Land off Hatfield Road and to the south of Jove Gardens, Smallford, St Albans, AL4 0HN

Noise Impact Assessment

4th December 2025

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1. Introduction

Heyda Ltd have been commissioned by Stonebond Properties (St Albans) Limited to carry out a noise impact assessment for the proposed residential development on land off Hatfield Road and to the south of Jove Gardens, Smallford, St Albans, AL4 0HN. This report is intended to support the planning application process and align with relevant local planning policy and national policy on noise.

The proposed development will deliver 52 dwellings (including 50% affordable), with access off Hatfield Road, associated hard and soft landscaping and open space.

This assessment has been prepared due to the potential for noise from existing environmental sources, primarily road traffic, existing commercial noise sources and future quarry noise emissions, to affect the proposed development.

Additionally, we acknowledge the potential noise impacts on nearby noise-sensitive receptors, including existing residential dwellings in the vicinity of the site.

The assessment adheres to the Professional Practice Guidance: Planning & Noise (ProPG) for New Residential Development (2017), which sets out a recommended approach for assessing noise impacts and the acoustic design of residential developments. This ensures the development is designed to avoid significant adverse impacts and minimise adverse impacts in line with both local and national planning policies.

Our objectives in this assessment are to:

1. Assess Noise Impact on Future Residents of the Proposed Development

    - Ensure that noise levels from external sources, including road traffic, commercial noise and potential future quarry noise are controlled to provide a suitable acoustic environment for future occupants.

2. Assess Noise Impact on Existing Sensitive Receptors

    - Minimise adverse impacts and prevent significant adverse impacts on existing noise-sensitive receptors due to the operation of the proposed development.

This report employs advanced acoustic assessment techniques, informed by local and national policies, to deliver a comprehensive evaluation of the noise implications associated with the proposed development. The document structure includes environmental noise surveys, analysis of noise ingress, and evaluation of potential noise impacts, along with recommendations for suitable mitigation strategies where required.

At this stage, noise from new external building services associated with the development has not been considered in detail, as it can be controlled by suitable conditions; however, we have proposed suitable limiting criteria in accordance with BS 4142:2014 guidance, to ensure no more than a low impact.

Construction noise and vibration have not been addressed in detail in this assessment. These can be effectively managed through planning conditions, such as requiring a

construction management plan or applications for Section 61 prior consent under the Control of Pollution Act 1974. This approach ensures that significant adverse impacts on nearby receptors are avoided as far as is reasonably practicable.

Our goal is to provide all stakeholders, including planning authorities, the client, and the local community, with a clear and comprehensive understanding of the implications associated with the proposed development. By doing so, we aim to support informed decision-making that promotes a successful outcome for all parties involved, ensuring the new development enriches the community without causing unacceptable impacts.

Whilst every effort has been made to ensure that this report is accessible and easily understood, it is technical in nature; a glossary of terms is included in Appendix A to assist the reader.

2. Policy, Standards and Guidance Documents

In preparing the noise impact assessment for the proposed residential development, the following policies, standards, and guidance documents have been consulted. These documents have informed the scope and direction of our noise impact assessment.

- **National Planning Policy Framework (NPPF), 2024:** Sets out national planning policies for England, promoting sustainable development and the effective management of environmental noise to protect health and quality of life. It also embeds the Agent of Change principle, requiring that new development is designed and located to ensure that existing noise-generating uses are not unduly restricted by the introduction of new noise-sensitive development.
- **Noise Policy Statement for England (NPSE), 2010:** Articulates the long-term vision for noise management, providing guiding principles to minimise adverse noise impacts while promoting good health and a high quality of life.
- **Planning Practice Guidance – Noise, 2019:** Offers insights on integrating noise considerations into planning decisions, providing a detailed approach to managing noise within the planning system.
- **Emerging St Albans Local Plan 2041 (Draft):** The draft Local Plan identifies noise pollution as a key consideration for public health and well-being. Policy HW1 – Air and Noise Pollution requires that development proposals for noise-sensitive uses, or those located in areas affected by elevated noise levels, must be supported by suitable noise assessments. Where necessary, developments must demonstrate effective mitigation through appropriate design, layout, orientation, separation distances, and building fabric measures (including sound insulation, ventilation, and filtration). Developments that would introduce new noise sources are also required to demonstrate that impacts on existing noise-sensitive uses are avoided or suitably mitigated.
- **ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise for New Residential Development, 2017:** Recommends approaches for noise impact assessment and the acoustic design of residential developments, aiming to avoid significant adverse impacts and minimise adverse impacts.
- **BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings:** Provides criteria and limits for acceptable internal and external noise levels, crucial for assessing and controlling noise ingress in residential environments to achieve a suitable acoustic environment for occupants.
- **BS 4142:2014+A1 Methods for Rating and Assessing Industrial and Commercial Sound:** Essential for evaluating the impact of sound from industrial and commercial sources, on noise-sensitive receptors, ensuring that developments do not adversely affect the acoustic environment.
- **Building Regulations Approved Document O (ADO), 2021:** Provides requirements for managing overheating in new residential buildings, including ventilation strategies that minimise reliance on open windows to maintain both thermal comfort and acceptable noise levels.
- **ANC Acoustics, Ventilation, and Overheating (AVO) Guidance, 2020:** Offers design strategies for balancing acoustic performance with ventilation and

overheating concerns in residential developments, promoting a holistic approach to sustainable and comfortable living environments.

- **Planning Practice Guidance – Minerals, 2014 (as updated):** Sets specific noise control expectations for mineral extraction and processing sites, including recommended daytime noise limits (typically ≤55 dB $L_{Aeq,1hr}$ at noise-sensitive receptors) and guidance on good practice mitigation measures such as bunding, restricted working hours, and ongoing noise monitoring.
- **National Design Guide, 2021:** Defines principles of well-designed places that promote health and well-being, including the expectation that new homes should provide good-quality internal and external environments by avoiding noise and pollution and supporting sustainable, comfortable living conditions.

Further details on these documents are presented in Appendix B.

3. Site Description and Development Proposals

3.1. Site Description

The proposed development site is located to the rear of Notcutts garden centre, off Hatfield Road (A1057) in St Albans, Hertfordshire, within the administrative area of St Albans City and District Council. The proposed development site comprises an area of predominantly undeveloped green space. The land is bounded by:

- **North:** Residential properties off Jove Gardens, forming the northern boundary of the site.
- **East:** The main service yard of Notcutts Garden Centre, with the proposed (but not permitted) Brett Quarry site located beyond.
- **South:** Hatfield Road (A1057), together with Notcutts Garden Centre, PJ Outdoors, and associated car parking facilities serving the garden centre, with commercial uses and residential properties beyond.
- **West:** Residential properties off Oaklands Lane, with leisure and recreational uses located further beyond.

The wider area is mixed-use in character, with a transition between the established residential neighbourhood along Oaklands Lane and mixed commercial/light industrial and residential uses fronting Hatfield Road.

A visual representation of the site's location and surroundings is provided in Figure 1.

Figure 1: Site Location (approximate red line)

3.2. Development Proposals

The proposed development comprises the construction of 52 residential units (26 private and 26 affordable), together public open space and associated drainage, landscaping, internal roads, utilities and other service infrastructure.

The houses will comprise a mix of bungalows and two- and two-and-a-half-storey dwellings (rooms-in-roof), predominantly configured as small terraces or semi-detached pairs. A masterplan illustrating the proposed site layout is provided in Figure 2.

Figure 2: Proposed Masterplan

4. Baseline Sound Conditions

4.1. Sound Survey Overview

Heyda Ltd conducted a comprehensive environmental noise survey at the site of the proposed residential development. This survey consisted of long-term unattended noise measurements undertaken between Friday 10th and Tuesday 14rd October 2025, aimed at accurately establishing the baseline noise levels around the site.

The results of the survey have been used to:

- Establish the existing sound levels affecting the proposed development site, to determine its suitability for residential use;
- Establish the existing background sound levels at locations representative of the nearest noise-sensitive receptors; and
- Identify and quantify typical and worst-case noise levels associated with activity at the adjacent Notcutts Garden Centre service yard, to inform the assessment of potential impacts and the need for mitigation.

4.2. Survey Methodology

A long-term part-attended, part-unattended noise survey was carried out at three fixed monitoring positions. All measurements were undertaken by a consultant experienced in environmental noise monitoring, using suitable measurement instrumentation. The survey procedure followed the principles of BS 7445.

The sound data was analysed to determine the following parameters for each relevant time interval (T):

- **dB $L_{Aeq,T}$**: The A-weighted equivalent continuous sound pressure level over the measurement period, T. This parameter represents the average sound level during the period.
- **dB $L_{AFmax,T}$**: The A-weighted maximum sound pressure level during a measurement period, T, measured in a way that approximates the time-response of the ear.
- **dB $L_{A90,T}$**: The A-weighted sound pressure level exceeded for 90% of the measurement period, T, often referred to as the "background sound level".

The measurement positions are detailed in Table 1 and illustrated in Figure 3.

Table 1: Noise Measurement Positions

Position Ref	Position Description	Measurement Conditions
MP1	Part-attended, part-unattended sound measurement position to the southern site boundary of Notcutts garden centre, facing onto Hatfield Road (A1057). Microphone was 2m above local ground level. This location was selected to establish representative source levels from road traffic on Hatfield Road and to provide indicative background noise levels for existing residential properties fronting the A1057.	Free-field
MP2	Part-attended, part-unattended sound measurement position to the northern boundary of the existing service yard associated with Notcutts garden centre. Microphone was 2.2m above local ground level. This position was intended to determine source levels associated with activity in the service yard and to provide indicative prevailing and background noise levels representative of the proposed residential plots closest to the yard.	Free-field
MP3	Part-attended, part-unattended sound measurement position to the north-western site boundary, facing onto the rear of the residential properties off Oaklands Lane. Microphone was 1.5m above local ground level. This location was chosen to capture ambient and background sound levels representative of the western site perimeter, influenced by residential garden activity, Oaklands Lane traffic, and the wider suburban acoustic climate.	Free-field

Figure 3: Noise Measurement Positions

4.3. Measurement Equipment

All acoustic measurement equipment used during the surveys conformed to Type 1 specification of British Standard 61672. A full inventory of this equipment is shown in Table 2 below:

Table 2: Sound Measurement Equipment

Item	Manufacturer/Model Type	Serial Number
Sound Level Meter	Norsonic Nor140	1406432
Preamplifier	Norsonic 1209	21316
Microphone	Norsonic 1225	215502
Sound Level Meter	NTi Audio XL3	A3A-00620-D1
Preamplifier	NTi Audio MA220	13934
Microphone	NTi Audio MC230A	A26542
Sound Level Meter	NTi Audio XL2	A2A-23886-E1
Preamplifier	NTi Audio MA220	13950

Microphone	NTi Audio MC230A	A25920
Calibrator	Norsonic 1251	30754

The meters had been calibrated by a UKAS accredited laboratory within the previous 24 months. The calibration level was also checked at the start and end of the survey using a field calibrator.

No significant drift in the calibration was measured over the course of the survey (≤0.2 dB). The calibrator used had itself been calibrated by a UKAS accredited calibration laboratory in accordance with IEC 60942, 2017 within the twelve months preceding the measurements.

Microphones were fitted with protective windshields for the measurements.

4.4. Observations

At MP1 the acoustic environment at was influenced primarily by regular mixed road traffic along Hatfield Road (A1057), with contributions from activity within the courtyard of the Notcutts garden centre café, including vehicle movements and patron activity during opening hours. Aircraft noise was occasionally audible overhead but was not a dominant feature. Overall, the sound environment reflected a steady but moderate level of road-related activity typical of a suburban roadside location.

At MP2, road traffic noise from Hatfield Road and Oaklands Lane was largely screened by intervening buildings and vegetation. The sound environment here was instead occasionally dominated by localised commercial activity within the Notcutts garden centre's service yard and, to a lesser extent, by activity associated with PJ Outdoors. Typical sound sources included skip loading and unloading, forklift and pallet truck movements on rough concrete surfaces, and HGV manoeuvres and engine idling. These operations were clearly audible and dominant when occurring, but the extended periods between short periods of activity were notably quiet, with background sound levels dropping substantially once yard operations ceased.

At MP3, road traffic noise from both Hatfield Road and Oaklands Lane was well screened by surrounding residential plots and boundary fencing. The acoustic environment was characterised by localised residential garden activity (conversation, children playing, and domestic equipment), together with natural sounds, such as birdsong and aircraft flyovers. The overall noise climate was typical of a quiet suburban residential setting.

These observations provide a detailed understanding of the acoustic environment at the proposed development site and will inform the assessment of potential impacts on future residents.

4.5. Weather Conditions

Weather data for the survey period (10th – 14th October 2025) indicate conditions that were generally suitable for environmental noise monitoring.

- Wind: Predominantly light throughout the survey, typically below 5 m/s (11 mph) and often calm, with occasional gentle north-easterly flows later in the period.
- Precipitation: No rainfall was recorded during the measurement periods,
- Temperature and Humidity: Temperatures ranged from approximately 6 °C to 16 °C (41–61 °F) with relative humidity between 60 % and 95 %.
- Atmospheric Pressure: Remained steady (around 30.3–30.4 in Hg), with no significant barometric fluctuations indicative of passing weather fronts.
- Cloud Cover: Predominantly cloudy or fair, limiting strong solar heating effects and supporting consistent sound propagation conditions.

Overall, meteorological conditions were calm, dry, and stable, providing suitable and representative conditions for environmental noise measurement in accordance with the principles of BS 7445-1 and BS 4142.

Further detail on the weather conditions during the survey is presented in Appendix B.

4.6. Measurement Results

A summary of the measured sound levels at the measurement positions is presented in Tables 3 and 4 below. Time history graphs are presented Appendix C.

Table 3: Summary of Measured Sound Levels – Measurement Position 1

Day (Date)	Period (T)	Equivalent continuous SPL $L_{Aeq,T}$ (dB)	Typical maximum sound pressure level L_{AFmax} (dB)	Typical background sound pressure level $L_{A90,1hour/15mins}$ (dB)
Friday (10/10/25)	Night-time (23:00 – 07:00)	58	78	41
Saturday (11/10/25)	Daytime (07:00 23:00)	64	-	54
	Night-time (23:00 – 07:00)	58	78	42
Sunday (12/10/25)	Daytime (07:00 23:00)	63	-	51
	Night-time (23:00 – 07:00)	58	77	41
Monday (13/10/25)	Daytime (07:00 23:00)	64	-	54
	Night-time (23:00 – 07:00)	58	76	41

Table 4: Summary of Measured Sound Levels – Measurement Position 2

Day (Date)	Period (T)	Equivalent continuous SPL $L_{Aeq,T}$ (dB)	Typical maximum sound pressure level L_{AFmax} (dB)	Typical background sound pressure level $L_{A90,1hour/15mins}$ (dB)
Friday (10/10/25)	Night-time (23:00 – 07:00)	43	66	30
Saturday (11/10/25)	Daytime (07:00 23:00)	47	-	38
	Night-time (23:00 – 07:00)	44	59	40
Sunday (12/10/25)	Daytime (07:00 23:00)	48	-	41
	Night-time (23:00 – 07:00)	41	61	35
Monday (13/10/25)	Daytime (07:00 23:00)	51	-	43
	Night-time (23:00 – 07:00)	39	57	33

Table 5: Summary of Measured Sound Levels – Measurement Position 3

Day (Date)	Period (T)	Equivalent continuous SPL $L_{Aeq,T}$ (dB)	Typical maximum sound pressure level L_{AFmax} (dB)	Typical background sound pressure level $L_{A90,1hour/15mins}$ (dB)
Friday (10/10/25)	Night-time (23:00 – 07:00)	39	59	31
Saturday (11/10/25)	Daytime (07:00 23:00)	45	-	40
	Night-time (23:00 – 07:00)	44	58	36
Sunday (12/10/25)	Daytime (07:00 23:00)	46	-	41
	Night-time (23:00 – 07:00)	40	58	31
Monday (13/10/25)	Daytime (07:00 23:00)	46	-	42
	Night-time (23:00 – 07:00)	39	57	32

The typical night-time maximum noise levels at each location were determined using the 10th highest 1-minute noise event recorded at each location over the relevant night-time period.

In accordance with BS4142:2014+A1 guidance, the typical background sound levels (L_{A90}) presented above have been derived following a detailed statistical analysis of the measured sound levels over the relevant daytime and night-time periods.

5. Noise Modelling

5.1. Noise Modelling Methodology

To predict the impact of transportation and commercial noise on the proposed residential development at land adjacent to Notcutts garden centre, St Albans, the baseline noise measurement results detailed in Section 4 have been used to develop a comprehensive noise model. The model considers the propagation of noise from surrounding transportation sources and existing commercial sources.

