Huddersfield Market

Noise Impact Assessment

12671.1001

21st August 2025

Revision B

ANC ACOUSTICS & NOISE CONSULTANTS

Institute of Acoustics sponsoring organisation

Huddersfield Market

Noise Impact Assessment

12671.1001

Revision	Description	Issued by	Date
A	First issue	LP	28th July 25
B	Report updated based on new MEP strategy	LP	21st Aug 25

Prepared for

Turner & Townsend Project Management Limited

Low Hall, Calverley Lane
Horsforth, Leeds LS18 4GH, United Kingdom

Prepared by

Redacted

EUR-ING Luis Pereira MSc MIOA

Checked by

Redacted

Adam Cooke MIOA

Apex Acoustics Limited Reg. in England no. 05656507
Design Works, William Street, Gateshead, NE10 0JP

T 0191 620 0750
E info@apexacoustics.co.uk
W www.apexacoustics.co.uk

Constructionline Gold Member

1 Contents

2 Summary

2.1 This report has been prepared in support of a Planning Application for the regeneration of Huddersfield Open Market Hall, a Grade II* listed structure dating from 1887.

2.2 The assessment evaluates potential noise impacts from fixed mechanical plant, amplified events, and traffic movements associated with the proposed redevelopment to ensure compliance with local and national policy requirements.

2.3 Kirklees Council's Environmental Health team has been consulted, and the assessment methodology using BS 4142 for plant noise, DMRB criteria for traffic noise, and the Code of Practice for Environmental Noise Control at Concerts for event noise has been agreed.

2.4 Background sound levels have been measured over 24 hours at two positions representative of the identified noise-sensitive receptors, with daytime levels of 61 dB L_{Aeq} and 57 dB L_{Aeq}, and representative background levels (L_{A90}) of 49/39 dB (day/night) at NSR 1 and 46/34 dB (day/night) at NSR 2.

2.5 Plant details have been provided by the mechanical engineers and include kitchen extract fans, air handling units, MVHR systems, and air source heat pumps, totalling 20 individual plant items. Noise emission from the proposed plant has been modelled using proprietary software CadnaA applying ISO 9613-2 methodology for outdoor sound propagation.

2.6 The assessment demonstrates that, the plant noise requirements for low impacts are achieved at both identified noise-sensitive receptors, based on BS 4142. It is considered that kitchen extract systems will include 600 mm acoustic attenuators as a minimum.

2.7 Event noise assessment for the proposed multifunctional space, hosting between 4 and 12 amplified events per year, shows Music Noise Levels of 61 dB and 51 dB at NSR 1 and NSR 2, respectively, both below the 64 dB and 61 dB limits established by the Code of Practice for Environmental Noise Control at Concerts.

2.8 Due to the age and permeability of the Grade II* cast-iron and glazed hall structure, verification measurements during the first few events are recommended to confirm predicted noise levels and determine if internal reverberant noise levels require limitation at certain frequencies.

2.9 Traffic noise assessment demonstrates negligible impacts, with maximum increases of 1.1 dB on Fridays falling within DMRB negligible to minor magnitude classifications, well below thresholds for significant environmental effects.

2.10 Considering the context of the existing acoustic environment, the assessment results indicate the likelihood of low impact at both receptors following implementation of the proposed noise control measures. This impact is considered to be below LOAEL in alignment with NPSE aims.

3 Introduction

3.1 Apex Acoustics (Apex) has been commissioned to undertake a noise survey and produce a Noise Impact Assessment for the proposed regeneration of Huddersfield Open Market Hall (HOMH).

3.2 The project aims to restore and enhance the historic market hall, characterised by its decorative cast iron frame, large roof spans, and glazed exterior walls, while improving its surroundings to create a vibrant focal point in Huddersfield town centre. The redevelopment will strengthen the market's offering by introducing an improved food experience and encouraging increased footfall throughout the day and into the evening, supporting surrounding businesses.

3.3 This report assesses the potential of noise impacts arising from all aspects of the proposed development, including fixed mechanical plant, noise from music and events which may take place within the Market main building, and vehicle movements, to ensure the amenity of nearby sensitive receptors is protected.

3.4 The scope of our appointment includes the following:

- Measure the existing noise environment over 24 hours at nearby sensitive receptors that may be affected by the proposed development;
- Noise modelling based on the proposed layout to assess noise impacts from all relevant sources;
- Provide guidance and mitigation measures to minimise the risk of adverse noise effects on nearby receptors, in accordance with local and national policy requirements.

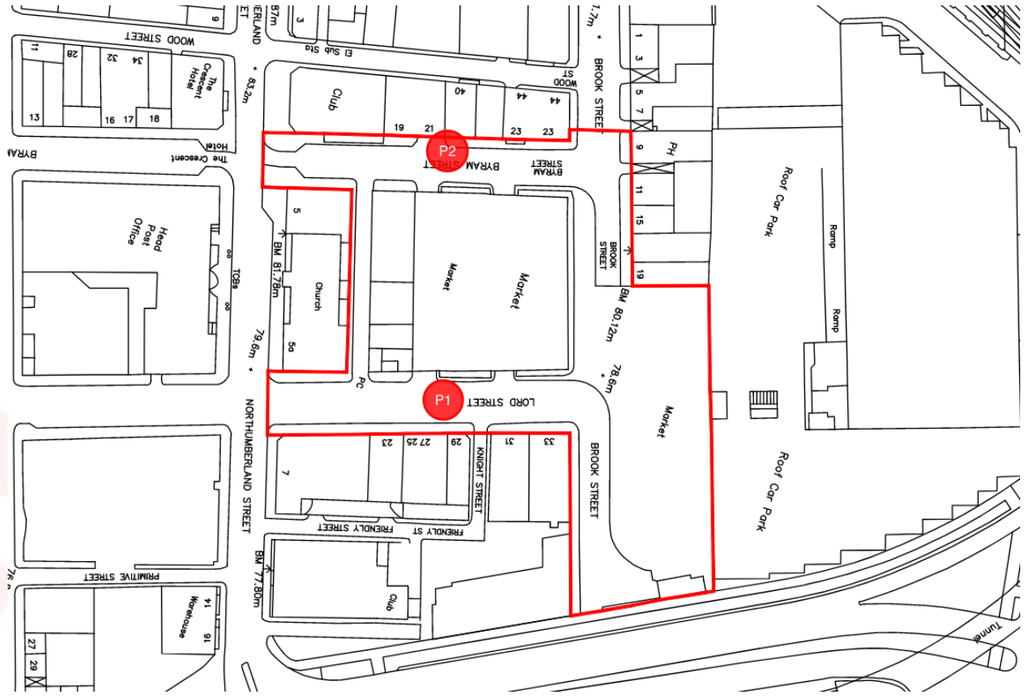


Figure 1: Proposed site, measurement position and identified NSRs

4 Planning policy and noise criteria

4.1 National Planning Policy Framework (NPPF)

4.2 The National Planning Policy Framework (NPPF), Reference 2, 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 187, 198 and 200 of the NPPF states the following:

4.3 Paragraph 187:

"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 198:

"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[65 [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 200:

"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 3, 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 Kirklees Council Noise Related Planning Policies

The proposed redevelopment of Huddersfield Market must align with noise-related policies from the Kirklees Local Plan (adopted 27 February 2019), Reference 4, to safeguard the amenity of nearby sensitive receptors and ensure compliance with local planning requirements. The relevant policies, quoted directly from the Kirklees Local Plan, are presented below:

4.11 <u>Policy LP23 Pollution control</u>

- "Development proposals must not give rise to, or be adversely affected by, unacceptable levels of pollution which cannot be satisfactorily mitigated within the development. The council will take the following into account:

  a. the polluting effects of a development in terms of air, land, water, noise, vibration, light and heat on the health, safety, natural environment and general amenity of the surrounding area;

  b. the impact of the existing background environmental quality in the vicinity of a proposed development and the cumulative impacts of the proposal in combination with other developments with permission;

c. the need to protect and improve environmental quality particularly in relation to sensitive receptors such as residential areas, schools, hospitals, areas of nature conservation value and the historic environment;

d. the viability of development where remediation is needed to ensure the development can proceed safely; and

e. any mitigation measures proposed as part of the development to reduce any adverse impacts.

