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CASICD Decants

Planning noise report – Kay Kendal

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Version	Date	Comments	Author	Reviewer
A	17 Apr 26		TS	MR

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Summary

Sandy Brown has been commissioned to provide an assessment of noise in relation to the proposed works at the Kay Kendal building at the Christie NHS Foundation Trust.

An unattended environmental noise survey has been carried out to determine the existing sound levels in the area. The noise survey was performed between 12:45 on 15 December 2022 and 16:15 on 19 December 2022. This was supplemented by additional attended noise measurements on 4 March 2026.

The representative background sound levels measured during the unattended survey were $L_{A90,15mins}$ 52 dB during the day and $L_{A90,15mins}$ 48 dB at night. The background sound level measured during the attended survey was $L_{A90,15mins}$ 51 dB during the day.

Based on the requirements of the Manchester City Council and on the results of the noise survey, all plant must be designed such that the cumulative free-field noise level at the worst affected windows of the nearby noise sensitive premises (exclusive of receptors within the hospital campus) does not exceed:

- $L_{Aeq,15min}$ 47 dB during the day, and $L_{Aeq,15min}$ 43 dB during the night at receptors to the east
- $L_{Aeq,15min}$ 46 dB during the day, and $L_{Aeq,15min}$ 42 dB during the night at receptors to the south.

The plant noise limits are cumulative and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied, and the limits will be more stringent than those set.

For buildings within the hospital campus, appropriate plant noise egress limits will be set with input from Hospital stakeholders, as part of the design process.

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Contents

1 Introduction 5

2 Site description 5

3 Development proposals 6

4 Building services noise egress criteria 7

5 Survey method 8

6 Measurement results 11

7 Plant noise egress 13

8 Conclusion 15

Appendix A 16

Survey details 16

Appendix B 19

Results of unattended measurements at Position L 19

Appendix C 21

BS 4142 corrections for attention catching features 21

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1 Introduction

Sandy Brown has been commissioned to provide an assessment of noise in relation to the proposed works at the Kay Kendal building at the Christie NHS Foundation Trust.

An environmental noise survey has been carried out to establish the existing background sound levels in the vicinity of nearby noise sensitive premises and to set appropriate limits for noise egress from building services plant.

The background sound levels measured during the survey are used as the basis for setting limits for noise emission from proposed building services plant. These limits are set in accordance with the requirements of Manchester City Council (MCC).

This report presents the survey method and results, and a discussion of acceptable limits for noise emissions from building services plant.

2 Site description

2.1 The site and its surroundings

The Kay Kendal building in relation to its surroundings is shown in Figure 1. The Kay Kendal building is outlined in red. It forms part of the wider campus at The Christie, shown in green.

The site is bound by Wilmslow Road to the east (shown in pink) and Oak Road to the south (shown in orange).

