

NOISE ASSESSMENT

on behalf of

CARITAS DIOCESE OF SALFORD

for the site at

**CARITAS HOUSE, NOBBY STILES DRIVE,
MANCHESTER, M4 4FA**

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Summary

A noise assessment was undertaken to predict the potential impact on a proposed supported housing development consisting of approximately 19 rooms at Caritas House, Nobby Stiles Drive, Manchester, M4 4FA. This was requested by the Local Authority to support a planning application for the development.

Measurements were made at the proposed site to identify the pre-development baseline noise levels. This data was subsequently used to predict the potential impact of noise from existing noise sources close to the proposed development when in use.

A noise model has been assembled for the proposed development site, the results from which are provided within this report.

The assessment shows that guideline internal noise limits can be achieved with the use of appropriate acoustic mitigation.

Record of changes

Prepared By: Sarah Cook

Reviewed By: Michael Rickard MIOA

Signed:



Date:

15/11/2023

Signed:



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1 Introduction

- 1.1 Miller Goodall Ltd has, on behalf of Caritas Diocese of Salford, undertaken a noise assessment in respect of the impact of noise on a proposed residential development for a homeless centre.
- 1.2 The report provides an assessment of existing environmental noise sources at the site which may have an impact on the amenity of the proposed residential units.

2 Site Description

- 2.1 The site is located approximately 1 km to the north-east of Manchester city centre and is currently occupied as office space by Caritas Salford. The site was originally built as a residential care home.
- 2.2 The site is located on Nobby Stiles Drive, with Rochdale Road being the closest main road. A carpark is located to the north of the site which is shared with the church, and further north of the site is a trainline. The site is located between two primary schools, and St Patrick's Church borders the south-east facade.
- 2.3 The site location is shown in Appendix 1.

3 Proposed Development

- 3.1 The proposal is for a change of use from offices to a residential site. The site is owned by Diocese of Salford, a local charity, who plan on using it as housing for homeless men with the planning use class understood to be determined as C3 (Dwellinghouses).
- 3.2 The site would have capacity to house 19 homeless men for a short period and support would be provided to help them move into their own accommodation or longer-term supported accommodation if needed. The building was originally designed as a residential care home and therefore, needs very little modification for supported housing.
- 3.3 Road access to the development is located off Nobby Stiles Drive. The site would be run and managed by Caritas Salford.
- 3.4 The current site layout is shown in Appendix 2.

4 Policy Context

4.1 Noise Policy Statement for England

4.1.1 The Noise Policy Statement for England (NPSE¹), published in March 2010, sets out the long-term vision of *Government noise policy*. *The Noise Policy aims, as presented in this document, are:*

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

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

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

4.1.3 The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the Statement). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

“...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development”.

4.1.4 Importantly, the NPSE goes on to state:

“This does not mean that such adverse effects cannot occur”.

¹ Noise Policy Statement for England, Defra, March 2010

- 4.1.5 The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

“Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available”

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

4.2 National Planning Policy Framework

- 4.2.1 The National Planning Policy Framework (NPPF²) initially published in March 2012, was updated most recently in September 2023. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) “Planning and Noise”³.

- 4.2.2 The revised NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

“to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”

- 4.2.3 At par. 174 we are advised that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local

² National Planning Policy Framework, Ministry of Housing, Communities and Local Government, September 2023

³ Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans...”

4.2.4 Par. 185 goes on to state:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; ...”

4.2.5 Par. 187 seeks to ensure that any development does not prejudice the legally permitted operations and activities of other, existing non-residential uses, stating:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

4.3 Planning Practice Guidance – Noise

4.3.1 As of March 2014, a Planning Practice Guidance⁴ for noise was issued which provides additional guidance and elaboration on the NPPF, the guidance was updated in July 2019. It advises that

⁴ Planning Practice Guidance – Noise, <https://www.gov.uk/guidance/noise--2> 22nd July 2019.

when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

4.3.2 In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

“...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation”.

4.3.3 Examples of these factors include:

- The source and absolute noise level of the source along with the time of day that it occurs;
- Where the noise is non-continuous, the number of noise events and pattern of occurrence;
- The frequency content and acoustic characteristics of the noise;
- The effect of noise on wildlife;
- The acoustic environment of external amenity areas provided as an intrinsic part of the overall design;
- The impact of noise from certain commercial developments such as night clubs and pubs where activities are often at their peak during the evening and night.

4.3.4 The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

“Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed”.

