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Noise Impact Assessment

546 Sipson Road, West Drayton UB7 0JB

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Quality Standards Control

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<i>Revision</i>	-
Date	04.05.2023
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1. Executive Summary

An assessment has been carried out of the present noise climate at **546 Sipson Road, West Drayton UB7 0JB** and the impact of that noise on the approved development. The approved scheme involves the redevelopment of the site including the demolition of the existing building and the erection of a new building ranging between 1 and 6 storeys to provide a 302-bedroom hotel (Use Class C1) with basement and ancillary facilities including restaurant, car parking, coach parking, hard and soft landscaping and associated works.

The approved development site is located in a predominantly residential area. Along the western boundary of the site are residential houses and the M4 spur road (Tunnel Road East) is located along the eastern boundary of the site. A car park is located on the southern boundary of the site. The A4 Bath Road is located approximately 200m to the south of the site and Heathrow Airport (north runway) is located approximately 600m to the south of the site.

The site is dominated by road traffic noise from the M4 spur road and frequent aircraft movements.

The assessment is based on the results of a noise measurement survey that has been carried out over a 48-hr period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

Maximum noise levels have been provided in respect of plant noise to meet the identified requirements of Planning Condition 20.

It has been identified that the internal noise level requirements can only be achieved through careful consideration of the building envelope. The construction assumptions that have led to this conclusion are:

- The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.
- A typical double-glazing system in a 6/16/6.8 (with acoustic laminate) configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of at least 38 dB R_w .
- An alternative means of ventilation, such as MVHR with consideration for cooling (where an overheating risk is identified) will be installed to allow adequate ventilation without the requirement to open windows.

Subject to installation of the above mitigation measures, the requirements of Planning Condition 21 will be achieved, and the condition can therefore be discharged.

2. Introduction

This report has been prepared to discharge planning conditions for the approved development at **546 Sipson Road, West Drayton UB7 0JB**. The approved scheme involves the redevelopment of the site including the demolition of the existing building and the erection of a new building ranging between 1 and 6 storeys to provide a 302-bedroom hotel (Use Class C1) with basement and ancillary facilities including restaurant, car parking, coach parking, hard and soft landscaping and associated works.

The report assesses, through on-site noise measurements, the impact of the existing noise climate on the approved development and the impact of the approved development on surrounding noise sensitive receptors.

The approved development site is located in a predominantly residential area. Along the western boundary of the site are residential houses and the M4 spur road (Tunnel Road East) is located along the eastern boundary of the site. A car park is located on the southern boundary of the site. The A4 Bath Road is located approximately 200m to the south of the site and Heathrow Airport (north runway) is located approximately 600m to the south of the site. The location of the approved development site is provided in **Figure 2.1** and the proposed site layout plan is provided in **Figure 2.2**.

