ENVIRONMENTAL NOISE ASSESSMENT

Trout Road, West Drayton

Produced by XCO2 for Troutbourne LLP

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CONTENTS

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EXECUTIVE SUMMARY

It is proposed to develop the site at Rainbow and Kirby Industrial Estates, Trout Road, Yiewsley, UB7 7XT, for residential and commercial use.

An environmental noise survey has been undertaken to determine the acoustic suitability of the site for its intended use. A vibration survey has been undertaken to identify whether ground borne noise and/or vibration may have a detrimental effect on the proposed buildings or the future occupants. An outline assessment of the potential for noise from the nearby supermarket has been made. Guidance has been provided with regard to maximum permissible noise emissions, such that the local authority's usual requirements will be met.

ENVIRONMENTAL NOISE AND VIBRATION ASSESSMENT

The highest noise levels across the site are within "NRC 2 – Medium" within the London Borough of Hillingdon Supplementary Planning Document, while the more typical noise levels are within "NRC – 1 Low". In both cases a noise assessment is required to "demonstrate how ... adverse impacts will be avoided".

It is understood that, for energy efficiency reasons, all dwellings will have individual mechanical ventilation and heat recovery (MVHR) systems.

Typical thermal double glazing and normal external building elements – such as cavity brick/blockwork or a lightweight façade with suitable internal acoustic lining – will be adequate to control intrusive noise to acceptable levels, with the exception of bedrooms overlooking the adjacent supermarket, where an enhanced glazing performance is specified.

The assessment has demonstrated that the proposals will not give rise to significant adverse effects on health and quality of life and that reasonable practicable mitigation measures can be put in place using conventional construction methods in order for adverse effects to be reduced.

OUTLINE ASSESSMENT OF NOISE FROM EXISTING SUPERMARKET

Noise from plant and deliveries at the existing ALDI supermarket to the northeast of the site has the potential to cause an adverse noise impact on residents in the closest of the proposed new buildings.

To minimise the risk of sleep disturbance in the case of late night and/or early morning opening hours and deliveries, it is recommended that glazing with an enhanced acoustic performance is used for bedrooms overlooking the premises. Mitigation of night-time overheating will be required to employ a suitable level of sound insulation, for example by opening acoustic louvres or by night-time cooling.

GUIDANCE ON PLANT NOISE TO ENVIRONMENT

Initial guidance on permissible plant noise levels has been provided in order that the Local Authority's normal criteria will be met.

SOUND INSULATION BETWEEN COMMERCIAL AND RESIDENTIAL PREMISES

Separating walls and floors between dwellings and commercial spaces must comply with the requirements Building Regulations Approved Document E. Additional recommendations have been made to control noise from non-residential spaces to the dwellings to acceptable levels.

INTRODUCTION

It is proposed to develop the site at Rainbow and Kirby Industrial Estates, Trout Road, Yiewsley, UB7 7XT, to provide new housing and commercial workspaces.

SITE LOCATION

The site is located on to the north of West Drayton town centre and is bounded by the Grand Union Canal to the southwest, Trout Road to the northwest, the rear of houses on St Stephen's Road to the southeast and an ALDI supermarket to the northeast (See Figure 1 below). The site is currently occupied by a variety of commercial and light industrial premises. The site is within the London Borough of Hillingdon.

Figure 1: Site location map (image © Google 2024).

PLANNING POLICIES

A great deal of change has occurred in recent years in the assessment of noise impacts and their relationship with planning decisions. The following sections introduce the applicable policies, either national or local, which ought to be considered to support the planning application. It should be highlighted that the assessment is mainly addressed to the local planning authority.

NOISE POLICY STATEMENT FOR ENGLAND

The Noise Policy Statement for England (NPSE[1]), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are: " *Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *avoid significant adverse effects on health and quality of life;*
- *mitigate and minimise adverse effects on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and quality of life occur.

The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the NPSE). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case: *"...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development."*

Importantly, the NPSE goes on to state that: " *This does not mean that such adverse effects cannot occur."*

The NPSE does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that: *"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*

It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

[1] Noise Policy Statement for England, Defra, March 2010

NATIONAL PLANNING POLICY FRAMEWORK

A new edition of NPPF was published in December 2023 and came into effect immediately. The original National Planning Policy Framework (NPPF) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The December 2023 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2023 edition.

Paragraph 180 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land stability."*

The NPPF goes on to state in Paragraph 180 "*planning policies and decisions should … :*

- *(a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and quality of life;*
- *(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason …*

The NPPF document does not refer to any other documents or British Standards regarding noise other than the NPSE.

Paragraph 2 of the NPPF states that "*planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise."*

Paragraph 12 of the NPPF states that *"The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed"*

Paragraph 123 states that *"Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land.*

PLANNING PRACTICE GUIDANCE – NOISE

An updated Planning Practice Guidance (PPG[2]) for noise was published on 22 July 2019 and provides additional guidance and elaboration on the NPPF. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and

[2] Planning Practice Guidance – Noise, https://www.gov.uk/guidance/noise--2, 22 July 2019

- Whether or not a good standard of amenity can be achieved.

This guidance introduced the concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). NOAEL differs from NOEL in that it represents a situation where the acoustic character of an area can be slightly affected (but not such that there is a perceived change in the quality of life). UAEL represents a situation where noise is 'very disruptive' and should be 'prevented' (as opposed to SOAEL, which represents a situation where noise is 'disruptive', and should be 'avoided').

As exposure increases above the LOAEL, the noise begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. As the noise exposure increases, it will then at some point cross the SOAEL boundary.

The LOAEL is described in PPG[3] as the level above which "noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard".

PPG identifies the SOAEL as the level above which "noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present."

In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG[4] acknowledges that "...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation."

The relevant guidance in the PPG in relation to the adverse effect levels is summarized in Table 1.

Table 1. PPG guidance on adverse effect levels.

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not Intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and Intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the	Observed Adverse Effect	Mitigate and reduce to a minimum

[3] Paragraph: 005 Reference ID: 30-005-20190722
[4] Paragraph: 006 Reference ID: 30-006-20190722

Perception	Examples of Outcomes	Increasing Effect Level	Action
	acoustic character of the area such that there is a small actual or perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Present and Disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very Disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

The Planning Practice Guidance[5] states the following in relation to mitigation measures:

"For noise sensitive developments, mitigation measures can include avoiding noisy locations in the first place; designing the development to reduce the impact of noise from adjoining activities or the local environment; incorporating noise barriers; and optimising the sound insulation provided by the building envelope."

In addition, the Guide notes that it may also be relevant to consider[6]:

"... whether any adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time (and the effect this may have on living conditions). In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations".

THE LONDON PLAN 2021

The London Plan 2021 was adopted in March 2021. The intent of The London Plan is to set out "an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years".

[5] Paragraph: 010 Reference ID: 30-010-20190722
[6] Paragraph: 006 Reference ID: 30-006-20190722

POLICY D3 OPTIMISING SITE CAPACITY THROUGH THE DESIGN-LED APPROACH REQUIRES THAT:

D Development proposals should: …

9) help prevent or mitigate the impacts of noise and poor air quality

POLICY D13 AGENT OF CHANGE REQUIRES THAT:

A The Agent of Change principle places the responsibility for mitigating impacts from existing noise and other nuisance-generating activities or uses on the proposed new noise-sensitive development. Boroughs should ensure that Development Plans and planning decisions reflect the Agent of Change principle and take account of existing noise and other nuisance-generating uses in a sensitive manner when new development is proposed nearby.

B Development should be designed to ensure that established noise and other nuisance-generating uses remain viable and can continue or grow without unreasonable restrictions being placed on them.

C New noise and other nuisance-generating development proposed close to residential and other noise-sensitive uses should put in place measures to mitigate and manage any noise impacts for neighbouring residents and businesses.

D Development proposals should manage noise and other potential nuisances by:
1) ensuring good design mitigates and minimises existing and potential nuisances generated by existing uses and activities located in the area
2) exploring mitigation measures early in the design stage, with necessary and appropriate provisions including ongoing and future management of mitigation measures secured through planning obligations
3) separating new noise-sensitive development where possible from existing noise-generating businesses and uses through distance, screening, internal layout, sound-proofing, insulation and other acoustic design measures.

E Boroughs should not normally permit development proposals that have not clearly demonstrated how noise and other nuisances will be mitigated and managed.

POLICY D14 *NOISE* STATES:

A In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:
1) avoiding significant adverse noise impacts on health and quality of life
2) reflecting the Agent of Change principle as set out in Policy D13 Agent of Change
3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses
4) Improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity)
5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout orientation, uses and materials – in preference to sole reliance on sound insulation
6) where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles
7) promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver.

B Boroughs, and others with relevant responsibilities, should identify and nominate new Quiet Areas and protect existing Quiet Areas in line with the procedure in Defra's Noise Action Plan for Agglomerations.

THE NARRATIVE TO POLICY D14 INCLUDES THE ADVICE[7] THAT:

The management of noise also includes promoting good acoustic design of the inside of buildings. Section 5 of BS 8233:2014 provides guidance on how best to achieve this. The Institute of Acoustics has produced advice Pro:PG Planning and Noise (May 2017) that may assist with the implementation of residential developments. BS 4142 provides guidance on monitoring noise issues in mixed residential/industrial areas.

LONDON BOROUGH OF HILLINGDON

The London Boroughs of Hillingdon, Hounslow and Richmond Upon Thames adopted a Supplementary Planning Document relating to noise-sensitive development in July 2014[8]. Section 5.0 of the document states:

Noise sensitive development includes residential properties, residential institutions, educational establishments and hospitals as well as noise sensitive land such as certain parks and gardens.

For transportation noise, the document sets out four Noise Risk Categories, as shown below:

[7] Paragraph 3.14.3, The London Plan 2021
[8] Development Control for Noise Generating and Noise Sensitive Development

Figure 2: Initial Site Noise Risk Assessment

External Transportation Noise Risk Assessment (measured/predicted, empty site, pre-mitigation)

Noise Risk Category*	Potential Effect if unmitigated	Pre-Planning Application Guidance
0 – Negligible $L_{Aeq,16hr}$ < 50dB $L_{Aeq,8hr}$ < 40dB	**No adverse effect on health and quality of life**	Development proposal is likely to be acceptable from a noise perspective. Noise assessment /report required to demonstrate no adverse impacts Good acoustic design encouraged to improve existing environment
1 – Low $L_{Aeq,16hr}$ 50-63dB $L_{Aeq,8hr}$ 40-55dB	**Adverse effect on health and quality of life**	Noise environment likely to cause adverse impacts Noise assessment /report required to demonstrate how adverse impacts will be minimised and how good acoustic design will be implemented. Planning conditions and other measures to control noise are likely to be required.
2 – Medium $L_{Aeq,16hr}$ 63-69dB $L_{Aeq,8hr}$ 55-60dB L_{ASmax} <82dB	**Significant adverse effect on health and quality of life**	Noise environment likely to cause significant adverse impacts and development may be refused unless Noise assessment /report required to demonstrate how significant adverse impacts will be avoided and other adverse impacts minimised and how good acoustic design will be implemented Planning conditions and other measures to minimise noise will be necessary.
3 – High $L_{Aeq,16hr}$ > 69dB $L_{Aeq,8hr}$ > 60dB L_{ASmax} <82dB	**Unacceptable adverse effect on health and quality of life**	Noise environment likely to cause unacceptable adverse impacts and development likely to be refused even if a good acoustic design process is followed, unless there is an overriding case for development in the context of Government policy on sustainable development.

Figure 2: Local Authority Noise Risk Categories (Figure 2 in SPD).

Internal noise levels within the SPD are those set out in BS 8233:2014 and referenced in the London Plan 2021 and the Institute of Acoustics Professional Practice Guidance document.

Section 6.0 of the document notes that for new commercial and industrial development, the rating noise level from plant, at the nearest noise-sensitive receptor and assessed using the method described in BS 4142:2014, should be at least 5 dB(A) below the existing representative background sound level.

DESIGN STANDARDS

INSTITUTE OF ACOUSTICS PROFESSIONAL PRACTICE GUIDANCE

The Institute of Acoustics published a guidance document for new residential development in May 2017, in conjunction with the ANC and the Chartered Institute of Environmental Health, "*to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England*".

The document advocates a two-stage process for consideration of noise affecting new residential developments. Stage 1 is an initial risk assessment of the proposed development site, based on the ambient noise levels in the area. Stage 2 recommends consideration of four main elements:

- demonstration of a "good acoustic design process"
- observation of internal noise guidelines
- an assessment of noise affecting external amenity areas
- consideration of other relevant issues

The initial risk assessment considers the indicative day-time and night-time equivalent continuous noise levels which indicates an "increasing risk of adverse effect" with increasing noise levels[9].

For Stage 2, the ProPG document recommends that the guidance in BS 8233:2014 is followed.

Noise control in and around buildings is discussed in the British Standard guides on an objective and quantifiable basis. The guides suggest criteria, such as suitable sleeping/resting conditions, and propose noise levels that normally satisfy these criteria for most people.

While the IoA ProPG is specifically intended to inform the acoustic design of residential premises the same principles provide a good foundation for the acoustic design of hotel accommodation.

BS 8233:2014 GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS.

This Standard provides recommended guideline values for internal noise levels within dwellings which are similar in scope to guideline values contained within the World Health Organisation (WHO) document, Guidelines for Community Noise (1999[10]). In the absence of formal guidance on acceptable intrusive noise levels for hotel bedrooms the guidance in BS 8233 is considered appropriate. These guideline noise levels are shown in Table 2, below:

Table 2. BS 8233 Desirable Internal Ambient Noise Levels for Dwellings.

Activity	Location	07:00 to 23:00 hours	23:00 to 07:00 hours
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

[9] Figure 1, IoA ProPG for New Residential Development, May 2017
[10] World Health Organisation Guidelines for Community Noise, 1999

BS 8233:2014 advises that: "regular individual noise events…can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values." The assessment of individual noise events during the night-time may only be considered necessary for intermittent environmental sources such as aircraft of train pass-bys for which there is research available to assist with the quantification of the impact. Individual noise events associated with night-time typical road traffic are not considered to be associated with the rise of significant adverse effects on health and quality of life, and this is indeed the case even if the site is located near a motorway.

SOUND INSULATION BETWEEN COMMERCIAL UNITS AND DWELLINGS

Airborne noise from the commercial units to adjoining dwellings must be controlled in order to meet the statutory requirements in the current Building Regulations. In addition, it is recommended that guidance values in BS 8233:2014 are also met or exceeded.

BUILDING REGULATIONS APPROVED DOCUMENT E

The building regulations Approved Document E *Resistance to the passage of sound* gives minimum acoustic performance requirements for separating walls and floors between dwellings and other spaces within the same building.

For new-build homes the airborne sound insulation provided by any separating wall or floor, where one side is a dwelling, must be at least 45 dB $D_{nT,w} + C_{tr}$. Where there is a dwelling below another space the impact sound level must not exceed 62dB $L'_{nT,w}$.

The requirements of Approved Document E are intended for use in residential and mixed-use buildings where noise levels are not expected to be high. Where such a situation occurs, additional guidance is taken from section 7.5 in BS 8233:2014.

This states:

> *… sound from adjacent spaces can affect the intended use, depending on the noise activity, noise sensitivity and privacy requirement. A matrix may be used to determine the sound insulation requirement of* separating partitions once the noise activity, noise sensitivity and privacy requirements for each room and space. An example matrix, which can be adapted according to the specific building use, is given in Table 3. Each room may be both a source and a receiving room. Where adjacent rooms have different uses, the worst-case sound *insulation should be specified.*

Table 3 **Example on-site sound insulation matrix (dB $D_{nT,w}$)**

Privacy requirement	Activity noise of source room	Noise sensitivity of receiving rooms		
		Low sensitivity	Medium sensitivity	Sensitive
Confidential	Very high	47	52	57 A)
	High	47	47	52
	Typical	47	47	47
	Low	42	42	47
Moderate	Very high	47	52	57 A)
	High	37	42	47
	Typical	37	37	42
	Low	No rating	No rating	37
Not private	Very high	47	52	57 A)
	High	37	42	47
	Typical	No rating	37	42
	Low	No rating	No rating	37

*NOTE Background noise can also influence privacy. See also **7.7.6.3**.*

A) $D_{nT,w}$ 55 dB or greater is difficult to obtain on site and room adjacencies requiring these levels should be avoided wherever practical.

BRITISH STANDARD 4142: 2014+A1:2019 METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND

The Standard sets out the method to be employed for assessing the likelihood of noise impact from services plant (and other noise sources not relevant to this development).

This British Standard describes a methodology to be exercised on the outside of a building for determining:

(a) Sound levels from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises; and
(b) Background sound level.

This standard also describes a method for assessing the impact of the sound referred to within (a) on the nearby residents. The likelihood of sound provoking complaints depends on its level relative to the background sound level and whether or not it has certain tonal or impulsive audible characteristics, such as a distinctive whine, bangs, thumps or clatters. Such sounds are assumed to increase the sound depending how perceptible these sounds are. BS 4142 states that Reference to paragraph 11 “Assessment of the impacts” gives the following conclusion:

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

The standard states that a sound 10 dB or greater than background sound would be likely to be an indication of a significant adverse impact. Around 5 dB would be an adverse impact, whereas a sound equal to background would be a low impact.

Section 8 of BS 4142:2014+A1:2019 states,

8.1 In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods …
Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound…

8.1.4 The monitoring duration should reflect the range of background sound levels for the period being assessed. In practice, there is no "single" background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed…. A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

BUILDING REGULATIONS PARTS L AND F

Part L of the Building Regulations mandates that buildings become more airtight, and Part F stipulates ventilation requirements. Even though there appears to be a contradiction in this, Part L limits uncontrollable ventilation while Part F ensures that ventilation requirements are provided in a controlled manner.

The 2021 edition of Approved Document F came into effect on 15 June 2022. Volume 1 sets out the requirements for ventilation of dwellings.

Paragraph 1.9 describes a ventilation strategy comprising **extract ventilation** of bathrooms and kitchens, **whole house ventilation** to provide fresh air and "remove water vapour and pollutants not removed by extract ventilation" and **purge ventilation** used intermittently to "remove high concentrations of pollutants produced by occasional activities (e.g. fumes from painting)". The use of purge ventilation to control overheating is described in Part O, as noted below.

The assessment within the main part of this report deals with controlling intrusive noise in the "whole house ventilation" scenario.

While the use of open windows to remove intermittent fumes would inevitably result in increased intrusive sound levels compared to when windows are closed, this is considered not to be significant in acoustic terms because activities producing the fumes to be removed would tend to be short in duration and under the control of the occupants and therefore not likely to take place when occupants are trying to sleep.

BUILDING REGULATIONS – PART O

Approved Document *O1: Overheating mitigation* of the Building Regulations 2010, came into force on 15 June 2022. Section 3 in the Approved Document includes the following:

Noise
3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.
a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use.

NOTE: Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020).

VIBRATION

Guidance on acceptable levels is taken from BS 6472-1:2008 'Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting'. Guidance on the likelihood of structural or cosmetic damage is given in BS 7385-2:1993 'Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from groundborne vibration'.

BS 6472-1:2008 provides guidance on predicting human response to vibration in buildings over the frequency range 0.5 Hz to 80 Hz. It describes frequency weighting curves for human beings exposed to whole-body vibration. It uses the principle of vibration dose values, VDV, to estimate the probability of adverse comment that might be expected from human beings experiencing vibration in buildings.

Table 1 in the Standard, given in Table 3 below, sets out vibration dose value ranges likely to result in various levels of disturbance.

Table 3 Vibration dose value ranges which might result in adverse comment within residential buildings (BS6472:2008 Part 1 table 1)

Place and time	Probability of adverse comment		
	Low	Possible	Probable
Residential buildings, 16 h day (0700-2300)	0.2 – 0.4 m $s^{-1.75}$	0.4 – 0.8 m $s^{-1.75}$	0.8 – 1.6 m $s^{-1.75}$
Residential buildings, 8 h night (2300-0700)	0.1 – 0.2 m $s^{-1.75}$	0.2 – 0.4 m $s^{-1.75}$	0.4 – 0.8 m $s^{-1.75}$

BS 7385-2:1993 contains guidance on damage levels from ground-borne vibration, and notes that the probability of damage tends towards zero at 12.5mm.s^{-1} peak component particle velocity.

