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ONE HORTON HEATH, SOUTHERN GREEN INFRASTRUCTURE
Acoustic Review – Revision A

ONE HORTON HEATH, SOUTHERN GREEN INFRASTRUCTURE Acoustic Review

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Acoustic Review

Revision A

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Plans

The following information has been referred to for this assessment:

Drawing number	Rev	Title
DD579L05	R4	Character Areas Southern Green Infrastructure Sheet 1 of 6
DD579L06	R4	Character Areas Southern Green Infrastructure Sheet 2 of 6
DD579L08	R2	Character Areas Southern Green Infrastructure Sheet 3 of 6
DD579L08	-	Character Areas Southern Green Infrastructure Sheet 4 of 6
DD579L09	R4	Character Areas Southern Green Infrastructure Sheet 5 of 6
DD579L10	R3	Character Areas Southern Green Infrastructure Sheet 6 of 6

Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By
Rev A 04/01/24	Red Line Boundary updated and NPPF references updated to reflect latest revision.	MT	JDB

1.0 INTRODUCTION

- 1.1 Create Consulting Engineers Ltd have been appointed by the One Horton Heath team on behalf of Eastleigh Borough Council to undertake an acoustic assessment for the One Horton Heath, Southern Green Infrastructure parcel.
- 1.2 The One Horton Heath development comprises a large parcel of land which is to be subdivided into eleven smaller development areas. Detailed design for each parcel will be provided in separate reports once sufficient information is available, under a separate instruction.
- 1.3 Although not a requirement under planning, the design team has recognised that there is an opportunity to incorporate positive acoustic features into the ecology areas to enhance the enjoyment of the spaces.
- 1.4 Construction of the Green Infrastructure includes open space landscaping, bridleways, footpaths, SuDS, play areas and ecological and biodiversity enhancements at One Horton Heath.
- 1.5 The proposed development has been designed in full accordance with the Development Plan and Outline Planning Application (OPA) O/20/89498, which has a resolution to grant consent subject to S106 negotiations relating to education. The application is for full planning consent due to the time for these negotiations to complete. Submitting details of the Green Infrastructure Landscaping (GI) as a full planning application will deliver the GI in accordance with, and as part of the OPA, but enable commencement more quickly than waiting for the resolution of the OPA S106 and the determination of an application for reserved Matters Approval of details of the Green Infrastructure.
- 1.6 This report summarises the proposed green infrastructure layouts for the southern areas of the site and discussed any acoustic benefits to the proposals. The report also discusses improvements that may lead to a better sound scape to the wider development and to the ecology areas.

2.0 RELEVANT GUIDANCE

- 2.1 Public amenity areas are rarely assessed for acoustic suitability, largely because people can choose to use public amenity and will congregate towards areas that they feel offer the best value to them as individuals.
- 2.2 This is different to private amenity where people will expect a certain level of acoustic comfort.
- 2.3 In absence of other guidance we have considered numerical criteria within BS 8233 and the WHO guidelines within this assessment.
- 2.4 Again these guideline values are for information purposes only and would not normally be a mandatory requirement under planning.
- 2.5 It is worth noting that, irrespective of numerical criteria, people's enjoyment of a space is often influenced by the sound scape of the space. That is to say, naturalistic features such as animal sounds and water running are generally held in higher regard to noise from commercial or infrastructure sources. Within reason people are generally more tolerant of higher noise levels from these naturalistic sources than commercial and industrial sources.
- 2.6 The quantitative assessment within this report, therefore, only considers noise from manmade activities as sound from natural sources falls outside of the scope of most guidance.

Standards and Guidance

BS 8233 (2014) Guidance on Sound Insulation and Noise Reduction for Buildings

- 2.7 British Standard 8233 (2014) 'Guidance on sound insulation and noise reduction for dwellings' provides contains guidance on limits for internal noise in common types of domestic and non-domestic buildings. The guidance is primarily intended for steady, continuous sources (such as noise from road traffic), but are also commonly used to provide a reasonable basis for assessing the suitability of noise levels within a dwelling. Careful interpretation and application of the guideline noise levels is often necessary.
- 2.8 This guidance does also provide recommendation for external noise limits.
- 2.9 Section 7.7.3.2 recommends that noise levels in external amenity areas should ideally not exceed 50 dB $L_{Aeq,T}$ and that 55 dB $L_{Aeq,T}$ should be considered as an upper limit. BS 8233 does, however, note that these values are guidelines and may not be achievable in all circumstances where development might be desirable.

WHO: Guidelines on Community Noise (1999)

- 2.10 The WHO Guidelines for Community Noise state the following guideline values for noise in specific environments, as can be seen in Table 2.1.

