ACOUSTICS CENTRAL

Warren Court, London

Plant Noise Assessment

20221107-0 R1

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Warren Court, London

Plant Noise Assessment

20221107-0 R1

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Document History and Version Control

Version	Purpose/Change	Author	Date
V1.0	First Issue	**Andy Emery** MEng(Hons) MIOA	7th December 2022

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Executive Summary

Planning permission is sought for the demolition of the existing sixth floor and the erection of a replacement single storey extension to provide four residential units at Warren Court, Euston Road, London NW1 3AA. New mechanical services plant is proposed to be installed to serve the development.

The local planning authority, The London Borough of Camden (LB Camden), have policy placing limits on the level of noise that can be generated by any mechanical services plant installed as part of new development. The limits are relative to the existing background noise levels at sensitivities within the vicinity of the proposed plant location.

Acoustics Central has been instructed to undertake a noise assessment of the proposed plant items to determine whether they would be expected to comply with any relevant planning requirements.

An assessment of atmospheric noise emissions has been undertaken of the 4 new external condenser units, accounting for the requirements of LB Camden planning policy and the existing background noise levels which were measured as part of a noise survey carried out at the site.

The assessment has found that in the proposed location the noise emissions from the proposed plant is calculated to fall within the relevant noise limits without the need for specific noise mitigation measures.

ACOUSTICS CENTRAL

Table of Contents

7th December 2022

Attachments

20221107-0 R1 TH1.1 to TH1.5
Time History figures showing noise levels recorded at position MP1

20221107-0 R1 TH2.1 to TH2.5
Time History figures showing noise levels recorded at position MP2

20221107-0 R1 SCH1
Plant Noise Schedule

20221107-0 R1 CS1 to CS6
Plant Noise Calculation Sheets

20221107-0 R1 Appendix A
Glossary of Acoustics Terms

20221107-0 R1 Appendix B
Document Naming and Version Control Policy

1 Introduction

1.1 Planning permission is sought for the demolition of the existing sixth floor and the erection of a replacement single storey extension to provide four residential units at Warren Court, Euston Road, London NW1 3AA. New mechanical services plant is proposed to be installed to serve the development.

1.2 The local planning authority, The London Borough of Camden (LB Camden), have policy placing limits on the level of noise that can be generated by any mechanical services plant installed as part of new development. The limits are relative to the existing background noise levels at sensitivities within the vicinity of the proposed plant location.

1.3 Acoustics Central has been instructed to undertake a noise assessment of the proposed plant items to determine whether they would be expected to comply with any relevant planning requirements.

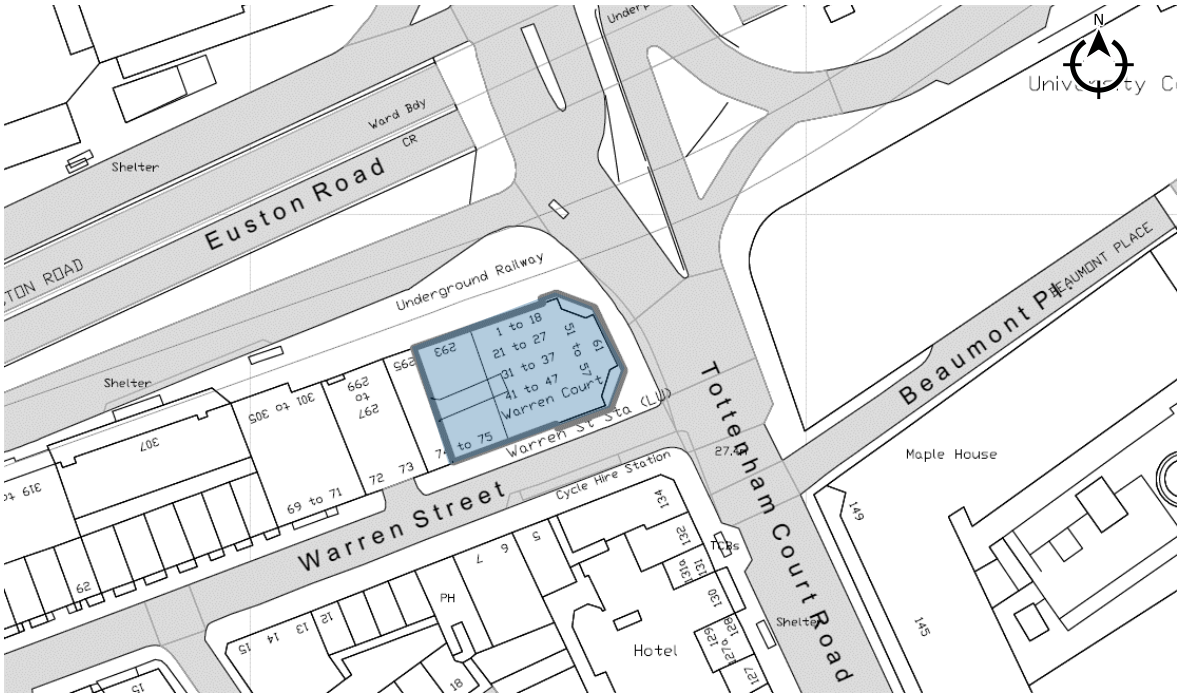
1.4 This report provides details of a noise survey undertaken on site to determine the current noise climate and the corresponding plant noise emission limits at the nearest noise sensitive receptors. Calculations of the noise emissions from the proposed plant to the nearest noise sensitive receptors are set out, along with the details of any necessary mitigation.

1.5 The report is necessarily technical in nature, however every effort has been made to make it as clear as possible. In this regard, the Glossary of Acoustics Terms attached as Appendix A gives further explanation on relevant acoustics terminology used within the report.

2 Site Layout

2.1 General

2.1.1 The site is located above the entrance to Warren Street London Underground station on Euston Road in London, NW1 3AA as indicated in the following figure.



F1 Figure indicating the location of the site

2.1.2 The existing building comprises a ground floor and six storeys above. It is within a block bounded by the A501 Euston Road to the north, the A400 Tottenham Court Road to the east, and Warren Street to the south.

2.1.3 It is proposed to install condensing units on the roof of the newly extended 6th floor to the building.

2.2 Site Context

2.2.1 There is a lightwell between the Warren Court building and the adjoining building to the west along Warren Street which contains residential windows at 5th floor facing north and 4th floor facing east.

2.2.2 To the opposite side of Warren Street to the south of the site is a Hotel extending five storeys above ground floor retail use.

2.2.3 To the east of the site across Tottenham Court Road is University College Hospital.

2.2.4 To the north of the site across Euston Road are office buildings including Euston Tower directly opposite.

2.3 Noise Climate

2.3.1 The noise climate at the site is primarily controlled by traffic on roads within the vicinity of the site. At roof level locations well screened from road traffic noise, existing mechanical services plant serving nearby premises affected the noise climate.

3 Design Requirements

3.1 The site is located within the London Borough of Camden. The current version of the Local Plan was adopted in 2017. Policy A4 relates specifically to noise:

We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity.

Planning conditions will be imposed to require that plant and equipment which may be a source of noise is kept working efficiently and within the required noise limits and time restrictions.

Conditions may also be imposed to ensure that attenuation measures are kept in place and are effective throughout the life of the development.

3.2 Appendix 3 goes on to provide the following guidance on noise limits for industrial and commercial noise sources:

"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15 dB if tonal components are present) should be considered as the design criterion)."

3.3 In order to address this requirement, the existing background noise levels representative of sensitive facades must first be quantified. The environmental noise survey described in Section 4 sets out the exercise to measure these. This allows noise limits to be established, complying with which would thereby demonstrate compliance with the requirements of the LB Camden policy. These noise limits are detailed in Section 4.8.

3.4 Following this, calculations of the noise from the proposed plant items need to be undertaken for comparison with the limits. The atmospheric-side plant noise assessment described in Section 5 sets out the details of the exercise undertaken to calculate these.