4.3.5 The PPG was amended in December 2014 to clarify guidance on the potential effect of noise from existing businesses on proposed new residential accommodation. Even if existing noise levels are

intermittent (for example, from a live music venue), noise will need to be carefully considered and appropriate mitigation measures employed to control noise at the proposed accommodation.

5 Local Authority Consultation

- 5.1 Manchester City Council were contacted regarding the noise survey on 4th October 2023 by Sarah Cook. A reply from Karen Williamson from Manchester City Council was received on the 10th October 2023, asking us to take into account the noise from Livesey Street and the large warehouse on Oldham Road.

6 Local Authority Policy

- 6.1 In October 2022, Manchester City Council adopted the 'Planning and Noise: Technical Guidance':
- 6.2 Section 3.7.1.1 gives the following limits for noise at residential properties based on BS 8233:2014 and WHO 'Guidelines for Community Noise' guidance:
1. Bedrooms (Night Time – 23:00 to 07:00): The noise level should not exceed 30 dB LAeq. Additionally, individual noise events should not normally exceed 45 dB LAFmax more than ten times during this period.
 2. Living Rooms (Daytime – 07:00 to 23:00): The noise level should be kept at or below 35 dB LAeq.
 3. Gardens and Terraces (Daytime): The noise level should not exceed 55 dB LAeq.

7 Acoustic Standards and Guidance

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

- 7.1.1 This standard carries the full weight of an adopted British Standard, provides recommended guideline acoustic design criteria for new dwellings and is supported by guidance contained within WHO GCN⁵. 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.

⁵ World Health Organisation Guidelines for Community Noise, 1999

Internal Amenity

7.1.2 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 1 below.

7.1.3 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 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 $L_{Aeq,8hr}$

7.1.4 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.”

7.1.5 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^6 or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values”.

7.1.6 For Internal spaces, the Standard states that;

⁶ Sound exposure level or L_{AE}

“..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

7.1.7 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.

7.1.8 The standard also states:

“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.”

7.2 World Health Organisation (WHO) Guidelines for Community Noise 1999

- 7.2.1 The WHO Guidelines 1999 recommends that to avoid sleep disturbance, indoor night-time guideline noise values of 30 dB L_{Aeq} for continuous noise and 45 dB L_{AFmax} for individual noise events should be applicable. It is to be noted that the WHO Night Noise Guidelines for Europe 2009⁷ makes reference to research that indicates sleep disturbance from noise events at indoor levels as low as 42 dB L_{AFmax} . The number of individual noise events should also be taken into account and the WHO guidelines suggest that indoor noise levels from such events should not exceed approximately 45 dB L_{AFmax} more than 10 – 15 times per night.
- 7.2.2 The WHO document recommends that steady, continuous noise levels should not exceed 55 dB L_{Aeq} on balconies, terraces and outdoor living areas. It goes on to state that to protect the majority of individuals from moderate annoyance, external noise levels should not exceed 50 dB L_{Aeq} .

⁷ WHO Night Noise Guidelines for Europe 2009

8 Noise Survey

8.1 Measurements of Existing Noise Sources

8.1.1 Noise measurements were undertaken at a location consistent with the proposed development in accordance with BS 7445-1: 2003⁸ by Sarah Cook of Miller Goodall Ltd. The calibration of the sound level meter was checked before and after measurements with negligible deviation (<0.1 dB). Details of the equipment used are shown in Table 2, below.

Table 2: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1 Calibrator ⁹	CAL 200	Larson Davies	14154	13/09/2023	06431/1
Class 1 ^{10,11} Integrating Real Time 1/3 Octave Sound Analyser	NTi XL2-TA	NTi Audio	A2A-15860-E0	27/02/2023	06143/1
Microphone	NTi MC230A	NTi Audio	A16445	27/02/2023	06143/1
Pre-amplifier	NTi MA220	NTi Audio	8102	27/02/2023	06143/1
Outdoor microphone housing	NTi WP30	NTi Audio	NA	NA	NA

8.1.2 Noise monitoring was undertaken at the times specified in Table 3, below. Weather conditions were determined both at the start and on completion of the survey. It is considered that meteorological conditions were appropriate for environmental noise measurements. Measurement locations are shown in Appendix 1.

