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PROJECT TECHNICAL MEMORANDUM

JOB TITLE : Ashbrook Point
REF : HT: 29207/PTM3
DATE : 1 May 2024
FROM : George Grenfell
ISSUED TO : David Broad

RE: ASHBROOK POINT CONDITION 27 AND 28 VERIFICATION REPORT

1.0 Introduction

The new build industrial site at Ashbrook point has been granted planning permission, subject to a number of conditions. Of these conditions 27 and 28 relate to noise. The wording of these conditions is as follows:

“27: a. Before any use hereby approved commences, the premises shall be acoustically insulated and treated to limit the breakout of noise in accordance with the submitted noise impact assessment report listed in condition 2.

b. Prior to the first use of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements. Approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. A verification report and measures shall be agreed until such a time as the development complies with part (a) of this planning condition.”

28: a. Before first occupation of the development the building, together with any externally mounted ancillary equipment, shall be acoustically insulated in accordance with the submitted noise impact assessment listed in condition 2 in order to secure a reduction in the level of noise emanating from the equipment.



b. Prior to the first use of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition.

Based on the wording of the conditions this Technical Memo presents measured data for façade sound insulation and extract fan noise. This data is then used to inform the subsequent assessments of operational breakout noise and plant noise emissions on the nearest noise sensitive receptors, for the discharge of condition 27b and 28b respectively.

2.0 Site Description

The proposed development is to be located on a currently unused plot of the at the end of Longstone Road, Heald Green, Manchester. The site lies to the northeast of Manchester Airport and falls under the jurisdiction of Manchester City Council.

The site location shown in relation to the wider area is shown in the site plan below.

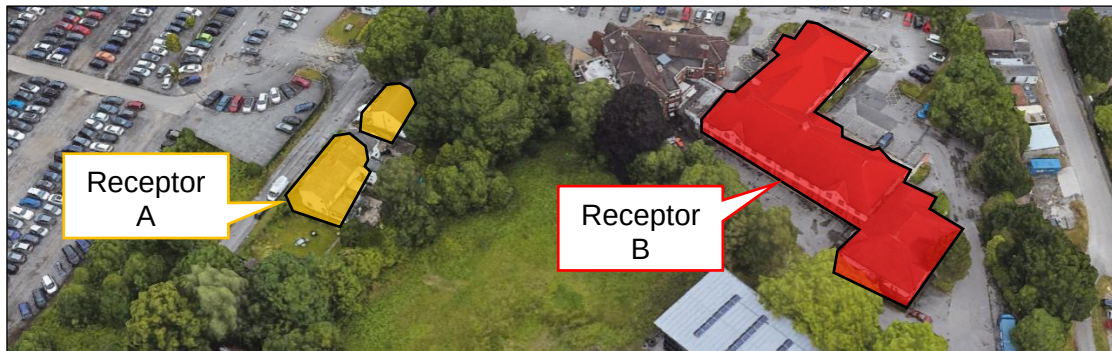


Site Location (© maps.google.co.uk)

The site is located approximately 1500m to the north east of Manchester Airport and the wider surrounding area has numerous surface car parks associated with the Airport.

The immediate surrounding area consists of residential premises located along Irvin Drive and a Premier Inn located to the north east of the site. A pub, the Heald Green Beefeater, is located to the north of the site with a gym located to the east of the site. The south of the site contains existing commercial units.

The nearest noise sensitive premises are the residential premises on Irvin Drive and the Premier Inn as indicated in the following plan:



The detailed methodology and results from the baseline noise survey are presented in Appendix A.

3.0 Discussion of Noise Climate

Due to the nature of the survey (ie unattended) it is not possible to establish the specific noise sources over the whole duration of the survey. However, based on the on-site observations the dominant noise sources affecting the site are frequent aircraft flyovers. To a lesser extent birdsong and existing plant noise associated with the adjacent gym affecting the manned measurements.

From analysis of the measured noise levels we consider that the background noise level at the most affected receptors could be up to 3 dB lower than the typical background noise levels measured in Position A.

