Our ref: NIA/6779/16/6676/v1/Baildon Mills

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Dear Sirs

NOISE IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT
LAND AT BAILDON MILLS, NORTHGATE, BAILDON, WEST YORKSHIRE

1.00 INTRODUCTION

1.01 KMRE Group & John Peel & Sons (Holdings) Ltd have commissioned a noise impact assessment for a proposed residential development at Baildon Mills, Northgate, Baildon, West Yorkshire (the application site).

1.02 The objectives of the noise impact assessment were to:

- Determine the ambient noise climate at the application site
- Assess the potential impact of the ambient noise climate on the proposed residential development with reference to pertinent guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary, to avoid any unacceptable loss of amenity due to noise

1.03 This report details the methodology and results of the assessment and commentary on the building envelope (fenestration and ventilation). It has been prepared to accompany a planning application to be submitted to Bradford Metropolitan Borough Council for the proposed residential development of the application site.

1.04 This report has been prepared for KMRE Group & John Peel & Sons (Holdings) Ltd 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 KMRE Group & John Peel & Sons (Holdings) Ltd (applicant), Roger Lee Planning Ltd (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 RESIDENTIAL DEVELOPMENT

2.01 The application site is located in a mixed residential and commercial area to the north of Baildon town centre. Roughly rectangular in shape, it is bound by (see Appendix 2 for reference):

- Providence Row to the north (existing residential dwellings on the opposite side)
- Existing residential dwellings to the west and south
- Northgate and existing commercial use to the east

2.02 The proposed residential development consists of 58 units as follows (see Appendix 3):

- Block A 8 units (conversion of existing building (Listed))
- Block B 21 units (conversion of existing building)
- Block C 3 units (conversion of existing Listed building)
- Block D 24 units (demolition of existing building followed by new build)
- Block E 0 units (demolition of existing building)
- Block F 2 units (demolition of existing building followed by new build)

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3.00 BASELINE NOISE SURVEY

3.01 In order to establish the ambient noise levels at the application site, a baseline noise survey was undertaken on Tuesday 21st June 2016 and Wednesday 29th June 2016. For the purpose of the assessment, the following noise monitoring positions were adopted (see Appendix 3 for reference):

- MP1 was located outside Unit A overlooking Northgate
- MP2 was located outside Unit D overlooking the rear of commercial premises
- MP3 was located outside Unit D overlooking the rear of commercial premises
- MP4 was located outside Unit A overlooking Northgate and Providence Row (but set back)
- MP5 was located outside Unit B
- MP6 was located outside Unit F overlooking Providence Row

3.02 Noise measurements were undertaken using Bruel & Kjaer 2250 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. Measurements consisted of A–weighted broadband parameters, together with linear third octave band L_{eq} levels.

3.03 The following table contains a summary of the measurement noise data rounded to the nearest decibel (note: a –3 dB façade enhancement correction has been applied to the noise measurement data at MP1 and MP4).

Table 3.1 – Noise Measurement Data

Position	Date	Time	LAeq (dB)	LA90 (dB)	LA10 (dB)	LA1 (dB)	Comments
MP1	21/06/16	1137–1237	61	49	64	70	Northgate circa 600 vehicles per hour
		1237–1337	61	48	64	70	
		1337–1437	61	49	64	71	
		2315–0000	52	31	52	65	Northgate circa 60 vehicles per hour
Daytime ambient noise level 61 dB LAeq (0700–2300) based on TRL Night time ambient noise level 53 dB LAeq (2300–0700) based on TRL							
MP2	21/06/16	0930–0945	50	45	52	59	Distant traffic, plant at commercial premises
		1030–1145	51	45	53	60	
		2157–2254	48	38	50	55	
	29/06/16	2307–0007	46	37	51	55	Distant traffic, plant at commercial premises
Daytime ambient noise levels 48 to 51 dB LAeq,T Night time ambient noise levels 45 dB LAeq,T							
MP3	21/06/16	1000–1020	49	44	51	60	Distant traffic
MP4	21/06/16	1438–1453	53	46	56	61	
MP5	21/06/16	1455–1510	45	40	48	54	
MP6	21/06/16	1512–1527	45	39	48	55	
MP7	21/06/16	1532–1547	47	43	50	57	
Daytime ambient noise levels 45 to 53 dB LAeq,T							

3.04 The ambient noise climate at the application site is predominantly due to local and distant road traffic. In the locality of Unit B (which is to be demolished and re-built), in addition to local and distant traffic there is also noise (albeit at a relatively low level) associated with ventilation plant at the nearby commercial premises which contributes to the ambient noise climate.

