MURRAY ACOUSTICS

# Astley Business Park Tyldesley, Wigan

## Operational Noise Survey & Assessment

21184-RP-NIA-01

19 August 2026

Astley Warehouse Action Group

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# Table of Contents

# 1.0 Introduction

## 1.1 Overview

Murray Acoustics Ltd has been instructed by the Astley Warehouse Action Group (herein AWAG), a group of residents living around Astley Business Park, Astley Park Way, Tyldesley, Wigan, to undertake an independent survey and assessment of operational noise from the development. The work has been undertaken without charge to the residents. Neither Jamie Murray nor Murray Acoustics Ltd has any commercial or personal interest in the site, in the development, in its developer or in any of its occupiers.

The development comprises four warehouse units (Use Classes B2 and B8) constructed under planning permission A/23/96226/MAJOR, granted by Wigan Council on 14 August 2024. The permission is unrestricted as to hours of operation. The unit nearest to the dwellings on Withington Drive (Unit 2 on the approved plot demise plan) has been occupied and in 24-hour operation since approximately the end of March 2026.

The permission was supported by a noise assessment, report reference 784-B034505. The revision of that report referred to in the planning conditions is Revision 7, dated 13 May 2024 (herein the approved assessment). The approved assessment predicted the noise levels that would arise at the surrounding dwellings and concluded that the development would fall below the Lowest Observed Adverse Effect Level at all receptors.

This report sets out the context to the assessment, summarises and reviews the approved assessment, describes the noise survey undertaken by Murray Acoustics Ltd between 25 and 29 July 2026, and presents an assessment of the measured operational noise against BS 4142:2014+A1:2019 and, for comparison, against the World Health Organization guideline values on which the approved assessment relied. It concludes with a list of the questions which, in the opinion of Murray Acoustics Ltd, the survey findings now require to be answered.

An interim technical note (Murray Acoustics ref. 21184-TN-01, 6 August 2026) was issued in advance of this report. That note was expressly preliminary and limited to a comparison of night-time maximum levels. This report supersedes it. Where the findings of this report differ from the interim note, this report prevails.

## 1.2 The Site and its Surroundings

Astley Business Park occupies approximately 12.7 hectares of former open land on the north side of the A580 East Lancashire Road, accessed from Astley Park Way off Chaddock Lane. The four units have a combined footprint of approximately 33,000 m². Units 1 and 2, the two larger units, are approximately 18 m to ridge. The service yard of Unit 2, with its loading docks, is on the southern face of the building and is the part of the estate closest to the dwellings of Withington Drive, whose rear gardens adjoin the western site boundary.

The dwellings on Withington Drive, Tanhouse Avenue, Thistle Croft, Dandelion Garden, Meadowgrass Gardens and Verdant Green Close were constructed between approximately 2017 and 2019 under an earlier outline permission for the wider site. They are two-storey houses with first-floor bedrooms. Garrett Hall Primary School lies to the north-west of the site.

The approved assessment identified 27No representative noise sensitive receptors around the site, of which receptor R05, 38 Withington Drive, is the closest and the worst affected by the current occupation. The receptor locations are reproduced at Figure 1.1, on which the measurement position used for the survey described in this report is also marked.

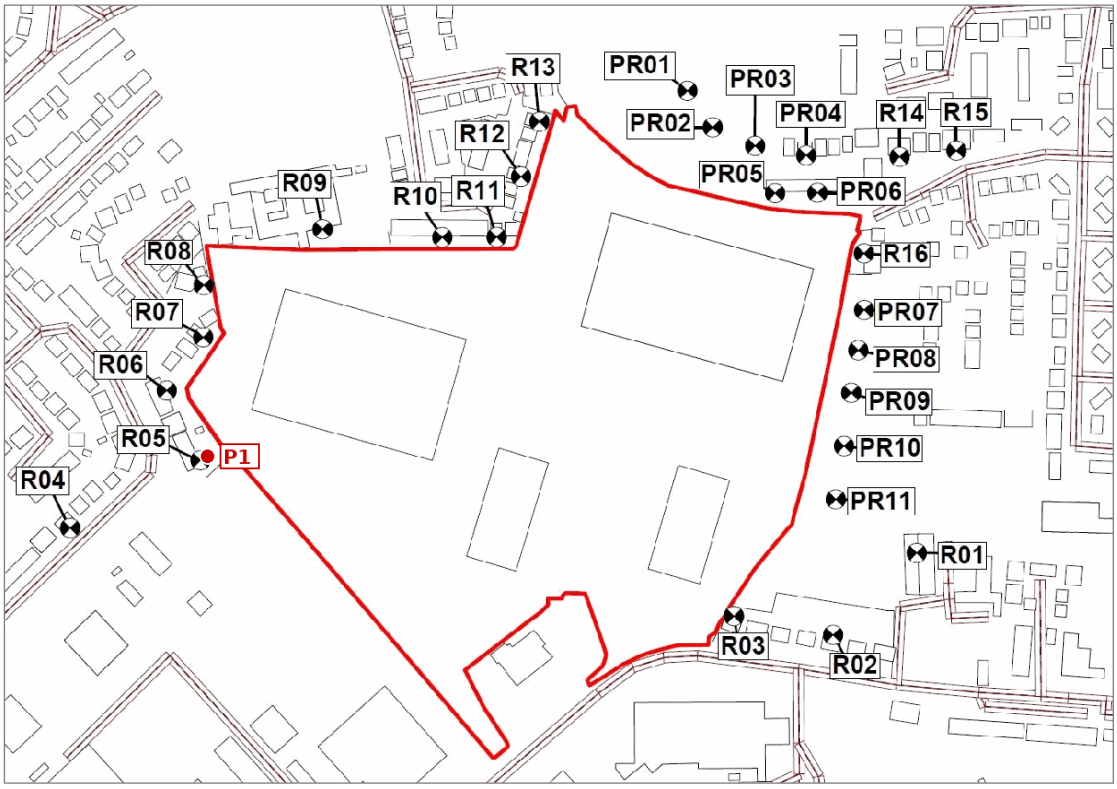


**Figure 1.1** Approved assessment receptor locations (planning report 784-B034505 Rev 7, Figure 3.1, annotated) with the July 2026 measurement position P1

## 1.3 The Planning Permission and Condition 4

Planning permission A/23/96226/MAJOR was granted on 14 August 2024 subject to 33 conditions. One condition relates to operational noise. Condition 4 states:

> *"The use of the development hereby approved shall not commence until the following measures to protect the existing residential properties from noise from the proposed development have been fully implemented: - The installation of acoustic fencing as detailed in Figure 6.1 "Noise Contour Plot Daytime with Mitigation ($L_{Aeq1hour}$)" of Tetra Tech's noise report number 784-B034505, Revision 7, dated 14th May 2024, and submitted by the applicant. Once fully installed, the above approved measures shall be retained thereafter."*

The permission contains no numerical noise limit, no restriction on hours of operation or delivery, no limit on vehicle numbers, no requirement for a noise management plan and no requirement for monitoring. The plant noise emission limits set out in the approved assessment are not secured by any condition. Condition 4 secures the acoustic fencing shown on a figure only; that figure is a daytime contour plot drawn not to scale, and neither the length nor the construction of the fencing is specified in the condition.

The noise report on deposit during the public consultation on the application was Revision 5, dated 25 September 2023. The consultation response of the Council's Environmental Health service (internal memorandum ref. EH/DSM/919762, dated 19 December 2023) recommended a condition securing acoustic fencing as detailed in Figure 6.1 of the report "dated 25th September 2023". Revisions 6 and 7 were issued on 9 and 13 May 2024, the former described in the report's document control as *"Amendments to barrier alignment and legislative policy"*. Condition 4 as issued refers to Revision 7. The barrier scheme shown at Figure 6.1 differs materially between Revision 5 and Revision 7; this is addressed at Section 4.0.

## 1.4 Status of this Report

This report is a technical report prepared for AWAG. It is not a report prepared under Part 35 of the Civil Procedure Rules, it is not expert evidence in any proceedings and it carries neither the declaration nor the statement of truth required by Practice Direction 35. It does not constitute legal advice and no opinion is expressed on any question of law. In particular, no opinion is expressed as to whether the noise described amounts to a statutory nuisance under Part III of the Environmental Protection Act 1990 or to a nuisance at common law; those are matters for the local authority and, ultimately, for a court.

This report will be published. It has been written so that every figure in it can be traced to its source. The approved assessment is a public document on the Wigan Council planning register. The survey data on which this report relies are summarised in the appendices, and the complete audio recording and one-second level data for the final

night of the survey are published at https://www.murrayacoustics.com/astley/night, where any reader may listen to the recording alongside the measured levels. The complete logger data set is available on request.

The report refers to and reviews a document issued in the public domain. It makes no comment on the motives of any person or organisation, and none should be inferred.

# 2.0 Assessment Guidance & Requirements

## 2.1 National Planning Policy

The relevant national planning framework for noise is set out in the National Planning Policy Framework (NPPF) and the Noise Policy Statement for England (NPSE), supported by the Planning Practice Guidance on noise (PPG). The NPPF requires planning decisions to mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, and to avoid noise giving rise to significant adverse impacts on health and quality of life. The NPSE introduces the concepts of the No Observed Effect Level (NOEL), the Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL). Above the SOAEL the PPG's stated action is to avoid the effect; above an Unacceptable Adverse Effect Level the stated action is to prevent it. Neither the NPPF nor the NPSE sets numerical values for these levels; the PPG leaves the values to be determined by reference to the relevant guidance for the source in question.

The relevant local planning policy is Policy CP 17 (Environmental Protection) of the Wigan Local Plan Core Strategy (2013), which is the policy cited in the reason for Condition 4 of the permission.

## 2.2 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'* (herein BS 4142) provides a method for assessing adverse impact from industrial and commercial sound sources at nearby noise sensitive receptors. Its scope, at clause 1.1, expressly includes:

- Sound from industrial and manufacturing processes
- Sound from fixed installations
- 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.

It excludes, at clause 1.3, the passage of vehicles on public roads. The service yard of a distribution warehouse, with its docking, unloading, vehicle manoeuvring and reversing alarms, falls squarely within the stated scope.

The assessment compares the rating level of the source in question against the prevailing background sound level at the receptor. The specific sound level is the equivalent continuous A-weighted sound pressure level produced by the specific source at the

assessment location over a reference time interval of 1 hour during the day (07:00 to 23:00) and 15 minutes at night (23:00 to 07:00). The rating level is the specific sound level with corrections added for acoustic features that make the sound more noticeable: tonality, impulsivity, intermittency and other characteristics. Clause 9.2 provides a subjective method and, at Annexes C, D and E, objective and reference methods. The subjective corrections are: **tonality** +2 dB (just perceptible), +4 dB (clearly perceptible) or +6 dB (highly perceptible); **impulsivity** +3 dB, +6 dB or +9 dB on the same scale; **intermittency** +3 dB where the sound has identifiable on and off conditions; and +3 dB for **other readily distinctive characteristics**. Where more than one feature is present the corrections are normally added arithmetically, unless one feature is dominant.

The background sound level is the A-weighted sound pressure level exceeded for 90% of the measurement period, $L_{A90,T}$, measured in the absence of the specific sound, and is taken as a value representative of the period being assessed, normally the most commonly occurring value rather than the lowest or an arithmetic average.

Clause 11 sets out the initial estimate of impact. A difference of around +10 dB or more between the rating level and the background sound level is likely to be an indication of a significant adverse impact, depending on the context. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context. 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 standard then requires the initial estimate to be considered in context, including the absolute level of sound, the character and level of the residual sound, and the sensitivity of the receptor. It also notes that where background sound levels and rating levels are low, absolute levels might be as relevant as the margin by which the rating level exceeds the background, and that this is especially true at night.

Clause 7.3 requires that the measurement and assessment of the specific sound take place under conditions representative of the source, and that measurements are not made in rain or in wind speeds above about 5 m/s at the microphone. Clause 1.3 states that the standard is not applicable to the assessment of low frequency noise, and the standard therefore does not cater for sound whose effects are governed by its low frequency content.

## 2.3 World Health Organization Guidelines for Community Noise (1999)

The WHO *'Guidelines for Community Noise'* (1999) (herein WHO 1999) are the source of the internal criteria adopted by the approved assessment. WHO 1999 recommends, for bedrooms at night, an internal level not exceeding 30 dB $L_{Aeq,8h}$ together with a level not exceeding 45 dB $L_{Amax}$ for individual events, and, outside bedrooms at night, 45 dB $L_{Aeq,8h}$ together with 60 dB $L_{Amax}$. For dwellings during the daytime and evening it recommends

35 dB $L_{Aeq,16h}$ indoors. WHO 1999 states at Section 4.1 that its guideline values are *"essentially values for the onset of health effects"*, and at Section 4.2.3 that effects have been observed at individual $L_{Amax}$ exposures of 45 dB or less, so that it is important to limit the number of noise events with a $L_{Amax}$ exceeding 45 dB. It further states, at Section 4.3, that where noise comprises distinct events a measure based solely on $L_{Aeq}$ does not adequately assess the health impacts and should be combined with a measure of the number of events. WHO 1999 derives its external guideline values from the internal values on the assumption of an attenuation of approximately 15 dB through a partly open window.

WHO 1999 is organised by environment rather than by source. It states at Section 2.2 that *"equal values of $L_{Aeq,T}$ for different sources do not always imply the same expected effect"*, at Section 3 that a number of studies have shown that equal levels of traffic and industrial noise result in different magnitudes of annoyance, and in its executive summary that stronger reactions have been observed when noise contains low frequency components or impulses. It recommends, at Section 3.9, that where prominent low frequency components are present measures based on A-weighting alone are inappropriate, and that where the difference between the C-weighted and A-weighted levels exceeds about 10 dB a frequency analysis should be performed. WHO 1999 did therefore, at the time of publishing, apply to noise from industry, but it provides no mechanism for distinguishing between sources of the same $L_{Aeq}$. In the United Kingdom that discrimination is provided by BS 4142.

## 2.4 Later WHO Guidance: Night Noise Guidelines (2009) and Environmental Noise Guidelines (2018)

WHO 1999 has been followed by two further WHO publications, the *'Night Noise Guidelines for Europe'* (2009) (herein WHO NNG 2009) and the *'Environmental Noise Guidelines for the European Region'* (2018) (herein WHO ENG 2018). The approved assessment cites neither. They are summarised here because they bear on two matters that the approved assessment treats as settled: the level at which sleep is affected, and the applicability of generic WHO guideline values to an industrial source.

WHO NNG 2009 reviewed the evidence on sleep and night noise published since 1999. Its table of effects for which it found sufficient evidence places the onset of body movements at 32 dB $L_{Amax}$ inside the bedroom, EEG awakening and changes in the duration of sleep stages at 35 dB $L_{Amax}$ inside, and waking in the night or too early in the morning at 42 dB $L_{Amax}$ inside. It states in terms that *"the thresholds are now known to be lower than $L_{Amax}$ of 45 dB for a number of effects"*. On long-term exposure it recommends a night noise guideline of 40 dB $L_{night,outside}$, with an interim target of 55 dB, and describes the range 40 dB to 55 dB $L_{night,outside}$ as one in which adverse health effects are observed among the exposed population and many people have to adapt their lives to cope with the noise, and levels above 55 dB as increasingly dangerous for public health. The 45 dB

$L_{Amax}$ internal criterion adopted at Table 2.1 of the approved assessment, and presented there as the value below which no adverse effect is observed, is therefore 10 dB to 13 dB above the levels at which WHO NNG 2009 finds that sleep is affected, and 3 dB above the level at which it finds people are woken. WHO NNG 2009 acknowledges that its evidence base derives mainly from transport noise.

WHO ENG 2018 is organised by source. It makes recommendations for road traffic, railway, aircraft, wind turbine and leisure noise, with strong recommendations to reduce night-time levels below 45 dB $L_{night}$ for road traffic, 44 dB for railways and 40 dB for aircraft, all long-term averages outside the most exposed façade. It states that it makes no recommendations for other sources, naming occupational, industrial and commercial, ventilation system, neighbour and recreational noise among them. It states that the 1999 internal guideline values remain valid and that its recommendations complement WHO NNG 2009.