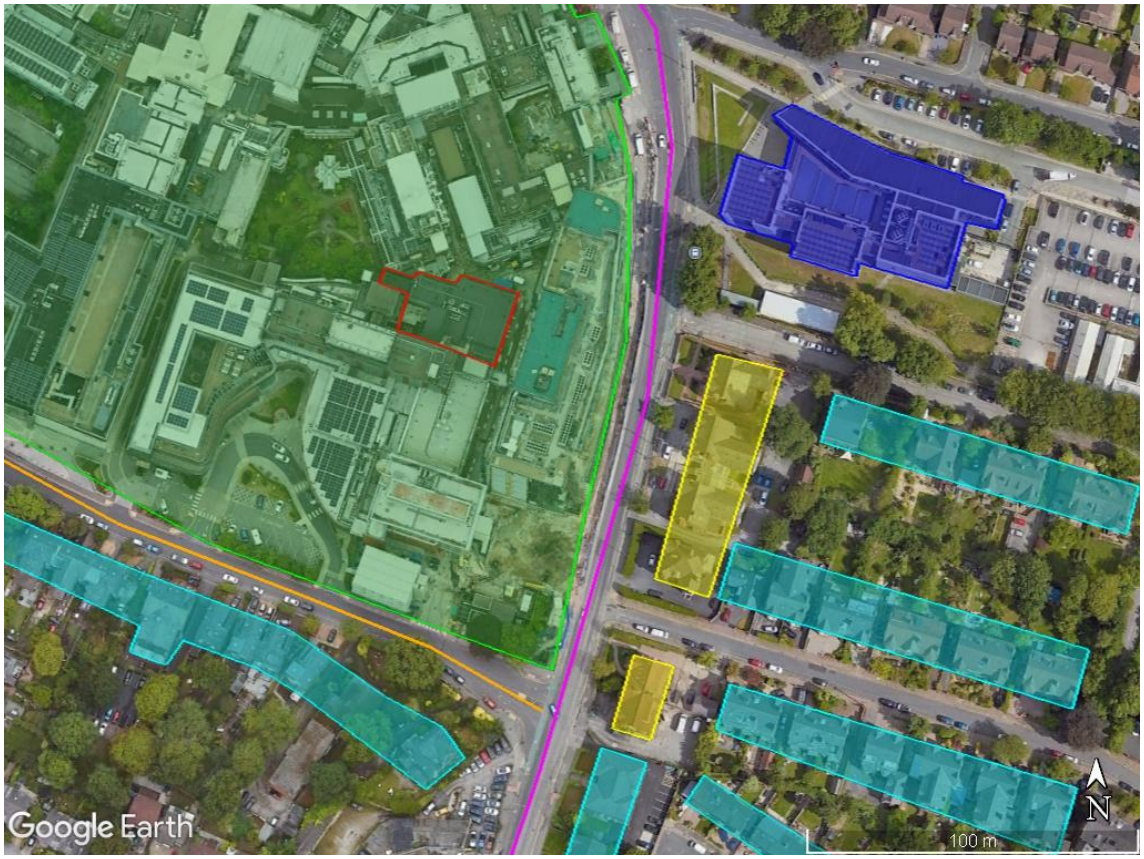


Figure 1 Aerial view of site (courtesy of Google Earth Pro)

2.2 Adjacent premises

Referring to Figure 1, nearby noise sensitive premises adjacent to the development are:

- Residential properties to the south and east (shown in cyan)
- Residential and commercial properties on Wilmslow Road (shown in yellow) to the south-east

Other nearby premises include the Manchester Cancer Research Centre (shown in blue) to the east.

3 Development proposals

The proposed works consist of an internal refurbishment of office and laboratory spaces. As part of these works, existing externally mounted rooftop plant items are to be replaced with new equipment. The development will be in use during the day (07:00-23:00) and may be operational at night (23:00-07:00).

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4 Building services noise egress criteria

External plant noise will need to be controlled to ensure that appropriate limits are achieved outside noise sensitive receptors within the scheme, within the hospital campus and also outside the hospital campus.

4.1 Standard guidance

BS 4142:2014:+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant against the existing background sound levels at nearby noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background sound level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

4.2 HTM 08-01

Health Technical Memorandum 08-01 (HTM 08-01) is commonly adopted for healthcare schemes and provides acoustic criteria. HTM 08-01 requires the following:

1. Noise outside buildings should be controlled to allow the internal noise criteria to be achieved (with windows or trickle vents open for ventilation if the space is naturally ventilated).
2. Open external areas should be protected. Noise from services should not exceed the existing daytime background noise level or L_{A90} 50 dB, whichever is the higher.

The proposed plant items are in close proximity to overlooking facades within The Christie campus. Suitable limits are discussed in Section 7.1.2 7.1.2to meet with the HTM 08-01 requirements.

4.3 Local Authority criteria

Manchester City Councils' plant noise egress criteria will be applicable at noise sensitive receptors outside the hospital campus.

Manchester City Council typically stipulate the following criteria for plant noise egress:

"Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location."

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5 Survey method

5.1 Noise survey method

The survey included attended and unattended noise measurements.

5.2 Unattended measurements

Unattended noise monitoring was undertaken at the site over 4 days. Details of the equipment used and the noise indices measured are provided in Appendix A. The unattended measurements were taken over 15-minute periods between 12:45 on 15 December 2022 and 16:15 on 19 December 2022. The rooftop measurement position used during the survey is indicated in Figure 2, denoted by the letter 'L'. The rooftop of the Holt building was chosen to be reasonably representative of noise levels at the site and outside the nearest noise sensitive premises. The microphone was positioned approximately 15 m from the ground and approximately 2 m from the rooftop in the free-field.

