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BILLINGTON STRUCTURES LTD - NOISE IMPACT ASSESSMENT

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Contents

Tables

Figures

Appendices

1 INTRODUCTION

1.1 Background

1.1.1 The Acoustics Team of RPS Environment (RPS) has been appointed by Billington Structures Limited to carry out a noise assessment to assess the potential impacts associated with the extension to the Billington Structures Limited warehouse facility located at Engine Lane, Shafton, Barnsley S72 8SP. This report has been prepared to accompany the planning application for the proposed extension.

1.1.2 RPS is a member of the Association of Noise Consultants (ANC), the representative body for acoustics consultancies, having demonstrated the necessary professional and technical competence. This noise assessment has been undertaken with integrity, objectivity and honesty in accordance with the Code of Conduct of the Institute of Acoustics (IOA) and ethically, professionally and lawfully in accordance with the Code of Ethics of the ANC.

1.1.3 Personnel and individual qualifications are provided within the Quality Management Table at the start of this report in accordance with the requirement of Section 12 of British Standard (BS) 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

1.1.4 This report has been peer reviewed within the RPS team to ensure that it is technically robust and meets the requirements of our Integrated Management System (IMS).

1.2 Site Description

1.2.1 The proposed extension to the warehouse is located close to existing residential properties on Engine Lane Close to the west and on Hodroyd Close to the south-west of the proposed extension. Therefore, there is the potential for adverse noise impacts to result from operations within the proposed extension at these properties. The site location and redline are shown on Figure 1.

1.2.2 The proposed development will extend one of the existing buildings at the premises (see Figure 1 for reference). The extension will accommodate additional workstations for metal fabrication. The works within this new extension will be the same as the existing activities taking place within the site. Based on information provided by the client, the works within the extension will operate 6am to 3pm Monday to Thursday and 6am to 12.30pm Friday. Afters shift would be 3pm to 12am Monday to Thursday and 12.30pm to 7.30pm Friday, therefore the noise assessment considers both the daytime and night-time periods. The doors of the extension will be closed at 8pm. This is in keeping with the existing activities.

1.2.3 It is understood that the noise generating plant and activities will be contained within the proposed extension and will comprise of the following:

- FLT and side loader.
- 2 x 10 tonne and 1x 16 tonne fixed overhead cranes.
- 30t and one 40t fixed overhead cranes.
- Metal fabrication using welds, cutting tools, and finishing tools.

1.2.4 The layout of the site is shown on Figure 1.

1.2.5 The area surrounding the proposed extension is predominantly rural in nature containing the existing Billington Structures facility and residential properties to the west and south west. The nearest noise sensitive receptors to the south are residential properties located on Engine Lane Close to the west and on Hodroyd Close Southwest of the proposed extension, approximately 180 metres and 140 metres away from the site boundary. There are no additional noise sensitive receptors identified to the north and to the east.

2 POLICY, GUIDANCE AND STANDARDS

2.1 Introduction

2.1.1 This section summarises the policy, standards and guidance referred to in this noise assessment report.

2.2 Guidance and Standards

2.2.1 The following planning, standards, and guidance have been used to inform the noise assessment:

- National Planning Policy Framework, 2024 (NPPF);
- Noise Policy Statement for England, 2010 (NPSE);
- Planning Practice Guidance – Noise, 2019 (PPG-N);
- British Standard 4142:2014 + A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound (BS 4142:2014 + A1:2019).

2.2.2 The guidance and legislation, set out above, and used to inform the noise assessment, are summarised in Appendix A of this report.

2.3 Guidance and Standards

2.3.1 The facility is located within the administrative boundary of Barnsley Metropolitan Borough Council (BMBC).

2.3.2 It is understood that the client has sought advice from BMBC on the requirements for a planning application, BMBC have confirmed that a noise assessment is required, and that this assessment should:

'outline the existing noise environment, the potential noise sources from the development, or the noise sources likely to affect the development, together with any mitigation measures'.

2.4 Assessment Methodology Summary

2.4.1 In summary, the noise assessment has followed the methodology and guidance set out in BS 4142:2014 + A1:2019, and this is the accepted national guidance to assess noise from new industrial premises at noise sensitive receptors. The assessment methodology involves comparing the noise emissions from the proposed development against the existing background sound level, and a consideration of the context of the sound in its environment.

2.4.2 Therefore, the initial objective of the survey is to determine the existing background sound levels to identify whether the planned development would have the potential to cause adverse impacts on local Noise Sensitive Receptors (ESR).

2.5 Existing Noise Sensitive Receptors

2.5.1 The following ESRs have been identified as those which are closest to the proposed development (e.g. the building extension). Other receptors may be affected by noise from the proposed development, however, the impact at the other receptors will be equal to or less than at the receptors identified. The ESRs are described in Table 2.1 below and shown on Figure 2.

Table 2.1 Location of the Existing and Future Noise Sensitive Receptors

Receptor	Location	Bearing from Site	Co-ordinates		Approximate Distance to Site
			X	Y	
ESR1	Residential properties on 1 & 3 Hodroyd Close	South-west	439963	410148	140m
ESR2	Residential properties on 5 & 7 Hodroyd Close	South-west	439951	410131	150m
ESR3	Residential properties on Engine Lane Close	West	439755	410260	360m

3 NOISE SURVEY

3.1 Introduction

3.1.1 RPS carried out a noise survey between the 10th and 13th September 2024 to establish the existing ambient and background sound levels at the proposed development site. The noise survey was carried out in two locations. Additional specific noise measurements were carried out on site to inform the plant noise assessment which are further discussed in Section 4.1.

3.1.2 The monitoring locations were chosen to be representative of the existing ESRs to the south and to the east of the proposed extension.

Table 3.1 Monitoring Locations

Monitoring Locations	Location Details	Representative Noise Sensitive Receptors
ML 1	Deployed to the west of the proposed development at 5 Hodroyd Close	ESR1 - Residential properties on 1 & 3 Hodroyd Close
ML 1	Deployed to the west of the proposed development at 5 Hodroyd Close	ESR2 - Residential properties on 5 & 7 Hodroyd Close
ML 2	Deployed to the west of the proposed development on Engine Lane Close	ESR3 - Residential properties on Engine Lane Close

3.2 Instrumentation

3.2.1 Details of the instrumentation used during the survey are provided in Table 3.2. Calibration certificates of the equipment are available upon request. Calibration of the equipment was carried out on installation and decommission of the noise monitor, no significant drift (< ± 0.5 dB) was observed.

Table 3.2 Sound Survey Instrumentation

Monitoring Location	Make / Model	Serial Number	Last Calibration Date
ML1	RION NL-52	164424	14/07/2024
ML2	RION NL-52	164423	14/07/2024
Attended	RION NL-52	943367	14/07/2024
Calibrator	RION NC-74	110118	01/02/2024

3.2.2 The noise monitors were mounted on tripods 1.5m above ground level. ML1 and ML2 were located at free-field position (at least 3.5 m from any reflecting surface, excluding the ground) with a windshield attached.

3.2.3 All sound level measurements were made using a ‘Class 1’ Rion NL-52 sound level meter (SLM) in accordance with BS 7445-2:1991. The SLMs were set up to log the A-weighted sound pressure level (SPL) in 100 m/s periods. Levels were post-processed into 15-minute periods.

3.3 Meteorological Conditions

3.3.1 Weather data from timeanddate.com was used to identify the weather conditions during the survey During the survey period weather conditions were dry with wind speeds below 5m/s.

3.4 Subjective Assessment of the Noise Climate

3.4.1 The noise measurements were undertaken unattended. However, observations were carried out when deploying and decommissioning the survey equipment. These observations identified that some noise from the existing Billington Structures facilities was distantly audible at the monitoring locations.

3.4.2 As stated in paragraph 8.1 of BS4142:2014+A1:2019, it is appropriate for the measured background sound level to include some industrial sound. Therefore, the measured noise levels are considered to be representative of the baseline environment at the receptors.

3.5 Survey Results

3.5.1 Table 3.3 below provides a summary of baseline sound levels measured at the monitoring position over the survey. The proposed development operation hours have been taken into consideration to inform the night-time background sound levels.

Table 3.3 Survey Measurement Results

Location	Period	Residual Sound Levels (dB $L_{Aeq,t}$)	Background Sound Levels (dB $L_{A90,\ 15\ min}$)	
		Average $L_{Aeq,t}$	Min.	Max
ML1	Daytime 16-hour (07:00 - 23:00)	52	39	52
	Night-time (23:00 - 00:00 & 06:00 – 07:00)	53	35	50
ML2	Daytime 16-hour (07:00 - 23:00)	52	36	52
	Night-time (23:00 - 00:00 & 06:00 – 07:00)	50	33	49

3.6 Representative Background Sound Levels

3.6.1 BS 4142:2014+A1:2019 requires that the background sound levels adopted for the assessment are representative of the period being assessed. The Standard recommends that the background sound level should be derived from continuous measurements of normally no less than 15-minute intervals, which can be contiguous or disaggregated (paragraph 8.13 of BS 4142:2014+A1:2019).

3.6.2 However, BS 4142:2014+A1:2019 also states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound level between the beginning and end of the night period, and the quieter middle part of the night period. The accompanying note states that:

> **"a representative level should account for the range of background sounds levels and should not automatically be assumed to be either the minimum or modal value".**

3.6.3 Table 3.4 below provide a summary of representative sound levels for this assessment. A Time history of the measured data and statistical analysis have been provided in Appendix B.

Table 3.4 Representative Baseline Sound Level

Location	Used for ESR	Daytime (07:00 to 23:00)		Night-time (23:00 to 05:00)	
		Background Sound Level $L_{A90, T}$ (dB)	Residual Sound Level $L_{Aeq, T}$ (dB)	Background Sound Level $L_{A90, T}$ (dB)	Residual Sound Level $L_{Aeq, T}$ (dB)
ML1	ESR1 - Residential properties on 1 & 3 Hodroyd Close	45	52	35	53
ML1	ESR2 - Residential properties on 5 & 7 Hodroyd Close	45	52	35	53
ML2	ESR3 - Residential properties on Engine Lane Close	47	52	47	50

4 CALCULATIONS AND MODELLING

4.1 Source Data

4.1.1 Source noise measurements for the proposed extension and associated activities have been carried out during the site visit. However, it is understood that the technical equipment may be subject to change as the detailed design progresses.

4.1.2 This section of the report details the source of the data. Source measurements were carried out at various locations across the facility. The measured levels were used to calibrate the source noise levels for the noise model.

4.2 Model Input

4.2.1 The computer noise model has been prepared to assess the propagation of industrial sound from the proposed building extension. However, it would not be appropriate to consider only the sound from the building extension itself. Therefore, the computer noise model includes the existing significant sources of sound, and the building extension itself. This approach ensures that the assessment is robust.