MEASUREMENT OF NOISE LEVELS

The following section describes the methodology undertaken in order to establish the environmental noise levels around the site.

DETAILS OF ENVIRONMENTAL SOUND SURVEY

Continuous measurements of environmental sound levels were made at four locations between 09.15hrs on Friday 9th August and 11.15hrs on Monday 12th August 2024. Additional attended measurements were made at three further positions within the existing commercial/industrial site between 11.30hrs and 13.30hrs on Friday 9th August.

The sound level meters were programmed to record the A-weighted L_{eq}, L_{90}, L_{10} and L_{max} noise indices and corresponding octave band frequency information (for L_{eq}) for consecutive sample periods for the duration of the survey.

MEASUREMENT POSITIONS

The measurements of environmental sound levels were undertaken at four locations, with additional attended measurements The approximate locations of the measurement positions are indicated in the aerial photograph below.

Figure 3: On site sound pressure level measurement positions *(Image © Google, 2024).*

Table 4. Description of measurement positions.

Position	Description
1	Secured to boundary fence on south side of site, adjacent to canal
2	Lamp-post on Trout Road, close to southern entrance to existing commercial/industrial site
3	Lamp-post on Trout Road, close to northern entrance to existing commercial/industrial site
4	Lamp-post on St Stephen's Road
A	Within commercial/industrial site, toward south west corner
B	Within commercial/industrial site, toward south east corner
C	Within commercial/industrial site, toward northeast boundary

EQUIPMENT

Details of the equipment used during the survey are provided in Table 5. The sound level meters were calibrated before and after the survey; no significant change in the calibration level was noted.

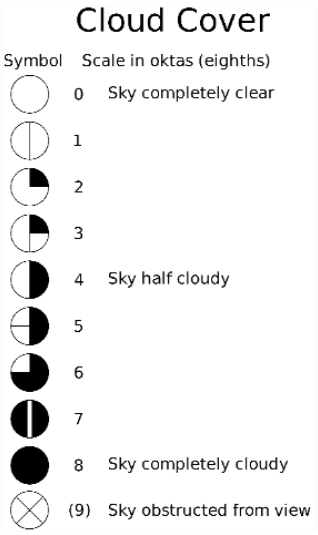
Table 5. On site instrumentation.

Position	Description	Model / serial no.	Calibration date	Calibration certificate no.
1	Class 1 Sound level meter	Svantek 977/ 97446	16/01/2023	1504305-1
	Condenser microphone	Microtech MK255 / 20194		
	Preamplifier	Microtech MK255 / 20194		
	Calibrator	Svantek SV 30A / 10847	04/06/2024	1508883-2
2	Class 1 Sound level meter	Svantek 977D / 99470	14/02/2024	Factory conformation certificate
	Condenser microphone	Microtech MK255 / 26252		
	Preamplifier	Svantek SV12L / 144633		
	Calibrator	Svantek SV33B / 125706	06/09/2023	1506399-2
3	Class 1 Sound level meter	Svantek 977D / 99472	07/02/2024	Factory conformation certificate
	Condenser microphone	Microtech MK255 / 26247		
	Preamplifier	Svantek SV12L / 144643		
	Calibrator	Svantek SV33B / 148015	06/03/2024	Factory conformation certificate
4, A, B, C	Class 1 Sound level meter	Svantek 977D / 99070	11/05/2023	Factory conformation certificate
	Condenser microphone	Microtech MK255 / 25429		
	Preamplifier	Svantek SV12L / 126981		
	Calibrator	Rion NC-74 / 35094453	06/09/2023	1503192-1

WEATHER CONDITIONS

Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. Table 6 below presents the weather conditions recorded on site at the beginning and end of the survey.

Table 6. Weather Conditions.

Date/Time	Description	Beginning of Survey	End of Survey
09.15 9 Aug – 11.15 12 Aug 2024	Temperature (°C)	19	26
	Precipitation:	No	No
	Cloud cover (oktas - see guide)	6-7	0
	Presence of fog/snow/ice	No	No
	Presence of damp roads/wet ground	No	No
	Wind Speed (m/s)	3	<1
	Wind Direction	W	No
	Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

*no influence in the conclusions of the assessment

RESULTS

At unattended measurement position 1 and the attended positions on the site, the main source of noise was observed to be plant and other equipment operating within the existing commercial areas within the site. At the other unattended survey positions the main source of noise was local road traffic.

ENVIRONMENTAL NOISE LEVELS

The single figure free field noise indices recorded are presented in tabular format within Appendix B. The relevant results of the survey have been summarised in Table 7.

Table 7: Summary of survey results (free field levels).

Position	Measurement period	Range of recorded sound pressure levels (dB)			
		$L_{Amax, T}$	$L_{Aeq, T}$	$L_{A10, T}$	$L_{A90, T}$
1	Daytime (07.00 – 23.00 hours)	55 - 107	44 - 77	45 - 78	39 - 64
	Night-time (23.00 – 07.00 hours)	47 - 82	37 - 57	38 - 62	33 - 49

Position	Measurement period	Range of recorded sound pressure levels (dB)			
		$L_{Amax, T}$	$L_{Aeq, T}$	$L_{A10, T}$	$L_{A90, T}$
2	Daytime (07.00 – 23.00 hours)	62 - 101	45 - 71	46 - 71	40 - 59
	Night-time (23.00 – 07.00 hours)	47 - 89	41 - 60	38 - 60	32 - 52
3	Daytime (07.00 – 23.00 hours)	75 - 110	52 - 78	50 - 68	43 - 52
	Night-time (23.00 – 07.00 hours)	56 - 93	45 - 66	46 - 67	36 - 51
4	Daytime (07.00 – 23.00 hours)	51 - 94	40 - 66	41 - 63	35 - 51
	Night-time (23.00 – 07.00 hours)	44 - 81	36 - 52	37 - 52	32 - 50
A	Survey period	86 - 90	64 - 68	63 - 70	47 - 53
B	Survey period	81 - 86	55 - 65	59 - 66	49 - 55
C	Survey period	71 - 76	51 - 52	52 - 54	45 - 46

Noise levels at positions A, B and C were dominated by activities within the development site.

Noise generated within the existing commercial and industrial premises on the site affected the noise levels measured before approximately 19.45hrs on Friday 9th August, between 07.00hrs and approximately 14.45hrs on Saturday 10th August and after 07.00hrs on Monday 12th August. Noise levels at survey positions 1 and 2 were affected. Since these commercial noise sources will not be present after the development of the site they have been excluded from the following analysis of noise at those locations.

Table 8 below presents the incident free field noise levels at the measurement positions in terms of daytime and night-time levels measured during the monitoring period at the survey locations (and ignoring the commercial activities as noted above).

Table 8: Daytime and night-time equivalent levels (free field levels).

Measurement period		Free field sound pressure levels (dB)			
		Position 1	Position 2	Position 3	Position 4
Friday 9th August (day)*	$L_{Aeq,T}$	53*	55*	65	53
9th – 10th August (night)	$L_{Aeq, 8hr}$	48	50	59	48
Saturday 10th August (day)	$L_{Aeq,T}$	57*	58*	64	53
10th – 11th August (night)	$L_{Aeq, 8hr}$	46	48	57	44
Sunday 11th August (day)	$L_{Aeq, 16hr}$	61	55	65	48
11th – 12th August (night)	$L_{Aeq, 8hr}$	49	51	57	45
Monday 12th August (day)*	$L_{Aeq,T}$	-	-	63	51
Overall – day	$L_{Aeq, 16hr}$	**58**	**55**	**65**	**52**
Overall - night	$L_{Aeq,8hr}$	**48**	**50**	**58**	**46**

*not complete 16-hour measurements.

The incident octave band sound pressure levels at the noise monitors are shown in Table 9.

Table 9 Summary of free field facade environmental noise levels at octave band centre frequencies.

Period	Free field sound pressure levels (dB) at Octave Band Centre Frequencies (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Position 1									
Daytime $L_{eq, 16\ hours}$	56	52	53	54	53	50	47	44	58
Night-time $L_{eq, 8\ hours}$	49	48	48	45	43	38	38	36	48
Spectrum of typical night-time L_{max}*	56	55	60	62	58	55	44	40	63
Position 2									
Daytime $L_{eq, 16\ hours}$	61	58	54	51	51	47	42	40	55
Night-time $L_{eq, 8\ hours}$	55	55	51	46	45	40	36	33	50
Spectrum of typical night-time L_{max}*	69	71	66	66	67	62	57	53	70
Position 3									
Daytime $L_{eq, 16\ hours}$	64	61	60	58	60	59	53	47	64
Night-time $L_{eq, 8\ hours}$	57	55	53	51	53	52	46	41	58
Spectrum of typical night-time L_{max}*	73	72	73	83	86	85	80	77	90
Position 4									
Daytime $L_{eq, 16\ hours}$	58	54	51	48	48	44	40	35	52
Night-time $L_{eq, 8\ hours}$	50	47	46	43	43	36	31	26	46
Spectrum of typical night-time L_{max}*	66	65	59	58	61	58	53	54	65

*Tenth-highest noise event

Octave band spectra of the L_{max} sound levels have been derived from review of the octave band spectra within the relevant time period.

BACKGROUND SOUND LEVELS

A statistical analysis of the daytime and night-time background sound levels at measurement position 1, at the south of the site, is shown in the histograms below. Noise levels at this location are least affected by passing traffic etc. and are therefore representative of the middle of the site after development.

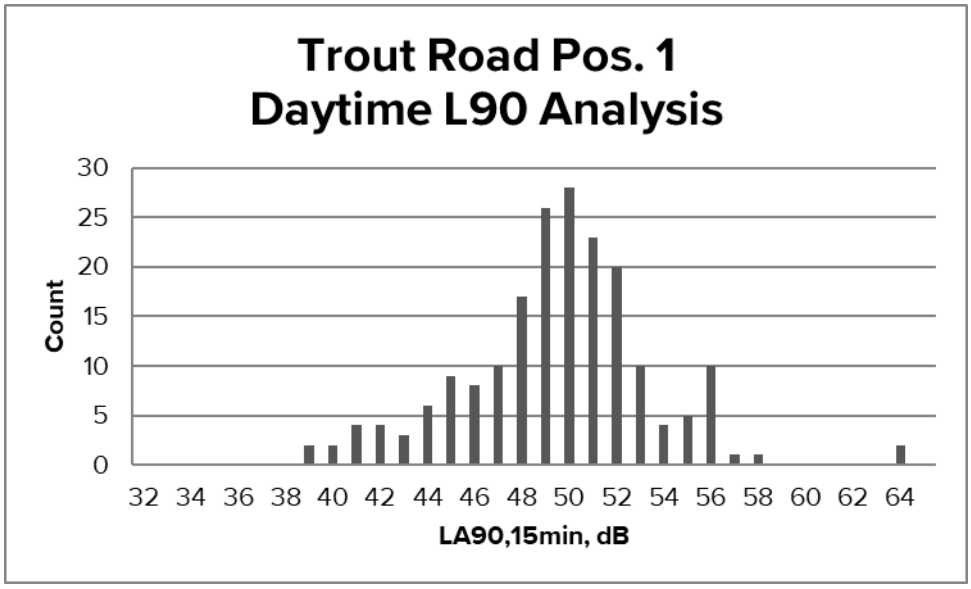


Figure 4: Background sound level dB(A) L_{A90} day-time.

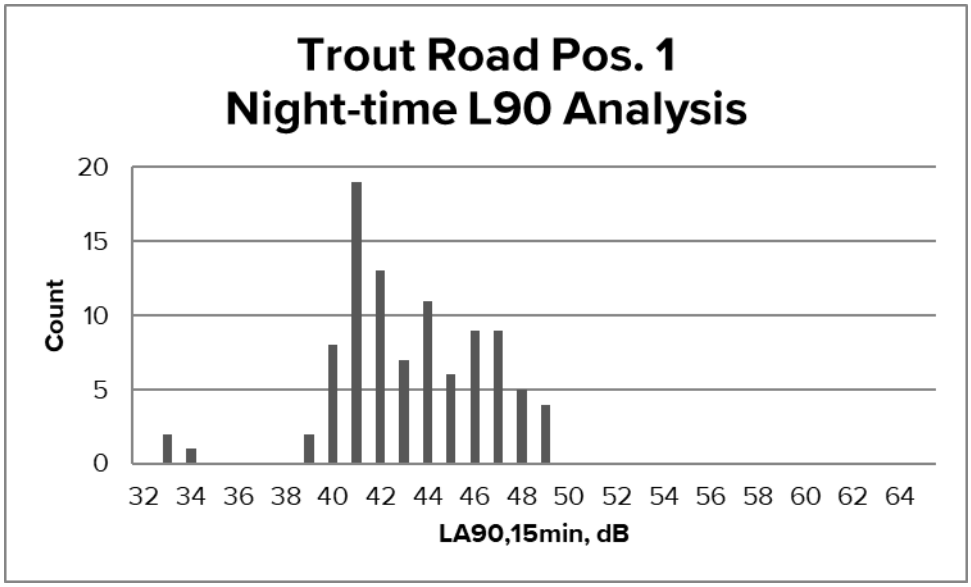


Figure 5: Background sound level dB(A) L_{A90} night-time.

From the histograms the representative background sound levels at the measurement position are considered to be 44 dB $L_{A90,1hour}$ during the day and 40 dB $L_{A90,15min}$ at night.

ASSESSMENT OF ENVIRONMENTAL NOISE IMPACTS

The following section presents the assessment of the various noise impacts in line with the methodology outlined in the preceding sections.

INCIDENT EXTERNAL SOUND LEVELS

Corrections for distance and, where appropriate, screening, angle of incidence and angle of view from the local noise sources have been made, to enable façade incident sound pressure levels to be calculated. These are summarised in Table 10. Predicted sound levels due to plant and deliveries at the existing supermarket are included for the relevant elevations; see later chapter for further details.

Table 10. Summary of free field facade incident environmental noise levels at octave band centre frequencies.

Façade		Sound pressure level (dB) at octave band centre frequency (Hz)								A
		63	125	250	500	1000	2000	4000	8000	
RED	Daytime $L_{eq,\ 16\ hours}$	64	61	60	58	60	59	53	47	64
	Night-time $L_{eq,8\ hours}$	57	55	53	51	53	52	46	41	58
	Typical Night-time L_{Max}	58	57	58	68	71	70	65	62	75
BLUE	Daytime $L_{eq,\ 16\ hours}$	56	52	53	54	53	50	47	44	58
	Night-time $L_{eq,8\ hours}$	55	55	51	46	45	40	36	33	50
	Typical Night-time L_{Max}	66	65	59	58	61	58	53	54	65
BLUE (due to plant and deliveries)	Night-time $L_{eq,15,min}$									55
	L_{Max}									77
GREEN	Daytime $L_{eq,\ 16\ hours}$	56	52	53	54	53	50	47	44	58
	Night-time $L_{eq,8\ hours}$	49	48	48	45	43	38	38	36	48
	Typical Night-time L_{Max}	56	55	60	62	58	55	44	40	63
YELLOW	Daytime $L_{eq,\ 16\ hours}$	58	54	51	48	48	44	40	35	52
	Night-time $L_{eq,8\ hours}$	50	47	46	43	43	36	31	26	46
	Typical Night-time L_{Max}	64	63	57	56	59	56	51	52	63
CYAN	Daytime $L_{eq,\ 16\ hours}$	61	58	54	51	51	47	42	40	55
	Night-time $L_{eq,8\ hours}$	55	55	51	46	45	40	36	33	50
	Typical Night-time L_{Max}	63	65	60	60	61	56	51	47	64

Night-time $L_{Af,max}$ sound levels are for the 10th-highest event sound level each night, derived from the survey data.

INITIAL RISK ASSESSMENT

As noted in Table 10, the highest predicted daytime incident noise levels are up to 64dB $L_{Aeq,16hr}$ during the daytime and 58 dB $L_{Aeq,8hr}$ at night, but are more typically up to 58dB $L_{Aeq,16hr}$ during the daytime and 50 dB $L_{Aeq,8hr}$ at night across the site.

The highest noise levels are in the “medium” range of noise levels in Figure 1 of the IoA ProPG document, while the more typical levels are in the “low” range of values.

The ProPG document notes that “high noise levels indicate that there is an increased risk that development may be refused on noise grounds”. The ProPG document notes that even where noise levels are high “the risk may be reduced by following a “good acoustic design process” which “confirms how the adverse impacts of noise will be mitigated and minimised.”

The highest noise levels are within “NRC 2 – Medium” within the London Borough of Hillingdon Supplementary Planning Document, while the more typical noise levels are within “NRC – 1 Low”. In both cases a noise assessment is required to “demonstrate how … adverse impacts will be avoided”.

INDOOR LEVELS

The composite acoustic performance required of any portion of the building envelope will depend on its location relative to the principal noise sources around the site and the nature of the spaces behind it (noise criteria, size, room finishes etc.).

As noted above, noise levels vary between façades. It is therefore appropriate to consider each façade separately and calculate the resulting internal noise levels within a typical room/studio on each façade. This will enable the acoustic suitability of typical glazing specifications to be assessed; since all bedrooms will be mechanically ventilated noise intrusion through ventilators need not be considered.

The detailed calculation methodology described in BS 8233:2014 will be used in the assessment using the following equation[11] as detail ed in the British Standard:

$$L_{eq,2} = L_{eq,ff} + 10log_{10}\left(\frac{A_0}{S}10^{\frac{-D_{n,e}}{10}} + \frac{S_{w1}}{S}10^{\frac{-R_{w,i}}{10}} + \frac{S_{ew}}{S}10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S}10^{\frac{-R_0}{10}}\right) + 10log_{10}(\frac{S}{A}) + 3$$

Different types of glazing will control noise to differing amounts and will vary according to the type of noise that should be reduced. The performance of glazing is established by measurement in the laboratory.

Since room layouts and window sizes have not been developed at this early stage an initial assessment has been made based on typical kitchen/living room and bedroom sizes. The minimum glazing specifications required to provide the internal noise levels recommended in BS 8233:2014 are shown in Table 11. The minimum acoustic performance required for each glazing type is shown in Table 12. It is understood that dwellings will be mechanically ventilated for energy-efficiency reasons and trickle ventilators are therefore not required.

Table 11. Glazing and ventilation types.

Façade	Façade Specifications (See Table 11) Glazing Type
BLUE bedrooms	Type B
ALL OTHER FACADES, BLUE living rooms	Type A

[11] See page 65 and 66 of BS8233:2014 for an explanation of the various terms used in the equation.

GLAZING PERFORMANCE

Octave band performance required for the glazing categories above are shown in Table 12. Performance requirements for windows must be met inclusive of frames, seals etc.

Table 12. Octave band performance specification for external building elements.

Item		Attenuation (dB) at Octave Band Centre Frequency (Hz)								
		63	125	250	500	1000	2000	4000	8000	$R_w + C_{tr}$
Type A Glazing [typically 4/16/4]	SRI	21	24	20	25	34	37	40	40	27
Type B Glazing [typically 10/16/6]	SRI	19	24	24	31	39	39	43	43	31
Non-vision wall – all areas **Cavity brick-block construction (or cladding with dry-lining with similar acoustic performance)**	SRI	35	41	45	45	54	58	55	55	48

**Single-figure values given are indicative; the proposed glazing and ventilation must meet or exceed the minimum octave band sound insulation values given in the table*

These are minimum sound reduction indices and higher specification are acceptable if required for other reasons or desired for ease of construction.

MECHANICAL VENTILATION

Ventilation systems must incorporate appropriate attenuation to control intrusive noise and fan noise in order that the overall internal noise levels achieve the recommendations in Table 2.

RESULTING INTERNAL NOISE LEVELS

The predicted internal sound pressure levels, based on the above are shown in Table 13.

Table 13. Internal sound levels (closed windows).

