BlueTreeAcoustics

Noise Assessment Report for Proposed Residential Development on land off Queens Street, Spring Vale

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On behalf of:
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1.0 INTRODUCTION

1.1 Blue Tree Acoustics has been appointed by Harard Developments (Penistone) Ltd to carry out an assessment of the existing noise climate at a proposed residential development on land situated off Queen Street, Spring Vale, Penistone.

1.2 The potential development plan proposes construction of new residential buildings on the site, which currently comprises an area of open grassland. The development site has existing residential properties to the South, the River Don to the North, a stream to the East, and Queen Street to the West. Beyond the stream to the East is a Bird Stainless Steel industrial unit. The proposed residential site is currently undeveloped and has vegetation across the whole site. The surrounding land is a mixture of undeveloped, residential and industrial areas, as shown in Figure 1.

1.3 The noise impact assessment has included:

i) Inspection of the site and surroundings.

ii) Noise monitoring surveys undertaken at locations on the site.

iii) Evaluation of the site in accordance with relevant planning policy guidance.

iv) Consideration of noise control measures required to maintain acceptable noise levels within the proposed bedrooms and living rooms in accordance with *British Standard 8233: 1999, 'Code of practice for Sound insulation and noise reduction for buildings'*.

2.0 NOISE SURVEY

2.1 Noise monitoring was undertaken by Blue Tree Acoustics in order to determine the existing ambient noise climate at the site. Measurements were taken during daytime hours, night time hours and during early morning hours on the 23rd and 25th July 2008.

2.2 Noise levels were measured at the following locations, as shown on Figure 1.

i) East side of development site, approximately 25m from stream (free-field)

ii) East side of development site, approximately 5m from river (free-field)

2.3 Noise measurements were carried out using a Rion NA28 Type 1, Class 1 Integrating Sound Level Meter. Noise was measured in terms of broadband A-weighted indices and at 1/3 octave bands from 50Hz to 10kHz. The sound level meter was mounted on a tripod at approximately 1.5m from local ground level and the proprietary windshield was fitted to the microphone. Calibration checks were carried out both before and after the measurements with no variance observed. Presented noise levels have been rounded to the nearest decibel as fractions of a decibel are not perceptible. The sound level meter was within a period of laboratory calibration.

2.4 Weather conditions during the noise survey period were generally dry and calm with wind speeds <5m/s.

2.5 During the day, the development site is dominated by river/stream noise and by industrial noise. During the night, the site is dominated by river/stream noise with occasional distant traffic movements and bird/animal noises. There was no industrial noise at night.

2.6 The measurement results are summarised in the tables below:

Table 1: Location 1 Daytime Noise Levels – Free field at approx 25m from stream

Date/Time	Time Period(mins)	dB L_{Aeq}	dB L_{Amax}	dB L_{A10}	dB L_{A90}	Comments
23/July/08 1401	10	50	69	51	47	Industrial and stream noise
1425	10	53	78	53	55	"
1436	10	53	75	54	50	"
1446	10	51	67	52	48	"
1456	10	50	65	52	48	"
1506	10	49	64	50	47	"
1516	10	50	70	51	47	"
1526	10	50	63	50	49	"
1536	10	49	62	53	46	"
1546	10	50	66	51	47	"
1556	10	50	51	50	50	"
25/July/08 0706	10	46	63	46	44	Stream noise, industry just starting up in final minute
Typical		**50**	**66**	**51**	**48**	

Table 2: Location 2 Daytime Noise Levels – Free field at approx 5m from stream

Date/Time	Time Period(mins)	dB L_{Aeq}	dB L_{Amax}	dB L_{A10}	dB L_{A90}	Comments
23/July/08 1414	1	56	58	57	55	Stream noise only, measured in gaps in industrial noise

Table 3: Location 1 Night time Noise Levels – Free field at approx 25m from stream

Date/Time	Time Period(mins)	dB L_{Aeq}	dB L_{Amax}	dB L_{A10}	dB L_{A90}	Comments
23/July/08 2303	5	43	54	43	42	Stream noise and distance traffic, occasional bird/animal noise
2313	5	42	52	43	41	"
2323	5	43	43	43	42	"
25/July/08 0625	5	43	55	44	42	"
0631	5	43	51	44	42	"
0636	5	44	57	44	43	
0642	5	44	59	45	43	"
0647	5	44	57	46	43	"
Typical		**43**	**54**	**44**	**42**	

