



PREPARED: 16 February 2026

KANES HILL, HEDGE END

CONDITION 25 AND CONDITION 31

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AS14422/SP1	Indicative Site Plan
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APPENDIX A	Acoustic Terminology
APPENDIX B	BS4142 Calculations Summary
APPENDIX C	BS4142 Methodology Summary

Project Ref:	AS14422	Project Name:	Kanes Hill, Hedge End
Report Ref:	AS14422.260121.NIA	Report Title:	Condition 25 and Condition 31
Client Name:	MJA Consulting		
Project Manager:	Andrew Nesbitt		
Report Author:	Andrew Nesbitt		
Clarke Saunders Acoustics Winchester SO22 5BE		This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.	

1.0 EXECUTIVE SUMMARY

- 1.1 Outline planning consent has been granted for the proposed commercial development at the Land at Netley Firs, Kanes Hill, Hedge End, Southampton, SO19 6AJ comprising new commercial units for Use Class B1(b), B1(c) and Use Class B2.
- 1.2 Condition 25 and Condition 31 relate to the control of operational noise emissions associated with the development to nearby noise-sensitive receptors and providing specifications for acoustic screening respectively. By definition, operations classified under B1 Use can be undertaken in residential areas without harming the amenity of the area. CSA has, therefore, undertaken a noise impact assessment focused upon anticipated operational activity associated with the B2 units, which has subsequently been used in determining appropriate performance specifications for the acoustic screening.
- 1.3 Assessments of commercial vehicle movements, loading and unloading activity, as well as noise breakout from the B2 industrial units have been undertaken following procedures in BS4142:2014+A.1:2019¹ (BS4142). The assessment has demonstrated that operational noise levels should be controlled to existing daytime background sound levels without any requirement for additional mitigation.
- 1.4 As the provision of acoustic screening is required by condition, however, specifications have been provided, such that the proposed screening will provide a further reduction in operational noise emissions to the nearby noise-sensitive receptors, reducing risk further.
- 1.5 The assessment has concluded that due to the elevated background sound levels and proposed physical and operational mitigation measures in place, there is a low likelihood of adverse impact at the nearest noise-sensitive receptors.

2.0 INTRODUCTION

- 2.1 Outline planning permission was granted conditional consent by Eastleigh Borough Council (EBC), for the development of 23 new employment units under reference O/18/82750 with the following description of development:

Outline application for the demolition of existing buildings and erection of 23 employment units (up to 5,905 sq.m.) with units 12-20 for Use Class B1 (b) and (c) and units 1-11 and 21-23 for Use Class B2, with associated car parking and access. Detailed matters considered: Access and layout.

- 2.2 Reserved matters approval was subsequently granted in June 2024 under reference RM/24/96684 with the following description of development:

Reserved Matters pursuant to Outline Planning Approval O/18/82750 for the demolition of existing buildings and erection of 23 employment units (up to 5,905 sq.m.) with units 12-20 for Use Class B1 (b) and (c) and units 1-11 and 21-23 for Use Class B2, with associated car parking and access. Detailed matters to be considered: appearance, landscaping and scale.

- 2.3 Clarke Saunders Acoustics (CSA) has been appointed to undertake a noise impact assessment of the proposals to aid in discharging Condition 25 and Condition 31 attached to the outline planning application, ref. O/18/82750, as further detailed in Section 3.1. This

¹ BS4142:2014+A.1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound*

will include an assessment of noise emissions from commercial and industrial operations associated with the development, as well as providing acoustic specifications for the acoustic barriers.

- 2.4 A summary of the acoustic terminology used throughout this report is provided in Appendix A.

3.0 PLANNING CONDITIONS

- 3.1 This noise impact assessment seeks to demonstrate that the following conditions, attached to the outline planning condition, ref. O/18/82750, can be discharged.

Condition 25

“25. Prior to the commencement of the development hereby permitted a detailed noise mitigation scheme to address noise impacts on nearby residential dwellings arising from the development and associated activities, shall be submitted to and approved in writing by the Local Planning Authority. The standards to be achieved shall be agreed in writing by the Local Planning Authority prior to the submission of the noise mitigation scheme. The noise mitigation measures, as approved in writing by the Local Planning Authority, shall be fully installed and verified as performing as required prior to the first occupation of each dwelling unit, and shall thereafter retained.

Reason: in the interests of residential amenity.”

Condition 31

“31. Prior to the first use of the development hereby approved, the constructional details of the acoustic barriers to be located in the positions shown on the approved drawing 16030-400 rev N shall be submitted to and approved in writing by the Local Planning Authority. The approved acoustic barriers shall be constructed prior to the first use of the development and thereafter maintained.

Reason: To protect the amenity of neighbouring occupiers of existing dwellings and to safeguard from damage the local environment.”

4.0 COMPETENCE

- 4.1 This project has been managed by Andrew Nesbitt, Senior Consultant at CSA, who also undertook the environmental noise survey and noise impact assessment, and is the author of this report. Andrew has over 8 years of experience in acoustics consultancy and holds an MEng degree in Acoustical Engineering from the University of Southampton. He is a Corporate Member of the Institute of Acoustics (MIOA).
- 4.2 This report adheres to the principles required by the Institute of Acoustics in their Code of Conduct, and the work is within the author's area of knowledge and expertise. Where opinions have been expressed, these represent true and complete professional opinions on the matters to which they refer.
- 4.3 CSA is a full member of the Association of Noise Consultants (ANC). The author of this report is a Corporate Member of the Institute of Acoustics.

5.0 SITE DESCRIPTION & PROPOSALS

Existing Site

- 5.1 The existing site comprises a large area of hardstanding in the north part of the site, with the south and east parts of the site generally being undeveloped open grassland. The site was last used by a cement distribution business.
- 5.2 The site is bound by the M27 to the east and A27 to the west. A residential estate, Pinewood Park, lies beyond the A27. To the north, there is further grassland and a collection of existing commercial premises. A wooded copse is located to the south of the site, with sparsely distributed dwellings.
- 5.3 The soundscape is primarily determined by road traffic noise emanating from the M27, but the A27 is also a major contributor, where traffic was noted to be generally continuous during both site visits.
- 5.4 The nearest noise-sensitive receptors are:
 - Copper Beeches, ca. 45m to the east of the development site;
 - Chaddlewood, ca. 20m to the south-east of the development site;
 - Hilltop and Avalon, located within Pinewood Park, ca. 40m west of the site.

Proposed Development

- 5.5 The proposed development will comprise the construction of 23 new commercial/industrial employment units under Use Class B2 and B1(b) and B1(c). It is noted that from 1st September 2020, Class B1 was merged into the current Class E, such that B1(b) use and B1(c) use are equivalent to the current E(g)ii and E(g)iii Class Use respectively.
- 5.6 Of the 23 commercial units, a total of 9 units will be B1 use, namely Units 12 to 20. The remaining 14 units, namely Units 1 to 11 and Units 21 to 23 will form B2 use.
- 5.7 Use Class B2 and E(g) [or B1] use are defined as follows:
 - **B2 use – General Industrial:** Premises used for any industrial process other than one falling within the uses described in Class E, sub paragraph (g).
 - **E(g) [formerly B1] use – Commercial, Business and Service:**
For –
 - (i) an office to carry out any operational or administrative functions,
 - (ii) the research and development of products or processes, or
 - (iii) any industrial process,being a use, which can be carried out in any residential area without detriment to the amenity of that area by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit.
- 5.8 Future tenants are still to be determined. It has been advised by the project team, however, that it is likely that the Class B1 units will be used primarily as an office environment. By definition, commercial, business and service operations falling under Use Class B1 can operate in residential areas without detriment to the amenity, including by reason of noise.

- 5.9 Due to size limitations, it is advised that the B2 units will comprise relatively light industrial use, such as workshops or small-scale fabrication.
- 5.10 The proposed commercial units will comprise a steel frame system with lightweight metal cladding forming the external walls and roof. External cladding will be installed above a low height brick plinth.
- 5.11 B1 units will feature larger areas of glazing than the B2 units, where the latter primarily limits window coverage to the front elevation, facing into the site. B2 units will have a single roller shutter on the front elevation, whilst B1 units will not.
- 5.12 A modern insulated cladding system will be used, and windows will comprise standard thermal double glazing.

Acoustic Barriers and Operational Hours

- 5.13 EBC's requisite for acoustic barriers at this site was formed following a preliminary noise assessment undertaken by others submitted with the outline application, in which 24-hour operation was sought. The assessment indicated a low impact from commercial operations during the daytime, and a significant adverse impact during the night-time.
- 5.14 Acoustic screening was suggested as a means of mitigating potential night-time noise impact at nearby noise-sensitive receptors. The site layout was subsequently redesigned; setting B2 units further away from nearby dwellings, positioning B1 units in a largely continuous line along the east boundary, and adding acoustic barriers along the east boundary that connects to the last B1 Unit (Unit 20). Positioning for subsequent acoustic screening was agreed with the environmental health department at EBC and the design secured through Condition 31, as shown in the approved drawing 16030-400 rev N.
- 5.15 Despite the mitigation measures being targeted at night-time commercial operations, the operational hours of all permitted Use Classes at the site were restricted within the outline planning decision notice, under Condition 33. The permitted operational hours for commercial activity is summarised as follows:
- Monday to Friday: 08:00 hours – 18:00 hours;
 - Saturday: 08:00 hours – 13:00 hours;
 - Sunday and Bank Holidays: Not permitted.
- 5.16 The appended indicative site plan, AS14422/SP1, shows the existing site and the surrounding area.

6.0 ENVIRONMENTAL HEALTH LIAISON AND RELEVANT GUIDANCE

- 6.1.1 On 22nd January 2026, CSA liaised with Andre Pires, a Pollution Control Manager at EBC, to discuss the assessment methodology and appropriate source noise levels with respect to operational sound sources.
- 6.1.2 It was agreed that the site's potential operational noise emissions should be assessed following procedures in BS4142, addressing the potential cumulative noise impact of commercial and industrial activities occurring throughout the site as well as those from commercial vehicle movements, including deliveries.

- 6.1.3 As the tenants are still to be finalised, the likely uses of the commercial/industrial units were discussed in the context of assessing potential noise emissions accordingly.
- 6.1.4 As presented by the project team, the Class B1 units are primarily targeted as an office environment. By definition, commercial, business and service operations falling under Use Class B1 can operate in residential areas without detriment to the amenity, including by reason of noise. It was agreed that assessment of the proposed B1 units would be limited to external activity, namely commercial vehicle movements that may be associated with the units.
- 6.1.5 The size limitations of the B2 units were discussed. Given these limitations, B2 units are expected to form a less intensive industrial use, such as workshops or small-scale fabrication. The assessment should therefore implement noise sources commensurate with the scale of the unit. It was agreed that CSA would use library sound level data measured at a vehicle workshop. This data includes an elevated reverberant ambient sound level measured across an extended period within the workshop, as well as short-term measurements from specific tools. It was further agreed that the assessment of B2 activity would also consider contributions from commercial vehicle activity and unloading/loading activity for the peak hour, using the data provided in the transport statement submitted within the outline application, ref. 020.0288/TA/8.
- 6.1.6 Given the restricted operating hours, the acoustic screening and any other specified mitigation measures, should control the cumulative BS4142 Rating Level from B1 and B2 Use to levels at or below the representative Background Sound Level at the nearest noise-sensitive receptors.
- 6.1.7 Mechanical fixed plant may be installed by future tenants. Tenants should control noise emissions from mechanical fixed plant to a Rating Level of 10 dB below the existing Background Sound Level, such that future noise contributions do not increase the cumulative noise impact from the development.

6.2 BS4142

- 6.2.1 BS4142 provides a methodology to assess the likelihood of adverse impact arising from sound generated by industrial and commercial sound sources.
- 6.2.2 Sound emissions which result in distinguishable features are subject to additional penalties. The context of the sound emissions and existing soundscape form an important part of the assessment.
- 6.2.3 It is noted that private cars (employees and customers) are not commercial vehicles and therefore, do not feature in the BS4142 assessment. Furthermore, it is noted that the assessment of sound from commercial vehicles on public roads is outside the scope of BS4142.
- 6.2.4 A detailed summary of the BS4142 assessment methodology is provided at Appendix C.

