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WM Morrison Supermarkets, Meltham

Environmental Noise Impact Assessment

P2630-REP01-BSW

30 April 2025

PROJECT WM Morrison Supermarkets, Meltham
Environmental Noise Impact Assessment

CLIENT Whittam Cox Architects
Carrwood Industrial Estate
Carrwood Rd
Chesterfield
S41 9QB

DOCUMENT REFERENCE P2630-REP01-BSW

SIGNED 
BEN SUN WAI

CHECKED 
THOMAS LEACH

DATE 30 / 04 / 2025

REVISIONS

Issue No.	Reviewer	Authorised by	Approval Date	Summary of Revisions
P01				
P02	Ben Sun Wai	Thomas Leach	30/04/2025	Change of gas cooler location

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Company Registration Number 4218702

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1 Executive Summary

- 1.1 Sol Acoustics Ltd has been commissioned by Whittam Cox Architects to conduct an environmental noise impact assessment of the proposed replacement fixed refrigeration plant to be located at the Morrisons store, Station Street, Meltham, Holmfirth HD9 5QR.
- 1.2 An unattended environmental noise survey was conducted at a single measurement position from Thursday 6th March 2025 to Monday 10th March 2025. The purpose of the survey was to ascertain the existing "Background Sound Level" at the nearest noise sensitive receptors through direct, environmental noise measurement.
- 1.3 An attended environmental noise survey was conducted at a single measurement position on Monday 10th March 2025. The purpose of the survey was to ascertain the existing "Background Sound Level" at the nearest noise sensitive receptors through direct, environmental noise measurement in the absence of noise from the store.
- 1.4 Based on the results of the noise survey an acoustic assessment has been carried out in line with British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. The purpose of the assessment is to determine the impact of the proposed fixed plant on the worst-affected noise sensitive receptors.
- 1.5 The environmental noise emissions that shall be arising from the operation of the plant have been quantified, modelled, and assessed using proprietary "CadnaA" 3D acoustic software.
- 1.6 The acoustic assessment is based on plant specifications provided by Abbey Design Associates.
- 1.7 **It is the conclusion of this environmental noise impact assessment that the total, aggregate environmental noise impact arising from the proposed operation of the plant in its entirety, results in a "low" noise impact at the worst affected noise sensitive receptors when assessed in accordance with British Standard BS 4142: 2014+A1: 2019.**

2 Introduction

2.1 Sol Acoustics Ltd has been commissioned by Whittam Cox Architects to conduct an environmental noise impact assessment of the proposed fixed refrigeration plant to be located at the Morrison store, Station Street, Meltham, Holmfirth HD9 5QR.

2.2 The purpose of this acoustic assessment is as follows:

- ◆ To identify the nearest pre-existing noise sensitive receptors (“NSRs”) which are most likely to be affected by environmental noise arising from the fixed plant
- ◆ To determine the prevailing daytime and nighttime “Background Sound Levels” at the nearest NSR through direct, environmental noise measurement
- ◆ To calculate the resultant environmental noise level contribution and impact at the nearest NSR to the site, as occurring during the daytime and nighttime periods
- ◆ To carry out an environmental noise assessment of the proposed plant in accordance with the methodology prescribed in relevant standards and guidance (i.e. British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*) in order to determine the significance of the potential noise impact specifically generated.

3 Description of Site

3.1 General Overview and Noise Sensitive Receptors (NSRs)

3.1.1 The site is located on Station Street, Meltham, Holmfirth HD9 5QR. The site sits in a valley in the centre of Meltham and is located directly adjacent to Meltham Dike. The area surrounding the site consists of mostly residential units with some commercial units nearby also. The nearest noise sensitive premises are as follows:

- A. Two-storey housing on The Cobbles, located c.30m to the east-northeast of the proposed plant location;
- B. Two-storey housing on Clifton Lane, located c.60m to the southeast of the proposed plant location;

3.2 Proposals

3.2.1 It is proposed that the existing condensers, situated on the roof to the northeast side of the supermarket, are to be replaced with newer units.

3.2.2 The proposed condenser unit to be used is a an "AFR-ZAP-EC-235-ECMP-H " Gas Cooler. It is understood that the plant will be operational 24/7.

