MILLER GOODALL

ACOUSTICS - AIR QUALITY - LIGHTING

ENVIRONMENTAL NOISE ASSESSMENT

on behalf of

Lidl Great Britain Ltd

for development at

Lidl, 550 Mauldeth Road West, Manchester M21 7AA

Report Number 102838-3

Date of Report 16 April 2025

Miller Goodall Ltd
Ashworth House
Deakins Business Park
Egerton
Bolton
Lancashire BL7 9RP
Tel: 01204 596166

www.millergoodall.co.uk

Company registration number 5201673

Summary

A noise assessment has been undertaken to support an application to discharge planning conditions relating to noise from Lidl, 550 Mauldeth Road West, Manchester M21 7AA.

A baseline computer noise model of the proposed development and surrounding site has been assembled based on the approved site layout, final plant specifications and mitigation in the form of an acoustic barrier. The likely noise levels at the nearest noise sensitive receptors (NSRs) due to noise from the site have been predicted.

The data from the environmental sound survey undertaken in July 2022 to support the planning approval has been used to represent the existing sound climate at nearby NSRs during periods when the plant will operate.

The predicted noise levels and data from the environmental sound survey have been used to assess the potential impact at the most affected NSR during the both the daytime and night-time periods.

The assessment indicates that the rating level of noise from the external plant is at least 5dB (L_{Aeq}) below the typical background (L_{A90}) sound level at the nearest noise sensitive receptor location. Thus, the limits set in condition 8a) of the planning approval for the development will be achieved and that this part of the planning condition can be discharged.

This report also reviews the potential for internal noise breakout from the retail unit. The building construction specification has been reviewed, in particular the glazing elements. The building's specification, the likely noise levels within the store, the distance to the nearest sensitive receptors and the existing ambient sound levels indicate that noise from within the retail unit will not be significant at nearby sensitive noise receptors. For this reason, condition 10a) of the planning approval can be discharged.

Original Author:	Lesley Goodall MIOA	**Reviewed By:**	Dan Emery MIOA
Signed:	[redacted]	**Signed:**	[redacted]
Date:	16 April 2025	**Date:**	16 April 2025

Revision Number	Date	Updated by	Checked by	Changes made

Advisory Note

The suitability of any recommended noise mitigation measures within this report should be approved by the relevant architects, structural engineers, building contractors, fire consultants and material manufacturers constituting the wider design team, prior to procurement and field application. This should ensure that when the recommended noise control measures are implemented on site they will satisfy the requirements of all disciplines, therefore should not cause any health and safety issues.

Contents

Summary **2**

1 Introduction **5**

2 Policy, Standards and Guidance **6**

3 Assessment Methodology **6**

3.1 Condition 8a) 6

3.2 Condition 10a) 7

4 Site Description **7**

5 Development **8**

6 Local Authority Consultation **8**

7 Rating Level of Plant – Condition 8a) **9**

7.1 Noise Modelling Methodology 9

7.2 BS 4142:2014+A1:2019 Rating Level Assessment 12

8 Internal Noise Breakout – Condition 10a) **13**

9 Summary and Conclusion **14**

APPENDICES **16**

Appendix 1: Standards and Guidance **17**

Appendix 2: Site Location and NSR Locations **21**

Appendix 3: Glazing Specification **22**

Glossary of Terms **23**

1 Introduction

1.1 Miller Goodall Ltd has undertaken a noise assessment to accompany an application to partially discharge two planning conditions for Lidl, 550 Mauldeth Road West, Manchester M21 7AA. There are two planning conditions relating to noise within the planning approval Ref 138626/JO/2023 dated 6 December 2023: conditions 8 and 10.

1.2 Condition 8 relates to noise from external noise sources and is in two parts as shown below;

a) Any externally mounted ancillary plant, equipment and servicing to be installed shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. Prior to its installation, the scheme shall be submitted to and approved in writing by the City Council as Local Planning Authority in order to secure a reduction in the level of noise emanating from the site.

b) Prior to any externally mounted ancillary plant, equipment and servicing to be installed becoming operational, an approved verification report shall be submitted to and approved in writing by the City Council as Local Planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non - conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

1.3 Condition 10 is also in two parts a) and b) as set out below.

a) The premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

b) Prior to occupation of the development a verification report shall be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that acceptable criteria have been met. Any instances of non-

conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

1.4 The scope of this report is to provide information to discharge conditions 8a) and 10a).

2 Policy, Standards and Guidance

2.1 The following planning policy and acoustics standards and guidance have been considered in this assessment.

- BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*'.
- BS 8233:2014 "*Guidance on Sound Insulation and Noise Reduction for Buildings* ". The criteria in **Table 1** have been considered.

