
GS CONSTRUCTION (NW) LTD

NOISE IMPACT ASSESSMENT REPORT

**41 BERRY BROW, NEWTON HEATH, MANCHESTER M40
1GR**

Client: GS Construction (NW) Ltd

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REPORT VERSION CONTROL:

Document Reference	Date	Report Prepared by	Report Checked and Authorised by
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1 INTRODUCTION

1.1 Overview

- 1.1.1 By instruction from GS Construction (NW) Ltd ('the client'), NoiseAir was commissioned to undertake a noise impact assessment (NIA) in support of a discharge of conditions application for a residential dwelling, herein referred to as 'the consented development site'.
- 1.1.2 General limitations with respect to this NIA are outlined in **Appendix A**.

1.2 Site Description

- 1.2.1 The assessment site is located at 41 Berry Brow, Newton Heath, Manchester M40 1GR. The site location and context are shown in figures below.



Figure 1: Site Location and context

- 1.2.2 The site is a completed new-build residential dwelling with an outstanding planning condition relating to internal noise levels. The applicant seeks to discharge the condition.

1.3 Condition 5 – Noise Requirements and Planning History

1.3.1 The site lies within the administrative boundary of Manchester City Council and was granted approval subject to conditions in February 2020 (planning ref. 125555/FO/2019).

1.3.2 Condition 5 of the decision notice relates to internal noise levels and states:

“Condition 5: Before the development commences a scheme for acoustically insulating the proposed residential accommodation against noise from the train crossing and passing trains shall be submitted for approval in writing by the City Council as local planning authority.

The approved noise insulation scheme shall be completed before the first occupation of the development hereby approved.

Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary.

The following noise criteria will be required to be achieved:

- *Bedrooms (night-time 23:00-07:00) 30 dB L_{Aeq} (individual noise events shall not exceed 45 dB $L_{Amax,F}$ more than 15 times)*
- *Living Rooms (daytime 07:00-23:00) 35 dB L_{Aeq}*
- *Gardens and terraces (daytime) 55 dB L_{Aeq}*

Upon completion of the development and before first occupation of the development, a verification report will 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 the internal noise criteria has 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 internal noise criteria.”

1.3.3 A subsequent application for the discharge of several conditions was submitted (application ref CDN/21/0087), which included a noise assessment by Nova Acoustics (report ref 5255GS dated 21/11/2020), which specified glazing and ventilation strategy options based on noise measurements that would achieve the criteria contained within the condition.

-
- 1.3.4 A partial discharge of condition 5 was granted in February 2021 with the following comments:

“5 Noise (Partially Discharged)

The information contained within the submitted Acoustic Report by Nova Acoustics stamped as received on the 15 January 2021 and the email from Clarkes Bespoke Design Ltd dated 17 May 2021 is satisfactory.

Based on the above, condition 5 may be partially discharged, with full discharge available upon the submission and agreement of a Verification Report upon completion of the development, in order to validate the works undertaken conform to the recommendations and requirements contained within the report. The report should contain details of mechanical ventilation, CRN (Rail noise calculations) based on a time table outside of the pandemic to establish if the noise levels we measured were representative and post completion testing to confirm that the internal noise criteria has been met. Any instances of non-conformity with the recommendations contained within the report shall be detailed, along with any measures required to ensure compliance with the internal noise criteria”

- 1.3.5 At the time of writing, acoustic conditions and rail traffic are generally accepted to have returned to ‘normal’ subsequent to the Covid-19 pandemic, and direct measurement at the dwelling can now be deemed representative.
- 1.3.6 The comments also contain reference to CRN calculations, but none are present in the Nova Acoustics report. It is likely that this refers in error to 29 Berry Brow, which directly overlooks the railway line and was issued with a similar condition. This forms part of a separate application by the same applicant and is addressed under separate cover. Since noise levels are now representative, noise levels can be directly measured at the property and predictions are no longer necessary.
- 1.3.7 The comments also refer to “details of mechanical ventilation”. The Noise Assessment submitted provided options for both mechanical and passive ventilation strategies that would achieve the required criteria. Since a passive ventilation strategy was demonstrated to be feasible with trickle ventilators within the assessment, the applicant opted to implement a passive ventilation strategy. The request for details about mechanical ventilation is therefore no longer applicable.

