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Outline Planning Application

Land off Penistone Road (A629), Birdsedge

Noise Impact Assessment

For:
Yorkshire Land Limited

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Contents

1	Introduction	1
	1.1 Overview	1
	1.2 Site Description and Development Proposals	2
2	Noise Criteria	3
	2.1 Assessment Guidance	3
3	Noise Survey and Results	9
	3.1 Overview	9
	3.2 Summary of Results	9
	3.3 Analysis	10
4	Assessment	11
	4.1 Acoustic Modelling	11
	4.2 Consideration of Good Acoustic Design	11
	4.3 Internal Noise Levels	11
5	External Amenity Areas	13
6	Summary and Conclusions	14
	Appendix A – Abbreviations and Definitions	15
	Appendix B – Noise Monitoring Positions	16
	Appendix C – Figures	17

1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Yorkshire Land Limited (hereafter referred to as 'the client') to undertake a noise impact assessment for an outline planning application for residential development including associated infrastructure works. All matters reserved except means of access into (but not within) the site on land to the north-east of the A629 Penistone Road, Birdsedge. (hereafter referred to as 'the site').

This report details:

- The methodology and results of a noise survey conducted at the site
- An assessment of potential noise sources in the vicinity of the site which may affect the proposed residential dwellings
- Recommendations for the building envelope (fenestration and ventilation)

This report details the methodology and results of the assessment and has been prepared to support an outline planning application for the residential development.

The report has been prepared on behalf of the client for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult the client and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix A.

1.2 Site Description and Development Proposals

The proposals are for the construction of an outline planning application for residential development including associated infrastructure works. All matters reserved except means of access into (but not within) the site from Penistone Road. The site is approximately centred on grid reference: 420332,407850 in an area of primarily residential land uses.

Figure 1.1 below indicates the approximate site location in red.

Figure 1.1: Location of Proposed Development



The site is bounded to the north by ancillary buildings and structures historically associated with Birdsedge Mill, along with vegetation and a dry stone wall. To the east, the site is bounded by a dry stone wall with agricultural fields located beyond. To the south, the site is bounded by residential properties and their associated curtilages. To the west, the site is bounded by Penistone Road (A629), with further residential properties and Birdsedge First School located beyond.

Ground heights across the site reduce from a height of approximately 271m above sea level at the western boundary, to a low of around 265 m above sea level at the south-eastern boundary.

2 Noise Criteria

2.1 Assessment Guidance

National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹ was updated in February 2025 and sets out the Government's planning policies for England and how these are expected to be applied.

Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 187 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'.

Paragraph 198 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'.

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

The Noise Policy Statement for England² (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

The 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

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2021)

2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

‘...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.’

British Standard 8233:2014 - Guidance on Sound Insulation and Noise Reduction for Buildings

British Standard 8233:2014 ‘Guidance on Sound Insulation and Noise Reduction for Buildings’ (BS 8233)³ provides recommendations for the control of noise both in and around buildings and suggests criteria and limits appropriate to their function. For residential dwellings, the main considerations are:

- Bedrooms - the effect of noise upon sleep
- Other habitable rooms - the effect of noise upon resting, listening and communicating

BS8233 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.’

Whilst BS 8233 is primarily concerned with noise within dwellings, the following guidance is also provided for external amenity areas:

“For traditional external areas that are used for amenity space, such as gardens or 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 recognised 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”.

