

ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 3865

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SAINT MARY'S CHAPEL, HULME
ENVIRONMENTAL NOISE IMPACT ASSESSMENT
ACOUSTIC CONSULTANCY REPORT ADT 3865/ENIA

Revision	Date	Issued By	Checked by	Revision Notes
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1.0 SUMMARY

Planning permission is being sought for the installation of new plant at St Mary's Chapel, Hulme as shown on the planning application drawings.

Acoustic Design Technology Limited have undertaken an environmental noise survey to determine the existing ambient noise levels in the vicinity.

The predicted cumulative rating level from the proposed installations is 11 dB below the typical background level at the nearest residential properties during the proposed hours of operation, satisfying the requirements outlined in the relevant sections of the Manchester City Council document 'Planning and Noise Technical Guidance' (2022).

Noise levels at the Rekindle School to the south east are low enough to achieve BB93 compliant noise levels inside the school and are below our suggested noise limit, ≤ 55 dB $L_{Aeq, 30 \text{ mins}}$ outside the school windows.

This report therefore concludes that the environmental noise impact of the proposed plant should be acceptable.

2.0 BASIS OF ASSESSMENT

2.1 Site Location

The site is located on St Mary's Street in a mixed use residential urban area. The surrounding roads that border the site, Chichester Road South, Parsonage Street and St Mary's Street. Approximately 75 metres to the north of the site is Loreto College, while to the west is the Ellis & Kennedy Education Centre, and the Rekindle School is located immediately to the south-east. There is also the Mawlawi Kurdish Cultural Centre Shekh Raouf Barzinji Mosque, located on Parsonage Street, approximately 25 metres to the south-west of the proposed site building.

The closest residential properties are to the east, on the other side of St Mary's Street, approximately 30 metres from the site building.

2.2 Proposed Development

Planning permission is being sought for the installation of new plant at St Mary's Church as shown on the planning application drawings. The proposed operating hours of the new plant are 09:00 until 22:00 hours, daily.

2.3 Assessment Criteria

The assessment criteria outlined by Manchester City Council is informed by the guidance on the control of noise emissions from new buildings of a commercial or industrial nature as found in BS 4142:2014+A1:2019 and BS8233:2014.

Section 3.7 of Manchester City Council 'Planning and Noise Technical Guidance' 2022 states the following:

“In the context of government policy, the Council require that developments aim for:

- 1. A noise level between the **No Observed Effect Level** (this is the level of noise exposure below which no effect at all on health or quality of life can be detected) and the **Lowest Observed Adverse Effect Level** (this is the level of noise exposure above which adverse effects on health and quality of life can be detected). Conditions may be attached.”*

Section 3.7.1.5 goes on to state:

“BS 4142 should be used to assess the likely impact of noise from industrial and commercial sources at noise sensitive premises (section 3.5). One of the indications of the impact of a BS 4142 assessment is 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.

The Council consider that new developments should contribute and enhance the area in which they are located and where possible i.e. prevent ‘noise creep’, contribute to the improvement of people’s health and quality of life as per the NPSE. With this in mind, the design objective should be:

‘The development should be designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.’”

The scope of BS 4142 relates specifically to residential properties. The school to the south-east is also noise sensitive, but the more appropriate assessment method would be to reference the indoor ambient noise criteria in Building Bulletin 93 (BB93). Assuming that the nearest rooms are classrooms (with a BB93 internal ambient noise limit of 35 dB $L_{Aeq, 30 \text{ mins}}$) and that the existing windows pessimistically provide 20 dB overall noise reduction, it would be reasonable to conclude that plant noise levels should be controlled to ≤ 55 dB $L_{Aeq, 30 \text{ mins}}$ outside the school windows.

2.4 Nearest Noise Sensitive Properties

The noise sensitive properties in the surrounding area have been grouped into two noise sensitive areas (NSA), as described below and as indicated on the attached site plan 3865/SP1.

