

sharps acoustics

York Close, Market Bosworth

Noise Impact Assessment

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1.0 Introduction

- 1.1 Sharps Acoustics LLP (SAL) has been commissioned by Gladman Developments to undertake a noise impact assessment for the below development:

"Outline planning application for the erection of up to 100 dwellings (including 40% affordable housing) with public open space, landscaping, sustainable drainage system (SuDS) a vehicular access point and the demolition of one residential dwelling. All matters reserved except for means of access."

- 1.2 The site is located to the west of Shenton Lane in Market Bosworth, off York Close. The site is bounded by houses to the north and north-east and Shenton Lane to the east. To the south and west are agricultural fields. The wider surrounding area is predominantly agricultural fields to the south and the market town of Market Bosworth to the north. The site location plan is shown in Figure A1 in Appendix A.
- 1.3 Residential developments of this sort are inherently quiet and do not normally require noise from their use to be assessed. However, in this instance, since the site would be accessed from an existing cul-de-sac, the potential impact from the increase in traffic flow to the site needs to be assessed to ensure that this does not cause a significant adverse effect.
- 1.4 Details of the assessment methodology employed, together with the results of the baseline survey, assessment and conclusions are presented within this report.

2.0 Policy and Guidance

NPPF

- 2.1 The Government's overarching policy in relation to planned development is contained in the National Planning Policy Framework (NPPF).
- 2.2 Paragraph 180 of the NPPF advises 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 ... noise pollution."

- 2.3 Paragraph 191 of the NPPF states that Planning policies and decisions should ensure that any:

"... 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:

a) 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 ...”

2.4 The NPPF does not provide prescriptive advice on how to avoid noise from giving rise to significant adverse impacts on health and quality of life. Therefore, it is necessary to consider advice in other guidance documents. This advice is discussed below.

2.5 In relation to the statement in paragraph 191 of the NPPF about significance, there is a footnote stating:

“See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)”. This is the NPSE – discussed below.

NPSE

2.6 The Noise Policy Statement for England was prepared by DEFRA and is dated March 2010.

2.7 Paragraph 1.5 of the NPSE states that the advice within the document applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

2.8 The NPSE, paragraph 2.12, explains that the WHO defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”.

2.9 The Noise Policy Aims of the NPSE (NPSE paragraphs 2.22 to 2.24) can be summarised as follows:

avoid significant adverse impacts on health and quality of life...;

mitigate and minimise adverse impacts on health and quality of life...; and

where possible, contribute to the improvement of health and quality of life.

2.10 The NPSE makes a distinction between “quality of life”, which is a subjective measure, and “health”, which refers to physical and mental well-being.

2.11 The latest WHO Guidelines (Environmental Noise Guidelines for the European Region, 2018) explain that impacts that may result from noise such as annoyance and sleep disturbance are considered to be “critical health outcomes” and that quality of life, well-being and mental health are “important health outcomes”. Sleep disturbance is also referred to as having an effect on quality of life.

2.12 The NPSE introduces the concepts of the “no observed effect level” (NOEL); the “lowest observed adverse effect level” (LOAEL); and a “significant observed adverse effect level” (SOAEL).

2.13 It is the last of these criteria – the SOAEL – that is the level above which significant adverse effects on health and quality of life occur. As can be seen from paragraphs 2.3 and 2.9 above, this criterion equates to the first aim of the NPSE and the policy requirement in the NPPF.

2.14 The second aim of the NPSE is to mitigate and minimise adverse impacts between LOAEL and SOAEL.

- 2.15 The NPSE does not provide noise guideline values or limits above which SOAEL occurs. Indeed, the document advises that it is not possible to have a single objective noise-based measure that defines SOAEL (NPSE paragraph 2.22). Therefore, it is necessary to refer to other advisory documents in order to seek to define such levels.