3.05 For the prediction of daytime road traffic noise, the Department of Transport's Memorandum on the Calculation of Road Traffic Noise (CRTN) explains that measurements of L_{A10} may be made during periods between 10:00 and 17:00 hours. The $L_{A10\ (18\ hour)}$ is calculated from:

(i) $L_{A10\ (0600–0000)} = L_{A10\ (3\ hour)} – 1$ dB

(ii) $L_{Aeq\ (0700–2300)} \approx L_{A10\ (0600–0000)} – 2$ dB

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3.06 Substituting (ii) into (i) gives the following approximation:

(iii) $L_{Aeq\ (0700–2300)} \approx L_{A10\ (3\ hour)} – 3\ dB$

3.07 Based on the above formula, the daytime ambient noise level at MP1 (Northgate frontage of Unit A which is to be converted to residential development) is measured / calculated at 61 dB $L_{Aeq\ (0700–2300)}$.

3.08 A study prepared by TRL Limited on behalf of the Department for Environment, Food and Rural Affairs (DEFRA) entitled 'Converting the UK Traffic Noise Index $L_{A10\ (18\ hour)}$ to EU Noise Indices for Noise Mapping' presents a methodology for calculating night time road traffic noise levels based on daytime road traffic noise level based on the following formula:

(iv) $L_{Aeq\ (2300–0700)} \approx 0.90 * L_{A10\ (18\ hour)} – 3.77$ (for non-motorways)

3.09 Based on the above formulae, the night time ambient noise level at MP1 (Northgate frontage of Unit A which is to be converted to residential development) is measured / calculated at 53 dB $L_{Aeq\ (2300–0700)}$.

4.00 NOISE IMPACT ASSESSMENT CRITERIA

4.01 British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233) sets guideline indoor ambient noise levels for residential dwellings' as reproduced in the following table.

Table 4.1 – Indoor Ambient Noise Levels in Dwellings (BS 8233:2014)

Location	Good Internal Ambient Noise Levels		Reasonable Internal Ambient Noise Levels	
Living Room	35 dB $L_{Aeq\ (0700–2300)}$	n/a	40 dB $L_{Aeq\ (0700–2300)}$	n/a
Bedroom	35 dB $L_{Aeq\ (0700–2300)}$	30 dB $L_{Aeq\ (2300–0700)}$	40 dB $L_{Aeq\ (0700–2300)}$	35 dB $L_{Aeq\ (2300–0700)}$

4.02 Note 4 to the above table states '*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFMax} depending on the character and number of events per night. Sporadic noise events could require separate values'.* It is therefore evident that the night time maxima guideline values set out in BS 8233 and the World Health Organisation (WHO) Guidelines for Community Noise relate to discrete, individual noise events such as aircraft and passing trains and not road traffic noise.

4.03 Note 5 to the above table states '*If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level. If applicable any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.*' It is therefore evident that BS 8233 (and Building Regulations) consider that trickle ventilators provide adequate ventilation.

4.04 Note 7 to the above table states '*Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved'.*

5.00 SOUND ATTENUATION SCHEME PROPOSALS

5.01 Based on measurements taken at numerous sites:

- A traditional single glazed sash window in a masonry building façade provides at least 23 dB(A) sound insulation (from external to internal) to road traffic noise
- A standard double glazed window with standard trickle vents in a masonry building facade provides a least 27 dB(A) sound insulation (from external to internal) to road traffic noise

5.02 The WHO Guidelines for Community Noise state '*the noise reduction from outside to inside with the window open is 15 decibels*'.

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5.03 The WHO Guidelines for Community Noise also state '*Noise protection at the receiver's site is manly used for existing situations. However, this approach must also be considered for new and, eventually, for old buildings in noisy areas. Residential buildings near main roads with heavy traffic, or near railway lines, may be provided with sound proofed windows'.*

5.04 Based on the ambient noise levels measured across the application site, it is evident that good to reasonable resting and/or sleeping conditions will be achieved across the application site with partially open windows (except for (part of) Unit A, which is the 4-storey mill warehouse fronting onto Northgate).

5.05 With respect to (part of) Unit A, and specifically the façade in closest proximity to Northgate, the daytime and night time free field ambient noise levels have been measured / calculated at 61 dB $L_{Aeq\ (0700–2300)}$ and 53 dB $L_{Aeq\ (2300–0700)}$, respectively. It is understood Unit A is a Listed Building with single glazed sash windows. It is evident that good to reasonable resting and/or sleeping conditions will be achieved with closed windows.

6.00 CONCLUSIONS

6.01 A noise impact assessment has been undertaken for a proposed residential development at Baildon Mills, Northgate, Baildon.

6.02 The ambient noise climate at the application site is predominantly due to local and distant road traffic. In the locality of Unit B (which is to be demolished and re-built), in addition to local and distant traffic there is also noise (albeit at a relatively low level) associated with ventilation plant at the nearby commercial premises which contributes to the ambient noise climate.

