Lloyds Bank
Regent Street
Wrexham

Plant Noise Impact Assessment

On behalf of

fit out

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T: 01252 519881
W: noisesolutions.co.uk
E: hello@noisesolutions.co.uk
Noise Solutions Ltd, 5 Oriel Court, Omega Park, Alton, GU34 2YT Reg no. 3483481

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	Name	Qualifications	Initials	Date
Prepared by:	Jon Stump	BSc(Hons), MIOA	JS	21st June 2024
Reviewed and approved by:	Nigel Chandler	BSc(Hons), MIOA	NAC	21st June 2024
For and on behalf of Noise Solutions Ltd				

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Reg no. 3483481 Trading office, 5 Oriel Court, Omega Park, Alton, GU34 2YT

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1.0 Introduction

1.1. Noise Solutions Ltd (NSL) has been commissioned by Fit Out UK to a produce a noise impact assessment for proposed replacement plant serving a Lloyds Bank branch on Regent Street, Wrexham.

1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.

1.3. Cumulative plant noise emission levels for the proposed plant have been predicted at what will be the most affected noise sensitive receptors and assessed following Wrexham County Borough Council's typical requirements.

1.4. A glossary of acoustic terminology is given in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

2.1. The Lloyds bank branch on Regent Street, Wrexham occupies the ground floor of a building on the corner of Regent Street and Egerton Street in the centre of Wrexham.

2.2. Existing plant serving the branch is located on a flat roof towards the rear (north) of the site and comprises an external air conditioning (AC) unit and an air handling unit. The AC unit is to be retained, being relocated, and is not included in this assessment. The existing air handling unit is to be removed.

2.3. In addition to the above, proposals include two new air handling units, one of which will be installed internally with intake and discharge ducts to atmosphere. The remaining unit will be installed externally on the rear roof, ducted to inside.

2.4. It is understood that all plant will operate only during branch opening hours, with no plant operating at night.

3.0 Nearest noise sensitive receptors

3.1. The branch is located within a typical high street setting, with the surrounding environs predominantly occupied by other commercial and retail premises.

3.2. A review of Council Tax bands does indicate, however, that there are some residential properties nearby. Flats at 16A and B Regent Street (Receptor R1) are located to the east of the branch at a distance of around 30m from the plant area. Windows of this receptor will benefit from some screening provided by intervening buildings. Flats at 3 Egerton Street (Receptor R2) are located immediately to the north of the branch, although it is noted that there are no windows in the elevation facing the plant area.

3.3. There are also office windows on the rear of adjacent properties (Receptor R3) overlooking the plant area.

3.4. A site plan showing the site and surrounding area, the nearest noise sensitive properties and noise monitoring location used in this assessment is presented in **Appendix B**.

4.0 Existing noise climate

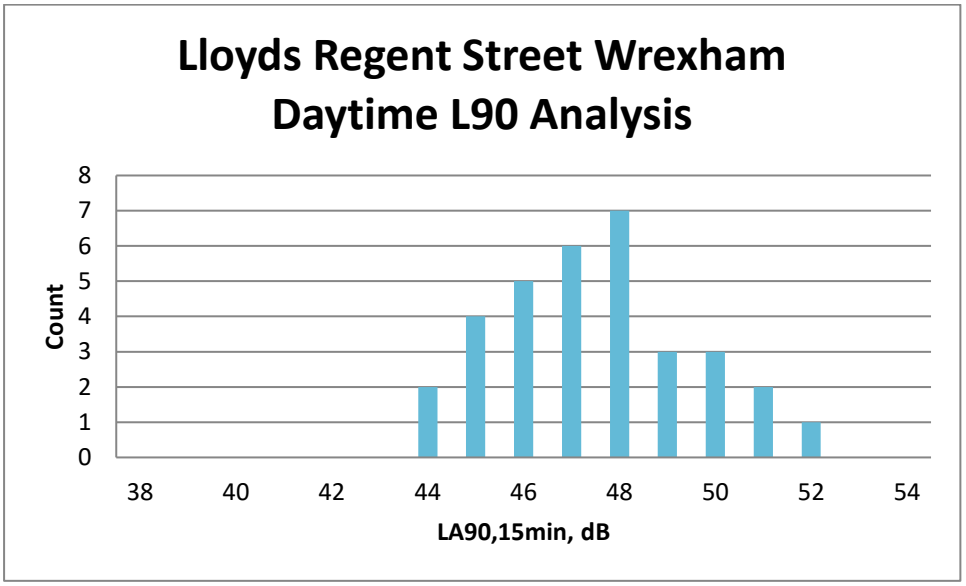
4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area, during the quietest times at which the plant will operate.

