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NOISE IMPACT ASSESSMENT REPORT – MECHANICAL PLANT

69 DENECROFT CRESCENT, UXBRIDGE UB10 9HY

FOR

TRICON DESIGNS

ISSUE STATUS: FINAL
DATE OF ISSUE: 28/01/2026
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1. EXECUTIVE SUMMARY

The Client intends to seek retrospective planning approval for the installation of mechanical plant (2 No. Air Conditioning Units) to service the premises at 69 Denecroft Crescent, Uxbridge UB10 9HY.

Sound Licensing has undertaken an environmental noise survey at the site in order to determine prevailing background noise levels that are representative of the nearest noise sensitive properties, which have been identified as the residential premises at 71 Denecroft Crescent UB10.

The results of the noise survey are considered reasonable given the location of the measurement position and the existing noise sources in the local vicinity.

Noise measurements and calculations of the mechanical plant have been undertaken using all available details and plans provided by the client and obtaining manufacturers' specifications wherever possible. The data and information form the basis of the assessment.

Noise break-out limits for the mechanical plant have been proposed based on the methodologies of British Standard (BS) 4142:2014+A1:2019 and in accordance to Local Authority policy. A robust, worst-case assessment of the noise levels associated to the existing mechanical plant has been undertaken.

In accordance with BS 4142:2014+A1:2019 guidance, the noise impact due to the operation of the mechanical plant, with recommended noise mitigation installed, ***"is an indication of the specific sound source having a low impact"***. The determined noise level of the mechanical plant at the nearest noise sensitive property, with recommended noise mitigation installed, is considered to comply with the London Borough of Hillingdon Council's policy.

2. INTRODUCTION

The client has installed 2 No. air conditioning units at the side of 69 Denecroft Crescent, Uxbridge UB10 9HY, the noise from which could have the potential to affect existing noise sensitive properties nearby.

The purposes of this report are:

- To determine prevailing environmental noise levels affecting surrounding properties due to nearby noise sources (e.g. road traffic, aircraft etc);
- Based on the above, to present noise emission limits in accordance with the requirements of BS 4142:2014+A1:2019 and Local Authority policy, and
- To undertake an assessment to demonstrate compliance with the Local Authority noise requirements.

3. SITE DESCRIPTION

Retrospective planning permission is being sought for the installation of 2no. air conditioning units at 69 Denecroft Crescent, Uxbridge UB10 9HY (hereafter referred to as 'the site'). The property is a traditionally built two-storey end of terrace building in the London Borough of Hillingdon. It is located in a predominantly residential area.

The nearest sensitive residential receptor was noted to be the first-floor window located on the side/front façade of 71 Denecroft Crescent at approximate distances of 3m and 3.5m from unit 1 and 2 respectively.

The nearest sensitive receptors are identified in Figure 3.1. If the noise impact assessment details that there is an indication of the specific sound source having a low impact at these premises then it can be safely assumed it will be met at other properties of equal distance and/or those further away.

Figure 3.1 shows the site highlighted in **blue** with the nearest noise sensitive premises highlighted in **red**.

Figure 3.1 Site Location and Surrounding Land Use

Source: Bing Maps

4. ENVIRONMENTAL NOISE SURVEY METHODOLOGY

An unmanned environmental noise survey was undertaken at a single measurement location at first-floor level to the side of the site. The survey was undertaken between 12:30 hours on the 23rd January and 10:45 hours on the 26th January 2026. A survey at this time covers the most sensitive period of time in which the mechanical plant may be operational.

Additional short-term manned measurements were undertaken on 23rd January 2026 of each unit operating and with the both units not in operation at a distance of 1m from the mechanical plant.

Ambient, background and maximum noise levels (L_{Aeq}, L_{A90} and L_{Amax} respectively) were measured throughout the noise survey in continuous 15-minute periods. The approximate measurement position is indicated in **orange** on Figure 4.1 below.

Figure 4.1 Site Plan Showing Approximate Location of Measurement Position

Source: Bing Maps

The sound level meter microphone was positioned on a tripod at a height of 3.5 metres at the side of the site during the unmanned survey. The position is considered to be in free-field and therefore no façade correction will be applied. The monitoring position is considered representative of background noise levels at the nearest identified noise sensitive properties. The monitoring position was chosen for equipment security reasons also.

The equipment used for the noise survey is summarised in Table 4.1.

Table 4.1 Description of Equipment used for Noise Survey

Equipment	Description	Quantity	Serial Number
Larson Davis Sound Expert LxT	Type 1 automated logging sound level meter	1	0004720
Larson Davis 377B02	½" microphone	1	159605
Larson Davis	Pre-amplifier	1	042612
Larson Davis CAL200	Class 1 Calibrator	1	11706

The noise survey and measurements were conducted in accordance with BS7445-1:2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'.

Weather conditions throughout the entire noise survey period were noted to be cold (approx. 4-10° Celsius), broken clouds (40 to 80% cloud cover approximately) with a light wind (<5m/s). These weather conditions were checked against and confirmed by the use of the Met Office mobile application available on smart phone technology. These conditions were maintained throughout the majority of the survey period and are considered reasonable for undertaking environmental noise measurements.

The noise monitoring equipment was field calibrated before and after the noise survey period. No significant drift was recorded (±0.3 dB). Equipment calibration certificates can be provided upon request.

5. NOISE SURVEY RESULTS AND OBSERVATIONS

5.1 Results

A summary of the measured ambient and typical background noise levels during the operational hours are shown in Table 5.1 below (full monitoring data can be found in Appendix C). The existing units were not in operation during the unmanned survey.

Table 5.1 Measured Ambient and Typical Background Sound Pressure Levels

Date / Period (hours)	Ambient Sound Pressure Level, dB $L_{Aeq,T}$*	Typical Background Sound Pressure Level, dB $L_{A90,T}$*
23/01/2026(12:30 to 23:00)	**51-56**	**49**
23/01/2026-24/01/2026 (23:00 to 07:00)	**41-60**	**42**
24/01/2026(07:00 to 23:00)	**48-53**	**49**
24/01/2026-25/01/2026 (23:00 to 07:00)	**40-55**	**39**
25/01/2026(07:00 to 23:00)	**49-54**	**50**
25/01/2026-26/01/2026 (23:00 to 07:00)	**40-54**	**39**
26/01/2026(07:00 to 10:45)	**51-53**	**49**

*Day Time 1-hour measurements and Night Time 15-minute measurements

The typical background noise level at the measurement position during the survey, at the time in which the plant could be operational, is **39dB** $L_{A90,T.}$

Additional short-term manned measurements were undertaken with each unit on (ambient) at and with both units off (residual) at a distance of 1m from the mechanical plant. The measured overall $L_{Aeq,5min}$ and 1/1 octave band frequency spectrum levels are shown in Table 5.1.2 below.

Table 5.1.2 Short-Term Ambient and 1/1 Octave Band Noise Measurements

Measurement	$L_{Aeq,5min}$ (dB)*	Frequency (Hz)*							
		63	125	250	500	1000	2000	4000	8000
Unit 1 (Ambient)	53.9	61.1	61.3	56.7	50.2	47.2	42.4	37.2	30.9
Unit 2 (Ambient)	52.0	62.0	57.2	55.7	47.9	46.6	40.6	35.5	30.5
Both Off (Residual)	49.4	56.5	53.5	51.7	45.4	45.1	38.6	33.4	26.0

*Façade correction -2dB

5.2 Observations

Given that the noise survey was unmanned, noise sources could not be identified. However, at the beginning and end of the survey background noise was dominated by noise from the vehicles on the local road network. After analysis of the data no significant abnormal noise source(s) were identifiable. It is considered that the measured noise levels are reasonable given the location of the measurement position.