4.12 These policies are directly relevant to the Huddersfield Market redevelopment, as the project involves potential noise from vehicle movements, fixed mechanical plant, and market events, all of which must be assessed and managed to prevent adverse impacts on nearby receptors.

4.13 **Local Authority consultation**

4.14 The proposed redevelopment of Huddersfield Market has undergone consultation with Kirklees Council's Environmental Health (Pollution & Noise Control) team, as outlined in the pre-application response (Ref: WK202432037, dated 09 October 2024) and subsequent correspondence.

4.15 The council initially raised concerns regarding noise from fixed mechanical plant, music noise during events and road traffic increase, which could affect nearby noise-sensitive receptors such as residential properties.

4.16 In response to these requirements, Apex Acoustics sought clarification from the EHO, Mohammed Nasim, via email on 14th of April 2025. Apex proposed assessing plant and equipment noise using BS 4142:2014+A1:2019, vehicle noise via the Design Manual for Roads and Bridges (DMRB) criteria, and music or event-related noise using the Code of Practice for Environmental Noise Control at Concerts.

4.17 The EHO confirmed agreement with the proposed methodology.

4.18 **Planning Practice Guidance – Noise**

4.19 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

4.20 **BS 4142**

4.21 The terminology used in BS 4142, Reference 5, to describe the various levels of potential adverse impact is respect to the PPG-N noise hierarchy are summarised Appendix A.

4.22 **Design Manual for Roads and Bridges (DMRB): LA 111, 'Noise and vibration'**

4.23 This document sets out procedures for undertaking the environmental assessment of new road schemes, including the assessment of noise impacts from road traffic. In undertaking a DMRB assessment, the calculation of traffic noise levels uses the methodology contained within the CRTN document as described below.

4.24 Although the DMRB strictly applies to new road schemes, the principles can also be applied to the assessment of noise from road traffic in general.

4.25 The significance of effect depends upon a number of factors, including the magnitude of change, the sensitivity of the receptor, the absolute noise level and the acoustic context.

4.26 The DMRB categorises operational road traffic noise into the magnitude of change bands. The short and long-term classification scales are provided in Table 1 and Table 2.

Short term magnitude	Short-term noise change (dB $L_{A10,18h}$ or L_{night})
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	Less than 1.0

Table 1: DMRB Classification of the magnitude of noise change (short-term)

Long term magnitude	Long-term noise change (dB $L_{A10,18h}$ or L_{night})
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	Less than 3.0

Table 2: DMRB Classification of the magnitude of noise change (long term)

4.27 **Code of Practice for Environmental Noise Control at Concerts**

4.28 This national Code of Practice (CoP) was published by the Noise Council in 1995 and provides guidance on the control of noise from concerts or events where amplified music is a component to reduce the risk of complaints from occupants of nearby noise-sensitive premises.

4.29 The CoP provides measurement, assessment and rating methods for outdoor music noise, using noise level, duration/frequency of exposure, comparison with ambient conditions and an absolute upper level. Local authorities often cite it during the planning and execution of outdoor entertainment events.

4.30 The CoP advises on appropriate music noise levels (MNLs), which are shown in Table 3 below.

Concert days per calendar year, per venue	Venue category	Guideline
1 to 3	Urban stadia or arenas	The MNL should not exceed 75 dBA over a 15-minute period
1 to 3	Other urban and rural venues	The MNL should not exceed 65 dBA over a 15-minute period
4 to 12	All venues	The MNL should not exceed the background noise level by more than 15 dBA over a 15-minute period

Table 3: Guideline music noise levels from concerts

4.31 The above limits are applicable at 1m from the façade of any noise-sensitive premises for events held between the hours of 09:00 and 23:00. The CoP suggests that music noise between the hours of 23:00 and 09:00 should not be audible within noise-sensitive premises with windows open in a typical manner for ventilation.

4.32 The guidance further recommends that for indoor venues used for up to about 30 events per year, the MNL should not exceed the background noise level by 5 dBA over a 15-minute period and should finish no later than 23:00 hrs.

4.33 One of the particular issues that the CoP introduces is the fact that its criteria do not correlate with the principles introduced by the Noise Policy Statement for England (NPSE), and as such, a classification in terms of NOEL, LOAEL and SOAEL is not apparent.

4.34 For this assessment, it is proposed that the limits introduced by the CoP are considered to be consistent with achieving a LOAEL, and that exceedance would tend towards SOAEL.

5 Existing acoustic environment

5.1 Measurements

5.2 A 24-hour baseline noise survey was undertaken on the 20th and 21st of May 2025 to characterise the prevailing acoustic climate at locations representative of the nearest noise-sensitive receptors (NSR 1 – residential dwellings, and NSR 2 – student accommodation). Measurements followed the procedures set out in BS 7445 (Reference 8).

5.3 Two monitoring positions (P1 and P2), shown in Figure 2, were selected to capture noise ingress at the receptors. Microphones were mounted on existing lamp posts at 3.5 m above ground and fitted with standard windshields, in free-field conditions.

5.4 All measurements were made with Class 1 instrumentation (see Table 4). Sound level meters and field calibrators held current, traceable calibration certificates. Field calibrations confirmed negligible instrument drift.

5.5 Throughout the survey, average wind speeds were < 5 m s^{-1}, temperatures varied between 4 °C and 7 °C, and no significant rainfall occurred.