7.0 ENVIRONMENTAL SOUND SURVEY

7.1 SURVEY PROCEDURE & EQUIPMENT

- 7.1.1 Automated measurements of consecutive 5-minute L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels were taken at positions LT1 and LT2, as shown in site plan AS14422/SP1, between 16:00 hours on Friday 23rd January and 09:15 hours on Thursday 29th January 2026, following procedures in BS4142 and BS7445:1991 *Description and measurement of environmental noise Part 2: Acquisition of data pertinent to land use*.
- 7.1.2 Some periods of adverse weather were observed during the survey. These periods are highlighted in grey in the relevant time histories, and the data measured during these times has been omitted from further analysis. Overall, there were sufficient periods of calm and dry weather which were suitable for the purposes of the survey.
- 7.1.3 The equipment used during the survey was as follows:
- 2 no. Rion Class 1 sound level meter type NL52;
 - 1 no. Rion sound level calibrator type NC74.
- 7.1.4 Calibration of the sound level meters was verified before and after the surveys, with no significant calibration drift detected. All CSA equipment has current traceable laboratory calibration which is available for inspection upon request.

7.2 SURVEY RESULTS

- 7.2.1 The ambient and typical background sound levels measured across the restricted operational hours are presented in Table 7.1. These metrics parameters are also reported for the full daytime period for reference.
- 7.2.2 The levels measured at LT1 are representative of the sound levels at Copper Beeches, whilst the levels measured at LT2 are representative of Chaddlewood.

Position	Monitoring Period	Ambient $L_{Aeq,T}$	Typical* Background $L_{A90,5min}$
LT1	Daytime T = 16hrs, 07:00hrs - 23:00hrs	61dB	55dB
	Operational Hours T = 1hr, 08:00hrs - 09:00hrs	61dB	57dB
	Operational Hours T = 10hrs, 08:00hrs - 18:00hrs	62dB	59dB
LT2	Daytime T = 16hrs, 07:00hrs - 23:00hrs	59dB	52dB
	Operational Hours T = 1hr, 08:00hrs - 09:00hrs	59dB	52dB
	Operational Hours T = 10hrs, 08:00hrs - 18:00hrs	60dB	54dB

Table 7.1: Measured average ambient and typical background sound levels [dB ref. 20 μ Pa]
*derived as the 10th percentile of the relevant L_{A90} dataset

7.2.3 The appended time histories, Figures AS14422/TH1-TH6 and TH7-TH12, show the variation of the measured sound levels at Position LT1 and LT2 respectively.

7.2.4 Ambient sound conditions at both positions are similar. Despite position LT2 being located much further away from the M27 than LT1, ambient sound levels remain high due to the contribution of road traffic noise from the A27.

7.2.5 Additional manual measurements were undertaken at ca. 40m from the A27, to determine equivalent environmental sound levels at nearby noise-sensitive receptors within Pinewood Park. Ambient sound levels were consistently around 64 dB $L_{Aeq,5min}$ at 09:00 hours on Thursday 29th January 2026, ca. 4dB higher than those measured at position LT2. Background sound levels were around 3 dB higher than those measured at position LT2.

7.3 TENANT FIXED PLANT NOISE CRITERIA

7.3.1 Future tenants should control noise emissions from mechanical fixed plant to a Rating Level of 10 dB below the existing Background Sound Level,

7.3.2 Table 7.2 presents the resultant plant sound emissions criteria at the nearest noise-sensitive receptors. It should be noted that the plant noise criteria are 10dB more stringent than that used for operational noise, such that future plant will not increase the cumulative noise impact assessed from the development.

Period	Future Fixed Plant Noise Emissions Criteria ($L_{A,T,r}$)		
	Copper Beeches	Chaddlewood	Pinewood Park
Operational Hours T = 10hrs, 08:00hrs - 18:00hrs	49dB	44dB	47dB

Table 7.2: Fixed plant noise emissions limits (Rating Level) at the nearest noise-sensitive receptors [dB ref. 20 μ Pa]

8.0 ASSESSMENT & DISCUSSION

8.1 OPERATIONAL ACTIVITY

8.1.1 As agreed with the environmental health department at EBC, the operational noise impact assessment will be undertaken as follows:

- B1 Use: External commercial vehicle movements only;
- B2 Use: External commercial vehicle movements, loading/unloading activity, noise breakout from the B2 units on the basis of data obtained from a car workshop.

8.1.2 Trip rates from commercial vehicle movements have been determined from the Transport Assessment prepared by Paul Basham Associates Ltd, ref. 020.0288/TA/8. From review of the TRICS data, the peak hour for commercial vehicle movements associated with the B1 and B2 use is 08:00 hours – 09:00 hours.

8.1.3 Anticipated trip generation numbers during the peak hour are presented in Table 8.1, on the basis of the TRICS trip rates and floor area of the proposed commercial/industrial units.

Use Class	Trip Rate (per 100m ²)		Trip Generation		
	Arrivals	Departures	Arrivals	Departures	Total
B1	2.006	0.279	32	4	36
B2	0.212	0.061	5	1	6

Table 8.1: Predicted trip generation for the peak hour 08:00 and 09:00

8.1.4 It is noted that the TRICS assessment has not differentiated between vehicle types. To allow for a robust assessment, it has been assumed that trips associated with B2 uses will be HGVs and larger good vehicles, whilst those associated with B1 uses will be cars and small vans.

8.1.5 Table 8.2 presents measured library data recorded by CSA, which has been used in the subsequent assessment of operational noise.

Sound Source	Measurement Unit	Octave Band Centre Frequency (Hz)								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Car manoeuvring at 4mph (Upper range of measurement data)	L_p at 1m	78	68	61	65	65	57	54	50	68
HGV driving forwards	L_p @ 5m	80	77	71	67	66	65	62	58	72
HGV reversing (with tonal reversing alarm)	L_p @ 5m	77	75	70	64	76	87	64	54	88
Unloading activity (incl. forklifts and trolley)	L_p @ 12m	66	64	59	61	59	59	57	46	65
Car Workshop (ambient)	$L_{p(rev)}$	64	64	67	69	66	63	59	56	71
Tool use within workshop (nut runner)	$L_{p(rev)}$	41	52	61	68	71	72	71	65	77

Table 8.2: Summary of library data used in BS4142 assessment

8.1.6 For the B2 units, noise breakout data is based upon reverberant ambient noise measurements in a car workshop. The assessment also includes further contributions from sporadic use of a nut runner, representative of short-term use of a louder hand tool. External B2 activity includes HGVs driving forward and reversing with reversing alarms, as well as measured loading and unloading activity which includes contributions from forklifts and trolley cages.

8.1.7 As discussed with environmental health, noise assessment of the B1 units is limited to vehicle movements from cars and small vans.

8.1.8 The assessment has been undertaken over a one-hour daytime period given the restricted operational hours of the site. The following timings for each of the operational sources have been used in the one-hour assessment period:

- Workshop ambience: Continuous for 1-hour;
- Tool use: 27 minutes, representative of 80no. 20-second periods;
- HGV movements: 30 seconds forwards, 30 seconds reversing;
- Unloading activity: 10 minutes per HGV;
- Small cars / vans manoeuvring: 20 seconds.

8.1.9 For the assessment, HGV movements and loading/unloading activity are distributed across the units, accordingly.

- 8.1.10 It is assumed that the small vehicle manoeuvres associated with the B1 use will primarily be distributed across the B1 parking spaces. Three larger car parking areas were identified, to the east, south, and in-between, and for the purposes of the assessment, it is assumed that manoeuvres will be equally distributed between these areas.
- 8.1.11 For the assessment, it is assumed that the proposed lightweight cladding system will achieve the following minimum performance, based upon that offered by a Kingspan KS1000RW roof panel (R_w 24dB).

Sound Source	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Minimum sound reduction index of lightweight cladding system, (R)	13	18	20	24	20	29	39	40

Table 8.3: Minimum sound reduction index of cladding system

8.2 ACOUSTIC SCREENING SPECIFICATION

- 8.2.1 As set out in Condition 31, acoustic boundary screening will be constructed in the positions shown on the approved drawing, ref. 16030-400 rev N. These must be constructed prior to the first use of the development and thereafter maintained.
- 8.2.2 The locations of the barriers have been chosen to form a continuous screen in conjunction with the B1 units, Units 12 to Units 20, along the south-east boundary of the site, providing acoustic screening to the two nearest receptors, Copper Beeches and Chaddlewood, from the majority of the B2 industrial units.
- 8.2.3 Whilst the original intention of the acoustic screening and layout re-design was to control noise emissions during the more sensitive night-time period, the developer remains committed to minimising potential noise impact on nearby noise-sensitive receptors through good acoustic design. Therefore, whilst not strictly necessary from a numerical or contextual impact standpoint, moderate specifications have been provided such that the acoustic barriers could provide losses in the region of 10dB at the nearby affected receptors.
- 8.2.4 The following specification is provided for the acoustic barriers, and included in subsequent assessment, in conjunction with the acoustic screening losses achieved through the building massing of the B1 units:
- The barrier is solid, continuous and imperforate;
 - The barrier is constructed with minimum surface mass 10kg/m²;
 - The barrier is at least 3m tall.

8.3 INITIAL BS4142 ASSESSMENT

- 8.3.1 The Specific Sound Level at the nearest noise-sensitive receptors has been calculated following procedures in BS4142. Appendix B details calculations of the Specific Sound Level.
- 8.3.2 The assessment has been made on the basis of the consented operational hours of the development, using the morning peak period, as the worst-case scenario, with peak levels of vehicle movements, normal operation from the B2 units, and typically lower Background Sound Levels than the remaining consented daytime operational period. As no night-time operations are permitted, the assessments have been made to the ground floor windows of the nearest noise-sensitive receptors.
- 8.3.3 Owing to the distances between anticipated sound sources and the receptors, and the high ambient sound levels from the M27, no tonal, impulsive or intermittent characteristics are anticipated to be noticeable at the receptors. As such, no acoustic character corrections have been applied.
- 8.3.4 Due to the relatively large number of commercial/industrial units proposed at the development site, calculations are acoustically complex, with higher levels of uncertainty associated with the various uses permitted. Acoustic screening calculations are therefore simplified, such that a screening loss of 5dB is applied where line-of-sight between the sound source and the receptor is just obscured, and for areas that benefit from more significant acoustic screening, a 10dB loss is applied.
- 8.3.5 At ground floor level, a large majority of the B2 units are likely to be obscured due to the acoustic screening, B1 units and existing boundary fences. To provide a robust assessment, however, it is assumed that noise breakout via the external building fabric will not benefit from screening losses to nearby noise-sensitive receptors. In likelihood, there will be some level of reduction, however, the assessment does not rely on this to reduce uncertainty given the variance in potential noise sources and their locations.
- 8.3.6 A summary of the initial BS4142 assessment at the nearest residential receptors is shown in Table 8.4.

Initial BS4142 Assessment			
Parameter	Copper Beeches	Chaddlewood	Pinewood Park
Assessment Period	08:00 – 09:00 hours		
Specific Sound Level ($L_{Aeq,1hr}$)	55dB	50 dB	54dB
Acoustic character corrections	N/A	N/A	N/A
Rating Level ($L_{A,r,Tr}$)	55dB	50dB	54dB
Background Sound Level (L_{A90})	57dB	52dB	55dB
Assessment level	-3dB	-2dB	-1dB

Table 8.4: Initial BS4142 assessment

- 8.3.7 Where the Rating Level does not exceed the Background Sound Level, this is indicative of a low likelihood of adverse impact, depending on the context.
- 8.3.8 This numerical assessment is based upon a number of pessimistic assumptions, including that all B2 units are simultaneously subject to elevated levels of internal ambient noise simultaneously for the entirety of the assessment period. In the balance of probabilities, it is expected that resultant noise contributions from the commercial development will be lower than calculated.