4 Noise Survey

4.1 General

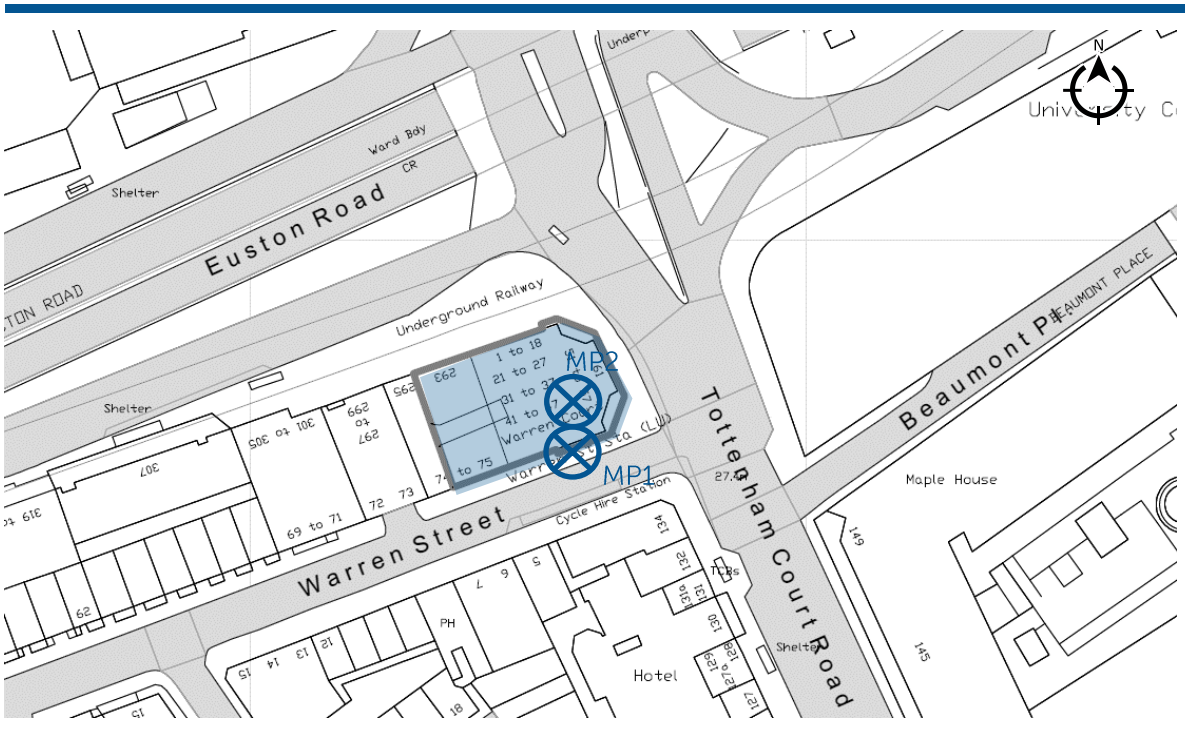
4.1.1 In order to quantify the noise levels at and around the site, an environmental noise survey was carried out, commencing at 11h00 on Friday 25th November and concluding at 09h00 on Tuesday 29th November 2022. This period included both weekdays and a weekend.

4.2 Guidance and Standards

4.2.1 The survey instrumentation, methodology and reporting of results has been carried out following guidance contained within British Standard 7445-1:2003 - *'Description and measurement of environmental noise - Part 1: Guide to quantities and procedures'*,

4.3 Measurement Positions

4.3.1 Noise measurements were made using two unattended noise monitors, located at roof level as illustrated in the following figure and described below:



F2 Figure indicating the noise measurement positions MP1 and MP2 on the site

- MP1 1m from the south façade overlooking Warren Street at 6th floor level. This location is considered representative of the hotel windows to the opposite side of Warren Street
- MP2 1.2m above top floor roof level, screened from direct sight of nearby roads. This location is considered representative of the residential windows within the lightwell to the west of the site.

4.3.2 We note that measurements were not made to the west side of the 5th floor roof (i.e. 6th floor level) due to existing plant items located in the vicinity. Both survey locations were selected to be as shielded from these existing noise sources as possible while still being representative of the noise climate at the nearby receptors.

4.4 Noise Monitoring Equipment

4.4.1 All noise measurements were made with the equipment detailed in the following table.

Item	Manufacturer	Type
Sound Level Analyser x2	NTi	XL2-TA
Acoustic Calibrator x1	NTi	CAL200

T1 Equipment used during unattended external noise measurements

4.4.2 The sound level analysers presented in the above table conform to the Type 1 specification as given in BS EN 61672-1:2003 - *'Electroacoustics - Sound level meters - Part 1: Specifications'*. The calibrator presented in the above table conforms to the Class 1 specification as specified in IEC 60942:2003 – *'Electroacoustics - Sound calibrators'*.

Calibrations

4.4.3 The measurement instrumentation, including sound level analysers, preamplifiers and microphones have undergone traceable calibration by either a competent laboratory or the equipment manufacturer within the last two years.

4.4.4 The acoustic calibrator has undergone traceable calibration by either a competent laboratory or the equipment manufacturer within the last year. The calibration certificates for the above equipment can be provided on request.

4.4.5 A field calibration check was undertaken on the noise measurement equipment before and after the survey to ensure a consistent and acceptable level of accuracy is maintained. No significant drift was noted to have occurred.

4.5 Data Recorded

4.5.1 Noise data was recorded over consecutive 15-minute periods in all relevant indices, including L_{Aeq}, L_{A90}, and $L_{AMax,F}$[1]. See attached Appendix A for an explanation of noise units used.

4.5.2 Octave band data for each of the above indices was also recorded at all positions, the filters for which met the requirements of BS EN 61260:1996, Class 1.

4.6 Meteorological Conditions

4.6.1 During the survey temperatures were generally cool, ranging between 9 - 13°C during the daytimes and 6 - 9°C during the night times. Wind speeds were generally low, being typically < 5m/s, except for the daytime Saturday 26th until the early hours of Sunday 27th when it

[1] Maximum A-weighted sound pressure level using time-weighting "F" and "S". As stated in BS EN 61672–1:2003 Design-goal time constants are 0,125 s for time-weighting F (Fast) and 1 s for time weighting S (Slow).

intermittently reached approximately 8m/s. Publicly available weather data suggests it was predominantly dry during the survey, except for some rain on Saturday 27th. The assessment is utilising the minimum background noise level from multiples days, most of which are dry and therefore the rain noted weather on this one day is not expected to materially affect the setting of the noise limits derived from the longer term survey.

4.7 Results

4.7.1 The attached time-history figures TH1.1 to TH1.5 and TH2.1 to TH2.5 present the noise levels measured at MP1 and MP2 respectively. A summary of results is presented in the following table.

Location	Measured $L_{A90,15min}$ (dB) (minimum)	
	Daytime (0700-2300 only)	Night time (2300-0700)
Position MP1	55	52
Position MP2	58	57

T2 Summary of measured L_{A90} background noise levels

4.8 Limits

4.8.1 Based on the results of the noise survey and the requirements of LB Camden policy, the following plant noise limits are to apply here:

Location	Noise Limit, dB	
	Daytime (0700-2300 only)	Night time (2300-0700)
Noise sensitive windows facing onto Warren Street or Tottenham Court Road	45	42
Noise sensitive windows at roof level screened from direct view of traffic on nearby roads	48	47

T3 Plant noise limits at the nearest noise sensitive properties.

4.8.2 The above limits apply to the cumulative noise emissions from all new plant items under normal operating conditions, and are to apply at 1 m from the outside of the windows of the nearest noise sensitive receptors.

4.8.3 The noise limits are to apply at 1m from the outside of nearby noise sensitive windows. Any plant with a tonal or other component out of character with the existing noise environment would be subject to a further 5dB penalty in line with the guidance set out above.

5 Atmospheric-Side Plant Noise Assessment

5.1 General

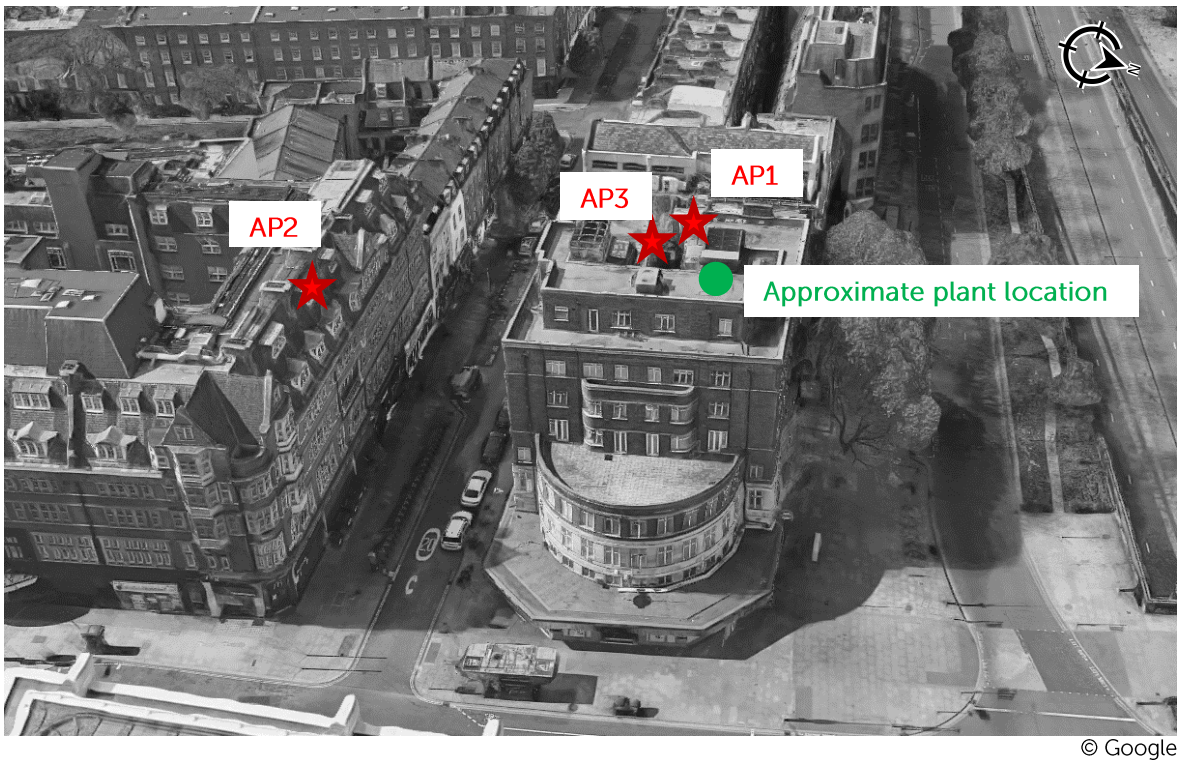
5.1.1 To address the requirements of LB Camden planning policy, an atmospheric plant noise assessment has been carried out.

