PROPOSED RESIDENTIAL DEVELOPMENT

LAND EAST OF WARWICK ROAD, BANBURY

Noise Impact Assessment

Prepared for: Vistry Homes Ltd

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1.0 Introduction

SLR Consulting Limited (SLR) has been commissioned by Vistry Homes Ltd to undertake a noise impact assessment in support of an outline planning application for a proposed residential development ('Proposed Development'), on land east of Warwick Road, Banbury (the 'Site'). The planning application seeks approval for the outline application for up to 170 dwellings (Use Class C3) with associated open space and vehicular access off Warwick Road, Banbury. All matters reserved except for access.

The Site is located adjacent to the A4100 Warwick Road and to the north of Dukes Meadow Drive; road traffic is the dominant noise source at the site.

This Noise Assessment seeks to establish existing sound levels at the proposed site, identify whether adverse impacts on future residents may occur and where necessary provide recommendations for mitigation.

Whilst reasonable effort has been made to make this report easily understandable, it is technical in nature. To assist the reader, a glossary of acoustic terminology has been included in Appendix 01.

2.0 Site Description

2.1 Development Site

The Site is located to the north west of Banbury, largely comprising residential, commercial and greenfield land uses, at the approximate National Grid Reference (NGR): x443282, y243069. The Site is bounded by:

- Green space and a farm to the north;
- Green space to the east, with the M40 motorway approximately 1.5km beyond;
- Residential properties to the south; and
- Green space to the west.

The proposed Site boundary is shown by the red line in Figure 2-1.

Figure 2-1
Site Location

2.2 Proposed Use of Site

The planning application seeks outline application for up to 170 dwellings (Use Class C3) with associated open space and vehicular access off Warwick Road, Banbury. All matters reserved except for access.

3.0 Scoping and Guidance

3.1 Scoping

The Environmental Health Department at Cherwell District Council was consulted on 11th March 2022 regarding the proposed methodology and assessment. The following methodology was proposed by SLR:

- A baseline sound survey will be conducted at three measurement positions, at the northern, southern and western site boundaries.
- Measured sound levels will be assessed against BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* and *ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise, New Residential Development.*
- To assess the noise from the commercial uses (farming to the north), the on-site noise data collected during the baseline survey and observations made by the surveyor regarding the audibility of noise would be used. In accordance with the '*Agent of Change*' Principle (defined in the National Planning Policy Framework), the new development should not result in '*unreasonable restrictions*' being placed on existing businesses and any proposed new development should include '*suitable mitigation*'.
- Recommendations to mitigate noise by site design would be proposed where necessary.

Neil Whitton confirmed[1] approval with the proposed scope.

3.2 BS8233:2014

BS8233:2014 is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate. The standard suggests suitable internal noise levels within different types of buildings, including residential dwellings, as shown in Table 3-1.

Table 3-1
Suitable Internal Noise Levels, dB

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

BS8233:2014 states that the recommended limits can be relaxed by up to 5dB *"where development is considered necessary or desirable".*

[1] Email correspondence dated 14 March 2022 with Neil Whitton, Environmental Health Officer

Whilst it may be considered desirable to achieve the BS8233:2014 recommended internal noise levels with windows open, it is stated that where the limit cannot be met with an open window *"there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level".*

It is therefore not essential that the recommended internal noise levels are achievable with open windows if suitable alternative means of ventilation can be provided.

With regard to external noise, Section 7.7.3.2 of BS8233:2014 states that:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited".

3.3 ProPG: Planning & Noise (2017)

ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise, New Residential Development was developed by a working group consisting of representatives from the Association of Noise Consultants (ANC), Institute of Acoustics (IOA), Chartered Institute of Environmental Health (CIEH) and practitioners from a planning and local authority background.

This guidance was made effective in May 2017 to provide a recommended approach to the management of noise within the planning system in England. It has drawn upon legislation, guidance and standards available at the time of publication to reflect the Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG-Noise) and other authoritative sources of guidance.

ProPG has been noted to advocate two sequential stages covering an 'initial noise risk assessment' at Stage 1 then a 'full assessment' at Stage 2 considering four key elements.

- Element 1 – Good acoustic design process.
- Element 2 – Internal noise level guidelines.
- Element 3 – External amenity area noise assessment.
- Element 4 – Assessment of other relevant issues.

The scope of ProPG considers new residential development that will be predominantly exposed to airborne noise from transportation sources. In cases where the site is exposed to noise of an industrial and/or commercial nature, this shall be considered at Stage 1 of the ProPG approach.

ProPG has provided a summary of internal noise level guidelines as part of Stage 2 assessment requirements. These guidelines values have been derived from British Standard BS 8233:2014 *Guidance on Sound Insulation and Noise Reduction for Buildings* and *The World Health Organisation Guidelines for Community Noise (1999)*.

Table 3-2
ProPG Internal Ambient Noise Levels, dB

Activity	Location	07:00 to 23:00 dB $L_{Aeq, 16\ h}$	23:00 to 07:00 dB $L_{Aeq, 8\ h}$
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30 45 dB $L_{Amax(F)}$ [1]
[1] *Not normally exceeded more than 10 times per night.*			

3.4 The 'Agent of Change' Principle from the National Planning Policy Framework

In accordance with the 'Agent of Change' Principle, the new development should not result in 'unreasonable restrictions' being placed on existing businesses and any proposed new development should include 'suitable mitigation'.

Section 187 from the National Planning Policy Framework states:

'*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.'*

4.0 Environmental Noise Survey

To establish the prevailing sound climate at the Site, a baseline survey was undertaken over a weekday period from Tuesday 5th April to Thursday 7th April 2022.

4.1 Survey Locations

The survey locations are described as follows:

- **Location 1** – at the eastern boundary of the Site, adjacent to the A4100 Warwick Road;
- **Location 2** – at the northern boundary of the Site, adjacent to the farm; and
- **Location 3** – at the southern boundary of the Site, representative of the existing residential properties on Bismore Road.

4.2 Equipment and Measurements

Sound pressure level measurements were carried out using the following equipment listed in Table 4-1, conforming to Class 1 acoustic accuracy for sound level meters and matched calibrators.

The sound level meters were calibrated before the measurements using the handheld acoustic calibrator and the calibration was checked upon completion of the survey. No significant drift was observed with calibration offsets of ≤ 0.2 dB. The calibration chain of equipment has been maintained to UKAS requirements, no greater than one year for sound calibrators and two years for sound level meters.

Table 4-1
Sound Monitoring Equipment

Location	Description	Serial No.
Location 1	Cirrus CR:171B Class 1 Sound Level Meter	G303356
	Cirrus CR:515 Acoustic Calibrator	97641
Location 2	Cirrus CR:171B Class 1 Sound Level Meter	G303390
	Cirrus CR:515 Acoustic Calibrator	97661
Location 3	Cirrus CR:171B Class 1 Sound Level Meter	G080288
	Cirrus CR:515 Acoustic Calibrator	83349

At each survey location, the sound level meter microphone was placed 1.5m above local ground level in free-field conditions, i.e. at least 3.5m from the nearest vertical reflecting surface. At Location 2, adjacent to the working farm, the audio trigger function was utilised for the survey to allow for a review of data post-survey to understand if commercial noise was audible at the Site.

The survey locations are shown in Figure 4-1.

Figure 4-1
Noise Survey Locations

4.3 Weather

During the survey, weather conditions were mostly dry with wind speeds of less than 5 ms^{-1} and temperatures of up to 12°C. These weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS 4142[2] and BS 7445-1:2003 *'Description and Measurement of Environmental Noise'*.

4.4 Soundscape and Context

Observations on the prevailing acoustic climate were made during site walkover during the daytime site visit during the setup and collection of equipment. During site walkover, the surveyor noted that the dominant noise source at all locations was road traffic from the B4100 and distant M40, with other sources including birdsong, high altitude aircraft.

The surveyor noted that at Location 3 there was construction activity in the form of HGV movements to the south of the new development, however this did not dominate over the distant road traffic noise.

