Land North of A507 and West of A10, Buntingford, Hertfordshire

Noise Impact Assessment for Outline Planning Application

13th May 2024

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Version	Comments	Date	Authored By	Checked By	Project Number
1	Noise Assessment	15/02/2024	Victor Valeron BEng MSc MIOA	Antony Best BSc (Hons) MIOA	23-325-N
2	Noise Assessment	25/03/2024	Victor Valeron BEng MSc MIOA	Antony Best BSc (Hons) MIOA	23-325-N
3	Client's comments	26/03/2024	Victor Valeron BEng MSc MIOA	Antony Best BSc (Hons) MIOA	23-325-N
4	Update to the context plan and development description	4/04/2024	Victor Valeron BEng MSc MIOA	Antony Best BSc (Hons) MIOA	23-325-N
5	Update to Red Line Boundary	13/05/2024	Victor Valeron BEng MSc MIOA	Antony Best BSc (Hons) MIOA	23-325-N

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to prepare a Noise Impact Assessment in support of an Outline Planning Application for development of up to 600 dwellings (C3), elderly accommodation (C3), Mixed Use Local Centre (including flexible use E, F and Sui Generis), First School, informal and formal open space, associated works and infrastructure including a new access from the A507 and pedestrian bridge over the A10, with all matters reserved save for access.

This report presents an assessment of noise constraints and opportunities of the proposed Framework Plan, in line with Stage 1 of Professional Practice Guidance (ProPG) – Planning & Noise[1]. It also assesses the suitability of an Illustrative Masterplan for residential development in line with Stage 2 of ProPG.

The assessment has been produced to provide supporting information to accompany an Outline Planning Application to East Herts Council and is based upon environmental noise measurements undertaken at the site.

This report is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

Full-time history graphs of the noise survey are presented in Appendix B.

Noise maps are presented in Appendix C.

1.2. Scope and Objectives

The scope of the Noise Assessment report can be summarised as follows:

- A baseline noise monitoring survey was undertaken at discrete locations around the Site;
- A 3-dimensional noise modelling exercise, in order to quantify the noise levels and risk category across the Site;
- An assessment of predicted changes in traffic noise in the surrounding road network; and
- Recommendations on outline mitigation measures, where necessary, to comply with the requirements of the National Planning Practice Guidance in England: Noise[2], BS8233:2014[3] and Pro:PG:2017[4]

[1] ProPG: Professional Practice Guidance on Planning & Noise. ANC, IOA, CIEH, May 2017
[2] Department for Communities and Local Government (DCLG), 2019. National Planning Practice Guidance for England: Noise. DCLG.
[3] British Standard 8233:2014 *Guidance on sound insulation and noise reduction for buildings.* BSI
[4] ProPG: Professional Practice Guidance on Planning & Noise. ANC, IOA, CIEH, May 2017

2. LEGISLATION AND POLICY FRAMEWORK

The development proposals for the Site are guided by the following policy directives and guidance:

2.1. National Policy

2.1.1. National Planning Policy Framework, 2023

The *National Planning Policy Framework* (NPPF)[5] sets out the UK Government's planning policies for England. Planning policy requires that applications for planning permission must be determined in accordance with the development plan, unless material considerations indicate otherwise.

The NPPF is also a material consideration in planning decisions. It sets out the Government's requirements for the planning system and how these are expected to be addressed.

Under Section 15; *Conserving and Enhancing the Natural Environment*, in Paragraph 180, the following is stated:

"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.".

Paragraph 191 of the document goes on to state:

"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 life;
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"

Paragraph 191 refers to the Noise Policy Statement for England, which is considered overleaf.

[5] Department for Levelling Up, Housing & Communities (DLUHC), December 2023. National Planning Policy Framework. HMSO. London.

2.1.2. Noise Policy Statement for England, 2010

The underlying principles and aims of existing noise policy documents, legislation and guidance are clarified in *DEFRA: 2010: Noise Policy Statement for England* (NPSE)[6]. The NPSE sets out the *"Long Term Vision"* of Government noise policy as follows:

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

The NPSE outlines three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- *"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 guidance states that it is not possible to have a single objective noise-based measure that defines *"Significant Observed Adverse Effect Level (SOAEL)"* that is applicable to all sources of noise in all situations and that not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

2.1.3. National Planning Practice Guidance in England: Noise, 2019 (PPGNoise)

Paragraph: 002 of the PPGNoise states the following:

"Can noise override other planning concerns?

It can, where justified, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern."

As such, Paragraph: 003 of the NPPG states that:

"Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- *whether or not a 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.*

In line with the Explanatory note of the NPSE, this would include identifying whether the overall effect of the noise exposure … is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation."

Consequently, the *National Planning Practice Guidance in England: Noise* (NPPG Noise)[7] summarises the noise exposure hierarchy, based on the likely average response. The following three observed effect levels are identified below, as identified in Paragraph 004:

[6] Department for Environment, Food and Rural Affairs (DEFRA), 2010. Noise Policy Statement for England. DEFRA.
[7] Department for Communities and Local Government (DCLG), 2019. National Planning Practice Guidance for England: Noise. DCLG.

- **Significant Observed Adverse Effect Level**: This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- **Lowest Observed Adverse Effect Level**: This is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
- **No Observed Adverse Effect Level**: This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Importantly, Paragraph: 004 of the PPGNoise states that:

"Although the word 'level' is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs."

Paragraph: 005 of the PPGNoise expands the significant criteria related to each of these levels, which are reproduced in Table 1, below.

TABLE 1: SIGNIFICANCE CRITERIA FROM NPPG IN ENGLAND: NOISE

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Noticeable and Not Intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and Disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and Very Disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Paragraph: 006 of the PPGNoise expands on what factors influence whether noise could be a concern; those factors relevant to this Planning Application are reproduced below:

"The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation.