Façade	Period	Sound pressure level, dB(A)			
		External façade level	Internal	Criterion	Excess
RED Living rooms	Daytime $L_{eq,\ 16\ hours}$	64	33	35	-2
RED bedrooms	Daytime $L_{eq,\ 16\ hours}$	64	31	35	-4
	Night-time $L_{eq,\ 8\ hours}$	58	24	30	-6
	Night-time L_{max}	75	38	45	-7
BLUE Living rooms	Daytime $L_{eq,\ 16\ hours}$	58	27	35	-8
BLUE bedrooms	Daytime $L_{eq,\ 16\ hours}$	58	21	35	-14
	Night-time $L_{eq,\ 8\ hours}$	50	18	30	-12
	Night-time L_{max}	65	28	45	-17

Façade	Period	Sound pressure level, dB(A)			
		External façade level	Internal	Criterion	Excess
BLUE (due to plant and deliveries)	Night-time $L_{eq,15,min}$	55	23	30	-7
	L_{Max}	77	40	45	-5
GREEN living rooms	Daytime $L_{eq,\ 16\ hours}$	58	27	35	-8
GREEN bedrooms	Daytime $L_{eq,\ 16\ hours}$	58	25	35	-10
	Night-time $L_{eq,\ 8\ hours}$	48	18	30	-12
	Night-time L_{max}	63	32	45	-13
YELLOW living rooms	Daytime $L_{eq,\ 16\ hours}$	52	24	35	-11
YELLOW bedrooms	Daytime $L_{eq,\ 16\ hours}$	52	22	35	-13
	Night-time $L_{eq,\ 8\ hours}$	46	16	30	-14
	Night-time L_{max}	63	29	45	-16
CYAN living rooms	Daytime $L_{eq,\ 16\ hours}$	55	27	35	-8
CYAN bedrooms	Daytime $L_{eq,\ 16\ hours}$	55	25	35	-10
	Night-time $L_{eq,\ 8\ hours}$	50	21	30	-9
	Night-time L_{max}	64	32	45	-13

OVERHEATING RISK

It is important to note that the building envelope sound insulation specifications and associated advice given in this report are based on meeting the design criteria under the “Whole Dwelling Ventilation” conditions set out in Approved Document F (and formerly referred to as “background ventilation” in previous editions of the AD), as distinct from “Extract Ventilation” or “Purge Ventilation” conditions within the AD, and from the overheating condition (which is only briefly mentioned in AD F).

In January 2020 the Association of Noise Consultants (ANC) and Institute of Acoustics (IoA) published a Residential Design Guide on Acoustic Ventilation and Overheating (“the AVO Guide”), which sets out some of the acoustic design issues associated with the control of overheating. The night-time thresholds suggested in the AVO Guide have been superseded by the limits set out in Approved Document O.

The sound insulation required to the external façade in the overheating condition are shown in Table 14, with the highest performance required for each façade shown in **bold**. Overheating categories are as described in Table 15. A markup of façades showing the corresponding colours in the first column of Table 14 is shown within Appendix C.

Table 14. Sound insulation required in overheating condition

Façade	Period	Sound pressure level, dB(A)			See Note	Category
		External façade level	Internal criterion	Minimum sound reduction required, dBA*		
RED (living rooms)	Daytime $L_{eq,\ 16\ hours}$	64	50**	**14**	1	n/a
RED (bedrooms)	Daytime $L_{eq,\ 16\ hours}$	64	50**	14	2	ADO01
	Night-time $L_{eq,\ 8\ hours}$	58	40	18		
	10th-highest night-time L_{max}	75	55	**20**		
BLUE (living rooms)	Daytime $L_{eq,\ 16\ hours}$	58	50**	**8**	3	n/a
BLUE (bedrooms)	Daytime $L_{eq,\ 16\ hours}$	58	50**	8	4	ADO01
	Night-time $L_{eq,\ 8\ hours}$	50	40	10		
	10th-highest night-time L_{max}	65	55	10		
BLUE (due to plant and deliveries)	Night-time $L_{eq,15,min}$	55	40	15		
	L_{Max}	77	55	**22**		
GREEN (living rooms)	Daytime $L_{eq,\ 16\ hours}$	58	50**	**8**	3	n/a
GREEN (bedrooms)	Daytime $L_{eq,\ 16\ hours}$	58	50**	8	3	ADO02
	Night-time $L_{eq,\ 8\ hours}$	48	40	8		
	10th-highest night-time L_{max}	63	55	**8**		
YELLOW (living rooms)	Daytime $L_{eq,\ 16\ hours}$	52	50**	**2**	5	n/a
YELLOW (bedrooms)	Daytime $L_{eq,\ 16\ hours}$	52	50**	2	3	ADO02
	Night-time $L_{eq,\ 8\ hours}$	46	40	6		
	10th-highest night-time L_{max}	63	55	**8**		
CYAN (living rooms)	Daytime $L_{eq,\ 16\ hours}$	55	50**	**5**	6	n/a
CYAN (bedrooms)	Daytime $L_{eq,\ 16\ hours}$	55	50**	5	7	ADO02
	Night-time $L_{eq,\ 8\ hours}$	50	40	**10**		
	10th-highest night-time L_{max}	64	55	9		

* Difference between external sound level and internal criterion

**AVO Guidance value

Notes:

1 Mitigation of overheating by opening windows will lead to excessive internal noise levels and an alternative means of providing the additional ventilation will be required. For example, louvred ventilation panels with an attenuation of $D_{ne,w} + C_{tr}$ 14dB or higher, or MVHR with summer bypass or cooling.

2 Mitigation of overheating by opening windows will lead to excessive internal noise levels and an alternative means of providing the additional ventilation will be required. For example, louvred ventilation panels with an attenuation of $D_{ne,w} + C_{tr}$ 20dB or higher, or MVHR with summer bypass or cooling.

3 Openable windows at night-time, with an equivalent openable area of up to 6% of floor area, would be acceptable to form part of overheating risk mitigation strategy.

4 Mitigation of overheating by opening windows will lead to excessive internal noise levels, due principally to plant and deliveries at the adjacent supermarket, and an alternative means of providing the additional ventilation will be required. For example, louvred ventilation panels with an attenuation of $D_{ne,w} + C_{tr}$ 22dB or higher, or MVHR with summer bypass or cooling.

5 Openable windows at night-time, with an equivalent openable area of up to 25% of floor area, would be acceptable to form part of overheating risk mitigation strategy.

6 Openable windows at night-time, with an equivalent openable area of up to 13% of floor area, would be acceptable to form part of overheating risk mitigation strategy.

7 Openable windows at night-time, with an equivalent openable area of up to 4% of floor area, would be acceptable to form part of overheating risk mitigation strategy.

Table 15. Overheating categories.

Ref.	Colour	Average external noise level, $L_{Aeq\ 8hr}$	10th-highest L_{AfMax} noise event	Part O Requirement for Bedrooms
ADO01		≥54dB	≥69dB	Part O Overheating Risk Assessment to demonstrate compliance with CIBSE TM59 criteria for bedrooms, with windows fully closed and ventilators fully open
ADO02		45-53dB	60-68dB	Part O Overheating Risk Assessment to demonstrate compliance with CIBSE TM59 criteria for bedrooms, with windows partially open (e.g. approx. 2% of floor area, typically around 20cm^2) and ventilators fully open
ADO03		≤44dB	≤59dB	Part O Overheating Risk Assessment to demonstrate compliance with CIBSE TM59 criteria for bedrooms, with windows open (e.g. 13% of floor area, for a "high risk site", which is typically around 1.3m^2) and ventilators fully open

GARDENS AND BALCONIES

At worst, noise levels in gardens and on balconies will be similar to those at adjacent façades, i.e. those on RED elevations may be up to 64dB $L_{Aeq\ 16hr}$ and those on BLUE and GREEN elevations may up to 58dB $L_{Aeq\ 16hr}$. Across the remainder of the site, however, noise levels would be between 50dB $L_{Aeq\ 16hr}$ and 55dB $L_{Aeq\ 16hr}$, and therefore below the upper guideline value (55 dB $L_{Aeq,16hours}$) described in BS 8233:2014. However, BS8233:2014 does suggest that:

"In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".

VIBRATION SURVEY AND ASSESSMENT

A vibration survey was conducted at each of the on-site measurement locations, shown as positions A, B and C in Figure 3.

VIBRATION SURVEY

Vibration levels were measured using a SEMEX "Menhir" vibration meter. This is a self-calibrating meter capable of simultaneously measuring vibration in the three orthogonal axes. The equipment was set to record Vibration Dose Values (VDV) and maximum peak component particle velocity (ppv) over 30-second intervals. Vibration measurements were made in three axes (x, y and z).

Details of the equipment used during the survey is provided in Table 16.

Table 16. Details of vibration measurement equipment

Description	Model / serial no.	Calibration date	Calibration certificate no.
Vibration measurement system	SEMEX "Menhir" 17130404	15/11/2023	AcSoft calibration certificate 100106 dated 15/11/2023

VIBRATION ASSESSMENT

VDV levels, measured over one-minute intervals, ranged between 0.0001 m $s^{-1.75}$ and 0.0020 m $s^{-1.75}$.

Taking the highest of these values, and assuming that this level is constant, gives a worst-case VDV level of 0.111 m $s^{-1.75}$ during the daytime and 0.09 m $s^{-1.75}$ at night. These values are significantly below the range where there is a "low probability of adverse comment" in BS 6472.

The highest PPV value measured was 1.23 mm s^{-1}. This is significantly below the level at which, according to BS 7385-2:1993, "damage tends towards zero".

Vibration and ground-borne noise is therefore not likely to result in any adverse effects on the proposed new dwellings or their occupants.

OUTLINE ASSESSMENT OF NOISE FROM EXISTING SUPERMARKET

It has not been possible to measure noise from plant and deliveries at the existing ALDI store to the north east of the site. Plant serving the store is located on the south side of the building, adjacent to the loading bay. The plant area is approximately 7m from the nearest new residential façade, with the delivery bay and closest pass-by of delivery vehicles approximately 9m from the residential facade.

OUTLINE ASSESSMENT OF PLANT NOISE

Plant installed at a typical supermarket of this size generally comprises refrigeration plant – a gas cooler and compressor pack and/or condenser units – and heating plant in the form of air conditioning (AC) units or air source heat pumps (ASHPs). The heating plant only operates during the store trading hours but the refrigeration plant may operate at any time.

Typically the refrigeration plant would have a combined sound pressure level of around 35dBA at 10m while the AC units / ASHPs would have a combined sound power level of around 65dBA. Plant generally does not exhibit any tonal or impulsive characteristics but, a penalty of 3dB as described in BS 4142:2014+A1:2019 has been applied for the possible presence of "...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...".

Table 17 provides an outline assessment of predicted sound levels at the nearest new residential façade

Table 17. Outline predictions of plant noise

	Daytime, 07.00-23.00hrs	Night-time, 23.00-07.00hrs
Sound pressure level of refrigeration plant, dBA at 10m	35	35
Distance correction, to 7m, dB	+3	+3
Acoustic reflections (store building), dB	+3	+3
Predicted sound level at receptor, dBA	41	41
Sound power level of heating plant, dBA	65	-
Distance correction, to 7m, dB	-25	-
Acoustic reflections (store building), dB	+3	-
Predicted sound level at receptor, dBA	43	-
Combined plant sound pressure level at receptor, dBA	45	41
BS4142:2014+A1:2019 feature correction, dB	+3	+3
Rating level at receptor	48	44
Local Authority Criterion (see following chapter)	39	35
Excess	**+9**	**+9**

OUTLINE ASSESSMENT OF DELIVERY NOISE

ALDI stores utilise a loading bay principle whereby delivery vehicles reverse up to a roller shutter door, providing level access from the trailer bed. This negates the requirement for tail-lift operation and wheeling trolleys across rough external ground finishes which is a scenario that often occurs at other food stores. Trollies are only manoeuvred internally, either inside the trailer or within the store, on flat level surfaces. The main noise source associated with deliveries is therefore the arrival and departure of the lorry itself. Typically this gives rise to noise levels of around 74dB SEL[12] at 10m and 71dB $L_{Af,max}$ at 10m, per delivery.

Table 18 provides an outline assessment of predicted delivery noise levels at the nearest new residential façade

Table 18. Outline predictions of plant noise

	Daytime, 07.00-23.00hrs	Night-time, 23.00-07.00hrs
Sound pressure level of delivery vehicle, SEL at 10m	74	74
Distance correction, to 7m, dB	+3	+3
Acoustic reflections (store building), dB	+3	+3
Predicted sound level at receptor, dBA	80	80
Time correction (daytime 1hr, night-time 15min), dB	-36	-30
Sound pressure level at receptor, dBA	44	50
BS4142:2014+A1:2019 feature correction, dB (intermittency)	+3	+3
Rating level at receptor	47	53
Background sound level, dB L_{A90}	44	40
Excess	**+3**	**+13**
Likely noise impact	**Low**	**Significant Adverse**
Maximum sound level		
Sound pressure level, dB $L_{Af,max}$	**71**	**71**
Distance correction, to 7m, dB	+3	+3
Acoustic reflections (store building), dB	+3	+3
Predicted sound level at receptor, dBA	77	77

[12] SEL is the L_{Aeq} over a one second period, and represents the noise energy from an event (e.g. cage movement) compressed into one second; it is used to model sound levels from various sources across different time periods.

CONCLUSIONS

It can therefore be seen that noise from typical existing plant is likely to exceed the local authority's criteria and noise from deliveries is likely to result in a significant adverse noise impact on occupants of the nearest new dwellings at night, with a lesser impact during the daytime.

Under the "Agent of Change" principle the onus for providing a suitable acoustic environment falls on the developer. Potential noise mitigation measures could include:

- attenuation to the services plant – this would have to be undertaken in conjunction with the store operator
- acoustic barrier along the boundary – the height required is likely to be prohibitive
- enhancement to the building façade to control intrusive noise to acceptable levels – it must be noted that this would not change the BS 4142:2014+A1:2019 assessments above as that Standard looks only at external sound levels.

As noted in Table 11 it is proposed that windows with an enhanced acoustic performance are installed to the bedrooms overlooking the supermarket, shown BLUE in the marked-up drawings in Appendix C. As shown in Table 13 resulting internal sound levels with windows closed would be significantly below the proposed noise criterion.

In order to minimise the risk of sleep disturbance due to night-time deliveries opened windows should not be relied upon to mitigate night-time overheating and an alternative method of ventilation must be considered, as noted in Table 14.

PLANT NOISE GUIDANCE

It is understood that the need for and extent of services plant is to be established. The following outline guidance is made in order to permit initial plant selections and identify at an early stage the likely need for attenuation.

PLANT LOCATIONS AND NEAREST NOISE-SENSITIVE RECEPTORS

Plant locations and types are to be confirmed. It is likely that ventilated plantrooms and roof-mounted air source heat pumps, for the commercial and residential buildings respectively, will be used.

The nearest noise-sensitive receptor to each of the new buildings will depend on plant location but will typically be windows above plantroom louvres, or on upper floors below roof-mounted plant. In the latter case the plant will be screened from the receptor by the building envelope. Windows on other existing or proposed buildings – particularly where they are higher than the plant location – are likely to be the most-affected by plant noise.

CRITERIA

London Borough of Hillingdon usually requires that the rating level of new plant, at the nearest noise-sensitive receptor, is at least 5 dBA below the lowest existing background sound level, when assessed using the methodology in BS 4142:2014. The maximum permissible rating level at the nearest noise-sensitive windows of the existing hotel would therefore be 39dB $L_{Ar,Tr}$ during the daytime and 35dB $L_{Ar,Tr}$ at night.

PLANT NOISE GUIDANCE

Typically, plant used for this type of development is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained. A penalty of 3dB as described in BS 4142:2014 would typically be applied for the possible presence of "…characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment…".

Taking account of the distances between the plant and the worst-affected receptors as set out above, noise from the likely plant louvres and rooftop plant as described should not exceed the following limits in order to demonstrate compliance with the criteria set out above:

Table 19: Guidance on maximum plant and louvre noise emission limits.

Plant	Period	Maximum total plant emission level dB(A)
PLANT – total per group of roof plant / louvre	Day (07.00 – 23.00 hours)	36dB @ 10m
	Night (23.00 – 07.00 hours)	32dB @ 10m

EMERGENCY PLANT

The above limits apply to plant operating under normal conditions. It is typically acceptable for noise levels from life-safety equipment, such as emergency generators and smoke extract fans, to be 5-10dBA above the representative daytime background sound level.

ADDITIONAL CONSIDERATIONS

All plant should be fitted with suitable vibration isolators, to prevent vibration from entering the structure and re-radiating in the bedrooms and other sensitive areas.

Airborne noise transmission from the plant into the dwellings and any noise-sensitive commercial spaces must also be considered as part of the acoustic design of the building structure, including the floors above or below any plant areas and any columns or risers passing through plant rooms.

SOUND INSULATION BETWEEN COMMERCIAL UNITS AND DWELLINGS

Sound insulation between proposed commercial spaces and adjoining dwellings must be controlled in order to meet the statutory requirements in the current Building Regulations. In addition, it is recommended that guidance values in BS 8233:2014 are also met or exceeded.

BUILDING REGULATIONS APPROVED DOCUMENT E

The building regulations Approved Document E *Resistance to the passage of sound* gives minimum acoustic performance requirements for separating walls and floors between dwellings and other spaces within the same building. For a new-build development, the airborne sound insulation provided by the separating floor must be at least 45 dB $D_{nT,w}$ + C_{tr}.

The sound insulation of the partitions separating the dwellings from non-residential spaces in general should also meet the guidance recommended in the matrix table in BS8233:2014. This requires an element of professional judgment when allocating privacy, activity noise and sensitivity categories[13] to the various spaces. Since the type of activity to be conducted within the "workspaces" is not known at this early stage a scenario is considered whereby activities with a relatively high – but not excessive – sound level may be present, as noted in the following section. Table 20 sets out the proposed categories and the resulting recommended sound insulation.

Table 20. Sound insulation guidance.

Source room	Privacy	Activity	Receptor	Sensitivity	Sound Insulation, $D_{nT,w}$ dB	Sound Insulation, $D_{nT,w}$ dB
Workspace	Not private	High	Dwelling	Sensitive	47	47
Dwelling	Confidential	Typical	Workspace	Medium	47	
Plant	Not private	High	Dwelling	Sensitive	47	47
Dwelling	Confidential	Typical	Plant	Not sensitive	47	

The recommendations above are in addition to the criterion in Building Regulations.

REVERBERANT SOUND LEVELS IN PLANT AND COMMERCIAL SPACES

The recommended minimum airborne sound insulation performance noted above will typically result in acceptable internal levels in the bedrooms above, where the reverberant sound level in the ancillary space(s) is no higher than the levels given in Table 21.

[13] In broad terms, "Confidential" suggests that the content of speech etc. in the source room should not normally be intelligible in the receiving room

Table 21. Permissible reverberant sound pressure levels in commercial spaces*.

	Reverberant sound pressure level (dB) at octave band centre frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
$L_{eq,15min\ (07:00 – 23:00)}$	85	85	85	85	85	80	80	80	85
$L_{Max,f\ (07:00 – 23:00)}$	95	95	95	95	95	90	90	90	95
$L_{eq,15min\ (23:00 – 07:00)}$	80	80	80	80	80	75	75	75	80
$L_{Max,f\ (23:00 – 07:00)}$	90	90	90	90	90	85	85	85	90

**Limits assume that sound insulation provided meets the requirements of Building Regulations and the recommendations in Table 20*

The above limits will typically permit the use of background music, but may preclude loud amplified music.

In the event that higher noise levels are likely, for example due to high levels of music noise, additional sound insulation would be required between the commercial/plant area and the dwellings.

In the event that any commercial space is used as a gym, or for another use that may result in impacts on the structure, a suitable resilient floating floor or similar treatment will be required.

All plant and any rigidly-connected pipes and ducts must be isolated from the structure using suitable anti-vibration mounts/hangers.

CONCLUSIONS

Measurements of environmental noise at the proposed development site at Trout Road in West Drayton have been used to assess its suitability for residential use.

Recommendations for the acoustic performance requirements of the external building fabric have been assessed and noted. Initial advice on plant noise limits has been provided.

Guidance has been provided with regard to sound insulation between potentially noisy spaces and adjoining dwellings.