Table 1: BS 8233: 2014 guideline indoor ambient noise levels for dwellings

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

2.2 Further detail is provided in **Appendix 1: Standards and Guidance**.

3 Assessment Methodology

3.1 Condition 8a)

3.1.1 A BS 4142 assessment has been undertaken in relation to noise from external plant associated with the development. Noise from the final plant selected for use at the development has been predicted using CadnaA software.

3.1.2 Data from environmental sound monitoring undertaken to establish background noise levels for use in the environmental noise assessment submitted with the planning application has been used within a BS 4142 assessment and a rating level has been established.

3.1.3 The assessment has been completed for both daytime and night-time periods. The receptors set it out in **Table 2** have been selected for the assessment as these are the nearest noise sensitive receptors. For the daytime assessment, the ground floor has been considered and for the night time assessment the first floor has been assessed as rooms on these facades are likely to be inhabited during the respective assessment periods..

Table 2: Noise Sensitive Receptors (NSRs)

Noise Sensitive Receptor (NSR)		Modelled Height, m
Reference	**Description**	
NSR1 (GF)	Ground floor facade at the west side of the dwelling at 537 Mauldeth Road West	1.5
NSR1 (FF)	First floor facade at the west side of the dwelling at 537 Mauldeth Road West	4
NSR2 (GF)	Ground floor facade at the west side of the dwelling at 541 Mauldeth Road West	1.5
NSR2 (FF)	First floor facade at the west side of the dwelling at 541 Mauldeth Road West	4

3.2 Condition 10a)

3.2.1 The building's construction specification, the likely noise levels within the store, the distance to the nearest sensitive receptors and the existing ambient noise levels have been reviewed to inform an assessment of the acoustic performance of the store.

4 Site Description

4.1 The site is located at Lidl, 550 Mauldeth Road West, Manchester M21 7AA. The site location is outlined in red in the figure presented in **Appendix 2: Site Location and NSR Locations.**

4.2 The site is located to the north of Mauldeth Road West and east of Nell Lane. The site is bound by Mauldeth Road West to the south east, Nell Lane to the south west, Chorlton High School to the north, and Mauldeth House office building, the associated car park and Hough End Hall to the west.

4.3 The nearest noise sensitive receptors are located on Mauldeth Road West as indicated in **Table 2** and **Appendix 2.**

5 Development

5.1 The store will include;

- Retail area;
- Bakery and bakery freezer;
- Chiller room; and,
- Delivery area and storage

5.2 Plant for the store will be provided on a plant deck at a height of 3.6 m, above the delivery bay to the north façade. In addition, extracts and intakes serving internal air handling units are to be located on the roof, at the east side of the store. Therefore, there is potential for noise to impact NSRs. The proposed external plant includes:

- 2No. food refrigeration dry coolers;
- 4No. VRVs units serving the warehouse, back of house and sales area.

5.3 This plant has the potential to operate 24 hours a day, 7 days a week.

6 Local Authority Consultation

6.1 Manchester City Council (MCC) was consulted in respect of the methodology used in this assessment[1]. It was agreed that:

- Noise monitoring completed between 17th June and 20th June 2022 (detailed in the noise assessment provided in support of the planning application) would be used in the assessment completed in respect of condition 8a). This monitoring indicated that typical background noise levels at the nearest noise sensitive receptors were;
    1. Daytime L_{A90}: 49 dB
    2. Night time L_{A90}: 33 dB
- A brief technical note outlining the sound reduction performance of each of the main elements of the building construction (walls, glazing and roof elements) and an indication of the general levels of noise within a typical Lidl store would be sufficient to discharge condition 10a).

[1] Email dated 19 June 2024. Response from Sharon McAndrew dated 5 July 2024

7 Rating Level of Plant – Condition 8a)

7.1 Noise Modelling Methodology

7.1.1 A baseline noise model of noise from the proposed development has been assembled using CadnaA noise modelling software.

7.1.2 The general horizontal plan information of the area surrounding and including the proposed development site was imported from Google Earth. This was used to determine road positions, building footprint areas and relative locations and is considered accurate to within 5%.