3.2.3 The hemispherical free-field acoustic performance of the plant provided to Sol by Abbey Design Associates is as follows:

- ◆ 3T AFR ZAP-EC-235-ECMP-H – Sound Pressure Level– 43 $L_{Aeq,T}$ at 10 metres distance

3.2.4 **Figure 1** indicates the location of the site in relation to its general surroundings as well as denoting the NSRs, the noise monitoring positions used during the noise survey, and the location of the proposed plant.

3.2.5 **Figure 2** indicates the proposed layout of the plant on the roof.



Figure 1: Proposed plant location, key noise receptors, and measurement position location (Google 2025)

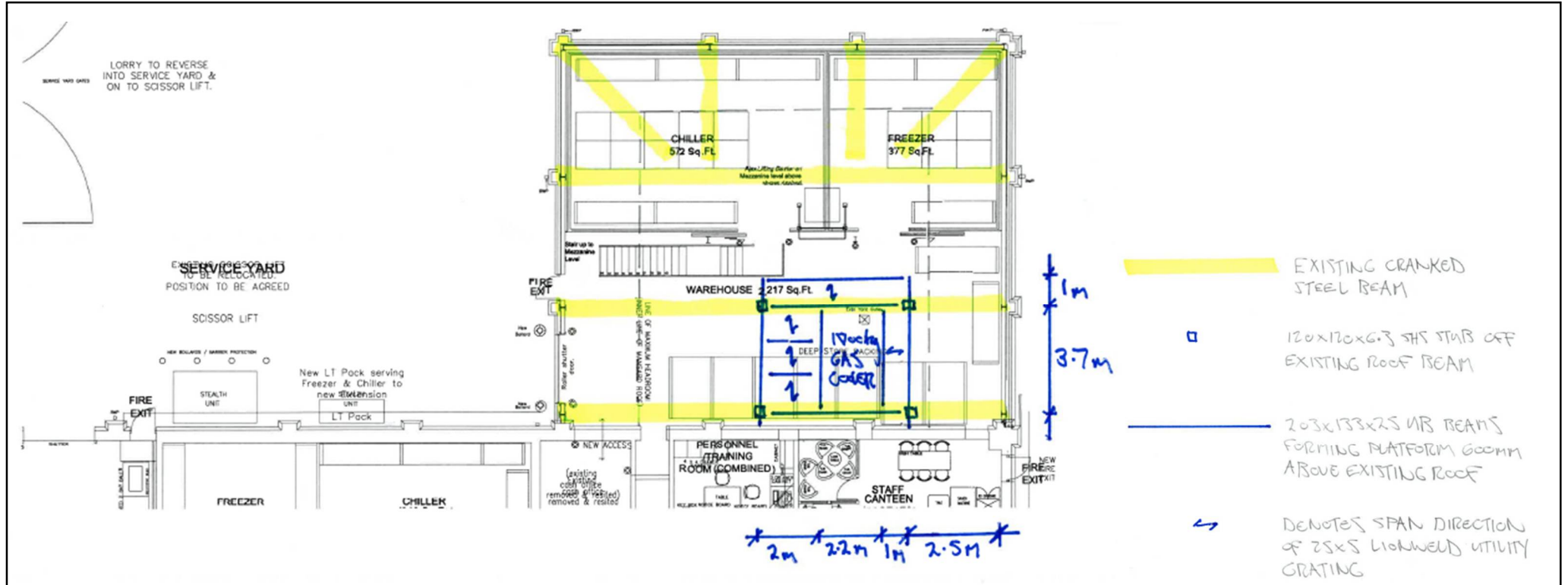


Figure 2: Location of Roof Mounted Condensers

4 Site Survey

4.1 Pre-existing Environmental Noise Climate

- 4.1.1 To inform the acoustic assessment, an environmental noise survey has been conducted by Sol to determine the prevailing, pre-existing Background Sound Levels ($L_{A90,15min}$) at the NSRs close to the site.
- 4.1.2 An unattended environmental noise measurement was carried out at MP1, between c.12:00 hours on Thursday 6th March and c.15:00 hours on Monday 10th March 2025.
- 4.1.3 An attended environmental noise measurement was carried out at MP2, between 21:15 hours and 23:45 hours on Monday 10th March 2025.
- 4.1.4 As shown in [Figure 1](#), Measurement Position 1 (MP1) was situated in a position considered to be acoustically representative of the NSRs. The sound level meter was mast mounted at a height of c.2.5 metres above local ground level and in free-field conditions.
- 4.1.5 A refrigerated trailer (reefer unit) was operational on-site during the time of measurement providing additional cold storage capacity to the store which dominated the Background Sound Level at MP1. It is understood that this reefer unit is permanently positioned at the store and will be in situ after the proposed plant is installed.
- 4.1.6 Measurement Position 2 (MP2) was situated in a position considered to be acoustically representative of the nearest NSRs in the absence of noise from the store. The sound level meter was mast mounted at a height of c.2 metres above local ground level and in free-field conditions. The acoustic environment was controlled by noise from running water in Meltham Dike and the nearby B6108 road.
- 4.1.7 The noise survey was carried out using Type 1 Precision Grade noise monitoring equipment, and the complete measuring system was field calibrated immediately before and after the noise survey. Full details of the noise monitoring systems are retained on file by Sol, including traceable calibration records; these are available for review if needed.

4.2 Noise Survey Results Summary