A subjective assessment of the air conditioning units was undertaken at the time of the manned survey. It was noted that the air conditioning units were audible at the nearest sensitive receptor but there were no perceptible acoustic characteristics produced by the noise sources.

6. EXTERNAL NOISE EMISSION LIMITS

6.1 Local Authority Requirements

The site lies within the jurisdiction of the London Borough of Hillingdon Council. It is stated within the Local Authority SPD 'Noise Generating and Noise Sensitive Development 2016' that where the "Rating Level ($L_{Ar,Tr}$) is at least 5 dB(A) below the Background Level LA90" is normally acceptable.

For the purposes of this report, an assessment has been undertaken in line with BS 4142:2014+A1:2019. A design criterion of achieving a minimum 5dB(A) below the typical background noise level has been adopted in line with the Local Authorities policy. Taking the noise monitoring data in Section 5 and Local Authority requirements above, the following design target has been adopted for mechanical plant as provided in Table 6.1.

Table 6.1 Maximum Noise Emission Design Target at Residential Premises

Date / Period (hours)	Typical Background Sound Pressure Level, dB $L_{A90,T}$*	Rating Noise Level at Nearest Residential Facade, dB $L_{Ar,T}$
23/01/2026 - 26/01/2026 (12:30 to 10:45)	**39**	**34**

*Day Time 1-hour measurements and Night Time 15-minute measurements

6.2 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound" presents a method for assessing the significance and possible adverse impact due to an industrial noise source, based on a comparison of the source noise levels and the background noise levels, both of which are measured or predicted at a noise sensitive receiver e.g. a residential property.

The specific noise level due to the source is determined, with a series of corrections for tonality, impulsivity, intermittency or other unusual characteristic. The rating level is then compared to the background noise level and the significance of the new noise source likelihood of any adverse impact is determined in accordance with the following advice:

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occur. 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."

7. EXISTING AIR CONDITIONING UNITS AND ASSOCIATED NOISE LEVELS

The following items of plant are installed at the side of the premises.

Table 7.0 Existing Air Conditioning Units

External Plant Item	Make	Model	Reference Noise Level* $L_{p(A)}$
Air Conditioning Unit	Samsung	AR12TXFCAWKXEU	47dB @ 1m
Air Conditioning Unit	Samsung	AC035RXADKG/EU	48dB @ 1m

*Reference sound pressure levels. Manufacturer's specifications are provided in Appendix B.

In reference to section 6 of this report, a penalty addition (+3dB) has been applied for intermittency as the units will switch on & off as and when required. Penalty additions have not been applied for tonality as measured & manufacturers' data shows no significant characteristics, or for impulsiveness as it is considered that these characteristics will not be perceptible sufficient to attract attention at the noise receptors. Penalty additions have not been applied for any other sound characteristics as these characteristics were not observed at the time of the survey.

8. NOISE IMPACT ASSESSMENT

This section presents calculations to determine the noise impact of the existing air conditioning units, located at the site, at the nearest noise sensitive property.

8.1 Operational Hours and Background Noise Levels

The air conditioning units may operate as required 24 hours a day, 7 days a week.

The typical background noise level at the measurement position during the survey is **39dB** $L_{A90,T}$. The design range is **34dB** $L_{Ar,T}$ at the façade of the nearest residential premises.

8.2 Nearest Noise Sensitive Properties

The nearest sensitive residential receptor was noted to be the first-floor window located on the side/front façade of 71 Denecroft Crescent at approximate distances of 3m and 3.5m from unit 1 and 2 respectively.

8.3 Description of Determination Process

In accordance with the methodologies of BS 4142:2014+A1:2019, measurements have been undertaken to determine noise levels in which the air conditioning units could be operational at their maximum level (heating mode).

Noise level measurements were completed with the units on (ambient) and off (residual) at 1m from the mechanical plant. The 1/1 octave band frequencies between 63Hz and 8000Hz with the units off have been logarithmically subtracted from the measurements with each unit on. Given the distances between the noise sources and the noise sensitive receptors, point source calculations have been used.

8.4 Noise Level Determination

Calculations to determine the noise of the air conditioning units operating at the facade of the residential property are given below. Full calculations are provided in Appendix D.

The rating noise level at the nearest sensitive receptor, with the mechanical plant operating, is determined to be **46dB $L_{Ar,T}$** which is **7dB(A) above** the typical background noise level (39dB $L_{A90,T}$).

In accordance with BS 4142:2014+A1:2019 guidance, noise from the mechanical plant ***"is an indication of the specific sound source having an adverse impact"***. *The lower the rating level is relative to the measured background level, the less likely it is that the specific sound source will have an adverse impact.*

8.5 Recommended Noise Mitigation

In order to meet the required design target, it is recommended to install a partial acoustic enclosure on the side closest to the nearest receptor and above the units (as shown in appendix B). As a result of this there will be no direct line of sight, therefore attenuation due to barrier loss has also been considered (calculations are provided in Appendix D). The barrier should be constructed of a solid material (minimum mass of 11kg/m^2) with no gaps in it and extend a minimum of 300mm beyond the dimensions of the units. The barrier should be fitted with a layer of weatherproof absorption to negate the influence of reflections. Any construction should be checked with the manufacturer/installer for ventilation requirements.

The rating noise level at the nearest sensitive receptor, with the mechanical plant operating, with recommended noise mitigation installed is determined to be **34dB $L_{Ar,T}$** which is **5dB(A) below** the typical background noise level (39dB $L_{A90,T}$).

In accordance with BS 4142:2014+A1:2019 guidance, noise from the mechanical plant ***"is an indication of the specific sound source having a low impact"***. *The lower the rating level is relative to the measured background level, the less likely it is that the specific sound source will have an adverse impact.*

8.6 Vibration

In addition to the control of airborne noise transfer, it is important to consider the transfer of noise as vibration to adjacent properties as well as any sensitive areas of the same building. Vibration from the units is not expected, however, as a precaution plant should wherever possible be installed on suitable type isolators.

Uncertainty

The levels of uncertainty in the data and calculations are considered to be low/medium given the robust exercise undertaken in noise monitoring and the confidence in the data statistical analysis. Detailed calculations and resultant noise levels at the residential location are considered to be confidently determined.

9. CONCLUSION

Sound Licensing has undertaken an environmental noise survey at the site in order to determine prevailing background noise levels that are representative of the nearest noise sensitive properties. The operation of the air conditioning units, in accordance with BS 4142:2014+A1:2019 guidance, with recommended noise mitigation installed, indicates to creating a low impact. All worst-case scenarios have been applied to the assessment. The determined cumulative operating noise level of the air conditioning units, with recommended noise mitigation installed, is demonstrated to comply with the London Borough of Hillingdon Council's policy.