4.2.2 A summary of the acoustic input data for the proposed sources is detailed within Table 4.1 below.

Table 4.1: Modelled Noise Source

Facility area	Source	Measured Internal Sound Pressure Level Calibration (dBA L_{Aeq})	Modelled Internal Sound Pressure Level Calibration (dBA L_{Aeq})	Source On Time Daytime	Source On Time Night-time
Building 1	Area	81.8	81.3	100%	50%
Building 2 (existing)	Area	81.8	81.6	100%	50%
Building 2 (proposed)	Area	N/A	81.6	100%	50%
Building 3	Area	91.4	91.8	100%	50%

4.2.3 Spectral data has been provided within Appendix C.

4.2.4 The following assumptions have been incorporated into the noise model:

- The topography for the site, and area between the site and receptors has been downloaded from Department for Environmental Food & Rural Affair website;
- The effect of screening from solid structures (building) has been incorporated into the modelling process by importing OS Open Data ‘building area’ data;
- The ground type of the model has been set to soft ground (G=0.5));
- Noise sources has been modelled as industrial noise sources due to distance separation to the receptors;
- Fabrication will be reduced by half for night-time hours; and,
- Doors will be closed from 8pm.

4.3 Modelling Results

4.3.1 The specific sound level from the existing and proposed activities has been predicted at the proposed development boundaries (for purposes of regulation) and the identified ESRs. During the daytime period the levels have been predicted at ground floor or outdoor amenity spaces, and during the night-time at first floor.

4.3.2 Table 4.2 below provides a summary of the modelled specific sound levels at the nearest ESRs for the daytime and night-time periods.

Table 4.2 Noise Modelling Results

ESR ID	ESR Name	Specific Sound Level $L_{Aeq,t}$ (dB)	
		Daytime (07:00 – 2300)	Night-time (23:00 – 07:00)
ESR1	Residential properties on 1 & 3 Hodroyd Close	48	37
ESR2	Residential properties on 5 & 7 Hodroyd Close	51	37
ESR3	Residential properties on Engine Lane Close	47	34

5 ASSESSMENT

5.1 Introduction

5.1.1 This section of the report details an assessment of the potential noise impact of the existing and proposed development using the methodology outlined in BS4142:2014 + A1:2019. This includes a comparison of the specific sound (i.e. sound from the development) corrected for 'acoustic character' (once corrected this is known as the 'rating level') against the background sound levels at noise sensitive receptors.

5.2 Initial BS 4142:2014+A1:2019 Assessment

5.2.1 With reference to BS 4142:2014+A1:2019, a character correction can be applied to the specific sound level depending on the acoustic characteristics of the sound, including tonality and impulsivity. The character adds a value to the calculated specific sound so that any detrimental characteristics of the sound can be accounted for in the assessment.

5.2.2 An analysis has been undertaken of the predicted 1/3-octave frequency data in accordance with 'Annex C – Objective method for assessing the audibility of tones in sound: One-third octave method' of BS 4142:2014+A1:2019. No tonal component was identified during the assessment; therefore, no tonal correction has been applied.

5.2.3 The plant and activities associated with the development include occasional banging of metal. Therefore, an impulsive correction has been applied accordingly.

5.2.4 The existing acoustic environment consists of traffic noise, therefore noise from the plant might be readily identifiable against the existing acoustic environment, however the residual sound in more than 10 dB above the specific sound therefore no correction for readily identifiable characteristics has been applied in accordance with BS 4142:2014+A1:2019. combined.

5.2.5 Table 5.1 below provides an initial estimate of the noise impact at the nearest ESRs during operation from the existing and proposed development combined.

Table 5.1: BS 4142:2014+A1:2019 – Initial Impact Assessment

ESR	Specific Sound Level (dB $L_{Aeq,t}$)	Rating Penalty (dB)	Rating Level (dB $L_{Ar,Tr}$)	Representative Background Sound Level (dB $L_{90,t}$)	Difference Between Rating and Background Sound Level (dB)
Daytime					
ESR1	48	0	48	**45**	+3
ESR2	51	3	54	**45**	+9
ESR3	47	0	47	**47**	0
Night-time					
ESR1	37	0	37	**45**	+2
ESR2	37	0	37	**35**	+2
ESR3	34	0	34	**47**	-13

5.2.6 With regards to the rating / background level difference, BS 4142:2014+A1:2019 states:

- 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; and

- 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.

5.2.7 With reference to combined impacts reported in Table 5.1, the initial assessment of the potential noise impact has been found that the rating levels of the existing premises and proposed extension at ESR1 is 3dB above the existing background sound level during the daytime. This is an indication that the specific sound source will have low noise impact at ESR1 during the daytime depending on the context.

5.2.8 The assessment has found that the rating levels of the existing premises and proposed extension at ESR2 is 9dB above the existing background sound level during the daytime. This is an indication that the specific sound source will have adverse noise impact at ESR2 during the daytime depending on the context.

5.2.9 At ESR3 the assessment has found that the rating levels of the existing premises and proposed extension at ESR3 is equal to the existing background sound level during the daytime. This is an indication that the specific sound source will have low impact at ESR2 during the daytime depending on the context.

5.2.10 During the night-time at ESR 1 and ESR 2 have been found that the rating levels of the existing premises and proposed extension are 2dB above the existing background sound level which is an indication of low impact depending on the context.

5.2.11 During the night-time at ESR 3 has been found that the rating levels of the existing premises and proposed extension is equal to the existing background sound level which is an indication of low impact depending on the context.

5.2.12 However, it is essential to also consider the context of the sound in its environment. This is particularly important as the results of the noise modelling include both the existing noise, and the proposed building extension.

5.3 BS 4142:2014+A1:2019 Consideration of Context for the Initial Assessment.

5.3.1 BS4142:2014+A1:2019 states; “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 sources exceeds the background sound level and the context in which the sound occurs”.

5.3.2 The first requirement of the above statement has been determined in the noise impact assessment section above. To establish the context in which the industrial / commercial sound will reside three pertinent factors must be considered, these are:

- The absolute sound level;
- The character and level of the residual sound compared to the character and level of the specific sound; and,
- The sensitivity of the receptor.

Absolute Level of Sound

5.3.3 To determine the first context in BS 4142:2014+A1:2019 it is necessary to determine whether the residual and background sound levels are high or low. Section 11 of BS 4142:2014+A1:2019 states:

> “Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the

rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."

5.3.4 The rating levels at ESR1 are 48 dB $L_{Aeq,t}$ at 1 & 3 Hodroyd Close, ESR2 are 54 dB $L_{Aeq,t}$ at 5 & 7 Hodroyd Close and 47 dB $L_{Aeq,t}$ at Engine Lane Close during the daytime. The background sound levels at ESR1 and ESR2 are 45 dB $L_{A90,t}$ and at ESR3 43 dB $L_{A90,t}$. Therefore, the rating levels are considered to be moderate and the background sound levels are considered to be moderate.

5.3.5 During the night-time periods, the rating sound levels at ESR1 are 37 dB $L_{Aeq,t}$ at 1 & 3 Hodroyd Close, ESR2 are 37 dB $L_{Aeq,t}$ at 5 & 7 Hodroyd Close and 34 dB $L_{Aeq,t}$ at Engine Lane Close . The background sound levels at ESR1 and ESR2 are and ESR3 35 dB $L_{A90,t}$ and 47 dB $L_{A90,t}$ respectively. The rating levels are considered to be low with the night-time background sound level being considered to be moderate/low.

5.3.6 Therefore, when considering the absolute level of sound the impact is likely to be equal to or less than that detailed within Table 5.1.

Character and Level of the Residual and Specific Sound

5.3.7 The residual sound at the ESRs consists of predominantly existing commercial noise from the existing works at Billington Structures. This source of noise is generally intermittent and impulsive. The specific sound will be similar in nature to that of the existing acoustic environment and therefore will not be readily identifiable.

5.3.8 During the daytime periods, the residual sound is 52dB(A) and the specific sound level is up to 48dB(A) at 1 & 4 Hodroyd Close. During the daytime periods, the residual sound is 52dB(A) and the specific sound level is up to 51dB(A) at 5 & 7 Hodroyd Close. The residual sound is 51dB(A) and the specific sound level is up to 47dB(A) at the residential property located on Engine Lane Close. Therefore, it is likely that noise from the proposed development will not be audible at ESR3 on Engine Lane Close during periods and just perceivable at ESR1 and ESR2 on Hodroyd Close.

5.3.9 During the night-time periods, the residual sound is 48dB(A) and the specific sound level is up to 37dB(A) at ESR1 and ESR2 on Hodroyd Close. The residual sound is 46dB(A) and the specific sound level is up to 34dB(A) at the residential property located at ESR3 on Engine Lane Close Therefore, it is likely that noise from the proposed development will not be audible at the ESRs during the night-time.

5.3.10 It should also be noted that this assessment has been undertaken considering the existing and proposed operations.

5.3.11 Table 5.2 below shows the predicted change in noise at receptors with the proposed extension. The assessment compares the existing operation predicted specific sound levels to the specific sound levels predicted from the operation of the existing and proposed extension.

Table 5.2 Comparison of the Specific Sound Level for Existing and Proposed operations

ESR	Existing Specific Sound Level (dB $L_{Aeq,t}$)	Future Specific Sound Level (dB $L_{Aeq,t}$)	Future Specific Sound Level excess over existing (dB)
Daytime			
ESR1	48	48	0
ESR2	51	51	0
ESR3	48	47	-1
Night-time			
ESR1	38	37	-1
ESR2	38	37	-1
ESR3	36	34	+2

5.3.12 It should be noted that the proposed extension will provide screening from the building to the north to the ESRs and will provide no change or positive change for all ESRs during the daytime. During the daytime the change is predicted to be positive at Hodroyd Close with a slight increase in specific sound level of 2dB at Engine Lane Close. This change is considered to be just perceivable.

5.3.13 Therefore, the proposed development is unlikely to affect the existing acoustic character at the ESRs and is unlikely to be readily identifiable over the existing ambient sound. Due to this it is likely that the noise impact will less than that stated within Table 5.1.

Sensitivity of the Receptor

5.3.14 Section 11 of BS 4142:2014+A1:2019 states the following:

> "The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal design and/or outdoor acoustic conditions, such as:
> Façade insulation treatment;
> Ventilation and/or cooling that will reduce the need to have windows open as to provide rapid or purge ventilation; and
> Acoustic screening."

5.3.15 The glazing and ventilation strategy for existing ESRs is not known and, as such, it has been assumed that the ESRs will rely on open windows to maintain sufficient background ventilation.