1.4 British Standard 8233:2014 (BS 8233:2014)

1.4.1 British Standard 8233:2014 – *Guidance on sound insulation and noise reduction for buildings* (BS 8233) provides guidance on internal ambient noise levels, resulting from break-in of external environmental noise that should not be exceeded in various locations within dwellings.

1.4.2 Guidelines for buildings in terms of internal noise level are reported in **Table 1**.

Table 1: Summary of internal noise guidelines.			
Activity	Location	0700 – 2300 hours	2300 – 0700 hours
Resting	Living Room	35 dB L _{Aeq,16hour}	-
Dining	Dining room / area	40 dB L _{Aeq,16hour}	-
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16hour}	30 dB L _{Aeq,8hour}

1.4.3 The standard clarifies that these values are based on the existing guidelines issued by the World Health Organisation (WHO). In addition, it states that the internal noise levels may be relaxed by up to 5 dB whilst maintaining a reasonable living condition. Conversely, in terms of internal maximum levels to be achieved during the night, the standard does not recommend any limits for individual noise events. However, a guideline value may be set in terms of SEL or L_{AFmax}, depending on the type and the number of events per night.

1.4.4 The requirements of Condition 5 are based upon this standard.

1.4.5 With regards to ventilation, BS 8233:2014 also states in Section 8.4.5.4:

“Ventilation

The Building Regulations’ supporting documents on ventilation recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant’s choice.”

1.4.6 In the case of 41 Berry Brow, sound attenuating trickle ventilators have been provided in line with the above. The number and size of trickle ventilators per room has been specified in line with Approved Document F requirements and deemed compliant by the Building Inspector.

1.5 Local Planning Policy – Manchester City Council Planning and Noise Technical Guidance (October 2022)

- 1.5.1 Manchester City Council has published technical guidance in relation to planning and noise requirements. The document supports the position of BS 8233:2014 with regards to ventilation:

“5.3.1.6 Ventilation & Overheating

Occupants should be provided with a supply of fresh air in habitable rooms without having to open the windows (whilst also having the option to do this for purge ventilation, or at the occupants’ discretion i.e. to reduce the potential for overheating).

If partially open windows were relied upon for background ventilation, the insulation would be reduced to 10-15 dB. The indoor noise level criteria for bedrooms and living rooms do not need to be achieved when windows are opened to achieve Part F purge ventilation requirements.

Where ambient noise levels are high a scheme of ventilation will need to be provided that does not compromise the acoustic attenuation afforded by the glazing. This may come in the form of individual window trickle vents or acoustic trickle vents.

Whilst these types of vents do not usually replace opening windows, they aim to minimise the need to open windows, providing a more comfortable internal noise level. The use of acoustic trickle vents can be used to permit adequate background ventilation as required by the Building Regulations Part F. Although it is worth noting that ventilation requirements can vary from dwelling to dwelling.

These vent types usually have an acoustic performance in excess of uprated glazing, whilst still allowing background ventilation to occur.

Where ambient noise levels are more extreme and the opening of windows is likely to be required to increase ventilation rates, then it may be necessary to consider forced acoustically treated mechanical ventilation.”.

- 1.5.2 The guidance further states:

“When undertaking residential environmental noise assessments noise break-in calculations (as per BS 8233:2014) must be made to determine what ventilation strategy is required to achieve the internal noise criteria.

Based on the results of the break-in calculations, the acoustician should advise the developer / design team when trickle ventilators are not a suitable background ventilation strategy, and include a suitable recommendation for a mechanical scheme in the acoustic report to accompany the planning application.”

- 1.5.3 In the case of 41 Berry Brow, the noise assessment upon which a partial discharge of Condition 5 was granted determined that alternative ventilation to open windows would be required.
- 1.5.4 It was demonstrated by calculation in the previous noise assessment that acoustic trickle ventilators would be sufficient to achieve the internal noise criteria required by the condition, meaning that forced mechanical ventilation would not be required. Trickle ventilators were therefore implemented in line with Manchester City Council (MCC) published guidance. This is consistent with the position of BS 8233:2014.
- 1.5.5 Where noise levels are ‘extreme’, even the introduction of acoustic trickle ventilators is sometimes insufficient to control internal noise levels, meaning the mechanical ventilation would be required, typically ducted from a quieter façade. This is not the case at 41 Berry Brow, (as demonstrated by the previous noise assessment). Therefore, the guidance referring to ‘forced acoustically treated mechanical ventilation’ is not applicable to the development.