APPENDIX A – Acoustic Terminology

Parameter	Description
Acoustic environment	Sound from all sound sources as modified by the environment
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far
Ambient sound level, La = LAeq,T	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T
Background sound level, LA90,T	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ($20x10^{-6}$ Pascals).
Equivalent continuous A-weighted sound pressure level, LAeq,T	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, T = t2 – t1, has the same mean-squared sound pressure as a sound that varies with time
Measurement time interval, Tm	Total time over which measurements are taken
Rating level, LAr,Tr	Specific sound level plus any adjustment for the characteristic features of the sound
Reference time interval, Tr	Specified interval over which the specific sound level is determined
Residual sound	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound
Residual sound level, Lr = LAeq,T	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T
Specific sound level, Ls = LAeq,Tr	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr
Specific sound source	Sound source being assessed

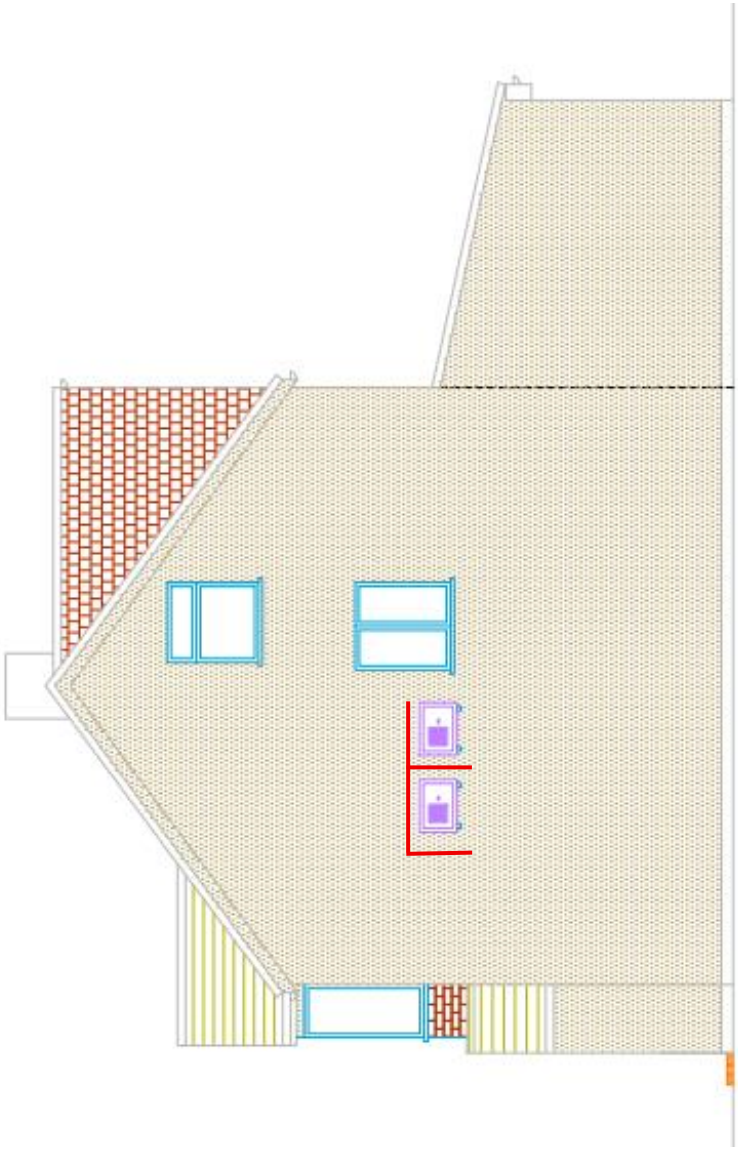
References:

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'
London Borough of Hillingdon 2016 'SPD Development Control for Noise Generating and Noise Sensitive Development'

APPENDIX B – Data Sheets and Figures

Front Elevation

Side Elevation with Recommended Partial Enclosure Indicated in Red

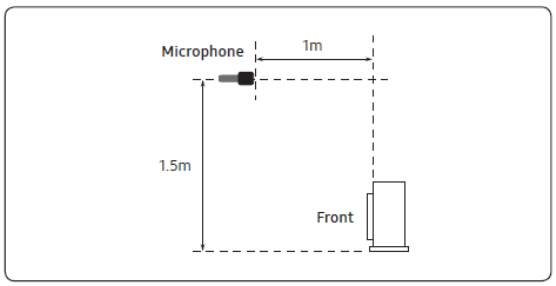


Existing Mechanical Plant and Unit 1 Manned Monitoring Position

Samsung ACO35RXADKG/EU – Unit 1

Samsung ACO35RXADKG/EU Data Sheet – Unit 1

Sound Pressure level

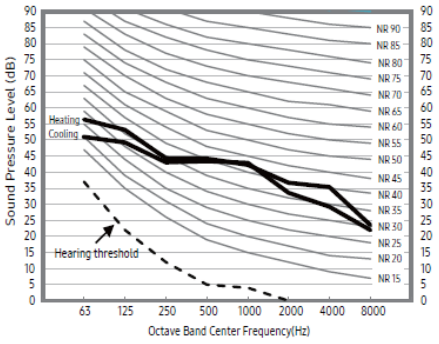


Unit: dB(A)

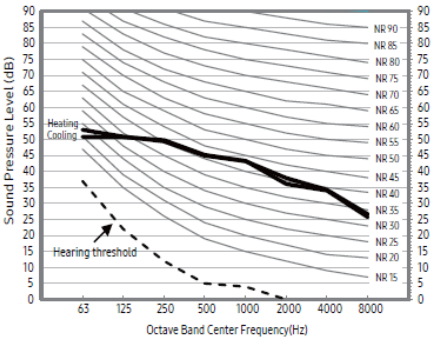
Model	Cooling	Heating
AC026RXADKG/EU	46	47
AC035RXADKG/EU	48	48
AC052RXADKG/EU	48	48
AC071RXADKG/EU	49	51

- NR Curve

1) AC026RXADKG/EU



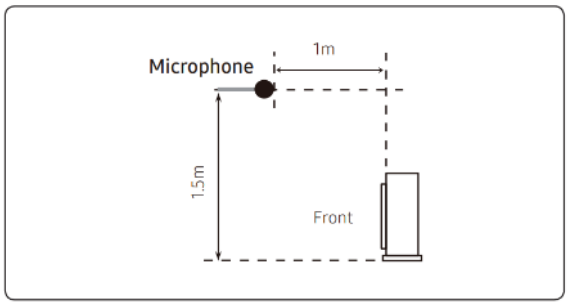
2) AC035RXADKG/EU



Samsung AR12TXFCAWKXEU - Unit 2

Samsung AR12TXFCAWKXEU Data Sheet – Unit 2

Sound Pressure level

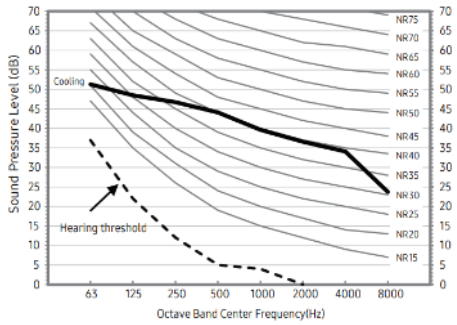


Unit: dB(A)

