



St Gabriel's Student Accommodation, Manchester

Noise impact assessment

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1st July 2022

Revision A



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Prepared for

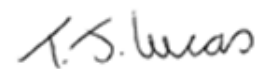
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2 Summary

- 2.1 This report has been prepared in support of a Planning Application for the development of four blocks of student accommodation at Oxford Place, Manchester. The two buildings – St Gabriel’s & Chapel Hall and Woodthorpe Hall will be retained and refurbished, and the remaining two buildings demolished for new build.
- 2.2 Ambient and background sound levels have been measured at two positions considered representative of the identified noise-sensitive receptors.
- 2.3 It is understood that the rear facades of St Gabriel’s & Chapel Hall, where the proposed external plant is located, will be mechanically ventilated to ensure the impact is reduced to a level where there is a low likelihood of adverse effect.
- 2.4 For all other facades, standard double glazing and trickle vents would be sufficient to meet the internal noise level criteria.
- 2.5 At this stage in the development, full details of mechanical plant specifications are unavailable; plant noise limits for the cumulative impact of all proposed plant at the nearest noise sensitive location are proposed to reduce the risk of an adverse impact.
- 2.6 Proposed plant noise limits are shown in Table 1.

Location	Period	Rated noise impact, L _{Ar,Tr}	Comments
Outside of noise sensitive residential facades on Hathersage Road (worst affected NSR)	Daytime (07:00 – 23:00)	≤ 46 dB	BS 4142 Rating Level of 5 dB below the background sound level
	Night time (23:00 – 07:00)	≤ 44 dB	

Table 1: Proposed upper noise limits for fixed mechanical plant

- 2.7 A screen to the north of St Gabriel’s & Chapel Hall may be required to meet the plant noise limits. A noise impact assessment will be undertaken once the plant details become available.

3 Introduction

- 3.1 A development of four blocks of student accommodation has been proposed at Oxford Place, Manchester. The two buildings – St Gabriel's & Chapel Hall and Woodthorpe Hall will be retained and refurbished, and the remaining two buildings demolished for new build; the site location is shown in Figure 1 with the site layout provided by the client shown in Figure 2.
- 3.2 Apex Acoustics has been commissioned to undertake a noise survey, and an assessment of the potential noise impact on the proposed development site and of noise from mechanical plant associated with the development in support of a Planning Application.
- 3.3 The scope of our instruction includes:
- Measurement of the existing noise environment during the daytime and night time at two locations;
 - Calculate the highest façade noise impact affecting the proposed development;
 - Determine representative background sound levels at the nearest identified noise sensitive receptors based on measurement data;
 - Determine upper noise limits for fixed mechanical plant following the guidance of BS 4142.
- 3.4 The NSRs are identified as the residential properties on Hathersage Road to the north and the student accommodation on Oxford Place to the south of the proposed site as shown in Figure 1.
- 3.5 It is understood that the proposed plant would be installed to the north of the site as shown in Figure 2. Therefore, the residential properties to the north are considered the worst affected NSR, the student accommodation situated to the south and further away from the proposed plant would be exposed to a lower noise impact.



Figure 1: Proposed site boundary outlined in red and identified NSRs outlined in yellow