5.3.16 When considering the ESRs, assuming a typical reduction of 13dB due to a partially open window, the internal noise levels at ESR1 will be approximately 35 dB(A) during the daytime and 24 dB(A) during night-time period this level is below the night-time internal ambient noise criteria of 30 dB(A) $L_{Aeq,8h}$ outlined within *BS8233:2014. – 'Guidance on sound insulation and noise reduction for buildings*' by 6 dB(A). For ESR2 the maximum internal noise levels will be 38 dB(A) during the daytime and 24 dB(A) during night-time period this level is below the night-time internal ambient noise criteria. For ESR3 the maximum internal noise levels will be 34 dB(A) during the daytime and 21 dB(A) during night-time period this level is below the night-time internal ambient noise criteria.

5.3.17 The internal noise criteria at ESR2 will not be met during the daytime. However, as shown in Table 5.2, the proposed extension will not affect the existing noise levels at ESR2.

5.3.18 The predicted rating levels are also below the external amenity upper limit of 55 dB(A) $L_{Aeq,30min,}$ reducing the potential noise impact further.

5.3.19 The Planning Practice Guidance (PPG) provides advice on the potential effect of noise on residential receptors. For NOAEL, PPG-Noise states;

> "Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life"

5.3.20 The assessment has shown that the proposed building extension does not significantly change the sound levels at the surrounding receptors. Subsequently, the building extension will not cause a change in behaviour of the residents, and so the development is considered to cause No Observed Adverse Effect.

5.3.21 As such, this is an indication that the impact is likely to be considered equal to or less that detailed within Table 5.1 and will be below SOAEL which is considered to have Low impact.

5.4 Summary

5.4.1 The proposed development has been modelled based upon the noise emission from the existing and proposed development.

5.4.2 The initial assessment of the potential noise impacts has found that the specific sound level of the existing premises and proposed extension could cause an adverse impact on receptors at ESR2 during the daytime. At ESR1 and ESR3 has been found the specific sound source of the existing premises and proposed extension will have low impact on the receptors at ESR1 and ESR3 during the daytime. During the night-time at all ESRs has been found that the rating levels of the proposed extension is equal to or lower than the existing background sound level which is an indication of low impact.

5.4.3 However, when considering the context of the sound, the impact of the proposed development can be reduced for ESR2 during the daytime from adverse to low when considering the character and level of the residual and specific sound along with the sensitivity of the receptors. Subsequently, when considering the context of the sound, in accordance with BS4142, he impact for the remaining ESRs and assessment periods will remain Low when considering the context.

5.4.4 Furthermore, when relating the potential impact to planning guidance, the proposed development will not cause a change in behaviours to the surrounding receptors, and in terms of PPG-Noise, the development is considered to be NOAEL.

5.4.5 Subsequently, there are no noise mitigation measures required for the proposed development.

6 UNCERTAINTY

6.1 Introduction

6.1.1 This section discusses the limitation and potential sources of uncertainty within the assessment methodology. The uncertainties are discussed below for the baseline sound survey, acoustic modelling and subsequent assessment.

6.2 Baseline Sound Survey

6.2.1 All sound surveys are limited by the instrumentation used to undertake the measurements. Uncertainty may arise as a result of the internal processes within the sound level meter to measure and process the measured sound into the relevant noise indices. The accuracy of the equipment used has been monitored via calibration both prior to and upon completion of the noise survey at each position. All sound level meters used meet the 'Class 1' criteria defined within BS EN 61672-2:2013+A1:2017 – 'Electroacoustics. Sound level meters – Pattern evaluation tests'. All calibrators used meet the 'Class 1' criteria defined within BS EN IEC 60942 – 'Electroacoustics sound calibrators'.

6.2.2 The variation in the local noise climate has been accounted for by undertaking long-term measurements, and to minimise the impact from adverse weather conditions, when wind speeds exceeded 5m/s or when rain was recorded. This allows for statistical analysis of any temporal variations in the noise climate due to reduce uncertainty in the derivation of representative sound levels at receptors.

6.2.3 Any influence due to human error has been minimised by ensuring that all sound monitoring equipment is installed safely and securely. All measurements were undertaken at a minimum of 1.5 m above local ground level.

6.3 Source Data

6.3.1 Given the data collected during the noise survey on site, assumptions and corrections have been made to ensure a worst-case scenario has been assessed, so that this assessment is robust.

6.4 Acoustic Modelling & Calculations

6.4.1 Uncertainty and limitations arise during the modelling process as a result of the sound propagation models used to inform the calculations. The sound levels at the nearest receptors have been calculated using the internationally accepted guidance within ISO 9613-2:2024 which is implemented by the 3D acoustic modelling software (SoundPLAN) used to predict noise levels due to the proposed development. This standard claims an accuracy of ±3 dB for source heights up to 30 m and propagation distances between 100 m and 1 km.

7 CONCLUSION

7.1 Conclusion

7.1.1 The Acoustics Team of RPS Environment (RPS) has been appointed by Billington Structures Limited to carry out a noise assessment to assess the potential impacts as part of the planning application for an extension to the Billington Structures Ltd. warehouse facility located at Engine Lane, Shafton, Barnsley S72 8SP.

7.1.2 An Environmental sound survey has been undertaken at the site to quantify the existing noise climate and assess the proposed extension and the associated activities in line with BS4142:2014+A1:2019. The baseline sound survey identified the existing acoustic environment commercial noise.

7.1.3 An assessment of the operational noise from the site has been undertaken by predicting and assessing noise emissions from the proposed activities with reference to guidance within BS4142:2014+A1:2019. The characteristics of the existing acoustic environment are like that of the noise emissions from the proposed development, as the main noise source is going to be in line with the existing noise climate in the area.

7.1.4 The initial assessment showed that the noise from the proposed development could result in adverse impact at residential properties 5 & 7 Hodroyd Close during the daytime and low impact at residential properties on 5 & 7 Hodroyd Close during the night-time.

7.1.5 When considering the existing and future predicted noise levels in terms of PPG-N, the impacts predicted at residential properties on Engine Lane Close is low during the daytime and night-time. When considered in context the potential noise impact at local sensitive receptors is can be reduced to low during the day and night-time periods.

7.1.6 Furthermore, the assessment has shown that the development will not cause a significant change in noise at receptors, and will therefore not change behaviours. This is a positive indication that receptors will not be adversely affected. In terms of PPG-Noise the development is considered to fall within the NOAEL category.

7.1.7 In conclusion, it has been demonstrated that the proposed development is unlikely to change existing noise levels in the area as such it is considered it will not give rise to significant adverse noise impacts at the nearest noise sensitive receptors. This meets with paragraph 185 of NPPF.

7.1.8 Therefore, it is considered that the development is compliant with the requirements of the Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and is below the Lowest Observable Adverse Effect Level (LOAEL) as set out in Planning Practice Guidance on Noise (PPG-N).

7.1.9 Noise should therefore not be considered a material issue in terms of the planning application, and there are no noise mitigation requirements for the proposed development.

FIGURES

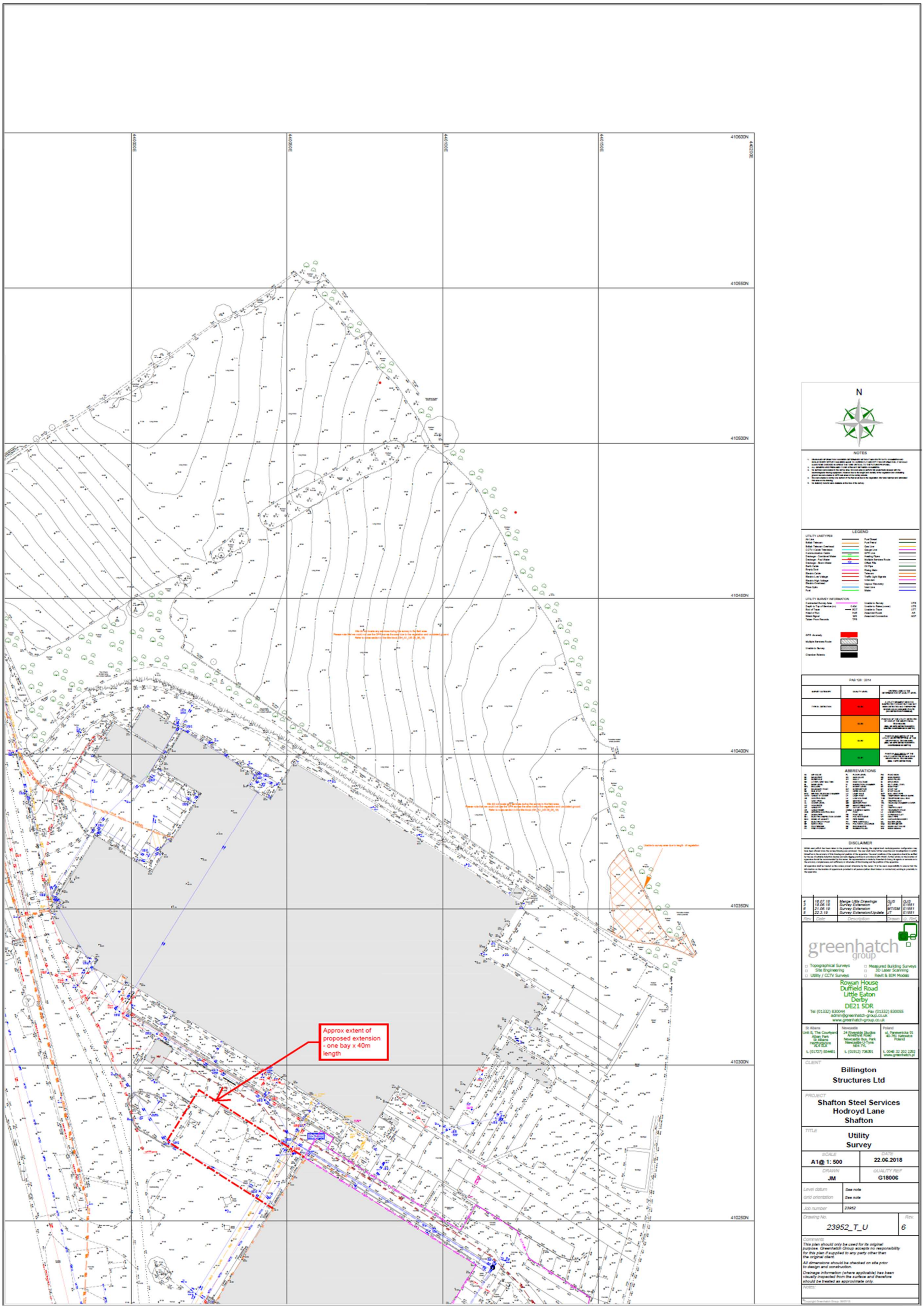
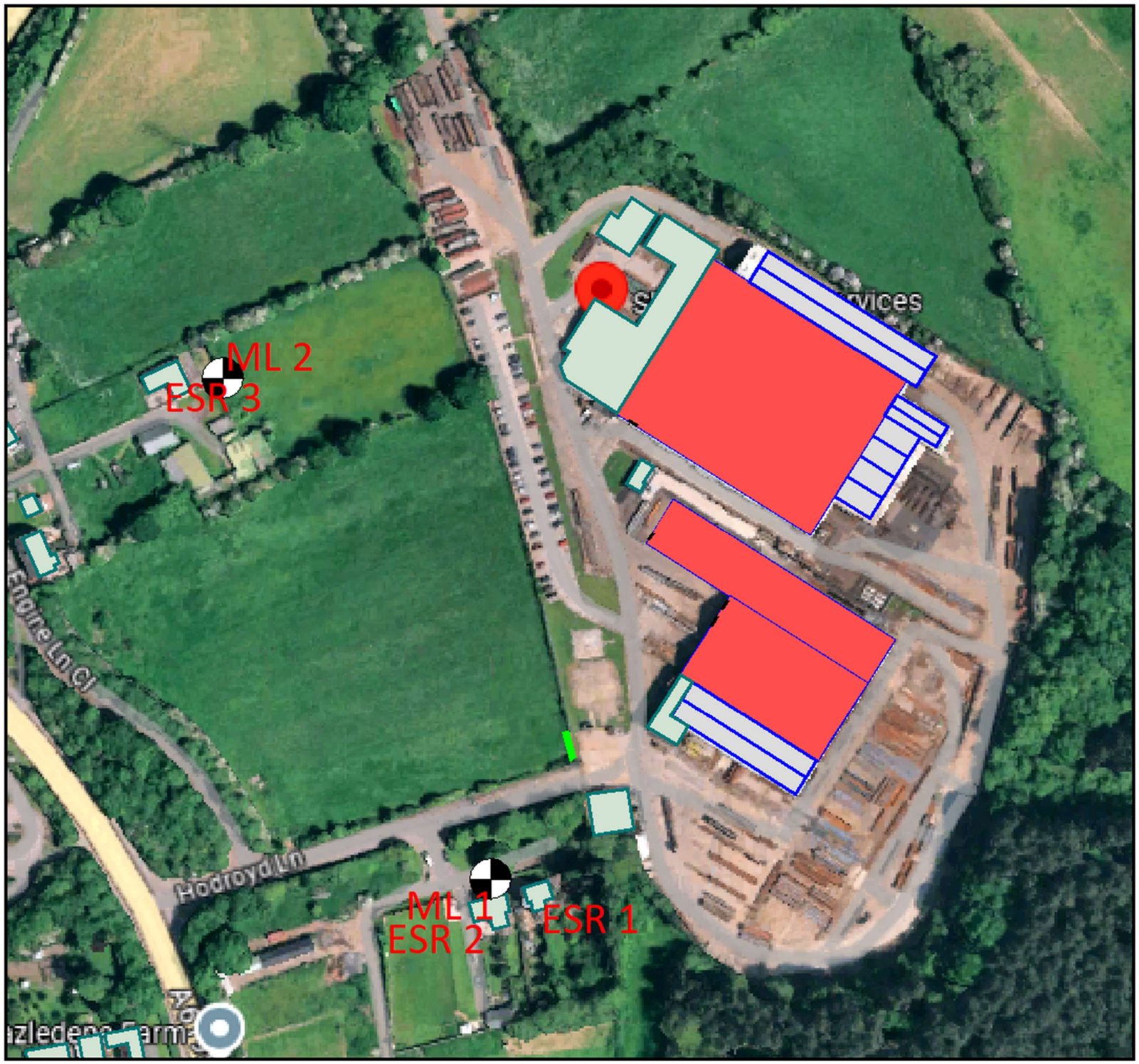


