

Honeyview Investments Limited

Barnard Road, Norwich

Noise Assessment (Draft)

**Report Ref.
2306810-R01**

December 2023

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Appendix A – Measured Noise Data

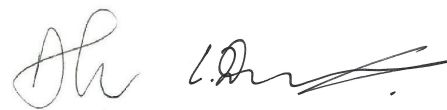
Appendix B – Traffic Flow Data and Noise Calculations

Appendix C – Relevant Policy and Guidance

Appendix D – Acoustics Terminology

Document Control Sheet

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	Draft	AS	LD	Draft only	28/11/23
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Distribution

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1. Introduction

- 1.1. Ardent Consulting Engineers has been appointed by Honeyview Investments Limited to undertake a Noise Assessment to support the development at Barnard Road, Norwich.
- 1.2. Prior to undertaking the development, it is necessary to ensure that the site will be able to operate efficiently, without disturbing the closest noise sensitive receptors.
- 1.3. The planning application for the proposed scheme is to be submitted to the Norwich City Council as the local planning authority.
- 1.4. The assessment is in accordance with BS 4142 and DMRB LA111 and provides details of the site surveys and subsequent qualitative and quantitative analysis.

Development Proposals

1.5. The proposed development description is provided below:

"Full planning application for construction of a Class E food store (Lidl) with associated access, car parking, servicing and landscaping".

1.6. The site is bound by the A1074 Dereham Road to the north, the Brook Hotel to the east, Barnard Road to the south and Bowthorpe Park Industrial Estate to the west.

1.7. The closest sensitive receptor locations are the Brook hotel to the east, with more distant receptors located to the north of the site on the opposite side of Dereham Road.

1.8. Based on information currently available, the Brook hotel appears to be disused at the current time. However, it has been considered as a sensitive receptor within this report to safeguard the future use of the site.