These factors include:

- *the source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;*
- *the spectral content of the noise (i.e. whether or not the noise contains particular high or low frequency content) and the general character of the noise (i.e. whether or not the noise contains particular tonal characteristics or other particular features), and;*
- *the local arrangement of buildings, surfaces and green infrastructure, and the extent to which it reflects or absorbs noise.*

More specific factors to consider when relevant include:

- *the cumulative impacts of more than one source of noise;*
- *whether any adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time (and the effect this may have on living conditions). In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations.*
- *where external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended."*

Paragraph: 009 of the PPGNoise expands on whether future noise generation could be a concern; which are reproduced below

"Development proposed in the vicinity of existing businesses, community facilities or other activities may need to put suitable mitigation measures in place to avoid those activities having a significant adverse effect on residents or users of the proposed scheme.

In these circumstances the applicant (or 'agent of change') will need to clearly identify the effects of existing businesses that may cause a nuisance (including noise, but also dust, odours, vibration and other sources of pollution) and the likelihood that they could have a significant adverse effect on new residents/users. In doing so, the agent of change will need to take into account not only the current activities that may cause a nuisance, but also those activities that businesses or other facilities are permitted to carry out, even if they are not occurring at the time of the application being made.

The agent of change will also need to define clearly the mitigation being proposed to address any potential significant adverse effects that are identified. Adopting this approach may not prevent all complaints from the new residents/users about noise or other effects, but can help to achieve a satisfactory living or working environment, and help to mitigate the risk of a statutory nuisance being found if the new development is used as designed (for example, keeping windows closed and using alternative ventilation systems when the noise or other effects are occurring)."

Paragraph: 010 of the PPGNoise outlines various approaches to reducing the adverse effects of noise; the approach considered in this report relates to providing a suitably design building façade.

Further to the comment on the previous page regarding Paragraph: 006 with respect to external amenity spaces, Paragraph: 011 of the PPGNoise goes on to state:

"Noise impacts may be partially offset if residents have access to one or more of:

- *a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling;*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects;*
- *a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5-minute walking distance)."*

PPGNoise recognises it would, of course, be preferable to have access to a relatively quiet external amenity space that is not subject to a significant adverse effect, but that this may not always be possible, and that it is *"generally desirable"* to have access to some external amenity space even if *"this area is exposed to noise levels that result in significant adverse effects"*.

Finally, Paragraph: 015 of the PPGNoise outlines other information that is available to assist in assessing noise. The paragraph, amongst other standards, recommends the use of:

- BS8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings; and
- ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development.

Critically, Paragraph: 015 of the PPGNoise states the following:

"Some of these documents contain numerical criteria. These values are not to be regarded as fixed thresholds and as outcomes that have to be achieved in every circumstance."

2.2. British Standards

2.2.1. BS8233:2014 *Guidance on sound insulation and noise reduction for buildings*

BS 8233:2014 draws on the results of research and experience to provide information on achieving internal acoustic environments appropriate to their functions. The guideline values provided are in terms of an average (L_{Aeq}) level.

The standard advises that, for steady external noise sources, it is desirable for internal ambient noise levels to not exceed the guidance values, as detailed below in Table 2.

TABLE 2: BS8233:2014 AMBIENT NOISE LEVELS

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS8233:2014 goes on to suggest that where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions will still be achieved.

With regard to maximum noise levels, the standard identifies that regular individual noise events (such as passing trains or scheduled aircraft etc) can cause sleep disturbance. The standard does not provide a guideline design target, but simply goes on to suggest that a guideline value may be set in terms of SEL or $L_{Amax,F}$, depending upon the character and number of events per night. It goes on to suggest that more sporadic noise events could require separate values.

In respect of external noise levels, the guidance in BS8233:2014 suggests that "*it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments*".

BS8233:2014 provides a much more detailed narrative on noise levels in external amenity areas and acknowledges that it may not always be necessary or feasible to ensure that noise levels remain within these guideline values.

In respect of gardens and patios, BS8233:2014 states;

"...it is *also recognized that these guideline values are not achievable in all circumstances where development might be desirable."*

BS8233: 2014 goes on to state, for areas adjoining the strategic transport network:

" ...a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".

In respect of balconies, roof gardens and terraces, BS8233:2014 states; *"Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses; however, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space"*.

It is clear from the narrative of BS8233:2014, that proposed development within noisy environments should be designed to ensure that the recommended internal design standards are achieved, and that noise levels in external amenity areas are designed to effectively control and reduce noise levels, although it acknowledges that in certain circumstance meeting the external design recommendations may not be feasible, or necessary, especially where the provision of such spaces is desirable for other technical, planning or policy reasons.

2.3. Other Guidance

2.3.1. The Design Manual for Roads and Bridges (DMRB) – LA 111 Noise and vibration

DMRB LA 111 Revision 2, dated May 2020, (which supersedes HD 213/11 and the accompanying IAN 185/15) sets out the requirements for noise and vibration assessments from road projects.

It sets out the magnitude of noise change due to changes in road traffic in the short-term, along with the significance of effects, which are presented below.

TABLE 3: MAGNITUDE OF CHANGE AND SIGNIFICANCE OF EFFECTS FROM ROAD TRAFFIC CHANGES - SHORT-TERM

Short-term noise change (dB $L_{A10,18hr}$)	Magnitude of Change	Significance of Effect
Greater than or equal to 5.0	Major	Significant
3.0 to 4.9	Moderate	Significant
1.0 to 2.9	Minor	Not significant
Less than 1.0	Negligible	Not significant

The above criteria have been used in the assessment to evaluate the significance of effect due to changes in the road traffic network due to the Proposed Development.

