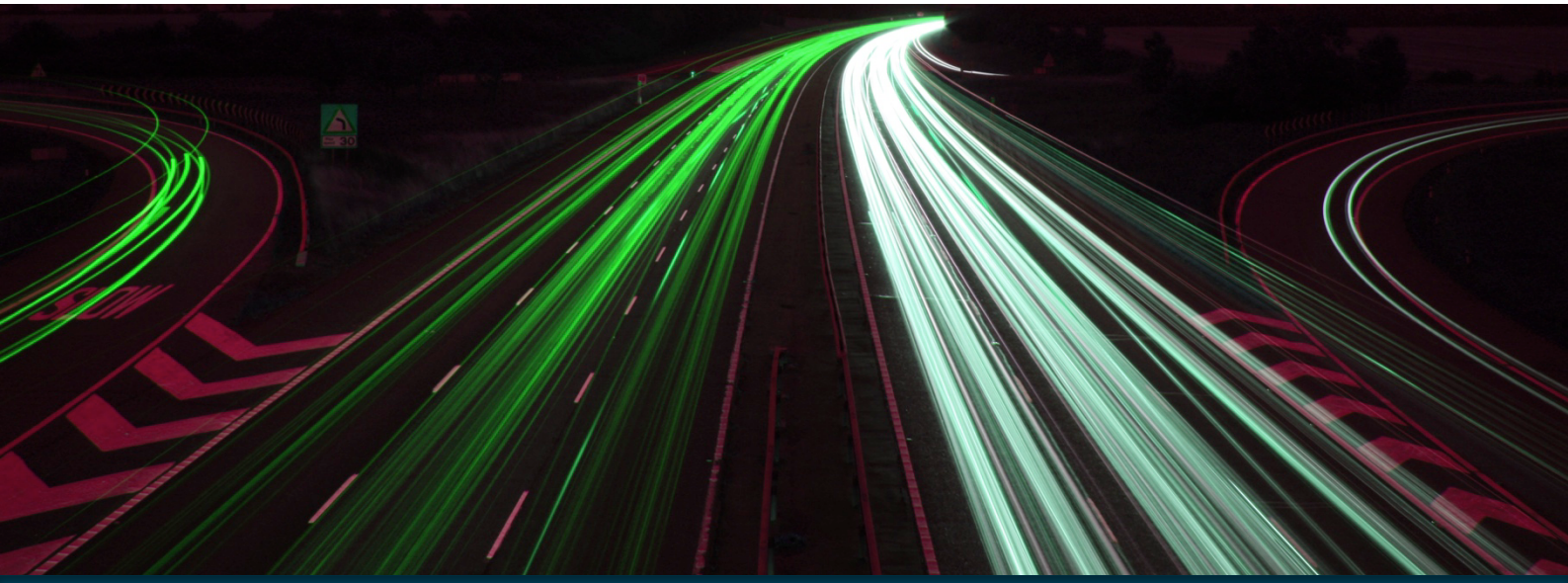


Post Noise Impact Assessment

Report: 4789 -R1 – Unit 3 Nanny Marr Road, Darfield, Barnsley S73 9AB
Client: Urbana

Northern Office: The Old Vicarage,
Barcroft Lane, Haywood DN6 0DS

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Report Revisions	*Date*		
4789-R1	24/10/2022	Initial Report	
	Produced by:	*Checked by:*	*Authorised by:*
Name:	Steve Clow MIOA	Steve McKeever AMIOA	Steve Clow MIOA

Steve Clow MIOA, is a member of The Institute of Acoustics and has achieved the IOA Diploma in Acoustics and Noise Control. Steve Clow has over 20 years experience in an acoustic consultant capacity working on many assessments involving planning and regulatory services.

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1. Introduction

Clover Acoustics Ltd has been commissioned by Urbana to undertake a BS4142 noise assessment of a proposed plant area to be installed to service a proposed take away at Unit 3, Nanny Marr Road, Darfield, Barnsley, S73 9AB. The purpose of the assessment is to assess the potential noise impact of the proposed plant on nearby residential dwellings.

