

**Brookleigh Eastern Primary School,
Brookleigh, Burgess Hill**

Reserved Matters Application

Noise Impact Assessment

Client



**Homes
England**

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1. Executive Summary

This report, prepared by Heyda Ltd for Homes England, presents a noise impact assessment for the proposed two-storey Brookleigh Eastern Primary School, Brookleigh, Burgess Hill. The assessment supports the reserved matters planning application and has been undertaken in accordance with the Town and Country Planning Act 1990, the Mid-Sussex District Plan (Policy DP29), and national planning policy on noise.

The proposal includes a reserved matters application to consider access, appearance, landscaping, layout and scale pursuant to application DM/21/3279 (original reference DM/18/5114) for parcel P1.2 comprising of the construction of a primary school with nursery and special support centre, car parking, multi-use games area, playing fields, landscaping and associated infrastructure.

Objectives and Approach

The purpose of this assessment is to ensure that the proposed development:

- provides suitable internal and external acoustic conditions for future pupils and staff;
- controls noise emissions from the school so as not to cause significant adverse impacts on nearby sensitive receptors; and
- complies with local and national planning requirements for noise.

The study draws upon baseline environmental sound surveys, predictive noise modelling using current and future traffic flows, and detailed assessment of external noise break-in, internal ambient noise levels, building services plant, and the proposed sports pitch.

Key Findings

- **External noise:** With the inclusion of a 2.4 m brick wall to the school frontage and acoustic fencing along the western boundary, external noise levels across teaching and recreational areas are predicted to comply with guidance, typically falling below 55–60 dB $L_{Aeq,30min}$.
- **Internal noise:** Using the proposed façade, glazing, roof, and rooflight performance specifications, SEN and non-SEN teaching spaces are predicted to meet the BB93 internal noise limits, accounting for the chosen ventilation strategy.
- **Ventilation:** Mechanical ventilation is proposed for SEN classrooms, while a hybrid strategy with acoustic louvres is under consideration for other teaching spaces. Minimum louvre performance requirements have been defined to safeguard internal conditions.
- **Building services noise:** Plant noise will be controlled to 5 dB below background levels at the nearest receptors, in line with Planning Condition 38 and BS 4142:2014+A1.



- **Sports pitch noise:** Predicted use of the sports pitch is expected to increase existing ambient levels by no more than +2 dB at the worst-affected receptor, which is below the relevant threshold and not expected to result in significant adverse impacts.

Conclusion

The assessment demonstrates that, with the recommended mitigation measures incorporated, the proposed school will provide a high-quality acoustic environment for pupils and staff while avoiding significant adverse impacts on the surrounding community. The development is therefore judged to be acoustically suitable and in full compliance with both local and national planning policies on noise.



2. Introduction

Heyda Ltd has been commissioned by Homes England to conduct a noise impact assessment for the proposed Brookleigh Eastern Primary School, Brookleigh, Burgess Hill. This report is to support the reserved matters planning application process under the Town and Country Planning Act 1990, and has been specifically designed to comply with the outline permission planning condition requirements (DM/18/5114, as amended by DM/21/3279), as well as noise policy aims of the Mid-Sussex District Plan and national planning policy on noise.

We have identified three key aspects that require assessment to ensure that the development complies with the noise policy aims of the Local Authority, as follows:

- To minimise adverse impacts and prevent significant adverse impacts on future building users due to noise from existing sources.
- To minimise adverse impacts and prevent significant adverse impacts on existing noise-sensitive receptors due to new external building services noise sources.
- To minimise adverse impacts and prevent significant adverse impacts on existing noise-sensitive receptors due to new external sports pitches.

We have not assessed noise emissions from general use of the school grounds during student breaks and lunchtimes, as there is no standardised method for evaluating such sources other than direct measurement of existing facilities. It is assumed that this aspect was considered during the outline planning stage when determining the school's location adjacent to new residential dwellings. Furthermore, it is expected that the design of these new homes will incorporate appropriate noise mitigation measures, in accordance with Planning Condition 9 of the outline permission.

Construction noise and vibration have not been considered in detail at this stage, as these can be managed through planning conditions requiring a construction management plan or applications for Section 61 prior consent in accordance with the Control of Pollution Act 1974, where deemed necessary. This approach ensures that significant adverse impacts on nearby receptors are avoided insofar as is reasonably practicable.

Employing the latest in acoustic assessment techniques, guided by Mid-Sussex noise policies, this report aims to deliver a comprehensive evaluation of the proposed development's noise implications. The structure of this document encompasses environmental noise surveys, an analysis of noise impact on the proposed development, and the impact of noise on nearby sensitive receptors, proposing suitable mitigation strategies where necessary.

Our goal is to provide all stakeholders, including the planning authorities, the client, and the local community, with a clear and comprehensive overview of the noise implications associated with the proposed educational use building. 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 significant adverse noise impacts.

3. Policy, Standards and Guidance Documents

In preparing the noise impact assessment for the proposed development of the new Brookleigh Eastern Primary School, the following policies, standards, and guidance documents have been consulted. These documents have informed the scope and direction of our noise impact assessment. A more detailed description of these documents can be found in Appendix B of this report.

- **National Planning Policy Framework (NPPF), 2024:** Sets the government's planning policies for England and how these are expected to be applied, emphasising sustainable development and environmental responsibility.
- **Noise Policy Statement for England (NPSE), 2010:** Articulates the long-term vision for noise management and provides the guiding principles necessary to achieve this vision, focusing on minimising adverse noise impacts and promoting good health and a high quality of life.
- **Planning Practice Guidance – Noise, 2019:** Offers additional insights on how noise considerations should be integrated into planning decisions, providing a detailed approach to managing noise within the planning system.
- **Mid Sussex District Plan (Policy DP29: Noise, Air, and Light Pollution), 2018** – Requires developments to be designed, located, and controlled to prevent significant adverse noise impacts on health, quality of life, and the surrounding environment, particularly for noise-sensitive developments such as schools.
- **Planning Noise Advice Document: Sussex (PNADS), 2023** – Provides guidance for developers and consultants on noise-related planning applications in East and West Sussex. It outlines best practices for noise assessments, considerations for noise-sensitive developments, and mitigation measures to comply with national policy aims, including those set out in NPSE and NPPF.
- **BB93: Acoustic Design of Schools, 2015:** Provides guidance on achieving suitable internal ambient noise levels within educational settings, ensuring environments conducive to learning and well-being.
- **Acoustics of Schools: A Design Guide (2015)** – Recommends external noise limits for school environments, including an upper limit of 60 dB $L_{Aeq,30min}$ for teaching and recreational areas, and a target of 55 dB $L_{Aeq,30min}$ for general outdoor spaces.
- **BS 4142:2014+A1 Methods for Rating and Assessing Industrial and Commercial Sound:** Essential for evaluating the impact of sound from industrial and commercial developments on noise-sensitive receptors, ensuring developments do not adversely affect the acoustic environment.
- **Sport England Artificial Grass Pitch (AGP) Acoustics – Planning Implications, 2015** – Provides guidance on noise emissions from AGPs, referencing WHO noise limits and advising that an increase in ambient noise levels of 3 dB(A) or more at sensitive receptors may require mitigation.

By adhering to the guidance and stipulations outlined in these documents, this report aims to thoroughly assess the noise impact of the proposed educational use building,



ensuring compliance with both national and local planning policies for noise management.

The outline planning permission for the development includes the following planning conditions related to noise. We have included a comment on the applicability of each condition.

Planning Condition 9:

"No development shall take place within each reserved matters area containing residential units until a scheme has been submitted to and approved in writing by the local planning authority for protecting the residential and other noise sensitive units within the reserved matters area, from noise generated by road traffic or other external sources. The scheme shall include an Acoustic Design Statement in line with the recommendations of ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise 2017..."