5.1.2 In essence, the assessment starts with plant noise levels, takes account of any system or propagation losses, and compares the resultant levels with the plant noise limits established in the previous section.

5.1.3 Our calculations take into account the effects of distance and, where relevant, screening from roof and wall edges where these obscure the plant from direct view. Calculations undertaken as part of this assessment are detailed in attached Calculation Sheets CS1 to CS6.

5.2 Assessment Locations

5.2.1 The closest off-site affected noise sensitive properties are the hotel to the opposite side of Warren Street to the south, and the residences within the adjoining building to the west with windows facing east into a lightwell. We have also considered the residences below the proposed development at 5th floor level. These have been represented as three assessment positions as illustrated in the following figure and described below:



F3 Figure indicating the noise assessment receiver positions AP1, AP2 and AP3

- AP1: 4th floor residential window facing east within adjoining building to west
- AP2: 5th floor hotel windows facing north from opposite side of Warren Street to south of application site
- AP3: 5th floor residential window facing north within lightwell to west

5.3 Proposed Scheme

5.3.1 The proposed plant is to be installed on the flat roof above a newly extended 6th floor of the building and comprise the following items:

- 4no. Mitsubishi Electric MXZ-4F80VF2 Inverter heat pump

5.3.2 The manufacturer's datasheet for the unit indicates a sound power level of 65dB(A). A sound pressure level spectrum is also defined as duplicated in the attached plant noise schedule SCH1.

5.4 Hours of Operation

5.4.1 The plant is to be available for use 24 hours a day so the night time noise limits form the targets for the assessment.

5.5 Assessment Results

5.5.1 By utilising the methodology set out above we calculate noise levels at the aforementioned assessment positions as presented in the following table. The noise limits are also reproduced for ease of comparison.

Location	Calculated Noise Level, dB	Noise Limit 24-hours, dB
AP1 – Residence to west (4th floor east facing)	35	47
AP2 – Hotel to south (5th floor north facing)	33	42
AP3 – Residence to west (5th floor north facing)	42	47

T4 Noise assessment results

5.5.2 As the above table shows, the noise emissions from the proposed plant are calculated to fall within the relevant noise limits without the need for specific noise mitigation measures.

5.5.3 To minimise transmission of structure borne noise, it is recommended the condenser units are mounted on resilient pads selected and sized to achieve a static of 2mm under load to minimise transmission of structure borne noise.

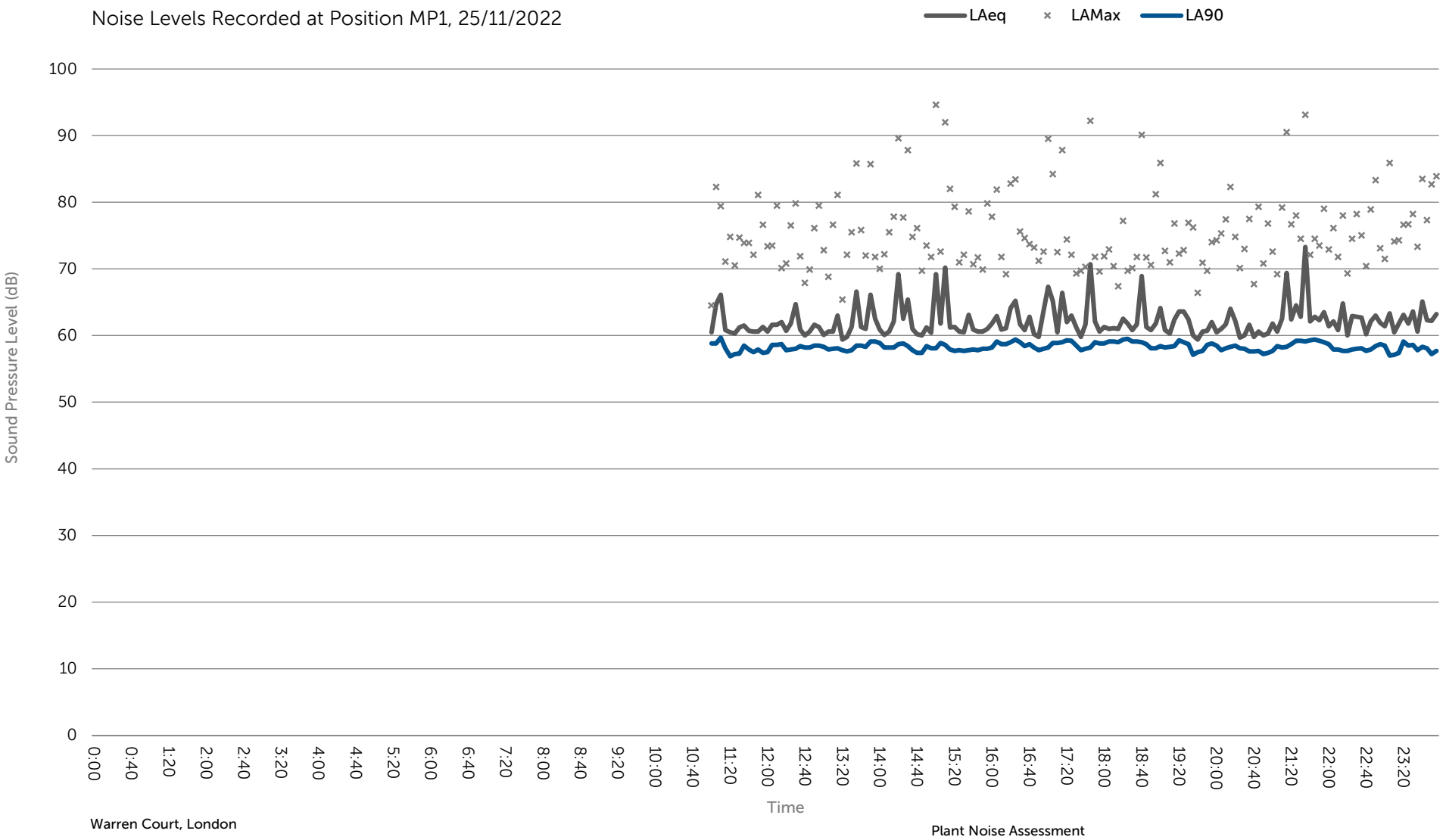
6 Conclusions

6.1 Planning permission is sought for the demolition of the existing sixth floor and the erection of a replacement single storey extension to provide four residential units at Warren Court, Euston Road, London NW1 3AA. New mechanical services plant is proposed to be installed to serve the development.

6.2 An assessment of atmospheric noise emissions has been undertaken, accounting for the requirements of The London Borough of Camden planning policy and the existing background noise levels which were measured as part of a noise survey carried out at the site.

6.3 The assessment has found that in the proposed location the noise emissions from the proposed plant is calculated to fall within the relevant noise limits without the need for specific noise mitigation measures.