1.9. Figure 1-1 shows the location site and the surrounding area.



Figure 1-1: Site location in context of the surrounding area

1.10. An extract of the development proposals is shown in Figure 1-2.

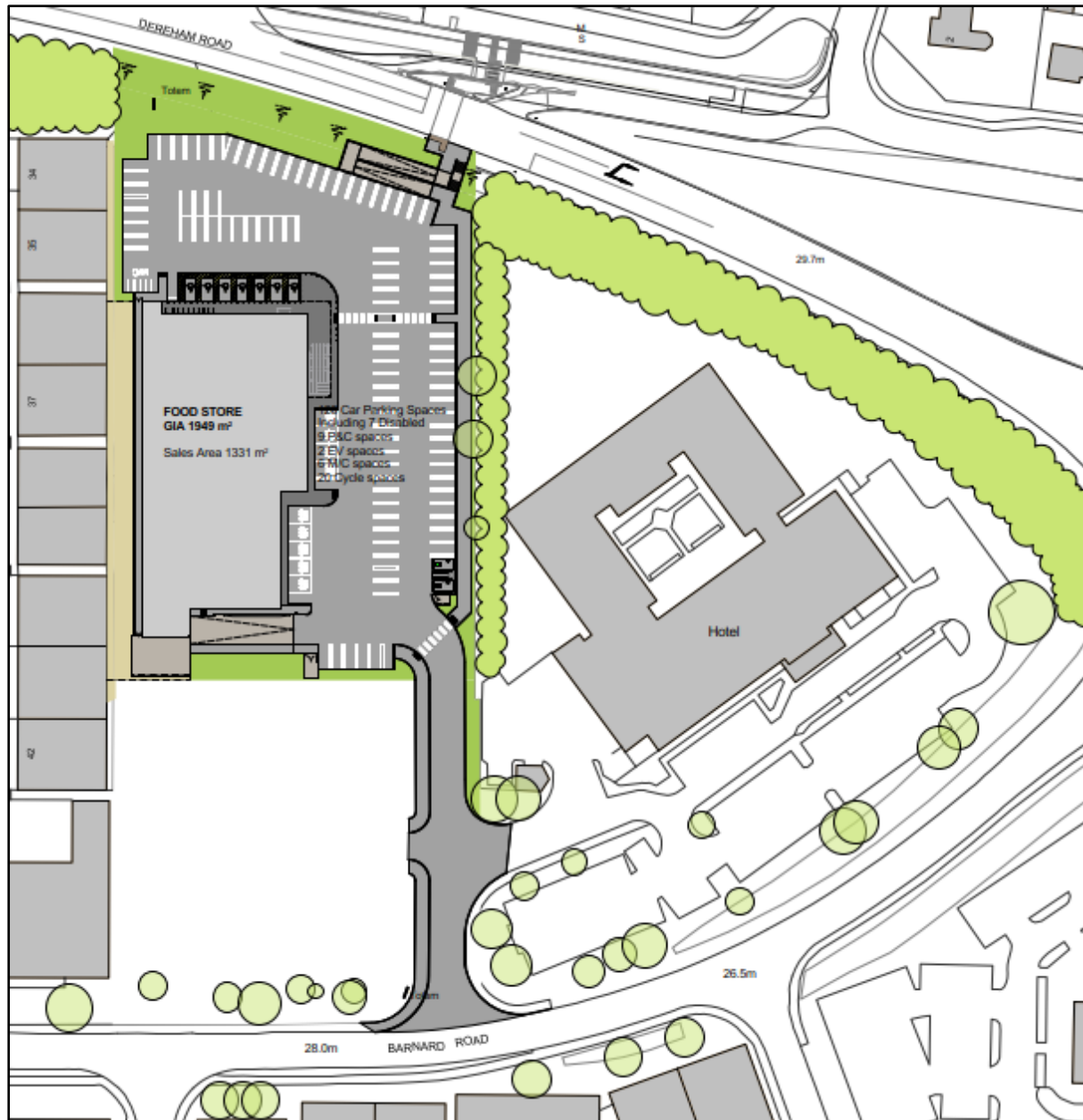


Figure 1-2: Development proposals

2. Local Authority Liaison

2.1. Contact¹ was made with officers at Norwich City Council, the following was agreed:

- The survey methodology was agreed as acceptable;
- The assessment of fixed mechanical plant noise would be conducted in accordance with BS4142.
- An operational noise assessment associated with deliveries would be undertaken.
- The impact of noise from vehicle movements would be considered in accordance with DMRB LA111, and the change in noise level compared to the baseline environment would be considered.

2.2. A summary of relevant policy and guidance is shown in Appendix C.

¹ Email contact with Sally Nicholson on 03/11/2023, response on 13/11/2023

3. Environmental Noise Measurements

- 3.1. A noise survey was conducted between 17th and 21st November 2023. The long-term measurement position was chosen to be representative of the acoustic environment in the vicinity of the closest noise sensitive receptors.
- 3.2. The measurement position and closest sensitive receptors (blue outline) are shown in Figure 3-1.



Figure 3-1 Measurement positions (receptors outlined in blue)

3.3. A description of the measurements positions is as follows:

- **Measurement Position 1 (P1)** - The microphone was mounted at approximately 2.5m above ground height, allowing for direct line of sight with Dereham Road.
- **Measurement Position 2 (P2)** - The microphone was mounted at approximately 2.0m above ground height along the eastern boundary of the site.

3.4. The equipment used was as follows:

- Norsonic 140 Sound Level Meter (serial number: 1405866);
- Norsonic 140 Sound Level Meter (serial number: 1405869);
- Bruel & Kjaer 4231 Calibrator (serial number: 2463721)

3.5. All equipment used has been professionally calibrated. Field calibration of the sound level meters (and complete measurement signal chain) was undertaken before and after measurement to ensure no drift of the calibration signal. Calibration certificates are available upon request.

3.6. Weather conditions were generally suitable for the duration of the surveys with a variable but low wind speeds noted.

3.7. A summary of the measurements taken at the site are summarised in Table 3-1. A time history of measured noise levels at Positions 1 & 2 are shown in Appendix A.

Monitoring Position	Ambient Sound Level dB L _{Aeq, T} Range (Average)		Background Sound Level, dB L _{A90} Range	
	Daytime	Night-time	Daytime	Night-time
P1	64-74 (70)	56-72 (63)	40-68	36-60
P2	48-60 (54)	41-60 (48)	37-58	34-55

Table 3-1: Summary of measured noise levels

3.8. The acoustic environment at the measurement positions was dominated by road traffic noise from the A1074 Dereham Road. Contributions also included noise from the local road network, including Barnard Road to the south. The site is currently

operational as a bowling alley, there was some noticeable activity from customers at the site, however these were not considered significant in the context of the surrounding area.

- 3.9. A histogram of the day and night background sound levels is shown in Figure 3-2 and Figure 3-3.

Figure 3-2: Histogram of daytime & night-time background sound levels at Position 1