2.7 There is a Bird Stainless Steel industrial unit to the West of the development site, across a stream and patch of woodland. The shortest distance between the two sites is 20m or so, however, the majority of the site is much further away. Bird Stainless Steel was contacted via telephone and via email in order to discuss the proposals and allow operations to be witnessed and considered. Bird Stainless Steel did not give permission for any such discussion or site visit. Sarah Newman, EHO at Barnsley Metropolitan Borough Council, was contacted in order to establish the restrictions in place on the industrial operation. No records were found. Bob Merryweather of Barnsley Metropolitan Borough Council Development Control has also been contacted. He could find no planning history for the site.

2.8 The majority of Bird Stainless Steel industrial noise as experienced on the development site and adjacent existing residential properties appears to be the loading of steel

products onto vehicles, and vehicle movements. There is also an alarm which sounds regularly, possibly reminding staff of duties.

2.9 As can be seen above, the industrial unit was found to not operate at night, with activity beginning just after 0700 hours.

2.10 During the day at Location 1, noise levels were modest, typically being around 50dB L_{Aeq}. This was found to be generated by a combination of industrial noise and stream noise. Location 1 was selected before the site layout was developed, and as shown in Figure 2, is it apparent that the easternmost dwelling will experience slightly higher noise levels of the order of 53dB L_{Aeq}.

3.0 NOISE ASSESSMENT

3.1 The planning system has recently been radically changed. On 27th March 2012, the National Planning Policy Framework came into force. This document replaces a great many planning guidance documents which previously informed the planning system in England. The new framework states that:

The planning system should contribute to and enhance the natural and local environment by:

- *protecting and enhancing valued landscapes, geological conservation interests and soils;*
- *recognising the wider benefits of ecosystem services;*
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability;*

  and

- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

Planning policies and decisions should aim to:

- *avoid noise from giving rise to significant adverse impacts[27] on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts[27] on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;[28]*

  and

- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

[27] *See Explanatory Note to the Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs).*

[28] *Subject to the provisions of the Environmental Protection Act 1990 and other relevant law.*

In preparing Local Plans, local planning authorities should:

- *identify and include policies for extraction of mineral resource of local and national importance in their area, but should not identify new sites or extensions to existing sites for peat extraction;*
- *so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;*
- *define Minerals Safeguarding Areas and adopt appropriate policies in order that known locations of specific minerals resources of local and national importance are not needlessly sterilised by non-mineral development, whilst not creating a presumption that resources defined will be worked; and define Minerals Consultation Areas based on these Minerals Safeguarding Areas;*
- *safeguard:*
  - *existing, planned and potential rail heads, rail links to quarries, wharfage and associated storage, handling and processing facilities for the bulk transport by rail, sea or inland waterways of minerals, including recycled, secondary and marine-dredged materials;*

    and
  - *existing, planned and potential sites for concrete batching, the manufacture of coated materials, other concrete products and the handling, processing and distribution of substitute, recycled and secondary aggregate material.*
- *set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non-mineral development to take place;*
- *set out environmental criteria, in line with the policies in this Framework, against which planning applications will be assessed so as to ensure that permitted operations do not have unacceptable adverse impacts on the natural and historic environment or human health, including from noise, dust, visual intrusion, traffic, tip- and quarry-slope stability, differential settlement of quarry backfill, mining subsidence, increased flood risk, impacts on the flow and quantity of surface and groundwater and migration of contamination from the site; and take into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;*
- *when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction; and*
- *put in place policies to ensure worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place, including for agriculture (safeguarding the long term*

potential of best and most versatile agricultural land and conserving soil resources), geodiversity, biodiversity, native woodland, the historic environment and recreation.