4.2.1 **Table 1** and **Table 2** provide a basic summary of the typical overall, A-weighted noise levels measured at the various noise monitoring locations, in $L_{Aeq,T}$ and $L_{A90,15min}$ terms. The specific, measured noise levels pertinent to the required BS 4142 environmental noise assessment are highlighted in **blue bold** text:

Date	Daytime (07:00 – 23:00 hours)		Nighttime (23:00 - 07:00 hours)	
	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Typical)
Thursday 6th March 2025	59*	51	56	54
Friday 7th March 2025	61	52	56	54
Saturday 8th March 2025	62	50	56	55
Sunday 9th March 2025	62	52	57	55
Monday 10th March 2025	61*	55	-	-

* Measurement not conducted for the full daytime or nighttime period

Table 1: Summary of the typical overall, A-weight noise levels as measured at Measurement Position 1

Measurement Period	Ambient Noise Level, $L_{Aeq,15min}$ dB	Maximum Sound Level, $L_{max,15min}$ dB	Background Sound Level, $L_{A90,15min}$ dB
10/03/2025 21:15	39	54	37
10/03/2025 21:30	39	45	37
10/03/2025 21:45	39	45	37
10/03/2025 22:00	42	63	37
10/03/2025 22:15	38	58	36
10/03/2025 22:30	37	47	36
10/03/2025 22:45	36	40	36
10/03/2025 23:00	37	42	36
10/03/2025 23:15	36	40	36
10/03/2025 23:30	36	41	36

Table 2: Summary of 15-minute A-weighted ambient, maximum, and background sound levels as measured at MP2

5 Acoustic Guidance and Criteria

5.1 Local Authority Criteria

5.1.1 The site sits within the Planning Authority of Kirklees Council. The Planning Authority has issued guidance for developers to determine the noise rating level of new developments in accordance with BS 4142. The guidance states that (emphasis added):

*"... during normal daytime hours (0700 to 2300 hours), the BS4142 rating level, measured over 1 hour, should be **5dB below the background (L_{A90})**. During the night-time period (2300 to 0700 hours), the BS4142 rating level, measured over 5 minutes should be **5dB below the background (L_{A90})**."*

5.1.2 Adherence to this guidance will result in an "indication of the specific sound source having a low impact, depending on the context" in BS 4142 terms.

5.2 BS 4142: 2014+A1: 2019: 'Method for Rating and Assessing Industrial and Commercial Sound'

5.2.1 BS 4142:2014+A1:2019 'Method for rating and assessing industrial and commercial sound' ("BS 4142") is intended to be used to assess noise of an industrial and commercial nature, which includes sound from fixed installations comprising mechanical and electrical plant and equipment.

5.2.2 The procedure contained in BS 4142 for assessing environmental noise impact is to compare the measured or predicted noise level from the source in question, the "Specific Sound Level" immediately outside the noise sensitive premises, with the corresponding "Background Sound Level". Where the noise contains attention attracting characteristics such as tonal, impulsive, and/or intermittent elements, it may be appropriate to apply a correction to the Specific Sound Level to obtain the "Rating Level".