7.1.3 Topography was imported from the DEFRA LIDAR dataset, and existing building height information was input based on site observations. A contour was added around the building footprint corresponding with ground level indicated on the construction tender drawings provided by the project architects.

7.1.4 The following parameters were assigned to the model:

- Propagation of noise using algorithms within ISO 9613:1996 *Acoustics - Attenuation of sound during propagation outdoors*.
- Default ground absorption G = 0.1. Representing mainly hard ground surrounding the site.
- No adverse meteorological effects.
- Two orders of reflection.
- Buildings are reflecting with smooth non-structured facades.
- Receiver heights of 1.5 m for ground floor receivers and 4 m for first floor receivers.
- Grid height for noise contour plots of 1.5 m for the daytime scenario and 4 m for the night-time scenario.

7.1.5 Details of the site layout and associated plant have been obtained from drawings, CAD files and data sheets provided by the client.

7.1.6 For the VRV units, octave band sound power level data was taken directly from the manufacturer's documentation. For the food refrigeration dry coolers, the manufacturer's data sheet provided a broadband dB(A) sound power level. An indicative spectrum from a similar unit was applied to achieve the equivalent sound power level.

7.1.7 For daytime operation, all plant is assumed to operate at 100% capacity.

7.1.8 The M&E consultant advised that during the night-time period, the VRVs serving the Warehouse, Back of House and Sales Area would operate at an assumed maximum capacity of 60%. The following corresponding noise levels were provided:

- CU01 Warehouse - 1No Daikin RXYSQ6TV9 (60%) = 47.0 dB(A) SPL at 1 m
- CU02 Back of House - 1No RXYSQ4TV9 (60%) = 46.0 dB(A) at 1 m
- CU05 & C05 - 2No Daikin RXYLQ14T(60%) = 47.0 dB(A) SPL at 1 m

7.1.9 The reduction in overall sound level has been applied to the sound power levels used in the noise model for night-time operation. **Table 3** summarises the sound power level data used within the noise model.

Table 3: Sound Power Level source data used within CadnaA

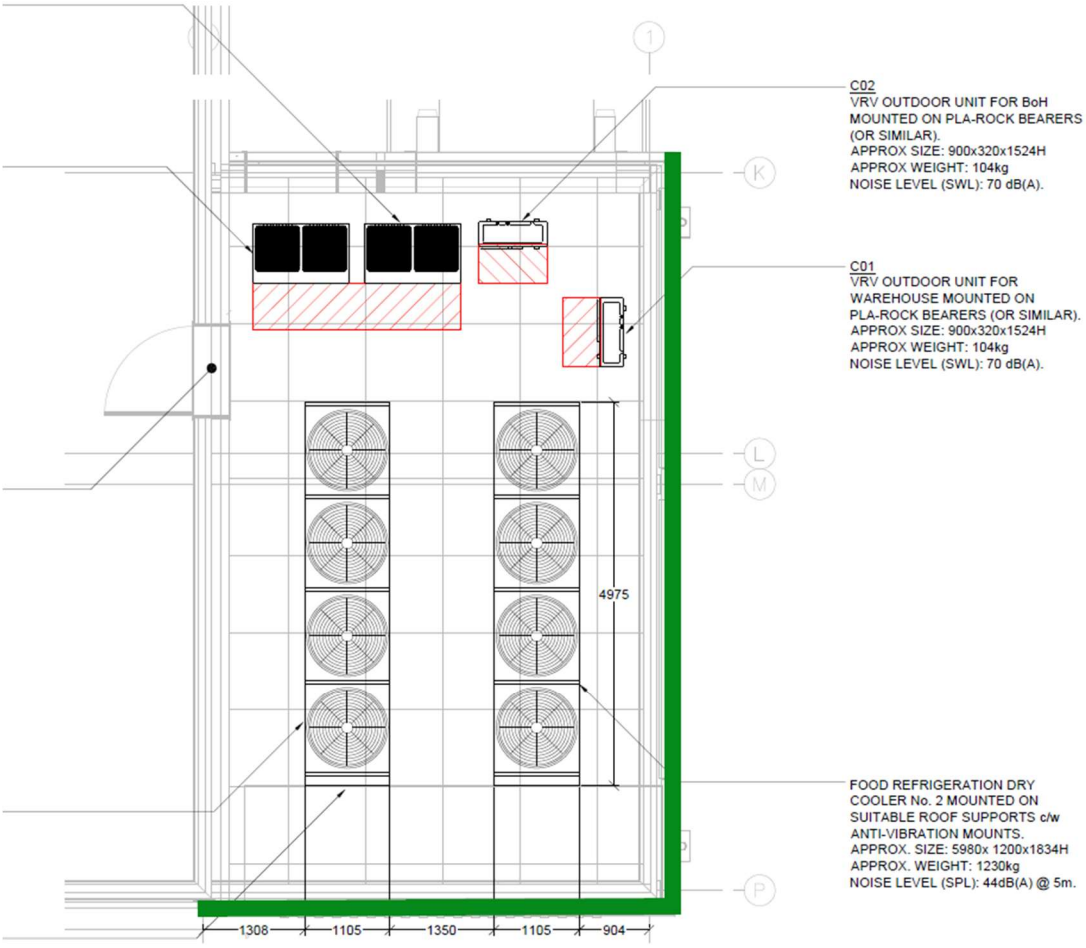
Description	Sound Power Level, dB at Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Basetec Dry Cooler 100kW	75.3	79.3	74.3	69.2	63.2	56.8	50.1	40.6	71
VRV - Daikin RXYSQ6TV9 (100%)	69	69	68	67	66	63	58	47	70.4
VRV - Daikin RXYSQ6TV9 (60%)	65	65	64	63	62	59	54	43	66.4
VRV - Daikin RXYSQ4TV9 (100%)	68	68	68	66	64	58	54	46	68.2
VRV - Daikin RXYSQ4TV9 (60%)	64	64	64	62	60	54	50	42	64.2
VRV – Daikin RXYLQ14T (100%)	83	82	78	77	77	73	70	60	81
VRV – Daikin RXYLQ14T (60%)	71	70	66	65	65	61	58	48	69
AHU-01 Intake	61.4	70.1	70.4	63.2	62.7	62.8	63	57.4	70
AHU-01 Extract	71.9	78.5	79.3	81.5	83.5	82.4	80.1	74.6	88.4
AHU02 Intake	68.3	68.9	67.7	65.3	56.9	51.9	52.5	45.1	65.5
AHU02 Extract	71.4	73	80.2	74.4	70.5	68.6	64.3	59.4	77.2