Therefore, to provide a robust assessment a 3 dB correction has been applied to the typical background noise levels measured in Position A to estimate the free-field background noise level at the most affected receptor in the table below:

Period	Calculated Typical Background Noise Level, L_{A90} (dB)
Daytime (07:00-23:00)	45 dBA
Night-time (23:00-07:00)	36 dBA

4.0 Noise Emission Limits

Based on the aforementioned acoustic standards and Local Authority guidance, and on the results of our noise survey, the following noise emission criteria are proposed to be achieved at 1 m from the worst affected noise sensitive residential window. These limits are presented as façade noise levels (ie include a +3 dB correction for the presence of a building façade as would be present at the assessment location).



Period	Cumulative Noise Emission Limit (BS 4142:2014 Rating Level)
Daytime (07:00-23:00)	43 dBA
Night-time (23:00-07:00)	34 dBA

The above limits should be achieved with all industrial units operating simultaneously including all fixed building services plant and site operations. As more than one industrial is proposed the noise emission limit imposed on each individual unit would be lower than the limits set out above.

Based on the above, the table overleaf provides suggested apportioned limits for each unit based on its location and respective distance to each off-site receptor, as well as with consideration to the unit sizes. These suggested limits are based on achieving the cumulative noise emission limit set out above when all units are in operation without imposing undue restrictions on any specific unit.

As the design progresses, and more information is known on future tenants and their respective operations, noise egress shall be assessed in accordance with BS 4142: 2014 with corrections made for any attention catching characteristics. This could be secured through a sensibly worded condition.

Receptor	Unit	Noise Emission Limit Per Unit (BS 4142:2014 Rating Level)	
		Day	Night
A	1	39	31
	2	37	29
	3	33	25
	4	38	30
B	1	38	30
	2	38	30
	3	38	30
	4	34	26

5.0 Condition 27b (Operational Noise Assessment)

5.1 Overview

To inform the assessment of operational noise breakout of the new units, a series of façade sound insulation tests were undertaken by George Grenfell (MSc, BSc (Hons), AMIOA) on 25 April 2024.



The facade testing was carried out using an internal loudspeaker playing pink noise and measuring the noise levels either side of the façade (ie both internally and externally). The speaker was turned off and the external noise level remeasured. This allowed the measurements to be corrected for any extraneous noise.

5.2 Façade Sound Insulation Testing

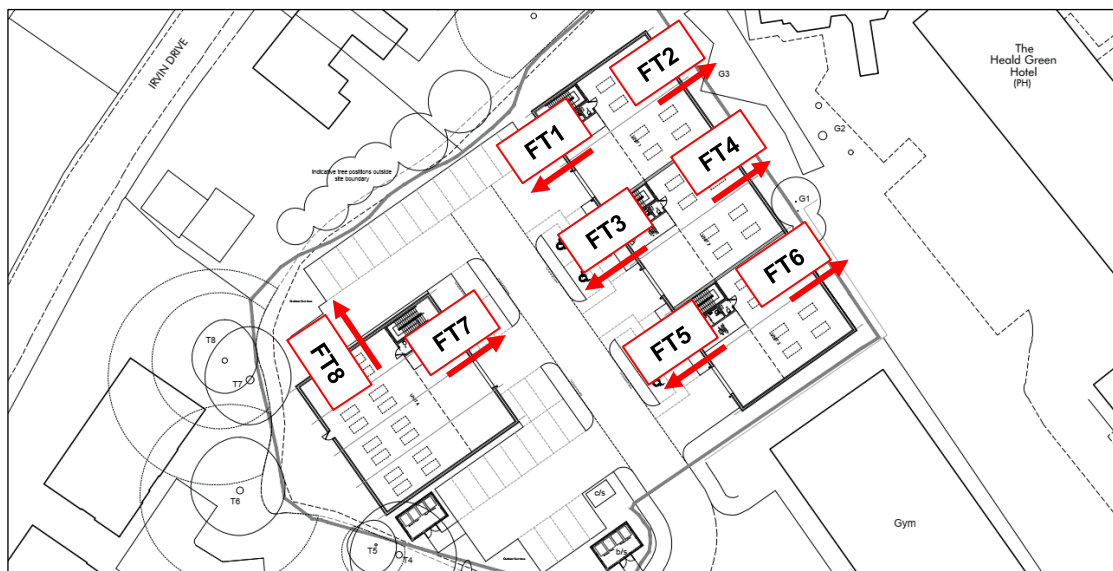
5.2.1 Equipment

The following equipment was used for the testing.