⁸ BS 7445-1: 2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

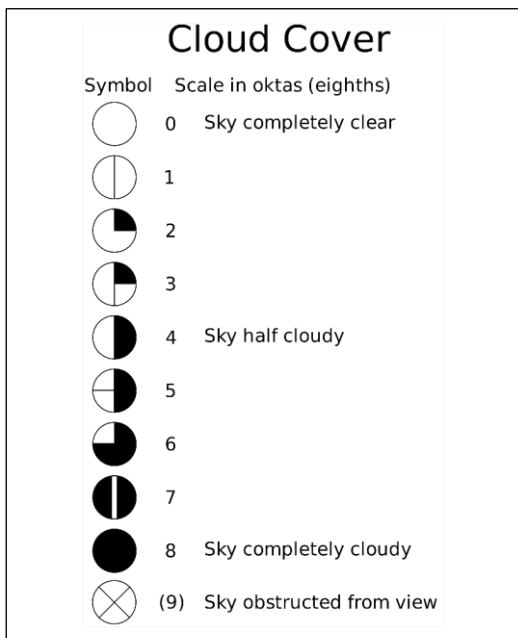
⁹ IEC 60942 (2003) Electroacoustics – Sound calibrators

¹⁰ IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

¹¹ IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

Table 3: Dates, times and weather conditions during noise measurements

Measurement Locations	Date/Time	Weather conditions		
		Description	At Start of Survey	On Completion
P1	16/10/23, 16:45 to 17/10/23, 17:00	Temperature:	11 °C	14 °C
		Precipitation:	Dry	Dry
		Cloud cover (oktas – see opposite):	3	3
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	No	Slight
		Wind speed:	3 m/s	5 m/s
		Wind direction:	West	West
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No



8.1.3 Measurements were taken at times considered to be representative of the periods during which the proposed residential accommodation would be subject to the highest levels of ambient noise. Measurements were made 1 m from the building façade on the first floor, at a height of 4 m above the ground, over a period of 24 hours.

8.1.4 The noise sources within the vicinity of the measurement locations are summarised in Table 4, below:

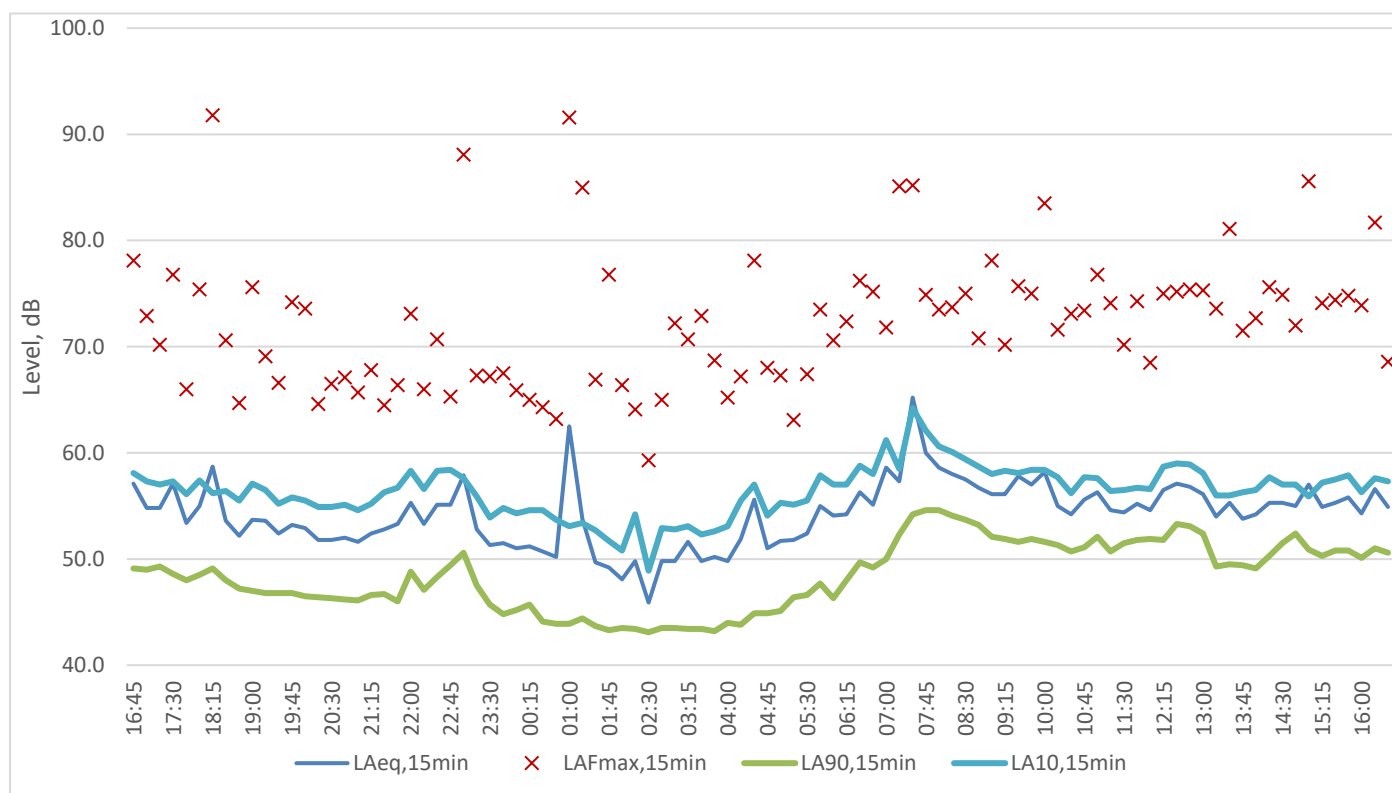
Table 4: Description of noise sources affecting the site