ENVIRONMENTAL NOISE ASSESSMENT

The highest noise levels across the site are in the “medium” range of noise levels in Figure 1 of the IoA ProPG document, while the more typical levels are in the “low” range of values.

The highest noise levels across the site are within “NRC 2 – Medium” within the London Borough of Hillingdon Supplementary Planning Document, while the more typical noise levels are within “NRC – 1 Low”. In both cases a noise assessment is required to “demonstrate how … adverse impacts will be avoided”.

It is understood that all dwellings will have individual mechanical ventilation and heat recovery (MVHR) systems.

Typical thermal double glazing and normal external building elements – such as cavity brick/blockwork or a lightweight façade with suitable internal acoustic lining – will be adequate to control intrusive noise to acceptable levels, with the exception of bedrooms overlooking the adjacent supermarket, where an enhanced glazing performance is specified.

The assessment has demonstrated that the proposals will not give rise to significant adverse effects on health and quality of life and that reasonable practicable mitigation measures can be put in place using conventional construction methods in order for adverse effects to be reduced.

VIBRATION ASSESSMENT

Vibration levels across the site are low and vibration and ground-borne noise is not likely to result in any adverse effects on the proposed new dwellings or their occupants.

OUTLINE ASSESSMENT OF NOISE FROM EXISTING SUPERMARKET

To minimise the risk of sleep disturbance as a result of plant and deliveries to the existing ALDI supermarket to the northeast of the site, it is recommended that glazing with an enhanced acoustic performance is used for bedrooms overlooking the premises. Mitigation of night-time overheating will be required to employ a suitable level of sound insulation, for example by opening acoustic louvres or by night-time cooling.

GUIDANCE ON PLANT NOISE TO ENVIRONMENT

Initial guidance on permissible plant noise levels has been provided in order that the Local Authority’s normal criteria will be met.

SOUND INSULATION BETWEEN COMMERCIAL UNITS AND DWELLINGS

Separating walls and floors between dwellings and commercial spaces must comply with the requirements Building Regulations Approved Document E. Additional recommendations have been made to control noise from non-residential spaces to the dwellings to acceptable levels.

APPENDIX A

Table 22. Acoustic Terminology.

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A –weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

APPENDIX B

Table 23. Results of environmental noise measurements at Position 1.

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 09:15	65.3	88.4	67.2	54.5
09/08/2024 09:30	59.9	72.8	62.7	53.7
09/08/2024 09:45	57.1	71.5	59.3	52.7
09/08/2024 10:00	59.2	81.4	58.7	52.0
09/08/2024 10:15	54.1	66.0	57.1	50.2
09/08/2024 10:30	55.3	73.0	58.3	49.7
09/08/2024 10:45	57.3	83.4	59.6	50.2
09/08/2024 11:00	55.6	69.9	58.7	50.6
09/08/2024 11:15	54.8	67.5	57.0	52.4
09/08/2024 11:30	54.1	69.2	56.6	50.2
09/08/2024 11:45	54.6	72.3	57.4	50.3
09/08/2024 12:00	54.6	72.3	57.5	49.7
09/08/2024 12:15	56.5	72.9	60.1	49.3
09/08/2024 12:30	54.0	79.5	56.3	48.0
09/08/2024 12:45	63.0	78.7	62.1	52.6
09/08/2024 13:00	61.6	76.7	65.7	52.3
09/08/2024 13:15	63.6	71.4	66.7	55.8
09/08/2024 13:30	63.6	79.8	67.2	56.1
09/08/2024 13:45	63.0	78.0	67.0	56.5
09/08/2024 14:00	63.3	76.9	66.2	55.7
09/08/2024 14:15	62.4	74.4	66.5	56.1
09/08/2024 14:30	67.8	97.1	71.9	56.2
09/08/2024 14:45	67.0	93.4	68.6	55.7
09/08/2024 15:00	65.8	74.8	67.2	55.8
09/08/2024 15:15	65.4	93.5	67.7	55.9
09/08/2024 15:30	60.1	72.6	65.2	49.2
09/08/2024 15:45	63.8	74.3	67.0	51.0
09/08/2024 16:00	63.7	71.6	67.7	49.7
09/08/2024 16:15	62.6	69.1	66.8	51.9
09/08/2024 16:30	60.0	70.7	66.2	50.0
09/08/2024 16:45	62.2	70.4	67.0	49.8
09/08/2024 17:00	63.9	72.6	68.2	51.1
09/08/2024 17:15	63.1	77.3	67.4	48.8
09/08/2024 17:30	62.3	70.1	66.6	46.8

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 17:45	60.9	69.0	65.2	50.3
09/08/2024 18:00	63.3	79.5	67.2	49.0
09/08/2024 18:15	64.0	76.9	68.2	50.1
09/08/2024 18:30	64.7	76.3	69.9	49.6
09/08/2024 18:45	64.4	78.2	67.8	50.0
09/08/2024 19:00	62.2	71.0	66.0	52.0
09/08/2024 19:15	62.9	73.9	66.2	54.2
09/08/2024 19:30	61.5	74.7	66.2	50.6
09/08/2024 19:45	53.8	78.4	55.4	47.9
09/08/2024 20:00	51.8	70.9	53.9	47.6
09/08/2024 20:15	50.4	66.5	52.4	46.6
09/08/2024 20:30	52.2	71.4	56.0	46.7
09/08/2024 20:45	52.0	67.7	54.4	48.3
09/08/2024 21:00	52.1	71.8	53.8	48.6
09/08/2024 21:15	53.3	65.5	55.2	49.0
09/08/2024 21:30	56.0	73.2	57.8	51.4
09/08/2024 21:45	51.8	66.1	54.1	48.6
09/08/2024 22:00	52.8	69.6	55.0	49.2
09/08/2024 22:15	52.9	64.6	55.5	49.1
09/08/2024 22:30	51.4	62.6	53.4	48.6
09/08/2024 22:45	51.2	61.8	53.3	48.3
09/08/2024 23:00	50.6	67.5	52.9	47.1
09/08/2024 23:15	50.2	67.8	52.5	46.4
09/08/2024 23:30	49.5	63.4	51.8	46.5
09/08/2024 23:45	50.2	63.3	52.5	46.6
10/08/2024 00:00	48.1	62.4	49.6	45.5
10/08/2024 00:15	49.5	57.1	51.5	46.6
10/08/2024 00:30	49.2	61.0	51.3	46.7
10/08/2024 00:45	46.4	54.3	47.5	44.9
10/08/2024 01:00	48.5	60.2	49.1	44.4
10/08/2024 01:15	46.7	55.5	48.2	43.8
10/08/2024 01:30	45.8	58.3	47.0	44.0
10/08/2024 01:45	47.8	61.8	49.4	43.4
10/08/2024 02:00	45.9	58.6	47.2	43.5
10/08/2024 02:15	46.1	55.6	47.5	44.1
10/08/2024 02:30	47.5	57.1	49.7	43.8
10/08/2024 02:45	43.9	53.9	45.4	41.8

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 03:00	44.6	59.2	46.2	42.4
10/08/2024 03:15	44.4	59.2	45.7	41.5
10/08/2024 03:30	43.2	50.0	44.7	41.1
10/08/2024 03:45	44.0	63.6	45.2	42.3
10/08/2024 04:00	45.6	53.6	47.0	43.7
10/08/2024 04:15	46.8	58.8	48.1	44.8
10/08/2024 04:30	48.0	57.6	49.1	45.9
10/08/2024 04:45	47.0	61.4	48.3	45.1
10/08/2024 05:00	46.4	50.9	47.7	44.8
10/08/2024 05:15	48.4	57.0	50.6	45.6
10/08/2024 05:30	51.2	74.6	49.9	46.8
10/08/2024 05:45	50.0	61.1	51.2	48.3
10/08/2024 06:00	50.4	57.2	51.5	49.0
10/08/2024 06:15	49.8	58.6	50.9	48.2
10/08/2024 06:30	49.4	57.8	50.5	47.6
10/08/2024 06:45	50.5	67.5	52.0	47.8
10/08/2024 07:00	50.5	63.7	52.5	47.1
10/08/2024 07:15	47.7	61.3	49.1	45.1
10/08/2024 07:30	50.2	65.2	52.4	45.3
10/08/2024 07:45	49.2	66.0	51.0	45.6
10/08/2024 08:00	50.1	64.8	51.7	46.3
10/08/2024 08:15	55.3	71.5	56.1	47.6
10/08/2024 08:30	57.1	69.7	62.0	47.9
10/08/2024 08:45	53.2	77.8	53.7	47.3
10/08/2024 09:00	57.1	81.5	58.5	49.3
10/08/2024 09:15	56.1	72.0	57.1	46.4
10/08/2024 09:30	68.4	83.1	74.1	46.7
10/08/2024 09:45	71.8	83.7	77.7	47.0
10/08/2024 10:00	67.3	85.0	66.0	47.8
10/08/2024 10:15	54.4	76.3	56.2	47.9
10/08/2024 10:30	64.4	84.5	66.5	49.3
10/08/2024 10:45	65.8	77.6	71.7	49.5
10/08/2024 11:00	55.4	85.1	58.4	48.0
10/08/2024 11:15	60.6	78.2	63.9	51.8
10/08/2024 11:30	60.3	81.8	62.7	52.4
10/08/2024 11:45	58.8	85.9	59.5	53.0
10/08/2024 12:00	60.6	76.8	63.7	50.5

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 12:15	67.0	81.1	73.5	48.2
10/08/2024 12:30	65.7	81.1	67.4	55.1
10/08/2024 12:45	68.0	78.7	70.7	58.3
10/08/2024 13:00	67.2	74.9	69.5	63.8
10/08/2024 13:15	67.9	75.5	70.4	56.0
10/08/2024 13:30	67.5	76.3	69.7	64.4
10/08/2024 13:45	64.2	76.2	68.6	51.8
10/08/2024 14:00	67.3	78.7	70.7	55.4
10/08/2024 14:15	66.5	76.8	69.0	56.3
10/08/2024 14:30	64.6	75.8	68.6	52.0
10/08/2024 14:45	61.2	79.0	67.2	48.7
10/08/2024 15:00	55.1	84.0	54.6	47.1
10/08/2024 15:15	53.6	75.1	55.8	46.0
10/08/2024 15:30	56.3	75.7	58.4	49.0
10/08/2024 15:45	54.6	72.9	57.5	46.1
10/08/2024 16:00	58.1	81.1	60.9	48.3
10/08/2024 16:15	59.8	77.1	62.5	49.9
10/08/2024 16:30	57.7	81.5	56.0	48.9
10/08/2024 16:45	54.7	77.1	55.4	46.5
10/08/2024 17:00	53.5	77.5	55.2	46.0
10/08/2024 17:15	55.9	74.6	56.5	45.0
10/08/2024 17:30	51.1	73.7	53.2	44.4
10/08/2024 17:45	53.5	77.4	56.7	48.3
10/08/2024 18:00	55.0	62.7	57.7	51.9
10/08/2024 18:15	55.3	66.5	57.9	52.8
10/08/2024 18:30	56.2	63.6	60.3	49.9
10/08/2024 18:45	56.5	72.9	60.4	52.1
10/08/2024 19:00	56.9	65.2	59.4	53.5
10/08/2024 19:15	57.4	63.6	60.2	52.8
10/08/2024 19:30	53.4	71.4	53.9	45.9
10/08/2024 19:45	54.4	75.2	55.3	50.8
10/08/2024 20:00	54.0	69.1	55.4	51.9
10/08/2024 20:15	67.5	95.5	56.2	51.9
10/08/2024 20:30	53.6	70.9	53.8	51.3
10/08/2024 20:45	52.4	61.5	53.2	51.1
10/08/2024 21:00	52.8	62.4	53.7	51.0
10/08/2024 21:15	52.0	59.7	52.7	50.8

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 21:30	51.9	59.4	52.7	50.8
10/08/2024 21:45	51.6	59.8	52.4	50.3
10/08/2024 22:00	52.1	58.6	52.9	51.0
10/08/2024 22:15	52.2	61.9	53.2	50.8
10/08/2024 22:30	51.7	63.6	52.4	50.7
10/08/2024 22:45	51.9	57.6	52.7	50.9
10/08/2024 23:00	49.7	62.6	51.7	46.1
10/08/2024 23:15	47.5	59.9	48.6	44.4
10/08/2024 23:30	44.6	56.0	46.0	40.9
10/08/2024 23:45	41.5	53.5	42.6	38.9
11/08/2024 00:00	44.7	60.9	46.6	40.6
11/08/2024 00:15	42.2	55.6	43.6	40.0
11/08/2024 00:30	42.7	63.7	43.5	40.1
11/08/2024 00:45	42.4	62.3	44.1	39.8
11/08/2024 01:00	42.8	47.9	44.0	41.3
11/08/2024 01:15	41.7	58.1	42.8	39.9
11/08/2024 01:30	42.0	59.8	43.1	39.4
11/08/2024 01:45	43.5	55.5	45.1	41.3
11/08/2024 02:00	44.0	58.9	46.1	40.6
11/08/2024 02:15	43.5	57.8	45.2	40.5
11/08/2024 02:30	42.7	59.3	43.7	40.0
11/08/2024 02:45	36.7	53.9	39.6	32.9
11/08/2024 03:00	36.7	52.6	37.6	33.4
11/08/2024 03:15	38.5	62.1	40.4	34.1
11/08/2024 03:30	46.4	61.9	48.3	42.8
11/08/2024 03:45	44.6	51.6	46.7	42.1
11/08/2024 04:00	43.0	58.0	44.6	41.0
11/08/2024 04:15	44.7	54.8	46.3	42.4
11/08/2024 04:30	45.2	49.0	46.7	43.2
11/08/2024 04:45	45.0	56.3	46.5	42.9
11/08/2024 05:00	44.5	58.1	45.6	42.1
11/08/2024 05:15	57.1	71.5	61.6	41.9
11/08/2024 05:30	49.2	68.0	48.2	42.3
11/08/2024 05:45	45.1	65.9	46.7	41.3
11/08/2024 06:00	44.5	59.8	46.6	41.0
11/08/2024 06:15	44.3	59.9	45.6	41.3
11/08/2024 06:30	45.5	66.0	45.8	41.5

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 06:45	43.1	52.5	44.3	41.3
11/08/2024 07:00	43.7	54.8	45.4	41.5
11/08/2024 07:15	44.1	65.1	45.6	41.5
11/08/2024 07:30	44.1	59.6	45.7	41.4
11/08/2024 07:45	44.5	61.1	45.9	40.6
11/08/2024 08:00	47.0	58.8	49.3	39.9
11/08/2024 08:15	45.7	63.5	49.0	39.1
11/08/2024 08:30	50.6	69.2	53.8	43.8
11/08/2024 08:45	49.1	67.1	52.2	42.3
11/08/2024 09:00	50.7	71.8	54.0	44.1
11/08/2024 09:15	48.3	62.4	51.7	42.7
11/08/2024 09:30	49.2	65.7	51.9	44.6
11/08/2024 09:45	52.1	62.9	55.1	44.2
11/08/2024 10:00	59.8	73.5	62.4	54.9
11/08/2024 10:15	56.4	75.7	59.3	44.8
11/08/2024 10:30	49.0	71.0	48.6	39.3
11/08/2024 10:45	49.2	62.4	53.0	40.9
11/08/2024 11:00	49.0	60.1	52.5	42.7
11/08/2024 11:15	49.9	64.9	53.4	41.2
11/08/2024 11:30	49.0	64.6	52.3	40.1
11/08/2024 11:45	51.6	74.6	53.7	42.6
11/08/2024 12:00	49.0	75.5	51.5	42.4
11/08/2024 12:15	52.4	66.5	55.6	43.9
11/08/2024 12:30	58.2	76.0	60.5	44.4
11/08/2024 12:45	55.5	70.3	56.8	46.9
11/08/2024 13:00	52.6	66.7	55.0	45.2
11/08/2024 13:15	51.8	65.8	54.8	45.7
11/08/2024 13:30	52.7	63.9	56.1	45.2
11/08/2024 13:45	53.2	69.5	55.9	48.3
11/08/2024 14:00	56.0	71.2	58.9	49.9
11/08/2024 14:15	62.0	73.9	65.3	53.7
11/08/2024 14:30	60.4	75.2	64.2	49.6
11/08/2024 14:45	59.6	75.8	62.8	52.3
11/08/2024 15:00	59.9	78.2	63.3	50.8
11/08/2024 15:15	55.8	69.5	58.6	50.8
11/08/2024 15:30	56.8	70.3	59.5	51.7
11/08/2024 15:45	53.4	68.8	55.1	49.5

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 16:00	55.5	70.9	57.7	49.5
11/08/2024 16:15	55.0	70.8	57.0	49.1
11/08/2024 16:30	54.7	71.6	55.7	49.4
11/08/2024 16:45	52.6	67.6	55.3	49.1
11/08/2024 17:00	54.1	73.9	55.8	48.6
11/08/2024 17:15	54.0	70.6	56.2	49.9
11/08/2024 17:30	77.3	107.3	58.1	50.7
11/08/2024 17:45	53.0	67.2	55.3	49.3
11/08/2024 18:00	54.6	66.5	56.8	51.0
11/08/2024 18:15	56.2	77.1	58.4	52.2
11/08/2024 18:30	55.9	65.0	58.5	51.7
11/08/2024 18:45	57.1	66.3	59.6	52.8
11/08/2024 19:00	59.8	69.6	62.3	55.1
11/08/2024 19:15	59.3	73.3	61.8	53.4
11/08/2024 19:30	58.4	77.3	60.5	52.5
11/08/2024 19:45	64.2	93.8	61.6	53.2
11/08/2024 20:00	60.1	85.5	60.7	52.9
11/08/2024 20:15	60.2	90.6	60.9	52.0
11/08/2024 20:30	59.0	87.2	59.6	51.5
11/08/2024 20:45	56.0	87.4	56.0	50.5
11/08/2024 21:00	52.9	77.9	56.2	44.5
11/08/2024 21:15	54.9	71.9	57.9	48.6
11/08/2024 21:30	56.1	67.2	59.0	51.8
11/08/2024 21:45	54.6	65.4	57.5	48.8
11/08/2024 22:00	56.6	64.5	59.7	49.4
11/08/2024 22:15	57.0	66.3	60.6	50.2
11/08/2024 22:30	56.4	64.7	59.3	50.9
11/08/2024 22:45	53.6	73.0	56.6	48.4
11/08/2024 23:00	52.5	61.9	56.0	45.5
11/08/2024 23:15	51.8	63.1	54.4	46.2
11/08/2024 23:30	51.8	62.7	55.0	46.5
11/08/2024 23:45	51.2	64.0	54.8	45.2
12/08/2024 00:00	50.8	60.7	53.7	45.8
12/08/2024 00:15	49.0	58.1	52.3	43.1
12/08/2024 00:30	48.5	57.4	51.5	44.2
12/08/2024 00:45	49.7	60.5	53.6	42.9
12/08/2024 01:00	44.8	52.2	47.9	41.0

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
12/08/2024 01:15	44.4	55.3	46.7	41.1
12/08/2024 01:30	44.5	52.2	46.6	41.6
12/08/2024 01:45	44.8	65.2	46.7	41.6
12/08/2024 02:00	44.7	56.3	46.8	41.5
12/08/2024 02:15	43.2	47.9	45.0	41.1
12/08/2024 02:30	42.0	55.3	43.2	40.4
12/08/2024 02:45	42.0	47.1	43.7	40.0
12/08/2024 03:00	42.6	56.7	44.3	40.5
12/08/2024 03:15	41.7	56.0	42.8	40.3
12/08/2024 03:30	42.0	52.9	43.1	40.5
12/08/2024 03:45	42.7	55.6	43.6	41.2
12/08/2024 04:00	42.8	54.5	43.7	41.4
12/08/2024 04:15	44.2	63.6	45.0	42.8
12/08/2024 04:30	46.1	63.3	47.3	44.1
12/08/2024 04:45	46.1	63.6	47.4	44.3
12/08/2024 05:00	46.4	57.9	47.2	44.8
12/08/2024 05:15	48.9	57.6	51.0	46.2
12/08/2024 05:30	48.8	56.8	50.5	46.8
12/08/2024 05:45	48.6	66.1	49.7	47.0
12/08/2024 06:00	52.5	63.8	55.8	48.3
12/08/2024 06:15	52.6	68.1	53.8	49.2
12/08/2024 06:30	52.0	70.4	53.2	49.2
12/08/2024 06:45	52.3	82.4	52.8	49.0
12/08/2024 07:00	54.0	67.5	55.7	49.8
12/08/2024 07:15	52.0	60.8	53.8	49.7
12/08/2024 07:30	51.9	65.0	53.3	49.2
12/08/2024 07:45	51.8	67.7	53.4	48.9
12/08/2024 08:00	60.6	95.4	58.5	49.9
12/08/2024 08:15	55.6	71.9	57.3	50.8
12/08/2024 08:30	54.4	74.6	55.7	49.7
12/08/2024 08:45	58.9	75.2	62.8	49.8
12/08/2024 09:00	57.6	81.8	61.1	48.3
12/08/2024 09:15	67.1	81.9	64.1	48.7
12/08/2024 09:30	52.8	70.7	55.5	47.7
12/08/2024 09:45	53.9	78.2	56.3	45.0