Specific Environment	Critical Health Effects	L _{Aeq,T} (dB)	L _{Amax,fast} (dB)
Dwelling, indoors	Speech intelligibility and moderate annoyance	35	-
Inside bedrooms	Sleep disturbance, night-time	30	45
Outdoor living area	Serious annoyance, daytime and evening	55	-
	Moderate annoyance, daytime and evening	50	-

Table 2.1: WHO Guideline Values for Community Noise

- 2.11 It should be noted that the guidance in the Eastleigh Borough Council's Local Plan 2016 – 2036 suggests that limits of 55 dB LAeq is appropriate for main gardens. It does however specify that communal gardens would not normally be required to demonstrate that these limits can be achieved.

3.0 PROPOSALS AND REVIEW

3.1 The combined southern green infrastructure proposals are provided below:

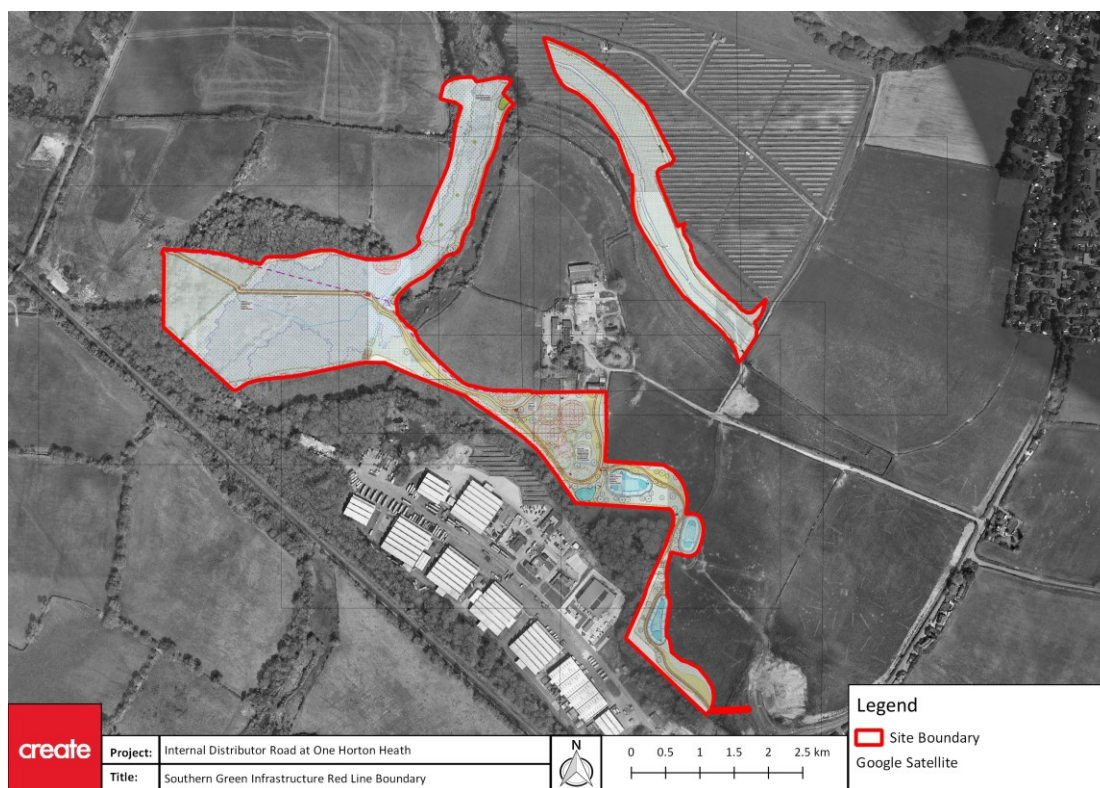


Figure 3.1: Southern Green Infrastructure Proposals

- 3.2 Broadly speaking, the proposals include grass lands and tree planting within the majority of the red line boundary. Attenuation basins are used close to the areas which are allocated for housing development. Pedestrian footways and cycle paths are included throughout much of the proposal and a small play area is included to the centre of the parcel just south of the Chalcroft Farm Parcel.
- 3.3 The southern most part of the green infrastructure provides a reasonable buffer between the existing industrial estate and the residential development areas.
- 3.4 The use of the green infrastructure to separate the residential and industrial areas follows good acoustic design principles particularly where the majority of the ground is acoustically 'soft' as it is shown to be in this case. This will provide a greater degree of ground absorption which is more effective at reducing noise propagation over distance.
- 3.5 An existing tree belt is located along the southwest of the site. Although, during a visit to site it was noted that this does not provide a particularly high degree of visual masking to the industrial units. This is relevant as people are often more tolerant of noise where it is ambiguous and more critical when the source of the noise is clearly identifiable.

