NOISE IMPACT ASSESSMENT

PRIMROSE LANE, LIVERSAGE

Prepared for: Jones Homes (Yorkshire) Ltd

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1.0 Introduction

1.1 Background

SLR Consulting (SLR) has been appointed by Jones Homes (Yorkshire) Ltd (the Client) to undertake a noise assessment to be submitted alongside a full planning application for residential property development at Primrose Lane, Liversage, West Yorkshire.

The Site is located in off Primrose Lane, Liversage, at National Grid Reference: 53.712738°, -1.703925°. A site location is presented in Section 2 of this Report.

This Noise Impact Assessment report has been prepared to assess the impact of environmental noise at the proposed development, with reference to the National Planning Policy Framework (NPPF). This assessment has also been completed with reference to:

- ProPG: *Planning & Noise – Professional Practice Guidance on Planning & Noise, New Residential Development* (ProPG).
- British Standard BS 8233:2014, *Guidance on sound insulation and noise reduction for buildings* (BS8233).

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 Site Location

The proposed development site is located at Primrose Lane, High Town, which currently comprises open land. The site is 2.48 hectares in size, and is within the site boundaries of the housing site allocation in Kirklees Local Plan (Policy HS117).

The site is bordered by:

- To the north by open land and a sports pitch, with the Spen Valley Leisure Centre beyond.
- To the east by residential dwellings on Denby Close and Darley Road.
- To the south by residential dwellings on Lower Hall Mount and Lower Hall Close, with the A649 Halifax Road is located around 150m from the site.
- To the west by open fields.

The site location plan is shown below in Figure 2-1, together with the site outline in red.

Figure 2-1
Site Location Plan

2.2 Proposed Development

The proposed development will comprise a residential development of 67 dwellings, plus associated infrastructure.

3.0 Scope and Guidance

3.1 Scoping

The scope of the assessment and proposed survey methodology were sent to the Environmental Health Department at Kirklees Council, on 31st October 2022. The following methodology was proposed by SLR:

- A baseline sound survey will be conducted at two measurement positions in the north and south of the site.
- Measured sound levels will be assessed against BS8233 and ProPG.
- Recommendations to mitigate noise by site design would be proposed where necessary.

However, at the time of writing, Kirklees Council have not yet responded.

3.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was introduced in March 2012, with latest revision dated July 2021. It acknowledges that there is a host of existing sources of national and international guidance which can be used, in conjunction with the Framework, to inform the production of Local Plans and decision making.

The NPPF defines the Government's planning policies for England and sets out the framework, within which local authorities must prepare their local and neighbourhood plans, reflecting the needs and priorities of their communities. The Government's stated purpose in producing the NPPF was to streamline policy so the planning process is less restrictive, to give a more easily understood framework for delivering sustainable development.

Under the heading of conserving and enhancing the natural environment and Paragraph 174 e), one aim of the NPPF is *"preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of … noise pollution…".*

Paragraph 185 requires planning policies and decision to ensure that new development is appropriate for its location. It stipulates a need to account for the likely effects of pollution on health and other matters, requiring the planning process to *"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"*.

3.3 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010 and sets out the Governments long-term vision on noise policy, which is fundamentally to: *"Promote good health and good quality of life through the effective management and control of noise within the context of Government policy on sustainable development"*. The vision is supported by three key aims:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and reduce to a minimum, other adverse impacts on health; and
- Where possible, contribute to the improvement of health and quality of life.

The NPSE should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace. The NPSE has adopted the following concepts, to help consider whether noise is likely to have *"significant adverse"* or *"adverse"* effects on health and quality of life:

SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.

LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times… (Defra, 2010)."

3.4 Planning Practice Guidance

The Planning Practice Guidance (PPG) was released to support the NPPF and last updated in July 2019. The Guidance stipulates that Local Planning Authorities' plan making and decision making should take account of the acoustic environment and in doing so consider:

- 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.

