

---

Our ref: NIA/7812/18/7750/v1/Vauxhall/ Phase 1

4<sup>th</sup> July 2019

Mr. Jim McVey  
Limekilns (Liverpool) Limited  
25–27 Naylor Street  
Liverpool  
L3 6DR



By email only: [jim\\_mcvey@btconnect.com](mailto:jim_mcvey@btconnect.com)

Dear Sir

**NOISE IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL-LED DEVELOPMENT  
PHASE 1 LAND SOUTH OF ORIEL STREET, VAUXHALL, LIVERPOOL**

**1.00 INTRODUCTION**

- 1.01 Environmental Noise Solutions has been commissioned by Limekilns (Liverpool) Limited, to carry out a noise impact assessment for a proposed residential-led development Phase 1 Land south of Oriel Street, Vauxhall, Liverpool (hereafter referred to as the application site).
- 1.02 The objectives of the noise impact assessment were to:
- Determine the external noise levels at the application site during representative periods of the daytime and night time.
  - Assess the potential impact of the ambient noise climate on the proposed residential development with reference to relevant guidelines.
  - Provide recommendations for a scheme of sound attenuation works, as necessary, to ensure that the future occupants of the proposed residential development do not experience any unacceptable loss of amenity due to noise.
- 1.03 This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation). It has been prepared to accompany a planning application to be submitted to Liverpool City Council for the proposed development.
- 1.04 This report has been prepared for Limekilns (Liverpool) Limited for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Limekilns (Liverpool) Limited (applicant), Smith Young (applicant's agent) and ENS as to the extent to which the findings may be appropriate for their use.
- 1.05 A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

## **2.00 APPLICATION SITE SETTING AND PROPOSED DEVELOPMENT**

- 2.01 The application site is located in a mixed-use setting in Vauxhall, Liverpool, and consists of two land parcels with separate phases, this report relates to Phase 1 only (see Appendix 2 for a site layout).
- 2.02 The southern land parcel is bound by:
- Oriel Street to the north, with Millwright's Ventilation Services, derelict industrial buildings and vacant yards further beyond.
  - Rear yard of Custom Print (printing company) to the west.
  - St. Bartholomew Road to the east, with existing 4-storey residential apartments (student accommodation) beyond.
  - Naylor Road and existing industrial/commercial premises on Naylor Road to the south.
- 2.03 Full planning permission is sought for the proposed development, consisting of connecting buildings ranging from 6 - 11 no. storeys, contains 240 no. residential apartments with ground floor commercial units.
- 2.04 The layout plan indicates that the residential development footprint is set back:
- Circa 8 metres from the nearside kerb of Naylor Street.
  - Circa 5 metres from the nearside kerb of St. Bartholomew Road.
  - Circa 4 metres from the nearside kerb of Oriel Street.
- 2.05 The ambient noise climate at the application site is characterised by intermittent road traffic on local roads with an underlying contribution from distant road traffic on the surrounding road network. Noise associated with existing commercial premises in the vicinity is occasionally audible in localised areas during the daytime, but not significant.

### **3.00 BASELINE NOISE SURVEY**

- 3.01 In order to establish the ambient noise levels at the application site, a baseline noise survey was carried out during the night time (early hours) and daytime on Thursday 15<sup>th</sup> February 2018.
- 3.02 For the purpose of the assessment, the following noise monitoring positions were adopted (the approximate location of the noise monitoring positions is shown in Appendix 2 for reference):
- MP1 was located at the north-western corner of the southern land parcel, at circa 4 metres from the nearside kerb of Oriel Street, at 1.5 metres above ground level (AGL).
  - MP1A was located at the north-western corner of the southern land parcel, at circa 4 metres from the nearside kerb of Oriel Street, at 5 metres AGL (in order to assess variation due to height).
  - MP2 was located at the south-eastern corner of the northern land parcel, at circa 5 metres from the nearside kerb of St. Bartholomew Road and at circa 5 metres from the nearside kerb of Oriel Street, at 1.5 metres AGL.
  - MP2A was located at the south-eastern corner of the northern land parcel, at circa 5 metres from the nearside kerb of St. Bartholomew Road and at circa 5 metres from the nearside kerb of Oriel Street, at 5 metres AGL (in order to assess variation due to height).
  - MP3 was located along the southern boundary of the southern land parcel, at circa 4 metres from the nearside kerb of Naylor Street, at 1.5 metres AGL.
- 3.03 Noise measurements were undertaken in free field conditions using Bruel & Kjaer 2260 Type 1 integrating sound level meters. The measurement system calibration was verified immediately before the commencement of the measurement sessions and again at the end, using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted. Weather conditions throughout the survey were appropriate for monitoring.
- 3.04 Measurements consisted of A-weighted broadband parameters, together with linear one-third octave band  $L_{eq}$  levels. The following table contains a summary of the measurement data for each measurement session, at each measurement position, rounded to the nearest decibel.
- 3.05 Ambient noise levels throughout the application site were due to intermittent road traffic on local roads and constant underlying distant road traffic noise from the surrounding road network. Noise associated with commercial premises in the vicinity was occasionally audible in localised areas during the daytime, but was not significant.