8.4 CONTEXT & DISCUSSION

- 8.4.1 The assessment has been carried out for a reasonable worst-case one-hour period, in which all assessed sound sources operate concurrently, and during the permitted operational hour when background sound levels are generally at their lowest. In likelihood, noise emissions are likely to be distributed across the day and the Rating Level in any given period would be expected to be lower. The assessment does demonstrate, however, that the proposed layout and outline mitigation measures, are capable of controlling moderate to high levels of noise propagation from the proposed development to appropriate levels at nearby noise-sensitive receptors.
- 8.4.2 Good acoustic design has been considered and integrated into the project to minimise commercial noise impact on nearby noise-sensitive receptors, following feedback and coordination with the environmental health team at Eastleigh Borough Council. The design has progressed such that the majority of noise sources benefit from moderate to high distance propagation losses as well as further acoustic screening losses.
- 8.4.3 All units have their doorways facing towards the centre of the site (i.e. facing away from the nearby dwellings); this is another example of good acoustic design.
- 8.4.4 Operational hours are restricted to daytime hours only. Background sound levels during the daytime period are high at this site due to the location between a motorway and major A-road. The site is therefore generally well suited to industrial activity.
- 8.4.5 The numerical assessment has assumed that all 14 of the Class B2 units will be used for industrial processes such as a car workshop or metal working. In reality it is expected that a number of these units will operate as merchant outlets, or less intensive industrial uses, which would generate significantly lower sound levels.
- 8.4.6 The numerical assessment has been undertaken assuming that all vehicle movements associated with the Class B2 units will be HGVs, and that all HGV movements within a peak hour will occur at a single location close to boundaries with the receptors. In reality some of the trips generated by the industrial units will be from smaller vehicles (such as LGVs), and not all movements will occur in proximity to the site boundaries.
- 8.4.7 The screening losses accounted for in the numerical assessment represent the minimum expected loss for those situations, to allow for a robust assessment. It is expected that a higher degree of screening would be present in the completed development.
- 8.4.8 The survey data was measured using a 5-minute sampling time for the background sound levels. BS4142 suggests measuring the $L_{A90,1\text{hour}}$, which would necessarily be higher than the value used due to statistical distribution.

- 8.4.9 When considered in context, the potential noise impact at the receptors is anticipated to be low.

8.5 UNCERTAINTY

- 8.5.1 As per the requirements of BS4142, the uncertainty in the assessment is considered and reported. This is not an indication of error, but an acknowledgement of possible variability of the factors contributing to the assessment.
- 8.5.2 Use of calibrated type 1 sound level meters reduces measurement instrumentation error to insignificant levels as compared to environmental variations.
- 8.5.3 A wide range of tenants and subsequent noise sources could be expected due to the permitted B1 and B2 use classes, which are not confirmed at the time of this assessment. This introduces inherent uncertainty into the assessment, where it has been necessary to rely on a number of assumptions. Assumptions have been based on a reasonable worst-case whilst considering the scale of the commercial units. These have been agreed with the environmental health department at Eastleigh Borough Council.
- 8.5.4 The source sound level data used in this assessment was measured by CSA, and the context of the measurements is understood and appropriate for use in this assessment.
- 8.5.5 Robust assumptions have been made in relation to sound propagation calculations and operational timings of noise sources, erring on the side of caution.

9.0 CONCLUSION

- 9.1 Clarke Saunders Acoustics has undertaken a noise impact assessment of potential operation noise sources associated with the proposed commercial and industrial units at the Land at Netley Firs, Kanes Hill, Hedge End, Southampton, SO19 6AJ.
- 9.2 An environmental sound survey was conducted, which indicated that the site is subject to relatively high ambient and background sound levels, owing to its proximity to the M27 motorway and A27.
- 9.3 A BS4142 assessment of the proposed commercial and industrial uses has been undertaken to the nearest residential receptors, in which a low risk of adverse impact has been determined.
- 9.4 Good acoustic design and mitigation measures have been incorporated to reduce risk of adverse impact from commercial and industrial noise emissions, including the use of acoustic screening.
- 9.5 This noise impact assessment has demonstrated that the proposed design and mitigation measures implemented, are sufficient to maintain a low noise impact at nearby noise-sensitive receptors.
- 9.6 Condition 25 and Condition 31 of the outline planning application, ref. O/18/82750, can therefore be discharged.



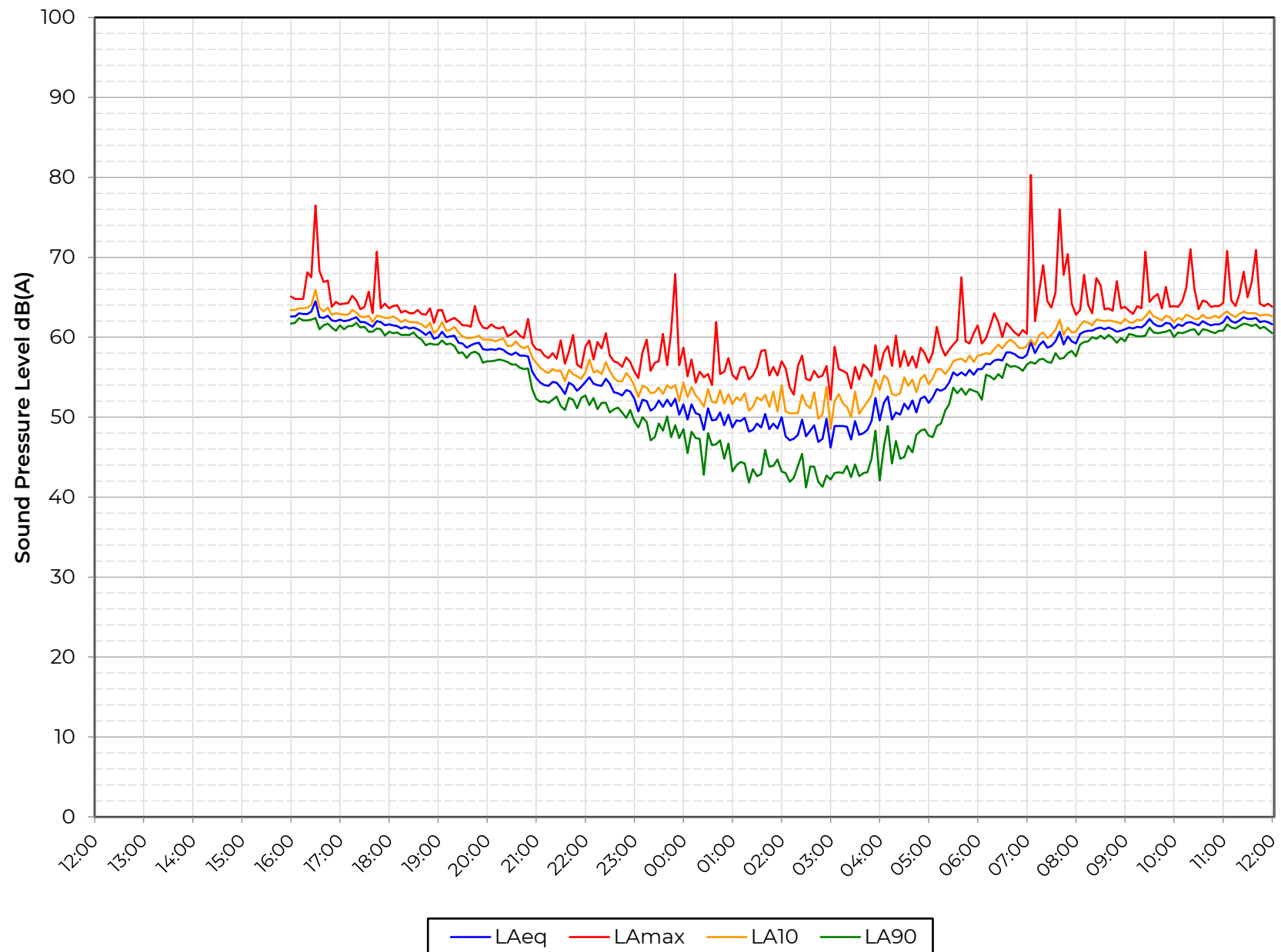
Andrew Nesbitt MIOA
CLARKE SAUNDERS ACOUSTICS