1.6 Scope of Works

- 1.6.1 At the time of writing, the development is constructed and unoccupied. Noise levels have therefore been measured internally within first floor rooms on both the northern and southern facades.
- 1.6.2 The results are assessed against the criteria contained within Condition 5.

2 ACOUSTIC SURVEY

2.1 Verification Measurements

- 2.1.1 A 24-hour noise survey was undertaken within first-floor bedrooms to the north and south of the site in January 2024. The initial survey identified a 1 dB night-time exceedance to the front façade, which prompted the applicant to undertake remedial work. A second 24 hour noise survey was undertaken in May 2024, which demonstrated compliant noise levels. The results of both surveys are presented in this report to demonstrate full compliance with the condition.
- 2.1.2 The January survey was undertaken during a weekday period covering Thursday-Friday. No events were noted that would affect road or railway traffic (e.g., roadworks, temporary traffic lights, etc.). The May survey was undertaken under the same conditions covering a Monday-Tuesday period.
- 2.1.3 At the time of the January survey, local schools within the borough had returned after the Christmas break and traffic was therefore deemed typical. The May survey was undertaken prior to the May half-term break and was therefore deemed typical.
- 2.1.4 Details of the survey are shown in **Figure 2** and **Figure 3** below. Larger versions of these images are shown in **Appendix B**.