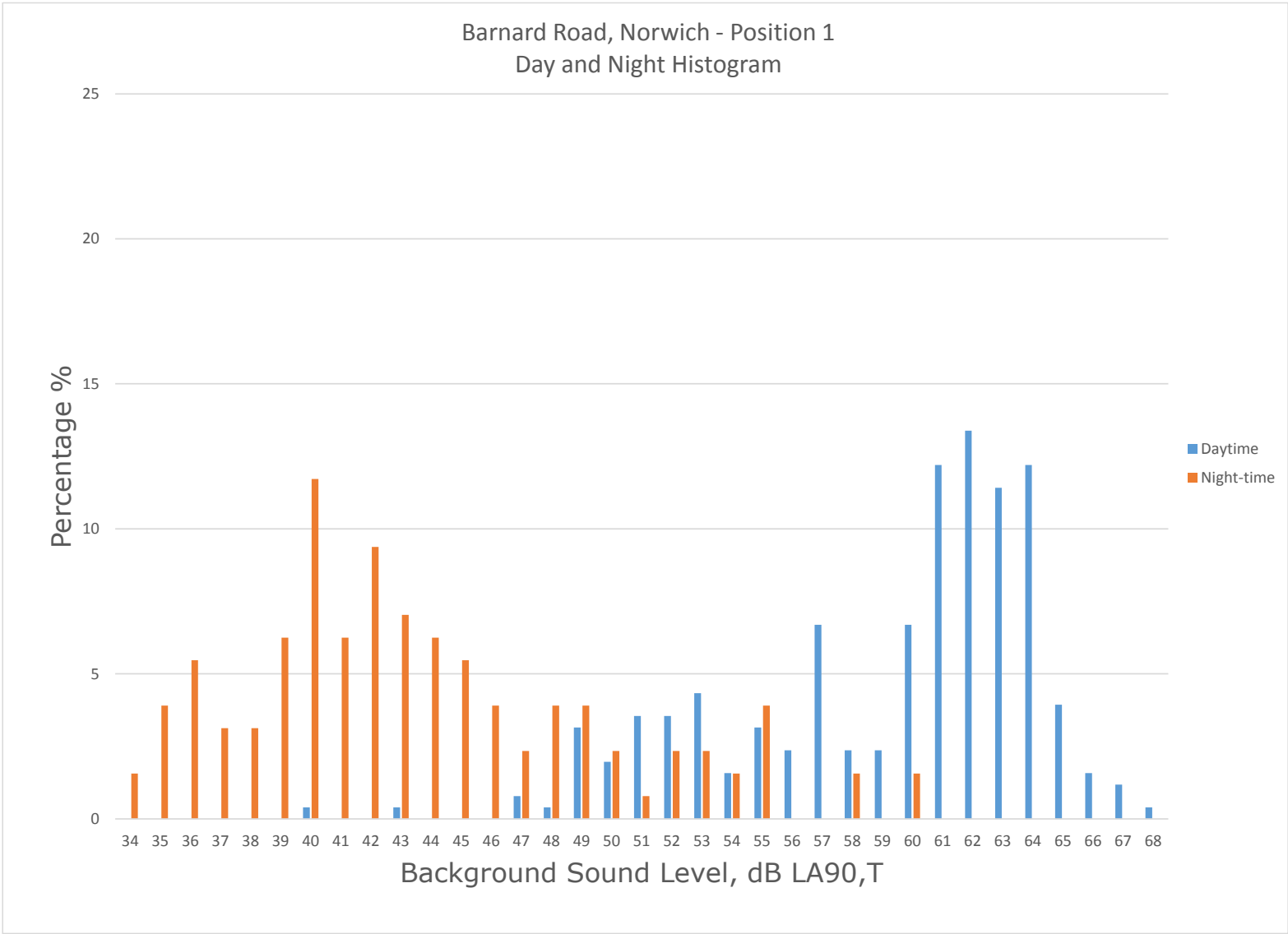
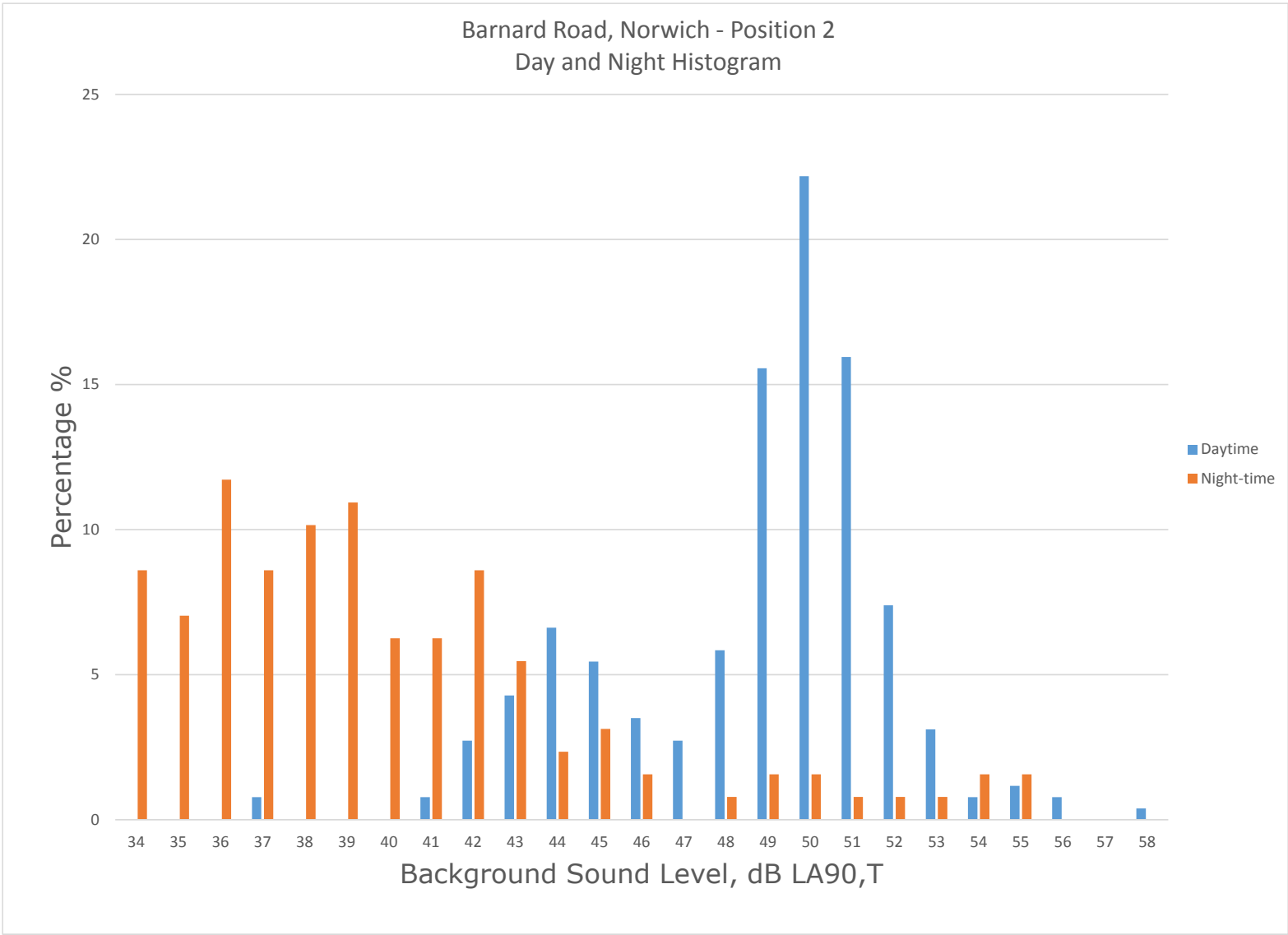