Equipment	Model	Serial Number	Calibration Date	Certificate No
Precision Sound Analyser Meter	Brüel & Kjær Type 2250	3007292	25/01/2024	06593/1
Sound Level Calibrator	Brüel & Kjær Type 4231	2271905	05/09/2023	05505/1
Sound Source	dB Technologies Opera Live 205	L188 000610	N/A	N/A

5.2.2 Test Locations

The locations where sound insulation tests were undertaken across existing facades, are highlighted in the markup below:





5.2.3 Results

The measured airborne sound insulation performance of existing façades is as presented in the table below:

Description	Distance From Façade (m)	Measured Level Difference (dB D) at Octave Band Centre Frequency (Hz)								D _w
		63	125	250	500	1000	2000	4000	8000	
FT1	10	18	32	32	34	33	36	44	44	36
FT2	1	17	23	23	25	22	26	24	24	25
FT3	10	24	27	34	35	36	39	48	45	38
FT4	1	20	19	21	26	25	29	29	30	28
FT5	10	22	27	33	33	31	37	46	40	35
FT6	1	19	20	23	27	25	37	40	40	25
FT7	10	22	28	33	31	34	35	39	35	35
FT8	6.5	22	30	33	33	31	40	39	33	36

5.3 Assessment

5.3.1 Internal Noise Levels

The noise impact assessment submitted for planning (29207-RP1-NIA-Rev2-JLS) stipulated that internal reverberant noise levels are unlikely to exceed 75 dB L_{Aeq,1hr} within these unit types. Subsequently, to inform this assessment a broadband pink noise level of 75 dB L_{Aeq} was generated with a loudspeaker in the finished shell unit during the commissioning visit on 25 April 2024, the measured noise spectrum is provided in the table below:

Approximate Internal Operational Noise Level (Hz) L _{Aeq,1hr} dB								
63	125	250	500	1000	2000	4000	8000	dBA
65	79	74	72	71	66	60	46	75

5.3.2 Operational Noise Transfer

Based on the predicted internal noise level and measured façade sound insulation performance, we have assessed the operational noise output to the nearest noise sensitive receptors from each of the industrial units.

The results from each of the units are provided below, along with the respective limits as shown in Section 4.0.



Receptor	Unit	Predicted Operational Noise Levels at Nearest Noise Sensitive Receptors $L_{A,r,tr}$ (BS 4142:2014 Rating Level)	Noise Emission Limit Per Unit $L_{A,r,tr}$ (BS 4142:2014 Rating Level)	
			Day	Night
A	1	28	39	31
	2	22	37	29
	3	21	33	25
	4	24	38	30
B	1	30	38	30
	2	28	38	30
	3	27	38	30
	4	12	34	26

5.3.3 Discussion of Results

Based on the provided data, the predicted operational noise levels at the nearest noise-sensitive receptors for both Receptor A and B are within the prescribed limits and subsequently compliant with Condition 27b. This is determined by considering the measured performance of the facade sound insulation and the predicted maximum internal noise levels of the units.

However, it's important to note that no BS 4142 penalties have been applied in this assessment. The reason being, the exact usage of the units and how the tenants will fit them out is uncertain. If tenants intend to operate in a manner that creates distinctly tonal, impulsive, or intermittent noise, they may need to mitigate this appropriately. This could possibly be achieved through a suitable site management plan, but it may also require specific mitigation measures to be implemented during the fit-out process.

