



Future Technologies Centre, Bradford College
Noise impact assessment

10597.5

23rd October 2023

Revision A



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10597.2

Revision	Description	Issued by	Date
A	First issue	SS	23 rd Oct 23

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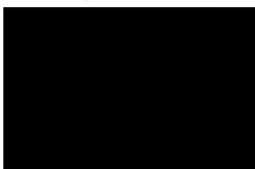
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2 Summary

- 2.1 This report has been prepared in support of a Planning Application for the proposed Future Technologies Centre at Bradford College.
- 2.2 At this stage in the development, mechanical plant specifications are not available; noise limits for the cumulative impact of all proposed plant at the nearest noise sensitive locations are proposed to reduce the risk of an adverse impact and satisfy Local Authority requirements.
- 2.3 Background sound levels have been measured locations considered representative of the nearest noise-sensitive receptor, identified to be the residential block of flats to the west of the proposed site.
- 2.4 It is proposed that the cumulative impact from all fixed plant should not exceed the background sound level at nearby noise sensitive receptors when rated according to BS 4142, considering typical requirements of Local Authority Environmental Health departments. The proposed plant noise limits are shown in Section 6.
- 2.5 Should fixed mechanical plant run continuously throughout a 24-hour day, the suggested upper limits during the night-time assessment period should be used as the design limit.
- 2.6 Considering the context of the existing acoustic environment and proposed plant noise limits, a BS 4142 assessment would indicate the likelihood of a low impact should the calculated upper limits be adhered to. This impact is considered to be at worst a LOAEL in alignment with the NPSE aims.

3 Introduction

3.1 The development of a Future Technologies Centre has been proposed at Bradford College, Thornton Road, Bradford; the site location is shown in Figure 1.

3.2 Apex Acoustics has been commissioned to undertake a noise survey and determine suitable noise limits for fixed mechanical plant associated with the development at the nearest noise sensitive receptors (NSRs), in support of a Planning Application.

3.3 The scope of our instruction includes:

Measurement of the existing noise environment over a 24 hour period at locations representative of the nearest noise-sensitive receptor;

Determine representative background sound levels at the nearest identified noise sensitive receptor based on measurement data; and

Determine upper noise limits for future fixed mechanical plant following the guidance of BS 4142.