PPG - Noise

- 2.16 This "Planning Practice Guidance note – Noise" was released on 6th March 2014 and has been updated since, most recently in July 2019.
- 2.17 The PPG reinforces the concept of LOAEL and SOAELs discussed above and seeks to define a person's perception at these different effect levels. It describes what is meant by levels below the LOAEL (at the NOEL and NOAEL) under the heading, "How can it be established whether noise is likely to be a concern?", as follows:

"At the lowest extreme, when noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'no observed effect' level. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it. The noise may slightly affect the acoustic character of an area but not to the extent there is a change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment."
Paragraph: 005 Reference ID: 30-005-20190722. Revision date: 22 07 2019

- 2.18 PPG describes the NOAEL as, "noise can be heard, but does not cause any change in behaviour, attitude or other physiological response ...", whereas at a LOAEL, "noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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 some reported sleep disturbance." Noise levels below the LOAEL are described as "present and not intrusive" whereas levels above the LOAEL but below the SOEAL are described as "present and intrusive".
- 2.19 A "significant" effect is described as "present and disruptive" resulting in "a material change in behaviour, attitude or other physiological response ...".
- 2.20 The PPG provides a hierarchy of planning actions required for different perceptions and effects of noise. Between LOAEL and SOAEL the recommended action is to mitigate noise and reduce to a minimum. At SOAEL the action recommended is to avoid. These are the same terms used in the NPPF and NPSE. The NPPF, NPSE and NPPG do not ascribe noise levels to any of the effects discussed within the three documents. Therefore, it is necessary to consider other guidance which attributes noise levels to health effects such as annoyance during the day or sleep disturbance at night.

Local Planning Policy

- 2.21 The Hinckley & Bosworth Borough Council Core Strategy does not specifically mention noise in its policies. However, the Council's "Good Design Guide supplementary planning document (SPD) 2020"

does contain pertinent guidance in relation to new residential development. In the Section relating to new residential development, it states that the guide:

"... provides specific guidance for what is expected from the design of applications for new residential development on greenfield and brownfield sites, including infill development."

2.22 In the Section titled "Appreciating the context", it advises:

"... an understanding of the following issues should be gained ... Human impact including boundaries, noise".

2.23 In relation to "Backland" sites, it advises:

"At a minimum, it will need to demonstrate that it will not result in loss of amenity to neighbouring properties by way of overlooking, overshadowing or noise."

Summary of Policy requirements

2.24 In summary, planning policy in relation to noise requires that planning decisions ensure that:

- Significant adverse effects from noise should be avoided;
- where noise levels have some adverse effect, but the effect is not significant, all reasonable steps should be taken to mitigate and minimise the level of noise; and
- There should be no loss of amenity for existing residents due to noise from a proposed development.

2.25 Noise which may be present and audible but which has no adverse effects requires no mitigation to be acceptable.

Derivation of suitable assessment methodology and criteria

2.26 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- i) The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and several other sources such as the World Health Organisation's (WHO) "Guidelines for Community Noise" GCN contain such guidelines.
- ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it can predict impact to all properties adjacent to a road link irrespective of their distance from the road.
- iii) Another method is described within British Standard BS 4142 (BS4142), the current version of which is BS 4142: 2014+A1: 2019, 'Methods for rating and assessing industrial and commercial sound', to determine the significance of sound impact from sources of industrial and/or

commercial in nature. The sources that the standard is intended to assess are sounds from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

- 2.27 In order to assess noise arising due to the proposed development, the change in noise level that would result from the proposal is useful assessment method, alongside a consideration of predicted noise levels against absolute values from WHO's Guidelines for Community Noise, 1999. The change in level method is explained in detail in 2.28 to 2.32 below. The WHO guidance is discussed in 2.33 to 2.38 below.

Change in noise level

- 2.28 The Institute of Environmental Management and Assessment (IEMA) produced 'Guidelines for Environmental Noise Impact Assessment' in October 2014, and the guidance contained in that document is relevant in this case.