5.2.3 BS 4142 states that the significance of sound arising from 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 also the context in which the sound occurs:

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

5.2.4 For the daytime, the assessment is carried out over a one-hour period, and over a 15-minute period at night. The daytime and night-time periods are defined as occurring between 07:00 hours to 23:00 hours, and 23:00 hours to 07:00 hours, respectively.

6 Noise Impact Assessment

6.1 Residential Noise Sensitive Receptors (BS 4142:2014+A1:2019 Assessment)

6.1.1 [Appendix C](#) provides a *CadnaA* noise map of the site and the surrounding environment, presenting the worst-case noise sensitive receptor.

6.1.2 The acoustic character correction has been determined in full accordance with the BS 4142 “subjective method” for assessing the acoustic character of a noise source. The Specific Noise Levels are significantly lower compared to the Residual Noise Levels at the site indicating a masking of sound from the proposed plant. It is not deemed that noise coming from the proposed gas coolers will be impulsive, and due to their 24/7 operation, nor intermittent. Due to their inverter-driven nature, it is understood that the fans of the proposed gas coolers will run individually and at variable speeds, negating any tonal effects that may arise from the units. An acoustic character correction of +0dB has therefore been applied to the Specific Noise Level to determine the Rating Level.

6.1.3 [Table 3](#) presents the predicted overall A-weighted, BS 4142-defined Rating Level at the identified NSRs:

Noise Sensitive Receptor	Assessment Period	Predicted Specific Level dB $L_{Aeq,T}$	Acoustic Character Correction dB	Predicted Rating Level dB $L_{Ar,Tr}$	Local Authority Limit dB $L_{Ar,Tr}$	Rating Level Exceedance ±dB
NSR A. Housing on The Cobbles	Daytime (07:00 – 23:00 hours) T = 1 hour	28	+0	28	31	-3
	Nighttime (23:00 - 07:00 hours) T = 5 mins	28	+0	28	31	-3
NSR B. Housing on Clifton Lane	Daytime (07:00 – 23:00 hours) T = 1 hour	27	+0	27	31	-4
	Nighttime (23:00 - 07:00 hours) T = 5 mins	27	+0	27	31	-4

Table 3: BS 4142 Summary Assessment

6.1.4 As presented in [Table 3](#) above, the predicted rating level is below the LPA limit and is therefore compliant with the LPA criteria.

6.1.5 Additionally, the total, aggregate environmental noise impact as arising from the proposed operation of the plant is not expected to exceed the typical Background Sound Level at any NSR. This is an indication of a ‘... *low impact, depending on the context...*’ in BS 4142 terms. The store is a longstanding commercial unit located near to a main road, and therefore context is not expected to change the outcome of the assessment in this case. The resulting environmental noise impact from the site is therefore **low**.

6.2 Uncertainty

6.2.1 Section 10 of BS4142: 2014 states the following with regards to uncertainty:

'... Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty...'

6.2.2 In accordance with the requirements of BS 4142: 2014+A1: 2019, Sol have undertaken the following steps to limit the level of uncertainty in the acoustic assessment:

1. All noise measurements have been carried out using Type 1 Precision Grade noise mounting equipment. All noise measuring instruments have traceable laboratory calibration certification.
2. All environmental noise level measurements were accompanied by continuous meteorological measurements as conducted at, or close to, the measurement position in order to ensure that the measurement data was not adversely affected by unfavourable weather conditions. Periods of adverse weather conditions have been excluded from the assessment.
3. Calculations have been conducted in line with appropriate and nationally recognised acoustic standards (ISO 9613-2), and using proprietary 3D noise modelling software, CadnaA.
4. The assessment assumes downwind propagation in all cases as this represents the worst case.