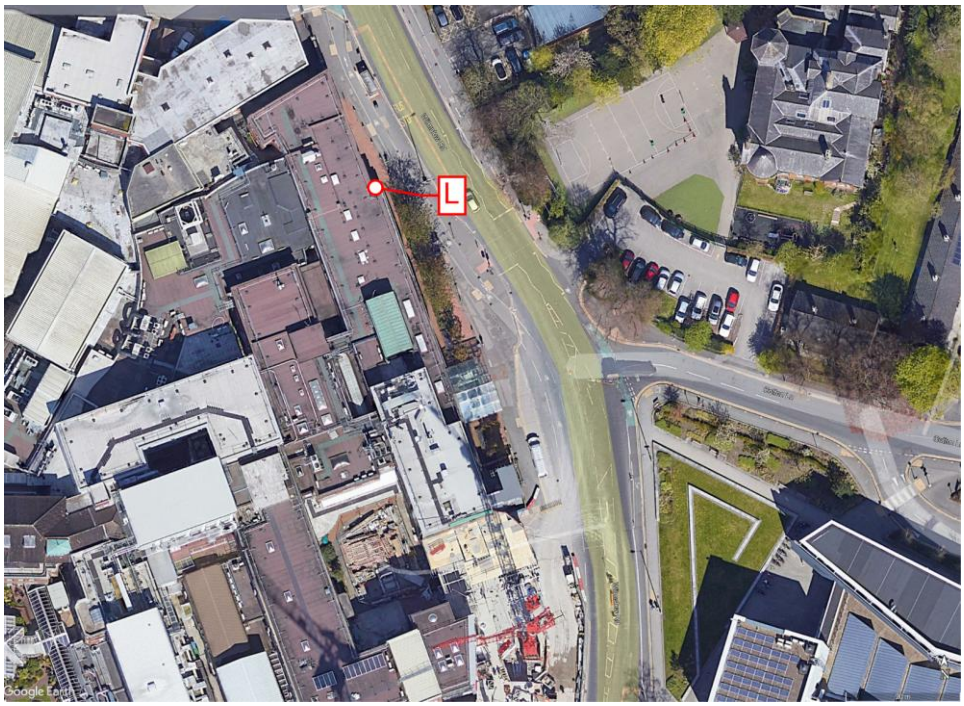


Figure 2 Unattended measurement location - Holt building rooftop

Photographs showing the unattended measurement location are provided in Figure 3 and Figure 4.

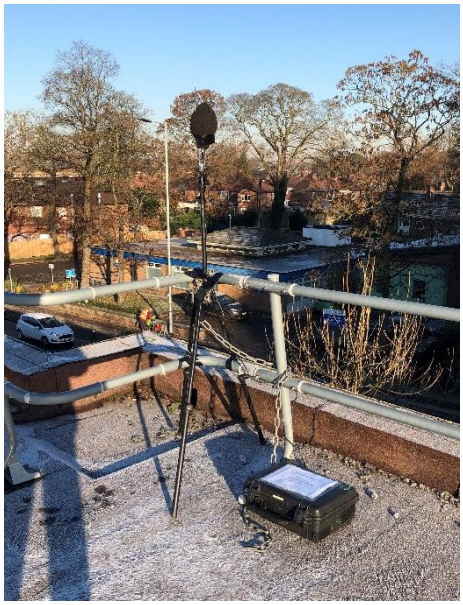


Figure 3 Unattended measurement equipment installed - Holt building rooftop



Figure 4 Unattended measurement equipment - seen from Wilmslow Road

5.3 Attended measurements

Additional attended measurements were undertaken near to residential premises on Oak Road to supplement the unattended measurements. The measurement location is indicated as position 'A' in Figure 5. At this position, the microphone was approximately 1.2 m above ground level and at least 3 m from any other reflective surface. As such, the measurement results are considered to be free-field measurements. Measurements were carried out over a 15-minute period on Wednesday 4 March 2026.



Figure 5 Aerial view of site with attended measurement location (courtesy of Google Earth Pro)

5.4 Weather conditions

Weather conditions during the unattended survey are described in Appendix A.

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6 Measurement results

6.1 Observations

The dominant noise sources observed at the unattended measurement position during the survey were from road traffic on Wilmslow Road, aircraft noise passing overhead, occasional construction noise from the Paterson building development and existing plant items. Less significant noise sources included pedestrian noise, noise from the crossing on Wilmslow Road and occasional emergency vehicle sirens.

Observations during the attended measurements are presented in Table 2.

6.2 Noise measurement results

6.2.1 Unattended measurement results

A graph showing the results of the unattended measurements is provided in Appendix B.

Day and night-time ambient noise levels measured during the unattended survey are presented in Table 1. The results presented in Table 1 are free-field measurements.