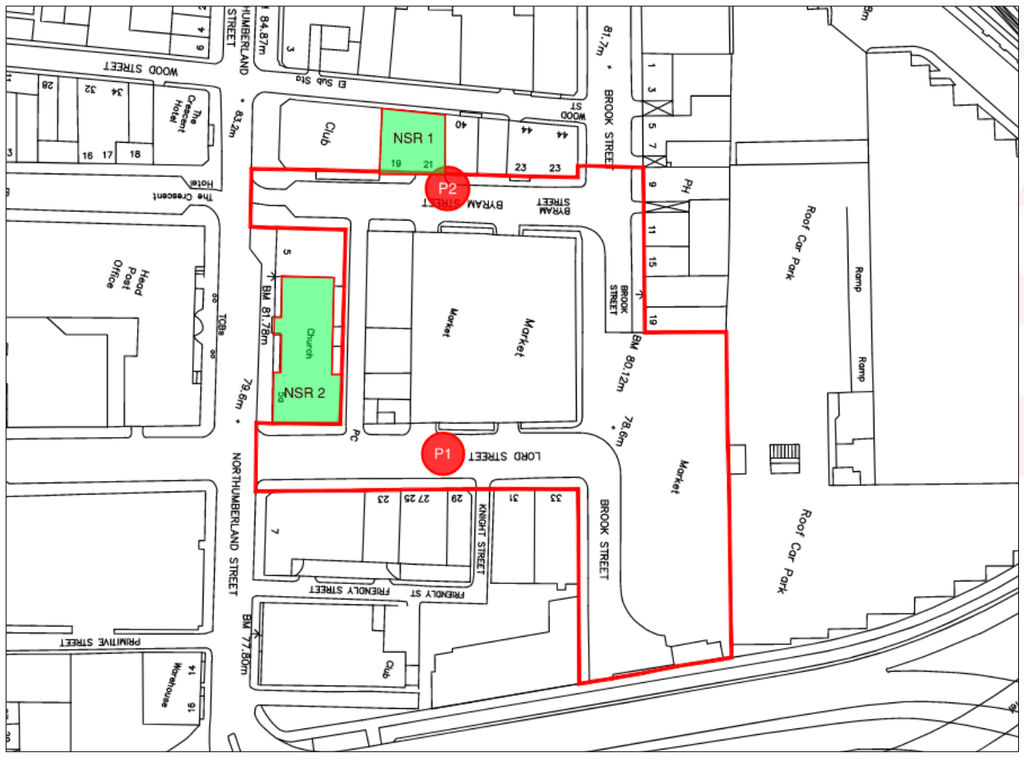


Figure 2: Noise measurement positions (P1 and P2)

Equipment	Model	Serial no.
Sound Level Meter	NTi XL2	A2A-12269-E0
Calibrator	Larson Davis CAL 200	13404
Sound Level Meter	NTi XL2	A2A-14205-E0
Calibrator	Larson Davis CAL 200	15308

Table 4: Equipment used

5.6 Noise sources

5.7 Site observations made during the survey indicate that the acoustic environment around the Proposed Development is as follows:

- Position 1 – Located at the main loading/unloading area and car park access. Daytime sound levels are driven mainly by road-traffic movements, engine idling and the handling of goods. The location becomes markedly quieter once market trading ceases and servicing activity subsides.
- Position 2 – Adjacent to the market entrance. While the market is operating, stall-holders set up, customer footfall and general street chatter dominate the acoustic environment. When the market is closed and shutters are down, overall sound levels drop significantly.

5.8 Results

5.9 A summary of the measured noise levels at each position is presented in Table 5. Time history charts for each position are included in Appendix B.

5.10 The statistical approach presented in BS 4142 and the ANC BS 4142:2014+A1:2019 Technical Note, Reference 9, has been used to determine representative background noise levels. Histogram charts showing the spread of the background noise levels over the measurement period are shown in Appendix C.

Measurement position	Period	dB $L_{Aeq,T}$	Representative dB L_{A90}
P1	Day	61	49
	Night	50	39
P2	Day	57	46
	Night	50	34

Table 5: Measured noise levels (Positions P1 and P2)

6 Plant Noise Impacts

6.1 Overview

6.2 This section assesses the potential noise impacts from fixed mechanical plant associated with the proposed Huddersfield Open Market development. The assessment evaluates noise emissions from all proposed plant items and predicts their cumulative impact at identified noise-sensitive receptors (NSRs). The analysis ensures compliance with established noise criteria and identifies any necessary mitigation measures.

6.3 Proposed Mechanical Plant

6.4 The assessment is based on the proposed plant, which is detailed in Table 6. Plant locations have been taken directly from the mechanical engineering drawings, Reference 11. Sound power levels for all plant items have been obtained from manufacturer specifications (Table 7).

6.5 It is considered that kitchen extract systems will include 600 mm acoustic attenuators as a minimum.

Plant	Manufacturer	Model	No. proposed
Extract fan (kitchen main)	NFAN	Powerbox 3 67-500-3	5
Extract fan (hot food outlets)	NFAN	Powerbox 3 67-450-3	5
AHU (kitchen supply)	Nuaire	Ecosmart boxer size 4	1
MVHR (Annex facilities)	Mitsubishi	LGH-100RVS-E	2
MVHR (Annex facilities)	Mitsubishi	LGH-80RVS-E	2
ASHP (Old WC block)	Mitsubishi	PUMY-P125VKM5	1
ASHP (Annex facilities)	Mitsubishi	PUZ-WZ50VAA(-BS)	3
ASHP (Bar/Café areas) *indicative	Mitsubishi	PUZ-ZM140VKA2	2

Table 6: Proposed plant

Plant	Data type	Position	dB(A)	Single-octave band centre frequency (Hz) Linear noise levels (dB)						
				63	125	250	500	1k	2k	4k
Powerbox 3 67-500-3	L_w	Inlet	80	80	87	77	77	69	74	70
		Outlet	80	85	84	74	75	72	74	72
		Breakout	59	65	70	65	52	48	43	41
Powerbox 3 67-450-3		Inlet	76	77	84	74	71	65	70	66
		Outlet	76	78	78	71	71	69	68	68
		Breakout	59	58	65	61	54	56	44	41
Ecosmart boxer size 4		Inlet	-	-	87	84	85	79	76	70
		Outlet	-	-	90	85	84	78	74	69
LGH-80RVS-E		Inlet	45	-	53	48	43	38	33	28
		Outlet	54	-	59	55	53	48	45	40
LGH-100RVS-E		Inlet	42	-	48	44	42	35	30	24
		Outlet	51	-	56	52	50	45	42	36
PUMY-P125VKM5		Breakout	70	-	-	-	-	-	-	-
PUZ-WZ50VAA(-BS)		Breakout	56	-	-	-	-	-	-	-
PUZ-ZM140VKA2		Breakout	70	-	-	-	-	-	-	-

Table 7: Manufacturers' noise levels

6.6 Assessment Methodology

6.7 Noise impact calculations have been carried out using CadnaA software, which applies ISO 9613-2, Reference 15, methodology for outdoor sound propagation. This internationally recognised standard provides reliable predictions for environmental noise under typical atmospheric conditions.

6.8 The modelling parameters and data sources are described in Table 8.

6.9 Each plant item has been modelled as a point source in CadnaA, with sound power levels assigned based on manufacturer data.

6.10 For ducted plant items, acoustic calculations follow CIBSE Guide B5, Reference 10, methodologies and account for:

- Duct length and configuration losses
- Elbow and directional losses
- End reflection losses
- In-duct attenuator performance

6.11 The assessment calculates both individual plant contributions and cumulative noise levels from all plant items operating simultaneously.

Parameter	Source	Details
Model dimensions	Google Earth	British Transverse Mercator coordinates
Site location and layout	Google Earth	Site coordinates and building layout from architectural drawings
Topography	Site observations and Google Street View	Modelled with no changes in topography
Building heights	Site observations and Google Street View	Estimated from Google Earth altitude function and street view imagery
Building and barrier absorption coefficient	ISO 9613-2	0.21 to represent a reflection loss of 1 dB
G, Ground factor	ISO 9613-2	Hard ground, G = 0; Porous ground, G = 1 (locally on model)
Max. order of reflections	Apex Acoustics	Three

Table 8: Modelling parameters and assumptions

6.12 **Operation times**

6.13 According to the information provided, it is understood that all of the proposed plant items will be working simultaneously during the daytime. Air source heat pumps (for heating), extract fans and kitchen AHU will be switched off during nighttime (from 11 pm to 7 am).

