Our ref: NIA/8683/19/8641/v1/Carlinghow Hill

25th September 2019

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Dear Sir

NOISE IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT, LAND AT CARLINGHOW HILL, BATLEY, WF17 0AE

1.00 INTRODUCTION

1.01 Environmental Noise Solutions Limited (ENS) has been commissioned by KUFIC to carry out a noise impact assessment for a proposed new build residential development at land at Carlinghow Hill, Batley, WF17 0AE (hereafter referred to as the application site).

1.02 The objectives of the noise impact assessment were to:

- Determine external noise levels at the application site.
- Assess the potential impact of the external noise climate on the proposed residential development with reference to relevant guidelines.
- Provide recommendations for a scheme of sound attenuation works, as necessary, to protect future occupants of the proposed residential development from a 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 the local planning authority.

1.04 This report has been prepared for KUFIC 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 KUFIC 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 within a mixed-use setting within the town of Batley. Irregular in shape (see Appendix 2 for a site layout) the application site is bound by:

- Batley Grammar School to the east with associated playing fields to the north east.
- Carlinghow Hill to the south-east with existing residential dwellings opposite.
- Existing residential dwellings on Transvaal Terrace to the south-west.
- Spring Lane to the west with light commercial units beyond (Morley Bedding, Bed Centre, Haani Furniture, Computer Repair Centre, Prestige Auto Centre).
- Open green space to the north-west.

2.02 The proposed residential development consists of 20 no. new build houses and the conversion of an existing building into 20 no. apartments with associated parking and landscaping (a site layout is shown in Appendix 2 for reference).

2.03 The noise environment at the application site is characterised by localised road traffic on Carlinghow Hill and the distant M62 to the north-east, with occasional contributions (school children in playgrounds) from Batley Grammar School.

2.04 With regard to the Batley Grammar School, the noise survey was performed at a 'peak time' (i.e. at lunch time when noise levels were elevated as a result of the children using the playgrounds.

2.05 With regard to the light industrial / commercial units to the south-west of the application site, it is understood that all units operate during daytime hours only (08:00 - 18:00 hrs). During the course of the noise survey no significant activity or operating plant was noted from the units. Indicative plans show the nearest proposed dwellings at circa 65 metres from the industrial units on the western boundary with the intervening land allocated for 'Urban Green Space', serving as a 'buffer zone'. Therefore, the existing commercial businesses / units to the west do not pose any constraints on the application site and noise environment.

3.00 BASELINE NOISE SURVEY

3.01 In order to establish external noise levels at the application site, a noise survey was undertaken on Tuesday 17th September 2019 and the early hours of Wednesday 18th September 2019.

3.02 The following noise monitoring positions were adopted (the approximate locations of the noise monitoring positions are shown in Appendix 2 for reference):

- MP1 was located in the north-east corner of the application site at 4 metres above ground level (AGL).
- MP1A was as per MP1 but at 1.5 metres AGL.
- MP2 was located in the north-west corner of the application site at 4 metres AGL.
- MP2A was as per MP1 but at 1.5 metres AGL.
- MP3 was located on the south-eastern boundary of the application site at 1 metre from the façade of the existing building and at 4 metres AGL (overlooking Batley Grammar playground).
- MP4 was located on the eastern boundary of the application site at 4 metres AGL (overlooking Batley Grammar School playground).
- MP4A was as per MP1 but at 1.5 metres AGL.
- MP5 was located on Transvaal Terrace at 1 metre from the façade of the existing building at 4 metres AGL.

3.03 Noise measurements were made in a free field environment using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. A windshield was fitted for all measurements. 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 octave band L_{eq} levels. Table 3.1 presents a summary of the noise data for each measurement session, at each position, rounded to the nearest decibel.

3.05 At MP3, as measurements were made at 1 metre from the existing building façade; therefore, a –3 decibel façade enhancement correction has been applied in order to establish the free field noise levels. The values within Table 3.1 include this correction for MP3 only.