- 2.29 The IEMA Guidelines state:

"Measuring in decibels means that a 3dB increase is equivalent to a doubling of the sound energy, and a 10dB increase is a tenfold increase in energy. For broad band sounds which are very similar in all but magnitude, a change or difference in noise level of 1dB is just perceptible under laboratory conditions, 3dB is perceptible under most normal conditions, and a 10dB increase generally appears to be twice as loud. These broad principles may not apply where the change in noise level is due to the introduction of a noise with different frequency and/or temporal characteristics compared to sounds making up the existing noise climate. In which case, changes of less than 1dB may be perceptible under some circumstances." A tenfold increase in energy is commonly perceived to be twice as loud."

- 2.30 The aim of this assessment is to consider the difference in noise which might arise as a result of an increase in number of vehicles using a cul-de-sac. Noise levels present in the area are predominantly from motor vehicles, although other community noise sources are also present. It is therefore considered appropriate to set the lowest threshold of audibility at 3dB. The IEMA Guidelines suggest that smaller changes in noise level would only be perceptible where the sound materially changes character.
- 2.31 The impact scale relevant for the assessment of changes in road traffic noise is shown in Table 2.1. The categories have been related to the guidance in the NPPF, NPSE and the PPG for noise and apply to residential receptors.

Table 2.1: Impact scale for a change in road traffic noise – from IEMA guidelines

Change in Noise Level dB(A)	Subjective Response	Magnitude of Impact
0	Not present	No change
0.1 to 0.9	Unlikely to be noticeable	Very low
1.0 to 2.9	Present but unlikely to be intrusive	Low
3.0 to 9.9	Present and potentially intrusive, particularly at higher end of scale	Medium
10.0+	Present and disruptive	High

- 2.32 The difference in impact can be used to evaluate the difference in noise level experienced at nearby noise sensitive receptors and, equating the changes in level to the thresholds described in planning policy and guidance, results in the values and descriptors shown in Table 2.2 below.

Table 2.2: Differences in noise level and effects thresholds in this case

Effect	Difference in noise level (dB)	PPG Action advised
Above SOAEL	Greater than or equal to 5.0	Avoid
Between LOAEL and SOAEL	3.0 to 4.9	Mitigate and reduce to a minimum
NOAEL (Below LOAEL)	1.0 to 2.9	No specific measures required
NOEL	less than 1.0	

Guideline values

- 2.33 WHO GCN suggest that, in relation to daytime noise:
- "During daytime, few people are highly annoyed at L_{Aeq} levels below 55 dB(A), and few are moderately annoyed at L_{Aeq} levels below 50 dB(A)."*
- 2.34 These values are often used as thresholds for a LOAEL for outdoor noise from a range of community noise sources. The 50dB, $L_{Aeq,16h}$ value is taken as a desirable target level (at which there would generally be no adverse effects observed) and 55dB, $L_{Aeq,16h}$ is taken to be a level above which adverse effects may begin to become more evident. In general, the SOAEL for community noise is taken to occur at a level in the range 60 to 65dB, depending on the circumstances and sounds present.
- 2.35 The aim for any new development is to keep daytime noise levels to below 55dB, $L_{Aeq,16h}$, where possible and, ideally to achieve a level at or below 50dB, $L_{Aeq,16h}$.

- 2.36 The WHO Night Noise Guidelines for Europe (NNGE) 2019 was written as an extension of the WHO Guidelines for Community Noise and the recommended night time noise level within this supersedes the value recommended in the earlier Guidelines.
- 2.37 The NNGE states that there is no sufficient evidence that the biological effects observed at the level below 40 dB $L_{night,outside}$ are harmful to health. The guidelines go on to state that $L_{night,outside}$ 40dB is equivalent to the Lowest Observed Adverse Effect Level (LOAEL) for night noise.
- 2.38 The NNGE go on to recognise that levels of below 40dB, $L_{night,outside}$ may not be an achievable aim in the near future for countries in the EU and recommends an "interim target" of 55dB, $L_{night,outside}$. This value is often used as the SOAEL for night time noise.