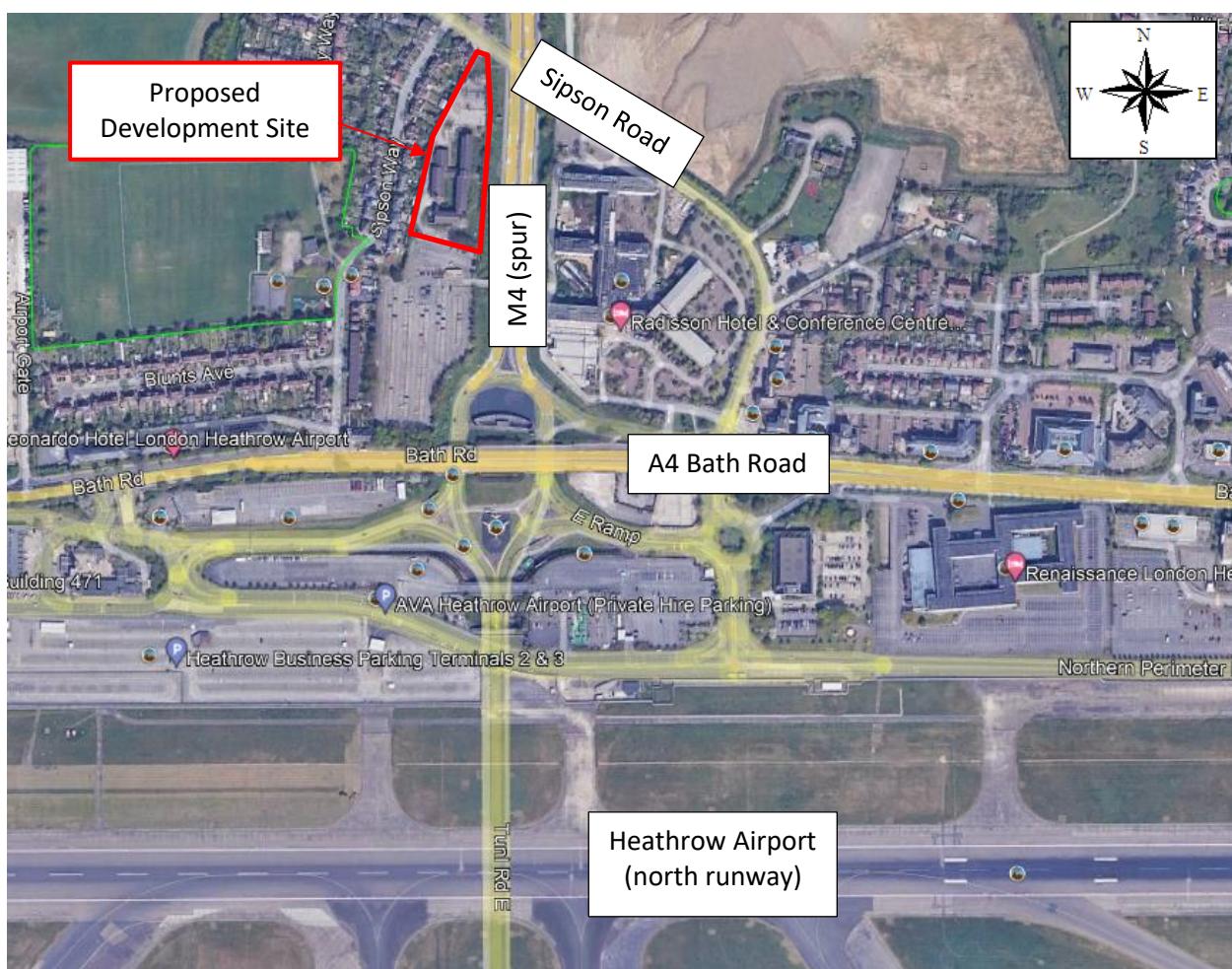


Figure 2.1: Site Location

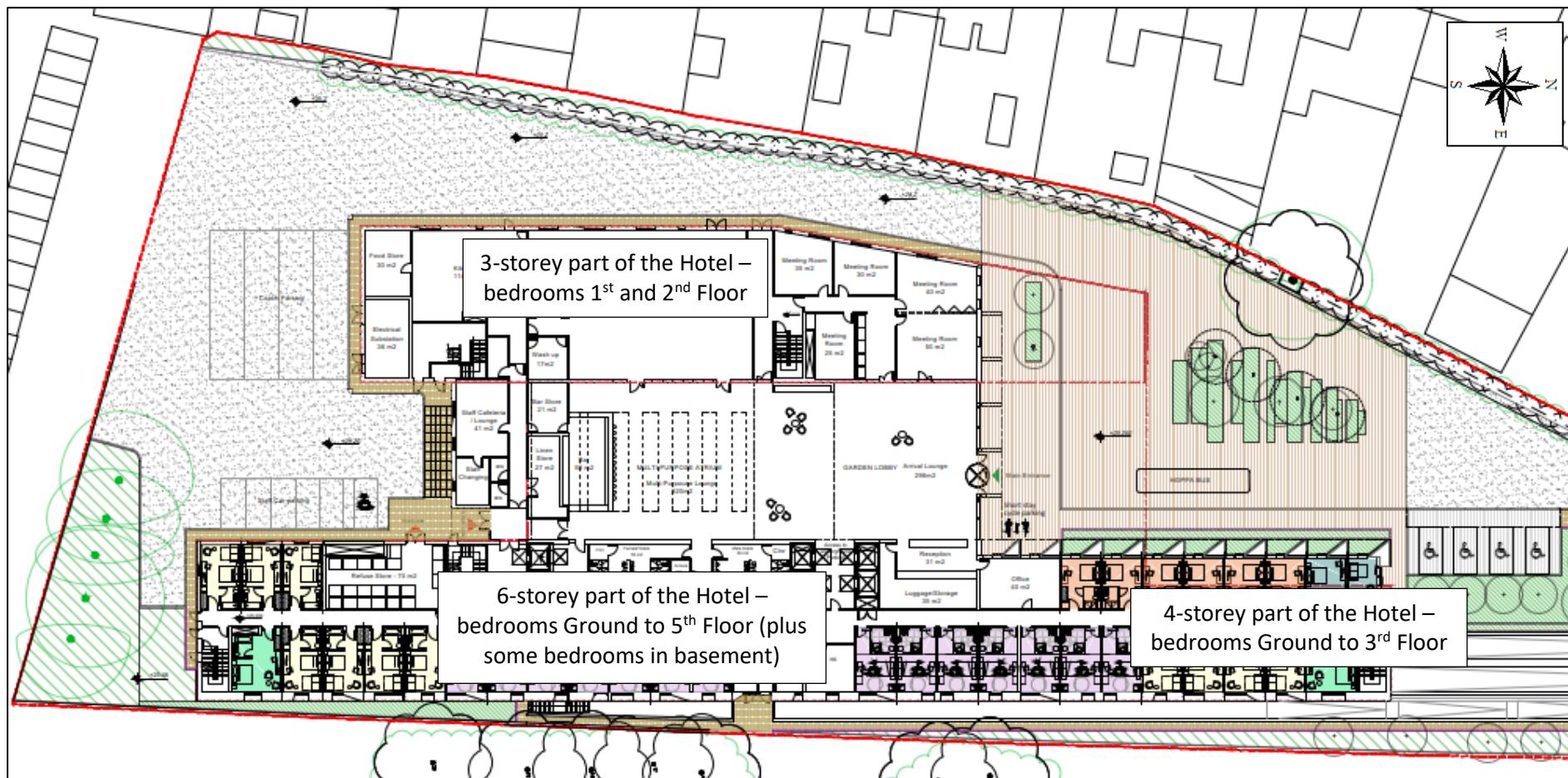


Figure 2.2: Approved Site Layout Plan (Ground Floor Layout Plan)

3. Planning Conditions

The development was granted planning permission by the London Borough of Hillingdon on the 3rd of November 2020 (application ref: 11068/APP/2020/1586) and the following conditions were set in respect of noise:

"20. Prior to above ground works, details shall be submitted to and approved in writing by the Council, of the external noise level emitted from plant/ machinery/ equipment and mitigation measures as appropriate. The measures shall ensure that the external noise level emitted from plant, machinery/ equipment will be lower than the lowest existing background noise level by at least 5dBA, by 10 dBA where the source is tonal, as assessed according to BS4142:2014 at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity. Thereafter, Prior to use, all machinery, plant or equipment including any extract/ ventilation system and ducting at the development shall be mounted with proprietary anti-vibration isolators and fan motors shall be vibration isolated from the casing and adequately silenced and maintained as such.

REASON

To ensure that the amenity of the occupiers of the proposed development is not adversely affected by road traffic and other noise in accordance with Policy EM8 of the Hillingdon Local Plan: Part One - Strategic Policies (November 2012) and Policy DMHB 11 of the Hillingdon Local Plan Part Two - Development Management Policies (January 2020).

21. Prior to the commencement of development, a sound insulation and ventilation scheme for protecting the proposed development from road traffic, rail traffic, air traffic and other noise has been submitted to and approved in writing by the Local Planning Authority. The scheme shall meet an acceptable internal noise design criteria as specified in BS8233:2014 for internal rooms and external amenity areas. Thereafter, the scheme shall be implemented and maintained in full compliance with the approved measures.

REASON

To ensure that the amenity of the occupiers of the proposed development is not adversely affected by noise in accordance with Policy EM8 of the Hillingdon Local Plan: Part One - Strategic Policies (November 2012), Policies DMAV 2 and DMAV 3 of the Hillingdon Local Plan Part Two - Development Management Policies (January 2020) and London Plan (2016) Policy 7.15."