4.2. The results of the attended and unattended environmental sound surveys are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in **Appendix D**.

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	$L_{Aeq(15mins)}$	$L_{AFmax(15mins)}$	$L_{A10(15mins)}$	$L_{A90(15mins)}$
Daytime (07.00 – 23.00 hours)	50-66	67-89	53-64	44-52
Night-time (23.00 – 07.00 hours)	43-63	57-89	44-63	39-48

Figure 1 Histogram of daytime L_{A90} background sound pressure levels

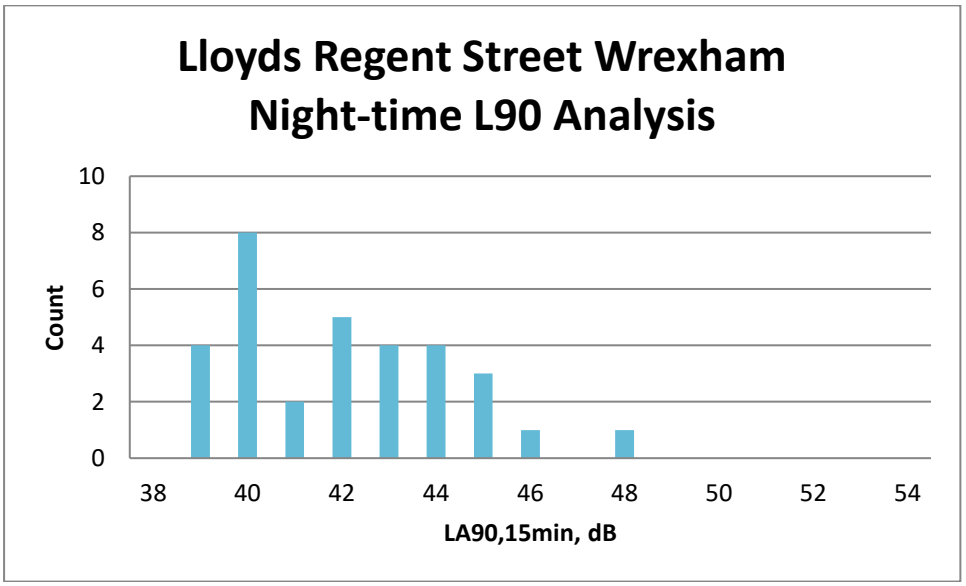


4.3. Further statistical analysis has been carried out on the data, and the mean, modal and median values are shown in Table 2 below.

Table 2 Statistical analysis of LA90,15min levels during the daytime period

dB, L_{A90} daytime period	
mean	47
modal	48
median	46

Figure 2 Histogram of night-time L_{A90} background sound pressure levels



4.4. Further statistical analysis has been carried out on the data and the mean, modal and median values are shown in Table 3 below.

Table 3 Statistical analysis of LA90,15min levels during the night-time period

dB, L_{A90} night-time period	
mean	42
modal	40
median	42

4.5. The following values are considered representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 45dB L_{A90} during the daytime period; and
- 40dB L_{A90} during the night-time period.

5.0 Plant noise design criteria

Planning Policy Wales and TAN 11

5.1. Planning Policy Wales (PPW) sets out the land use planning policies for the Welsh Government.

5.2. Paragraph 13.15.1 of the PPW states that: *"Noise can be a material planning consideration, for example in proposals to use or develop land near an existing source of noise or where a proposed new development is likely to generate noise. Local planning authorities should make a careful assessment of likely noise levels and have regard to any relevant Noise Action Plan before determining such planning applications and in some circumstances it will be necessary for a technical noise assessment to be provided by the developer."*

5.3. PPW refers to *Technical Advice Note (Wales) 11 – Noise* (TAN 11) for specific guidance regarding noise assessments. TAN 11 was updated by a Policy Clarification Letter CL-01-15 to refer to the latest British Standards BS 4142:2014 and BS 8233:2014.