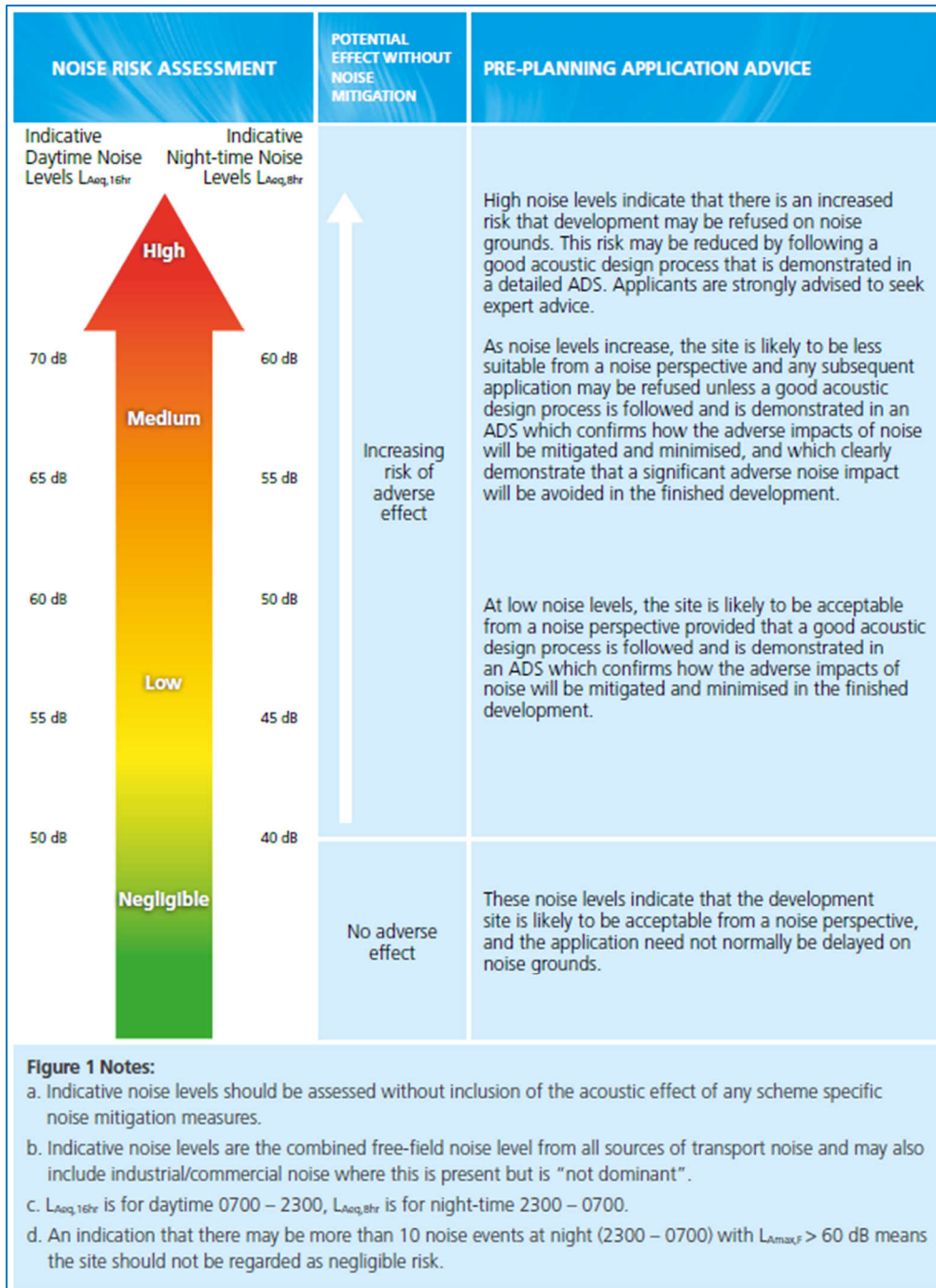
³ British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings. BSI

ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)⁴ recommends compliance with indoor noise level targets in residential dwellings based on the guidance contained in BS 8233 (see Table 2.1).

Stage 1 consists of an initial noise risk assessment, as summarised in Figure 1 of ProPG (reproduced as Figure 2.1 below).

Figure 2.1: ProPG Initial Site Noise Risk Assessment



⁴ 'ProPG Planning and Noise: New Residential Development (ProPG)', 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

Stage 2 requires consideration of four key elements, as follows:

- Element 1 – demonstrating a “Good Acoustic Design Process”
- Element 2 – observing internal “Noise Level Guidelines”
- Element 3 – undertaking an “External Amenity Area Noise Assessment”
- Element 4 – consideration of “Other Relevant Issues”

With regard to Element 1, ProPG requires evidence that a good acoustic design process has been followed, and that the following aspects have been considered:

- Check the feasibility of relocating, or reducing noise levels from relevant sources.
- Consider options for planning the site or building layout.
- Consider the orientation of proposed building(s).
- Select construction types and methods for meeting building performance requirements.
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.
- Assess the viability of alternative solutions.
- Assess external amenity area noise.