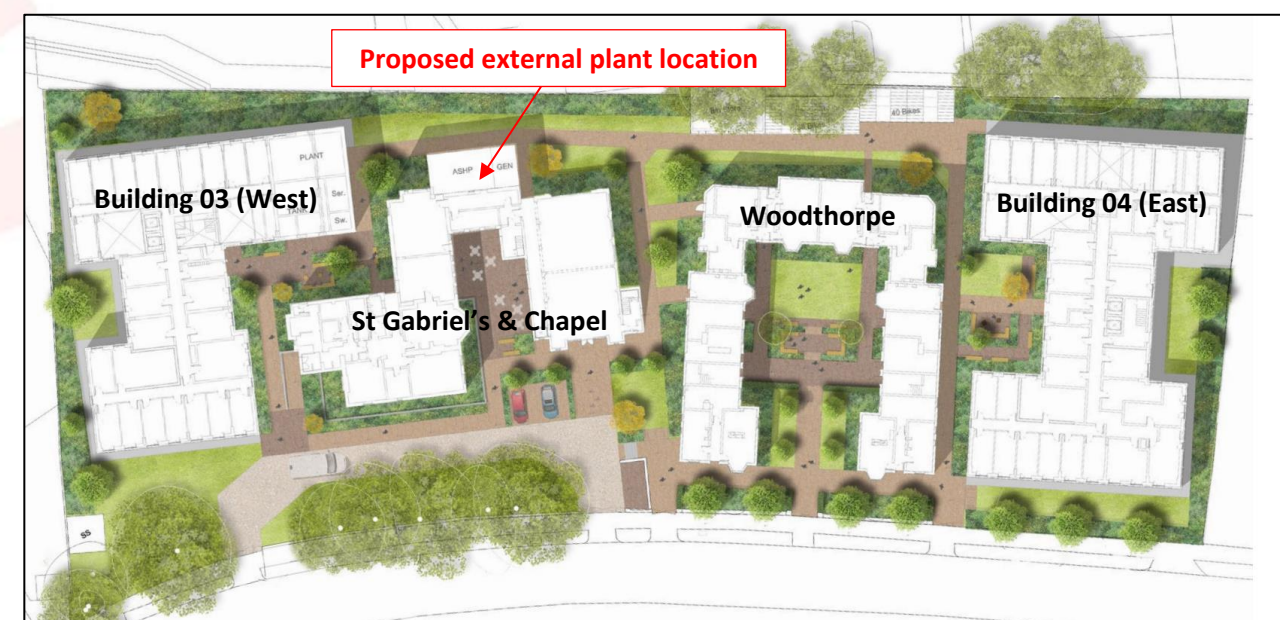


Figure 2: Site layout (provided by the client)

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 life;
- 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 Manchester City Council Planning & Noise Technical Guidance

4.13 The Manchester City Council policies on noise, Reference 3, have been identified and summarised below.

4.14 Noise ingress (BS 8233 & WHO)

4.15 The proposed criteria for the indoor ambient noise levels for residential dwellings are presented in Table 2.

Activity	Location	Guideline upper limit, dB		
		L _{Aeq} , daytime (07:00 - 23:00)	L _{Aeq} , night-time (23:00 – 07:00)	L _{AFmax} (23:00 – 07:00)
Resting	Living room	35	-	-
Dining	Dining room	40	-	-
Sleeping (daytime resting)	Bedroom	35	30	45

Table 2: Internal noise level requirements

4.16 The levels are based on BS 8233:2014, Reference 4, and WHO Guidelines, Reference 5.

4.17 With regards to the night-time L_{AFmax} criterion, the Manchester City Council guidance states that individual noise events should not normally exceed 45 dB L_{AFmax} more than 15 times a night.

4.18 If closed windows are to be relied upon to meet the values, there needs to be an appropriate alternative means of ventilation that does not compromise the façade insulation or the resulting noise level.

4.19 Plant noise (BS 4142)

4.20 The assessment of noise of a commercial/ industrial nature is commonly based on BS 4142:2014, Reference 6, which includes sound from fixed installations that comprise mechanical and electrical plant and equipment.

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

4.22 The Manchester City Council guidance states that the development should be designed so as to achieve a rating level of 5 dB below the typical background sound level at the nearest noise sensitive location.

5 Existing acoustic environment

5.1 The existing acoustic environment was measured for a 24-hour period from around 13:00 hours on the 2nd March 2022.

5.2 The measurement positions are shown in Figure 3.



Figure 3: Measurement positions

5.3 The microphone was located 3.5 metres above ground level and away from other reflecting surfaces such that the measurements are considered free-field.

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

5.5 The most significant noise sources were traffic noise from the surrounding road networks.

5.6 The equipment used is listed in Table 3.

Equipment	Model	Serial no.
Sound Level Meter	NTi XL2	A2A-11084-E0
Calibrator	Larson Davis CAL 200	10665
Sound Level Meter	NTi XL2	A2A-11062-E0
Calibrator	Larson Davis CAL 200	13403

Table 3: Equipment used

- 5.7 Both meter and calibrator have current calibration certificates traceable to national standards. The sound level meter has been calibrated within the last two years and calibrator has been calibrated within the last year in accordance with the guidance of BS 4142; calibration certificates are available on request.
- 5.8 The equipment was field-calibrated before and after the measurements with no significant drift in sensitivity noted.
- 5.9 **Ambient sound level, L_a**
- 5.10 The ambient sound environment included noise sources such as traffic noise from the surrounding road networks.
- 5.11 Ambient sound levels considered representative of the daytime and night time at both positions with the tenth highest maximum levels are shown in Table 4.
- 5.12 **Background sound level**
- 5.13 The background sound level, $L_{A90, T}$, is derived from the $L_{Aeq, T}$, with results shown in Appendix B.
- 5.14 The background sound levels considered representative of the assessment periods are shown in Table 4.