Model	Cooling
AR09TXFCAWKXEU	46
AR12TXFCAWKXEU	47
AR18TXFCAWKXEU	57
AR24TXFCAWKXEU	60

- NR Curve

1) AR09TXFCAWKXEU



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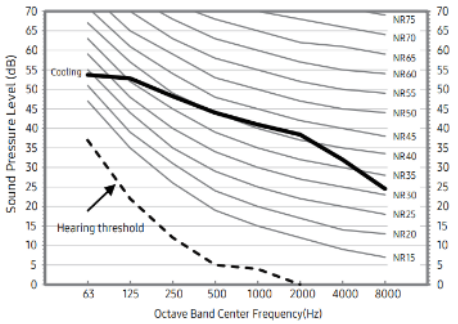
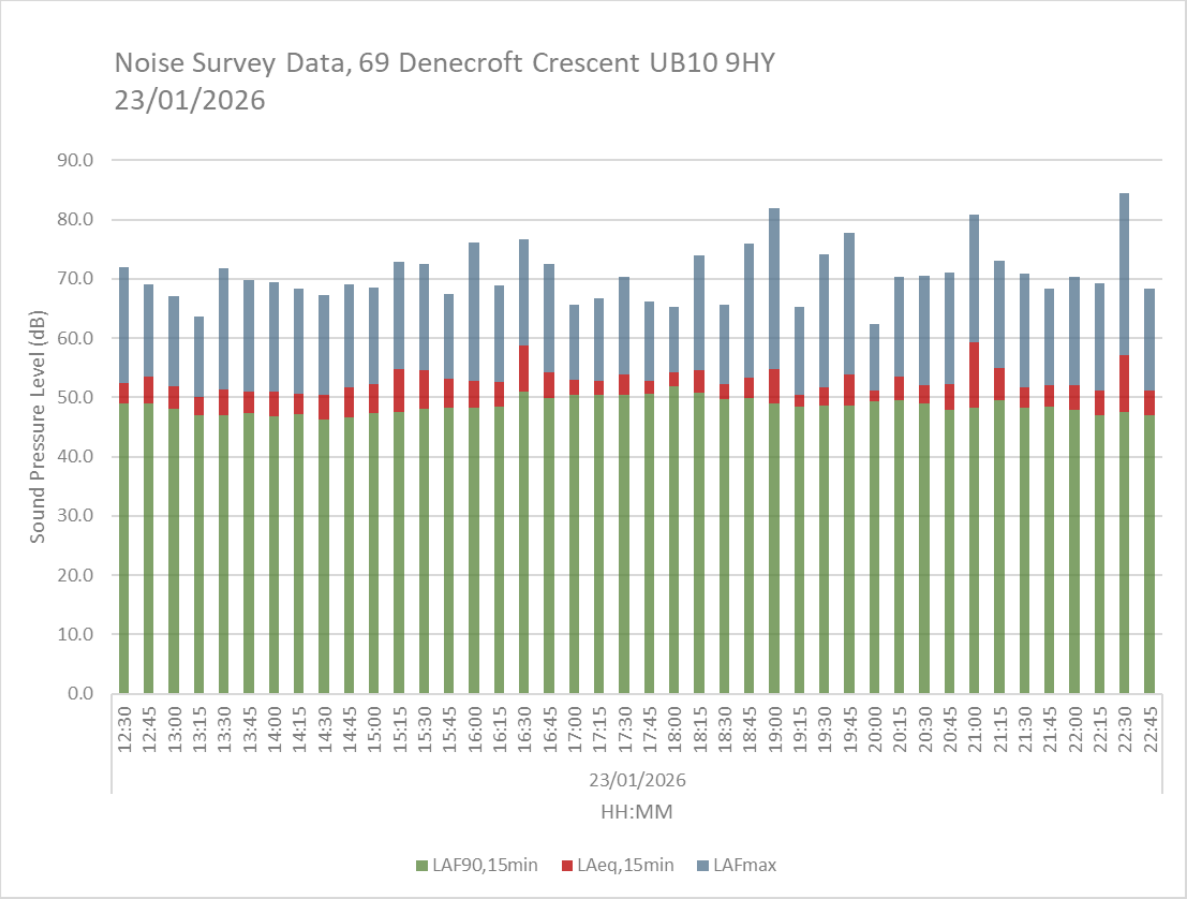


APPENDIX C – Noise Monitoring Data



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23/01/2026	12:30	52.4	71.9	48.9	53.0	48.9	23/01/2026	18:00	54.3	65.3	51.8	53.7	50.6
	12:45	53.5	69.0	48.9				18:15	54.5	74.0	50.7		
	13:00	51.9	67.1	48.0	51.1	47.4		18:30	52.3	65.7	49.7		
	13:15	50.1	63.7	47.0				18:45	53.4	75.9	49.8		
	13:30	51.3	71.8	47.0				19:00	54.7	81.9	48.9	53.0	48.7
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	14:00	51.0	69.5	46.8	51.0	46.8		19:30	51.7	74.1	48.7		
	14:15	50.6	68.4	47.2				19:45	53.9	77.8	48.6		
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	15:00	52.3	68.6	47.4	53.8	47.8		20:30	52.0	70.5	48.9		
	15:15	54.7	72.8	47.5				20:45	52.3	71.1	47.8		
	15:30	54.6	72.5	48.0				21:00	59.3	80.9	48.2	55.6	48.6
	15:45	53.2	67.4	48.2				21:15	54.9	73.1	49.6		
	16:00	52.8	76.2	48.3	55.4	49.5		21:30	51.6	70.9	48.2		
	16:15	52.6	68.9	48.5				21:45	52.0	68.3	48.4		
	16:30	58.8	76.6	51.0				22:00	52.1	70.4	47.8	53.7	47.4
	16:45	54.3	72.5	49.8				22:15	51.2	69.3	47.0		
	17:00	52.9	65.6	50.5	53.1	50.5		22:30	57.1	84.4	47.6		
	17:15	52.8	66.7	50.4				22:45	51.1	68.4	47.0		
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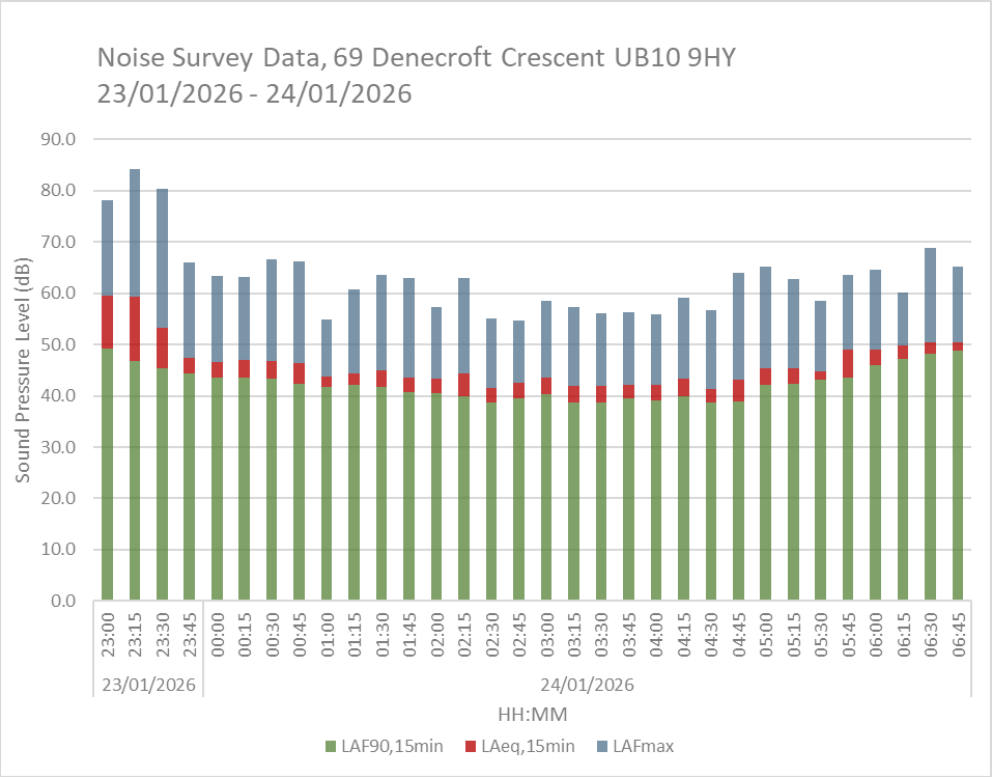
	17:45	52.8	66.2	50.6									