**Table 3.1 – Summary of Noise Measurement Data**

Position	Date	Time	L <sub>Aeq</sub> (dB)	L <sub>A90</sub> (dB)	L <sub>A10</sub> (dB)	L <sub>A1</sub> (dB)	Comment
MP1	15/02/18	1429–1459	55	49	56	66	Road traffic on Oriel Street dominant, noise from Millwright's occasionally audible but not significant.
MP1	15/02/18	0244–0319	44	35	46	55	Very occasional vehicle passes on Oriel Street (typically 60 dB L <sub>AFMax</sub> ) no commercial/industrial activity.
Daytime and night time ambient noise levels circa 55 dB L <sub>Aeq, T</sub> and 44 dB L <sub>Aeq, T</sub> respectively. Maximum noise levels typically 60 dB L <sub>AFMax</sub> during the night.							
MP1A	15/02/18	1536–1619	56	51	59	65	Intermittent road traffic on Oriel Street dominant, noise from Millwright's occasionally audible but not significant.
Daytime ambient noise level circa 56 dB L <sub>Aeq, T</sub> Comparison of ambient noise levels at MP1 and MP1A shows negligible difference due to variation in height							
MP2	15/02/18	1311–1409	58	53	60	67	Road traffic on St. Bartholomew Road (circa 80 vehicles / hour)
MP2	15/02/18	1443–1520	58	53	60	67	
MP2	15/02/18	0049–0149	48	43	51	56	Occasional vehicle passes on St. Bartholomew Road (up to 67 dB L <sub>AFMax</sub> ), no commercial/industrial activity.
MP2	15/02/18	0149–0249	47	40	49	58	
MP2	15/02/18	0249–0332	46	38	49	56	
Daytime and night time ambient noise levels circa 58 dB L <sub>Aeq, T</sub> and 47 dB L <sub>Aeq, T</sub> respectively. Maximum noise levels up to 67 dB L <sub>AFMax</sub> during the night.							
MP2A	15/02/18	1325–1346	58	53	61	68	Road traffic on St. Bartholomew Road
Daytime ambient noise level circa 58 dB L <sub>Aeq, T</sub> Comparison of ambient noise levels at MP3 and MP3A shows negligible difference due to variation in height							
MP3	15/02/18	1506–1556	60	52	63	71	Road traffic on Naylor Street (circa 100 vehicles / hour)
MP3	15/02/18	0156–0236	53	39	53	67	Occasional vehicle passes on Naylor Street (up to 75 dB L <sub>AFMax</sub> ), no commercial/industrial activity.
Daytime and night time ambient noise levels circa 60 dB L <sub>Aeq, T</sub> and 53 dB L <sub>Aeq, T</sub> respectively. Maximum noise levels up to 75 dB L <sub>AFMax</sub> during the night.							

#### **4.00 NATIONAL PLANNING POLICY FRAMEWORK AND OTHER RELEVANT GUIDANCE**

##### National Planning Policy Framework

- 4.01 The National Planning Policy Framework (NPPF) was updated in February 2019 and sets out the Government's planning policies for England and how these are expected to be applied.
- 4.02 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 170 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

*'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of.....noise pollution'.*

4.03 Paragraph 180 advises that:

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

4.04 With regard to extant community noise sources and the potential to affect proposed new developments, Paragraph 182 states that:

*'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.'*

4.05 The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF

Noise Policy Statement for England

4.06 The Noise Policy Statement for England (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life.
- Mitigate and minimise adverse impacts on health and quality of life.
- Where possible, contribute to the improvement of health and quality of life.