4.5 Baseline Survey Results

The full noise survey results are provided within Appendix 03 of this report. Summaries for the purposes of the assessment have been given in terms of derived period averages within Table 4-2.

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

Table 4-2
Derived Free-Field Period Average Sound Levels, dB

Measurement Details			$L_{Aeq, T}$		$L_{Amax(F)}$*	
Location	Period	Time	Range	Logarithmic Average	Range	10th Highest
1	Day	07:00 – 23:00	60 -72	70		
	Night	23:00 – 07:00	41 - 69	61	50 - 92	83
2	Day	07:00 – 23:00	40 - 65	58		
	Night	23:00 – 07:00	44 - 68	57	53 - 89	75
3	Day	07:00 – 23:00	41 - 60	52		
	Night	23:00 – 07:00	39 - 62	51	49 - 84	68
** Not normally exceeded 10 times per night*						

Night-time levels have been established from the period 23:00 – 07:00 between, with maxima reviewed in terms of 1-minute dB $L_{Amax(F)}$ values, with the 10th highest reported per industry guidance[3]. A nominal difference of dB $L_{Amax} \approx L_{night}$ + 17 dB has promoted its significance in acoustic design requirements for the scheme subject to transportation noise.

From review of the audio data collected at Location 2 along with a subjective impression of the site and its surroundings, it has been concluded that road noise dominates the noise climate at the development. Commercial noise and activities, specifically plant and activity noises were not observed or could be measured whilst on site. As such, it has not been deemed necessary to carry out a BS 4142 assessment in the review of *Agent of Change*.

[3] Paxton, B. Conlan, N et al. Assessing Lmax for residential developments: the AVO guide approach. Proceedings of the Institute of Acoustics. Volume 41, Part 1, 2019.

5.0 ProPG Assessment

The assessment method of ProPG has been applied to the Site, with the proposed development in place, to understand the risks and design requirements to mitigate the proposal from environmental noise sources.

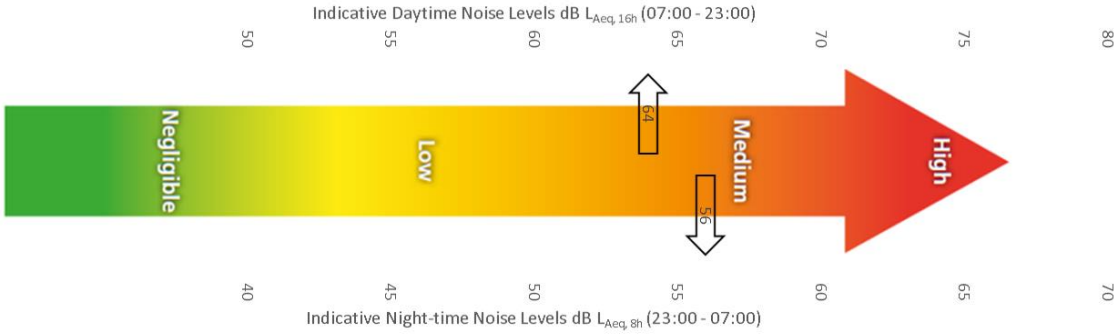
5.1 Stage 1 – Initial Risk Assessment

The environmental survey provided in Section 4.0 of this report has described the following period sound pressure levels that have been used for an initial site risk assessment according to Stage 1 of ProPG.

Table 5-1
Summary Assessment External Noise Levels, dB

Dwelling Location	Period	Hours	Indicative Noise Level
Western boundary of site	Daytime	07:00 – 23:00	64 dB $L_{Aeq,\ 16\ h}$
	Night-Time	23:00 – 07:00	56 dB $L_{Aeq,\ 8\ h}$
			79 dB $L_{Amax(F)}$ *
Northern boundary of site	Daytime	07:00 – 23:00	53 dB $L_{Aeq,\ 16\ h}$
	Night-Time	23:00 – 07:00	52 dB $L_{Aeq,\ 8\ h}$
			67 dB $L_{Amax(F)}$ *
South eastern boundary of site	Daytime	07:00 – 23:00	51 dB $L_{Aeq,\ 16\ h}$
	Night-Time	23:00 – 07:00	52 dB $L_{Aeq,\ 8\ h}$
			67 dB $L_{Amax(F)}$ *
** Value exceeded 10 times during entire night-time period, per industry guidance.*			

Figure 5-1
ProPG Indicative Risk Assessment



The dominant sound source at the site was noted to be from transportation sources, specifically road traffic using Warwick Road. Commercial activities were not observed at any point of site attendance or reflected within data. On this basis, the risk to residential amenity has been primarily considered from the influence of transportation noises, where ProPG directly applies.

The initial site noise risk assessment has been categorised as 'medium risk' on future occupants of the new noise sensitive development, based upon the readings along the western boundary. This would otherwise be considered as low in the case of average values to the north and south.

Where a medium noise risk has been noted, the pre-planning application advice stated in ProPG has been considered as follows:

"As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development."

6.0 Noise Model

To determine the daytime and the night-time sound levels across the Site, SLR has developed a noise model of the proposed development. The sound predictions in this assessment have been undertaken using a proprietary software-based noise model, CadnaA, which implements the full range of UK calculation methods. The calculation algorithms set out in ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation* have been used and the model assumes:

- A ground absorption factor of 0.5.
- A reflection factor of 2.
- A daytime receiver height of 1.5m and a night-time receiver height of 4m.

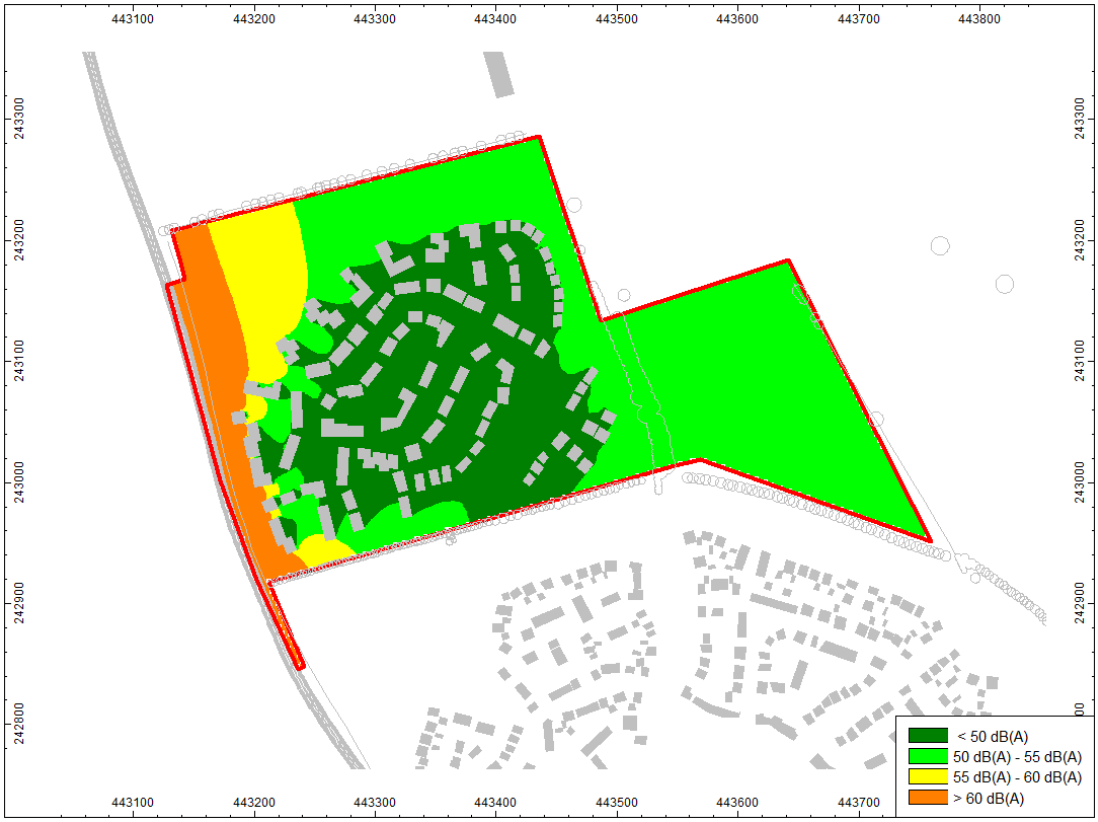
Model inputs include the noise survey data, the proposed layout and topographical data. The daytime and night-time noise survey results have been used to calibrate the noise model. The model has been adjusted to ensure that the predicted sound levels at the monitoring locations closely match the surveyed daytime and night-time noise levels.