4. Guidance Documents

4.1. British Standard 4142:2014

British Standard 4142:2014 “*Methods for rating and assessing industrial and commercial sound*” provides a method for the measurement and rating of industrial type noise sources and background noise levels outside dwellings. The rating level (defined in the BS) is used to rate the noise source outside residential dwellings (this is defined as the “specific sound level”).

The rating level is determined by assessing the character of the noise and applying an acoustic feature correction if appropriate. Corrections are applied for the tonality and intermittency of the noise source which can both make noise more noticeable.

The initial assessment described in BS 4142 to determine whether an adverse impact is likely is based on establishing the difference between the rating level and the background noise level outside the residential property of interest. The British Standard states that the following points should be considered:

- *Typically, the greater this difference, the greater 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.*

4.2. British Standard BS 8233:2014

BS 8233: *Sound Insulation and Noise Reduction for Buildings – Code of Practice* has a number of design criteria and limits for intrusive external noise. Appropriate internal noise levels for hotel bedrooms are provided in Table H.3 in the informative Annex H and these are reproduced in **Table 4.1**.

Period	Noise Level
Daytime (07:00 – 23:00 hrs)	30 – 40 dB L _{Aeq,1hour}
Night-time (23:00 – 07:00 hrs)	25 – 35 dB L _{Aeq,1hour}
Night-time (23:00 – 07:00 hrs)	45 – 55 dB L _{Amax}

Table 4.1: Indoor Ambient Noise Level Ranges for Hotel Bedrooms

It is noted that Planning Condition 21 also states that external amenity areas should achieve the requirements of BS 8233:2014, however, no external amenity areas are proposed as part of the approved development and therefore no criteria will be set.

5. Baseline Noise Levels

In order to determine the extent to which the site is currently affected by noise, a detailed measurement study has been carried out at the site. Measurements have been carried out in order to characterise the existing noise climate over a 48-hour period. The noise climate at the site was entirely dominated by road traffic noise from the M4 spur road and aircraft taking off and landing.

The noise measurements utilised a Norsonic 140 Type 1 Precision Sound Level Meter which holds a current certificate of calibration. The full list of equipment is detailed in **Appendix 2**. Before and after the measurement period the equipment was calibrated in order to ensure that the equipment had remained within reasonable calibration limits (+/- 0.5 dB).

Measurements were carried out between 1000 hrs on Wednesday 19th April 2023 and 0900 hrs on Friday 21st April.

During the noise measurement survey, the temperature was up to 16°C, dropping to approximately 4°C overnight. There was a moderate (3-4 m/s) predominantly north-easterly wind throughout the survey period. The cloud cover was noted to be 20% at the start of the survey and 80% at the end. No precipitation was noted during the survey.

Noise measurements were carried out at Measurement Position 1 (MP1) in a free-field location at a height of approximately 2.5m towards the south-east corner of the site. The location was chosen in order to obtain the road traffic noise levels from the M4, aircraft noise and any movement noise from the adjacent car park.

The noise monitoring position is shown in **Figure 5.1**.



Figure 5.1: Noise Monitoring Location

Table 5.1 below displays a summary of the measured noise levels and detailed measurement results are presented in **Appendix 3**. The façade noise levels measured at MP1 have been corrected by -3 dB in order to obtain the equivalent free-field noise levels.

Measurement Position	Period (hours)	$L_{Aeq,1hr}$ (dB)	L_{Amax} (dB)	Typical L_{A90} (dB)
MP1	Daytime (0700 – 2300)	68	79	64
	Night-time (2300 – 0700)	67	74	49

Table 5.1: Summary of Free Field Semi-Permanent Noise Levels

Note: The average noise levels stated are logarithmic for L_{Aeq} and are from the worst-case 1-hour period (refer to Appendix 3). The $L_{Amax,F}$ noise levels stated are the arithmetic average of the hourly noise levels during the daytime (0700 hrs – 2300 hrs) and the 10th highest $L_{Amax,F,5min}$ noise level at night (2300 hrs – 0700 hrs), in line with normal good acoustic practice. The typical L_{A90} is the most commonly measured $L_{A90,5min}$ measured over the identified assessment period (refer to Appendix 3).

