19 Frederick Street, South Shields

Noise impact assessment

13285.1001-A

16th March 2026

Revision A

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1 Summary

1.1 A noise impact assessment has been undertaken in support of the proposed change of use at 19 Frederick Street, South Shields, where the attic level of the existing building is proposed to be converted to a Pilates and Yoga fitness studio.

1.2 The Local Planning Authority requested that a noise assessment be undertaken due to the proximity of nearby residential properties. The assessment has therefore considered the potential for noise generated by activities within the proposed studio to affect nearby receptors.

1.3 The assessment comprised two principal elements:

- A long-term environmental noise survey, undertaken between 27th February and 2nd March 2026, to characterise the existing acoustic environment at locations representative of the nearest potential residential receptors; and
- A noise break-out testing undertaken within the attic space using controlled test noise in order to determine the sound transmission characteristics of the building envelope and predict potential external noise levels at nearby receptors.

1.4 Analysis of the long-term survey data identified the quietest periods occurring within the proposed operating hours of the studio, representing the most sensitive conditions for assessing potential noise impact.

1.5 Break-out testing was undertaken using an internal pink-noise source operating significantly higher than would be expected during normal studio operation. The measured transmission has then been applied to a representative internal sound level derived from comparable gym environments, which is expected to be higher than the noise levels typically associated with low-impact Pilates and Yoga classes.

1.6 The assessment indicates that the predicted façade sound levels associated with studio operation would remain between 9 dB and 15 dB below the lowest measured background sound levels during the proposed operating hours at the nearest potential receptor locations.

1.7 It is also noted that the break-out testing was undertaken while the attic space remained unfinished, with exposed structural elements and openings within the roof structure. The proposed development includes the installation of dormer windows and completion of the attic envelope, which will improve the integrity of the building fabric and is expected to further increase sound insulation performance.

1.8 On this basis, noise break-out from the proposed studio would be expected to be masked by the prevailing ambient noise environment and therefore highly unlikely to give rise to adverse noise impact at nearby residential properties.

2 Introduction

2.1 A change of use is proposed at 19 Frederick Street, South Shields, to convert the attic level of the existing building from office accommodation to a Pilates and Yoga fitness studio. The proposed studio would comprise a single open-plan exercise space at attic level, accessed via the existing internal staircase. Figure 1 shows the location of the site and the nearest identified residential receptors.

2.2 The building currently contains a mix of commercial uses across the lower floors. The lower ground floor comprises a number of separate rooms and storage areas, the ground floor includes a shop unit and ancillary spaces, and the first and attic floors are currently arranged as offices. Under the proposals, the lower floors would be used for commercial purposes including barbering, sunbeds and beauty treatment rooms, with the attic level repurposed as the fitness studio.

2.3 A terrace had previously been considered as part of the proposals; however, this has been omitted and does not form part of the current scheme.

2.4 The planning application indicates proposed opening hours of 07:00–19:00 Monday to Saturday and 08:00–19:00 on Sundays and Bank Holidays, meaning the use would operate during daytime and early evening periods only.

2.5 The Local Planning Authority has requested that a Noise Impact Assessment be undertaken in support of the planning application due to the proximity of nearby residential properties.

2.6 Apex Acoustics has been commissioned to assess the potential noise impact associated with the proposed Pilates and Yoga studio on nearby residential properties.

2.7 The scope of our instruction includes:

- Measurement of the existing acoustic environment over an extended monitoring period at positions representative of the nearest potentially affected residential receptors;
- Noise break-out testing using controlled test noise within the proposed studio space to determine the sound insulation performance of the building envelope; and
- Prediction of potential external noise levels at nearby residential properties based on the measured transmission characteristics of the building.

2.8 The proposed use comprises low-impact Pilates and Yoga classes only. Activities typically associated with higher noise levels in conventional gyms, such as dropped weights, high-intensity training, or amplified music intended to create a high-energy environment, are not proposed.

2.9 The proposed studio is located at attic level and does not adjoin any residential premises. The only directly adjoining space is the commercial floor below, which is proposed to comprise of commercial units.