Figure 3-3: Histogram of daytime & night-time background sound levels at Position 2



3.10. At Position 1, a background sound level of **62dB L_{A90,T}** has been used during the day and **40dB L_{A90,T}** at night, representing the receptors on the opposite side of Dereham Road.

3.11. For Position 2, a background sound level of **50dB L_{A90,T}** has been used during the day and **36dB L_{A90,T}** at night, representing the hotel receptors.

4. Road Traffic noise Assessment

- 4.1. Road traffic flows have been provided by Focus Transport Planning, which have been used to calculate the change in noise levels arising from the operational traffic, including future 2028 baseline and operational scenario. The data is presented as 18 hour AAWT traffic flows shown in Appendix B, along with calculations of the road traffic noise.
- 4.2. Table 4-1 presents a summary of the future 2028 baseline traffic flows, and the resulting predicted change in noise levels with the development.

Road	2028 Baseline	2028 Baseline + Development traffic	Change in Noise Level, dB
Harvest Hill (W of site access)	4,520	4,476	0.0
Harvest Hill (E of site access)	6,573	8,079	0.9
A308 South of Braywick Roundabout	27,452	27,591	0.0
A308 North of Braywick Roundabout	26,563	26,848	0.0
Frascati Way	14,920	15,181	0.1
A404 (North)	5,040	5,082	0.0
A404 (South)	4,028	4,064	0.0
M4 (East)	9,250	9,335	0.0
M4 (West)	7,322	7,404	0.0

Table 4-1: Change in Noise Levels Due to Development Traffic

- 4.3. The change in noise levels is negligible when compared to Table 3.54b of DMRB, LA 111 for all scenarios and no further assessment is necessary.

5. Operational Noise Assessment

5.1. The assessments below include 24-hour operations of deliveries and operational fixed plant, to determine the likely impact at the closest identified noise sensitive receptor.

Deliveries

5.2. The sound generated by the movement of vehicles accessing the service yard will be similar to that on the local road network and will be masked by local activity.

5.3. Delivery vehicles will enter the site from the south, manoeuvre and reverse down the ramp into the warehouse on the southern elevation of the building. Goods will be unloaded from a sealed dock leveller inside the building, minimising any noise break out from internal delivery activities.