The noise predictions were carried out using the noise-modelling suite Cadna/A, applying the CRTN and ISO 9613 prediction methodologies as appropriate.

This approach accounts for acoustic propagation from the adjacent transportation and commercial sources and the effects of topographical conditions, ground absorption, atmospheric absorption, and acoustic reflections.

5.2. Model Calibration and Validation

5.2.1. Road Traffic Sources

Baseline transportation noise levels affecting the site were established using survey data from each relevant measurement position, capturing noise emissions from the adjacent road traffic sources during both daytime and night-time periods.

The noise model was calibrated to ensure that the predicted noise levels aligned closely with measured values at all key positions across the site.

5.2.2. Commercial Noise Sources

With regard to existing commercial noise sources affecting the site, it is understood that any potentially noisy activity is generally confined to the garden centre service yard located to the rear of the garden centre site. Based on discussions with the centre's management team, typical operations within the service yard are understood to be limited to daytime hours only and to include:

- Goods deliveries (typically one per day);
- Materials handling using a forklift; and
- Loading and unloading activities.

In addition, general customer vehicle movements and parking activity also contribute to the overall sound environment during operating hours.

In order to predict the likely worst-case commercial noise emissions from the garden centre site, the assessment considers the following potential noise sources associated with its ongoing operation:

- Goods vehicle movements to and from the service yard;
- Loading and unloading operations, including engine idling, reversing alarms, and handling of materials via forklift truck;
- Car parking activity, including customer vehicle movements.

The assessment has been based on reasonable worst-case assumptions, using representative sound power levels from Heyda Ltd's internal database of comparable commercial and light industrial operations. All sources are assumed to operate concurrently during the sites normal daytime operating hours, ensuring a robust and conservative prediction of potential impacts.

The following assumptions have informed the operational noise modelling and form the basis of the impact assessment. They represent realistic but worst-case conditions to ensure the appraisal provides a robust prediction of potential operational noise impacts associated with the proposed development.

HGV Activity

HGV activity has been modelled as one of the dominant external sources associated with loading and delivery operations. Each HGV event (arrival, manoeuvring, loading/unloading, and departure) has been represented within the noise model by a combination of point and line sources along the existing access route and within the service yard area to the rear of the garden centre site.

The assumed operational scenario includes:

- A reasonable worst-case assumption of one HGV arrival and one departure per worst-case daytime hour, inclusive of associated loading and unloading operations.
- Loading and unloading operations typically covering up to 15 minutes in any daytime hour.
- Manoeuvring and loading/unloading activity is concentrated within the service yard.

The sound pressure level ($L_{Aeq,1h}$) associated with HGV activity has been calculated based on an assumed worst-case scenario of one vehicle movement in and one out within a one-hour daytime period, inclusive of associated loading and unloading operations.

Source noise data have been derived from a series of reference measurements as detailed in Table 6.

Table 6: Assumed Source Data – HGV Movements & Loading/Unloading

Source	Activity Description	Duration	Distance (m)	$L_{Aeq,T}$ (dB)	SEL (dBA)	Notes
Arrival / manoeuvring	Low-speed approach, turning, reversing	1 min 53 s	10	72	92	HGV, < 10 km/h
Departure	Exit manoeuvre and acceleration	37 s	10	72	87	Typical departure

Loading / unloading	Pallet transfer, tail-lift, door impacts, light metal impacts	15 mins	25	59	89	Typical loading/unloading activity

Based on an assumed spectrum, the broadband source data was subsequently converted to spectral sound power data, assuming normal outdoor propagation. The resultant source sound power levels are shown in Table 7.

Table 7: HGV Spectral Source Data

Source	Data Type	Sound Power Level (dB) at Octave Band Centre Frequency, Hz								dBA
		63	125	250	500	1k	2k	4k	8k	
Arrival/manoeuvring & Departure	Line L_w	80	72	66	66	67	64	60	54	71
Loading & unloading	Area L_w	76	80	83	85	84	82	78	74	89

The corresponding sound power levels per metre for each moving and fixed source were then derived and calibrated within the noise model to ensure consistency with the calculated sound pressure levels.

Car Park Noise

Car park activity has been modelled as one of the dominant external sources associated with the ongoing operation of the garden centre site. Each passenger car arrival or departure has been represented within the noise model by an area source covering the existing entry ways and car parking provisions.

The assumed operational scenario includes:

- A reasonable worst-case assumption of 122 passenger vehicle arrivals or departures per peak daytime hour, aligned with the allocation of car parking spaces.
- Vehicle movements could be distributed evenly across the proposed operating hours of 07:00–23:00.
- Manoeuvring and driving will be concentrated within the designated entry ways and car parking areas.

The sound pressure level ($L_{Aeq,1h}$) associated with car park activity has been calculated based on an assumed worst-case scenario of 122 vehicle movements in or out within a one-hour peak daytime period.

Source noise data have been derived from a series of reference measurements as detailed in Table 8.

Table 8: Assumed Source Data – Car Parking Noise Levels

Source	Activity Description	Distance (m)	SEL (dBA)	Notes
Arrival / manoeuvring	Pass-by, turning, reversing	10	67	Cars looking for spaces
Departure	Ignition, exit manoeuvre and acceleration	10	62	Typical departure
Door slams	Opening or closing of doors	10	65	Typical modern car doors

Based on an assumed spectrum, the broadband source data detailed in Table 8 was subsequently converted to spectral sound power data, assuming normal outdoor propagation. The resultant source sound power levels are shown in Table 9.

Table 9: Car Parking Spectral Source Data

Source	Data Type	Sound Power Level (dB) at Octave Band Centre Frequency, Hz								dBA
		63	125	250	500	1k	2k	4k	8k	
Internal Processes	Area L_w	92	85	80	80	79	79	75	71	84

Forklift Operations

External activity has been assessed on a worst-case basis, assuming the use of a medium-sized forklift truck within the service yard area, which is understood to be representative of typical on-site material handling requirements.

The assumed operational scenario includes:

- Forklift operations have been represented within the noise model as an area source covering the service yard area where loading, unloading, and pallet handling occur. This approach provides a realistic representation of the mobile and spatially distributed nature of forklift activity, rather than assuming a single fixed source.
- The source height has been set to 1 metre above ground level, which is representative of the typical emission height for forklifts during manoeuvring and handling operations.
- The assessment considers the daytime peak hour as the worst-case operational period, during which forklift activity is assumed to occur for approximately 25% of the hour. This reflects intermittent operation typical of loading activity, including pallet movement, vehicle turnaround, and idle periods between tasks.
- Noise emissions have been adjusted to account for the assumed duty cycle. This provides a conservative yet realistic representation of noise associated with forklift use during normal loading operations.

Table 10: Forklift Spectral Source Data

Source	Data Type	Sound Power Level (dB) at Octave Band Centre Frequency, Hz								dBA
		63	125	250	500	1k	2k	4k	8k	
Forklift Truck	Area L_w	83	88	91	92	90	86	82	77	96

5.2.3. Other Assumptions

In addition to the road noise and commercial noise source described, the model also considers the effects of the topographical conditions throughout the area, ground absorption, atmospheric absorption, acoustic reflections and acoustic screening, as well as applying a light downwind propagation correction to represent a worst-case.

5.3. Prediction of Sitewide Noise Levels

In the first instance, the noise model has been used to determine typical worst-case daytime (07:00–23:00) and night-time (23:00–07:00) equivalent continuous sound pressure levels ($L_{Aeq,T}$) resulting from anonymous sources across the site in its existing state, as well as the typical worst-case daytime hourly equivalent continuous sound pressure levels resulting from normal commercial activity associated with the adjacent garden centre. The predicted daytime and night-time noise levels resulting from road traffic sources are illustrated in Figures 4 and 5, and daytime noise levels from commercial activity is illustrated in Figure 6.

The noise maps depict predicted noise levels at two representative heights:

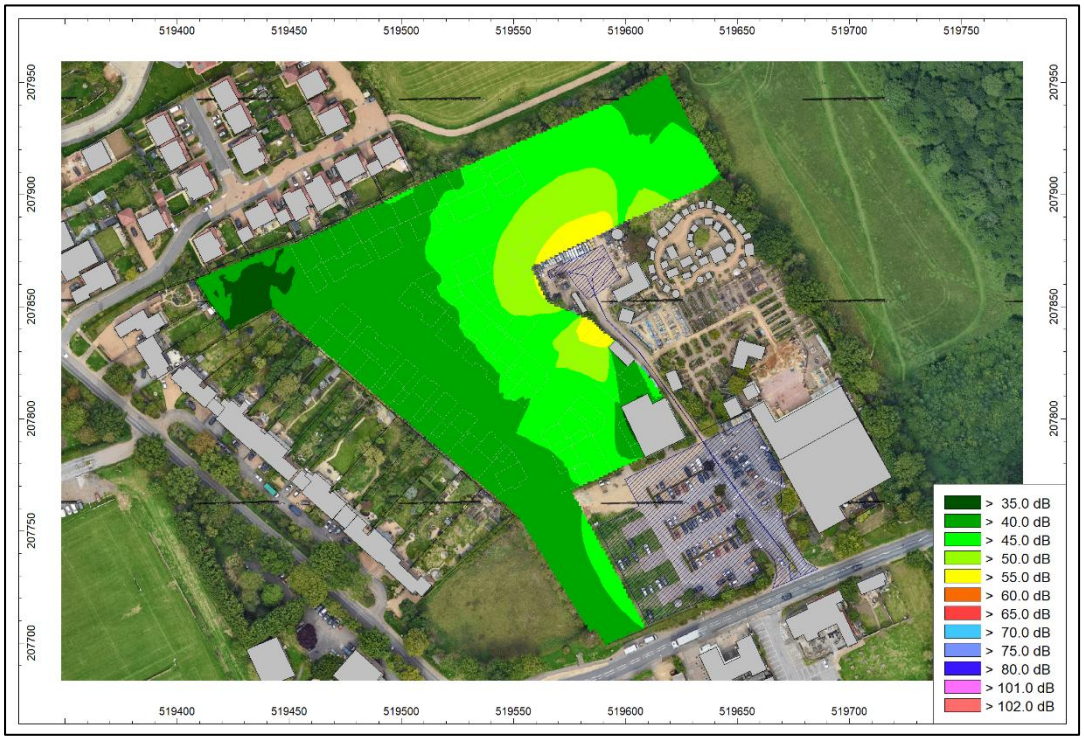
- Daytime: 1.5m above ground level, corresponding to a typical ground floor living room.
- Night-time: 4.5m above ground level, corresponding to a typical first-floor bedroom.

The results provide a clear understanding of the likely noise exposure levels across the site.

Figure 4: Predicted Daytime Sitewide Road Traffic Noise Levels

Figure 5: Predicted Night-time Sitewide Road Traffic Noise Levels

Figure 6: Predicted Daytime Commercial Noise Levels, $L_{As,1hr}$



In addition to the equivalent continuous noise levels, night-time L_{AFmax} noise levels were also included in the model. This was achieved by calibrating a point source in the centre of the adjacent roads to reflect the typical measured night-time L_{AFmax} levels at MP1 and MP3. Once calibrated, the point sources were then moved along the path of the respective roads to enable an assessment of the likely maximum noise levels across the proposed development site.

Due to constraints in graphical presentation, site-wide L_{AFmax} noise maps have not been included. However, modelling results indicate that night-time L_{AFmax} noise levels of up to approximately 62 dB may occur at the worst-affected southern boundary of the site, primarily as a result of instantaneous vehicle pass-bys along Hatfield Road (A1057).

In comparison, maximum noise levels across the site that are associated with traffic on Oaklands Lane are expected to be lower, typically below 60 dB L_{AFmax} in the worst-cases, largely due to the reduced traffic volumes, greater distance from the site boundary and due to the significant levels of intervening acoustic screening provided by the existing dwellings fronting onto Oakland Lane.

6. ProPG Level 1 Noise Risk Assessment

As required for a level 1 assessment, the noise model has been used to determine typical worst-case daytime (07:00–23:00) and night-time (23:00–07:00) equivalent continuous sound pressure levels ($L_{Aeq,T}$) resulting from anonymous road traffic sources across the site in its existing state, prior to the construction of the proposed development.

The daytime and night-time noise levels are illustrated in Figures 7 and 8 ,which are presented in terms of ProPG noise risk and therefore provide a clear understanding of the likely road traffic noise exposure levels across the site, enabling a detailed assessment of noise risks during both daytime and night-time periods in accordance with ProPG guidance.

Figure 7: ProPG Stage 1 Daytime Noise Map (Equivalent continuous sound pressure levels, $L_{Aeq,16hours}$)

Figure 8: ProPG Stage 1 Night-time Noise Map (Equivalent continuous sound pressure levels, $L_{Aeq,8hours}$)

6.1. Daytime Noise Risk Assessment

Across the open site, predicted daytime noise levels ($L_{Aeq,16hr}$) indicate a distinct variation in ProPG: Planning & Noise risk categories. The southern boundary, closest to Hatfield Road (A1057), falls within the Medium to High Risk range due to exposure to regular traffic movements and intermittent heavy vehicles. This area is therefore less suitable for noise-sensitive residential use and is best utilised for access roads, parking, or landscaped buffers to separate dwellings from the primary noise source.

Moving northwards, the central and northern parts of the site experience substantially lower exposure, corresponding to the Low to Negligible Risk categories under the ProPG framework. These areas are acoustically suitable for residential development, where good acoustic design, such as optimised building orientation and appropriate façade treatments, will readily ensure compliance with internal noise criteria.

This classification suggests that transportation noise levels are relatively low during the daytime, are manageable and unlikely to pose significant constraints to development.

6.2. Night-time Noise Risk Assessment

During the night-time period (23:00–07:00 hours), predicted $L_{Aeq,8hr}$ noise levels across the site show a similar spatial pattern to that observed during the day, but with generally lower absolute levels.

The southern boundary, closest to Hatfield Road (A1057), falls within the Medium to High Risk categories under the ProPG: Planning & Noise framework, primarily due to intermittent vehicle pass-bys and occasional L_{AFmax} events from individual vehicle movements. This area remains less suitable for noise-sensitive residential use and is more appropriate for ancillary or non-residential elements such as access or landscaping.

Noise exposure reduces substantially across the central and northern parts of the site, corresponding to Low to Negligible Risk categories. These areas experience very limited night-time activity, with the acoustic climate dominated by residual background sounds and occasional distant traffic. Accordingly, these parts of the site are acoustically suitable for residential development. This classification suggests that noise levels during the night-time are generally low and similarly, manageable and unlikely to pose significant constraints to development.

6.3. ProPG Level 1 Conclusion

Based on the results of the baseline sound survey and modelling, it is concluded that the proposed development site is generally suitable for residential use from a noise perspective.

The assessment identifies a clear gradient in noise exposure:

- The southern boundary, immediately adjacent to Hatfield Road (A1057), falls within the Medium to High Risk category under the ProPG: Planning & Noise framework. This area experiences the highest exposure due to passing traffic and occasional maximum noise events. It is therefore less suitable for noise-sensitive development and should preferably accommodate non-residential or ancillary uses, such as access roads, car parking, or landscaped buffer zones.
- The central and northern parts of the site fall within the Low to Negligible Risk categories, where both daytime and night-time noise levels are low, stable, and readily manageable through standard good acoustic design. These areas are appropriate for residential development, subject to normal façade design and ventilation provisions.

This Level 1 assessment has been undertaken under open-site conditions, without allowing for the additional acoustic screening benefits of the proposed built form. Once the new dwellings and boundary treatments are introduced, onsite noise levels are expected to decrease further, particularly within the interior of the site.

Overall, the findings indicate that, with a proportionate good acoustic design process and appropriate layout, the proposed development can achieve compliance with the aims of ProPG Stage 1 and provide a satisfactory acoustic environment for future residents.

Further details on mitigation strategies and compliance with ProPG Stage 2 requirements are presented in the subsequent sections of this report. This proactive approach ensures that potential noise impacts are comprehensively assessed and further reduced, supporting the successful integration of the new residential development into its local environment.

7. Residential ProPG Stage 2 – Full Noise Assessment

7.1. Assessment Overview

The ProPG Level 1 assessment has identified a noise risk which ranges between the Negligible and Low risk categories. Whilst the site is considered to be generally acceptable from a noise perspective with respect to transportation noise sources, a full ProPG assessment has been carried out to identify and incorporate additional design measures. These measures aim to minimise noise levels as far as is reasonably practicable and to ensure that significant adverse impacts are avoided.

ProPG outlines four key elements to be addressed in the full noise assessment, as follows:

1. Good acoustic design process
2. Internal noise level guidelines (including overheating considerations where applicable)
3. External amenity area noise assessment
4. Assessment of other relevant issues

The following report sections detail how the four key elements are applicable to the proposed development. We conclude with an assessment of noise impact to confirm alignment with local and national planning policy.