6. Plant Noise Assessment

The precise details of the proposed plant types are not yet available; therefore, the maximum sound level has been derived utilising the typical background noise level presented in **Table 5.1** and the basic methodologies presented in BS 4142:2014. This derivation is summarised in **Table 6.1**. The aim is to achieve the requirements of Planning Condition 20, for which the specific noise level should be at least 5 dB below the background noise level, or 10 dB below if the noise is tonal.

Results	Daytime (0700 hrs – 2300 hrs)	Night-time (2300 hrs – 0700 hrs)	Relevant Clauses of BS 4142:2014	Commentary
Typical Background Sound Level L_{A90} (dB)	64	49	8.1, 8.2	Refer to Table 5.1 .
Required Difference between Rating Level and Background Sound Level	-5	-5	9.2	The requirement is to be 5 dB below the background sound level
Specific Sound Level $L_{Aeq,T}$ (dB)	59	44	7.3.7, 7.3.9, 7.3.11	(Background Sound Level + Required Difference)
Maximum Sound Power Level L_{wA} (dB)	95	80	-	Indicative only – assumes receptor is 60m from plant.

Table 6.1: Total Sound Level of Plant Equipment

It will be important to ensure that the selected plant does not exceed the specific noise levels identified in this section of the report. It is important to note that the maximum noise levels identified are the total plant noise level, and not the noise level for each individual item of plant. If the plant is tonal, this would reduce the maximum specific noise level identified in **Table 6.1**. Careful consideration is required as to the specification and siting of any plant. If the plant was positioned further away from the identified noise sensitive receptors or is in a screened position, a higher sound power level would be acceptable to achieve the total sound levels identified in **Table 6.1**.

When the exact items of plant to be installed have been identified, Syntegra would recommend that a detailed plant noise assessment is carried out in order to ensure compliance with the target noise criteria.

7. Internal Noise Levels

Ideally internal noise levels should be achieved in as many properties as possible with windows open. Due to the relatively high noise levels present at the site, bedrooms will not be able to achieve the requirement with windows open, and therefore the sound insulation of the building façade will be required to mitigate noise levels. In carrying out our assessment, Syntegra have therefore made the following assumptions:

- The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.
- A typical double-glazing system in a 6/16/6.8 (with acoustic laminate) configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of at least 38 dB R_w .
- An alternative means of ventilation, such as MVHR with consideration for cooling (where an overheating risk is identified) will be installed to allow adequate ventilation without the requirement to open windows.

Table 7.1 identifies the likely L_{Aeq} and L_{Amax} internal noise levels, assuming windows closed, utilising the *Simple Calculation Method* described in BS 8233:2014. It can be seen that habitable rooms will achieve the requirements of BS 8233 with closed windows.

Location	Period (hrs)	External Noise Levels (dB) (ref. Table 5.1)	Sound Insulation of Glazing (dBA)	Internal Noise Levels (dB)	Compliance with Criteria
					BS 8233
Ambient Noise Level L_{Aeq} (dB)					
Front of Site	Daytime (0700 – 2300)	68	38	30	✓
Front of Site	Night-time (2300 – 0700)	67	38	29	✓
Maximum Noise Level L_{Amax} (dB)					
Front of Site	Night-time (2300 – 0700)	74	38	36	✓

Table 7.1: Internal Noise Levels

Achievement of the target noise criteria demonstrates compliance with Planning Condition 21 and the condition can therefore be discharged.

8. Conclusion

An assessment has been carried out of the present noise climate at **546 Sipson Road, West Drayton UB7 0JB** and the impact of that noise on the approved development.

The assessment is based on the results of a noise measurement survey that has been carried out over a 48-hr period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

Maximum noise levels have been provided in respect of plant noise to meet the identified requirements of Planning Condition 20.

It has been identified that the internal noise level requirements can only be achieved through careful consideration of the building envelope. The construction assumptions that have led to this conclusion are:

- The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.
- A typical double-glazing system in a 6/16/6.8 (with acoustic laminate) configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of at least 38 dB R_w .
- An alternative means of ventilation, such as MVHR with consideration for cooling (where an overheating risk is identified) will be installed to allow adequate ventilation without the requirement to open windows.

Subject to installation of the above mitigation measures, the requirements of Planning Condition 21 will be achieved, and the condition can therefore be discharged.