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- 3.6 Given the position of the walkways it is likely that some industrial activities will be audible, particularly during periods of low winds where the existing and new trees will provide less masking. We understand that fences and earth bunds in this location are unlikely to be feasible due to the high density of trees.
- 3.7 With that being said these industrial areas are unique to this location and people who find noise from industrial activities intrusive or annoying have the flexibility to utilise other amenity spaces allocated around the wider development. As this industrial estate is clearly visible, activities from the area are likely to be perceived as 'in context' with the area.
- 3.8 It would be for the future developments to consider the impact of noise from the existing commercial activities to minimise the likely hood of adverse impact.
- 3.9 At this stage we have not been provided with details of any topographical changes. However, as the design is progressed, we would recommend that consideration is given to incorporating earth bunding, living barriers, or other impervious barriers where possible to break line of sight from industrial areas to the wider development.
- 3.10 There is a rich grassland area with a stream shown to the north of the parcel southwest of the solar farm. There are no foot paths at this location. From an acoustic perspective it would have been more beneficial to locate the green space to the west side of the main road and provided a greater buffer to houses proposed at Chalcroft Farm. This would allow the road to be positioned further away from the houses and hence reduce the noise levels at the façade. However, the road layout is now fixed and the consideration for the location of the main road is outside the scope of this report. We would expect that a balance of consultant's feedback to have been considered when allocating the space for the main road and a balanced decision made based on the requirements of the project. Ultimately the onus for mitigating noise from the proposed road will fall on the housing developments.
- 3.11 The main road is also located relatively far from the proposed footpaths and play area. Once the site is complete there will be development between the road and the footpaths with in the southern green infrastructure parcel of land which will help reduce noise from the main road to the amenity spaces.
- 3.12 Figure 3.2 shows a map of noise levels across the southern green infrastructure area, including indicative draft housing locations. It can be seen that combined noise from the surrounding road network falls below the upper limit proposed in BS 8233 and the WHO guidelines, while some areas fall below the lower limits proposed.