Table 1 Ambient noise levels measured during the unattended survey

Date	Day (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
15 Dec 2022	-	58
16 Dec 2022	63	58
17 Dec 2022	63	58
18 Dec 2022	63	56
Average	63	58

Daytime and night-time statistical analysis of representative values for the site are given in Figure 6.

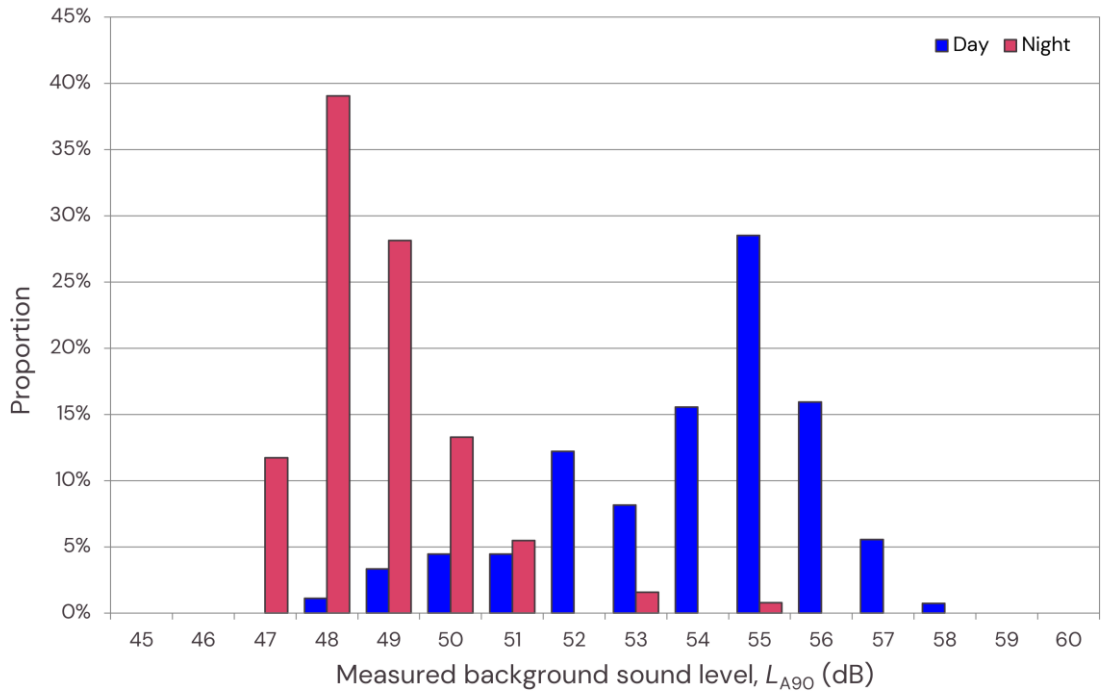


Figure 6 Day time and night-time measured background level

From this analysis, the representative background sound levels measured during the survey were $L_{A90,15min}$ 52 dB during the daytime and $L_{A90,15min}$ 48 dB at night.

6.2.2 Attended measurement results

Noise levels and key sources recorded during the attended measurements are summarised in Table 2.

Table 2 Noise levels and key noise sources from attended measurements

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
A	15:27	59	76	51	Dominated by road traffic on Oak Rd with contribution from road traffic on Wilmslow Road. Maximum noise level caused by car horn on Oak Rd.

7 Plant noise egress

7.1 Noise egress limits

7.1.1 Normally operating plant – Receptors outside the hospital campus

Based on the above criteria and the measurement results, the cumulative noise level from the operation of all new plant should not exceed the limits set out in Table 3. These are based on plant noise being limited to be at least 5 dB lower than the typical background noise level for receptors outside the hospital campus in line with the requirements of MCC.

The plant noise limits at noise sensitive receptors to the east are based on the measured noise levels at the unattended measurement position. The plant noise limit at noise sensitive receptors to the south during the day is based the attended measurement presented in Section 6.2.2. The unattended and attended measurement positions were both dominated by road traffic noise. There was a reduction of 4 dB from the representative background sound level during the day compared to the night at the unattended noise position. This reduction in noise level has been applied to the attended measurement position, to determine a reasonable estimation of the representative background sound level during the night for receptors to the south of the site.

The limits apply at the worst affected windows of the nearest noise sensitive premises and are presented as free-field levels. Commercial premises would not typically be considered to be noise sensitive during the night.