NSA	Location	Direction	Approximate distance from proposed plant (metres)
1	St Mary's Street Housing	East	30
2	Rekindle School	South-east	6

The above NSA represent the closest noise sensitive properties, with others located further from the site and in some cases screened by the intervening buildings. A satisfactory noise impact at the defined NSA should therefore ensure a satisfactory noise impact at other noise sensitive areas.

2.5 Strategy for Noise Impact Assessment

Based on the information in Sections 2.1 to 2.4 above, the strategy for the noise impact assessment has been broken down into the following stages:

- i. undertake an environmental noise survey to obtain baseline noise data, as described in Section 3.0 below
- ii. assess the impact of noise emissions from the proposed mechanical plant as described in Section 4.0 below

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Purpose

The purpose of the survey was to obtain representative background noise levels during the most sensitive period of plant operation.

3.2 Scope of Survey

An automated environmental noise survey was undertaken between 18:00 hours on Tuesday 18 March 2025 and 12:00 hours Thursday 20 March 2025. Prior to this, an attended environmental noise survey was undertaken between 11:00 hours and 12:00 hours on Tuesday 18 March 2025.

3.3 Instrumentation

The instrumentation used, and the field calibration values before and after the survey are detailed in Appendix A of this report.

3.4 Procedure

Three measurement positions were selected as described below and indicated on the attached site plan 3865/SP1:

- i. Projected 1 metre from a first-floor window at 1A Parsonage Street
- ii. To the rear of St Mary's Church
- iii. On the corner of St Mary's Street, outside the nearest residential property

Position 1 was chosen to obtain background levels for a 24-hour period covering both the day and night time. Positions 2 and 3 were selected to obtain representative daytime measurements at the existing dwellings.

At the automatic noise logging position 1, the microphone was mounted on a pole at first floor level (around 4.5 metres above ground), and projected out of a window approximately 1 metre in front of the existing building facade. The noise levels were logged continuously for the duration of the survey period, using the 01dB Fusion sound level meter set to store the octave band and 'A' weighted 100ms short-term L_{eq} for subsequent post processing.

For the attended measurements at positions 2 and 3, the microphone was mounted on a tripod approximately 1.2 metres above the ground and least 3.5 metres from any other acoustically reflective surface. Measurements were taken at each position using the 01dB Fusion sound level meter set to store the octave band and A-weighted 100ms short-term L_{eq} levels over a 15 minute sample of the hour for subsequent post processing.

3.5 Results

The logged data from measurement position 1 has been post processed to determine $L_{Aeq,T}$, $L_{A90,T}$ and L_{Amax} levels for each 15 minute period, and these are listed in the attached time history graph 3865/TH1.

The logged data from measurement positions 2 and 3 has been post processed to determine $L_{Aeq,T}$, $L_{A90,T}$ and L_{Amax} levels for each 15 minute period, and these are listed in the table below:

Location	$L_{Aeq,T}$ dB	$L_{90,T}$ dB	$L_{Amax,T}$ dB
Position 2 – Church Rear	52	46	72
Position 3 – Nearest Dwelling	55	51	76

Please refer to Appendix B for explanation of the noise units and the A-weighting term used in this report.

3.6 Weather Conditions

As the survey was primarily unattended it is not possible to provide a detailed description of the weather conditions throughout the entire survey period. However, at the start of the survey the weather conditions were dry and still and remained consistent throughout according to publicly available forecasting data.

3.7 Description of Existing Acoustic Environment

As the survey was primarily unattended it is not possible to provide a fully detailed account of the noise climate over the entire survey. The following description is therefore based on the observations made during site visits, the pattern of the measured time history and interrogation of periodic audio samples.

The noise climate was primarily controlled by road traffic on the surrounding roads, with an underlying background contribution from more distant traffic. There are regular spikes in activity in the area, related to Loreto College, that see noise levels at the site elevated. The background sound levels were typical of a mixed use urban area, with some residential, educational and some commercial buildings.