Wrexham County Borough Council

5.4. It is understood that Wrexham County Borough Council's typical condition for noise from fixed plant is:

> *"The rating level of any noise generated by plant associated with the development shall not exceed the pre-existing background level by more than 5dB(A) at any time. The noise levels shall be determined at nearby noise sensitive premises, and measurements and assessment shall be made in accordance with BS4142:2014 Methods for rating and assessing industrial and commercial sound"*

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

5.5. BS 4142:2014+A1:2019 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes "sound from fixed plant installations which comprise mechanical and electrical plant and equipment".

5.6. The procedure contained in BS 4142:2014+A1:2019 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

5.7. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.

5.8. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: "Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."

5.9. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: "Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."

5.10. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB 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 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.*

5.11. The standard does state that "adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

5.12. The standard goes on to note that: "Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."

5.13. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

> *"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."*

5.14. BS 4142:2014+A1:2019 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Proposed criteria

5.15. Notwithstanding the local authority's typical criterion, in order to minimise the likelihood of future complaints it is proposed to limit noise from the plant to a level no louder than the existing representative background sound level at the nearest residential premises. Noise from the new plant should not therefore exceed the limits shown in the table below.

Table 4 Plant sound emission limits at residences

Receptor	Period	Cumulative plant rating level, dB(A)
Residential	Daytime (07.00 – 23.00 hours)	45
	Night-time (23.00 – 07.00 hours)	40

5.16. The above limits have not been approved by the local authority at this stage.

6.0 Plant noise impact assessment

6.1. The cumulative plant noise level, at the most affected noise sensitive receptor has been predicted based on manufacturer's noise data for the proposed equipment. The assessment has taken into consideration distance attenuation and directivity.

6.2. It should be noted that none of the proposed plant is anticipated to exhibit any tonal or impulsive characteristics providing it is well maintained. The new proposed plant is inverter driven and, therefore, will gently ramp up and down depending on the demands placed upon the system.

6.3. Table 5 summarises the results of the assessment at the most affected properties. All other nearby receptors benefit from increased distance/screening to the plant such that resulting noise levels will be lower than at the receptor considered. The full set of calculations can be found in **Appendix E**.

Table 5 Assessment of predicted rating level at the nearest noise sensitive receptors

Receptor	Period	Predicted rating level at receptor, L_{Aeq} (dB)	Criterion (dB)	Difference
R1	Daytime (07.00 - 23.00 hours)	19	45	**-26**
	Night-time (23.00 - 07.00 hours)	-	40	**-**
R2	Daytime (07.00 - 23.00 hours)	28	45	**-17**
	Night-time (23.00 - 07.00 hours)	-	40	**-**
R3	Daytime (07.00 - 23.00 hours)	34*	50	**-16**
	Night-time (23.00 - 07.00 hours)	-	-	**-**

**Specific level, not Rating Level*

6.1. The noise level predictions demonstrate that cumulative noise emissions from the proposed plant will comply with the proposed limits at the nearest noise sensitive properties.

Context and uncertainties

6.1. Where possible, uncertainty in the above assessments has been minimised by taking the following steps:

- The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.
- Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method.

- Care was taken to ensure that the background noise levels were established at a location representative of the nearby residential dwellings and not in a position where higher noise levels were present.

6.2. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessment is undertaken at the nearest residential windows. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.
- The assessment has been made with all plant operating at maximum capacity, as this is not always the case, the assessment is an absolute worst case scenario.
- The proposed equipment replaces existing plant and does not, therefore, represent the introduction of new equipment into a previously quiet area.

7.0 Summary

7.1. Noise Solutions Ltd (NSL) has been commissioned by Fit Out UK to a produce a noise impact assessment for proposed replacement plant serving a Lloyds Bank branch on Regent Street, Wrexham.

7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at a location representative of the noise climate outside the nearest noise sensitive receptors to the plant area.

7.3. The cumulative plant noise emission levels for the proposed plant have been predicted at the most affected noise sensitive receptor and determined to be in compliance with Wrexham County Borough Council's usual requirements. Therefore, noise from the plant proposals should not be a reason for refusal of planning permission.