2.3.2. ProPG Planning and Noise 2017 – New Residential Development

The ProPG advocates a systematic, proportionate, risk-based 2-stage approach. This encourages early consideration of noise issues, facilitates straightforward accelerated decision making for lower risk sites and assists proper consideration of noise issues where the acoustic environment presents more challenges. The key stages of the approach are:

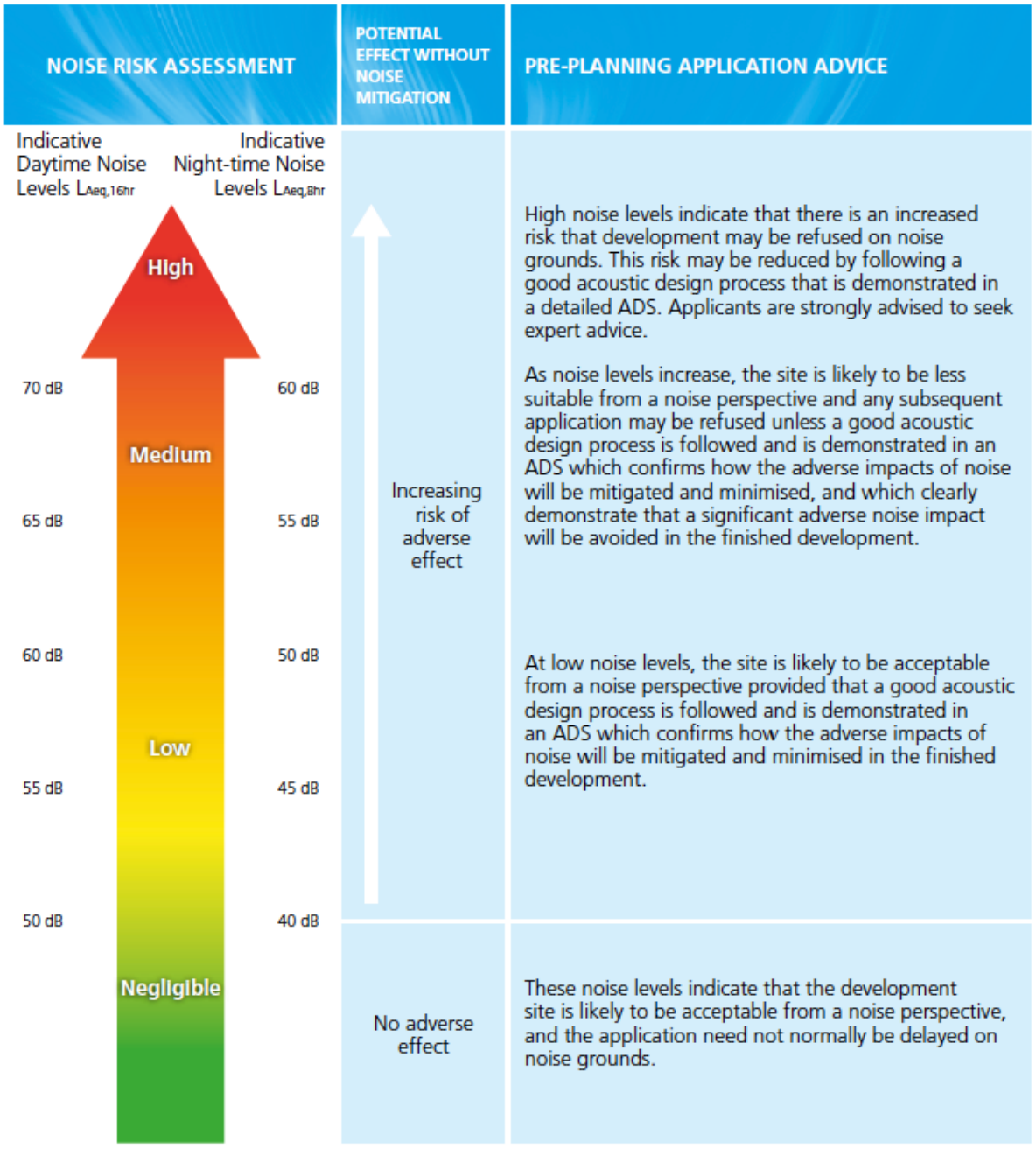
- Stage 1 – an initial noise risk assessment of the site; and
- Stage 2 – a systematic consideration of four key elements.

Stage 1 – Initial Site Noise Risk Assessment

ProPG states that "*A good acoustic design process takes a multi-faceted and integrated approach to achieve optimal acoustic conditions, both internally and externally*". It follows on to say that *"Good acoustic design does not mean overdesign or gold plating of all new development but seeking to deliver the optimum acoustic outcome for a particular site"*..

For reference, the indicative noise levels for the initial site noise risk assessment as presented in ProPG are illustrated below.

FIGURE 1: PROPG STAGE 1– INITIAL SITE NOISE RISK ASSESSMENT



Stage 2 – Full Assessment

The four key elements of Stage 2 of the recommended approach are as follows:

- Element 1 – demonstrating a good design process;
- Element 2 – observing internal noise level guidelines;
- Element 3 – undertaking an external amenity area noise assessment; and
- Element 4 – consideration of other relevant issues.

Element 1 – Good Acoustic Design Process

Supplementary Document 2 of the ProPG advises the following principles of Good Acoustic Design, in order of preference:

- Maximising spatial separation of noise sources and receptors;
- Reducing existing noise levels or relocating noise sources, if possible;
- Using existing topography and existing structures;
- Incorporating noise barriers as part of the scheme;
- Using layout to reduce noise propagation across the site;
- Using orientation to reduce noise exposure of sensitive rooms; and
- Using building envelope to mitigate noise.