7 Conclusion

- 7.1 Sol Acoustics Ltd has been commissioned by Whittam Cox Architects to conduct an environmental noise impact assessment of the proposed fixed refrigeration plant to be located at Morrisons, Station St, Meltham, Holmfirth HD9 5QR.
- 7.2 An unattended environmental noise survey was conducted at a single measurement position from Thursday 6th March 2025 to Monday 10th March 2025. The purpose of the survey was to ascertain the existing "Background Sound Level" at the nearest noise sensitive receptors through direct, environmental noise measurement.
- 7.3 An attended environmental noise survey was conducted at a single alternative measurement position on Monday 10th March 2025. The purpose of the survey was to ascertain the existing "Background Sound Level" at the nearest noise sensitive receptors through direct, environmental noise measurement.
- 7.4 Based on the results of the noise surveys an acoustic assessment has been carried out in line with British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. The purpose of the assessment is to determine the impact of the proposed fixed plant on the worst-affected noise sensitive receptors.
- 7.5 The environmental noise emissions that shall be arising from the operation of the plant have been quantified, modelled, and assessed using proprietary "CadnaA" 3D acoustic software.
- 7.6 The acoustic assessment is based on plant specifications provided by Abbey Design Associates.
- 7.7 It is the conclusion of this environmental noise impact assessment that the total, aggregate environmental noise impact arising from the proposed operation of the plant in its entirety, complies with the Local Planning Authority's noise criteria for new developments. The environmental noise impact assessment therefore results in a "low" noise impact at the worst affected noise sensitive receptors when assessed in accordance with British Standard BS4142: 2014+A1: 2019.**

APPENDIX A

Glossary of Acoustic Terms

Term	Abbreviation	Description
Decibel	dB	A scale for comparing the ratios of two quantities, including sound pressure and sound power.
A-weighting	dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the change in sensitivity of the human ear at varying frequencies.
Sound Pressure Level	L_{pA}	A measure of the sound pressure at a particular location. Typically expressed in dB(A) referenced to 2×10^{-5} Pascals.
Equivalent Continuous Sound Level	$L_{Aeq,T}$	The steady level of sound over a prescribed period of time which would contain the same total sound energy as the actual fluctuating noise under consideration in the same period of time.
Statistical Sound Levels	L_{A10} and L_{A90}	The level of noise exceeded for a percentage of the time period being sampled, namely 10% or 90% respectively.
Background Sound Level	$L_{A90,T}$	The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of the time period being sampled.
Maximum Sound Level	L_{Amax}	The maximum sound or noise level determined with instrumentation set to either a fast time weighting, L_{AFmax} or a slow time weighting, L_{ASmax} as occurring during the time period being sampled.
Sound Power Level	L_{WA}	A measure of the total sound energy radiated from a source. Like sound pressure levels, this is also expressed in dB(A) terms, but it is referenced to 1×10^{-12} W.
Broadband		Sound sampled over a wide range of frequencies.
Narrow band		Sound sampled over a specific, restricted frequency range. Used to ascertain the amplitude and significant of individual, audible tones, and to assist in identifying particular sources of noise within a complex, multi-source soundscape environment.
Ambient Sound	$L_{eq,T}$	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, both near and far.
Specific Sound Level	$L_{eq,T}$	The Equivalent Continuous A-Weighted Sound Level at an assessment position produced by a specific sound over a given reference time interval, T_r
Rating Level	$L_{Ar,Tr}$	The Specific Sound Level plus any adjustment for the acoustic characteristic features of the noise (e.g. intermittency, tones etc.).
Residual Noise	$L_{Aeq,T}$	The ambient sound remaining at given position in a given situation, when the specific sound source is suppressed to such an extent that it no longer contributes to the ambient sound.
Sound Reduction Index	<i>SRI</i>	The reduction in sound energy when transmitted through a panel or similar planar element, typically used in relation to single octave or one-third octave frequency band values.
Weighted Sound Reduction Index	R_w	The Sound Reduction Index expressed as a single figure, as expressed against a reference curve.
Dynamic Insertion Loss	<i>DIL</i>	Reduction in acoustic energy resulting from the insertion of a noise control element (e.g. an attenuator, acoustic enclosure etc.).
Free Field		Noise measuring location that is free from the presence of sound reflecting objects (except the ground), usually taken to mean being at least 3.5 metres distance from reflective surface(s) or greater.