Two things follow. First, the WHO guidance that addresses industrial noise at all is the 1999 document and its 2009 night-time update, and the 2009 update sets its effect thresholds below the values the approved assessment adopted. Second, where WHO has been able to set source-specific night-time values, they sit at 40 dB to 45 dB $L_{night}$ outside the façade for sources whose sound is, in the main, steadier and less impulsive than that of a service yard.

None of this alters the basis of the assessment in this report, which is BS 4142 because that is the standard whose scope covers the source. It is recorded because the approved assessment chose WHO values in preference to BS 4142 for the dominant source, and the WHO guidance it relied on has since been reviewed by WHO itself in a direction that makes the values adopted less, not more, protective than the evidence now supports.

## 2.5 Basis of Comparison in this Report

The primary assessment in this report is made to BS 4142, because the source is one the standard expressly covers and because it is the standard against which the approved assessment assessed the fixed plant on the same site. A secondary comparison is then made against the WHO 1999 values, because those are the values the approved assessment adopted for the service yard and HGV activity, and it is against those values that the approved assessment judged itself.

# 3.0 The Approved Noise Assessment

## 3.1 The Document

The approved planning report 784-B034505, *'Noise Assessment for Proposed Distribution Units'*, Astley Business Park, Wigan, was first issued on 23 September 2022 and was revised six times, to Revision 7 dated 13 May 2024. Revision 5 (25 September 2023) was the version submitted with the planning application and available during public consultation. Revision 6 (9 May 2024) records *"Amendments to barrier alignment and legislative policy"* and Revision 7 (13 May 2024) *"Minor Client Amendments"*. The report was prepared using CADNA noise modelling software implementing ISO 9613 propagation. The sources assessed were HGV access, parking and docking and loading, staff car parking, and building services plant; construction noise was also considered.

## 3.2 Baseline Survey and Background Sound Levels

The baseline survey was undertaken between 17 and 23 March 2022, four years before the development became operational, at three unattended positions (LT1 to LT3) and five attended positions (ST1 to ST5). The equipment was Class 1. The background sound levels adopted for the assessment are given at Table 5.2 of the approved assessment. For receptors R04 to R09, which include 38 Withington Drive, the adopted background sound levels are 37 dB $L_{A90,1h}$ during the daytime and 34 dB $L_{A90,15min}$ at night. The report describes the adopted $L_{A90}$ values as the modal value of the 5-minute measurements over the survey period. No further statistical analysis is noted, nor made possible by way of published survey data.

## 3.3 Assessment Criteria

Section 2.0 of the approved assessment presents, at its Table 2.1, a set of criteria said to be adopted from BS 4142 and WHO 1999 and arranged by NOEL, LOAEL and SOAEL. The table has two limbs: a difference between *"source noise levels"* and the existing background level (zero or lower at the NOEL; zero to +5 dB at the LOAEL; +10 dB at the SOAEL), and a set of internal noise levels (35 dB $L_{Aeq,16h}$ daytime in living rooms and 30 dB $L_{Aeq,8h}$ and 45 dB $L_{Amax}$ at night in bedrooms at the LOAEL row). The table does not state which limb governs where the two give different answers. The relevance of this is addressed at Section 4.0.

## 3.4 Source Data and Method

The night-time source term for HGV loading and unloading (Section 3.2.1 of the approved assessment) is derived from a sequence of one 4-minute period at 69 dB and one 11-minute period at 67 dB at 3 m, giving 67.6 dB $L_{Aeq,15min}$ at 3 m per active bay, with a

maximum level of 85.4 dB $L_{Amax}$ at 3 m. The calculation is stated to be based on *"50% of the bays operational during the night-time scenario to represent typical activity"*. The same section records that noise from a docking event *"has been known to vary from site to site by as much as 22 dB $L_{Aeq}$ at 3 m distance even with the same vehicle type"* and that individual events at the same location have been recorded to vary by as much as 14 dB. HGV movements on the access road are modelled as a line source on the basis of 441 HGVs per 24 hours, and building services plant as 19No rooftop point sources set at emission limits (73.0 dB(A) at 1 m daytime, 68.5 dB(A) at 1 m night-time) chosen so that the plant rating levels would be "at least equal to" the background sound levels.

The approved assessment applies BS 4142 to the building services plant only (its Section 5.1 and Table 5.2), adopting a speculative +2 dB character correction. The HGV docking, loading and movement sources and the car park are assessed at Section 5.2 as "noise intrusion": the predicted external level at 1 m from the façade is reduced by an allowance for a partially open window, stated in the text of Section 5.2 to be 10 dB, and compared with the internal WHO 1999 values. No rating level is derived for these sources, no comparison with the background sound level is made for them, and no acoustic feature correction is applied to them.

## 3.5 Predictions at the Closest Receptor

The predicted levels at receptor R05, 38 Withington Drive, are summarised at Table 3.1. The "with mitigation" values include the acoustic barriers described at Section 6.0 of the approved assessment. It is not clear whether the daytime and night-time values are overall period (i.e. 16h & 8h) averages or calculated to periods of 1h & 15min per BS 4142.

**Table 3.1** Approved assessment predictions at R05, 38 Withington Drive (report 784-B034505 Rev 7, Tables 5.3 to 6.3)

| Quantity | External at 1 m from façade (dB) | Internal, windows open, as tabulated (dB) | Criterion adopted (dB) | Margin (dB) |
|---|---|---|---|---|
| Daytime $L_{Aeq}$, unmitigated (Table 5.3) | 46.3 | 31.3 | 35 | 3.7 |
| Daytime $L_{Aeq}$, with mitigation (Table 6.1) | 46.3 | 31.3 | 35 | 3.7 |
| Night-time $L_{Aeq}$, unmitigated (Table 5.4) | 51.7 | 36.7 | 30 | -6.7 |
| Night-time $L_{Aeq}$, with mitigation (Table 6.2) | 44.8 | 29.8 | 30 | 0.2 |
| Night-time $L_{Amax}$, unmitigated (Table 5.5) | 57.2 | 42.2 | 45 | 2.8 |
| Night-time $L_{Amax}$, with mitigation (Table 6.3) | 51.1 | 36.1 | 45 | 8.9 |

The internal values tabulated in the approved assessment are 15 dB below the external values, notwithstanding that Section 5.2 states a reduction of 10 dB for a partially open window.

## 3.6 Mitigation and Conclusions

Section 6.0 of the approved assessment states that mitigation has been considered "in the form of acoustic bunds and barriers ranging between 3.0m and 5.0m in height", the locations of which are presented at Figure 6.1. Figure 6.1 of Revision 7 shows two barrier segments: a 5 m barrier at the south-west corner of the Unit 2 service yard, facing Withington Drive, and a shorter 3 m barrier at the eastern edge of the Unit 1 service yard. The approved plot demise plan (drawing 4557-007-P11) annotates the Unit 2 barrier as "close boarded timber or similar 15m long x 5m high acoustic fence to achieve a mass of 20kg/m²". Bund heights are not stated anywhere in the approved assessment.

Section 7.0 concludes that, with the mitigation specified, the WHO noise intrusion criteria will be achieved at all of the closest sensitive receptors with windows open or closed, that the development is not expected to have a significant adverse impact on health or quality of life, and that it is below the Lowest Observed Adverse Effect Level.

# 4.0 Review of the Approved Noise Assessment

## 4.1 Purpose of the Review

This section sets out the matters identified on a reading of the approved assessment which, in the opinion of Murray Acoustics Ltd, bear on the reliability of its conclusions. The review is confined to the document itself and to the other documents on the planning register. It does not rely on the measurements described later in this report, which are addressed separately at Sections 5.0 to 7.0. Each point below can be checked against the page of the approved assessment cited.

## 4.2 BS 4142 Applied Only to the Least Significant Source

The approved assessment applies BS 4142 to the building services plant (its Table 5.2) and not to the service yard, docking, loading and HGV activity, which its own predictions show to be the dominant source of noise at the nearest dwellings. No reason for the distinction is given. The scope of BS 4142 names the loading and unloading of goods at industrial and commercial premises in terms, and the same standard was available and was used elsewhere in the same report. The plant, by contrast, is assessed at emission limits that no condition of the permission secures.

Had BS 4142 been applied to the yard activity on the approved assessment's own figures, the result can be read from its own tables. Its Table 6.2 predicts an external night-time level of 44.8 dB $L_{Aeq}$ at 1 m from the façade of R05 with the mitigation in place. Its Table 5.2 adopts a night-time background sound level of 34 dB $L_{A90}$ at the same receptor. The difference is +10.8 dB before any correction for the character of the sound or the use of a night-time average in place of the 15-minute reference interval required by the standard, if that is what the tabulated value represents. The approved assessment's own Table 2.1 describes a difference of +10 dB as its SOAEL trigger. Under clause 11 of BS 4142 a difference of around +10 dB or more is likely to be an indication of a significant adverse impact. The same calculation at PR11, Dandelion Garden, gives +10.4 dB, and during the daytime at R05 (46.3 dB against 37 dB) gives +9.3 dB.

Reversing alarms, air brake releases, dock impacts and trailer coupling are, in the experience of Murray Acoustics Ltd, among the most readily identifiable features of distribution yard sound at night, and each would attract a correction under clause 9 of BS 4142. Any such correction raises the rating level further. On the approved assessment's own predicted level and its own adopted background, a BS 4142 assessment of the yard activity would therefore have indicated a significant adverse impact at the closest dwellings before any correction for character, and a margin well above +10 dB with any such correction. The conclusion at Section 7.0 that the development is below the LOAEL cannot be reconciled with the report's own figures once

the standard that the report itself identifies at Section 2.0 is applied to the dominant source. It is not considered that any context would apply to reduce this indication of impact.

## 4.3 The Source Noise Levels

The night-time predictions of the approved assessment rest on the source terms at its Section 3.2.1: 67.6 dB $L_{Aeq,15min}$ and 85.4 dB $L_{Amax}$ at 3 m for each active loading bay, with half of the bays assumed inactive at night "to represent typical activity". The report describes these values as based on measurements of HGVs at "an existing distribution depot", which is not identified, and in the same paragraph records that docking noise varies between sites by as much as 22 dB $L_{Aeq}$ at 3 m and between events at the same site by as much as 14 dB. No site-specific justification is given for the value chosen within that range.

The same consultancy has published, on other public registers, its own source data for the same activity. Its noise assessment for two B2/B8 employment units at Hoad Way, Theale (West Berkshire Council ref. 24/00145/FULMAJ, appeal core document CD1.39; ref. 784-B030924 Rev 0, 24 August 2023, one month before Revision 5 of the Astley report, and approved by the same director who approved every revision of the Astley report) models HGV loading and unloading as a point source at 3 m per unloading bay at 73.8 dB $L_{Aeq,1h}$ daytime, 76.3 dB $L_{Aeq,15min}$ night-time and 89.4 dB $L_{Amax}$, with one event assumed at every bay at night. The identical three values, with the same attribution, appear in the consultancy's noise assessment for a waste treatment facility at Beddington Lane, Croydon (Environment Agency permit application; ref. 784-B049125 Rev 3, 11 March 2025, approved by the person recorded as checker of Revisions 6 and 7 of the Astley report). The comparison is set out at Table 4.1.

**Table 4.1** HGV loading and unloading source terms used by the same consultancy, dB at 3 m per active bay

| Quantity | Theale 784-B030924 (Aug 2023) | Astley 784-B034505 (May 2024) | Croydon 784-B049125 (Mar 2025) | Astley lower by |
|---|---|---|---|---|
| Daytime $L_{Aeq,1h}$ | 73.8 | **65.5** | 73.8 | 8.3 |
| Night-time $L_{Aeq,15min}$ | 76.3 | **67.6** | 76.3 | 8.7 |
| $L_{Amax}$ | 89.4 | **85.4** | 89.4 | 4.0 |
| Night-time bay occupancy | 100% of bays | **50% of bays** | 100% of bays | - |

All three reports describe the data as the consultancy's own survey measurements. The Astley values are derived in the report from a stated sequence of arrival, unloading and departure levels; the Theale and Croydon values are presented as measured data without working. Of the three, Astley is the outlier: its $L_{Aeq}$ terms are 8 dB to 9 dB below the figure the same firm was using one month earlier and was still using eighteen months later, its $L_{Amax}$ term is 4 dB below, and it alone assumes half of the bays to be idle at night. It is also the one of the three with the closest dwellings and the smallest margins.

Had the consultancy's own Theale and Croydon figures and bay occupancy been applied at Astley, the predicted night-time level at 38 Withington Drive could have been of the order of 10 dB higher than the 44.8 dB tabulated, and the internal criterion would have been exceeded with or without the barriers, on either window allowance.

None of this is to say which dataset is right/wrong for Astley; it is to say that the dataset used is the lowest the same firm appears to have used for the same activity in the same period, that the document gives no reason for the choice, and that the choice is the difference between the scheme passing and failing its own test. The measurements at Section 5.0 are more consistent with the higher dataset and not with the lower one.

The open-window allowance shows the same pattern. The Theale report applies 15 dB throughout. The Astley report states 10 dB in its text and applies 15 dB in its tables, and as set out at Section 4.5 the 5 dB between those figures is the whole of the night-time $L_{Aeq}$ case at the closest dwellings. The source term, the bay occupancy assumption and the window allowance each vary between these documents without site-specific justification, and at Astley it is of note that each sits at the end of its range that favours the scheme.

## 4.4 The Criteria Table

Table 2.1 of the approved assessment contains several internal inconsistencies. Its NOEL row gives the WHO 1999 values transposed (35 dB $L_{Aeq,8h}$ for bedrooms at night and 30 dB $L_{Aeq,16h}$ for living rooms during the day) while its LOAEL row gives them correctly (30 dB and 35 dB respectively), so that the bedroom threshold at the NOEL sits above the threshold at the LOAEL. It is understood that this is likely a typo, rather than ithe intent of the assessment. The value of 35 dB $L_{Aeq,8h}$ appears both as a NOEL ceiling and as the SOAEL trigger, and 45 dB $L_{Amax}$ appears identically at all three levels.

The descriptors attached to the background difference are shifted relative to BS 4142: a difference of up to +5 dB is described as "an indication of a low impact", where clause 11 of BS 4142 describes a difference of around +5 dB as an indication of an adverse impact, and +10 dB is described as a level at which adverse effects "may" be indicated, where the standard says "likely to be an indication of a significant adverse impact" and applies it to +10 dB "or more". This is a concerning misrepresentation of the assessment standard.

The action against the SOAEL row is "mitigate ... if possible" and "where practicable, mitigate", whereas Table 1.1 of the same report correctly reproduces the PPG action against the SOAEL as "Avoid". No band above the SOAEL is provided, so the criteria as framed are incapable of returning an unacceptable outcome.

## 4.5 The Open-Window Allowance

Section 5.2 of the approved assessment states that a reduction of 10 dB has been used for a partially open window. Every assessment table (Tables 5.3 to 5.5 and 6.1 to 6.3) applies a reduction of 15 dB; for example the R05 night-time LAeq of 44.8 dB externally is tabulated as 29.8 dB internally. On the 15 dB figure applied in the tables, all 26 dwellings pass the 30 dB night-time $L_{Aeq}$ criterion, the closest by 0.2 dB. On the 10 dB figure stated in the text, nine of the 26 dwellings fail it, R05 by 4.8 dB. For the night-time $L_{Amax}$ assessment the choice does not alter the outcome on the predicted levels.

It is acknowledged that WHO 1999 itself assumes an attenuation of approximately 15 dB through a partly open window, and that a range between 10 to 15 dB is a conventional figure. The point to note is that the document states one method and applies another, and that the difference is the difference between passing and failing the adopted criterion at the closest dwellings.

## 4.6 The Margins and the Assumptions Behind Them

The approved assessment's night-time case at the closest dwellings rests on margins of 0.2 dB (R05) and 0.6 dB (PR11) against the 30 dB internal $L_{Aeq}$ criterion. Those margins are achieved only with the barriers in the model, and only on a source term that assumes half the loading bays to be inactive at night. The same report acknowledges that docking noise varies by up to 22 dB between sites and 14 dB between events at the same location. A margin of 0.2 dB is smaller than the rounding of the result, smaller than the uncertainty of the prediction method and smaller than the acknowledged variability of the source by more than an order of magnitude. The assessment does not discuss sensitivity to any of its inputs.