Applicability: Not applicable to the proposed development as it does not contain residential units. Confirms that the proposed residential adjacent to the school must be designed to mitigation noise from 'other external sources', including noise from the school.

Planning Condition 38:

"Unless otherwise agreed in writing, noise associated with fixed plant and machinery incorporated within the development shall be controlled such that the Rating Level, measured or calculated at 1-metre from the façade of the nearest existing noise sensitive premises, shall not exceed: 5dB below the existing L_{A90} background noise level. Rating Level and existing background noise levels to be determined as per the guidance provided in BS 4142:2014. Details of any mitigation measures required to achieve this shall be submitted to and approved in writing by the Local Planning Authority. The approved measures shall be implemented before the commercial operation concerned begins operating on site, and thereafter be maintained in accordance with the approved details."

Applicability: Applicable, and considered in Section 8.1.

Planning Condition 41:

"Unless otherwise agreed in writing by the LPA, prior to the occupation of any unit to operate as a commercial or business premises, a Noise Management Plan shall be submitted to and approved in writing by the Local Planning Authority. The Noise Management Plan shall assess the likely risks posed to residential amenity from the emission of noise from the intended use of that unit and shall include measures to protect residential amenity..."

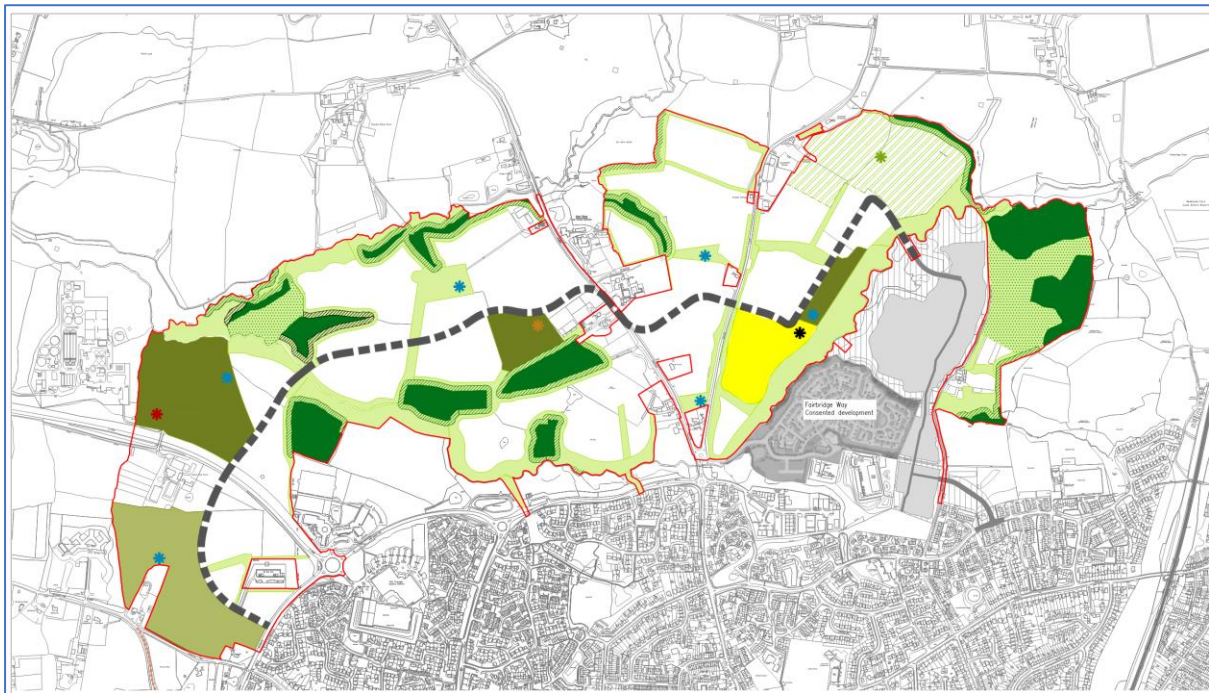
Applicability: Not applicable to the proposed development as it is not operating as a commercial or business premises.

4. Site Location and Proposed Development

4.1. Site Description

The proposed development site forms part of the consented Burgess Hill Brookleigh development (DM/18/5114, as amended by DM/21/3279), the proposed extent of which is indicated in Figure 1, with the proposed school site highlighted in yellow.

Figure 1: Northern Arc Masterplan Constraints Plan



The proposed development is to be situated off the existing Issac's Lane (A273) and the proposed new Northern Arc Avenue to Eastern Bridge and Link Road (now Holmbush Avenue). The proposed development site and its immediate surroundings currently comprise open ground, although a number of the consented residential parcels surrounding the site are under phased construction.

The context of the site's immediate surroundings, in terms of the consented masterplan development are as follows:

- **North:** Proposed new residential dwellings.
- **East:** Proposed new residential dwellings and semi-natural greenspace and Fairbridge Way residential development beyond.
- **South:** Proposed new residential dwellings and existing residential dwellings beyond.
- **West:** Issac's Way and proposed residential dwellings beyond.

A detailed representation of the site's location in the context of the masterplan is provided in Figure 2. This offers a comprehensive understanding of the site's setting and its acoustic considerations.

The nearest noise sensitive receptors are identified in Figure 2, and are referenced later in this report. These are summarised as follows:

- R1: Proposed residential dwellings to the south of Northern Arc Avenue.
- R2: Proposed residential dwellings to the north of Northern Arc Avenue.
- R3: Proposed residential dwellings to the east of the proposed development.
- R4: Proposed residential dwellings to the south of the proposed development.

Figure 2: Detailed Site Location Plan and Sensitive Receptor Locations



4.2. Proposed Development

The proposed development consists of the construction of a new two-storey primary school with nursery and special support centre, car parking, multi-use games area, playing fields, landscaping and associated infrastructure.

As illustrated in Figure 2, the key features of the development include:

- A modern two-storey school building housing general teaching rooms, a central assembly hall, an activity studio, and other ancillary facilities to support educational activities.
- Extensive outdoor areas, including a sports pitch, playing fields, and dedicated recreational spaces, designed to enhance physical activity and outdoor learning.
- Staff parking facilities, ensuring adequate provision for school personnel.

For reference, the proposed ground and first-floor plans are presented in Figures 3 and 4.