3.4 The NSR is identified as the block of flats to the west of the site as shown in Figure 1.

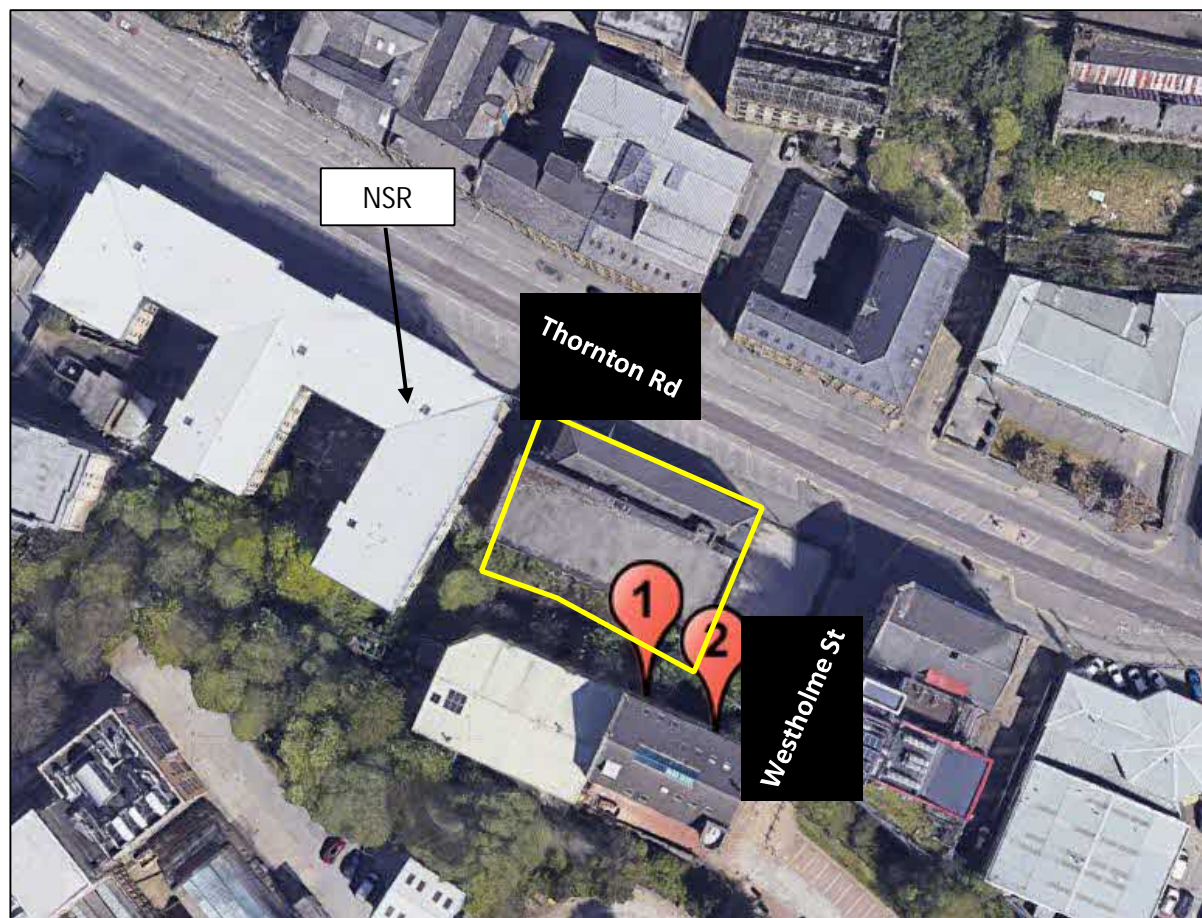


Figure 1: Proposed site (yellow outline), identified NSR, and measurement positions (red markers)

4 Planning policy and noise criteria

4.1 National Planning Policy Framework (NPPF)

4.2 The National Planning Policy Framework (NPPF) Reference 1, sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. In respect of noise, Paragraph 174, 185 and 187 of the NPPF states the following:

4.3 Paragraph 174:

“e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability...”

4.4 Paragraph 185:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁵ [See Explanatory Note to the Noise Policy Statement for England];

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

4.5 Paragraph 187:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses 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. “

4.6 Noise Policy Statement for England (NPSE)

4.7 The Noise Policy Statement for England, Reference 2, states three policy aims as follows:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

avoid significant adverse impacts on health and quality of life;

mitigate and minimise adverse impacts on health and quality of life; and

where possible, contribute to the improvement of health and quality of life.”

4.8 The NPSE defines adverse noise impact as follows:

No Observed Effect Level (NOEL)

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.

Lowest Observed Adverse Effect Level (LOAEL)

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

Significant Observed Adverse Effect Level (SOAEL)

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

4.9 The first two aims of the NPSE require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

“... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.”

4.10 Planning Practice Guidance – Noise

4.11 Further Government guidance on how planning can manage potential noise impact in new development is outlined in Planning Practice Guidance (PPG-N) notes on the Government website: www.gov.uk/guidance/noise--2

4.12 BS 4142

4.13 BS 4142, Reference 3, defines an assessment method to quantify the potential level for adverse impact from commercial and / or industrial noise sources impacting upon sound sensitive receptors, i.e., residential properties.

4.14 The terminology used in BS 4142 to describe the various levels of potential adverse impact in respect to the PPG-N noise hierarchy, are summarised Appendix A.

5 Existing acoustic environment

5.1 Equipment

5.2 The equipment used is listed in Table 1.

Equipment	Model	Serial no.
Sound Level Meter	NTi XL2	A2A-04045-D2
Calibrator	Larson Davis CAL 200	11705
Sound Level Meter	NTi XL2	A2A-12479-E0
Calibrator	Larson Davis CAL 200	13405

Table 1: Equipment used

5.3 Both meters and calibrators have current calibration certificates traceable to national standards. The sound level meters have been calibrated within the last two years and calibrators have been calibrated within the last year in accordance with the guidance of BS 4142; calibration certificates are available on request.