Assessment criteria in this case

- 2.39 Table 2.3 below sets out the various assessment criteria and related outcomes in this case.

Table 2.3: Assessment criteria and related outcomes in this case

Effect	Level difference, dB (day or night)	L _{Aeq,16h} , dB, day	L _{night,outside} , dB, night	PPG Action advised
Above SOAEL	≥ 5.0	≥ 60	≥ 55	Avoid
Between LOAEL and SOAEL	3.0 - 4.9	50-60	40-55	Mitigate and reduce to a minimum
NOAEL (Below LOAEL)	1.0 - 2.9	<50	<40	No specific measures required
NOEL	< 1.0	Not defined in this case		

3.0 Noise Survey

- 3.1 An unattended noise survey was undertaken between approximately 11:30 hours on Friday 21st May and 10:30 hours on Friday 28th May 2024.
- 3.2 A single monitoring location was used for the survey which was projected on a pole approximately 1m external to the first-floor front window of number 35 York Close. The monitoring location used for the survey is shown in the aerial view in Figure A1 Appendix A. The recording equipment was a Norsonic 140 Sound Analyser. The equipment was calibrated before and after the survey with no significant drift.
- 3.3 The average daytime and night-time L_{Aeq} , L_{A90} and L_{AFmax} results are summarised in Table 3.1 below and provided in graphically in Figure B1 in Appendix B.

Table 3.1: Summary of measured noise levels

Measurement Position	Period	Sound Pressure Level dB		
		L _{Aeq,T}	L _{AFmax}	L _{A90,T}
MP1	Daytime (0700 to 2300 hours)	49	84	32
	Night-time (2300 to 0700 hours)	44	73	21

Weather

- 3.4 Meteorological conditions were generally suitable for the measurement of environmental noise, although there was some light rain at times which does not appear to have had any effect on readings overall.

Description of noise climate

- 3.5 Noise sources present were vehicles on York Close and birdsong along with other general community noise (for example people talking whilst passing, working in gardens).
- 3.6 Reference to Figure B1 in Appendix B shows that during the unattended aspects of the survey the noise levels follow a typical traffic-controlled environment with the loudest noise levels measured during the day, with a reduction in the evening and the lowest levels measured at night.

4.0 Assessment**Noise from vehicles passing in York Close**

- 4.1 Transport consultants Ashley Helme have carried out an exercise to predict the total numbers of trips to and from the proposed up to 100 dwellings. They have predicted that there would be a total number of trips during day and night as follows:

Day (0700 to 2300 hours): 473

Night (2300 to 0700 hours): 12

- 4.2 SAL library data for a single car passing in this kind of environment is that, typically, the single event level, L_{AE} would be 69dB, L_{AE} at 10m.

- 4.3 Given the predicted numbers of vehicles, this would result in a noise level from additional vehicles passing in York Close of:

Day (0700 to 2300 hours): 48dB, L_{Aeq,16h}

Night (2300 to 0700 hours): 35dB, L_{Aeq,8h}.

4.4 These levels are at a nominal distance of 10m from the passing vehicles. In fact, dwellings on York Close vary in distance from the kerb between 5 and 8m. This means that they vary from the centre line of the road by between 8 and 11m.

4.5 Correcting for distance of 8m and façade effect (increasing the level by 2dB to account for reflections), the resultant noise level from additional traffic due to the development at the closest façade would be:

Day (0700 to 2300 hours): 51dB, $L_{Aeq,16h}$

Night (2300 to 0700 hours): 38dB, $L_{Aeq,8h}$.

4.6 Using the existing noise levels shown in Table 3.1 above and adding the noise from the additional traffic results in total noise levels with the development at the most affected dwelling in York Close as shown in Table 4.1 below. Table 4.1 also compares the total predicted level with the existing level to derive a level difference.