When determining planning applications, local planning authorities should:

- *give great weight to the benefits of the mineral extraction, including to the economy;*
- *as far as is practical, provide for the maintenance of landbanks of nonenergy minerals from outside National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage sites, Scheduled Monuments and Conservation Areas;*
- *ensure, in granting planning permission for mineral development, that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;*
- *ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties;*
- *not grant planning permission for peat extraction from new or extended sites;*
- *provide for restoration and aftercare at the earliest opportunity to be carried out to high environmental standards, through the application of appropriate conditions, where necessary. Bonds or other financial guarantees to underpin planning conditions should only be sought in exceptional circumstances;*
- *not normally permit other development proposals in mineral safeguarding areas where they might constrain potential future use for these purposes;*
- *consider how to meet any demand for small-scale extraction of building stone at, or close to, relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites; and*
- *recognise the small-scale nature and impact of building and roofing stone quarries, and the need for a flexible approach to the potentially long duration of planning permissions reflecting the intermittent or low rate of working at many sites.*

3.2 In addition, the Noise Policy Statement for England (NPSE) states:

Noise Policy Vision

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- **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.**

Guiding principles of sustainable development

Ensuring a Strong Healthy and Just Society – Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.

Using Sound Science Responsibly – Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.

Living Within Environmental Limits – Respecting the limits of the planet's environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

Achieving a Sustainable Economy – Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised.

Promoting Good Governance – Actively promoting effective, participative systems of governance in all levels of society – engaging people's creativity, energy and diversity.

Source: Securing the future – delivering UK sustainable development strategy, HM Government, March 2005.

3.3 The Noise Policy Statement for England Explanatory note states that:

Noise is an inevitable consequence of a mature and vibrant society. For some the noise of city life provides a desirable sense of excitement and exhilaration, but for others noise

is an unwanted intrusion that adversely impacts on their quality of life, affecting their health and well being.

The management of noise has developed over many years as the types and character of noise sources have altered and as people's attitude to noise has changed. The Noise Abatement Act came into law in 1960 and the Report from the Committee on the Problem of Noise was published in 1963 (the Wilson report). Since then, examples of noise management can be found in many areas including reducing noise at source; the use of the land use and transport planning systems, compensation measures, the statutory nuisance and licensing regimes and other related legislation.

Furthermore, the broad aim of noise management has been to separate noise sources from sensitive noise receivers and to 'minimise' noise. Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as reasonably practical. This concept can be found in the Environmental Protection Act 1990, where, in some circumstances, there is a defence of 'best practicable means' in summary statutory nuisance proceedings.

By describing clear policy vision and aims the NPSE provides the necessary clarity and direction to enable decisions to be made regarding what is an acceptable noise burden to place on society.

The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise). For the purposes of the NPSE, "noise" includes:

- *"environmental noise" which includes noise from transportation sources;*
- *"neighbour noise" which includes noise from inside and outside people's homes;*

And

- *"neighbourhood noise" which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street.*

The application of the NPSE should mean that noise is properly taken into account at the appropriate time. In the past, the opportunity for the cost effective management of noise has often been missed because the noise implications of a particular policy, development or other activity have not been considered at an early enough stage.

In addition, the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications.

In the longer term, the Government hopes that existing policies could be reviewed (on a prioritised basis), and revised if necessary, so that the policies and any noise management measures being adopted accord with the vision, aims and principles of the NPSE.

Noise management is a complex issue and at times requires complex solutions. Unlike air quality, there are currently no European or national noise limits which have to be met, although there can be specific local limits for specific developments. Furthermore, sound only becomes noise (often defined as 'unwanted sound') when it exists in the wrong place or at the wrong time such that it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance. Unlike many other pollutants, noise pollution depends not just on the physical aspects of the sound itself, but also the human reaction to it. Consequently, the NPSE provides a clear description of desired outcome from the noise management of a particular situation.

The guiding principles of Government policy on sustainable development should be used to assist in its implementation. The development of further principles specifically to

underpin implementation of noise management policy will be kept under review as experience is gained from the application of the NPSE.

There are several key phrases within the NPSE vision and these are discussed below.

Health and quality of life

The World Health Organisation defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, and recognises the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being.

It can be argued that quality of life contributes to our standard of health. However, in the NPSE it has been decided to make a distinction between 'quality of life' which is a subjective measure that refers to people's emotional, social and physical well being and 'health' which refers to physical and mental well being.

It is recognised that noise exposure can cause annoyance and sleep disturbance both of which impact on quality of life. It is also agreed by many experts that annoyance and sleep disturbance can give rise to adverse health effects. The distinction that has been made between 'quality of life' effects and 'health' effects recognises that there is emerging evidence that long term exposure to some types of transport noise can additionally cause an increased risk of direct health effects. The Government intends to keep research on the health effects of long term exposure to noise under review in accordance with the principles of the NPSE.