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	23:30	53.3	80.4	45.4
	23:45	47.4	66.1	44.3
24/01/2026	00:00	46.5	63.4	43.6
	00:15	47.0	63.2	43.6
	00:30	46.8	66.6	43.3
	00:45	46.3	66.3	42.3
	01:00	43.8	54.8	41.7
	01:15	44.4	60.8	42.1
	01:30	45.0	63.5	41.7
	01:45	43.5	62.9	40.7
	02:00	43.4	57.3	40.6
	02:15	44.4	62.9	40.0
	02:30	41.6	55.0	38.6
	02:45	42.5	54.6	39.6
	03:00	43.6	58.6	40.3
	03:15	41.9	57.4	38.8
	03:30	41.9	56.1	38.7
	03:45	42.1	56.2	39.6
	04:00	42.1	55.9	39.1
	04:15	43.4	59.1	39.9
	04:30	41.3	56.8	38.7
	04:45	43.2	64.0	38.9
	05:00	45.4	65.1	42.2
	05:15	45.4	62.8	42.3
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	06:00	49.0	64.5	45.9
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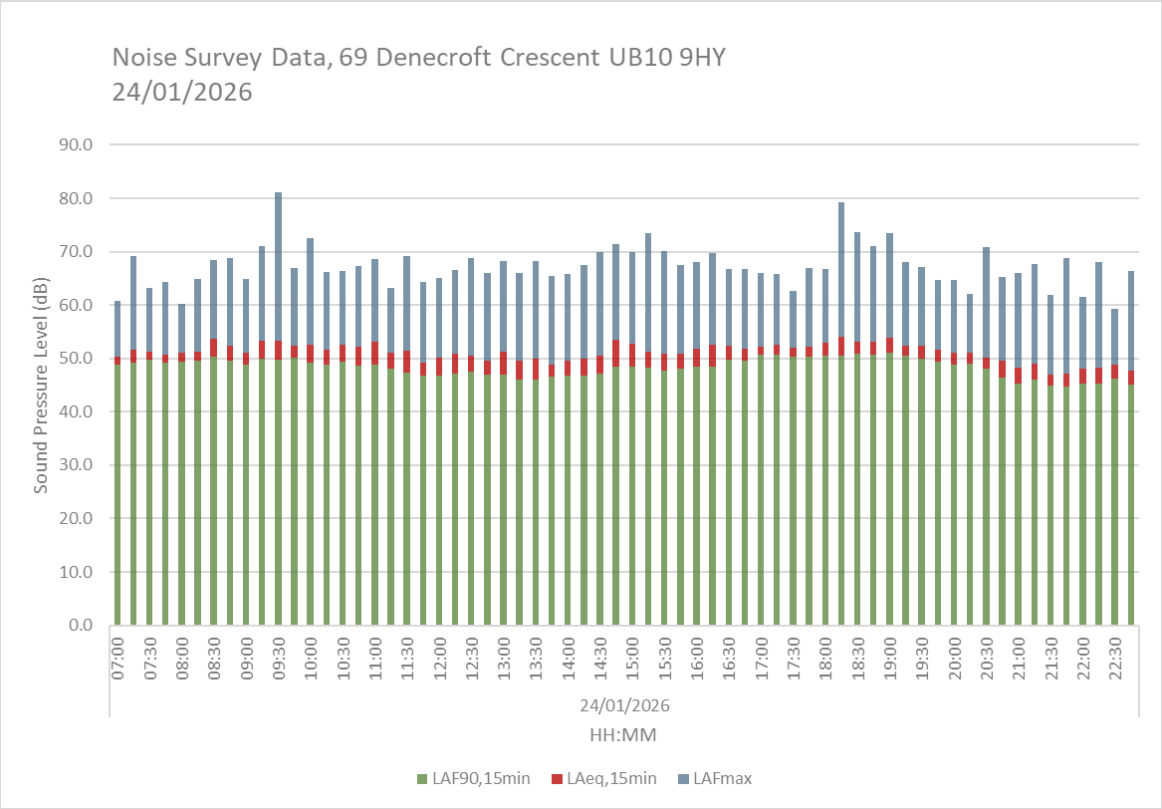
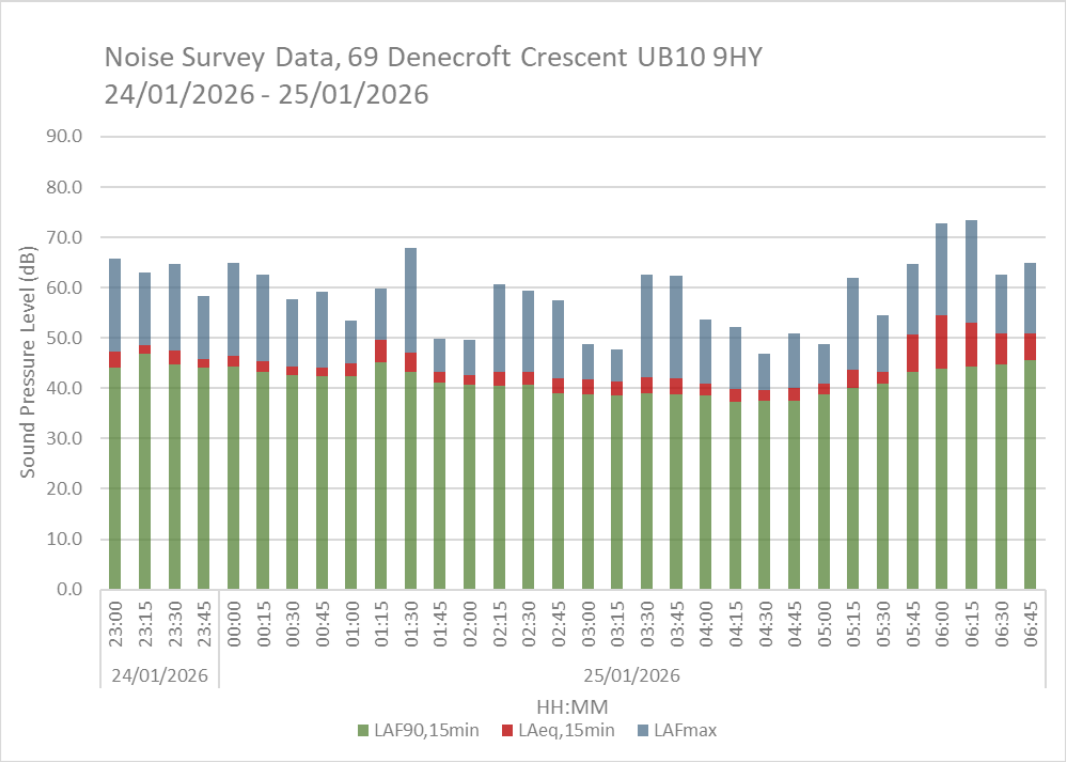


