



ONE HORTON HEATH, INTERNAL DISTRIBUTOR ROAD
Acoustic Assessment – Revision C

ONE HORTON HEATH, INTERNAL DISTRIBUTOR ROAD Acoustic Assessment

Client: Eastleigh Borough Council

Engineer: Create Consulting Engineers Limited
15 Princes Street
Norwich
Norfolk
NR3 1AF

Tel: 01603 877010
Email: enquiries@createce.co.uk
Web: www.createce.co.uk

Report By: Mat Tuora, BSc (Hons), MloA

Checked By: Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE

Reference: MT/VL/P22-2687/03 Rev C

Date: March 2023

ONE HORTON HEATH, INTERNAL DISTRIBUTOR ROAD
Acoustic Assessment – Revision C

ONE HORTON HEATH, INTERNAL DISTRIBUTOR ROAD

Acoustic Assessment

Revision C

Contents

- 1.0 Introduction
- 2.0 Existing Environment and Site Proposals
- 3.0 Policy, Standards and Criteria
- 4.0 Road and Traffic Noise Computer Model
- 5.0 Construction Noise
- 6.0 Uncertainty
- 7.0 Disclaimer

Appendices

- A. Acoustic Glossary
- B. Summary of National Policy
- C. Traffic Data Used in This Assessment

Plans

This report is based on information provided to us by the design team, including the Illustrative Masterplan provided by Clague Architects Doc Ref: 30454A/3875 Rev A data July 2023

Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By
Rev A 18.07.23	Updates made based on client comments	NP/SW	MT
Rev B 09.11.23	Incorporating minor change to layout and client's comments	MT	JDB
Rev C 22.11.2023	Final issue	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 Internal Distributor Road development. The application is for the construction of an internal distributor road with associated footways, cycleways, lighting, drainage and landscaping at One Horton Heath.
- 1.2 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. This application is for full planning consent due to the time for these negotiations to complete. Submitting details of the Secondary Infrastructure Road (SIR) as a full planning application will deliver SIR 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 SIR.
- 1.3 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.
- 1.4 This report addresses the impact from the new road to pass through the proposed sites. At the time of writing site layouts are indicative and therefore the noise produced by the road is likely to determine the placement of the buildings and any façade mitigation required.
- 1.5 It should be noted that previous reports have been submitted for other areas of the development, mainly the new link road which connects the roundabouts to the north and south of the site. These reports were authored by Hydrock and this report relies on some of the data within these to inform our model.
- 1.6 This report contains:
- a description of the site and the proposed work to be carried out;
 - a summary of global and local policy and standards relevant to this part of the planning application;
 - an assessment of sound against the relevant standards.
- 1.7 Recommendations given in this report are for acoustic purposes only. It is the Client's responsibility to ensure that any work carried out complies with other regulations.
- 1.8 A glossary of acoustic terms used in this report is provided in Appendix A.

2.0 EXISTING ENVIRONMENT AND SITE PROPOSALS

- 2.1 The application site is located in the rural land to the west of Horton Heath in Hampshire.
- 2.2 The development is approximately 1.7 km from the closest section of the M27 and over 2.5 km away from Southampton Airport.
- 2.3 The site and surrounding area is shown in Figure 2.1.

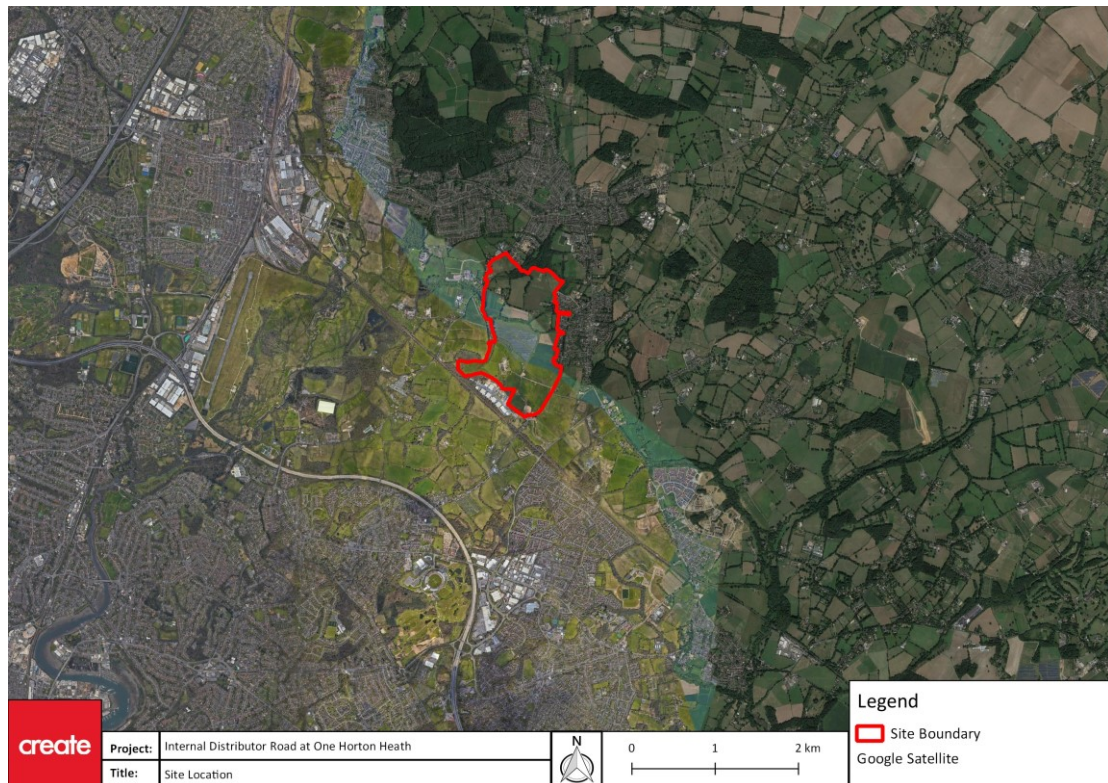


Figure 2.1: Site and surrounding area

- 2.4 The proposals for the site wide delivery are provided in the One Horton Heath design code and essentially comprise eleven parcels of development land.
- 2.5 The proposed development will include the construction of 1.4 km internal distributor road pursuant to outline planning application O/20/89498 for the construction of major mixed use development at One Horton Heath. Additionally, the development will connect two roundabouts to the northwest and southeast extents of the site. Smaller access and link roads are proposed around the site to enable vehicle movements to the wider site.
- 2.6 The access road to the development parcels is the subject of this assessment.
- 2.7 The majority of the existing residential properties within the development area are understood to be demolished or otherwise incorporated into the scheme. We understand that there are a small number of houses accessible off of Fir Tree Lane which are to remain.