6.14 **BS 4142 Assessment Results**

6.15 The calculated noise contours extracted from CadnaA, showing the cumulative noise emissions from all proposed plant items, at each identified NSR, are presented in Figure 3 and Figure 4.

6.16 Based on these results, Table 9 summarises the predicted Rating Levels ($L_{Ar,Tr}$) for both daytime and night time assessment periods.

6.17 The Rating Levels fall below the background sound levels at NSR 1 by 6-13 dB, indicating low impact in accordance with BS 4142 guidance. At NSR 2, the Rating Level is calculated to be 7 dB below the background noise during the day and is equal to the background noise during the night, indicating low impacts.

6.18 These results demonstrate that with current proposals, the required criteria is achieved.

Parameter	NSR 1	NSR 2	Relevant Clause	Commentary
Assessment Period	Day / Night	Day / Night	—	—
Background Level (L_{A90})	49 / 39 dB	46 / 34 dB	8.1.2 / 8.1.4	Based on statistical analysis of long-term monitoring data (Appendix C)
Specific Sound Level (L_s)	40 / 23 dB	36 / 31 dB	7.2 / 7.3.6	Calculated values with proposed mitigation in place
Acoustic Feature Correction	3 dB	3 dB	9.2 / 9.3	Intermittent, non-tonal or impulsive noise features
Rating Level ($L_{Ar,Tr}$)	43 / 26 dB	39 / 34 dB	—	L_s + 3 dB feature correction
Excess of $L_{Ar,Tr}$ over background sound level	-6 / -13 dB	-7 / 0 dB	11	Difference between Rating Level and background
Impact Significance	Low	Low	—	According to BS 4142 initial estimate and contextual considerations

Table 9: BS 4142 assessment results with proposed mitigation measures

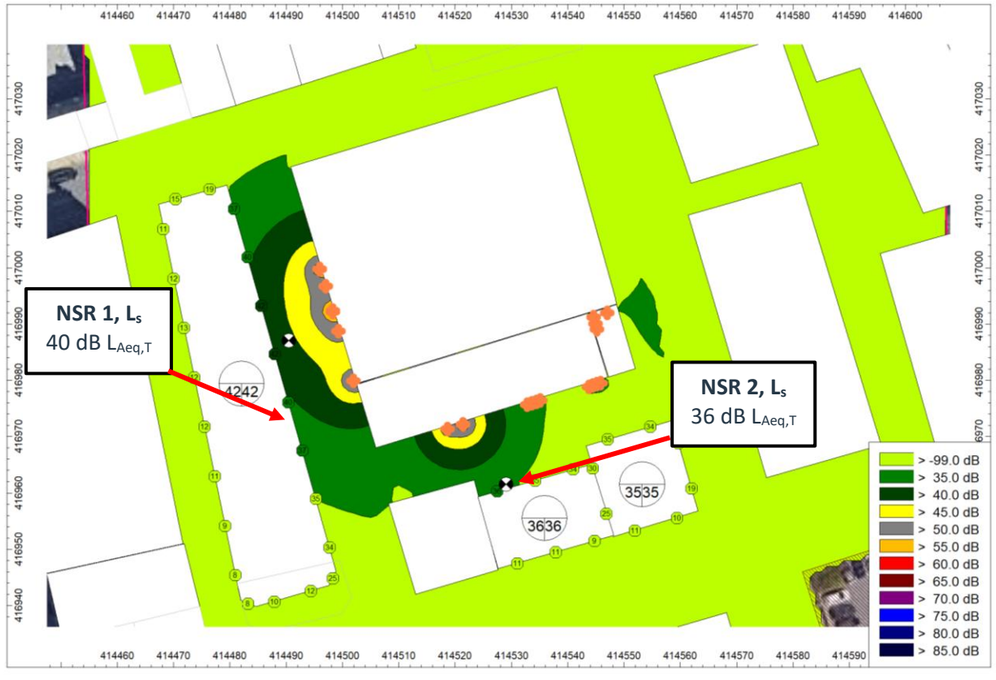


Figure 3: Sound contours at 3 m, showing the daytime calculated specific plant sound level, $L_{Aeq\ 1\ hr}$ (with mitigation)

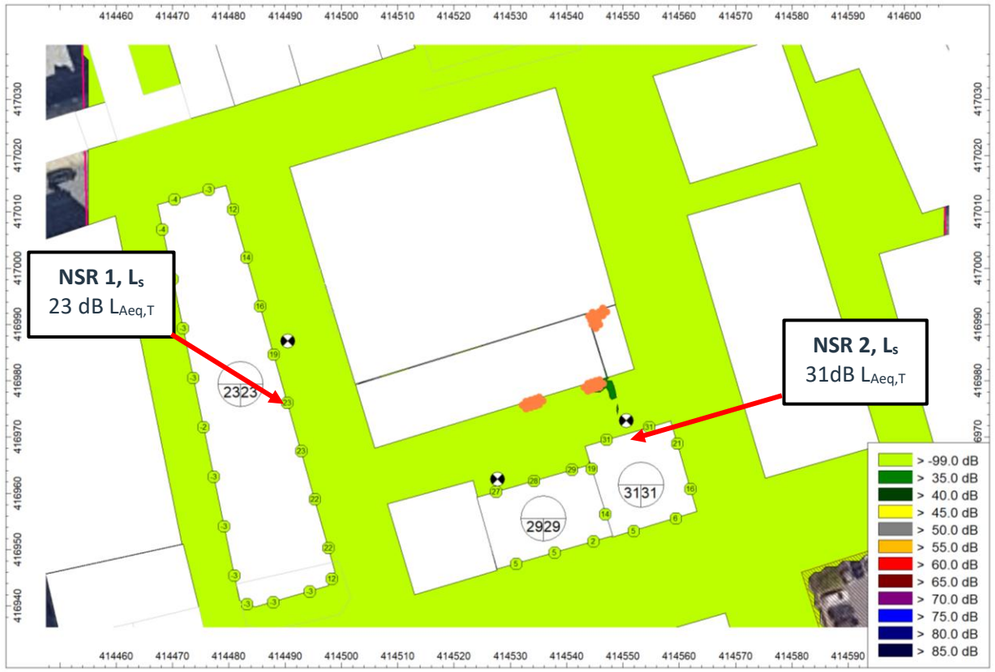


Figure 4: Sound contours at 3 m, showing the night time calculated specific plant sound level, $L_{Aeq\ 15\ min}$ (with mitigation)

7 Noise from Events at Huddersfield Open Market

7.1 The Huddersfield Open Market Hall will be used as a multifunctional space hosting events with a stage and an audience area.

7.2 According to the information provided by the architect and the client, between 4 and 12 amplified events are expected to take place at the market and may include events such as Irish Festivals, Caribbean Festivals, and Pride, typically finishing by 10 pm and never operating past 11 pm. Based on the criteria in Section 0 the MNL should therefore not exceed the background noise level by more than 15 dBA over a 15-minute period.

7.3 An in-house PA system will be installed. Although the PA characteristics (array type, sub configuration, processing) will partially determine reverberant noise levels (due to the market being a large volume), for calculation purposes, it is considered that reverberant noise levels are even throughout the space.