Appendix A Acoustic terminology

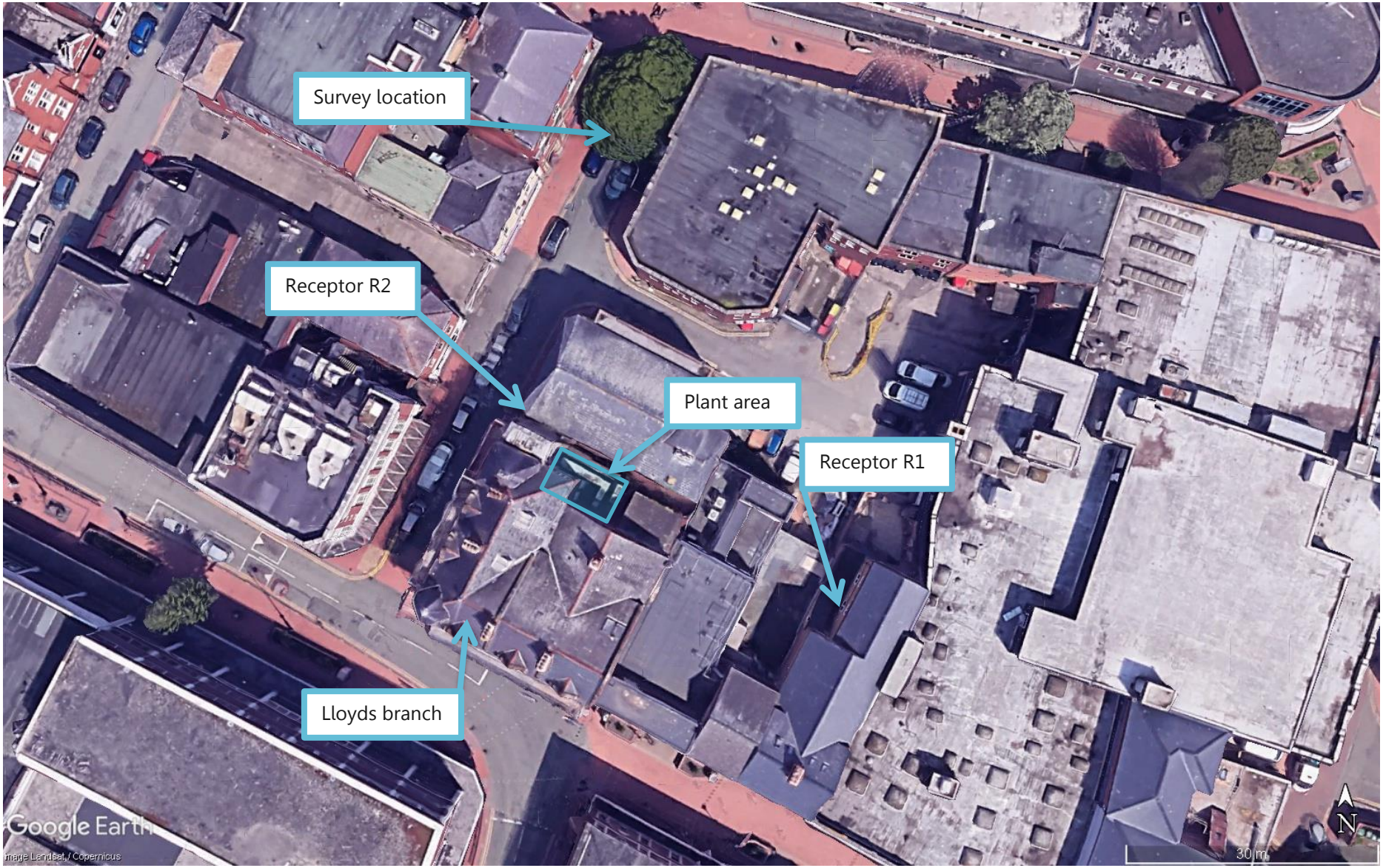
Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 $\log_{10}$ (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A –weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Plant information and manufacturer published sound pressure levels

Plant Item	Make/Model	No. off	note	Octave band centre frequency, Hz								
				63	125	250	500	1k	2k	4k	8k	dBA
AHU1	Daikin VAM650	1	In duct L_w, discharge*	55	57	48	47	45	39	32	26	50
			In duct Lw, intake*	55	57	48	47	45	39	32	26	50
AHU2	Daikin VAM2000	1	Overall L_p at 1.5m	50	47	43	40	39	30	25	18	43

*In duct data not available; based on unit of similar capacity

Appendix C Aerial photograph site showing areas of interest



Appendix D Environmental sound survey

Details of sound surveys

D.1 Measurements of the existing background sound levels were undertaken between 18.30 hours on Monday 3rd June and 10.45 hours on Tuesday 4th June 2024..