Table 4.1: Comparing existing and predicted noise levels at closest dwelling in York Close

Period	Noise level, dB, $L_{Aeq,T}$			
	Existing level	Additional noise from cars	Total predicted level with development	Increase in level
Day	49	51	53	4
Night	44	38	45	1

4.7 Comparing the levels in Table 4.1 with the assessment criteria in Table 2.3, it can be seen that:

- The existing noise level during the day is below the daytime LOAEL (50dB, $L_{Aeq,T}$) and at night is slightly above the night time LOAEL (40dB, $L_{Aeq,T}$) but below the night time SOAEL (55dB, $L_{Aeq,T}$). This indicates that few people would be moderately annoyed with community noise levels as they are at present during the day and that there is a low risk of sleep disturbance for anyone sleeping with bedroom windows open at night.
- Adding the predicted noise arising due to the development, noise levels during the day would rise to a level which is slightly above the daytime LOAEL (50dB, $L_{Aeq,T}$) but would be below the daytime SOAEL (60dB, $L_{Aeq,T}$). At night the level would increase, but not so much as to cause a change in outcome.
- The level difference during the day would be 4dB which would be likely to be noticeable and at night the increase in level would be so low as to be unlikely to be noticeable.

4.8 During the day, there would be a small, but noticeable adverse effect due to noise of additional traffic. This would not be a significant adverse effect, so planning policy does not require that this should be avoided.

4.9 At night, there would be no adverse effect due to noise.

- 4.10 Where a noise would result in an adverse, but less than significant adverse effect, planning practice guidance (PPG paragraph 005 Reference ID: 30-005-20190722) states that, at this level:

"... consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise)."

- 4.11 At a level between the LOAEL and SOAEL, the second aim of the NPSE:

"... requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur."

- 4.12 Ordinarily, therefore, noise would be mitigated and minimised, so far as can reasonably be achieved. However, measures such as improving the road surface or lowering the speed limit would have no practical effect, as vehicles would be moving too slowly for this to make any difference, so mitigation is not feasible in this case.

Noise from vehicles passing on the access road

- 4.13 Noise from vehicles on the access road can be compared to guideline values to establish their potential for there to be an adverse effect.
- 4.14 Using the flows from paragraph 4.1 above and distances between the access road and the closest facades of the dwellings either side of the access road, the noise levels at these facades would be as shown in Table 4.2 below.

Table 4.2: Noise levels to dwellings to either side of the access road – no mitigation

Location	Period	Level, $L_{Aeq,T}$, dB
Dwelling to the west of the proposed access road	Day	51
	Night	38
Dwelling to the east of the proposed access road	Day	49
	Night	36