7.1.10 Since the planning application was approved, several non-material amendments to the store have been approved and the plant is now located on a plant deck at a height of 3.6 m, above the delivery bay to the north façade.

7.1.11 Following the outcome of the initial noise assessment, the noise model in this study included the following mitigation:

- An imperforate barrier to the perimeter of the rooftop plant area, minimum height of 2 m, to the side (north-east elevation) and front (south-east elevation), as indicated by green lines in **Figure 1** below.

Figure 1 Location of Noise Barriers



7.2 BS 4142:2014+A1:2019 Rating Level Assessment

7.2.1 A BS 4142 noise impact assessment has been undertaken to assess the potential impact of noise emissions from external plant during daytime and night-time periods.

7.2.2 Acoustic feature corrections have been considered for the various plant items. No acoustic feature corrections have been added as it is considered that the plant would operate in a steady state with no distinguishable intermittency and would not be tonal. Based on the predicted absolute noise levels of the proposed plant and the existing environmental sound levels at the site, it is considered that any other acoustic characteristics of the plant are unlikely to be readily distinguishable.

7.2.3 The BS 4142 assessments of noise impact at the NSRs are presented in **Table 4**.

Table 4: BS 4142 Assessment of plant noise in isolation

Assessment Period	Receptor	Background Sound Level, dB $L_{A90,15min}$	Specific Noise Level*1., dB $L_{Aeq,Tr}$	Acoustic Feature Correction dB	Rating Level*1., dB $L_{Ar,Tr}$	Excess of Rating level over Background Soid level dB
Daytime	NSR1 (GF)	49	33	0	33	- 16
	NSR2 (GF)		30		30	- 19
Night-time	NSR1 (FF)	33	26	0	26	-7
	NSR2 (FF)		25		25	-8

*1. For daytime scenarios, the assessment period Tr is 1 hour. For the night-time scenario, the assessment period Tr is 15 minutes.

7.2.4 It can be seen from **Table 4** Error! Reference source not found.that the outcome of the BS 4142 assessment indicates a rating level at least 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive receptors.