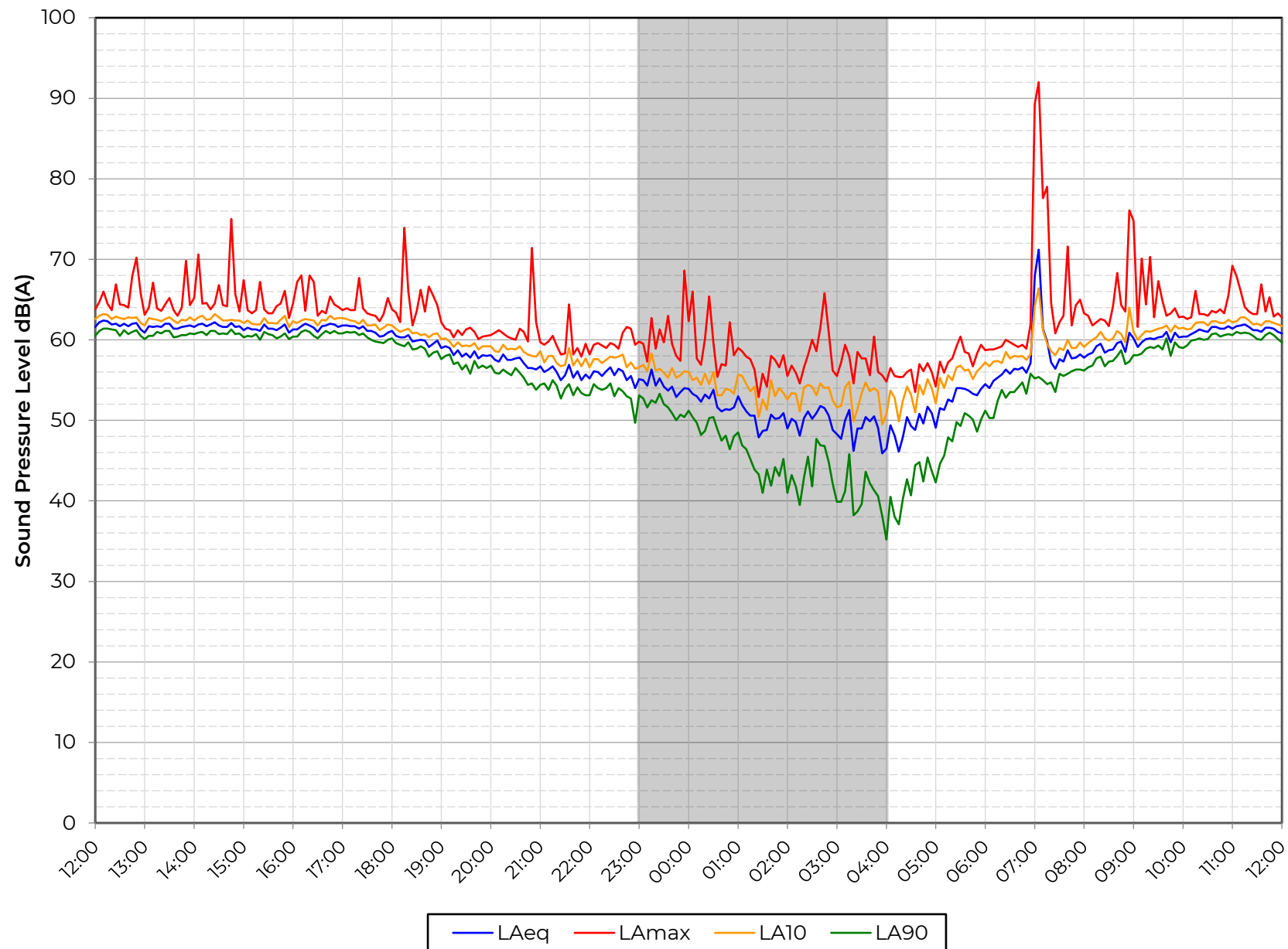
Indicative Site Plan

Figure AS14422/SP1

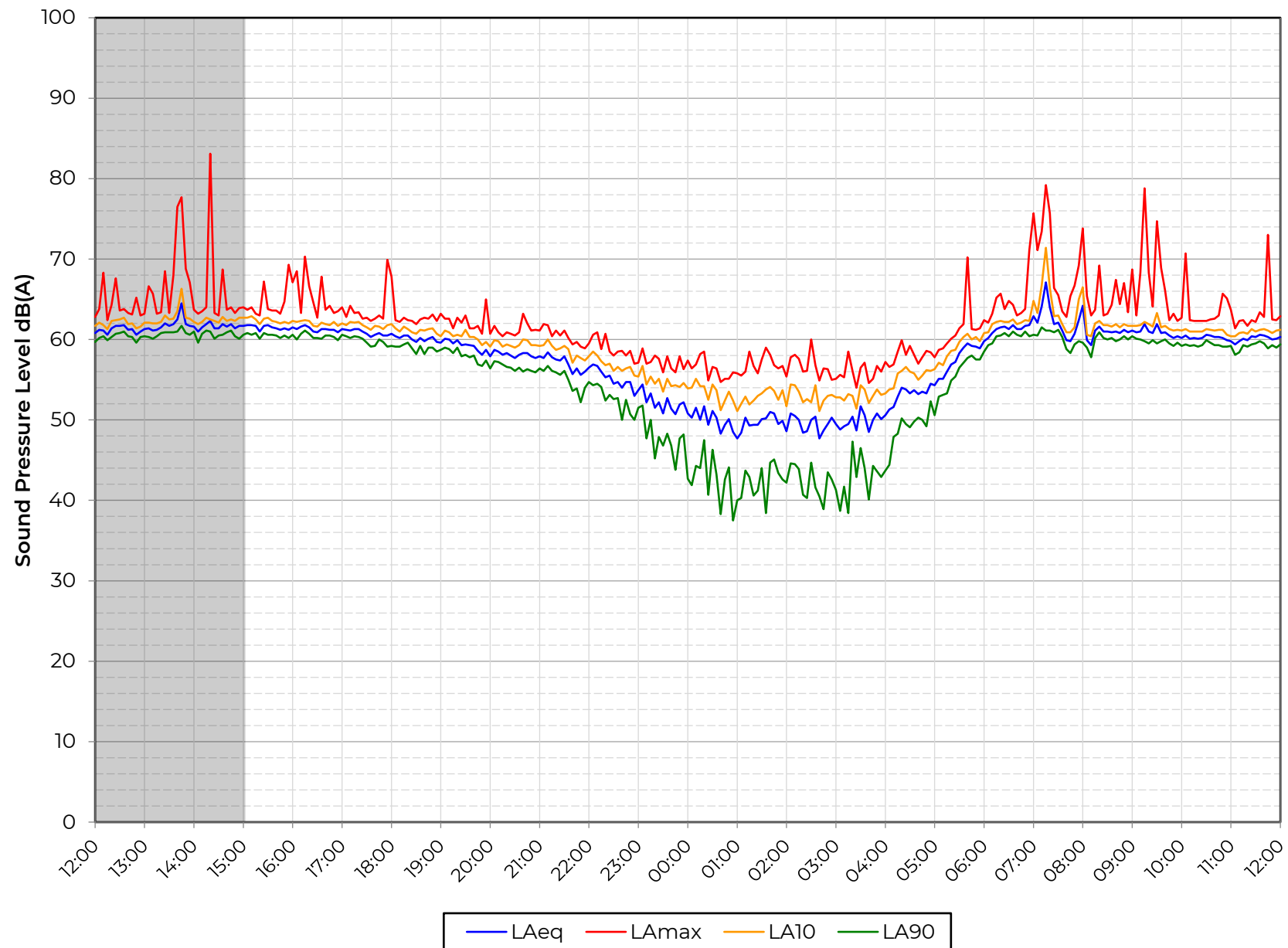
Position LT1



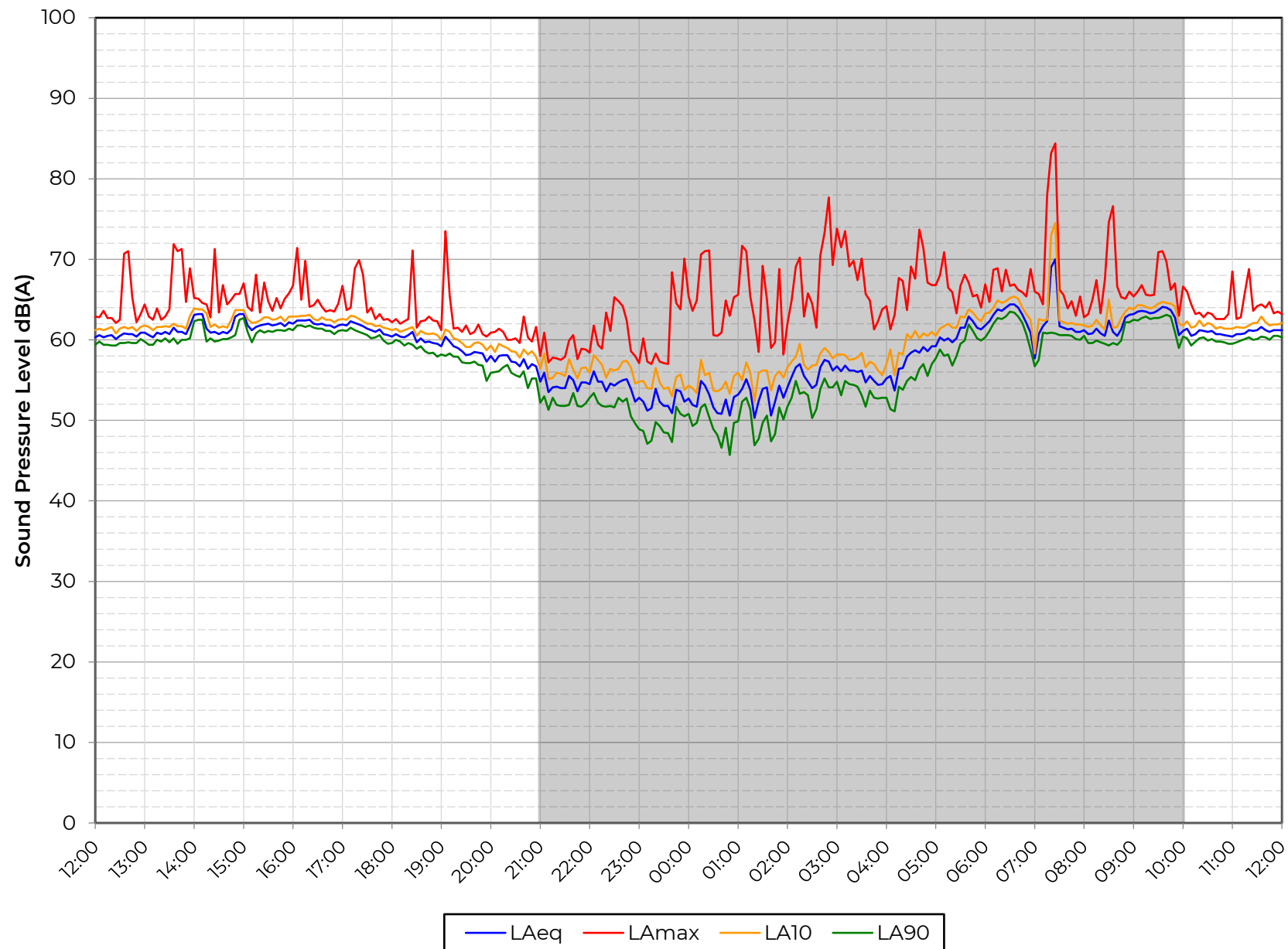
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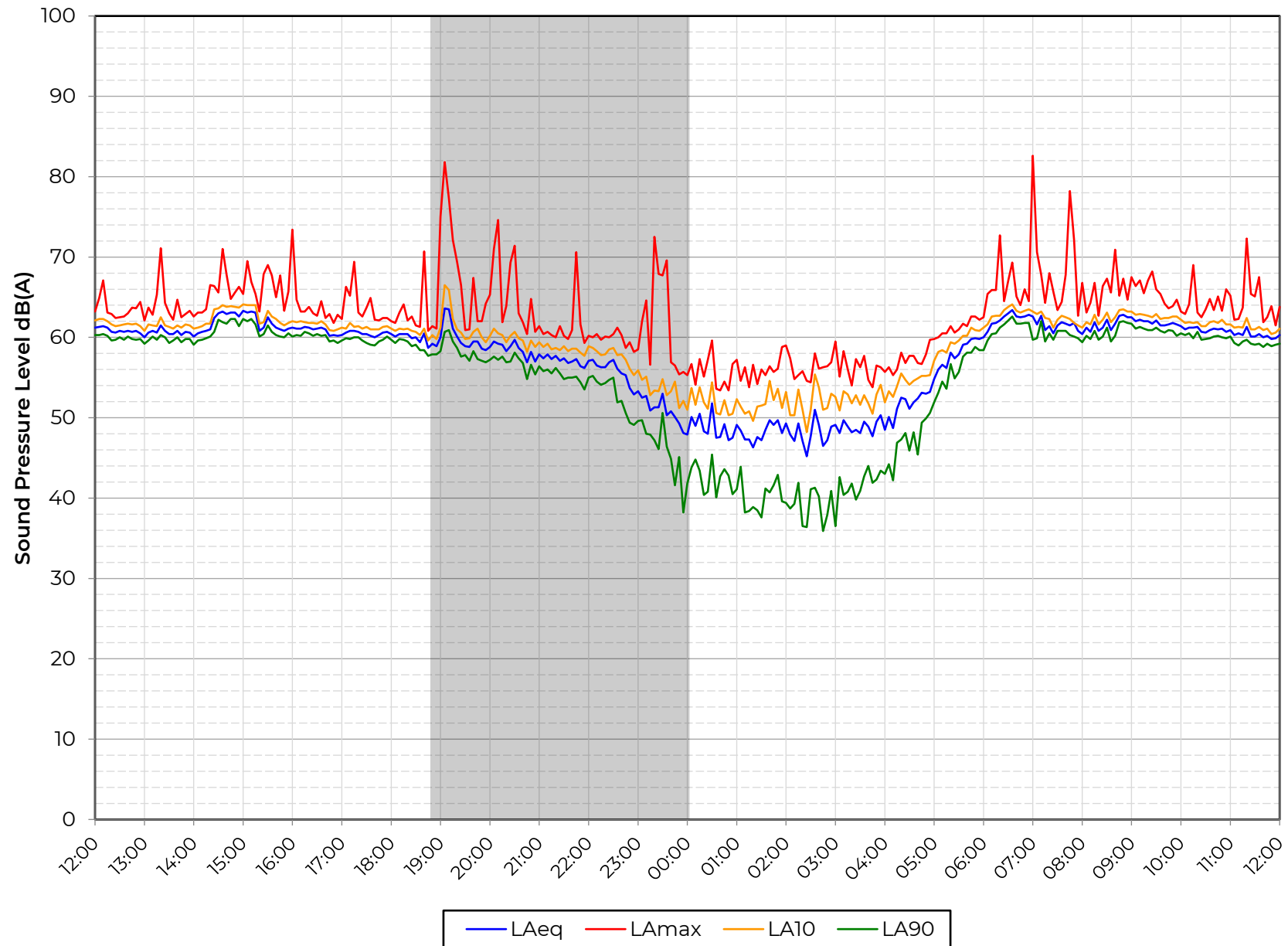
Position LT1