7.2. Good Acoustic Design Process

ProPG states that *"good acoustic design should provide an integrated solution whereby the optimum acoustic outcome is achieved, without design compromises."* The guidance outlines several recommendations for acoustic design in residential developments. Although it may not always be possible to implement each recommendation fully, it is crucial that they are considered throughout the design process. The key ProPG recommendations are addressed below with details of their consideration for the proposed development:

1. **Maximise the distance between the proposed dwellings and noise sources:** The primary transportation noise source affecting the site is Hatfield Road (A1057), with some contribution from Oaklands Lane. The proposed dwellings are located approximately 70–80 m from Hatfield Road, within an area assessed as Low to Negligible noise risk under the ProPG framework. As such, the current masterplan layout is considered suitable.
2. **Provide screening between noise sources and proposed dwellings:** The site benefits from a combination of natural and built screening that provides effective attenuation of noise from surrounding sources. To the south, the existing Notcutts garden centre buildings, service yard structures, and boundary fencing offer substantial shielding from Hatfield Road (A1057), which is the dominant transportation noise source in the area. To the west, the existing residential properties along Oaklands Lane and Jove Gardens, together with their rear garden fences and garages provide further physical and acoustic screening for the western

edge of the site. This greatly reduces the influence of road traffic from Oaklands Lane and typical domestic garden noise from those dwellings on the interior of the development site.

The first row of proposed new dwellings and ancillary buildings near the site access will, in turn, create an additional layer of acoustic screening for plots located further north and east within the development, effectively enclosing the site acoustically from both external and on-site activity.

Given the predicted external noise levels, the proposed built form would be expected to provide sufficient mitigation against transportation noise. As such, engineered noise barriers or bunds are not considered necessary for the control of transportation noise, and the current masterplan layout is considered acoustically efficient and appropriate for the site setting.

It is noted, however, that additional localised screening measures may be beneficial in relation to commercial activity noise from the adjacent garden centre. For the purposes of this assessment, it has been assumed that a 2.5 m high acoustic barrier will be introduced along the boundary with the garden centre site to provide attenuation of noise from the adjacent service yard. While this measure is not expected to achieve full compliance with prevailing background sound levels at the nearest façades, it represents a reasonable and proportionate provision that would deliver a meaningful reduction in commercial noise intrusion and improve the overall acoustic environment within the development.

For the purposes of the assessment, the proposed fence has been assumed to be constructed from a close-boarded timber design or proprietary acoustic fencing system, providing a minimum surface mass of 15 kg/m^2 with no gaps or openings. This specification would be expected to achieve an insertion loss of 10–15 dBA for typical mid- to high-frequency industrial noise sources, ensuring the barrier performs effectively as part of the overall noise control strategy.

3. **Locate sensitive habitable rooms away from the primary noise sources:** Where practicable, habitable rooms shall be located to the rear of the residential properties (away from the adjacent transportation and commercial noise sources) wherever possible, with rooms such as kitchens positioned facing the roads and nursery service yard. Some habitable rooms will inevitably face these sources, as bedrooms on the upper floors will need to have varied orientations, but acceptable internal conditions can be maintained through appropriate façade design and glazing performance as necessary.

4. **Locate external amenity spaces away from primary noise sources:** Given the predicted site-wide noise levels, with respect to transportation sources, noise levels in all of proposed external amenity areas are expected to be acceptable. Nevertheless, private rear gardens should be located on the quieter sides of the buildings, shielded by the building envelopes themselves wherever possible to minimise noise levels as far as practicable.

5. **Provide an appropriate ventilation strategy:** Given the relatively low site-wide road traffic and commercial noise levels, openable windows can be used as the primary means of ventilation under normal, overheating and purge ventilation conditions across much of the site. This approach aligns with guidance for achieving adequate internal acoustic conditions while supporting the use of a natural ventilation strategy. Dwellings closest to Hatfield Road, and those that are affected by commercial noise from the adjacent service yard, will require an alternative ventilation strategy that does not rely on the use of openable windows (such as passive trickle ventilators or MVHR) for background and overheating ventilation conditions during the daytime and night-time periods. This will ensure that road traffic and commercial noise do not compromise internal acoustic amenity or conflict with the requirements of BS 8233:2014 and ProPG guidance for residential environments.

6. **Provide sufficient building envelope sound reduction:** The required acoustic performance specifications for the building envelope, including glazing and wall construction, should ensure that noise ingress is controlled to acceptable levels. This is detailed further in subsequent sections of this report.

Each of these design measures has been considered to ensure the development adheres to ProPG guidance and achieves a high standard of acoustic design, enhancing the living environment for future residents.

7.3. Assessment of Noise Impacts

7.3.1. Internal Noise Level Guidelines

The St Albans District Local Plan Review (1994) remains in force as a set of saved policies pending adoption of the emerging Local Plan. The saved policies include provisions requiring that new development safeguards the amenity of both existing and future occupiers. Although the 1994 Plan does not contain a policy specific to noise, the general design and amenity principles set out within the saved policies require that development proposals do not give rise to unacceptable levels of noise or other environmental disturbance and that new residential environments provide an appropriate standard of amenity.

The Emerging St Albans Local Plan 2041 (Draft) builds upon these principles, with Policy HW1 – Air and Noise Pollution specifically addressing the need to assess and mitigate noise impacts. Policy HW1 requires that proposals for noise-sensitive development, such as new residential dwellings, schools, nurseries, and care homes, must be supported by suitable noise assessments where noise may be a concern. Where necessary, appropriate mitigation measures must be incorporated into the design to ensure that future occupiers are protected from adverse noise effects. The policy also requires that developments introducing new noise sources demonstrate that impacts on existing noise-sensitive uses are avoided or suitably mitigated, reflecting the Agent of Change principle embedded in national policy.

In demonstrating compliance with both national and local policy objectives, this assessment follows the methodology and guidance set out in ProPG: Planning & Noise (2017) and BS 8233:2014, which provide recognised criteria for achieving suitable internal and external noise environments in new residential developments. These standards ensure that the development achieves a high standard of amenity and accords with the emerging local policy framework for environmental protection and health and well-being.

Table 11: Residential Internal Ambient Noise Level Guidance

Activity	Location	Daytime	Night-time
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ & no more than 10 events greater than 45 dB L_{AFmax}

ProPG states the following:

"Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice [stated below]."

"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form."

By adhering to these guidelines, which are aligned with ProPG and British Standard 8233:2014 for indoor noise levels, we can ensure that the proposed development will meet the policy aims set out in the St Albans District Local Plan Review and Emerging Local Plan.

7.3.2. Achieving Suitable Internal Ambient Noise Levels

In order to assess the impact of each noise source (i.e. road traffic and commercial noise) on the proposed development, the noise model was updated to include the proposed buildings and proposed boundary treatments. The model was then used to determine cumulative daytime and night-time $L_{Aeq,T}$ noise levels at each proposed dwelling from each source.

It is important to note that the assessment considers commercial noise levels representative of a worst-case ($L_{Aeq,1hr}$) operating scenario, which are expected to occur only intermittently during daytime hours. These worst-case activity noise levels have been considered in conjunction with the 16-hour road traffic noise exposure to provide a robust evaluation of the overall acoustic environment.

ProPG advises that, wherever practicable, suitable internal ambient noise levels should be achieved within residential dwellings under open-window conditions.

While this is expected to be achievable across most of the site in relation to transportation noise, dwellings to the southern boundary of the site will only be expected to meet the recommended internal noise levels with windows closed during the daytime and night-time periods. Similarly, facades to the dwellings located close to the existing garden centre service yard will also only be expected to achieve the recommended internal noise levels with windows closed at first floor level during the garden centre's daytime operational hours. However, within most ground floor rooms, the recommended noise levels would be achieved with windows opened.

Figures 9, 10 and 11 identify the façades where partially open windows may still enable the achievement of 'good' internal noise levels, when considering both commercial and road traffic sources. A reduction of 15 dB has been assumed for a partially open window.

Figure 9: Daytime $L_{Aeq,T}$ BS8233 Internal Amenity Constraints (1.5m above ground level)

Figure 10: Daytime $L_{Aeq,T}$ BS8233 Internal Amenity Constraints (4.5m above ground level)

Figure 11: Night-time $L_{Aeq,T}$ BS8233 Internal Amenity Constraints (4.5m above ground level)

Daytime and night-time noise modelling indicates that despite the presence of road traffic and commercial noise, the proposed massing and boundary treatments mean that many of the proposed habitable rooms can be expected to achieve acceptable internal noise levels using standard building envelope specifications (brick and block cavity walls, traditional pitched roofs, thermal double glazing) and utilising openable windows as the default whole-dwelling ventilation strategy.

ProPG allows for schemes to rely on having windows closed during the whole dwelling ventilation condition, provided there is adequate justification and/or it is necessary to achieve internal noise level targets. One of the allowable justifications is for sites adjacent to transportation noise sources, which is applicable in this instance.

In addition, commercial noise from the adjacent nursery service yard presents a distinct acoustic character that may adversely affect internal amenity if windows were open for ventilation. In these areas, it is therefore appropriate to adopt a closed-window ventilation strategy to ensure compliance with internal noise criteria and to prevent disturbance from the character and intermittency of commercial noise.

It is also recognised that boundary mitigation measures (such as acoustic fencing) can provide a degree of control over external noise levels; however, the effectiveness of such measures must be balanced against visual impact, site layout constraints, and diminishing acoustic returns at upper-storey façades. On this basis, reliance on closed-window ventilation in combination with proportionate boundary screening represents a

reasonable and robust design response to ensure suitable internal acoustic conditions for future residents.

To demonstrate that suitable internal ambient noise levels can be achieved throughout the proposed development, indicative sound reduction requirements have been determined for the worst-case proposed dwelling with the highest predicted façade-incident transportation and/or commercial noise levels.

Noise ingress calculations have been carried out using the rigorous calculation method within BS 8233:2014, in order to determine assess the indoor noise levels at the worst affected location while windows are closed. The following assumptions were made in the assessment:

- Bedroom and Living Room dimensions assumed to be 3m x 4m x 2.4m and 4m x 5m x 2.4m respectively.
- External glazing is assumed to constitute up to 25% of the overall façade area in each room.
- The reverberation time in living rooms and bedrooms is assumed to be circa 0.5 seconds and 0.4 seconds respectively when complete and furnished.
- One trickle ventilator in bedrooms, and two in living rooms.

The external windows, doors, walls, roofs of the dwellings should achieve the following sound reduction indices to ensure external noise break-in is suitably controlled.

Table 12: Standard Building Envelope Sound Insulation Performance Requirements

Element Type	Octave Band Centre Frequency, Hz							Weighted Sound Reduction Index dB $R_w + C_{tr}$
	63	125	250	500	1k	2k	4k	
	Sound Reduction Index dB R							
All rooms: External Windows and doors (standard thermal double glazing)	17	22	20	26	36	39	31	27
All rooms: External Walls (standard brick and block cavity walls)	36	41	45	45	54	58	58	48
All rooms: External Roofs (standard pitched roofs)	16	21	26	33	33	35	35	30

Potential specifications shall demonstrate compliance with the above criteria through laboratory testing in accordance with BS EN ISO 10140-(Parts 1 and 2):2021. The performance specifications for the windows and doors apply to the system as a whole - inclusive of glazing, framing etc. The performance of the glazing system will depend on many factors, such as the configuration, size, frame quality, quality of sealing etc.

The required sound reduction performances are not significant and can be achieved using relatively standard specifications and build-ups.

Where proposed, trickle ventilators shall achieve the following minimum sound reduction requirements.

Table 13: Minimum Trickle Ventilator Sound Insulation Performance Requirements

Element Type	Octave Band Centre Frequency, Hz							Weighted Normalised Element Level Difference dB $D_{n,e,w}$
	63	125	250	500	1k	2k	4k	
	Element level difference dB $D_{n,e}$							
All Rooms: Trickle Ventilators	24	29	22	32	30	29	23	30

7.3.3. Impact Assessment

To determine whether suitable internal ambient noise levels are achieved, and therefore that adverse impacts are minimised, Tables 14 and 15 present the expected worst-case façade-incident noise levels for the dwellings most affected by transportation noise (facing Hatfield Road) and commercial noise (facing the service yard), respectively.

Tables 14 and 15 also present the predicted resultant internal ambient noise levels during the whole-dwelling ventilation condition, assuming windows are closed and trickle ventilators are open, and assuming the building envelope specifications achieve the requirements presented in Tables 12 and 13.

Table 14: Predicted Worst-Case Internal Ambient Noise Levels – Transportation Sources

Room	Period	Predicted External Façade Noise Level		Predicted Internal Ambient Noise Level	
		Equivalent continuous SPL $L_{Aeq,T}$ (dB)	Typical maximum sound pressure level $L_{Amax,T}$ (dB)	Equivalent continuous SPL $L_{Aeq,T}$ (dB)	Typical maximum sound pressure level $L_{Amax,T}$ (dB)
Bedroom	Daytime	58	-	**33**	**-**
	Night-time	52	62	**27**	**39**
Living Room	Daytime	58	-	**34**	**-**

Table 15: Predicted Worst-Case Internal Ambient Noise Levels – Commercial Sources

Room	Period	Predicted External Façade Noise Level	Predicted Internal Ambient Noise Level
		Equivalent continuous SPL $L_{Aeq,1hr}$ (dB)	Equivalent continuous SPL $L_{Aeq,1hr}$ (dB)
1st Floor Bedroom	Daytime	56	**29**
Ground Floor Living Room	Daytime	50	**26**

These worst-case projections indicate that typical building envelope constructions and ventilation specifications will be sufficient to ensure that external transportation noise and commercial noise intrusion is adequately mitigated, achieving and improving upon the residential guideline limits set out in ProPG and BS 8233:2014.

Accordingly, any potential adverse impacts on the internal amenity of future residents will be effectively controlled, in line with both national and local planning policy.

7.4. Noise and Overheating

7.4.1. Overheating Ventilation

ProPG states the following with regards to internal ambient noise levels during the overheating ventilation condition:

"Open windows can also be used to mitigate overheating. Therefore, should the LPA accept a scheme is to be assessed with windows closed, but this scheme is reliant on open windows to mitigate overheating, it is also necessary to consider the potential noise impact during the overheating condition."

We assume that the proposed development will be reliant on open windows to mitigate overheating, wherever noise levels allow.

The Building Regulations Approved Document O (ADO) provides noise requirements for the overheating ventilation condition in new residential buildings.

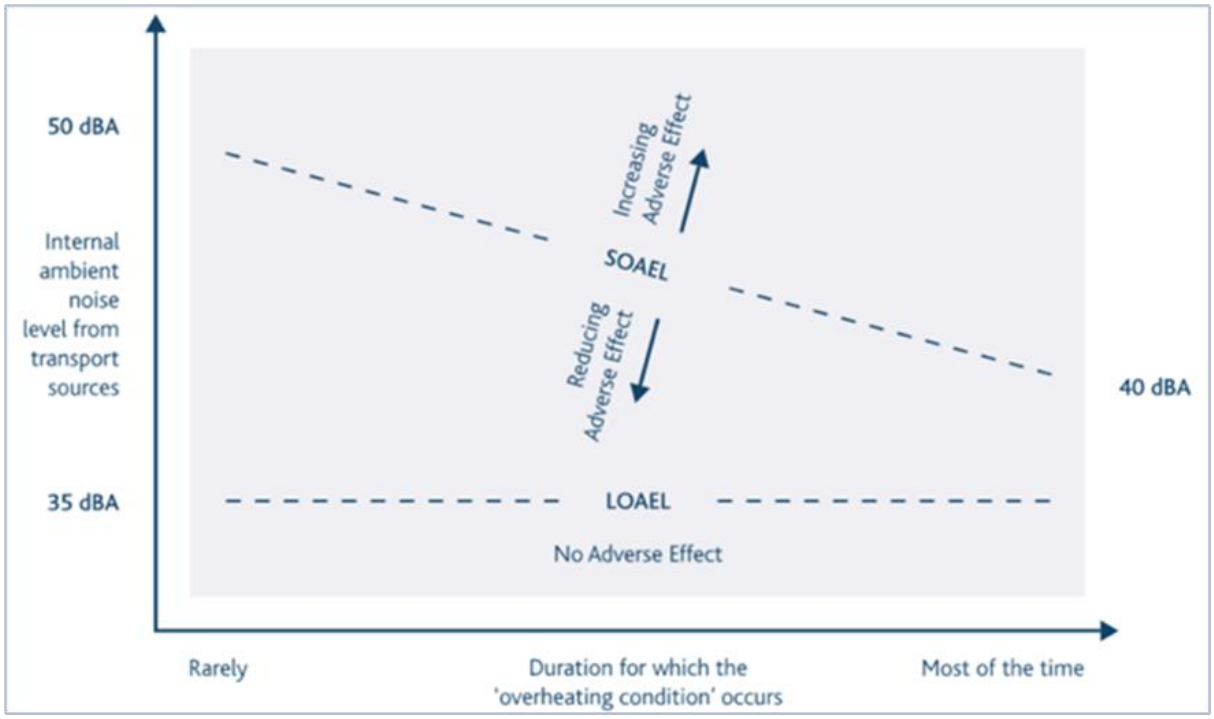
ADO specifies that windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following thresholds:

- 40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11 pm and 7 am).
- 55 dB L_{AFmax}, more than 10 times a night (between 11 pm and 7 am).