Element 2 - Internal Noise Level Guidelines

In summary, this echoes the internal sound level guidance set out within BS8233:2014, as quoted within Table 2 of his report, with supplementary guidance, as follows;

NOTE 4. 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 LAmax,F, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events

NOTE 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7

NOTE 6 Attention is drawn to the requirements of the Building Regulations.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form

Paragraphs 2.34 to 2.36 of the ProPG document offer guidance relating to the use of open windows in relation to ventilation and overheating, as follows:

Where the LPA accepts that there is a justification that the internal target noise levels can only be practically achieved with windows closed, which may be the case in urban areas and at sites adjacent to transportation noise sources, special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment. In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide "whole dwelling ventilation" in accordance with Building Regulations Approved Document F (e.g. trickle ventilators) in the open position. Furthermore, in this scenario the internal L_{Aeq} target noise levels should not generally be exceeded.

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

In addition to providing purge ventilation, open windows can also be used to mitigate overheating. Therefore, should the LPA accept a scheme is to be assessed with windows closed, but this scheme is reliant on open windows to mitigate overheating, it is also necessary to consider the potential noise impact during the overheating condition.

Element 3

In summary, this effectively echoes the external sound level guidance set out within BS8233:2014, as quoted within Section 2.2.1 of his report.

It also advises that if despite following a Good Acoustic Design significant adverse noise impacts remain on any private external amenity space, then this is partially off-set if residents are provided with access to a *"relatively quiet"* alternative external amenity space.

Element 4

The *"other relevant issues"* to be considered comprise, in summary:

- Compliance with relevant policy;
- Magnitude and extent of compliance with ProPG guidance;
- Likely occupants of the development;
- Acoustic design and unintended adverse consequences; and
- Acoustic design and wider planning issues.

3. Site Description and Development Proposals

3.1. Site and Surrounding Area

The Site is situated on Land North of A507 and West of A10, Buntingford, Hertfordshire.

The site is largely bound to the A10 road to the east, Throcking Lane to the north, Baldock Road (A507) to the south and agricultural fields to the west. The Site currently comprises agricultural fields.

The Proposed Development site and the surrounding area can be seen in Figure 2, below.

The ambient sound environment at the area is influenced by road traffic noise from the A10 to the east of the Site. In addition to this, other sounds affecting the general ambient sound climate were road traffic noise from Baldock Road and natural sources such as birdsong and breeze-induced vegetation movement.

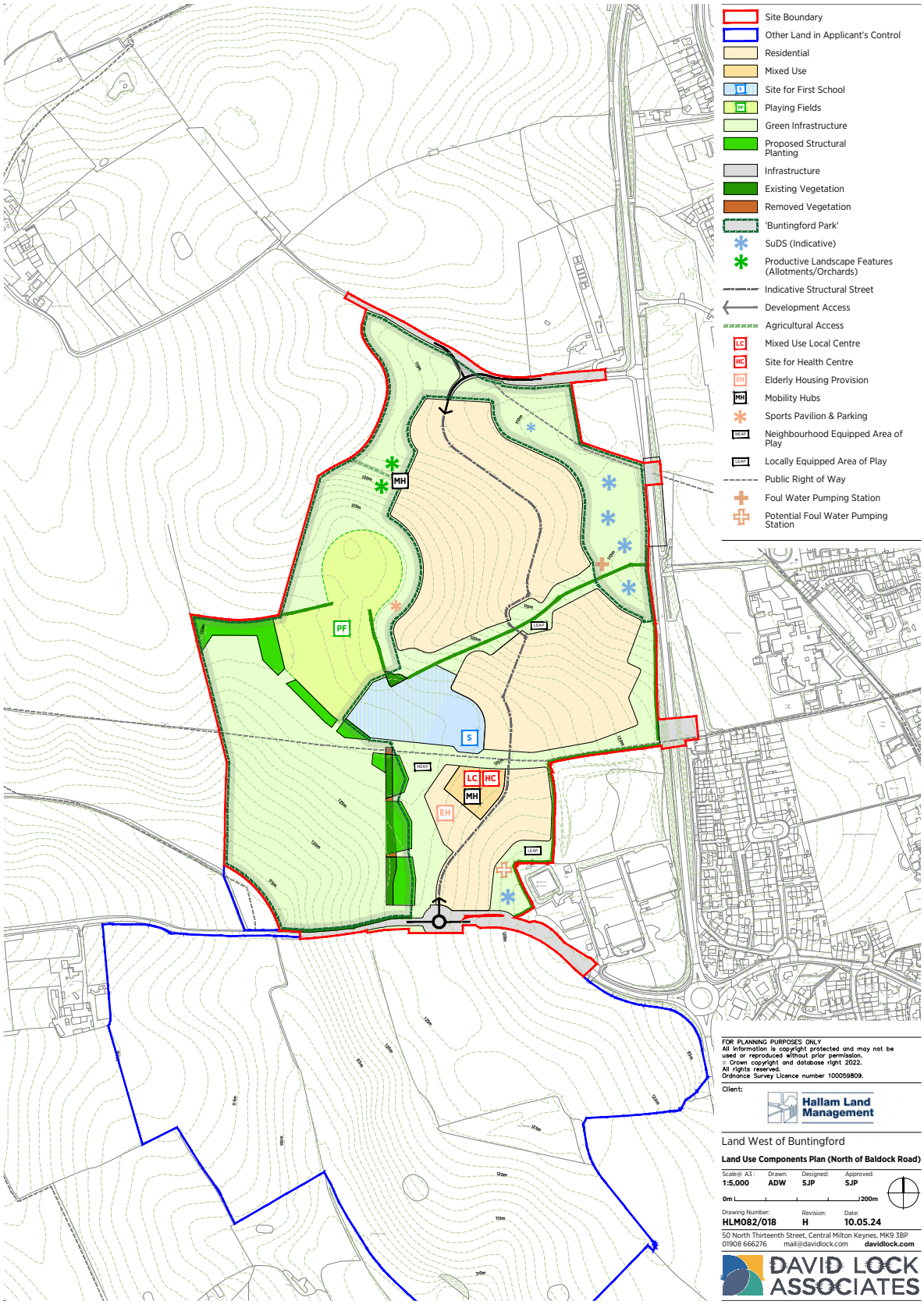
Figure 2: Proposed Development Site and Surrounding Area

3.2. Proposed Development

Outline planning application for development of up to 600 dwellings (C3), elderly accommodation (C3), Mixed Use Local Centre (including flexible use E, F and Sui Generis), First School, informal and formal open space, associated works and infrastructure including a new access from the A507 and pedestrian bridge over the A10, with all matters reserved save for access.