Figure 1 Site Layout and Proposed Extension



Key

- Monitoring Location
- Industrial Building
- Point source
- Industrial building; Room
- Transmissive area
- Indoor area source
- Wall
- Base line

Daytime Noise Levels (dB $L_{Aeq, 1\ hr}$)

	<= 40
40 <	<= 42
42 <	<= 44
44 <	<= 46
46 <	<= 48
48 <	<= 50
50 <	<= 52
52 <	<= 54
54 <	<= 56
56 <	<= 58
58 <	<= 60
60 <	

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Project:
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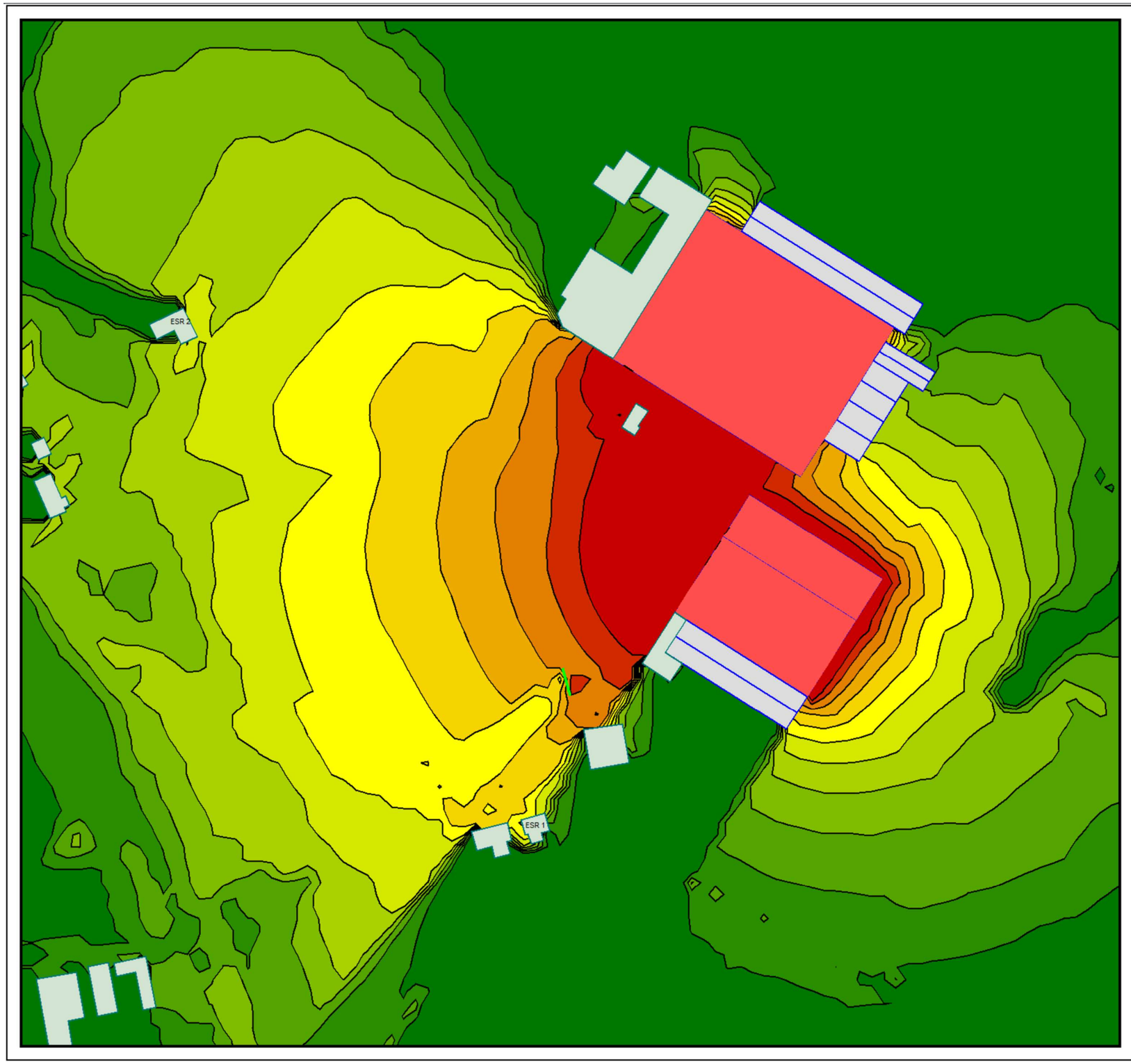
Figure 2

Title:
Monitoring Locations and Existing Noise Sensitive Receptors

Figure 2 Monitoring Locations and Existing Noise Sensitive Receptors



Key

- Basemap
- Monitoring Location
- Industrial Building
- Point source
- Industrial building; Room
- Transmissive area
- Indoor area source
- Receiver

Daytime Noise Levels (dB $L_{Aeq, 1\,hr}$)

	<= 40
40 <	<= 42
42 <	<= 44
44 <	<= 46
46 <	<= 48
48 <	<= 50
50 <	<= 52
52 <	<= 54
54 <	<= 56
56 <	<= 58
58 <	<= 60
60 <	