The guidance has also provided the following noise exposure hierarchy table *"when noise could be a concern"*.

Table 3-1
Planning Practice Guidance Noise Exposure Hierarchy Table

Response	Example of Outcomes	Increasing Effect Level	Action
NOEL – No observed effect level			
Not present	No effect	NOEL	No specific measures required
No observed adverse effect level			
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
LOAEL – Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for sleep disturbance. Affects acoustic character of the area and creates a perceived change in quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
SOAEL – Significant Observed Adverse Effect Level			

Response	Example of Outcomes	Increasing Effect Level	Action
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

3.5 BS8233

British Standard 8233:2014, Guidance on sound insulation and noise reduction for buildings (BS8233), suggests guideline noise values 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 3-2.

Table 3-2
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".*

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".

3.6 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 3-3
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.*			

4.0 Noise Survey

To establish the prevailing sound climate at the Site, a baseline survey was undertaken between Thursday 3rd November and Monday 7th November. However, as discussed within this Section of the report, only the measured data up until 1300 hours on Friday 4th November has been used.

The equipment, survey methodology and results are set out below.

4.1 Equipment

The noise survey was undertaken using the equipment listed in Table 4-1, which conforms to Class 1 acoustic accuracy for sound level meters and matched calibrators.

The sound level meters were calibrated before and after the measurements using the handheld acoustic calibrator, and no significant drift was observed. The calibration chain of equipment has been maintained as at least traceable to National Standards, no greater than one year for sound calibrators and two years for sound level meters.

Table 4-1
Noise Monitoring Equipment

Location	Description	Serial No.
Location 1	Cirrus CR:171B Class 1 Sound Level Meter	G301839
	Cirrus CR:515 Acoustic Calibrator	93674
Location 2	Cirrus CR:171B Class 1 Sound Level Meter	G303390
	Cirrus CR:515 Acoustic Calibrator	93674

4.2 Locations

Unattended noise measurements were undertaken at two monitoring locations, representative of the proposed dwellings to the north and south, closest to the main sources of transportation noise. The locations are detailed in Table 4-2. The monitoring locations are identified in Figure 4-1 below.

Table 4-2
Noise Monitoring Locations

Location	Description	Grid Ref	Monitoring Start	Monitoring End
Location 1	At the southern boundary of the site	53.712072° -1.702760°	03/11/2022 14:45	06/11/2022 20:45 *
Location 2	At the northern boundary of the site	53.713974° -1.703189°	03/11/2022 15:15	07/11/2022 14:45
** Monitoring ended early due to low battery*				

Figure 4-1
Monitoring Locations

4.3 Weather

The weather data for the local area has been reviewed for the full survey period. It shows that high wind speeds (i.e. above 5m/s) were noted from around 1300 hours on Friday 4th November, which continued into the evening period. From the morning of Monday 7th November, high wind speeds were again noted together with light rain.

A review of the measured noise levels during these periods, highlights increased noise levels, therefore the data from these periods has not been used in the impact assessment.

4.4 Soundscape

The noise survey was undertaken between Thursday 3rd November and Monday 7th November 2022. During the site visit at the start and end of the survey, a detailed log of observations was noted to describe main sources of ambient noise audible at the development site.

At Location 1 and 2, noise from distant road traffic on Halifax Road and the surrounding network was audible across the development site. Furthermore, birdsong and aircraft were also audible, together was low level construction noise during the setup.

During Friday and Saturday evening, and to a lesser extent Sunday, noise from frequent fireworks was present in the measured noise levels. Therefore, data from these periods has not been used in the impact assessment.

4.5 Results

A summary of the measured noise levels to be used in the assessment are summarised below in Table 4-3. The results have been divided into daytime (0700 to 2300 hours) and night-time (2300 to 0700 hours) periods for both locations, which consider traffic noise as the domain source of noise.