Figure 20221107-0 R1 TH1.1



Warren Court, London

Plant Noise Assessment

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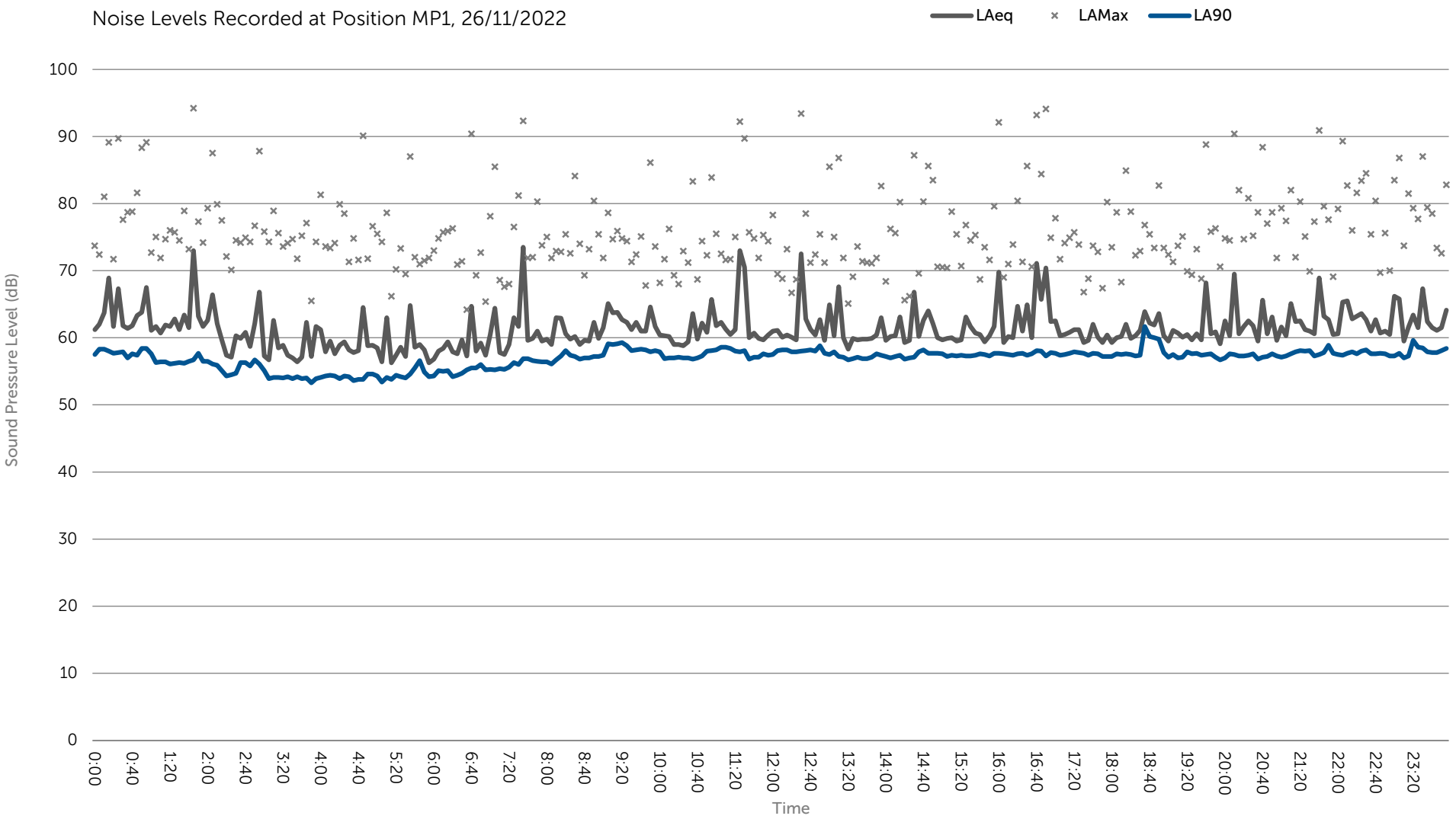
Figure 20221107-0 R1 TH1.2



Warren Court, London

Plant Noise Assessment

ACOUSTICS CENTRAL

Figure 20221107-0 R1 TH1.3

Noise Levels Recorded at Position MP1, 27/11/2022

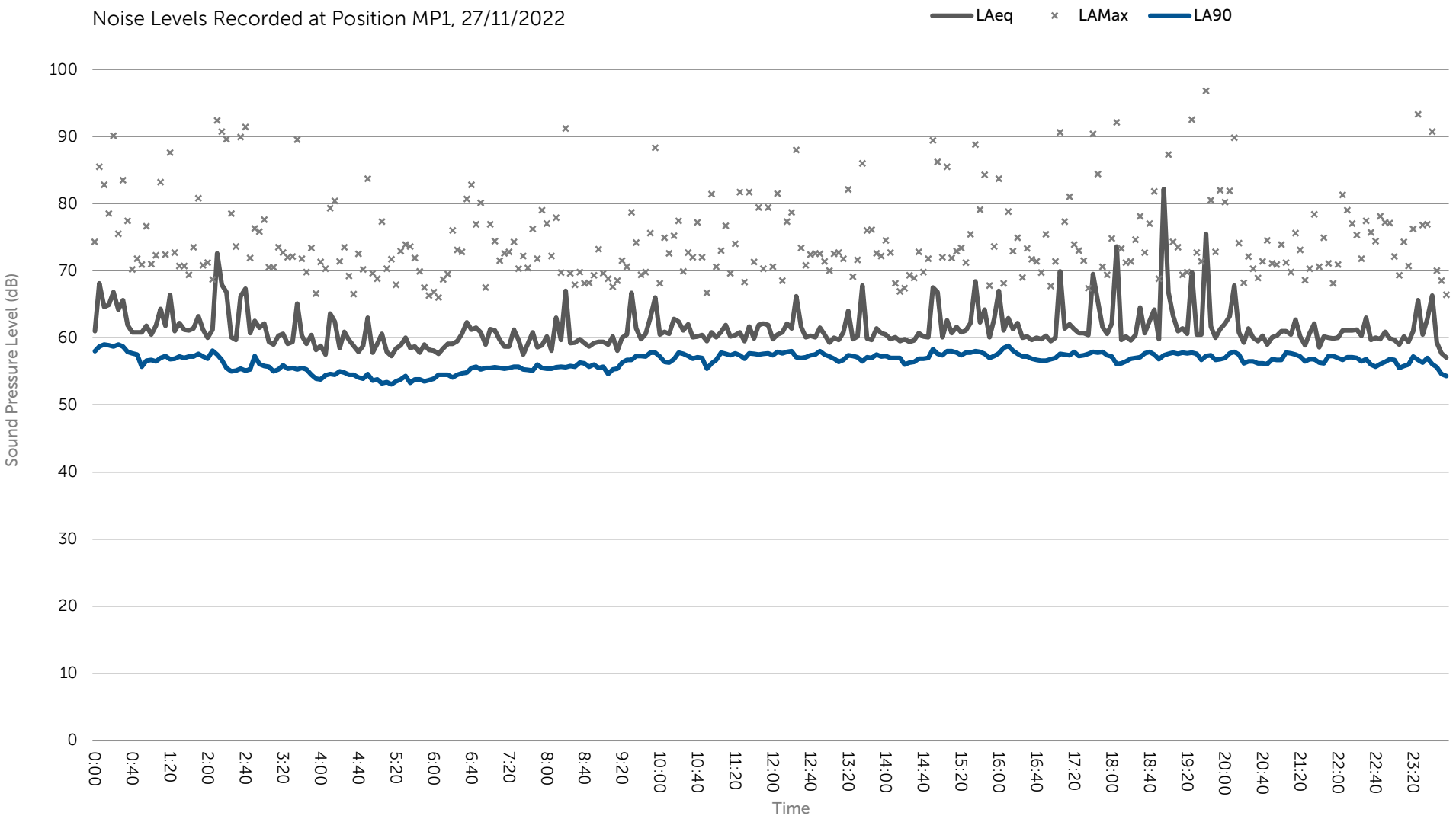


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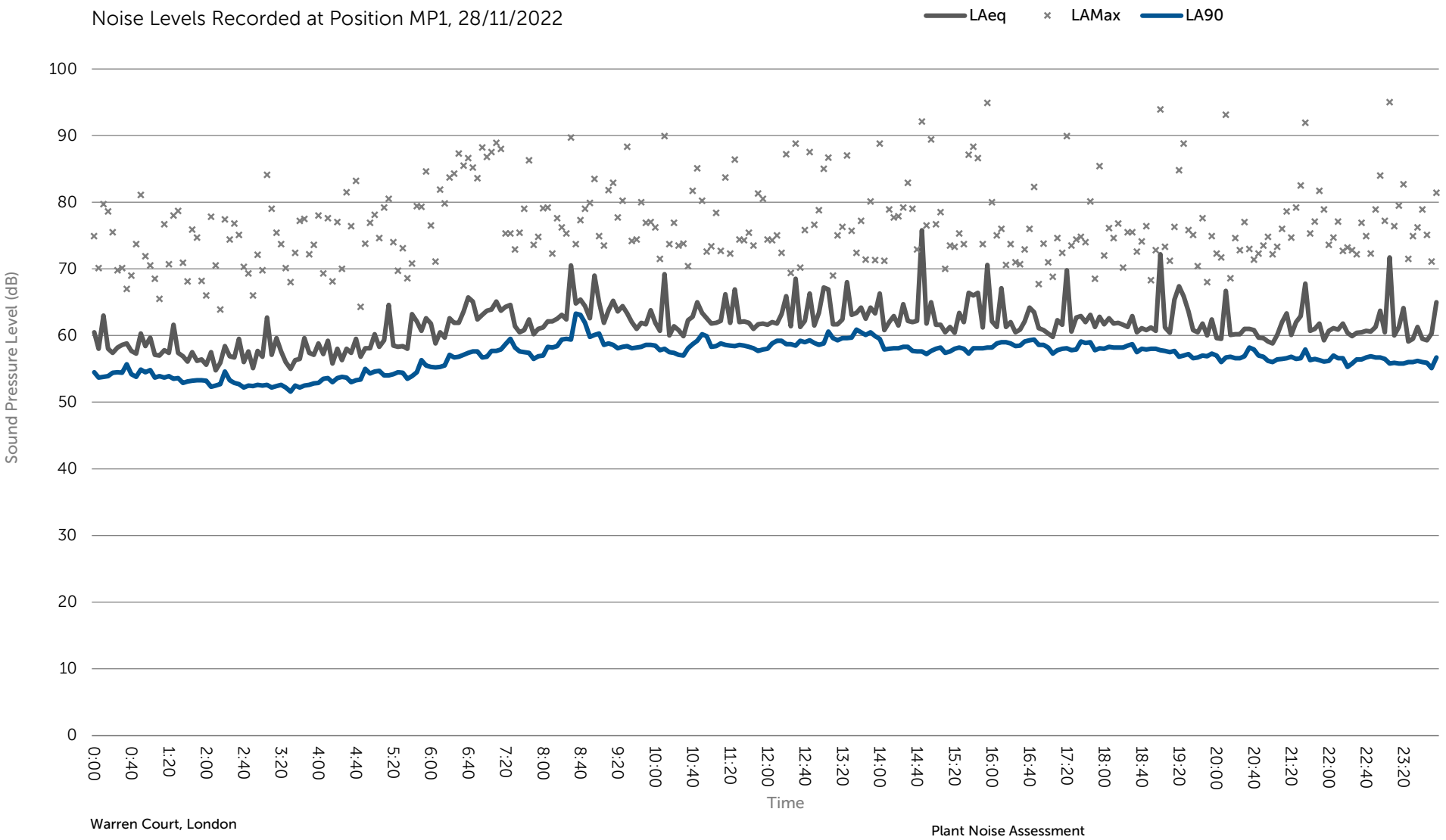
Figure 20221107-0 R1 TH1.4