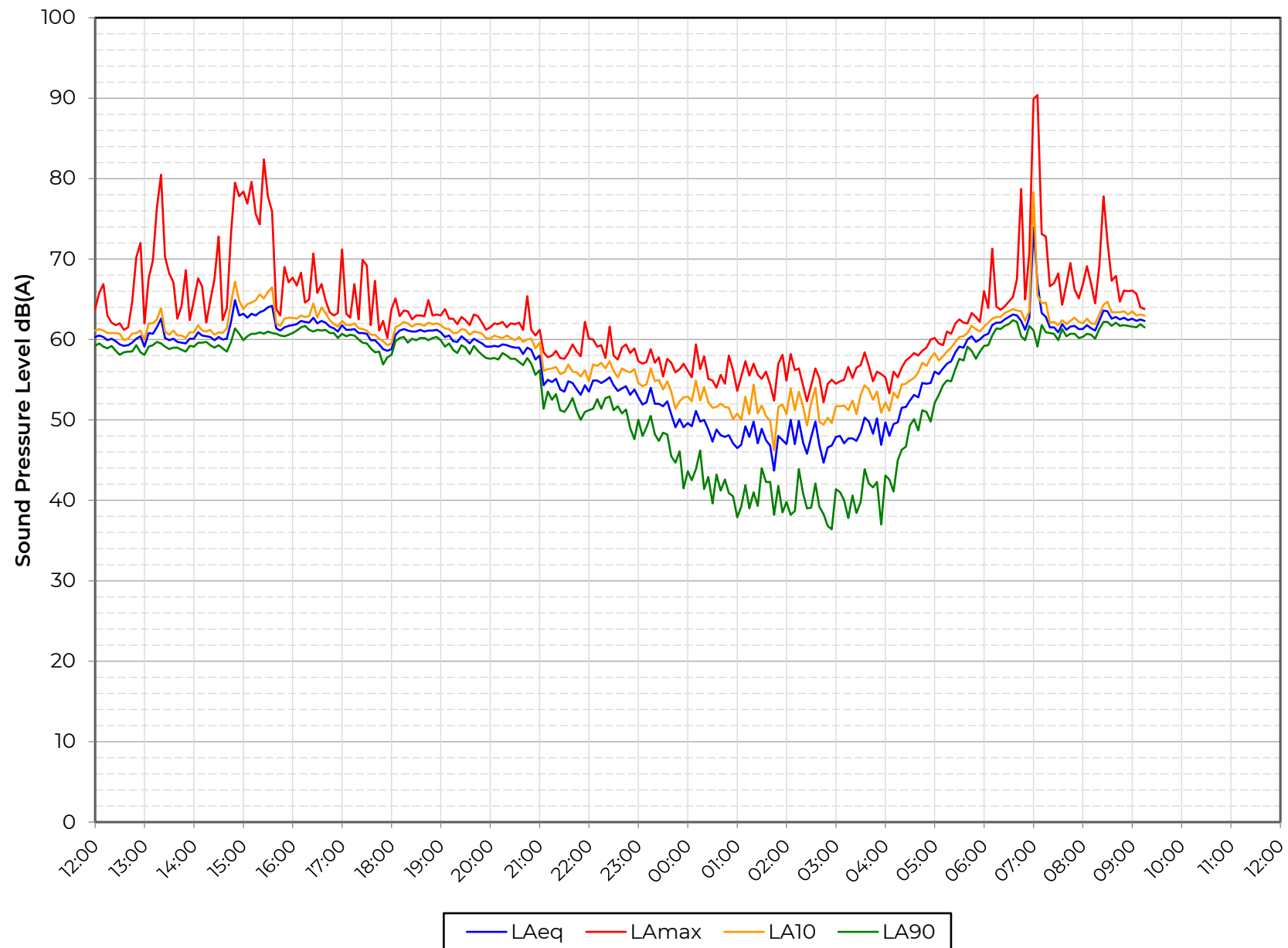
Position LT1



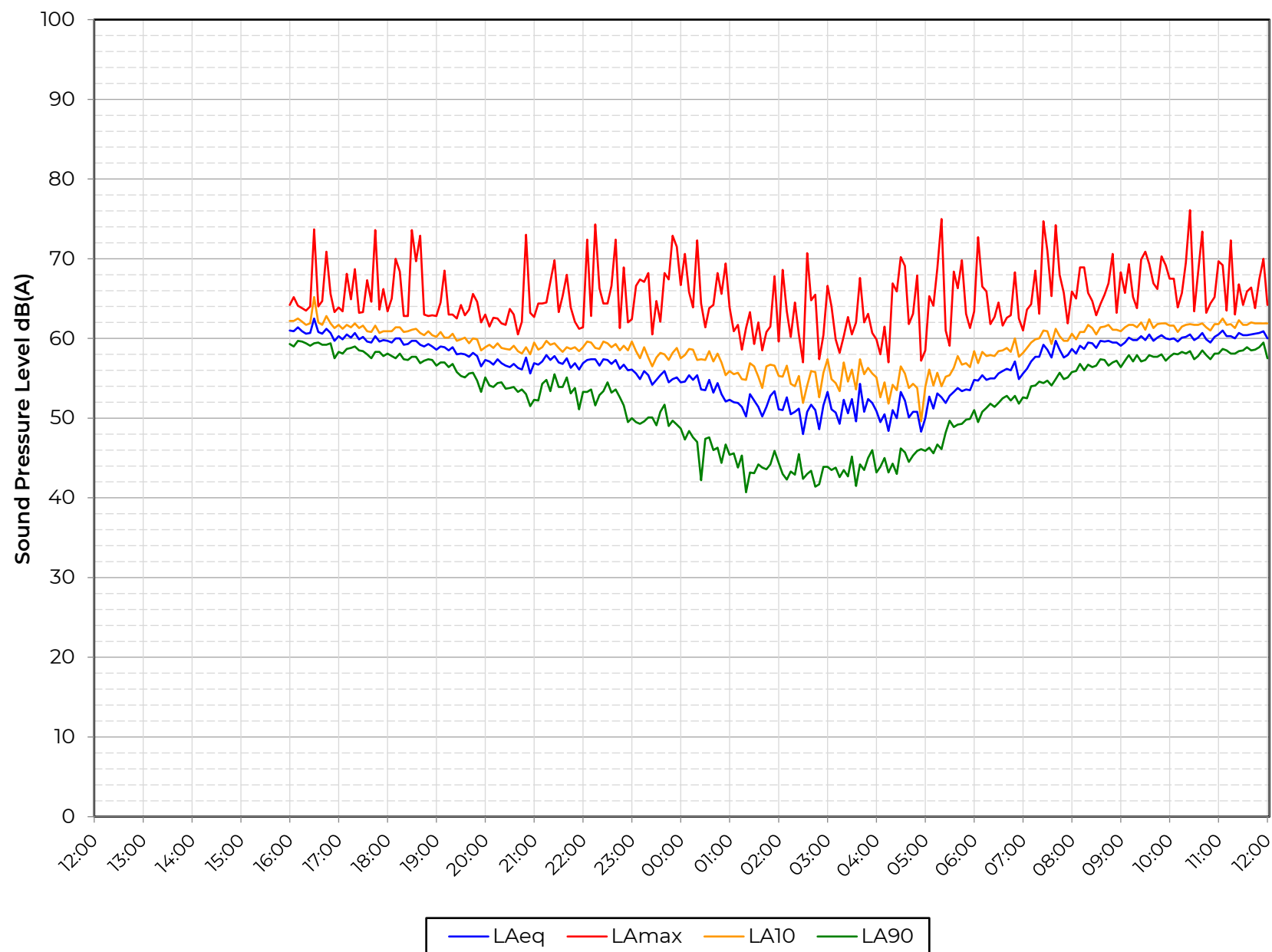
Position LT1



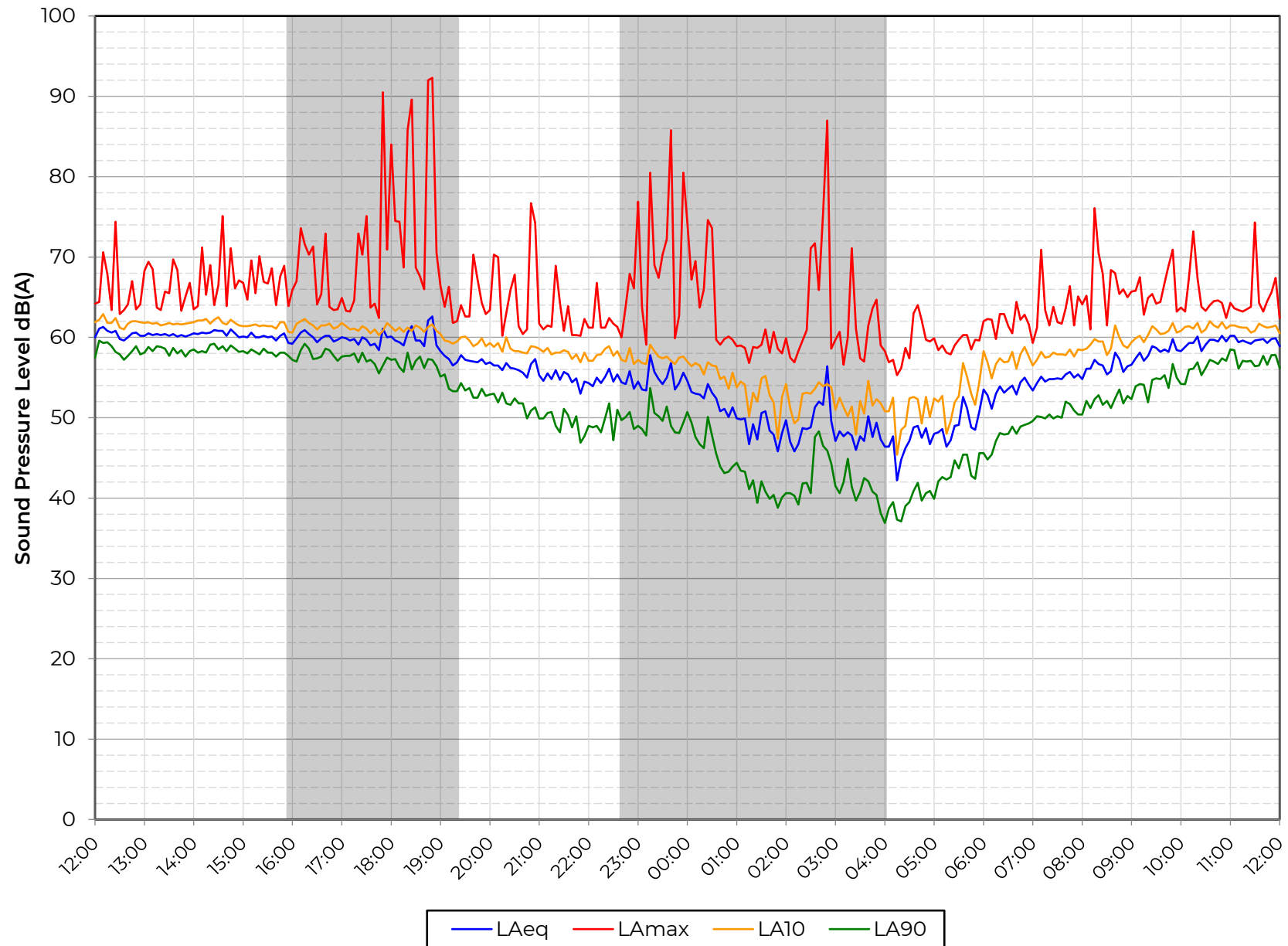
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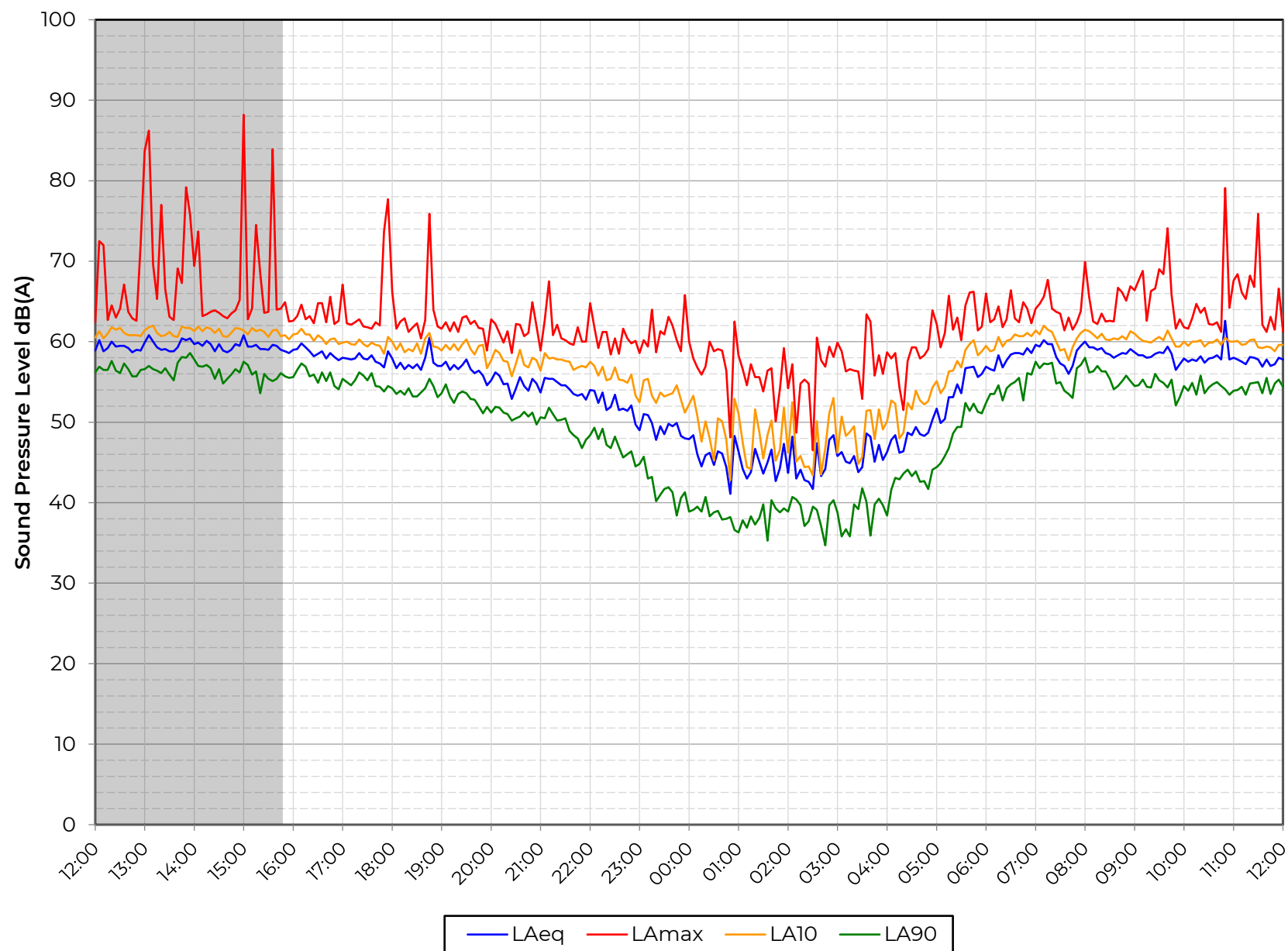
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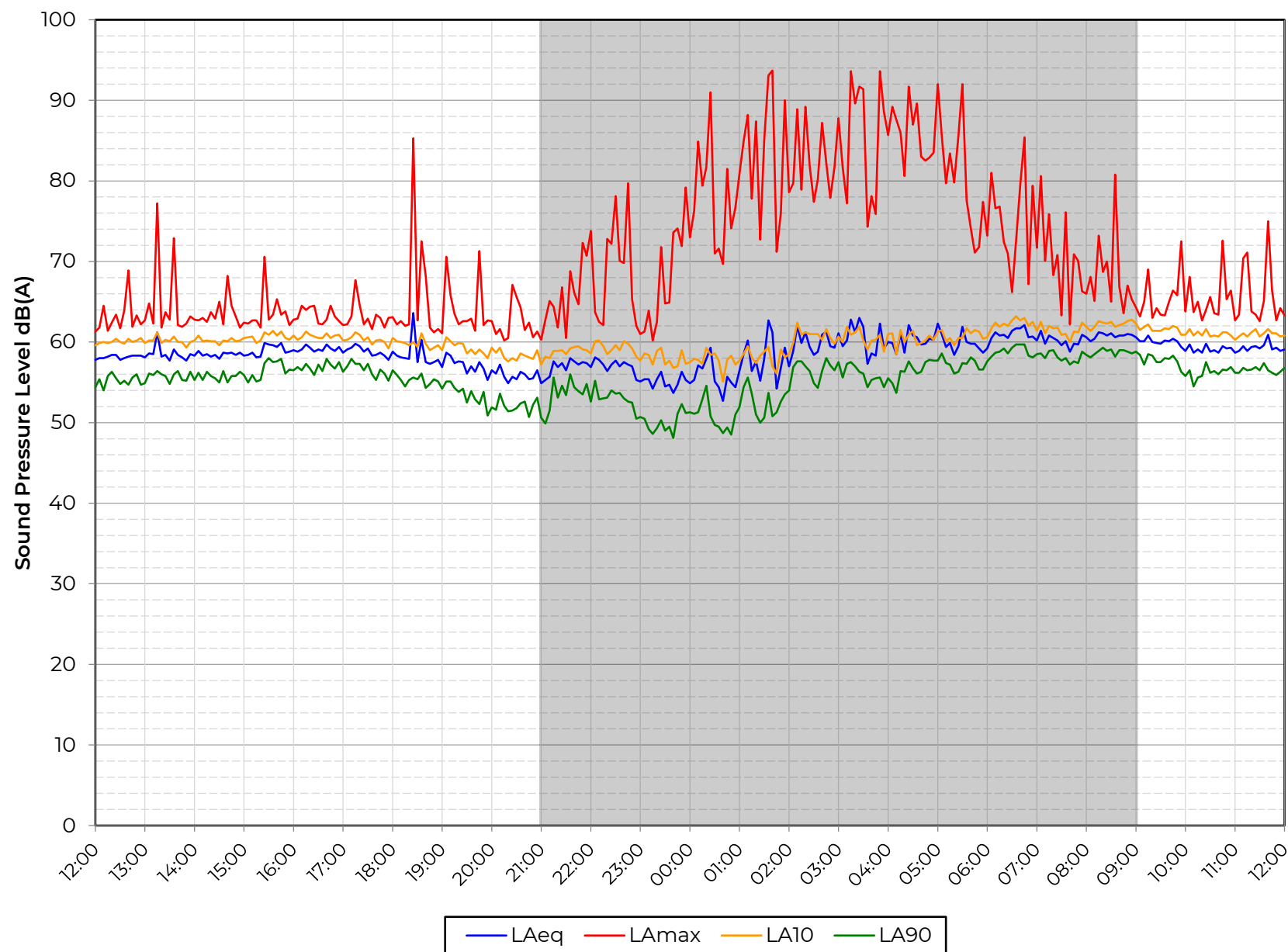
Position LT2