9. Appendix 1: Glossary of Acoustic Terminology

Term	Description
'A'-Weighting	<i>This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.</i>
Decibel (dB)	<i>This is a tenth (deci) of a bel. The decibel can be a measure of the magnitude of sound, changes in sound level and a measure of sound insulation. Decibels are not an absolute unit of measurement but are an expression of ratio between two quantities expressed in logarithmic form.</i>
$L_{Aeq,T}$	<i>The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. T may be as short as 1 second when used to describe a single event, or as long as 24 hours when used to describe the noise climate at a specified location. $L_{Aeq,T}$ can be measured directly with an integrating sound level meter.</i>
L_{A10}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 10 per cent of a given time and is the L_{A10T}. The L_{A10} is used to describe the levels of road traffic noise at a particular location.</i>
L_{A50}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 50 per cent of a given time and is the L_{A50T}.</i>
L_{A90}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time and is the L_{A90T}. The L_{A90} is used to describe the background noise levels at a particular location.</i>
L_{Amax}	<i>The 'A'-weighted maximum sound pressure level measured over a measurement period.</i>

10. Appendix 2: List of Equipment

Equipment Type	Manufacturer	Serial Number	Calibration Certification Number	Date of Last Calibration Check
Nor-140 Type 1 Sound Level Meter	Norsonic	1406389	TCRT21/1767	November 2021
Nor-1225 Microphone	Norsonic	225519	TCRT21/1767	November 2021
Nor-1209 Preamplifier	Norsonic	20598	TCRT21/1767	November 2021
Nor-1251 Sound Calibrator	Norsonic	35115	TCRT22/1700	November 2022

11. Appendix 3: Detailed Noise Measurement Results

19.04.2023

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
1000-1100	67	82	68	67
1100-1200	67	79	68	67
1200-1300	67	78	68	67
1300-1400	68	77	68	67
1400-1500	68	86	69	67
1500-1600	68	75	68	67
1600-1700	68	86	69	67
1700-1800	69	80	69	68
1800-1900	68	83	68	67
1900-2000	68	81	69	68
2000-2100	67	80	68	66
2100-2200	66	80	67	66
2200-2300	66	75	67	66
2300-0000	66	86	67	65
1000-2300	68	80	68	67
2300-0000	66	86	67	65

