

Our ref: NIA/9305/20/9302/v1/ Barnsley Road

17th December 2020

Mr. David Wroe
Hoover Homes



By email only: david.wroe@hooverhomes.co.uk

Dear Sir

**NOISE IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT,
LAND TO THE NORTH OF BARNSELEY ROAD**

BARNSELEY METROPOLITAN BOROUGH COUNCIL PLANNING PERMISSION REF: 2014/1020

1.00 INTRODUCTION

1.01 Environmental Noise Solutions Limited (ENS) has been commissioned by Hoover Homes to carry out a noise impact assessment for a proposed residential development at land to the north of Barnsley Road (hereafter referred to as the application site).

1.02 As part of a hybrid application (including a full application for a food store) outline planning permission (ref: 2014/1020) for the residential development was granted by Barnsley Metropolitan Borough Council (BMBC) in November 2014, subject to conditions. Condition 28 relates to the control of noise as follows:

28. *A Noise Assessment shall accompany the reserved matters submission, undertaken by a competent person, to assess the impact of road noise on the proposed residential development. The assessment shall demonstrate the noise levels on the site and the proposed monitoring methodology shall be agreed with the Local Planning Authority prior to being undertaken. Where necessary, the Assessment shall include proposals to mitigate the effects of noise. The development shall be carried out in accordance with the approved details.*

Reason: To protect the amenity of existing and future occupiers from road noise in accordance with Core Strategy Policy CSP 40.'

1.03 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 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 dwellings from a loss of amenity due to noise

1.04 This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation) and boundary treatments. It has been prepared to accompany a reserved matters planning application to be submitted to BMBC.

1.05 This report has been prepared for Hoover Homes 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 the aforementioned parties and ENS as to the extent to which the findings may be appropriate for their use.

1.06 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 on Barnsley Road on the western fringe of Goldthorpe. Irregular in shape (see Appendix 2 for a site layout) the application site is bound by:
- Aldi supermarket to the west
 - A635 to the north
 - Barnsley Road to the south
 - Existing residential dwellings to the east on Mulberry Close
- 2.02 Proposals are to construct 42 no. dwellings with associated access roads and landscaping.
- 2.03 As stated, outline planning permission (ref: 2014/1020) was granted for the residential development as part of a hybrid application which included full planning permission for the adjacent Aldi supermarket. It is therefore evident that the principle of residential development at the application site has been established.
- 2.04 For reference, Condition 22 of Planning Permission ref: 2014/1020 restricted the delivery hours associated with the Aldi store as follows:
22. *Deliveries shall be only take place between the hours of 0700 & 2300 Monday to Saturday and 0800 & 1800 on Sundays and Bank Holidays. Reason: In the interests of the amenities of local residents and in accordance with Core Strategy Policy CSP 40.*
- 2.05 These delivery hours were subsequently extended to 0600 to 2300 hours Monday to Sunday as part of Planning Permission ref: 2020/ENQ/00331.
- 2.06 Condition 23 of Planning Permission ref: 2014/1020 set limits for any fixed plant associated with the Aldi store at the closest neighbouring properties as follows:
23. *Fixed plant installed shall be designed to operate so that the noise rating level (as defined in BS 4142 : 1997) at the nearest neighbouring properties is no louder than 35dBA at all times.*

3.00 BASELINE NOISE SURVEYS

- 3.01 In order to establish external noise levels at the application site, noise surveys were undertaken on Thursday 10th September 2020 (in order to encapsulate an early morning Aldi store delivery), on Monday 21st September 2020 and on Friday 6th November 2020.
- 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 circa 15 metres from the nearside kerb of Barnsley Road at a height of 4 metres above ground level (AGL)
 - MP2 was located circa 15 metres from the nearside kerb of the A635 at 1.5 metres AGL
 - MP2A was located circa 15 metres from the nearside kerb of the A635 at 4 metres AGL (to assess attenuation due to height)
 - MP3 was located along the northern boundary of the application site, at the nearest proposed residential dwelling to the Aldi store, at 4 metres AGL
 - MP3A was located along the western boundary of the application site, at the nearest proposed residential dwelling to the Aldi store, at 4 metres AGL
- 3.03 Noise measurements were made in a free field environment using two Bruel & Kjaer 2250 Type 1 integrating sound level meters. A windshield was fitted for all measurements. The calibration of each measurement system was verified immediately before and after the survey 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 measurement data for each measurement session, at each measurement position, rounded to the nearest decibel.