The proposed Framework Plan is presented in Figure 3 overleaf. It is noted that the Land South of Baldock Road is proposed for Employment Use and Solar Farm and is subject of a separate Outline Planning Application. However, it is included in this report as part of a cumulative assessment.

FIGURE 3: PROPOSED FRAMEWORK PLAN



4. Baseline Sound Survey

4.1. General

The prevailing noise conditions in the area have been determined by an environmental noise survey conducted during both daytime and night-time periods between Sunday 23rd and Wednesday 26th July 2023.

4.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445[8].

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672[9]. A full inventory of this equipment is shown in Table 4 below.

Table 4: Inventory of Sound Measurement Equipment

Position	Make, Model & Description	Serial Number	Calibration Certificate Number	Calibration Due Date
MP1	Brüel & Kjær 2238 Sound Level Meter	2163634	1144539	15/05/2025
	Brüel & Kjær 4188 Microphone	2200693		
MP2	Rion NL-52 Sound Level Meter	00810575	CONF032202	11/03/2024
	Rion NH-25 Preamplifier	11118		
	Rion UC-59 Microphone	19968		
All	Rion NC-74 Acoustic Calibrator	34984020	1131148	10/08/2023

The sound measurement equipment used during the survey was field calibrated at the start and end of the measurement period. A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements. A drift of less than 0.2 dB in the field calibration was found to have occurred on the sound level meters.

The weather conditions during the survey were conducive to noise measurement; it being predominantly dry, with wind speeds consistently below 5 m/s.

The microphones were fitted with a protective windshield for the measurements, which are described in Table 5, with an aerial photograph indicating its locations shown in Figure 4.

[8] British Standard 7445: 2003: *Description and measurement of environmental noise*. BSI.
[9] British Standard 61672: 2013: *Electroacoustics. Sound level meters*. Part 1 *Specifications*. BSI.

Table 5: Measurement Positions Description

Measurement Position	Description
MP1	Largely unattended daytime and night-time measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level, located at the east boundary of the Site. The microphone was located at approximately 7 metres from the closest road's carriageway edge. The sound environment at this location was dominated by road traffic noise from the A10 road.
MP2	Largely unattended daytime and night-time measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level, located at the middle of the Site. The microphone was located at approximately 5 metres from the closest road's carriageway edge. The sound environment at this location was dominated by road traffic noise from the Baldock road (A507).

Figure 4: Measurement Positions

4.3. Sound Indices

The parameters reported are the average Equivalent Continuous Sound Level, $L_{Aeq,T}$, the statistical index (typical) Background Sound Level, $L_{A90,T}$, as well as the and the typical Maximum Sound Pressure Level, L_{AFmax}. An explanation of the sound units presented is given in Appendix A.

The measured L_{Aeq}, L_{AFmax}, and L_{AF90} sound levels are presented as time histories in a graph in Appendix B.

4.4. Summary Results

The summarised results of the environmental sound measurements, during the day and night-time periods, can be seen below in Table 6. Values have been rounded to the nearest whole number.

TABLE 6: SUMMARY OF SOUND MEASUREMENT RESULTS

Measurement Position	Period	$L_{Aeq,T}$ (dB)	$L_{AF90,T}$ (dB)	L_{AFmax} (dB)
MP1	Day	71	48	89
	Night	66	25	87
MP2	Day	63	46	81
	Night	57	23	77

5. Noise Modelling

5.1. Overview

The noise levels across the site have been predicted using the Cadna/A suite of noise modelling software. This software utilises standard acoustic principles in conjunction with approved prediction methodologies and it is a tried and tested method for accurately predicting and assessing the impact of noise from a variety of sources. Road traffic noise predictions have been carried out in accordance with the calculation methodology presented in the Calculation of Road Traffic Noise (CRTN[10]).

The noise model was validated to ensure that the levels predicted at the site boundary were an accurate reflection of real world measured noise levels at the measurement positions, both at daytime and night-time periods, plus any adjustments to reflect future traffic noise changes, should the Proposed Development go ahead.

5.2. Model Assumptions

In addition to the road source noise levels used in the predictions, the model also considers the effects of the topographical conditions throughout the area, based on associated LIDAR Composite DTM topographic contours sourced from the Defra Data Services Platform, ground absorption, acoustic reflections and acoustic screening. The ground factor has been set to 0.5.

5.3. Changes in Future Traffic Noise

For a robust assessment, the model has considered the potential changes of traffic noise levels due to changes in traffic flows in the future.

Traffic data for the surrounding roads have been provided by the Applicant's traffic consultants. The predictions of changes in traffic noise have been undertaken in accordance with the BNL principles detailed within CRTN. These predictions consider the relative change in noise level that is likely as a result of changes in traffic pattern at a notional roadside receptor for each considered road link. The relevant traffic parameters and predicted changes in noise level are presented Table 7.