5.4 The equipment was field-calibrated before and after the measurements with no significant drift in sensitivity noted.

5.5 Measurements

5.6 The existing acoustic environment was measured over a 24-hour period from 12:46 hrs on 7th February 2023.

5.7 The measurement positions are shown in Figure 1.

5.8 Measurement positions 1 and 2 were made out of windows of the existing building at first floor level.

5.9 Data was recorded in single-octave band frequencies at one-second intervals throughout the 24-hour measurement period.

5.10 The most significant noise source was road traffic noise on Thornton Road at the measurement positions.

5.11 Noise from nearby mechanical plant was audible at Position 1 during the night-time.

5.12 Residual sound level, L_r

5.13 The existing acoustic environment measured during the survey period is the L_r .

5.14 Time history of the recorded residual $L_{Aeq,T}$ levels are shown in Appendix B.

5.15 The range of measured existing residual $L_{Aeq,T}$ levels are shown in Table 2.

5.16 Background sound level

5.17 Statistical analysis is undertaken of the results of all the $L_{A90,15min}$ data following the guidance of BS 4142, to determine background sound levels considered to be representative of the assessment periods. Results of the analysis are shown in Appendix B.

5.18 Based on the statistical analysis results, the background sound levels considered representative of the daytime and night-time assessment periods are shown in Table 2.

5.19 The measurements include façade reflections and have been corrected by 3 dB to determine free-field levels.

Period	L_{A90} (dB)		Range of residual $L_{Aeq,T}$ (dB)	
	Position 1	Position 2	Position 1	Position 2
Daytime (07:00 – 23:00 hrs)	56	50	56 – 65	53 – 62
Night-time (23:00 – 07:00 hrs)	49	45	51 - 59	47 - 56

Table 2: Background and range of residual sound levels representative of the assessment periods

6 Proposed plant noise limits

- 6.1 Noise limits for future plant associated with the development are proposed with reference to BS 4142 to ensure the impact is reduced to a level where there is a low likelihood of adverse effect upon the nearest noise sensitive locations.
- 6.2 As the measurements at Position 1 were affected by existing plant noise, the background sound levels measured at Position 2 are used to determine plant noise limits as the NSR is unlikely to be affected by existing plant noise measured at Position 1. The background sound levels at Position 2 are also lower than the levels measured at Position 1 and is considered representative for the NSR facades closest to the development.
- 6.3 The proposed noise limits are presented in Table 3.

Period	Rated noise impact limit, $L_{Ar,Tr}$ (dB)
Daytime (07:00 – 23:00 hrs)	50
Night-time (23:00 – 07:00 hrs)	45

Table 3: Proposed noise limits for fixed mechanical plant associated with the development

- 6.4 To reduce the risk of an adverse impact, rated noise levels no greater than the proposed limits should be attained during all 1-hour periods during the daytime and all 15 minute periods throughout the night time.

7 Conclusion

- 7.1 This report has been prepared in support of a Planning Application for the proposed Future Technologies Centre at Bradford College.
- 7.2 At this stage in the development, mechanical plant specifications are unavailable; noise limits are proposed for the cumulative impact of all proposed plant at the nearest noise sensitive locations to reduce the risk of an adverse impact.
- 7.3 A BS 4142 rated noise impact not exceeding the background sound levels at the nearest noise sensitive receptors has been adopted for the cumulative impact due to fixed mechanical plant, considering typical Local Authority requirements.
- 7.4 Considering the context of the existing acoustic environment and proposed plant noise limits, a BS 4142 assessment would indicate the likelihood of a low impact should the calculated upper limits be adhered to. This impact is considered to be at worst a LOAEL in alignment with the NPSE aims.