4.0 NOISE IMPACT ASSESSMENT

4.1 Introduction

As already mentioned in Section 2.3 above, the objective is to assess noise emissions from the new plant installations following the guidance of Manchester City Council Planning and Noise Technical Guidance 2022, which is informed by BS 4142:2014+A1:2019.

The standard provides a methodology for assessing the likely impact of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The assessment involves comparing the *rating* level of the sound source with the typical *background* levels for the period of interest. The standard concludes that if the rating level does not exceed the background levels, the noise impact should be low, depending on the context.

Please refer to Appendix C for an explanation of the technical terms defined in the Standard.

4.2 Specific Sound Level

4.2.1 Computer Model

As the analysis is relatively complex, a computer model of the proposed installation has been constructed using Datakustik Cadna/A 2024 to predict how the sound will radiate from the new plant installation to the identified noise sensitive areas.

Within the model all buildings and barriers have been assumed to be acoustically reflective, with ground absorption taken into account as appropriate. The receiver height has been assumed to be 4.5 metres - the approximate height of the closest windows.

4.2.2 Source Sound Levels

The source levels used in this model are taken from the manufacturer's data sheets and are outlined in the attached table 3865/PNS.

4.3 Predicted Sound Levels

The scheduled plant noise levels have been input into the Cadna/A computer model, and the predicted cumulative noise levels with all plant running at the identified noise sensitive areas are as follows:-

Location	Predicted $L_{eq,T}$ (dB) at octave band centre frequency (Hz)								$L_{Aeq,T}$ dB
	63	125	250	500	1k	2k	4k	8k	
NSA1 houses	42	42	41	36	33	28	23	12	39
NSA2 Rekindle School	55	55	54	49	47	42	37	29	52

The $L_{Aeq,T}$ in the above table are the specific sound levels.

4.4 Background Sound Level

The applicant is seeking permission for a 13-hour period of operation, between 09:00 and 22:00 hours. BS4142 outlines a statistical, modal analysis for determining the typical background sound level and such analysis of the survey data from Position 1 shows that the typical background level during the daytime period (07:00 – 23:00) was 50dB $L_{A90,1 \text{ hour}}$.

4.5 Rating Level

To convert the specific sound level into a rating level, corrections have to be applied for impulsivity, intermittency, tonality and other sound characteristics where such features are present. It is important to note that these distinctive features are determined at the assessment location, not at the plant noise source.

4.5.1 Tonality

BS 4142 contains detailed objective methods for determining tonality including narrow band analysis. In this case the manufacturers' noise data is only available in octave bands, so those methods are not usable. For the purposes of this assessment, clear tonality is defined as an $L_{eq,T}$ in one octave band rising 5 dB above the levels in both adjoining octave bands.

According to that definition, a tonal correction is not required.

4.5.2 Impulsivity

The noise emissions from plant of the type proposed for this development would not be impulsive in character, so no correction is required.

4.5.3 Other Sound Characteristics

There are no additional sound characteristics which would warrant the addition of an extra correction.

4.5.4 Intermittency

The plant will operate continuously over a 13 hour period between 09:00 and 22:00 hours. As such, no correction for intermittency is required.

4.6 Assessment of Impact (Residential NSA1)

The initial assessment of impact for the day time period (07:00 – 23:00 hours) is set out in the following table:

Initial assessment of impact – day time period	
	NSA1 St Mary's Street Housing
Specific Sound Level <i>L</i> _{Aeq, 1 hour} (dB)	39
Tonality correction (dB)	0
Intermittency correction (dB)	0
Other distinctive character (dB)	0
Predicted Rating Level <i>L</i> _{Ar, 1 hour} (dB)	39
Background level <i>L</i> _{A90, 1 hour} (dB)	50
Excess of rating level over background sound level (dB)	-11
Initial assessment of impact	Low

The Manchester City Council requirement to achieve a BS 4142 rating level 5 dB below the otherwise prevailing background sound level at residential properties would therefore be achieved.