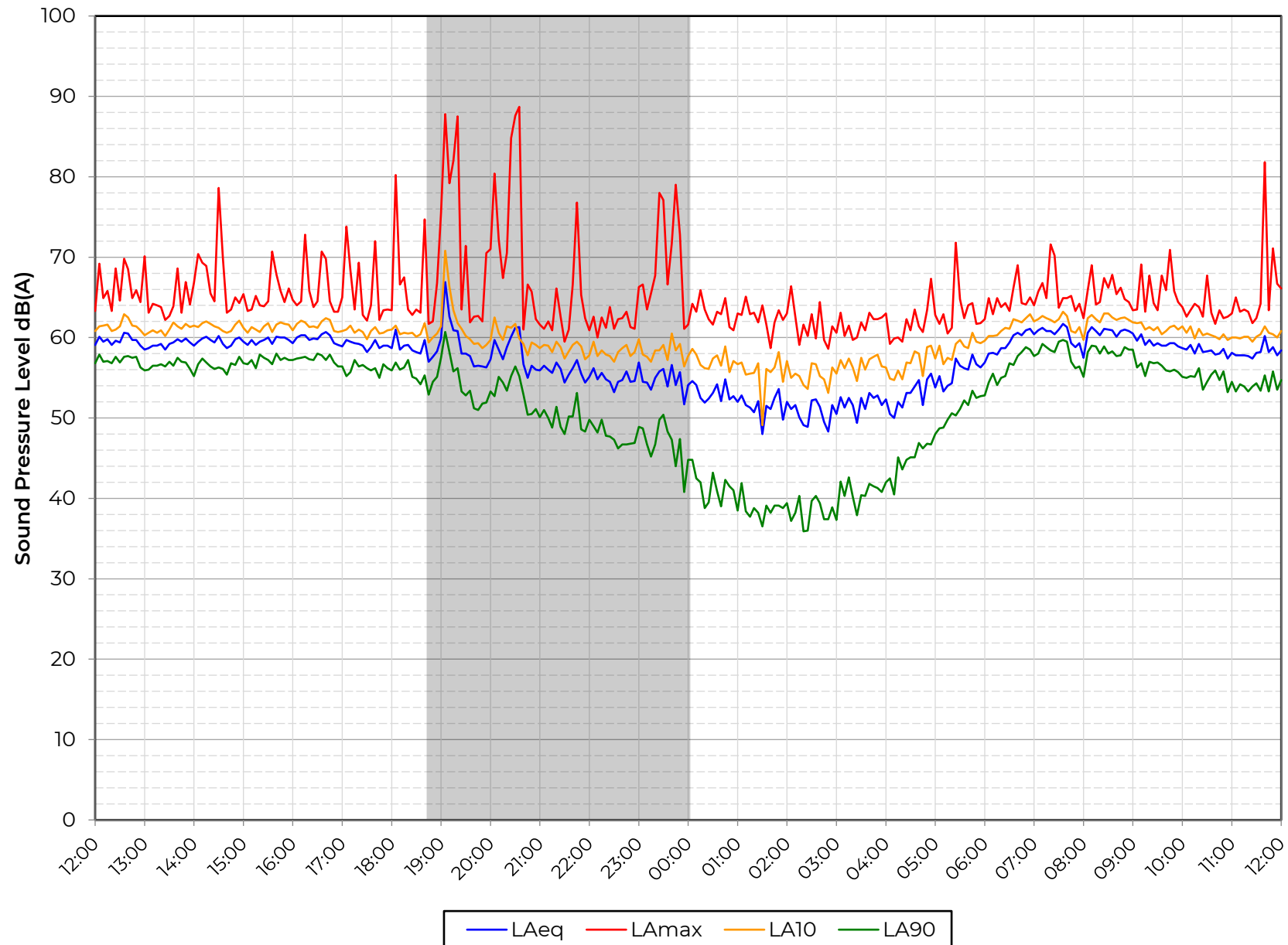
Position LT2



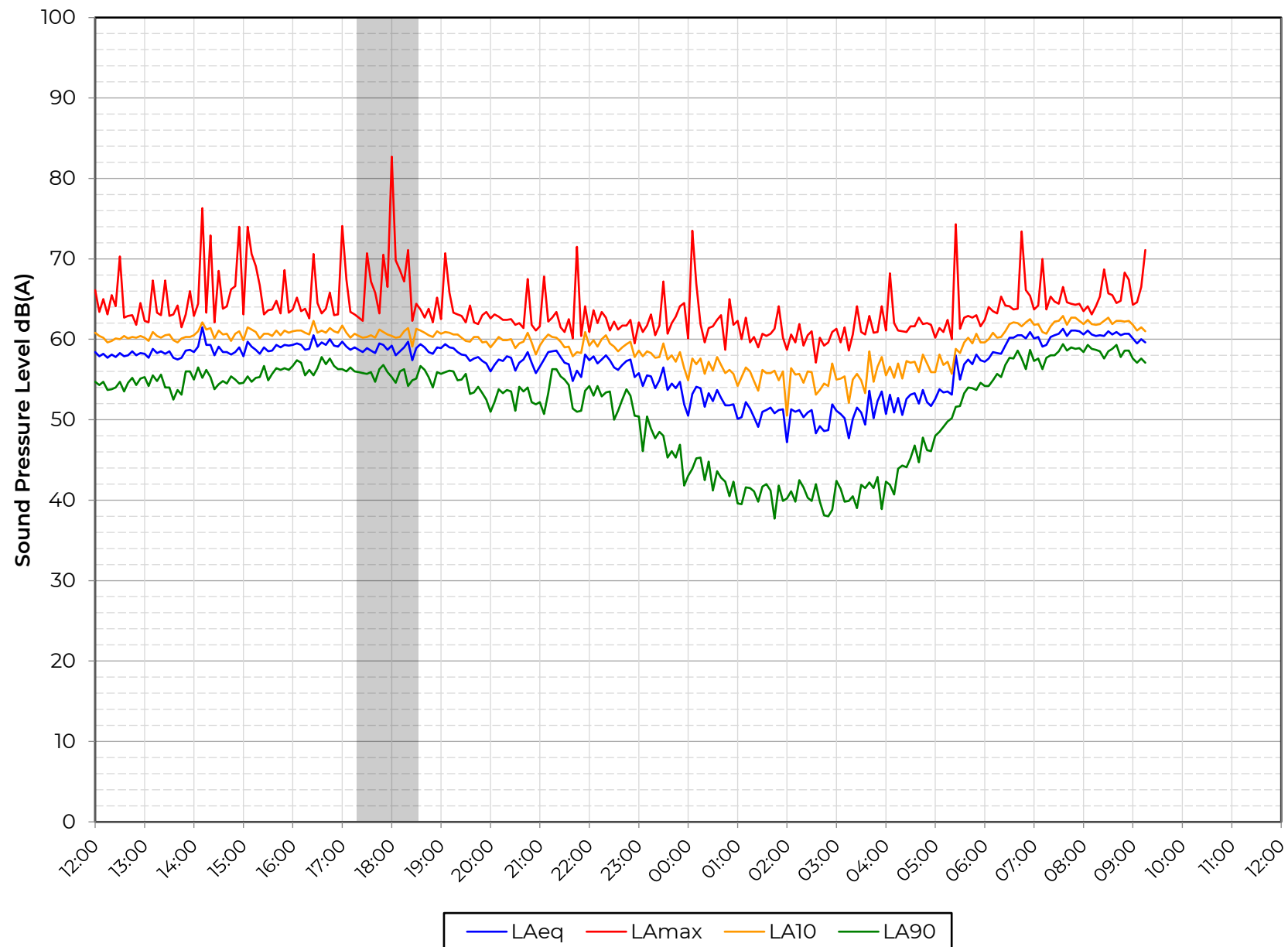
Position LT2

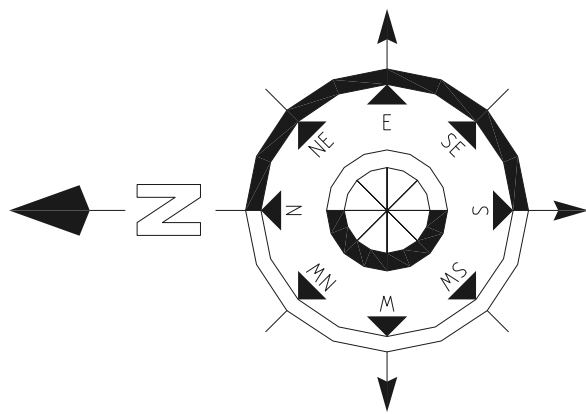


Position LT2



Position LT2





Floor Areas

Units 1-11 & 21-23 B2 use
Total floor area = 2314.00 sqm

Units 12-20 B1 use
Total floor area = 3311.00 sqm

Parking

parking spaces - 135
disabled spaces - 23
secure cycle spaces - 36

existing trees surveyed

RPA's

TPO locations

woodland gravel
pedestrian footpath

N	Acoustic fence repositioned between units 15 - 16	mv	05.02.20	
M	6.0m landscape zone noted	mv	05.06.19	
L	Acoustic fence indicated, 6.0m corridor indicated	mv	04.06.19	
K	Units 12-20 revised, car parking revised	mv	13.05.19	
J	Units 12-20 revised, car parking revised	mv	13.05.19	
H	Car parking amended	mv	06.03.19	
G	Woodland footpath revised, FFLs indicated, existing trees updated	mv	06.03.19	
F	Woodland footpath revised	mv	20.08.18	
E	Surveyed trees added, Unit sizes adjusted	mv	15.08.18	
D	Layout revised to include additional unit & parking	mv	11.04.18	
C	SW Main indicated	mv	05.03.18	
B	Layout revised	mv	16.02.18	
A	Layout revised	mv	13.02.18	
.	Original issue			
Rev			Dwn / Date	Chk / Date

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Scaled dimensions are not to be used for construction

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PROJECT

Proposed Development
Netley Firs, Kanes Hill
Hedge End, Southampton

CLIENT

Redlane Ltd

DRAWING TITLE

Site Plan
TPO Areas

PROJECT NO. 16030
DRAWING NO. 400
REV. N
SCALE 1:500 @A1

Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A .
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90}:	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max}:	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.
NR	<i>Noise Rating</i> . A single figure noise level rating that takes into account the frequency content of an acoustic environment.
R	<i>Sound Reduction Index</i> . Effectively the Level Difference of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room.
D	The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a

sound source on one side and the reverberant characteristics of the adjoining 'receive' space. D is the arithmetic Level Difference in decibels between the source and receive sound levels when filtered into frequency bands.

D_{nT}	<i>Weighted Standardised Level Difference.</i> As defined in BS EN ISO 717-1, representing the Weighted Level Difference, when standardised for reference receiving room reverberant characteristics.
$D_{n,e}$	Normalised sound insulation of small building elements of fixed dimensions, such as vents, measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010.
$D_{n,f}$	Flanking sound insulation of lightweight elements, such as curtain wall mullions, measured in an accredited laboratory test suite in accordance with the procedures laid down in ISO 10848-2:2006
$R_w D_w$ $D_{nT,w} D_{n,e,w}$ $D_{n,f,w}$	Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value.
C, C_{tr}	Spectral adaptation terms to be added to a single number quantity such as $D_{nT,w}$, to take account of the sound insulation within frequency ranges of particular interest.
$L'_{nT,w}$	<i>Weighted Standardised Impact Sound Pressure Level</i> as defined in BS EN ISO 717-2, representing the level of sound pressure when measured within a space where the floor above is under excitation from a calibrated tapping machine, standardised for the receiving room reverberant characteristics.
ΔL_w	Change in impact sound pressure level when a floor is fitted with a 'soft' or resilient covering, as measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-3:2010.

Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band.

In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
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Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other

experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if they climb up a ladder (and are closer to the top of the barrier) than if they were standing at ground level. Equally if they sat on the ground the sound would seem quieter than if standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.

Copper Beeches

Industrial Activity (B2 Use) to Copper Beeches		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Units 21-23</u>										
General workshop ambient	Lp(rev)	64	64	67	69	66	63	59	56	71
Number of	3no	5	5	5	5	5	5	5	5	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	1 - Unit 21	-29	-29	-29	-29	-29	-29	-29	-29	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Façade + Roof Area Correction	140.0m ²	21	21	21	21	21	21	21	21	
Specific sound level at receptor	L _{eq 1hr}	48	43	44	42	43	31	17	13	45

Industrial Activity (B2 Use) to Copper Beeches		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Units 21-23</u>										
Nut runner in workshop	Lp(rev)	41	52	61	68	71	72	71	65	77
Number in a 1 hour period	80	-	-	-	-	-	-	-	-	
Time of each use (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-4	-4	-4	-4	-4	-4	-4	-4	
Number of	3no	5	5	5	5	5	5	5	5	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	1 - Unit 21	-29	-29	-29	-29	-29	-29	-29	-29	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Façade + Roof Area Correction	140.0m ²	21	21	21	21	21	21	21	21	
Specific sound level at receptor	L _{eq 1hr}	21	27	34	37	45	36	25	18	46

Industrial Activity (B2 Use) to Copper Beeches		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 1</u>										
General workshop ambient	Lp(rev)	64	64	67	69	66	63	59	56	71
Number of	1no	0	0	0	0	0	0	0	0	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	2 - Unit 1 t	-30	-30	-30	-30	-30	-30	-30	-30	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Front & Side Façade Area Correction	169.0m ²	22	22	22	22	22	22	22	22	
Specific sound level at receptor	L _{eq 1hr}	44	38	40	37	39	26	13	8	41

Industrial Activity (B2 Use) to Copper Beeches		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 1</u>										
Nut runner in workshop	Lp(rev)	41	52	61	68	71	72	71	65	77
Number in a 1 hour period	80	-	-	-	-	-	-	-	-	