Measurement Location	Description of Measurement Location and Condition	Noise Sources
P1	Outside of a room on the first floor of the building. Microphone on pole approximately 1m from building façade.	Noise from school across the road, road noise, background noise from offices as room was occupied during the day.*

* No noise was audible from the warehouses on Oldham Road, including the royal mail HGV depot, and given the distance to these sources (at least 180 m) and the many intervening buildings, noise from these sources is not considered to contribute to the environmental noise levels at the site, which are dominated by regular traffic, particularly along Rochdale Road, which is the primary source of noise.

8.2 Monitoring Results

8.2.1 A summary of the broadband measurement data is provided in Chart 1 below. All data are sound pressure levels in dB re 20 μ Pa.

Chart 1: Broadband noise

- 8.2.2 Each measurement period consisted of sequential 15-minute samples which therefore allowed the variation in noise level over time to be assessed. 1-minute L_{AFmax} data was also analysed in order to determine the 11th highest L_{AFmax} noise level during the night time for the assessment of L_{AFmax} noise levels.
- 8.2.3 Noise monitoring data has been used to calibrate a computer noise model of the site. During visits to the site and site walkovers it was determined that the road traffic on Rochdale Road was the greatest contributor to ambient noise, with Livesey Street having far less traffic by comparison. As a worst-case simplification therefore, the noise at the site is modelled with Rochdale Road as the primary noise source, with any secondary contributions from Livesey Road or Abbot Community School being subsumed in the model, which has been calibrated to match the total noise levels recorded throughout the survey.
- 8.2.4 Octave band frequency data was obtained during surveying, and this was utilised within noise ingress calculations to determine suitable mitigation in terms of glazing and ventilation requirements. This source data is provided in Table 5, below.

Table 5: Octave band free-field external noise level spectra at MP1

Measurement Descriptor	Sound Pressure Level, dB(A)								dB(A)
	in Octave Band Centre Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	
Daytime noise level, $L_{eq,T}$	35	36	42	46	50	51	50	38	56
Night time noise level, $L_{eq,T}$	31	33	38	43	48	48	48	37	54
Maximum noise level, L_{Fmax}	43	54	56	60	63	66	71	44	73

- 8.2.5 The night time maximum noise level spectrum was taken as an average of the top 11 L_{AFmax} events, adjusted to give a level equal to the 11th highest L_{AFmax} event.

9 Impact of Existing Noise Sources on the Development

9.1 Computer Modelling

9.1.1 Predictions of existing noise levels on the site have been undertaken using the CadnaA noise modelling package. Specific model parameters were applied as follows:

- Propagation of noise using algorithms within ISO 9613: 1993 *Acoustics – Attenuation of sound during propagation outdoors*. Roads were modelled as line sources at a height of 0.5 m above ground level and calibrated using spectral data measured during the survey.
- Default ground absorption $G = 0.1$
- Ground attenuation: spectral all sources
- No adverse meteorological effects
- Two orders of reflection
- Topographical data was obtained DEFRA LIDAR data.

9.2 Validation of the Noise Model

9.2.1 A noise level receptor point was incorporated into the CadnaA model at the noise survey measurement location to calibrate the model using the measured octave band L_{eq} and L_{Fmax} noise levels. The modelled results agreed with the measured results to within ± 0.1 dB.

9.3 Noise Model Predictions

9.3.1 Three scenarios were modelled using the indicative master plan provided: daytime L_{Aeq} noise levels affecting the site, night-time L_{Aeq} noise levels and night-time L_{AFmax} noise levels. Modelling outputs are provided in Appendix 3.

9.3.2 The noise modelling demonstrates that the noise levels at worst-case (northwest facing elevations) are likely to be 56dB $L_{Aeq,16h}$ in the daytime, and that the night time noise levels are likely to be 54dB $L_{Aeq,8h}$, with a representative night time maximum noise level of 73 dB L_{AFmax} .