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Figure 3

Title:
Daytime Noise Levels from Existing Operations

Figure 3 Daytime Noise Levels from Existing Operations

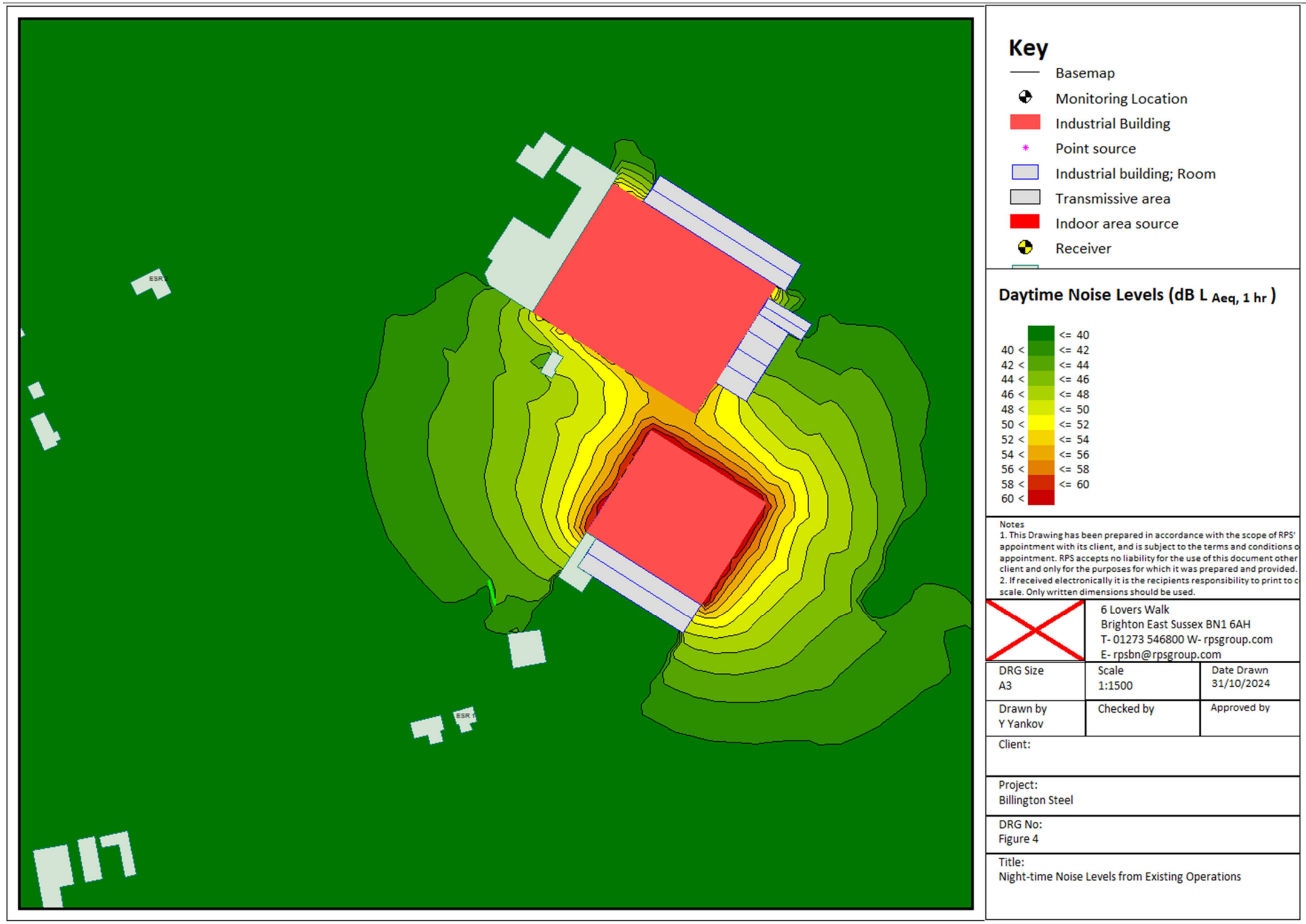
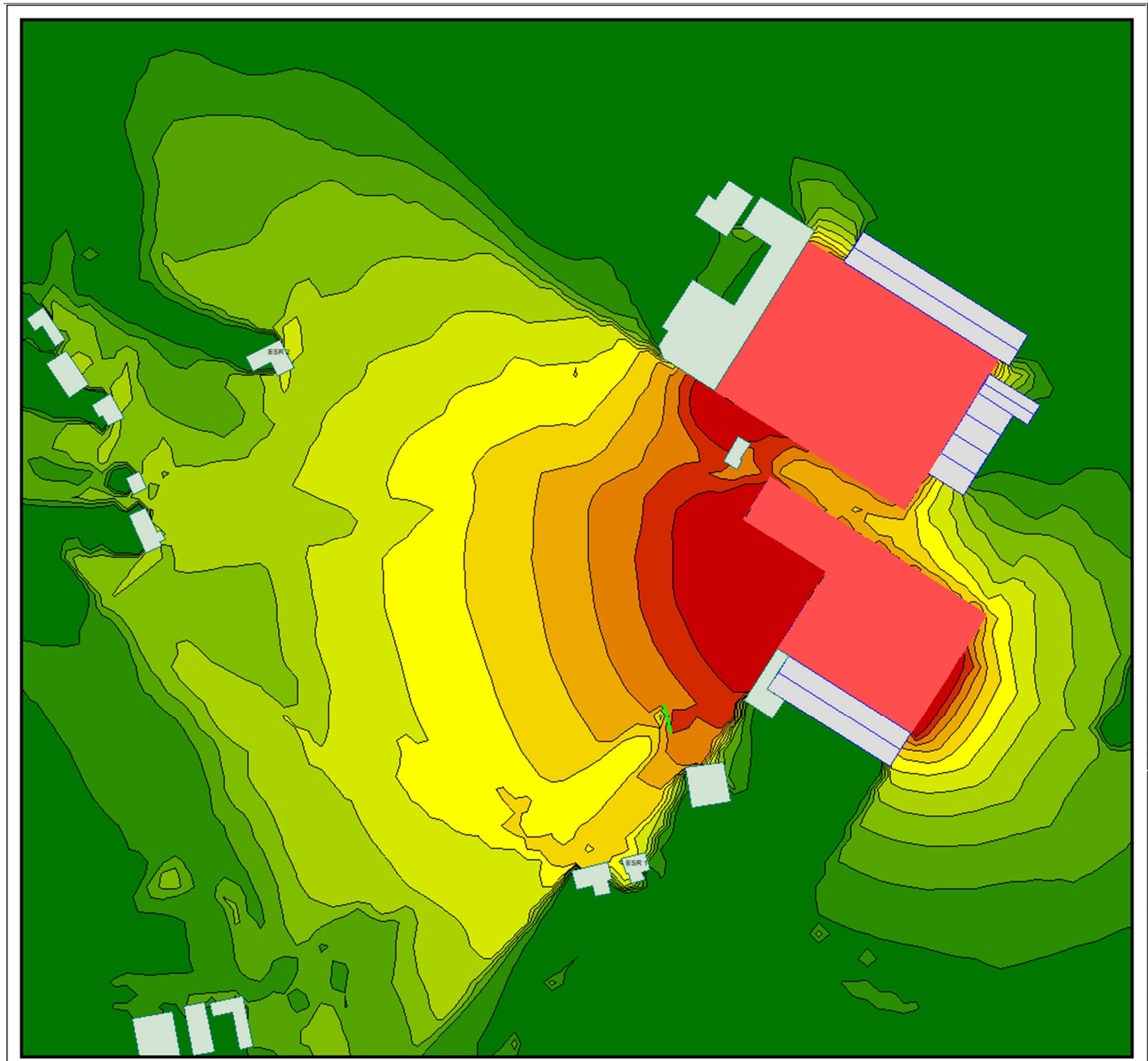


Figure 4 Night-time Noise Levels from Existing Operations



Key

- Basemap
- Monitoring Location
- Industrial Building
- Point source
- Industrial building; Room
- Transmissive area
- Indoor area source
- Receiver

Daytime Noise Levels (dB $L_{Aeq, 1\,hr}$)

	<= 40
40 <	<= 42
42 <	<= 44
44 <	<= 46
46 <	<= 48
48 <	<= 50
50 <	<= 52
52 <	<= 54
54 <	<= 56
56 <	<= 58
58 <	<= 60
60 <	

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Project:
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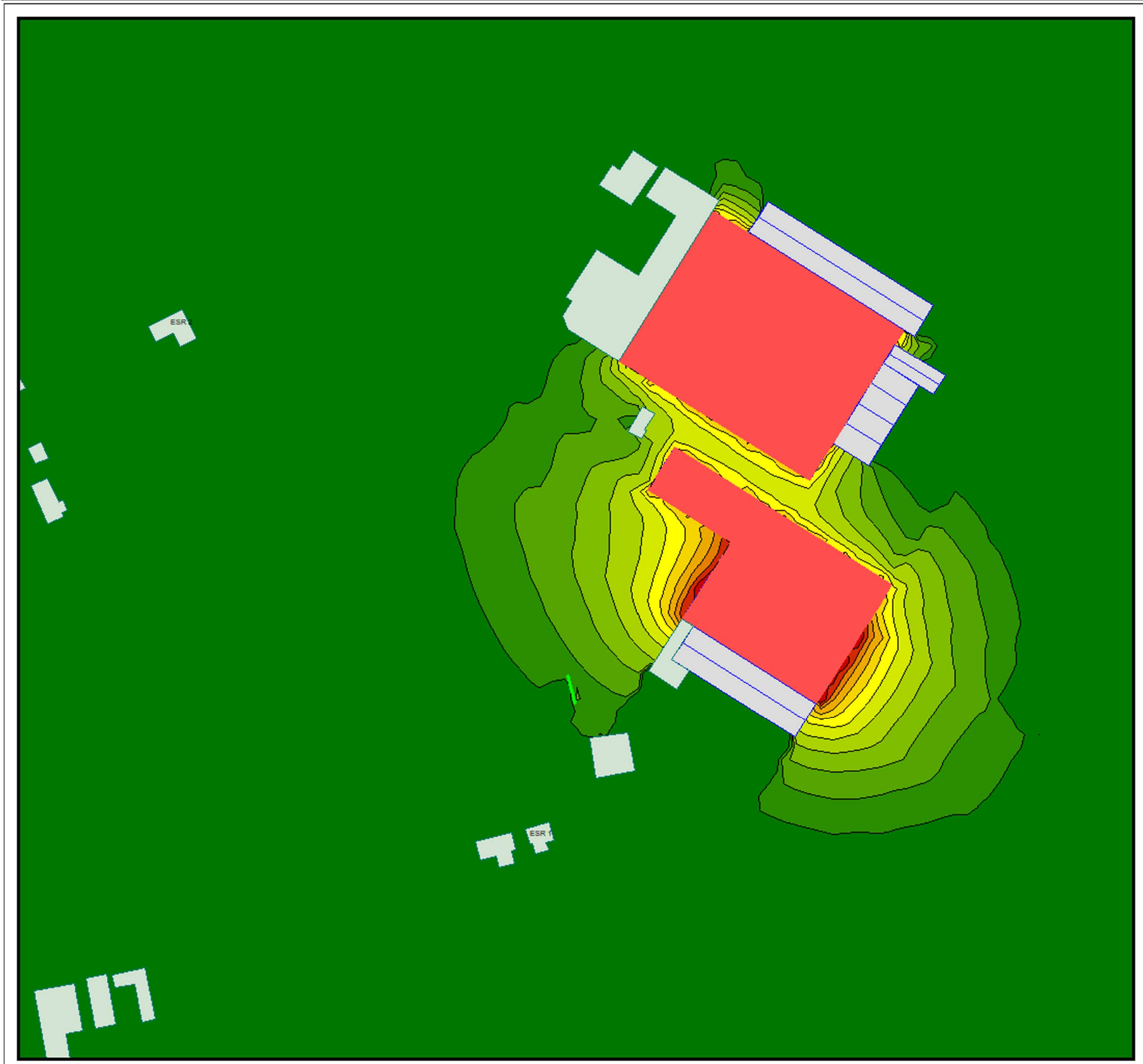
DRG No:
Figure 5

Title:
Daytime Noise Levels from Proposed Operations

Figure 5 Night-time Noise Levels from Proposed Operations



Key

- Basemap
- Monitoring Location
- Industrial Building
- Point source
- Industrial building; Room
- Transmissive area
- Indoor area source
- Receiver

Daytime Noise Levels (dB $L_{Aeq, 1\ hr}$)

	<= 40
40 <	<= 42
42 <	<= 44
44 <	<= 46
46 <	<= 48
48 <	<= 50
50 <	<= 52
52 <	<= 54
54 <	<= 56
56 <	<= 58
58 <	<= 60
60 <	

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Figure 6

Title:
Daytime Noise Levels from Proposed Operations

Figure 6 Night-time Noise Levels from Proposed Operations

APPENDICES

Appendix A

Guidance and Legislation

A.1.1 National Planning Policy Framework

In September 2023 the 'National Planning Policy Framework' (NPPF) was amended as the current planning policy guidance within England.