Warren Court, London

Plant Noise Assessment

Figure 20221107-0 R1 TH1.5

Noise Levels Recorded at Position MP1, 29/11/2022

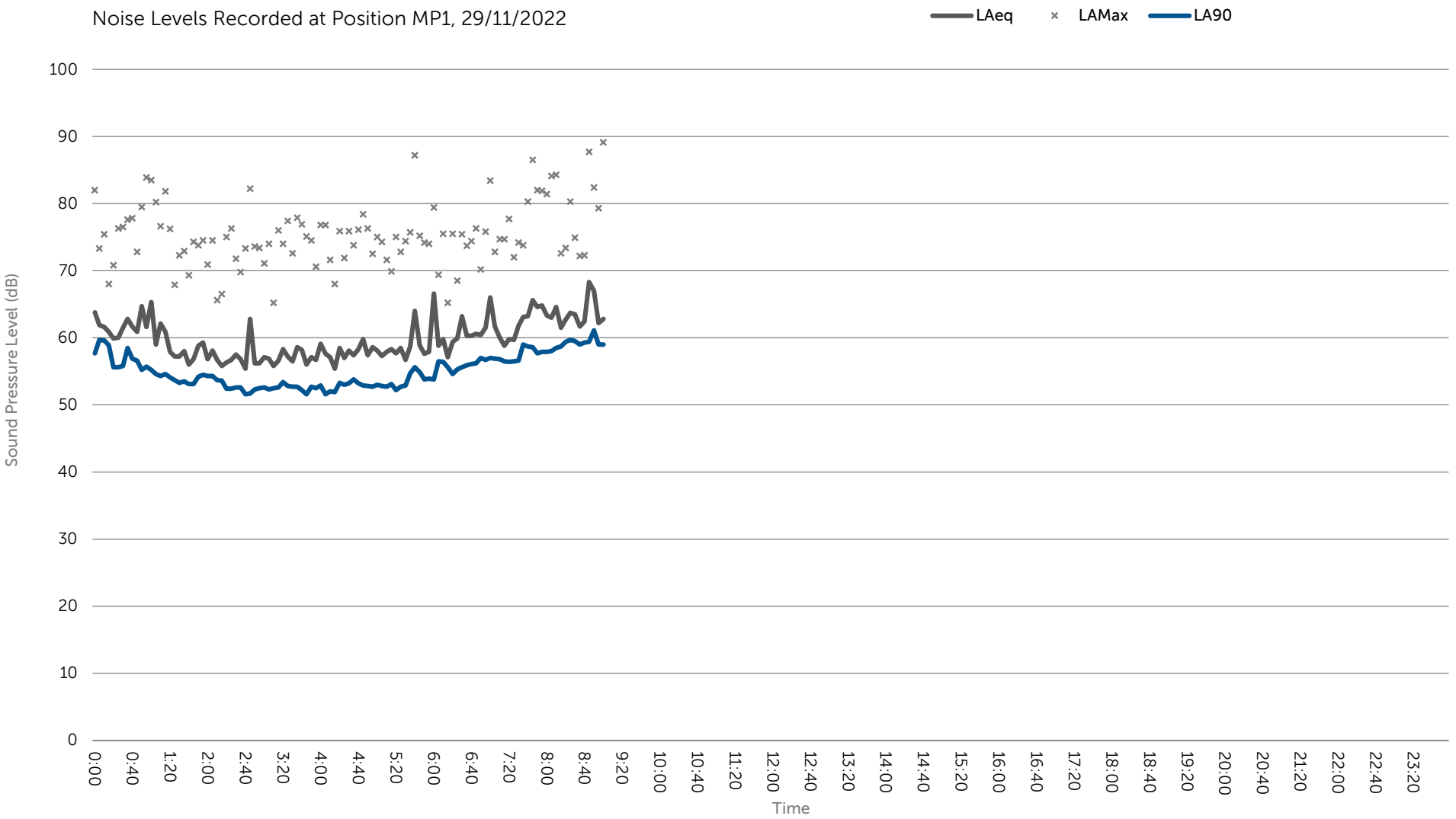
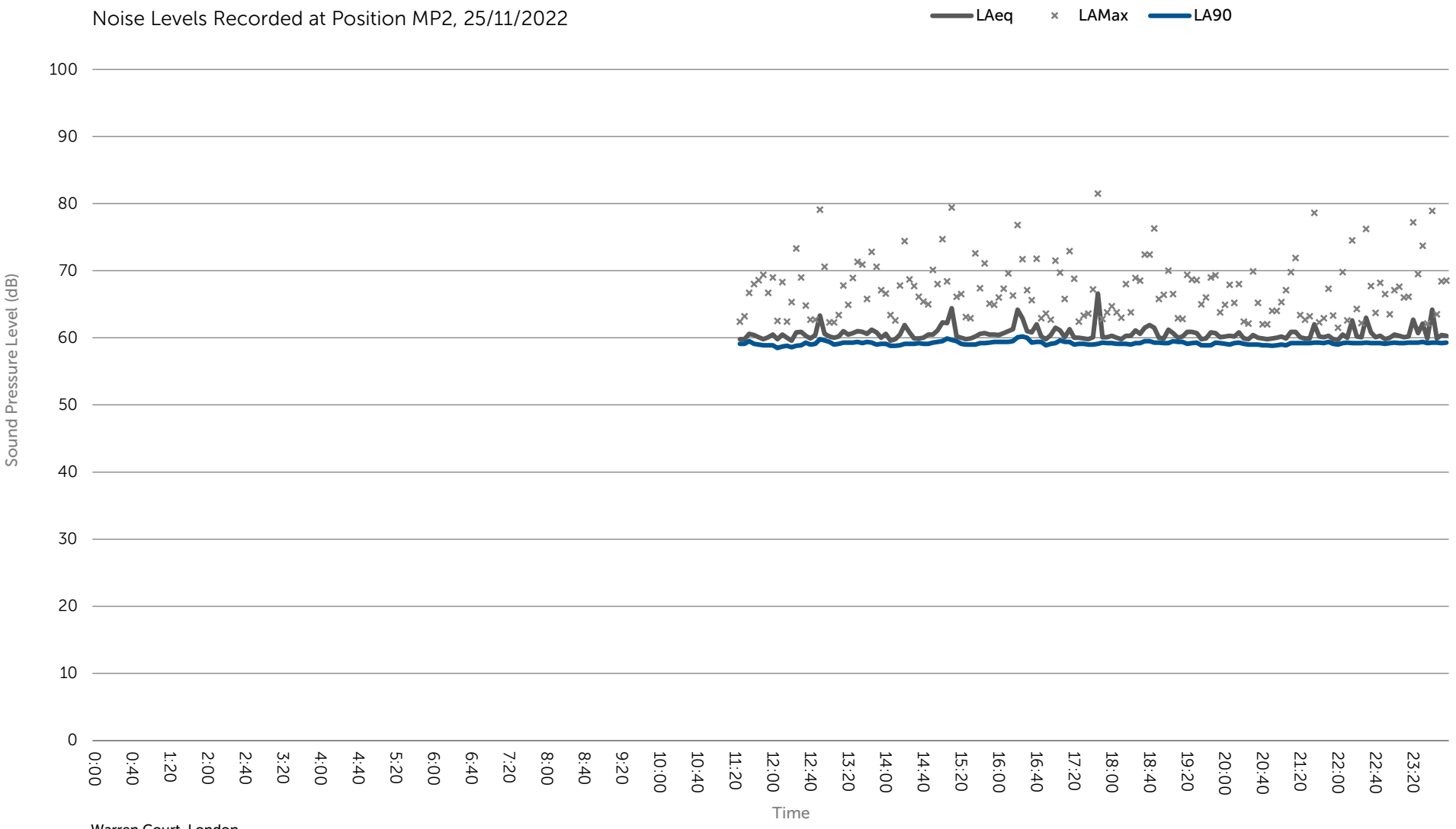