Table 3.1 – Summary of Noise Measurement Data

Position	Date	Time	L _{Aeq} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comment
MP1	21/09/20	1135-1235	55	43	58	Dominated by road traffic on Barnsley Road
		1235-1335	56	48	59	
		1335-1435	56	48	59	
	06/11/20	1251-1321	57	47	61	
		1321-1351	58	48	61	
Daytime noise level 57 dB L_{Aeq} (0700-2300) based on CRTN methodology Night time noise level circa 50 dB L_{Aeq} (2300-0700) based on TRL methodology Typical maximum noise level of passing vehicles measured up to 71 dB L_{AFMax} (Barnsley Road) in daytime						
MP2	21/09/20	1151-1251	57	41	61	Dominated by road traffic on the A635
		1251-1351	58	43	62	
		1351-1451	58	44	62	
Daytime noise level 59 dB L_{Aeq} (0700-2300) based on CRTN methodology Night time noise level circa 52 dB L_{Aeq} (2300-0700) based on TRL methodology Typical maximum noise level of passing vehicles measured up to 73 dB L_{AFMax} (A635) in daytime						
MP2A	21/09/20	1440-1455	61	47	64	Dominated by road traffic on the A635
Daytime noise level 61 dB L_{Aeq,T} Comparison of MP2 (1.5mAGL) and MP2A (4.0mAGL) indicates circa 3 dB difference due to height						
MP3	10/09/20	0406-0506	47	40	50	Dominated by road traffic on Barnsley Road (A635 closed), delivery taking place at Aldi audible but not significant
		0506-0533	50	45	52	
		0547-0601	51	48	54	
Night time noise level during Aldi delivery circa 47-51 dB L_{Aeq,T}						
MP3A	10/09/20	0535-0545	48	41	52	Dominated by road traffic on Barnsley Road (A635 closed), delivery taking place at Aldi audible but not significant
Night time noise level during Aldi delivery circa 48 dB L_{Aeq,T}						

- 3.05 The noise environment at the application site was dominated by road traffic on the A635 and Barnsley Road, with no other significant noise sources noted during the survey.

- 3.06 For the prediction of daytime road traffic noise, the Department of Transport's Memorandum on the Calculation of Road Traffic Noise (CRTN) explains that the following shortened measurement procedure may be used. Measurements of L_{A10} are made over any three consecutive hours between 10:00 and 17:00 hours. Using L_{A10} (3 hour) as the arithmetic mean of the three consecutive values of hourly L_{A10} , the L_{A10} (18 hour) can be calculated from the equation:

$$(i) \quad L_{A10} (18 \text{ hour}) = L_{A10} (3 \text{ hour}) - 1 \text{ dB}$$

- 3.07 PPG24 (now withdrawn) further states that for road traffic noise:

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

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

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

3.09 Based on the above formula, the daytime ambient noise levels at MP1 and MP2 are measured / calculated at **57 dB L_{Aeq} (0700-2300)** and **59 dB L_{Aeq} (0700-2300)** respectively.

3.10 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:

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

3.11 Based on the above formula, the night time ambient noise levels at MP1 and MP2 are measured / calculated at **50 dB L_{Aeq} (2300-0700)** and **52 dB L_{Aeq} (2300-0700)** respectively.

3.12 Noise levels at MP2A (4.0 metres AGL) were circa 3 dB higher than those at MP2 (1.5 metres AGL). For the purpose of the assessment, this correction is robustly applied to the measured / calculated noise levels at MP2 and the higher levels are subsequently adopted for dwellings fronting towards the A635.