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Table 3.1 – Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	17/09/19	1040-1055	47	45	48	Distant road traffic (M62)
Daytime ambient noise level circa 47 dB $L_{Aeq, T}$ (at 4 metres AGL)						
MP1A	17/09/19	1057-1110	44	42	46	Distant road traffic (M62)
		1313-1328	46	44	48	
Daytime ambient noise level circa 44-46 dB $L_{Aeq, T}$ (at 1.5 metres AGL)						
MP2	17/09/19	1118-1134	48	46	50	Distant road traffic (M62)
		2304-2334	40	37	42	
Daytime ambient noise level 48 dB $L_{Aeq, T}$ Night time ambient noise level 40 dB $L_{Aeq, T}$ Maximum noise levels measured up to 57 dB L_{AFMax} at night (at 4 metres AGL)						
MP2A	17/09/19	1135-1150	45	44	47	Localised Road Traffic on Carlinghow Hill
		1330-1400	48	44	50	Distant road traffic (M62)
Daytime ambient noise level 45-48 dB $L_{Aeq, T}$ (at 1.5 metres AGL)						
MP3	17/09/19	1200-1230	61	50	64	Batley Grammar School Lunch Time Children playing in playgrounds
Daytime ambient noise level 61 dB $L_{Aeq, T}$ (at 4 metres AGL)						
MP4	17/09/19	1233-1245	53	48	55	Batley Grammar School Lunch Time Children playing in playgrounds
Daytime ambient noise level 53 dB $L_{Aeq, T}$ (at 4 metres AGL)						
MP4A	17/09/19	1253-1310	51	45	54	Batley Grammar School Lunch Time Children playing in playgrounds
Daytime ambient noise level 51 dB $L_{Aeq, T}$ (at 1.5 metres AGL)						
MP5	17/09/19	1410-1440	47	43	47	Localised Road Traffic on Carlinghow Hill
		2338-0008	40	38	41	Distant road traffic (M62)
Daytime ambient noise level 47 dB $L_{Aeq, T}$ Night time ambient noise level 40 dB $L_{Aeq, T}$ Maximum noise levels measured up to 67 dB L_{AFMax} (at 4 metres AGL)						

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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 1 of ProPG comprises an initial site noise risk assessment which correlates external noise levels at the site with the risk of an adverse impact. For reference, Figure 1 of ProPG indicates that daytime noise levels of ≤ 60 dB $L_{Aeq\ (0700\text{-}2300)}$ are assessed as a low to medium risk in terms of adverse impacts.

4.13 Based on the absolute levels measured, the application site would be considered a low to medium risk in accordance with ProPG.

4.14 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 $L_{AFMax\ (2300–0700)}$

4.15 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.'

4.16 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'.

4.17 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'.

4.18 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.*'

ENS note: It is evident that BS 8233 considers that reasonable resting and sleeping conditions are achieved with indoor ambient noise levels of ≤ 40 dB $L_{Aeq\ (0700–2300)}$ and ≤ 35 dB $L_{Aeq\ (2300–0700)}$.

4.19 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:

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

4.20 With respect to external amenity, ProPG reflects the advice contained in BS 8233, as follows:

'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.'

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5.00 SOUND ATTENUATION SCHEME PROPOSALS

5.01 For a robust assessment the highest measured levels across the application site have been adopted for design purposes.

- **≤ 61 dB $L_{Aeq,T}$** during the daytime.
- **≤ 40 dB $L_{Aeq,T}$** during the night time.
- **≤ 67 dB L_{AFMax}** during the night time.

5.02 Based on measurements taken at numerous sites, a typical standard double-glazed window with standard trickle vents provides circa 27 dB(A) sound insulation (from external to internal) for road traffic noise.

5.03 The resultant internal noise levels are set out in the table below:

Table 5.1 – Ambient Noise Levels and Noise Mitigation Measures

Ambient Noise Level	Reduction	Resultant Internal Level	Internal Criteria
≤ 61 dB $L_{Aeq\ (day)}$	–27 dB	≤ 34 dB $L_{Aeq\ (day)}$	≤ 35 dB $L_{Aeq\ (0700–2300)}$
≤ 40 dB $L_{Aeq\ (night)}$		≤ 13 dB $L_{Aeq\ (night)}$	≤ 30 dB $L_{Aeq\ (2300–0700)}$
≤ 67 dB $L_{AFMax\ (night)}$		≤ 40 dB $L_{AFMax\ (night)}$	≤ 45 dB $L_{AFMax\ (2300–0700)}$

5.04 It is therefore considered that standard double glazing and standard trickle vents are appropriate throughout the application site. This applies to the new build aspect as well as the conversion aspect.

5.05 It should also be noted that the above recommendations are based on a worst-case scenario where the absolute level of 61 dB $L_{Aeq,T}$ measured at MP3 has been adopted for design purposes. The time-weighted daytime ambient noise level is calculated at 52 dB $L_{Aeq\ (0700-2300)}$ (assuming 1.5 hours of elevated levels (i.e. lunch / breaks) and taking into account the noise levels measured in the absence of the children playing measured at circa 47 dB $L_{Aeq,T}$. Such levels would be considered a low risk in accordance with ProPG Stage 1 assessment guidelines (see section 4).

External amenity (gardens)

5.06 Daytime garden levels were measured at up to 51 dB $L_{Aeq,T}$ (MP4A at 1.5 metres AGL, representative of the new build dwelling gardens) during peak time (Batley Grammar School Lunch time). This is within range of the 'desirable' external amenity level and readily satisfies the upper guideline value for external amenity areas, as recommended by BS8233 / ProPG. Therefore, no specific measures are required to protect garden amenity.

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6.00 CONCLUSIONS

6.01 A noise impact assessment has been undertaken for a proposed new build residential development at land at Carlinghow Hill, Batley, WF17 0AE

6.02 The noise environment at the application site is characterised by localised road traffic on Carlinghow Hill and the distant M62 with limited contributions from Batley Grammar School.

6.03 A scheme of sound insulation works has been developed to protect the proposed residential development from the ambient noise climate.