2.8 The closest noise sensitive areas outside of the development area are directly to the east and north of the site.

2.9 The proposed site location, layout and surrounding area are shown below.

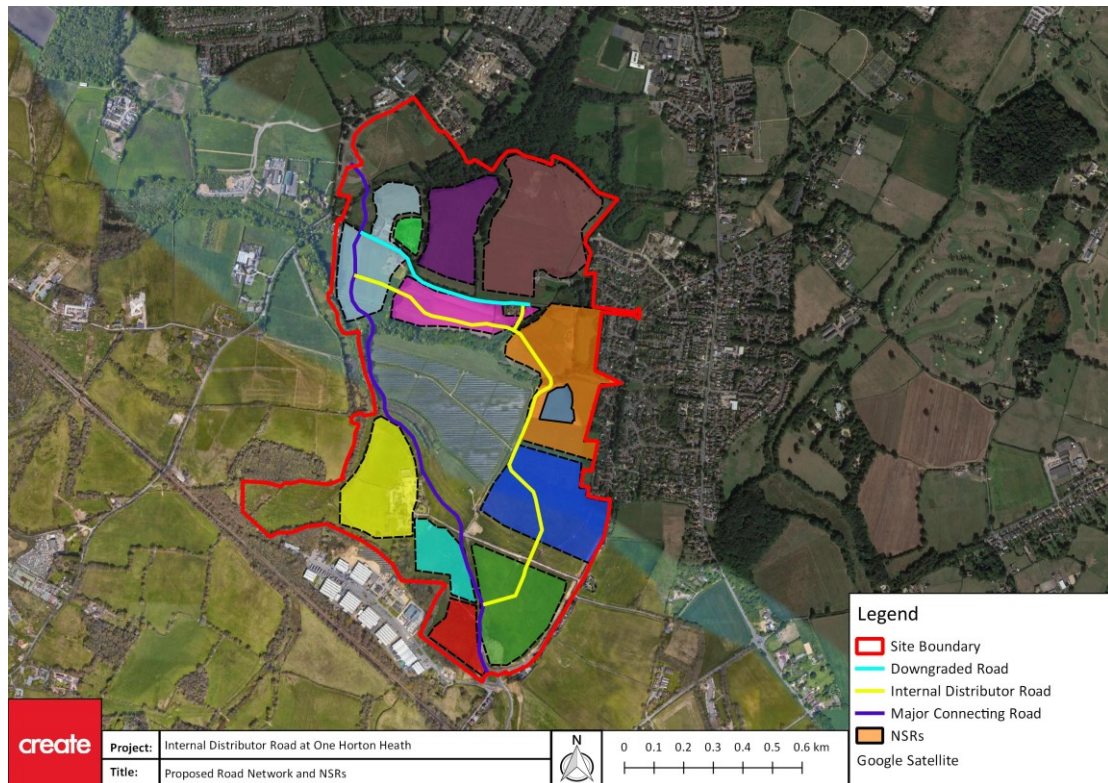


Figure 2.2: Primary Road and Internal Distributor Road and downgraded section

2.10 Again, this report is intended to support the planning application for the Internal Distributor Road (shown in yellow), but the wider transport network has also been considered as this is important to the context of the assessment and more representative of the perceived impact.