D.2 The sound level meter was programmed to record the A-weighted L_{eq}, L_{90}, L_{10} and L_{max} noise indices for consecutive 15-minute sample periods for the duration of each of the noise surveys.

Measurement positions

D.3 The unattended representative measurement position was located on a lamppost along Egerton Street, to the west of the bank and nearest noise sensitive receptor (location indicated on the site plan in **Appendix C**).

D.4 Measurements were undertaken in accordance with BS 7445-2:1991 'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use', the measurements were undertaken under free-field conditions.

Equipment

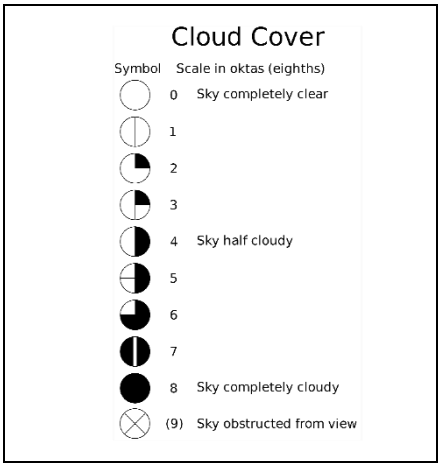
D.5 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after in both the attended and unattended surveys; in each instance, no significant change in the calibration level was noted.

Environmental noise survey

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977D / 99472	07/02/2024	Factory conformation certificate
Condenser microphone	Microtech MK255 / 26247		
Preamplifier	Svantek SV12L / 144643		
Calibrator	Svantek SV33B / 148015	06/03/2024	Factory conformation certificate

Weather conditions

D.6 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were generally appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

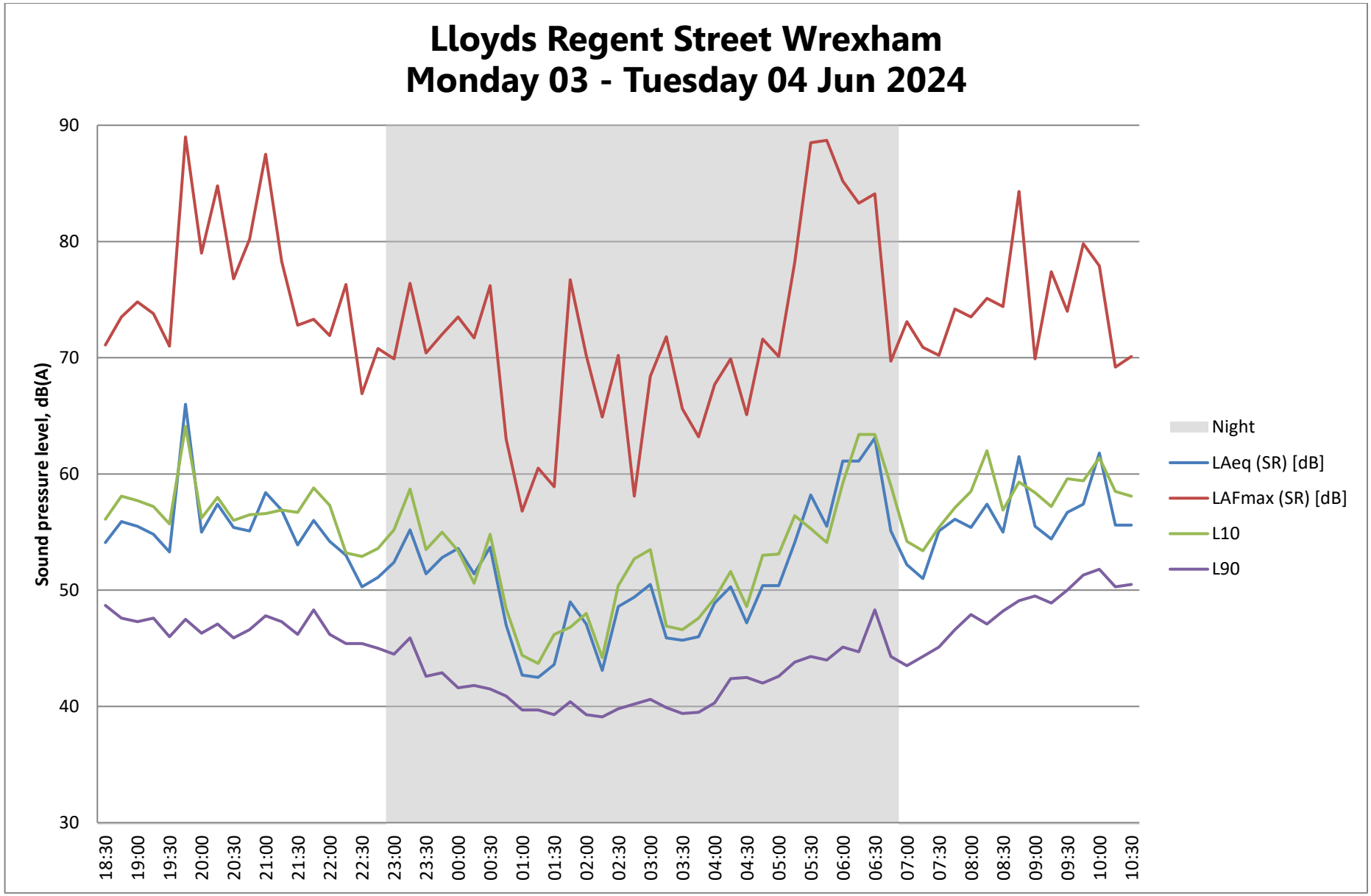
Weather Conditions				
Measurement Location	**Date/Time**	**Description**	**Beginning of Survey**	**End of Survey**
As indicated on Appendix C	18.30 3 Jun - 10.45 4 Jun 2024	Temperature (°C)	17	14
		Precipitation:	No	Yes
		Cloud cover (oktas - see guide)	8	8
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	No	Yes
		Wind Speed (m/s)	<1	2
		Wind Direction	-	NE
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