Figure 3: Proposed Ground Floor Plan

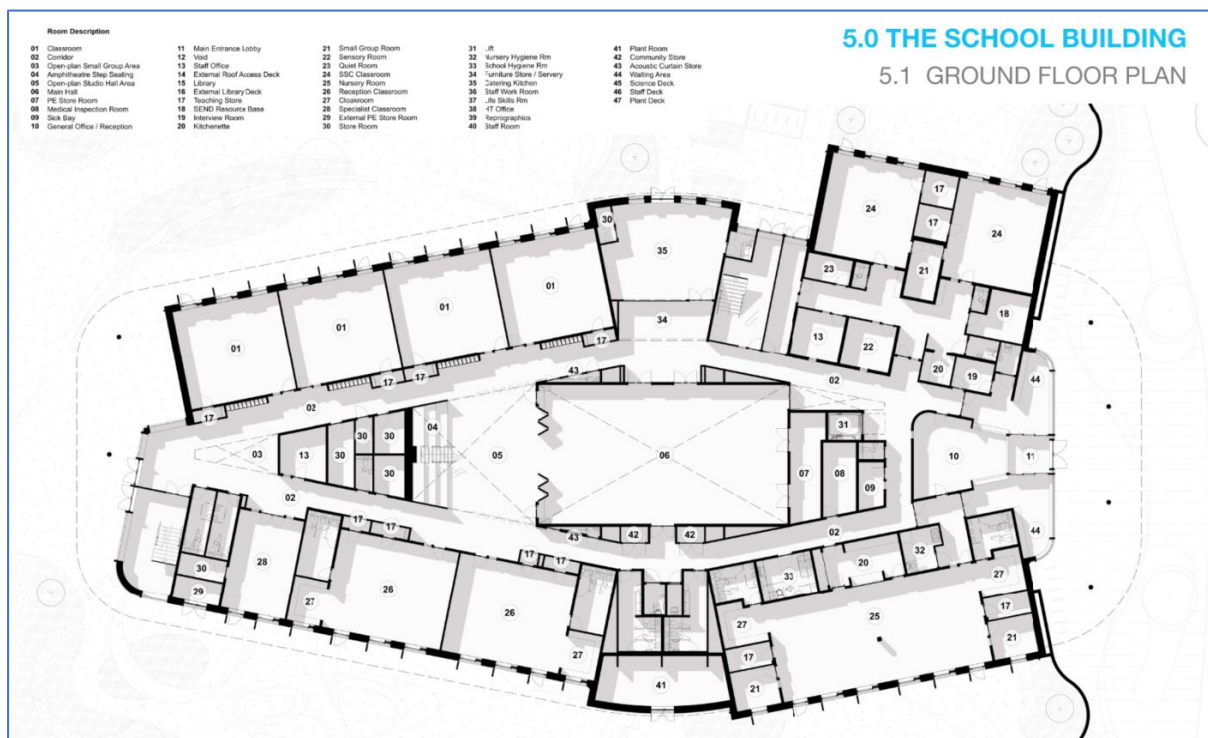
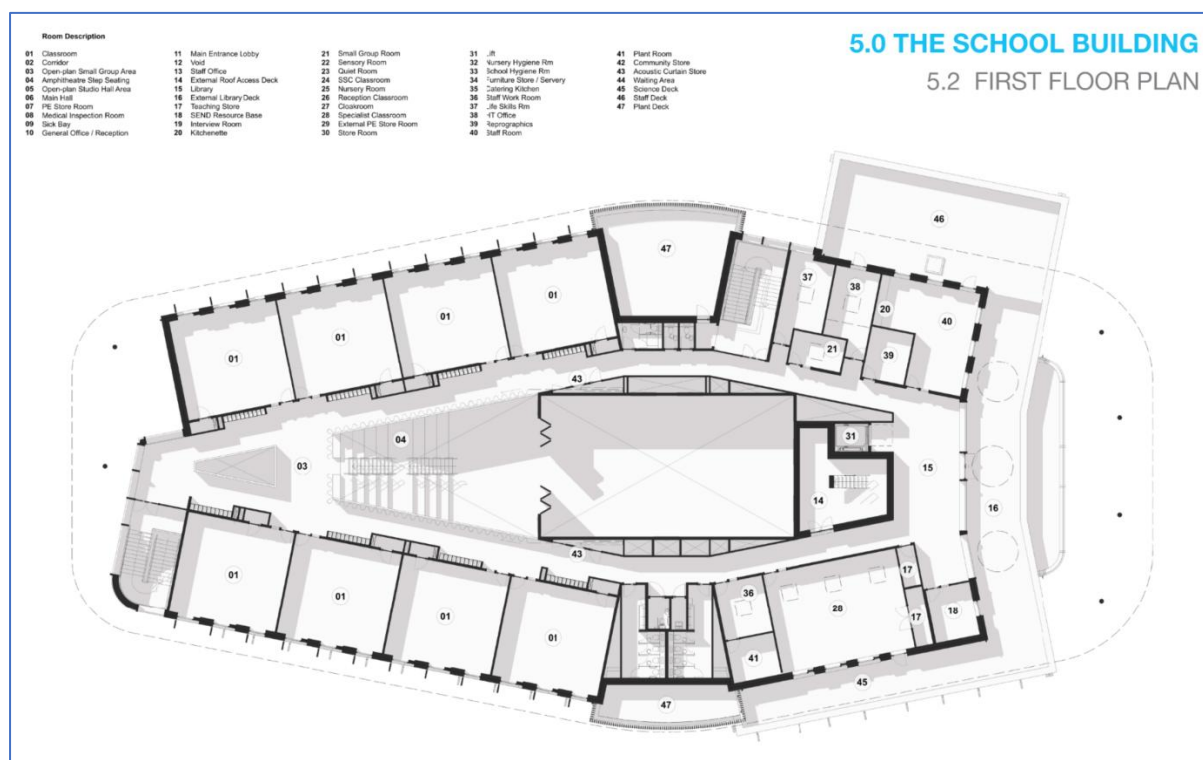


Figure 4: Proposed First Floor Plan



5. Baseline Sound Conditions

5.1. Sound Survey Overview

Heyda Ltd has undertaken an environmental sound survey to establish the baseline sound levels affecting the proposed development site. The survey consisted of long-term unattended measurements at two fixed measurement positions.

The measurements were carried out between 15th and 16th January 2025.

5.2. Survey Methodology

The environmental sound survey was undertaken using suitable measurement instrumentation configured to log sound pressure levels in each octave frequency band every second. The sound data was then 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_{A90,T}**: The A-weighted sound pressure level exceeded for 90% of the measurement period, T, often referred to as the “background sound level”.
- **dB L_{A1,T}**: The A-weighted sound pressure level exceeded for 1% of the measurement period, T, which typically represents the maximum noise levels.

The measurement positions are detailed in Table 1 and illustrated in Figure 5.

Table 1: Noise Measurement Positions

Position reference	Position description	Microphone height above ground level	Conditions
MP1	At 7.5m from the kerb of Isaac’s Lane. Position chosen primarily to ascertain the existing road noise level impacting the site and the background sound level in the area.	1.5m	Free-field
MP2	Along the eastern boundary of the site. Position chosen primarily to ascertain the existing climate at the rear of the site and the background sound level in the area. Measurements at this location were affected by temporary works (both during the day and night-time periods). As a result, they have been excluded from the assessment and are provided for informational purposes only.	1.5m	Free-field

Figure 5: Noise Measurement Positions



5.3. Measurement Equipment

The following table outlines the acoustic measurement equipment used, all conforming to the Type 1 specification of British Standard 6167 with valid calibration certificates within the last 12 months.

Table 2: Noise Measurement Equipment

Item	Manufacturer/Model Type	Serial Number
Sound Level Meter	NTi Audio XL2	A2A-23886-E1
Preamplifier	NTi Audio MA220	13950
Microphone	NTi Audio MC230A	A25920
Sound Level Meter	Norsonic Nor140	1406432
Preamplifier	Norsonic 1209	21316
Microphone	Norsonic 1225	215502
Calibrator	Norsonic 1251	30754

5.4. Observations

The primary noise source during the survey was road traffic along Isaac's Lane. However, at monitoring position MP2, located further from the road, the noise climate was also influenced by nearby construction activity.

A review of the full 24-hour dataset indicates that measurements at MP2 were not representative due to the temporary construction noise. As a result, these measurements have been included for reference only. It is recommended that noise monitoring at this location be repeated once construction activity has ceased to ensure more representative data.

5.5. Weather Conditions

The weather conditions during the survey were observed and noted as being suitable for environmental sound measurement.

For the majority of the measurements the conditions were dry, with local wind speeds not exceeding 5 m/s. The local roads were dry.

5.6. Measurement Results

The results of the noise survey that are used for the assessments in this report are presented in the following tables, including L_{Aeq} , L_{A1} , and L_{A90} measurements.