For bedrooms at night, an assessment of internal noise levels has been conducted, using the calculated noise reduction provided by windows sufficiently open to remove excess heat, as required by ADO (9 dB). This assessment has identified the plots where it will be necessary to keep windows closed during the overheating ventilation condition.

ADO does not provide specific noise limits for the daytime period or for other areas such as living rooms, but it references the AVO (Acoustic Ventilation and Overheating) guidelines. AVO states that the impact of increased daytime noise during the overheating ventilation condition is assessed on a sliding scale, which depends on the noise level during the ventilation condition and the duration for which the ventilation condition is needed. Figure 12, sourced from the AVO guide, is utilised to determine the noise risk for the overheating ventilation condition.

Figure 12: AVO Diagram indicating noise levels associated with adverse effects during the daytime



For the purposes of this assessment, we take the middle point of the sliding scale based on the assumption that windows will be open for some of the time in the most cases. This makes the point at which windows will remain closed as follows:

- 45 dB $L_{Aeq,T}$, averaged over 16 hours (between 7 am and 11 pm).

Accordingly, on the basis of a typical 9 dB insertion loss for a partially open window opened sufficiently to provide effective overheating mitigation, the use of opening windows is considered suitable where façade-incident noise levels do not exceed the following limits:

- Daytime: 54 dB $L_{Aeq,16h}$
- Night-time: 49 dB $L_{Aeq,8h}$ and 64 dB L_{Amax}

By assessing the noise levels against these established and conservative benchmarks, we ensure that the proposed development achieves suitable internal noise levels during all ventilation conditions, and therefore confirm that adverse noise on future occupants are mitigated.

7.4.2. Noise Restrictions during the Overheating Ventilation Condition

To determine the restrictions that must be imposed on the overheating mitigation strategy, the following figures present confirmation of the dwellings where windows can be open and where windows should be designed to be closed during the overheating ventilation condition, with respect to transportation and commercial noise.

Figure 13: Daytime Overheating Constraints (1.5m height)

Figure 14: Daytime Overheating Constraints (4.5m height)

Figure 15: Night-time Overheating Constraints (4.5m height)

An overheating assessment should be conducted for the proposed development to determine whether the dwellings are expected to maintain suitable internal temperatures. This assessment typically follows the TM59 methodology, which is a standard approach for evaluating building thermal performance.

Figures 13, 14 and 15 should be used to inform the TM59 assessment by indicating which windows can be assumed to be opened by residents when temperatures reach a certain level:

- **Green Areas:** These areas represent facades where opening windows is acceptable for mitigating overheating. Based on our assessment, opening windows in these locations is not expected to result in significant adverse noise impacts, in line with local and national planning policy. Therefore, in the TM59 assessment, it is assumed that windows on these facades can be opened.
- **Red Areas:** These areas indicate facades where, if overheating occurs and residents open their windows, adverse noise impacts are expected. This means that residents would need to choose between thermal comfort and maintaining acoustic conditions. For the TM59 assessment, it is assumed that windows on these facades will remain closed.

If the TM59 assessment shows that rooms on facades with closed windows are likely to overheat, then alternative methods for reducing and mitigating overheating will need to be implemented.

The overheating assessor will provide guidance on the exact measures required to limit solar gains or remove excess heat without opening windows. A summary of potential measures from the Building Regulations Approved Document O includes:

Limiting Solar Gains

1. Orientation and Shading: Buildings should be designed to minimise solar gains during the summer months. This can be achieved by orienting the building to reduce exposure to direct sunlight and using shading devices such as overhangs, awnings, or brise-soleil.

   Consideration should be given to the use of trees and vegetation for natural shading.

2. Glazing Strategy: The amount, type, and position of glazing should be carefully considered. High-performance glazing with low solar transmittance values (g-values) can help limit solar heat gain.

   Use of external shading devices or blinds to reduce solar gain through windows.

3. Internal Layout: Arrange internal spaces to position heat-sensitive rooms (such as bedrooms) away from areas of high solar gain.

   Use buffer zones, such as corridors or storage areas, on the sunniest side of the building.

Removing Excess Heat

Ventilation

Design for effective natural ventilation through the use of large acoustically attenuated vents where external noise levels allow. Use cross-ventilation by having openings on opposite sides of the building (this reduces noise break-in by reducing the opening area required on each side of the building).

Mechanical Ventilation and Cooling

Where natural ventilation is insufficient, mechanical ventilation systems may be used, potentially incorporating heat recovery to improve energy efficiency.

In extreme cases, mechanical cooling (such as air conditioning) may be necessary, but should be used as a last resort due to its energy consumption.

Thermal Mass

Use thermal mass within the building to absorb heat during the day and release it during cooler periods (e.g., at night).

Materials like concrete, brick, or stone can provide effective thermal mass.

7.4.3. Impact Assessment

The assessment confirms that the proposed development can be designed to achieve appropriate internal noise levels under the overheating ventilation condition. Significant adverse effects are not expected, and any residual impacts, primarily limited to first-floor façades closest to Hatfield Road and the garden centre service yard, can be effectively mitigated through appropriate façade design, use of closed-window operation where necessary, and the provision of alternative ventilation systems to maintain acceptable internal conditions during the overheating condition. Therefore, the proposals are deemed to align with local and national planning policy on noise.

7.5. External Amenity Area Noise Assessment

7.5.1. Criteria and Planning Policy

This assessment intends to demonstrate that the proposed development aligns with local and national planning policy by demonstrating that significant adverse noise impacts will not occur. To do so we follow the ProPG guidance for external amenity noise assessment, which is summarised as follows:

1. **Design Consideration:** If amenity spaces like gardens or balconies are integral to the design, their acoustic quality should be considered to ensure usability.
2. **Noise Levels:** Ideally, noise levels in these areas should be between 50 – 55 dB $L_{Aeq,16hr}$. If this isn't achievable, aim for the lowest practicable noise levels.
3. **Quiet Access:** Ensure access to a quiet or relatively quiet external space, which is part of good acoustic design.
4. **Offsetting Impacts:** If significant noise impacts remain, provide access to:
    - A quiet façade with openable windows or an enclosed balcony;
    - An alternative quiet amenity space, such as a garden or balcony;
    - A nearby quiet amenity for a group of residents; or
    - A nearby public park or green space.

7.5.2. External Amenity Noise Predictions

The following noise map illustrates the areas of the proposed development that are predicted to fall within the ProPG external amenity noise guideline of ≤55 dB $L_{Aeq,16hr}$, representing locations where transportation and commercial noise levels are expected to remain acceptable for outdoor use.

It should be noted that the modelling incorporates 1.88m boundary fencing to all private garden and external amenity areas, consistent with the current outline layout proposals. These structures provide localised screening from both road traffic noise along Hatfield Road and, to a lesser extent, commercial noise from the adjoining garden centre site. In addition, 2.5m high acoustic fencing has been assumed along the commercial boundary with the garden centre, offering attenuation of service yard activity noise and providing the primary control measure for mitigating commercial noise intrusion at the nearest proposed dwellings.

Figure 16: External Amenity Area Noise Constraints

Figure 16 illustrates that the private external amenity areas across the entire site are expected to comply with the upper and lower daytime external amenity guideline values of 55 dB and 50 dB $L_{Aeq,16hr}$.

7.5.3. Impact Assessment

The assessment demonstrates that noise levels within private external amenity areas are expected to be suitable with respect to both transportation and commercial noise sources. Adverse noise impacts in external amenity areas are not expected and therefore the proposals are deemed to align with local and national noise policy.

7.6. Assessment of Commercial Noise Impacts

7.6.1. Overview

This section presents a standalone assessment of the potential impacts of existing commercial and industrial noise on the future occupants of the proposed development, with specific reference to ongoing operations at the adjacent Notcutts garden centre site and associated service yard.

It is noted that commercial noise impacts have already been considered earlier in this report in terms of absolute sound levels and with reference to the guidance provided in BS 8233:2014 and ProPG: Planning and Noise (2017). That assessment concluded that, through the inclusion of appropriate boundary barriers and façade treatments, it is entirely feasible to achieve acceptable internal and external noise levels throughout the development. The current section therefore provides additional analysis, undertaken in accordance with BS 4142:2014 +A1:2019, to support and supplement the earlier findings, ensuring that potential commercial noise effects have been comprehensively assessed and that the conclusions are robust and transparent.

The following subsections describe the adopted notional emission limits, assessment methodology, modelling assumptions, and the results of the detailed BS 4142 impact analysis, together with a contextual interpretation of the findings in line with the framework of the standard.

7.6.2. Assessment Methodology

The operational noise impact assessment has been undertaken in accordance with the principles of BS 4142:2014 +A1:2019 "Methods for Rating and Assessing Industrial and Commercial Sound", which provides a framework for evaluating the significance of sound from industrial and commercial operations at existing or proposed noise-sensitive receptors.

Predicted operational noise levels have been determined using Cadna/A environmental noise modelling software, incorporating the calculation methodology of ISO 9613-2:2024 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation". The model accounts for distance attenuation, ground absorption, barrier screening, reflection effects, and meteorological conditions representative of a neutral atmosphere (moderate downwind propagation), and has taken account of the proposed boundary treatments discussed earlier in this report.

The assessment considers the following noise sources associated with the adjacent nursey development:

- Goods vehicle movements to and from the garden centre service yard;
- Loading and unloading operations, including engine idling, reversing alarms, and handling of materials;
- General yard activity, including staff vehicle movements and light-vehicle activity within operational areas;
- Customer car parking activity.

The assessment has been based on reasonable worst-case assumptions, using representative sound power levels from Heyda Ltd's internal database of comparable commercial and light industrial operations. All sources are assumed to operate concurrently during the garden centre's daytime operating hours, ensuring a robust and conservative prediction of potential impacts.

Where appropriate, acoustic feature corrections (for tonality, impulsivity, or intermittency) have also been applied in accordance with BS 4142 to derive the overall rating level ($L_{Ar,Tr}$) for comparison with the assessment criteria.

Predicted rating levels at the nearest noise-sensitive receptors have been compared against the prevailing background noise level (L_{A90}) at the receptor location.

7.6.3. Assessment Assumptions

A number of assumptions have informed the operational noise modelling and form the basis of the impact assessment. These represent realistic yet conservative worst-case conditions to ensure the appraisal provides a robust prediction of potential operational noise impacts associated with the proposed development.

In terms of operational noise emissions, the assumptions detailed in Section 5.2.2 have been adopted. The modelling also incorporates the 2.5m high acoustic fence along the commercial boundary and the 1.88m garden boundary fencing throughout the site, both of which contribute to the control and mitigation of commercial noise transmission to the proposed dwellings.

7.6.4. Noise Impact Assessment

Specific Level Results

Using the methodology and assumptions outlined previously, the assessment has determined the specific noise levels at the nearest noise-sensitive receptors. The results, representing the worst-affected windows and rear gardens of the worst-affected receptor, are summarised in Table 16.

Table 16: Predicted Specific Noise Levels at Proposed Dwellings

Source	Location	Predicted Daytime (07:00-23:00) Specific Operational Noise Level $L_{As\ 1hr}$ dB
Garden Centre Operations	Ground floor window	50
	First floor window	56
	Private garden	50

Feature Correction Applicability

Following BS 4142's subjective methodology, the identified specific sound levels have been reviewed to determine whether any acoustic feature corrections are appropriate. Corrections are applied to the cumulative specific sound level to account for tonality, impulsivity intermittency or any other distinctive acoustic character that increase audibility and potential impact.

The combined sound environment at the receptors is likely to be dominated by HGV and forklift operational noise, which each have the potential to exhibit intermittent and impulsive characteristics. Accordingly, an overall feature correction of +6 dB has been applied to the calculated cumulative specific sound level at each receptor, consistent with BS 4142 guidance.

No other tonal features or other distinctive characteristics are likely to occur.

BS 4142 Impact Assessment

The noise impact analysis, combining specific sound levels with feature corrections, generates the rating levels ($L_{Ar,Tr}$) for comparison against background sound levels. This comparative analysis aims to ascertain the potential noise impact on adjacent receptors. The analysis is detailed in Table 17 and has only been carried out for the daytime operational period.

Table 17: Predicted Specific and Rating Levels for Typical Operational Activity

Location	Typical Background Sound Level, $L_{A90,T}$, dB	Predicted Specific Sound Level dB $L_{Aeq,1hour}$	Predicted Rating Level dB $L_{Ar,1\ hour}$	Rating against Typical Background Sound Level (dB)
Ground floor window	41	50	56	+15
First floor window		56	62	+21
Private garden		50	56	+15

The results presented in Table 17 demonstrate that the predicted, mitigated rating levels associated with typical operational activity are likely to exceed the prevailing background sound levels at the worst-affected of the proposed receptors. The predicted worst-case rating level of 62 dB $L_{Ar,1hr}$ at first-floor windows exceeds the existing typical background sound level by approximately 21 dB, while the corresponding predicted level of 56 dB $L_{Ar,1hr}$ at ground-floor level windows and gardens exceeds the background by around 15 dB.

This indicates that, when assessed in accordance with the framework set out in BS 4142:2014+A1:2019, commercial noise from the garden centre could be expected to give

rise to a significant adverse impact at the most exposed façades and gardens of the proposed dwellings under worst-case conditions.

Notwithstanding the above, BS 4142:2014 +A1:2019 emphasises the importance of context when interpreting rating level exceedances. In this case, several contextual factors moderate the apparent significance of the predicted numerical differences:

- The commercial operations are confined to daytime hours and are intermittent, with no evening or night-time activity.
- The mitigated absolute rating levels (≤ 62 dB $L_{Ar,1hr}$) are relatively moderate and typical of daytime sound environments adjoining mixed-use areas.
- Private garden levels, when combined with road traffic noise, are predicted to remain at or below the 50 dB $L_{Aeq,16hr}$ external amenity guideline value. Given that commercial activity is typically limited to only a fraction of the daytime period, the equivalent 16-hour average exposure would be several decibels lower than the predicted one-hour levels, further reducing the overall impact.
- Internal conditions will remain within the design targets when windows are closed, and suitable alternative ventilation can be provided.

Considering the above factors in combination, the sensitivity of the proposed dwellings to existing commercial noise sources is significantly reduced. While commercial noise will remain audible at the closest façades, the building envelope and boundary specifications have been designed specifically to control these sources. The resultant internal impact is therefore expected to be low, and no significant adverse effects are anticipated for future residents.

However, noise levels within a limited number of private gardens are expected to exceed the SOAEL under peak operational conditions. As these areas cannot be practically mitigated further, some degree of significant impact in these gardens is therefore likely. This could be addressed either through a minor amendment to the site layout (e.g., orienting dwellings to provide screening to garden areas) or by acknowledging that occasional significant effects will occur externally, while internal and overall residential amenity remain appropriately protected in accordance with national and local planning policy.

Uncertainty

This assessment has been undertaken in accordance with industry best practice, following the procedures set out in BS 4142:2014+A1:2019, BS 8233:2014, and ISO 9613-2:1996 for the prediction of sound propagation in outdoor environments.

The predictive model has been developed using Cadna/A environmental noise modelling software, incorporating measured baseline sound data obtained using Class 1 precision sound level monitoring equipment, together with detailed site observations and the proposed site layout drawings. Calculations of sound propagation have been undertaken in accordance with ISO 9613-2, accounting for local ground absorption, terrain, and open-source topographical and building height data to accurately represent the acoustic environment.

The model includes all primary operational noise sources associated with the adjacent garden centre, based on reasonable worst-case source assumptions for each activity type, including HGV movements, loading and unloading operations, forklift use and customer car parking activity. Noise levels have been predicted at the nearest proposed receptors under peak daytime operational conditions, representing the most adverse but realistic scenario for site activity.

Accordingly, the assessment is considered to provide a robust and conservative representation of the likely operational noise impact. The uncertainty associated with the modelling and input data is regarded as low, given the use of measured site data, well-established propagation algorithms, and conservative source assumptions consistent with Local Planning Authority guidance.