Date	Time	$L_{Aeq,15min}$	L_{AFmax}	$L_{AF90,15min}$	$L_{Aeq,1hour}$	$L_{AF90,1hour}$	Date	Time	$L_{Aeq,15min}$	L_{AFmax}	$L_{AF90,15min}$	$L_{Aeq,1hour}$	$L_{AF90,1hour}$
24/01/2026	07:00	50.4	60.7	48.8	51.0	49.2	24/01/2026	15:00	52.8	69.9	48.5	51.5	48.1
	07:15	51.6	69.2	49.2				15:15	51.2	73.4	48.2		
	07:30	51.3	63.2	49.7				15:30	50.8	70.1	47.8		
	07:45	50.7	64.4	49.2				15:45	50.8	67.5	48.0		
	08:00	51.0	60.3	49.4	52.2	49.7		16:00	51.9	68.0	48.4	52.2	49.1
	08:15	51.3	64.9	49.5				16:15	52.5	69.8	48.5		
	08:30	53.7	68.5	50.3				16:30	52.3	66.7	49.8		
	08:45	52.3	68.8	49.6				16:45	51.9	66.7	49.5		
	09:00	51.0	64.9	48.9	52.6	49.7		17:00	52.2	66.0	50.7	52.3	50.5
	09:15	53.3	71.0	50.0				17:15	52.6	65.9	50.7		
	09:30	53.3	81.1	49.7				17:30	52.1	62.6	50.4		
	09:45	52.4	66.9	50.1				17:45	52.2	66.9	50.3		
	10:00	52.6	72.6	49.3	52.3	49.1		18:00	53.0	66.7	50.5	53.4	50.6
	10:15	51.7	66.2	48.9				18:15	54.1	79.2	50.5		
	10:30	52.6	66.3	49.4				18:30	53.2	73.6	50.8		
	10:45	52.2	67.4	48.7				18:45	53.2	71.0	50.7		
	11:00	53.1	68.6	48.8	51.4	47.8		19:00	53.8	73.5	51.1	52.6	50.3
	11:15	51.1	63.2	48.1				19:15	52.3	68.1	50.5		
	11:30	51.5	69.2	47.3				19:30	52.3	67.2	50.0		
	11:45	49.2	64.4	46.7				19:45	51.6	64.7	49.4		
	12:00	50.2	65.0	46.7	50.3	47.1		20:00	51.0	64.7	48.9	50.5	48.2
	12:15	50.9	66.6	47.1				20:15	51.1	62.0	49.1		
	12:30	50.5	68.9	47.6				20:30	50.1	70.8	48.0		
	12:45	49.5	66.1	46.9				20:45	49.6	65.3	46.5		
	13:00	51.3	68.3	47.0	50.0	46.4		21:00	48.3	66.1	45.3	48.0	45.3
	13:15	49.6	66.1	46.0				21:15	49.1	67.6	46.1		
	13:30	49.9	68.3	46.0				21:30	46.9	61.9	44.9		
	13:45	48.9	65.5	46.6				21:45	47.2	68.8	44.8		
	14:00	49.6	65.9	46.7	51.2	47.3		22:00	48.0	61.6	45.2	48.2	45.5
	14:15	49.9	67.5	46.8				22:15	48.2	68.1	45.3		
	14:30	50.5	69.9	47.1				22:30	48.9	59.3	46.3		
	14:45	53.5	71.4	48.5				22:45	47.7	66.3	45.1		



Date	Time	$L_{Aeq,15min}$	L_{AFmax}	$L_{AF90,15min}$
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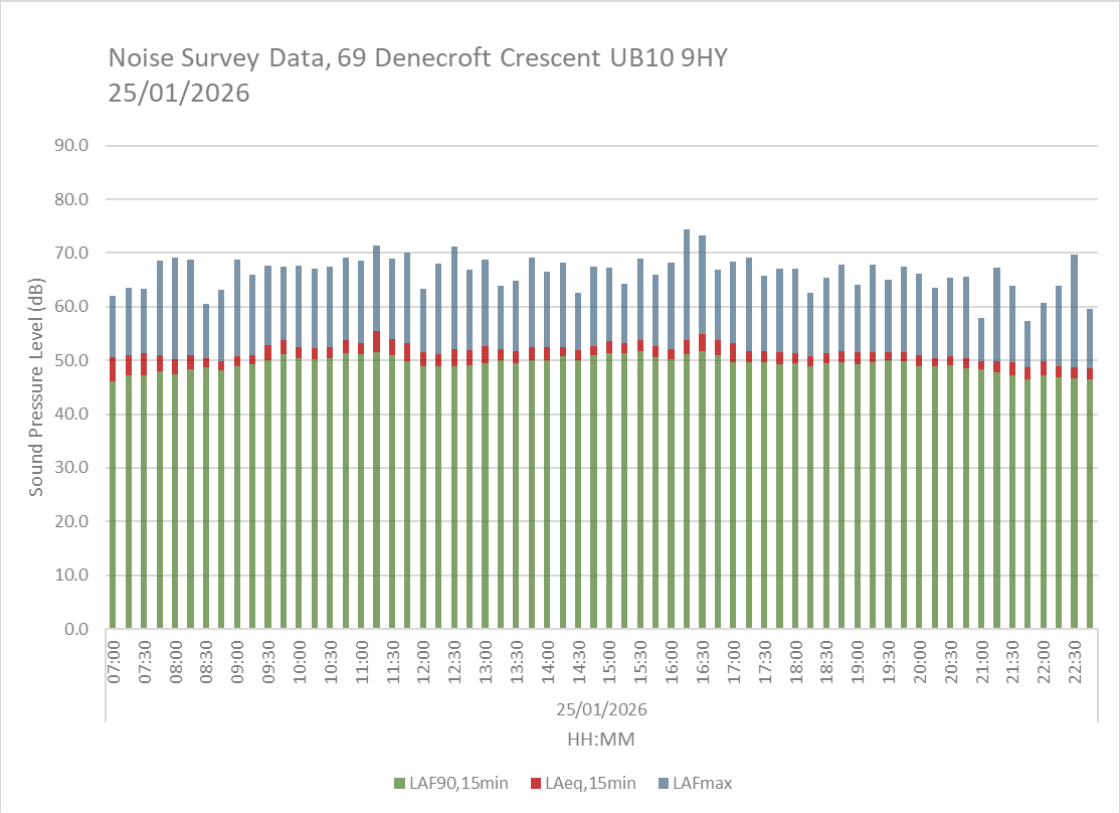
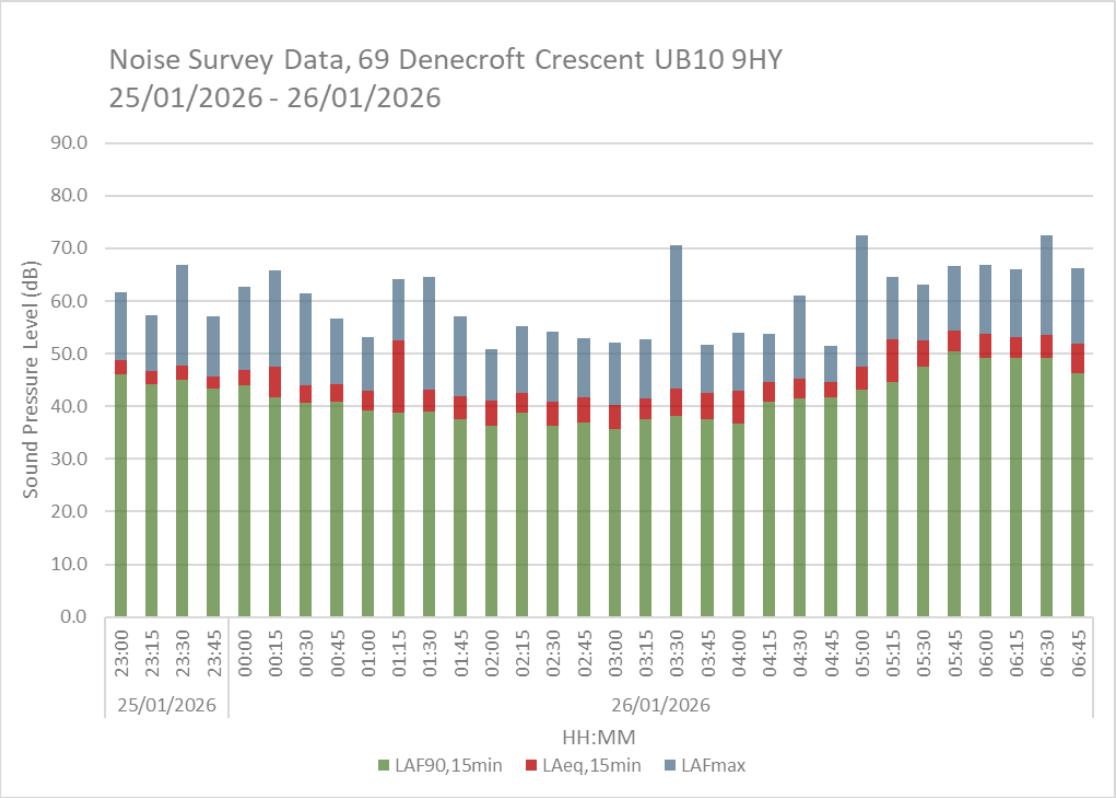
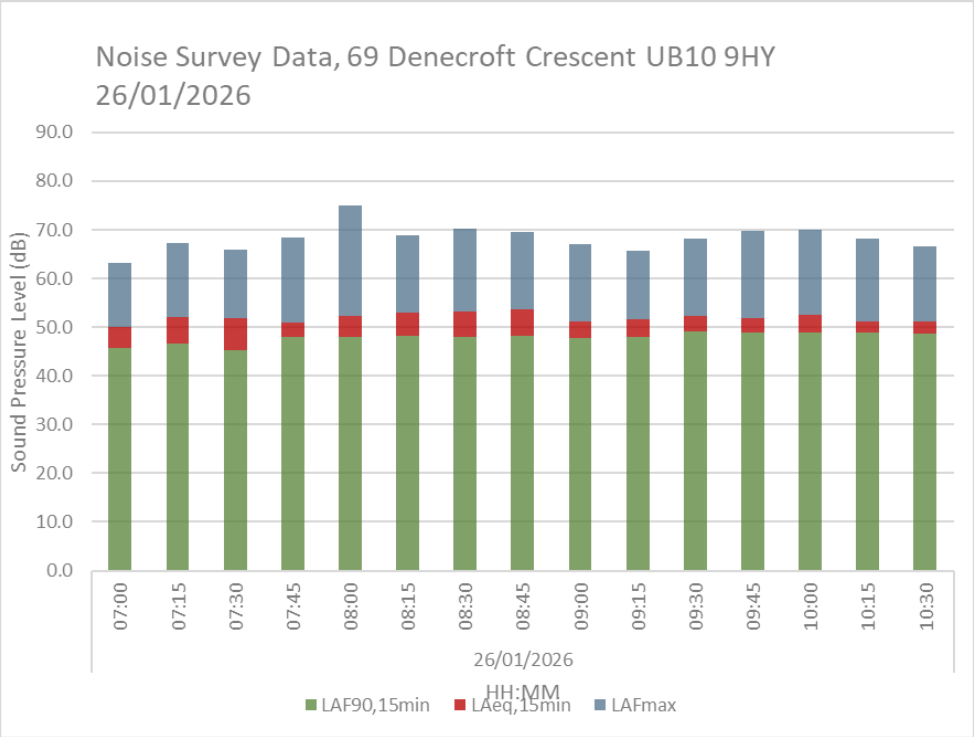
	23:15	48.6	63.0	46.8
	23:30	47.4	64.6	44.8
	23:45	45.8	58.4	44.0
25/01/2026	00:00	46.4	64.9	44.3
	00:15	45.4	62.5	43.3
	00:30	44.3	57.7	42.6
	00:45	44.1	59.2	42.4
	01:00	45.0	53.4	42.3
	01:15	49.6	59.8	45.2
	01:30	47.0	67.8	43.2
	01:45	43.2	49.8	41.1
	02:00	42.7	49.6	40.6
	02:15	43.2	60.7	40.4
	02:30	43.2	59.4	40.6
	02:45	42.0	57.4	39.0
	03:00	41.7	48.8	38.7
	03:15	41.4	47.8	38.5
	03:30	42.1	62.5	39.0
	03:45	41.9	62.4	38.8
	04:00	41.0	53.6	38.5
	04:15	39.8	52.1	37.4
	04:30	39.6	46.9	37.5
	04:45	40.0	50.9	37.5
	05:00	41.0	48.8	38.8
	05:15	43.6	62.0	40.0
	05:30	43.3	54.5	40.9
	05:45	50.6	64.8	43.3
	06:00	54.5	72.7	43.9
	06:15	53.1	73.5	44.4
	06:30	50.8	62.6	44.7
	06:45	50.9	65.0	45.5