7.4 Propagation has been modelled using CadnaA for breakout to external receptors. Based on information provided by the architect, the building envelope consists of a mixture of elements, including standard double glazing to the external walls and single glazing to the roof. Although other components, such as opaque panels and roof slats provide higher acoustic resistance, for the purposes of a simplified and conservative assessment, the glazing elements — particularly the double-glazed walls and single-glazed roof — have been treated as the dominant transmission paths. Breakout calculations have therefore primarily considered these elements. The acoustic performance of the glazing used in the CadnaA model is shown in Table 10 below.

Element	Parameter	Octave band centre frequency (Hz)							R_w dB
		63	125	250	500	1k	2k	4k	
4/16/4 glazing	dB R	22	23	20	32	41	45	39	35
6 mm glazing		21	22	25	30	33	31	35	32

Table 10: Typical double glazing acoustic resistance performance

7.5 The dominant variable during these events is the overall reverberant noise level. The typical noise level during music events stated in the Little Red Book of Acoustics for a Music Bar is used to determine noise breakout (see Table 11). In practice, the market hall noise levels might be lower due to its large volume; using these levels is considered to be a conservative approach.

Event type	Parameter	Octave band centre frequency (Hz)							Global dB(A)
		63	125	250	500	1k	2k	4k	
Music Bar	dB L_{eq}	110	110	100	100	95	90	85	101

Table 11: Typical spectral dB L_{eq} levels for a music bar (source: Little Red Book of Acoustics)

7.6 **Results**

7.7 A summary of the results extracted from the CadnaA model at the identified noise-sensitive receptors is provided in Table 12. Imagery extracted from the noise model is presented in Figure 5 and illustrates the predicted MNL at the identified NSRs.

7.8 The main observations are as follows:

- Based on the calculations carried out, the magnitude of impacts is expected to be minor. This translates to an NPSE classification below LOAEL at both NSRs.
- It is recommended that the in-house PA system point in a direction opposite to the NSRs, which, given the space's volume, is likely to reduce reverberant noise levels even further at the NSRs.
- The reverberation noise levels in Table 11 represent typical music bar conditions and may overestimate actual impacts. The large volume of the market hall is expected to drive lower noise levels, further reducing potential impacts during events.

Position	Music Noise Level Limit, dB (4 events/yr)	Predicted MNL, dB $L_{Aeq,15min}$	Exceedance (dB)	Magnitude of Impact	NPSE Classification
NSR 1	64	61	-3	Moderate	Below LOAEL
NSR 2	61	51	-10	Minor	NOEL to LOAEL

Table 12: Estimated MNLs at the identified NSRs

7.9 **Event Management / Access Control**

7.10 To manage crowd ingress/egress noise, it is recommended that public access during major events is restricted to the Lord Street and Brook Street entrances, with other doors reserved for loading, emergency egress or managed staff access.

7.11 This will prevent an increase in the predicted MNLs during events.

7.12 **Verification and Monitoring**

7.13 Owing to the age and permeability of the Grade II* cast-iron/glazed hall, internal-to-external transmission is difficult to predict accurately, so results should be verified during the first few events at the identified NSRs, to determine if internal reverberant noise levels in the Open Market Hall must be limited at the Front of House, for certain frequencies.

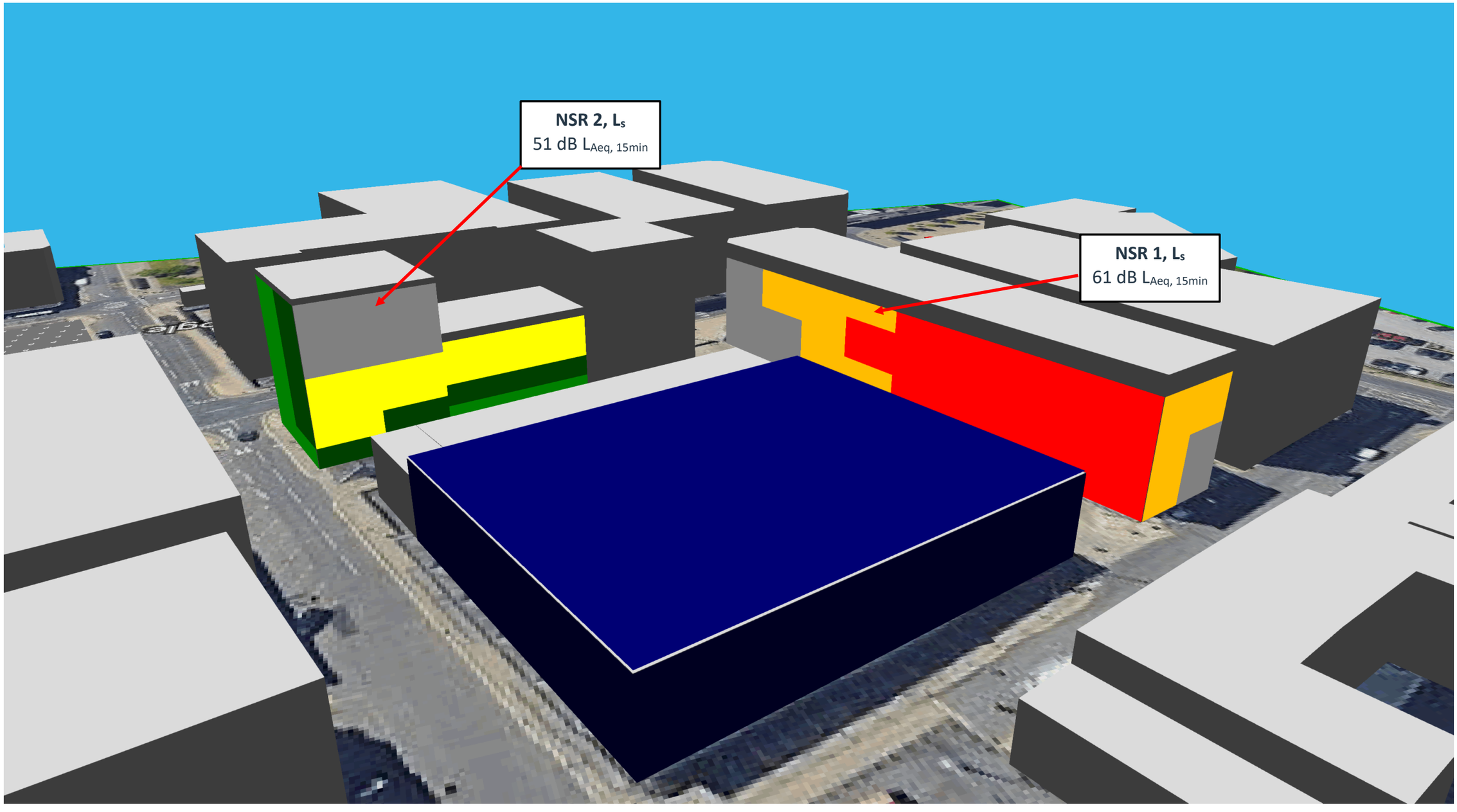


Figure 5: Building sound contours, showing the calculated MNLs, $L_{Aeq\ 15min}$

8 Traffic Noise Impact Assessment

8.1 Assessment Methodology

8.2 To determine the potential impacts from changes in road traffic noise associated with the proposed Huddersfield Open Market development, the principles in the Design Manual for Roads and Bridges (DMRB) have been applied. The DMRB sets out procedures for assessing noise impacts from road traffic and categorises operational road traffic noise into magnitude of change bands.