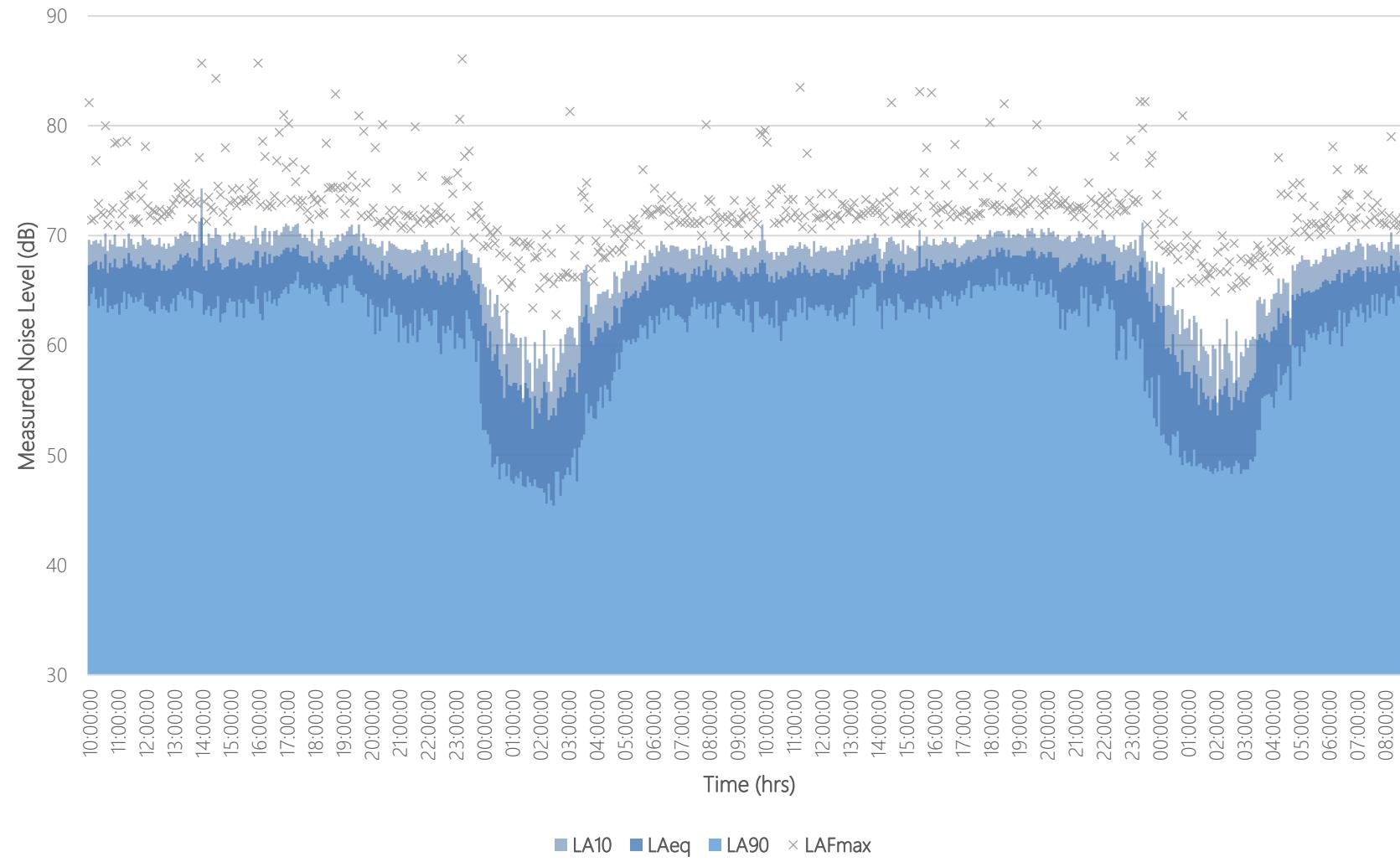
20.04.2023

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
0000-0100	59	71	62	56
0100-0200	56	70	57	54
0200-0300	55	71	56	54
0300-0400	60	81	63	57
0400-0500	62	71	63	61
0500-0600	65	76	66	64
0600-0700	67	74	67	66
0700-0800	67	80	67	66
0800-0900	67	73	67	66
0900-1000	67	79	67	66
1000-1100	66	80	67	66
1100-1200	67	84	67	66
1200-1300	67	74	67	66
1300-1400	68	73	68	67
1400-1500	67	82	68	67
1500-1600	67	83	68	67
1600-1700	67	78	68	67
1700-1800	68	76	68	68
1800-1900	68	82	69	68
1900-2000	68	80	69	68
2000-2100	68	74	68	67
2100-2200	68	75	68	67
2200-2300	67	77	68	66
2300-0000	66	82	68	64
0700-2300	67	78	68	67
2300-0700	63	74	63	60

21.04.2023

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
0000-0100	61	81	64	58
0100-0200	56	70	58	55
0200-0300	56	70	57	54
0300-0400	59	69	61	56
0400-0500	63	77	65	61
0500-0600	65	75	66	65
0600-0700	66	78	67	66
0700-0800	67	76	67	67
0800-0900	67	79	68	67
0700-0900	67	78	67	67
0000-0700	62	74	62	59

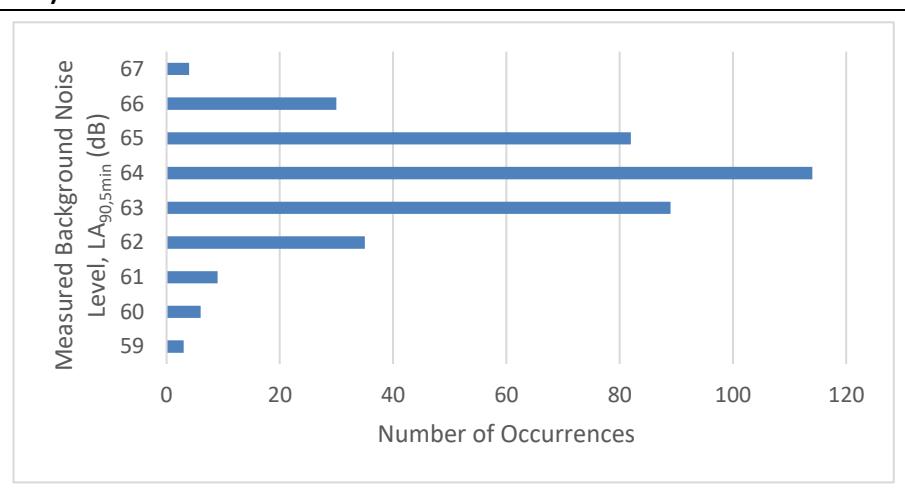
MP1 Measured Noise Levels from 1000 hrs on 19/04/2023 to 0855 hrs on 21/04/2023