A baseline noise survey has been carried out over a representative period in order to establish the existing background noise levels. The background survey was conducted at one monitoring location covering a typical operational period on Saturday 22nd October 2022.

The purpose of this report is to demonstrate that due consideration for noise affecting neighboring residential properties has been made and to assess the significance of noise impact from the operation of equipment.

2. Scope

BS4142:2014 Methods for rating and assessing industrial and commercial sound.
BS4142 gives a method for rating sound from industrial and commercial sources affecting people inside or outside dwellings or premises used for residential purposes. An initial estimate of the significance of the sound from the industrial/commercial nature can be assessed by subtracting the measured background noise level from the rating level (this is the specific sound level of the source with any corrections or penalties for distinctive acoustic characteristics). 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 source will have an adverse impact or 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.

3. Site Description

The proposal is for to allow for new condenser and kitchen extract to service a proposed takeaway at Nanny Marr Road, Darfield. The proposed installation will be located to the rear of the building opposite a new build residential area. It was noted that the adjacent unit has a Mitsubishi FDC250VSA unit installed to the rear to support the bakery/sandwich business which is not yet commissioned and was not running during the survey.

Background sound measurements of the existing noise climate were taken prior to the specification of the equipment. Subjectively, the background noise was dominated by road traffic noise from surrounding area. It is assumed for the purpose of this assessment that both the extract and condenser would be running during the assumed operational hours of 12:00 - 00:00 with just the condenser unit running outside of these hours. It is assumed that the extract would be above the height of the existing fence and would not benefit from screening attenuation. Attenuation in respect of a ground mounted condenser has been considered.

- The receivers to the proposed condenser and extract installation on the eastern elevation of the unit are identified as ’26 Nanny Marr Crescent’ approximately 18 meters from the installation.

Figure 1 shows the site location and background monitoring location.



Figure 1 – Site layout with background monitoring location

4. Survey Information

Measurement Instrumentation

The measurement instrumentation used on the survey was as follows:

Equipment	Manufacturer & Type	Serial Number	Calibration Certificate
Sound Level Meter	Norsonic 118	28952	21/1166
Acoustic Calibrator	Norsonic 1251	32856	22/1230

The equipment was calibrated to comply with section 4.2 of BS7445:1-2003 before and after the surveys. The calibration was as follows:

Meter	Serial	Before		After	
Norsonic 118	28952	114.1	-26.3	114.1	-26.3

Measurements & Timescales

During the background survey measurements were made during a typical 24-hour period commencing on Saturday 22nd October 2022 at locations representative of the nearest sensitive receivers.