8.3 Traffic noise changes have been calculated using the logarithmic relationship:

$$\text{Noise Change (dB)} = 10 \times \log_{10}(\text{New Traffic Flow} / \text{Existing Traffic Flow})$$

8.4 Traffic Flow Analysis

8.5 Based on the transport consultant's analysis of parking provision changes, the proposed development will generate varying traffic flow changes throughout the week. The analysis shows significant variations in daily traffic changes, with Friday experiencing the peak increase of 289 vehicle movements per day. Weekend traffic changes are more moderate, with Saturday generating an additional 170 movements and Sunday 246 movements per day. Notably, Monday shows a net reduction of 171 vehicle movements compared to existing conditions.

8.6 Noise Impact Assessment

8.7 To assess the noise impact from these traffic changes, the logarithmic relationship for traffic noise has been applied. For a typical town centre street with existing traffic flows, it is considered that the existing traffic levels are of at least 1,000 vehicles per day (representing the mixed commercial/residential streets around the market). Therefore the noise changes can be calculated as follows:

- Friday (worst case scenario): $10 \times \log_{10}((1000 + 289)/1000) = 10 \times \log_{10}(1.289) = +1.1$ dB

8.8 According to DMRB criteria, all calculated increases fall within the Negligible magnitude of change category (less than 1.0 dB for most days, with Friday marginally exceeding at 1.1 dB but still within the Minor category threshold).

8.9 This is a very conservative assessment as current traffic levels are very likely to exceed 1,000 vehicles and therefore, in practice, the magnitude of change is likely to be negligible.

8.10 Several factors will reduce the actual noise impact below even these low calculated levels. Vehicle movements will be distributed across multiple access routes and throughout operating hours, reducing peak concentrations on any single street. Market operations are primarily daytime, avoiding sensitive evening and nighttime periods. Additionally, the market area is already established as a mixed-use commercial centre with existing traffic activity, meaning additional movements integrate into the existing urban soundscape rather than introducing a new noise source.

8.11 Assessment Conclusions

8.12 The traffic noise assessment demonstrates that the maximum predicted increase of 1.1 dB on Friday falls within the Negligible to Minor magnitude classifications according to DMRB criteria, placing impacts well below thresholds for significant environmental effects.

8.13 The proposed traffic changes are consistent with the existing mixed-use character of the town centre location, established commercial activity in the immediate area, daytime operational restrictions that avoid sensitive periods, and the distributed access strategy that prevents concentrated impacts on any single street.

8.14 Traffic noise impacts from the proposed Huddersfield Open Market development will be negligible in magnitude, well below levels that would cause adverse effects on residential amenity and appropriate for the established commercial character of the area. No specific traffic noise mitigation measures are required, though operational management, including restricted delivery hours and designated loading areas, will help minimise potential impacts on nearby residents even further.

9 Conclusion

9.1 Based on the current development proposals, , the calculated BS 4142 Rating Levels at NSR 1 are 6-13 dB below the measured background levels, and at NSR 2 are 7 dB below background (day) and equal to background (night), therefore complying with Local Authority requirements.

9.2 Event noise from the proposed multifunctional space will comply with established criteria, with predicted Maximum Noise Levels remaining 3-10 dB below the relevant limits at both noise-sensitive receptors.

9.3 Traffic noise impacts from the proposed development are negligible in magnitude, with maximum increases of 1.1 dB well below DMRB thresholds for significant effects. The distributed access strategy and daytime operational focus ensure integration with the existing mixed-use commercial character of the area.

9.4 Considering the context of the existing acoustic environment, the assessment results indicate the likelihood of low impact on the basis of implementing the proposed noise control measures. This impact is considered to be below the LOAEL in alignment with the NPPF and NPSE aims.

10 References

1 BS 4142 2014: A1+2019, Method for rating and assessing industrial and commercial sound.

2 National Planning Policy Framework, Ministry of Housing, Communities & Local Government, December 2024.

3 Noise Policy Statement for England, Department for Environment, Food and Rural Affairs, March 2010.

4 Kirklees Council, "Kirklees Local Plan: Strategy and Policies," Kirklees Council, Huddersfield, UK, Feb. 27, 2019. [Online]. Available: https://www.kirklees.gov.uk/beta/planning-policy/local-plan.aspx

5 British Standards Institution, "BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound," BSI Standards Limited, London, UK, 2019.

6 Highways England, "LA 111 Noise and vibration," Design Manual for Roads and Bridges (DMRB), Highways England, UK, Nov. 2020. [Online]. Available: https://www.standardsforhighways.co.uk/dmrb/

7 Noise Council, "Code of Practice for Environmental Noise Control at Concerts," Noise Council, London, UK, 1995.

8 British Standards Institution, "BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures," BSI Standards Limited, London, UK, 2003.

9 Association of Noise Consultants, "BS 4142:2014+A1:2019 Technical Note," Association of Noise Consultants, St. Albans, UK, 2020.

10 Chartered Institution of Building Services Engineers, "CIBSE Guide B5: Noise and Vibration Control for Building Services Systems," CIBSE, London, UK, 2018.

11 AECOM, "Huddersfield Market Mechanical Services Drawings: Ground Floor Cooling (HUD-ACM-MM-01-DR-ME-31010), Ventilation Layout (HUD-ACM-MM-01-DR-ME-34010), and Heating Layout (HUD-ACM-MM-01-DR-ME-51010)," AECOM, Leeds, UK, 2025. Kaizen, HOM-KCE-MM-01-DR-M-5601.

12 CadnaA environmental noise modelling software, version 2024, Datakustik GmbH.

13 International Organization for Standardization, "ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation," ISO, Geneva, Switzerland, 1996.

Appendix A Noise exposure hierarchy

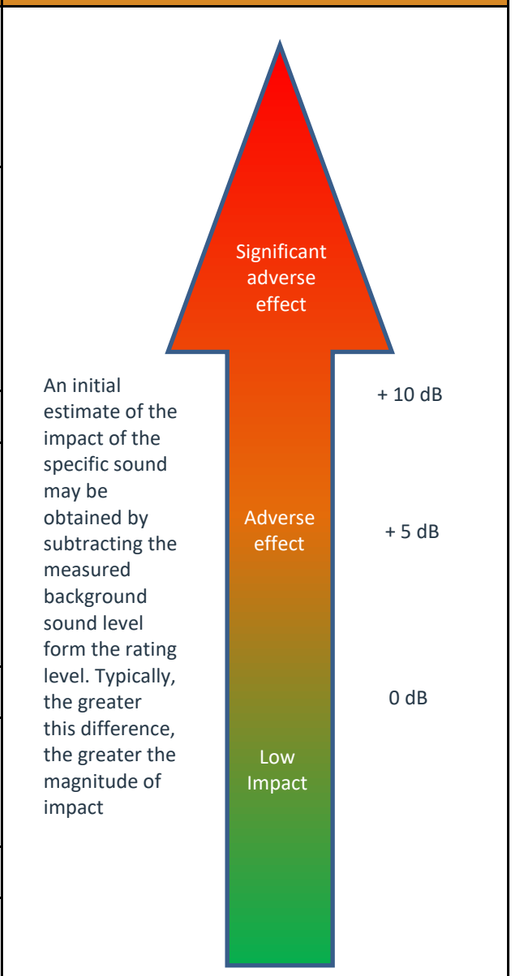
Planning Practice Guidance - Noise				BS 4142: Initial estimate of external noise risk significance
Noise	***Example of outcomes***	***Increasing effect level***	***Action***	
Present and very distributive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an 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**	
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 13: PPG-N Noise Exposure Hierarchy and BS 4142 initial estimate of impact