2.11 The future land parcels associated with the wider development scheme are summarised in Figure 2.3.

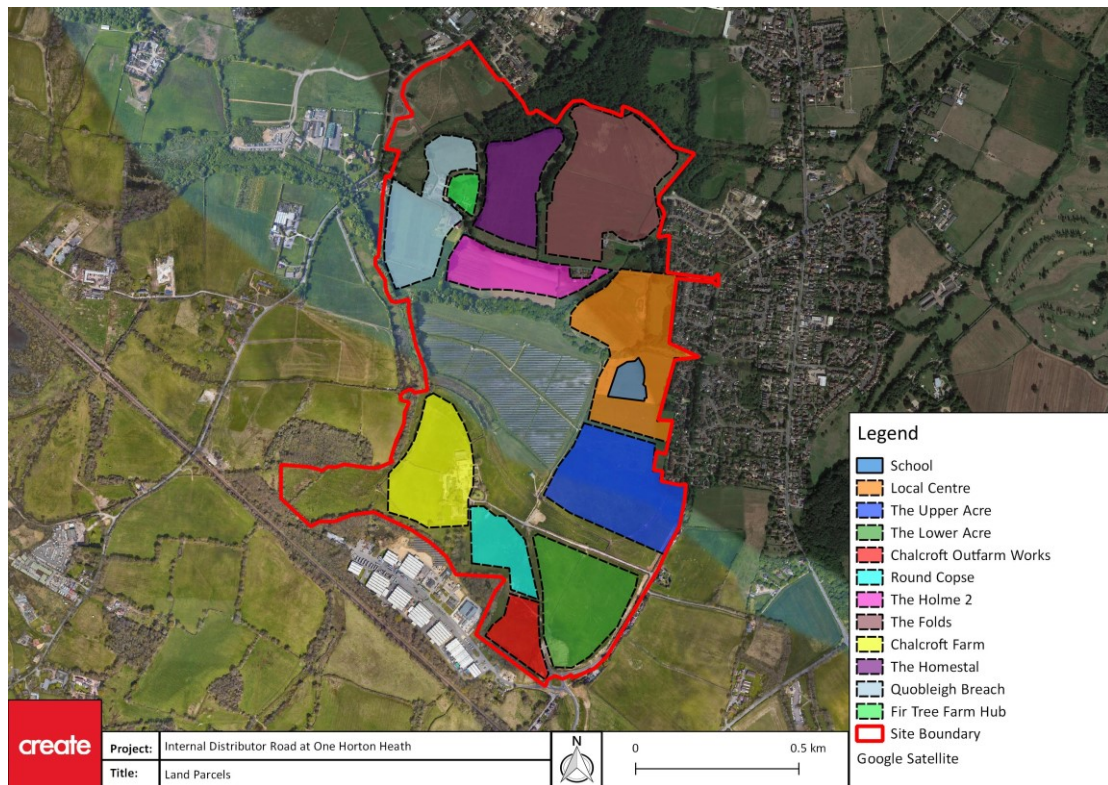


Figure 2.3: Site phasing and local area

3.0 POLICY, STANDARDS AND CRITERIA

National Policy

- 3.1 A summary of the National Planning Policy Framework, National Planning Practice Guidance and the Noise Policy Statement for England is provided in Appendix B of this report.

Local Policy

EBC Local Plan 2016 – 2036

- 3.2 Policy DM8 details Eastleigh Borough Council's approach to "Pollution" with regards to proposed developments.

1. Development will not be permitted if it is likely to cause loss of amenity or impact on public health or other unacceptable environmental impacts through:
 - a) air pollution (including odours or particulate emissions);
 - b) pollution of surface, underground, coastal waters or other watercourses;
 - c) noise or vibration;
 - d) light intrusion, both generally and with respect to the South Downs National Park's status as an International Dark Night Skies reserve; or
 - e) land contamination.
2. Development susceptible to particular forms of pollution will not be permitted: a. where it will be adversely affected by such pollution, unless measures can be taken that adequately mitigate the polluting effects; or b. where it would inhibit existing economic or other activities giving rise to acceptable polluting effects.
3. Where a development site is known or suspected to be contaminated, before the site is developed the Borough Council will require the contamination to be remediated to a standard where as a minimum it cannot be defined as 'contaminated land' under Part IIA of the Environmental Protection Act 1990

- 3.3 The supporting text following this policy states:

Noise: *The adverse effects of exposure to excessive noise and vibration on health and quality of life are well documented and recognised as a material planning consideration. The Council supports the approach of the Noise Policy Statement for England in relation to the effective control of noise within the context of sustainable development. Any proposals likely to generate noise (including demolition and construction noise) will be expected to take account of the impact of this on any noise sensitive population, including those using recreational areas. Similarly, in assessing proposals for noise sensitive development, the*

Council will expect the developer to take into account existing noise levels and foreseeable changes to these. In doing so, developers must avoid significant adverse noise impacts to residential amenities. Development proposals should ensure that they mitigate and minimise adverse noise impacts and, where possible, contribute to the improvement of health and quality of life. Where necessary, the Council will require a noise assessment which will be expected to:

- identify all significant sources of noise;*
- assess the likely short and long term impacts of noise generated or exposure to noise;*
and
- propose noise protection measures.*

Wherever possible, developments should use site and building layout and design to manage levels of noise on development sites. Where acceptable internal noise levels cannot be met with open windows, alternative ventilation will be required. Where the development site is affected by air pollution in addition to noise, early consideration of the location of air ventilation inlets is recommended. The following standards will be used to assess the acceptability of development proposals affected by steady external noise sources:

In respect of the Solent and Southampton Water SPA and Ramsar sites and supporting habitat, construction noise should be kept below 69dBA max either alone or in combination with other developments (measured at the sensitive receptor which is the nearest point of the SPA/Ramsar or supporting habitat) during the bird overwintering period, or works timed so that they do not coincide with the wintering bird season. Natural England will provide advice on a case by case basis where construction noise exceeds 69dBA max.

Standards for Maximum Ambient Noise Levels (in spaces when they are unoccupied) for Dwellings Subject to Transport-Related Noise			
Living Area	Night-Time (2300-0700) LAeq, 8hr	Daytime (0700- 2300) LAeq, 16hr	Additional Requirements
Bedrooms	30	35	1. Individual noise events must not normally exceed 45 dB L _{Amax} (measured with fast time-weighting) during the night time. 2. Provision of suitable means of sound attenuating ventilation to allow for the fact that opening windows will render noise insulation ineffective.
Living Rooms	-	35	Provision of suitable means of sound attenuating ventilation to allow for the fact that opening windows will render noise insulation ineffective.
Gardens ^a	-	55	Balconies will need to meet the same standard unless it is clear that they are not intended to be an outdoor living area, for example due to their small size.

Note – Levels based on Table 4 of BS8233:2014 Guidance on sound insulation and noise reduction for buildings. Where development site affected by non-steady noise source, commercial or industrial noise, or noise that does not follow a typical diurnal pattern, the acceptability of noise levels will be determined on a case by case basis.

a – This standard applies to main gardens (usually rear gardens) only, but not communal gardens.

Standards and Guidance

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

- 3.4 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.
- 3.5 The standard suggests the following internal ambient noise levels for dwellings:

Activity	Location	Day-Time Period 07:00 – 23:00	Night-Time Period 23:00 – 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$
NOTE 7 – Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved			

Table 3.1: BS 8233 (2014) Indoor Ambient Noise Levels

3.6 Note 4 of Section 7.7.2 of BS 8233 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.”

3.7 Note 5 of BS 8233 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.”

3.8 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)

3.9 The WHO Guidelines for Community Noise state the following guideline values for noise in specific environments, as can be seen in Table 3.2.

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 3.2: WHO Guideline Values for Community Noise

3.10 The document also states:

‘For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB $L_{A\text{MAX}}$ more than 10-15 times per night (Vallet & Varnet, 1991).’

These levels are reflected in the guidance provided in BS 8233 (2014).