Date	Time	$L_{Aeq,15min}$	L_{AFmax}	$L_{AF90,15min}$	$L_{Aeq,1hour}$	$L_{AF90,1hour}$	Date	Time	$L_{Aeq,15min}$	L_{AFmax}	$L_{AF90,15min}$	$L_{Aeq,1hour}$	$L_{AF90,1hour}$
25/01/2026	07:00	50.6	62.0	46.1	51.0	47.2	25/01/2026	15:00	53.6	67.3	51.4	53.3	51.3
	07:15	51.0	63.6	47.2				15:15	53.2	64.3	51.3		
	07:30	51.3	63.4	47.3				15:30	53.8	69.0	51.7		
	07:45	51.0	68.6	47.9				15:45	52.6	65.9	50.6		
	08:00	50.2	69.1	47.4	50.4	48.2		16:00	52.1	68.2	50.3	53.7	51.1
	08:15	51.0	68.7	48.3				16:15	53.7	74.4	51.2		
	08:30	50.4	60.6	48.7				16:30	55.0	73.3	51.8		
	08:45	49.8	63.2	48.2				16:45	53.7	66.9	50.9		
	09:00	50.8	68.8	49.0	52.2	49.9		17:00	53.2	68.4	49.7	52.1	49.6
	09:15	51.0	66.0	49.2				17:15	51.7	69.2	49.6		
	09:30	52.8	67.6	50.0				17:30	51.8	65.8	49.7		
	09:45	53.7	67.4	51.1				17:45	51.5	67.1	49.3		
	10:00	52.5	67.7	50.4	52.8	50.6		18:00	51.3	67.0	49.4	51.3	49.4
	10:15	52.2	67.0	50.3				18:15	50.7	62.5	49.0		
	10:30	52.5	67.4	50.4				18:30	51.4	65.4	49.5		
	10:45	53.7	69.1	51.3				18:45	51.7	67.9	49.6		
	11:00	53.3	68.6	51.1	54.1	50.9		19:00	51.5	64.0	49.2	51.6	49.7
	11:15	55.5	71.4	51.6				19:15	51.6	67.8	49.6		
	11:30	53.9	68.9	51.0				19:30	51.6	65.0	50.1		
	11:45	53.3	70.0	49.9				19:45	51.6	67.4	49.8		
	12:00	51.5	63.3	48.9	51.7	49.0		20:00	50.9	66.1	48.9	50.7	48.9
	12:15	51.2	68.1	48.9				20:15	50.5	63.6	48.9		
	12:30	52.1	71.3	49.0				20:30	50.8	65.4	49.1		
	12:45	51.9	66.9	49.1				20:45	50.5	65.5	48.5		
	13:00	52.7	68.8	49.5	52.3	49.8		21:00	49.9	57.9	48.3	49.5	47.5
	13:15	52.1	63.9	50.1				21:15	49.8	67.2	47.7		
	13:30	51.7	64.9	49.4				21:30	49.6	63.9	47.2		
	13:45	52.5	69.1	50.1				21:45	48.7	57.4	46.5		
	14:00	52.4	66.6	50.1	52.4	50.5		22:00	49.9	60.8	47.2	49.1	46.8
	14:15	52.5	68.2	50.8				22:15	49.0	63.9	46.8		
	14:30	52.0	62.6	50.1				22:30	48.8	69.8	46.6		
	14:45	52.7	67.5	50.9				22:45	48.5	59.6	46.4		



Date	Time	$L_{Aeq,15min}$	L_{AFmax}	$L_{AF90,15min}$
25/01/2026	23:00	48.7	61.7	46.1
	23:15	46.8	57.3	44.3
	23:30	47.8	66.8	45.0
	23:45	45.7	57.0	43.3
26/01/2026	00:00	47.0	62.8	44.0
	00:15	47.6	65.8	41.7
	00:30	44.0	61.4	40.7
	00:45	44.3	56.6	40.8
	01:00	43.0	53.2	39.3
	01:15	52.5	64.2	38.9
	01:30	43.1	64.6	39.0
	01:45	41.9	57.0	37.6
	02:00	41.1	50.8	36.4
	02:15	42.6	55.2	38.8
	02:30	40.9	54.2	36.3
	02:45	41.7	52.9	37.0
	03:00	40.3	52.1	35.7
	03:15	41.5	52.8	37.5
	03:30	43.4	70.7	38.2
	03:45	42.6	51.7	37.5
	04:00	43.0	53.9	36.7
	04:15	44.6	53.8	40.9
	04:30	45.2	61.1	41.5
	04:45	44.6	51.4	41.7
	05:00	47.5	72.5	43.2
	05:15	52.7	64.5	44.7
	05:30	52.6	63.1	47.5
	05:45	54.3	66.6	50.4
	06:00	53.8	66.9	49.3
	06:15	53.1	66.1	49.3
	06:30	53.5	72.4	49.1
	06:45	51.9	66.2	46.3