4.7 Assessment of Impact (School)

The predicted noise level at the Rekindle School windows is 52 dB $L_{Aeq,30\text{ mins}}$, which is within the limit of 55 dB proposed in Section 2.3 above, to achieve BB93 compliance inside the building based on pessimistic assumptions of the sound insulation of the windows.

4.8 Conclusion

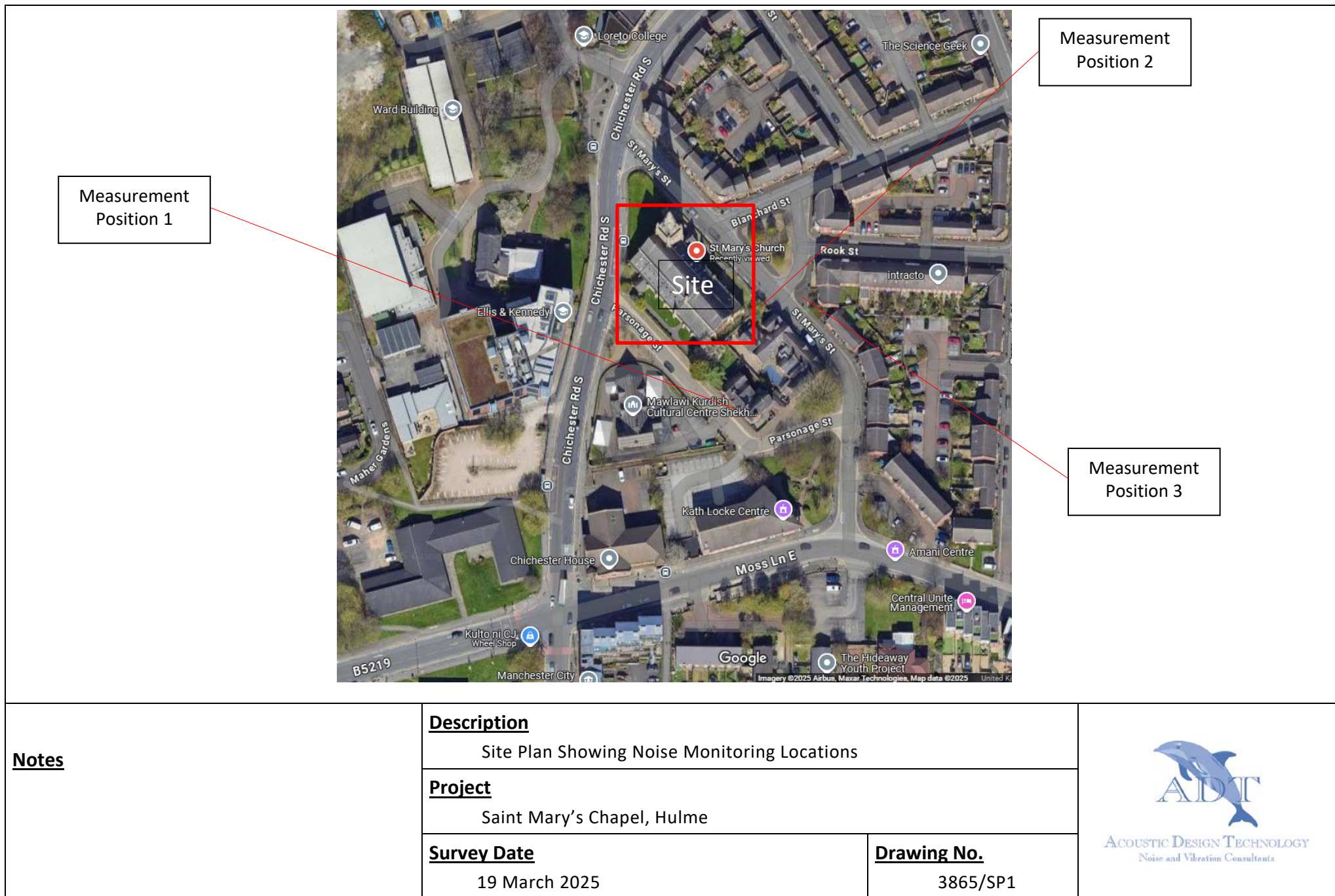
This assessment has demonstrated that when assessed following the methodology of BS 4142, compliance with the Manchester City Council requirements relating to noise from new plant affecting dwellings would be achieved.