Figure 2: Markup showing location of rooms used for noise monitoring

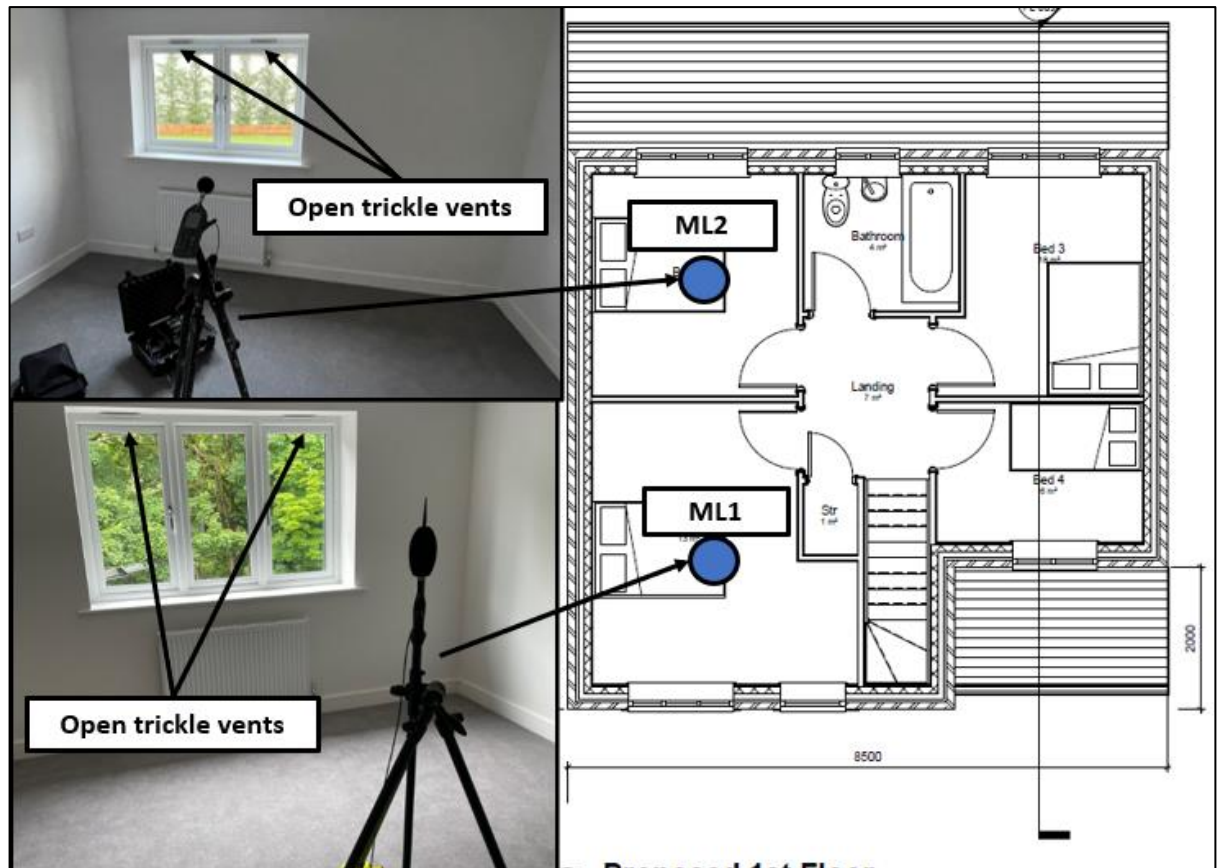


Figure 3: Further survey details

- 2.1.5 The surveys were undertaken with the windows in survey rooms closed, and the trickle ventilators in the window frames open for background ventilation.
- 2.1.6 This is in line with the requirements of BS 8233:2014 as stated in Section 7 of the standard:

“Note 5: If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.

If applicable, any room should have adequate ventilation (e.g., trickle ventilators should be open during assessment).”

- 2.1.7 The monitoring equipment consisted of two NOR140 Class 1 sound level meters (SLMs) with enhanced windshields and calibrated to traceable standards.

2.1.8 Details of the SLMs and associated field calibrations can be found in **Tables 2-3** below:

Table 2: Summary of SLM used for survey and associated field calibration (January Survey – rear facade)						
SLM (Serial Number)	Preamp (Serial Number)	Microphone (Serial Number)	Calibrator (Serial Number)	Start Calibration	End Calibration	Drift
NOR140 (1403328)	NOR1209 (12694)	NOR1225 (72914)	B&K 4231 (2482550)	-26.1	-26.0	0.1 dB

Table 3: Summary of SLM used for survey and associated field calibration (May Survey – front facade)						
SLM (Serial Number)	Preamp (Serial Number)	Microphone (Serial Number)	Calibrator (Serial Number)	Start Calibration	End Calibration	Drift
NOR140 (1402826)	NOR1209 (12113)	NOR1225 (15455)	B&K 4231 (2431761)	-26.3	-26.1	0.2 dB

2.1.9 The survey results are presented in **Table 4** below and are shown graphically in **Chart 1** & .

Table 4: Average Measured Daytime and Night-time Noise Levels				
Monitoring Location	Time	Measured Noise Level		
		$L_{Aeq,T}$ (dB)	Mode $L_{AF90,15min}$ (dB)	$L_{AFmax,15min}$ Range (dB)
ML1	Mon 20/05/2024 07:00 – Mon 20/05/2024 23:00	27.7	19	36.1-57.3
	Mon 20/05/2024 23:00 – Tue 21/05/2024 07:00	22.2	16	30.3-55.5
ML2	Thu 04/01/2024 11:00 - Thu 04/01/2024 23:00	27.2	22	32.8 – 65.4
	Thu 04/01/2024 23:00 - Fri 05/01/2024 07:00	20.5	17	26.7 – 45.4
	Fri 05/01/2024 07:00 - Fri 05/01/2024 11:00	27.7	22	34.5 – 47.0
	Thu 04/01/2024 11:00 – Thu 04/01/2024 23:00 & Fri 05/01/2024 07:00 – Fri 05/01/2024 11:00 combined	27.3	22	32.8 – 65.4

2.1.10 At ML1, the 11th highest $L_{AFmax,1min}$ level between 23:00-07:00 was 41.3 dB. At ML2, the 11th highest $L_{AFmax,1min}$ night-time event between 23:00 – 07:00 was 36 dB.