Time of each use (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-4	-4	-4	-4	-4	-4	-4	-4	
Number of	1no	0	0	0	0	0	0	0	0	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	2 - Unit 1 t	-30	-30	-30	-30	-30	-30	-30	-30	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Front & Side Façade Area Correction	169.0m ²	22	22	22	22	22	22	22	22	
Specific sound level at receptor	L _{eq 1hr}	17	23	30	33	40	32	21	14	41

APPENDIX C

AS14422 - Kane's Hill, Hedge End SUMMARY OF BS4142 CALCULATIONS

Vehicle Movements (B2 Use) to Copper Beeches		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Forwards	Lp @ 5m	80	77	71	67	66	65	62	58	72
Number in a 1 hour period	6	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-13	-13	-13	-13	-13	-13	-13	-13	
Lorry Forwards		67	64	58	54	53	52	49	45	
Screening Loss	Line of Sight	-5	-5	-5	-5	-5	-5	-5	-5	
Distance Loss	45m	-19	-19	-19	-19	-19	-19	-19	-19	
Specific sound level at receptor	$L_{eq\ 1hr}$	43	40	34	30	29	28	25	21	

Vehicle Movements (B2 Use) to Copper Beeches		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Reverse (incl. beeper)	Lp @ 5m	77	75	70	64	76	87	64	54	88
Number in a 1 hour period	6	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-13	-13	-13	-13	-13	-13	-13	-13	
Lorry Reverse (incl. beeper)		64	62	57	51	63	74	51	41	
Screening Loss	Line of Sight	-5	-5	-5	-5	-5	-5	-5	-5	
Distance Loss	45m	-19	-19	-19	-19	-19	-19	-19	-19	
Specific sound level at receptor	$L_{eq\ 1hr}$	40	38	33	27	39	50	27	17	

Unloading Activity (B2 Use) to Copper Beeches		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unloading Activity	Lp @ 12m	66	64	59	61	59	59	57	46	65
Number in a 1 hour period	6	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	600	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		0	0	0	0	0	0	0	0	
Unloading Activity		66	64	59	61	59	59	57	46	
Screening Loss	Line of Sight	-5	-5	-5	-5	-5	-5	-5	-5	
Distance Loss	45m	-11	-11	-11	-11	-11	-11	-11	-11	
Specific sound level at receptor	$L_{eq\ 1hr}$	50	48	43	45	43	43	41	30	

B1 Vehicle Movements to Copper Beeches (Area1)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manoeuvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manoeuvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	127m	-42	-42	-42	-42	-42	-42	-42	-42	
Specific sound level at receptor	$L_{eq\ 1hr}$	14	4	0	1	1	0	0	0	

B1 Vehicle Movements to Copper Beeches (Area2)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manoeuvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manoeuvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	93m	-39	-39	-39	-39	-39	-39	-39	-39	
Specific sound level at receptor	$L_{eq\ 1hr}$	17	7	0	4	4	0	0	0	

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B1 Vehicle Movements to Copper Beeches (Area3)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manouvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manouvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	11
Distance Loss	60m	-36	-36	-36	-36	-36	-36	-36	-36	
Specific sound level at receptor	L _{eq} 1hr	20	11	4	8	8	0	0	0	11

Cumulative sound level at receptor	L _{eq} 1hr	53	50	48	48	50	51	41	31	55
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APPENDIX C

AS14422 - Kane's Hill, Hedge End SUMMARY OF BS4142 CALCULATIONS

Chaddlewood

Industrial Activity (B2 Use) to Chaddlewood		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unit 21										
General workshop ambient	Lp(rev)	64	64	67	69	66	63	59	56	71
Number of	1no	0	0	0	0	0	0	0	0	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	3 - Unit 21	-29	-29	-29	-29	-29	-29	-29	-29	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Side Façade Area Correction	104.0m ²	20	20	20	20	20	20	20	20	
Specific sound level at receptor	L_{eq} 1hr	32	27	28	25	27	15	1	-3	29

Industrial Activity (B2 Use) to Chaddlewood		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unit 21										
Nut runner in workshop	Lp(rev)	41	52	61	68	71	72	71	65	77
Number in a 1 hour period	80	-	-	-	-	-	-	-	-	
Time of each use (minutes)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-4	-4	-4	-4	-4	-4	-4	-4	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	3 - Unit 21	-29	-29	-29	-29	-29	-29	-29	-29	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Side Façade Area Correction	104.0m ²	20	20	20	20	20	20	20	20	
Specific sound level at receptor	L_{eq} 1hr	5	11	18	21	28	20	9	2	30

Industrial Activity (B2 Use) to Chaddlewood		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unit 11										
General workshop ambient	Lp(rev)	64	64	67	69	66	63	59	56	71
Number of	1no	0	0	0	0	0	0	0	0	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	4 - Unit 11	-27	-27	-27	-27	-27	-27	-27	-27	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Front & Side Façade Area Correction	169.0m ²	22	22	22	22	22	22	22	22	
Specific sound level at receptor	L_{eq} 1hr	37	31	33	30	32	19	6	2	34

Industrial Activity (B2 Use) to Chaddlewood		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unit 11										
Nut runner in workshop	Lp(rev)	41	52	61	68	71	72	71	65	77
Number in a 1 hour period	80	-	-	-	-	-	-	-	-	
Time of each use (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-4	-4	-4	-4	-4	-4	-4	-4	
Number of	1no	0	0	0	0	0	0	0	0	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	4 - Unit 11	-27	-27	-27	-27	-27	-27	-27	-27	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Front & Side Façade Area Correction	169.0m ²	22	22	22	22	22	22	22	22	
Specific sound level at receptor	L_{eq} 1hr	10	16	23	26	33	25	14	7	34

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AS14422 - Kane's Hill, Hedge End SUMMARY OF BS4142 CALCULATIONS

Vehicle Movements (B2 Use) to Chaddlewood		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Forwards	Lp @ 5m	80	77	71	67	66	65	62	58	72
Number in a 1 hour period	6	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-13	-13	-13	-13	-13	-13	-13	-13	
Lorry Forwards		67	64	58	54	53	52	49	45	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	40m	-18	-18	-18	-18	-18	-18	-18	-18	
Specific sound level at receptor	L _{eq} 1hr	39	36	30	26	25	24	21	17	