BS 5228-1 (2009) +A1 (2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise

- 3.11 The British Standard 5228 - Part 1 (2009) gives recommendations for basic methods of noise control relating to construction sites, including sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites, where work activities/operations generate significant noise levels, including industry-specific guidance.
- 3.12 The legislative background to noise control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. This part of BS 5228 provides guidance concerning methods of predicting noise and assessing its impact on those exposed to it.
- 3.13 The document contains a method of setting noise limits to surrounding areas, referred to as the ‘ABC Method’. In essence, the residual ambient noise level ($L_{Aeq T}$) is determined and rounded to the nearest 5 dB, this is then compared against the category A threshold. A site operating above the defined threshold has the potential to generate a significant effect.
- 3.14 The threshold values and method to determine these is shown in Table 3.3 below:

Assessment category and threshold value period	Threshold value (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23:00 - 07:00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07:00 - 19:00) and Saturdays (07:00 - 13:00)	65	70	75
NOTE 1 - A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.			
NOTE 2 - If the ambient noise level exceeds the category Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.			
NOTE 3 - Applied to residential receptors only.			
^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.			
^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.			
^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are greater than Category A values.			
^{D)} 19:00 - 23:00 weekdays, 13:00 - 23:00 Saturdays and 07:00 - 23:00 Sundays			

Table 3.3: The ABC Method

BS 5228-2 (2009) +A1 (2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration

- 3.15 Part 2 of BS 5228 (2009) gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration levels, including industry-specific guidance.
- 3.16 The legislative background to vibration control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. Guidance is provided concerning methods of measuring vibration and assessing its effect on the environment.
- 3.17 The typical threshold of perception of vibration in the PPV range is between 0.14 mm/s^{-1} to 0.3 mm/s^{-1} . As vibrations increases above these values, they have differing impacts. The following table provides guidance on the effects of vibration levels:

Vibration Level ^{A) B) C)}	Effect
0.14 mm/s ⁻¹	Vibration might be just perceptible in the most sensitive of situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s ⁻¹	Vibration might be just perceptible in residential environments.
1.0 mm/s ⁻¹	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mm/s ⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.
A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry to the recipient. B) A transfer function (which related an external level to an internal level) needs to be applied if only external measurements are available. C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to and degree of adverse comment.	

Table 3.4: Table B.1 Guidance on the effects of vibration (From BS5228-1 Part 2)

The Department of Transport – Calculation of Road Traffic Noise (1988)

3.18 The Calculation of Road Traffic Noise (CRTN) document outlines the procedures for calculation noise from road traffic, allowing for the environmental appraisal of road schemes, highway design and land use planning.

3.19 The document comprises of three main sections:

- Section 1 outlines a step-by-step method of calculation for predicting noise levels at a distance from a highway, taking into account different traffic parameters, intervening ground cover, road configuration and site layout.
- Section 2 provides additional procedures that may be taken into consideration when applying the method outlined within section 1. Although calculation will constitute the preferred prediction technique, it is likely that in some cases conditions will fall outside of the scope of the method, and measurement will be required.
- Section 3 details a simplified measurement procedure.

Design Manual for Roads and Bridges LA111 – Noise and Vibration (2020)

- 3.20 Guidance for acceptable increases in road traffic noise is contained in the Design Manual for Roads and Bridges LA 111.
- 3.21 This guidance is given in terms of the $L_{A10, 18\text{-hour}}$, although we would consider the principle and guidance based on the magnitude of impact to be a useful reference in this case.
- 3.22 The guidance considering the short-term impact and long-term impact are given below in tables 3.5 and 3.6 respectively.

Noise change, $L_{A10, 18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

Table 3.5: Classification of magnitude of noise impacts in short term

Noise change, $L_{A10, 18h}$	Magnitude of Impact
0	No change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

Table 3.6: Classification of magnitude of noise impacts in long term

- 3.23 This guidance also identifies that a façade noise level of 55 dB $L_{A10, 18\text{ hour}}$ during the day and free field level of 40 dB L_{night} during the night-time would indicate a low observed adverse effect. The guidance states that a façade noise level of 68 dB $L_{A10, 18\text{ hour}}$ during the day and free field level of 55 dB L_{night} during the night-time would indicate a significant observed adverse effect.

Criteria

- 3.24 The following summaries the criteria we have applied for this project:
- Road traffic should ideally not give rise to level exceeding the WHO guidelines in amenity areas.
 - Given the location of the road it is not expected that vibration would be significant given the distance to nearby houses.
 - Previous monitoring across the site shows noise levels are generally low. This is not surprising given the undeveloped nature of the area. Construction activities should

aim to achieve the lower category (Category A) as summarised in Table 3.3 when measured at the closest occupied house to the works.

- An assessment in absolute levels has been considered to the new properties across the development as a change in noise does not accurately reflect the impact to new properties.

4.0 ROAD TRAFFIC NOISE AND COMPUTER MODEL

- 4.1 Although this assessment considers the impact of the new road through the development, it is important to understand the impact of the existing and new link roads, as the combined sound levels will be relevant to informing the design of the wider development.
- 4.2 The housing layouts used in this report are indicative based on preliminary information we have been issued and should not be considered indicative of the final layouts.
- 4.3 The new road infrastructure is not yet constructed and as such it is not possible to measure the future noise climate across the site.
- 4.4 We have therefore relied on the recommendations in CRTN and traffic predictions to inform our model.
- 4.5 It should be noted that the model accounts for through routes only. It is not normally required to consider infrequent vehicle movements on access roads and cul-de-sacs as the road traffic is normally sufficiently slow moving and infrequent to not adversely impact the nearby houses.
- 4.6 It should also be noted that in an effort to introduce a sense of community within the design, the proposals aim to minimise road corridor widths in some locations.
- 4.7 This will inevitably mean that any mitigation measures required due to the houses being close to the roads will need to take the form of sound insulating facades.
- 4.8 According to CRTN there is a 2.5 dB noise reduction during low-speed traffic movements where a pervious road surface is used over an impervious road surface. In practice the type of road surface used throughout the residential areas are likely to be governed by other project requirements and for the purposes of calculating worst case scenarios our model considers in previous road finishes. Should the scheme be able to accommodate a pervious road finish, a small reduction in noise over the entirety of the development would be expected over that calculated in this report.
- 4.9 Data for the new and existing road traffic volume was provided to us by Campbell Reith and is contained in Appendix C of this report. For the wider road networks we have relied on information contained within the original environmental impact assessment submitted for the overall site.
- 4.10 The following day time and night-time noise maps show the calculated noise levels across the development:

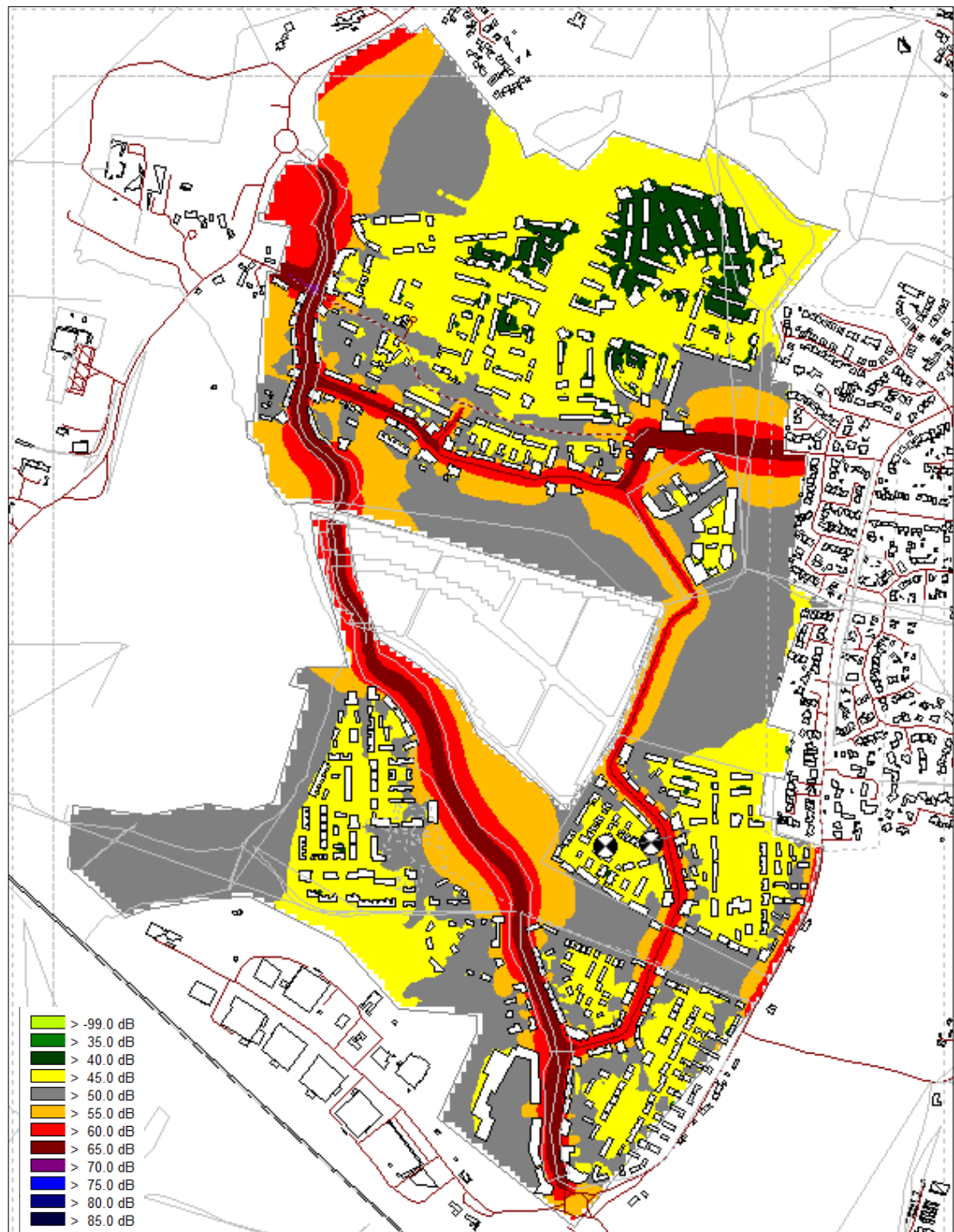


Figure 4.1: Daytime predicted levels during 2030

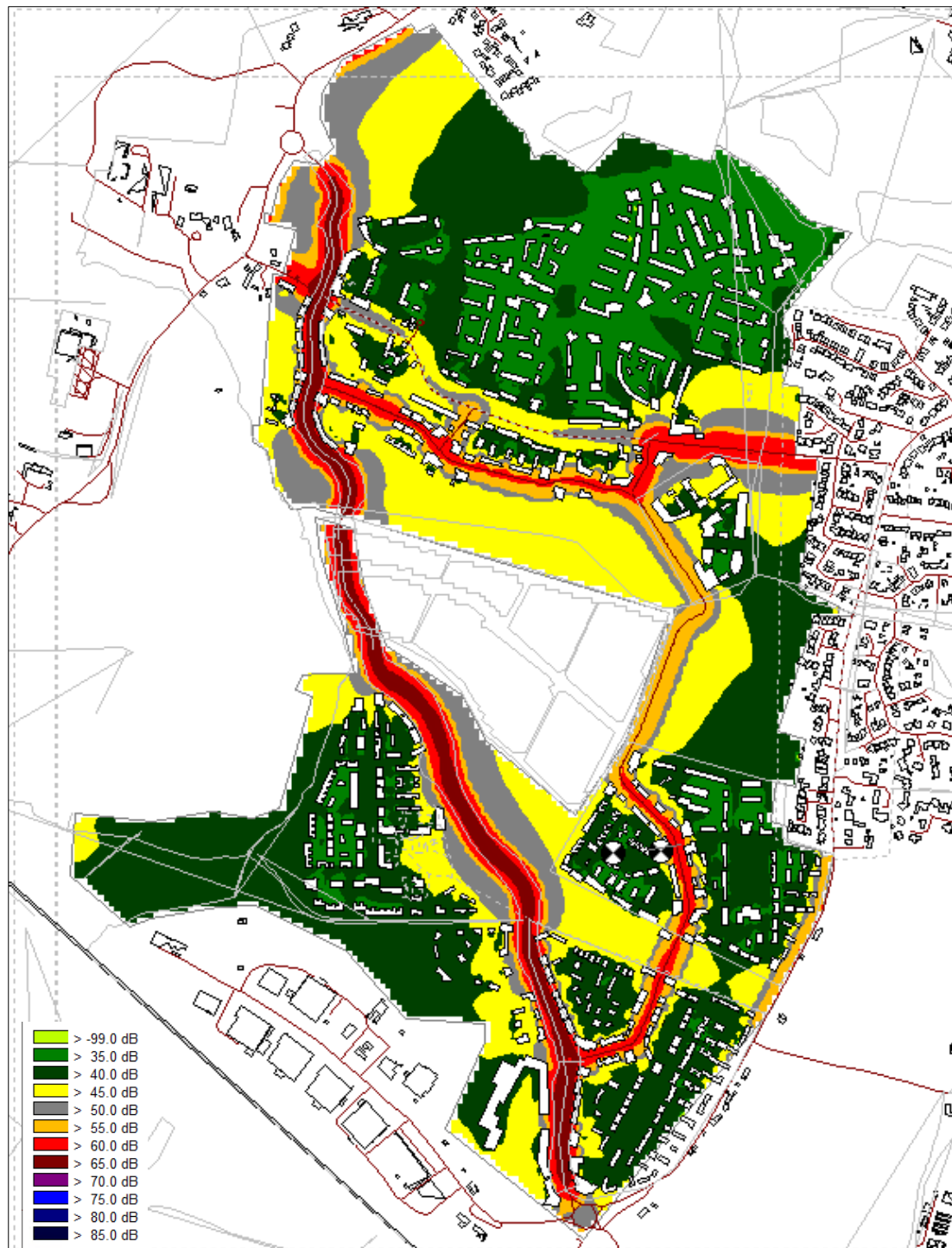


Figure 4.2: Night-time predicted levels during 2030

- 4.11 It can be seen that areas close to roads experience higher noise levels than those which are shielded by the houses.
- 4.12 It can also be seen that the link road is generally the quietest road proposed for the new development. This is not surprising given the relatively low traffic flows and low speed limit of the road.

-
- 4.13 The majority of the future development is shown to be below the 55 dB $L_{Aeq\ 16\text{-hours}}$ upper limit of the WHO guidelines (areas shown in grey) while most houses have external areas below the lower 50 dB $L_{Aeq\ 16\text{-hours}}$ guideline level of the WHO guidelines (areas shown in yellow and green).
- 4.14 The detailed design of the houses will be subject to a separate report, but it is likely that houses close to the road will not be able to benefit from openable windows to support the background ventilation strategy in habitable rooms.
- 4.15 It would therefore be sensible to orientate habitable rooms within houses to face away from the main transport routes.
- 4.16 The proposed school site is shown to have external noise levels in the region of 50 dB $L_{Aeq\ 16\text{-hours}}$ to 55 dB $L_{Aeq\ 16\text{-hours}}$ during the daytime. This meets the requirements of the BB93 Design Guide, but it should be noted that additional on-site mitigation may be beneficial to reduce noise levels to external areas used for teaching. It is for the detailed design of the school site to propose mitigation measures to provide a suitable teaching environment.
- 4.17 We consider it likely that the school will have to meet the internal ventilation requirements with windows closed on some facades for the noise sensitive teaching spaces, although this would be subject to further review at the appropriate design stage.
- 4.18 It is also prudent to understand the potential impact on to existing dwellings. The dwellings closest to the proposed road are to the east in Horton Heath. The following figures show the noise level during the daytime with and without the new road.
- 4.19 It must be highlighted that the colour scaling is shown in 1 decibel increments in Figure 4.3, as opposed to the 5 decibel increments in Figures 4.1 and 4.2.