Position	Assessment period	L_{Aeq} (dB)	L_{AFmax} (dB)	L_{A90} (dB)
1 - Front (Facing Oxford Place)	Daytime (07:00 – 23:00 hrs)	61	-	52
	Night time (23:00 – 07:00 hrs)	56	71	50
2 - Rear (Shielded from Oxford Place)	Daytime (07:00 – 23:00 hrs)	54	-	51
	Night time (23:00 – 07:00 hrs)	51	57	49

Table 4: Ambient, 15th highest maximum and background sound levels considered representative of the assessment periods

6 Noise ingress

- 6.1 The proposed development will be exposed to existing road traffic noise from Oxford Place.
- 6.2 The proposed development will need to achieve the indoor ambient noise level requirements of the local authority while providing suitable ventilation to the spaces.
- 6.3 The noise levels required in the bedrooms are 35 dB $L_{Aeq, T}$ during the daytime and 30 dB $L_{Aeq, T}$ during the night-time, with individual noise events should not normally exceeding 45 dB L_{AFmax} more than 15 times a night.
- 6.4 For living rooms, where applicable, the indoor ambient noise level requirement of 35 dB $L_{Aeq, T}$ during the daytime should be met.
- 6.5 To comply with the local authority requirements the indoor ambient levels must be achieved when the windows are closed, and any vents are open.
- 6.6 The predicted highest noise level at the facades is 61 dB during the daytime and 56 dB during the night-time, with the 15th highest maximum level of 71 dB L_{AFmax} .
- 6.7 It is understood that the rear facades of St Gabriel's & Chapel Hall, where the proposed external plant is located, will be mechanically ventilated to ensure the impact is reduced to a level where there is a low likelihood of adverse effect.
- 6.8 It is understood that rooms in other parts of the buildings are to be ventilated via trickle vents mounted within the façade.
- 6.9 The reduction in noise from outside to inside of standard double glazing and trickle vents is approximately 30 dB(A). This would therefore be sufficient to meet the internal noise level criteria.
- 6.10 The internal ambient noise level criteria will therefore be achieved with the proposed ventilation strategy and the site is considered suitable for the proposed use.

7 Proposed plant noise limits and mitigation

7.1 Plant

At this stage in the development, full details of mechanical plant specifications are unavailable, however, it is understood that external plant will include 5 or 6 no. air source heat pumps.

7.2 It is understood that the external plant is proposed to be installed to the north of St Gabriel's & Chapel Hall as shown in Figure 4 below.