4.07 NPSE describes the following levels at which noise impacts may be identified:

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

Planning Practice Guidance – Noise

4.08 In December 2014, Planning Practice Guidance (PPG) was updated online which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

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

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

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

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

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

#### ProPG Planning and Noise: New Residential Development

- 4.11 ProPG Planning and Noise: New Residential Development (ProPG) was published in May 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.
- 4.12 Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 ‘Guidance on Sound Insulation and Noise Reduction for Buildings’ (BS 8233) (see table below).

**Table 4.1 – Indoor Ambient Noise Levels in Dwellings**

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq}$ (0700–2300)	-
Dining	Dining Room/Area	40 dB $L_{Aeq}$ (0700–2300)	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq}$ (0700–2300)	30 dB $L_{Aeq}$ (2300–0700) 45 dB $L_{AFMax}$ (2300–0700)

- 4.13 Note 4 to the above table states:

*‘A guideline value may be set in terms of SEL or  $L_{Amax,F}$ , depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB  $L_{Amax,F}$  more than 10 times a night.’*

- 4.14 Note 5 to the above table states:

*‘Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade 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, subject to the further advice in Note 7’.*

- 4.15 This is consistent with the guidance contained within the PPG, which states that:

*‘... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations’.*

- 4.16 On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed residential development and considered to represent good resting and sleeping conditions:

- $\leq 35$  dB  $L_{Aeq}$  (0700-2300) during the daytime.
- $\leq 30$  dB  $L_{Aeq}$  (2300-0700) and 45 dB  $L_{AFMax}$  not regularly exceeded during the night time.

## 5.00 SOUND ATTENUATION SCHEME PROPOSALS

- 5.01 The worst-case (MP3) daytime and night ambient noise levels at the application site were measured at **60 dB  $L_{Aeq,T}$**  and **53 dB  $L_{Aeq,T}$**  respectively, with maximum noise levels of up to **75 dB  $L_{AFMax}$**  during the night time.
- 5.02 The worst-case maximum noise level at MP2 (corner of Oriel Street and St Bartholomew Road) was measured up to **67 dB  $L_{AFMax}$**  during the night time. For design purposes this level has been adopted for bedrooms fronting onto Oriel street only. The remaining bedroom facades have sight or partial sight of Naylor Street and therefore the associated higher maximum noise level of **75 dB  $L_{AFMax}$**  which was measured at 4 metres to the near side kerb has been used and distance corrected as to obtain the design  $L_{AFMax}$  levels for Naylor Street and Bartholomew Road.
- 5.03 The facades on Naylor Street are set back circa 8 metres from the near side kerb and therefore a correction of – 3dB has been applied (also representative of Bartholomew Road). For the Naylor street some facades are set back further at circa 20 metres to the nearside kerb. For these facades a correction of – 7dB has been applied.
- 5.04 In order to calculate the sound insulation requirements of the building envelope for habitable rooms at the application site, the Building Research Establishment (BRE) building envelope insulation calculation spreadsheet was used. This spreadsheet is based on the calculation methodology advocated in BS 8233. The spreadsheet allows input of external noise levels, room dimensions and reverberation time together with parameters for the various elements of the building envelope and calculates the internal noise level in terms of the external noise level metric ( $L_{Aeq}$  and  $L_{AFMax}$  in this case).
- 5.05 The scheme of sound insulation is set out in the following table. Note: it is the control of discrete event maxima during the night time period which governs the glazing/ventilation requirements in bedrooms.