5.4. Figure 5-1 shows the floor plan of the building identifying the location of the warehouse entrance.

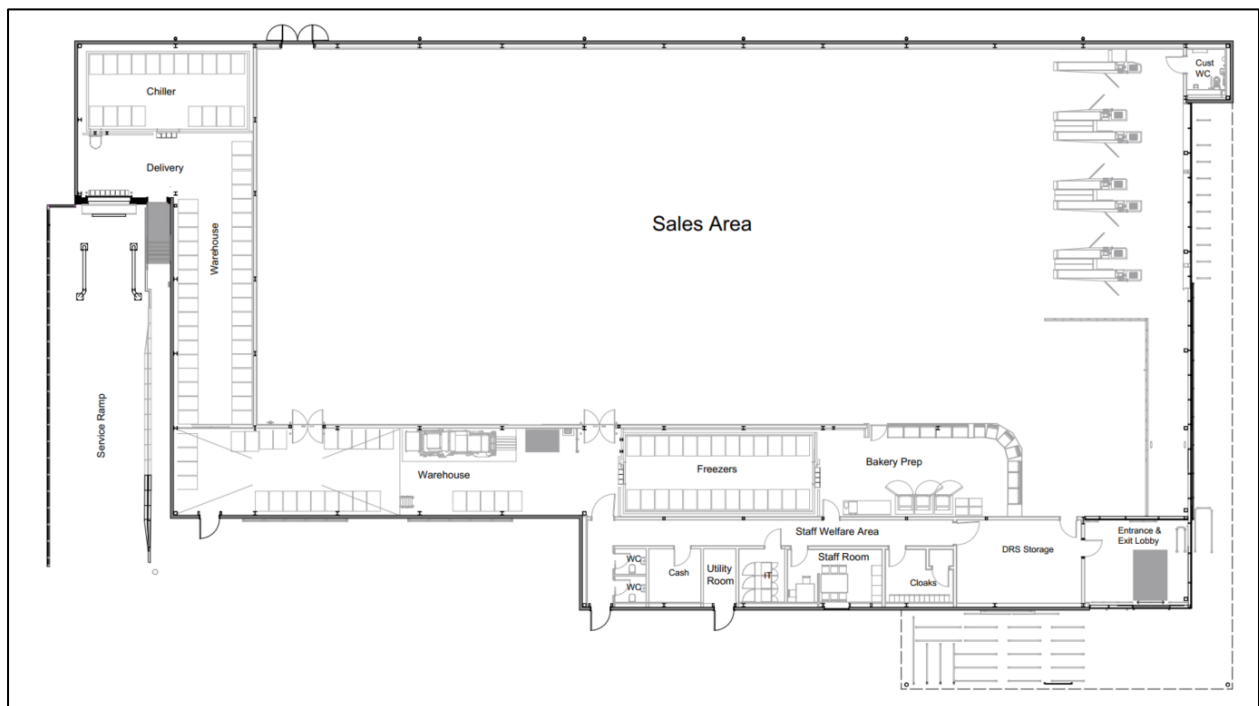


Figure 5-1: Proposed Ground Floor Plan

5.5. The below control measures will be implemented to minimise any noise associated with deliveries on nearby sensitive receptors.

Noise Control Measures for Deliveries

- 5.6. Best Practicable Means (BPM) and mitigation methods will be employed at all times to minimise operational noise.
- 5.7. Each of the below control measures will be given as instructions to all staff, site supervisors and delivery drivers upon site induction:
- I. Manoeuvring of vehicles should be minimised, particularly during the night;
 - II. On site speed limit controls to a maximum of 10 mph;
 - III. Ensure engines are switched off once in the delivery area;
 - IV. There should be no vehicle cab radios left on when at the site;
 - V. Vehicle doors should be closed without excessive force;
 - VI. There should be no shouting in the car park or external yard areas and maintain conversation to a minimum, particularly at night;
 - VII. There should be no use of vehicle horns in the area except in event of emergency;
 - VIII. Keep engine revs to a minimum; apply brakes gently and accelerate gently until the vehicle is a reasonable distance from the site.

Fixed Mechanical Plant

- 5.8. At this stage of the development, the selection of any fixed plant and equipment has not been decided.
- 5.9. BS 4142 notes that *'where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.'*
- 5.10. Given that the existing residual sound level is up to 70dB L_{Aeq} during the day and 63dB L_{Aeq} at night LT1, with background sound levels up to 62dB L_{A90} in the day and 40dB L_{A90} at night, a direct comparison between the rating and background sound level is not considered appropriate.
- 5.11. Therefore, to avoid elevating the existing residual acoustic environment, the cumulative sound from fixed mechanical plant should be designed to achieve a rating level at the closest identified noise sensitive receptors of **45dB $L_{Ar,Tr}$** during the day and **40dB $L_{Ar,Tr}$** at night.
- 5.12. Plant should be designed, selected and where appropriate, attenuated so that it does not produce any distinguishable acoustic characteristics. The above criteria will need to be considered on the basis of the configuration of plant and the operational conditions.