8 References

- 1 National Planning Policy Framework, Ministry of Housing, Communities & Local Government, July 2021.
- 2 Noise Policy Statement for England, Department for Environment, Food and Rural Affairs, March 2010.
- 3 BS 4142 2014: A1+2019, Method for rating and assessing industrial and commercial sound.

Appendix A Noise exposure hierarchy

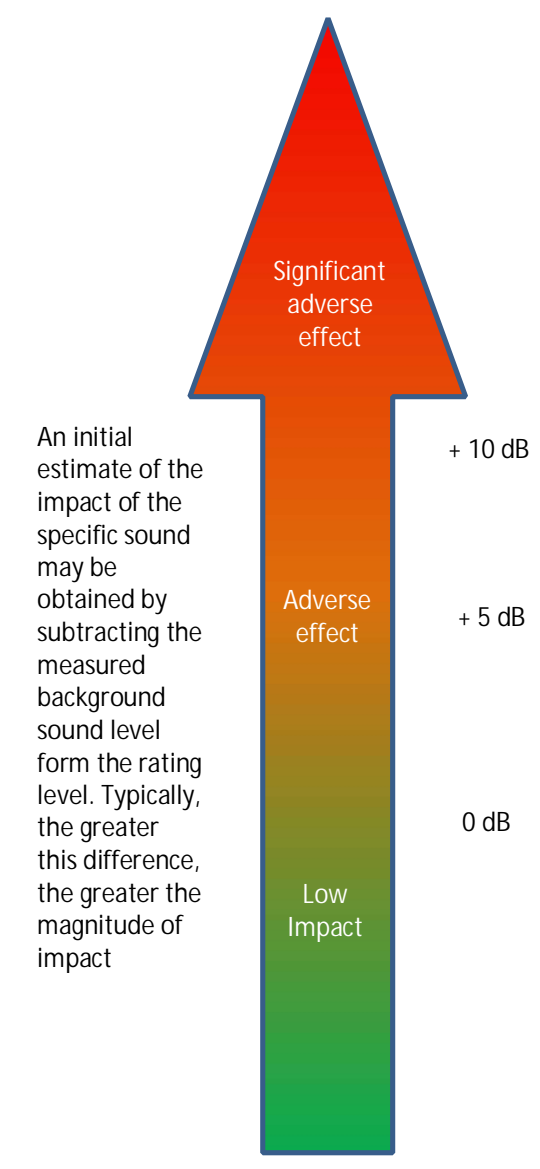
Planning Practice Guidance - Noise				BS 4142: Initial estimate of external noise risk significance
Noise	Example of outcomes	Increasing effect level	Action	
Present and very distributive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate 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	 <p>An initial estimate of the impact of the specific sound may be obtained by subtracting the measured background sound level from the rating level. Typically, the greater this difference, the greater the magnitude of impact</p>
Present and distributive	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	
Significant Observed Adverse Effect Level (SOAEL)				
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	
Lowest Observed Adverse Effect Level (LOAEL)				
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	
No Observed Adverse Effect Level (NOAEL)				
Not present	No effect	No Observed Effect	No specific measures required	
No Observed Effect Level (NOEL)				