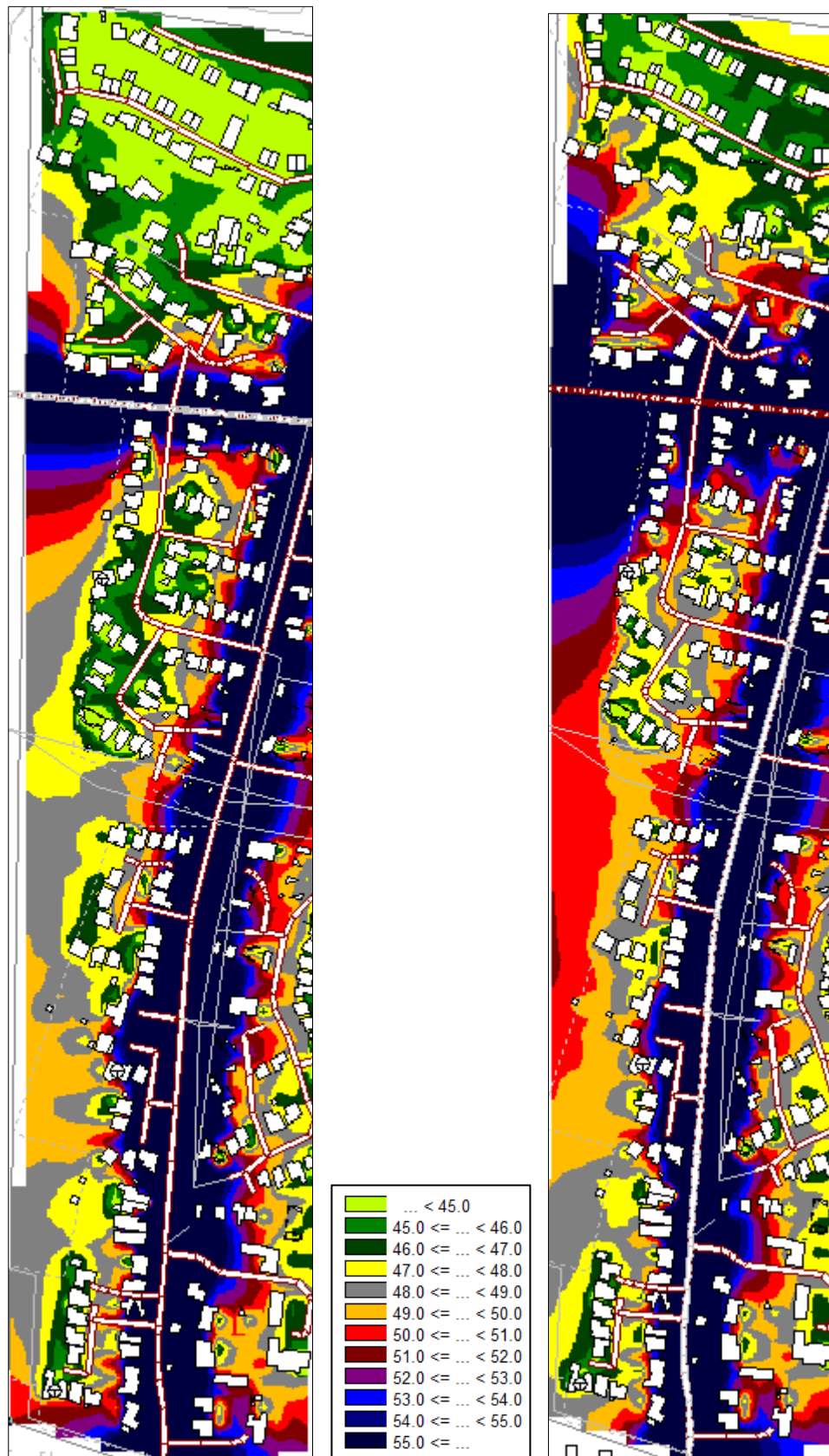


Figure 4.3: Impact to closest residents of Horton Heath (Left: Before, Right: After)

- 4.20 In the worst effected locations for houses to the east a +4 dB increase is expected. This is classified as a **moderate short-term increase**, but a **minor long-term increase** in accordance with DMRB.
- 4.21 However, the areas to the south are further screened by the proposed development areas included in our model and the houses at these locations are subject to broadly similar noise levels as the existing conditions.
- 4.22 It is expected that the minor long term increase experienced due to the road is representative of the worst-case impact, and it is likely that once the development is complete the majority of existing houses in the area will be subject to a **negligible** impact or experience **no change** due to the new link road.
- 4.23 The small number of houses to be retained on this project (those on Fir Tree Lane) will experience a reduction in noise next to a section of road which is to be downgraded but will experience up to a 2 dB increase in noise during the daytime. It should be noted we have not undertaken a detailed site assessment in this location and have based our model on satellite imagery taken in 2023 which shows a fence surrounding the houses to be retained. Street view imagery taken in august 2020 does not show the fence we have considered in our model. It would therefore be prudent to ensure that the fence surrounding the property is in good repair as our model shows this forms part of desirable mitigation to the bungalow to the east of this package of land.

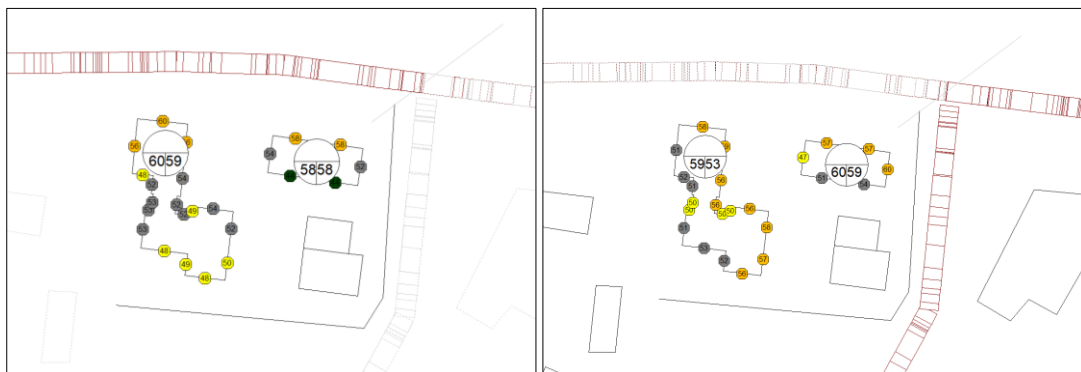


Figure 4.4: Impact to houses on Fir Tree Lane (Left: Before, Right: After)

- 4.24 It can be seen that the short-term impact would be considered **minor** to these properties and the long-term impact would be considered **negligible** in accordance with DMRB.
- 4.25 Given the relatively low impact predicted we have not considered further mitigation necessary, but we would be happy to advise the design team on potential mitigation options if required.

5.0 CONSTRUCTION NOISE AND VIBRATION

- 5.1 At this stage, detailed construction methods have not been reviewed, but this should be done once detailed construction methods are available.
- 5.2 Once a detailed construction method for the new road has been agreed a construction noise assessment should be undertaken. It is expected that the main receptors would be existing properties as the proposed development would follow the new link road. However, new properties occupied at the time of constructions should be considered the closest noise sensitive receptors during the construction phase.
- 5.3 Given the relatively low ambient sound levels across the site, we would consider assessment against the lower threshold of 65 dB from BS 5228 to be appropriate in this case.
- 5.4 We understand that existing water courses in the area are in a poor condition currently and we would therefore not expect an assessment of construction noise to these areas to be required. We understand that the intention is to improve ecological areas through the development.
- 5.5 Where sensitive species are identified prior to construction it may be prudent to assess noise levels to minimise impact on to the surrounding environment.
- 5.6 We would not expect vibration due to the construction of the road to be problematic as there is a significant distance between the road and the closest properties. We would however, recommend that construction proposals are reviewed to ensure that any high vibratory activities are considered prior to commencements on site.