Appendix B Time History Charts

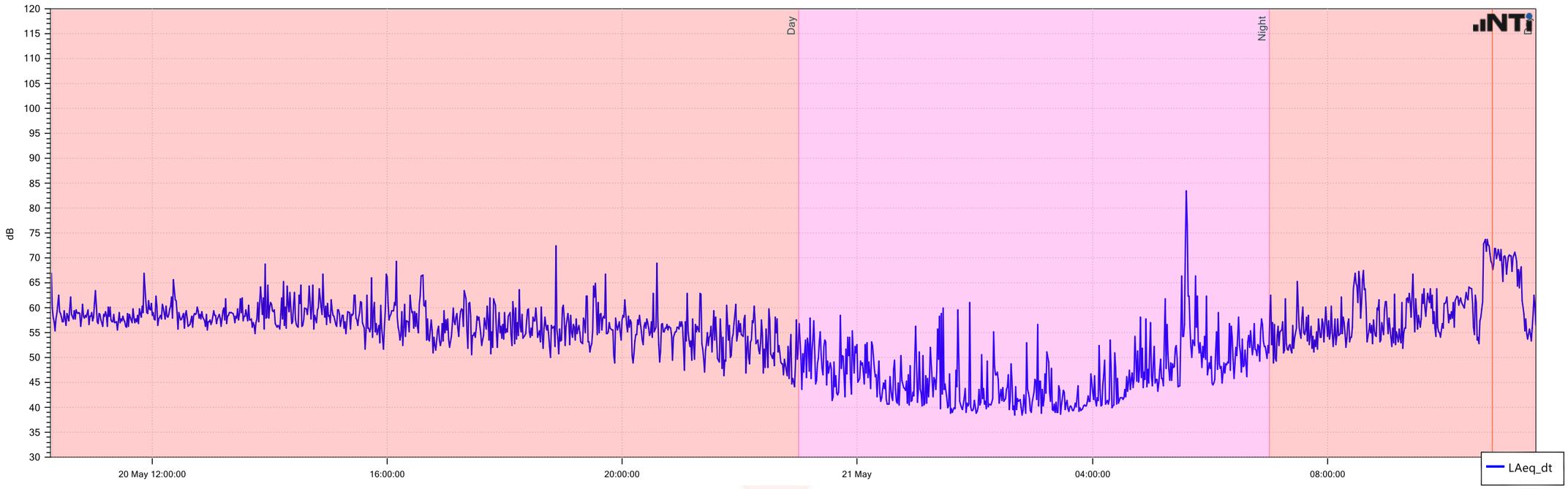


Figure 6: Time history of the recorded $L_{Aeq,T}$ at P1

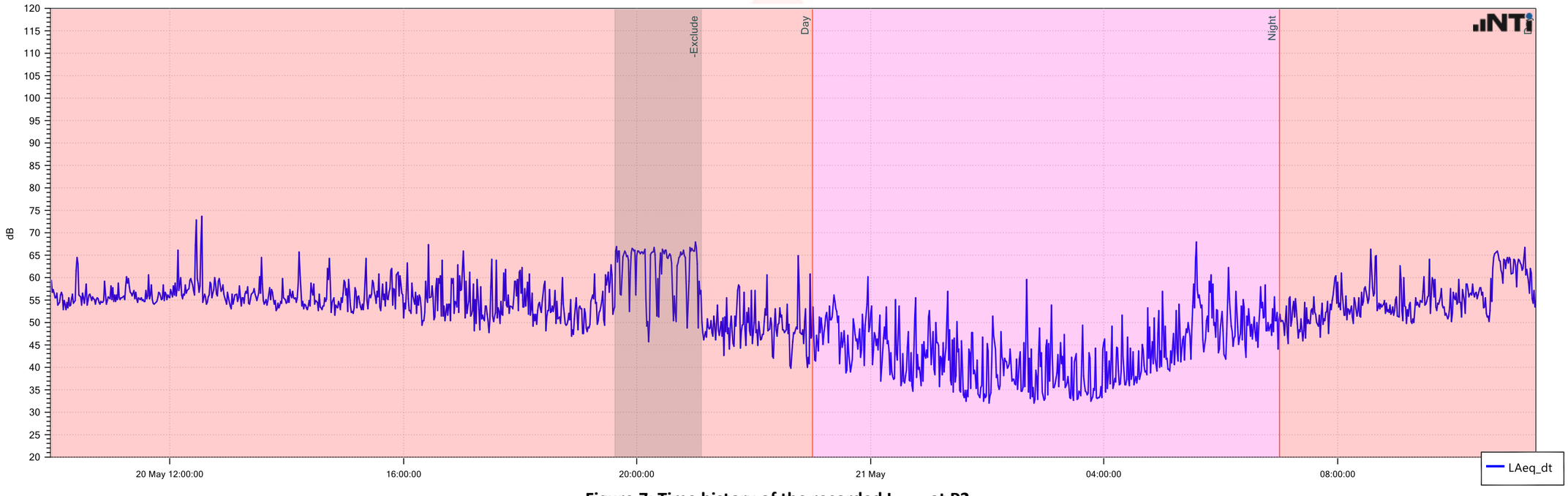


Figure 7: Time history of the recorded $L_{Aeq,T}$ at P2

Appendix C Background noise levels statistical analysis

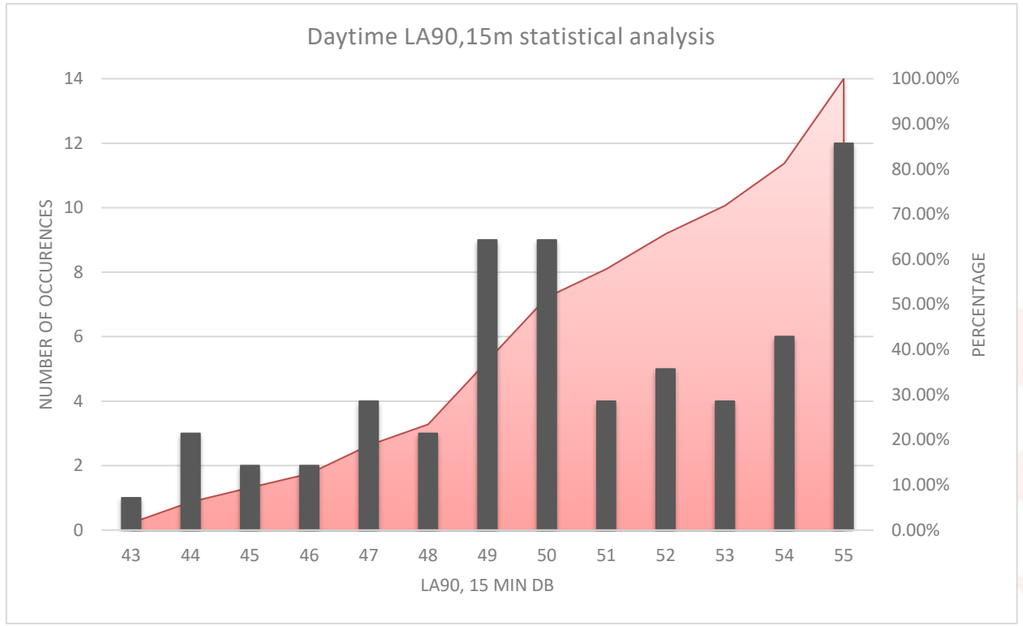


Figure 8: Daytime $L_{A90,15m}$ statistical analysis – P1

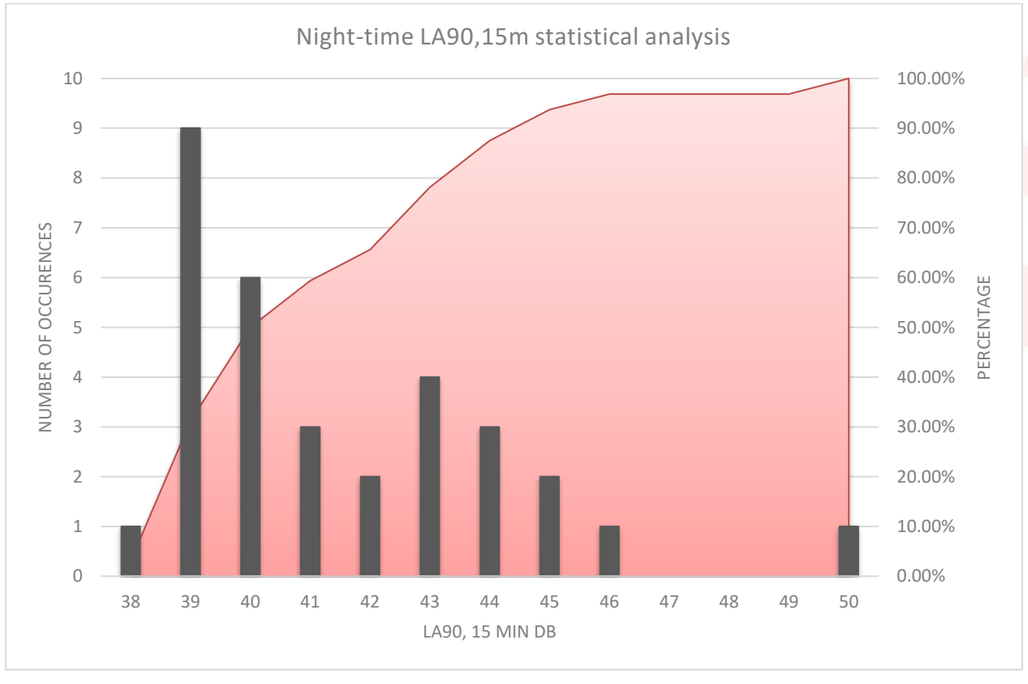


Figure 9: Night-time $L_{A90,15m}$ statistical analysis – P1

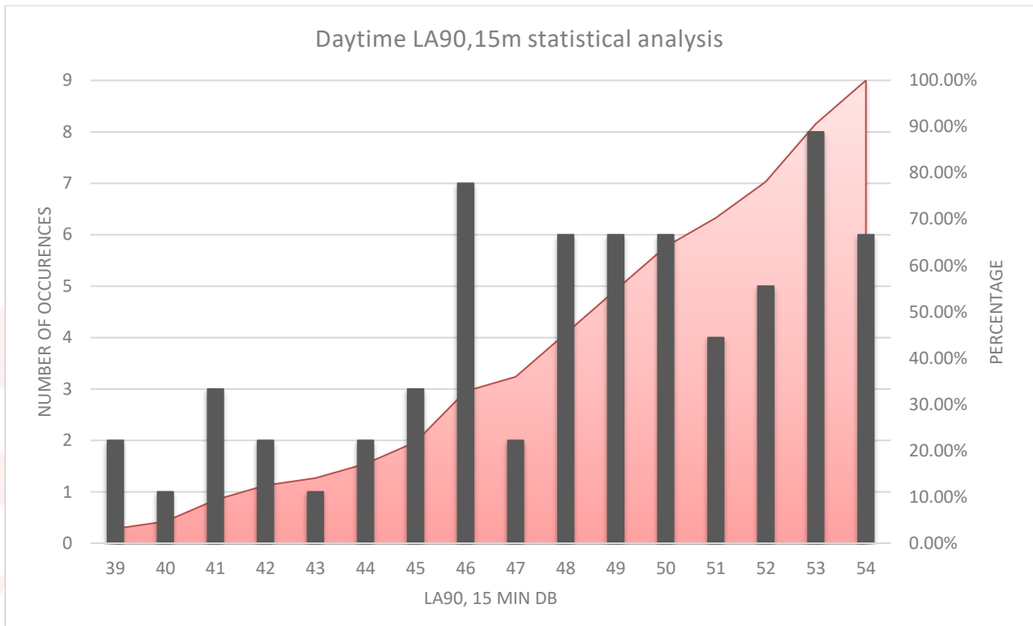