Promote good health and good quality of life

This statement expresses the long term desired policy outcome, but in the use of 'promote' and 'good' recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations.

Effective management of noise

This concept confirms that the policy applies to all types of 'noise' (environmental, neighbour and neighbourhood) and that the solution could be more than simply minimising the noise.

Within the context of Government policy on sustainable development

Sustainable development is a core principle underpinning all government policy. For the UK Government the goal of sustainable development is being pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment and a just society that promotes social inclusion, sustainable communities and personal wellbeing. The goal is pursued in ways that protect and enhance the physical and natural environment, and that use resources and energy as efficiently as possible.

There is a need to integrate consideration of the economic and social benefit of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focussing solely on the noise impact without taking into account other related factors.

There are several key phrases within the NPSE aims and these are discussed below.

"Significant adverse" and "adverse"

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

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.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL . Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

The first aim of the Noise Policy Statement for England

Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development.

The second aim of the Noise Policy Statement for England

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It 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. This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

3.4 Unfortunately, the above guidance gives no objective, tangible standards or criteria which enable planning decisions to be made. In the absence of such guidance,

inevitably, reference to the former principal noise planning policy document must be made.

3.5 *Planning Policy Guidance note No 24 'Planning and Noise'* (PPG24), issued by the Department of the Environment in 1994, set out the Government's policies relating to noise until its recent withdrawal in March 2012. The document gave guidance to local authorities in England on the use of their planning powers to minimise the adverse impact of noise. PPG24 outlined the considerations to be taken into account in determining planning applications both for noise-sensitive developments and for those activities which generate noise. It introduced the concept of Noise Exposure Categories (NEC) for new residential developments.

Table 4: PPG24 NEC Categories

Categories For New Dwellings dB $L_{Aeq,T}$				
	Noise Exposure Category			
Noise Source	**A**	**B**	**C**	**D**
Road Traffic				
07.00 - 23.00	<55	55 – 63	63 – 72	>72
23.00 - 07.00	<45	45 – 57	57 – 66	>66
Rail Traffic				
07.00 - 23.00	<55	55 – 66	66 – 74	>74
23.00 - 07.00	<45	45 – 59	59 – 66	>66
Air Traffic				
07.00 - 23.00	<57	57 – 66	66 – 72	>72
23.00 - 07.00	<48	48 – 57	57 – 66	>66
Mixed Sources				
07.00 - 23.00	<55	55 – 63	63 – 72	>72
23.00 - 07.00	<45	45 – 57	57 – 66	>66

3.6 PPG24 states that the NEC categories are interpreted as follows:

NEC A

"Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level."

NEC B

"Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise."

NEC C

"Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise."

NEC D

"Planning permission should normally be refused."

3.7 The level of noise measured at the development site is modest. If assessed against the noise exposure categories of PPG24, it would fall within NEC A across the site during the day and at night.

3.8 It is understood that the Local authority are willing to consider a BS8233-type approach to allow development of this site. In order to protect potential future residents against the impact of noise, the guidance given in *British Standard 8233: 1999, 'Code of*

practice for Sound insulation and noise reduction for buildings' (BS8233) should be considered.

3.9 The table below sets out the range of levels recommended in BS8233 for residential accommodation.

Table 5: BS8233 Guidance Criteria

Criterion	Typical Situations	Design Range ($L_{Aeq,T}$ dB)	
		Good	Reasonable
Reasonable resting / sleeping conditions	Living rooms	30	40
	Bedrooms	30	35

3.10 In addition, BS8233 makes reference to external noise levels in gardens and balconies, etc., stating that it is desirable that the steady noise level not exceed 50dB $L_{Aeq,T}$ dB, and that 55dB $L_{Aeq,T}$ should be regarded as the upper limit.

3.11 The following noise mitigation section is based on achieving the adopted noise criteria to ensure a suitable level of protection for the future occupants of the development. The following criteria are therefore proposed in accordance with BS8233.