2.10 On this basis, the assessment focuses on potential noise break-out to external receptors. A conservative approach has been adopted whereby the nearest potential receptors are assumed to be located at first-floor level within neighbouring properties to the north and south of the site, despite there being no clear indication that residential units are present at these positions.

2.11 It is also understood that no external mechanical plant (such as air-conditioning condensers or extract equipment) is proposed as part of the development, and the previously considered terrace will not be used for studio activities.

2.12 The results of this assessment are used to determine whether the proposed development is likely to give rise to adverse noise impacts at nearby residential properties and whether any mitigation measures may be required.

Figure 1: Proposed site (red), measurement positions (green) and identified NSRs (yellow)

3 Existing building construction

3.1 The external walls of the building appear to comprise solid brick masonry construction. The attic level occupies the uppermost part of the structure beneath a pitched roof. The external façade and surrounding context are shown in Figure 2

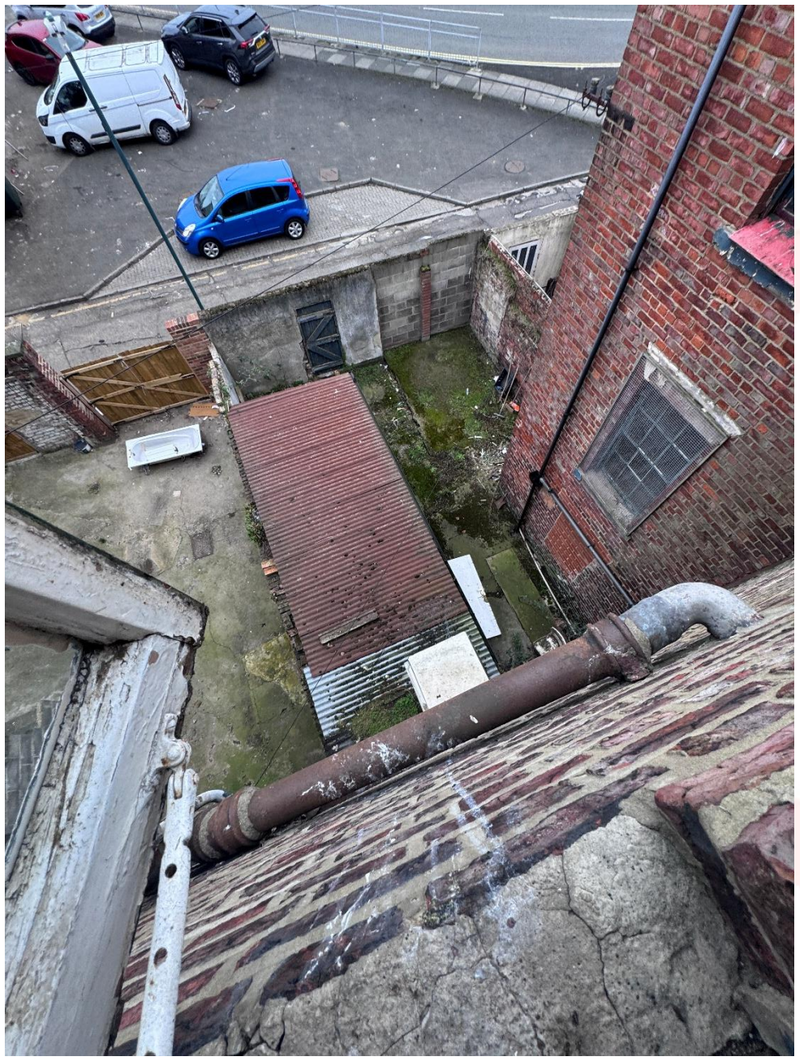

Figure 2: View of the rear elevation of the building and surrounding yard area.

3.2 The attic space itself is formed within the roof void and is defined by sloping ceilings following the roof rafters, with exposed timber structural members visible in several locations. Internal surfaces include a combination of plastered masonry and lightweight linings fixed to the roof structure.

3.3 During the inspection, several service penetrations, voids and areas of lightweight internal construction were observed within the attic space, including openings within the roof structure and gaps around structural members. These elements were noted as potential pathways for airborne sound transmission and were therefore considered during the break-out testing undertaken as part of this assessment.