3.13 During March 2020 the UK Government announced measures to stem the coronavirus pandemic, including restrictions on non-essential travel. However, Highways England traffic flow data for the closest relevant count point to the application site indicates that traffic flows in on the day of the September survey were circa 70 % of typical traffic volumes prior to the restrictions¹.

3.14 Using the methodology in the CRTN, a 30 % reduction in traffic volumes equates to a noise level change of circa 2 dB. Therefore, for a robust assessment a +2 dB correction is applied to the measured road traffic noise levels across the application site.

3.15 For reference, the delivery took place slightly earlier than the currently-permitted hours of 0600–2300 hours. It is understood that this is due to the current Coronavirus restrictions allowing strategic businesses such as supermarkets to operate outside of existing restrictions.

3.16 Notwithstanding this, noise measurements undertaken in the vicinity of the adjacent Aldi supermarket (MP3 and MP3A) indicated that noise associated with an early morning delivery to the store was not significant or measurable over the residual noise climate of distant road traffic noise. It should also be noted that the A635 was temporarily closed during the measurements due to roadworks, and that ordinarily this road would provide further masking to any delivery noise.

3.17 No fixed plant noise from the Aldi was noted during the course of the noise surveys.

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

Noise Policy Statement for England

4.05 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.

4.06 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

4.07 Planning Practice Guidance (PPG) is an online resource (as updated 2019) 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.

4.08 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'.

4.09 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

- 4.10 ProPG Planning and Noise: New Residential Development (ProPG) was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.
- 4.11 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)

- 4.12 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.'

- 4.13 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'.

- 4.14 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'.

- 4.15 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} (0700-2300) during the daytime.
- ≤ 30 dB L_{Aeq} (2300-0700) and 45 dB L_{AFMax} not regularly exceeded during the night time.

- 4.16 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.'

5.00 SOUND ATTENUATION SCHEME PROPOSALS

5.01 Including an adjustment for traffic flows (see Paragraph 3.14), the design noise levels for dwellings fronting onto Barnsley Road are as follows:

- **59 dB $L_{Aeq,T}$** during the daytime
- **52 dB $L_{Aeq,T}$** during the night time
- **71 dB L_{AFMax}** during the night time

5.02 Including an adjustment for traffic flows (see Paragraph 3.14), the design noise levels for dwellings fronting onto the A635 are as follows

- **64 dB $L_{Aeq,T}$** during the daytime
- **57 dB $L_{Aeq,T}$** during the night time
- **73 dB L_{AFMax}** during the night time

5.03 In order to calculate the sound insulation requirements in road-fronting habitable rooms 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)

5.04 Internal noise levels have been calculated with closed windows. Calculations have incorporated:

- The measured/calculated external noise level data acquired on site
- An assumed room volume of 50 m³ with a glazing area of 3 m² for living rooms
- An assumed room volume of 25 m³ with a glazing area of 1.5 m² for bedrooms
- An assumed typical masonry external wall construction
- An assumed reverberation time of 0.5 seconds for living rooms and bedrooms

5.05 An indicative scheme of sound insulation is summarised in Table 5.1.

Table 5.1 – Scheme of Sound Insulation Works

Location	Noise Level	Internal Criteria	Glazing and Ventilation
Habitable rooms fronting onto Barnsley Road	59 dB L_{Aeq} (0700-2300) 52 dB L_{Aeq} (2300-0700) 71 dB L_{AFMax} (2300-0700)	≤ 35 dB L_{Aeq} (0700-2300) ≤ 30 dB L_{Aeq} (2300-0700) ≤ 45 dB L_{AFMax} (2300-0700)	Enhanced glazing rated at 32 dB R_w+C_{tr} e.g. 10 / (6-20) / 6 and acoustic trickle vents*
Habitable rooms fronting onto A635	64 dB L_{Aeq} (0700-2300) 57 dB L_{Aeq} (2300-0700) 73 dB L_{AFMax} (2300-0700)	≤ 35 dB L_{Aeq} (0700-2300) ≤ 30 dB L_{Aeq} (2300-0700) ≤ 45 dB L_{AFMax} (2300-0700)	Enhanced glazing rated at 32 dB R_w+C_{tr} e.g. 10 / (6-20) / 6 and acoustic trickle vents*
Remaining habitable rooms across the application site (set back and/or screened from the road network)			Standard glazing and standard trickle vents