Stage 2: Element 1, ProPG requires evidence that a good acoustic design process has been followed with regards to site layout and the feasibility of relocating or reducing noise levels from relevant sources and 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’⁵ (BS 8233), see Table 2.1.

Table 2.1: Indoor Ambient Noise Levels in Dwellings

Activity	Location	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)

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.’

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,

⁵ British Standards Institution (2014). *British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.*

the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.

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.'

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 $L_{Amax,F}$ not regularly exceeded during the night-time

With reference to external amenity, ProPG reflects the advice 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.'

Additionally, with regard to individual noise events, ProPG 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 $L_{Amax,F}$, 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. However, where it is not reasonably practicable to achieve this guideline, then the judgement of acceptability will depend not only on the maximum noise levels but also factors such as the source, number, distribution, predictability and regularity of the noise events.’

ProPG acknowledges that the internal target noise levels may only be practically achieved with windows closed in certain areas (e.g. in urban areas or sites adjacent to transportation noise sources) and states that:

‘In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide ‘whole dwelling ventilation’ in accordance with Building Regulations Approved Document F (e.g. trickle ventilators in the open position).

It should also be noted that the internal noise level guidelines are generally not applicable under ‘purge ventilation’ conditions as defined by Building Regulations Approved Document F, as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food).’

3 Noise Survey and Results

3.1 Overview

Noise monitoring was undertaken at the site on Wednesday 28th January 2026.

The following noise monitoring positions were selected (illustrated in Appendix B) as follows:

- 1 – at the south-western site boundary at 4m above ground level
- 2 – at the north-western site boundary at 4m above ground level
- 3 – at the south-eastern site boundary at 4m above ground level

All noise measurements were undertaken using NTi XL3 and Brüel & Kjaer 2250 Type 1 integrating sound level meters. The sound level meters were connected to a windshield covered microphone at all times in free field conditions.

The calibration of each measurement system was verified immediately before and after the survey period using a Brüel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted.

Measurements consisted of A-weighted broadband parameters including L_{Aeq} , L_{A10} , L_{A90} and $L_{Amax,F}$ together with linear octave band data.

3.2 Summary of Results

Table 3.1 presents a summary of the noise 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 (hh:mm)	$L_{Aeq,T}$ (dB)	$L_{Amax,F}^{[1]}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
1	28/01/26	09:58-12:58	58	-	62	46
2	28/01/26	10:00-10:30	51	-	52	51
3	28/01/26	10:46-11:16	47	-	51	44

Notes: ^[1] Highest value recorded during survey period

Noise levels from individual events were typically ≤ 81 dB based on the 95th percentile of the noise levels measured at monitoring position 1.

The noise climate during the survey period site was controlled by distant and local road traffic noise. Noise from fixed plant associated with residential dwellings north-west of the site boundary was observed at monitoring position 2, resulting in a slightly higher background noise level in comparison to the other locations, however it was not significant in the context of the existing noise climate.

3.3 Analysis

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 $L_{A10,3hr}$ as the arithmetic mean of the three consecutive values of hourly L_{A10} , the $L_{A10,18hr}$ can be calculated from the equation:

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

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 $L_{A10,18hr}$ to EU Noise Indices for Noise Mapping' presents a methodology for calculating daytime L_{Aeq} (0700-2300) and night-time L_{Aeq} (23:00-07:00) ambient noise levels based on the L_{A10} (18 hour) noise levels, as follows:

$$L_{Aeq,16hr} = 10 \times \log_{10} \left(\frac{\left(\left(10^{\left(\frac{0.95 \times L_{A10,18hr} + 1.44}{10} \right)} \times 12 \right) + \left(10^{\left(\frac{0.97 \times L_{A10,18hr} - 2.87}{10} \right)} \times 4 \right) \right)}{16} \right)$$

$$L_{Aeq,8hr} = 0.9 \times L_{A10,18hr} - 3.77$$

Based on the above formulae, the daytime and night-time ambient noise levels at MP1 are calculated at 59 dB $L_{Aeq,16hr}$ and 51 dB $L_{Aeq,8hr}$ respectively.