Figure 20221107-0 R1 TH2.1

Noise Levels Recorded at Position MP2, 25/11/2022



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Plant Noise Assessment

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Figure 20221107-0 R1 TH2.2

Noise Levels Recorded at Position MP2, 26/11/2022

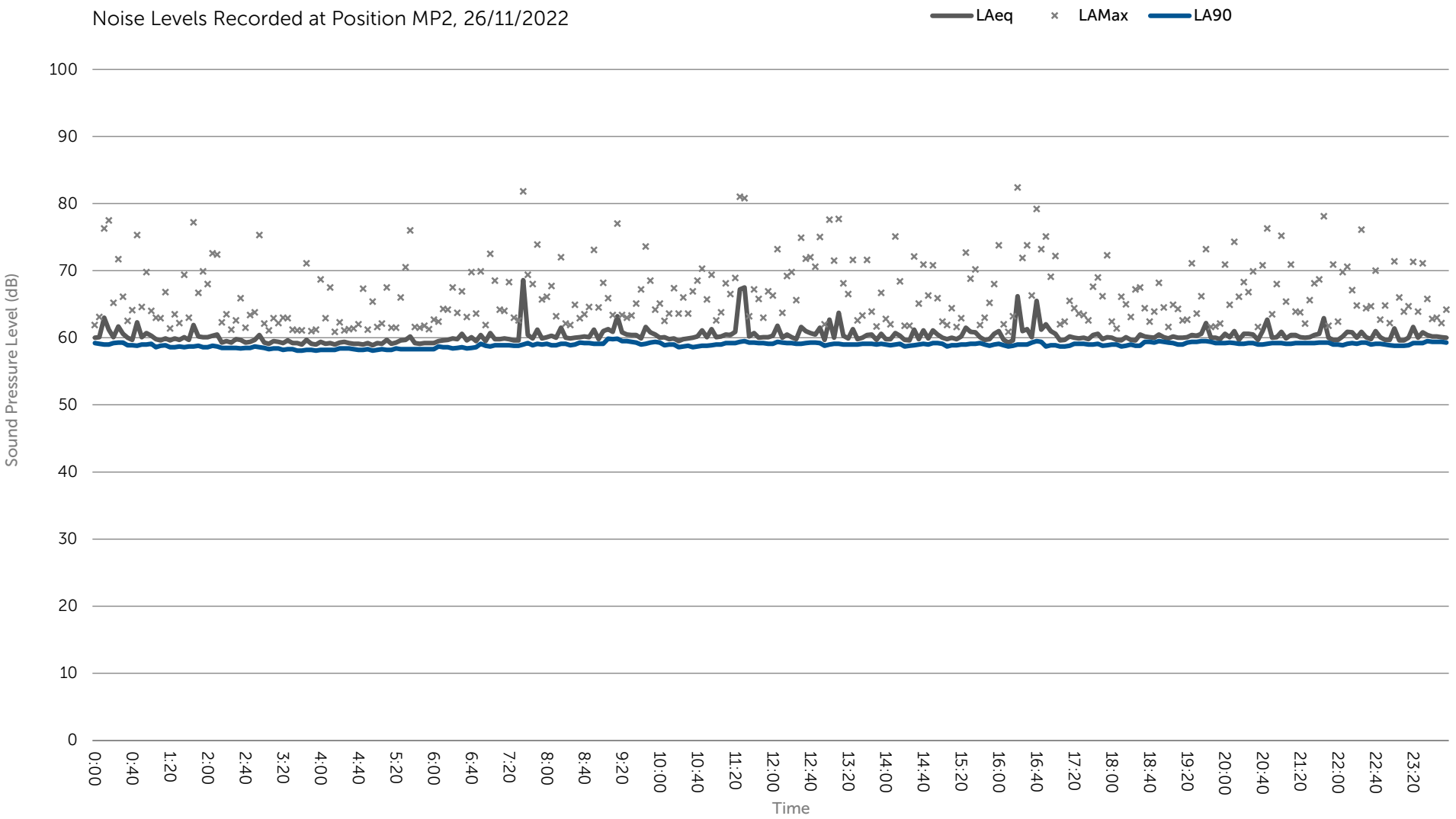

Figure 20221107-0 R1 TH2.3

Noise Levels Recorded at Position MP2, 27/11/2022

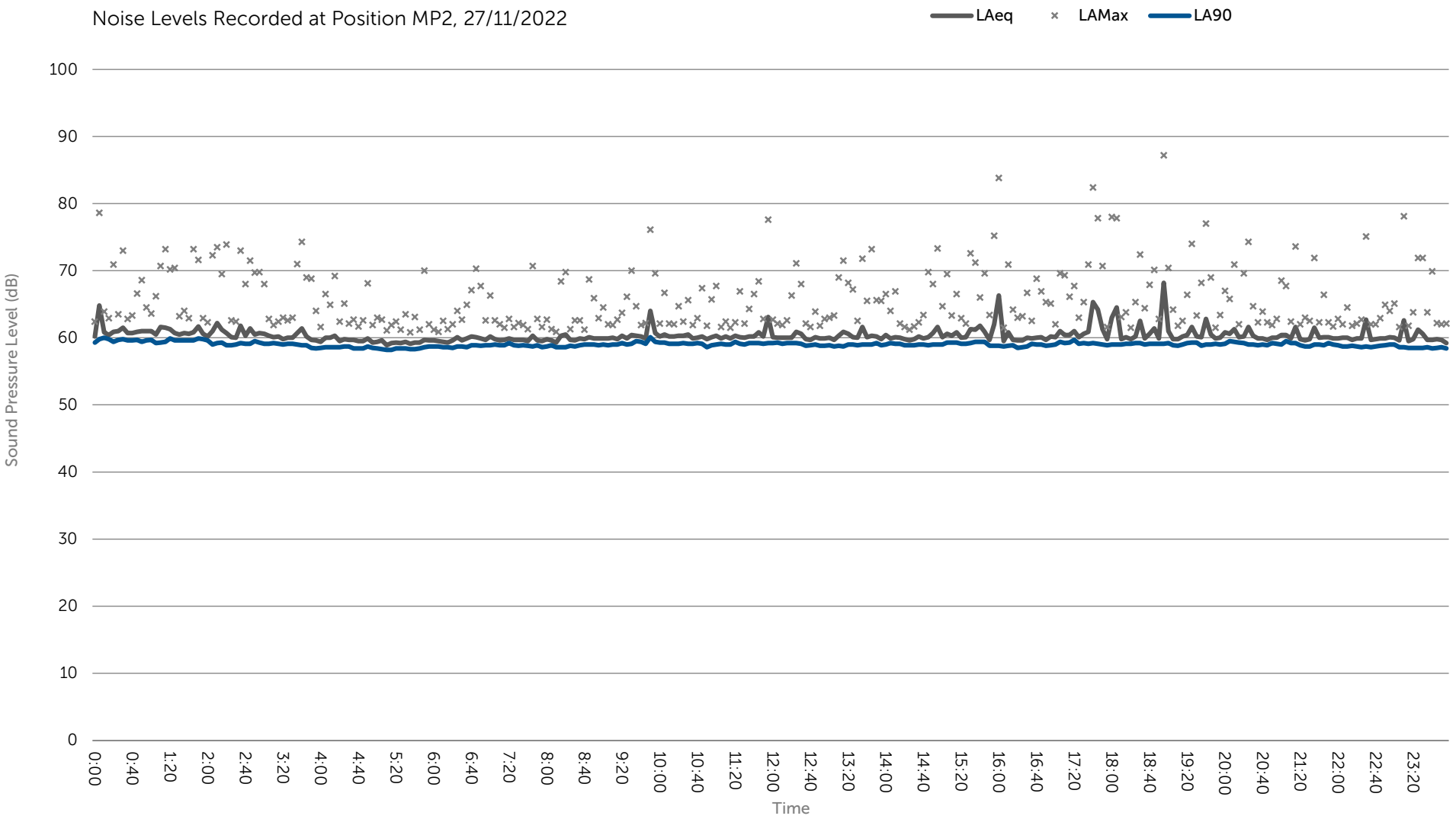

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Figure 20221107-0 R1 TH2.4

Noise Levels Recorded at Position MP2, 28/11/2022

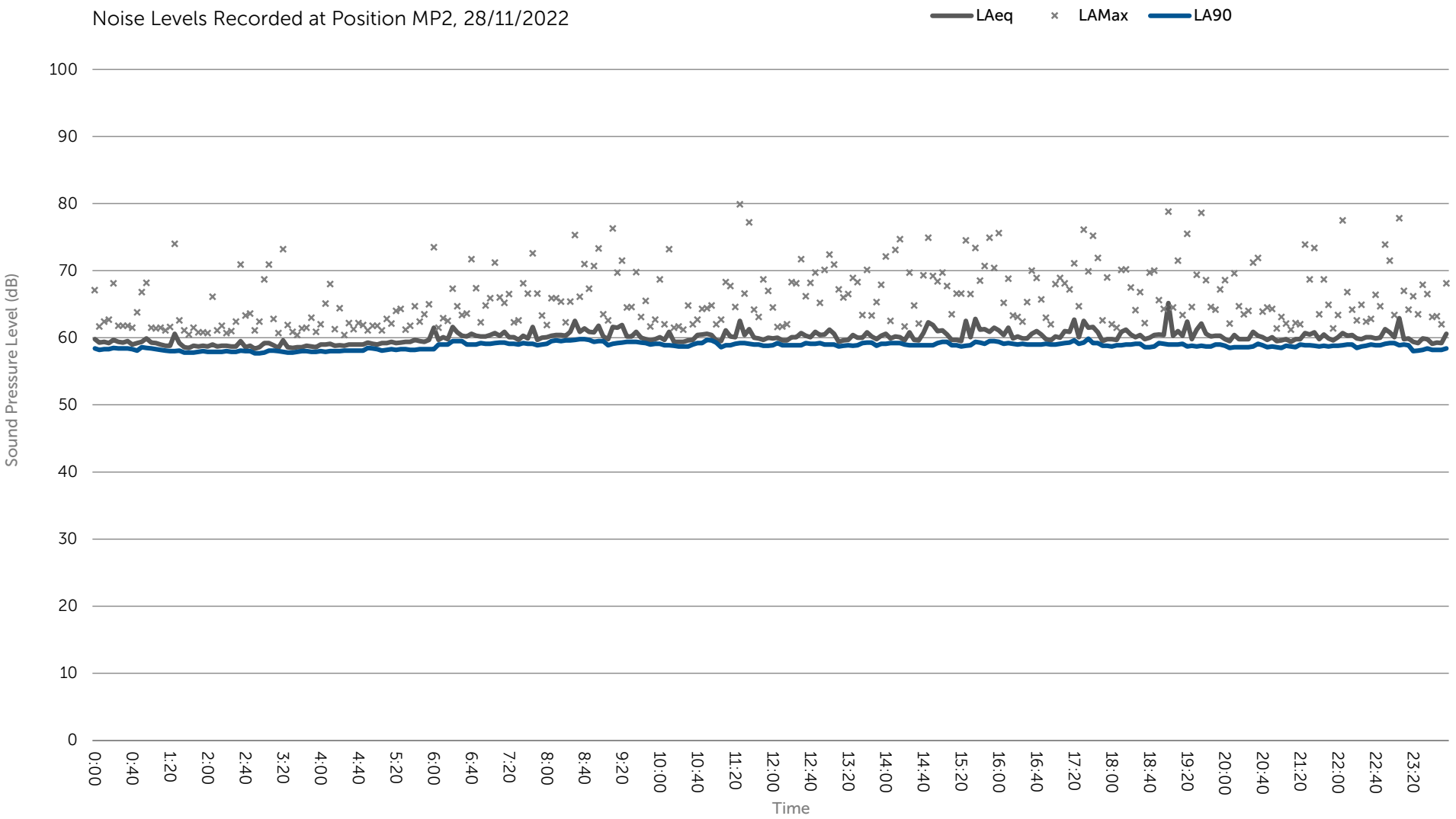

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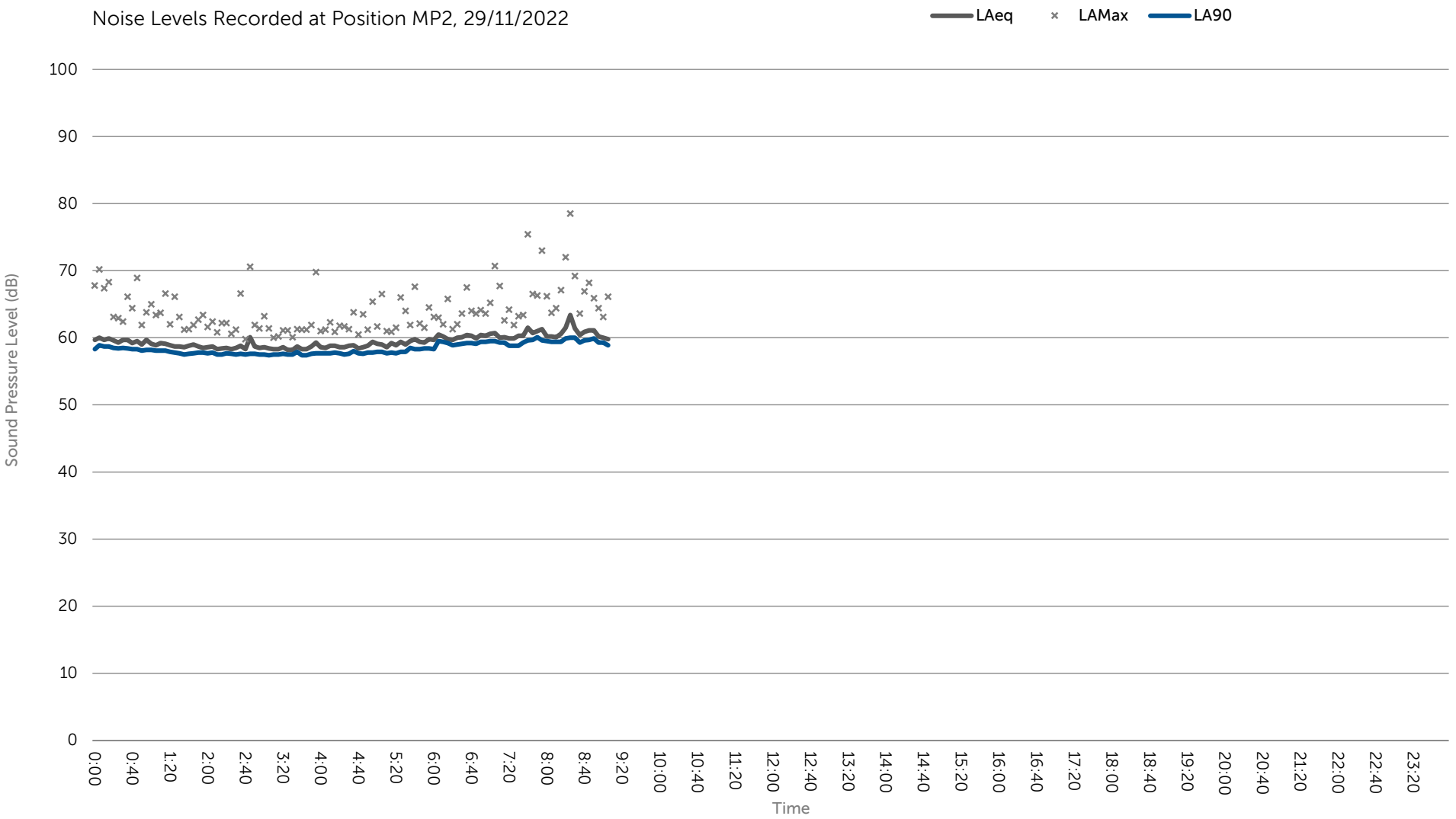
Figure 20221107-0 R1 TH2.5

Noise Levels Recorded at Position MP2, 29/11/2022



Warren Court, London

Plant Noise Assessment

Plant Noise Schedule

Reference	Description	Unit Details	Data Source	Noise Level Type	dB(A)	Noise Levels (dB)							
						63	125	250	500	1k	2k	4k	8k
CON01 - 04	External condensers	Mitsubishi MXZ-4F80VF2	Man	Sound Pressure, Lp @ 1m		55.0	58.5	52.0	51.5	51.5	46.0	39.0	30.0

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Calculation Sheet

CON01 - 04 to AP1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - CON01 - 04									
Sound Pressure Levels @ 1m		55.0	58.5	52.0	51.5	51.5	46.0	39.0	30.0
Sound pressure Lp to sound power Lw correction									
Correction value, dB	10.0								
		10.0	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*
+10 log (N)									
N	1.0								
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Silencer									
Silencer - NONE									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Maekawa Screening Loss									
Path Difference (m)	0.0								