## 4.7 The Change to the Barrier Scheme After Consultation

Figure 6.1 of Revision 5, the version on deposit during public consultation, shows four 5 m barrier runs (two at the south-west corner of the Unit 2 yard and two at the eastern edge of the Unit 1 yard) and is drawn at a receiver height of 4.0 m, the height of the first-floor bedroom windows.

Figure 6.1 of Revision 7, the version secured by Condition 4, shows two 5 m barriers at the Unit 2 yard (one with a reduced extent) and one shorter 3 m barrier at the Unit 1 yard, and is drawn at 1.5 m. The report text describing the mitigation changed from "bunds and barriers ranging between 4m and 5m in height" (Revision 5) to "between 3.0m and 5.0m" (Revision 7).

The consultation closed on 30 November 2023; Revisions 6 and 7 are dated May 2024. The Environmental Health consultation response of 19 December 2023 recommended the condition by reference to the September 2023 report. Whether the consultee reviewed the revised scheme before the condition was issued by reference to Revision 7 is not recorded in any document on the planning register seen by Murray Acoustics Ltd at the time of writing.

In Revision 7 the daytime predictions with mitigation (its Table 6.1) are numerically identical, at every one of the 27 receptors and to one decimal place, to the daytime predictions without mitigation (its Table 5.3). Either the unmitigated run already contained the barriers or the mitigated table was not updated; in either case the approved document does not demonstrate any daytime benefit from the mitigation that Condition 4 secures. In Revision 5 the corresponding tables differed by 4.6 dB at R05 (49.3 dB without mitigation, 44.7 dB with).

## 4.8 Matters Not Assessed

The approved assessment contains no count of night-time maximum noise events, although WHO 1999, from which it takes its 45 dB $L_{Amax}$ criterion, states that the number of events exceeding that level must be limited and that an $L_{Aeq}$-based measure alone is inadequate for event noise. It contains no assessment of low frequency content, although WHO 1999 recommends frequency analysis where the C-weighted level exceeds the A-weighted level by more than about 10 dB and BS 4142 states that it is not applicable to low frequency noise. It contains no external amenity assessment of gardens. No operational noise limit, management plan or monitoring is proposed, and the plant emission limits at its Table 5.1 are not carried into any condition.

## 4.9 What the Review Indicates

Taking the approved assessment on its own terms, and before any measurement, the review indicates that:

- The standard which the report itself identifies as the applicable standard for industrial and commercial sound was applied only to the fixed plant; applied to the dominant source on the report's own predicted levels and background sound levels, that standard would have returned a difference at least +10 dB or more at the closest dwellings, which is the level at which the standard indicates a likely significant adverse impact, before any correction for the character of the sound;
- The internal criteria case rests on margins of 0.2 dB to 0.6 dB that depend on a window allowance applied differently from the method stated, on an assumption of half the bays inactive at night, and on barriers whose modelled benefit the document does not demonstrate; and
- The mitigation secured by condition is a fraction of the mitigation consulted upon.

In the opinion of Murray Acoustics Ltd these matters together mean that the conclusion that the development would be below the LOAEL was not supported by the document that reached it.

# 5.0 Environmental Noise Survey

## 5.1 Procedure

Continuous unattended noise measurements were undertaken at a single position, P1, from 12:30 on Saturday 25 July 2026 until 06:15 on Wednesday 29 July 2026, a period of approximately 3.7 days covering four night-time periods (23:00 to 07:00). The position is shown at Figure 1.1 and described at Section 5.2. The measurement procedure followed BS 4142 and BS 7445-1:2003, with the sound level meter logging at 1-minute and 15-minute intervals throughout.

The instrument logged, for every minute, the A-weighted equivalent continuous level ($L_{Aeq}$), the A-weighted fast maximum level ($L_{AFmax}$), the C-weighted equivalent continuous level ($L_{Ceq}$), the C-weighted peak level ($L_{Cpeak}$) and one-third octave band levels from 8 Hz to 20 kHz, and, for every 15 minutes, the same quantities together with the statistical levels $L_{A10}$ and $L_{A90}$. A continuous calibrated audio recording (mono, 16-bit, 48 kHz) was made throughout, time-synchronised with the logged data, so that any logged event can be listened to and its source identified.

The audio for the final night has been listened to in full, with sources attributed, and is published in full at https://www.murrayacoustics.com/astley/night.

## 5.2 Measurement Position

Position P1 was located within the rear garden of the dwelling represented by receptor R05 in the approved assessment, on Withington Drive, with the consent of the householder. The microphone was mounted at a height of 2.5 m above local ground level, approximately 22 m from the western site boundary and approximately 15 m from the rear façade of the dwelling, and was fitted with a windshield. The microphone was positioned within free-field conditions (at least 3.5 m from reflecting surfaces other than the ground).

The position was chosen because it is the nearest accessible residential garden to the Unit 2 service yard and corresponds to the worst affected receptor identified by the approved assessment. It is not, however, the first-floor bedroom window position at which the approved assessment made its night-time predictions (4.0 m above ground, 1 m from the façade). The measurement position sits lower than the bedroom windows and nearer to the boundary screening, where the acoustic screening is expected to be more effective. Levels measured at P1 are therefore expected to understate the levels at the first-floor bedroom windows of the same dwelling. This is addressed at Section 7.0.

## 5.3 Equipment and Calibration

The survey equipment is detailed at Table 5.1. The sound level meter is a Class 1 instrument meeting BS EN 61672-1. The calibration of the measurement chain was checked with a field calibrator before and after the survey and no significant drift was observed.

**Table 5.1** Survey equipment

| Equipment | Make and model | Serial No. | Laboratory calibration date |
|---|---|---|---|
| Class 1 sound level meter and analyser | Svantek SVAN 971A | 189249 | 12 Jun 2026 |
| Preamplifier | Svantek SVAN SV18A | 179467 | |
| Microphone | ACO 7152 | 99044 | |
| Acoustic calibrator | Svantek SV33B | 182123 | 30 Jan 2026 |

## 5.4 Weather

No weather station was deployed at P1. Weather conditions have been taken from the hourly observations of the Met Office synoptic station at Manchester Airport (EGCC), approximately 18 km to the south-east of the site, as published in the Weather Underground historical archive, supplemented by observations on site at deployment and collection. The hourly observations for the survey period are reproduced in full at Appendix B and summarised for the night-time periods at Table 5.2. No precipitation gauge data are available for the site itself; the observation nearest in time to any interval relied upon in the assessment is noted in Appendix B.

**Table 5.2** Summary of weather conditions during the night-time periods (Manchester Airport observations, Appendix B)

| Night (23:00 to 07:00) | Conditions | Wind | Temp. | Use in assessment |
|---|---|---|---|---|
| Sat 25 to Sun 26 July | Light rain, drizzle and rain from about 00:20 until after 07:00; heavy rain reported at 05:20 | SSW to W, 2 to 8 m/s | 17°C | Excluded (rain, BS 4142 clause 7.3) |
| Sun 26 to Mon 27 July | Rain at 23:50; cloudy thereafter with light rain reported at 03:50; otherwise dry | W to WNW, 3 to 5 m/s | 14 to 15°C | Background verification only (Section 5.7) |
| Mon 27 to Tue 28 July | Dry; cloudy to fair | S to SSW, 1 to 3 m/s | 17 to 19°C | Assessment |
| Tue 28 to Wed 29 July | Dry; fair | S to SSW, 1 to 3 m/s | 15 to 19°C | Assessment (audio published) |

The conditions on the nights of 27/28 and 28/29 July, being dry with light winds of well under 5 m/s, were suitable for the measurement of environmental noise and meet the requirements of BS 4142. The Saturday night was wet throughout and has been excluded from the assessment; its data are nevertheless reported in full at Appendix A. The Sunday night was largely dry with light to moderate westerly winds and is used only to inform the background sound level, where any weather effect, if any, is likely to raise rather than lower the measured $L_{A90}$.

## 5.5 Noise Climate and Sources

The residual sound at P1 in the absence of activity at the site comprises distant road traffic on the A580 and the local road network, occasional vehicle movements on the estate roads, domestic sources, and, from approximately 05:00, birdsong, which on each night raised the $L_{A90}$ through the final two hours of the night-time period. These sources are consistent with those the approved assessment recorded during its 2022 baseline survey at the same part of the estate.

The sound of the site at P1 at night, identified from the synchronised audio recording, comprises the movement and manoeuvring of heavy goods vehicles within the service yard, voices, engines idling, reversing alarms, air brake releases, impacts associated with docking, trailer coupling and uncoupling, and intermittent activity from the loading docks. The character of the sound is therefore impulsive (impacts and brake releases), intermittent (discrete vehicle and docking events against a quiet residual) and, at times, tonal (reversing alarms and idling engines).

Nothing in the logged data attributes any individual event to the site of itself. Attribution in this report rests on the audio recording, which for the final night is published in full so that the reader can make the same judgement, and on the character of the events, which is not that of the residual sources. The measured $L_{Aeq}$ values reported below are total ambient levels at P1; the treatment of the residual in deriving the specific sound level is set out at Section 6.2.

## 5.6 Results

The night-time results at P1 are summarised at Table 5.3 for each of the four nights and Table 5.4 for each daytime period. The full 15-minute results for each night are tabulated at Appendix A, together with time history charts of the 1-minute $L_{Aeq}$ and $L_{AFmax}$ and the 15-minute $L_{A90}$. The logger stopped at 06:15 on 29 July, so the final night covers 23:00 to 06:15 only.

Daytime periods include contribution from other nearby industrial/commercial sites, and have therefore not been relied upon for the assessment of noise impact or the attribution of any specific noise level arising from the site, but are presented for completeness.

**Table 5.3** Summary of night-time (23:00 to 07:00) results at P1 (free-field garden position, 2.5 m)

| Night | $L_{Aeq,8h}$ (dB) | Highest $L_{Aeq,15min}$ (dB) | Median $L_{Aeq,15min}$ (dB) | $L_{A90,15min}$ range (dB) | Modal $L_{A90,15min}$ (dB) | Highest $L_{AFmax}$ (dB) | $L_{AFmax}$ events ≥ 60 dB |
|---|---|---|---|---|---|---|---|
| Sat 25 Jul | 44.1 | 52.1 (05:00) | 43.4 | 34 to 44 | 39 | 64.3 (04:49) | 3 |
| Sun 26 Jul | 41.9 | 48.3 (06:45) | 39.9 | 31 to 44 | 32 | 69.2 (06:59) | 13 |
| Mon 27 Jul | 46.6 | 56.9 (06:45) | 43.5 | 34 to 50 | 36 | 71.9 (06:38) | 39 |
| Tue 28 Jul | 43.7 | 47.7 (05:30) | 43.1 | 31 to 43 | 35 | 68.4 (01:27) | 30 |

Night of Sat 25/26 July affected by rain throughout (Table 5.2). Night of Tue 28/29 July covers 23:00 to 06:15 only. The 15-minute periods from 05:00 onwards on each night include birdsong and significant early morning site activity, which raise both the $L_{Aeq}$ and the $L_{A90}$.

**Table 5.4** Summary of daytime (07:00 to 23:00) results at P1

| Day | $L_{Aeq,16h}$ (dB) | Range of $L_{Aeq,1h}$ (dB) | Lowest $L_{A90,15min}$ (dB) | Modal $L_{A90,15min}$ (dB) | Highest $L_{AFmax}$ (dB) |
|---|---|---|---|---|---|
| Sat 25 Jul | 49.0 | 41.5 to 52.7 | 38 | 46 | 89.5 |
| Sun 26 Jul | 48.8 | 42.3 to 51.3 | 35 | 46 | 75.7 |
| Mon 27 Jul | 59.8 | 44.9 to 71.1 | 33 | 48 | 81.7 |
| Tue 28 Jul | 53.7 | 43.3 to 61.2 | 35 | 43 | 97.1 |

Saturday 25 July from 12:30 only. Daytime levels at P1 include local garden and neighbourhood sources that could not be attributed; the daytime data are reported for completeness and are not relied upon in the BS 4142 assessment (Section 6.8).

## 5.7 Background Sound Level

The approved assessment adopted a night-time background sound level of 34 dB $L_{A90}$ for receptors R04 to R09, from its March 2022 survey. That value has been tested against the levels measured at P1 in July 2026. The site now operates 24 hours a day, so no measurement at P1 is entirely free of its influence; the measured $L_{A90}$ values therefore represent an upper bound on the background sound level as BS 4142 defines it, and any error is in the direction of overstating the background and understating the margins reported below.

On the Sunday night of 26/27 July, when activity at the site was at its lowest during the survey, the $L_{A90,15min}$ values between 23:00 and 07:00 ranged from 31 dB to 44 dB, with a

most commonly occurring value of 32 dB and a median of 34 dB; between 23:00 and 05:00, before the onset of birdsong, the modal value was 32 dB. On the two weekday nights the modal values were 36 dB and 35 dB, the increase being consistent with a near-continuous contribution from the site raising the level exceeded for 90% of the time. The distribution of the measured values is shown at Figure 5.1.

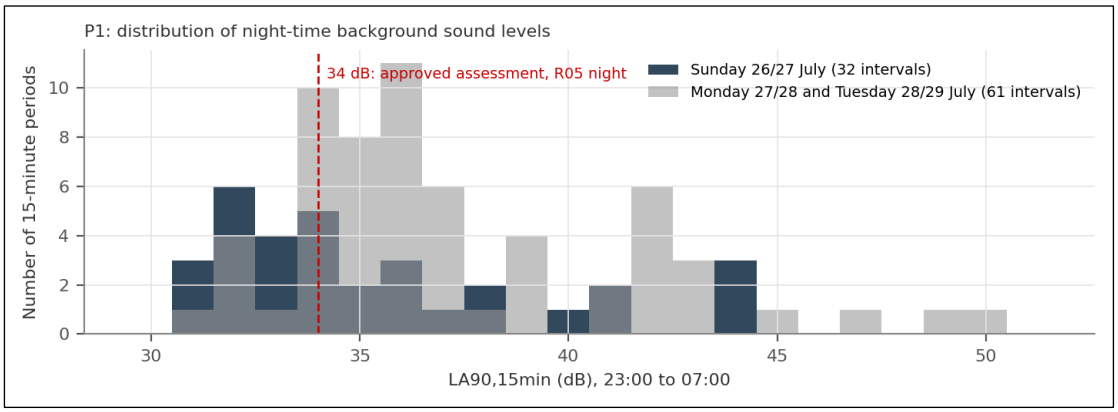


**Figure 5.1** Distribution of measured night-time $L_{A90,15min}$ at P1, with the background sound level adopted in the approved assessment

The background sound level of 34 dB $L_{A90}$ adopted in the approved assessment for this part of the estate is therefore corroborated by the July 2026 measurements, which indicate that, if anything, a value of 32 dB would now be representative of the quietest periods. The assessment at Section 6.0 adopts the approved assessment's own figure of 34 dB as the primary basis, so that the comparison is made on that document's own terms, and reports the effect of using 32 dB alongside it. The daytime background sound level of 37 dB $L_{A90}$ adopted in the approved assessment has not been tested, for the reason given at Section 6.8.

## 5.8 Maximum Levels and Event Counts

On the two weekday nights the highest 1-minute $L_{AFmax}$ values at P1 were 71.9 dB (minute beginning 06:38 on 28 July) and 68.4 dB (minute beginning 01:27 on 29 July). Between 23:00 and 05:00, before the dawn chorus, the highest values were 68.5 dB (00:09 on 28 July) and 68.4 dB (01:27 on 29 July); the latter is the event at 01:27 in the published recording, logged during the audio review as banging consistent with an impact within the service yard. The number of minutes in which the $L_{AFmax}$ reached or exceeded 60 dB was 39 on the night of 27/28 July and 30 on the night of 28/29 July (to 06:15), with 103 and 79 minutes respectively at or above 55 dB. By comparison the Sunday night recorded 13 minutes at or above 60 dB and the wet Saturday night 3.