**Table 5.1 – Scheme of Sound Insulation Works**

Location	Noise Level	Internal Criteria	Glazing and Ventilation
Bedrooms fronting onto Oriel Street	$\leq 60$ dB $L_{Aeq, day}$ $\leq 53$ dB $L_{Aeq, night}$ $\leq 67$ dB $L_{AFMax}$	$\leq 35$ dB $L_{Aeq}$ (0700–2300) $\leq 30$ dB $L_{Aeq}$ (2300–0700) $\leq 45$ dB $L_{AFMax}$ (2300–0700)	Enhanced glazing rated at 31 dB $R_w+C$ i.e. 6 mm glass / (6-20) / 4 mm glass and acoustic trickle vents $\geq 38$ dB $D_{n,e,w}+C$ *
Bedrooms fronting onto Bartholomew Road & eastern end of Naylor Street	$\leq 60$ dB $L_{Aeq, day}$ $\leq 53$ dB $L_{Aeq, night}$ $\leq 72$ dB $L_{AFMax}$	$\leq 35$ dB $L_{Aeq}$ (0700–2300) $\leq 30$ dB $L_{Aeq}$ (2300–0700) $\leq 45$ dB $L_{AFMax}$ (2300–0700)	Enhanced glazing rated at 33 dB $R_w+C$ i.e. 8 mm glass / (6-20) / 6 mm glass and acoustic trickle vents $\geq 38$ dB $D_{n,e,w}+C$ *
Bedrooms set back from Naylor Street (western end)	$\leq 60$ dB $L_{Aeq, day}$ $\leq 53$ dB $L_{Aeq, night}$ $\leq 68$ dB $L_{AFMax}$	$\leq 35$ dB $L_{Aeq}$ (0700–2300) $\leq 30$ dB $L_{Aeq}$ (2300–0700) $\leq 45$ dB $L_{AFMax}$ (2300–0700)	Enhanced glazing rated at 32 dB $R_w+C$ i.e. 8 mm glass / (6-20) / 4 mm glass and acoustic trickle vents $\geq 38$ dB $D_{n,e,w}+C$ *
All Living Rooms Across Phase 1	$\leq 60$ dB $L_{Aeq, day}$	$\leq 35$ dB $L_{Aeq}$ (0700–2300)	Enhanced glazing rated at 31 dB $R_w+C$ i.e. 6 mm glass / (6-20) / 4 mm glass and acoustic trickle vents $\geq 38$ dB $D_{n,e,w}+C$ *

\* Acoustic trickle vents rated at least 38 dB  $D_{n,e,w}+C$  per 5000 mm<sup>2</sup> EA in open position, such as the Greenwood 5000EAW.AC1 or equivalent (note: 1 no. required per habitable room). Ventilation requirements to be confirmed by developer

## **6.00 CONCLUSIONS**

- 6.01 A noise impact assessment has been undertaken for a proposed residential-led development at Phase 1 Land south of Oriel Street, Vauxhall, Liverpool.
- 6.02 The ambient noise climate at the application site is characterised by intermittent road traffic on local roads with an underlying contribution from distant road traffic on the surrounding road network. Noise associated with existing commercial premises in the vicinity is occasionally audible in localised areas during the daytime, but not significant.
- 6.03 A scheme of sound attenuation works has been developed to protect the proposed residential development from the ambient noise climate in accordance with pertinent guidelines. On this basis, the ambient noise climate is not considered to pose a constraint to the proposed residential development.

I trust the foregoing is sufficient for your needs. Should you have any queries regarding the above, please do not hesitate to contact me.

Yours sincerely

Richard Whitaker  
AMIOA, Diploma in Acoustics and Noise Control  
Environmental Noise Solutions Limited

cc File

## **Appendix 1**

### **Glossary of Acoustic Terms**

#### **Sound Pressure Level ( $L_p$ )**

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20  $\mu$ Pa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where  $L_p$  = sound pressure level in dB;  $p$  = rms sound pressure in Pa; and  $p_0$  = reference sound pressure (20  $\mu$ Pa).

#### **A-weighting Network**

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

#### **Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$**

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval,  $T$ , has the same mean-square sound pressure as a sound that varies with time.  $L_{Aeq, 16h}$  (07:00 to 23:00 hours) and  $L_{Aeq, 8h}$  (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

#### **$L_{A10, T}$**

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period,  $T$ .  $L_{A10, 18h}$  is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

#### **$L_{A90, T}$**

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval,  $T$ .  $L_{A90}$  is typically taken as representative of background noise.

#### **$L_{AF \max}$**

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

#### **Sound Exposure Level (SEL or $L_{AE}$ )**

The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

#### **Weighted Sound Reduction Index ( $R_w$ )**

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies ( $R_w$  is used to characterise the insulation of a material or product that has been measured in a laboratory).

**Appendix 2**  
**Noise Monitoring Positions**



- = 6 mm / (6-20) / 4 mm & acoustic vents
- = 8 mm / (6-20) / 6 mm & acoustic vents
- = 8 mm / (6-20) / 4 mm & acoustic vents

**Appendix 3**  
**Drawings / Site Plan (Phase 1)**  
**Scheme of Sound Insulation for Bedrooms**