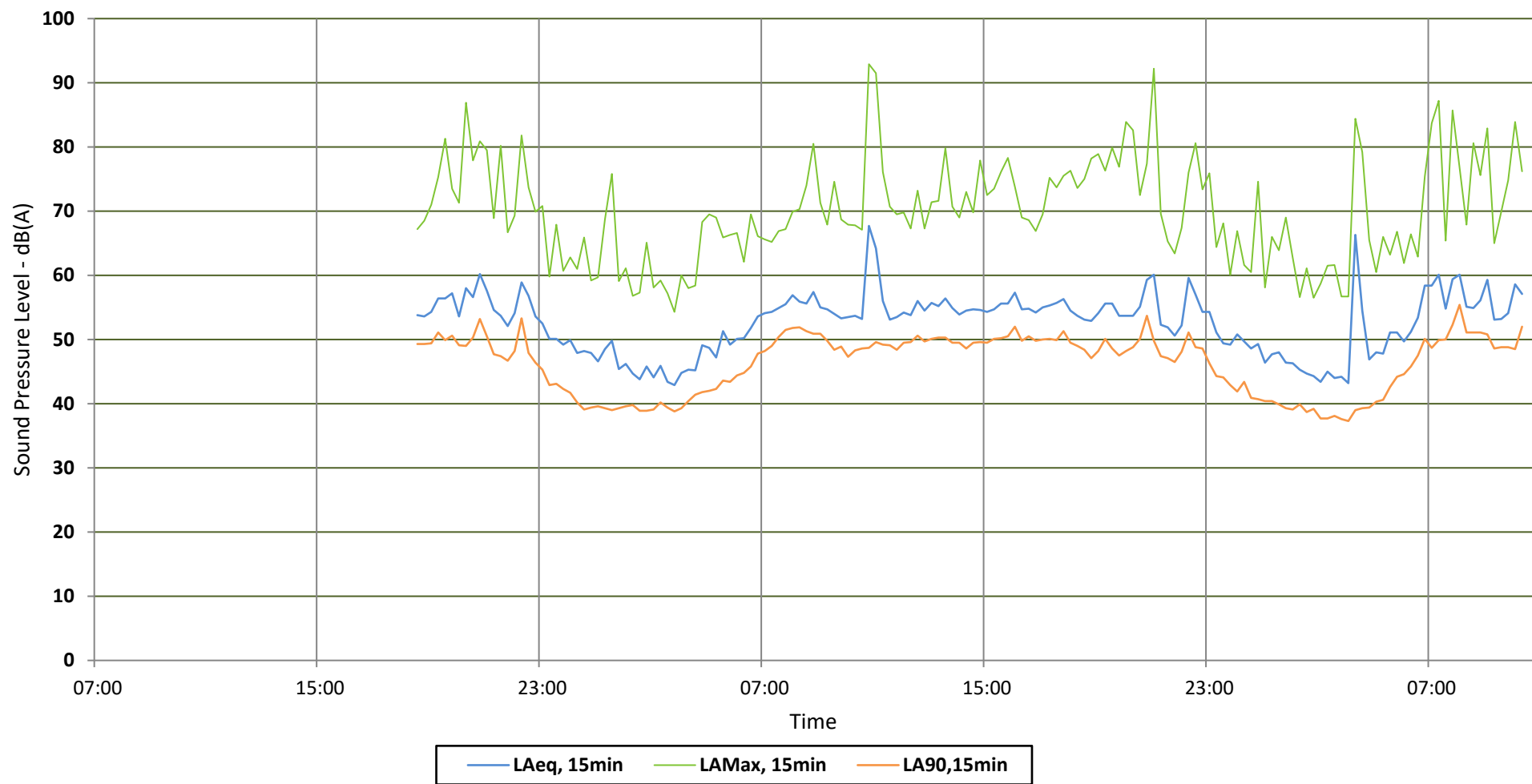
Noise levels at the neighbouring school are low enough to achieve BB93 compliant noise levels inside the school.