8 Internal Noise Breakout – Condition 10a)

8.1 Sources of noise in the retail area include hum of refrigeration units, the clatter of shopping carts, and the conversation of customers. In backroom areas, noise sources include plant for refrigeration and freezers, trolley movements and conversations between Lidl employees. However, the levels within Lidl supermarkets are very unlikely to breach the lower exposure values within the Control of Noise at Work Regulations 2005 (the Noise Regulations). Internal sound levels within a Lidl store are therefore unlikely to exceed 80 dB at any time, in any location, including within the storage, chiller or freezer areas.

8.2 Specifications for the walls and glazing elements of the retail unit are provided in the following plans;

- GA sections A:A and B:B dwg T300 rev C
- Ground Floor Wall Types Plan dwg T110 rev B
- Wall Finishes Plan dwg T108 rev B
- Store Front Glazing and Canopy Detail Section dwg T304

8.3 These provide the following wall specifications;

External Wall Construction:

Aarcelormittal Pflaum panel f module 4 (or equal and approved) 1000mm high, horizontally laid with smooth flat face finish fixed directly to primary steel.

Delivery Bay Walls:

Pre-cast concrete sandwich wall with 100mm insulated cavity to specialist sub-contractor's detail.

CASH OFFICE, UTILITY ROOM AND IT ROOM:

146mm metal stud - 2 x 15mm fireline board each side, with securilath steel mesh between external boards, and face flush to concrete upstand inner face

WELFARE AND CLOAKS:

146mm metal stud - 2 x 15mm fireline board each sidewith face flush to concrete upstand inner face

8.4 Typically, noise breakout from any building is dominated by breakout through glazing. Lild stores have a large quantity of glazing and noise breakout from the store is likely to be greatest through this façade element.

8.5 The glazing utilised in the construction of the store will be double-glazed units with laminated safety glass. The specification is 8.8/16/min 8.8mm and the void is argon filled. This detail is provided in Store Front Glazing and Canopy Detail Section dwg T304. The acoustic performance of this glazing is Rw 40. A performance sheet for this glazing specification is provided in **Appendix 3**.

8.6 If the noise level within the store is, at most, 80 dB, the transmitted noise level 1 m from the glazed elevation will be no more than 40 dB.

8.7 The existing ambient sound level during the daytime period is approximately 55 dB LAeq, reducing to approximately 50 dB LAeq by around 23:00 hrs. On this basis, the additional contribution from any store breakout noise would result in no change to the existing ambient sound level.

8.8 During the night-time period, the existing ambient sound level is approximately 45 dB LAeq. The nearest noise sensitive receptors are at least 35 m away. With distance attenuation, this would likely reduce any breakout noise to a level below 35 dB as a conservative worst-case assumption. In which case, the additional contribution from any store breakout noise would result in no change to the existing ambient sound level and would be unlikely to result in any disturbance.

9 Summary and Conclusion

~~9.1~~ A baseline computer noise model of the proposed development and surrounding site has been assembled based on the approved site layout, final plant specifications and mitigation in the form of an acoustic barrier. The likely noise levels at the nearest noise sensitive receptors (NSRs) due to noise from the site have been predicted.

9.2 The data from the environmental sound survey undertaken in July 2022 to support the planning approval has been used to represent the existing sound climate at nearby NSRs during periods when the plant will operate.

9.3 The predicted noise levels and data from the environmental sound survey have been used to assess the potential impact at the most affected NSR during the night-time and day time periods when existing background sound levels are at their lowest whilst the plant is operational.

9.4 The assessment indicates that the rating level of noise from the external plant is at least 5 dB below the typical background (L_{A90}) level at the nearest noise sensitive receptor location. Thus, the limits set in condition 8a) of the planning approval for the development will be achieved and this part of the planning condition can be discharged.

9.5 This report also reviews the potential for internal noise breakout from the retail unit. The building construction specification has been reviewed, in particular, the glazing elements. The building's specification, the likely noise levels within the store, the distance to the nearest sensitive receptors and existing ambient noise levels indicate that noise from within the retail unit will not be significant at nearby sensitive noise receptors. For this reason, condition 10a) of the planning approval can be discharged.

APPENDICES

Appendix 1: Standards and Guidance

1 BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

1.1 BS 4142:2014+A1:2019[2] provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

1.2 The Specific Noise Level - the noise level produced by the source in question at the assessment location - is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

1.3 In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- *Typically, the greater this difference, the greater the magnitude of the impact,*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context,*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context,*
- *The lower the Rating Level is relative to the measured Background Sound Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Sound Level, this is an indication of the specific sound source having a low impact, depending on the context.*

[2] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

1.4 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

> *An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.*

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

2.1 This standard provides recommended guideline acoustic design criteria for new dwellings and is supported by guidance contained within WHO GCN[3]. The guideline noise design criteria of BS 8233 apply to external noise "*without a specific character*" (previously and sometimes termed or referred to as "*anonymous noise*") such as that associated with road and rail traffic.