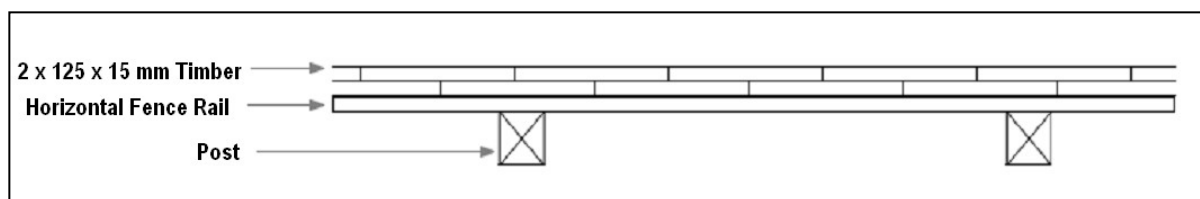
* Acoustic trickle vents rated at least 39 dB $D_{n,e,w}$ (vent open), such as the Greenwood 5000EAW.AC1 (note: 1 no. required per habitable room) – ventilation requirements to be confirmed by developer.

5.06 With regard to Table 5.1, the glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing

5.07 Ceilings of any room-in-roof bedrooms fronting towards the surrounding road network should be double boarded with dense plasterboard, with 100 mm (minimum) mineral wool insulation above. The glazing specification in Table 5.1 is also applicable to 'Velux' windows.

External Amenity (Gardens)

- 5.08 A site layout plan (H51-BRG-001-B) indicates that dwellings at the southern boundary front towards Barnsley Road, such that gardens are screened from the road by the dwellings themselves.
- 5.09 Gardens at the northern boundary (Plots 11 to 17) and at the northern and southern extents of the western boundary (Plots 1 and 10) should be provided with 1.8-metre-high timber fences/masonry walls to screen them from the surround road network. See Appendix 3 for locations of fences.
- 5.10 A masonry wall of any construction is appropriate, providing there are no gaps. Acoustic fencing should be built in double-thickness solid timber construction as illustrated below. The barrier should have no gaps or holes (cover strips should also be used to prevent gaps forming over time) and should be fully sealed at the ground (i.e. include a gravel board).



- 5.11 For reference, BS 5228:2009 Part 1, states that screening attenuation may be approximated as 10 dB 'when the noise screen completely hides the sources from the receiver'. With at least 10 dB of screening attenuation afforded by the proposed timber fence/masonry walls, daytime noise levels in gardens of plots fronting towards the road network will readily be reduced to < 55 dB L_{Aeq} (0700-2300).
- 5.12 Indicative plans show a 1.8-metre-high timber fence along the western boundary with Aldi. It is recommended that this fence is upgraded to meet the specification detailed in Paragraph 5.10.

6.00 CONCLUSIONS

- 6.01 A noise impact assessment has been undertaken for proposed residential development at land to the north of Barnsley Road.
- 6.02 The noise environment at the application site was dominated by road traffic on the A635 and Barnsley Road, with no other significant noise sources noted during the survey.
- 6.03 A scheme of sound insulation works has been developed to protect the proposed residential development from the external 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 BSc (Hons)
MIOA, 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.