D.7 The results of the environmental survey have been considered and used appropriately in conjunction with attended survey measurements to select noise levels representative of the background sound pressure levels at the façades of the nearest noise sensitive receptors during the quietest times at which the plant will operate.

D.8 Upon the setup and collection of the unattended noise level meter, the noise climate was dominated by local road traffic, with occasional noise from pedestrians.

D.9 The results of the unattended survey are presented in a time history graph overleaf.


Lloyds Regent Street Wrexham
Monday 03 - Tuesday 04 Jun 2024
Sound pressure level, dB(A)
90
80
70
60
50
40
30
18:30
19:00
19:30
20:00
20:30
21:00
21:30
22:00
22:30
23:00
23:30
00:00
00:30
01:00
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02:00
02:30
03:00
03:30
04:00
04:30
05:00
05:30
06:00
06:30
07:00
07:30
08:00
08:30
09:00
09:30
10:00
10:30
Night
LAeq (SR) [dB]
LAFmax (SR) [dB]
L10
L90

Appendix E Noise level predictions

Internal AHU - intake

NSL Ref: **92406**
Project **Lloyds Wrexham**

Compiled by:	JS	21/06/2024

Plant Ref **Internal AHU intake**
Plant Description **Daikin VAM650 intake**

Description	Notes.	Sound level (dB) at octave band centre frequencies (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
Source noise level (unattenuated)	In-duct L_w	55	57	48	47	45	39	32	26	**50**
System losses		0	0	0	0	0	0	0	0	
Atmospheric side attenuator	I.L.	0	0	0	0	0	0	0	0	
Sound power level leaving terminal		**55**	**57**	**48**	**47**	**45**	**39**	**32**	**26**	**50**
Receptor R1	V angle H angle									
Directivity correction	90 0	0 x 0 (90,0)	0	0	0	0	-4	-7	-7	-7	
Distance correction	30 m	30 m	-38	-38	-38	-38	-38	-38	-38	-38	
Screening correction	Screened: δ=	-30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Surface corrections etc											
Resultant at Receptor R1		L_p	**17**	**19**	**10**	**9**	**3**	**-6**	**-13**	**-19**	**10**
Receptor R2	V angle H angle									
Directivity correction	45	0 x 0 (45,0)	1	2	2	3	3	4	4	4	
Distance correction	10 m	10 m	-28	-28	-28	-28	-28	-28	-28	-28	
Screening correction	Screened: 10 δ=	0	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	
Surface corrections etc											
Resultant at Receptor R2		L_p	**23**	**26**	**17**	**17**	**15**	**10**	**3**	**-3**	**19**
Receptor R3	V angle H angle									
Directivity correction	90	0 x 0 (90,0)	0	0	0	0	-4	-7	-7	-7	
Distance correction	5 m	5 m	-22	-22	-22	-22	-22	-22	-22	-22	
Screening correction	Screened: δ=	-5	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Surface corrections etc											
Resultant at Receptor R3		L_p	**33**	**35**	**26**	**25**	**19**	**10**	**3**	**-3**	**26**