		-4.9	*-5.0*	*-5.2*	*-5.5*	*-6.2*	*-7.3*	*-8.8*	*-10.9*
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8.0	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*
Point Source Distance Loss									
Start Distance (m)	1.0								
End Distance (m)	17.0								
		-24.6	*-24.6*	*-24.6*	*-24.6*	*-24.6*	*-24.6*	*-24.6*	*-24.6*
Facade Reflection									
Reflection (dB)	2.5								
		2.5	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
External Receiver									
External Receiver - AP1									
Sound Pressure, Lp		30.0	33.4	26.7	25.9	25.2	18.6	10.1	-1.0

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Calculation Sheet

CON01 - 04 to AP2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - CON01 - 04									
Sound Pressure Levels @ 1m		55.0	58.5	52.0	51.5	51.5	46.0	39.0	30.0
Sound pressure Lp to sound power Lw correction									
Correction value, dB	10.0								
		10.0	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*
+10 log (N)									
N	1.0								
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Silencer									
Silencer - NONE									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Maekawa Screening Loss									
Path Difference (m)	0.0								
		-4.9	*-5.0*	*-5.2*	*-5.5*	*-6.2*	*-7.3*	*-8.8*	*-10.9*
Point Source Radiation Loss									
Radiation - Quarterspherical									
		-5.0	*-5.0*	*-5.0*	*-5.0*	*-5.0*	*-5.0*	*-5.0*	*-5.0*
Point Source Distance Loss									
Start Distance (m)	1.0								
End Distance (m)	30.0								
		-29.5	*-29.5*	*-29.5*	*-29.5*	*-29.5*	*-29.5*	*-29.5*	*-29.5*
Facade Reflection									
Reflection (dB)	2.5								
		2.5	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
External Receiver									
External Receiver - AP2									
Sound Pressure, Lp		28.1	31.5	24.8	23.9	23.3	16.7	8.1	-2.9