For the purposes of this assessment, 68 dB $L_{AFmax}$ has been determined as the highest night-time maximum attributed to operations at the site, and that figure is carried forward in Section 7.0.

The minute counts are counts of total ambient sound and are not, of themselves, counts of site events. They are reported because, at a garden position on a quiet residential estate at night, levels of 60 dB $L_{AFmax}$ are not ordinarily produced by the residual sources described at Section 5.5, other than by occasional vehicle movements on the estate roads, and because the published recording allows the character of each such minute on the final night to be heard. The approved assessment contains no prediction of the number of maximum noise events per night against which these counts could be compared.

## 5.9 Low Frequency Content

The logged $L_{Ceq}$ and $L_{Aeq}$ values permit the C-minus-A difference to be examined for each 15-minute period. On the two weekday nights the median difference between 23:00 and 07:00 was 12 dB and 12 dB, with maxima of 15 dB and 17 dB. The difference exceeded 10 dB in the great majority of night-time periods. WHO 1999 advises that where the C-weighted level exceeds the A-weighted level by more than about 10 dB a frequency analysis should be performed and that A-weighted measures alone may be inappropriate.

BS 4142 states that it is not applicable to the assessment of low frequency noise. The one-third octave band data logged at P1 are available for such an analysis, which is outside the scope of this report.

The A-weighted assessment at Section 6.0 should be read with the knowledge that it takes no account of the low frequency content of the sound, and that the low frequency content of idling and manoeuvring heavy goods vehicles is not captured by it.

# 6.0 BS 4142 Assessment

## 6.1 Reference Time Intervals

BS 4142 requires the night-time specific sound level to be determined over a reference time interval of 15 minutes, selected to be representative of the source. The two dry weekday nights of 27/28 and 28/29 July have been used. In selecting the intervals, the 15-minute periods from 05:00 onwards have been set aside, because on every night of the survey the $L_{A90}$ rises steadily from about 05:00 with birdsong and early morning activity, and the $L_{Aeq}$ of those periods cannot be attributed to the site without reservation. The assessment therefore considers two cases:

- The **highest** 15-minute period between 23:00 and 05:00 on the two weekday nights, which is the period beginning 02:30 on Tuesday 28 July 2026, with a measured $L_{Aeq,15min}$ of 47.0 dB ($L_{AFmax}$ 64.9 dB, $L_{A90}$ 35.8 dB). An onerous, but justifiable, approach; and
- A **typical** 15-minute period, represented by the median of the 48 measured 15-minute $L_{Aeq}$ values between 23:00 and 05:00 on the two weekday nights, which is 42.6 dB, rounded to 43 dB. The median over the full 23:00 to 07:00 periods is 43.2 dB and the $L_{Aeq}$ over the 23:00 to 05:00 periods is 43.0 dB, so the figure is not sensitive to the choice of window.

Three of the 48 periods between 23:00 and 05:00 exceeded 45 dB $L_{Aeq,15min}$ and twenty exceeded 43 dB. On the final night, for which the audio is published, the highest period between 23:00 and 05:00 began at 01:45 (45.9 dB) and the highest of the whole night began at 05:30 (47.7 dB).

The audio recordings from the interval periods noted above have been listened to in full, and have been confirmed to be dominated by noise arising from the adjacent unit.

## 6.2 Specific Sound Level

The site operates continuously, and the residual sound level at P1 in its absence cannot now be measured directly. The measured $L_{Aeq,15min}$ values at P1 have therefore been taken as the specific sound level on the basis that the audio recording shows the sound of the site to dominate the selected periods, with a sensitivity case in which a residual is subtracted. For the sensitivity case a residual sound level of 38 dB $L_{Aeq,15min}$ has been adopted, being the upper end of the range of 15-minute $L_{Aeq}$ values recorded in the quietest periods of the Sunday night (between 35 dB and 39 dB in most of the 15-minute periods from midnight to 04:00); since those periods themselves contain some activity at the site, the true residual is likely to be lower and the subtraction is conservative. On that basis the specific sound levels are as given at Table 6.1.

**Table 6.1** Specific sound levels at P1 adopted for the assessment

| Case | Measured $L_{Aeq,15min}$ at P1 (dB) | Specific level, no residual correction (dB) | Specific level, 38 dB residual subtracted (dB) |
|---|---|---|---|
| Highest 15-minute period (02:30, 28 July) | 47.0 | 47 | 46 |
| Typical 15-minute period (median, 23:00 to 05:00) | 42.6 | 43 | 42 |

The specific sound levels are free-field values at 2.5 m above ground in the garden. They are lower than the levels at the first-floor bedroom windows of the same dwelling, for the reasons given at Section 5.2, and no correction has been applied for this. The assessment is therefore made at a position that understates the actual specific noise level at the windows. This is supported by the results of a 3D modelling exercise discussed in Section 7.0.

## 6.3 Background Sound Level

The background sound level adopted is 34 dB $L_{A90,15min}$, being the value adopted for receptor R05 in the approved assessment and corroborated at Section 5.7. The effect of adopting the contemporaneous value of 32 dB is shown alongside.

## 6.4 Acoustic Feature Corrections

### 6.4.1 Subjective Method

Under clause 9.2 of BS 4142 the sound of the site at P1 at night attracts the following corrections in the opinion of Murray Acoustics Ltd, based on the audio recording and the character of the events described at Section 5.5:

- **Impulsivity**: the dock impacts, trailer coupling and air brake releases are clearly to highly perceptible at P1 against a quiet residual, and a correction of **+6 dB to +9 dB** is applicable;
- **Intermittency**: the vehicle and docking events have identifiable on and off conditions that are readily distinctive against the residual, and a correction of **+3 dB** is applicable; alternatively
- **Tonality**: reversing alarms and idling engines are just to clearly perceptible at P1 for part of the time, and a correction of **+2 dB to +4 dB** would be applicable in place of the intermittency correction.

Clause 9.3.3 provides that where more than one feature is present the corrections are normally added arithmetically, unless one feature dominates. The assessment below applies the impulsivity correction together with one of the intermittency or tonality

corrections, giving a combined correction of between +8 dB and +13 dB, with a central case of +9 dB (+6 dB impulsive, +3 dB intermittent). The assessment is also presented with no correction at all, so that the reader can see the result that would be obtained if every feature of the sound were disregarded.

### 6.4.2 Reference Methods

As a check on the subjective judgement, the reference methods at Annex D (tonality, Joint Nordic Method) and Annex E (impulsivity) of BS 4142 were applied computationally to the calibrated audio recording for every 15-minute period of the final night, 23:00 on 28 July to 06:00 on 29 July. Tonality was evaluated in 1-minute segments, the minimum averaging time permitted by Annex D, and the worst segment in each interval taken, because a tone present for part of an interval is diluted by averaging over the whole of it; impulsivity was evaluated over each interval, because the Annex E correction derives from the single most prominent impulse. The results are tabulated in full at Appendix C.

The Annex E impulsivity correction KI lay between 4.9 dB and 9.0 dB in every one of the 28 intervals, with a median of 7.4 dB, and reached the maximum of 9 dB in eight intervals. The Annex D tonality correction KT was zero in 15 intervals and between 1.1 dB and 6.0 dB in the remaining 13, with the maximum of 6.0 dB in two intervals. The tones identified lie between about 95 Hz and 410 Hz, consistent with engines, and between about 2.1 kHz and 3.0 kHz, consistent with reversing alarms, including the 2.7 kHz tone in the interval beginning 03:30; the 8 kHz tones identified in the intervals beginning 04:30 and 05:45 are more probably birdsong and are disregarded.

Two cautions apply. First, Annex E responds to any sound with a fast onset, and natural sounds in a garden recording (birdsong, wind in foliage) can register; the method has been found to return non-zero values on quiet rural recordings, and its results on a survey recording are best treated as an upper bound on the impulsivity of the specific sound rather than a measurement of it. Second, the audio contains the residual sound as well as the specific sound. With those cautions, the reference methods are used only to corroborate the subjective judgement: they indicate clearly to highly perceptible impulsivity in every interval and perceptible tonality in about half, and the combined reference corrections (median 8.4 dB, maximum 15 dB) bracket the subjective range adopted.

## 6.5 Rating Level and Initial Estimate of Impact

The rating levels and their differences from the background sound level are given at Table 6.2.

**Table 6.2** BS 4142 rating levels at P1 and difference from background sound level (night-time, 15-minute reference interval)

| Case | Specific level (dB) | Correction (dB) | Rating level (dB) | Excess over 34 dB background (dB) | Excess over 32 dB background (dB) |
|---|---|---|---|---|---|
| Highest period, no acoustic feature correction | 47 | 0 | 47 | +13 | +15 |
| Highest period, +6 dB impulsive, +3 dB intermittent | 47 | +9 | 56 | +22 | +24 |
| Highest period, +9 dB impulsive, +4 dB tonal | 47 | +13 | 60 | +26 | +28 |
| Typical period, no acoustic feature correction | 43 | 0 | 43 | +9 | +11 |
| Typical period, +6 dB impulsive, +3 dB intermittent | 43 | +9 | 52 | +18 | +20 |
| Typical period, +9 dB impulsive, +4 dB tonal | 43 | +13 | 56 | +22 | +24 |

With the 38 dB residual subtracted (Table 6.1) every value in the last three columns reduces by 1 dB. All values rounded to the nearest whole decibel in accordance with clause 8.6 of BS 4142.

On every basis in Table 6.2 the rating level exceeds the background sound level by around +10 dB or more, and in some cases up to +28 dB. With no correction for the character of the sound at all, the highest period exceeds the background by +13 dB and the typical period by +9 dB.

With the corrections that in the opinion of Murray Acoustics Ltd the sound attracts, the excess is between +18 dB and +26 dB. The initial estimate under clause 11 of BS 4142 is therefore that the sound of the site at the closest dwellings on Withington Drive is likely to give rise to a **significant adverse impact** at night, and that this is so for a typical 15-minute period and not only for the loudest.

For comparison, the reference method rating levels for the final night at Appendix C, which combine the measured $L_{Aeq,15min}$ with the Annex D and E corrections in the same way, range from 48 dB to 60 dB with a median of 52 dB when the corrections are added and from 46 dB to 55 dB when only the dominant feature is applied; every interval of that night exceeds the 34 dB background by more than +11 dB on the dominant-feature basis.

## 6.6 Context

BS 4142 requires the initial estimate to be considered in context. The following matters have been considered.

- **Absolute level.** The rating levels of 52 dB to 60 dB, and the measured $L_{Aeq,15min}$ of 43 dB to 47 dB, arise in a residential garden at night in an area whose background sound level is in the low 30s. The measured $L_{Aeq,8h}$ at P1 alone is close to or above the WHO 1999 outdoor night-time guideline of 45 dB $L_{Aeq}$ outside bedrooms (Section 7.0). The absolute levels do not moderate the initial estimate; if anything they reinforce it, as the standard notes is especially the case at night.
- **Character and level of the residual sound.** The residual is distant road traffic and the ordinary sounds of a quiet suburban estate, with no industrial or impulsive component. The sound of the site is incongruous with it, and readily distinguishable in both spectrum and temporal pattern, as the published recording demonstrates.
- **Sensitivity of the receptor.** The receptors are dwellings whose rear elevations, with first-floor bedroom windows, face the site. The houses are of modern construction with double glazing, but are not understood to have mechanical ventilation or cooling, so that bedroom windows will be opened in warm weather; the survey took place in late July with overnight temperatures of 15°C to 19°C. The garden boundary fences offer no screening to the first-floor windows. No design measure secures good internal conditions at these dwellings with windows open.
- **Measurement position.** The assessment position understates the levels at the bedroom windows of the same dwelling (Section 5.2). The initial estimate is therefore, if anything, conservative in favour of the site.
- **Uncertainty.** The instrument is Class 1 and was calibrated before and after the survey. The assessment does not rest on decimal places: the margin by which the rating level exceeds the background is many times greater than the measurement uncertainty, and the conclusion is the same whether the background is taken as 34 dB or 32 dB, whether or not a residual is subtracted, and whether or not any acoustic feature correction is applied.

None of these factors modifies the initial estimate. In the opinion of Murray Acoustics Ltd, on the measurements of 27 to 29 July 2026, the sound of the operational development at the closest dwellings on Withington Drive gives rise to a significant adverse impact at night when assessed in accordance with BS 4142, and would do so even if the sound were assessed as having no distinguishing character at all.

## 6.7 Relation to the Approved Assessment

The approved assessment predicted, with its mitigation in place and at the bedroom window height of 4.0 m, an external night-time level of 44.8 dB $L_{Aeq}$ at 1 m from the façade of R05, although it is not clear whether this is for an 8-hour average, or a 15-minute period.

The measured free-field $L_{Aeq,15min}$ values at the garden position, lower and better screened than the bedroom window, were 43 dB in a typical period and 47 dB in the highest. Depending on which parameter was presented by the report, the approved assessment therefore appears to have predicted the average level at this dwelling within a few decibels. What it did not do is compare that level with the background, correct it for the character of the sound, or count the events within it. It is those omissions, not the arithmetic of propagation, that separate a conclusion of "below the LOAEL" from the conclusion reached here. The comparison of maximum levels is addressed at Section 7.0.

## 6.8 Daytime

A daytime assessment to BS 4142 has not been presented. The daytime levels at P1 (Table 5.4) include other nearby commercial/industrial activity, and the unattended data do not permit the specific sound level to be separated from such sources with the confidence that the night-time data allow. The daytime $L_{Aeq,1h}$ at P1 on the weekdays otherwise lay between 43 dB and 61 dB against a daytime background of 37 dB $L_{A90}$ adopted in the approved assessment. A daytime assessment would require attended measurement and is recommended at Section 9.0.

Nothing in the daytime data suggests that the daytime picture would be more favourable than the night-time one.

# 7.0 Comparison with the WHO 1999 Criteria ($L_{Amax}$)

## 7.1 Purpose

The approved assessment assessed the service yard and HGV activity against internal WHO 1999 values only, and concluded that they were met. This section compares the measured levels with the predictions of the approved assessment on that same basis, using the approved assessment's own criteria, its own receptor (R05), its own receptor height for the comparison of maximum levels, and its own window allowances. The section is included because it is the comparison the approved assessment invites; it is not the assessment that Murray Acoustics Ltd considers appropriate to the source, which is that at Section 6.0.

## 7.2 Average Levels

The measured night-time $L_{Aeq,8h}$ at P1 was 46.6 dB on the night of 27/28 July (which includes the 06:00 to 07:00 hour, see note to Table 5.3) and 43.7 dB on the night of 28/29 July (to 06:15). The approved assessment predicted 44.8 dB at 1 m from the façade of R05 at 4.0 m with mitigation (its Table 6.2), and 51.7 dB without (its Table 5.4). Applying the approved assessment's window allowances to the measured free-field values gives internal levels of 32 dB and 29 dB with 15 dB (as applied in its tables) and 37 dB and 34 dB with 10 dB (as stated in its text), against its criterion of 30 dB $L_{Aeq,8h}$. The measured values are at a position lower than, and better screened than, the bedroom window, and include no allowance for façade reflection; at the bedroom window they would be higher. On its own $L_{Aeq}$ criterion, therefore, the approved assessment's conclusion of compliance is at best marginal on the 15 dB allowance and is not met on the 10 dB allowance it stated, on measurements taken at a position that favours the site.

## 7.3 Maximum Levels

The comparison of maximum levels is set out at Table 7.1. The measured value of 68 dB $L_{AFmax}$ at P1 is the highest night-time maximum attributed to operations at the site in the interim note, and is consistent with the maxima recorded between 23:00 and 05:00 on both weekday nights (Section 5.8). The transfer of that value from the measurement position (2.5 m) to the bedroom window position assessed by the approved assessment (4.0 m, 1 m from the façade) was made in the interim note by three-dimensional modelling in CadnaA using the ISO 9613-2 method, on the geometry, building heights and boundary mitigation of the approved assessment, with the source levels calibrated to reproduce the measured maximum at P1; that modelling gives 71 dB $L_{Amax}$ at the R05 bedroom window, the 3 dB difference reflecting the reduced effectiveness of the boundary screening at the greater height.