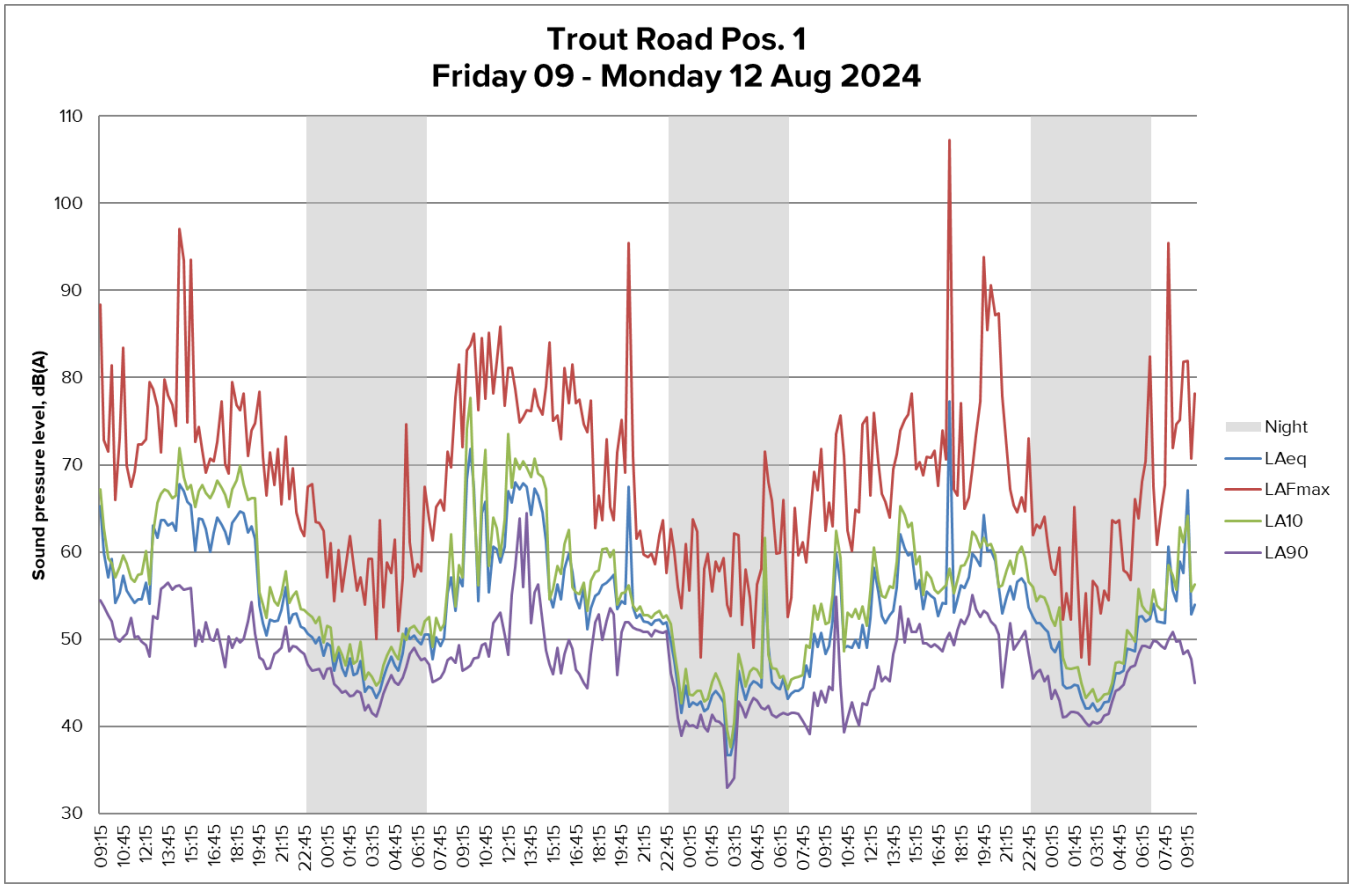


Table 24. Results of environmental noise measurements at Position 2.

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 10:15	58.3	74.0	61.5	49.9
09/08/2024 10:30	58.0	80.3	60.5	48.3
09/08/2024 10:45	56.6	73.5	60.1	48.5
09/08/2024 11:00	55.2	70.8	58.4	48.1
09/08/2024 11:15	55.8	73.8	58.2	48.4
09/08/2024 11:30	62.4	90.4	63.0	49.3
09/08/2024 11:45	58.4	84.6	60.5	50.0
09/08/2024 12:00	57.0	71.2	60.4	48.7
09/08/2024 12:15	57.9	73.8	61.1	50.7
09/08/2024 12:30	63.6	92.7	60.9	51.0
09/08/2024 12:45	57.2	76.0	60.6	48.9
09/08/2024 13:00	58.2	80.5	60.5	48.3
09/08/2024 13:15	57.4	77.1	59.6	49.7
09/08/2024 13:30	58.6	81.5	61.4	50.0
09/08/2024 13:45	61.4	82.4	62.8	58.9
09/08/2024 14:00	61.9	77.6	63.2	58.9

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 14:15	62.3	87.0	63.6	52.5
09/08/2024 14:30	58.6	79.7	61.0	49.1
09/08/2024 14:45	58.2	79.8	59.8	48.9
09/08/2024 15:00	59.1	80.2	61.7	48.3
09/08/2024 15:15	56.4	71.8	59.6	48.3
09/08/2024 15:30	60.8	88.7	61.2	48.9
09/08/2024 15:45	60.1	89.1	60.2	49.5
09/08/2024 16:00	59.8	82.9	61.5	49.2
09/08/2024 16:15	60.4	84.7	62.6	51.6
09/08/2024 16:30	66.1	84.4	69.6	52.8
09/08/2024 16:45	66.1	82.5	70.6	54.0
09/08/2024 17:00	62.1	76.1	65.3	54.1
09/08/2024 17:15	64.4	90.2	63.5	50.0
09/08/2024 17:30	61.8	77.7	66.0	47.1
09/08/2024 17:45	59.9	77.9	62.4	49.4
09/08/2024 18:00	57.7	77.8	59.2	47.6
09/08/2024 18:15	57.6	75.6	60.4	46.9
09/08/2024 18:30	56.7	73.5	60.6	47.5
09/08/2024 18:45	57.1	80.3	60.4	47.2
09/08/2024 19:00	57.8	76.7	60.7	48.7
09/08/2024 19:15	59.9	87.6	61.2	47.3
09/08/2024 19:30	56.8	73.5	60.0	46.5
09/08/2024 19:45	56.8	77.6	58.5	46.9
09/08/2024 20:00	56.4	78.5	57.5	46.5
09/08/2024 20:15	54.4	72.6	57.0	45.1
09/08/2024 20:30	56.1	77.7	57.7	45.7
09/08/2024 20:45	56.3	77.4	57.8	47.2
09/08/2024 21:00	53.6	75.4	54.8	47.2
09/08/2024 21:15	56.0	80.1	57.8	47.7
09/08/2024 21:30	55.1	75.2	55.8	47.9
09/08/2024 21:45	57.2	81.5	56.2	46.8
09/08/2024 22:00	53.8	75.7	55.1	47.3
09/08/2024 22:15	54.3	76.2	56.4	47.3
09/08/2024 22:30	55.7	78.1	54.1	46.6
09/08/2024 22:45	49.9	66.9	50.3	46.0
09/08/2024 23:00	51.1	73.9	52.5	44.5
09/08/2024 23:15	49.4	64.3	51.9	44.2

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 23:30	52.3	75.0	51.3	44.1
09/08/2024 23:45	50.1	69.2	51.6	44.5
10/08/2024 00:00	51.1	77.2	49.0	42.4
10/08/2024 00:15	52.7	75.6	52.4	43.9
10/08/2024 00:30	51.9	69.9	53.7	44.4
10/08/2024 00:45	47.1	65.6	47.0	42.9
10/08/2024 01:00	49.0	71.7	48.3	42.0
10/08/2024 01:15	49.1	71.1	50.6	41.2
10/08/2024 01:30	44.6	64.0	44.8	41.3
10/08/2024 01:45	47.7	65.5	49.6	41.2
10/08/2024 02:00	45.7	64.8	45.3	41.4
10/08/2024 02:15	43.8	48.7	45.2	42.0
10/08/2024 02:30	45.6	57.6	46.3	41.3
10/08/2024 02:45	44.4	63.3	42.8	39.4
10/08/2024 03:00	49.3	74.1	44.3	39.8
10/08/2024 03:15	41.9	51.4	43.4	39.6
10/08/2024 03:30	44.3	62.3	43.6	39.6
10/08/2024 03:45	43.0	56.4	44.0	41.1
10/08/2024 04:00	46.5	65.0	45.9	42.3
10/08/2024 04:15	47.1	66.2	47.1	43.3
10/08/2024 04:30	50.0	69.8	49.0	45.1
10/08/2024 04:45	47.4	59.8	48.7	45.2
10/08/2024 05:00	47.6	61.4	48.9	45.2
10/08/2024 05:15	54.8	69.7	59.5	45.9
10/08/2024 05:30	48.7	62.2	49.4	46.8
10/08/2024 05:45	50.5	66.3	50.3	47.3
10/08/2024 06:00	50.6	65.2	51.9	47.9
10/08/2024 06:15	51.9	77.5	53.3	47.1
10/08/2024 06:30	51.4	66.5	53.3	46.8
10/08/2024 06:45	56.2	74.8	58.7	49.2
10/08/2024 07:00	59.2	79.0	61.3	54.8
10/08/2024 07:15	57.6	78.2	59.6	51.8
10/08/2024 07:30	54.7	71.4	57.7	47.9
10/08/2024 07:45	58.3	83.4	59.3	48.1
10/08/2024 08:00	59.5	88.6	59.9	50.8
10/08/2024 08:15	57.7	81.5	60.0	47.0
10/08/2024 08:30	59.1	77.8	61.3	52.9

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 08:45	59.5	86.5	60.1	50.5
10/08/2024 09:00	57.0	73.7	60.0	49.4
10/08/2024 09:15	53.4	68.5	56.3	47.6
10/08/2024 09:30	57.9	70.0	61.3	48.2
10/08/2024 09:45	61.0	84.7	59.3	47.3
10/08/2024 10:00	56.8	77.0	59.5	47.7
10/08/2024 10:15	61.5	85.9	63.2	53.3
10/08/2024 10:30	63.2	89.3	62.3	50.3
10/08/2024 10:45	56.3	75.2	59.4	48.2
10/08/2024 11:00	60.0	83.9	61.5	48.3
10/08/2024 11:15	59.5	76.9	61.8	51.8
10/08/2024 11:30	62.1	88.0	61.1	50.5
10/08/2024 11:45	59.5	82.1	60.9	48.2
10/08/2024 12:00	65.5	93.2	65.8	50.1
10/08/2024 12:15	61.0	82.8	61.1	48.9
10/08/2024 12:30	59.2	80.0	61.2	50.4
10/08/2024 12:45	60.2	84.3	61.6	50.8
10/08/2024 13:00	62.0	91.9	60.7	49.0
10/08/2024 13:15	57.5	73.8	60.2	51.0
10/08/2024 13:30	60.1	84.8	61.0	49.4
10/08/2024 13:45	56.0	73.2	58.6	48.2
10/08/2024 14:00	56.2	74.9	58.9	47.4
10/08/2024 14:15	54.5	72.9	57.3	47.3
10/08/2024 14:30	57.1	77.8	59.8	47.0
10/08/2024 14:45	57.9	78.8	60.1	45.9
10/08/2024 15:00	54.8	73.2	58.3	45.7
10/08/2024 15:15	56.6	78.4	59.8	44.8
10/08/2024 15:30	57.8	78.3	61.3	46.2
10/08/2024 15:45	59.1	82.8	60.6	44.6
10/08/2024 16:00	56.6	74.4	60.1	45.3
10/08/2024 16:15	55.6	75.1	58.7	45.8
10/08/2024 16:30	55.2	76.2	57.8	45.6
10/08/2024 16:45	56.2	73.7	59.2	45.1
10/08/2024 17:00	59.7	81.3	61.0	45.6
10/08/2024 17:15	56.8	75.4	60.7	44.5
10/08/2024 17:30	70.6	101.2	57.0	44.1
10/08/2024 17:45	56.1	79.1	58.3	44.1

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 18:00	51.9	69.5	54.9	44.0
10/08/2024 18:15	58.0	77.8	60.1	45.2
10/08/2024 18:30	53.9	73.7	56.6	43.7
10/08/2024 18:45	54.3	70.0	58.5	44.5
10/08/2024 19:00	55.1	72.1	57.7	44.0
10/08/2024 19:15	55.5	78.3	57.7	43.9
10/08/2024 19:30	56.4	73.2	60.0	44.7
10/08/2024 19:45	54.5	80.3	55.9	45.8
10/08/2024 20:00	53.9	72.6	56.8	45.9
10/08/2024 20:15	53.8	68.9	56.5	47.0
10/08/2024 20:30	52.0	71.9	54.6	46.4
10/08/2024 20:45	53.4	75.9	55.5	46.3
10/08/2024 21:00	53.5	71.8	56.6	46.6
10/08/2024 21:15	54.5	73.2	58.0	45.6
10/08/2024 21:30	52.1	70.9	55.1	44.8
10/08/2024 21:45	51.4	67.5	53.5	45.2
10/08/2024 22:00	50.7	67.3	53.5	44.9
10/08/2024 22:15	50.1	64.2	52.5	44.5
10/08/2024 22:30	52.5	70.5	54.2	43.9
10/08/2024 22:45	50.6	66.1	53.5	43.7
10/08/2024 23:00	50.5	67.2	53.2	43.6
10/08/2024 23:15	51.5	69.9	54.4	42.4
10/08/2024 23:30	49.2	70.0	51.0	40.0
10/08/2024 23:45	49.4	71.6	50.7	37.5
11/08/2024 00:00	48.9	68.8	49.7	39.8
11/08/2024 00:15	53.1	81.0	51.7	38.7
11/08/2024 00:30	52.1	80.7	42.6	38.1
11/08/2024 00:45	47.9	79.4	45.3	37.5
11/08/2024 01:00	46.3	66.9	44.1	39.3
11/08/2024 01:15	45.5	63.7	43.5	38.8
11/08/2024 01:30	43.6	65.0	42.8	38.0
11/08/2024 01:45	45.3	63.8	44.7	39.8
11/08/2024 02:00	45.4	64.3	45.2	37.8
11/08/2024 02:15	48.1	68.1	47.3	38.1
11/08/2024 02:30	43.1	63.7	41.9	37.8
11/08/2024 02:45	40.6	63.9	38.4	31.8
11/08/2024 03:00	46.0	70.0	42.3	33.3

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 03:15	46.0	67.3	42.7	34.6
11/08/2024 03:30	48.9	67.1	50.6	43.6
11/08/2024 03:45	47.8	66.6	48.6	41.4
11/08/2024 04:00	43.3	52.0	45.6	40.4
11/08/2024 04:15	51.7	78.3	48.6	43.3
11/08/2024 04:30	47.4	64.3	48.7	44.0
11/08/2024 04:45	49.0	67.0	49.1	42.9
11/08/2024 05:00	47.4	66.2	48.1	43.9
11/08/2024 05:15	49.5	72.1	48.4	43.7
11/08/2024 05:30	46.4	61.3	47.8	43.8
11/08/2024 05:45	47.3	72.4	47.0	42.3
11/08/2024 06:00	46.5	63.5	47.0	41.7
11/08/2024 06:15	44.6	58.3	46.2	41.8
11/08/2024 06:30	47.3	73.2	46.0	42.0
11/08/2024 06:45	46.1	64.7	46.4	41.8
11/08/2024 07:00	48.0	66.4	49.3	41.8
11/08/2024 07:15	45.9	67.5	47.0	41.5
11/08/2024 07:30	45.6	62.2	47.0	41.8
11/08/2024 07:45	45.2	72.9	46.3	40.4
11/08/2024 08:00	49.9	71.1	52.6	40.1
11/08/2024 08:15	48.8	66.2	51.6	40.1
11/08/2024 08:30	49.4	69.0	51.4	41.4
11/08/2024 08:45	51.5	75.8	52.1	41.4
11/08/2024 09:00	49.8	67.3	51.3	41.3
11/08/2024 09:15	47.7	64.1	49.9	41.6
11/08/2024 09:30	52.7	76.0	52.9	41.9
11/08/2024 09:45	49.0	70.2	51.3	40.5
11/08/2024 10:00	52.5	70.4	54.8	43.2
11/08/2024 10:15	55.3	81.2	58.1	41.6
11/08/2024 10:30	53.4	71.9	56.7	40.4
11/08/2024 10:45	51.2	66.9	55.2	41.5
11/08/2024 11:00	51.7	67.4	55.1	42.9
11/08/2024 11:15	53.9	71.9	57.7	41.9
11/08/2024 11:30	53.6	70.7	57.3	42.0
11/08/2024 11:45	53.7	71.4	56.2	42.4
11/08/2024 12:00	56.0	77.8	58.5	44.2
11/08/2024 12:15	56.2	80.5	58.8	43.1

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 12:30	56.9	78.0	59.2	42.7
11/08/2024 12:45	56.5	81.8	58.3	44.0
11/08/2024 13:00	54.3	73.5	57.6	44.5
11/08/2024 13:15	55.4	70.9	58.9	44.5
11/08/2024 13:30	54.7	74.6	56.5	43.2
11/08/2024 13:45	56.7	77.2	59.6	45.0
11/08/2024 14:00	54.8	70.6	57.7	44.1
11/08/2024 14:15	56.3	76.0	59.2	43.3
11/08/2024 14:30	55.6	75.9	58.2	43.7
11/08/2024 14:45	51.8	68.2	55.5	43.3
11/08/2024 15:00	55.8	74.0	58.7	43.3
11/08/2024 15:15	54.0	68.4	57.1	43.6
11/08/2024 15:30	58.0	81.6	58.9	44.8
11/08/2024 15:45	55.2	73.8	58.4	44.2
11/08/2024 16:00	57.4	80.7	60.2	44.2
11/08/2024 16:15	52.0	67.4	55.4	42.8
11/08/2024 16:30	54.1	73.3	57.1	44.2
11/08/2024 16:45	53.0	66.6	56.1	43.8
11/08/2024 17:00	54.0	71.8	57.4	44.2
11/08/2024 17:15	55.2	73.4	58.3	44.9
11/08/2024 17:30	55.1	85.0	57.8	43.4
11/08/2024 17:45	60.8	92.6	58.0	44.8
11/08/2024 18:00	55.9	75.7	58.5	46.7
11/08/2024 18:15	53.2	71.4	57.0	44.3
11/08/2024 18:30	55.4	74.8	56.7	44.1
11/08/2024 18:45	54.8	80.1	57.6	44.8
11/08/2024 19:00	51.8	66.5	55.1	45.5
11/08/2024 19:15	55.0	68.0	58.2	47.4
11/08/2024 19:30	55.6	71.8	58.6	47.1
11/08/2024 19:45	64.0	88.9	61.2	47.6
11/08/2024 20:00	56.0	72.8	59.0	48.2
11/08/2024 20:15	53.8	75.8	55.9	45.8
11/08/2024 20:30	54.7	78.0	57.6	45.7
11/08/2024 20:45	52.0	68.3	54.5	45.1
11/08/2024 21:00	50.8	67.2	52.6	43.1
11/08/2024 21:15	55.9	77.6	58.7	45.3
11/08/2024 21:30	53.9	68.2	56.6	48.6