The conclusion of this report is therefore that the environmental noise impact of the proposed plant should be acceptable.

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke at the bottom.

FOR ACOUSTIC DESIGN TECHNOLOGY





Notes

Description

Time History Graph - Measurement Position 1

Project

Saint Mary's Chapel, Hulme

Survey Date

18 to 20 March 2025

Drawing No.

3865/TH1



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APPENDIX A
Instrumentation

Manufacturer	Type and / or Model	Serial Number	Last Laboratory Calibration	Calibrator Output (dB)	Free Field Correction (dB)	Initial Reading (dB)	Final Reading (dB)
01dB	Fusion 2 Class 1 Sound Level Meter (SLM12)	15130	Jan 2025		-0.20	113.8	113.8
01dB	Fusion MCE3 Microphone	14050	Jan 2025				
Norsonic	Nor1251 Calibrator (Cal 5)	34220	February 2025	113.98			

APPENDIX B

Acoustic Terminology

The annoyance produced by noise is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and any variations in its level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

A-weighting The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the A-weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average person. It is also possible to calculate the A-weighted noise level by applying certain corrections to an un-weighted spectrum.

When the noise being measured has variable amplitude, such as traffic noise, it is necessary to qualify the basic dB unit. This may be done using a statistical index L_n dB, where n is any value between 0 and 100, and is the percentage of the sample time for which the stated level is exceeded. In defining the use of the index, both the value of n and the length of the sample period must be stated.

L_{10} L_{10} , being the level exceeded for 10% of the time, has been shown to be a good indicator for traffic noise intrusion, and is used in assessing the effect of traffic noise on residential or commercial premises.

L_{90} L_{90} is the level exceeded for 90% of the time, and is used as a measure of background noise level, as it excludes the effects of occasional transient levels, such as individual passing cars or aircraft.

In addition to the statistical noise indices defined above, the following noise units are also used to define variable amplitude noise sources:

$L_{eq,T}$ $L_{eq,T}$ is defined as the notional steady sound pressure level which, over a stated period of time, would contain the same amount of acoustical energy as the actual fluctuating sound measured over the same period. In other words, it is a measure of the "average" noise level

L_{max} L_{max} is the maximum time-weighted sound pressure level recorded over the stated time period

APPENDIX C
Definitions from BS 4142:2014+A1:2019

reference time interval, T_r

specified interval over which the specific sound level is determined (1 h during the day, and 15 min during the night)

specific sound level, $L_{Aeq,Tr}$

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

rating level, $L_{At,Tr}$

specific sound level plus any adjustment for the characteristic features of the sound

background noise level, $L_{A90,T}$

see Appendix B

15 April 2025

Plant Description	Location	Duty m ³ /s : Pa	Data L _w / L _p	Octave Band Centre Frequency - Hz								dB(A)
				63	125	250	500	1k	2k	4k	8k	
PUZ-M100VKA2 (3 no.)	Rear Elevation – South East	-	L _p ⁽¹⁾	54	54	53	49	46	41	36	29	
			L _w ⁽²⁾									70
PUZ-ZM60VHA2 (2 no.)	Rear Elevation – South East	-	L _p ⁽¹⁾	53	52	53	44	43	39	34	27	
			L _w ⁽²⁾									67

(1) Manufacturer's octave band sound pressure level data provided for measurements taken at 1m metre from the unit
 (2) The manufacturer's data sheet provides an A-Weighted Sound Power Level only