3.4 At the time of the survey, the attic level was largely unfinished, with exposed structural elements and limited internal finishes present.

3.5 At the time of the survey, the attic level remained unfinished and contained several openings and areas of relatively lightweight construction within the roof structure. The noise break-out measurements undertaken therefore represent a conservative scenario, reflecting the existing condition of the space which is likely to contain more gaps and weaknesses than would be present once the studio fit-out is complete.

4 Existing acoustic environment

4.1 The site is located within a mixed-use town centre environment along Frederick Street, which comprises a retail high street characterised by commercial premises, pedestrian activity and local vehicle movements. The front (west-facing) elevation of the building directly overlooks Frederick Street and is therefore influenced by road traffic and activity associated with nearby shops and commercial units.

4.2 The rear (east-facing) elevation faces toward a service yard area and is influenced by road traffic associated with the nearby A194 Western Approach, which forms a significant transport corridor within the area. The existing acoustic environment around the site is therefore characterised by a combination of road traffic noise and general commercial activity typical of an urban town centre setting.

4.3 The equipment used is listed in Table 1.

Equipment	Model	Serial no.
Sound Level Meter	NTi XL2	A2A-05832-E0
Calibrator	Larson Davis CAL 200	9462
Sound Level Meter	NTi XL2	A2A-09585-E0
Calibrator	Larson Davis CAL 200	12573

Table 1: Equipment used

4.4 Both meters and calibrators 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.

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

4.6 The existing acoustic environment was measured from 14:46 hours on 27th February 2026 to 14:59 hours on 2nd March 2026, accounting for both weekday and weekend periods in order to capture a representative range of environmental noise conditions.

4.7 Unattended measurements were undertaken at Position 1 (P1) and Position 2 (P2), as shown in Figure 1.

4.8 The sound level meter at P1 was installed at approximately first-floor window height on the front (west-facing) façade of the building.

4.9 The sound level meter at P2 was installed at approximately second-floor window height on the rear (east-facing) façade of the building.

4.10 The microphones were positioned approximately 1 metre away from the façades using a window-mounted extension kit. Measurements taken at these positions are therefore considered representative of façade-level conditions.

4.11 The acoustic environment at P1 is influenced primarily by road traffic noise along Frederick Street, which runs directly in front of the site. Additional sound sources include activity associated with nearby commercial premises along the street, intermittent vehicle manoeuvres and parking movements, and general pedestrian activity typical of a mixed-use town centre location.

4.12 The acoustic environment at P2 is influenced primarily by road traffic associated with the nearby A194 Western Approach. Additional sound sources include activity associated with surrounding commercial premises and occasional vehicle movements within the rear yard areas.

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

4.14 **Weather conditions**

4.15 Weather conditions during the survey period included:

- Wind speed typically < 4 m/s
- Temperature between 3-17°C / Temperature of 10°C at the start of the survey and 13°C at the end of the survey.
- Light and intermittent precipitation, including occasional overnight drizzle

4.16 **Results**

4.17 A time history of the measured L_r is shown in Appendix A.

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

4.19 The proposed studio opening hours are 07:00–19:00 Monday to Saturday and 08:00–19:00 on Sundays. To identify the most sensitive conditions for the assessment, the survey data was reviewed for the open hours of operation across the full survey period (Friday to Monday).

4.20 For each day, the first operational hour and final operational hour were examined, and the lowest background noise level occurring during these periods was identified. These periods represent the quietest conditions during the proposed operating hours and therefore provide a conservative basis for the assessment. The specific periods from which these values were derived are presented in Table 2.

Position	Period	Range of residual $L_{Aeq,T}$ (dB)	$L_{A90,\ 15min}$ (dB)
P1	Daytime (07:00 – 23:00 hrs)	50 - 67	48
	Saturday 28th February (07:00–08:00 hrs)	54 - 67	44 *(quietest opening hour)*
	Saturday 28th February (18:00–19:00 hrs)	54 - 57	47 *(quietest closing hour)*
P2	Daytime (07:00 – 23:00 hrs)	57 – 70	57
	Sunday 1st March (08:00–09:00 hrs)	57 - 60	47 *(quietest opening hour)*
	Sunday 1st March (18:00–19:00 hrs)	62 - 63	58 *(quietest closing hour)*

Table 2: Summary of measured background and residual noise levels at Positions P1 and P2

5 Noise break-out measurements

5.1 Noise break-out measurements were undertaken from 15:00 hours on 2nd March 2026. Weather conditions at the time of testing were suitable for environmental noise measurements and are not considered to have materially influenced the recorded noise levels.