4 Assessment

4.1 Acoustic Modelling

Noise levels across the site have been predicted using a three-dimensional Cadna-A noise model. The model was constructed using topographical survey data and mapping from Ordnance Survey, in conjunction with drawings and information supplied by the client.

Noise propagation is calculated in spectral terms according to BS EN ISO 1963: 1996, with 2nd order reflections considered. All off-site buildings within the model have an assumed height of 8m above ground level, and are assumed to be reflective.

The following assumptions were used in the model:

- Ground absorption set to $G = 0.5$ for mixed ground
- Meteorological conditions: Temp. 10 °C, Relative Humidity 70%
- Reflections: set to two orders of reflection
- Absorption coefficient of buildings set to 0.2

Predicted noise levels within the site boundary are presented as a façade noise plot in Appendix C.

With respect to the initial ProPG assessment set out in Section 2, areas of the site located at distances of 12m or more from the south-western site boundary are considered 'low risk' with regards to existing road traffic noise, with no other significant noise sources noted.

4.2 Consideration of Good Acoustic Design

The dominant noise source across the site is the A629 Penistone Road, which cannot be relocated.

Whilst noise levels at distance greater than 12m from the site boundary are considered low risk in respect to ProPG, consideration should be given to the orientation of the first row of dwellings fronting on to the south-western site boundary, such that bedrooms are situated on east facing façades and gardens of the first row of dwellings will be screened from the A629 by the dwellings themselves.

Where gardens are still exposed to the road, consideration should be given to boundary screening in the form of circa 2-metre-high solid timber fences or brick walls.

4.3 Internal Noise Levels

Feasibility of Open Windows

With regard to internal noise levels when windows are open, the World Health Organisation (WHO) Guidelines for Community Noise (1999) states:

'the noise reduction from outside to inside with the window partly open is 15 decibels'.

The results of the noise modelling discussed above indicate that some habitable areas of the site will likely to be exposed to noise levels $>50\text{dB } L_{\text{Aeq},16\text{hr}}$, during the daytime and $>45 L_{\text{Aeq},8\text{hr}}$ and/or $> 60 \text{ dB } L_{\text{Amax},F}$ during the night time.

On this basis, it is not recommended that permanently open windows are relied upon as the primary means of ventilation for habitable rooms in these areas.

A scheme of sound insulation will be required such that the minimum ventilation rates specified in Approved Document Part F can be achieved with windows closed.

Windows can be opened for temporary purge ventilation (to enable discretionary rapid air changing) with resultant internal levels exceeding the noise criteria; however, this would be on a temporary basis at the occupier's discretion.

Scheme of Mitigation

Indicative calculations have been performed to determine the glazing performance required to satisfy the internal noise criteria with closed windows. The calculations have incorporated the measured external noise level data and the rigorous noise ingress calculation methodology outlined in Annex G.2 of BS 8233:2014.

In addition to satisfying the requirements of BS 8233, the scheme of sound insulation presented below is expected to control individual noise events in line with the ProPG requirement to not exceed 45 dB $L_{Amax,F}$ internally within bedrooms more than 10 to 15 times per night, as set out in Section 2.

With reference to the NPSE, in satisfying the ProPG and BS 8233 guideline noise levels, the scheme of mitigation is considered to provide noise levels in line with the NOEL, in that noise may be audible but not at a level at which effects on health and quality of life are observed.