Internal Amenity

2.2 The Standard states that for external noise without a specific character, such as road traffic, it is desirable that the internal ambient noise level does not exceed the guideline values shown in **Table A3.1.**

2.3 The note to paragraph 7.7.1 states that where noise has a specific character (i.e. it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content) *"lower noise limits might be appropriate".*

Table A3.1: BS 8233: 2014 guideline indoor ambient noise levels for dwellings

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

[3] World Health Organisation Guidelines for Community Noise, 1999

2.4 Note 7 to Table 4 of BS 8233 states:

> *"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."*

2.5 Guidance on reasonable acoustic design criteria for individual noise events are also provided, and the Standard advises that:

> *"regular individual noise events…can cause sleep disturbance. A guideline value may be set in terms of SEL[4] or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values".*

2.6 For Internal spaces, the Standard states that:

> *"…to avoid sleep disturbance, sound pressure levels at the outside facades of living spaces should not exceed 45 dB L_{Aeq} (taken as a façade level, and equating to a free-field external level of 42 dB L_{Aeq}) and 60 dB L_{AFmax} so that people may sleep with bedroom windows open."*

External Amenity

2.7 BS 8233:2014 adopts guideline external noise values provided in WHO for external amenity areas such as gardens, patios and private outdoor amenity spaces. BS 8233:2014 adopts guideline external noise level limits provided in WHO for external amenity areas such as gardens and patios. The standard states that it is "*desirable*" that the external noise does not exceed 50 dB $L_{Aeq,16hr}$ with an upper guideline value of 55 dB $L_{Aeq,16hr}$ whilst recognising in paragraph 7.7.3.2 that development in higher noise areas, such as urban areas or those close to the transport network, may require a compromise between elevated noise levels (i.e., above 55 dB $L_{Aeq,16hr}$) and other factors that determine if development in such areas is warranted. In such circumstances, the development should be designed to achieve the lowest practicable noise levels in external amenity areas, but should not be prohibited.

2.8 The standard also states:

[4] Sound exposure level or L_{AE}

"Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

Appendix 2: Site Location and NSR Locations

Appendix 3: Glazing Specification

GUARDIAN GLASS

Acoustic Performance

Glazing Configuration

8.76mm (44.2) LamiGlass (PVB)
16mm Cavity
8.76mm (44.2) LamiGlass (PVB)

Sound Reduction Indices

Frequency, Hz / dB*						Rw	C	Ctr	OITC	STC
125	250	500	1000	2000	4000	40	-1	-4	33	40
29	34	40	41	39	56					

*The values expressed in the frequency table correspond to the central values of the 1/3 octave band

Disclaimer: The acoustic performance data provided in the reports is based on a test protocol or an estimation and may be used if user actual glazing is identical to input data described herein. Acoustic performance data herein is only applicable for glazing dimensions 1,23 m x 1,48 m (as per testing standard). Estimation of acoustic performance is based on component-similarity assumptions which are derived from measured data and interpolation to expand the database of values from test protocols. Due to inherent variations in acoustic performance when testing in accordance with EN ISO 10140-3/EN ISO 10140-2, some variation in the calculated performance can also be expected. As such, the weighted performance, Rw, and adaptation terms, C and Ctr, should typically be considered to be accurate within ±2 dB. However, wider deviations can occur. Actual performance may vary according to the glazing dimensions, frame system, noise sources and many other parameters. The acoustic performance data herein should not be used as a substitute for tests of actual glazing. For more information, please consult Assumptions and Terminology section in Guardian Acoustic Assistant. By accessing this calculator, you agree not to alter or modify the generated report data and information, by any means. Any manual alteration will be your own responsibility and will annul all the content of the report.

Tuesday, April 15, 2025 | Acoustic database 20221229 | ASSUMPTION

Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under laboratory conditions.

dB L_A Decibels measured on a sound level meter incorporating a frequency weighting (A-weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A.

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014+A1:2019 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

$L_{AF,max}$ The highest A-weighted noise level recorded during the time period using a Fast time-weighting. It is usually used to describe the highest noise level that occurred during the event.

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