To Summarise, while the current noise egress levels are within acceptable limits, future operations could necessitate additional noise control measures depending on the final use of the units.

5.4 Delivery Noise

In Section 10.3 of the Noise Impact Assessment issued for Planning (29207-RP1-NIA-Rev2-JLS) it was stipulated that a 3.5m barrier is required along the rear site boundary to completely screen the loading bay of Unit 3 from the upper most window associated with the properties on Irvin Drive.

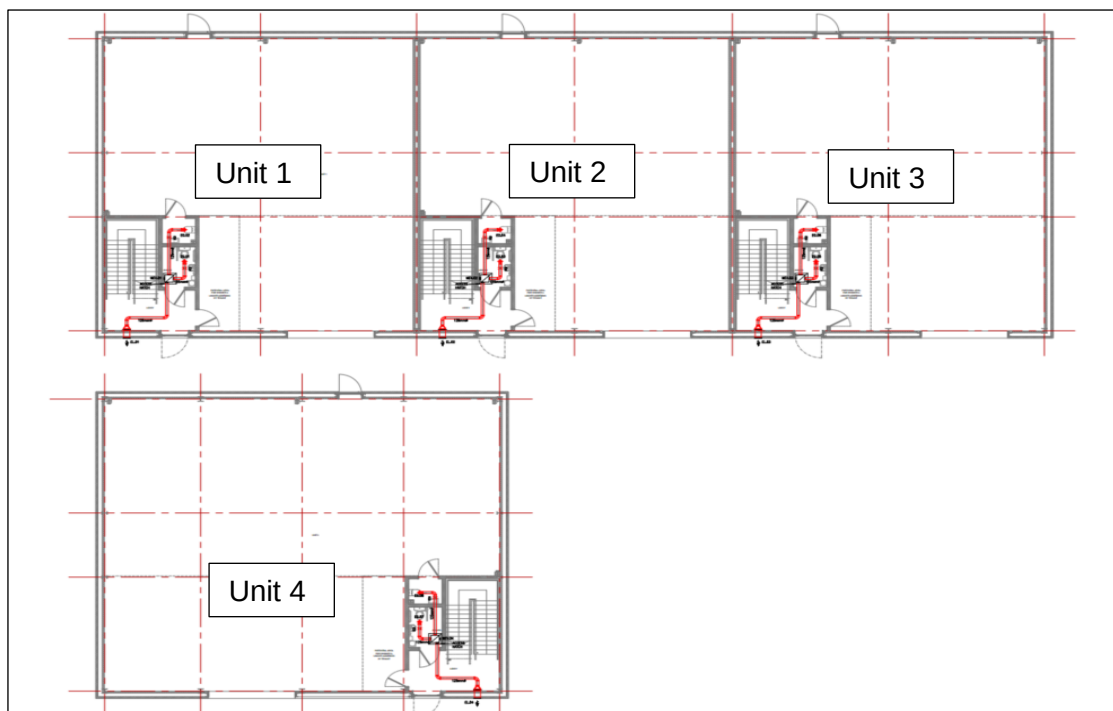


Onsite inspections confirm that the barrier has been installed to the correct specification, (imperforate with a minimum surface mass of 10 kg/m²) and so should effectively mitigate delivery noise egress to within the operational noise limits provided in Section 4.0.

6.0 Condition 28b

6.1 Plant Installation

The installed toilet extract fan locations are as shown in the following plan:



Each of the units are Lo-Carbon MVDC-MS/MSH Multivent by Vent Axia. These units have fully adjustable speed settings and the manufacturer noise levels for these units are provided in the following table:

Speed Percentage	Sound Pressure Level at 3m
20 (minimum)	21
40	29
60	40
80	45
100 (Maximum)	52



6.2 Test Locations

Each measurement of the extract fans was taken at a distance of 2m from the respective building façade and a height of approximately 1.5m. Measurements were taken of the fans at design duty and turned off to correct for background noise levels.

6.3 Measurement Results

While on site, the extract fans were noted to be running at design duty. The measured results can be seen in the table below.