5.2 Break-out testing was undertaken within the attic level of the building, which is proposed to accommodate the Pilates and Yoga studio. The space was largely unfinished at the time of testing, with exposed structural elements and several openings and gaps present within the roof structure.

5.3 For the purposes of the measurements, broadband pink noise was generated within the attic space using two loudspeakers as shown in Figure 3. The sound source was operated at a level significantly above typical operational noise levels in order to simulate a conservative worst-case scenario.

Figure 3: Noise break-out measurements in progress

5.4 For the noise break-out measurements, all external doors and windows were kept closed, replicating the typical conditions during studio operation. This ensured that the measurements accurately reflected the sound levels that would be contained within the venue under normal operating circumstances.

5.5 Data was recorded in one-third octave band frequencies at one-second intervals throughout each measurement period.

5.6 Noise levels were measured internally within the attic space and externally at several locations around the building envelope. External measurements were undertaken using a microphone mounted on a pole outside the attic façade and at window positions representative of the nearest potential receptor locations to the north and south of the site. The microphone was positioned approximately 1 m from the façade in order to represent façade-level sound levels.

5.7 An overview of the measured internal and external noise levels obtained during the breakout testing are summarised in Table 3.

Position	Duration T (hh:mm:ss)	$L_{Aeq,T}$ dB(A)	Single-octave band centre frequency (Hz) A-weighted noise levels (dB)							
			63	125	250	500	1k	2k	4k	8k
Attic Studio – internal (speakers on)	0:01:01	**105**	71	84	93	100	100	97	97	79
Front façade – external @ 1 m from attic (speaker off) background	00:01:16	**54**	35	39	43	48	51	45	40	32
Front façade – external @ 1 m from NSR 2 nearest window (speaker on)	00:01:01	**60**	38	45	52	54	56	53	44	35
Front façade – external @ 1 m from NSR 1 nearest window (speaker on)	00:01:01	**63**	45	49	54	58	58	55	50	43
Rear façade – external @ 1 m from attic (speaker off) background	00:01:01	**57**	36	37	46	50	55	49	39	29
Rear façade – external @ 1 m from NSR 2 nearest window (speaker on)	00:01:00	**68**	38	53	57	62	64	59	54	37
Rear façade – external @ 1 m from NSR 1 nearest window (speaker on)	00:00:58	**63**	38	46	52	55	60	55	44	33

Table 3: Measured Noise Levels

5.8 During the pink-noise break-out tests, break-out noise was audible externally when positioned close to the building façade, confirming that sound transmission through the building envelope could be measured. The limited audibility observed appeared to be associated with gaps around internal doors and imperfect door seals rather than transmission through the external masonry envelope itself. However, the audibility reduced rapidly with increasing distance from the attic façade.

5.9 The external noise level during the testing period remained dominated by road traffic noise from Frederick Street at the front of the site and the A194 Western Approach to the rear. At positions further away from the façade, the pink-noise source was only intermittently perceptible during brief lulls in traffic and was otherwise masked by passing vehicles.

5.10 **Results**

5.11 Predicted façade sound levels at the nearest receptor locations during studio operation have been estimated using the measured internal-to-external level differences derived from the break-out testing at the most exposed elements of the building envelope.

5.12 The internal test source level of 105 dB(A) was set higher than would be expected during normal studio operation in order to establish the transmission performance of the building envelope under conservative conditions.

5.13 For the purposes of prediction, a representative internal sound level has been adopted from Apex Acoustics reference measurements undertaken at comparable gym facilities. As gym activity typically generates higher sound levels than low-impact Pilates and Yoga classes, this approach provides a conservative basis for the assessment.

5.14 Applying the measured façade level differences to this representative internal level provides an estimate of the likely façade sound levels at the nearest potential receptor locations. The results are summarised in Table 4.