The following measurements are reported: $L_{Aeq,T}$, $L_{A90,T}$, $L_{Amax,T}$

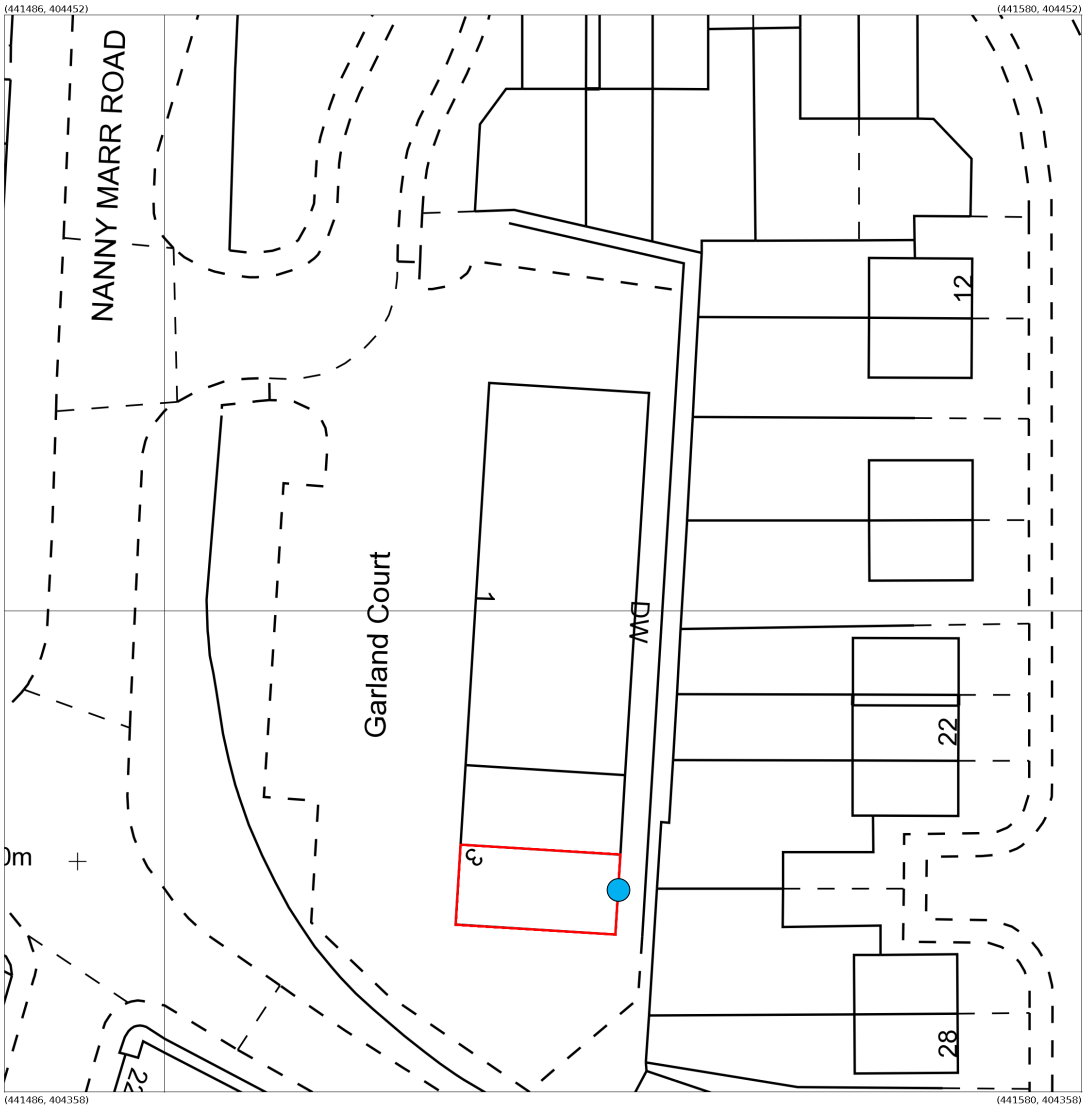
The measurements and their interpretation shall be in accordance with BS 7445: Parts 1 and 2. All sound pressure levels are in dB (re 20µPa).

Meteorology

Temperature was recorded at 11-16°C with no precipitation during the measurement period.

Position of Monitoring Equipment

The equipment was mounted free field. Figure 3 shows the site location plan with the location of the installations.



Produced 26 Oct 2022 from the Ordnance Survey MasterMap(Topography)Database and incorporating surveyed revision available at this date.

The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

Version 1.0 Unversioned directory PNG

Metres
0 4 8 12 16 20
1:500

15, Nanny Marr Rd, Darfie
S73 9AB

Supplied by: Stanfords 26 Oct 2022
© Crown copyright and database rights 2022 OS 100035409
Reference: OI1568152
Centre coordinates: 441533 404405

Figure 2 – Site Location Plan

Proposed Installation

5. Survey Results

Background Noise Summary

Site: Unit 3, Nanny Marr Road, Darfield, Barnsley, S73 9AB
Table 1a: Background Summary - Position
Report: 4789 Start Date: 22/10/2022 End Date: 23/10/2022