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 21:45	54.2	78.5	55.9	46.1
11/08/2024 22:00	53.4	69.2	56.2	47.4
11/08/2024 22:15	56.6	75.3	59.2	49.2
11/08/2024 22:30	56.1	79.8	57.9	48.7
11/08/2024 22:45	53.6	72.5	55.9	47.0
11/08/2024 23:00	51.3	69.0	52.5	44.2
11/08/2024 23:15	48.9	65.0	51.2	43.8
11/08/2024 23:30	48.1	65.0	51.0	43.4
11/08/2024 23:45	49.0	66.9	51.8	43.1
12/08/2024 00:00	46.2	61.3	47.9	42.7
12/08/2024 00:15	49.4	75.1	47.1	42.4
12/08/2024 00:30	45.1	60.0	47.0	41.8
12/08/2024 00:45	47.4	69.6	46.5	41.4
12/08/2024 01:00	49.8	78.2	44.2	40.3
12/08/2024 01:15	45.0	65.3	45.0	40.4
12/08/2024 01:30	41.8	46.8	42.9	40.3
12/08/2024 01:45	42.8	52.4	44.3	40.6
12/08/2024 02:00	44.9	62.7	43.5	40.2
12/08/2024 02:15	43.4	60.8	43.6	40.7
12/08/2024 02:30	45.6	63.1	46.4	41.2
12/08/2024 02:45	44.7	63.2	44.6	40.7
12/08/2024 03:00	46.3	69.8	45.1	40.9
12/08/2024 03:15	44.4	66.7	43.4	41.0
12/08/2024 03:30	45.4	70.1	44.2	41.3
12/08/2024 03:45	43.3	48.1	44.2	42.0
12/08/2024 04:00	43.6	59.6	44.3	42.0
12/08/2024 04:15	46.0	65.0	45.7	43.4
12/08/2024 04:30	47.3	61.2	48.5	44.6
12/08/2024 04:45	46.8	60.1	48.2	44.8
12/08/2024 05:00	49.0	69.1	50.5	45.4
12/08/2024 05:15	49.8	63.4	51.6	46.4
12/08/2024 05:30	49.7	62.7	51.6	47.0
12/08/2024 05:45	50.9	66.5	52.1	47.5
12/08/2024 06:00	55.6	76.8	55.6	49.1
12/08/2024 06:15	54.9	72.1	56.9	49.9
12/08/2024 06:30	59.4	81.4	57.2	50.6
12/08/2024 06:45	59.5	89.3	60.0	52.0

Date & time	L_{Aeq} [dB]	L_{AFmax} [dB]	L_{A10} [dB]	L_{A90} [dB]
12/08/2024 07:00	57.7	76.4	60.3	52.8
12/08/2024 07:15	58.0	73.1	60.9	51.8
12/08/2024 07:30	56.9	76.2	58.4	51.4
12/08/2024 07:45	65.6	99.4	63.0	51.4
12/08/2024 08:00	60.6	81.7	62.8	52.5
12/08/2024 08:15	60.5	83.3	62.9	51.8
12/08/2024 08:30	61.0	85.0	61.8	53.5
12/08/2024 08:45	59.2	82.2	61.2	51.1
12/08/2024 09:00	61.0	82.7	62.7	53.0
12/08/2024 09:15	57.6	72.9	60.2	52.3
12/08/2024 09:30	58.6	76.5	61.0	52.1
12/08/2024 09:45	57.4	80.1	59.5	49.9
12/08/2024 10:00	58.1	80.3	60.1	51.7
12/08/2024 10:15	59.9	75.1	62.3	53.8

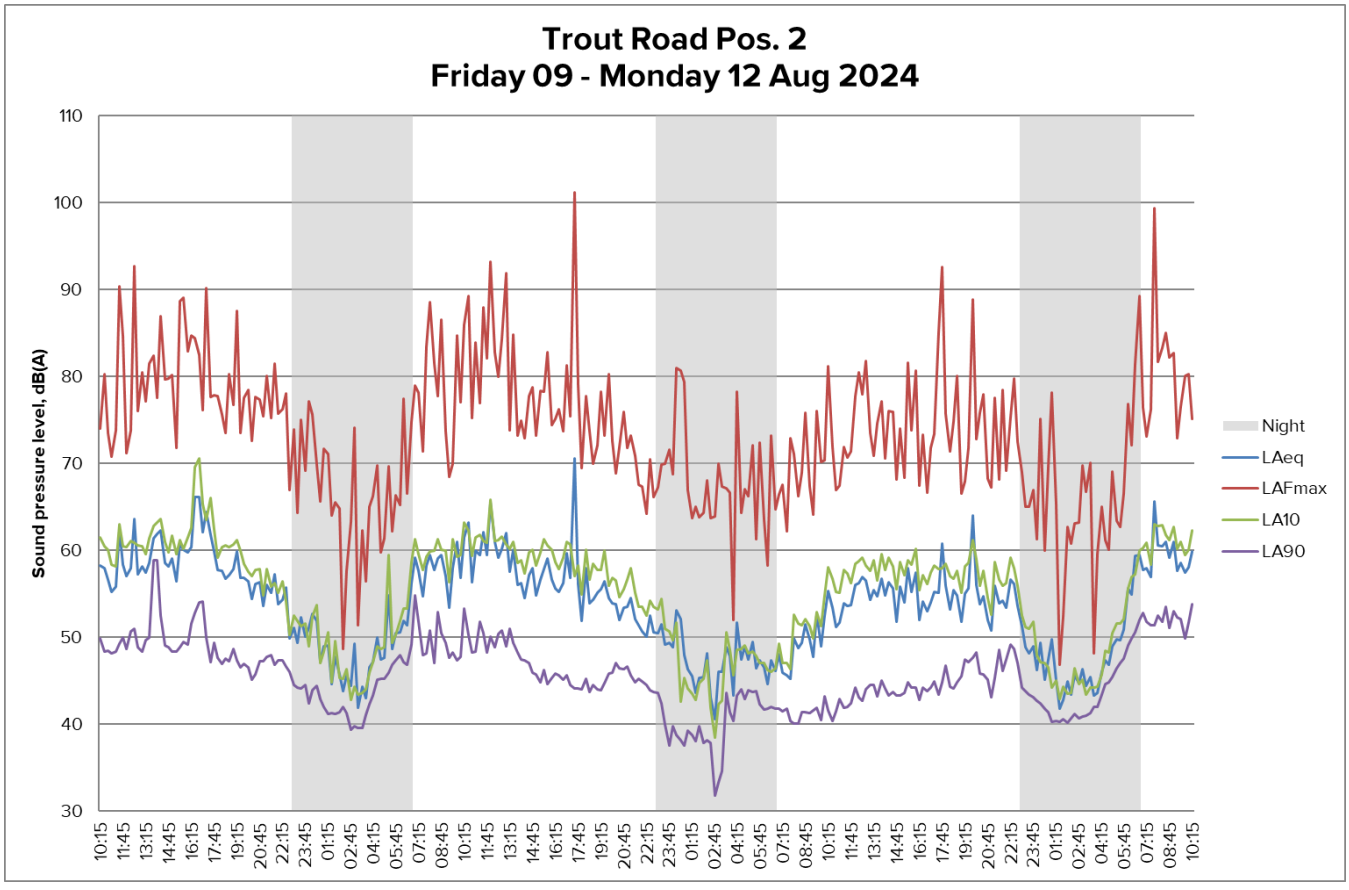


Table 25. Results of environmental noise measurements at Position 3.

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 11:00	63.4	89.5	63.8	48.7
09/08/2024 11:15	64.7	91.9	64.0	48.2
09/08/2024 11:30	66.3	93.9	65.6	48.6
09/08/2024 11:45	64.6	92.5	65.7	49.9
09/08/2024 12:00	63.4	87.9	65.8	48.6
09/08/2024 12:15	61.5	87.6	64.2	48.9
09/08/2024 12:30	66.2	96.0	64.8	49.2
09/08/2024 12:45	66.3	91.0	66.9	50.3
09/08/2024 13:00	66.3	92.2	65.2	49.7
09/08/2024 13:15	64.7	89.8	66.2	49.8
09/08/2024 13:30	65.1	92.6	66.2	48.8
09/08/2024 13:45	63.2	89.2	64.3	49.1
09/08/2024 14:00	66.0	92.6	66.5	49.8
09/08/2024 14:15	69.2	95.5	66.9	48.7
09/08/2024 14:30	67.9	94.8	68.1	49.5
09/08/2024 14:45	64.7	94.7	64.3	49.2
09/08/2024 15:00	65.8	91.1	66.7	49.1
09/08/2024 15:15	65.1	91.4	65.0	49.3
09/08/2024 15:30	64.6	93.3	63.8	48.4
09/08/2024 15:45	63.2	88.0	64.9	48.2
09/08/2024 16:00	63.9	92.1	65.2	48.2
09/08/2024 16:15	65.3	92.0	65.6	48.9
09/08/2024 16:30	65.2	92.2	66.7	50.8
09/08/2024 16:45	65.5	92.3	65.1	50.5
09/08/2024 17:00	65.0	91.6	65.0	51.0
09/08/2024 17:15	66.4	91.1	66.5	50.0
09/08/2024 17:30	67.2	91.8	65.9	49.7
09/08/2024 17:45	67.6	94.2	66.4	50.1
09/08/2024 18:00	65.2	89.7	65.4	48.8
09/08/2024 18:15	66.9	92.9	65.3	48.1
09/08/2024 18:30	66.5	91.8	66.3	47.8
09/08/2024 18:45	66.3	95.6	65.9	48.7
09/08/2024 19:00	67.5	96.4	66.0	50.0
09/08/2024 19:15	67.3	92.3	66.4	50.2
09/08/2024 19:30	63.9	91.7	64.7	47.8
09/08/2024 19:45	64.2	87.8	65.8	48.2

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 20:00	64.9	91.5	64.6	48.5
09/08/2024 20:15	62.4	88.8	63.6	47.2
09/08/2024 20:30	65.2	94.1	62.4	47.6
09/08/2024 20:45	64.4	90.4	63.9	48.8
09/08/2024 21:00	58.6	88.8	58.4	48.9
09/08/2024 21:15	59.6	80.3	61.7	49.3
09/08/2024 21:30	61.5	90.5	61.1	49.6
09/08/2024 21:45	63.3	93.1	59.7	48.8
09/08/2024 22:00	61.2	91.1	57.6	48.9
09/08/2024 22:15	62.9	91.2	58.5	48.2
09/08/2024 22:30	60.5	91.3	57.3	47.8
09/08/2024 22:45	60.5	88.8	54.4	47.6
09/08/2024 23:00	61.0	92.6	56.0	47.0
09/08/2024 23:15	60.4	88.8	57.5	47.0
09/08/2024 23:30	59.2	85.0	54.6	46.6
09/08/2024 23:45	64.1	92.6	57.5	46.2
10/08/2024 00:00	56.1	87.6	52.4	44.5
10/08/2024 00:15	61.7	91.1	58.3	45.7
10/08/2024 00:30	59.5	87.6	58.4	46.1
10/08/2024 00:45	59.2	90.0	56.5	44.0
10/08/2024 01:00	58.3	90.2	53.9	43.8
10/08/2024 01:15	58.6	88.2	51.7	43.7
10/08/2024 01:30	56.5	91.3	48.2	43.3
10/08/2024 01:45	49.5	73.4	49.7	42.8
10/08/2024 02:00	56.0	90.3	48.5	42.3
10/08/2024 02:15	51.6	84.9	47.7	43.6
10/08/2024 02:30	46.1	60.1	48.0	43.2
10/08/2024 02:45	50.3	73.3	47.1	41.2
10/08/2024 03:00	51.3	80.8	48.6	42.5
10/08/2024 03:15	58.6	91.0	49.2	41.3
10/08/2024 03:30	51.2	81.7	47.7	40.4
10/08/2024 03:45	48.7	80.1	47.4	42.0
10/08/2024 04:00	55.5	89.3	50.7	43.2
10/08/2024 04:15	48.8	71.0	48.1	43.8
10/08/2024 04:30	56.8	90.1	51.1	46.1
10/08/2024 04:45	53.9	86.4	49.2	44.9
10/08/2024 05:00	59.8	92.9	50.5	43.9

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 05:15	54.5	78.6	51.8	45.6
10/08/2024 05:30	53.1	72.7	55.5	46.9
10/08/2024 05:45	62.3	93.2	53.3	47.8
10/08/2024 06:00	58.0	87.6	55.5	48.7
10/08/2024 06:15	61.5	91.4	56.7	47.4
10/08/2024 06:30	62.0	90.8	60.8	47.5
10/08/2024 06:45	63.5	91.3	63.1	46.9
10/08/2024 07:00	63.8	87.1	64.5	47.3
10/08/2024 07:15	67.5	102.5	61.3	46.7
10/08/2024 07:30	60.4	91.5	59.2	45.9
10/08/2024 07:45	63.0	88.0	63.1	46.7
10/08/2024 08:00	61.7	90.6	62.5	46.9
10/08/2024 08:15	63.2	92.9	63.4	47.6
10/08/2024 08:30	62.7	91.3	61.5	47.2
10/08/2024 08:45	61.6	87.8	62.5	47.4
10/08/2024 09:00	63.7	94.3	63.9	47.5
10/08/2024 09:15	61.5	90.9	60.1	46.9
10/08/2024 09:30	62.8	89.7	64.3	47.3
10/08/2024 09:45	63.7	93.2	63.2	47.6
10/08/2024 10:00	63.3	89.5	64.0	48.5
10/08/2024 10:15	64.5	90.3	65.2	48.1
10/08/2024 10:30	63.1	87.4	63.7	46.9
10/08/2024 10:45	67.3	93.6	67.2	48.6
10/08/2024 11:00	63.5	87.1	66.4	48.6
10/08/2024 11:15	64.7	90.2	65.0	48.9
10/08/2024 11:30	63.8	90.8	64.3	48.9
10/08/2024 11:45	64.4	92.6	64.3	48.7
10/08/2024 12:00	65.5	92.2	65.1	49.0
10/08/2024 12:15	60.3	82.0	62.9	47.5
10/08/2024 12:30	64.6	91.1	64.8	48.3
10/08/2024 12:45	64.2	92.3	64.3	50.5
10/08/2024 13:00	63.7	92.0	64.1	48.4
10/08/2024 13:15	63.6	89.6	64.1	49.2
10/08/2024 13:30	60.5	85.8	60.7	48.8
10/08/2024 13:45	64.7	93.5	62.7	49.4
10/08/2024 14:00	64.9	91.8	64.0	48.9
10/08/2024 14:15	63.9	92.2	62.8	47.1

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 14:30	64.8	91.8	64.6	48.5
10/08/2024 14:45	65.1	92.0	64.6	46.7
10/08/2024 15:00	64.4	91.5	63.5	46.6
10/08/2024 15:15	65.6	91.2	64.9	46.8
10/08/2024 15:30	64.8	89.7	65.2	47.6
10/08/2024 15:45	67.2	98.7	64.7	47.6
10/08/2024 16:00	64.4	92.2	64.9	47.3
10/08/2024 16:15	67.2	98.9	64.6	49.2
10/08/2024 16:30	62.5	89.0	63.4	47.4
10/08/2024 16:45	63.2	89.3	63.1	47.1
10/08/2024 17:00	67.0	93.6	65.6	46.6
10/08/2024 17:15	65.7	91.8	66.0	45.9
10/08/2024 17:30	64.1	92.1	63.5	45.9
10/08/2024 17:45	64.3	89.7	64.0	47.3
10/08/2024 18:00	60.4	89.0	59.6	46.8
10/08/2024 18:15	64.7	90.4	63.5	48.4
10/08/2024 18:30	60.5	88.4	61.4	47.2
10/08/2024 18:45	64.7	93.0	60.7	47.4
10/08/2024 19:00	62.4	90.4	62.8	47.9
10/08/2024 19:15	62.3	87.5	62.8	47.5
10/08/2024 19:30	65.5	90.9	64.8	47.6
10/08/2024 19:45	66.9	91.9	63.3	48.9
10/08/2024 20:00	61.9	91.5	62.9	48.8
10/08/2024 20:15	63.6	91.2	62.4	49.6
10/08/2024 20:30	60.4	88.4	60.2	49.6
10/08/2024 20:45	62.9	92.0	61.7	49.1
10/08/2024 21:00	60.8	89.4	59.3	49.0
10/08/2024 21:15	62.4	86.8	62.2	48.9
10/08/2024 21:30	61.2	87.2	60.1	47.2
10/08/2024 21:45	59.0	86.7	58.7	47.8
10/08/2024 22:00	59.5	87.3	57.3	47.1
10/08/2024 22:15	62.6	90.1	59.8	46.9
10/08/2024 22:30	63.3	91.5	59.9	47.3
10/08/2024 22:45	58.8	89.2	57.9	47.3
10/08/2024 23:00	61.7	91.2	57.3	47.9
10/08/2024 23:15	59.4	89.1	54.1	46.8
10/08/2024 23:30	59.2	89.6	54.2	43.8

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 23:45	62.1	91.9	57.2	42.6
11/08/2024 00:00	61.7	89.2	58.8	43.5
11/08/2024 00:15	61.3	91.4	59.7	42.6
11/08/2024 00:30	54.6	85.2	51.4	41.4
11/08/2024 00:45	55.3	88.4	51.1	41.2
11/08/2024 01:00	55.4	86.3	51.8	42.7
11/08/2024 01:15	54.1	79.9	48.0	39.6
11/08/2024 01:30	57.8	89.0	49.2	40.1
11/08/2024 01:45	51.1	73.0	48.1	41.4
11/08/2024 02:00	54.7	84.7	52.1	41.5
11/08/2024 02:15	59.3	90.8	51.0	41.6
11/08/2024 02:30	55.5	87.7	48.9	39.7
11/08/2024 02:45	52.1	86.3	46.1	36.5
11/08/2024 03:00	53.3	79.9	47.2	36.3
11/08/2024 03:15	56.4	86.5	49.6	37.5
11/08/2024 03:30	55.2	84.2	53.4	44.9
11/08/2024 03:45	59.5	92.1	52.0	45.9
11/08/2024 04:00	47.3	63.7	48.7	44.2
11/08/2024 04:15	54.6	80.8	51.0	45.8
11/08/2024 04:30	57.5	91.6	51.4	46.8
11/08/2024 04:45	58.1	91.8	52.3	46.6
11/08/2024 05:00	55.4	88.3	51.6	45.9
11/08/2024 05:15	57.3	89.5	52.5	45.1
11/08/2024 05:30	51.2	71.2	52.8	46.1
11/08/2024 05:45	51.8	79.1	51.1	44.4
11/08/2024 06:00	54.1	75.7	51.7	43.9
11/08/2024 06:15	49.0	67.0	50.2	44.1
11/08/2024 06:30	57.1	89.9	53.8	44.8
11/08/2024 06:45	55.4	87.3	52.7	44.2
11/08/2024 07:00	53.9	79.5	52.1	43.8
11/08/2024 07:15	52.3	74.9	51.6	44.1
11/08/2024 07:30	51.5	79.7	52.4	43.8
11/08/2024 07:45	54.3	86.4	50.0	43.2
11/08/2024 08:00	59.2	89.2	54.0	42.9
11/08/2024 08:15	57.8	86.5	55.3	43.4
11/08/2024 08:30	56.3	87.0	55.4	44.0
11/08/2024 08:45	60.4	91.1	60.0	45.3