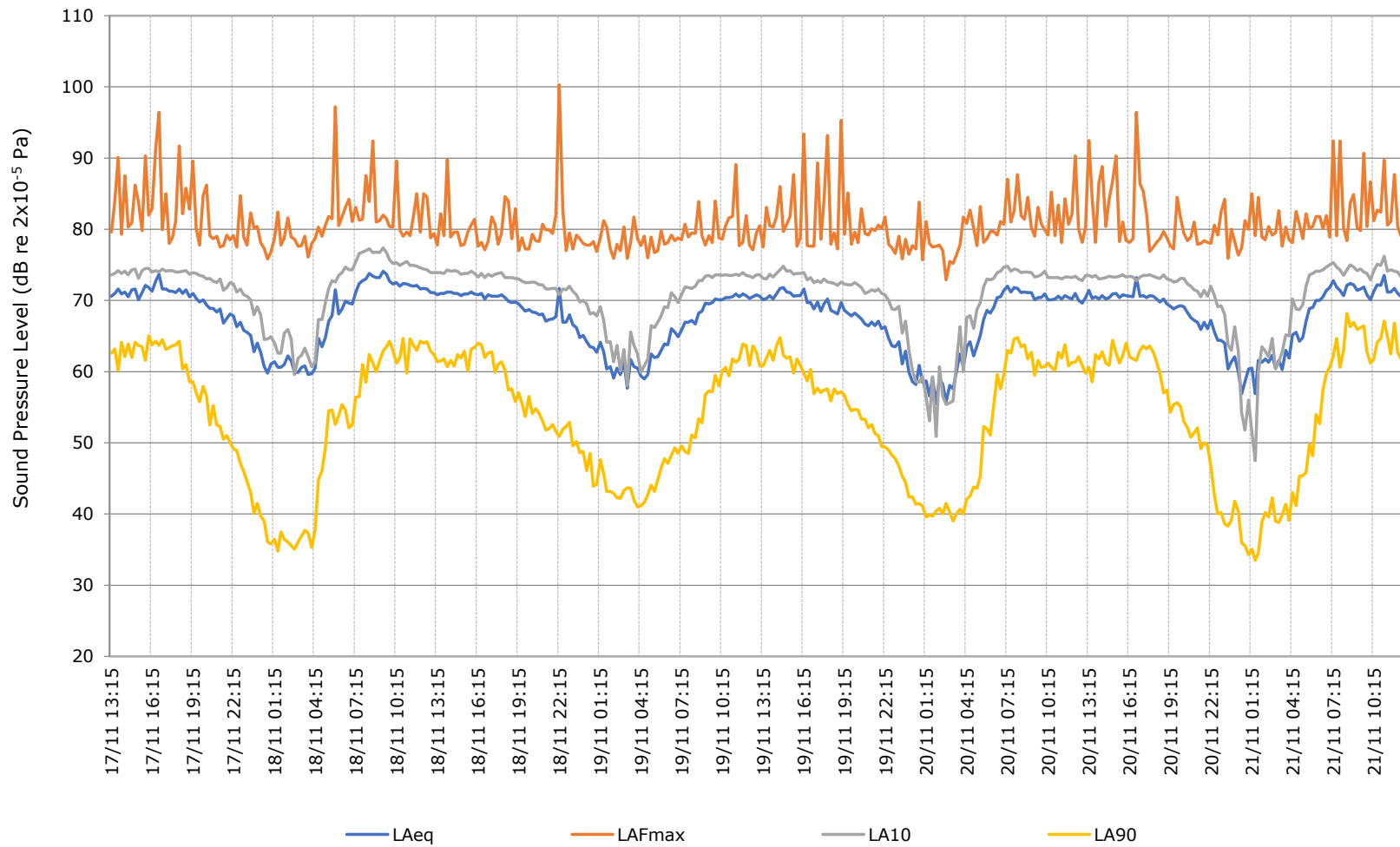
6. Conclusions

- 6.1. Ardent Consulting Engineers has been appointed by Honeyview Investments Limited to undertake a Noise Assessment to support the development at the Barnard Road, Norwich.
- 6.2. The increase in traffic numbers as a result of the development are negligible when viewed in the context of existing movements in the area.
- 6.3. The proposed delivery operations will result in a low impact at the closest identified noise sensitive receptors when assessed in accordance with BS 4142.
- 6.4. Cumulative sound from fixed mechanical plant should be designed to achieve a rating level at the closest identified noise sensitive receptors of 45dB $L_{A,r,T,r}$ during the day and 40dB $L_{A,r,T,r}$ at night.
- 6.5. This assessment demonstrates that the site is suitable for development subject to the recommendations included in this report.