Hourly Summary			
Hour Start	LAeq,1hr	Ave LA90,1hr	LAMax,1hr
07:00	48.0	39.8	67.4
08:00	49.5	42.3	69.3
09:00	51.0	44.9	72.4
10:00	51.2	44.9	72.1
11:00	51.0	44.7	69.5
12:00	51.2	44.0	77.7
13:00	50.4	43.9	67.2
14:00	49.6	43.3	70.8
15:00	49.4	41.7	73.8
16:00	47.8	41.6	64.9
17:00	49.6	41.8	67.8
18:00	49.2	41.2	71.6
19:00	46.4	39.1	71.6
20:00	44.7	37.7	65.9
21:00	45.8	37.6	70.3
22:00	42.7	36.6	66.7
23:00	40.5	35.1	60.5
00:00	42.0	33.5	66.9
01:00	42.8	33.4	71.5
02:00	38.1	33.6	56.7
03:00	41.5	36.3	59.1
04:00	43.1	36.1	65.6
05:00	43.7	35.6	62.5
06:00	47.5	37.9	73.3

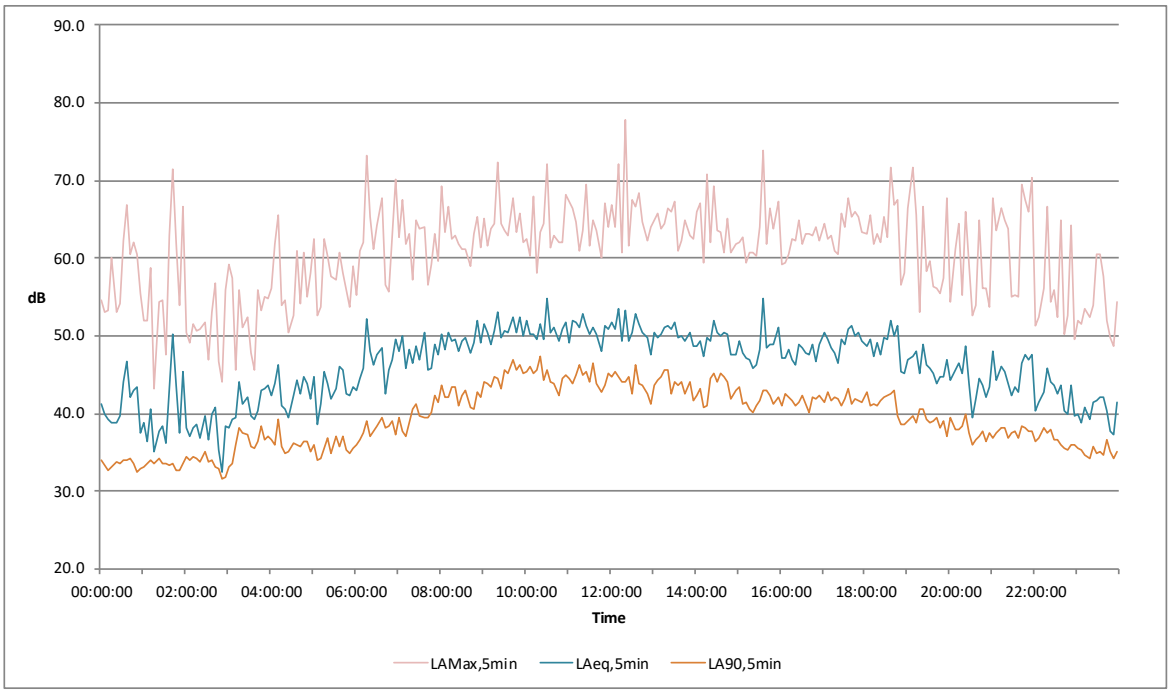


Table 1 – Monitoring Position 1

Site: Unit 3, Nanny Marr Road, Darfield, Barnsley, S73 9AB
Table 1b: Daytime Background LA90 Summary - Position
Report: 4789 Start Date: 22/10/2022 End Date: 23/10/2022