7.7. Assessment of Other Relevant Issues

7.7.1. Compliance with Relevant National/Local Policy

The proposed development has been designed to align with the principles of the National Planning Policy Framework (NPPF, 2024) and the Noise Policy Statement for England (NPSE, 2010), as well as relevant local planning policies relating to noise and amenity. These policies seek to ensure that new residential development is not exposed to unacceptable noise levels and that noise from existing commercial or industrial sources does not result in significant adverse effects on future occupants.

It is understood that the local authority typically seeks to limit commercial noise emissions to levels no greater than the prevailing background sound level (L_{A90}) at the location of new sensitive receptors. While the detailed BS 4142:2014 assessment indicates that this criterion would not be achieved under worst-case operating conditions, particularly at the most exposed façades and gardens, the context and character of the commercial activity, together with the mitigation incorporated into the site layout and building design, moderate the overall impact.

Commercial noise sources are daytime-only, of limited duration and intermittently audible, and the predicted absolute levels are moderate and typical of mixed-use environments. Some significant adverse effects are likely to occur occasionally within a limited number of gardens, particularly those directly exposed to the commercial premises, and further mitigation is unlikely to be practicable without altering the site layout. However, internal noise levels and the majority of external amenity areas are expected to remain within or close to the guideline values of BS 8233:2014 and ProPG: Planning and Noise (2017).

In addition to assessing existing commercial operations, the study has also considered potential contributions from building-services plant associated with the proposed development (see Section 8) and from the proposed mineral extraction site at the former Hatfield Aerodrome (see Section 9). Section 8 confirms that the plant noise limits, derived in accordance with BS 4142 and local policy, will ensure a low impact at nearby existing receptors and will not materially add to the commercial noise context at the site. Section 9 demonstrates that, should the Hatfield Aerodrome quarry be approved and operated in line with national minerals planning guidance, any resulting noise at the

proposed dwellings would be intermittent, daytime-only, and controllable through appropriate source-side planning conditions. Consequently, while existing commercial activity remains the dominant residual noise influence, other sources are not expected to materially alter the overall impact profile or change the conclusions of this assessment.

When interpreted within the aims of the NPPF and NPSE, the development is therefore considered to avoid unacceptable adverse effects, while acknowledging that some localised and occasional significant impacts may occur externally. On balance, the proposals achieve an appropriate outcome consistent with national and local planning policy objectives for noise and amenity.

7.7.2. Magnitude and Extent of Compliance with ProPG

The results of the detailed noise survey and modelling indicate that, in relation to transportation noise, most of the proposed dwellings fall within the Negligible to Low risk categories during both the daytime and night-time periods under the ProPG: Planning & Noise framework. Accordingly, acceptable internal and external noise levels can be achieved across the site using standard building constructions and relying on openable windows as the default means of whole-dwelling ventilation for most plots.

For dwellings closest to Hatfield Road (A1057), where higher external noise levels are experienced, it is recommended that an alternative ventilation strategy be adopted to ensure suitable internal conditions are maintained with windows closed during both normal and overheating conditions. This approach is consistent with the Acoustics, Ventilation and Overheating (AVO) guidance and Approved Document O.

In relation to commercial noise, the detailed BS 4142:2014 assessment indicates that predicted rating levels under worst-case operating conditions would exceed the prevailing background sound levels. While this suggests the potential for adverse or significant adverse effects at the most exposed façades and private gardens, the overall magnitude and duration of exposure are limited. When considered over the typical daytime period, and in conjunction with the proposed 2.5m acoustic boundary fence, 1.88m garden fencing, and enhanced façade insulation, the combined noise environment remains broadly compatible with residential use.

The additional assessments presented in Sections 8 and 9 confirm that external plant noise and any future quarry operations can be appropriately managed to achieve compliance with the relevant assessment criteria. Adherence to the BS 4142 plant noise limits defined in Table 18 and the source-side noise controls expected for any permitted quarry would ensure that these additional sources do not materially worsen the overall noise environment.

Across the development as a whole, most external amenity areas are predicted to remain within, or very close to, the BS 8233:2014 and ProPG guideline range of 50–55 dB $L_{Aeq,16\ hr}$, confirming that outdoor spaces will generally provide suitable conditions for their intended use. However, a limited number of gardens closest to the commercial premises are expected to experience occasional significant noise effects that cannot be practicably mitigated further within the current layout.

Accordingly, while some localised significant effects may persist externally, the proposed mitigation ensures that unacceptable adverse effects are avoided and that the development, as a whole, achieves an appropriate and policy-compliant standard of amenity, consistent with the aims of ProPG, BS 8233:2014, and the Noise Policy Statement for England (NPSE).

7.7.3. Likely Occupants of the Development

It is considered that, given the relatively low site-wide noise levels and the comprehensive mitigation strategy adopted, the proposed development would be suitable for a wide range of occupants, with all areas designed insofar as is possible to achieve the best practicable acoustic conditions for all occupant types.

7.7.4. Acoustic Design versus Unintended Adverse Consequences

The acoustic design of the proposed development has been guided by the principles of good acoustic design as defined in ProPG: Planning & Noise (2017), ensuring that mitigation measures are both effective and proportionate, while avoiding unintended adverse consequences for other aspects of residential amenity and building performance.

A key consideration has been the potential interaction between acoustic mitigation and summer-overheating risk. Given the relatively low site-wide noise levels from transportation and the intermittent nature of commercial activity, the use of openable windows as the primary means of ventilation remains an appropriate and effective strategy across the majority of the development. This approach maintains internal comfort and air quality under normal and overheating conditions without compromising the acoustic environment.

In locations closest to Hatfield Road or the garden-centre service yard, where façade-incident sound levels are higher, reliance on openable windows during certain periods could lead to a loss of acoustic benefit. In these cases, the design incorporates alternative ventilation provisions, such as acoustically attenuated background ventilators or mechanical systems (e.g. MVHR), to ensure that suitable internal noise conditions can be maintained while still allowing for effective control of thermal comfort. The adopted strategy is also sufficiently robust to account for potential future off-site developments, including the proposed mineral extraction site at the former Hatfield Aerodrome. Should such operations be approved and proceed in line with national minerals planning guidance, internal and external noise levels at the proposed dwellings would remain within the BS 8233:2014 and ProPG guideline values when windows are closed and alternative ventilation is in use.

The proposed 2.5m acoustic fence along the commercial boundary has been designed with due regard to potential unintended effects. Its height reflects a careful balance between acoustic effectiveness, visual impact, and practical considerations such as maintenance access, longevity, and structural integrity. A higher barrier would offer only marginal additional acoustic benefit while introducing disproportionate visual and amenity impacts. The adopted specification therefore represents a proportionate and well-integrated design solution, providing meaningful noise reduction for garden and façade areas while respecting the overall character of the development.

This balanced approach ensures that the acoustic strategy contributes positively to wider environmental design objectives, avoiding excessive reliance on mechanical systems, maintaining visual quality, and supporting sustainable and healthy living conditions.

Finally, the potential noise impacts of the proposed development on the surrounding area have been considered separately in Section 8, confirming that the scheme performs well in both inward and outward acoustic terms.

7.7.5. Acoustic Design versus Planning Objectives

The proposed development has been designed to balance the need for new housing with a careful response to the site's acoustic environment, ensuring that noise is appropriately controlled without imposing unnecessary design or visual constraints.

Although parts of the site are influenced by road traffic along Hatfield Road and by intermittent commercial activity from the adjacent service yard, the overall noise climate is relatively modest and typical of a mixed suburban setting. As such, achieving suitable internal and external acoustic conditions is readily achievable using standard construction methods and a combination of boundary treatments, façade design, and appropriate ventilation strategies.

A structured good acoustic design process has been followed throughout, consistent with ProPG: Planning & Noise (2017), BS 8233:2014, and the Noise Policy Statement for England (NPSE). This has included:

- Optimising site layout insofar as is possible to locate dwellings and gardens away from the most exposed boundaries;
- Incorporating a 2.5m acoustic fence along the commercial boundary, representing a balanced and proportionate design response that provides effective noise attenuation while limiting visual and maintenance impacts;
- Ensuring that façades and ventilation systems are specified to maintain internal comfort under both normal and overheating conditions; and
- Avoiding over-engineered or intrusive mitigation that could conflict with broader sustainability or amenity objectives;
- Applying suitable limits to building-services plant noise in accordance with BS 4142 and local policy (see Section 8); and
- Recognising that any potential quarry noise would be addressed through source-side mitigation and planning controls (see Section 9), consistent with the Agent of Change principle.

The detailed BS 4142 assessment confirms that commercial noise levels will exceed background sound levels at the most exposed façades and garden areas. While this indicates the potential for adverse or significant adverse effects in those locations, the impacts are daytime-only, intermittent, and limited in extent. The overall noise environment, when considered alongside transport noise and the effectiveness of the proposed mitigation, remains compatible with residential use and ensures a good internal acoustic standard across the development.

Accordingly, the acoustic strategy represents a balanced and policy-compliant design, acknowledging the potential for some localised significant effects but ensuring that unacceptable adverse impacts are avoided. The scheme therefore supports the delivery of high-quality, sustainable housing that provides safe, comfortable, and acoustically appropriate living environments consistent with national and local planning objectives.

8. Limits on Building Services Noise

8.1. Overview

The proposed development may include the operation of mechanical plant and building services systems which are sources of sound of an industrial and/or commercial nature. It's important to consider the impact of these noise sources on the surrounding area to ensure that adverse impacts on existing noise sensitive receptors are minimised, and that nearby residents are not subject to unacceptable adverse noise impacts.

8.2. Assessment Criteria

The assessment of plant noise emissions to the surrounding area should be undertaken in accordance with BS 4142:2014 + A1:2019 – Methods for Rating and Assessing Industrial and Commercial Sound. This standard advises that the cumulative sound rating level ($L_{Ar,Tr}$) from any proposed building services plant or machinery should generally not exceed the prevailing typical background sound level ($L_{A90,15min}$) at the nearest noise-sensitive receptors.

Adopting this approach ensures that the proposed development is unlikely to result in significant adverse impacts on the existing acoustic environment and will therefore be consistent with the environmental quality objectives of the emerging St Albans Local Plan 2041.

Based on the location of the proposed development site, a number of potential noise-sensitive receptor locations have been identified, as follows:

- **NSR1**: Rear of residential properties located off Oaklands Lane;
- **NSR2**: Rear of residential properties located off Jove Gardens; and
- **NSR3**: Residential properties located off Hatfield Road.

The limiting noise thresholds at each noise sensitive receptor have been determined through analysis of the existing background sound levels as detailed in Section 4 of this report and are presented in Table 18.

Table 18: Proposed Rating Level Limits for Building Services Plant Equipment

Location of Nearest Sensitive Receptor	Representative measurement position	Daytime (07:00 – 23:00)		Night-time (23:00 – 07:00)	
		Background Sound Level $L_{A90,T}$ (dB)	Rating Level Limit, $L_{Ar,Tr}$ (dB)	Background Sound Level $L_{A90,T}$ (dB)	Rating Level Limit, $L_{Ar,Tr}$ (dB)
NSR1 & NSR2	MP3	40	40	31	31
NSR3	MP1	51	51	41	41

The proposed limits apply to the total noise emission levels from all static plant and processes within the proposed development. Individual plant items may need to be designed to a lower limit such that the overall total level achieves the stated criteria above. It is anticipated that if the above limits are adhered to, this would result in a low impact at the nearest sensitive receptors.

8.3. Potential Mitigation Measures and Likely Noise Impact

The specific types and specifications of the external plant, which may include air handling units, extract fans, and condenser units and/or heat pumps for ventilation, heating, and cooling, remain under consideration.

The type of plant proposed is not expected to result in very high noise levels, and there are effective attenuation measures available, such as barriers, enclosures, and in-duct silencers that can be used to reduce noise emissions where necessary.

Therefore, achieving the defined external noise limits is highly probable, ensuring that adverse noise impacts on the nearest noise-sensitive receptors are minimised in accordance with planning policy expectations.

It is anticipated that, where considered necessary, the Local Authority will condition the stipulated noise limits, necessitating the submission of a detailed plant noise assessment following the completion of the design phase (where applicable).

9. Assessment of Noise Impacts from Adjacent Quarry

9.1. Overview

The proposed development site lies to the west of land at the former Hatfield Aerodrome (Ellenbrook Fields), where Brett Aggregates Ltd has proposed a sand and gravel quarry. The scheme involves long-term mineral extraction and restoration but remains unconsented at the time of writing.

This section summarises the planning status and relevance of the proposed quarry in the context of assessing environmental noise risk for the proposed residential development.

9.2. Planning History

The quarry has been subject to a complex planning process. The original application (Ref. 5/0394-16 / CM0961) was refused by Hertfordshire County Council (HCC) in January 2021, with an appeal dismissed in January 2022. A subsequent, revised application (Ref. PL/0232/21) was also refused in January 2024.

Following this refusal, HCC confirmed in September 2024 that it would withdraw its reasons for refusal and not defend the decision at appeal (Ref. APP/M1900/W/24/3346607). The appeal has been recovered for determination by the Secretary of State, and no final decision has yet been issued following the inquiry closure in January 2025.

In short, the quarry proposal currently has no planning consent, and there is no approved or operational source of mineral extraction noise affecting the proposed development site.

9.3. Noise Considerations

Noise impacts from quarry operations were considered in the Environmental Impact Assessment submitted with the quarry applications. These assessments concluded that, with appropriate controls such as acoustic bunding and restricted working hours, noise at nearby residential receptors would meet the limits set out in national minerals planning guidance.

If the quarry were to be approved in future, operational noise would be regulated through planning conditions. These would typically include defined noise limits, ongoing monitoring, and maintenance of screening features, ensuring compliance with the relevant standards.

At present, however, there is no authorised quarry activity, and therefore no requirement or justification for additional noise mitigation within the proposed residential development. Any future noise controls will properly rest with the quarry operator, consistent with the Agent of Change principle established in NPPF paragraph 187.

9.4. Summary and Conclusions

The conclusions regarding the noise implications of the proposed quarry are as follows:

- The proposed Ellenbrook Fields quarry remains unconsented, and there is no confirmed noise source at present.
- Should it be approved, quarry operations will be subject to enforceable planning conditions controlling noise emissions at nearby receptors.
- The responsibility for managing potential quarry noise therefore lies with the quarry operator, not this development.
- The proposed residential scheme has been designed to achieve compliance with BS 8233:2014, ProPG: Planning & Noise, and relevant local and national planning policy requirements, ensuring suitable internal and external amenity for future occupants.
- Accordingly, the risk of adverse noise impact from the proposed quarry is considered low, and no further assessment or mitigation is required at this stage.

10. Conclusion

This Noise Impact Assessment has been prepared by Heyda Ltd on behalf of Stonebond Properties (St Albans) Limited to evaluate the acoustic implications of the proposed residential development on land off Hatfield Road and to the south of Jove Gardens, Smallford, St Albans, AL4 0HN.

The assessment has considered the influence of road traffic, commercial activity, and potential future mineral extraction at the former Hatfield Aerodrome, as well as potential noise emissions from building-services plant. The work has been undertaken in accordance with ProPG: Planning & Noise (2017), BS 8233:2014, BS 4142:2014 + A1:2019, and relevant national and local planning policies.

Key findings are as follows:

- **Transportation Noise:** Most of the site experiences Low to Negligible risk under ProPG Stage 1. The southern boundary near Hatfield Road lies within the Medium risk category but can be effectively managed through site layout, boundary fencing, and typical façade and ventilation design.
- **Commercial Noise:** Operations within the adjacent garden-centre service yard are daytime-only and intermittent. The predicted BS 4142 rating level is expected to exceed background at a limited number of gardens closest to the boundary under worst-case one-hour operating conditions, indicating likely significant adverse effects at those times in those external areas. These effects are localised and intermittent, and internal noise levels remain compliant across all dwellings due to the proposed façade and ventilation design (with windows closed where required). The 2.5m acoustic fence, garden fencing, and standard façade insulation reduce but do not eliminate these residual external effects; however, the overall acoustic environment is compatible with residential use and is not unacceptable in planning terms. If avoidance of significant external effects is required, this could be achieved through layout adjustments (e.g., orienting dwellings to screen gardens).
- **Overheating & Ventilation:** The proposed ventilation strategy has been developed in line with Approved Document O and ANC AVO Guidance (2020), ensuring acceptable internal noise conditions during both normal and overheating scenarios. The same approach would also remain appropriate should any future off-site noise source, such as a mineral operation, ever be approved and controlled in accordance with national minerals planning guidance.
- **External Amenity Areas:** Predicted noise levels within private and communal garden spaces generally remain within or close to the 50–55 dB $L_{Aeq,16\ hr}$ guideline range of BS 8233 and ProPG, confirming that suitable outdoor amenity will be achieved.
- **Building-Services Plant:** Defined plant-noise limits, based on measured background levels, will ensure that future equipment achieves a low impact at existing receptors in accordance with BS 4142 and local policy.