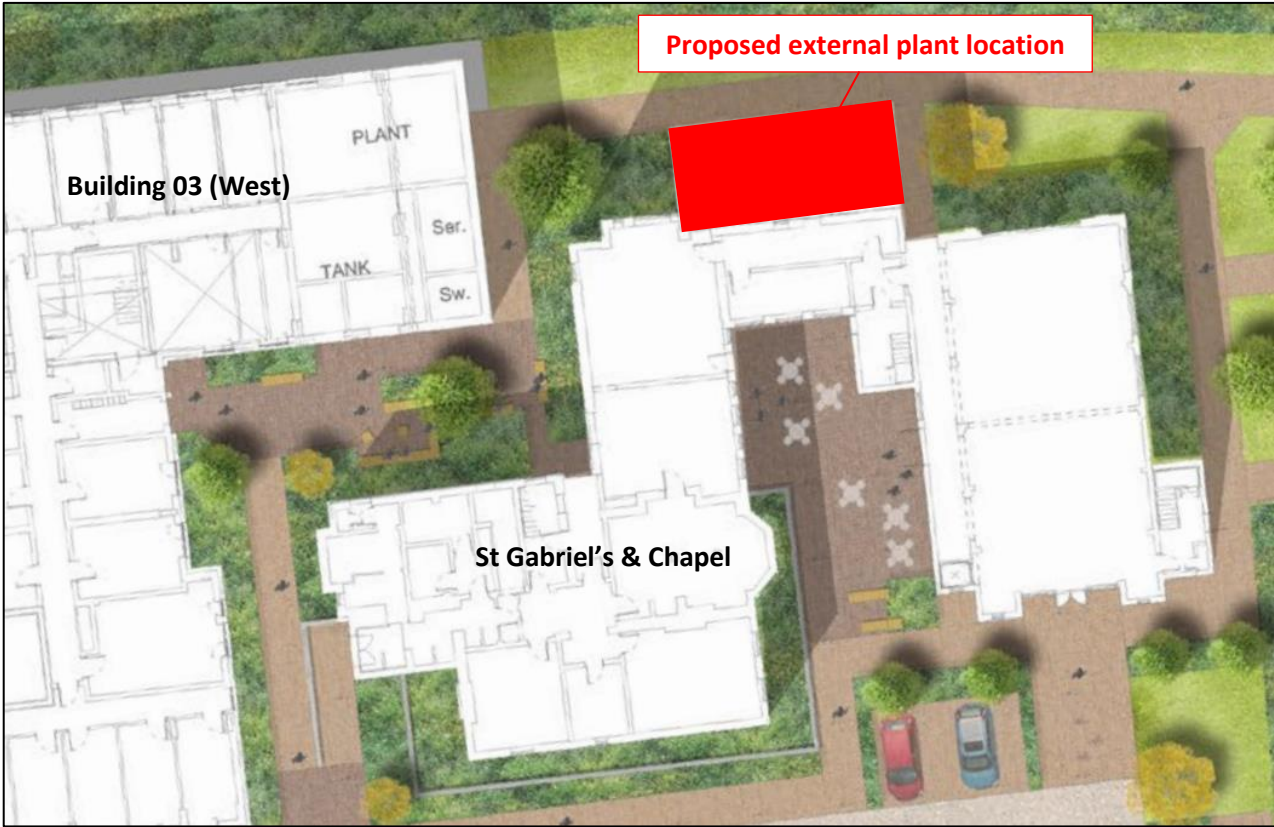


Figure 4: Proposed external plant location

7.3 Proposed plant noise limits

7.4 The following plant noise limits have been determined in accordance with BS 4142 and the Manchester City Council planning guidance. The proposed noise limits, which are based on the background sound levels considered representative of the assessment periods at Position 2 (to the north of the proposed site), are presented in Table 5.

Location	Period	Rated noise impact, L _{Ar,Tr}	Comments
Outside of noise sensitive residential facades on Hathersage Road (worst affected NSR)	Daytime (07:00 – 23:00)	≤ 46 dB	BS 4142 Rating Level of 5 dB below the background sound level
	Night time (23:00 – 07:00)	≤ 44 dB	

Table 5: Proposed noise limits for fixed mechanical plant

7.5 Proposed Mitigation

7.6 A screen to the north of St Gabriel's & Chapel Hall may be required to meet the plant noise limits.

7.7 A noise impact assessment will be undertaken once the plant details become available.

8 Conclusion

- 8.1 This report has been prepared in support of a Planning Application for the development of four blocks of student accommodation at Oxford Place, Manchester.
- 8.2 The internal ambient noise level criteria will be achieved with the proposed ventilation strategy and the site is considered suitable for the proposed use.
- 8.3 At this stage in the development, full details of mechanical plant specifications are unavailable; plant noise limits for the cumulative impact of all proposed plant at the nearest noise sensitive location are proposed to reduce the risk of an adverse impact.
- 8.4 A noise survey has been carried out at site and analysis of representative background sound levels carried out based on guidance included within BS 4142.
- 8.5 Plant noise limits have been determined in accordance with BS 4142 and the Manchester City Council planning guidance.
- 8.6 A screen to the north of St Gabriel's & Chapel Hall may be required to meet the plant noise limits. A noise impact assessment will be undertaken once the plant details become available.