Vehicle Movements (B2 Use) to Chaddlewood		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Reverse (incl. beeper)	Lp @ 5m	77	75	70	64	76	87	64	54	88
Number in a 1 hour period	6	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-13	-13	-13	-13	-13	-13	-13	-13	
Lorry Reverse (incl. beeper)		64	62	57	51	63	74	51	41	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	40m	-18	-18	-18	-18	-18	-18	-18	-18	
Specific sound level at receptor	L _{eq} 1hr	36	34	29	23	35	46	23	13	

Unloading Activity (B2 Use) to Chaddlewood		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unloading Activity	Lp @ 12m	66	64	59	61	59	59	57	46	65
Number in a 1 hour period	6	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	600	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		0	0	0	0	0	0	0	0	
Unloading Activity		66	64	59	61	59	59	57	46	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	40m	-10	-10	-10	-10	-10	-10	-10	-10	
Specific sound level at receptor	L _{eq} 1hr	46	44	39	41	39	39	37	26	

B1 Vehicle Movements to Chaddlewood (Area1)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manoeuvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manoeuvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	60m	-36	-36	-36	-36	-36	-36	-36	-36	
Specific sound level at receptor	L _{eq} 1hr	20	11	4	8	8	0	0	0	

B1 Vehicle Movements to Chaddlewood (Area2)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manoeuvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manoeuvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	74m	-37	-37	-37	-37	-37	-37	-37	-37	
Specific sound level at receptor	L _{eq} 1hr	19	9	2	6	6	0	0	0	

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B1 Vehicle Movements to Chaddlewood (Area3)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manoeuvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manoeuvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	9
Distance Loss	97m	-40	-40	-40	-40	-40	-40	-40	-40	
Specific sound level at receptor	L _{eq 1hr}	16	7	0	3	4	0	0	0	9

Cumulative sound level at receptor	L _{eq 1hr}	47	45	41	42	42	46	37	27	50
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Pinewood Park

Industrial Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 6</u>										
General workshop ambient	Lp(rev)	64	64	67	69	66	63	59	56	71
Number of	3no	5	5	5	5	5	5	5	5	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	6 - Unit 6	-28	-28	-28	-28	-28	-28	-28	-28	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Rear Façade & Roof Area Correction	165.0m ²	22	22	22	22	22	22	22	22	
Specific sound level at receptor	L _{eq 1hr}	50	45	46	43	45	33	19	15	47

Industrial Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 6</u>										
Nut runner in workshop	Lp(rev)	41	52	61	68	71	72	71	65	77
Number in a 1 hour period	80	-	-	-	-	-	-	-	-	
Time of each use (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-4	-4	-4	-4	-4	-4	-4	-4	
Number of	3no	5	5	5	5	5	5	5	5	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	6 - Unit 6	-28	-28	-28	-28	-28	-28	-28	-28	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Rear Façade & Roof Area Correction	165.0m ²	22	22	22	22	22	22	22	22	
Specific sound level at receptor	L _{eq 1hr}	23	29	36	39	46	38	27	20	48

Industrial Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 9</u>										
General workshop ambient	Lp(rev)	64	64	67	69	66	63	59	56	71
Number of	3no	5	5	5	5	5	5	5	5	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	7 - Unit 9	-29	-29	-29	-29	-29	-29	-29	-29	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Rear Façade & Roof Area Correction	135.0m ²	21	21	21	21	21	21	21	21	
Specific sound level at receptor	L _{eq 1hr}	48	43	44	41	43	30	17	13	45

Industrial Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 9</u>										
Nut runner in workshop	Lp(rev)	41	52	61	68	71	72	71	65	77
Number in a 1 hour period	80	-	-	-	-	-	-	-	-	
Time of each use (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-4	-4	-4	-4	-4	-4	-4	-4	
Number of	3no	5	5	5	5	5	5	5	5	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	7 - Unit 9	-29	-29	-29	-29	-29	-29	-29	-29	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Rear Façade & Roof Area Correction	135.0m ²	21	21	21	21	21	21	21	21	
Specific sound level at receptor	L _{eq 1hr}	21	27	34	37	44	36	25	18	46

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Industrial Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 5</u>										
General workshop ambient	Lp(rev)	64	64	67	69	66	63	59	56	71
Number of	1no	0	0	0	0	0	0	0	0	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	5 - Unit 5	-27	-27	-27	-27	-27	-27	-27	-27	
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Side Façade Area Correction	104.0m ²	20	20	20	20	20	20	20	20	
Specific sound level at receptor	L _{eq 1hr}	44	39	40	37	39	27	13	9	41

Industrial Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Unit 5</u>										
Nut runner in workshop	Lp(rev)	41	52	61	68	71	72	71	65	77
Number in a 1 hour period	80	-	-	-	-	-	-	-	-	
Time of each use (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-4	-4	-4	-4	-4	-4	-4	-4	
Number of	1no	0	0	0	0	0	0	0	0	
Sound Reduction Index	KS1000RW	-13	-18	-20	-24	-20	-29	-39	-40	
Rathe Decay	5 - Unit 5	-27	-27	-27	-27	-27	-27	-27	-27	42
Screening Loss	No Screen	0	0	0	0	0	0	0	0	
Side Façade Area Correction	104.0m ²	20	20	20	20	20	20	20	20	
Specific sound level at receptor	L _{eq 1hr}	17	23	30	33	40	32	21	14	

Vehicle Movements (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Forwards	Lp @ 5m	80	77	71	67	66	65	62	58	72
Number in a 1 hour period	2	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-18	-18	-18	-18	-18	-18	-18	-18	
Screening Loss	Line of Sig	-5	-5	-5	-5	-5	-5	-5	-5	
Distance Loss	80m	-24	-24	-24	-24	-24	-24	-24	-24	
Specific sound level at receptor	L _{eq 1hr}	33	30	24	20	20	18	15	11	25

Vehicle Movements (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Reverse (incl. beeper)	Lp @ 5m	77	75	70	64	76	87	64	54	88
Number in a 1 hour period	2	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-18	-18	-18	-18	-18	-18	-18	-18	
Screening Loss	Line of Sig	-5	-5	-5	-5	-5	-5	-5	-5	
Distance Loss	80m	-24	-24	-24	-24	-24	-24	-24	-24	
Specific sound level at receptor	L _{eq 1hr}	30	28	24	17	29	40	17	7	41

Unloading Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unloading Activity	Lp @ 12m	66	64	59	61	59	59	57	46	65
Number in a 1 hour period	2	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	120	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Screening Loss	Line of Sig	-5	-5	-5	-5	-5	-5	-5	-5	
Distance Loss	80m	-16	-16	-16	-16	-16	-16	-16	-16	
Specific sound level at receptor	L _{eq 1hr}	33	31	26	28	26	26	24	13	32

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Vehicle Movements (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Forwards	Lp @ 5m	80	77	71	67	66	65	62	58	72
Number in a 1 hour period	4	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-15	-15	-15	-15	-15	-15	-15	-15	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	90m	-25	-25	-25	-25	-25	-25	-25	-25	22
Specific sound level at receptor	L _{eq} 1hr	30	27	21	17	17	15	12	8	

Vehicle Movements (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Lorry Reverse (incl. beeper)	Lp @ 5m	77	75	70	64	76	87	64	54	88
Number in a 1 hour period	4	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	30	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-15	-15	-15	-15	-15	-15	-15	-15	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	90m	-25	-25	-25	-25	-25	-25	-25	-25	38
Specific sound level at receptor	L _{eq} 1hr	27	25	20	14	26	37	14	4	

Unloading Activity (B2 Use) to Pinewood Park		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Unloading Activity	Lp @ 12m	66	64	59	61	59	59	57	46	65
Number in a 1 hour period	4	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	600	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-2	-2	-2	-2	-2	-2	-2	-2	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	90m	-18	-18	-18	-18	-18	-18	-18	-18	36
Specific sound level at receptor	L _{eq} 1hr	37	35	30	32	30	30	28	17	

B1 Vehicle Movements to Pinewood Park (Area1)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manouvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manouvre		66	57	49	53	53	45	42	38	
Screening Loss	Line of Sight	-5	-5	-5	-5	-5	-5	-5	-5	12
Distance Loss	97m	-40	-40	-40	-40	-40	-40	-40	-40	
Specific sound level at receptor	L _{eq} 1hr	21	12	5	8	9	1	0	0	

B1 Vehicle Movements to Pinewood Park (Area2)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manouvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manouvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	8
Distance Loss	113m	-41	-41	-41	-41	-41	-41	-41	-41	
Specific sound level at receptor	L _{eq} 1hr	15	5	0	2	2	0	0	0	

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B1 Vehicle Movements to Pinewood Park (Area3)		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Upper Range Car Manouvre	Lp @ 1m	78	68	61	65	65	57	54	50	68
Number in a 1 hour period	12	-	-	-	-	-	-	-	-	
Time of each movement (seconds)	20	-	-	-	-	-	-	-	-	
Correction to 1 hour Leq		-12	-12	-12	-12	-12	-12	-12	-12	
Upper Range Car Manouvre		66	57	49	53	53	45	42	38	
Screening Loss	Significant	-10	-10	-10	-10	-10	-10	-10	-10	
Distance Loss	150m	-44	-44	-44	-44	-44	-44	-44	-44	
Specific sound level at receptor	L _{eq 1hr}	13	3	0	0	0	0	0	0	7

Cumulative sound level at receptor	L _{eq 1hr}	53	48	49	48	52	45	33	25	54
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BS4142 is designed to allow contextual assessment of impact from commercial, or industrial sound on sensitive receptors. Examples covered by the Standard include:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment.
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises, and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes.

In brief, the assessment procedure involves establishing sound levels from the items or processes of interest, (the specific sound source(s)), corrected for any acoustic features to derive the Rating Level, (L_{Ar,T_r}), at the relevant assessment position(s). The Rating Level is compared against the existing Background Sound Level, (L_{A90,T_r}), to provide an initial estimate of impact. The Standard offers the following guidance with regard to the significance of estimated impact:

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

Where relevant, the initial estimate should then be modified by accounting for contextual aspects of the operation of the specific sound source and / or the context of the character of the area.

Other Assessment Parameters and Guidance on Character Corrections

The Specific Sound Level (L_s) is expressed in terms of an L_{Aeq} for a reference time interval, (T_r) of one-hour during the daytime (07:00 – 23:00 hours) and a fifteen-minute period during the night-time (23:00 – 07:00 hours). The Rating Level is also expressed in terms of the reference time interval, T_r .

The Specific Sound Level can be determined by various means, which can include prediction based on manufacturer's data and accompanying propagation calculations to the assessment position(s). This method could be used, for instance, where the specific sound source is not yet in-situ, or is in-situ but not yet operational.

Where the specific sound source is already operational and in-situ, measurements of the sound climate resulting from both the specific sound source and all other contributing sources, (known as the Ambient Sound Level, $L_a = L_{Aeq,T_r}$) should be measured over a representative time period, ideally at the assessment position(s).

Depending on the relative contribution of other sources not related to the specific sound, (known as the residual sound), the Specific Sound Level can be derived by logarithmically subtracting the Residual Sound Level, $L_r = L_{Aeq, T_r}$ from the Ambient Sound Level.

With justification, representative proxy locations can be used for the measurement of the ambient and/or residual sound climate. Where these measurement locations are not fully representative of the assessment position(s), measurement can be supplemented with calculation.

The Background Sound Level should ideally also be measured at the assessment position(s) but can be measured at representative proxy locations where suitable reasons can be provided. The Background Sound Level should be measured over a period which is suitable to characterise the background sound climate during the period of interest and should normally be at least 15 minutes.

When deriving the Rating Level from the Specific Sound Level, consideration is given to the character of the sound. The Standard provides several methods for deriving appropriate character corrections, offering the following advice for subjective assessment:

Tonality

For sound ranging from not tonal to prominently tonal, the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be allocated as a penalty of 2 dB for a tone which is just perceptible at the sound receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9dB can be applied for sound that is highly impulsive considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be allocated as a penalty of 3dB for impulsivity which is just perceptible at the receiver, 6dB where it is clearly perceptible and 9dB where it is highly perceptible.

Other sound characteristics

Where the specific sound contains characteristics that are neither tonal nor impulsive, but are otherwise startling, disturbing or incongruous with the residual acoustic environment, a penalty of +3dB can be applied.

Intermittency

When the specific sound has identifiable on/off conditions, if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3dB can be applied.