Figures 7.1 and 7.2 reproduce the resulting contours for the approved source data and for the measured source data respectively.

**Table 7.1** Night-time maximum levels at 38 Withington Drive: approved assessment predictions and July 2026 measurements

| Quantity | Approved, with mitigation (its Table 6.3) | Approved, no mitigation (its Table 5.5) | Measured at P1, 2.5 m | Derived at bedroom window, 4.0 m | Criterion adopted |
|---|---|---|---|---|---|
| External $L_{Amax}$ (dB) | 51.1 | 57.2 | 68 | 71 | 60 |
| Internal $L_{Amax}$, 15 dB window allowance as tabulated (dB) | 36.1 | 42.2 | 53 | 56 | 45 |
| Internal $L_{Amax}$, 10 dB window allowance as stated at Section 5.2 (dB) | 41.1 | 47.2 | 58 | 61 | 45 |

The external LAmax criterion of 60 dB is the WHO 1999 value outside bedrooms and was not adopted in the approved assessment, which compared internal values only; it is shown because it avoids the window allowance altogether.

On the approved assessment's own criterion of 45 dB $L_{Amax}$ internally, the measured maximum exceeds the criterion by 8 dB at the measurement position on the 15 dB allowance, and by 11 dB at the bedroom window; on the 10 dB allowance the excess is 13 dB and 16 dB. The measured external maximum exceeds the approved assessment's mitigated prediction by approximately 17 dB at the measurement position and 20 dB at the bedroom window, and exceeds its unmitigated prediction, that is the prediction with no barriers at all, by 11 dB and 14 dB respectively. An increase of 10 dB corresponds, as a rule of thumb, to a doubling of perceived loudness.

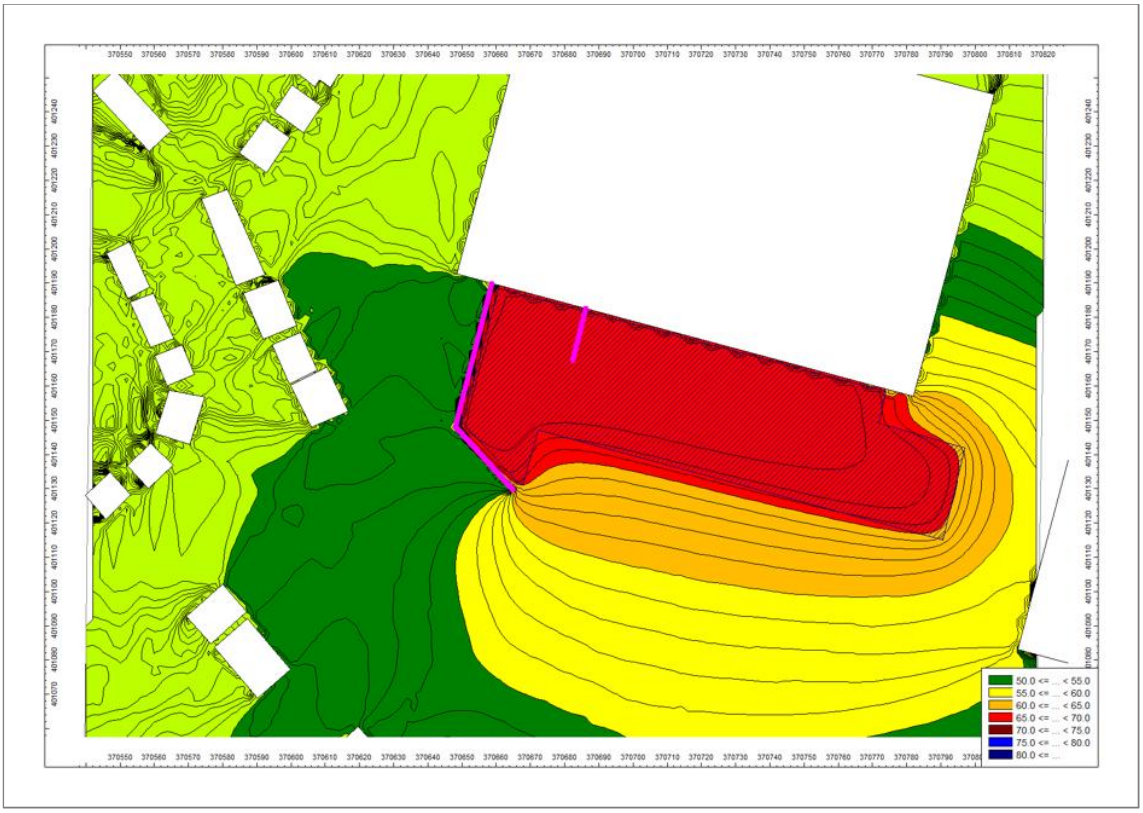


**Figure 7.1** Night-time $L_{Amax}$ contours at 4.0 m on the source data of the approved assessment (Scenario A, from 21184-TN-01)

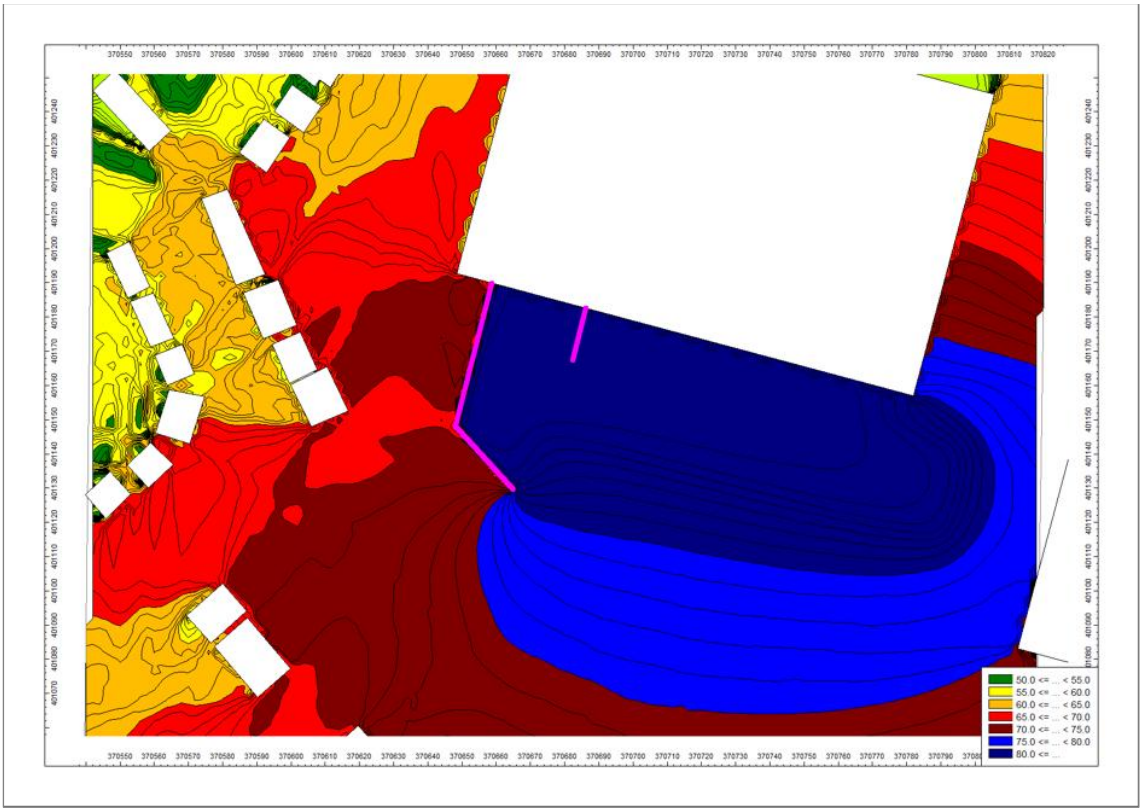


**Figure 7.2** Night-time $L_{Amax}$ contours at 4.0 m on source data calibrated to the July 2026 measurements at P1 (Scenario B, from 21184-TN-01)

## 7.4 Number of Events

WHO 1999 ties its 45 dB $L_{Amax}$ value to the number of events, and states that it is important to limit the number of events exceeding it. An internal level of 45 dB corresponds, on the approved assessment's allowances, to 55 dB to 60 dB outside the window. At P1, which is lower and better screened than the window, the $L_{AFmax}$ reached or exceeded 60 dB in 39 minutes on the night of 27/28 July and 30 minutes on the night of 28/29 July (to 06:15), and 55 dB in 103 and 79 minutes respectively (Table 5.3).

The approved assessment made no prediction of the number of events and the permission contains no limit on them. Whatever number of events per night is taken as the threshold at which the WHO value ceases to be met, the numbers recorded are well beyond it.

## 7.5 Outcome on the Approved Assessment's Own Basis

On the criteria the approved assessment adopted for itself, the measured levels show its night-time $L_{Amax}$ criterion to be exceeded by a wide margin at the closest dwelling, its night-time $L_{Aeq}$ criterion to be at best marginal on one window allowance and exceeded on the other, and its implicit assumption that the number of maximum events would be small to be unfounded.

The difference between the predicted and measured maximum levels is of the order the approved assessment itself acknowledged as the variability of docking noise between sites (up to 22 dB). It also appears reasonable to conclude that the assumption of half the loading bays inactive at night, or the source term of 85.4 dB $L_{Amax}$ at 3 m, or both, do not represent the operation as it exists.

# 8.0 Discussion

## 8.1 Prediction and Measurement

The approved assessment predicted the average night-time level at the closest dwelling to within a few decibels of what was measured, and predicted the maximum level to be some 17 dB to 20 dB lower than what was measured. Those two facts are consistent with one another. The $L_{Aeq}$ of a 15-minute period is governed by the number and duration of events within it as much as by their level, and a modest number of loud, short events can leave the average close to a prediction that assumed more frequent, quieter ones.

The maximum level, by contrast, is governed by the loudest single event, and it is the loudest single events, the dock impacts, brake releases and coupling, that the approved assessment's source term of 85.4 dB $L_{Amax}$ at 3 m, itself taken from measurements at an unnamed depot elsewhere, evidently does not appear to represent. The approved assessment itself recorded that docking noise varies between sites by as much as 22 dB. The measured difference lies within the range the document itself described.

The approved assessment also assumed that half of the loading bays would be inactive at night "to represent typical activity", and that nine HGV movements would occur in a night-time 15-minute period. Neither the number of bays in use at night nor the number of vehicle movements has been counted in this survey, and no inference is drawn about them beyond the observation that the approved assessment's night-time scenario is expressly a typical one rather than a worst case, in a document that describes itself as assessing the worst case. What the measurements show is that, whatever the yard is doing at night, the sound it produces at the nearest gardens is of a level and character that BS 4142 rates as a likely significant adverse impact, and that the maximum levels are well above those the approved assessment predicted and the criterion it adopted.

## 8.2 The Mitigation

The mitigation modelled in the approved assessment comprises bunds whose height is stated nowhere in the document and three barrier segments. The barrier facing Withington Drive is annotated on the plot demise plan as 15 m long and 5 m high. Because the as-built mitigation has not been measured for this report, no conclusion is drawn here as to whether Condition 4 has been complied with. The comparison at Section 7.0 is made against the approved assessment's predictions with its mitigation as modelled; if the mitigation as built is less than that modelled, the measured levels would be expected to be higher than the predictions for that reason among others, and if it is as modelled, the predictions were wrong for other reasons. Either way the measured levels are what the residents experience.

## 8.3 What the Survey Does and Does Not Show

The survey was made at one position over four nights, of which two were dry weekday nights suitable for assessment. It shows the levels at the nearest gardens on those nights, and it shows that the background sound level the approved assessment adopted is, if anything, generous to the site. It does not show the levels at other dwellings, except by the modelling reproduced at Figures 7.1 and 7.2, which rests on the approved assessment's own geometry. It does not show the daytime position with the same confidence. It does not measure the mitigation as built. It does not capture any seasonal variation in the operation. The survey was conducted in late July. The measured levels are total ambient levels and the attribution of events to the site rests on the audio recording, which is published so that it can be checked.

What the survey does show is that the sound of the operational development at the closest dwellings, assessed by the British Standard whose scope names this kind of source and which the approved assessment itself applied to the fixed plant on the same site, exceeds the background sound level by a margin that the standard associates with a significant adverse impact, in a typical 15-minute period and not only in the worst, with or without any correction for the character of the sound, and against the approved assessment's own background sound level or the lower contemporaneous one. It also shows that the maximum levels the approved assessment predicted at the closest bedroom, and on the basis of which it concluded that the WHO criterion it adopted was met with a margin of 9 dB, are exceeded by around 20 dB.

## 8.4 The Absence of any Operational Control

The permission contains no noise limit of any kind. The consequence is that there is no standard, within the planning permission, against which the operation can be held, however loud it becomes: Condition 4 is discharged by building a fence, and thereafter the permission is silent.

The approved assessment's plant emission limits are unenforceable because no condition carries them. The committee report recorded that "the use of acoustic fencing throughout the development and the landscape bund around the periphery of the site" and the fact that the servicing areas "face internally within the site and away from residential boundaries" were among the reasons the activity would not significantly harm residents; the fencing secured comprises two segments, and the western end of the Unit 2 service yard lies close to the boundary with the rear gardens of Withington Drive.

The same Council has, on other B2 and B8 permissions in the borough determined under the same Policy CP 17, imposed a condition limiting the cumulative BS 4142 rating level at the nearest dwellings to the background sound level by day and 5 dB below it at night

(for example A/22/94796/MAJOR, Hindley Green Business Park, September 2023, eleven months before this permission), paired with a condition on delivery hours.

The Environmental Health consultation response on this application records its noise recommendation as "CONG7 (Variation of)". Had a condition of that kind been imposed here, the measurements in this report would show it exceeded at night by between about 15 dB and 30 dB, depending on the acoustic feature corrections applied.

## 8.5 Mitigation Going Forward

It is not the purpose of this report to design mitigation, and nothing here should be read as an opinion on whether the present impact can be reduced to an acceptable level. It is observed only that the margins reported at Section 6.0 are of a size that physical screening at the boundary is unlikely to close on its own, that the events which govern both the rating level and the maximum levels are operational in origin (docking, coupling, braking, reversing, idling) and are therefore amenable to operational control (the allocation of bays at night, the parking and coupling of trailers away from the western boundary, the specification of reversing alarms, engine idling, and hours of yard activity), and that any proposal, physical or operational, would need to be demonstrated by assessment to BS 4142 against the background sound levels reported here, and verified by measurement after implementation.

# 9.0 Questions That Should Now Be Answered

The findings of this report raise questions that Murray Acoustics Ltd cannot answer from the documents available to it, and which in its opinion ought now to be put to, and answered by, those who can. They are listed here in the order in which the relevant matters arise in this report. They are questions, not allegations; each has a factual answer that exists somewhere, and the purpose of listing them is that the answers be produced.

1. **Which revision of the noise report did the Council's Environmental Health service review?** Its consultation response of 19 December 2023 recommends a condition by reference to the report dated 25 September 2023 (Revision 5). Condition 4 as issued refers to Revision 7 of May 2024, in which the barrier scheme at Figure 6.1 had been reduced. Was the consultee asked to review the revised scheme before the condition was issued, and if so where is that review recorded?
2. **What is "CONG7", and why was it varied?** The Environmental Health response describes its noise recommendation as "CONG7 (Variation of)". If CONG7 is the Council's standard condition limiting the BS 4142 rating level of industrial and commercial development at the nearest dwellings, as imposed on other B2 and B8 permissions in the borough under Policy CP 17, what was the reason for varying it to a fencing-only condition on a 24-hour distribution estate within 30 m of bedrooms, and where is that reason recorded?
3. **Why was BS 4142 applied to the fixed plant and not to the service yard?** The approved assessment identifies BS 4142 as its assessment standard at Section 2.0 and applies it at Table 5.2 to the building services plant only. The scope of the standard names the loading and unloading of goods. Who decided that the dominant source would be assessed against internal WHO values instead, on what reasoning, and was the Council aware that no rating level had been derived for the yard?
4. **Did anyone apply the approved assessment's own Table 2.1 to its own Table 6.2?** The report's criteria table treats a difference of +10 dB above background as the trigger for the SOAEL. Its own mitigated night-time prediction at 38 Withington Drive is 44.8 dB against its own background of 34 dB. If that comparison was made, what conclusion was drawn from it; if it was not made, why not?
5. **Which open-window allowance was intended, 10 dB or 15 dB?** Section 5.2 of the approved assessment states 10 dB; every table applies 15 dB. On the stated figure nine dwellings would fail the night-time $L_{Aeq}$ criterion. Was the discrepancy noticed by the author, the checker, the approver or the reviewing officer, and which figure was the Council's decision made on?