Table 7: Road traffic Basic Noise Level (BNL) Changes

Road Link	Year 2023 Baseline Traffic			Year 2035 Predicted Traffic*			BNL Change, dB
	AAWT-18H	HGV%	Speed (km/h)	AAWT 18H	HGV%	Speed (km/h)	
Ermine St W	1464	6.6	97	1680	6.4	97	+0.8
Ermine St E	2345	2.1	97	2655	2.1	97	+0.6
The A10 N of Ermine St	9468	7.0	97	10615	6.9	97	+0.5
The A10 S of Ermine St	9590	6.6	97	10808	6.6	97	+0.5
The A10 S of Throcking Ln	9637	6.4	97	10676	6.4	97	+0.4
The A10 N of Baldock Rd	9900	7.2	97	10967	7.2	97	+0.4
Baldock Rd East of A10	9800	4.9	48	11517	4.6	48	+0.6

[10] Department of Environment: 1988: Calculation of Road Traffic Noise, HMSO0.7

Side Access	1237	6.7	30	1370	6.7	30	+0.7
The A10 S of Baldock Rd	15399	7.0	97	18239	6.6	97	+0.7
Baldock Rd West of A10	9927	4.9	69	12837	4.3	48	-1.0
Baldock Rd East of Site Access	10415	4.9	97	13378	4.3	48	-6.5
Baldock Rd West of Site Access	10415	4.9	97	11931	4.7	48	-6.9
Baldock Rd West of High Street	6169	4.6	48	7419	4.3	48	+0.7
High Street N	3280	2.5	48	3767	2.5	48	+0.6
High Street S	7974	3.4	48	9286	3.2	48	+0.6
High Street North of Hare St	7950	3.2	48	9258	3.1	48	+0.2
Hare Street	4507	4.0	48	5122	3.9	48	+0.5
High Street South of Hare St	7311	2.5	48	8422	2.5	48	+0.6
Station Road north of the A10	7976	3.8	64	9082	3.7	64	+0.5
Access	233	3.0	30	258	3.0	30	+0.4
The A10 South	20879	5.7	80	24065	5.6	80	+0.6
The A10 West	15586	6.9	97	18447	6.5	97	+0.7
Throcking Ln	271	1.0	50	483	1.3	48	+2.4

** Year 2035 Predicted Traffic includes Growth Background Traffic and Proposed Development Traffic, as provided by the Applicant's Traffic Consultants.*

It can be seen that changes to the Basic Noise Level (BNL) on the surrounding road network as a result of the Proposed Development are predicted to remain largely below 1 dB, which is considered negligible with reference to Table 3. A major decrease in noise levels (in the order of 6-7 dB) is expected on Baldock Road due to the reduction in traffic speed, should the Proposed Development proceed. A minor increase in noise levels is predicted in Throcking Lane due to an increase in traffic flows.

6. ProPG Stage 1: Initial Site Noise Risk Assessment – Framework Plan

6.1. Overview

The results of the environmental noise survey and the noise modelling exercise have been used to determine the noise levels and the potential noise constraints across the proposed Framework Plan, which forms the basis of this Outline Application. It must be noted that, as required for a ProPG Stage 1 assessment, the results do not include the impact of any new or additional mitigation measures to be included in the development proposals.

Open site noise risk assessment maps for the daytime and night-time periods, at 1.5 metres high and 4 metres above local ground level respectively, are included in Appendix C.

6.2. Noise Risk Assessment

The noise map presented in Figure 10 in Appendix C identify that during the daytime (07:00 – 23:00) the majority of the site is at Negligible or Low noise risk, with some areas closer to the A10 road at Low/Medium noise risk. Only areas at less than 65 metres from the A10 are at Medium noise risk.

During the night-time (23:00-07:00) Figure 11 in Appendix C shows that the majority of the site is at Negligible, Low or Low/Medium noise risk. At the north of the site, areas at less than 170 metres from the A10 are at Medium noise risk. Areas of the site at less than 75 metres from the A10 road are at Medium/High noise risk.

From the initial noise risk assessment of the Framework Plan, it is concluded that without mitigation the Site is largely suitable for residential development, provided that a good acoustic design process is followed to design the Masterplan.

The current Framework Plan already includes elements of 'Good Acoustic Design', such as maximising the distance by locating green spaces and Sustainable Drainage Systems (SuDS) between the A10 and areas proposed for residential dwellings. In addition, the area proposed for school uses is largely below 50 dB(A) during the daytime, which would facilitate the use of natural ventilation for the buildings and appropriate external noise levels.

In terms of external amenity areas, Informal Open Spaces and Playing Fields proposed to the west of the site are exposed to low noise levels, compliant with guideline parameters within BS8233 and Word Health Organisation (WHO).

It is recommended, however, that where feasible, areas allocated for residential dwellings are within the Negligible, Low or Low/Medium noise risk. This would mean a distance in the order of 170 metres from the A10 on the northern parcels. Alternatively, a noise screen or earth bund could be designed along the eastern boundary of the site with the A10 to reduce noise levels across the site, which would allow noise-sensitive uses to be allocated closer to the road or reduce the requirements for façade mitigation.

It must be noted that this noise risk assessment upon the proposed Framework Plan considers an open site. Once the built form of the development is considered, the noise effects within the site, away from the adjacent noise sources will be significantly reduced, as each layer of buildings adds acoustic screening.

7. ProPG Stage 2: Assessment of Illustrative Masterplan

7.1. Overview

In accordance with Stage 2 of Professional Practice Guidance (ProPG) – Planning & Noise, a more detailed noise assessment of a potential Illustrative Masterplan has been undertaken.

7.2. Good Acoustic Design Process

A Good Acoustic Design process has been undertaken during the derivation of the Framework Plan and an Illustrative Masterplan layout. Distance to the main roads has been maximised as far as practicable, with consideration to other design constraints.

In practice, using the built form of the development is in many cases a very efficient form of reducing site-wide noise levels behind the first row of dwellings, facing the dominant noise source, which in this case is the A10 to the east. This typically results in the first row of dwellings being exposed to higher noise levels, hence these would need to be sufficiently mitigated.

Consideration has also been given to potential noise ingress during overheating condition, should this be found a material consideration during further design stages.