Table 4: PPG-N Noise Exposure Hierarchy and BS 4142 initial estimate of impact

Appendix B Residual and background sound levels

B.4 Position 1

B.1 Measurement time history

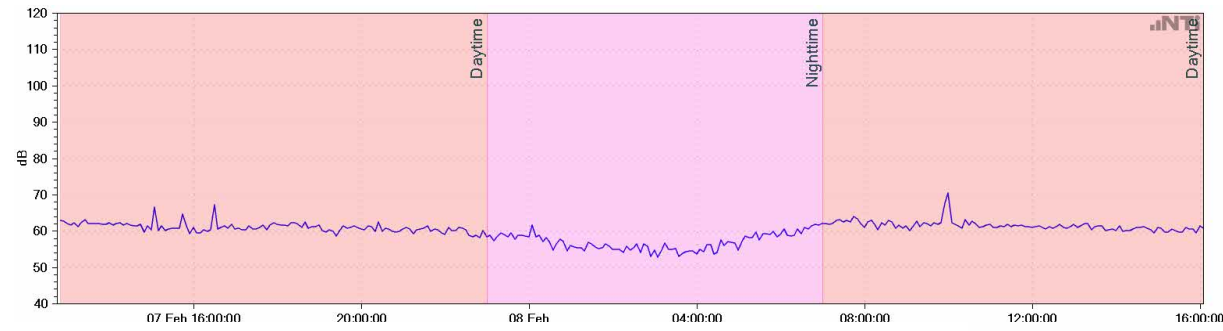


Figure 2: Time history showing $L_{Aeq,5min}$ levels – Position 1

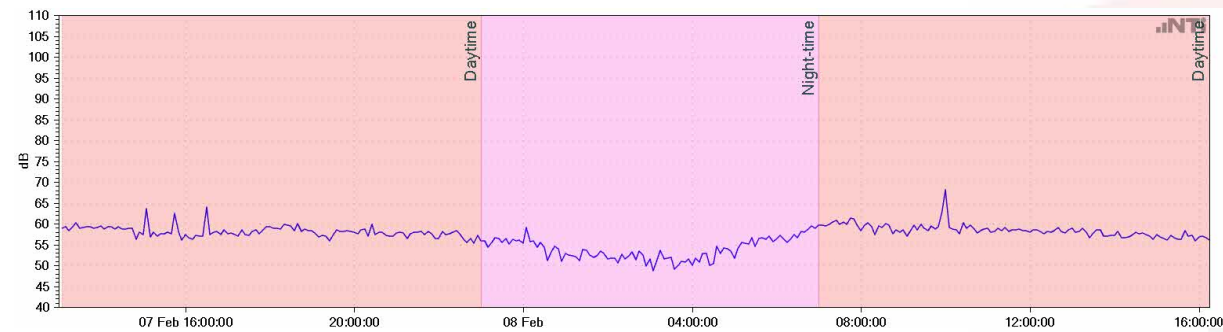


Figure 3: Time history showing $L_{Aeq,5min}$ levels – Position 2

B.2 Statistical analysis of background sound levels

B.3 Analysis to determine the typical background sound level representative of the daytime and night-time period is undertaken following the guidance of BS 4142, with results shown below.