Location	Plant Item Measured	Measurement Duration	L _{Aeq}	L _{A90}
Unit 1 at 2m	TEF	30 Seconds	48	45
	Background Noise	30 Seconds	47	45
Unit 2 at 2m	TEF	30 Seconds	44	41
	Background Noise	30 Seconds	49	45
Unit 3 at 2m	TEF	30 Seconds	46	41
	Background Noise	30 Seconds	44	42
Unit 4 at 2m	TEF	30 Seconds	46	45
	Background Noise	30 Seconds	44	41

During the measurement process, it was observed that the noise emissions from the toilet extraction fans were largely indistinguishable from the ambient noise levels. This observation is consistent with the data presented in the table above, which shows recorded fan noise levels were similar to background noise levels.

For unit 2, as the background noise level is louder than the source noise level, it is not possible to accurately quantify the noise emissions from the fans. However, given that the fan noise was near inaudible at the measurement location, it has pessimistically been assumed that background noise levels are equal in level, resulting in a -3dB correction for this unit. All background corrected fan noise levels are provided in the following table.

Location	Plant Item Measured	Measurement Duration	L _{Aeq,1hr} dB
Unit 1 at 2m	TEF corrected for background noise.	30 Seconds	41
Unit 2 at 2m		30 Seconds	41
Unit 3 at 2m		30 Seconds	41
Unit 4 at 2m		30 Seconds	42



The noise levels in the previous table have been used to inform the following assessment of plant noise emissions at each receptor. It has been assumed that Toilet extract fans may run continuously over any given 1hr/15min daytime/night-time assessment period.

6.4 Receptor A Assessment

The impact of the current plant on receptor A is detailed in the following table:

Description	Unit 1 TEF	Unit 2 TEF	Unit 3 TEF	Unit 4 TEF
Noise Level at 2m L_{Aeq} dB	41	41	41	42
Distance to Receptor A m	18	33	45	47
Distance Loss Correction dB	-19	-24	-27	-28
Screening Loss dB	-5	-7	-6	-10
BS4142 Corrections	0	0	0	0
Predicted Rating Level at receptor A $L_{A,r,tr}$ dB	17	10	8	4
Cumulative Rating Level at Receptor A $L_{A,r,tr}$ dB	18			
Daytime / Night-time Criteria $L_{A,r,tr}$	43 / 34			
Compliance Note	✓/✓			

6.5 Receptor B Assessment

The impact of the current plant on receptor B is detailed in the following table:

Description	Unit 1 TEF	Unit 2 TEF	Unit 3 TEF	Unit 4 TEF
Noise Level at 2m L_{Aeq} dB	41	41	41	42
Distance to Receptor B m	45	45	45	85
Distance Loss Correction dB	-27	-27	-27	-32
Screening Loss dB	-10	-10	-10	-10
BS4142 Corrections	0	0	0	0
Predicted Rating Level at receptor A $L_{A,r,tr}$ dB	4	4	4	0



Description	Unit 1 TEF	Unit 2 TEF	Unit 3 TEF	Unit 4 TEF
Cumulative Rating Level at Receptor A $L_{A, tr}$ dB	9			
Daytime / Night-time Criteria $L_{A, tr}$	43 / 34			
Compliance Note	✓/✓			

6.6 Discussion of Results

During our time on site, the operating plant items were barely audible at the nearest site boundary and are not expected to be audible at each of the receptors. The numerical assessment based on measured source noise levels indicate that plant noise emission limits should be significantly below background noise levels at the nearest receptor during the hours of operation. As such, the scheme demonstrates compliance with Condition 28b compliance.

Yours sincerely

George Grenfell
for HANN TUCKER ASSOCIATES



Appendix A – Baseline Noise Survey

A1 Baseline Noise Survey

A1.1 Procedure

Unattended noise monitoring was undertaken from 13:00 hours on Friday 10 September 2021 to 16:00 hours on Monday 13 September 2021 to establish the prevailing noise climate over typical weekday and weekend periods.