Table 3 Plant noise limits at 1 m from the nearest noise sensitive premises

Location	Maximum sound pressure level from plant at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Day (07:00-23:00)	Night (23:00-07:00)
Noise sensitive receptors outside hospital campus to east (Wilmslow Road)	47	43
Noise sensitive receptors outside hospital campus to south (Oak Road)	46	42

[1] The limits set out in Table 3 do not include any attention catching features. The penalty corrections for attention catching features may be significant, and will need to be considered as the building services design progresses. This is discussed in Appendix C.

7.1.2 Normally operating plant – Within the hospital campus

For buildings within the hospital campus, appropriate plant noise egress limits for normally operating plant will be set with input from Hospital stakeholders, as part of the design process.

7.2 Plant equipment strategy

The design of the plant is currently under development. The current strategy includes a rooftop plant area with externally located chiller units, fume extract fans and an air handling unit. No emergency or life-safety plant items are proposed. All building services plant will need to be designed to achieve the noise limits set out above, including any corrections for attention catching features. Outline noise control measures to be considered within the design are:

- Localised acoustic screening
- Low noise equipment
- Acoustic canopies/attenuation packages to equipment
- Double-skin casings to air-handling plant
- In-duct attenuators
- Acoustic lagging and lining to ductwork
- Select attenuators so that regenerated noise from the attenuator does not increase the resultant noise level
- Limiting airflow across louvres.

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8 Conclusion

The representative background sound levels from the noise survey were $L_{A90,15min}$ 52 dB during the day, and $L_{A90,15min}$ 48 dB during the night on Wilmslow Road, to the east. The measured background sound level near Oak Road was $L_{A90,15min}$ 51 dB.

Based on the requirements of the Manchester City Council and on the results of the noise survey, all plant must be designed such that the cumulative free-field noise level at the worst affected windows of the nearby noise sensitive premises (exclusive of receptors within the hospital campus) does not exceed:

- $L_{Aeq,15min}$ 47 dB during the daytime, and $L_{Aeq,15min}$ 43 dB during the night at receptors to the east
- $L_{Aeq,15min}$ 46 dB during the daytime, and $L_{Aeq,15min}$ 42 dB during the night at receptors to the south.

These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, the limits will be more stringent than those set out above. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied.

For buildings within the hospital campus, appropriate plant noise egress limits will be set with input from Hospital stakeholders, as part of the design process.

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Appendix A

Survey details

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Reference standards

- BS 7445 Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*
- BS 7445: Part 2: 1991 *Description and measurement of environmental noise, Part 2. Guide to the acquisition of data pertinent to land use*.

Equipment

The unattended noise measurements were taken using a Rion NL-52 sound level meter. The sound level meter was within calibration at the time of the survey.

The attended noise measurements were taken using a B&K 2250 sound level meter.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Unattended measurements				
Sound level meter	NL-52/00932326	Rion	16 Mar 23	TCRT21/1182
Microphone	UC-59/05549	Rion	16 Mar 23	TCRT21/1182
Pre-amp	NH-25/32354	Rion	16 Mar 23	TCRT21/1182
Calibrator	NC-74/34125432	Rion	16 Mar 23	TCRT21/1181
Attended measurements				
Sound level meter	2250/3011964	Brüel & Kjær	14 April 27	UCRT25/1609 UCRT25/1610
Microphone	4189/3100176	Brüel & Kjær	14 April 27	UCRT25/1609 UCRT25/1610
Pre-amp	ZC0032/26376	Brüel & Kjær	14 April 27	UCRT25/1609 UCRT25/1610
Calibrator	4231/3019123	Brüel & Kjær	14 April 27	UCRT25/1603

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS 7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*.