All of the above demonstrate Good Acoustic Design. Further mitigations that could be considered as the design of the Masterplan progresses includes the erection of a 3.5m high earth bund to the east of the site, to increase the noise screening from the A10.

7.2.1. Façade Performance Specifications

Based on the results of the noise survey and modelling exercise, an assessment of the required minimum façade mitigation for the Illustrative Masterplan has been undertaken. For the purposes of this outline planning application, the assessment assumes typical rooms dimensions (12m^2 bedrooms and 16m^2 living rooms) and up to 50% of a façade being glazed. It has also been assumed that bedrooms are to be acoustically 'soft', with carpets, curtains and other soft furnishings, and living rooms to have a hard floor finish and to be less acoustically absorptive.

In order to provide a robust assessment and a high quality living environment for future residents, providing internal noise levels of <35 dB $L_{Aeq,16\text{-}hour}$ by day and <30 dB $L_{Aeq,8\text{-}hour}$ by night, as well as <45 dB typical L_{AFMax} by night, as defined in BS 8233/ProPG has been adopted as the design target for the proposed development. In this instance, the target indoor ambient noise levels can be achieved with the following façade types, as a combination of various glazing and ventilation performance.

TABLE 8: EXAMPLE OF SUITABLE FAÇADE MITIGATIONS OPTIONS

External Noise Level, dB			Minimum Sound Reduction Performance, dB		
$L_{Aeq,day}$	$L_{Aeq,night}$	$L_{AMax,night}$	Mitigation Type	Glazing R_W+C_{tr}	Ventilation D_{new}
≤50	≤45	≤60	TYPE 1a	27	Partially open window
50-55	45-50	60-65	TYPE 1b	27	Partially open window *
55-60	50-55	65-70	TYPE 2	27	32
60-65	55-60	70-75	TYPE 3	33	38
** Reasonable internal conditions (5dB relaxation) achieved with windows open. Otherwise, standard trickle vent will ensure compliance IANL targets.*					

The above mitigation measures demonstrate that appropriate internal noise levels are entirely achievable through the use of suitable façade treatments, resulting in No Observed Adverse Effect.

It is noted that the assessment with windows partially open is based on a sound reduction of 15 dB, based upon the Napier report titled NANR116: '*Open/closed window research' – Sound Insulation Through Ventilated Domestic Windows'* which has been authored for DEFRA, which demonstrates that for road traffic noise a partially openable window will achieve between 12-18 dBA. Therefore, 15dB of attenuation is the average level difference and is considered to be robust. In addition, the *WHO Environmental Noise Guidelines 2018* states that '*the difference between indoor and outdoor levels are usually estimated at around 10 dB for open, 15 dB for tilted or half-open and about 25 dB for closed windows*'.

The mark-up with outline required acoustic performance values at each façade is presented in Figure 5 overleaf, also replicated in Figure 12 in Appendix C.

FIGURE 5: OUTLINE FAÇADE SOUND INSULATION PERFORMANCE REQUIREMENTS

It can be seen that suitable indoor ambient noise levels can be achieved with windows open at the vast majority of dwellings. It can also be seen that dwellings requiring closed windows in order to achieve the BS8233:2014 criteria on one façade do include a façade on a less noise-exposed side of the dwelling, where ventilation can be provided via openable windows.

When ventilation means other than partially open windows are required, windows should be closed and ventilators maintained in the open position. It should also be noted that the sound reductions detailed above apply to habitable rooms such as living rooms, dining rooms and bedrooms only. For non-habitable rooms such as kitchens, bathrooms, stairways, halls or landings, lower performance standards would be permissible.

Performance specifications are frequency specific. Overall performance values presented in Table 8 are given for guidance purposes only, with detailed frequency spectra and system examples provided below.

Glazing

TABLE 9: MINIMUM ACOUSTIC PERFORMANCE FOR GLAZING

Example of Glazing	Octave Frequency Band (Hz)							$R_w + C_{tr}$
	63	125	250	500	1000	2000	4000	
	Sound Reduction Performance, R dB							
Standard Double Glazing (4mm/12mm/4mm)	19	24	20	25	34	37	35	**27**
Thermal Double Glazing (10mm/12mm/6mm)	21	26	27	34	40	38	46	**33**

The 4mm/12mm/4mm notation refers to a glazing unit comprising two 4mm panes of glass separated by a 12mm air gap, and similarly for the other notations. The glazing system performance specifications detailed above apply to the glazing package as a whole, inclusive of glazing, framing, spandrel panels, etc. Other units may be suitable and it is the responsibility of the glazing manufacturer to recommend and provide appropriate systems. The performance of the glazing systems will depend on many factors, such as the glazing configuration, size of window panels, quality of framing, quality of sealing, etc. Performance specifications are frequency specific. Overall performance values are given for guidance purposes only. The proposed configurations are given as an example only. Other units may be suitable and it is the responsibility of the glazing manufacturer to recommend and provide appropriate systems.

Ventilation

TABLE 10: MINIMUM ACOUSTIC PERFORMANCE FOR VENTILATION

Example of Ventilation	Octave Frequency Band (Hz)							$D_{n,e,w}$
	63	125	250	500	1000	2000	4000	
	Sound Reduction Performance, R dB							
Hit & Miss Standard Trickle Vent	26	31	31	31	37	28	31	**32**
Acoustic Trickle Vent	25	30	33	38	37	36	36	**38**

One trickle ventilator or air inlet has been assumed per room. Where more ventilators are used, the acoustic performance of the ventilators would need to be upgraded by 10*log(N); N being the number of ventilators per room.

Windows may be openable for purge ventilation purposes at the user's discretion, as this is applicable only to occasional occurrences, such as to remove smoke from burnt food, and not subject to acoustic assessment.