9 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 Manchester City Council Planning & Noise Technical Guidance, December 2015.
- 4 BS 8233: 2014, Guidance on sound insulation and noise reduction for buildings.
- 5 Guidelines for Community Noise, Edited by Birgitta Berglund, Thomas Lindvall, Dietrich H Schwela, World Health Organisation, 1999.
- 6 BS 4142 2014: A1+2019, Method for rating and assessing industrial and commercial sound.

Appendix A Noise exposure hierarchy

Planning Practice Guidance - Noise				Significant adverse effect Adverse effect Low Impact + 10 dB + 5 dB 0 dB 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
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	
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 6: PPG-N Noise Exposure Hierarchy and BS 4142 initial estimate of impact

Appendix B Background sound levels

B.1 Analysis to determine the typical background sound level representative of the daytime and night-time period at Positions 1 and 2 has been undertaken following the guidance of BS 4142, with results shown in Figure 5 - Figure 8.

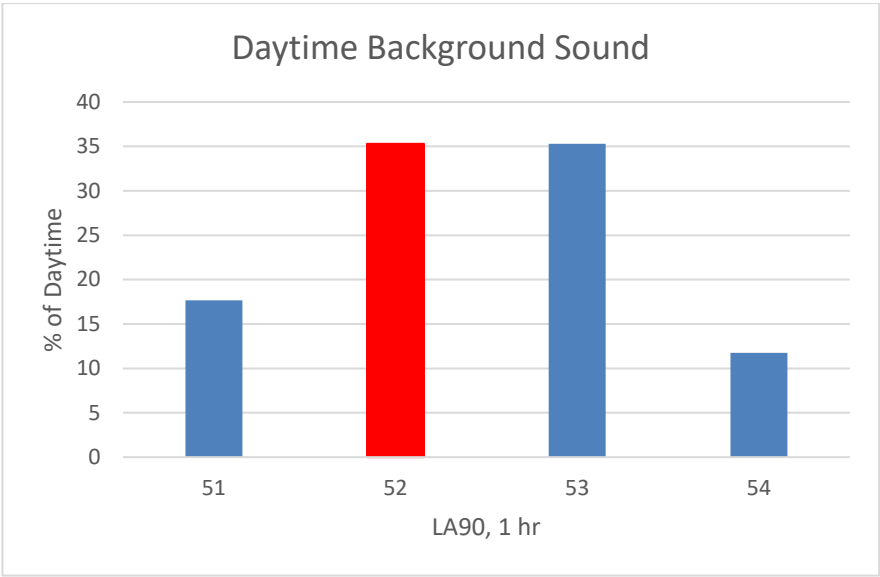


Figure 5: Analysis of daytime background levels, LA90, 1hr at Position 1 (facing Oxford Place)

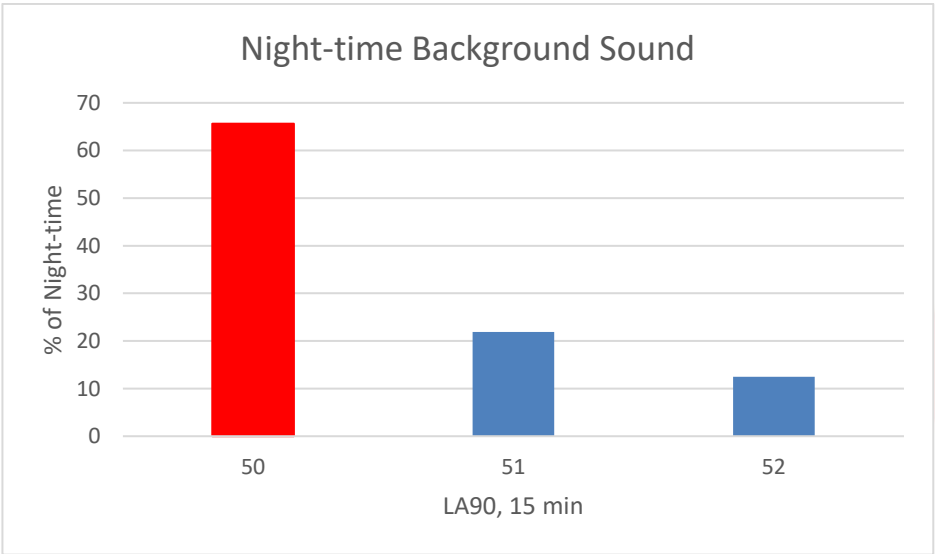


Figure 6: Analysis of night-time background levels, LA90, 15min at Position 1 (facing Oxford Place)