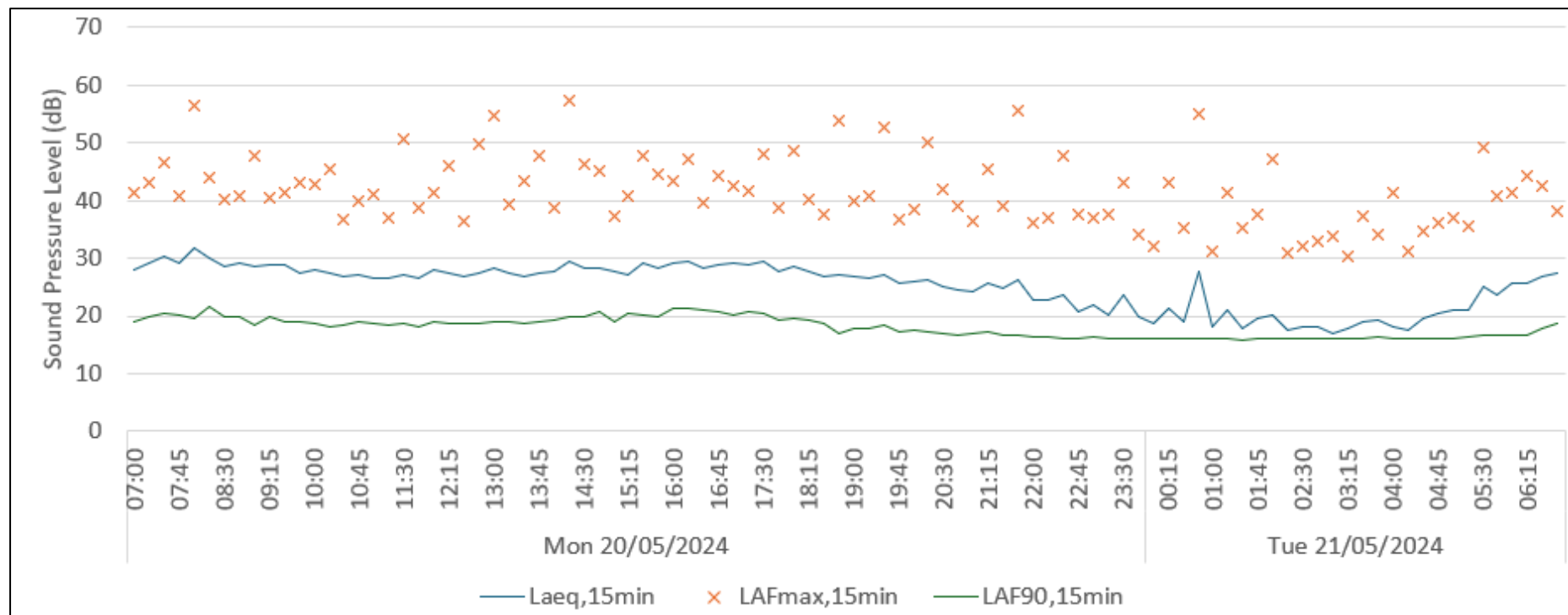


Chart 1: Noise Monitoring Results at ML1 (May Survey)