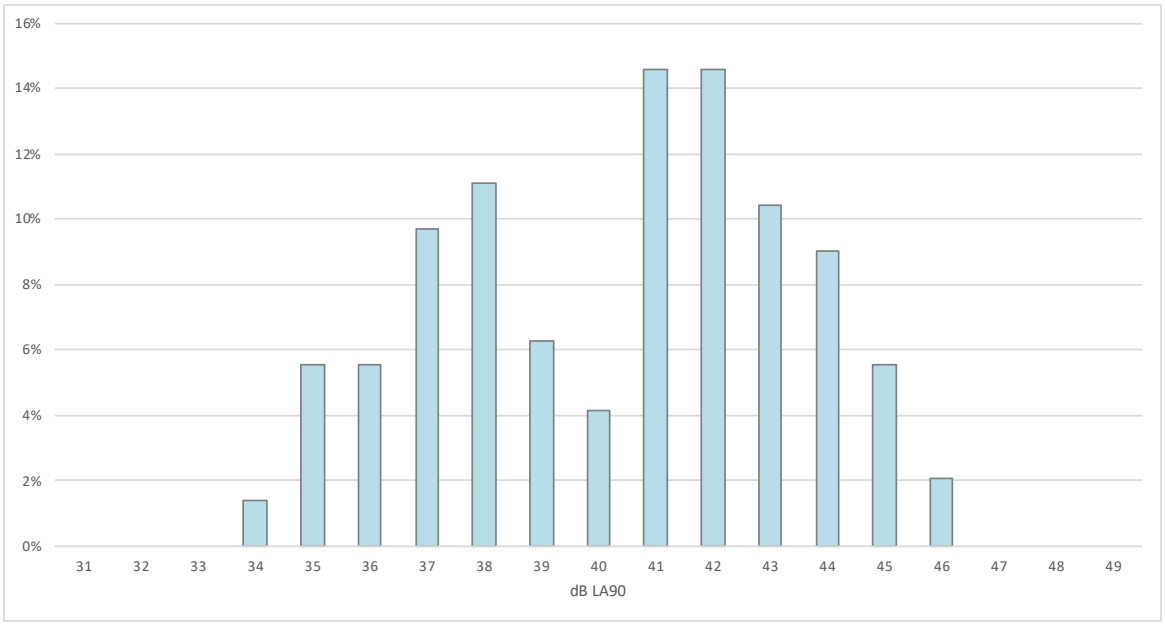


Table 2B – Daytime LA90 Summary

Site: Unit 3, Nanny Marr Road, Darfield, Barnsley, S73 9AB
Table 1c: Night-time Background LA90 Summary - Position
Report: 4789 Start Date: 22/10/2022 End Date: 23/10/2022