11.1. Typical Background Noise Level Analysis for BS 4142:2014 Assessment

MP1 - Daytime (0700 hrs – 2300 hrs)

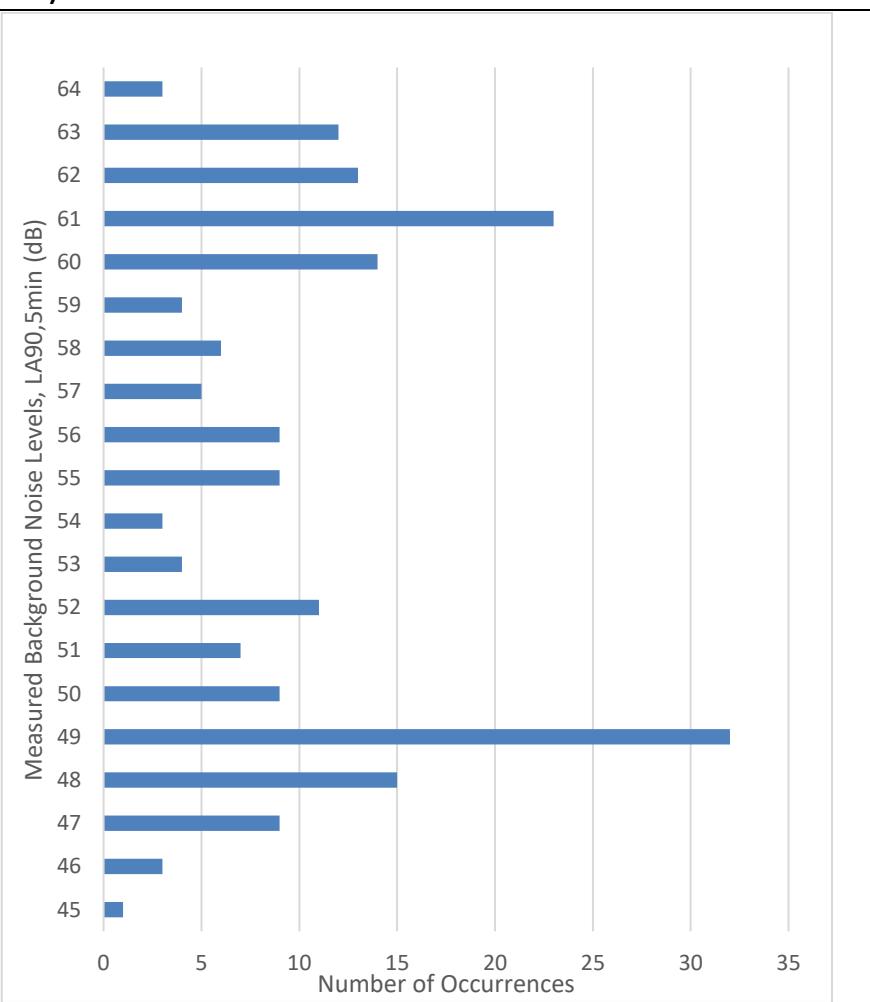
L _{A90,5min} (dB)	Number of Occurrences
59	3
60	6
61	9
62	35
63	89
64	114
65	82
66	30
67	4



Note: The row marked in bold is the chosen Typical L_{A90} for the BS 4142 plant noise assessment.

MP1 – Night-time (2300 hrs – 0700 hrs)

L _{A90,5min} (dB)	Number of Occurrences
45	1
46	3
47	9
48	15
49	32
50	9
51	7
52	11
53	4
54	3
55	9
56	9
57	5
58	6
59	4
60	14
61	23
62	13
63	12
64	3



Note: The row marked in bold is the chosen Typical L_{A90} for the BS 4142 plant noise assessment.

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