6.1 Results

6.1.1 Daytime External Noise Levels

Amenity areas (gardens) are proposed for all dwellings. Modelling of the development in Figure 6-1 has provided that useful screening loss will occur from the dwellings as to provide them within ProPG guidance of 50-55 dB $L_{Aeq, 16h}$ to provide suitably protected, quiet and tranquil outdoor space within this development.

Figure 6-1
External Amenity Areas – Daytime dB $L_{Aeq, 16h}$ – Grid Height 1.5m



6.1.2 Daytime Internal Sound Levels

With regard to internal sound levels, the noise model output shows that daytime sound levels are expected to exceed the recommended value of 35 dB $L_{Aeq,16hr}$ for living and bedrooms by up to 30dB along the western boundary.

As an open window can be expected to reduce the attenuation of a glazing unit to approximately 13dB sound reduction, mitigation will be required to reduce sound levels further to within the guideline value for habitable rooms.

6.1.3 Night-time Internal Sound Levels

With regard to external sound levels, $L_{Aeq,8hr}$ sound levels are expected to exceed the recommended value of 30dB(A) by up to 26dB.

The noise model outputs show that L_{Amax} sound levels are expected to exceed the recommended value of L_{Amax} 45dB(A) by up to 34dB.

Mitigation will therefore be required in order to reduce sound levels to within the guideline value within bedrooms.

6.2 Assessment Summary

6.2.1 Daytime External Noise Levels

Within private gardens the recommended guidelines are achieved to provide suitably quiet and tranquil outdoor spaces. No further mitigation or development designs need be considered.

6.2.2 Internal Noise Levels

The assessment indicates that recommended internal guideline values for habitable rooms would be exceeded within areas of the development with windows open. Mitigation measures to reduce internal sound levels to within guideline values will therefore be required.

Mitigation measures are considered further within Section 7.0.

7.0 Mitigation

Assessment indicates that to achieve acceptable noise levels internally, mitigation will be required. An iterative CadnaA modelling exercise has been undertaken to identify a practicable mitigation strategy, to inform the master planning process. The proposed mitigation strategy comprises:

- Selection of glazing and acoustically attenuated ventilation to provide sufficient sound reduction.

7.1 Internal Sound Levels

In terms of acoustics, windows are the 'weakest' point in any façade. Therefore, the required level of sound reduction would be provided by appropriate glazing and ventilation systems at windows to habitable rooms.

Considering that a partially open window provides a sound reduction of up to 13 dB between outside and inside, it is anticipated that at the façades which have a required sound reduction of 13 dB or lower, the noise limits would be met even during occasional purge ventilation with an open window.

At façades where the required sound reduction is greater than 13 dB, the sound reduction will be provided by the installation of glazing and ventilation systems. Glazing does not reduce sound equally across the entire frequency spectrum, so the frequency content of the sound will influence the overall sound reduction performance of a given window and by extension, the resulting noise levels within the receiving room.

However, many glazing manufacturers test their products under laboratory conditions using a typical road traffic noise frequency spectrum source. The resultant measured noise attenuation, in dB, gives a very useful guide to in-situ sound reduction performance of the window for situations where road traffic noise dominates. This performance index is known as the $R_W + C_{tr}$ (the weighted sound reduction index, which takes into account the road traffic frequency spectrum).

7.1.1 Living Rooms

Analysis of the daytime sound level predictions at ground floor shows that the highest glazing specification required to meet the guideline values within habitable rooms is 30dB $R_W + C_{tr}$.

Standard thermal double glazing (4mm float-20mm cavity-4mm float or similar) is generally capable of providing up to 30dB $R_W + C_{tr}$ (the weighted sound reduction index, which takes into account the road traffic frequency spectrum) sound reduction.

The installation of standard thermal double glazing is therefore expected to be sufficient to reduce sound levels to within the guideline values at all façades, for living rooms at ground floor level.

7.1.2 Bedrooms

Analysis of the night-time maximum sound level predictions at first floor shows that the highest glazing specification required to meet the guideline values within bedrooms is 35dB $R_W + C_{tr}$.

To assist in identifying appropriate glazing systems, a guide to the sound reduction performance delivered by an example glazing configuration is provided in Table 7-1.

Table 7-1
Sound Reduction Performance of Example Window Configurations

Example Glazing System (mm)	4/20/4	6/20/4
Sound Reduction $R_w + C_{tr}$ (dB)	30	34

Source: St Gobain

As the sound reduction performance of glazing systems can vary from manufacturer to manufacturer, the actual sound reduction performance of the glazing system should first be confirmed with the glazing system supplier.

It is noted that, at this stage, the mitigation measures can only be outlined. The detailed design of the proposed development will affect both the required sound reduction performance of the façade and the appropriate selection of glazing and the ventilation strategy. The aspects of the detailed design that are important are the room dimensions, room finishes, window dimensions and the sound reduction performance of non-glazed elements.

Background ventilation must be provided in accordance with the Building Regulations Approved Document F. If a passive ventilation strategy will be implemented, then window mounted trickle vents or through-wall ventilators, which are acoustically attenuated to provide an equivalent sound reduction to the glazing, should be installed. Professional Practice Guidance on Planning & Noise (ProPG) recommends that, *"Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however, any facade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the 'open' position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded".* This means that the vent, when 'open', should provide a sound reduction not less than that provided by the selected glazing system.

The sound reduction performance of ventilators is typically indicated as a $D_{n,e,w} + C_{tr}$ rating. Where window mounted or through-wall ventilators are to be installed, in order to provide a sound reduction equivalent to that of the specified glazing, the $D_{n,e,w} + C_{tr}$ value of the vent (when open) should be approximately 7dB higher than the specified $R_W + C_{tr}$ of the glazing.

It is noted that, the requisite sound reductions must be achieved by the glazing and passive ventilation systems as a whole, including all framing and furniture.

It is noted that the sound insulation performance of the external building fabric must be at least 10dB better than that of any specified glazing and ventilation system.

7.2 Summary

It is considered that, based on the proposed site layout, and with the implementation of the recommended mitigation strategy, sound levels across the proposed development can be attenuated to achieve the requisite internal sound level criteria.

It considered that the above assessment demonstrates than an acceptable scheme can be delivered. It is therefore considered that, in terms of noise, there are not any constraints to the principle of the development.

8.0 Agent of Change Assessment

The northern area of the proposed development is located in proximity to existing commercial use. However, as sound from nearby commercial premises was observed to be imperceptible at the Site, with road traffic being the dominant noise source, it is considered that the BS8233:2014 assessment above is appropriate.

Notwithstanding this, in accordance with the '*Agent of Change*' Principle (defined within the National Planning Policy Framework), the new development should not result in '*unreasonable restrictions*' being placed on existing businesses, and any proposed new development should include '*suitable mitigation*'. Example mitigation measure are included within ProPG and include:

- Maximising the spatial separation of noise source(s) and receptor(s).
- Investigating the necessity and feasibility of reducing existing noise levels and relocating existing sources.
- Using existing topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the Proposed Development site from significant sources of noise.
- Incorporating noise barriers as part of the scheme to screen the Proposed Development site from significant sources of noise.
- Using the layout of the scheme to reduce noise propagation across the site.
- Using the orientation of buildings to reduce the noise exposure of noise sensitive rooms.
- Using the building envelope to mitigate noise to acceptable levels.