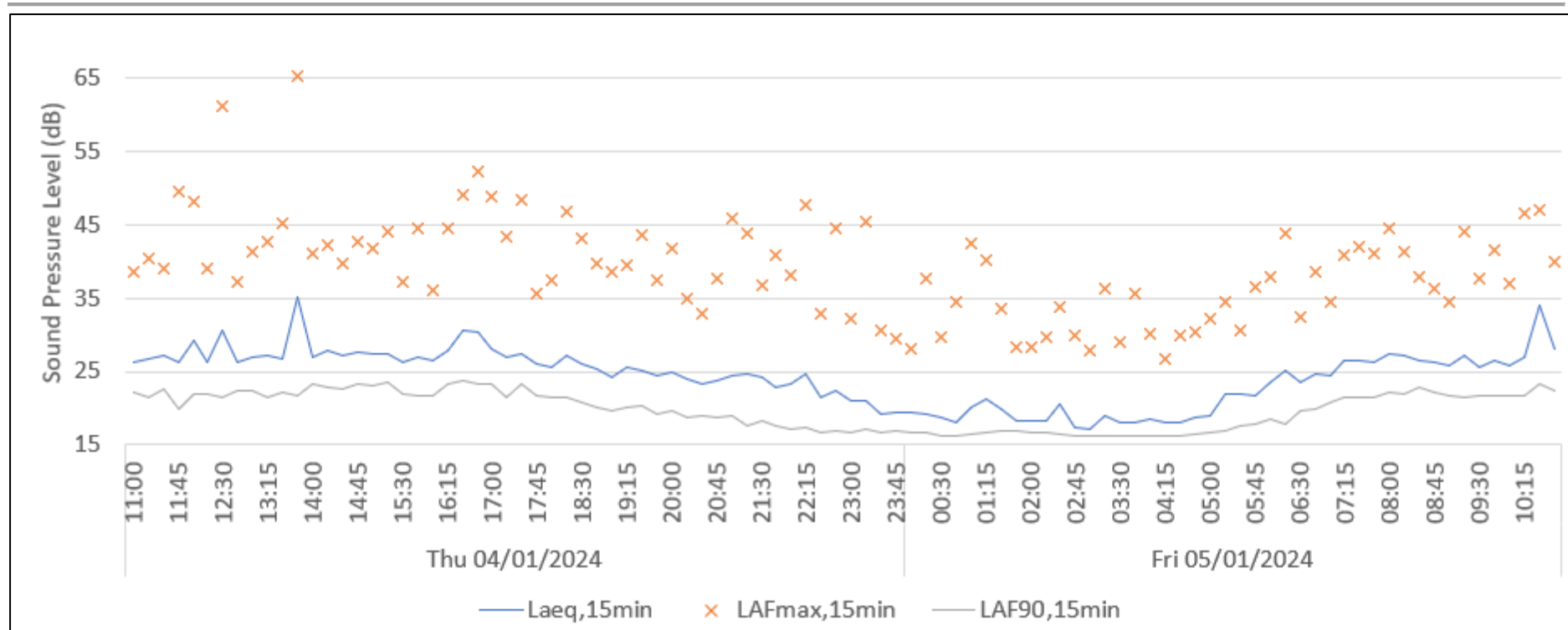


Chart 2: Noise Monitoring Results at ML2 (January Survey)

3 DETERMINATION OF COMPLIANCE WITH CONDITION 5

3.1 Assessment of Internal Noise Levels

3.1.1 A summary of the measured noise levels against the criteria of the condition is presented in **Table 5** below. $L_{AFmax,1min}$ levels have been assessed against the Condition 5 requirement for L_{AFmax} events to not exceed 45 dB more than 15 times in one night. All figures presented have been rounded to the nearest whole number.

Table 5: Assessment of Measured Internal Noise Levels								
Assessment Period	Measured Internal Noise Level (dB)		Condition 5 Criteria (dB)		Difference (dB)		Criteria Achieved?	
	$L_{Aeq,T}$	$L_{AFmax,T}$	$L_{Aeq,T}$	$L_{AFmax,T}$	$L_{Aeq,T}$	$L_{AFmax,T}$	$L_{Aeq,T}$	$L_{AFmax,T}$
South Façade Daytime $L_{Aeq,16hour}$ Average (ML1)	28	N/A	35	N/A	-7	N/A	Yes	N/A
South Façade Night-time $L_{Aeq,8hour}$ Average (ML1)	22	41	30	45	-8	-4	Yes	Yes
North Façade Daytime $L_{Aeq,16hour}$ Average (ML2)	27	N/A	35	N/A	-8	N/A	Yes	N/A
North Façade Night-time $L_{Aeq,8hour}$ Average (ML2)	21	36	30	45	-9	-9	Yes	Yes

3.1.2 It can be seen from the table above that the requirements of the condition have been met with the survey undertaken in accordance with the guidance in BS 8232:2014 and Manchester City Council Noise and Planning Guidance.

3.1.3 We would therefore recommend that the condition is discharged.

4 CONCLUSIONS

- 4.1.1 By instruction from GS Construction (NW) Ltd (the client'), NoiseAir was commissioned to undertake a noise impact assessment in support of a discharge of conditions application.
- 4.1.2 The condition set requirements for internal noise levels. Measurements of internal noise levels were undertaken at the site, the results of which are detailed in this report.
- 4.1.3 The measurements demonstrate compliance with the condition when measured in accordance with BS 8233:2014 and Manchester City Council's Noise and Planning Guidance.
- 4.1.4 We therefore recommend that the condition is discharged.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to GS Construction (NW) Ltd and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

Notwithstanding anything to the contrary contained in the report, NoiseAir Limited is obliged to exercise reasonable skill, care and diligence in the performance of the services required by GS Construction (NW) Ltd and NoiseAir shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