Parameter	Front façade result	Rear façade result
Measured internal sound level during breakout test	105 dB(A)	
Measured façade sound level at NSR1 during breakout test	63 dB(A)	63 dB(A)
Measured façade sound level at NSR2 during breakout test	60 dB(A)	68 dB(A)
Measured background sound level at façade position (Speakers off)	54 dB(A)	57 dB(A)
Background-corrected façade sound level at NSR1	63 dB(A)	61 dB(A)
Background-corrected façade sound level at NSR2	59 dB(A)	67 dB(A)
Derived internal-to-façade level difference – NSR1	- 42 dB	- 44 dB
Derived internal-to-façade level difference – NSR2	- 46 dB	- 38 dB
Representative internal studio sound level	76 dB(A)	
Predicted façade sound level at NSR1 during operation	**34 dB(A)**	**32 dB(A)**

Parameter	Front façade result	Rear façade result
Predicted façade sound level at NSR2 during operation	**30 dB(A)**	**38 dB(A)**
Lowest measured background sound level during proposed studio operating hours	44 $L_{A90,\ 15min}$ (dB)	47 $L_{A90,\ 15min}$ (dB)
Difference between predicted level and background sound level – NSR1	- 10	- 15
Difference between predicted level and background sound level – NSR2	- 14	- 9

Table 4: Summary of measured breakout levels and predicted façade levels at nearby receptors

5.15 Table 4 shows that the predicted façade sound levels associated with studio operation are below the measured background sound levels at the nearest potential receptor locations. Predicted levels are between 9 dB and 15 dB below the lowest measured background levels during the proposed operating hours, indicating that breakout from the studio would be masked by the prevailing ambient noise levels, and therefore unlikely to be perceptible.

5.16 The break-out measurements were undertaken while the attic space remained unfinished and prior to the proposed refurbishment works being undertaken. At the time of testing, the space contained exposed structural elements together with several openings and gaps within the roof structure and internal linings. The measurements therefore represent a conservative scenario reflecting the existing condition of the building envelope.

5.17 As part of the proposed development, the attic level will be refurbished and fitted with dormer windows and completed internal finishes, which will improve the overall integrity of the building envelope. These works would be expected to increase the sound insulation of the structure and further reduce the potential for noise break-out.

6 Conclusion

6.1 The noise impact assessment indicates that noise generated by activities within the proposed Pilates and Yoga studio is unlikely to result in adverse noise impact at nearby residential receptors.

6.2 Predicted façade sound levels associated with studio operation are shown to remain below the lowest measured background sound levels during the proposed operating hours, indicating that breakout noise would be masked by the prevailing ambient noise environment.

6.3 The assessment has been undertaken on a conservative basis, using an internal test source level significantly higher than expected during normal operation and applying reference noise levels derived from gym environments, which are likely to exceed those associated with low-impact Pilates and yoga classes. In addition, testing was undertaken while the attic space remained unfinished; completion of the proposed refurbishment works is expected to further improve the sound insulation performance of the building envelope.

6.4 On this basis, the proposed development is unlikely to give rise to unacceptable noise effects on nearby residential amenity.