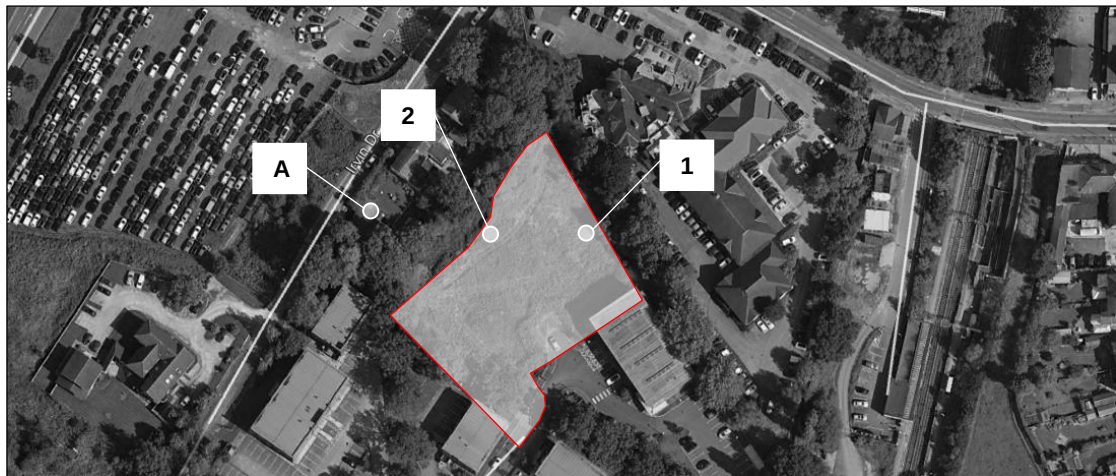
Supplementary manned measurements were obtained on Friday 10 September 2021 and Monday 13 September 2021 to establish how the noise levels vary across the wider site.

All measurements undertaken obtained the L_{90} , L_{01} , L_{eq} and L_{Fmax} sound pressure levels over discrete 15 minute periods. Measurements were undertaken in general accordance with BS 7445-1:2003 Description and Measurement of Environmental Noise.

A1.2 Measurement Positions

Unattended noise measurements were undertaken at the nearest noise sensitive receptor. The measurement locations are as illustrated in the table/figure below.

Position	Description
A	Unattended monitoring located on Irvin Drive. The microphone was located approximately 3m above local ground level at least 3m from any other reflective surface. The noise levels measured in this location are free-field noise levels.
1	Attended measurement position chosen to be representative of the south side of the Premier Inn. The microphone was mounted on a tripod at least 1.5m above local ground level and at least 3m from any other reflective surface. The noise levels measured in this location are free-field noise levels.
2	Attended measurement position chosen to be representative of the east side of the premises on Irvin Drive. The microphone was mounted on a tripod at least 1.5m above local ground level and at least 3m from any other reflective surface. The noise levels measured in this location are free-field noise levels.



Site Location showing measurement positions (© maps.google.co.uk)

A1.3 Instrumentation

The instrumentation used during the survey is presented in the table below.

Position	Description	Manufacturer	Type	Serial Number	Calibration
A	Sound Level Meter	Larson Davis	LxT	4086	15/07/2021
1&2	Sound Level Meter	Larson Davis	LxT	5104	15/07/2021
All	Calibrator	Larson Davis	CAL200	3083	06/05/2021

The sound level meters were mounted on a tripod with the microphone fitted with a windshield. All equipment was calibrated prior to and on completion of the survey. No significant deviations occurred (no more than 0.3 dB).

A1.4 Weather Conditions

For the unattended survey between 10 September 2021 and 13 September 2021, local weather reports indicated no notable periods of prolonged or heavy rainfall, with temperatures ranging from 13 °C (night) 21 °C (day).

During our time on site to undertake the manned surveys, skies were overcast with patchy cloud cover, wind conditions were calm and road surfaces were largely dry.

Weather conditions were deemed suitable for obtaining representative noise readings.