Paragraph 185 of the NPPF states:

> 'Planning policies and decisions should also ensure that new development is appropriate for its location taking in account the likely effects (including cumulative effects) of pollution on heath, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impact that could arise from the development. In doing so they should:
>
> Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impact on health and the quality of life;
>
> Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'…

Paragraph 187 of the NPPF states:

> 'Planning policies and decisions should ensure that new development can be integrated with existing business and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'

A.1.2 Noise Policy Statement for England

With regard to 'significant adverse impacts on health and the quality of life' the NPPF refers to the 'Noise Policy Statement for England' (NPSE).

The Noise Policy Statement for England refers to the World Health Organisation when discussing noise impacts and introduces observed effect levels which are based on established concepts from toxicology that are applied to noise impacts by WHO.

Three levels are defined as follows:

> 'NOEL – No Observed Effect Level

- This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

> LOAEL – Lowest Observed Adverse Effect Level

- This is the level above which adverse effects on health and quality of life can be detected.

> SOAEL – Significant Observed Adverse Effect Level

- This is the level above which significant adverse effects on health and quality of life occur'.

The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. However, this does not mean that such adverse effects cannot occur.

A.1.3 Planning Practice Guidance - Noise

The Planning Practice Guidance for Noise (PPG-N) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable, however it has no adverse effect as it does not cause any change in behaviour or attitude. Once noise crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused. At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. Table 2.1 summarises the noise exposure hierarchy.

Table 2.1: National Planning Practice Guidance Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
	No Observed Effect Level (NOEL)		
Not present	No Effect	No Observed Effect	No specific measures required
	No Observed Adverse Effect Level (NOAEL)		
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
	Lowest Observed Adverse Effect Level (LOAEL)		
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
	Significant Observed Adverse Effect Level (SOAEL)		
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The PPG-N summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

> "Neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separate from the economic, social and other environmental dimensions of proposed development"

A.1.4 ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise

ProPG Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

The guidance reflects the Government's overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance (including PPG-Noise) and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisors, on achieving good acoustic design in and around new residential developments.

While ProPG is typically used for residential developments, it is considered to be appropriate to use in for this proposed development. As the proposed premises comprises predominantly short stay apartments, with long term studio accommodations, the assessment methodology of assessing the risk of adverse noise impacts, set out in ProPG is considered to be appropriate.

A.1.5 British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

British Standard 8233 "Guidance on sound insulation and noise reduction for buildings" 2014 (BS 8233:2014), suggests the following guideline noise levels and states that they are based on guidelines issued by the World Health Organisation (WHO);

- 35 dB $L_{Aeq\ (16\ hour)}$ during the daytime in noise sensitive rooms
- 30 dB $L_{Aeq\ (8\ hour)}$ during the night-time in bedrooms
- 45 dB $L_{Amax,F}$ during the night time in bedrooms
- 50 dB $L_{Aeq\ (16\ hour)}$ desirable external noise levels for amenity space such as gardens and patios
- 55 dB $L_{Aeq\ (16\ hour)}$ upper guideline value which would be acceptable in noisier environments.

In addition, for internal noise levels it states;

> "Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

Furthermore, with regard to external noise, the Standard states;

> "However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".

A.1.6 British Standard 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142:2014+A1:2019 primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e., the 'specific sound' from the proposed development) at residential Noise Sensitive Receptors (NSR). The specific sound level may then be corrected for the character of the sound (e.g., perceptibility of tones and/or impulses), if appropriate, and it is then termed the 'rating level', whether or not a rating penalty is applied. The 'residual sound' is defined as the 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.

The specific sound levels should be determined separately in terms of the $L_{Aeq,T}$ index over a period of T = 1-hour during the daytime and T = 15-minutes during the night-time. For the purpose of the Standard, daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours.

BS 4142:2014+A1:2019 requires that the background sound levels adopted for the assessment be representative for the period being assessed. It recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements.

BS 4142:2014+A1:2019 states that measurement locations should be outdoors, where the microphone is at least 3.5 m from any reflecting surfaces other than the ground and, unless there is a specific reason to use an alternative height, at a height of between 1.2 m and 1.5 m above ground level. However, where it is necessary to make measurements above ground floor level, the measurement position, height and distance from reflecting surfaces should be reported, and ideally measurements should be made at a position 1 m from the façade of the relevant floor if it is not practical to make the measurements at least 3.5 m from the facade.

With regards to the rating correction, paragraph 9.2 of BS 4142:2014+A1:2019 states:

> **"Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention."**

The commentary to paragraph 9.2 of BS 4142:2014+A1:2019 suggests the following subjective methods for the determination of the rating penalty for tonal, impulsive and/or intermittent specific sounds:

> **"Tonality**
>
> **For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a rating penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.**
>
> **Impulsivity**
>
> **A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.**
>
> **NOTE 2 If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics.**
>
> **Intermittency**
>
> **When the specific sound has identifiable on/off conditions, the specific sound level should be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. … If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.**
>
> **Other sound characteristics**

Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."

An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level of the specific sound. In the context of the Standard, adverse impacts include, but are not limited to, annoyance and sleep disturbance. Typically, the greater this difference, the greater is the magnitude of the impact:

- 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.

The final impact of the noise in should be determined on the basis of the initial estimate of impact from the BS 4142:2014+A1:2014 and a consideration of the context of the sound. It is necessary to consider all pertinent factors, including:

- the absolute level of sound,
- the character and level of the residual sound compared to the character and level of the specific sound, and
- the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:
  - facade insulation treatment; and
  - ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation.

Definitions of some of the key terms from this standard, and used in this report, are provided below.

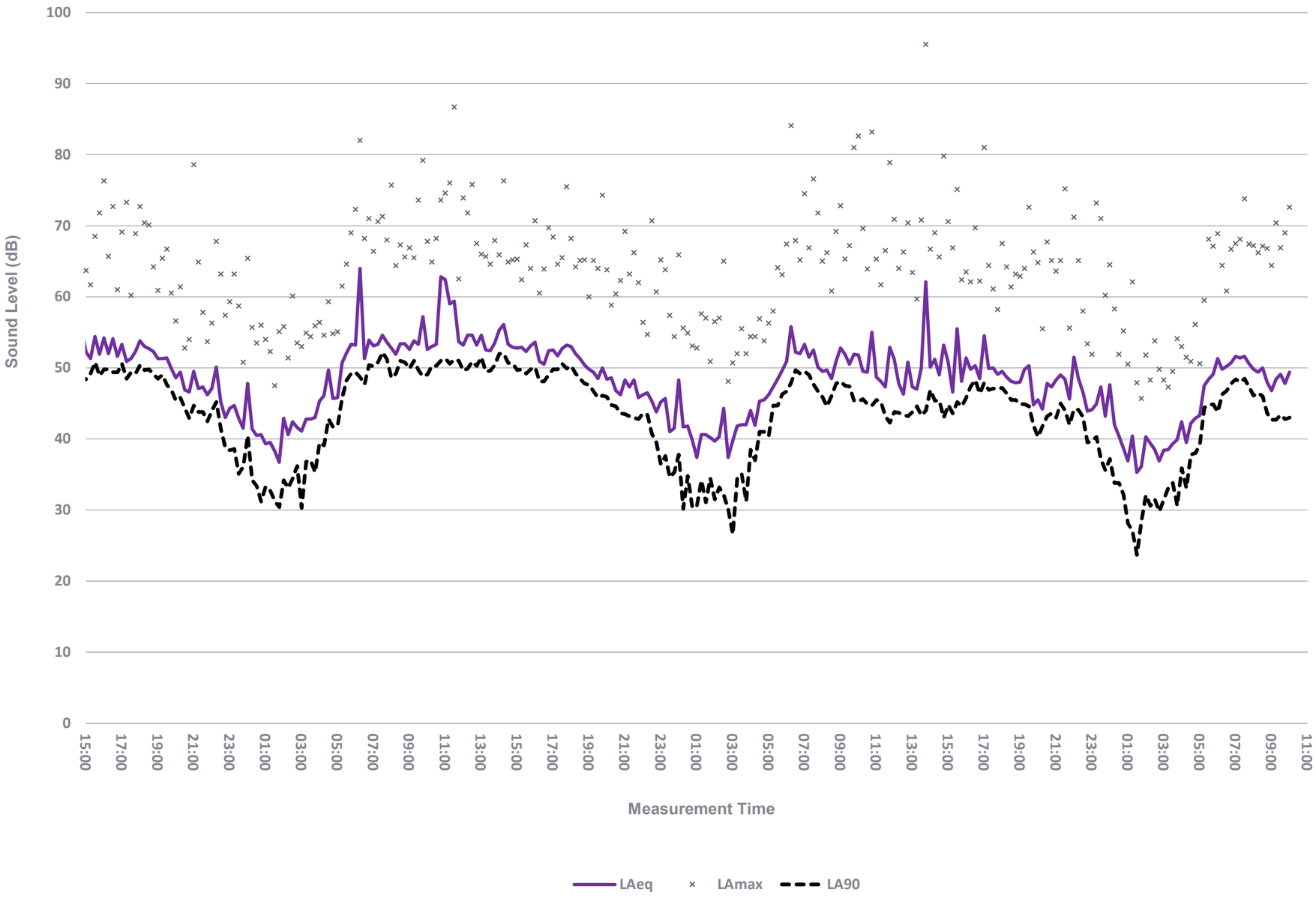
Table 7.1: Definition of Acoustic Terms

Terminology	Definition
Rating Level, $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Background Sound Level, $L_{A90,T}$	The 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 fast time-weighting, *F*, and quoted to the nearest whole number of decibels.
Ambient Sound Level, $L_{Aeq,T}$	The steady sound level which, over a period of time *T*, contains the same amount of A-weighted sound energy as the time varying sound over the same period. Also known as the equivalent continuous sound pressure level. NOTE The ambient sound level is a measure of the residual sound and the specific sound when present.
Specific Sound Level, $L_{Aeq,Tr}$	The equivalent continuous A-weighted sound pressure level produced by the specific noise source at the assessment location over a given reference time internal, T_r.