The L_{Aeq} and L_{A1} results are presented for the school period only as these are used to assess noise break-in to the building whilst the school is open. The background noise levels are presented for the daytime and night-time periods so that suitable external building services noise limits can be determined depending on their period of operation.

Table 3: Summary of Measured Noise Levels

Position	Period	Equivalent continuous SPL $L_{Aeq,30mins}$ (dB)	1st percentile sound pressure level $L_{A1,30mins}$ (dB)	Typical background sound pressure level $L_{A90,1hour/15mins*}$ (dB)
MP1	School (08:00 to 18:00)	66 – 70	74 – 77	-
	Daytime (07:00 to 23:00)	-	-	55
	Night time (23:00 to 07:00)	-	-	42
MP2**	School (08:00 to 18:00)	54 – 60	58 – 63	-
	Daytime (07:00 to 23:00)	-	-	56
	Night time (23:00 to 07:00)	-	-	53

* The assessment intervals (T) for the background sound levels are 1 hour for the daytime analyses and 15 minutes for the night time.

** Presented for information purposes only.

The octave-band ambient noise levels which make-up the broadband equivalent continuous sound pressure levels during the school period in Table 3 above (70 dBA at MP1), and which are used to determine the façade acoustic specification for the project are shown in the following table.



Table 4: Measured Octave Band Equivalent Sound Pressure Level

Position	Period (T = 30 minutes)	Octave Band Centre Frequency, Hz							
		63	125	250	500	1000	2000	4000	8000
		Equivalent Continuous SPL L_{Zeq} dB							
MP1	School Day	68	64	63	63	66	64	57	55

6. Noise Modelling

6.1. Basis of Modelling Approach

6.1.1. Overview

To predict the impact of noise on the proposed development, the baseline noise measurement results presented in Section 5 have been used to produce a detailed noise model of the site, considering the propagation of noise from the nearby roads.

The predictions have been carried out using the noise-modelling suite Cadna/A, in accordance with the CRTN and ISO 9613 prediction methodologies (where applicable), which allow consideration of the effects of the acoustic screening provided by the existing topography and the as-built structures of the proposed development.

6.1.2. Road Traffic Sources

The noise survey results from MP1 have been processed to determine appropriate noise emission levels for the adjacent existing road sources, as required to populate the model for the day and night-time periods.

The noise model was then calibrated to validate the assumptions and ensure that the predicted noise levels were equivalent to the measured levels across the site.

In the first instance, the noise model has been used to determine typical worst-case daytime equivalent continuous sound pressure levels $L_{Aeq,30 \text{ mins}}$ across the existing site.

6.1.3. Proposed New Dwellings

The proposed site is to be neighboured by multiple new dwellings, which are to be delivered as part of the wider masterplan redevelopment. To account for these dwellings, the site and its immediate surroundings has been modelled based on the currently proposed masterplan layouts (as presented in Figure 2). Each building has been assumed to have a total height of 8m, representative of a two-story building with pitched roof.

6.1.4. Provision for Future Noise Levels

The proposed development assessed in this report is part of a wider regeneration of the local area, which includes the construction of new road networks, modifications to existing roads, and large-scale residential and mixed-use development. Consequently, future ambient noise levels are expected to differ from those measured during the survey.

A review of the proposed infrastructure changes and predicted future peak traffic flows on surrounding roads indicates that the measured noise levels are not representative of future worst-case environmental noise conditions. This is due to the following key factors:

Increased Traffic Volumes:

Forecasted traffic data for the year 2032 (with all development phases completed) indicate significant traffic flows on the key roads surrounding the site:

- AM Peak (2032)
 - Isaac's Lane (southern arm, west of the site): 1,037 two-way vehicles
 - Northern Arc Avenue (north of the site): 205 two-way vehicles
- 18h AAWT (2032)
 - Isaac's Lane (southern arm, west of the site): 13,258 two-way vehicles
 - Northern Arc Avenue (north of the site): 2615 two-way vehicles
- The percentage of heavy goods vehicles (HGVs) in the dataset is 3% on Isaac's Lane and 1.5% on Northern Arc Avenue.
- The traffic speeds are 64 kph for Isaac's Lane and 32 kph for Northern Arc Avenue.
- No traffic flow data has been provided for the road to the east of the site.

Road Network Changes and Increased Noise Levels:

- The dominant noise source is currently Isaac's Lane (A273), which runs along the western boundary of the site and serves as a key north-south transit route. The planned construction of Northern Arc Avenue to the north will introduce additional traffic, further increasing noise emissions in the area.
- The surrounding residential developments will not provide significant acoustic screening, as they are located directly adjacent to Isaac's Lane and Northern Arc Avenue.

The road traffic noise levels have been adjusted based on the predicted 2032 traffic flows meaning that future noise levels at the site are expected to be slightly higher than those measured during the survey. The CRTN basic noise level prediction method was used to predict the likely increase due to changes in traffic flows between the current scenario and the future scenario; these changes were then applied to the road traffic noise sources in the model.