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 & Noise Control
For 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 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.

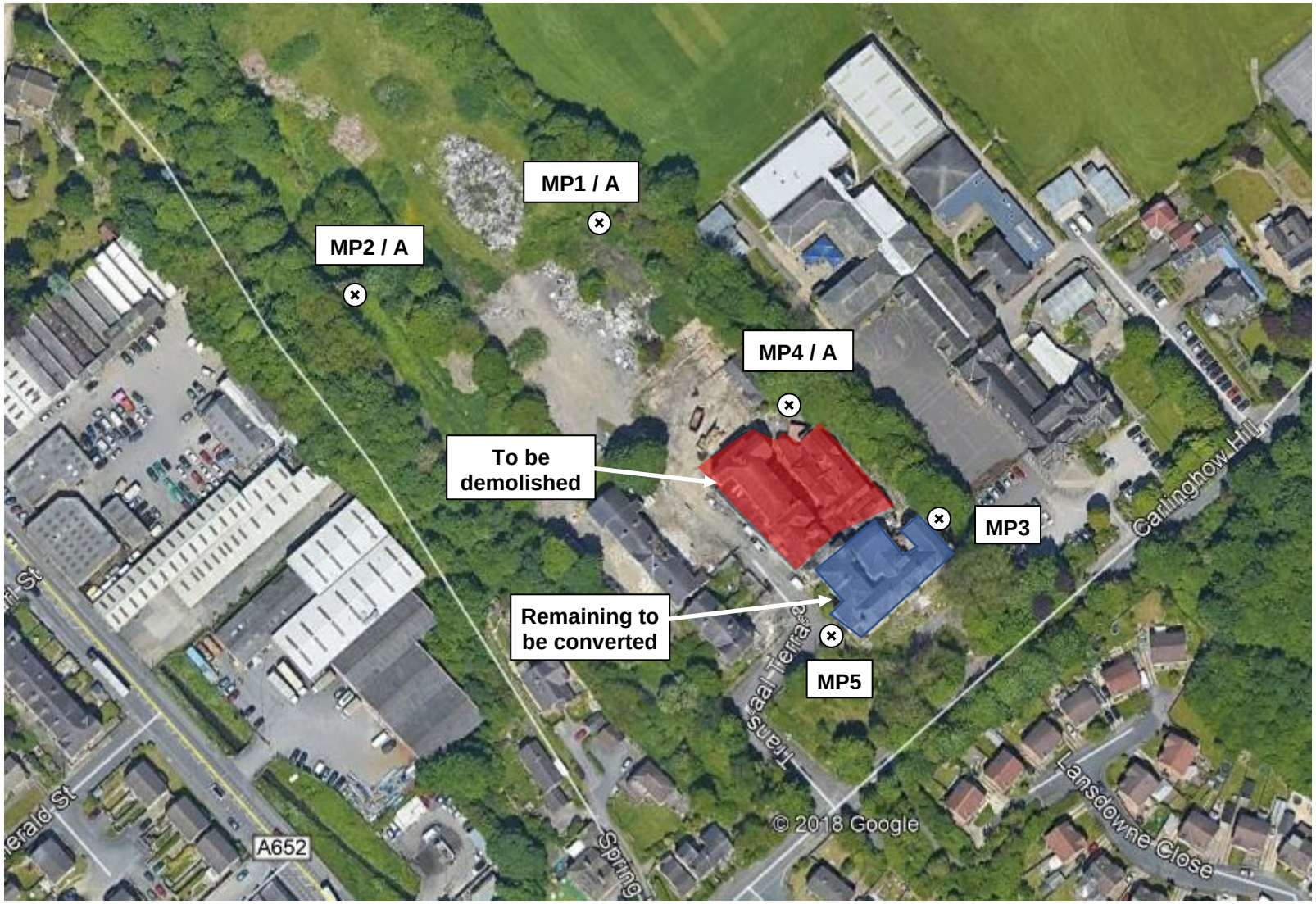
Sound Exposure Level (SEL or L_{AE})

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
Noise Monitoring Positions



Appendix 2
Site Plan

PROPOSED SITE PLAN
SCALE 1:1000 @ A3

Extent of previously developed land within greenbelt
Demolition
Soft Landscaping
Grass
Hard Landscaping

SCHEDULE:

Houses
Detached Units - 6
Semi-Detached Units - 6
Town Houses - 8
Total - 20

Flats
1 Bed - 9
2 Bed - 6
3 Bed - 5
Total - 20

No. of units in GB (brownfield) - 7
No. of units outside GB (brownfield) - 13+20=33

Total site area - 1.88 Ha (18788 sqm)

Existing GIA - 4062sqm
GIA lost to demolition - 2187 sqm
GIA retained as flats - 1875 sqm

KUFIC

DRAWING NO	STAGE 2/DESIGN
LOCATION:	CARLINGHOW HILL, BATLEY
TITLE:	RESIDENTIAL DEVELOPMENT
DESCRIPTION:	SITE PLAN