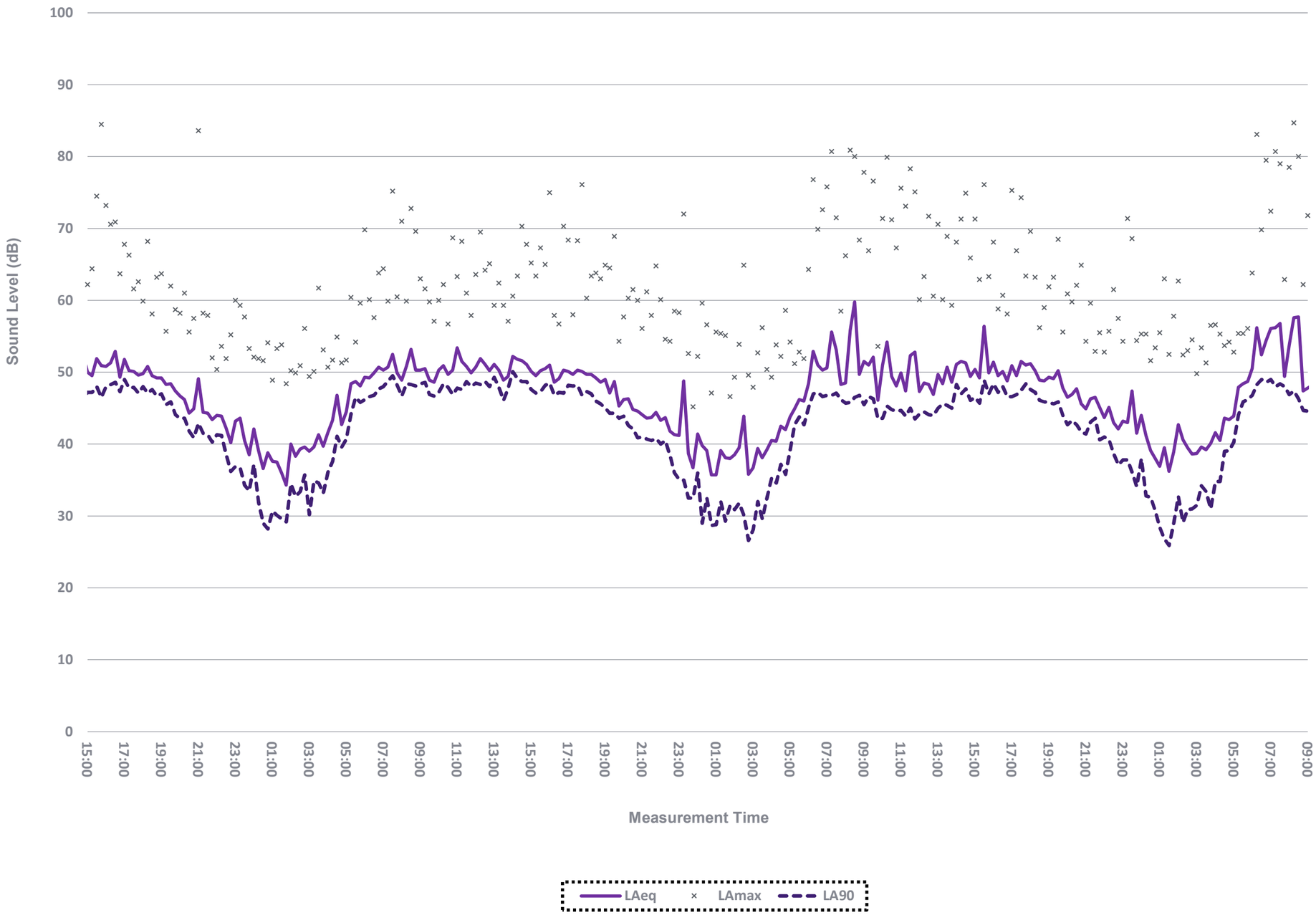
Appendix B

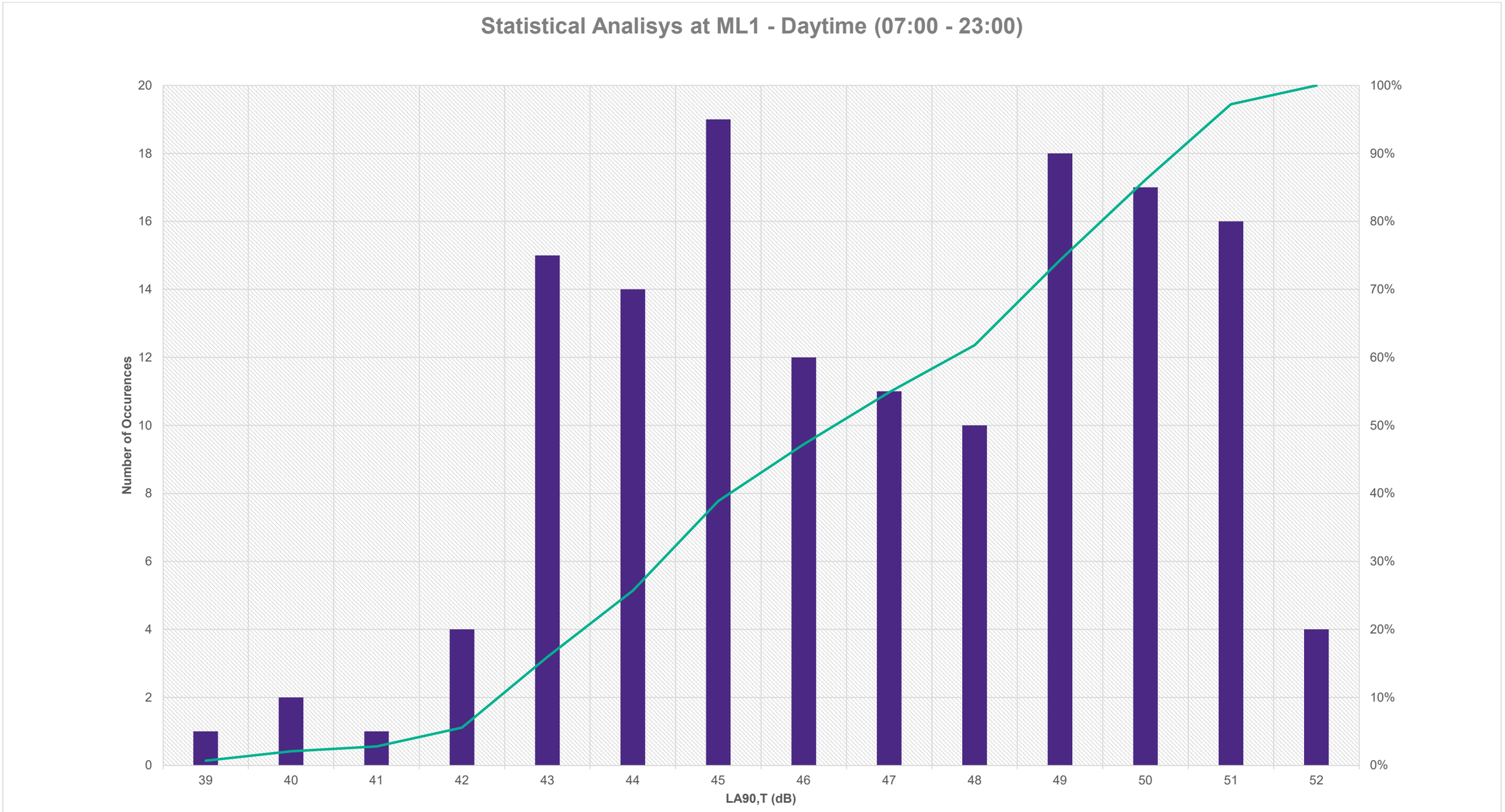
Measurement Data

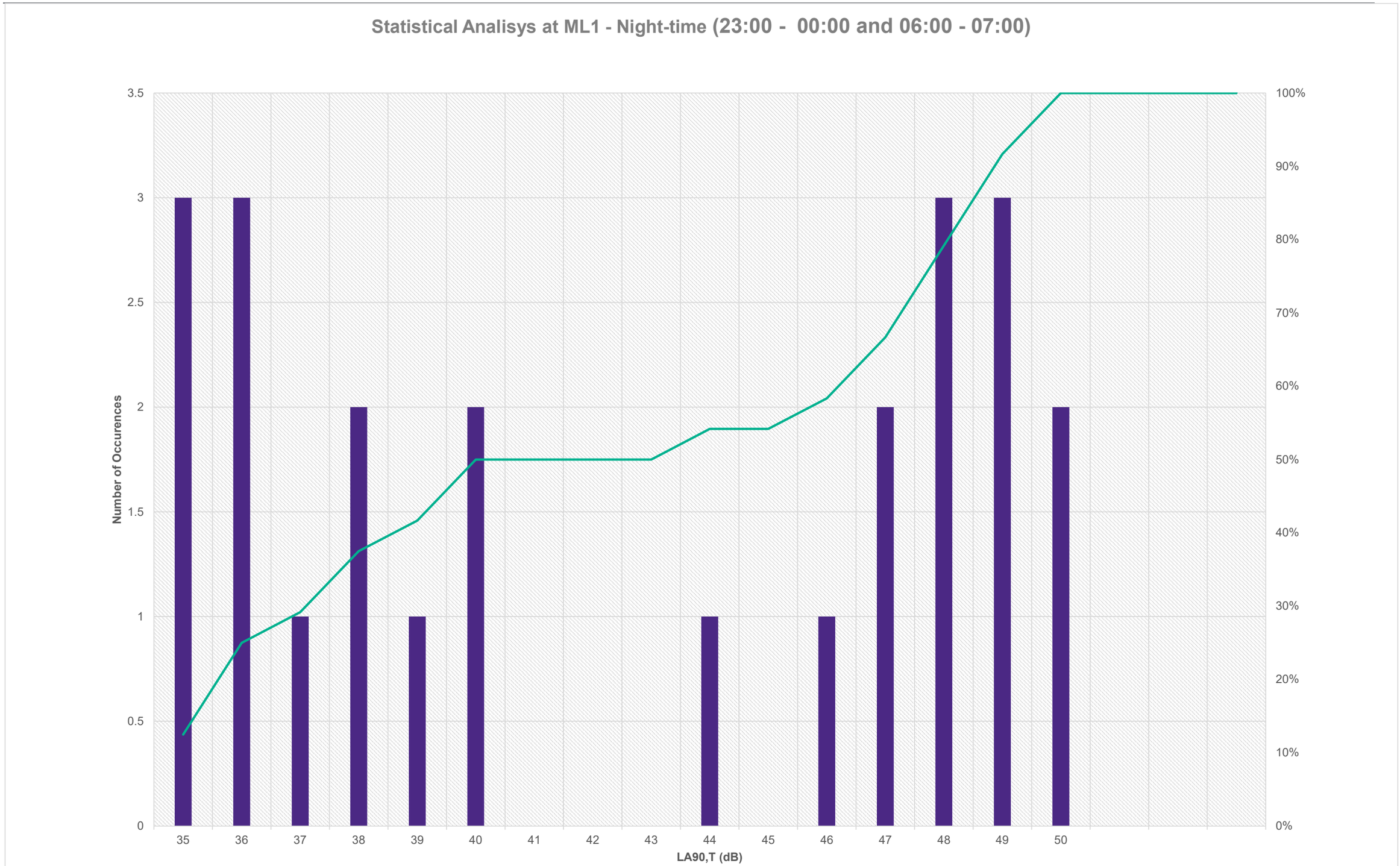
Measured Noise Levels at ML1, 10 to 13 September 2024