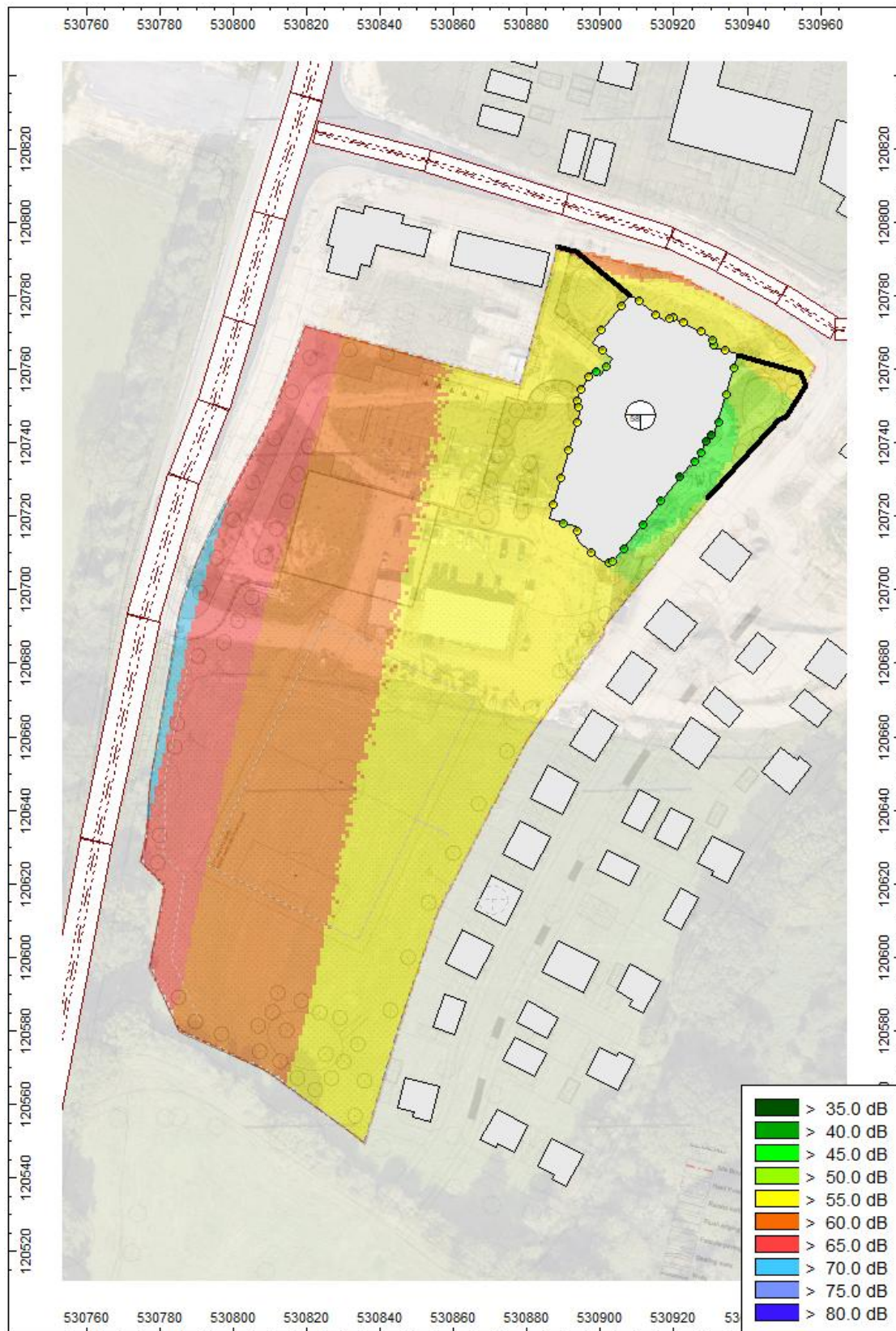
6.1.5. Other Assumptions

In addition to the road source noise levels used in the predictions, the model also considers the effects of the topographical conditions throughout the area, ground absorption (assumed to be 0.6), atmospheric absorption, acoustic reflections and acoustic screening, as well as applying a light downwind propagation correction to represent a worst-case.

6.2. Modelling Outcomes

The predicted worst daytime ambient noise levels ($L_{Aeq,30mins}$) affecting the site as a result of the predicted road traffic sources are shown in Figure 6. The noise map depicts the predicted noise levels at 1.5m above local ground level.

Figure 6: Predicted Worst-Case $L_{Aeq,30mins}$ at Ground Floor Level – Future Case (2032)





The noise model indicates that future ambient noise levels at the façades of the proposed development, due to local road traffic, are expected to range between 45 dB $L_{Aeq,30min}$ and 58 dB $L_{Aeq,30min}$, depending on proximity to adjacent noise sources. Additionally, $L_{A01,30min}$ noise levels at the building façades are predicted to range from 47 dB $L_{A01,30min}$ to 64 dB $L_{A01,30min}$, varying by location.

Within the school grounds, predicted noise levels are expected to range from 45 dB $L_{Aeq,30min}$ to 70 dB $L_{Aeq,30min}$, with the majority of usable outdoor space experiencing levels between 55 dB $L_{Aeq,30min}$ and 65 dB $L_{Aeq,30min}$.

7. Noise Impact on the Proposed Development

7.1. External Noise Impact

7.1.1. Suitable External Noise Conditions

It should be ensured that the site is suitable from a noise perspective, and that existing external noise levels will not result in significant adverse impacts on future building users and users of the wider site facilities.

The document "Acoustics of Schools: a design guide (2015)" offers guidelines to ensure suitable acoustic conditions outside school buildings, complementing the revised performance standards for the acoustic design of schools by the Department for Education in December 2014. These guidelines, although not mandated by Requirement E4 of the Building Regulations, are recommended as good practice:

- **Upper Limit for External Noise:** For new schools, an external noise level of 60 dB $L_{Aeq,30min}$ at the boundary of external areas designated for teaching, both formal and informal, and recreation is recommended as the upper limit to maintain conducive outdoor learning environments.
- **Noise Levels in Outdoor Areas:** Noise levels in unoccupied playgrounds, playing fields, and other outdoor areas should not normally exceed 55 dB $L_{Aeq,30min}$. Moreover, there should be at least one designated area for outdoor teaching activities where noise levels are maintained below 50 dB $L_{Aeq,30min}$ to ensure effective communication and learning outcomes in an outdoor setting.

By achieving compliance with the above guidance, the development can ensure that adverse noise impacts are minimised, and that significant adverse noise impacts are avoided.

7.1.2. Impact Assessment of External Noise Levels

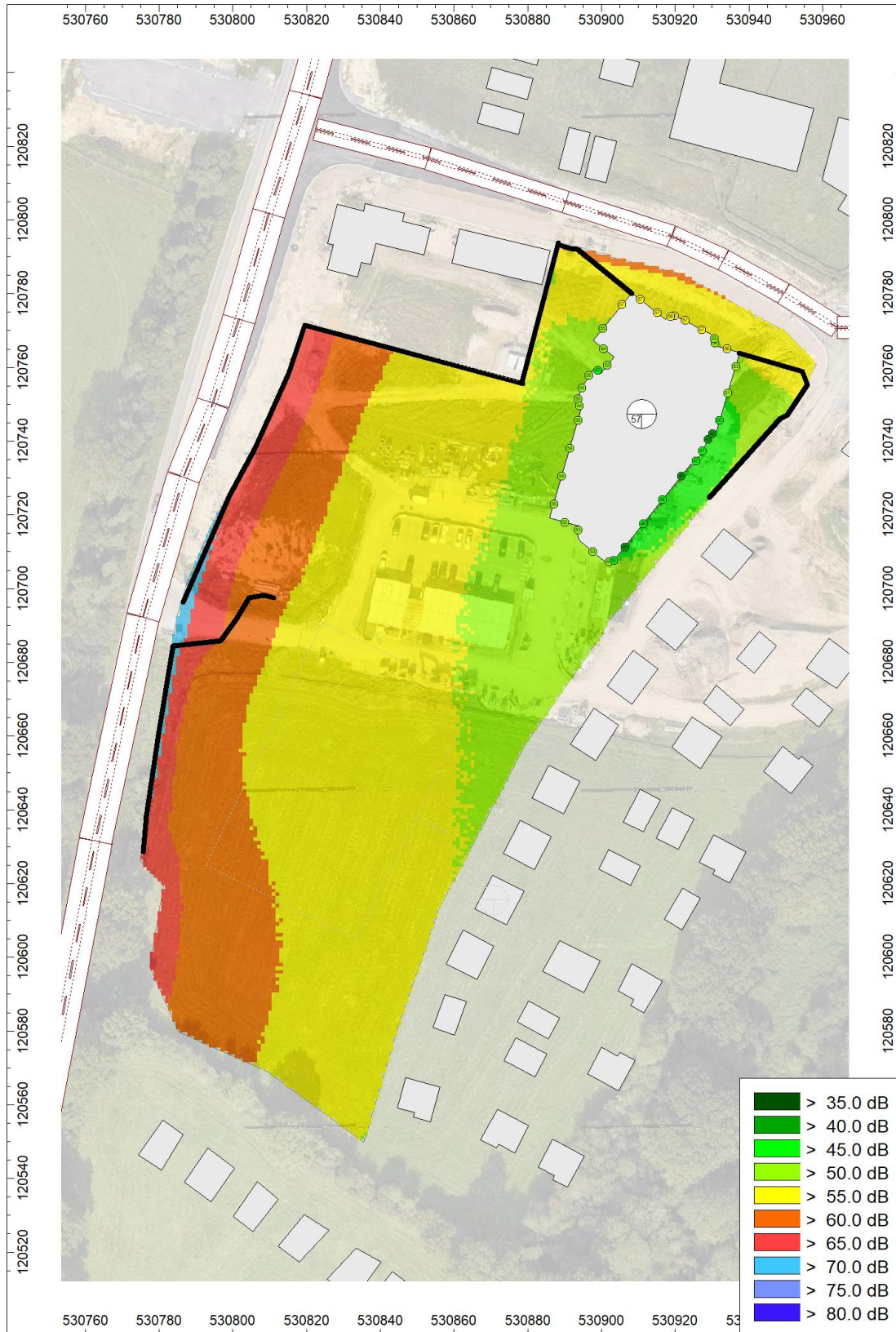
As outlined in Section 6.2, predicted external noise levels within the school grounds are expected to range between 45 dB $L_{Aeq,30min}$ and 70 dB $L_{Aeq,30min}$ during a typical school day.