Conclusion

The assessment confirms that, with the inclusion of the identified mitigation measures, the proposed development is acoustically suitable for residential use. Commercial activity within the adjacent service yard is predicted to exceed background sound levels at a small number of gardens during worst-case daytime operations, indicating that significant adverse effects are likely in those external areas at such times. These impacts are localised, intermittent, and daytime-only, and are effectively moderated by the proposed 2.5m acoustic fence, garden boundaries, and the robust building-fabric and ventilation design, which together ensure compliant internal noise levels across all dwellings.

When considered in its planning context, the development is judged to avoid unacceptable adverse effects and to achieve a reasonable and policy-compliant standard of amenity for future occupants. It therefore accords with the aims of the NPPF, NPSE, ProPG, and BS 8233, and noise should not represent a reason for refusal.

Appendix A - Glossary of Acoustic Terminology

This glossary provides an overview of key acoustic terms and concepts:

- Sound: Vibration of particles in a medium like air, detectable by the human ear. When sound is audible and unwanted or undesirable, it is termed 'noise'.
- Sound Pressure: Local pressure fluctuations from the normal pressure caused by the vibration or oscillation of particles. The number of oscillations per second is termed 'frequency'.
- Frequency: The rate at which particles oscillate, measured in Hertz (Hz). The human ear can typically detect frequencies from 20 Hz (low bass) to 20,000 Hz (high treble), with varying sensitivity across this range.
- Sound Pressure Level: Quantified in decibels (dB), this logarithmic parameter approximates the human ear's response to sound, measuring the ratio of a given pressure to the threshold of hearing.
- A-Weighted Decibels (dB(A) or dB L_{pA}): A frequency weighting used in sound level meters to mimic the human ear's response, particularly at typical environmental sound pressure levels.
- Measurement Parameters in Acoustics:
    - dB $L_{Aeq,T}$: Equivalent continuous A-weighted sound pressure level over a period, T, representing the energy-average sound pressure.
    - dB $L_{AFmax,T}$: Maximum A-weighted sound pressure level during a period, T, approximating the ear's time-response.
    - dB $L_{A90,T}$: The 90th percentile A-weighted sound pressure level, exceeded for 90% of the period, T, often referred to as the background sound level.
- Sound Level Meters: Instruments incorporating a microphone to measure sound pressure levels, using frequency filters to approximate the human ear's response.

Tables A1 and A2 in the appendix present sound pressure levels in typical environments and further definitions of acoustic parameters, respectively.

Table A1: Sound pressure levels within typical environments

Sound Pressure Level, dB	Typical Environment or Description
0	Threshold of hearing
15 to 25	A recording studio
25 to 35	A hotel bedroom at night
35 to 45	An unoccupied office
45 to 55	Quiet residential street
55 to 65	Normal conversation, 1 m away TV programme, listener position
65 to 75	Raised voices, 1 m away Urban high street traffic
75 to 85	Busy motorway traffic, on hard shoulder Typical small plant room
85 to 95	High-speed hand-dryer, operator position Inside London underground (average)
95 to 105	Pneumatic hammer, operator position Concert orchestra
105 to 115	Typical nightclub Untreated generator plantroom
115 to 140	Aircraft take-off, close proximity Threshold of pain

Table A2: Definitions of Acoustic Terminology and Parameters

Wording	Description
Ambient sound level	The total sound pressure level at a specific position from all surrounding noise sources. Usually expressed as dB $L_{Aeq,T}$, the equivalent continuous A-weighted sound pressure level.
A-weighting	A process adjusting observed sound pressure levels across different frequencies to mimic the human ear's sensitivity. Expressed as dB(A) or dB L_{Ap}.
Background sound level ($L_{A90,T}$)	The A-weighted sound pressure level exceeded for 90% of the time interval, T, indicating the typical minimum sound level.
BS 8233:2014	Guidance on sound insulation and noise reduction for buildings, providing criteria for acceptable internal and external noise levels.
Building envelope	The physical barrier between the interior and exterior of a building, including walls, roofs, windows, and doors.
C_{tr}	Spectrum adaptation term from BS EN ISO 717-1, used to adjust weighted standardised level difference, especially for low and medium frequency sounds (like traffic noise).
Decibel (dB)	A logarithmic unit measuring sound pressure or power relative to a reference value (20 µPa for sound pressure.
Equivalent continuous	The A-weighted average sound level over a specified time interval, T, representing the energy-average level.

sound level ($L_{Aeq,T}$)	
Façade Position	A monitoring position affected by reflection from an adjacent structure, typically 1-2 metres from it.
Free-field	A monitoring position free from sound reflections, at least 3.5 metres from reflecting structures.
Frequency	The number of oscillations per second of a particle, measured in Hertz (Hz).
$L_{A1,T}$	The A-weighted level exceeded during 1% of the time interval, representing peak noise levels.
$L_{Aeq,T}$	Equivalent continuous A-weighted level over time interval T, an energy-average level.
$L_{AFmax,T}$	Maximum A-weighted level during interval T, measured with fast time-weighting.
Noise	Unwanted or undesirable sound.
Octave band	A frequency division in acoustical measurements, dividing the hearing range into ten equal parts.
ProPG: Planning & Noise	Professional Practice Guidance on Planning & Noise, providing guidelines to achieve suitable internal noise levels in new residential development.
Rating level, $L_{Ar,Tr}$	Specific level plus corrections for sound characteristics like tones or impulses.
Residual sound level	The background level without the contribution of the specific sound source being assessed.
Reverberation	Sound reflection in a room, prolonging sound persistence.
Reverberation time	Time for sound level to decrease by 60 dB after a source stops, indicating room acoustics.
R_w	Weighted sound reduction index, a single-figure rating of sound insulation in ideal conditions.
Sound	Vibration in a medium like air, detectable by the human ear.
Sound insulation	The ability of structures to reduce sound transmission, mainly through reflection.

Appendix B - Legislation, Policy, Standards and Guidelines

Legislation

Town and Country Planning Act, 1990

The Town and Country Planning Act (TCPA) is a key piece of legislation in the United Kingdom that governs the planning process. Established to regulate the development and use of land in the public interest, the Act provides a framework for making decisions on land use planning at the local level. It ensures that any development undertaken is sustainable, environmentally sound, and in accordance with local planning policies and guidelines.

Section 73 of the TCPA allows for the application to make minor material amendments to an existing planning permission, without the need for a completely new application. This process is often used to make changes to the details of a previously approved development proposal, which may include alterations to address new environmental considerations or to comply with updated local planning policies.

The noise impact assessment is a crucial element of the documentation required to support a Section 73 application, demonstrating that the proposed amendments to the development will not result in significant adverse noise impacts on the surrounding area. This includes ensuring that the development adheres to the standards and guidelines for noise management set forth in local planning policies, as well as national guidelines and best practices, such as those outlined in British Standard 8233 and WHO guidelines.

National Policy

National Planning Policy Framework, 2024

The latest revision to the National Planning Policy Framework (NPPF) was published in 2024. The NPPF sets out the Government's planning policies for England and how these should be applied. It provides a framework within which local plans for housing and other development can be produced.

This document makes reference to avoiding significant adverse impacts, and mitigating and reducing potential adverse impacts resulting from noise to a minimum but it does not set absolute criteria.

Noise Policy Statement for England, 2010

The underlying principles and aims of existing noise policy documents, legislation and guidance are clarified in the Noise Policy Statement for England (NPSE). The NPSE sets out the 'Long Term Vision' of Government noise policy as follows: "Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development".

The NPSE outlines the following three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- "Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life".

The guidance defines three established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO):

- "NOEL (No observed Effect Level) – This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise"
- "LOAEL (Lowest Observed Adverse Effect Level) – This is the level above which adverse effects on health and quality of life can be detected"; and
- "SOAEL (Significant Observed Adverse Effect Level) – This is the level above which significant adverse effects on health and quality of life occur".

The guidance also states that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations and that not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

National Planning Practice Guidance, England, 2019

Further guidance in relation to the National Planning Policy Framework and the Noise Policy Statement for England has been published in the National Planning Practice Guidance in England: Noise (NPPG-Noise), which summarises the noise exposure hierarchy, based on the likely average response.

The National Planning Practice Guidance (NPPG) has been revised and updated to be easily accessible and available online.

The Noise Guidance advises on how planning can manage potential noise impacts in new development. It sets out when noise is relevant to planning and outlines the following Observed Effect Levels to determine the noise impact:

- Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur
- Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected
- No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

The document recognises the subjective relationship between noise levels and the impact on those affected and advises on factors which may influence on whether noise could be a concern.

The significance criteria from NPPG-Noise are reproduced in Table B1 below.

Table B1: Significance Criteria from NPPG In England: Noise

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. 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 (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Planning Practice Guidance – Minerals (2014, as updated)

The Planning Practice Guidance for Minerals (PPG: Minerals) provides detailed advice on how mineral extraction and related activities should be managed to protect human health, quality of life, and the natural environment. It supports the implementation of the National Planning Policy Framework (NPPF) by setting out clear expectations for local planning authorities and mineral operators regarding noise control and mitigation.

Key points include:

- **Noise Limits:** The PPG establishes that mineral planning authorities should normally aim to ensure that the noise level at noise-sensitive properties does not exceed 55 dB $L_{Aeq,1hr}$ (free-field) during normal daytime working hours (07:00–19:00). For night-time operations, the limit should typically not exceed 42 dB $L_{Aeq,1hr}$.
- **Temporary or Exceptional Operations:** Short-term activities such as soil stripping, bund construction, or restoration may be permitted to generate up to 70 dB $L_{Aeq,1hr}$ for limited periods (up to 8 weeks in any 12 months), provided every effort is made to mitigate noise and inform residents in advance.
- **Background Considerations:** Where existing ambient levels are below the recommended limits, local authorities may impose stricter site-specific conditions to avoid significant adverse effects on amenity, taking into account the character of the area and cumulative operations.
- **Good Practice in Mitigation:** The guidance promotes the use of acoustic screening bunds and fences, haul road management, careful plant selection, and operational controls (e.g., restricted working hours, regular maintenance of equipment, avoidance of reversing alarms where possible).
- **Monitoring and Enforcement:** The PPG recommends that mineral planning authorities require ongoing noise monitoring and specify action plans in the event that limits are approached or exceeded. This ensures accountability and compliance with planning conditions throughout the operational life of the quarry.

In summary, the PPG: Minerals provides a national benchmark framework for managing and limiting noise from mineral extraction, balancing operational needs with the protection of residential amenity. The 55 dB $L_{Aeq,1hr}$ daytime limit is directly derived from this document and represents the standard planning threshold for assessing quarry noise impacts.

Local Policy

St Albans District Local Plan Review (1994) – Saved Policies

Although dated, the saved policies of the 1994 Local Plan remain part of the adopted development plan for decision-making purposes. The plan seeks to ensure that new development is well designed and safeguards the amenity of both existing and future occupiers. While it does not contain a policy specifically on noise, the general design and

environmental protection policies require that development does not give rise to unacceptable levels of noise, disturbance, or other pollution, and that proposals create a satisfactory living environment.

Emerging St Albans Local Plan 2041 – Draft Policy HW1: Air and Noise Pollution

The draft Local Plan identifies air and noise pollution as key environmental considerations within Chapter 13: Public Health and Well-being. Policy HW1 requires that proposals for new noise-sensitive uses (such as residential development) or development in areas affected by elevated noise levels must be supported by suitable noise assessments. Where necessary, appropriate mitigation should be incorporated to protect future occupiers. The policy also requires that developments generating new noise are designed and managed to prevent adverse impacts on existing sensitive uses, in accordance with the Agent of Change principle.

Standards and Guidelines

National Design Guide (Ministry of Housing, Communities and Local Government, 2021)

The National Design Guide forms part of the Government's planning practice guidance and sets out the principles of good design for achieving well-planned, sustainable, and healthy places. It complements the NPPF and the National Model Design Code, providing qualitative measures that inform planning and design decisions, including the integration of acoustic considerations within the concept of environmental quality and well-being.

Key relevant principles include:

- **"Well-designed places"** are defined as those that promote health and well-being by providing good quality internal and external environments, free from harmful levels of noise, air, and light pollution.
- **Paragraph 127** highlights that developments should support a sense of safety, comfort, and enjoyment for residents, ensuring that places are "fit for purpose" and conducive to relaxation and community life.
- **"Resources and Lifespan" (Principle R3)** notes that good design should consider environmental impacts, including noise, over the long term, minimising exposure and promoting resilience through durable and adaptable design measures such as effective layout, landscaping, and façade treatments.
- **"Movement and Nature" (Principles M1 and N3)** further emphasise that the arrangement of buildings and open spaces should be informed by environmental constraints, including noise, so that quiet areas and outdoor amenity spaces can be provided where residents can comfortably use them.
- The Guide directly links to the Building for a Healthy Life framework, encouraging developers to adopt design solutions that integrate acoustic comfort, ventilation, and

environmental quality holistically, recognising their combined influence on health and well-being.

In summary, the National Design Guide underpins the expectation that new residential development should not only meet technical noise standards but deliver a perceptibly high-quality living environment. It frames acoustic design as an essential component of placemaking and public health, reinforcing that avoiding or mitigating noise is integral to achieving "well-designed" homes and neighbourhoods.

BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'

British Standard 8233:2014 (BS 8233:2014) provides guidance on designing for sound insulation and noise reduction in buildings, aiming to achieve a good standard of amenity and comfort for occupants. This standard is particularly relevant for residential spaces, where managing internal ambient noise levels is crucial for ensuring a comfortable living environment.

BS 8233:2014 offers detailed recommendations on acceptable internal noise levels for different types of spaces within residential environments. It outlines the importance of considering both external noise sources, such as traffic or industrial activities, and internal noise sources when designing building layouts and selecting construction materials.

For residential spaces, BS 8233:2014 suggests specific ambient noise level guidelines to ensure that indoor environments are conducive to rest, relaxation, and sleep. The standard recommends that internal ambient noise levels should not exceed certain thresholds, which vary depending on the room type and time of day. For bedrooms, for example, it is generally recommended that the night-time noise level ($L_{Aeq,8h}$) should not exceed 30-35 dB to prevent sleep disturbance. Living rooms should have slightly higher allowable noise levels during the day to accommodate more active use.

The standard also emphasises the need for bespoke solutions tailored to the specific context of each development, taking into account the characteristics of the noise source, the sensitivity of the receiver, and the potential for adverse impacts. It encourages the use of architectural and building design measures to achieve these noise level guidelines, such as sound insulation, acoustic treatment, and careful planning of room layouts and building orientation.

ProPG: Planning & Noise

The ProPG: Planning & Noise - Professional Practice Guidance on Planning and Noise is a key document designed to assist practitioners in the management of noise within the planning system in England. The guidance is particularly relevant for new residential developments exposed to transportation noise sources such as road, rail, and air traffic. ProPG is a collaborative effort by the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA), and the Chartered Institute of Environmental Health (CIEH).

Key Objectives:

The primary objective of ProPG is to encourage better acoustic design in new residential developments to minimize the impact of noise on future residents. The guidance aims to ensure that:

- New housing developments provide an acceptable acoustic environment.
- Noise issues are considered early in the planning process.
- Developers and planners work together to mitigate noise impacts effectively.

Internal Noise Level Guidelines:

ProPG provides specific guidelines for internal noise levels in residential spaces to ensure a good standard of living:

- Daytime (07:00 to 23:00): 35 dB $L_{Aeq,16hour}$ for living rooms and bedrooms.
- Night-time (23:00 to 07:00): 30 dB $L_{Aeq,8hour}$ for bedrooms, with the additional criterion that individual noise events should not normally exceed 45 dB $L_{Amax,F}$ more than 10 times per night.

BS 4142:2014+A1 'Methods for Rating and Assessing Industrial and Commercial Sound'

BS 4142:2014+A1 describes the method for assessing the likely impact of noise sources of an industrial, commercial or fixed nature on people residing in the area.

New commercial development can often incorporate plant and processes that have the potential to generate noise, especially if operated at night-time when background noise levels are at their lowest.

Good practice dictates that new developments should be designed to give a cumulative noise rating level ($L_{Ar,Tr}$) of no more than the current prevailing background noise level (L_{A90}) at a distance of 1m from the nearest residential facades, when assessed in accordance with BS 4142:2014+A1 as this is defined as a low impact.

BS 4142:2014+A1 sets out a method to assess the likely impact of noise from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises on noise-sensitive receptors in the vicinity.