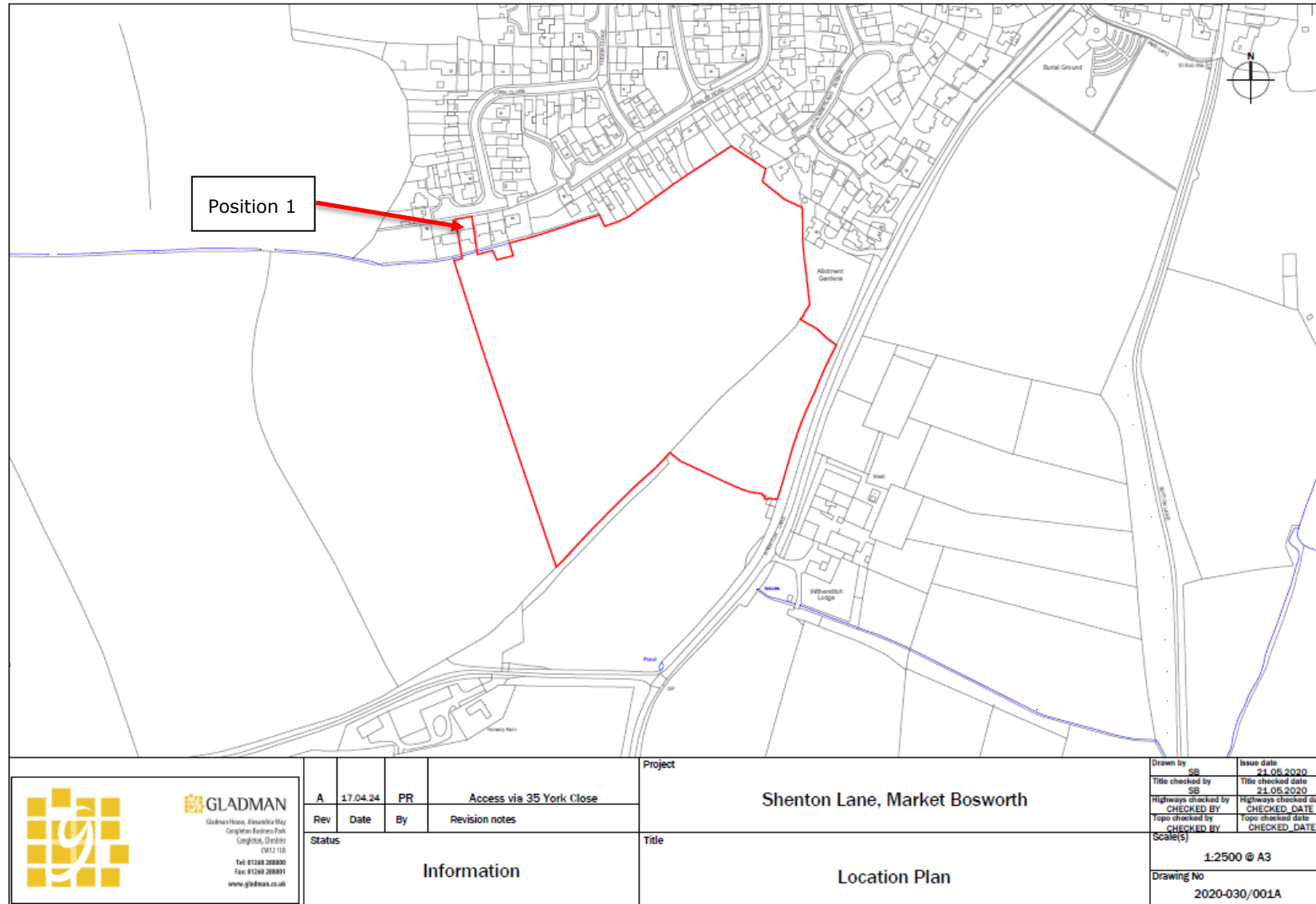
- 4.15 The levels would be below the LOAEL for day and night (50dB and 40 dB, $L_{Aeq,T}$, respectively) other than at the dwelling to the west of the site during the day. This would be 1dB above the LOAEL indicating a very small adverse effect without mitigation. It is therefore proposed to provide a 1.8m high close boarded timber fence along the boundary between the access road and the property to the west. This would provide at least 5dB reduction due to barrier attenuation and would ensure that there would be no adverse effects from noise as a result of the use of the access road onto site.

Summary

- 4.16 In conclusion, therefore, with the proposed screening along the access road, there would be no significant adverse effects due to noise as a result of this scheme so the circumstances do not need to be avoided and planning permission need not be refused.
- 4.17 However, during the day, there would be a small but noticeable change in the character of the area in York Close due to noise from the additional vehicles and this would not result in a significant adverse effect.
- 4.18 At night, there would be a negligible effect.

Appendix A: Site and Surrounding Area

Figure A1: Site and surrounding area



Appendix B: Noise Survey Results

Figure B1: Position 1 Noise Levels