APPENDIX B

Noise Survey Details and Summary Results

Location

Morrison's, Station St, Meltham, Holmfirth HD9 5QR

Personnel

Ben Sun Wai MEng – Sol Acoustics

Instrumentation

01dB Cube Sound level meter (serial no. 14027)

01dB Pre22 Microphone preamplifier (serial no. 2105097)

GRAS 40CD Microphone capsule (serial no. 428400)

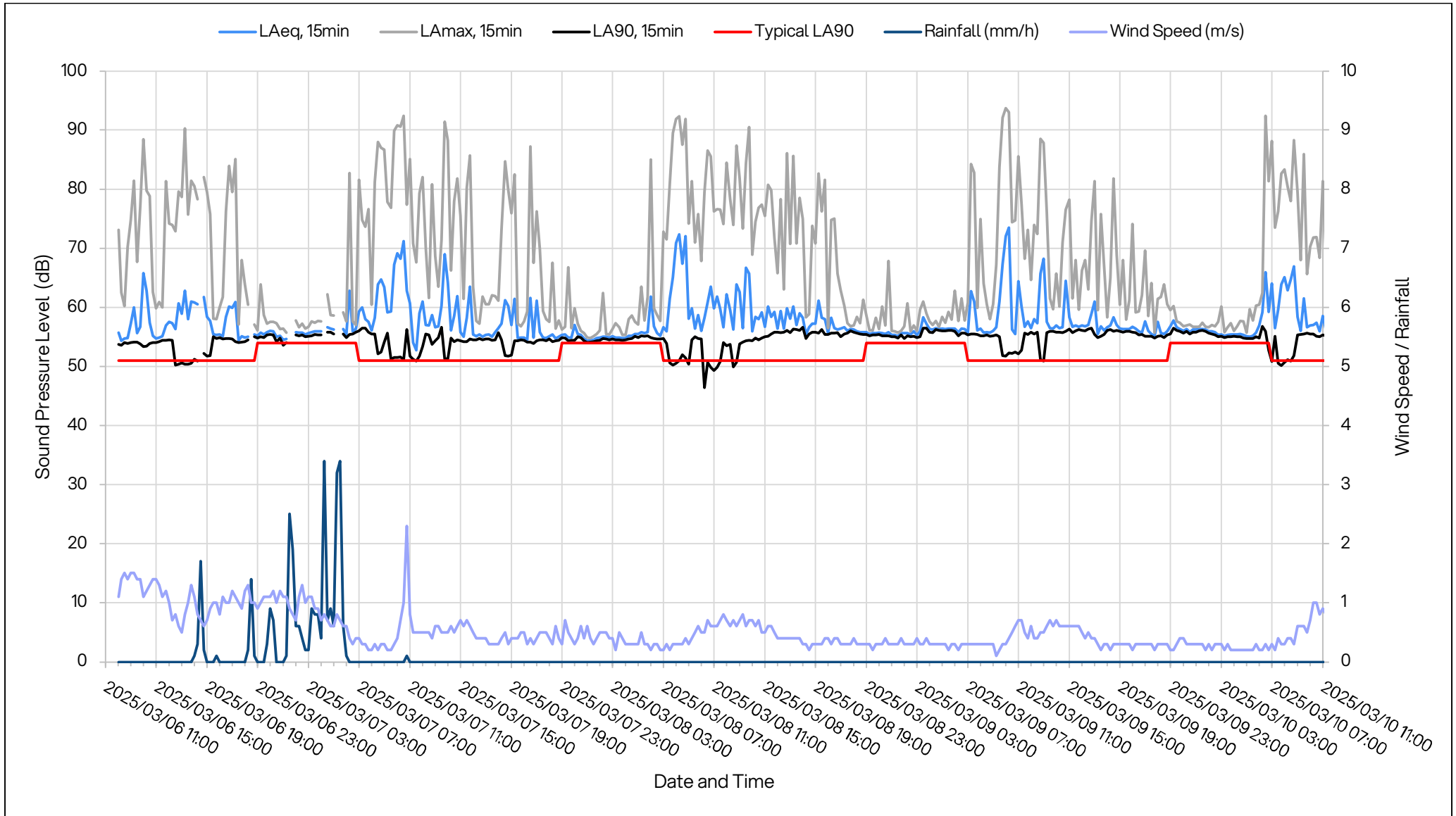
01dB Cal21 acoustic calibrator (serial no. 34675320)

Methodology

Before and after the measurements the noise monitoring equipment was calibrated to an accuracy of ± 0.1 dB using the Cal 21 Calibrator. The calibrator produces a sound pressure level of 94dB re 2×10^{-5} Pa @ 1kHz.

