5.6 Installed equipment (Units A-F have no external plant equipment installed) inc sound pressures.

Unit Number	Air conditioning unit	Sound Pressure (dBA)	Sound Pressure (low Power/nighttime) (dBA)
1	PURY-P250 NW-A2	61	45
2	PURY-P200 NW-A2	59	44
3	PURY-P200 NW-A2	59	44
6	PURY-P450 NW-A2	66	53

5.7 All equipment stated has been verified by site visit.

5.8 The calculation to determine the specific noise level at the nearest noise sensitive receiver.

$$L_2 = L_1 - 20 \times \log \left(\frac{r_2}{r_1} \right)$$

5.9

r_1 = the distance the recording was taken from the noise source

r_2 = the distance to the nearest noise sensitive receptor

L_1 = the sound pressure recorded

L_2 = the sound level that carries to the noise sensitive receptor

5.10 Distances from Plant equipment to NNSR

Position	NSR	Distance from Plant Equipment
Unit 1	93 Ten Acres	270m
Unit 2	93 Ten Acres	190m
Unit 3	93 Ten Acres	130m
Unit 6	93 Ten Acres	150m

5.11 Daytime Sound Pressure levels

93 Ten Acres

Unit 1	$L_2 = 61\text{dB} - 20 \times \log \left(\frac{270}{1} \right) = 12\text{dB}$
Unit 2	$L_2 = 59\text{dB} - 20 \times \log \left(\frac{190}{1} \right) = 13\text{dB}$
Unit 3	$L_2 = 59\text{dB} - 20 \times \log \left(\frac{130}{1} \right) = 17\text{dB}$
Unit 6	$L_2 = 66\text{dB} - 20 \times \log \left(\frac{150}{1} \right) = 22\text{dB}$

5.12 Nighttime Sound Pressure levels

93 Ten Acres

Unit 1	$L_2 = 45\text{dB} - 20 \times \log \left(\frac{270}{1} \right) = -4\text{dB}$
Unit 2	$L_2 = 44\text{dB} - 20 \times \log \left(\frac{190}{1} \right) = -2\text{dB}$
Unit 3	$L_2 = 44\text{dB} - 20 \times \log \left(\frac{130}{1} \right) = 2\text{dB}$
Unit 6	$L_2 = 53\text{dB} - 20 \times \log \left(\frac{150}{1} \right) = 9\text{dB}$

5.13 The calculated sound pressure is more than 5dB lower than both daytime and nighttime measured background noise from 'T2324-203 Lowry Park Baseline Noise Survey.

5.14 All measurements and noise levels calculated indicate, it will have no impact on any noise sensitive receptors therefore the POL 05 credit will be awarded.

By signature of the below, Andrew and Adrian hereby confirm that they have read and reviewed the report and have found it to:

1. Represent sound industry practice
2. Be appropriate given the building being assessed and scope of works proposed
3. Avoid invalid, biased and exaggerated recommendations.



Andrew Hunt



Adrian Popplewell

Appendices

A. These are the main noise indices in use in the UK.

- dB(A): The human ear does not hear all frequencies with the same intensity. It is most sensitive to sounds in the 500Hz-8kHz range. Above and below this range the ear becomes progressively less sensitive. To compensate for this, sound level meters incorporate electronic filtering to correspond with the varying sensitivity of the ear. This filtering is called A-weighting and Sound Pressure Levels obtained with this weighting are referred to as A-weighted and signified as dB(A).
- LA90: The sound level (in dBA) exceeded for 90% of the time. This unit gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background noise level" of an area.
- LAeq,T: The equivalent continuous sound pressure level over a period of time, T; (in dBA) This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the varying noise in question". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as road traffic, aircraft and trains.
- LA1: The sound pressure level (in dBA) exceeded for 1% of the time. This unit can give an indication of a regular maximum noise level from such activities as dance music.
- LAe: The sound exposure level, (previously denoted SEL) is the noise level of an event, such as a train or aircraft event, normally expressed in a 1 second time period.
- LAmin: The minimum sound pressure level (in dBA) measured over the time period.
- LAmax: The maximum level of sound (in dBA), i.e. the peak level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.
- LArT: sound rating level, the a-weighted, leq sound level of an industrial noise during a specified time period, adjusted for tonal character and impulsiveness.