Date	Time	$L_{Aeq,15min}$	L_{AFmax}	$L_{AF90,15min}$	$L_{Aeq,1hour}$	$L_{AF90,1hour}$
26/01/2026	07:00	50.1	63.2	45.8	51.3	46.6
	07:15	52.1	67.2	46.6		
	07:30	51.8	66.0	45.2		
	07:45	50.9	68.5	48.1		
	08:00	52.3	74.9	47.9	53.1	48.1
	08:15	53.0	68.9	48.2		
	08:30	53.2	70.3	48.0		
	08:45	53.6	69.5	48.2		
	09:00	51.2	67.1	47.7	51.7	48.5
	09:15	51.6	65.7	48.1		
	09:30	52.2	68.1	49.2		
	09:45	51.8	69.7	49.0		
	10:00	52.6	70.1	49.0	51.7	48.8
	10:15	51.1	68.2	48.8		
	10:30	51.2	66.6	48.6		

APPENDIX D – Calculations

As Existing - Measured

Attenuation per double distance required = (6dB for LpA recommended)	6	dB			Metres	Ref Dist'
		Enter Distance =			3	1

	Frequency Hz								
	63	125	250	500	1000	2000	4000	8000	Total
	59.3	60.5	55.0	48.5	43.0	40.1	34.9	29.2	63.79
'A' Weight	26.2	16.1	8.6	3.2	0	-1.2	-1	1.1	
LPA	33.1	44.4	46.4	45.3	43.0	41.3	35.9	28.1	51.62
LPA at New Dist'	23.22	34.58	36.62	35.43	33.21	31.43	26.03	18.27	41.80
LPA After Insert	**23.22**	**34.58**	**36.62**	**35.43**	**33.21**	**31.43**	**26.03**	**18.27**	**41.80**

Unit 1 @ 3m = 42dB $L_{Aeq,T}$

Attenuation per double distance required = (6dB for LpA recommended)	6	dB			Metres	Ref Dist'
		Enter Distance =			3.5	1

	Frequency Hz								
	63	125	250	500	1000	2000	4000	8000	Total
	60.6	54.8	53.5	44.3	41.3	36.3	31.3	28.6	62.33
'A' Weight	26.2	16.1	8.6	3.2	0	-1.2	-1	1.1	
LPA	34.4	38.7	44.9	41.1	41.3	37.5	32.3	27.5	48.76
LPA at New Dist'	23.48	27.80	34.01	30.23	30.37	26.59	21.46	16.62	37.88
LPA After Insert	**23.48**	**27.80**	**34.01**	**30.23**	**30.37**	**26.59**	**21.46**	**16.62**	**37.88**

Unit 2 @ 3.5m = 38dB $L_{Aeq,T}$

Adding dB

Levels to be added (Max. of eight)

Enter values	42	38	0	0	0	0	0	0

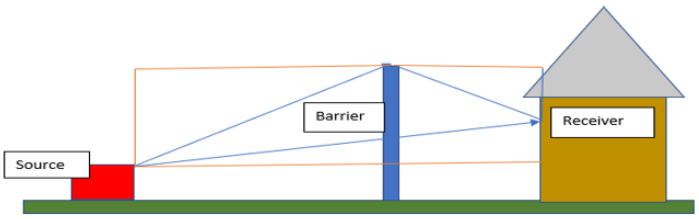
Total = **43.46** dB

Cumulative Sound Pressure Level @ Nearest Sensitive Receptor + Intermittency (3dB) = 46dB $L_{Ar,T}$

With Recommended Mitigation

Applicable where barrier breaks line of sight between source and receiver

Example Illustration of Barrier Attenuation



		Metres
Source to Barrier		0.3
Receiver to Barrier		3
Source to Receiver		3

Path Difference	0.3

Frequency Hz	63	125	250	500	1000	2000	4000	8000
Barrier Correction	7.2	8.7	10.7	13.1	15.8	18.6	21.6	24.5

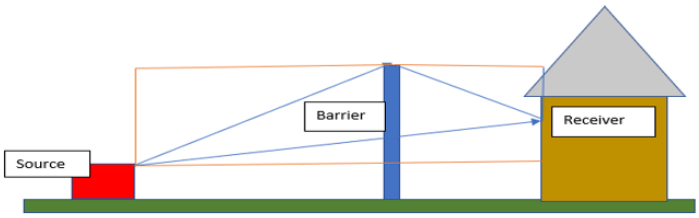
Partial Enclosure Screening Attenuation Calculation – Unit 1

Attenuation per double distance required =				6	dB			Metres	Ref Dist'
(6dB for LpA recommended)					Enter Distance =			3	1
	Frequency Hz								
	63	125	250	500	1000	2000	4000	8000	Total
	59.3	60.5	55.0	48.5	43.0	40.1	34.9	29.2	63.79
'A' Weight	26.2	16.1	8.6	3.2	0	-1.2	-1	1.1	
LPA	33.1	44.4	46.4	45.3	43.0	41.3	35.9	28.1	51.62
LPA at New Dist'	23.22	34.58	36.62	35.43	33.21	31.43	26.03	18.27	41.80
SCREENING	7.2	8.7	10.7	13.1	15.8	18.6	21.6	24.5	
LPA After Insert	**16.06**	**25.91**	**25.92**	**22.31**	**17.41**	**12.80**	**4.48**	**-6.24**	**30.29**

Unit 1 @ 3m = 30dB $L_{Aeq,T}$

Applicable where barrier breaks line of sight between source and receiver

Example Illustration of Barrier Attenuation



		Metres
Source to Barrier		0.3
Receiver to Barrier		3.5
Source to Receiver		3.5

Path Difference	0.3

Frequency Hz	63	125	250	500	1000	2000	4000	8000
Barrier Correction	7.2	8.7	10.7	13.1	15.8	18.6	21.6	24.5

Partial Enclosure Screening Attenuation Calculation – Unit 2

Attenuation per double distance required = (6dB for LpA recommended)				6	dB			Metres	Ref Dist'
					Enter Distance =			3.5	1
	Frequency Hz								
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	Total
	60.6	54.8	53.5	44.3	41.3	36.3	31.3	28.6	62.33
'A' Weight	26.2	16.1	8.6	3.2	0	-1.2	-1	1.1	
LPA	34.4	38.7	44.9	41.1	41.3	37.5	32.3	27.5	48.76
LPA at New Dist'	23.48	27.80	34.01	30.23	30.37	26.59	21.46	16.62	37.88
SCREENING	7.2	8.7	10.7	13.1	15.8	18.6	21.6	24.5	
LPA After Insert	**16.32**	**19.13**	**23.31**	**17.11**	**14.58**	**7.96**	**-0.10**	**-7.90**	**26.30**

Unit 2 @ 3.5m = 26dB $L_{Aeq,T}$

Adding dB

Levels to be added (Max. of eight)

Enter values	30	26	0	0	0	0	0	0

Total = **31.47** dB

Cumulative Sound Pressure Level @ Nearest Sensitive Receptor + Intermittency (3dB) = 34dB $L_{Ar,T}$