6. **Why are the daytime predictions with and without mitigation identical?** Tables 5.3 and 6.1 of Revision 7 are the same to one decimal place at all 27 receptors, whereas in Revision 5 the mitigation produced a 4.6 dB reduction at 38 Withington Drive. What daytime benefit does the mitigation secured by Condition 4 actually provide, and was any reviewer aware that the approved document did not show one?

7. **What were the inputs to the noise model?** Specifically: the source sound power levels and their provenance (the "existing distribution depot" from which the docking levels were taken), the number of bays assumed active by night and by day, the number of night-time HGV movements, the barrier and bund heights and positions as entered, the ground absorption and order of reflections, and the receiver heights. Will the CadnaA model files be made available so that the predictions can be reproduced?

8. **Was the assumption of 50% of bays inactive at night ever checked against the operation consented?** The permission is unrestricted. The approved assessment describes the assumption as representing "typical activity" within a document that elsewhere describes itself as worst-case. Who considered whether a typical-activity assumption was an appropriate basis for a night-time case that passed by 0.2 dB?

9. **What has been built, and who verified it?** What are the height, length, construction, surface mass and continuity of the acoustic fencing installed under Condition 4, and of the bunds, and how do they compare with what the noise model assumed? Did the Council verify the installation before the use commenced, as the condition requires, and is that verification recorded?

10. **Are the plant emission limits of Table 5.1 met by the plant as installed, and how would anyone know?** No condition secures them, no verification was required, and the plant now installed was not the plant assessed. Has the as-installed plant been assessed, and by whom?

11. **How many maximum noise events a night did the Council consider acceptable when it accepted the WHO criterion?** The approved assessment adopted 45 dB $L_{Amax}$ internally from WHO 1999, which ties that value to the number of events, but made no prediction of their number. On the final night of this survey the measured level at the nearest garden reached or exceeded 60 dB $L_{AFmax}$ in 30 minutes before 06:15. Against what number was the criterion judged to be met?

12. **What is the low frequency content of the sound, and has anyone assessed it?** The C-weighted level exceeded the A-weighted level by 10 dB to 17 dB in most night-time periods at the nearest garden. WHO 1999 recommends frequency analysis in that case; BS 4142 excludes low frequency noise from its scope; the approved assessment did not consider it. Which document, and which authority, is responsible for it now?

13. **What assessment of operational noise will the Council now require, and from whom?** The measurements in this report were made by a consultant instructed by residents, at one position, without charge. A full assessment to BS 4142, at several positions, by day and by night, with attended observation and the operator's cooperation, is within the power of the Council to require. Will it be required, on what timetable, and will the results be published?
14. **What operational controls are in place now?** Is there a noise management plan for the estate or for Unit 2; which bays are used at night; where are trailers parked and coupled at night; what reversing alarm systems are fitted; and is there any limit on the number of vehicle movements at night? If there are none, on what basis does the operation proceed 24 hours a day beside a residential estate without any? If noise monitoring is being undertaken, will the data be made public? If not, why not?

# 10.0 Conclusions

Murray Acoustics Ltd was instructed by the Astley Warehouse Action Group, without charge, to survey and assess operational noise from Astley Business Park, Tyldesley, Wigan, and to review the noise assessment that supported planning permission A/23/96226/MAJOR.

The approved assessment applied BS 4142, the British Standard for the rating and assessment of industrial and commercial sound, to the building services plant and not to the service yard and HGV activity which its own predictions show to be the dominant source. Applied to that source on the document's own predicted levels and its own background sound levels, the standard would have indicated a difference of around +10 dB or more at the closest dwellings before any correction for the character of the sound, which is the difference the standard associates with a likely significant adverse impact. The document's conclusion that the development would be below the Lowest Observed Adverse Effect Level rested instead on internal criteria met by margins of 0.2 dB to 0.6 dB, on a window allowance applied differently from the method stated, and on an assumption that half the loading bays would be inactive at night. The mitigation secured by the permission is a fraction of that consulted upon, and the permission contains no noise limit, hours restriction, management plan or monitoring requirement.

Measurements were made continuously at a garden position at the closest dwelling between 25 and 29 July 2026 with a Class 1 instrument and a synchronised calibrated audio recording, the final night of which is published in full. Two dry weekday nights were suitable for assessment. The background sound level of 34 dB $L_{A90}$ adopted in the approved assessment was corroborated and, if anything, is generous to the site; the contemporaneous value is 32 dB.

Assessed in accordance with BS 4142, the sound of the site at the closest dwellings at night has a specific sound level of 47 dB $L_{Aeq,15min}$ in the highest 15-minute period and 43 dB in a typical one, at a position lower than and better screened than the bedroom windows. The sound is impulsive, intermittent and at times tonal; the reference methods of the standard, applied to the recording, corroborate that judgement. With the acoustic feature corrections that in the opinion of Murray Acoustics Ltd the sound attracts, the rating level exceeds the previously measured background sound level by between +18 dB and +26 dB. With no correction at all, it exceeds the background by +13 dB in the highest period and +9 dB in a typical one. The context does not modify the initial estimate. The measured sound is therefore, in the opinion of Murray Acoustics Ltd, likely to give rise to a significant adverse impact at the closest dwellings at night, and would be so rated even if every distinguishing feature of the sound were disregarded.

Compared on the approved assessment's own basis, the measured night-time maximum level at the closest garden is 68 dB $L_{AFmax}$, some 17 dB above the 51 dB predicted at the

bedroom window of the same dwelling with mitigation and 11 dB above the 57 dB predicted with none; transferred to the bedroom window by modelling it is 71 dB. Against the 45 dB internal criterion the approved assessment adopted, the internal level is 53 dB to 61 dB depending on the position and the window allowance used. The $L_{AFmax}$ reached or exceeded 60 dB in 30 to 39 minutes a night at the garden position. The approved assessment predicted no number of events and the permission limits none.

The findings raise the questions set out at Section 9.0. In the opinion of Murray Acoustics Ltd they warrant a full assessment of operational noise to BS 4142 at several positions, by day and by night, with the cooperation of the operator; verification of the mitigation as built against that modelled; and the introduction of operational controls on night-time yard activity pending that assessment. The data on which this report relies are available to any party who wishes to check them.

# Appendix A – Environmental Noise Survey Results

Time history charts of the logged 1-minute $L_{Aeq}$ and $L_{AFmax}$ and the 15-minute $L_{A90}$ at P1 are presented at Figures A.1 to A.5, followed by the full 15-minute results for each night-time period at Tables A.1 to A.4. Times are the start of each interval (British Summer Time). The C-minus-A column is the difference between the 15-minute $L_{Ceq}$ and $L_{Aeq}$.

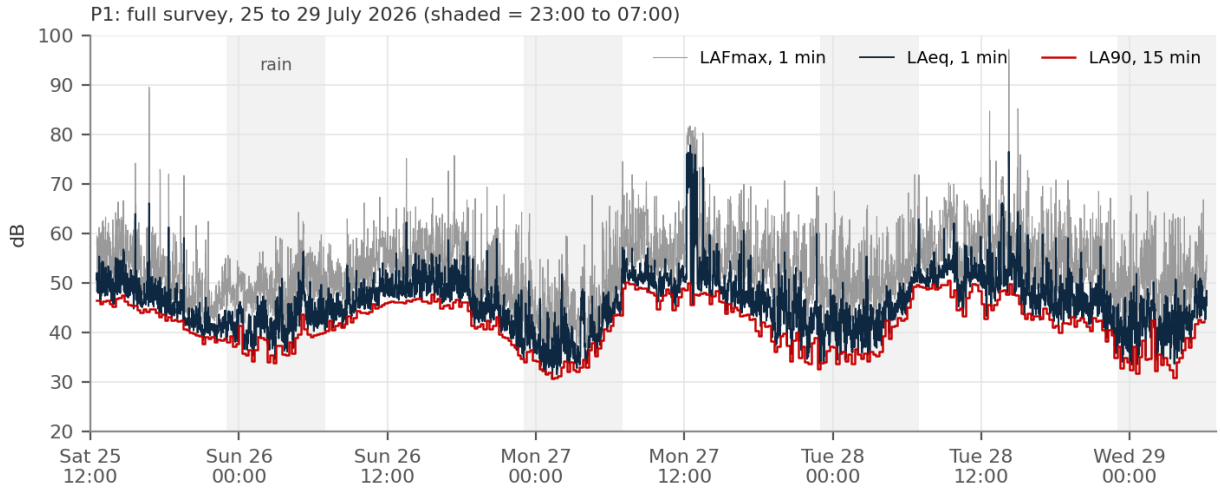


**Figure A.1** P1, full survey period, 25 to 29 July 2026

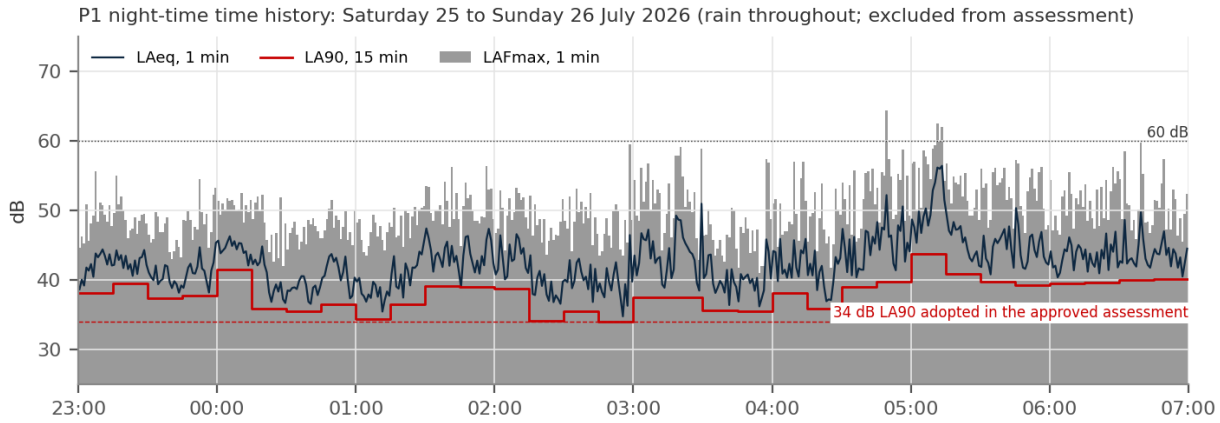


**Figure A.2** P1, night of Saturday 25 to Sunday 26 July 2026 (rain throughout; excluded from assessment)

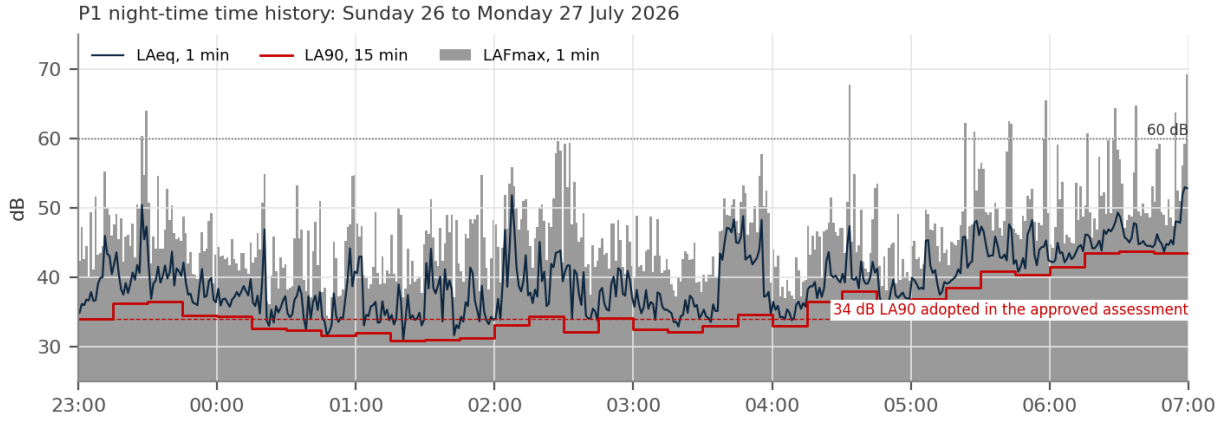

**Figure A.3** P1, night of Sunday 26 to Monday 27 July 2026

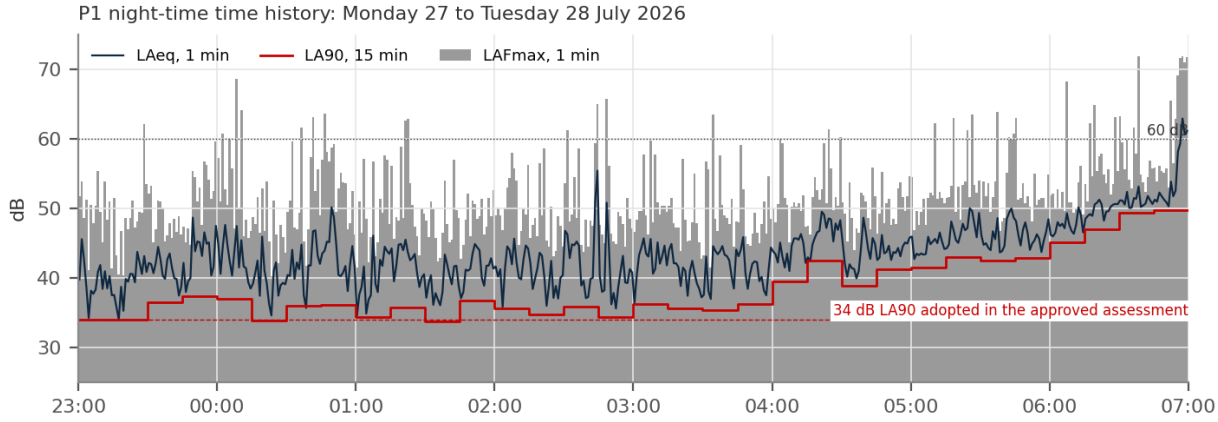


**Figure A.4** P1, night of Monday 27 to Tuesday 28 July 2026

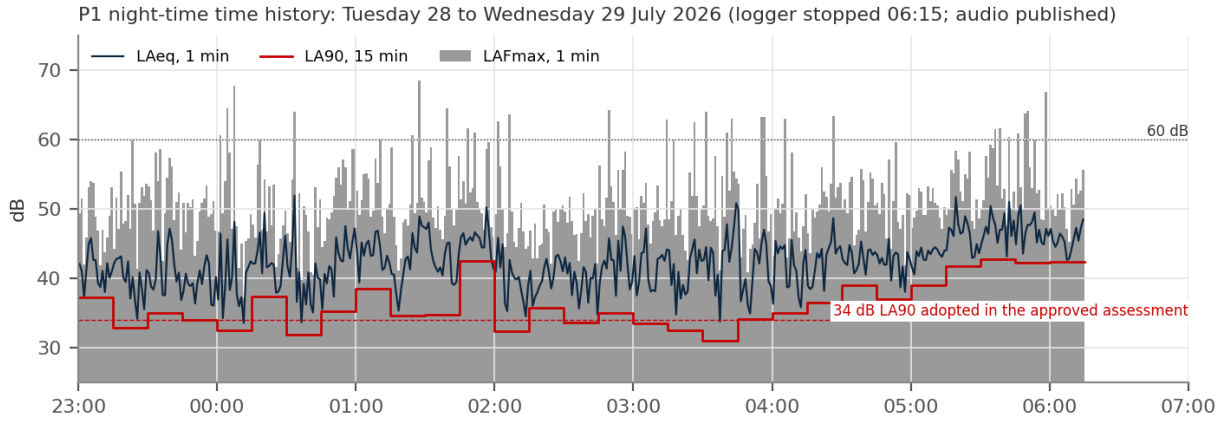


**Figure A.5** P1, night of Tuesday 28 to Wednesday 29 July 2026 (logger stopped 06:15; audio published)

**Table A.1** P1 15-minute results, night of Saturday 25 to Sunday 26 July 2026 (dB)

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Sat 23:00 | 42.3 | 55.6 | 44.9 | 38.1 | 48.8 | 6.5 |
| Sat 23:15 | 42.7 | 54.9 | 44.9 | 39.4 | 47.7 | 5.1 |
| Sat 23:30 | 40.2 | 49.7 | 42.3 | 37.3 | 46.9 | 6.7 |
| Sat 23:45 | 41.8 | 54.5 | 44.3 | 37.7 | 46.9 | 5.1 |
| Sun 00:00 | 44.7 | 52.4 | 46.9 | 41.4 | 47.6 | 2.9 |
| Sun 00:15 | 40.8 | 52.1 | 43.5 | 35.8 | 45.5 | 4.7 |
| Sun 00:30 | 38.9 | 48.8 | 41.2 | 35.4 | 44.9 | 6.0 |
| Sun 00:45 | 41.5 | 51.5 | 44.1 | 36.5 | 46.0 | 4.5 |
| Sun 01:00 | 38.3 | 49.3 | 40.7 | 34.3 | 43.5 | 5.3 |
| Sun 01:15 | 42.0 | 50.6 | 45.2 | 36.5 | 45.4 | 3.5 |
| Sun 01:30 | 44.0 | 56.2 | 46.9 | 39.1 | 46.7 | 2.7 |
| Sun 01:45 | 44.0 | 56.4 | 47.2 | 38.9 | 48.3 | 4.2 |
| Sun 02:00 | 43.6 | 53.2 | 46.8 | 38.7 | 47.1 | 3.4 |
| Sun 02:15 | 39.3 | 52.0 | 42.3 | 34.1 | 43.3 | 4.0 |

