

**Blackley Fire Station
Rochdale Road
Manchester**

BREEAM Acoustic
Commissioning Report
1520/BACR1

18 November 2025

For:

Jameson Acoustics Limited
Eden Point
Cheadle
Manchester
SK8 6RL



2nd Floor 3 Hardman Square
Spinningfields Manchester M3 3EB

☎ 0161 457 0515 ■ 07415 151 901
✉ Enquiry@LighthouseAcoustics.co.uk
🌐 www.LighthouseAcoustics.co.uk

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Registered Office: 2nd Floor 3 Hardman Square Spinningfields Manchester M3 3EB
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1.0 Introduction

A new build detached 2 storey Fire Station has been completed at Blackley.

The following subjects have been tested during the commissioning process:

- Sound insulation between internal spaces;
- Internal noise levels (due to external noise intrusion and building services noise);
- Room Acoustics;
- Atmospheric plant noise emissions.

This report summarises the acoustic commissioning undertaken at the development.

2.0 Sound Insulation

2.1 Requirements

Based on the requirements of BREEAM section Hea 05 a programme of pre-completion acoustic testing is required to demonstrate that the relevant spaces achieve the required performance standards.

Based on the requirements of BS 8233:2014, the table below presents the airborne sound insulation ratings to be achieved on site by partitions/floors between the spaces concerned.

Source room	Receive room	Sound insulation ratings ($D_{nT,w}$ dB) to be achieved on site
Study Room	Study Room	47
Study Room	Quiet Room	47
Quiet Room	Office	47
Study Room	Toilet	47
Kitchen/Dining	Gym	47
Kitchen/Dining	TV/Mess Room	N/A
Office	Gym	47
Study Room	Stairs	47
Office	Office	47
Office	Community/training room	47
Quiet Room	Community/training room	47
Study Room	Community/training room	47
Kitchen/Dining	Office	47
TV/Mess Room	Office	47
Locker Rooms	Gym	47

For floors, the impact sound insulation should not exceed $L'_{nT,w}$ 60dB in office spaces below.

2.2 Measurements

Measurements were undertaken on Tuesday 11 November 2025 between 16:00 and 19:00 hours. Measurements were undertaken in accordance with the testing and measurement procedures of BREEAM section Hea 05.

Measurements were undertaken by Robin Wood, Approved Tester No. 210/1, of Lighthouse Acoustics, ANC Registered Organisation No. 210 at the time of testing.

Measurements were undertaken across a selection of partitions and floors.

2.3 Equipment

The following equipment was used to undertake the acoustic measurements.

Equipment	Manufacturer	Model	Serial No.	Calibration Date
Class 1 Sound Level Meter	Bruel & Kjaer	2250	2626230	01/11/2024
Preamplifier	Bruel & Kjaer	ZC-0032	21309	01/11/2024
Microphone	Bruel & Kjaer	4189	2621208	04/11/2024
Class 1 Sound Calibrator	Casella	120/1	3864878	05/11/2025
Tapping Machine	Retec Instruments	RI 069	070306-4	15/05/2024
8" Active Loudspeaker with Vented Cabinet	Electro-Voice	Everse8	-	-

The sound level meter was calibrated prior to and on completion of the measurements and was found to be within acceptable tolerance limits.

2.4 Results

The measurement results for the airborne sound insulation tests are detailed in the table below.

Source Room	Receive Room	Separating Construction	Measured $D_{nT,w}$ (dB)	Required $D_{nT,w}$ (dB)	Pass/Fail
Study Rm Wh 10	Quiet Rm Wh 62	Plasterboard Partition	47	≥ 47	Pass
Study Rm Wh 10	Study Rm Wh 11	Plasterboard Partition	44	≥ 47	Fail
Gym Wh 09	Kitchen/Dining Wh 07	Plasterboard Partition	43	≥ 47	Fail
Gym Wh 09	Ambulance Office /Locker Rm Wh 71	Plasterboard Partition	47	≥ 47	Pass
Watch Manager Office Wh 05	Watch Rm Wh 03	Plasterboard Partition	44	≥ 47	Fail
TV/Mess Rm Wh 08	Watch Rm Wh 03	Concrete Floor	63	≥ 47	Pass

The measurement results for the impact sound insulation tests are detailed in the table below.