The following has been assumed for assessment purposes:

- Room and façade element dimensions are based on typical dimensions for a development of this type: 9m² bedrooms with up to 5m² façade area and 2m² of glazing
- Reverberation time of 0.5 seconds for habitable areas
- Masonry external wall construction
- Mechanical supply and extract ventilation without simple façade openings for the first row of bedrooms of properties fronting onto the south-western boundary

Minimum sound reduction values for the glazing elements are presented in Table 4.1, based on commonly available products. Table 4.1 should be read in conjunction with the noise contour plot presented in Appendix C.

Table 4.1: Required Sound Reduction of façade Elements for All Habitable Rooms

Element	Required Sound Reduction (dB)						Indicative Specification
	125 Hz	250 Hz	500 Hz	1kHz	2kHz	Weighted $R_w (R_w + C_{tr}) /$ $D_{n,e,w} (D_{n,e,w} + C_{tr})$	
Specification 1 – Bedrooms on south-western façades							
Glazing	24	30	39	47	45	41 (36)	6/15/6.5 Acoustic double glazing
Specification 1 – All other habitable rooms (≥ 55 dB $L_{Aeq,16hr}$ and ≥ 50 dB $L_{Aeq,8hr}$)							
Glazing	21	20	26	38	37	30 (28)	6/(6-20)/4 thermal double glazing
Ventilation	42	37	37	43	57	43 (41)	Ryton AAC125HP through wall acoustic vent
Specification 2 – all habitable rooms (≤ 55 dB $L_{Aeq,16hr}$ and ≤ 50 dB $L_{Aeq,8hr}$ & ≤ 65 dB $L_{Amax,F}$)							
Glazing	21	17	25	35	37	28 (25)	4/(6-20)/4 thermal double glazing
Ventilation	35	33	35	33	29	32 (32)	Titon XS13 5000EA + XC13 500 canopy acoustic trickle vent

A more detailed building envelope specification can be provided when the detailed internal layouts are determined (as part of a Reserved Matters application). However, based on the above, the proposed residential development is not constrained by the existing noise climate.

5 External Amenity Areas

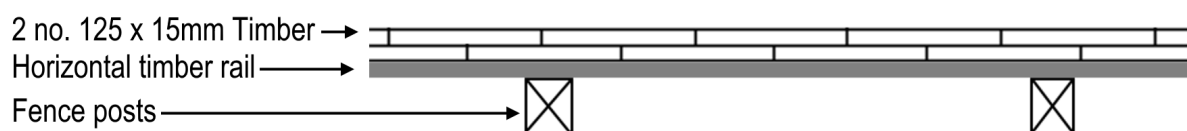
It is recommended that private gardens be located to the rear of properties fronting on to the A629 such that the building massing provides a substantial acoustic barrier.

Areas of the site which do not benefit from the acoustic barrier formed by intervening properties once built out are likely to be exposed to noise levels above the lower BS 8233 guideline noise level for external amenity areas.

To reduce noise levels as far as practicably possible, localised screening may be required.

This can typically be achieved with the provision of close boarded timber fencing to a minimum height of 1.8m above ground level. The fence itself should be formed of timber or other dense material having a minimum superficial mass $\geq 10\text{kg/m}^2$, and should be free of voids or gaps.

Figure 5.1 below presents a suitable build-up for the proposed noise barrier.



A detailed boundary treatment mark-up may be provided when the detailed site layout has been determined as part of a Reserved Matters application.

6 Summary and Conclusions

A noise impact assessment has been performed for an outline planning application for residential development including associated infrastructure works. All matters reserved except means of access into (but not within) the site from Penistone Road (A629), Birdsedge.

A noise survey was undertaken at the site, to assess background noise levels in the vicinity of nearby noise sensitive receptors. The noise climate was found to be controlled primarily by noise from local and distant road traffic.

Outline recommendations for a scheme of mitigation is set out in Section 4 of this report to satisfy relevant guideline noise levels for habitable rooms and external amenity areas.

The measures set out in this report are considered to provide suitable control of external noise levels for all habitable areas of the development and demonstrate that noise is not a constraint to the proposed development.

A more detailed building envelope specification can be provided when the detailed layout is determined.