6.03 Based on the ambient noise levels measured across the application site, it is evident that good to reasonable resting and/or sleeping conditions will be achieved across the application site with partially open windows (except for (part of) Unit A, which is the 4-storey mill warehouse fronting onto Northgate).

6.04 With respect to (part of) Unit A, and specifically the façade in closest proximity to Northgate, it is evident that good to reasonable resting and/or sleeping conditions will be achieved with closed windows.

6.05 In summary, the ambient noise climate is not considered to pose a constraint to the proposed residential development.

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 µPa 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 µPa).

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.

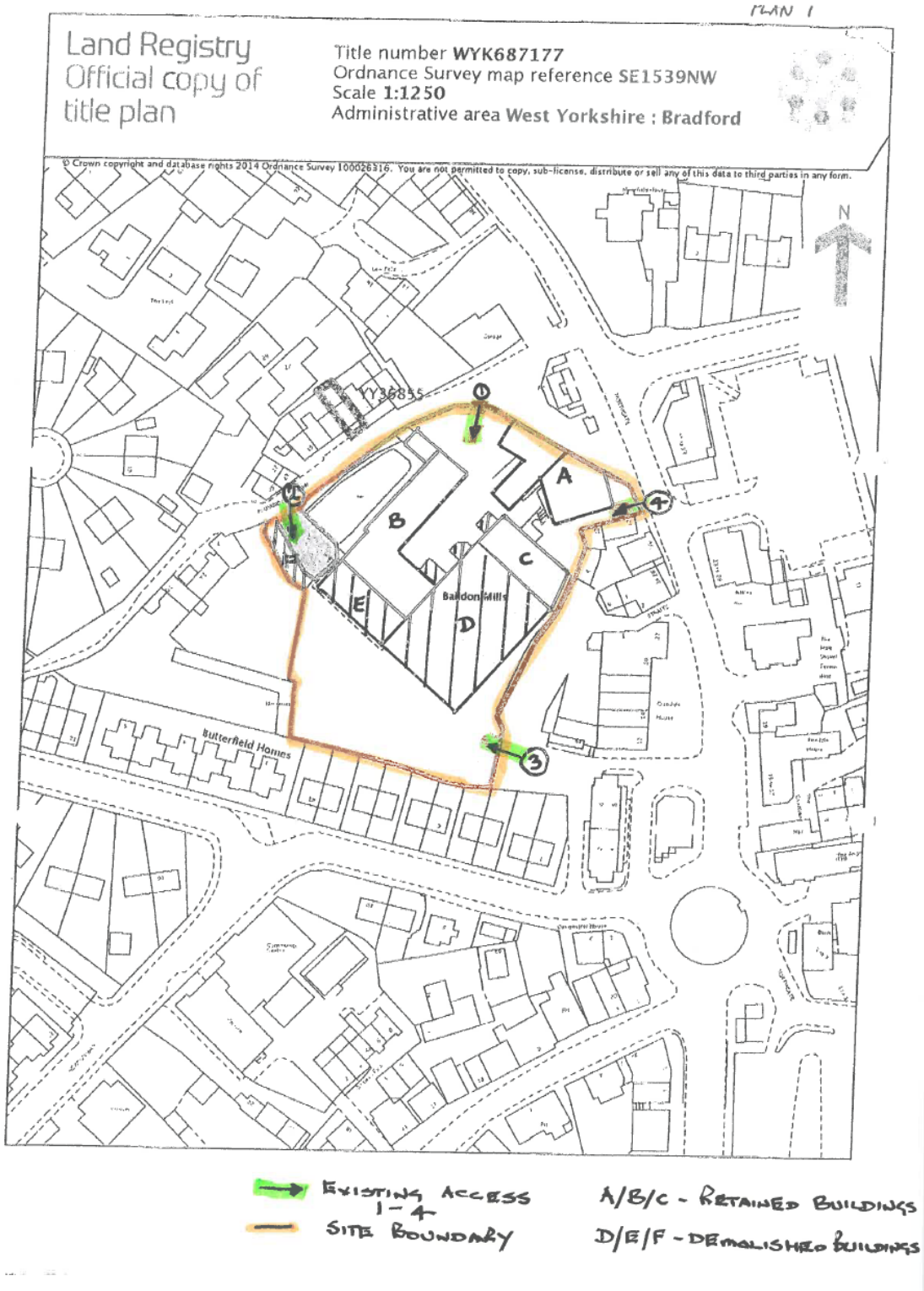
Sound Exposure Level (SEL or L_{AE})

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
Site Location Plan



Appendix 3
Proposed Site Layout Plan and Noise Monitoring Positions