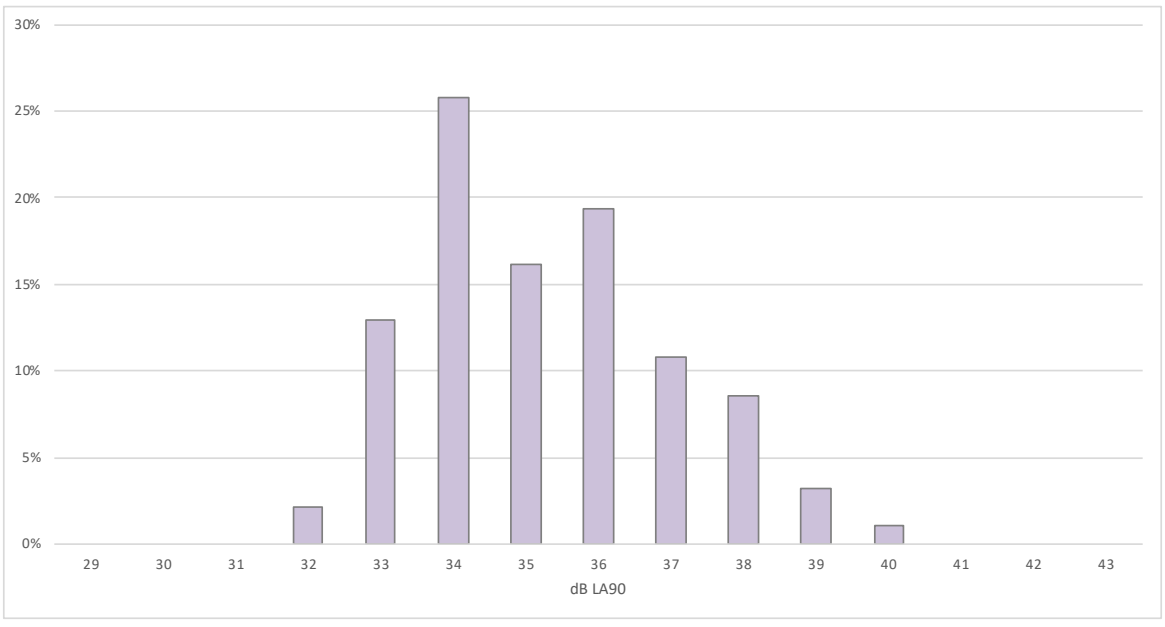


Table 3C – Night-time LA90 Summary

6. Noise Assessment

BS4142:2014 – Methods for rating and assessing industrial and commercial sound

Noise Source Description

The proposal is to install a condenser and extract to the eastern elevation of unit 3. As the proposed equipment is a not yet specified this report seeks to establish a noise emissions limit to ensure that there is no significant impact at the nearest receivers.

- The assessment location for the proposed installation on the eastern elevation of the unit is approximately 18 meters from the nearest receiver. The typical background noise level monitored was 41dB$_{LA90}$ during the hours of 12:00 until midnight when it is assumed that the extract and condenser may be in operation, and 34dB$_{LA90}$ for the remaining period when it is assumed that the condenser may be in operation to support refrigeration requirements.

Acoustic Feature Correction

BS4142:2014 allows a character correction to be applied to the specific sound level where acoustic features are present at the assessment location. BS4142 considers that certain acoustic features can increase impact of a new noise source over that expected from a straight comparison between the specific noise level and the background noise level.

These features and the penalties applied to calculate a rating level when assessing subjectively as defined by BS4142 are as follows:

Tonality: For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 and +6dB for tonality.

- 2dB for a tone that is just perceptible
- 4dB where it is clearly perceptible
- 6dB where it is highly perceptible

Impulsivity: A correction of up to 9dB can be applied for sound that is highly impulsive, considering both the rapidity of change in sound level and the overall change in sound level.

- 3dB just perceptible impulsivity
- 6dB clearly perceptible impulsivity
- 9db highly perceptible impulsivity

Distinctive: Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive from the residual acoustic environment a 3dB penalty can
be applied.

Intermittency: Where the specific sound has identifiable on/off conditions the specific sound level should be representative of the time period of length equal to the reference time period which contain the greatest amount of ‘on’ time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

Corrections Applied: in the absence of specific data it would be prudent to include for a tonal component in the extract and condenser units. Typically extract and condensing equipment would not be considered impulsive. Subjectively restricting the unit noise output to below the ambient background would mean it is unlikely to be readily distinctive. In normal operation the equipment would not switch on/off several times within the reference time period and as such would not be considered intermittent.

Site Context

The dominant noise source is road traffic noise from the surrounding area.

Distance Attenuation

The nearest sensitive receivers identified to the north are approximately 18m from the nearest AHU installation. Distance attenuation has been calculated using the following formula:

$$L_{p2} = L_{p1} + 20\log\left(\frac{r_1}{r_2}\right) + 3$$

BS4142 Assessment 1 – Operational Hours

The individual units should be limited to a noise output of 57dB(A) at 1m. Applying the factors discussed above would predict a noise rating level of 36dB(A) at the receiver. This would give an assessment level -1dB below the lowest measured existing background noise level. BS4142 advises, "*The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or 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*".

BS4142 Assessment 1 – Operational Hours	dB(A)
Extract Source Level L_p @ 1m	57
Distance Attenuation	-22
Screening Attenuation	0
Extract Specific Level at Receiver	35
Condenser Source Level L_p @ 1m	57
Distance Attenuation	-22
Screening Attenuation[1]	-6
Condenser Specific Level at Receiver	29
Total Specific Level at Receiver	36
Acoustic Feature Correction – Tonal	4
Rating Level at Receiver	40
Background Level L_{A90}	41
Rating Below Background	-1

[1] Barrier Calculation included in Appendix

BS4142 Assessment 2 – Non-Operational Hours

The individual condenser unit should be limited to a noise output of 57dB(A) at 1m. Applying the factors discussed above would predict a noise rating level of 33dB(A) at the receiver. This would give an assessment level -1dB below the lowest measured existing background noise level. BS4142 advises, "*The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or 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*".