Figure 10: Daytime $L_{A90,15m}$ statistical analysis – P2

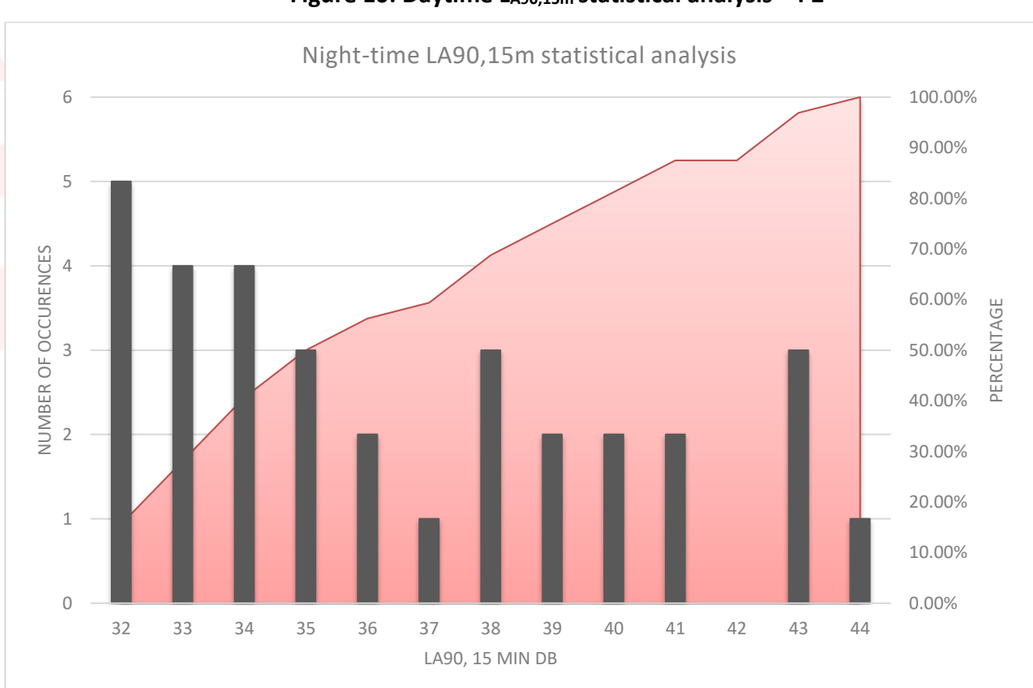


Figure 11: Night-time $L_{A90,15m}$ statistical analysis – P2

Appendix D Professional qualifications and competence

D.1 All Apex Acoustics consultants work under the close supervision of a member who holds a qualification in acoustics and is a member of the IOA.

D.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

D.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 members' competency.

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