9.3.3 Environmental noise levels at the site are slightly too high for internal noise limits to be achieved while windows are open, and therefore recommendations for glazing and trickle ventilator specifications that would result in suitable internal levels when windows are closed are provided in the following section.

9.4 Mitigation for Achieving Suitable Internal Noise Levels

9.4.1 In order to assess the potential glazing and ventilation requirements for dwellings, noise ingress calculations were undertaken based on the methodology in BS EN 12354-3¹². The following assumptions were made regarding the internal rooms:

- 'Normal' internal surface finished e.g., carpeted with curtains etc.
- Reverberation time of 0.5 s
- One trickle vent in each room

9.4.2 Room dimensions and glazing areas have been taken from the plans provided by Caritas Salford.

9.4.3 The areas of the proposed site where internal noise may exceed the standards when windows are open are bedrooms on elevations closest to, and facing, Nobby Stiles Drive.

9.4.4 The results from the noise ingress calculations with mitigation are provided in Table 8, below:

Table 6: Predicted internal noise levels

Description	External Noise Levels		Predicted Internal Noise Levels		BS 8233 Criteria		Exceedance of Criteria		Proposed Glazing and Ventilation
	dB $L_{Aeq,T}$	dB L_{AFmax}	dB $L_{Aeq,T}$	dB L_{AFmax}	dB $L_{Aeq,T}$	dB L_{AFmax}	dB $L_{Aeq,T}$	dB L_{AFmax}	
Daytime – façade closest to Nobby Stiles Road	56	–	29	–	35	–	–6	–	Option 1
Night time – façade closest to Nobby Stiles Road	54	73	26	44	30	45	–4	–1	Option 1
Daytime – existing office on west elevation (future bedroom)	55	–	30	–	35	–	–5	–	Option 2

¹² BS EN 12354-3:2000 Building acoustics. Estimation of acoustic performance in buildings from the performance of elements – Airborne sound insulation against outdoor sound

Description	External Noise Levels		Predicted Internal Noise Levels		BS 8233 Criteria		Exceedance of Criteria		Proposed Glazing and Ventilation
	dB $L_{Aeq,T}$	dB L_{AFmax}	dB $L_{Aeq,T}$	dB L_{AFmax}	dB $L_{Aeq,T}$	dB L_{AFmax}	dB $L_{Aeq,T}$	dB L_{AFmax}	
Night time – existing office on west elevation (future bedroom)	53	72	27	45	30	45	-3	0	Option 2

- **Option 1** – Glazing with minimum weighted sound reduction index of 27 dB $R_w + C_{tr}$ (e.g. 4/12/4); ventilators with a minimum element normalised sound level difference of 34 dB $D_{ne,W} + C_{tr}$.
- **Option 2** – Glazing with minimum weighted sound reduction index of 27 dB $R_w + C_{tr}$ (e.g. 4/12/4); ventilators with a minimum element normalised sound level difference of 29 dB $D_{ne,W} + C_{tr}$.

9.4.5 It can be seen from Table 8 that rooms on the noisiest elevation are predicted to satisfy the internal noise level requirements with glazing with the proposed mitigation measures in place. Glazing configurations are indicative only and it is the $R_w + C_{tr}$ and $D_{ne,W} + C_{tr}$ ratings which must be achieved by the glazing and ventilation elements respectively. $R_w + C_{tr}$ ratings apply to the complete glazed assembly including frames and seals.

9.4.6 The locations where uprated glazing / vent specs are required is laid out in Appendix 2. All facades marked in **RED** will require **option 1** facade treatments and all facades marked in **BLUE** will require **option 2** facade treatments.

9.4.7 For dwellings with habitable rooms facing away from road sources or where shielding from other buildings is provided, a lower specification of glazing or ventilation may be feasible. These facades are marked in **GREEN** and will meet internal noise criteria with standard thermal double glazing and any standard trickle ventilator. Final proposals for glazing and ventilation options would need to be reviewed as the final master plan of the site is developed at the reserved matters stage. Trickle ventilation with CMEV has been assumed as a typical ventilation strategy where windows are required to be closed to meet indoor noise criteria.

10 Consideration of Other Discipline Requirements

- 10.1 It is recommended that you confirm the suitability of all recommended noise mitigation measures with your architects, structural engineers, building contractors, fire consultants and material manufacturers prior to procurement and field application so 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.