6.0 UNCERTAINTY

- 6.1 All assessments have a degree of uncertainty that needs to be considered.
- 6.2 At such an early stage of planning a larger development, such as this, there are several assumptions that must be adopted. In this assessment we have not considered the maximum noise level produced by the new road. It is not practical to do this at this stage as the max events are governed by individual events during the night-time. Although this is likely to be cars passing on the road, the character of the area is likely to influence this. Given the 30-mph speed limit it is not expected that regular maximum noise event will alter the outcome of this assessment.
- 6.3 The HGV movement associated with the existing road networks has been assumed to be relatively low in line with the recommendations from the transport consultant. In practice this may underestimate the existing sound levels but should tend to a worst-case assessment in accordance with DMRB. We would therefore not expect uncertainty associated with this aspect of the assessment to adversely impact our conclusions.
- 6.4 The impact considers the introduction of both the primary road and Internal Distributor road in the future development scenario. Given the low impact predicted by both road sources we would not expect an adverse impact to be perceived by the introduction of the Internal Distributor road. An assessment of the Internal Distributor road, in isolation, will result in a lower impact than has been predicted in this assessment. However, this would be disingenuous to the way in which the impact of the development would be perceived by existing residents and in our opinion would not represent a robust assessment of impact.
- 6.5 Assumption on road finishes and speed limits tend to the worst case assessment and any uncertainty associated with this is likely to result in a reduced impact over that predicted in this assessment.
- 6.6 The housing layouts used are indicative only. It will be for the detailed plan for each development parcel to address the sound insulation required to comply with the planning requirements for the residential developments. This is outside of the scope for this assessment.
- 6.7 Construction noise limits have been proposed, based on existing sound levels around the site.

7.0 DISCLAIMER

- 7.1 Create Consulting Engineers Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.
- 7.2 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.
- 7.3 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 (July 2021)

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 174 (e) and 185:

'Para.174 (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.185. 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 life⁶⁵;

(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 65 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.

APPENDIX C

Traffic Data Used in This Assessment

Road details			Inputs									Factors			Outputs: 24h AADT					
№	Road Name	Direction	All traffic					HGV	Speed		Width	Base to 2019	Base to 2027	Base to 2030	2019		2027		2030	
			Base	Total	Type	Year	Detail	%	mph	kph	(m)				Base	Total	Base	Total	Base	Total
1	Link road, northern section	NB		5878	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	5141	0	5744	0	5878
		SB		5167	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4519	0	5049	0	5167
2	Link road, Fir Tree to Local Centre access	NB		5878	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	5141	0	5744	0	5878
		SB		5167	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4519	0	5049	0	5167
3	Fir Tree Lane, west	EB	1281	10	Surveyed	2030	PBA calc'd	1.0%	30	48.3		0.87454	0.97713	1.00000	1120	9	1252	10	1281	10
		WB	1152	10	Surveyed	2030	PBA calc'd	1.0%	30	48.3		0.87454	0.97713	1.00000	1007	9	1126	10	1152	10
4	Fir Tree Lane, central	EB	1281	10	Surveyed	2030	PBA calc'd	1.0%	30	48.3		0.87454	0.97713	1.00000	1120	9	1252	10	1281	10
		WB	1152	10	Surveyed	2030	PBA calc'd	1.0%	30	48.3		0.87454	0.97713	1.00000	1007	9	1126	10	1152	10
5	Fir Tree Lane, east	EB	1070	2757	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	936	2411	1046	2694	1070	2757
		WB	1134	2663	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	992	2329	1108	2602	1134	2663
6	Burnetts Lane, north of Fir Tree	NB	2287	3797	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	2000	3321	2235	3710	2287	3797
		SB	1628	2962	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	1424	2590	1591	2894	1628	2962
7	Burnetts Lane, south of Fir Tree	NB	1805	1846	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	1579	1614	1764	1804	1805	1846
		SB	1311	1370	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	1147	1198	1281	1339	1311	1370
8	Fir Tree to Local Centre access (W)	NB		1002	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	876	0	979	0	1002
		SB		1144	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	1000	0	1118	0	1144
9	Fir Tree to Local Centre access (E)	NB		3759	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	3287	0	3673	0	3759
		SB		3807	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	3329	0	3720	0	3807
10	Local Centre access, west section	EB		2863	Predicted	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	2504	0	2798	0	2863
		WB		3268	Predicted	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	2858	0	3193	0	3268
11	Local Centre access, centre section	EB		1861	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	1628	0	1818	0	1861
		WB		2124	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	1858	0	2075	0	2124
12	East link, north section	NB		1083	Predicted	2030	PBA calc'd	3.0%	20	32.2		0.87454	0.97713	1.00000	0	947	0	1058	0	1083
		SW		1227	Predicted	2030	PBA calc'd	3.0%	20	32.2		0.87454	0.97713	1.00000	0	1073	0	1199	0	1227
13	Link Road, south of Local Centre access	NB		5372	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4698	0	5249	0	5372
		SB		5008	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4380	0	4893	0	5008
14	East link, south of sports pitches	NB		1699	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	1486	0	1660	0	1699
		SB		1910	Surveyed	2030	PBA calc'd	3.0%	30	48.3		0.87454	0.97713	1.00000	0	1670	0	1866	0	1910
15	Link Road, north of east link	NB		5108	Surveyed	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4467	0	4991	0	5108
		SB		4973	Surveyed	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4349	0	4859	0	4973
16	Link road, southernmost	NB		5225	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4569	0	5106	0	5225
		SB		5302	Predicted	2030	PBA calc'd	5.0%	30	48.3		0.87454	0.97713	1.00000	0	4637	0	5181	0	5302

Factors

1.00000	No change
0.87454	2030 to 2019 (all day)
0.97713	2030 to 2027 (all day)

Base traffic types

Surveyed	from PBA TA
Predicted	from PBA TA

All flows based on OPA and Phase 3 TA traffic analysis, flows and survey data