Without appropriate mitigation, these noise levels could adversely impact the usability of outdoor recreation and teaching spaces. As such, the school frontage has been designed to have a 2.4m high brickwork wall, and the majority of the western boundary will have a 2.4m high acoustic fence.

To be effective, the fence will be solid, continuous, and free from gaps or discontinuities, as even small openings can significantly reduce its noise attenuation performance. Additionally, it shall have a minimum surface density of 10 kg/m² to provide sufficient mass for sound insulation.

The noise map of the development, with the proposed brick wall and fence (shown as black lines) are presented in Figure 7.

Figure 7: Predicted Worst-Case $L_{Aeq,30mins}$ at Ground Floor Level with Barrier 2.4m above Local Ground Level – Future Case (2032)





The noise map in Figure 7 demonstrates that the proposed barrier along the western boundary is predicted to control noise levels across most outdoor areas to within the recommended 50 - 60 dB $L_{Aeq,30min}$ range.

Noise Levels in the external areas near to the school, which are those likely to be used most frequently for teaching activities, are typically below 55 dBA. The vast majority of external areas are expected to be within the upper guideline of 60 dBA, other than those on the western boundary which are less likely to be used frequently.

Therefore, with the proposed barrier in place, external noise levels are predicted to align with the relevant guidance and are unlikely to result in significant adverse impacts on future users of the school, aligning with Policy DP29 of the Mid Sussex District Plan. Should specific quieter external areas be required, these could be incorporated at the detailed design stage through careful site planning and targeted localised screening.

7.2. Internal Noise Impact due to External Sources

7.2.1. Suitable Internal Noise Conditions

To ensure that “adverse impacts” are minimised, and “significant adverse impacts” are avoided due to external noise intrusion to the building, it is important to ensure that internal noise levels will be suitable for the proposed usage.

BB93 stipulates that maximum indoor ambient noise levels (IANL), $L_{Aeq,30min}$, in unoccupied teaching spaces should not exceed certain values, in order to provide clear communication of speech between teacher and student and thus, suitable study conditions.

The building envelope should provide sufficient sound insulation from external noise sources in order to achieve suitable internal ambient noise levels.

For teaching spaces intended specifically for students with special hearing and communication needs, it should be ensured that internal noise levels in a new-build educational facility do not exceed 30 dB $L_{Aeq,30min}$.

For primary school teaching spaces, it should be ensured that internal noise levels in a new-build educational facility do not exceed 35 dB $L_{Aeq,30mins}$ and 60 dB $L_{A01,30mins}$.

There is a 5 dB relaxation applicable to the limits stated above where the rooms are naturally ventilated.

These limits include contributions from external noise sources and building services. At the planning stage of the development, we are concerned primarily with existing external noise sources. Building services will be designed to achieve appropriate noise levels as the design progresses.

By achieving compliance with the above, we can ensure that adverse noise impacts are minimised, and that significant adverse noise impacts are avoided.

7.2.2. Assessment Overview

The assessment of noise intrusion to the proposed development is dependent on the external noise level, the ventilation strategy and the sound reduction afforded by the building envelope.

Based on the external noise modelling, including for the proposed boundary treatments, the highest predicted façade-incident noise levels range from 45 dB $L_{Aeq,30\text{ mins}}$ to 57 dB $L_{Aeq,30\text{ mins}}$. The 57 dB occurs only at the first floor library on the northern façade; the worst-case noise level at a classroom is 55 dB on the western façade, and similarly, 55 dB is expected at the worst affected classroom specifically designed for students with special hearing and communication needs.

To demonstrate site suitability, only the worst-case scenario need be considered in detail to ensure that significant adverse impacts can be avoided. A full detailed acoustic design of the building envelope should be undertaken at the detailed design stage.

The requirements for the ventilation strategy have been determined based on the external noise levels in the worst-case location accounting for different boundary treatments. The minimum sound reduction index requirements for the external windows and walls have then been calculated in accordance with BB93. This calculation takes into account the proposed room dimensions and the maximum internal reverberation time design requirement for the relevant spaces, however the exact dimensions of the different façade elements will likely be subject to change, and therefore updates will be required to finalise the exact performance requirements as the design progresses.

The Building Regulations (Part E) require the BB93 standards to be achieved through detailed design of the building which should provide assurance that the requirements stated in this report will be taken through to completion of the development, however an appropriately worded planning condition could also be imposed to secure these requirements.

7.2.3. Ventilation Acoustic Requirements

The ventilation strategy for the proposed development remains under consideration. Current proposals indicate that SEN teaching spaces, and potentially other areas, will be mechanically ventilated. Where full mechanical ventilation, heating, and cooling are provided, there are no significant external noise break-in risks to address.

For the majority of non-SEN teaching and ancillary spaces, a hybrid ventilation strategy incorporating openable acoustic louvres is under consideration, subject to further detailed design. Where such louvres are used on the most exposed western façade, they shall achieve the minimum sound reduction performance set out in Table 5, based on an assumed maximum louvre area of 1.4 m².

Table 5: Minimum Acoustic Louvre Sound Reduction Performance Requirements

Table 6.7: Minimum Acoustic Louvre Sound Reduction Performance Requirements								
Element Type	Octave Band Centre Frequency, Hz							Weighted Sound Reduction Index R _w + C _{tr}
	63	125	250	500	1000	2000	4000	
	Sound Reduction Index dB R							
Acoustic Louvre - Classroom	0	1	2	2	5	9	7	4

The final ventilation approach for each room will be confirmed at the technical design stage.

7.2.4. Building Envelope Sound Reduction Requirements

Calculations of external noise break-in have been undertaken using the 'rigorous' method defined in BS 8233:2014 to determine the minimum required sound reduction performance for the external walls, windows, roofs and rooflights.

External Walls

External walls shall achieve the minimum sound reduction indices detailed in Table 6, when tested in accordance with BS EN ISO 10140-(Parts 1 and 2):2021.

Table 6: Minimum External Wall Sound Insulation Performance Requirements

Element Type	Octave Band Centre Frequency, Hz							Weighted Sound Reduction Index R _w + C _{tr}
	63	125	250	500	1000	2000	4000	
	Sound Reduction Index dB R							
External Wall	19	24	34	40	45	49	49	36

The minimum external wall sound insulation requirements are achievable using both heavy and lightweight construction types. Once the proposed external wall build-up has been developed, we will assess the expected sound reduction performance and recommend design enhancements where required.

7.2.5. External Windows

External windows and doors should achieve the minimum sound reduction indices detailed in Table 7, when tested in accordance with BS EN ISO 10140-(Parts 1 and 2):2021.

Table 7: Minimum Window and Door Sound Insulation Performance Requirements

Element Type	Octave Band Centre Frequency, Hz							Weighted Sound Reduction Index $R_w + C_{tr}$
	63	125	250	500	1000	2000	4000	
	Sound Reduction Index dB R							
SEN Teaching Spaces	18	23	23	30	39	36	43	30
All Other Spaces	17	22	20	26	36	39	31	27

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 window sound reduction requirements should be achievable using a relatively standard acoustic double-glazing specification.

Roofs

The roof should achieve the minimum sound reduction indices detailed in Table 8, when tested in accordance with BS EN ISO 10140-(Parts 1 and 2):2021.

Where combined with the façade requirements detailed above, adherence to the specification below will ensure the relevant IANL limits are capable of being met.