Appendix A Residual and background sound levels

6.5 Residual sound level time history, $L_{Aeq, 5min}$

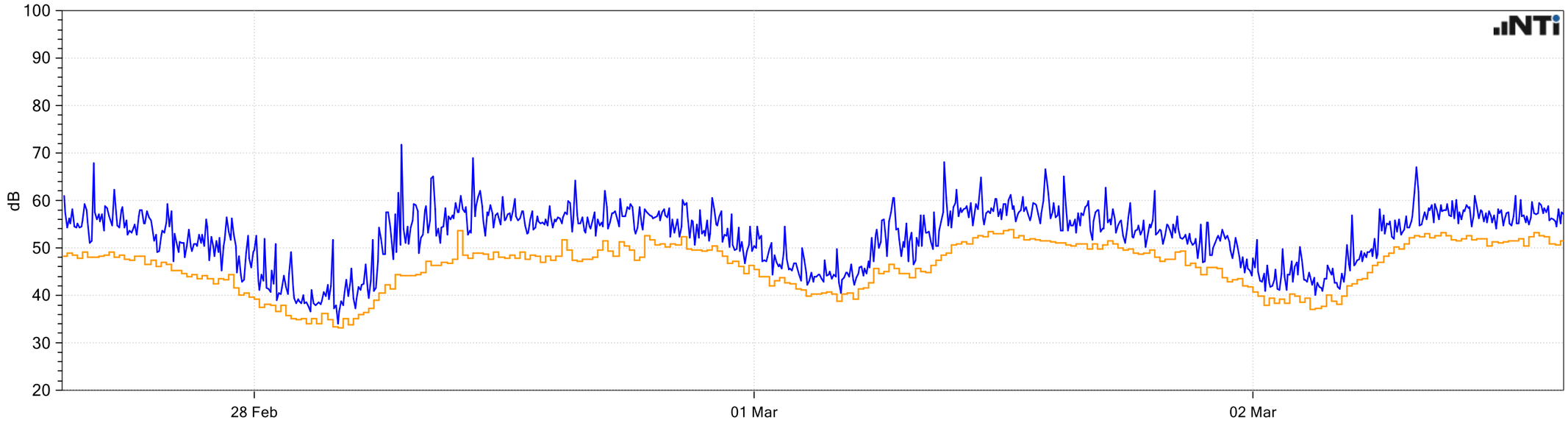

Figure 4: P1 residual sound level time history, $L_{Aeq, 5min}$ (dB) shown as blue and $L_{A90, 15 min}$ (dB) shown as orange

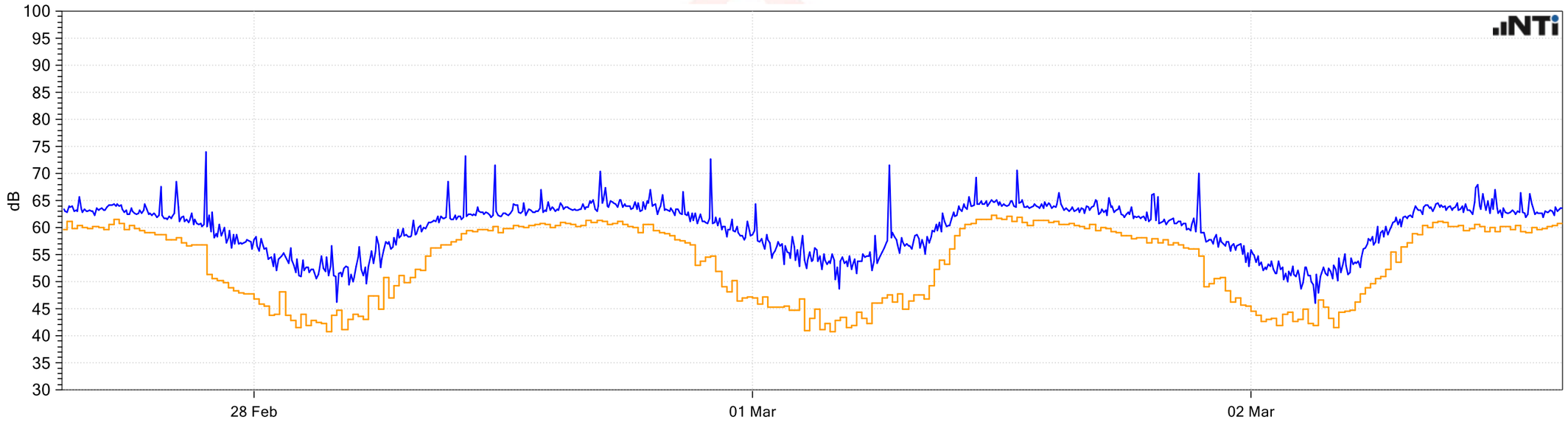

Figure 5: P2 residual sound level time history, $L_{Aeq, 5min}$ (dB) shown as blue and $L_{A90, 15 min}$ (dB) shown as orange

6.6 Background sound level data, $L_{A90,\ 15min}$

A.1 Analysis to determine the typical background sound level representative of the daytime period during operating hours is shown in Figure 6 and Figure 7 respectively.