In-line the ProPG, the 10th highest maximum level ($L_{Amax,f\ 1min}$) measured can be considered for the assessment of maximum noise events. The representative maximum noise levels measured the night time period of the survey are also summarised in Table 4-3.

Table 4-3
Measured Sound Levels, dB

Location	Time Period	$L_{Aeq,T}$	$L_{Amax,f}$	Median L_{A10}	Median L_{A90}
Location 1	Daytime	47	76	47	44
	Night-Time	43	54	43	39
Location 2	Daytime	46	87	46	42
	Night-Time	41	55	40	36

5.0 Assessment

The assessment method of ProPG has been applied to the residential development to understand the risks and design requirements to mitigate the proposal from environmental noise sources.

5.1 ProPG Stage 1 - Initial Risk Assessment

In accordance with ProPG an initial site noise risk assessment has been carried out. The assessment considers the initial risk of noise from transportation sources which could have an adverse impact on the proposed development, based on the overall measured levels with no mitigation in place.

The results of the noise measurements carried out during the daytime and nigh-time periods, are presented in Table 5-1 below, and have been assessed to **Error! Reference source not found.** below which provides an i ndication of risk in accordance with ProPG.

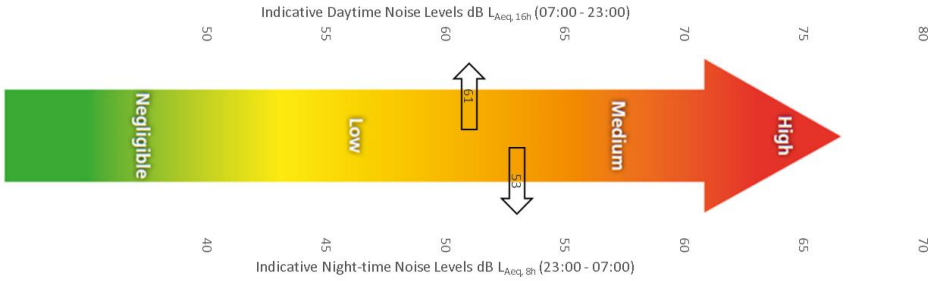
Table 5-1
ProPG Stage 1 Initial Risk Assessment

Residential Property Location	Daytime Noise Level (dB L_{Aeq})	Risk of Adverse Effect During the Daytime (ProPG)	Night-time Noise Level (dB L_{Aeq})	Risk of Adverse Effect During the Night-time (ProPG)
Proposed dwellings near the southern boundary of the site (i.e., Location 1)	47	Negligible	43	Negligible
Proposed dwellings near the northern boundary of the site (i.e., Location 2)	46	Negligible	41	Negligible

Table 5-1 indicates that during the daytime the proposed receptors across the entire site, would be at negligible risk of experiencing an adverse noise impact due to environmental noise. With regard to negligible risk, ProPG states:

"These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds."

Figure 5-1
ProPG Indicative Risk Assessment



5.2 BS8233 Assessment

As demonstrated within the ProPG assessment, the existing noise levels across the undeveloped site have a negligible risk of adverse impact. In order to determine the required mitigation measures, this section of the assessment compares the measured noise levels to the BS8233 guideline noise values for internal and external living areas at the proposed dwellings.

5.2.1 External Living Areas

As detailed in Table 5-1, external noise levels across the proposed development site are below 50dB lower guideline noise value for garden areas. Therefore, mitigation measures are not required.

5.2.2 Internal Living Area

When assessing noise levels within internal areas of the proposed dwellings, the performance of the building envelope will be reduced in the event windows are opened for ventilation or cooling purposes.

The measured noise levels as detailed in Table 4-3, have been used to determine the noise levels likely at the proposed dwellings at the northern and southern edges of the development, during the daytime and night time periods.

When assuming that open window provides 13dB attenuation, the guideline noise values within internal living and bedroom areas can be achieved with open windows, during the daytime and night-time. Therefore, mitigation measures are not required.