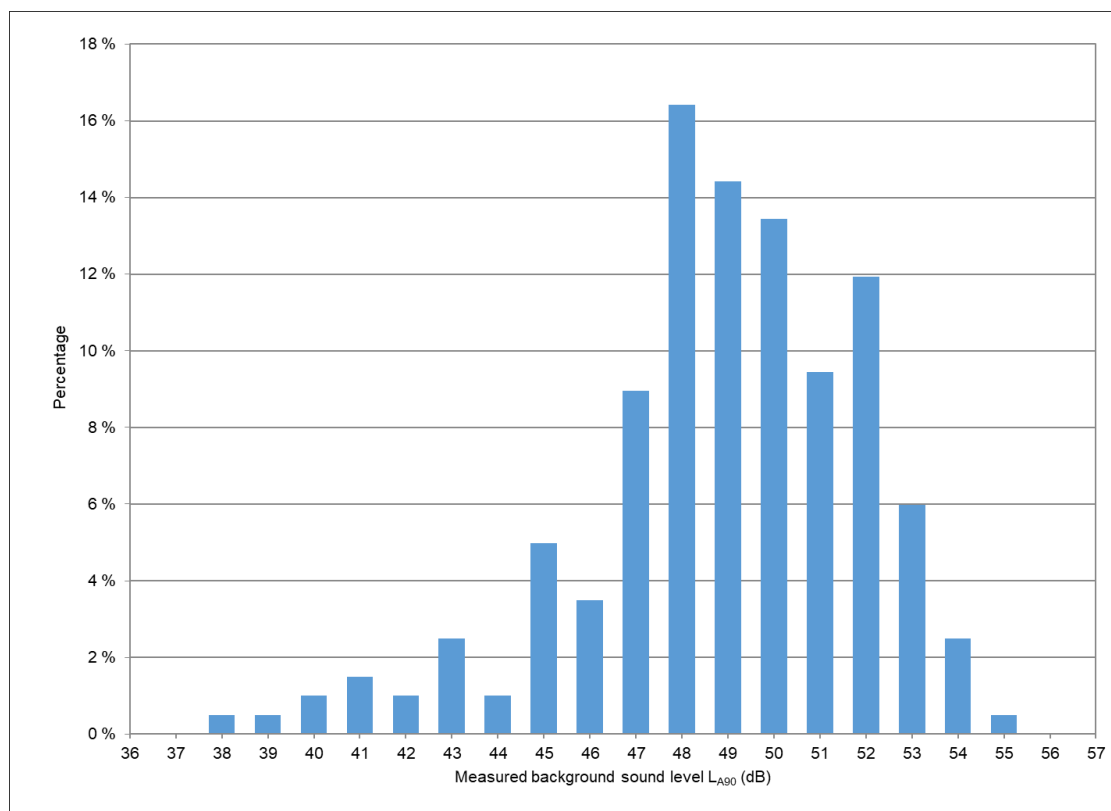


A2 Measurement Results

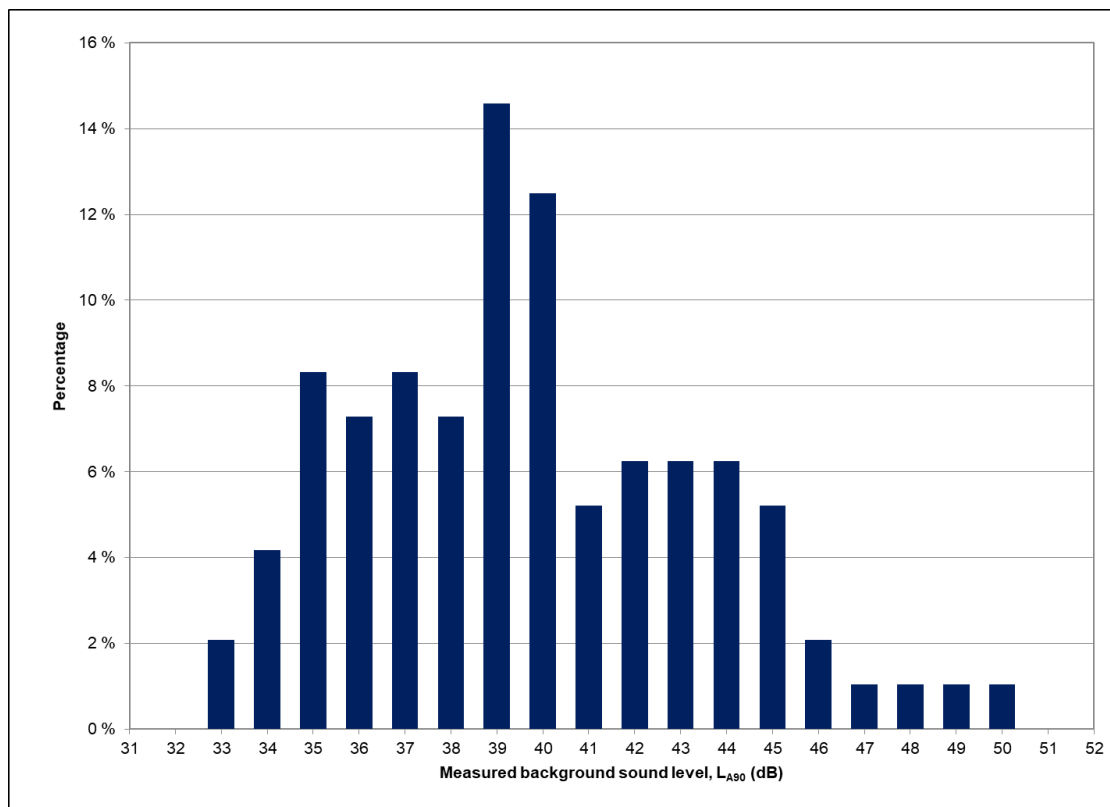
A2.1 Unattended Results

The results of the unattended noise survey have been plotted on Time History Graph 29207/TH1. This graph presents the 15 minute A-weighted L_{90} , L_{eq} and L_{max} levels throughout the duration of the survey.

BS 4142 states that “the background sound level must be reliable and suitably represent 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.” Taking this into account, the following histograms have been created which display the occurrence of each sound level (L_{90}) as a percentage for the day and night-time periods.



[MP1] Statistical analysis of daytime background noise levels (07:00-23:00)



[MP1] Statistical analysis of night-time background noise levels (07:00-23:00)

A summary of the results from the environmental noise survey, as used to inform subsequent assessments of environmental noise impact, are presented in the table below as free-field levels.