Inside Bedrooms:	$L_{Aeq(8hour)}$ 30dB (2300 to 0700 hours)
Inside Living Rooms:	$L_{Aeq(16hour)}$ 40dB (0700 to 2300 hours)
External areas such as Gardens:	$L_{Aeq(16hour)}$ 55dB (0700 to 2300 hours)

3.12 Noise ingress calculations have been carried out in accordance with BS8233.

4.0 NOISE MITIGATION MEASURES

4.1 PPG24 acknowledged a variety of proportionate and reasonable techniques that could be introduced to mitigate the effects of noise. These were, specifically:

Engineering: reduction of noise at source (e.g. use of quiet machinery and working methods), containment of generated noise, and protection of noise-sensitive buildings (e.g. by sound insulation and/or screening them by purpose-built barriers);

Layout: adequate distance between source and noise-sensitive building; screening by natural barriers, other buildings or non-critical rooms in a building;

Administrative: limiting operating time of source, restricting activities on site, specifying an acceptable noise limit.

Site Layout

4.2 Considering the proposed residential layout shown in Figure 2, the dwellings most exposed to noise will be those along the eastern site boundary.

Dwelling Protection

4.3 The design of the building envelope of the new dwellings can incorporate suitable sound insulation to satisfy the requirements of BS8233. The precise design requirements will depend on the external noise level experienced at each property. Based on the measured noise levels, the following examples would be indicative of suitable building envelope construction.

4.4 Generally, all new housing should be of masonry construction, e.g. external cavity walls with block-work inner leaf and external brick leaf.

4.5 Roof constructions should be tiled, with ceilings to rooms below comprising a minimum of 1 layer of solid gypsum-based board (total minimum mass per unit area 8kg/m^2), with all joints staggered and overlaid with 100mm mineral fibre insulation. Any proposed

rooms in the roof-space should be designed to have suitable internal linings to achieve the required sound insulation.

4.6 Suitable sound insulation can be achieved by provision of double glazing with standard trickle ventilators. Standard double glazing configurations will typically provide suitable sound insulation, but the proposed glazing system should be checked at detailed design stage to verify acoustic performance. It may be prudent to provide the easternmost houses with additional measures such as acoustic ventilation and an enhanced glazing system, as such a system will provide an additional safeguard against noise intrusion.

4.7 We therefore recommend that the easternmost properties (within 30m of the eastern boundary) be provided with a double glazed systems comprising one pane of 10mm glass and one pane of 6mm glass in a standard framing system to all rooms. In addition, these houses should be provided with acoustic ventilation such as the Rytons Cowled Acoustic Aircore AAC635HMCW, Greenwood EHA574, or Renson Invisivent AK49.

4.8 Existing daytime noise levels are below 55dB L_{Aeq} and are therefore within BS8233 limits for private gardens. However, in order to provide an additional margin of safety, it is advisable for gardens to be enclosed by 1.8m high close-boarded timber fences in order to provide localised acoustic screening. In addition, it would be prudent to provide a 750mm bund to the eastern boundary, with acoustic fence above, such that the barrier between site and industry is 3m high.

4.9 It is considered that the above measures will provide internal noise levels of 15dB $L_{Aeq(15\ mins)}$ at night, and 10dB $L_{Aeq(15\ mins)}$ at in the day. This is a very low noise level. Externally, the worst affected gardens will most likely achieve a noise level of around 50dB L_{Aeq} and certainly will be no higher than 55dB L_{Aeq}.

4.10 All recommendations given above are for acoustic purposes only. Any other requirements such as structural, thermal, fire safety, etc. should be checked by suitably qualified specialists.

5.0 SUMMARY AND CONCLUSIONS

5.1 A noise assessment has been carried out on behalf of Harard Developments (Penistone) Ltd for a proposed residential development on land off Queen Street, Spring Vale, Penistone.

5.2 The assessment has included measurements of the prevailing ambient noise levels at the site during daytime and night-time.