As detailed above, on-site observations were that sound from road traffic sources was dominant at the site, and that nearby sound from commercial use was imperceptible. It is therefore considered that a detailed BS4142:2014 + A1:2019 assessment is not required.

The development has been designed to provide separation between the proposed development and the commercial use, and external amenity areas will be screened by the proposed buildings.

Glazing and ventilation requirements have been identified to attenuate road traffic sound levels. It is considered that, with the installation of the proposed mitigation, residents will be suitably protected against potential commercial noise impact.

It is therefore considered that the proposed development would not result in '*unreasonable restrictions*' being placed on existing businesses, and that further, more detailed assessment is not required.

9.0 Conclusion

SLR was commissioned by Vistry Homes Ltd to undertake a noise assessment in support of an outline planning application for a proposed residential development, on land east of Warwick Road, Banbury:

- BS8233:2014 Guidance on sound insulation and noise reduction for buildings.
- ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise, New Residential Development; and
- The NPPF Agent of Change Principle.

Sound levels at the proposed development have been predicted using CadnaA noise modelling software. Road traffic data, noise survey data and the proposed site layout have been used to calculate daytime and night-time $L_{Aeq,T}$ and L_{Amax} sound levels across the proposed development.

Results and assessment indicate that sound levels within all external living areas are expected to remain within the recommended upper value of $L_{Aeq,16hr}$ 55dB. Additional mitigation measures will therefore not be required to reduce sound levels within gardens.

Results and assessment indicate that mitigation will be required to achieve internal sound level criteria in certain areas of the proposed development.

The proposed mitigation strategy for the site comprises:

- Selection of glazing and acoustically attenuated ventilation to provide sufficient sound reduction.

It is considered that, with implementation of the proposed mitigation measures, sound levels at the proposed development can be readily attenuated to achieve the requisite external and internal noise level criteria.

With regard to existing commercial use near to the Site, it has been demonstrated that the proposed development would not result in '*unreasonable restrictions*' being placed on existing businesses.

The noise assessment confirms that noise is not a constraint to residential development, and that good standard of acoustic design can be achieved using reasonable and practicable design measures.

APPENDIX 01

Glossary of Terminology

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table 01-01
Sound Levels Commonly Found in the Environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel) — The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (of 20 µPa).

dB(A) — A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

$L_{Aeq, T}$ — $L_{Aeq, T}$ is defined as the notional steady sound level which, over a stated period T, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

$L_{A10, T}$ & L_{A90} — If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.

$L_{Amax(F)}$ — $L_{Amax(F)}$ is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

APPENDIX 02

Survey Results

Location 1 - 15-minute History Results, dB

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 12:30	69.9	91.5	74.6	51.4
05/04/2022 12:45	68.9	85.5	74.0	48.2
05/04/2022 13:00	69.3	84.0	74.4	45.7
05/04/2022 13:15	69.0	84.9	73.9	45.2
05/04/2022 13:30	69.6	86.2	74.4	49.5
05/04/2022 13:45	68.5	82.3	74.0	45.5
05/04/2022 14:00	69.4	82.2	74.9	47.9
05/04/2022 14:15	69.0	81.3	74.3	47.5
05/04/2022 14:30	69.2	84.9	74.4	48.5
05/04/2022 14:45	70.0	86.5	75.1	49.4
05/04/2022 15:00	71.3	93.2	75.9	51.2
05/04/2022 15:15	68.8	83.2	73.9	47.9
05/04/2022 15:30	70.6	84.7	75.7	52.6
05/04/2022 15:45	69.9	85.8	75.0	51.6
05/04/2022 16:00	69.8	83.3	75.1	50.4
05/04/2022 16:15	71.1	85.4	76.2	53.4
05/04/2022 16:30	70.4	84.9	75.7	53.5
05/04/2022 16:45	70.5	84.1	75.5	50.0
05/04/2022 17:00	71.4	85.8	76.3	52.2
05/04/2022 17:15	71.2	89.1	76.1	49.5
05/04/2022 17:30	70.3	85.6	75.7	47.8
05/04/2022 17:45	71.5	88.9	76.3	52.5
05/04/2022 18:00	70.2	82.9	75.5	51.0
05/04/2022 18:15	69.8	91.7	74.4	48.0
05/04/2022 18:30	70.6	83.3	75.6	48.6
05/04/2022 18:45	70.4	85.6	75.7	47.3
05/04/2022 19:00	68.3	83.5	73.3	42.8
05/04/2022 19:15	67.7	82.2	72.0	42.0
05/04/2022 19:30	68.2	82.6	72.6	42.4
05/04/2022 19:45	66.0	86.2	68.7	39.7
05/04/2022 20:00	65.2	83.7	67.0	36.8

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 20:15	66.2	84.9	69.5	34.7
05/04/2022 20:30	65.7	82.8	68.1	34.4
05/04/2022 20:45	63.7	82.5	64.2	32.9
05/04/2022 21:00	63.8	80.7	64.7	35.4
05/04/2022 21:15	65.8	90.4	67.7	37.0
05/04/2022 21:30	64.1	82.8	64.3	35.6
05/04/2022 21:45	64.1	84.4	63.8	33.9
05/04/2022 22:00	63.9	82.7	63.7	32.8
05/04/2022 22:15	61.2	83.2	56.0	32.7
05/04/2022 22:30	63.1	82.8	60.7	35.2
05/04/2022 22:45	60.2	82.0	54.3	36.0
05/04/2022 23:00	60.3	84.8	54.8	33.9
05/04/2022 23:15	61.2	82.4	52.8	33.0
05/04/2022 23:30	60.6	83.0	55.5	33.0
05/04/2022 23:45	55.2	78.9	42.1	33.9
06/04/2022 00:00	65.5	92.3	46.8	33.3
06/04/2022 00:15	56.4	82.4	45.1	37.3
06/04/2022 00:30	46.8	74.3	43.2	36.8
06/04/2022 00:45	53.9	81.5	44.8	35.6
06/04/2022 01:00	51.3	75.8	44.5	33.4
06/04/2022 01:15	55.1	80.9	47.7	37.3
06/04/2022 01:30	41.4	50.2	43.8	36.6
06/04/2022 01:45	53.1	80.4	44.0	37.3
06/04/2022 02:00	56.1	80.9	49.4	39.9
06/04/2022 02:15	51.4	77.2	51.4	43.2
06/04/2022 02:30	54.9	81.5	53.6	44.3
06/04/2022 02:45	48.6	60.4	51.4	42.5
06/04/2022 03:00	55.7	79.6	51.5	42.3
06/04/2022 03:15	58.0	82.7	52.0	41.3
06/04/2022 03:30	50.8	79.3	49.6	40.1
06/04/2022 03:45	42.3	51.5	45.2	37.7
06/04/2022 04:00	58.7	86.5	46.7	37.4

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 04:15	57.6	81.9	48.4	40.0
06/04/2022 04:30	55.7	78.1	47.2	37.5
06/04/2022 04:45	54.9	80.9	43.4	37.6
06/04/2022 05:00	61.3	83.9	56.2	39.5
06/04/2022 05:15	63.9	81.6	63.7	40.8
06/04/2022 05:30	66.1	83.0	68.3	40.3
06/04/2022 05:45	63.7	81.8	62.8	39.0
06/04/2022 06:00	66.2	83.9	67.5	39.0
06/04/2022 06:15	65.8	82.9	68.0	40.9
06/04/2022 06:30	67.7	83.0	71.2	42.8
06/04/2022 06:45	68.5	83.7	72.7	43.2
06/04/2022 07:00	70.7	86.1	75.9	47.0
06/04/2022 07:15	70.6	87.7	75.7	45.7
06/04/2022 07:30	72.3	86.2	77.4	52.4
06/04/2022 07:45	72.0	84.3	77.0	51.9
06/04/2022 08:00	71.9	84.6	77.5	48.9
06/04/2022 08:15	72.0	85.1	77.3	49.8
06/04/2022 08:30	71.6	83.9	76.6	51.1
06/04/2022 08:45	71.5	84.7	76.8	51.4
06/04/2022 09:00	69.3	84.8	74.5	44.5
06/04/2022 09:15	69.5	84.9	74.3	47.4
06/04/2022 09:30	68.3	84.5	72.8	46.4
06/04/2022 09:45	69.2	83.0	74.6	47.5
06/04/2022 10:00	69.1	86.1	74.3	46.4
06/04/2022 10:15	68.3	83.1	73.2	45.7
06/04/2022 10:30	68.2	85.4	73.2	48.3
06/04/2022 10:45	68.4	82.4	73.5	48.1
06/04/2022 11:00	68.0	82.3	73.3	49.3
06/04/2022 11:15	68.7	84.9	73.7	49.0
06/04/2022 11:30	69.4	82.9	74.7	49.9
06/04/2022 11:45	69.5	86.1	74.6	49.5
06/04/2022 12:00	69.4	83.9	74.4	51.0