APPENDIX A

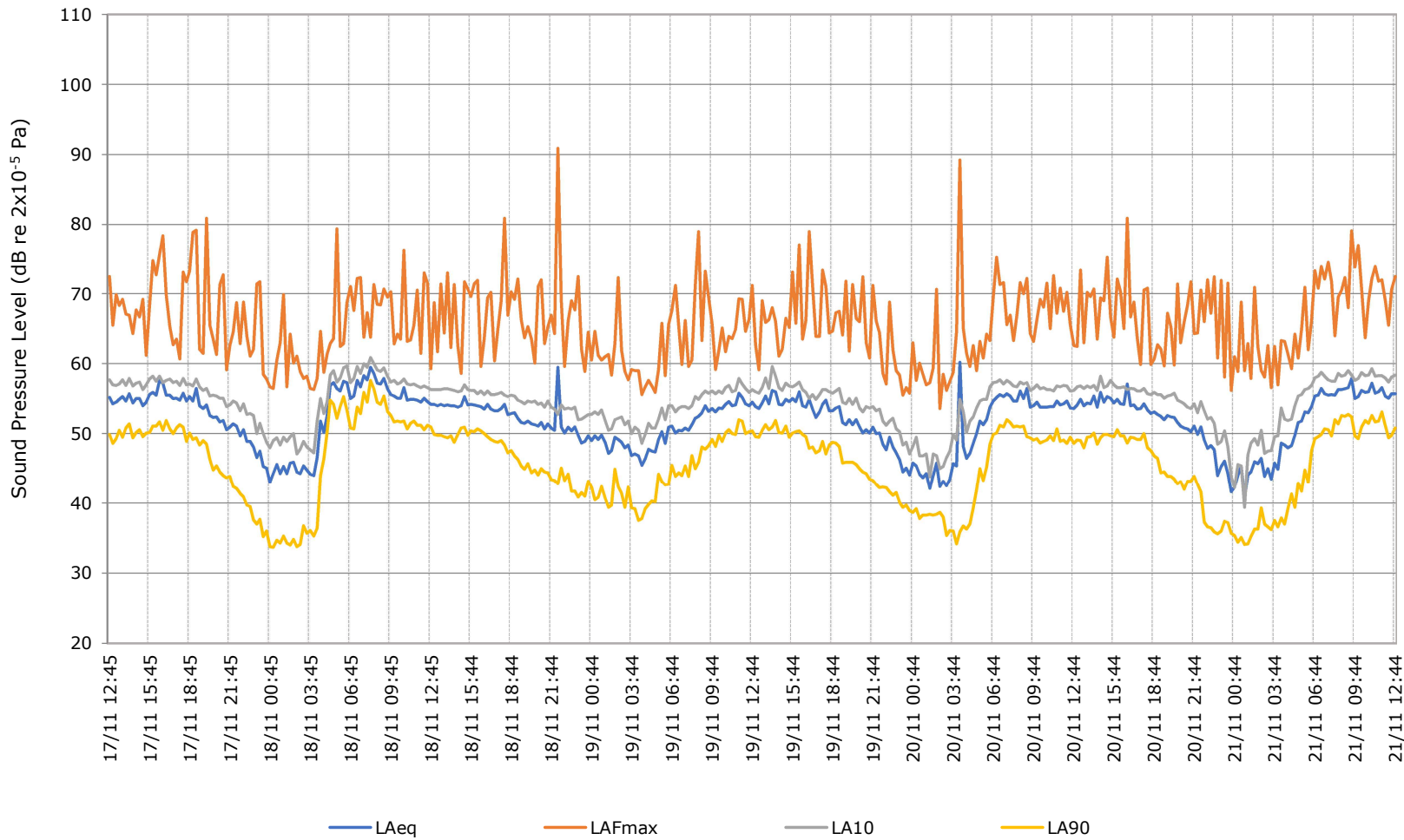
Position 1 - Barnard Road, Norwich

Environmental Noise Time History
17th - 21st November 2023



Position 2 - Barnard Road, Norwich

Environmental Noise Time History
17th - 21st November 2023



APPENDIX B

Description	Future Baseline (2028)	Future Baseline (2028) + Development Traffic	Change in Noise Level, dB
Barnard Road (W of Site)	4,520	4,476	0.0
Barnard Road (W of Roundabout)	6,573	8,079	0.9
A1074 Dereham Rd (W of Roundabout)	27,452	27,591	0.0
A1074 Dereham Rd (W of Roundabout)	26,563	26,848	0.0
Wendene (S of Roundabout)	14,920	15,181	0.1
Breckland Road (N of Roundabout)	5,040	5,082	0.0
Wendene (S of Traffic Signals)	4,028	4,064	0.0
Chapel Break Road	9,250	9,335	0.0
Clover Hill Road	7,322	7,404	0.0

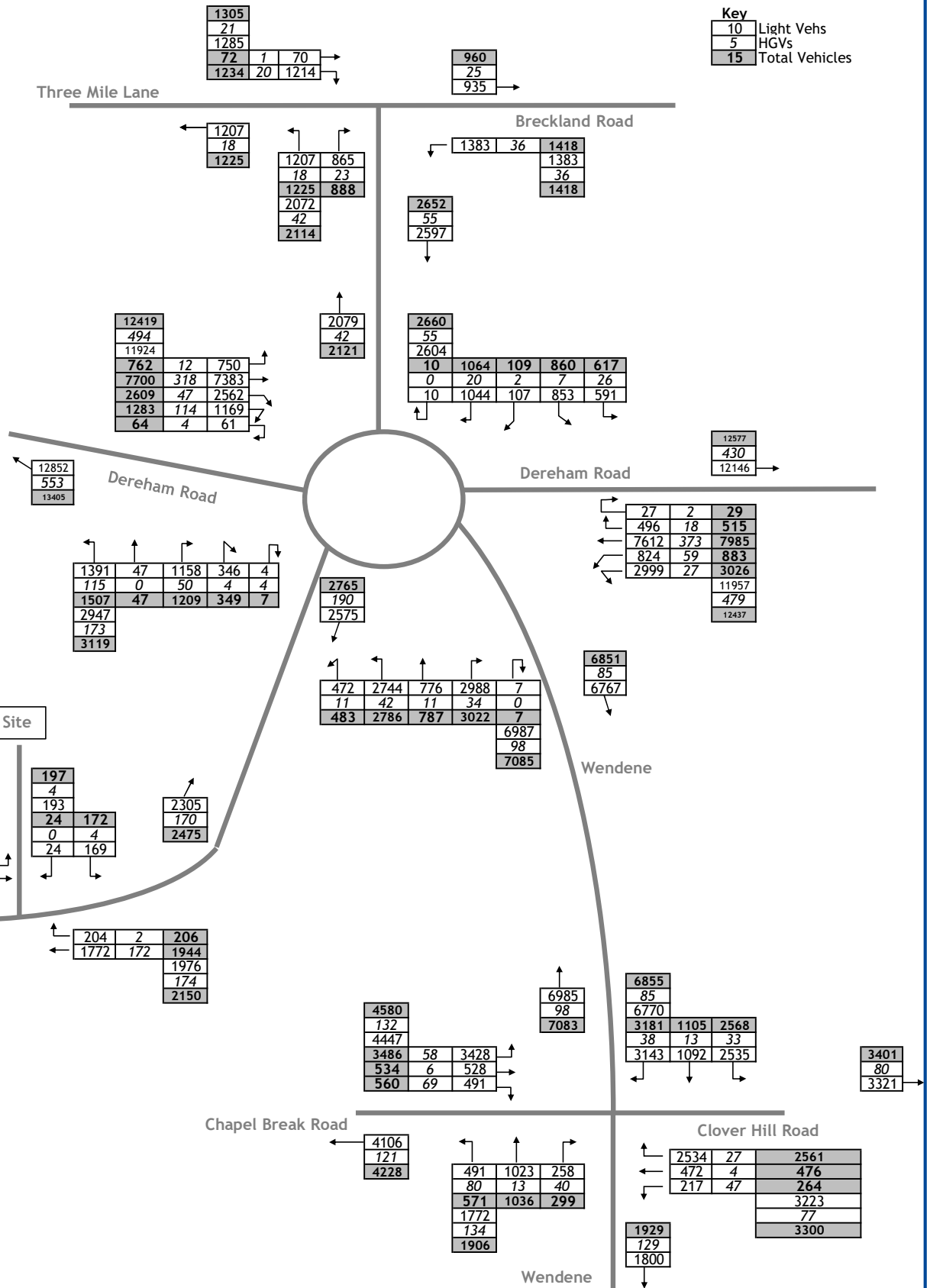


FIGURE NA1

2023 18hr Observed Weekday Background Traffic

J000420

Land at Barnard Road, Norwich

November 2023

APPENDIX C

RELEVANT POLICY & GUIDANCE

National Planning Policy Framework (NPPF) – September 2023

Under the NPPF: paragraph 185 of Section 15, with regard to environmental noise; Planning policies and decisions should aim to: -