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 09:00	59.1	85.2	57.9	45.4
11/08/2024 09:15	59.3	88.4	58.3	44.8
11/08/2024 09:30	60.4	91.5	59.0	45.6
11/08/2024 09:45	59.5	92.7	57.1	45.1
11/08/2024 10:00	63.8	91.8	60.0	46.2
11/08/2024 10:15	61.2	89.3	62.2	46.4
11/08/2024 10:30	63.1	90.4	61.8	46.8
11/08/2024 10:45	63.0	93.0	62.5	47.7
11/08/2024 11:00	63.5	91.1	63.9	47.9
11/08/2024 11:15	62.0	89.2	63.1	47.9
11/08/2024 11:30	64.7	91.3	62.9	47.7
11/08/2024 11:45	64.0	92.5	65.1	47.5
11/08/2024 12:00	61.5	89.4	63.0	49.6
11/08/2024 12:15	64.6	92.0	64.3	47.6
11/08/2024 12:30	66.6	92.1	65.6	47.9
11/08/2024 12:45	60.4	85.9	62.7	48.2
11/08/2024 13:00	63.8	87.7	66.7	48.9
11/08/2024 13:15	64.5	91.6	64.2	47.5
11/08/2024 13:30	62.1	89.2	61.2	46.6
11/08/2024 13:45	65.1	91.5	65.1	47.4
11/08/2024 14:00	62.7	88.6	63.4	47.7
11/08/2024 14:15	63.8	91.1	62.8	47.4
11/08/2024 14:30	64.0	90.7	62.6	47.1
11/08/2024 14:45	59.7	87.8	61.6	46.9
11/08/2024 15:00	63.0	90.5	62.7	47.0
11/08/2024 15:15	62.2	90.3	62.9	47.5
11/08/2024 15:30	73.8	105.0	63.1	48.0
11/08/2024 15:45	64.1	89.3	64.8	47.6
11/08/2024 16:00	63.8	91.3	63.0	46.9
11/08/2024 16:15	64.4	92.4	62.4	47.3
11/08/2024 16:30	59.8	87.5	60.9	46.8
11/08/2024 16:45	60.9	88.8	60.1	46.0
11/08/2024 17:00	60.9	87.3	60.6	47.5
11/08/2024 17:15	62.0	91.8	61.4	46.9
11/08/2024 17:30	60.9	87.0	61.7	46.5
11/08/2024 17:45	62.4	90.1	62.0	47.8
11/08/2024 18:00	63.6	90.8	63.5	47.9

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 18:15	62.6	88.2	62.6	47.9
11/08/2024 18:30	64.8	92.7	61.9	46.9
11/08/2024 18:45	59.8	80.2	62.5	48.2
11/08/2024 19:00	57.9	79.2	58.2	46.6
11/08/2024 19:15	69.0	99.2	63.6	47.4
11/08/2024 19:30	65.8	94.1	63.1	47.9
11/08/2024 19:45	77.6	109.9	65.4	48.5
11/08/2024 20:00	63.7	89.1	61.7	48.1
11/08/2024 20:15	62.0	90.0	59.7	47.0
11/08/2024 20:30	59.7	87.3	59.8	47.2
11/08/2024 20:45	59.7	88.2	58.7	46.5
11/08/2024 21:00	61.5	90.9	58.8	46.6
11/08/2024 21:15	61.8	89.7	60.3	47.5
11/08/2024 21:30	61.3	87.8	58.1	47.1
11/08/2024 21:45	57.6	85.5	55.6	46.8
11/08/2024 22:00	60.9	91.8	55.1	46.9
11/08/2024 22:15	60.7	90.4	60.2	47.7
11/08/2024 22:30	60.9	87.2	58.7	47.0
11/08/2024 22:45	65.2	88.0	61.0	46.6
11/08/2024 23:00	58.5	87.6	54.2	46.5
11/08/2024 23:15	57.9	84.5	56.6	44.8
11/08/2024 23:30	55.5	81.5	53.9	45.3
11/08/2024 23:45	59.0	87.0	57.2	44.3
12/08/2024 00:00	55.1	87.1	53.5	44.8
12/08/2024 00:15	55.1	86.6	50.4	43.7
12/08/2024 00:30	53.2	85.1	51.8	43.2
12/08/2024 00:45	49.5	73.7	48.4	42.0
12/08/2024 01:00	52.6	79.9	48.2	41.6
12/08/2024 01:15	55.0	83.7	50.1	41.6
12/08/2024 01:30	52.4	86.0	47.7	41.8
12/08/2024 01:45	45.2	56.0	47.6	41.8
12/08/2024 02:00	54.2	86.7	47.5	41.4
12/08/2024 02:15	54.6	88.5	47.0	41.8
12/08/2024 02:30	53.1	82.2	49.5	42.5
12/08/2024 02:45	48.1	69.1	46.8	41.9
12/08/2024 03:00	54.4	88.3	48.0	41.6
12/08/2024 03:15	52.8	86.1	46.1	41.6

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
12/08/2024 03:30	52.1	75.3	48.8	42.9
12/08/2024 03:45	47.8	71.3	46.8	42.7
12/08/2024 04:00	46.0	57.2	47.7	43.3
12/08/2024 04:15	53.5	85.1	50.0	45.2
12/08/2024 04:30	50.0	70.4	50.8	46.0
12/08/2024 04:45	48.5	62.1	50.4	46.0
12/08/2024 05:00	52.6	80.9	51.4	45.7
12/08/2024 05:15	52.2	71.3	53.0	47.5
12/08/2024 05:30	53.0	79.6	53.0	47.7
12/08/2024 05:45	59.0	86.7	57.9	48.6
12/08/2024 06:00	60.9	90.9	57.2	49.6
12/08/2024 06:15	60.9	89.2	61.9	50.5
12/08/2024 06:30	60.6	89.3	60.3	50.1
12/08/2024 06:45	65.8	90.3	66.5	50.6
12/08/2024 07:00	63.7	89.7	64.9	50.7
12/08/2024 07:15	61.7	89.0	61.5	50.4
12/08/2024 07:30	61.4	87.7	62.0	50.2
12/08/2024 07:45	63.5	87.8	65.4	50.9
12/08/2024 08:00	64.6	86.6	65.8	51.8
12/08/2024 08:15	62.7	86.9	63.1	51.0
12/08/2024 08:30	61.8	87.5	62.7	50.9
12/08/2024 08:45	62.8	87.2	63.4	50.3
12/08/2024 09:00	62.9	87.3	64.0	49.8
12/08/2024 09:15	63.7	89.3	64.9	51.1
12/08/2024 09:30	62.1	84.7	63.1	50.4
12/08/2024 09:45	61.8	87.2	63.1	48.9
12/08/2024 10:00	63.1	89.5	62.6	47.7
12/08/2024 10:15	64.0	88.1	65.4	49.4
12/08/2024 10:30	63.8	91.1	63.8	48.1

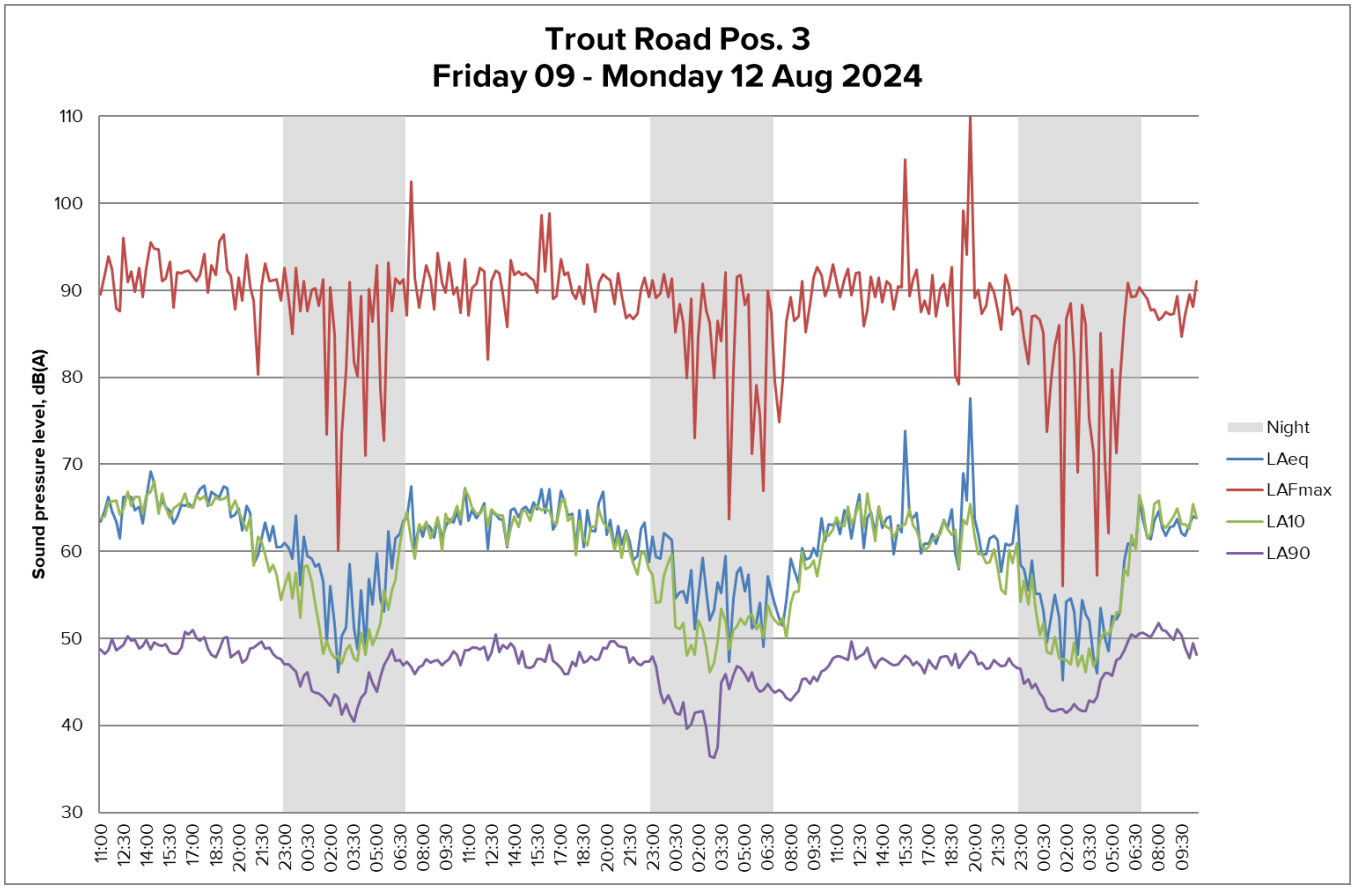


Table 26. Results of environmental noise measurements at Position 4

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 14:30	56.8	73.8	59.5	51.3
09/08/2024 14:45	55.5	74.2	57.8	48.1
09/08/2024 15:00	52.6	67.5	55.3	46.9
09/08/2024 15:15	51.1	66.7	53.2	47.1
09/08/2024 15:30	51.8	69.2	53.6	46.9
09/08/2024 15:45	54.5	74.3	57.0	47.4
09/08/2024 16:00	54.5	69.7	58.6	47.6
09/08/2024 16:15	51.5	66.5	53.5	47.5
09/08/2024 16:30	52.7	73.2	53.5	46.8
09/08/2024 16:45	55.5	85.9	56.6	47.2
09/08/2024 17:00	54.3	74.0	56.4	47.4
09/08/2024 17:15	53.8	77.2	57.1	46.1
09/08/2024 17:30	51.1	72.9	52.7	44.5
09/08/2024 17:45	51.5	68.0	53.4	46.1
09/08/2024 18:00	55.3	75.0	56.9	45.8

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
09/08/2024 18:15	51.6	68.5	54.1	46.5
09/08/2024 18:30	51.2	64.3	53.5	46.0
09/08/2024 18:45	55.0	79.6	56.6	47.3
09/08/2024 19:00	52.6	72.5	54.4	47.5
09/08/2024 19:15	52.8	75.5	53.1	46.9
09/08/2024 19:30	55.2	77.6	55.7	47.2
09/08/2024 19:45	51.4	72.4	53.6	46.7
09/08/2024 20:00	54.8	76.6	55.8	47.2
09/08/2024 20:15	50.2	67.5	50.2	45.1
09/08/2024 20:30	51.3	74.5	53.7	45.8
09/08/2024 20:45	52.3	66.8	54.8	47.3
09/08/2024 21:00	52.6	66.3	54.6	48.3
09/08/2024 21:15	51.3	66.7	52.0	48.5
09/08/2024 21:30	52.4	70.8	53.5	49.4
09/08/2024 21:45	51.8	68.8	53.1	48.3
09/08/2024 22:00	53.3	68.8	54.6	48.8
09/08/2024 22:15	51.2	70.3	52.0	48.1
09/08/2024 22:30	50.1	64.9	51.0	47.8
09/08/2024 22:45	50.5	69.6	50.3	47.3
09/08/2024 23:00	48.1	58.8	48.8	46.0
09/08/2024 23:15	47.6	56.9	49.1	45.6
09/08/2024 23:30	48.3	56.1	49.5	46.3
09/08/2024 23:45	49.5	64.4	52.1	46.3
10/08/2024 00:00	46.6	60.3	47.8	44.5
10/08/2024 00:15	47.3	57.2	48.4	45.4
10/08/2024 00:30	51.0	68.1	52.3	46.4
10/08/2024 00:45	48.0	65.9	47.9	44.6
10/08/2024 01:00	48.1	60.6	48.7	44.2
10/08/2024 01:15	47.2	61.1	48.5	43.7
10/08/2024 01:30	46.0	57.2	47.3	44.1
10/08/2024 01:45	47.5	58.3	50.5	43.6
10/08/2024 02:00	45.5	51.5	47.0	43.5
10/08/2024 02:15	47.4	65.7	48.1	44.5
10/08/2024 02:30	47.5	63.3	49.6	44.3
10/08/2024 02:45	43.8	49.8	45.2	42.0
10/08/2024 03:00	45.2	50.6	46.7	43.1
10/08/2024 03:15	44.8	58.5	46.4	42.3

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 03:30	43.9	48.7	45.4	41.9
10/08/2024 03:45	45.6	62.8	46.4	42.9
10/08/2024 04:00	47.7	65.1	47.9	44.4
10/08/2024 04:15	48.2	64.1	48.7	45.4
10/08/2024 04:30	48.4	56.5	49.6	46.4
10/08/2024 04:45	50.6	78.6	49.3	46.1
10/08/2024 05:00	47.0	52.1	48.4	45.1
10/08/2024 05:15	48.0	62.6	49.1	45.9
10/08/2024 05:30	48.9	54.4	50.1	47.3
10/08/2024 05:45	51.0	64.3	51.8	49.0
10/08/2024 06:00	51.2	61.9	52.3	49.6
10/08/2024 06:15	50.0	64.9	51.0	48.6
10/08/2024 06:30	49.7	62.4	50.5	47.9
10/08/2024 06:45	48.5	66.1	49.6	46.6
10/08/2024 07:00	48.0	64.0	49.3	45.9
10/08/2024 07:15	46.8	56.0	48.0	45.1
10/08/2024 07:30	48.4	64.5	49.9	45.4
10/08/2024 07:45	47.9	60.5	48.8	45.2
10/08/2024 08:00	50.2	67.0	51.2	45.7
10/08/2024 08:15	48.2	60.9	49.8	45.8
10/08/2024 08:30	48.9	65.6	49.8	45.7
10/08/2024 08:45	49.4	63.5	50.7	45.6
10/08/2024 09:00	49.9	64.5	51.6	45.4
10/08/2024 09:15	48.9	64.9	49.9	44.9
10/08/2024 09:30	50.8	67.9	54.1	44.6
10/08/2024 09:45	51.0	64.5	54.7	44.4
10/08/2024 10:00	51.1	64.1	55.1	45.6
10/08/2024 10:15	50.0	67.2	51.6	45.0
10/08/2024 10:30	51.5	65.8	54.4	45.5
10/08/2024 10:45	50.3	62.7	52.9	46.1
10/08/2024 11:00	52.4	69.8	55.3	46.0
10/08/2024 11:15	52.9	65.4	56.3	47.4
10/08/2024 11:30	60.7	74.8	63.1	48.2
10/08/2024 11:45	58.1	78.9	59.5	49.0
10/08/2024 12:00	52.7	70.7	55.4	46.8
10/08/2024 12:15	66.1	93.8	57.7	46.2
10/08/2024 12:30	52.6	68.3	55.2	46.4

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 12:45	52.6	73.5	54.8	46.8
10/08/2024 13:00	54.2	74.0	57.6	46.5
10/08/2024 13:15	52.4	68.9	55.4	46.9
10/08/2024 13:30	51.9	67.6	54.5	46.6
10/08/2024 13:45	51.8	70.2	52.8	46.6
10/08/2024 14:00	54.7	70.4	57.8	47.7
10/08/2024 14:15	52.6	71.6	55.2	46.3
10/08/2024 14:30	54.9	84.5	58.2	46.0
10/08/2024 14:45	49.5	67.7	52.0	44.8
10/08/2024 15:00	52.1	72.4	51.4	44.7
10/08/2024 15:15	51.3	67.4	54.2	44.5
10/08/2024 15:30	51.6	67.6	54.0	45.1
10/08/2024 15:45	50.8	69.1	52.6	43.8
10/08/2024 16:00	50.0	63.0	52.7	44.8
10/08/2024 16:15	53.1	73.4	55.1	45.3
10/08/2024 16:30	51.4	73.3	52.2	45.4
10/08/2024 16:45	48.3	63.1	50.2	44.3
10/08/2024 17:00	49.0	66.1	51.3	43.1
10/08/2024 17:15	48.1	65.0	50.8	42.4
10/08/2024 17:30	55.3	89.3	53.4	44.7
10/08/2024 17:45	48.5	68.1	49.0	42.5
10/08/2024 18:00	49.0	69.2	50.4	42.8
10/08/2024 18:15	49.3	67.0	50.4	44.0
10/08/2024 18:30	48.6	68.0	51.9	42.9
10/08/2024 18:45	49.7	66.8	51.7	44.4
10/08/2024 19:00	51.1	69.3	53.4	44.6
10/08/2024 19:15	50.4	60.5	54.7	44.0
10/08/2024 19:30	49.8	70.3	52.2	44.0
10/08/2024 19:45	50.1	65.8	51.9	45.6
10/08/2024 20:00	52.0	74.8	51.5	46.2
10/08/2024 20:15	52.1	65.9	54.9	47.6
10/08/2024 20:30	51.1	68.8	52.5	47.5
10/08/2024 20:45	51.4	66.5	53.6	48.0
10/08/2024 21:00	50.4	63.5	51.8	47.1
10/08/2024 21:15	48.0	65.8	48.2	45.4
10/08/2024 21:30	46.6	56.9	47.9	44.1
10/08/2024 21:45	49.7	65.3	51.1	45.0