Internal AHU discharge

NSL Ref: **92406**
Project **Lloyds Wrexham**

Compiled by: JS 21/06/2024

Plant Ref **Internal AHU discharge**
Plant Description **Daikin VAM650 discharge**

Description				Notes.	Sound level (dB) at octave band centre frequencies (Hz)								dBA
					63	125	250	500	1k	2k	4k	8k	
Source noise level (unattenuated)				In-duct L_w	55	57	48	47	45	39	32	26	**50**
System losses					0	0	0	0	0	0	0	0	
Atmospheric side attenuator				I.L.	0	0	0	0	0	0	0	0	
Sound power level leaving terminal					**55**	**57**	**48**	**47**	**45**	**39**	**32**	**26**	**50**
Receptor R1	V angle	H angle											
Directivity correction	90	0		0 x 0 (90,0)	0	0	0	0	-4	-7	-7	-7	
Distance correction	30	m		30 m	-38	-38	-38	-38	-38	-38	-38	-38	
Screening correction	Screened:		δ=	-30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Surface corrections etc													
Resultant at Receptor R1				L_p	**17**	**19**	**10**	**9**	**3**	**-6**	**-13**	**-19**	**10**
Receptor R2	V angle	H angle											
Directivity correction	45			0 x 0 (45,0)	1	2	2	3	3	4	4	4	
Distance correction	10	m		10 m	-28	-28	-28	-28	-28	-28	-28	-28	
Screening correction	Screened:	10	δ=	0	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	
Surface corrections etc													
Resultant at Receptor R2				L_p	**23**	**26**	**17**	**17**	**15**	**10**	**3**	**-3**	**19**
Receptor R3	V angle	H angle											
Directivity correction	90			0 x 0 (90,0)	0	0	0	0	-4	-7	-7	-7	
Distance correction	5	m		5 m	-22	-22	-22	-22	-22	-22	-22	-22	
Screening correction	Screened:		δ=	-5	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Surface corrections etc													
Resultant at Receptor R3				L_p	**33**	**35**	**26**	**25**	**19**	**10**	**3**	**-3**	**26**

External AHU

NSL Ref: **92406**
Project **Lloyds Wrexham**

Compiled by: JS 21/06/2024

Plant Ref **External AHU**
Plant Description **Daikin VAM2000 total**

					Sound level (dB) at octave band centre frequencies (Hz)								
					63	125	250	500	1k	2k	4k	8k	
Source noise level (unattenuated)	Sound Pressure Level at 1.5m				50	47	43	40	39	30	25	18	**43**
Casing Lagging / Enclosure				I.L.	0	0	0	0	0	0	0	0	
Attenuated source noise level					**50**	**47**	**43**	**40**	**39**	**30**	**25**	**18**	**43**
Receptor R1													
Distance correction	30	m		30 m	-26	-26	-26	-26	-26	-26	-26	-26	
Screening correction	Screened:	30	δ=	0	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	
Surface corrections etc													
Resultant at Receptor R1				L_p	**19**	**16**	**12**	**9**	**8**	**-1**	**-6**	**-13**	**12**
Receptor R2													
Distance correction	10	m		10 m	-16	-16	-16	-16	-16	-16	-16	-16	
Screening correction	Screened:	10	δ=	0	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	**-5**	
Surface corrections etc													
Resultant at Receptor R2				L_p	**29**	**26**	**22**	**19**	**18**	**9**	**4**	**-3**	**22**
Receptor R3													
Distance correction	5	m		5 m	-10	-10	-10	-10	-10	-10	-10	-10	
Screening correction	Screened:		δ=	-5	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Surface corrections etc													
Resultant at Receptor R3				L_p	**40**	**37**	**33**	**30**	**29**	**20**	**15**	**8**	**33**

Summary

Plant	Receptor		
	R1	R2	R3
Internal AHU intake	10	19	26
Internal AHU discharge	10	19	26
External AHU	12	22	33
Cumulative level (specific)	16	25	34
BS 4142 Feature Correction	3	3	0
Cumulative level (rating level)	**19**	**28**	**34**