Source Room	Receive Room	Separating Construction	Measured $L'_{nT,w}$ (dB)	Required $L'_{nT,w}$ (dB)	Pass/Fail
Station Mgr Office Wh 06	Training & Community Rm Wh 61	Concrete Floor	42	≤ 60	Pass
TV/Mess Rm Wh 08	Watch Rm Wh 03	Concrete Floor	43	≤ 60	Pass

2.5 Discussion

Whilst the concrete floors achieved the required sound insulation performance requirements the plasterboard partitions fell short in three of the five walls tested.

Between Study Rm Wh 10 and Study Rm Wh 11 flanking paths were noted via the ceiling void.

Between Gym Wh 09 and Kitchen/Dining Wh 07 flanking paths were noted via the ceiling void. The Gym did not feature a suspended ceiling leaving steelwork exposed.

Between Watch Manager Office Wh 05 and Watch Rm Wh 03 no obvious flanking paths were noted.

2.6 Summary

Due to the shortfalls of the sound insulation requirements of BREEAM section Hea 05, the first credit available under Hea 05 is not achieved.

3.0 Indoor Ambient Noise Levels

3.1 Requirements

Based on the requirements of BREEAM section Hea 05 a programme of acoustic measurements is required to demonstrate that the relevant spaces achieve the required performance standards.

Based on the requirements of BS 8233:2014, the table below presents the criteria for noise intrusion from external sources and noise from mechanical and electrical services to be achieved within the spaces concerned.

Room Type	$L_{Aeq,T}$ Indoor Ambient Noise Level (dB)
Community/training room, Single Person Office	40
Study Room	40 (35 night)
Multi-Person Office, TV/Mess Room, Gym, Kitchen/Dining, Corridors	45
Locker Rooms, Fire Kit Rooms, Stairs	50

3.2 Measurements

Measurements were undertaken on Tuesday 11 November 2025 between 16:00 and 19:00 hours. Measurements were undertaken in accordance with the testing and measurement procedures of BREEAM section Hea 05.

Measurements were undertaken by Robin Wood, Approved Tester No. 210/1, of Lighthouse Acoustics, ANC Registered Organisation No. 210 at the time of testing.

All building services systems were understood to be operational at the design duties for the duration of the measurements and road traffic was flowing along the surrounding roads.

Measurements were undertaken in a selection of spaces.

3.3 Equipment

The following equipment was used to undertake the acoustic measurements.

Equipment	Manufacturer	Model	Serial No.	Calibration Date
Class 1 Sound Level Meter	Bruel & Kjaer	2250	2626230	01/11/2024
Preamplifier	Bruel & Kjaer	ZC-0032	21309	01/11/2024
Microphone	Bruel & Kjaer	4189	2621208	04/11/2024
Class 1 Sound Calibrator	Casella	120/1	3864878	05/11/2025

The sound level meter was calibrated prior to and on completion of the measurements and was found to be within acceptable tolerance limits.

3.4 Results

The measurement results are detailed in the table below.

Room	Measured $L_{Aeq,T}$ Indoor Ambient Noise Level (dB)	Required $L_{Aeq,T}$ Indoor Ambient Noise Level (dB)	Pass/Fail
Study Rm Wh 11	26	40/35	Pass
Quiet Rm Wh 62	32	40	Pass
Station Mgr Office Wh 06	35	40	Pass
Kitchen/Dining Wh 07	28	45	Pass
Ambulance Office /Locker Rm Wh 71	26	40	Pass
Watch Rm Wh 03	23	40	Pass
Training & Community Rm Wh 61	35	40	Pass
Personal Locker Rm Wh 41	48	50	Pass

3.5 Discussion

The indoor ambient noise level measurements achieved the required indoor ambient noise level requirements in all spaces tested

3.6 Summary

By achieving the indoor ambient noise level requirements of BREEAM section Hea 05, the second credit available under Hea 05 should be awarded.

4.0 Reverberation Times

Based on the requirements of BREEAM section Hea 05 a programme of acoustic measurements is required to demonstrate that the relevant spaces achieve the required performance standards.

Based on the requirements of BS 8233:2014, since the development does not feature any spaces used for speech or music, it is our understanding that it does not need to comply with the relevant reverberation requirements.