BS4142 Assessment 2 – Non-Operational Hours	dB(A)
Condenser Source Level L_p @ 1m	57
Distance Attenuation	-22
Screening Attenuation[2]	-6
Condenser Specific Level at Receiver	29
Total Specific Level at Receiver	29
Acoustic Feature Correction – Tonal	4
Rating Level at Receiver	33
Background Level L_{A90}	34
Rating Below Background	-1

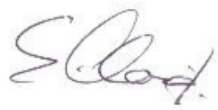
[2] Barrier Calculation included in Appendix

7. Conclusion

A noise assessment has been carried out at the Unit 3, Nanny Marr Road, Darfield, Barnsley, S73 9AB to assess the impact of a proposed kitchen extract and condenser to the rear of the unit. A background noise survey was conducted commencing on Saturday 22nd October 2022 at a location representative of the nearest sensitive receivers.

A prediction assessment has been made in accordance with BS4142:2014 which has shown a rating level for the proposed installation of -1dB below the existing background noise level monitored can be achieved through limiting new installation noise as prescribed in section 6 of this report.

According to BS4142, "*The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or 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*".



Steve Clow MIOA
Acoustic Consultant

8. Appendix

Glossary of Terms

Specific Noise Source

The noise source under investigation for assessing the likelihood of complaints.

Specific Noise Level, $L_{Aeq,T}$

The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval.

Rating Level, $L_{A,T}$

The specific noise level plus any adjustment for the characteristic features of the noise.

Background Noise Level, $L_{A90,T}$

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 % of a given time interval, T.

Residual Noise

The ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.

Ambient Noise

Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Reference Time Interval, T

The specified interval over which an equivalent continuous A-weighted sound pressure level is determined.

$L_{Aeq,T}$

The A-weighted equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as the fluctuating sound over a specified measurement period, T.

$L_{A10,T}$

The A-weighted sound level exceeded for 10% of the specified measurement period, T.

L_{Amax}

The highest short duration A-weighted sound level recorded during a noise event.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to approximate to the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies.

Octave Band

A frequency band in which the upper limit of the band is twice the frequency of the lower limit.

One-third-octave Band

A frequency band in which the upper limit of the band is 1/3 times the frequency of the lower limit.

Screening Attenuation

Site: Proposed Condenser - Unit 3
Barrier Attenuation
4789

Barrier Attenuation

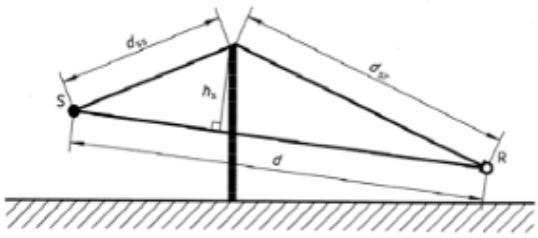


Figure 6 — Geometrical quantities for determining the pathlength difference for single diffraction

from ISO 9613-2:1996

Noise Source		Frequency	Hz	63	125	250	500	1000	2000	4000	8000
Description: Condenser		Source Spectrum	dB	62.5	55	52.5	50	46.5	43	37.5	30

Barrier Attenuation - Source 1				Frequency	Hz	63	125	250	500	1000	2000	4000	8000
Source to Barrier	2	Receiver to Barrier	18	Barrier Attenuation	dB	6.0	6.9	8.3	10.3	12.6	15.3	18.1	21.0
Source Height	1.2	Receiver Height	4	Effective Attenuation	dB	6.0	6.9	8.3	10.3	12.6	15.3	18.1	20.0
Barrier Height	2.2			Resultant Spectrum	dB	56.5	48.1	44.2	39.7	33.9	27.7	19.4	10.0
Path Difference	0.131									**Barrier Attenuation**		**dB**	**-6**

Photo Appendix



Photo 1 – Rear of Site