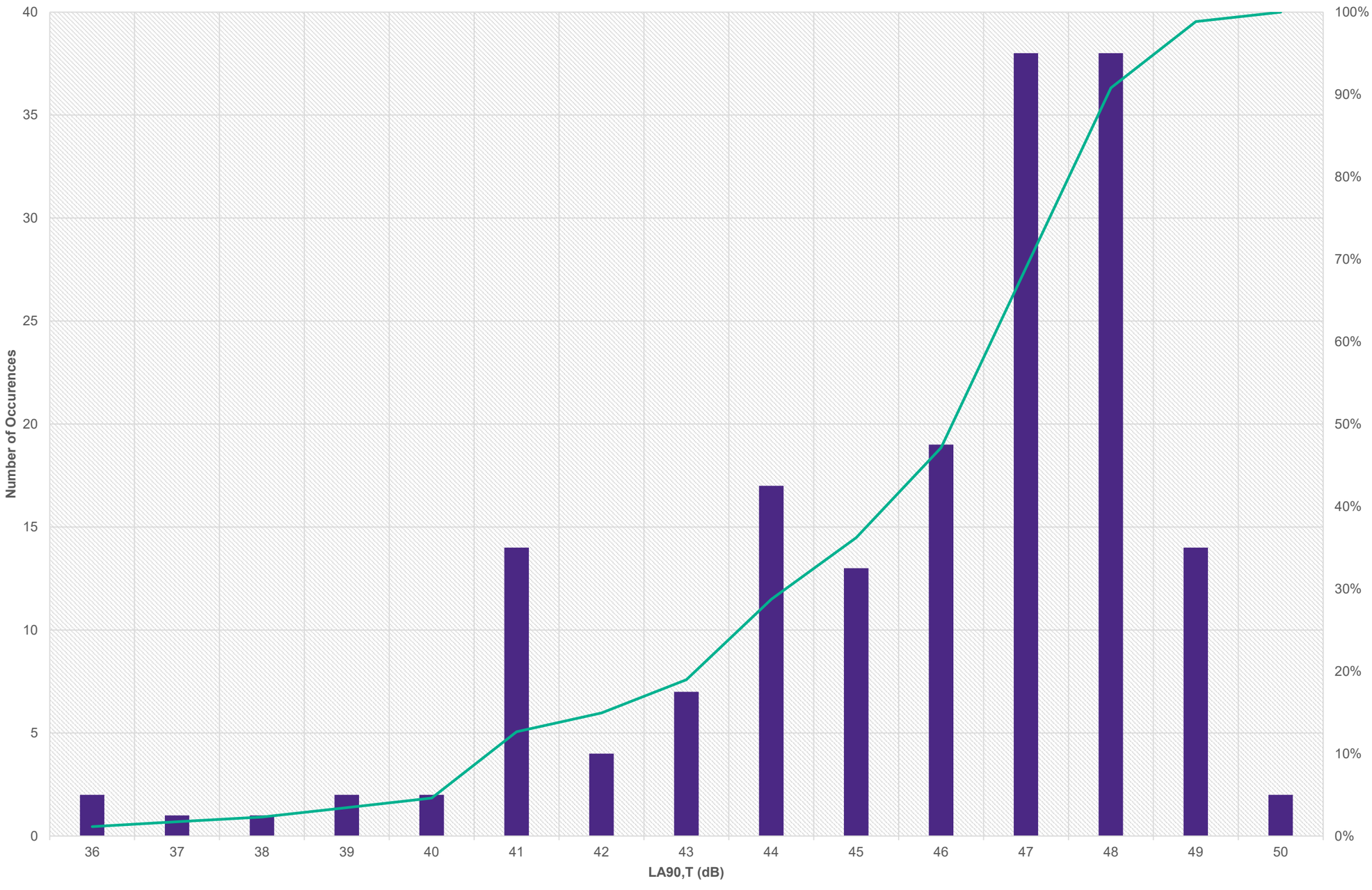
Measured Noise Levels at ML2, 10 to 13 September 2024

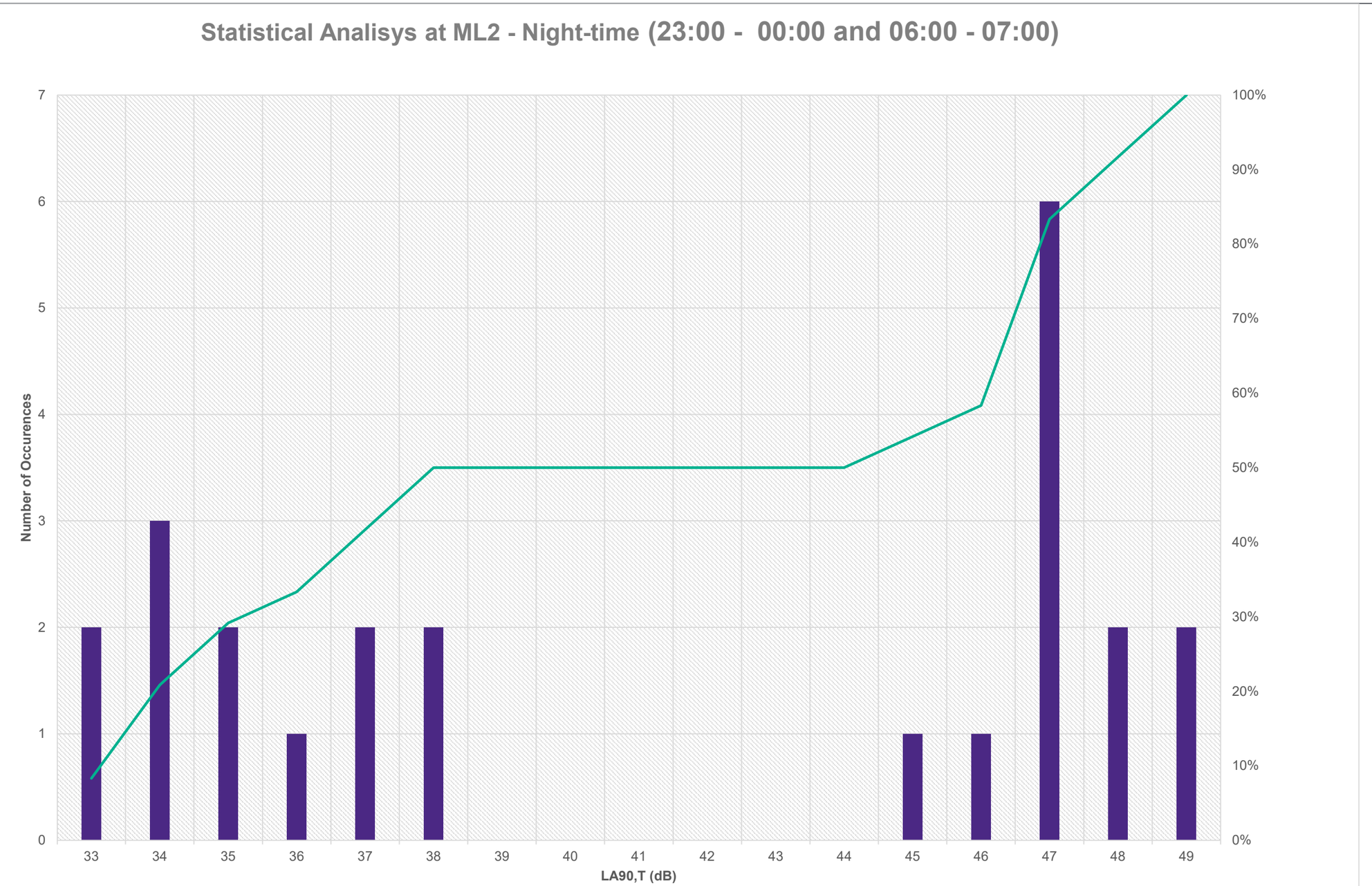



Statistical Analisys at ML1 - Daytime (07:00 - 23:00)
Number of Occurences
LA90,T (dB)
0
2
4
6
8
10
12
14
16
18
20
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
39
40
41
42
43
44
45
46
47
48
49
50
51
52


Statistical Analisys at ML1 - Night-time (23:00 - 00:00 and 06:00 - 07:00)
Number of Occurences
LA90,T (dB)
0
0.5
1
1.5
2
2.5
3
3.5
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Statistical Analisys at ML2 - Daytime (07:00 - 23:00)




Statistical Analisys at ML2 - Night-time (23:00 - 00:00 and 06:00 - 07:00)
Number of Occurences
LA90,T (dB)
0
1
2
3
4
5
6
7
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49

Appendix C
Plant Data

Measured Internal Sound Pressure Levels																																
Building Name	**Leq**	**12.5 Hz**	**16 Hz**	**20 Hz**	**25 Hz**	**31.5 Hz**	**40 Hz**	**50 Hz**	**63 Hz**	**80 Hz**	**100 Hz**	**125 Hz**	**160 Hz**	**200 Hz**	**250 Hz**	**315 Hz**	**400 Hz**	**500 Hz**	**630 Hz**	**800 Hz**	**1 kHz**	**1.25 kHz**	**1.6 kHz**	**2 kHz**	**2.5 kHz**	**3.15 kHz**	**4 kHz**	**5 kHz**	**6.3 kHz**	**8 kHz**	**10 kHz**	**12.5 kHz**	**16 kHz**	**20 kHz**
Lower Fabrication Building	91.6	56.4	56.2	55	58.9	63	61.5	61.1	64.4	62.5	60	62.6	65.5	66.4	65.8	68	70.1	74.1	75.1	78.1	79.6	78	78.5	79.8	80.8	82	82.4	82	80.2	76.7	72.5	68.2	64.2	58.7
Upper Fabrication Building	81.8	58.9	63.3	68.4	78.5	79	79	72.7	73.5	69.2	70.5	72.3	75.9	77.6	74.1	77.4	76	70.2	70.2	68.9	68	66.8	67.4	68.3	69.3	70.7	69.8	69.9	68.7	68.6	67.4	63.4	57.9	49.8