As such, the third credit available under Hea 05 should be awarded where the building complies with the indoor ambient noise level and sound insulation requirements.

5.0 Atmospheric Plant Noise Emissions

5.1 Requirements

Based on the requirements of BREEAM section Pol 05 the noise level from the proposed building services, as measured in the locality of the nearest or most exposed noise-sensitive development, must be at least 5dB lower than the background noise throughout the day and night.

Typical background sound levels measured during the environmental sound survey (see Noise Impact Assessment Report 22019-RP-2-R2 dated 15 May 2023 produced by Jameson Acoustics) are presented in the table below.

Receptor	Typical $L_{A90,T}$ Background Sound Levels (dB) at Nearest Noise Sensitive Receptors	
	Daytime (07:00–23:00 hours)	Night-Time (23:00–07:00 hours)
1	50	38

5.2 Measurements

The requirements of BREEAM section Pol 05 are for L_{Aeq} atmospheric plant noise emission levels to achieve 5dB below the typical L_{A90} background noise level at the nearest noise sensitive receptors.

Since it is not possible to demonstrate this by measurement of atmospheric plant noise emission levels at the nearest noise sensitive receptor, noise levels at 1m from the plant items will be used to calculate the cumulative atmospheric plant noise emission levels at the nearest noise sensitive receptor.

A visual inspection of the installed units was undertaken on Tuesday 11 November 2025. It was noted that the Condenser Unit and Heat Pumps were not all operating at the time of the visit (due to load requirements). As such, manufacturers noise data will be used for these items.

5.3 Results

The manufacturers plant noise emission levels for the installed units are presented in the table below.

Plant Item	Location	L_{Aeq} Sound Pressure Level at 1m (dB)
Condenser Unit Mitsubishi PUZ-ZM71VHA2	External Plant Compound	49
Heat Pump Mitsubishi CAHV-R450YA-HPB		64*
Heat Pump Mitsubishi CAHV-R450YA-HPB		64*

* COP Priority Mode

A review of the octave band noise data for the above manufacturers plant noise emission levels indicates that they are unlikely to be considered to emit tonal noise.

It is understood that the 2No. Mitsubishi CAHV-R450YA-HPB units operate on a N+1 basis so only 1No. unit will operate at any one time.

5.4 Assessment

5.4.1 Operating Hours

It is understood that the installed building services have the potential to operate 24 hours a day.

It is understood that the 2No. Mitsubishi CAHV-R450YA-HPB units operate on a N+1 basis so only 1No. unit will operate at any one time.

In order to undertake a worst case assessment, it is assumed that the installed building services will operate for the full duration of the daytime and night-time assessment periods.

5.4.2 Nearest Noise Sensitive Receptor

It is understood that the nearest affected noise sensitive receptor is the existing residential property situated to the north of the site on Rochdale Road.

The distance between the installed building services and the nearest affected noise sensitive receptor is approximately 40m.

5.4.3 Screening Attenuation

A worst case assessment will be undertaken assuming no screening attenuation between the installed building services and the nearest affected noise sensitive receptors.

5.4.4 Calculation

The assessment has been undertaken in accordance with generally accepted acoustic principles for building services plant items.

The table below details the calculated cumulative L_{Aeq} atmospheric plant sound emission levels at the nearest affected noise sensitive receptor based on the manufacturers L_{Aeq} levels at 1m along with the typical daytime and night-time background noise levels and the differences between them.

Receptor to the north

Period	Cumulative L_{Aeq} Atmospheric Plant Sound Emission Level (dB)	Typical Background Sound Level $L_{A90,T}$ at Receptor (dB)	Difference (dB)	BREEAM Pol 05 Requirement Achieved
Daytime	32	50	-18	Yes
Night-time	32	38	-6	Yes

5.5 Discussion

The calculated cumulative L_{Aeq} atmospheric plant sound emission level at the nearest affected noise sensitive receptor is 18dB and 6dB below the typical daytime and night-time background sound levels respectively.

The assessment therefore indicates that the installed building services are likely to achieve the daytime and night-time requirements at the nearest affected noise sensitive receptors.

5.6 Summary

By achieving the requirements of BREEAM section Pol 05 the single credit available under Pol 05 should be awarded.