Table 8: Minimum Roof Sound Insulation Performance Requirements

Element Type	Octave Band Centre Frequency, Hz							Weighted Sound Reduction Index R _w + C _{tr}
	63	125	250	500	1000	2000	4000	
	Sound Reduction Index dB R							
Roof	19	24	34	40	45	49	49	36

Note that additional sound reduction may be required if rooftop plant with high noise emissions is installed on the roof. This is subject to confirmation of roof plant layouts and specifications.

7.2.6. Roof Lights

Roof-lights should comprise a double-glazed system with a sound reduction performance such that the overall acoustical integrity of the roof is not compromised. Lightweight materials, such as polycarbonate or ETFE should be avoided.

Table 9 provides the minimum airborne sound reduction indices required for the roof lights.

Table 9: Minimum Rooflight Sound Insulation Performance Requirements

Element Type	Octave Band Centre Frequency, Hz							Weighted Sound Reduction Index $R_w + C_{tr}$
	63	125	250	500	1000	2000	4000	
	Sound Reduction Index dB R							
Rooflights	17	22	20	26	36	39	31	27

It is imperative that the suppliers confirm the acoustic performance specifications of the above system. The proposed roof-lights shall be tested for airborne sound insulation and rain impact noise under heavy rainfall in full accordance with BS EN ISO 10140-(Parts 1 and 2):2021. Test reports shall be submitted for review.

Note that additional sound reduction may be required if rooftop plant with high noise emissions is installed on the roof. This is subject to confirmation of roof plant layouts and specifications.

7.2.7. Impact Assessment for Internal Ambient Noise Levels

The Indoor Ambient Noise Levels (IANLs) within the proposed teaching spaces designed for students with special hearing and communication needs and a typical non-SEN classroom have been predicted for the worst-case western façade, considering external noise intrusion only. These predictions are based on the minimum external window, door, wall, and roof requirements outlined in the previous sections, under the assumption that windows remain closed.

This assessment assumes a mechanical ventilation strategy in SEN spaces, and a hybrid solution for classrooms using acoustic louvres with a maximum area of 1.4m² per room (in the open position).

The predicted IANLs are detailed in Table 10 below.

Table 10: Predicted Resultant IANLs

Room	Period	Required Internal Ambient Noise Level (BB93 refurbishment standards)	Predicted Internal Ambient Noise Level
		L _{Aeq,30mins} (dB)	L _{Aeq,30mins} (dB)
SEN Classroom	School Day	30	27
Classroom	School Day	40*	38

*The applicable 5 dB relaxation has been applied for natural ventilation, as per the BB93 requirements

These results indicate that the proposed building envelope specification effectively mitigates external noise intrusion, ensuring compliance with BB93 requirements. As a result, significant adverse impacts on building users are not expected, aligning with Policy DP29 of the Mid Sussex District Plan.

8. Noise Impact on Existing Receptors

8.1. Noise Impacts from Fixed Plant

8.1.1. Overview

The proposed development includes 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 significant adverse noise impacts.

8.1.2. Assessment Criteria

The assessment of noise emission from items of fixed/static plant to the surroundings should align with the guidance provided in BS 4142:2014+A1 Methods for Rating and Assessing Industrial and Commercial Sound. This standard suggests that the cumulative sound rating level ($L_{Ar,Tr}$) from static services plant and machinery should not exceed the prevailing typical background sound level ($L_{A90,T}$) at the nearest noise-sensitive receptors. This approach typically ensures that the development is likely to have a low impact on the surrounding noise climate, contingent on specific site contexts, and would therefore align with the Mid Sussex DP29 policy aims. Planning Condition 38 goes beyond this and states that:

“the Rating Level, measured or calculated at 1-metre from the façade of the nearest existing noise sensitive premises, shall not exceed: 5dB below the existing L_{A90} background noise level. Rating Level and existing background noise levels to be determined as per the guidance provided in BS 4142:2014.”

The limiting noise thresholds at nearby noise sensitive receptors have been determined through analysis of the existing background sound levels as detailed in Section 5 of this report and are presented in Table 11. The receptor locations were defined previously in Figure 2.

Table 11: Noise Emissions Criteria for Fixed Plant at Noise Sensitive Receptors

Receptor	Period (T)	Typical background sound level $L_{A90,T}$ (dB)	Limiting Rating Level Criteria for Normally Operating Plant $L_{Ar,Tr}$ (dB)
R1 – R3	Daytime (07:00 – 23:00)	55	50
	Night-time (23:00 – 07:00)	42	37

Note: The operational times of the proposed plant are yet to be established, hence limits cover all potential periods.

Please note that the measured noise levels at the second survey location were impacted by ongoing site works and therefore we recommend that an additional survey is undertaken during the design stage to re-confirm the stated rating limits.

The above 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.

8.1.3. Potential Mitigation Measures and Likely Noise Impact

The specific types and specifications of the external plant, including air handling units, extract fans, and condenser units 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 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.

8.2. Noise Impacts from Sports Pitches

8.2.1. Overview

An assessment of noise emissions from the proposed sports pitch has been undertaken based on a design guidance note published by Sports England on Artificial Grass Pitch (AGP) Acoustics – Planning Implications, 2015.

8.2.2. Criteria

The AGP guidance references the 1999 WHO guidelines which recommended that to prevent serious annoyance during daytime hours (07:00 – 23:00), sound pressure levels on balconies, terraces, and outdoor living areas should not exceed 55 dB L_{Aeq} for steady, continuous noise sources. To avoid moderate annoyance, outdoor noise levels should not exceed 50 dB L_{Aeq} . While these criteria apply mainly to steady noise sources such as road traffic, they can serve as a useful reference in the absence of specific standards for outdoor sports facilities like the pitch proposed.

The AGP guidelines also recognise that in circumstances where existing noise levels are high, an alternative assessment methodology may be appropriate. The AGP guidelines refer to the IOA/IEMA Working Party Consultation Draft 2002, which categorises the significance based on a change in noise level, stating that a 3 dBA increase is the minimum perceptible change in noise under normal conditions. As such, the aim of this assessment is to ensure that the existing ambient noise is not increased at existing noise-sensitive receptors by 3 dBA as a result of the operations of the MUGAs.

8.2.3. Prediction Methodology

The noise emissions from the proposed sports pitch were predicted following the guidance outlined in the Artificial Grass Pitch (AGP) Acoustics guidance. This methodology stipulates that noise levels from an AGP typically reach 58 dB $L_{Aeq,1hr}$ at a distance of 10 metres from the halfway line.

Predictions were performed using the Cadna/A noise modelling software, which integrates Calculation of Road Traffic Noise (CRTN) and ISO 9613-2 algorithms. This model considers factors such as screening, reflections, and attenuation effects arising from the existing and proposed buildings and other structures within the study area.

The sports pitch was modelled as an area source corresponding to the proposed locations (refer to Figure 2). Emission heights were set at 1.5 metres above local ground level, calibrated to align with the AGP guidance of 58 dB $L_{Aeq,1hr}$ at 10 metres from the centrelines. In line with typical use, it was assumed that the sports pitch would only operate during daytime hours (07:00–23:00).

To estimate the potential increase in ambient noise levels due to sports pitch operations, the existing ambient noise conditions were incorporated into the model. These were derived from the measured noise levels obtained during the environmental sound survey adjusted to account for the future traffic flows.

8.2.4. Predictions and Assessment of Noise Increase

The predicted noise levels associated with the use of the proposed sports pitch are detailed below for the worst-affected residential receptor (R3). These assume that the proposed 2.4m tall acoustic fence on the western site boundary has been installed meaning that noise levels at the receptor, in the absence of sports pitch noise are the lowest they are likely to be (therefore representing the worst-case assessment scenario).