Appendix A – Abbreviations and Definitions

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 μ 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 μ Pa).

A-weighting

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.

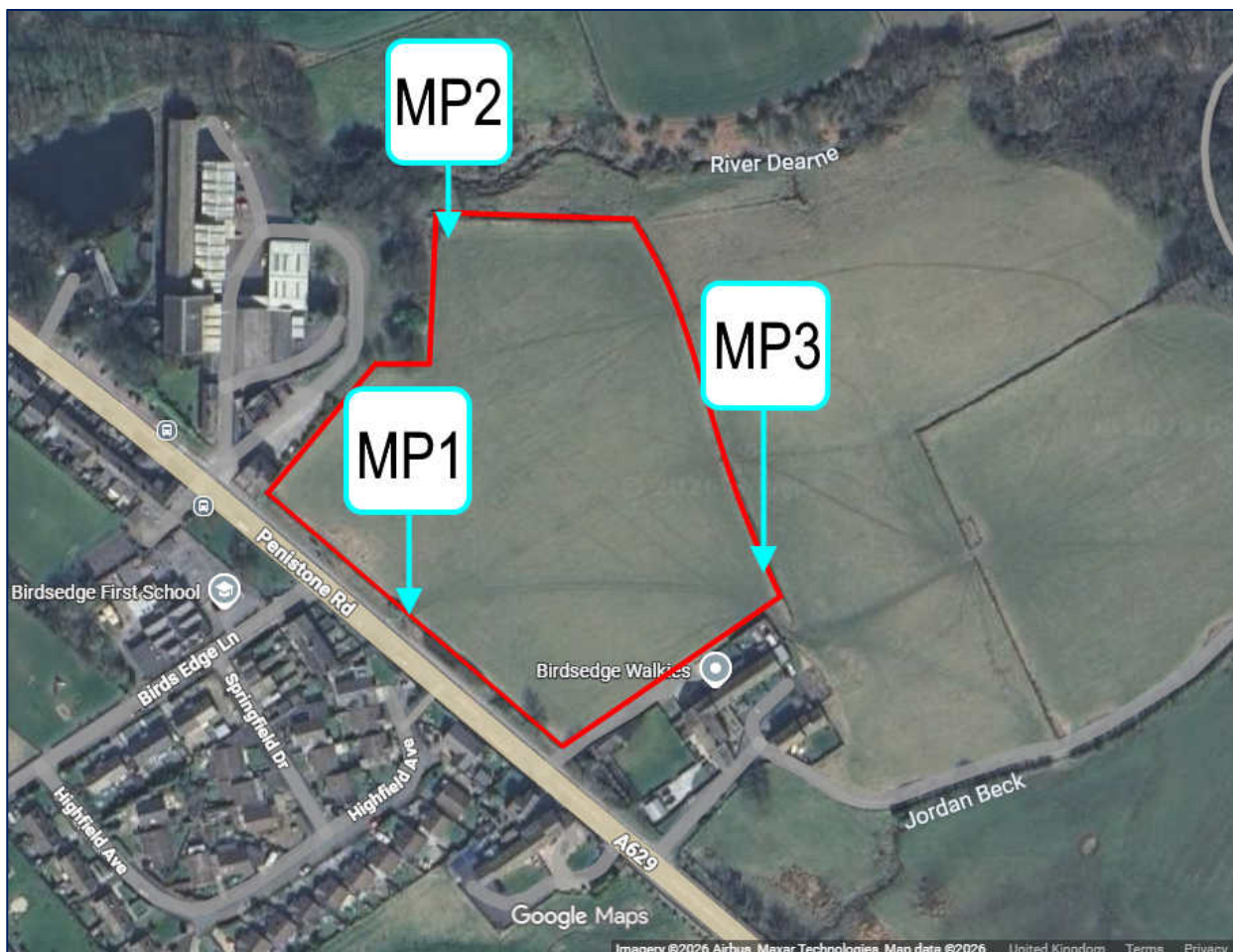
Single Event Level / Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, regardless of the event duration. 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 B – Noise Monitoring Positions