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 12:15	68.8	82.5	74.1	49.4
06/04/2022 12:30	69.3	83.6	74.4	50.5
06/04/2022 12:45	69.6	84.7	74.8	51.7
06/04/2022 13:00	69.2	85.4	74.1	51.2
06/04/2022 13:15	69.4	82.4	74.4	54.2
06/04/2022 13:30	71.1	83.9	76.1	52.8
06/04/2022 13:45	70.7	86.1	76.0	49.2
06/04/2022 14:00	70.4	85.8	75.6	50.4
06/04/2022 14:15	70.2	85.2	75.4	51.6
06/04/2022 14:30	70.5	84.6	75.4	53.3
06/04/2022 14:45	70.2	81.8	75.3	54.7
06/04/2022 15:00	70.0	82.3	75.3	50.3
06/04/2022 15:15	69.9	83.4	74.9	52.0
06/04/2022 15:30	70.1	82.5	75.3	51.0
06/04/2022 15:45	70.0	84.4	74.9	53.8
06/04/2022 16:00	70.8	84.2	75.9	53.5
06/04/2022 16:15	70.9	83.2	75.9	53.9
06/04/2022 16:30	71.6	84.3	76.3	55.7
06/04/2022 16:45	71.9	89.5	76.4	53.9
06/04/2022 17:00	71.2	83.2	76.3	54.2
06/04/2022 17:15	69.9	82.3	75.2	52.1
06/04/2022 17:30	71.3	87.5	76.3	53.0
06/04/2022 17:45	70.4	84.3	75.8	49.7
06/04/2022 18:00	71.0	84.8	76.0	53.8
06/04/2022 18:15	70.6	83.1	75.8	52.7
06/04/2022 18:30	69.5	83.9	74.7	48.0
06/04/2022 18:45	69.7	86.5	74.8	49.6
06/04/2022 19:00	70.0	85.5	75.2	48.2
06/04/2022 19:15	70.4	91.8	75.1	49.5
06/04/2022 19:30	68.0	84.9	72.4	46.6
06/04/2022 19:45	67.4	84.9	69.9	46.7
06/04/2022 20:00	66.6	83.2	69.9	44.7

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 20:15	67.9	85.2	71.9	47.4
06/04/2022 20:30	67.6	87.5	71.3	48.5
06/04/2022 20:45	66.9	83.4	70.6	48.3
06/04/2022 21:00	66.6	85.8	69.3	46.8
06/04/2022 21:15	63.9	81.8	64.1	46.4
06/04/2022 21:30	64.9	81.9	64.8	46.0
06/04/2022 21:45	63.2	81.8	64.7	48.3
06/04/2022 22:00	63.8	83.1	63.6	46.0
06/04/2022 22:15	63.7	82.9	63.6	44.0
06/04/2022 22:30	64.1	81.1	64.9	41.5
06/04/2022 22:45	62.0	84.7	56.5	40.7
06/04/2022 23:00	61.7	81.1	58.2	42.0
06/04/2022 23:15	60.1	81.2	54.9	44.5
06/04/2022 23:30	59.4	80.8	53.7	45.3
06/04/2022 23:45	62.5	84.1	56.6	45.1
07/04/2022 00:00	58.2	82.9	56.0	44.7
07/04/2022 00:15	57.4	87.7	54.5	43.3
07/04/2022 00:30	58.8	79.7	59.6	50.7
07/04/2022 00:45	61.5	75.3	64.8	54.7
07/04/2022 01:00	62.7	83.2	67.0	48.3
07/04/2022 01:15	58.2	78.8	61.5	51.0
07/04/2022 01:30	58.6	82.3	54.3	45.6
07/04/2022 01:45	52.4	77.3	52.9	44.1
07/04/2022 02:00	51.2	76.7	51.2	43.7
07/04/2022 02:15	54.9	81.1	52.4	43.4
07/04/2022 02:30	53.6	78.2	50.3	42.6
07/04/2022 02:45	51.0	74.7	49.1	42.1
07/04/2022 03:00	54.8	80.9	48.1	40.2
07/04/2022 03:15	54.8	79.6	45.1	34.8
07/04/2022 03:30	41.9	51.3	45.8	36.5
07/04/2022 03:45	40.8	51.5	42.9	37.4
07/04/2022 04:00	48.7	77.2	39.4	34.3

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
07/04/2022 04:15	56.3	83.8	43.1	34.6
07/04/2022 04:30	55.5	81.0	44.4	35.2
07/04/2022 04:45	58.4	79.5	52.8	40.4
07/04/2022 05:00	60.2	79.8	55.7	38.8
07/04/2022 05:15	63.8	80.4	64.6	42.2
07/04/2022 05:30	64.9	83.3	65.9	45.9
07/04/2022 05:45	65.2	84.6	65.3	46.7
07/04/2022 06:00	65.7	83.2	66.0	46.5
07/04/2022 06:15	65.8	85.9	66.7	48.3
07/04/2022 06:30	67.8	83.8	71.1	49.1
07/04/2022 06:45	68.4	84.2	72.8	50.8
07/04/2022 07:00	70.4	86.2	75.2	49.5
07/04/2022 07:15	71.3	84.6	76.5	51.3
07/04/2022 07:30	72.0	85.1	77.1	56.7
07/04/2022 07:45	71.8	83.2	76.8	57.0
07/04/2022 08:00	71.6	82.5	76.8	55.7
07/04/2022 08:15	71.7	85.0	76.9	53.9
07/04/2022 08:30	72.0	84.7	76.6	57.9
07/04/2022 08:45	70.2	84.9	75.3	55.1
07/04/2022 09:00	69.7	83.5	74.4	56.7
07/04/2022 09:15	69.7	85.7	74.1	57.5
07/04/2022 09:30	70.6	82.1	75.5	59.6
07/04/2022 09:45	69.8	84.1	74.8	57.5
07/04/2022 10:00	69.4	82.2	74.3	55.3

Location 2 - 15-minute History Results, dB

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 12:15	49.7	60.1	52.0	45.3
05/04/2022 12:30	51.9	68.9	53.9	47.6
05/04/2022 12:45	50.4	70.7	52.1	44.7
05/04/2022 13:00	50.9	62.9	53.5	45.3
05/04/2022 13:15	50.5	71.2	52.4	43.7