- 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;
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Noise Policy Statement for England (NPSE)

To avoid and mitigate adverse noise effects on health arising from and impacting on new development, the NPPF makes reference to NPSE. The NPSE was published in March 2010 and covers all forms of noise, other than occupational noise. For the purposes of this report, "Neighbourhood Noise" is most relevant as NPSE defined at paragraph 2.5:

"neighbourhood noise which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street. "

NPSE introduces three concepts to the assessment of noise in the UK:

- NOEL – No Observed Effect Level – This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.
- LOAEL – Lowest Observable Adverse Effect Level – This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level – This is the level above which significant adverse effects on health and quality of life occur.

NPSE does not numerically define levels for the NOEL, LOAEL or SOAEL rather it makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc.

National Planning Practice Guidance (2014)

The purpose of the guidance is to complement the NPPF and provide advice on how to deliver its policies.

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The guidance includes a table (as shown in Table 1) that summarises "the noise exposure hierarchy, based on the likely average response" and which offers "examples of outcomes" relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE.

BS4142:2014 Methods for rating industrial and commercial sound

BS4142:2014 uses a comparison between the rating and background sound levels to establish an initial estimate of the likely significance of impact. The standard notes:

- a) *Typically, the greater this difference, the greater the magnitude of the impact.*
- b) *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- d) *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

The context of the assessment must then be considered, which can significantly alter the outcome of the assessment. Factors that might alter the outcome of the assessment include the absolute level of sound compared to the residual sound level, the character of the sound compared to the residual, the sensitivity of the receptor etc.

Design Manual for Road and Bridges, Volume 11 (LA111 – Noise and Vibration

Changes in noise level as a result of additional vehicles on the public highway can be assessed using methodologies presented in Design Manual for Road and Bridges (DMRB LA111),

This guidance document sets out the requirements for noise and vibration assessments from road projects. The construction, operation and maintenance of highway projects can lead to changes in noise and vibration levels in the surrounding environment.

The magnitude of change (in sound level) is defined in Table 3.54a of the guidance for short term and Table 3.54b for long term, as presented in Table 2:

Short term magnitude	Short term noise change (dB $L_{A10,18hr}$ 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

Long term magnitude	Long term noise change (dB $L_{A10,18hr}$ 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 (Table 3.54a and b DMRB, LA 111 - Magnitude of Change)

APPENDIX D

ACOUSTIC TERMINOLOGY

The effects of noise on human beings may be expressed in terms of physiological damage and annoyance. It is, however, only the annoyance impacts that need to be considered in detail when addressing environmental noise impacts. Annoyance also includes the immediate effects of activity interference, for example sleep disturbance and speech interference.

The practice has become to measure sound levels in decibels (dB). The decibel scale is logarithmic rather than linear and it is useful to bear in mind that a noise level change of 3dB would be equivalent to doubling the energy level (for example doubling the volume of traffic) and that an increase of 10 dB is perceived, subjectively, as a doubling of loudness. The human ear responds differently to sounds of different frequency. The ear perceives high frequency sound of a given sound pressure level more loudly than a low frequency sound at the same level. The A-weighted sound level, dB(A), takes this response into consideration and is commonly used for measurement of environmental noise in UK. It thus indicates the subjective human response to sound.

Environmental noise levels vary continuously from second to second, it is clearly impractical to specify the sound level continuously and thus time averaging is required. In practice human response has been related to various units which include allowance for the fluctuating nature of sound with time. For the purpose of this report these include:

LAeq,T : the equivalent A-weighted continuous sound level.

This unit relates to the equivalent level of continuous sound for a specific time period T, for example 16 hours for daytime noise. It contains all the sound energy of the varying sound levels over the same time period and expresses it as a continuous sound level over that period. The unit is used for assessing traffic and industrial noise for planning purposes and in particular for PPG24.

LA10,T : the A-weighted level of sound exceeded for 10% of the time period T.

This unit is used for traffic noise measurement and is the preferred unit for prediction of traffic noise in the publication, 'Calculation of Road Traffic Noise'.

LA90,T : the A-weighted level of sound exceeded for 90% of the time period T.

This unit is commonly used to represent the background noise and is used in assessing the effects of industrial noise in UK.

LAm_{ax} : the maximum A-weighted level of sound over a period of measurement.

LAr,T : the rating level.

The specific Noise plus any adjustments for the characteristic features of the noise. Used for comparison between background levels with the noise source off.

SEL : the Sound Exposure Level.

Sound exposure level abbreviated as SEL and LAE, is the total noise energy produced from a single noise event condensed into a 1 second time period.

R_w : weighted sound reduction index.

A laboratory-measured value as defined in ISO717 Part 1.

D_{nTw} :

The equivalent of R_w, but measured onsite as oppose to in a laboratory