Appendix C – Figures

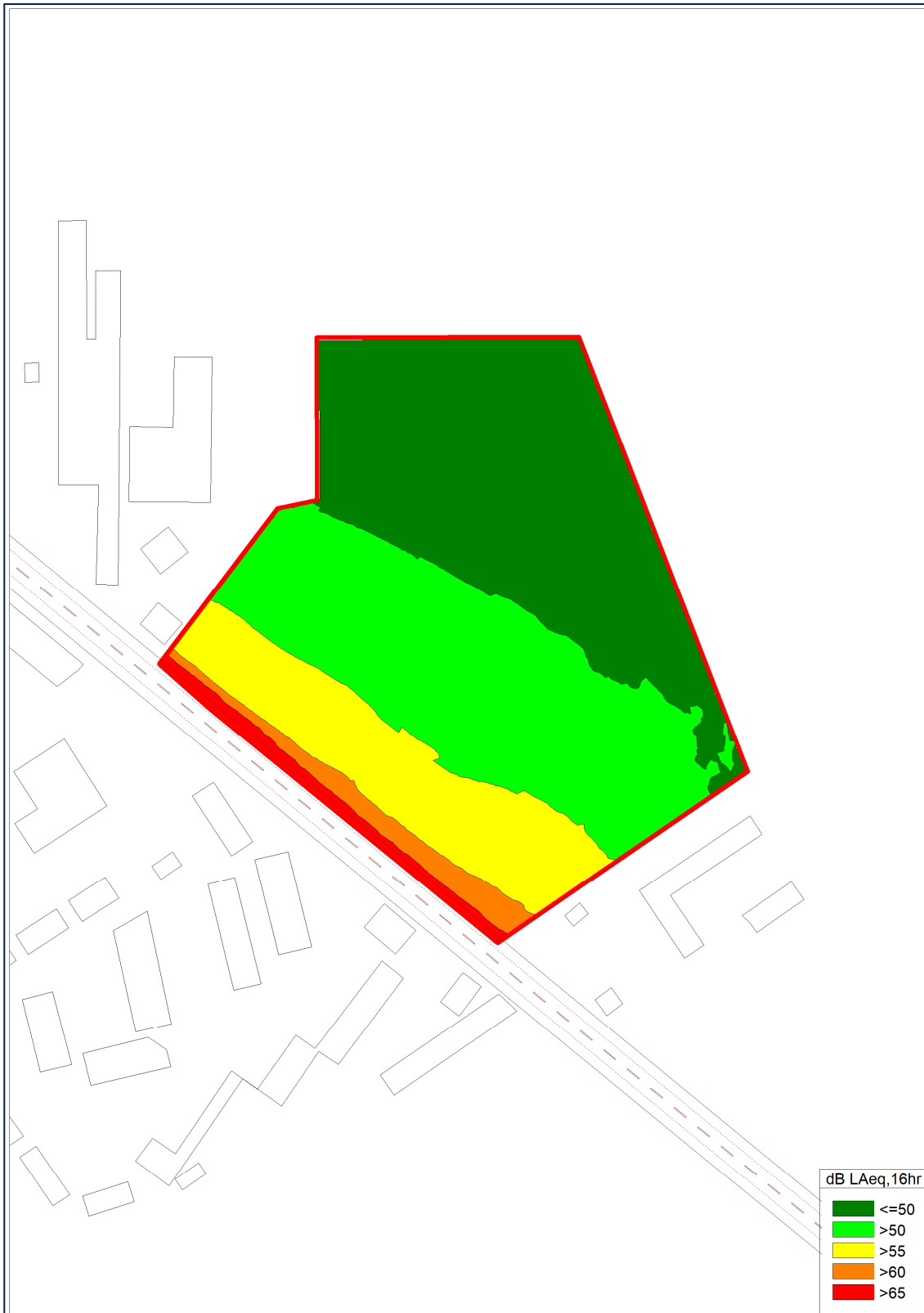


Figure C1: Daytime Noise Contour Plot (dB $L_{Aeq,16hr}$)