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 13:30	50.2	66.9	52.5	45.3
05/04/2022 13:45	50.2	59.8	52.8	46.0
05/04/2022 14:00	50.1	59.0	52.5	46.2
05/04/2022 14:15	54.2	76.4	54.4	45.6
05/04/2022 14:30	52.4	68.5	54.6	46.8
05/04/2022 14:45	52.7	65.8	54.9	47.9
05/04/2022 15:00	51.9	65.8	54.6	46.3
05/04/2022 15:15	51.7	64.1	54.8	45.8
05/04/2022 15:30	52.3	65.4	54.8	48.3
05/04/2022 15:45	58.3	80.9	57.5	49.7
05/04/2022 16:00	51.9	62.6	54.3	47.2
05/04/2022 16:15	52.4	60.9	54.7	48.6
05/04/2022 16:30	51.9	62.0	54.4	47.6
05/04/2022 16:45	51.0	61.7	53.3	47.1
05/04/2022 17:00	50.8	60.9	52.9	46.9
05/04/2022 17:15	51.7	68.1	53.9	45.8
05/04/2022 17:30	50.5	62.4	53.1	45.7
05/04/2022 17:45	53.6	64.0	56.2	49.3
05/04/2022 18:00	53.8	63.5	56.9	48.1
05/04/2022 18:15	51.1	65.0	53.5	46.0
05/04/2022 18:30	51.5	59.3	54.0	46.9
05/04/2022 18:45	50.3	65.5	52.9	44.7
05/04/2022 19:00	49.9	59.3	52.8	44.7
05/04/2022 19:15	49.7	58.1	52.7	43.9
05/04/2022 19:30	49.2	58.7	51.9	44.1
05/04/2022 19:45	50.3	78.4	51.1	41.7
05/04/2022 20:00	47.6	60.9	50.7	42.1
05/04/2022 20:15	46.4	57.3	49.9	36.6
05/04/2022 20:30	44.2	56.8	48.1	34.6
05/04/2022 20:45	48.2	65.9	49.3	31.7
05/04/2022 21:00	44.6	58.7	47.8	35.3
05/04/2022 21:15	47.1	58.7	50.0	39.8

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 21:30	48.3	64.4	50.7	37.8
05/04/2022 21:45	43.7	57.1	47.6	34.0
05/04/2022 22:00	49.4	69.7	49.1	32.4
05/04/2022 22:15	40.4	52.0	44.8	32.2
05/04/2022 22:30	45.0	56.0	48.1	39.1
05/04/2022 22:45	45.0	53.1	48.3	39.2
05/04/2022 23:00	47.7	66.4	49.8	39.7
05/04/2022 23:15	43.8	56.3	47.2	37.9
05/04/2022 23:30	43.5	53.3	47.2	35.9
05/04/2022 23:45	43.9	54.4	47.0	37.6
06/04/2022 00:00	63.3	88.7	49.6	37.7
06/04/2022 00:15	50.9	59.8	54.2	44.9
06/04/2022 00:30	48.0	58.9	51.2	42.4
06/04/2022 00:45	47.7	62.3	51.0	40.2
06/04/2022 01:00	44.2	53.9	47.8	37.2
06/04/2022 01:15	47.8	63.0	50.8	40.1
06/04/2022 01:30	46.2	58.1	49.8	38.6
06/04/2022 01:45	48.2	57.6	52.0	40.2
06/04/2022 02:00	53.2	64.2	56.9	45.5
06/04/2022 02:15	54.9	67.4	57.9	47.8
06/04/2022 02:30	54.5	62.8	57.5	48.6
06/04/2022 02:45	53.3	63.2	56.9	47.1
06/04/2022 03:00	52.2	63.5	55.4	46.0
06/04/2022 03:15	52.7	63.8	56.6	45.1
06/04/2022 03:30	54.2	67.0	57.9	44.4
06/04/2022 03:45	46.9	59.0	50.0	41.4
06/04/2022 04:00	49.7	59.0	53.0	42.4
06/04/2022 04:15	49.2	60.9	52.6	42.2
06/04/2022 04:30	47.8	58.7	50.9	41.8
06/04/2022 04:45	47.2	58.3	50.1	41.2
06/04/2022 05:00	48.4	59.6	51.8	41.9
06/04/2022 05:15	49.3	57.6	52.4	43.4

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 05:30	48.0	56.5	50.9	42.4
06/04/2022 05:45	51.0	67.3	54.2	42.0
06/04/2022 06:00	54.1	73.3	55.0	42.3
06/04/2022 06:15	50.9	70.0	51.9	42.8
06/04/2022 06:30	50.1	62.4	52.8	44.8
06/04/2022 06:45	51.2	66.0	53.6	45.3
06/04/2022 07:00	51.7	65.6	54.1	47.2
06/04/2022 07:15	53.5	70.3	54.3	47.5
06/04/2022 07:30	54.2	70.8	54.3	48.9
06/04/2022 07:45	52.8	69.4	54.1	46.9
06/04/2022 08:00	52.4	69.7	54.3	47.4
06/04/2022 08:15	51.7	63.0	53.9	46.9
06/04/2022 08:30	52.1	70.2	54.1	46.2
06/04/2022 08:45	56.5	74.5	56.3	47.6
06/04/2022 09:00	51.0	67.7	53.7	45.6
06/04/2022 09:15	52.0	67.9	54.7	47.0
06/04/2022 09:30	55.3	73.1	56.0	48.0
06/04/2022 09:45	54.5	68.1	56.5	48.5
06/04/2022 10:00	53.0	68.2	55.4	47.5
06/04/2022 10:15	51.5	63.8	54.0	47.1
06/04/2022 10:30	55.1	69.4	58.0	48.6
06/04/2022 10:45	54.1	62.9	57.8	48.1
06/04/2022 11:00	53.4	62.8	56.5	47.4
06/04/2022 11:15	55.8	66.4	58.6	49.8
06/04/2022 11:30	56.9	66.0	59.8	51.4
06/04/2022 11:45	59.8	70.1	63.3	51.9
06/04/2022 12:00	56.6	67.0	59.2	52.1
06/04/2022 12:15	59.4	69.1	62.8	52.8
06/04/2022 12:30	57.9	71.6	61.5	50.3
06/04/2022 12:45	61.4	80.0	64.1	54.0
06/04/2022 13:00	61.5	73.8	64.9	54.6
06/04/2022 13:15	63.5	74.3	67.1	55.3

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 13:30	64.4	74.5	68.2	56.5
06/04/2022 13:45	54.2	61.4	56.6	50.2
06/04/2022 14:00	56.6	73.2	59.5	51.1
06/04/2022 14:15	61.9	70.9	65.5	54.5
06/04/2022 14:30	60.9	72.2	63.8	55.4
06/04/2022 14:45	62.3	71.0	65.6	56.5
06/04/2022 15:00	60.2	71.1	63.9	53.5
06/04/2022 15:15	59.4	67.7	62.4	53.6
06/04/2022 15:30	60.5	70.8	63.3	54.1
06/04/2022 15:45	57.6	66.2	60.6	52.3
06/04/2022 16:00	58.2	67.9	61.4	52.5
06/04/2022 16:15	57.9	70.6	60.5	51.3
06/04/2022 16:30	61.5	74.4	65.1	54.7
06/04/2022 16:45	58.6	68.8	61.9	52.7
06/04/2022 17:00	59.9	70.9	62.6	55.4
06/04/2022 17:15	61.2	72.3	64.5	55.2
06/04/2022 17:30	59.2	71.0	62.7	52.4
06/04/2022 17:45	58.0	68.0	60.9	51.7
06/04/2022 18:00	58.5	68.6	61.1	53.6
06/04/2022 18:15	59.9	72.9	63.3	52.2
06/04/2022 18:30	57.0	65.9	60.3	51.5
06/04/2022 18:45	56.9	71.4	59.4	51.5
06/04/2022 19:00	55.3	66.3	58.4	49.5
06/04/2022 19:15	56.1	66.8	58.8	51.9
06/04/2022 19:30	53.7	63.9	56.4	48.3
06/04/2022 19:45	58.7	73.8	61.0	49.5
06/04/2022 20:00	52.6	69.5	55.2	46.4
06/04/2022 20:15	55.6	66.2	59.2	49.0
06/04/2022 20:30	56.9	67.9	60.2	50.5
06/04/2022 20:45	57.1	70.2	60.3	50.4
06/04/2022 21:00	56.7	67.4	60.0	50.1
06/04/2022 21:15	57.5	66.9	61.2	50.8