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Sun 02:30 | 40.7 | 53.1 | 43.7 | 35.4 | 48.2 | 7.5 |
| Sun 02:45 | 40.4 | 59.4 | 42.7 | 33.9 | 50.8 | 10.3 |
| Sun 03:00 | 43.9 | 56.7 | 46.9 | 37.4 | 52.7 | 8.8 |
| Sun 03:15 | 45.9 | 59.0 | 49.5 | 37.4 | 60.9 | 15.0 |
| Sun 03:30 | 40.4 | 50.3 | 43.5 | 35.6 | 52.8 | 12.4 |
| Sun 03:45 | 40.7 | 57.3 | 43.3 | 35.4 | 56.7 | 16.0 |
| Sun 04:00 | 43.2 | 57.0 | 46.4 | 38.1 | 56.8 | 13.6 |
| Sun 04:15 | 41.1 | 53.9 | 43.9 | 35.8 | 51.4 | 10.3 |
| Sun 04:30 | 44.6 | 56.0 | 47.7 | 38.9 | 56.9 | 12.3 |
| Sun 04:45 | 47.2 | 64.3 | 50.3 | 39.7 | 63.5 | 16.3 |
| Sun 05:00 | 52.1 | 62.5 | 55.9 | 43.7 | 60.1 | 7.9 |
| Sun 05:15 | 46.1 | 56.7 | 49.2 | 40.8 | 50.5 | 4.4 |
| Sun 05:30 | 45.0 | 56.1 | 48.3 | 39.7 | 54.7 | 9.8 |
| Sun 05:45 | 45.3 | 57.2 | 48.6 | 39.2 | 58.8 | 13.5 |
| Sun 06:00 | 43.6 | 55.5 | 46.1 | 39.5 | 51.8 | 8.2 |
| Sun 06:15 | 43.8 | 56.2 | 46.3 | 39.6 | 55.2 | 11.4 |
| Sun 06:30 | 44.6 | 59.8 | 46.7 | 39.9 | 55.8 | 11.2 |
| Sun 06:45 | 43.9 | 57.3 | 46.3 | 40.1 | 53.3 | 9.4 |

**Table A.2** P1 15-minute results, night of Sunday 26 to Monday 27 July 2026 (dB)

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Sun 23:00 | 40.1 | 55.2 | 42.8 | 34.0 | 52.7 | 12.6 |
| Sun 23:15 | 43.4 | 64.0 | 46.1 | 36.2 | 52.8 | 9.4 |
| Sun 23:30 | 40.5 | 54.5 | 43.1 | 36.5 | 50.9 | 10.3 |
| Sun 23:45 | 38.5 | 49.2 | 41.7 | 34.5 | 47.4 | 8.9 |
| Mon 00:00 | 37.5 | 45.5 | 39.6 | 34.3 | 45.5 | 8.1 |
| Mon 00:15 | 38.4 | 54.8 | 38.6 | 32.6 | 52.3 | 13.9 |
| Mon 00:30 | 36.2 | 53.2 | 38.6 | 32.3 | 50.7 | 14.5 |
| Mon 00:45 | 37.5 | 54.8 | 42.1 | 31.6 | 49.5 | 12.0 |
| Mon 01:00 | 37.7 | 49.3 | 42.6 | 32.0 | 48.7 | 11.1 |
| Mon 01:15 | 34.9 | 49.9 | 37.2 | 30.8 | 49.0 | 14.0 |
| Mon 01:30 | 39.1 | 51.2 | 42.0 | 30.9 | 51.9 | 12.8 |
| Mon 01:45 | 36.6 | 54.7 | 40.0 | 31.2 | 51.0 | 14.4 |
| Mon 02:00 | 43.9 | 55.8 | 48.0 | 33.1 | 48.3 | 4.4 |
| Mon 02:15 | 41.0 | 59.5 | 43.4 | 34.3 | 54.8 | 13.8 |
| Mon 02:30 | 38.5 | 59.3 | 41.2 | 32.1 | 49.3 | 10.8 |
| Mon 02:45 | 38.7 | 48.3 | 41.6 | 34.1 | 46.0 | 7.3 |

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Mon 03:00 | 36.3 | 48.9 | 38.6 | 32.5 | 47.8 | 11.5 |
| Mon 03:15 | 35.2 | 45.0 | 37.3 | 32.1 | 48.2 | 13.0 |
| Mon 03:30 | 43.5 | 51.4 | 47.4 | 33.0 | 56.9 | 13.4 |
| Mon 03:45 | 43.8 | 57.7 | 46.1 | 34.6 | 56.6 | 12.8 |
| Mon 04:00 | 35.3 | 44.0 | 36.9 | 33.0 | 49.3 | 14.1 |
| Mon 04:15 | 39.8 | 51.4 | 42.3 | 36.5 | 53.3 | 13.6 |
| Mon 04:30 | 41.6 | 67.7 | 42.9 | 37.9 | 52.9 | 11.3 |
| Mon 04:45 | 37.6 | 53.5 | 38.9 | 35.3 | 49.7 | 12.0 |
| Mon 05:00 | 40.8 | 49.7 | 44.4 | 36.8 | 49.1 | 8.3 |
| Mon 05:15 | 43.8 | 62.2 | 47.3 | 38.4 | 52.3 | 8.6 |
| Mon 05:30 | 44.8 | 62.5 | 47.0 | 40.8 | 52.5 | 7.7 |
| Mon 05:45 | 44.2 | 65.5 | 47.0 | 40.3 | 55.7 | 11.5 |
| Mon 06:00 | 43.3 | 59.1 | 44.7 | 41.4 | 56.3 | 12.9 |
| Mon 06:15 | 46.3 | 64.4 | 47.5 | 43.5 | 57.4 | 11.1 |
| Mon 06:30 | 45.9 | 64.7 | 47.3 | 43.7 | 56.6 | 10.7 |
| Mon 06:45 | 48.3 | 69.2 | 50.4 | 43.5 | 59.1 | 10.9 |

**Table A.3** P1 15-minute results, night of Monday 27 to Tuesday 28 July 2026 (dB)

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Mon 23:00 | 40.3 | 55.4 | 43.9 | 33.9 | 55.4 | 15.1 |
| Mon 23:15 | 40.2 | 62.1 | 43.0 | 34.0 | 52.4 | 12.2 |
| Mon 23:30 | 41.5 | 53.2 | 43.9 | 36.4 | 52.7 | 11.2 |
| Mon 23:45 | 44.4 | 59.6 | 47.4 | 37.3 | 56.1 | 11.7 |
| Tue 00:00 | 43.8 | 68.5 | 45.9 | 37.0 | 56.9 | 13.2 |
| Tue 00:15 | 40.5 | 53.8 | 43.3 | 33.8 | 52.9 | 12.4 |
| Tue 00:30 | 42.8 | 63.1 | 45.1 | 35.9 | 56.5 | 13.7 |
| Tue 00:45 | 44.6 | 63.5 | 48.4 | 36.1 | 58.9 | 14.3 |
| Tue 01:00 | 41.4 | 57.6 | 44.4 | 34.3 | 53.6 | 12.3 |
| Tue 01:15 | 42.9 | 62.8 | 45.0 | 35.7 | 54.8 | 11.9 |
| Tue 01:30 | 39.8 | 56.9 | 42.5 | 33.7 | 54.5 | 14.7 |
| Tue 01:45 | 41.9 | 52.6 | 44.8 | 36.7 | 54.8 | 12.8 |
| Tue 02:00 | 42.5 | 58.0 | 45.2 | 35.6 | 56.3 | 13.7 |
| Tue 02:15 | 40.5 | 58.5 | 43.2 | 34.7 | 53.1 | 12.6 |
| Tue 02:30 | 47.0 | 64.9 | 46.7 | 35.8 | 58.1 | 11.2 |
| Tue 02:45 | 42.5 | 65.7 | 43.2 | 34.3 | 54.1 | 11.6 |
| Tue 03:00 | 43.2 | 59.7 | 45.6 | 36.2 | 56.7 | 13.5 |
| Tue 03:15 | 41.3 | 57.0 | 44.1 | 35.6 | 52.4 | 11.1 |

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Tue 03:30 | 42.5 | 63.4 | 44.7 | 35.3 | 53.4 | 10.9 |
| Tue 03:45 | 41.9 | 59.1 | 44.6 | 36.2 | 56.0 | 14.1 |
| Tue 04:00 | 44.1 | 60.1 | 46.5 | 39.4 | 55.5 | 11.4 |
| Tue 04:15 | 47.1 | 61.3 | 49.5 | 42.5 | 61.1 | 14.1 |
| Tue 04:30 | 44.1 | 55.8 | 47.1 | 38.8 | 56.6 | 12.5 |
| Tue 04:45 | 44.2 | 55.3 | 46.1 | 41.2 | 54.5 | 10.3 |
| Tue 05:00 | 44.7 | 62.2 | 46.7 | 41.4 | 52.7 | 8.1 |
| Tue 05:15 | 47.3 | 63.5 | 49.9 | 43.0 | 55.4 | 8.1 |
| Tue 05:30 | 46.8 | 63.8 | 49.0 | 42.5 | 55.8 | 9.1 |
| Tue 05:45 | 46.2 | 63.0 | 48.5 | 42.8 | 58.0 | 11.7 |
| Tue 06:00 | 47.6 | 68.2 | 49.2 | 45.1 | 58.4 | 10.8 |
| Tue 06:15 | 49.9 | 64.8 | 51.3 | 46.9 | 63.5 | 13.6 |
| Tue 06:30 | 51.1 | 71.9 | 52.0 | 49.3 | 63.5 | 12.3 |
| Tue 06:45 | 56.9 | 71.8 | 53.7 | 49.7 | 65.2 | 8.2 |

**Table A.4** P1 15-minute results, night of Tuesday 28 to Wednesday 29 July 2026 (dB)

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Tue 23:00 | 41.8 | 54.0 | 44.2 | 37.2 | 54.9 | 13.1 |
| Tue 23:15 | 40.5 | 59.9 | 43.4 | 32.8 | 56.0 | 15.5 |
| Tue 23:30 | 42.6 | 58.6 | 46.2 | 35.0 | 56.1 | 13.5 |
| Tue 23:45 | 39.9 | 53.3 | 43.1 | 34.0 | 54.8 | 14.9 |
| Wed 00:00 | 42.0 | 67.7 | 44.2 | 32.5 | 56.1 | 14.1 |
| Wed 00:15 | 43.6 | 60.0 | 46.2 | 37.3 | 54.5 | 10.9 |
| Wed 00:30 | 42.9 | 63.9 | 43.6 | 31.8 | 52.0 | 9.0 |
| Wed 00:45 | 43.5 | 58.6 | 46.9 | 35.2 | 54.5 | 11.0 |
| Wed 01:00 | 44.0 | 60.1 | 47.0 | 38.4 | 55.6 | 11.5 |
| Wed 01:15 | 44.1 | 68.4 | 47.1 | 34.6 | 56.0 | 11.9 |
| Wed 01:30 | 43.6 | 64.4 | 46.8 | 34.7 | 56.2 | 12.6 |
| Wed 01:45 | 45.9 | 61.6 | 47.1 | 42.5 | 60.8 | 14.8 |
| Wed 02:00 | 40.9 | 63.6 | 43.3 | 32.3 | 56.2 | 15.3 |
| Wed 02:15 | 40.8 | 50.6 | 43.5 | 35.7 | 53.3 | 12.6 |
| Wed 02:30 | 40.1 | 52.2 | 43.6 | 33.6 | 53.2 | 13.0 |
| Wed 02:45 | 43.1 | 64.2 | 45.7 | 35.0 | 54.8 | 11.7 |
| Wed 03:00 | 42.5 | 62.8 | 45.8 | 33.5 | 54.6 | 12.1 |
| Wed 03:15 | 41.8 | 62.5 | 45.0 | 32.5 | 54.7 | 13.0 |
| Wed 03:30 | 44.8 | 63.9 | 48.1 | 30.9 | 57.2 | 12.4 |
| Wed 03:45 | 43.4 | 63.2 | 45.7 | 34.1 | 54.6 | 11.2 |

| Start | $L_{Aeq,15min}$ | $L_{AFmax}$ | $L_{A10,15min}$ | $L_{A90,15min}$ | $L_{Ceq,15min}$ | C minus A |
|---|---|---|---|---|---|---|
| Wed 04:00 | 42.6 | 63.0 | 45.4 | 34.9 | 59.6 | 17.0 |
| Wed 04:15 | 43.6 | 63.4 | 46.1 | 36.5 | 54.8 | 11.2 |
| Wed 04:30 | 43.1 | 55.7 | 45.0 | 38.9 | 54.0 | 11.0 |
| Wed 04:45 | 42.5 | 59.6 | 45.1 | 37.0 | 53.2 | 10.6 |
| Wed 05:00 | 43.4 | 53.2 | 46.0 | 38.9 | 55.9 | 12.5 |
| Wed 05:15 | 46.9 | 58.4 | 49.3 | 41.7 | 57.3 | 10.4 |
| Wed 05:30 | 47.7 | 61.5 | 50.3 | 42.7 | 57.9 | 10.2 |
| Wed 05:45 | 47.2 | 66.8 | 49.7 | 42.2 | 59.9 | 12.7 |
| Wed 06:00 | 45.8 | 55.6 | 48.0 | 42.3 | 57.3 | 11.5 |

# Appendix B – Weather Observations

Hourly observations at Manchester Airport (EGCC, 53.365°N 2.310°W, approximately 18 km south-east of the site), taken from the Weather Underground historical archive of Met Office METAR reports, for the survey period. Times are British Summer Time. Wind speeds are converted from miles per hour to metres per second and temperatures from degrees Fahrenheit to degrees Celsius; the original values are rounded in the source. No precipitation amounts are reported by the station; the condition column records the observed weather. Observations between 23:00 and 07:00 are those relevant to the night-time assessment.