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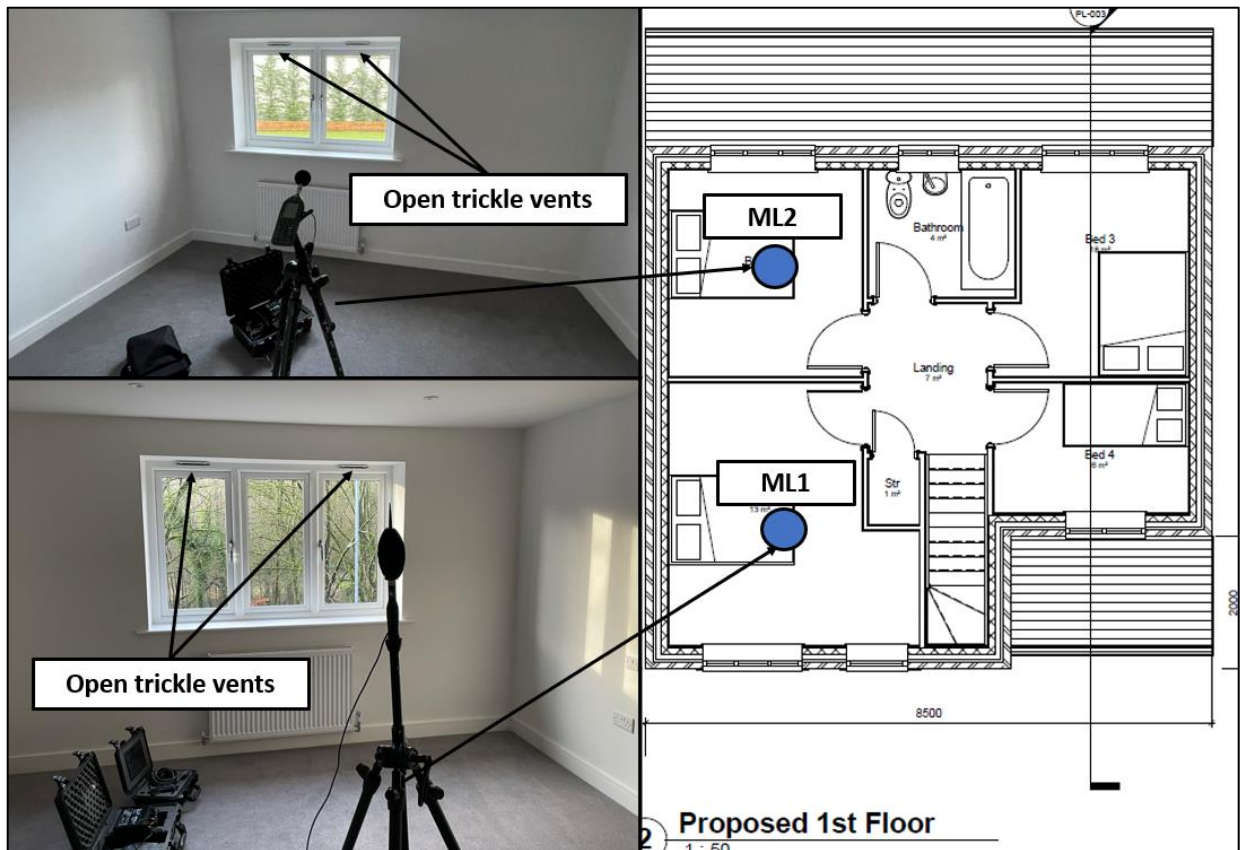
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APPENDIX B – SURVEY PHOTOS





APPENDIX C - GLOSSARY

A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network. <i>NOTE: The A-weighting network modifies the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.</i>
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure in decibels (dBA).
Acoustic environment	Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013].
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T, has the same mean-squared sound pressure as the sound under consideration that varies with time.
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants. <i>NOTE: The location(s) within the room at which the ambient indoor noise is to be measured or calculated ought to be considered.</i>
Sound pressure, p	Root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound.
Sound pressure level, L_p	Quantity of sound pressure, in decibels (dB).

Symbols

D_w	Weighted level difference (dB)
D_{nT}	Standardized level difference (dB)
$D_{nT,w}$	Weighted standardized level difference (dB)
L_{Amax}	Maximum noise level (dB)
$L_{Ar,Tr}$	Rating level (dB)
L_n	Normalised impact sound pressure level (dB)
L'_{nT}	Standardised impact sound pressure level (dB)
$L'_{nT,w}$	Weighted standardised impact sound pressure level (dB)
$L'_{n,w}$	Weighted normalised impact sound pressure level (dB)
L_p	Sound pressure level (dB)
L_{pA}	A-weighted sound pressure level (dB)
$L_{AN,T}$	Percentile level (dB)
L_{AE}	Sound exposure level (dB)
$L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level (dB)
p	Sound pressure (Pa)
p_A	A-weighted sound pressure (dB)
$p_{A(t)}$	Instantaneous A-weighted sound pressure (Pa)

R	Sound reduction index (dB)
R_w	Weighted sound reduction index (dB)
T	Time interval (also used for reverberation time) (s)
t_0	Reference time interval (s)

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