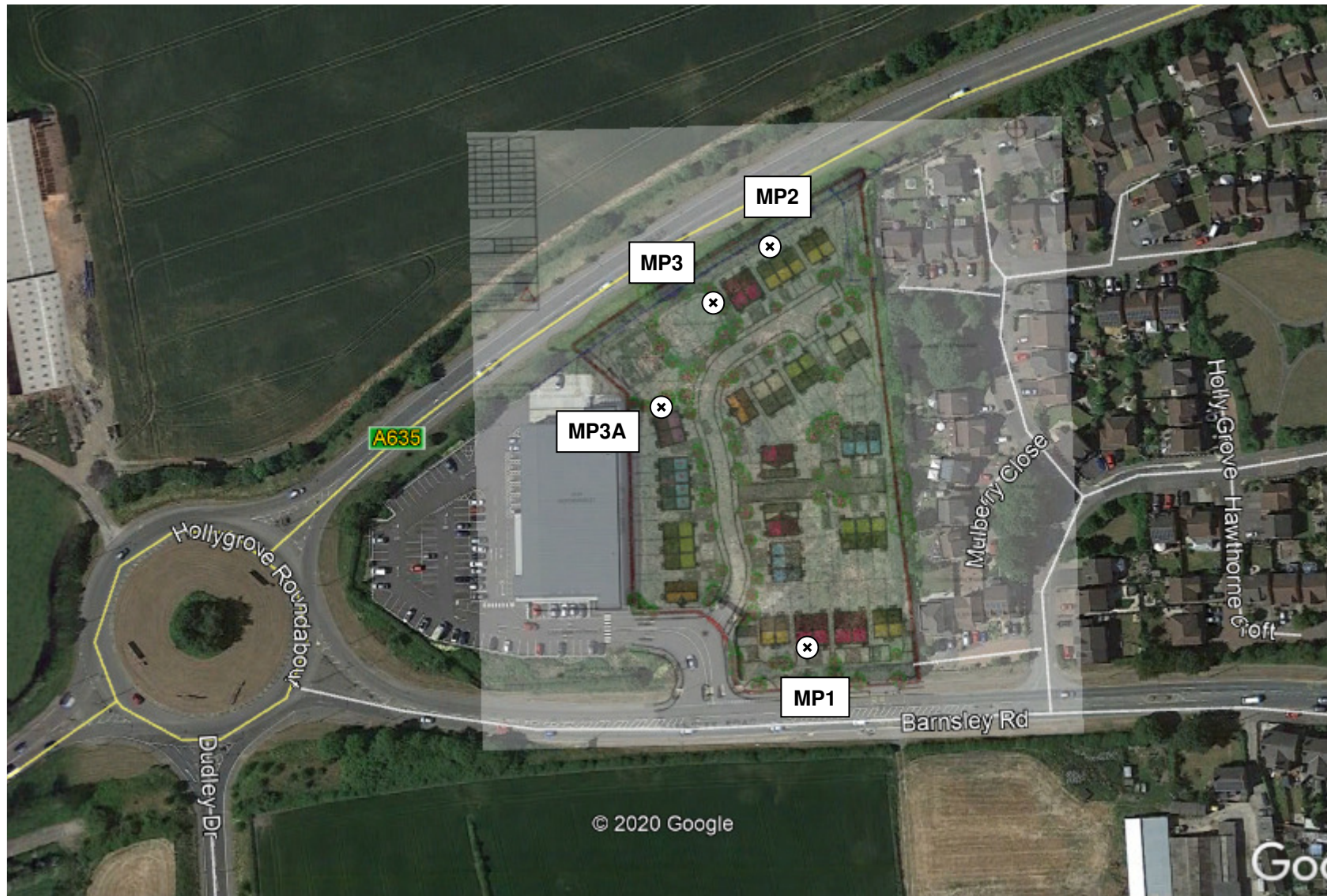
Sound Exposure Level (SEL or L_{AE})

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 – Site Layout Plan and Approximate Noise Monitoring Positions



Appendix 3 – Proposed Boundary Treatments

 = 2.4-metre-high solid timber fence/masonry wall