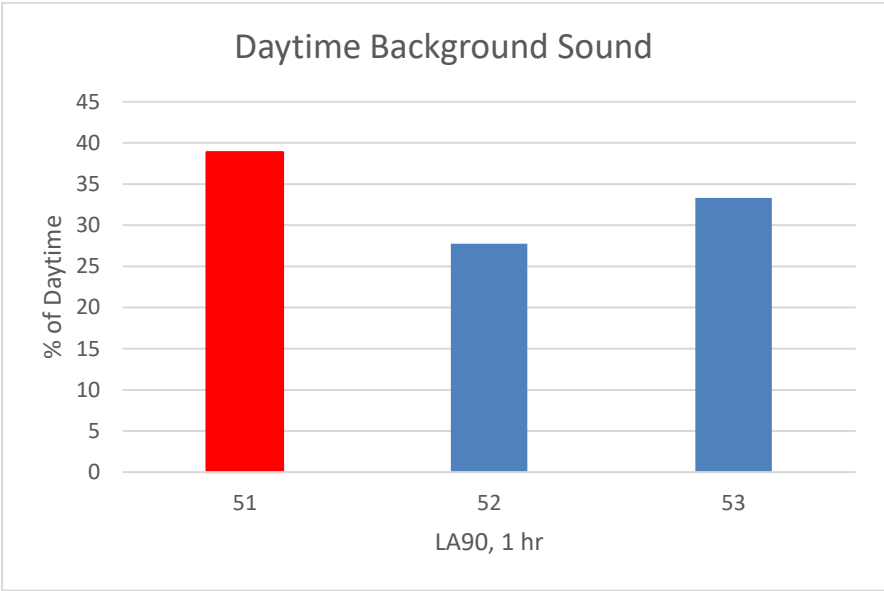


Figure 7: Analysis of daytime background levels, LA90, 1hr at Position 2 (shielded from Oxford Place)

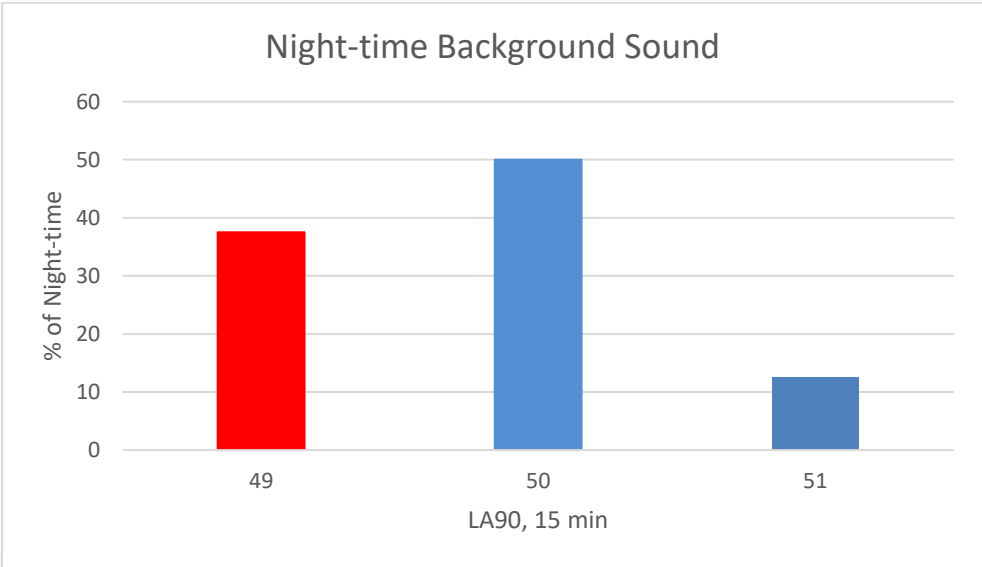


Figure 8: Analysis of night-time background levels, LA90, 15min at Position 2 (shielded from Oxford Place)

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 checked by an appropriately qualified and experienced acoustic consultant.