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 21:30	54.8	63.9	57.6	49.3
06/04/2022 21:45	58.8	70.0	61.8	52.2
06/04/2022 22:00	56.0	67.7	58.8	49.6
06/04/2022 22:15	53.0	61.6	55.7	47.7
06/04/2022 22:30	52.9	61.5	56.1	47.9
06/04/2022 22:45	52.0	62.3	54.9	46.3
06/04/2022 23:00	53.2	62.4	55.8	48.8
06/04/2022 23:15	55.4	67.1	58.6	48.7
06/04/2022 23:30	56.4	70.6	59.9	50.2
06/04/2022 23:45	56.3	65.8	59.6	49.5
07/04/2022 00:00	53.4	64.4	56.4	47.1
07/04/2022 00:15	56.1	68.8	59.8	47.0
07/04/2022 00:30	62.1	78.8	64.9	54.8
07/04/2022 00:45	67.6	77.4	70.9	60.7
07/04/2022 01:00	62.5	77.8	65.7	53.6
07/04/2022 01:15	65.7	75.7	69.2	56.6
07/04/2022 01:30	57.3	67.1	60.9	50.3
07/04/2022 01:45	56.1	67.5	59.2	49.7
07/04/2022 02:00	56.4	68.5	59.5	48.9
07/04/2022 02:15	57.0	66.3	60.3	50.3
07/04/2022 02:30	53.9	64.7	57.3	47.5
07/04/2022 02:45	53.5	64.8	56.7	47.9
07/04/2022 03:00	52.5	62.6	56.1	45.8
07/04/2022 03:15	48.2	58.8	52.3	39.5
07/04/2022 03:30	46.5	59.5	48.8	41.4
07/04/2022 03:45	48.6	59.6	51.8	42.3
07/04/2022 04:00	43.8	55.4	46.3	37.9
07/04/2022 04:15	46.2	56.3	49.1	39.9
07/04/2022 04:30	48.0	57.2	51.3	41.6
07/04/2022 04:45	53.1	66.0	56.8	45.8
07/04/2022 05:00	50.2	62.0	53.2	43.7
07/04/2022 05:15	53.2	66.0	55.9	47.1

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
07/04/2022 05:30	57.9	68.0	61.0	50.3
07/04/2022 05:45	59.5	70.5	62.8	52.9
07/04/2022 06:00	57.9	71.2	60.8	52.6
07/04/2022 06:15	59.0	70.6	62.0	53.3
07/04/2022 06:30	59.3	69.8	62.3	54.5
07/04/2022 06:45	59.1	70.4	62.1	54.5
07/04/2022 07:00	58.9	67.4	61.2	55.2
07/04/2022 07:15	57.7	71.3	60.4	52.6
07/04/2022 07:30	61.4	71.7	65.4	54.6
07/04/2022 07:45	60.4	75.3	63.0	53.9
07/04/2022 08:00	63.9	74.7	67.2	57.1
07/04/2022 08:15	60.7	69.8	63.4	56.2
07/04/2022 08:30	61.7	71.3	64.6	56.4
07/04/2022 08:45	63.1	74.4	66.2	57.2
07/04/2022 09:00	64.2	75.9	67.5	58.1
07/04/2022 09:15	64.6	76.3	67.7	56.7
07/04/2022 09:30	65.1	77.5	68.9	57.2
07/04/2022 09:45	62.3	75.9	65.8	55.3
07/04/2022 10:00	62.3	76.0	65.7	55.1
07/04/2022 10:15	61.9	73.4	65.3	55.4

Location 3 - 15-minute History Results, dB

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 12:00	48.7	63.9	50.8	44.6
05/04/2022 12:15	49.3	57.3	51.7	45.4
05/04/2022 12:30	50.2	65.5	52.4	45.9
05/04/2022 12:45	48.3	58.1	50.7	44.2
05/04/2022 13:00	48.8	62.8	51.3	42.7
05/04/2022 13:15	48.0	55.2	50.5	43.4
05/04/2022 13:30	50.0	68.5	52.2	45.3
05/04/2022 13:45	49.5	65.2	51.3	44.4
05/04/2022 14:00	49.3	57.5	51.7	45.1

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 14:15	48.6	58.2	50.8	44.3
05/04/2022 14:30	49.5	58.2	52.3	45.0
05/04/2022 14:45	50.5	64.1	52.9	45.7
05/04/2022 15:00	50.8	67.3	52.7	46.1
05/04/2022 15:15	49.5	56.0	52.0	44.9
05/04/2022 15:30	51.0	60.0	53.1	47.9
05/04/2022 15:45	55.9	78.9	53.4	47.4
05/04/2022 16:00	50.0	59.2	52.2	46.2
05/04/2022 16:15	51.8	61.7	54.0	48.6
05/04/2022 16:30	51.1	64.8	53.1	48.0
05/04/2022 16:45	50.5	65.8	52.6	46.5
05/04/2022 17:00	51.1	75.2	53.1	46.5
05/04/2022 17:15	51.7	67.3	53.6	46.0
05/04/2022 17:30	49.7	59.5	52.3	44.9
05/04/2022 17:45	51.3	61.5	53.5	47.6
05/04/2022 18:00	50.6	57.4	52.8	46.8
05/04/2022 18:15	49.2	66.5	51.6	44.1
05/04/2022 18:30	49.9	58.8	52.5	45.4
05/04/2022 18:45	50.3	70.7	52.6	45.1
05/04/2022 19:00	48.9	63.5	51.9	42.2
05/04/2022 19:15	47.6	61.8	50.4	40.9
05/04/2022 19:30	51.2	70.7	53.0	41.3
05/04/2022 19:45	45.3	58.9	48.4	38.5
05/04/2022 20:00	44.8	57.2	48.6	36.1
05/04/2022 20:15	44.8	65.2	48.6	34.0
05/04/2022 20:30	43.3	54.0	47.4	33.6
05/04/2022 20:45	49.0	68.1	48.2	32.2
05/04/2022 21:00	42.7	52.7	46.2	35.3
05/04/2022 21:15	44.5	59.2	47.7	37.4
05/04/2022 21:30	46.5	64.3	48.9	33.6
05/04/2022 21:45	42.2	56.0	46.4	33.7
05/04/2022 22:00	49.6	67.6	48.2	31.2

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
05/04/2022 22:15	41.9	60.5	45.4	31.6
05/04/2022 22:30	42.8	55.0	46.4	35.8
05/04/2022 22:45	41.2	52.2	44.6	34.7
05/04/2022 23:00	45.7	65.3	47.9	33.3
05/04/2022 23:15	40.4	53.2	44.9	32.7
05/04/2022 23:30	40.4	54.1	44.0	33.1
05/04/2022 23:45	40.3	60.8	43.3	32.3
06/04/2022 00:00	60.4	84.1	45.2	31.9
06/04/2022 00:15	43.0	54.6	46.0	37.2
06/04/2022 00:30	41.6	49.2	44.0	37.7
06/04/2022 00:45	42.7	53.7	45.7	37.3
06/04/2022 01:00	40.7	56.2	44.0	31.7
06/04/2022 01:15	43.4	54.2	47.0	36.0
06/04/2022 01:30	39.9	52.1	43.1	34.0
06/04/2022 01:45	41.4	52.8	45.0	34.3
06/04/2022 02:00	44.8	54.5	48.1	38.4
06/04/2022 02:15	50.6	67.7	53.6	42.7
06/04/2022 02:30	50.0	61.0	53.6	43.8
06/04/2022 02:45	49.8	68.0	52.8	40.5
06/04/2022 03:00	49.1	61.4	52.4	41.5
06/04/2022 03:15	49.1	63.8	52.1	42.2
06/04/2022 03:30	48.7	63.7	52.5	40.8
06/04/2022 03:45	43.7	57.5	47.2	37.3
06/04/2022 04:00	46.8	60.6	50.3	38.8
06/04/2022 04:15	44.9	57.2	48.3	38.7
06/04/2022 04:30	43.9	55.3	46.6	38.4
06/04/2022 04:45	45.1	63.9	47.4	36.0
06/04/2022 05:00	45.0	60.0	48.5	37.3
06/04/2022 05:15	45.8	55.8	49.0	39.5
06/04/2022 05:30	45.8	56.7	49.0	39.6
06/04/2022 05:45	44.6	56.0	48.4	38.4
06/04/2022 06:00	46.4	62.3	49.4	39.1