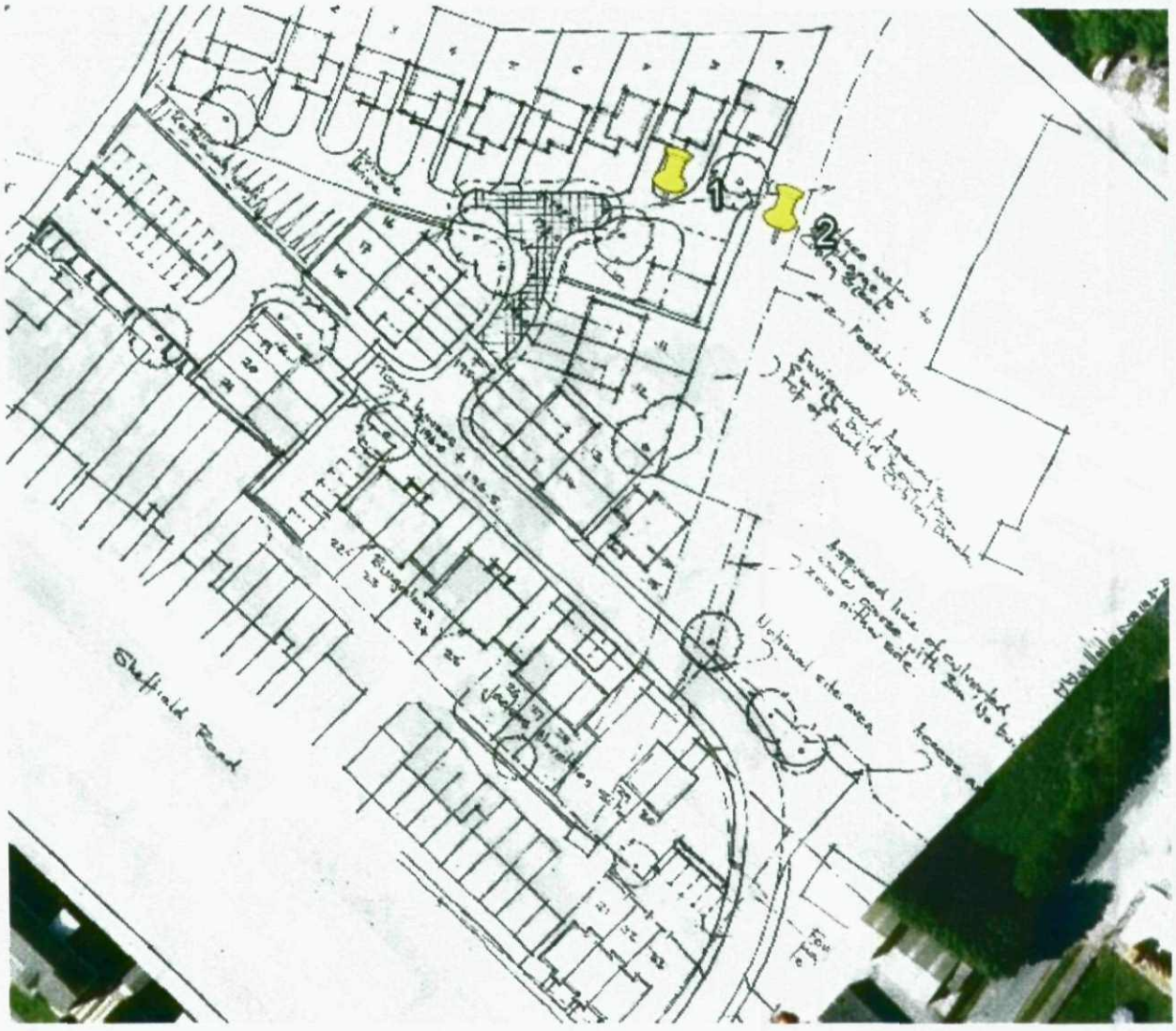
5.3 Outline noise control measures have been recommended in order to meet suitable noise level criteria for the proposed residential development.

5.4 It is considered that as the Local Authority are prepared to consider the site in BS8233 terms, the site should be deemed acceptable in planning and noise terms, as acceptable noise levels in accordance with BS8233 can be achieved following the design and implementation of suitable noise mitigation measures.

FIGURE 1 – NOISE MONITORING LOCATIONS



FIGURE 2 – INDICATIVE SITE LAYOUT



APPENDIX I – NOISE UNITS AND INDICES

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

b) Frequency and Hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or Hertz (Hz). Sometimes large frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz.

Young people with normal hearing can hear frequencies in the range 20Hz to 20kHz. However, the upper frequency limit gradually reduces as a person gets older.

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighing applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period.

L_{Amax} This is the maximum A-weighted sound level that was recorded during the monitoring period.

L_{A90} This is the A-weighted sound level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

L_{A10} This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.