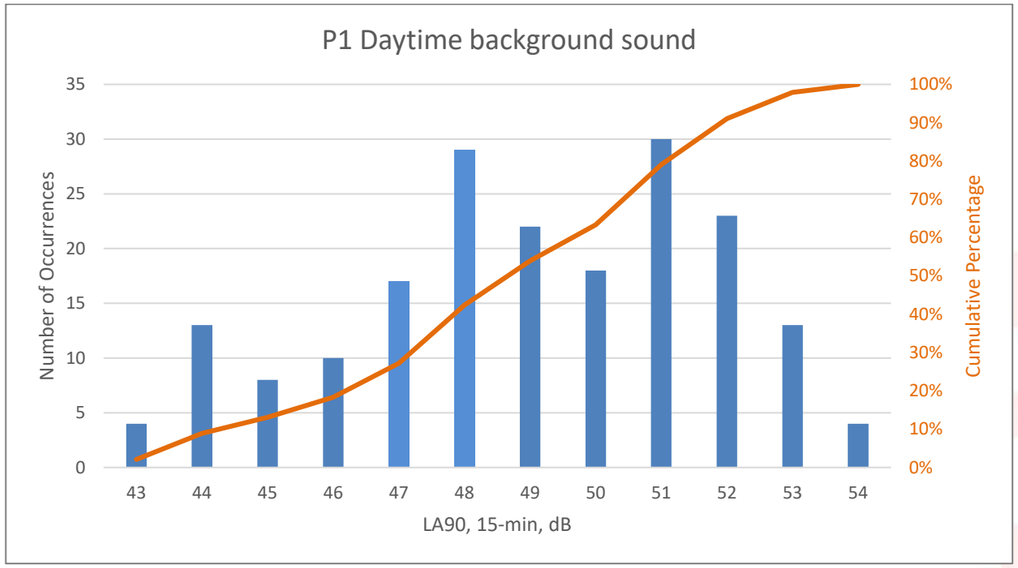

Figure 6: P1 analysis of daytime background levels, $L_{A90,\ 15min}$

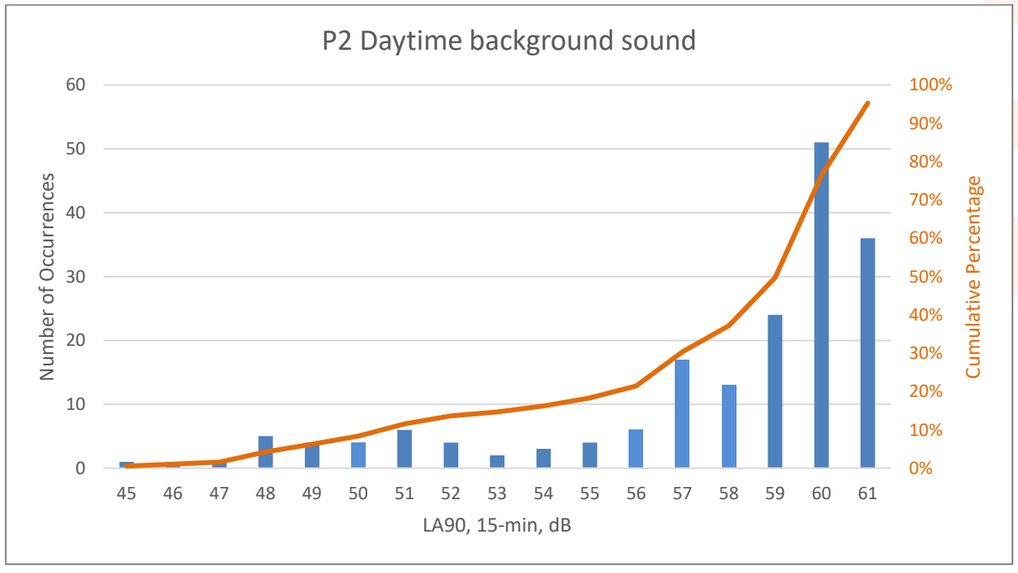

Figure 7: P2 analysis of daytime background levels, $L_{A90,\ 15min}$

Appendix B Professional qualifications and competence

B.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.

B.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

B.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.

B.4 This report has been checked by an appropriately qualified and experienced acoustic consultant.