5.3 Development Related Road Traffic

The operational phase of the Proposed Development will generate additional traffic movements on the existing road network. Additional vehicle movements have the potential to increase road traffic noise levels at existing dwellings located on Darley Road and Ripley Road.

The traffic data has been provided with and without the development, by the transport consultant Vectos. The traffic data used in both scenarios, comprises of the baseline traffic flows, and the baseline plus development traffic flows. A road traffic noise calculation has been carried out to determine the impact of development led road traffic at the Noise Sensitive Receptors (NSR's) most likely to be impacted by additional vehicle movements to and from the site. The locations of the NSR's is shown on Figure 4-1 above.

The Basic Noise Level was calculated for the NSR locations using the formulae detailed in CRTN and a correction applied for composition and speed. No correction for distance propagation or a noise level at a specific receptor was calculated as there are no expected changes in alignment; therefore, traffic would be travelling along the link in the same way for the 'with' and 'without' scenarios.

Paragraph 12 of The Calculation of Road Traffic Noise (CRTN) states:

"The basic noise level at a reference distance of 10 m away from the nearside carriageway edge is obtained from the traffic flow, the speed of the traffic, the composition of the traffic, the gradient of the road and the road surface. On any given road the traffic flow, mean speed and composition are interdependent; for example, increasing the traffic flow may cause a reduction in the mean speed so that the net increase in noise level may be comparatively small. Similar effects are observed with changes in composition. The choice of reference point or distance is arbitrary and other reference distances could be used by changing the numerical values of constants appearing in certain of the predictions."

Additionally, no correction has been applied for the gradient or road surface type as these parameters are assumed to remain unchanged, and only total flows as indicated in the traffic data would vary due to the development related traffic on the existing road network.

Table 5-2 below shows the results of the CRTN road traffic noise calculation, and the location of the receptors in shown on Figure 4-1 above.

Table 5-2
CRTN Road Traffic Noise Calculation

Receptor Location	Traffic Flows (18hr AAWT)	Basic Noise Level ($L_{A10, 18\ hour}$)	Traffic Flows (18hr AAWT)	Basic Noise Level ($L_{A10, 18\ hour}$)	Increase ($L_{A10, 18\ hour}$)
NSR1	322	54.9	431	56.6	+1.7
NSR2	449	57.4	602	59.2	+1.8
NSR3	194	51.2	260	52.8	+1.7

As shown in Table 5-2, the highest predicted increase is 1.8dB at NSR2, which will be imperceptible, and therefore considered **negligible**.

It is acknowledged that the traffic noise levels at sensitive receptors will increase following the development, specifically those nearest to the site access, as the residents are presently living on a road leading to a cul-de-sac, and the development will change this into a through road. However, noise from road traffic following the the opening of development, will not be dissimilar to the noise currently experienced from road traffic on the southern part of Darley Road and Ripley Road.

6.0 Conclusion

SLR has been appointed by Jones Homes (Yorkshire) Ltd (the Client) to undertake a noise assessment to be submitted alongside a full planning application for residential property development at Primrose Lane, High Town.

The existing noise source which will potentially affect the residents of the proposed residential development is distant road traffic, on Halifax Road and the surrounding road network.

Road traffic noise levels have been assessed against the guideline values suggested by ProPG and BS8233. The initial Site Noise Risk Assessment carried out in accordance with ProPG shows that proposed receptors at the proposed development are at a negligible risk of experiencing an adverse noise impact due to road traffic during the day and night−time periods respectively, with no mitigation in place.

The assessment indicated that guideline values can be achieved within garden areas, and internal areas without the requirement for any mitigation measures.

The operational phase of the Proposed Development will generate additional traffic movements on the existing road network, which has the potential to increase road traffic noise levels at existing dwellings. However, the predicted change in road traffic noise, indicates that any changes in noise will be imperceptible, and therefore considered negligible.

Therefore, adverse noise impacts will be avoided at the proposed development as to accord the NPPF and overarching national planning policy for new residential development.

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.

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