**Table B.1** Manchester Airport hourly observations, 25 to 29 July 2026

| Date | Time | Temp (°C) | Wind dir. | Wind (m/s) | Observed weather |
|---|---|---|---|---|---|
| Sat 25 Jul | 12:50 | 21 | W | 8.9 | Fair |
| Sat 25 Jul | 13:50 | 21 | WNW | 9.4 | Showers in the Vicinity |
| Sat 25 Jul | 14:50 | 20 | WNW | 10.3 | Partly Cloudy / Windy |
| Sat 25 Jul | 15:50 | 20 | W | 10.3 | Showers in the Vicinity |
| Sat 25 Jul | 16:50 | 19 | W | 7.6 | Showers in the Vicinity |
| Sat 25 Jul | 17:50 | 19 | W | 4.5 | Mostly Cloudy |
| Sat 25 Jul | 18:50 | 19 | W | 6.3 | Cloudy |
| Sat 25 Jul | 19:20 | 19 | W | 5.4 | Cloudy |
| Sat 25 Jul | 19:50 | 19 | W | 5.4 | Cloudy |
| Sat 25 Jul | 20:20 | 19 | WSW | 4.5 | Cloudy |
| Sat 25 Jul | 20:50 | 18 | W | 3.6 | Cloudy |
| Sat 25 Jul | 21:20 | 17 | SW | 2.7 | Light Rain |
| Sat 25 Jul | 21:50 | 16 | S | 2.2 | Cloudy |
| Sat 25 Jul | 22:20 | 16 | SSW | 2.7 | Mostly Cloudy |
| Sat 25 Jul | 22:50 | 16 | SSW | 3.1 | Light Rain |
| Sat 25 Jul | 23:20 | 16 | SSW | 2.7 | Cloudy |
| Sat 25 Jul | 23:50 | 17 | SSW | 2.2 | Cloudy |
| Sun 26 Jul | 00:20 | 17 | SSW | 2.2 | Light Rain |
| Sun 26 Jul | 00:50 | 17 | SSW | 2.7 | Light Rain |
| Sun 26 Jul | 01:50 | 17 | SSW | 3.1 | Drizzle |
| Sun 26 Jul | 02:50 | 17 | SW | 2.7 | Drizzle |
| Sun 26 Jul | 03:20 | 17 | SW | 3.1 | Rain |
| Sun 26 Jul | 03:50 | 17 | W | 7.2 | Light Rain |
| Sun 26 Jul | 04:50 | 17 | W | 5.8 | Light Rain |
| Sun 26 Jul | 05:20 | 17 | W | 6.3 | Heavy Rain |
| Sun 26 Jul | 05:50 | 17 | W | 7.6 | Light Rain |
| Sun 26 Jul | 06:20 | 17 | W | 5.8 | Light Rain |
| Sun 26 Jul | 06:50 | 17 | W | 7.2 | Mostly Cloudy |
| Sun 26 Jul | 07:50 | 16 | W | 6.7 | Light Rain |
| Sun 26 Jul | 08:50 | 16 | W | 6.7 | Light Rain |
| Sun 26 Jul | 09:50 | 16 | W | 5.8 | Light Drizzle |
| Sun 26 Jul | 10:50 | 16 | W | 6.7 | Light Rain |
| Sun 26 Jul | 11:50 | 17 | W | 7.2 | Mostly Cloudy |
| Sun 26 Jul | 12:50 | 17 | W | 8.9 | Light Rain Shower |
| Sun 26 Jul | 13:50 | 17 | W | 7.6 | Showers in the Vicinity |
| Sun 26 Jul | 14:50 | 18 | W | 8.9 | Showers in the Vicinity |

| Date | Time | Temp (°C) | Wind dir. | Wind (m/s) | Observed weather |
|---|---|---|---|---|---|
| Sun 26 Jul | 15:50 | 18 | W | 7.6 | Showers in the Vicinity |
| Sun 26 Jul | 16:50 | 18 | W | 6.3 | Showers in the Vicinity |
| Sun 26 Jul | 17:50 | 17 | W | 7.2 | Showers in the Vicinity |
| Sun 26 Jul | 18:50 | 18 | W | 5.8 | Rain Shower |
| Sun 26 Jul | 19:50 | 16 | W | 3.1 | Mostly Cloudy |
| Sun 26 Jul | 20:20 | 15 | W | 5.4 | Rain |
| Sun 26 Jul | 20:50 | 15 | W | 4.0 | Mostly Cloudy |
| Sun 26 Jul | 21:50 | 15 | W | 2.7 | Cloudy |
| Sun 26 Jul | 22:50 | 15 | W | 4.0 | Fair |
| Sun 26 Jul | 23:20 | 15 | W | 5.4 | Fair |
| Sun 26 Jul | 23:50 | 15 | WNW | 4.0 | Rain |
| Mon 27 Jul | 00:50 | 14 | W | 4.0 | Cloudy |
| Mon 27 Jul | 01:50 | 15 | W | 4.0 | Cloudy |
| Mon 27 Jul | 02:50 | 15 | W | 4.0 | Cloudy |
| Mon 27 Jul | 03:50 | 15 | WNW | 4.0 | Light Rain |
| Mon 27 Jul | 04:50 | 15 | W | 3.1 | Partly Cloudy |
| Mon 27 Jul | 05:50 | 15 | W | 3.1 | Cloudy |
| Mon 27 Jul | 06:50 | 15 | WSW | 3.6 | Partly Cloudy |
| Mon 27 Jul | 07:50 | 15 | W | 5.8 | Mostly Cloudy |
| Mon 27 Jul | 08:50 | 16 | WSW | 6.3 | Mostly Cloudy |
| Mon 27 Jul | 09:50 | 16 | W | 7.6 | Mostly Cloudy |
| Mon 27 Jul | 10:50 | 17 | W | 7.2 | Mostly Cloudy |
| Mon 27 Jul | 11:50 | 18 | W | 7.6 | Partly Cloudy |
| Mon 27 Jul | 12:50 | 19 | W | 7.2 | Partly Cloudy |
| Mon 27 Jul | 13:50 | 20 | W | 5.8 | Partly Cloudy |
| Mon 27 Jul | 14:50 | 20 | W | 4.0 | Partly Cloudy |
| Mon 27 Jul | 15:50 | 19 | WSW | 2.2 | Mostly Cloudy |
| Mon 27 Jul | 16:50 | 20 | WSW | 3.1 | Cloudy |
| Mon 27 Jul | 17:50 | 21 | W | 5.4 | Cloudy |
| Mon 27 Jul | 18:50 | 20 | W | 2.7 | Showers in the Vicinity |
| Mon 27 Jul | 19:50 | 20 | WSW | 3.6 | Cloudy |
| Mon 27 Jul | 20:50 | 20 | SW | 4.0 | Showers in the Vicinity |
| Mon 27 Jul | 21:50 | 18 | VAR | 0.9 | Cloudy |
| Mon 27 Jul | 22:50 | 18 | S | 1.3 | Cloudy |
| Mon 27 Jul | 23:50 | 19 | SSW | 2.2 | Cloudy |
| Tue 28 Jul | 00:50 | 18 | SSW | 2.7 | Mostly Cloudy |
| Tue 28 Jul | 01:50 | 18 | S | 2.7 | Partly Cloudy |
| Tue 28 Jul | 02:50 | 18 | VAR | 0.9 | Fair |
| Tue 28 Jul | 03:50 | 18 | SSW | 2.7 | Fair |
| Tue 28 Jul | 04:50 | 18 | SSW | 3.1 | Fair |
| Tue 28 Jul | 05:50 | 18 | S | 2.2 | Fair |
| Tue 28 Jul | 06:50 | 19 | SSW | 2.7 | Fair |
| Tue 28 Jul | 07:50 | 19 | SSW | 3.1 | Fair |
| Tue 28 Jul | 08:50 | 20 | SSW | 3.1 | Fair |
| Tue 28 Jul | 09:50 | 22 | SSW | 3.6 | Partly Cloudy |
| Tue 28 Jul | 10:50 | 24 | SW | 4.0 | Mostly Cloudy |
| Tue 28 Jul | 11:50 | 25 | SSW | 4.0 | Partly Cloudy |
| Tue 28 Jul | 12:50 | 25 | SW | 4.0 | Partly Cloudy |
| Tue 28 Jul | 13:50 | 26 | SSW | 2.7 | Partly Cloudy |

| Date | Time | Temp (°C) | Wind dir. | Wind (m/s) | Observed weather |
|---|---|---|---|---|---|
| Tue 28 Jul | 14:50 | 25 | WSW | 4.5 | Cloudy |
| Tue 28 Jul | 15:50 | 25 | W | 5.4 | Mostly Cloudy |
| Tue 28 Jul | 16:50 | 25 | SW | 4.5 | Mostly Cloudy |
| Tue 28 Jul | 17:50 | 25 | SW | 4.5 | Fair |
| Tue 28 Jul | 18:50 | 26 | SSW | 4.5 | Fair |
| Tue 28 Jul | 19:50 | 24 | SW | 3.1 | Fair |
| Tue 28 Jul | 20:50 | 22 | SSW | 1.3 | Fair |
| Tue 28 Jul | 21:50 | 20 | VAR | 0.4 | Fair |
| Tue 28 Jul | 22:50 | 20 | S | 0.9 | Fair |
| Tue 28 Jul | 23:50 | 18 | VAR | 0.9 | Fair |
| Wed 29 Jul | 00:50 | 19 | S | 1.3 | Fair |
| Wed 29 Jul | 01:50 | 19 | SSW | 2.2 | Partly Cloudy |
| Wed 29 Jul | 02:50 | 16 | SSW | 1.3 | Fair |
| Wed 29 Jul | 03:50 | 16 | S | 1.3 | Fair |
| Wed 29 Jul | 04:50 | 16 | SSW | 2.2 | Fair |
| Wed 29 Jul | 05:50 | 15 | SSW | 1.3 | Fair |
| Wed 29 Jul | 06:50 | 17 | S | 1.3 | Fair |

# Appendix C – BS 4142 Reference Method Results, Final Night

Results of the BS 4142 Annex D (tonality, Joint Nordic Method) and Annex E (impulsivity) reference methods applied to the calibrated audio recording at P1 for each 15-minute interval from 23:00 on 28 July to 06:00 on 29 July 2026. $L_{Aeq,15min}$ is the meter's logged value energy-averaged over the interval. KT is the Annex D tonal correction from the worst 1-minute segment in the interval, with the frequency of the tone identified; KI is the Annex E impulsivity correction over the interval. The rating level is given with the corrections added (clause 9.3.3) and with the dominant correction only. The recording contains the residual sound as well as the specific sound, and Annex E responds to any sound with a fast onset; the results are an upper bound on the corrections attributable to the site and are presented as corroboration of the subjective assessment at Section 6.4. Tones identified at about 8 kHz (04:30 and 05:45) are more probably birdsong.

**Table C.1** Reference method results by 15-minute interval, 28/29 July 2026

| Start | $L_{Aeq,15min}$ (dB) | KT (dB) | Tone (Hz) | KI (dB) | Rating, added (dB) | Rating, dominant (dB) | Added, minus 34 dB | Dominant, minus 34 dB |
|---|---|---|---|---|---|---|---|---|
| 23:00 | 41.8 | 0.0 | 141 | 6.5 | 48.2 | 48.2 | +14 | +14 |
| 23:15 | 40.5 | 2.1 | 2981 | 9.0 | 51.6 | 49.5 | +18 | +16 |
| 23:30 | 42.6 | 0.0 | 256 | 9.0 | 51.6 | 51.6 | +18 | +18 |
| 23:45 | 39.9 | 0.0 | 256 | 9.0 | 48.9 | 48.9 | +15 | +15 |
| 00:00 | 42.0 | 0.0 | 2769 | 8.5 | 50.5 | 50.5 | +16 | +16 |
| 00:15 | 43.6 | 1.5 | 231 | 4.9 | 50.0 | 48.5 | +16 | +14 |
| 00:30 | 42.9 | 0.0 | 95 | 6.3 | 49.3 | 49.3 | +15 | +15 |
| 00:45 | 43.6 | 2.0 | 2870 | 6.8 | 52.3 | 50.4 | +18 | +16 |
| 01:00 | 44.0 | 2.1 | 2115 | 6.5 | 52.7 | 50.6 | +19 | +17 |
| 01:15 | 44.1 | 0.0 | 188 | 8.8 | 52.9 | 52.9 | +19 | +19 |
| 01:30 | 43.6 | 2.3 | 249 | 8.6 | 54.5 | 52.2 | +20 | +18 |
| 01:45 | 45.9 | 1.1 | 240 | 5.3 | 52.4 | 51.3 | +18 | +17 |
| 02:00 | 40.9 | 0.0 | 210 | 8.3 | 49.2 | 49.2 | +15 | +15 |
| 02:15 | 40.8 | 2.2 | 233 | 4.9 | 47.9 | 45.7 | +14 | +12 |
| 02:30 | 40.1 | 2.3 | 343 | 9.0 | 51.4 | 49.1 | +17 | +15 |
| 02:45 | 43.1 | 3.1 | 256 | 9.0 | 55.2 | 52.1 | +21 | +18 |
| 03:00 | 42.5 | 0.0 | 360 | 9.0 | 51.5 | 51.5 | +18 | +18 |
| 03:15 | 41.8 | 0.0 | 275 | 8.4 | 50.1 | 50.1 | +16 | +16 |
| 03:30 | 44.8 | 6.0 | 2723 | 9.0 | 59.8 | 53.8 | +26 | +20 |
| 03:45 | 43.4 | 0.0 | 614 | 7.1 | 50.4 | 50.4 | +16 | +16 |
| 04:00 | 42.6 | 0.0 | 190 | 6.7 | 49.3 | 49.3 | +15 | +15 |
| 04:15 | 43.6 | 1.5 | 410 | 9.0 | 54.0 | 52.6 | +20 | +19 |
| 04:30 | 43.1 | 6.0 | 7997 | 6.5 | 55.5 | 49.5 | +22 | +16 |
| 04:45 | 42.6 | 0.0 | 3820 | 6.3 | 48.8 | 48.8 | +15 | +15 |
| 05:00 | 43.4 | 0.0 | 233 | 5.1 | 48.5 | 48.5 | +14 | +14 |
| 05:15 | 46.9 | 0.0 | 249 | 5.0 | 51.9 | 51.9 | +18 | +18 |
| 05:30 | 47.7 | 1.9 | 2902 | 6.0 | 55.6 | 53.6 | +22 | +20 |
| 05:45 | 47.2 | 0.0 | 7132 | 7.6 | 54.9 | 54.9 | +21 | +21 |

# Appendix D – Glossary

**Table D.1** Terms used in this report

| Term | Meaning |
|---|---|
| dB | Decibel: the unit of sound pressure level, a logarithmic ratio relative to 20 µPa. An increase of 10 dB is perceived as approximately a doubling of loudness; a change of 3 dB is just perceptible. |
| A-weighting, dB(A), LA | A frequency weighting approximating the sensitivity of human hearing at moderate levels. C-weighting (LC) is much flatter and retains low frequency content; the difference LC minus LA indicates the low frequency content of a sound. |
| $L_{Aeq,T}$ | The equivalent continuous A-weighted sound pressure level over a period T: the level of a steady sound with the same energy as the fluctuating sound measured. |
| $L_{AFmax}$ | The maximum A-weighted sound pressure level with fast time weighting (125 ms) in a period; used to describe individual events. |
| $L_{A90,T}$ | The A-weighted level exceeded for 90% of the period T; used to describe the background sound level. |
| $L_{A10,T}$ | The A-weighted level exceeded for 10% of the period T. |
| Ambient, residual, specific sound | BS 4142 terms: the ambient sound is everything present; the residual is the ambient sound without the specific source; the specific sound is that from the source being assessed. |
| Rating level, $L_{Ar,Tr}$ | The specific sound level with corrections added for tonal, impulsive, intermittent or otherwise distinctive character, over the reference time interval Tr (1 hour by day, 15 minutes by night). |
| Background sound level | The LA90 that is representative of the period, measured in the absence of the specific sound. |
| Free-field | A measurement position away from reflecting surfaces other than the ground. A position 1 m from a façade is typically about 3 dB higher than the free-field level. |
| NOEL, LOAEL, SOAEL | No Observed Effect Level, Lowest Observed Adverse Effect Level and Significant Observed Adverse Effect Level, as used in the Noise Policy Statement for England. |