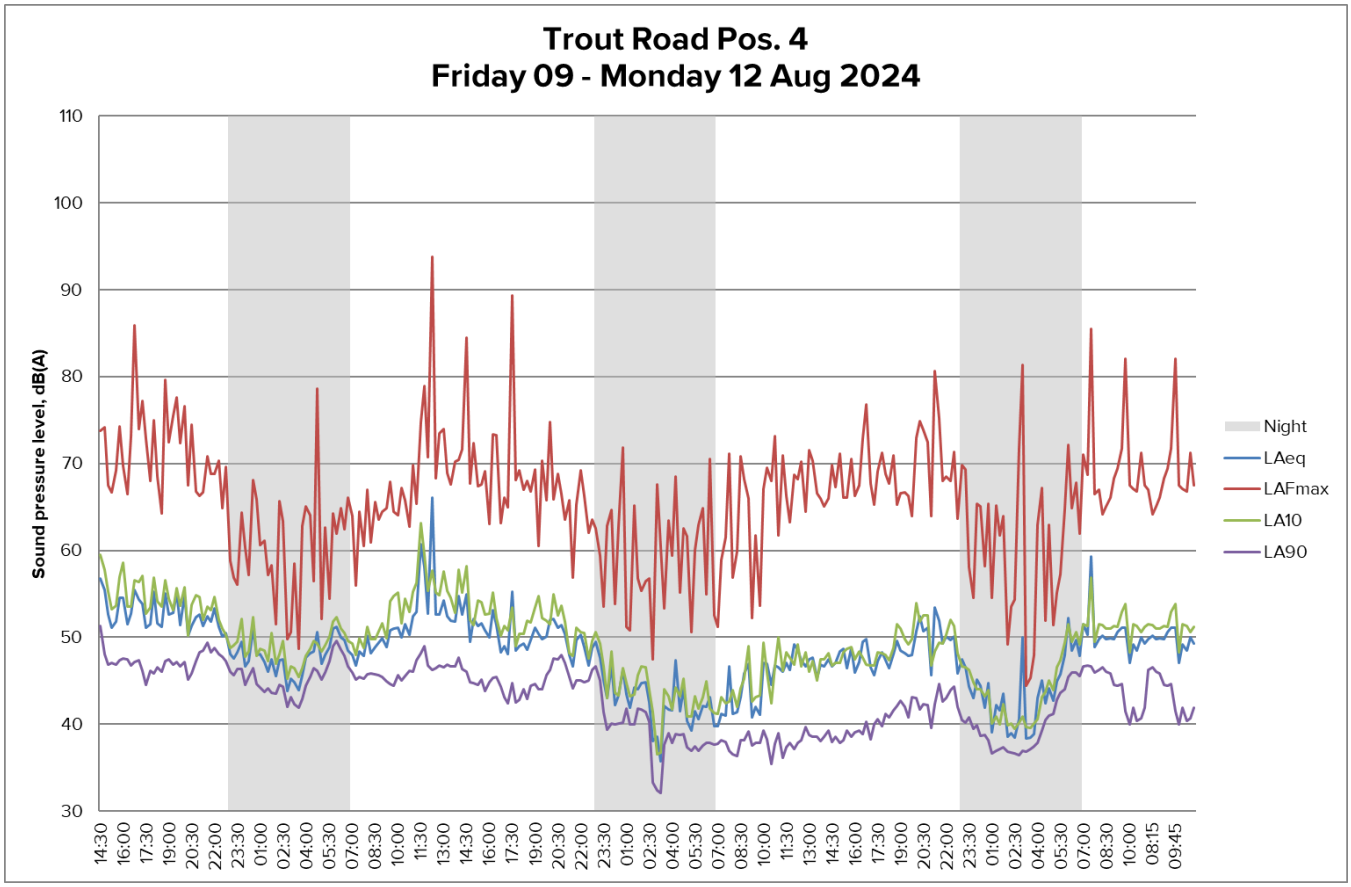
Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
10/08/2024 22:00	50.3	69.2	50.6	45.0
10/08/2024 22:15	48.9	66.3	50.5	44.8
10/08/2024 22:30	46.8	62.0	47.6	45.0
10/08/2024 22:45	48.8	63.5	49.6	46.2
10/08/2024 23:00	49.5	62.5	50.6	46.7
10/08/2024 23:15	47.7	59.4	49.3	45.0
10/08/2024 23:30	45.0	53.5	46.7	41.4
10/08/2024 23:45	43.0	62.8	43.0	39.4
11/08/2024 00:00	46.8	64.7	48.4	40.1
11/08/2024 00:15	42.2	53.8	43.6	40.0
11/08/2024 00:30	43.3	62.7	43.3	40.1
11/08/2024 00:45	46.2	71.8	46.4	40.2
11/08/2024 01:00	43.4	51.2	44.7	41.8
11/08/2024 01:15	41.9	50.8	43.2	40.0
11/08/2024 01:30	44.2	65.2	43.4	40.0
11/08/2024 01:45	44.0	56.8	45.6	41.8
11/08/2024 02:00	44.7	55.4	46.7	41.7
11/08/2024 02:15	44.8	56.5	46.5	41.4
11/08/2024 02:30	42.5	56.8	43.9	40.3
11/08/2024 02:45	38.0	47.5	41.4	33.3
11/08/2024 03:00	38.6	67.6	36.5	32.4
11/08/2024 03:15	35.7	60.4	36.7	32.1
11/08/2024 03:30	42.1	53.3	44.0	37.6
11/08/2024 03:45	41.7	63.4	43.2	39.0
11/08/2024 04:00	41.6	59.4	41.7	37.8
11/08/2024 04:15	47.4	68.5	44.2	38.9
11/08/2024 04:30	41.5	55.1	43.2	38.8
11/08/2024 04:45	44.1	62.5	45.2	38.9
11/08/2024 05:00	40.4	61.6	40.9	37.3
11/08/2024 05:15	39.3	50.6	40.9	36.9
11/08/2024 05:30	41.5	60.0	43.2	37.4
11/08/2024 05:45	40.6	62.9	41.8	36.9
11/08/2024 06:00	42.1	64.9	43.1	37.5
11/08/2024 06:15	42.0	54.9	44.9	37.8
11/08/2024 06:30	43.1	70.5	41.8	37.8
11/08/2024 06:45	39.8	52.5	41.3	37.6
11/08/2024 07:00	39.8	51.2	41.2	37.7

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 07:15	41.2	58.9	43.1	38.2
11/08/2024 07:30	41.0	61.5	42.4	37.9
11/08/2024 07:45	46.7	71.1	42.6	36.9
11/08/2024 08:00	41.2	56.9	43.9	36.5
11/08/2024 08:15	41.4	59.9	42.0	36.3
11/08/2024 08:30	43.1	70.8	44.1	38.1
11/08/2024 08:45	45.8	68.2	45.2	38.1
11/08/2024 09:00	47.0	66.0	49.0	39.2
11/08/2024 09:15	40.8	52.2	42.6	37.5
11/08/2024 09:30	42.0	61.7	43.1	37.8
11/08/2024 09:45	41.1	53.6	43.3	37.8
11/08/2024 10:00	47.1	67.1	49.4	39.3
11/08/2024 10:15	47.0	69.5	45.9	38.3
11/08/2024 10:30	44.5	68.0	42.4	35.4
11/08/2024 10:45	46.8	73.2	46.7	37.7
11/08/2024 11:00	46.5	61.7	50.0	39.0
11/08/2024 11:15	46.0	70.9	46.1	36.1
11/08/2024 11:30	47.1	66.3	48.3	37.3
11/08/2024 11:45	46.2	63.2	47.7	37.8
11/08/2024 12:00	49.2	68.7	46.9	37.1
11/08/2024 12:15	48.6	68.2	49.2	37.8
11/08/2024 12:30	47.4	70.2	46.7	38.1
11/08/2024 12:45	46.6	64.5	48.3	39.7
11/08/2024 13:00	47.5	71.5	46.0	38.8
11/08/2024 13:15	47.7	70.3	47.3	38.6
11/08/2024 13:30	45.3	66.6	45.0	38.6
11/08/2024 13:45	46.9	66.0	47.5	38.0
11/08/2024 14:00	46.7	65.1	47.5	38.6
11/08/2024 14:15	47.5	66.0	48.2	39.3
11/08/2024 14:30	46.7	69.8	46.8	37.9
11/08/2024 14:45	47.1	67.3	47.1	38.6
11/08/2024 15:00	48.4	71.1	47.1	37.8
11/08/2024 15:15	48.7	66.1	48.3	38.2
11/08/2024 15:30	46.4	66.1	48.7	39.3
11/08/2024 15:45	48.8	70.5	48.9	38.6
11/08/2024 16:00	45.9	66.3	47.5	39.1
11/08/2024 16:15	47.2	67.5	48.4	39.3

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
11/08/2024 16:30	49.5	72.9	47.7	38.9
11/08/2024 16:45	49.8	76.8	46.9	40.3
11/08/2024 17:00	46.5	67.7	46.8	38.3
11/08/2024 17:15	45.6	65.3	46.8	40.0
11/08/2024 17:30	47.3	69.1	48.3	40.6
11/08/2024 17:45	48.3	71.2	48.2	39.8
11/08/2024 18:00	47.4	68.8	48.0	41.2
11/08/2024 18:15	46.4	67.7	47.4	40.8
11/08/2024 18:30	48.1	70.9	48.8	41.6
11/08/2024 18:45	49.6	65.3	51.5	42.1
11/08/2024 19:00	48.5	66.6	51.0	42.7
11/08/2024 19:15	48.2	66.7	49.8	42.0
11/08/2024 19:30	47.9	66.3	49.2	40.8
11/08/2024 19:45	48.0	64.0	49.8	43.1
11/08/2024 20:00	50.7	73.0	53.9	43.0
11/08/2024 20:15	52.4	74.9	51.8	41.7
11/08/2024 20:30	50.7	73.9	52.5	42.3
11/08/2024 20:45	51.1	72.5	52.5	42.2
11/08/2024 21:00	45.6	64.0	46.8	39.6
11/08/2024 21:15	53.4	80.6	48.4	42.3
11/08/2024 21:30	51.9	75.2	49.4	44.6
11/08/2024 21:45	49.3	68.0	49.3	42.6
11/08/2024 22:00	50.1	68.5	50.3	43.0
11/08/2024 22:15	49.7	68.0	52.0	43.9
11/08/2024 22:30	50.1	71.3	51.3	44.3
11/08/2024 22:45	45.8	63.6	48.2	42.0
11/08/2024 23:00	47.5	69.8	46.7	40.5
11/08/2024 23:15	46.5	69.3	46.5	40.2
11/08/2024 23:30	44.3	58.1	46.2	40.8
11/08/2024 23:45	43.0	54.5	44.8	39.5
12/08/2024 00:00	45.1	65.4	44.0	39.9
12/08/2024 00:15	44.4	65.1	44.0	38.7
12/08/2024 00:30	41.9	58.2	43.2	38.8
12/08/2024 00:45	44.7	65.4	43.9	38.2
12/08/2024 01:00	39.1	54.5	40.1	36.6
12/08/2024 01:15	42.2	65.2	40.9	36.9
12/08/2024 01:30	41.6	61.7	40.0	37.1

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
12/08/2024 01:45	43.5	64.0	42.3	37.3
12/08/2024 02:00	38.6	49.2	39.9	36.8
12/08/2024 02:15	39.0	53.5	40.1	36.7
12/08/2024 02:30	38.5	54.3	39.5	36.6
12/08/2024 02:45	40.6	71.7	40.2	36.4
12/08/2024 03:00	50.0	81.4	40.9	36.9
12/08/2024 03:15	38.4	44.4	39.7	36.8
12/08/2024 03:30	38.5	45.3	39.6	37.1
12/08/2024 03:45	38.9	48.0	40.1	37.4
12/08/2024 04:00	43.0	62.9	40.6	37.8
12/08/2024 04:15	45.0	67.2	43.1	39.3
12/08/2024 04:30	42.4	51.9	43.7	40.5
12/08/2024 04:45	44.1	62.9	45.0	41.0
12/08/2024 05:00	42.7	51.4	43.9	41.2
12/08/2024 05:15	44.9	55.1	46.5	42.8
12/08/2024 05:30	45.7	57.3	47.4	43.6
12/08/2024 05:45	48.0	64.8	49.4	44.0
12/08/2024 06:00	52.2	72.1	51.5	45.4
12/08/2024 06:15	48.5	64.9	49.5	45.9
12/08/2024 06:30	49.7	67.8	50.6	45.9
12/08/2024 06:45	47.9	61.9	49.2	45.5
12/08/2024 07:00	51.5	71.0	51.5	46.7
12/08/2024 07:15	50.3	68.7	51.3	46.8
12/08/2024 07:30	59.3	85.5	56.9	46.7
12/08/2024 07:45	48.9	66.5	49.5	45.9
12/08/2024 08:00	49.8	67.0	51.5	46.2
12/08/2024 08:15	50.2	64.2	51.4	46.5
12/08/2024 08:30	49.8	65.1	51.0	46.0
12/08/2024 08:45	49.9	66.1	51.0	45.8
12/08/2024 09:00	49.8	68.3	51.3	44.5
12/08/2024 09:15	50.6	69.4	51.2	44.4
12/08/2024 09:30	51.1	71.7	52.9	44.6
12/08/2024 09:45	51.1	82.1	53.8	41.5
12/08/2024 10:00	47.1	67.5	48.3	40.0
12/08/2024 10:15	49.2	67.1	51.5	41.9
12/08/2024 10:30	48.5	66.8	51.3	40.4
12/08/2024 10:45	50.0	71.2	50.6	40.7

Date & time	L_{Aeq} [dB]	L_{Amax} [dB]	L_{A10} [dB]	L_{A90} [dB]
12/08/2024 11:00	49.3	67.5	51.2	41.9
12/08/2024 10:15	49.2	67.1	51.5	41.9
12/08/2024 10:30	48.5	66.8	51.3	40.4
12/08/2024 10:45	50.0	71.2	50.6	40.7
12/08/2024 11:00	49.3	67.5	51.2	41.9



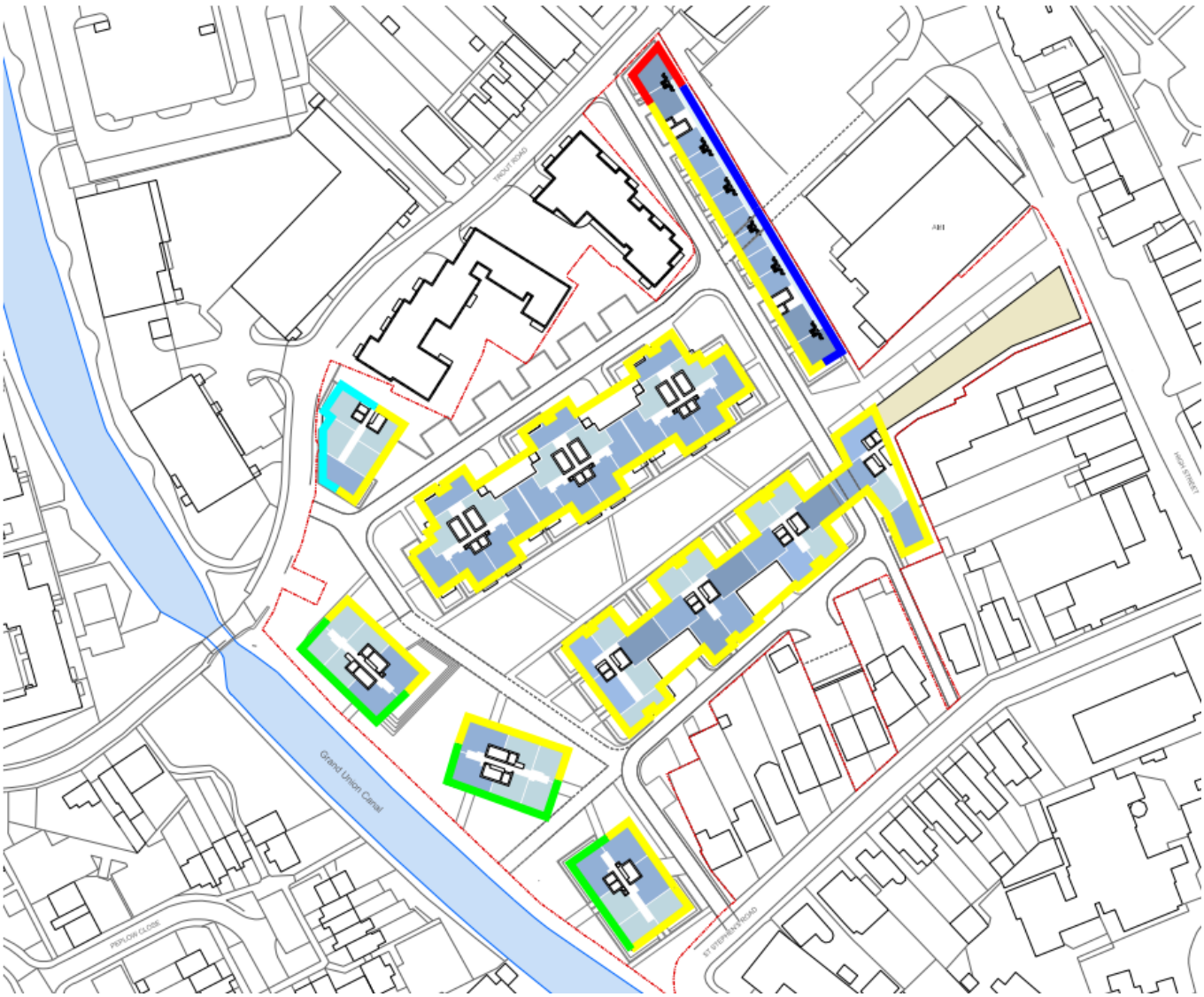
APPENDIX C

Façade identification – Ground floor

Ground floor arrangement plan

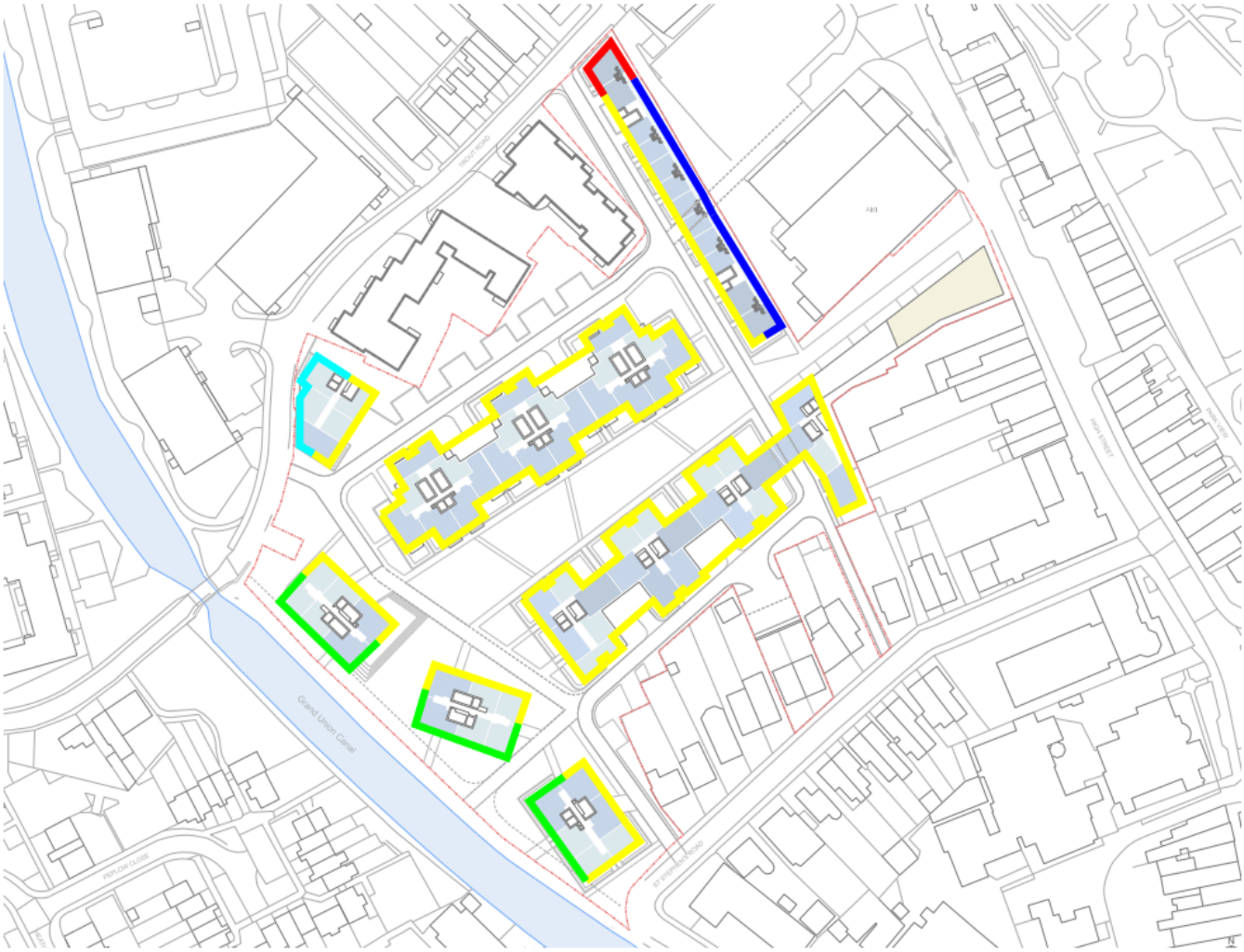
Façade identification – Typical lower floor

Typical lower plan



Façade identification – Typical upper floor

Typical upper plan



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