11 Conclusions

- 11.1 A noise assessment has been undertaken at the site of a proposed development of land at Caritas House, Nobby Stiles Drive, Manchester to support a planning application. Measurements have been taken to determine the ambient noise levels affecting the proposed site. Recommended glazing and ventilation specifications have been provided to enable the recommended internal noise limits to be achieved within the properties.
- 11.2 Final proposals for glazing and ventilation options would need to be reviewed as the final master plan of the site is developed at the reserved matters stage.
- 11.3 With the implementation of these recommendations, it is considered that a suitable and commensurate level of protection against noise will be provided to the occupants of the proposed dwellings and the site is suitable for development.

APPENDICES

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Appendix 1: Site Location and Survey Position (outside 1st floor window)

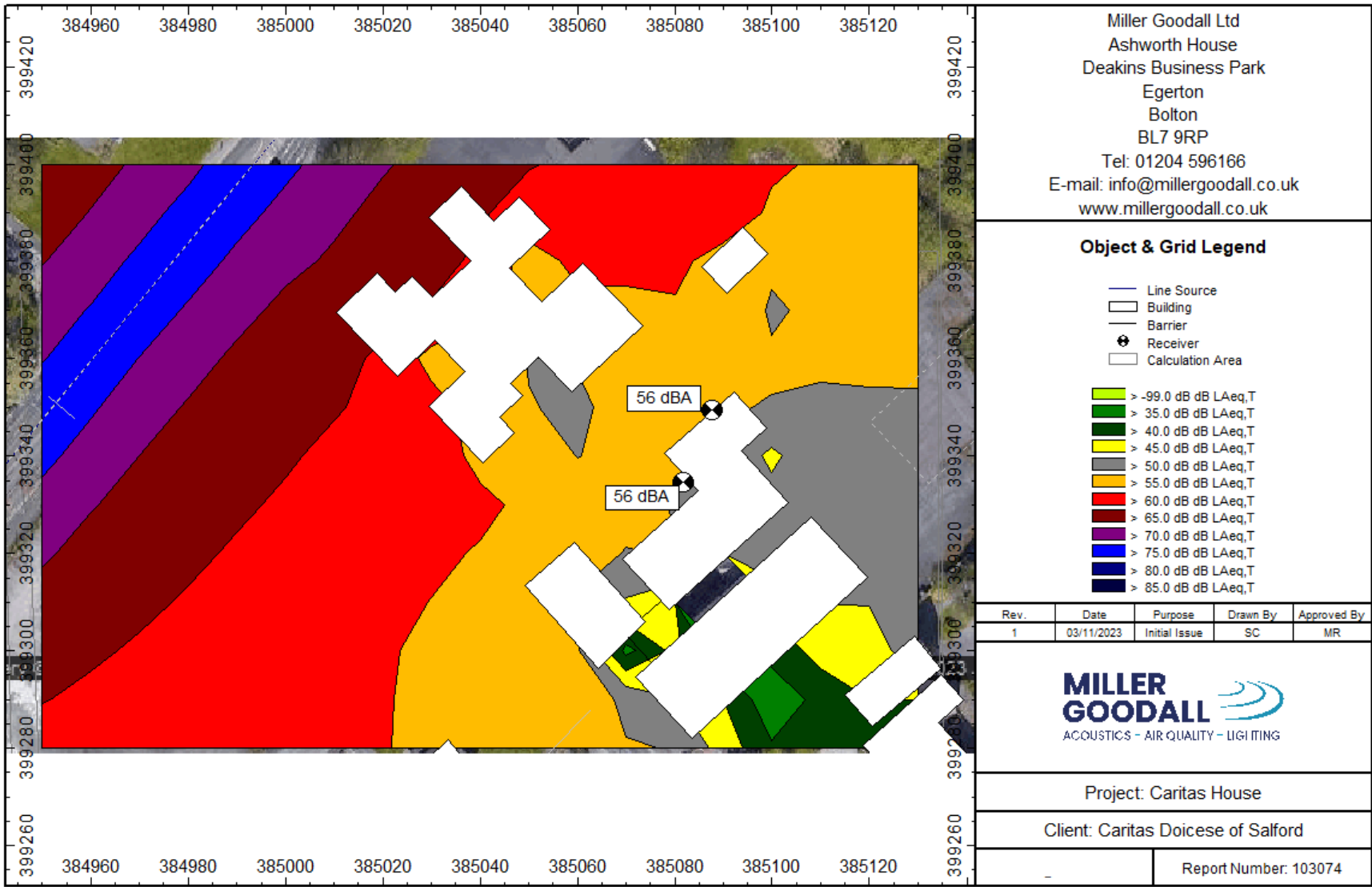


RED - Option 1

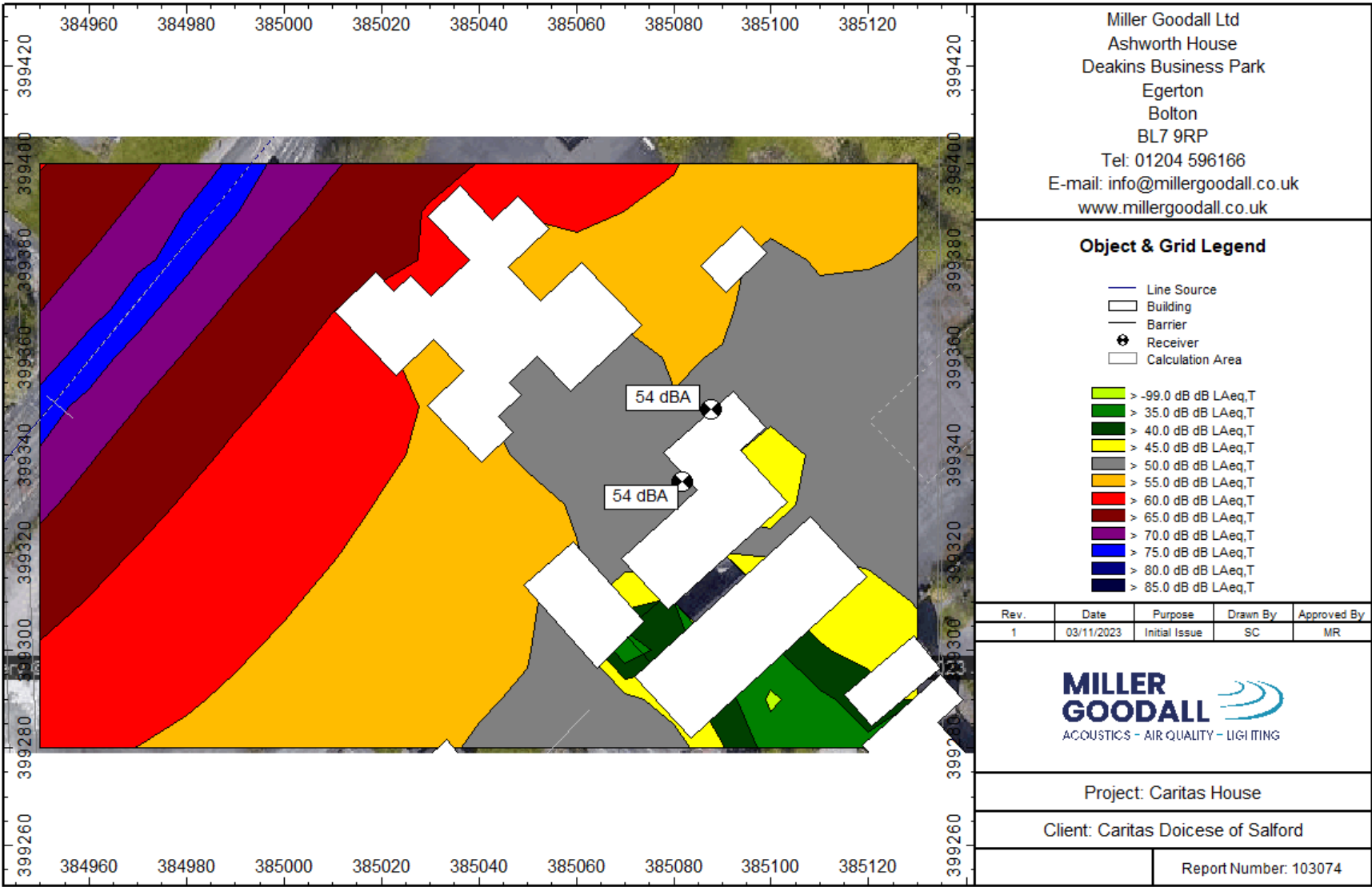
BLUE - Option 2

GREEN - Any standard thermal double glazing and trickle ventilator

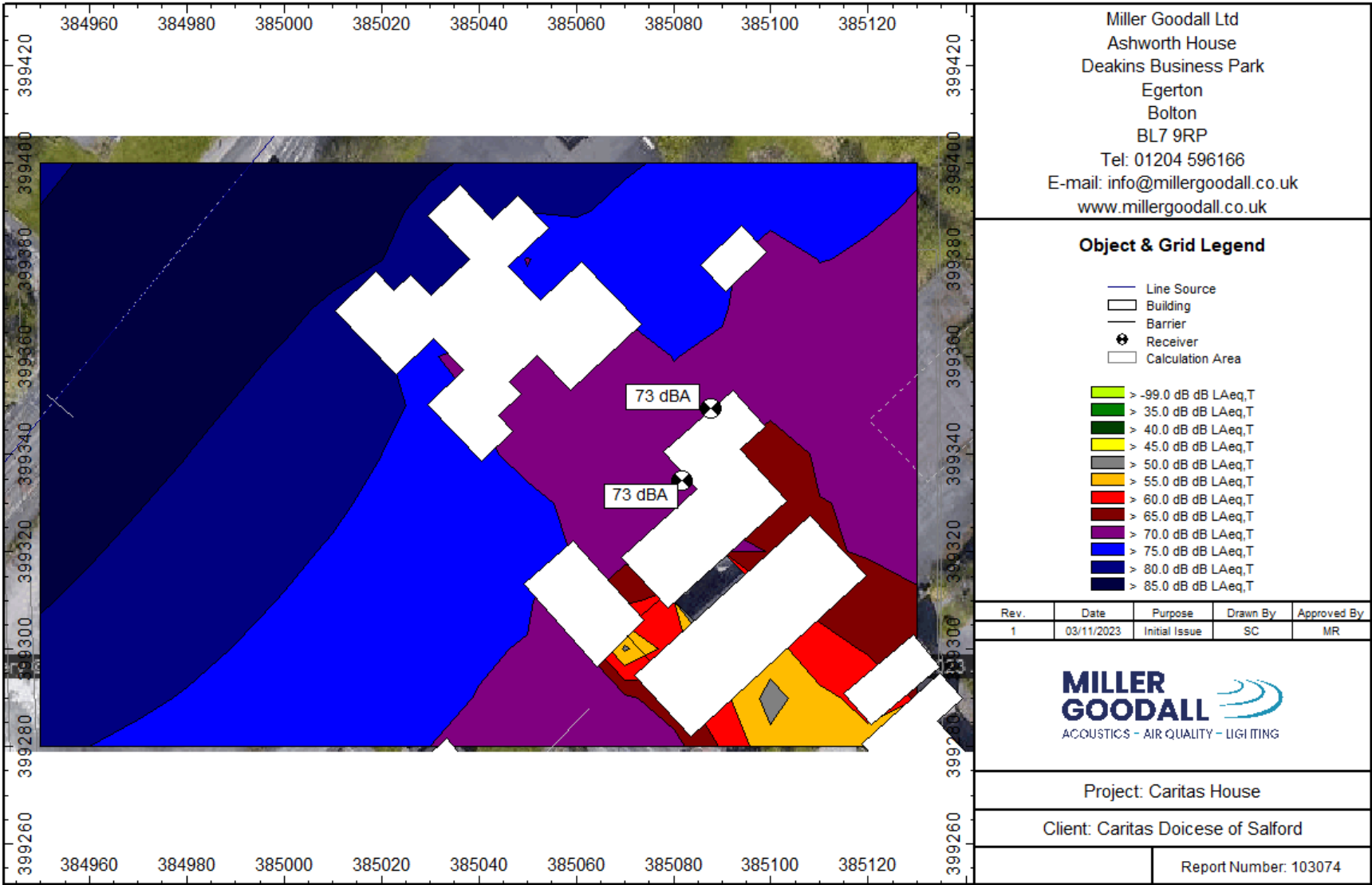
Appendix 3a: Noise Model Output – Daytime $L_{Aeq,16h}$ at 4.0m



Appendix 3b: Noise Model Output – Night time $L_{Aeq,8h}$ at 4.0m



Appendix 3c: Noise Model Output – Night time L_{AFmax} at 4.0m



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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 controlled 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_{Amax} The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.

$L_{A10(18\text{ hour})}$ Often referred to as the UK road traffic noise index, this is the arithmetic average of the values of L_{A10} hourly for each of the 18 one hour periods between 06:00 and 00:00.

R_w Single number rating used to describe the sound insulation of building elements and is defined in BS EN ISO 10140-2: 2010 (formerly BSEN ISO 140-3:1995). It is derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.

- $D_{ne,w}$** The weighted element-normalized level difference is a single figure rating used to describe the sound insulation of small elements within a larger construction and is defined in BS EN ISO 10140-2:2010 (BSEN ISO 140-10:1991). It is most often used to rate the sound insulation performance of ventilator units e.g. trickle vents.
- C_{tr}** A single-number spectrum adaptation term used to characterise the sound insulation rating with respect to urban traffic. It is defined in ISO 717-1:20-13.

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