Table 12: Sports Pitch Noise Predictions at Locations of Off-site Receptors

Receptor	Predicted Sports Pitch Noise Level ($L_{Aeq,T}$ dB)	Predicted Existing Ambient Noise Level ($L_{Aeq,T}$ dB)	Predicted Combined Ambient Noise Level ($L_{Aeq,T}$ dB)	Calculated Increase of Existing Ambient Noise Level ($L_{Aeq,T}$ dB)
R3 – Nearest Dwelling	53	55	57	+2

As shown in Table 12, the predicted sports pitch noise levels at off-site receptors result in a maximum increase of +2 dB(A) in the future ambient noise climate. Such an increase is below the minimum perceptible change according the AGP guidelines and therefore significant adverse impacts are not likely, aligning the proposals with Policy DP29 of the Mid Sussex District Plan.

9. Conclusion

This noise impact assessment, prepared by Heyda Ltd for Homes England, has evaluated the potential noise implications of the proposed Brookleigh Eastern Primary School, Brookleigh, Burgess Hill.

The assessment has been informed by baseline environmental noise surveys, predictive noise modelling using both current and future traffic data, and detailed consideration of noise break-in, building services noise, and sports pitch use. Policy requirements at national, regional, and local levels have been addressed, including compliance with BB93, the *Acoustics of Schools: A Design Guide*, BS 4142:2014+A1, and Policy DP29 of the Mid Sussex District Plan.

Key findings include:

- **External noise:** With the inclusion of a 2.4 m brick wall to the school frontage and 2.4m acoustic fencing along the western boundary, predicted outdoor noise levels within the school grounds fall within recommended limits for teaching and recreational areas, avoiding significant adverse impacts.
- **Internal noise:** Calculations demonstrate that suitable internal ambient noise levels can be achieved across all teaching spaces through an appropriate combination of façade specifications, glazing, roof/rooflight performance, and ventilation strategy. SEN classrooms are predicted to meet the stricter BB93 limits of 30 dB $L_{Aeq,30min}$.
- **Ventilation:** While the final strategy is subject to detailed design, minimum acoustic louvre performance requirements have been identified to ensure compliance in non-SEN teaching spaces where hybrid ventilation is adopted.
- **Building services noise:** Fixed plant will be controlled to meet Planning Condition 38, requiring rating levels at least 5 dB below the prevailing background noise levels. This ensures a low impact at the nearest sensitive receptors, in line with BS 4142.
- **Sports pitch use:** Predicted noise emissions are not expected to increase the future ambient noise climate at the worst-affected receptor by more than +2 dB, which is below the threshold that would be expected to result in significant adverse impacts.

Overall, the proposed school is considered acoustically suitable for its intended purpose. The development, with the adoption of the proposed boundary treatments and the stated minimum building envelope specifications, is not expected to result in significant adverse effects for either future building users or the surrounding community.

In conclusion, the proposed Brookleigh Eastern Primary School is judged to comply fully with both national and local planning policy aims on noise. The findings of this assessment confirm that, subject to detailed design and implementation of the identified



mitigation measures, noise considerations should not constitute a barrier to the approval of the reserved matters planning application.



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.
BB93	Guidance on the acoustic design of schools, ensuring suitable internal ambient noise levels within educational settings.
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 μ Pa for sound pressure, 10^{-12} W for sound power).
Equivalent continuous sound level ($L_{Aeq,T}$)	The A-weighted average sound level over a specified time interval, T, representing the energy-average level.

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.
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 absorption	Reduction of sound energy by transmission through an absorbing medium.
Sound absorption coefficient, α	A fractional measure of the ability of a material or surface to absorb incident sound. Expressed as a value between 1.0 (total absorption) and 0.0 (no absorption).
Sound insulation	The ability of structures to reduce sound transmission, mainly through reflection.
Sound power level	Total emitted sound power, relative to a reference, measured in decibels.



Appendix B - 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 2023. 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 voiding 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



Local Policy

Mid Sussex District Plan 2014 – 2031 (Adopted 2018)

Policy DP29 of the Mid Sussex District Plan sets out requirements to manage and mitigate noise pollution in new developments to protect public health and the local environment.

Noise Pollution Considerations:

- **Minimisation of Noise Impacts:** Developments must be designed and controlled to prevent unacceptable noise impacts on health, neighbouring properties, and the wider environment.
- **Noise-Generating Developments:** If a development is expected to produce significant noise, appropriate noise mitigation measures must be implemented.
- **Noise-Sensitive Developments:** Residential and other noise-sensitive developments will not be permitted near existing or planned high-noise sources unless effective noise insulation is provided.
- **Assessment Requirements:** In cases where noise may be a concern, applicants may be required to submit:
 - A noise impact assessment for the proposed development.
 - An assessment of existing noise sources affecting the proposed development site.
- **Rural and Sensitive Areas:** Noise impacts are of particular concern in rural and environmentally sensitive areas, where stricter controls may be necessary.

This policy ensures that developments contribute to a high-quality living environment while balancing the needs of growth and sustainability

Standards and Guidelines

Building Bulletin 93 (BB93), "Acoustic Design of Schools," 2015

Building Bulletin 93 (BB93), "Acoustic Design of Schools," provides comprehensive guidance on the acoustic conditions required for schools within England. Its primary aim is to ensure that school buildings are designed with adequate acoustic performance to support teaching and learning. The guidance is particularly focused on the internal ambient noise levels in schools, emphasizing the importance of creating environments conducive to communication and learning without excessive noise interference. This summary highlights the guidance BB93 provides concerning internal ambient noise levels, particularly those resulting from external noise sources.

1. Objective of BB93:

BB93 establishes performance standards for the acoustics of school buildings to:

- Facilitate clear communication of speech between teacher and student, and among students.
- Provide an environment that enables effective teaching and learning while minimising disruption from external and internal noise sources.

2. Internal Ambient Noise Levels (IANLs):



BB93 specifies maximum indoor ambient noise levels (IANLs) to ensure educational environments are free from excessive noise. The focus is on maintaining low noise levels from external sources when windows are closed to ensure a conducive learning atmosphere. These standards are crucial for spaces intended for speech, including classrooms, lecture theatres, and other learning areas.

Key Requirements:

- Teaching and study spaces should not exceed specific noise levels to ensure that speech can be heard clearly.
- For general teaching spaces, the IANL from external noise should not exceed 35 dB $L_{Aeq,30min}$ during school hours.
- Special consideration is given to spaces used by individuals with special hearing and communication needs, recommending lower noise levels to accommodate heightened sensitivity to interference.

3. Impact of External Noise Sources:

BB93 acknowledges that schools may be exposed to various external noise sources, including traffic, industrial activities, and others. The guidance outlines the necessity for:

- Adequate sound insulation of the building envelope to minimize noise break-in from external sources.
- Consideration of the site's acoustic environment in the school design, suggesting placement of buildings and layout to shield noise-sensitive areas from predominant noise sources.

4. Acoustic Design Considerations:

- The design of school buildings should incorporate features that limit noise ingress, such as specifying high-performance windows and constructing barriers or buffer zones.
- Where high external noise levels exist, mechanical ventilation may be recommended to allow windows to remain closed, maintaining low noise levels indoors.

5. Ventilation and Cooling Strategies:

Given the potential for external noise intrusion through open windows, BB93 suggests that mechanical ventilation and cooling systems may be necessary to achieve the desired IANLs. This approach ensures that internal spaces remain comfortable and quiet even when external conditions are noisy.

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 ($L_{A,r,T,r}$) 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 $L_{A,r,T,r}$ '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.