The procedure contained in BS 4142:2014+A1 for assessing the likely impact is to compare the measured or predicted noise level from the source in question, the $L_{Aeq,T}$ 'specific noise level', immediately outside the dwelling with the $L_{A90,T}$ background noise level.

Where the noise contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific noise level to obtain the $L_{Ar,Tr}$ 'rating noise level'. A correction to include the consideration of a level of uncertainty in noise measurements, data and calculations can also be applied, when considered necessary.

BS 4142:2014+A1 states: “The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs”. An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:

Typically, the greater this difference, the greater the magnitude of the impact.

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background 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 level, this is an indication of the specific sound source having a low impact, depending on the context.”

The periods associated with day or night, for the purposes of the standard, are considered to be 07.00 to 23.00 and 23.00 to 07.00, respectively.

Appendix C - Historical Weather Data

Table C1: Historical Weather Data (London City Airport)

Date	Time	Temp	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
10/10/25	11:20 PM	54 °F	48 °F	82 %	CALM	0 mph	0 mph	30.40 in	0.0 in	Cloudy
	11:50 PM	54 °F	48 °F	82 %	W	1 mph	0 mph	30.40 in	0.0 in	Cloudy
11/10/25	12:20 AM	54 °F	48 °F	82 %	NW	2 mph	0 mph	30.40 in	0.0 in	Mostly Cloudy
	12:50 AM	52 °F	48 °F	88 %	NNW	3 mph	0 mph	30.40 in	0.0 in	Cloudy
	1:20 AM	52 °F	48 °F	88 %	CALM	0 mph	0 mph	30.40 in	0.0 in	Cloudy
	1:50 AM	52 °F	48 °F	88 %	NNW	1 mph	0 mph	30.40 in	0.0 in	Cloudy
	2:20 AM	52 °F	48 °F	88 %	N	1 mph	0 mph	30.40 in	0.0 in	Cloudy
	2:50 AM	52 °F	48 °F	88 %	WNW	1 mph	0 mph	30.40 in	0.0 in	Cloudy
	3:20 AM	52 °F	48 °F	88 %	W	2 mph	0 mph	30.40 in	0.0 in	Cloudy
	3:50 AM	52 °F	50 °F	94 %	NW	1 mph	0 mph	30.40 in	0.0 in	Cloudy
	4:20 AM	52 °F	50 °F	94 %	CALM	0 mph	0 mph	30.40 in	0.0 in	Cloudy
	4:50 AM	52 °F	50 °F	94 %	N	2 mph	0 mph	30.40 in	0.0 in	Cloudy
	5:20 AM	52 °F	50 °F	94 %	W	1 mph	0 mph	30.40 in	0.0 in	Cloudy
	5:50 AM	52 °F	50 °F	94 %	W	1 mph	0 mph	30.40 in	0.0 in	Cloudy
	6:20 AM	52 °F	50 °F	94 %	NW	2 mph	0 mph	30.40 in	0.0 in	Cloudy
	6:50 AM	52 °F	50 °F	94 %	WNW	1 mph	0 mph	30.40 in	0.0 in	Mostly Cloudy
	7:20 AM	54 °F	50 °F	88 %	NW	2 mph	0 mph	30.40 in	0.0 in	Cloudy
	7:50 AM	54 °F	50 °F	88 %	NW	1 mph	0 mph	30.40 in	0.0 in	Mostly Cloudy
	8:20 AM	54 °F	50 °F	88 %	W	1 mph	0 mph	30.40 in	0.0 in	Mostly Cloudy
	8:50 AM	54 °F	50 °F	88 %	WNW	1 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	9:20 AM	55 °F	50 °F	82 %	NNW	3 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	9:50 AM	55 °F	46 °F	72 %	WNW	2 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	10:20 AM	55 °F	46 °F	72 %	SE	1 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	10:50 AM	57 °F	46 °F	67 %	E	2 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	11:20 AM	57 °F	46 °F	67 %	NNW	5 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	11:50 AM	57 °F	46 °F	67 %	S	1 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	12:20 PM	57 °F	46 °F	67 %	NNE	3 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy
	12:50 PM	59 °F	48 °F	67 %	W	3 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy

	1:20 PM	59 °F	46 °F	63 %	NNW	5 mph	0 mph	30.40 in	0.0 in	Mostly Cloudy
	1:50 PM	61 °F	46 °F	59 %	WSW	2 mph	0 mph	30.40 in	0.0 in	Fair
	2:20 PM	61 °F	46 °F	59 %	NW	6 mph	0 mph	30.40 in	0.0 in	Fair
	2:50 PM	59 °F	45 °F	59 %	NNW	5 mph	0 mph	30.40 in	0.0 in	Fair
	3:20 PM	61 °F	46 °F	59 %	NNE	3 mph	0 mph	30.40 in	0.0 in	Fair
	3:50 PM	61 °F	46 °F	59 %	N	3 mph	0 mph	30.40 in	0.0 in	Partly Cloudy
	4:20 PM	61 °F	46 °F	59 %	NNE	5 mph	0 mph	30.37 in	0.0 in	Partly Cloudy
	4:50 PM	61 °F	46 °F	59 %	N	3 mph	0 mph	30.37 in	0.0 in	Partly Cloudy
	5:20 PM	59 °F	46 °F	63 %	N	6 mph	0 mph	30.37 in	0.0 in	Fair
	5:50 PM	57 °F	46 °F	67 %	N	7 mph	0 mph	30.37 in	0.0 in	Fair
	6:20 PM	55 °F	46 °F	72 %	N	6 mph	0 mph	30.37 in	0.0 in	Fair
	6:50 PM	54 °F	46 °F	77 %	NNE	5 mph	0 mph	30.37 in	0.0 in	Fair
	7:20 PM	54 °F	46 °F	77 %	NE	6 mph	0 mph	30.37 in	0.0 in	Fair
	7:50 PM	54 °F	46 °F	77 %	NE	6 mph	0 mph	30.37 in	0.0 in	Fair
	8:20 PM	52 °F	46 °F	82 %	NNE	5 mph	0 mph	30.40 in	0.0 in	Fair
	8:50 PM	48 °F	45 °F	87 %	NE	3 mph	0 mph	30.40 in	0.0 in	Fair
	9:20 PM	48 °F	45 °F	87 %	NE	1 mph	0 mph	30.40 in	0.0 in	Fair
	9:50 PM	46 °F	43 °F	87 %	CALM	0 mph	0 mph	30.40 in	0.0 in	Fair
	10:20 PM	45 °F	43 °F	93 %	NNE	1 mph	0 mph	30.40 in	0.0 in	Mist
	10:50 PM	45 °F	43 °F	93 %	NNE	2 mph	0 mph	30.40 in	0.0 in	Mist
	11:20 PM	45 °F	43 °F	93 %	E	1 mph	0 mph	30.40 in	0.0 in	Mist
	11:50 PM	43 °F	43 °F	100 %	CALM	0 mph	0 mph	30.40 in	0.0 in	Mist
12/10/25	12:20 AM	43 °F	41 °F	93 %	CALM	0 mph	0 mph	30.40 in	0.0 in	Fair
	12:50 AM	45 °F	43 °F	93 %	N	1 mph	0 mph	30.37 in	0.0 in	Fair
	1:20 AM	43 °F	41 °F	93 %	NNW	3 mph	0 mph	30.37 in	0.0 in	Mist
	1:50 AM	41 °F	41 °F	100 %	N	1 mph	0 mph	30.37 in	0.0 in	Mist
	2:20 AM	43 °F	41 °F	93 %	WNW	2 mph	0 mph	30.37 in	0.0 in	Mist
	2:50 AM	41 °F	41 °F	100 %	NNW	1 mph	0 mph	30.37 in	0.0 in	Mist
	3:20 AM	41 °F	41 °F	100 %	NNW	1 mph	0 mph	30.37 in	0.0 in	Mist
	3:50 AM	41 °F	39 °F	93 %	NNE	1 mph	0 mph	30.37 in	0.0 in	Fog
	4:20 AM	41 °F	41 °F	100 %	NNW	2 mph	0 mph	30.37 in	0.0 in	Mostly Cloudy

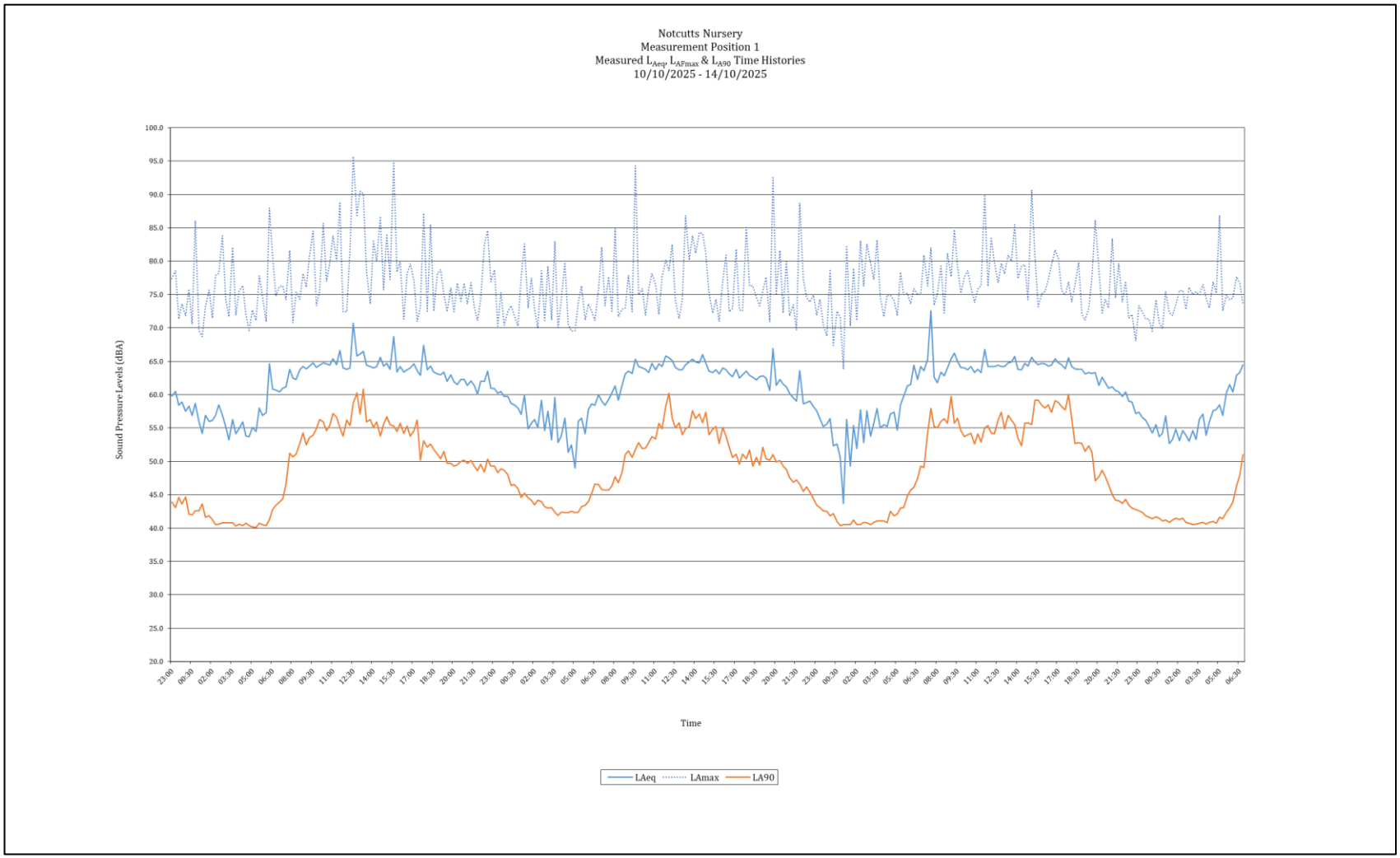
4:50 AM	41 °F	41 °F	100 %	NNW	2 mph	0 mph	30.34 in	0.0 in	Mostly Cloudy
5:20 AM	41 °F	41 °F	100 %	N	2 mph	0 mph	30.34 in	0.0 in	Mist
5:50 AM	43 °F	43 °F	100 %	N	1 mph	0 mph	30.34 in	0.0 in	Mist
6:20 AM	45 °F	43 °F	93 %	NW	2 mph	0 mph	30.34 in	0.0 in	Mist
6:50 AM	45 °F	45 °F	100 %	NNW	2 mph	0 mph	30.34 in	0.0 in	Mist
7:20 AM	46 °F	45 °F	93 %	NNW	2 mph	0 mph	30.34 in	0.0 in	Mist
7:50 AM	46 °F	45 °F	93 %	NNW	2 mph	0 mph	30.34 in	0.0 in	Mist
8:20 AM	46 °F	46 °F	100 %	S	1 mph	0 mph	30.34 in	0.0 in	Mist
8:50 AM	48 °F	46 °F	93 %	W	1 mph	0 mph	30.34 in	0.0 in	Mist
9:20 AM	50 °F	48 °F	94 %	NNE	3 mph	0 mph	30.37 in	0.0 in	Mist
9:50 AM	50 °F	46 °F	87 %	NE	3 mph	0 mph	30.37 in	0.0 in	Mist
10:20 AM	50 °F	48 °F	94 %	N	6 mph	0 mph	30.37 in	0.0 in	Mist
10:50 AM	50 °F	48 °F	94 %	N	6 mph	0 mph	30.37 in	0.0 in	Mist
11:20 AM	52 °F	48 °F	88 %	N	6 mph	0 mph	30.37 in	0.0 in	Mist
11:50 AM	52 °F	48 °F	88 %	N	5 mph	0 mph	30.34 in	0.0 in	Mostly Cloudy
12:20 PM	54 °F	46 °F	77 %	N	5 mph	0 mph	30.34 in	0.0 in	Mostly Cloudy
12:50 PM	54 °F	46 °F	77 %	NE	6 mph	0 mph	30.34 in	0.0 in	Mostly Cloudy
1:20 PM	55 °F	46 °F	72 %	NNE	6 mph	0 mph	30.34 in	0.0 in	Mostly Cloudy
1:50 PM	55 °F	46 °F	72 %	NE	7 mph	0 mph	30.34 in	0.0 in	Fair
2:20 PM	55 °F	48 °F	77 %	ENE	6 mph	0 mph	30.34 in	0.0 in	Fair
2:50 PM	57 °F	46 °F	67 %	NE	5 mph	0 mph	30.31 in	0.0 in	Fair
3:20 PM	57 °F	46 °F	67 %	ENE	7 mph	0 mph	30.31 in	0.0 in	Fair
3:50 PM	57 °F	46 °F	67 %	ENE	7 mph	0 mph	30.31 in	0.0 in	Fair
4:20 PM	59 °F	46 °F	63 %	ENE	7 mph	0 mph	30.31 in	0.0 in	Fair
4:50 PM	59 °F	46 °F	63 %	NE	8 mph	0 mph	30.31 in	0.0 in	Fair
5:20 PM	59 °F	48 °F	67 %	NE	8 mph	0 mph	30.31 in	0.0 in	Fair
5:50 PM	59 °F	48 °F	67 %	ENE	9 mph	0 mph	30.31 in	0.0 in	Fair
6:20 PM	57 °F	46 °F	67 %	NE	9 mph	0 mph	30.31 in	0.0 in	Fair
6:50 PM	55 °F	46 °F	72 %	NE	5 mph	0 mph	30.31 in	0.0 in	Fair
7:20 PM	55 °F	46 °F	72 %	NE	5 mph	0 mph	30.31 in	0.0 in	Fair
7:50 PM	54 °F	46 °F	77 %	NE	6 mph	0 mph	30.31 in	0.0 in	Fair