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 06:15	47.8	63.0	50.6	39.8
06/04/2022 06:30	48.6	62.4	51.7	42.9
06/04/2022 06:45	48.6	62.2	51.2	42.5
06/04/2022 07:00	50.4	63.1	53.3	44.4
06/04/2022 07:15	49.3	59.1	51.9	44.2
06/04/2022 07:30	50.6	58.3	53.0	46.8
06/04/2022 07:45	50.9	62.1	53.1	46.5
06/04/2022 08:00	50.1	58.9	52.5	45.5
06/04/2022 08:15	50.5	61.0	52.8	46.5
06/04/2022 08:30	50.4	58.3	52.7	46.1
06/04/2022 08:45	50.3	58.0	52.5	46.6
06/04/2022 09:00	48.7	56.3	51.3	44.3
06/04/2022 09:15	50.1	60.0	52.6	45.0
06/04/2022 09:30	53.1	73.3	52.4	44.5
06/04/2022 09:45	50.6	63.8	53.1	45.7
06/04/2022 10:00	49.5	58.1	52.4	44.6
06/04/2022 10:15	48.7	55.9	51.6	43.5
06/04/2022 10:30	51.5	66.5	54.4	45.7
06/04/2022 10:45	51.1	62.8	53.9	45.7
06/04/2022 11:00	51.2	63.8	53.7	46.6
06/04/2022 11:15	52.0	61.4	54.8	47.0
06/04/2022 11:30	52.0	60.2	54.5	47.6
06/04/2022 11:45	52.3	66.5	54.6	47.7
06/04/2022 12:00	52.0	61.2	54.6	47.8
06/04/2022 12:15	53.0	62.5	56.4	46.5
06/04/2022 12:30	54.1	65.7	56.9	47.8
06/04/2022 12:45	57.2	75.3	59.4	48.8
06/04/2022 13:00	56.2	73.6	59.1	49.8
06/04/2022 13:15	57.2	70.3	60.2	52.4
06/04/2022 13:30	56.2	69.1	58.9	49.9
06/04/2022 13:45	50.9	67.7	53.5	46.6
06/04/2022 14:00	52.8	64.7	55.1	48.3

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 14:15	53.9	65.5	56.5	50.1
06/04/2022 14:30	53.5	62.9	55.5	50.0
06/04/2022 14:45	55.4	64.4	58.2	51.0
06/04/2022 15:00	53.4	63.2	56.2	48.1
06/04/2022 15:15	53.3	63.0	56.4	48.8
06/04/2022 15:30	54.0	62.6	56.9	49.5
06/04/2022 15:45	55.3	66.3	57.8	50.8
06/04/2022 16:00	54.0	70.4	57.1	48.4
06/04/2022 16:15	56.1	71.9	58.4	50.7
06/04/2022 16:30	57.2	67.3	60.3	52.0
06/04/2022 16:45	53.6	64.2	56.1	50.0
06/04/2022 17:00	54.7	64.6	57.6	50.4
06/04/2022 17:15	54.4	63.1	58.1	48.8
06/04/2022 17:30	52.3	63.7	54.4	49.0
06/04/2022 17:45	55.0	82.8	56.1	46.7
06/04/2022 18:00	54.4	65.8	56.9	50.0
06/04/2022 18:15	52.3	67.1	54.6	48.8
06/04/2022 18:30	52.2	62.4	54.6	48.5
06/04/2022 18:45	53.1	61.0	56.0	47.0
06/04/2022 19:00	51.8	61.0	54.5	45.5
06/04/2022 19:15	53.2	64.9	56.2	47.7
06/04/2022 19:30	49.8	59.4	52.4	44.4
06/04/2022 19:45	49.9	61.0	52.7	44.9
06/04/2022 20:00	48.3	56.5	51.2	42.5
06/04/2022 20:15	50.4	58.5	53.3	45.5
06/04/2022 20:30	51.1	62.0	53.8	46.7
06/04/2022 20:45	50.7	63.5	53.1	46.0
06/04/2022 21:00	50.5	59.1	53.4	45.0
06/04/2022 21:15	51.1	60.7	54.1	45.7
06/04/2022 21:30	50.2	59.2	53.2	44.8
06/04/2022 21:45	52.0	62.7	55.0	46.8
06/04/2022 22:00	51.2	61.2	54.0	45.9

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
06/04/2022 22:15	48.1	58.8	51.0	41.9
06/04/2022 22:30	47.1	55.9	49.6	42.5
06/04/2022 22:45	46.7	65.1	49.9	38.9
06/04/2022 23:00	48.0	57.7	51.0	42.9
06/04/2022 23:15	48.2	60.0	50.8	43.3
06/04/2022 23:30	50.2	61.1	53.6	43.2
06/04/2022 23:45	51.4	60.4	54.4	46.3
07/04/2022 00:00	52.0	64.2	55.6	43.0
07/04/2022 00:15	50.7	66.4	53.7	44.0
07/04/2022 00:30	57.2	68.4	60.9	49.5
07/04/2022 00:45	62.0	76.2	65.3	54.0
07/04/2022 01:00	59.1	73.4	63.6	46.1
07/04/2022 01:15	56.2	68.8	59.5	48.7
07/04/2022 01:30	50.8	59.2	54.1	45.4
07/04/2022 01:45	49.7	63.0	53.1	43.1
07/04/2022 02:00	48.5	57.9	51.5	42.3
07/04/2022 02:15	47.5	56.4	50.4	42.8
07/04/2022 02:30	46.1	54.3	48.7	40.9
07/04/2022 02:45	46.3	55.9	49.6	39.6
07/04/2022 03:00	45.8	58.2	48.9	39.9
07/04/2022 03:15	39.9	53.0	42.2	33.2
07/04/2022 03:30	41.8	56.4	44.1	37.1
07/04/2022 03:45	43.0	53.0	46.2	36.5
07/04/2022 04:00	39.0	49.3	41.3	33.8
07/04/2022 04:15	40.2	56.4	42.9	34.7
07/04/2022 04:30	41.0	54.1	44.6	35.3
07/04/2022 04:45	44.8	57.2	48.3	38.4
07/04/2022 05:00	44.2	59.9	47.5	38.0
07/04/2022 05:15	47.2	57.3	50.7	41.2
07/04/2022 05:30	48.5	60.1	51.1	43.9
07/04/2022 05:45	49.5	59.3	52.4	44.3
07/04/2022 06:00	51.0	61.4	53.6	45.7

Date and Time	$L_{Aeq, 15\ min}$	$L_{Amax(F)}$	$L_{A10, 15\ min}$	$L_{A90, 15\ min}$
07/04/2022 06:15	50.7	60.2	53.5	46.8
07/04/2022 06:30	51.7	61.1	54.5	46.9
07/04/2022 06:45	53.1	63.8	56.0	47.6
07/04/2022 07:00	51.9	59.5	54.5	47.2
07/04/2022 07:15	52.1	61.4	54.3	48.5
07/04/2022 07:30	54.8	65.7	57.4	50.4
07/04/2022 07:45	54.6	65.5	56.8	51.1
07/04/2022 08:00	55.5	63.7	57.7	52.2
07/04/2022 08:15	55.2	64.7	57.7	51.1
07/04/2022 08:30	55.7	65.9	57.9	52.2
07/04/2022 08:45	55.7	68.3	58.0	52.1
07/04/2022 09:00	56.8	71.5	59.6	52.5
07/04/2022 09:15	58.5	68.3	60.8	53.3
07/04/2022 09:30	59.5	68.2	62.3	55.2
07/04/2022 09:45	56.9	67.9	59.6	52.6

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