Measurement Results

Graph B1 summarises the broadband A-weighted results obtained at Measurement Position 1.



Graph B1: Environmental noise time history, Measurement Position 1

APPENDIX C

Environmental Noise Modelling Results

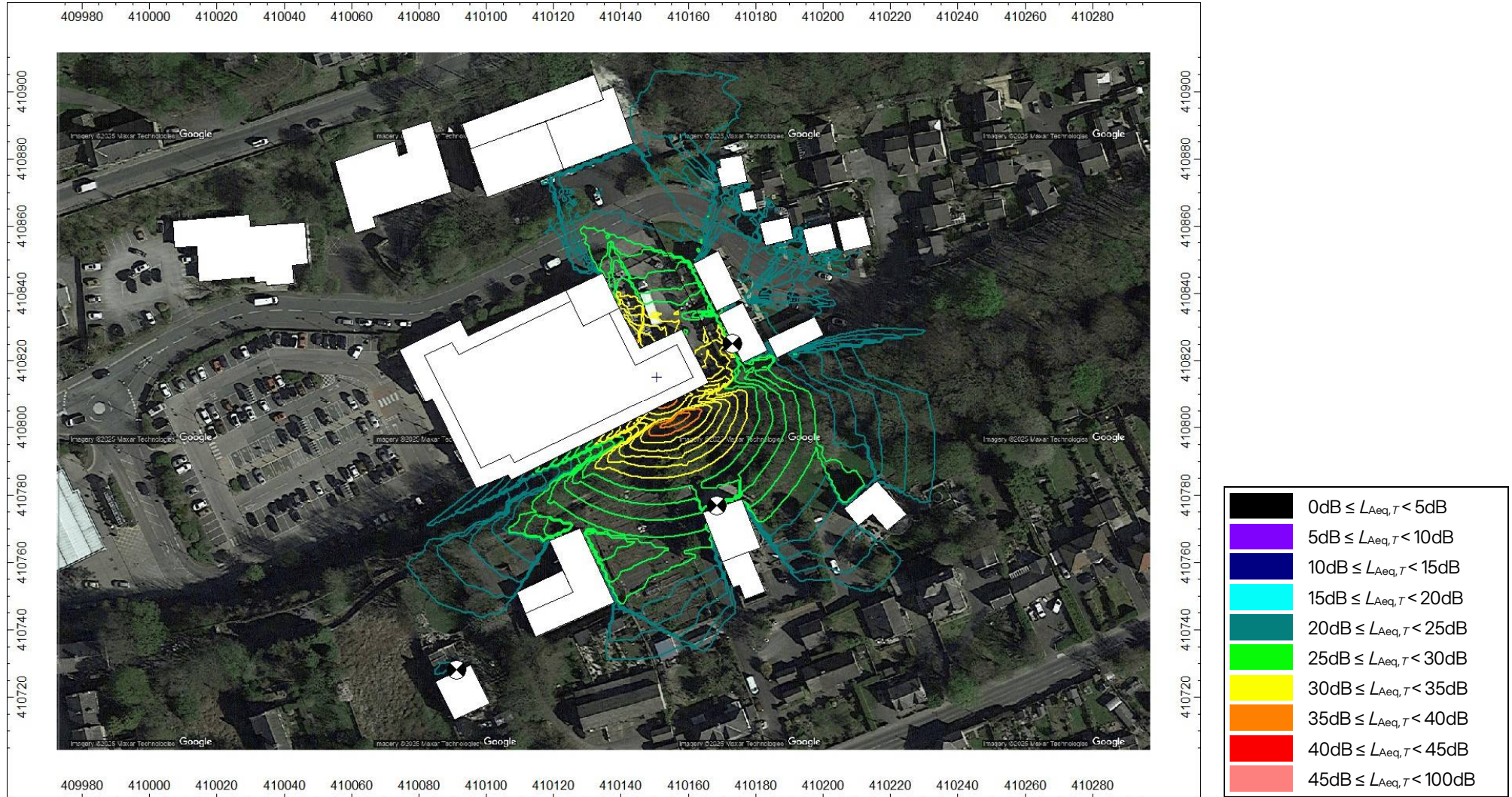


Figure C1: Predicted Specific Sound Level from the Site at 4.0m grid height