Weather conditions

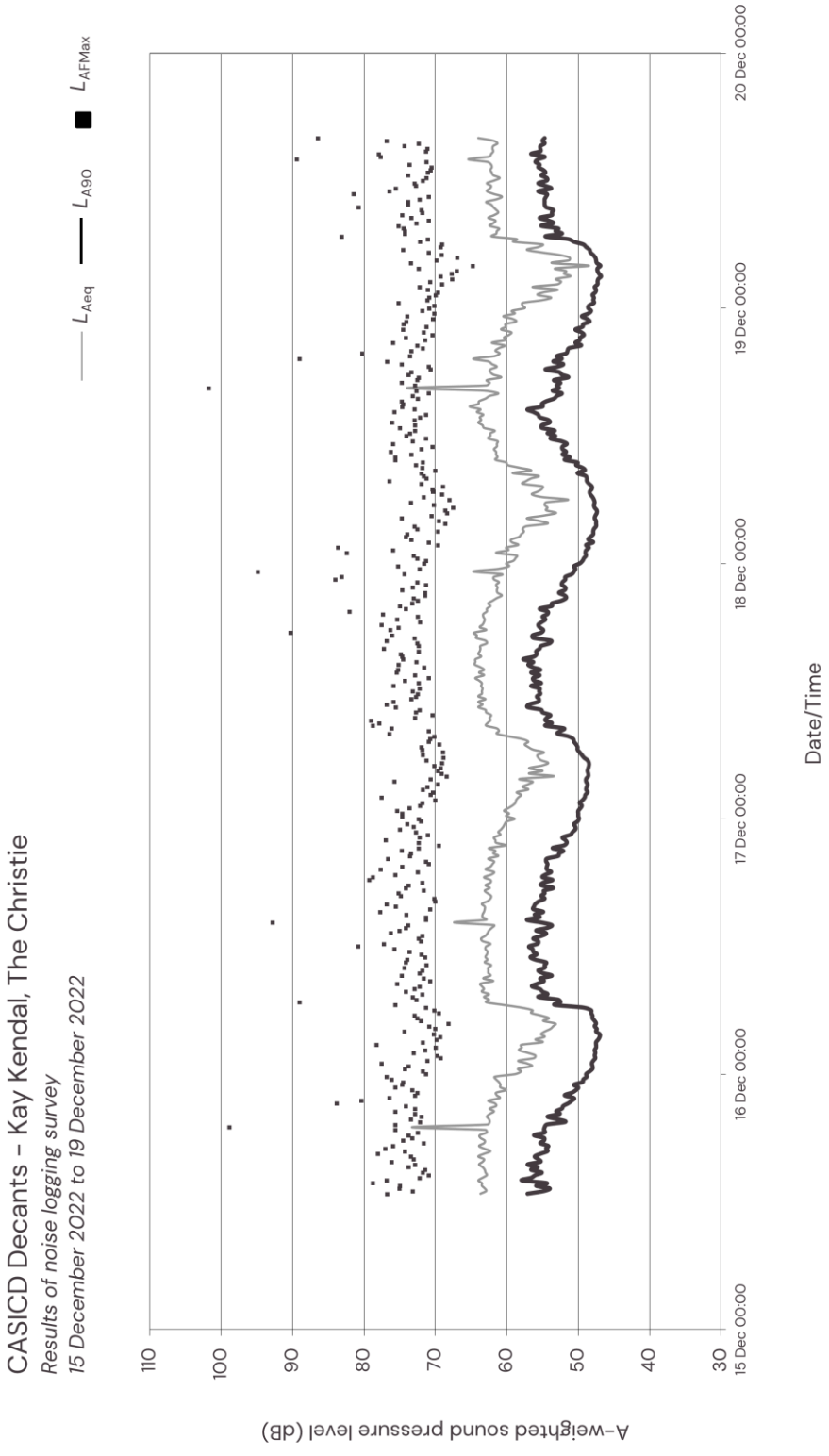
During the unattended noise measurements, weather reports for the area indicated that temperatures varied between -5°C at night and 12°C during the day, and the wind speed was less than 5 m/s.

Rain showers occurred throughout the survey however, the survey duration was sufficiently long to include periods unaffected by adverse weather and no variation in noise levels was seen to correlate with the weather. These measurements are consequently considered to have obtained a representative sample of noise data.

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Appendix B

Results of unattended measurements at Position L


CASICD Decants - Kay Kendal, The Christie
Results of noise logging survey
15 December 2022 to 19 December 2022
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
110
100
90
80
70
60
50
40
30
15 Dec 00:00
16 Dec 00:00
17 Dec 00:00
18 Dec 00:00
19 Dec 00:00
20 Dec 00:00
Date/Time

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Appendix C

BS 4142 corrections for attention catching features

The following applies where plant noise is assessed in accordance with BS 4142:2014+A1:2019.

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), penalty corrections should be applied based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible.

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible.

For noise which is equally both impulsive and tonal, then both features can be accounted for by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment of tonality is not appropriate, an objective assessment can be made by analysis of time-averaged, third-octave band sound pressure levels. A noise source is deemed to be tonal if the level in a third-octave band exceeds the level in adjacent third-octave bands by the level differences given below:

- 15 dB in the low frequency third-octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency third-octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency third-octave bands (500 Hz to 10000 Hz).

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

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