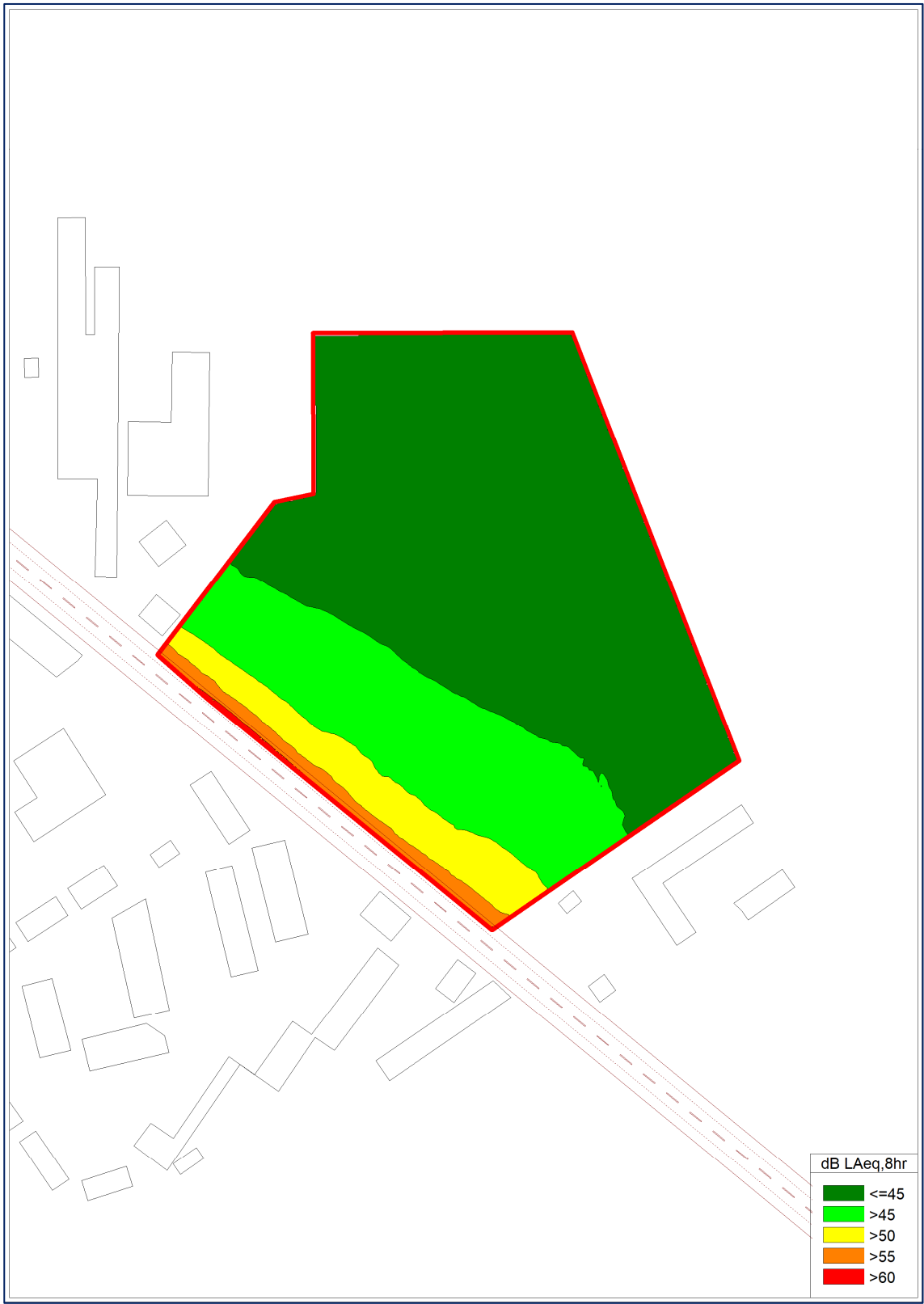


Figure C2: Night time Noise Contour Plot (dB $L_{Aeq,8hr}$)