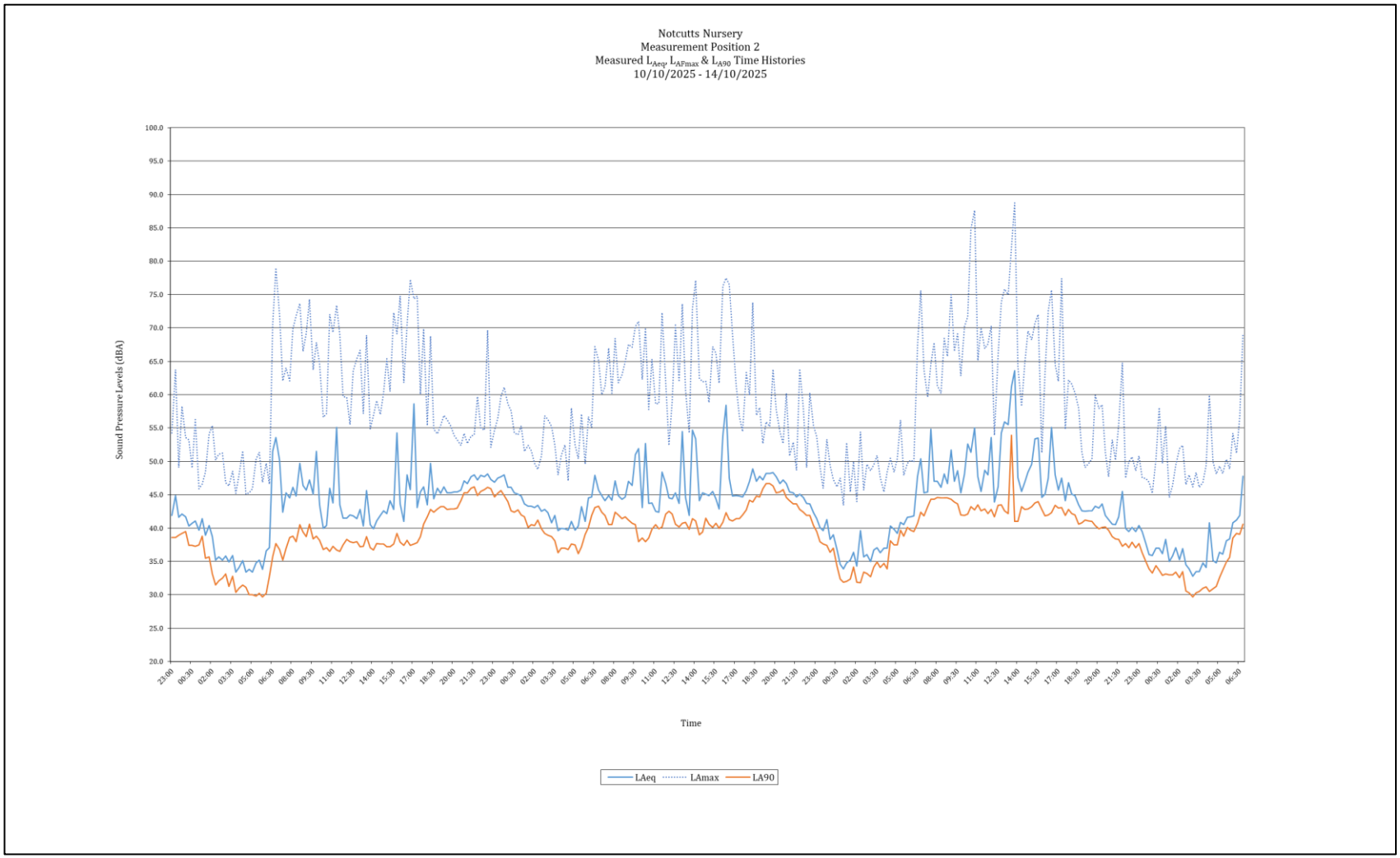
	8:20 PM	54 °F	48 °F	82 %	NE	7 mph	0 mph	30.31 in	0.0 in	Fair
	8:50 PM	54 °F	48 °F	82 %	ENE	8 mph	0 mph	30.31 in	0.0 in	Fair
	9:20 PM	52 °F	48 °F	88 %	ENE	7 mph	0 mph	30.31 in	0.0 in	Fair
	9:50 PM	52 °F	48 °F	88 %	ENE	5 mph	0 mph	30.31 in	0.0 in	Mostly Cloudy
	10:20 PM	54 °F	50 °F	88 %	ENE	6 mph	0 mph	30.31 in	0.0 in	Cloudy
	10:50 PM	54 °F	50 °F	88 %	NE	6 mph	0 mph	30.31 in	0.0 in	Cloudy
	11:20 PM	55 °F	50 °F	82 %	ENE	8 mph	0 mph	30.31 in	0.0 in	Cloudy
	11:50 PM	55 °F	52 °F	88 %	ENE	7 mph	0 mph	30.31 in	0.0 in	Cloudy
13/10/25	12:20 AM	55 °F	52 °F	88 %	NE	6 mph	0 mph	30.31 in	0.0 in	Cloudy
	12:50 AM	55 °F	52 °F	88 %	NE	7 mph	0 mph	30.31 in	0.0 in	Cloudy
	1:20 AM	55 °F	52 °F	88 %	NE	5 mph	0 mph	30.31 in	0.0 in	Mist
	1:50 AM	54 °F	52 °F	94 %	NNE	6 mph	0 mph	30.28 in	0.0 in	Mist
	2:20 AM	54 °F	52 °F	94 %	NE	6 mph	0 mph	30.28 in	0.0 in	Light Drizzle
	2:50 AM	55 °F	54 °F	94 %	NE	6 mph	0 mph	30.28 in	0.0 in	Light Drizzle
	3:20 AM	55 °F	54 °F	94 %	NE	6 mph	0 mph	30.28 in	0.0 in	Cloudy
	3:50 AM	55 °F	54 °F	94 %	NNE	3 mph	0 mph	30.28 in	0.0 in	Cloudy
	4:20 AM	55 °F	54 °F	94 %	NNE	5 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	4:50 AM	55 °F	54 °F	94 %	NNE	5 mph	0 mph	30.28 in	0.0 in	Mist
	5:20 AM	55 °F	54 °F	94 %	NE	5 mph	0 mph	30.28 in	0.0 in	Mist
	5:50 AM	55 °F	54 °F	94 %	NE	6 mph	0 mph	30.28 in	0.0 in	Mist
	6:20 AM	55 °F	54 °F	94 %	NE	6 mph	0 mph	30.28 in	0.0 in	Mist
	6:50 AM	55 °F	54 °F	94 %	NE	6 mph	0 mph	30.25 in	0.0 in	Cloudy
	7:20 AM	55 °F	52 °F	88 %	NE	6 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	7:50 AM	55 °F	52 °F	88 %	NE	7 mph	0 mph	30.25 in	0.0 in	Cloudy
	8:20 AM	55 °F	52 °F	88 %	NE	7 mph	0 mph	30.25 in	0.0 in	Mist
	8:50 AM	55 °F	52 °F	88 %	NE	5 mph	0 mph	30.28 in	0.0 in	Mist
	9:20 AM	55 °F	52 °F	88 %	NE	7 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	9:50 AM	55 °F	52 °F	88 %	NE	7 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	10:20 AM	57 °F	52 °F	82 %	NE	9 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	10:50 AM	57 °F	52 °F	82 %	ENE	10 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	11:20 AM	57 °F	52 °F	82 %	NE	9 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy

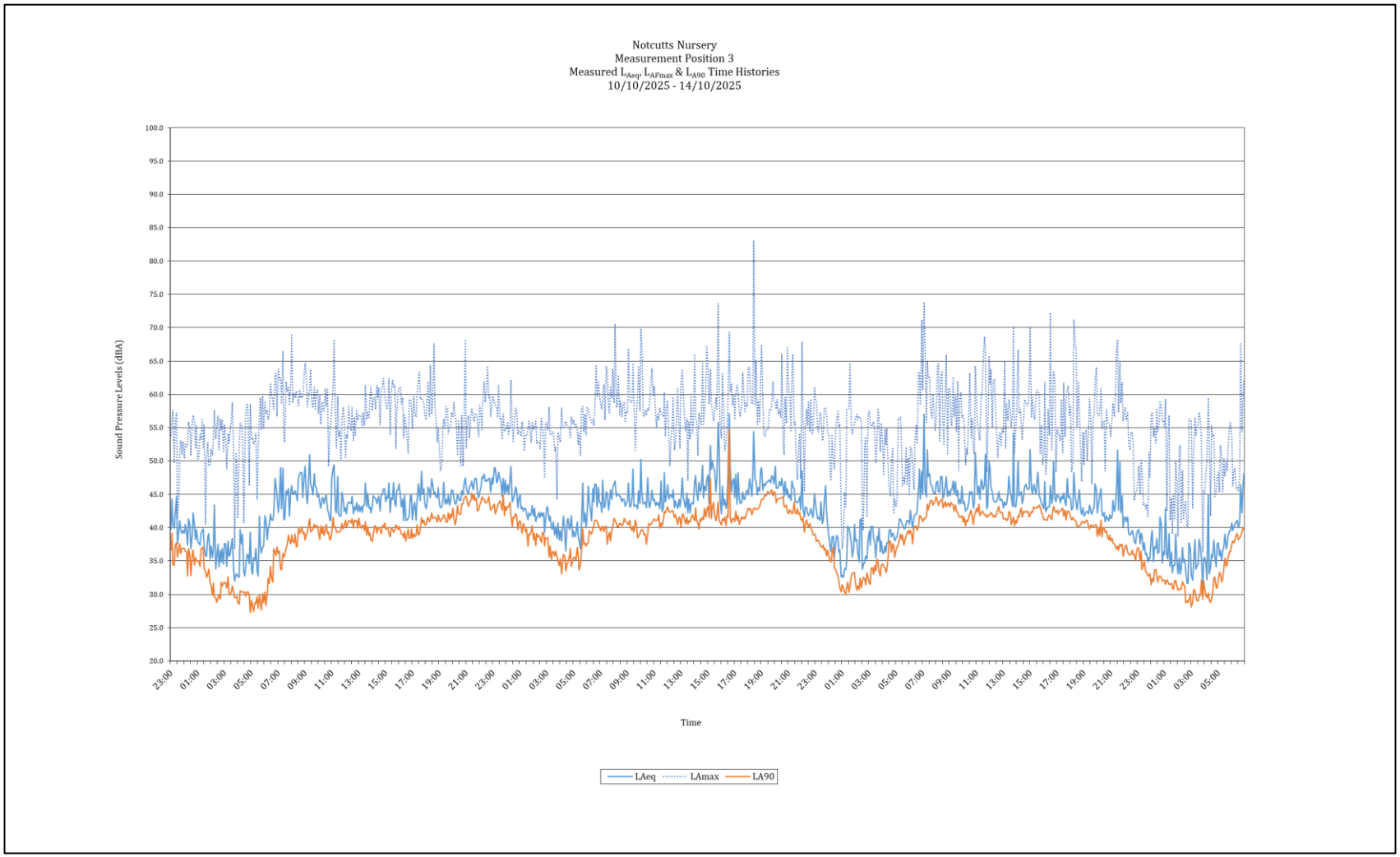
	11:50 AM	57 °F	52 °F	82 %	E	10 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	12:20 PM	59 °F	52 °F	77 %	NE	9 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	12:50 PM	59 °F	52 °F	77 %	NE	9 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	1:20 PM	59 °F	52 °F	77 %	NE	8 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
	1:50 PM	61 °F	52 °F	72 %	ENE	8 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	2:20 PM	59 °F	52 °F	77 %	NE	10 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	2:50 PM	59 °F	52 °F	77 %	ENE	10 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	3:20 PM	59 °F	52 °F	77 %	NE	7 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	3:50 PM	59 °F	52 °F	77 %	NE	10 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	4:20 PM	59 °F	52 °F	77 %	NE	8 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	4:50 PM	59 °F	52 °F	77 %	NNE	7 mph	0 mph	30.22 in	0.0 in	Mostly Cloudy
	5:20 PM	59 °F	52 °F	77 %	NNE	7 mph	0 mph	30.22 in	0.0 in	Mostly Cloudy
	5:50 PM	59 °F	52 °F	77 %	NE	8 mph	0 mph	30.22 in	0.0 in	Mostly Cloudy
	6:20 PM	59 °F	52 °F	77 %	NE	10 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	6:50 PM	59 °F	54 °F	82 %	NE	9 mph	0 mph	30.25 in	0.0 in	Mostly Cloudy
	7:20 PM	57 °F	54 °F	88 %	NE	8 mph	0 mph	30.25 in	0.0 in	Cloudy
	7:50 PM	57 °F	54 °F	88 %	NE	8 mph	0 mph	30.25 in	0.0 in	Cloudy
	8:20 PM	57 °F	54 °F	88 %	NE	8 mph	0 mph	30.25 in	0.0 in	Cloudy
	8:50 PM	57 °F	54 °F	88 %	NE	7 mph	0 mph	30.25 in	0.0 in	Cloudy
	9:20 PM	57 °F	54 °F	88 %	NE	7 mph	0 mph	30.25 in	0.0 in	Cloudy
	9:50 PM	57 °F	54 °F	88 %	NE	7 mph	0 mph	30.25 in	0.0 in	Cloudy
	10:20 PM	57 °F	54 °F	88 %	NE	8 mph	0 mph	30.25 in	0.0 in	Cloudy
	10:50 PM	57 °F	54 °F	88 %	NE	9 mph	0 mph	30.25 in	0.0 in	Cloudy
	11:20 PM	57 °F	54 °F	88 %	NE	9 mph	0 mph	30.25 in	0.0 in	Cloudy
	11:50 PM	57 °F	52 °F	82 %	ENE	12 mph	0 mph	30.25 in	0.0 in	Cloudy
14/10/25	12:20 AM	57 °F	50 °F	77 %	E	10 mph	0 mph	30.25 in	0.0 in	Cloudy
	12:50 AM	57 °F	50 °F	77 %	E	9 mph	0 mph	30.25 in	0.0 in	Cloudy
	1:20 AM	55 °F	50 °F	82 %	E	7 mph	0 mph	30.25 in	0.0 in	Cloudy
	1:50 AM	55 °F	50 °F	82 %	ENE	10 mph	0 mph	30.25 in	0.0 in	Cloudy
	2:20 AM	55 °F	50 °F	82 %	E	8 mph	0 mph	30.25 in	0.0 in	Cloudy
	2:50 AM	55 °F	50 °F	82 %	E	5 mph	0 mph	30.25 in	0.0 in	Cloudy

	3:20 AM	55 °F	50 °F	82 %	E	5 mph	0 mph	30.25 in	0.0 in	Cloudy
	3:50 AM	55 °F	50 °F	82 %	E	7 mph	0 mph	30.25 in	0.0 in	Cloudy
	4:20 AM	55 °F	50 °F	82 %	ENE	8 mph	0 mph	30.25 in	0.0 in	Cloudy
	4:50 AM	55 °F	50 °F	82 %	ENE	8 mph	0 mph	30.25 in	0.0 in	Cloudy
	5:20 AM	55 °F	50 °F	82 %	NE	5 mph	0 mph	30.25 in	0.0 in	Cloudy
	5:50 AM	55 °F	50 °F	82 %	NNE	6 mph	0 mph	30.25 in	0.0 in	Cloudy
	6:20 AM	54 °F	50 °F	88 %	NNE	9 mph	0 mph	30.25 in	0.0 in	Cloudy
	6:50 AM	54 °F	50 °F	88 %	NNE	8 mph	0 mph	30.25 in	0.0 in	Cloudy

Appendix D - Time History Graphs


Notcutts Nursery
Measurement Position 1
Measured L_{Aeq}, L_{AFmax} & L_{A90} Time Histories
10/10/2025 - 14/10/2025
Sound Pressure Levels (dBA)
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
23:00 00:30 02:00 03:30 05:00 06:30 08:00 09:30 11:00 12:30 14:00 15:30 17:00 18:30 20:00 21:30 23:00 00:30 02:00 03:30 05:00 06:30 08:00 09:30 11:00 12:30 14:00 15:30 17:00 18:30 20:00 21:30 23:00 00:30 02:00 03:30 05:00 06:30 08:00 09:30 11:00 12:30 14:00 15:30 17:00 18:30 20:00 21:30 23:00 00:30 02:00 03:30 05:00 06:30
Time
LAeq
LAmax
LA90


Notcutts Nursery
Measurement Position 2
Measured L_{Aeq}, L_{AFmax} & L_{A90} Time Histories
10/10/2025 - 14/10/2025
Sound Pressure Levels (dBA)
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
23:00 00:30 02:00 03:30 05:00 06:30 08:00 09:30 11:00 12:30 14:00 15:30 17:00 18:30 20:00 21:30 23:00 00:30 02:00 03:30 05:00 06:30 08:00 09:30 11:00 12:30 14:00 15:30 17:00 18:30 20:00 21:30 23:00 00:30 02:00 03:30 05:00 06:30 08:00 09:30 11:00 12:30 14:00 15:30 17:00 18:30 20:00 21:30 23:00 00:30 02:00 03:30 05:00 06:30
Time
LAeq
LAmax
LA90


Notcutts Nursery
Measurement Position 3
Measured L_{Aeq}, L_{AFmax} & L_{A90} Time Histories
10/10/2025 - 14/10/2025
Sound Pressure Levels (dBA)
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
23:00 01:00 03:00 05:00 07:00 09:00 11:00 13:00 15:00 17:00 19:00 21:00 23:00 01:00 03:00 05:00 07:00 09:00 11:00 13:00 15:00 17:00 19:00 21:00 23:00 01:00 03:00 05:00 07:00 09:00 11:00 13:00 15:00 17:00 19:00 21:00 23:00 01:00 03:00 05:00
Time
LAeq
LAmax
LA90