Pos	Daytime (07:00 – 23:00 hrs)				Night-time (23:00 – 07:00 hrs)			
	$L_{Aeq,16h}$	Typical $L_{A90,15min}$	$L_{AFmax,15min}$	$L_{A01,15min}$	$L_{Aeq,8h}$	Typical $L_{A90,15min}$	$L_{AFmax,15min}$	$L_{A01,15min}$
A	68	48	90 – 97 ¹	85 – 87 ¹	64	39	88 – 92 ¹	75 – 85 ¹

¹ L_{AFmax} and L_{A01} noise levels given as a range from the 10th highest in the period to the absolute highest.

A2.2 Attended Results

The following table summarises noise levels recorded at each of the manned measurement positions and also the noise levels measured in the unattended measurement location during the same time period.



Position	Date	Period	Sound Pressure Level (dB)			
			L _{Aeq,T}	L _{A90,T}	L _{Amax,T}	L _{A01}
1	10/09/2021	13:15 – 13:30	64	49	88	72
	13/09/2021	15:15 – 15:30	66	47	85	81
2	10/09/2021	13:30 – 14:00	66	46	85	81
	13/09/2021	15:30 – 15:45	67	46	87	83
A	10/09/2021	13:15 – 13:30	72	50	95	86
		13:30 – 14:00	70	49	90	86
	13/09/2021	15:15 – 15:30	68	49	89	82
		15:30 – 15:45	67	49	88	82