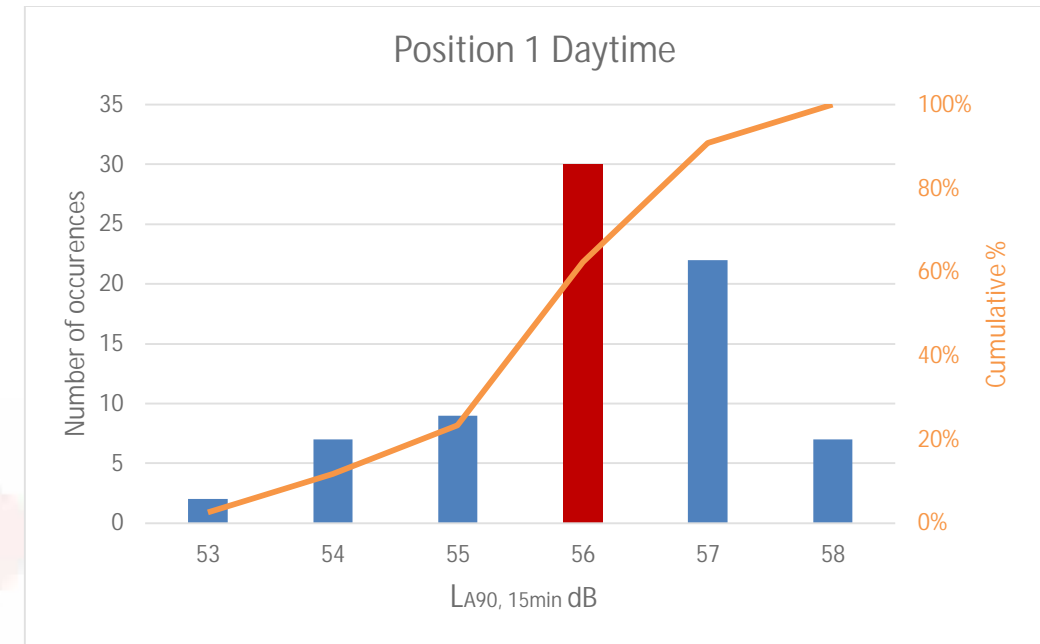


Figure 4: Analysis of daytime background levels, $L_{A90, 15min}$

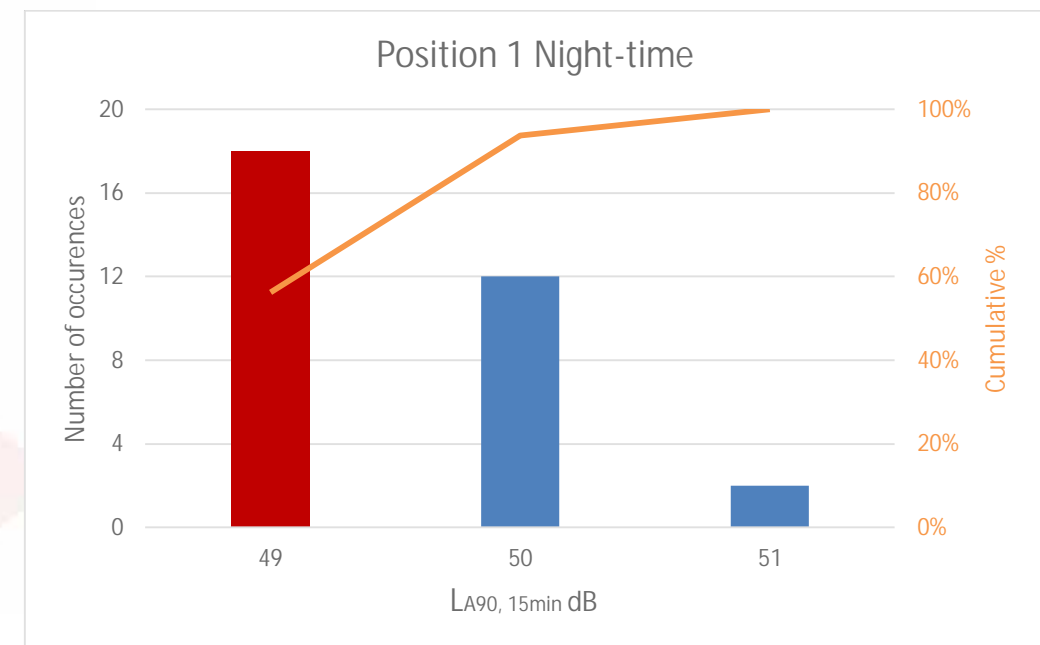


Figure 5: Analysis of night-time background levels, $L_{A90, 15min}$

B.5 Position 2

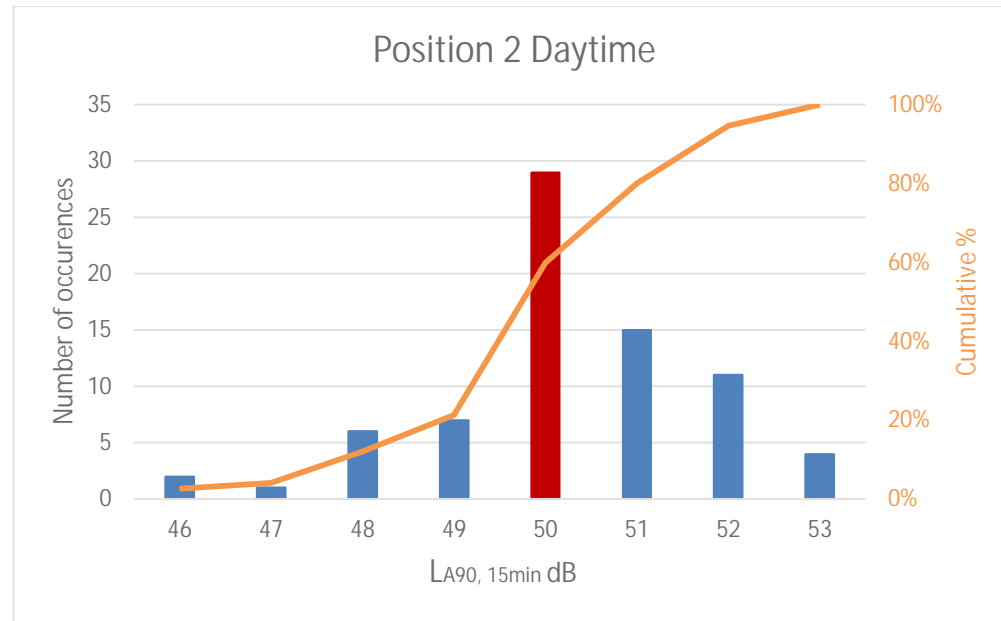


Figure 6: Analysis of daytime background levels, LA90, 15min

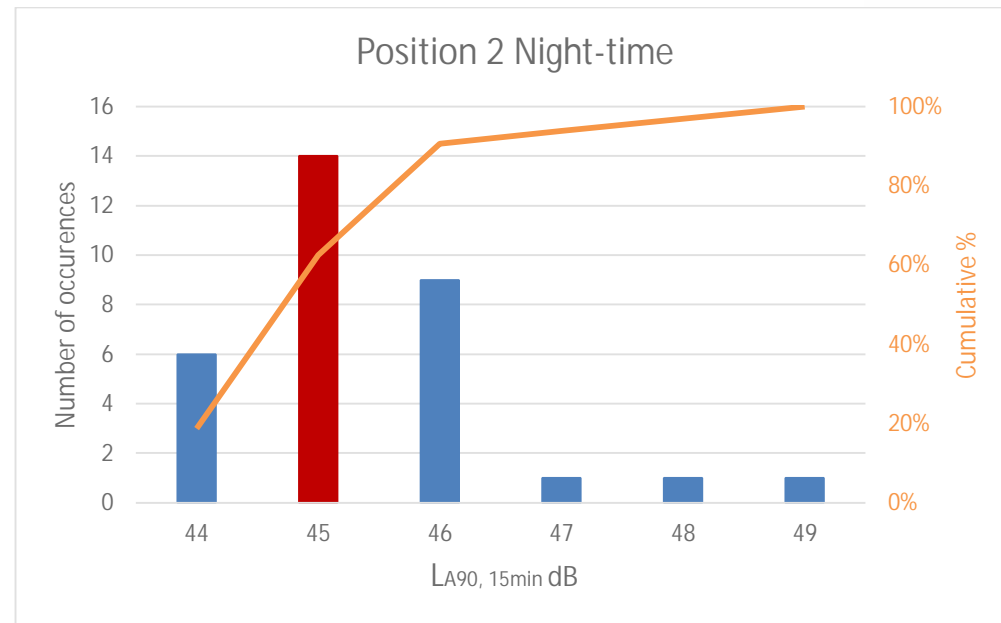


Figure 7: Analysis of night-time background levels, LA90, 15min

Appendix C Professional qualifications and competence

- C.1 All Apex Acoustics consultants work under the close supervision of a member who holds qualification in acoustics and is a member of the IOA.
- C.2 This can be verified by searching the Institute of Acoustics' list of Members, available here, with the surname of the consultant.
<http://www.ioa.org.uk/membership-check>
- C.3 Apex Acoustics is a member of the Association of Noise Consultants (ANC). The ANC is a trade organisation which seeks to raise the standards of acoustic consultancy and as such there are barriers to entry to ensure member's competency.
- C.4 This report has been completed and checked by an appropriately qualified and experienced acoustic consultant.