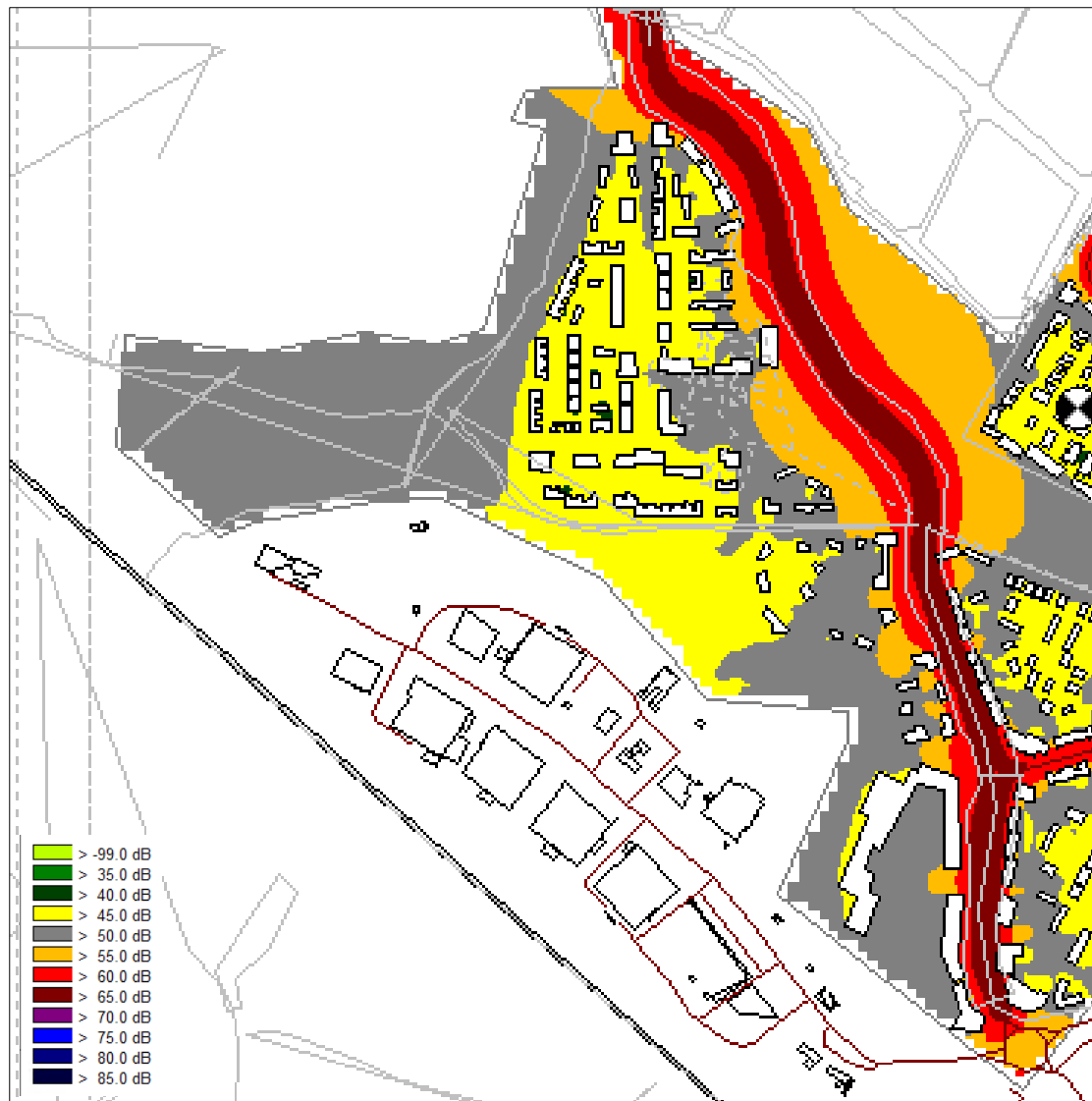


Figure 3.2: Southern green infrastructure noise levels

3.13 Again, further reduction could be achieved through the use of bunding or barriers.

4.0 DISCLAIMER

- 4.1 Create Consulting Engineers Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.
- 4.2 The copyright of this report is vested in Create Consulting Engineers Ltd and Eastleigh Borough Council. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or Eastleigh Borough Council.
- 4.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

APPENDICES

APPENDIX A

Acoustic Glossary

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter can be used to duplicate the ear's variable sensitivity to sound across a spectrum of frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the average ear. This is called an "A-weighting filter". Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

 $L_{eq,T}$

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period (T).

 $L_{10,T}$

This is the minimum level exceeded for not more than 10% of the time period (T). This parameter is often used as a "not to exceed" criterion for noise.

 $L_{90,T}$

This is the minimum level exceeded for not more than 90% of the time period (T). This parameter is often used as a descriptor of "background noise" for environmental impact studies.

 L_{fmax}

This is the maximum sound pressure level that has been measured over a period using a fast time constant.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combine, on a logarithmic scale, to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 3 identical sources produce a 5dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g., stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

IANL

IANL or 'Internal Ambient Noise Level' refers to the recorded (or predicted) $L_{Aeq,T}$ within a dwelling, office, commercial unit or treatment space. IANL typically defines a design limit or range.

APPENDIX B

Summary of National Policy

NATIONAL PLANNING POLICY

National Planning Policy Framework (December 2023)

The National Planning Policy Framework (NPPF) replaces the previous version of the NPPF and the Planning Policy Statements (PPS) and Planning Policy Guidance (PPG), including the Department of the Environment's Planning Policy Guidance Note 24: 'Planning and Noise' (PPG 24), which was published in 1994. The main reference to noise within the latest version of the NPPF is at Paragraphs 180 (e) and 191:

'Para.180 (e). "Planning policies and decisions should contribute to and enhance the natural and local environment by:

(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability."

'Para.191. 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:

(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 life⁶⁹;

(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.; and

(c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

The reference number 69 cross references the National Policy Statement for England (NPSE) Explanatory Note.

Although some qualitative guidance on noise has been provided in the web-based Planning Practice Guidance document, there has been no alternative quantitative guidance proposed by the Government as a direct replacement for PPG24. This was due to the recognition that every site is different and that there is no single acceptable noise level, suitable for all applications.

National Planning Policy Guidance (2019)

On 6th March 2014, the Department for Communities and Local Government (DCLG) launched the National Planning Practice Guidance (NPPG) web-based resource to supersede previous planning guidance documents including PPG24 and provide clarification over all disciplinary sectors in the delivery of the design quality aspirations of the NPPF. This has been updated in July 2019.

The NPPG-Noise provides guidance on the assessment of noise, the needs to be considered when new developments may create additional noise and when developments would be sensitive to the prevailing acoustic environment.

The acoustic environment should be taken into account in the planning of new development and decision making should take the following into consideration:

- *‘whether or not significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.’*

It then cross-references the Noise Policy Statement for England (2010) for further clarification on how to assess the overall effect of noise exposure.

The Noise Policy Statement for England (2010)

The Noise Policy Statement for England (NPSE) was published in March 2010 and is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long-term vision of Government noise policy which is to:

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

The vision is supported by the following aims which are reflected in paragraph 1.7 of the Noise Policy Statement for England:

‘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.’*

The Explanatory Note to the NPSE introduces three concepts to the assessment of the potential effects of noise:

- ***‘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.’***

Unlike the now redundant PPG24, the three levels are not defined numerically in the NPSE, and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent a SOAEL for noise is acknowledged and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.