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Calculation Sheet

CON01 to AP3

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
CON01									
CON01 - CON01 - 04									
Sound Pressure Levels @ 1m		55.0	58.5	52.0	51.5	51.5	46.0	39.0	30.0
Sound pressure Lp to sound power Lw correction									
Correction value, dB	10.0								
		10.0	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*
+10 log (N)									
N	1.0								
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Silencer									
Silencer - NONE									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Maekawa Screening Loss									
Path Difference (m)	-1.0								
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8.0	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*
Point Source Distance Loss									
Start Distance (m)	1.0								
End Distance (m)	9.0								
		-19.1	*-19.1*	*-19.1*	*-19.1*	*-19.1*	*-19.1*	*-19.1*	*-19.1*
Facade Reflection									
Reflection (dB)	2.5								
		2.5	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
External Receiver									
External Receiver - AP3									
Sound Pressure, Lp		40.4	43.9	37.4	36.9	36.9	31.4	24.4	15.4

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Calculation Sheet

CON02 - 04 to AP3

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
CON02 - 04									
CON02 - 04 - CON01 - 04									
Sound Pressure Levels @ 1m		55.0	58.5	52.0	51.5	51.5	46.0	39.0	30.0
Sound pressure Lp to sound power Lw correction									
Correction value, dB	10.0								
		10.0	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*	*10.0*
+10 log (N)									
N	1.0								
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Silencer									
Silencer - NONE									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Maekawa Screening Loss									
Path Difference (m)	0.0								
		-4.9	*-5.0*	*-5.2*	*-5.5*	*-6.2*	*-7.3*	*-8.8*	*-10.9*
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8.0	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*	*-8.0*
Point Source Distance Loss									
Start Distance (m)	1.0								
End Distance (m)	10.0								
		-20.0	*-20.0*	*-20.0*	*-20.0*	*-20.0*	*-20.0*	*-20.0*	*-20.0*
Facade Reflection									
Reflection (dB)	2.5								
		2.5	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
External Receiver									
External Receiver - AP3									
Sound Pressure, Lp		34.6	38.0	31.3	30.5	29.8	23.2	14.7	3.6

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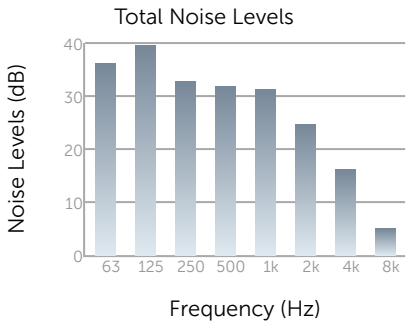
Project Name	Warren Court, London
Project Reference	20221107-0
Reference	AP1
Description	West - 4th floor lightwell
Noise Limit (dBA)	47
Calculated Level (dBA)	34.8



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
CON01 - 04	4	30.0	33.4	26.7	25.9	25.2	18.6	10.1	-1.0

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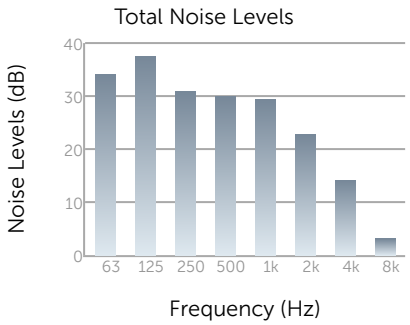
Project Name	Warren Court, London
Project Reference	20221107-0
Reference	AP2
Description	South - 5th floor hotel
Noise Limit (dBA)	42
Calculated Level (dBA)	32.8



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
CON01 - 04	4	28.1	31.5	24.8	23.9	23.3	16.7	8.1	-2.9

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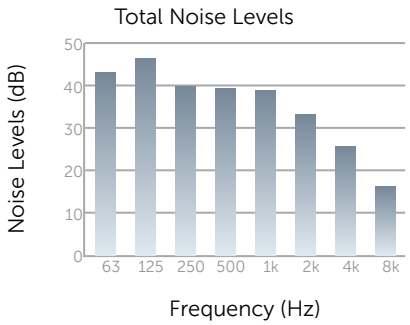
Project Name	Warren Court, London
Project Reference	20221107-0
Reference	AP3
Description	West - 5th floor lightwell
Noise Limit (dBA)	47
Calculated Level (dBA)	42.4



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
CON01	1	40.4	43.9	37.4	36.9	36.9	31.4	24.4	15.4
CON02 - 04	3	34.6	38.0	31.3	30.5	29.8	23.2	14.7	3.6

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20221107-0 R1 Appendix A

Glossary of Acoustics Terms – Noise Levels

Single Figures and Spectra

Generally speaking, the human ear is capable of hearing noise within the frequency range 20Hz to 20kHz. To make handling of data more meaningful and manageable, the range is often divided into 'bands', each of which covers a specific part.

For most acoustics applications, either octave or third-octave bands are used. Each band has a specific centre frequency which is used to identify it. When reported, the band centre frequency is given, along with the associated noise level, e.g. 63dB L_{eq} at 500Hz.

Noise levels can also be reported as single figure values where all energy contained within the measured frequency range is summed to provide a single figure. However, as the human ear does not hear noise at different frequencies with equal loudness, a weighting curve is often applied to levels before summing to account for this fact.

The most common curve is the A-weighting curve, and its use is denoted by including the letter 'A' with either the index e.g. 63dB L_{Aeq}, or with the decibel suffix (if the index is described elsewhere), e.g. 63dBA. 'B' and 'C' weighting curves may also be applied, depending on the application. A 'Z' is used to indicate a single figure where no weighting has been applied, e.g. 63dB L_{Zeq}.

Noise Level Indices

Noise level measurements can be made and reported in a variety of indices. The index is reported using the letter *L* to indicate Level, followed by, for example, abbreviations to represent the specifics of the index, and time intervals where applicable. The most commonly used are given below.

$L_{eq,T}$, (dB) - Equivalent Continuous Sound Pressure Level

The $L_{eq,T}$ value is the sound pressure level in decibels of a continuous steady sound that within a specified time interval, T, has the same mean-squared sound pressure as a sound that varies with time. It is often used as a descriptor of the **ambient noise climate**, and commonly seen as a single A-weighted figure $L_{Aeq,T}$.

L_{max}, (dB) - Maximum Sound Pressure Level

The L_{max} value is the highest recorded sound pressure level in decibels averaged across a specified time constant during a noise measurement of certain duration. Two time constants are used, Fast and Slow, where the time constants are 0.125s and 1s respectively. The time constant is denoted in the index, $L_{max,F}$ for Fast and $L_{max,S}$ for Slow. It is often used to identify transient events that have a high-level relative to the ambient noise climate, and commonly seen as a single A-weighted figure L_{Amax}.

$L_{10,T}$, (dB) - Equivalent Continuous Sound Pressure Level

The $L_{10,T}$, value is the sound pressure level in decibels that is exceeded for 10% of a given time interval, T. It is often used as a measurement of noise from transportation sources such as road and rail. It is commonly seen as a single A-weighted figure $L_{A10,T}$.

$L_{90,T}$, (dB) - Equivalent Continuous Sound Pressure Level

The $L_{90,T}$, value is the sound pressure level in decibels that is exceeded for 90% of a given time interval, T. It is often used as a descriptor of the **background noise climate**, and commonly seen as a single A-weighted figure $L_{A90,T}$.

20221107-0 R1 Appendix B

Document Naming and Version Control Policy

All documents are issued with a unique number which comprises the principle 8-digit project and 1-digit subsection numbers, for example 20151203-0, and a reference indicting iteration of document type, for example R1 for Report 1, M2 for Memorandum 2 etc.

All documents employ version control through the use of a unique version number. The version numbers employ two levels of hierarchy, and use the format illustrated below:

V 1 . 2

Major Minor

Major

A major revision occurs when the report is revised to reflect significant changes in design strategy. For example, wide scale changes to building footprint or general arrangements, changes to principle construction type (e.g. masonry to lightweight), reselection of mechanical services plant etc. A change in strategy that takes place within the same RIBA work stage for example will prompt a major revision to a document.

Minor

A minor revision occurs when the report is revised to reflect minor changes to the design implementation. For example a change in the type of natural vent, extract fan, surface finish etc. to be used, on the project. Minor revisions will also occur when there is a change in wording of the report text.

Reporting

The Document History and Version Control table on the second page of each report identifies the versions through which the document has moved, along with the date, author that produced the version, and a description of its purpose or change. Prior to issue, the document will be signed (physically or electronically) by the most recent author and reviewer.

Electronic File Naming

Reports issued electronically use the following format:

2015xxxx	-	x	Rx	Noise Assessment Report	v1.0	yy.mm.dd	.pdf
Project Number		Subsection Report Number		Report Name	Version	Date	File Extension

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