External Wall

TABLE 11: MINIMUM ACOUSTIC PERFORMANCES FOR EXTERNAL WALL

Example of External Wall	Octave Frequency Band (Hz)							$R_W + C_{tr}$
	63	125	250	500	1000	2000	4000	
	Sound Reduction Performance, R dB							
260kg/m^2 brick wall	31	36	40	41	45	52	52	**43**

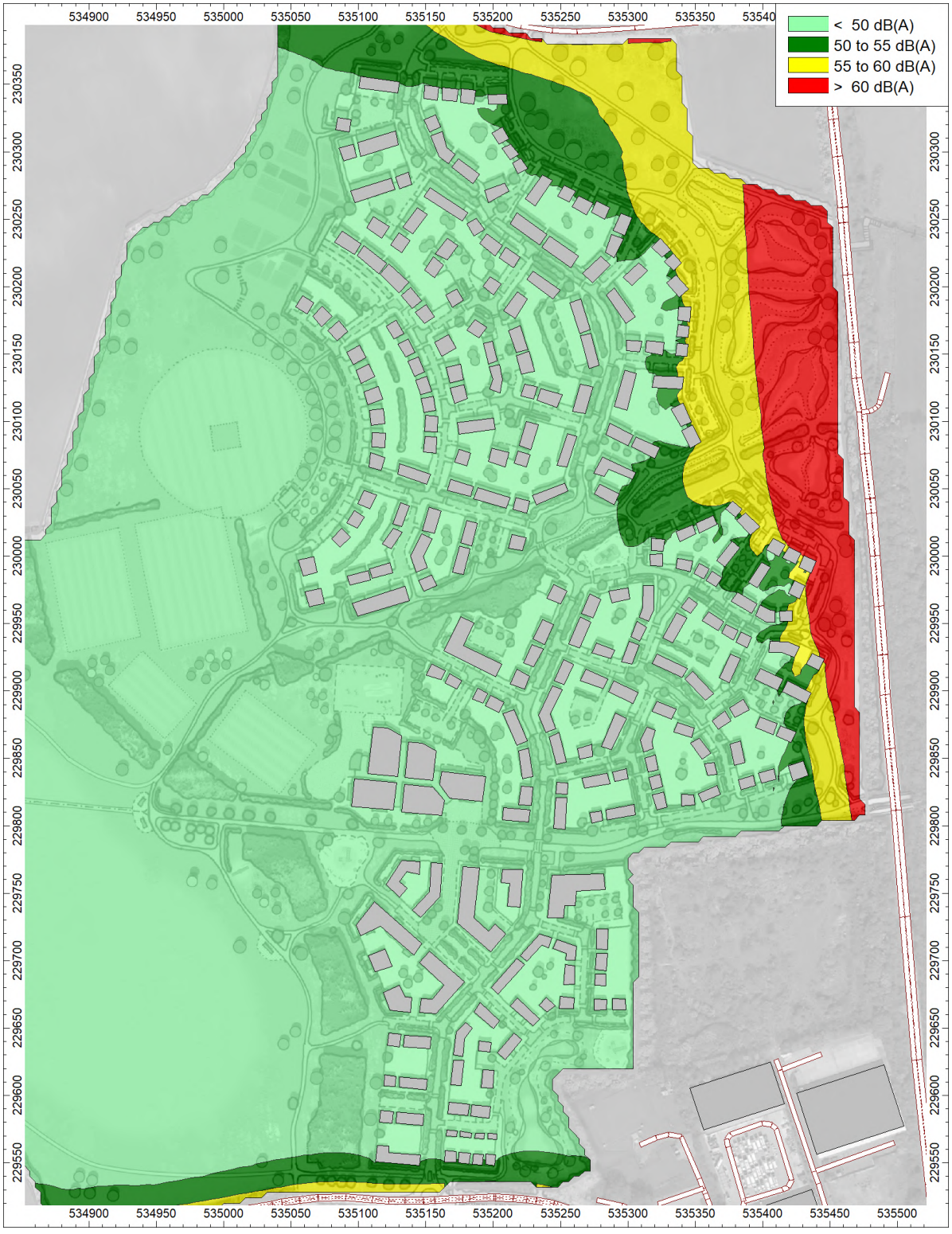
The above façade components are conducive with those typically required for thermal insulation and represent no uplift in design beyond that required to achieve the necessary thermal standards.

7.3. External Amenity Areas

BS 8233:2014 and ProPG advise that the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50–55 dB $L_{Aeq,16hr}$. They also recognise, however, that these guideline values are not achievable in all circumstances where development might be desirable, such as city centres or urban areas adjoining the strategic transport network. In such a situations the guidance advise that the development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

Figure 6 overleaf, also replicated in Figure 13 in Appendix C, identifies the site-wide noise levels in the context of the guidance contained within BS 8233 for external amenity areas. The contours depict noise levels at 1.5 metres above ground level and show compliance in all private and communal external amenity areas, providing that gardens for the first row of dwellings are facing away from the A10 road and screened by the built form of their respective dwellings.

FIGURE 6: DAYTIME BS8233 EXTERNAL AMENITY CONSTRAINTS



8. Compliance with the Noise Requirements within Approved Document O

Building Regulations Approved Document O – Overheating, which took effect in England in June 2022, aims to protect the health and welfare of occupants of a building by reducing the occurrence of high indoor temperatures.

Details for compliance with Building Regulation requirements is not normally a planning matter, unless specifically requested by the Local Planning Authority. However, given that the design strategy to mitigate overheating can affect the building appearance, an initial assessment of compliance with AD-O noise criteria using open windows for the simplified method is undertaken for information at this stage.

Paragraph 2.10 of AD-O states that excess heat should be removed from the residential building by any of the following means:

a) Opening windows
b) Ventilation louvres in external wall
c) A mechanical ventilation system
d) A mechanical cooling system

AD-O provides two methods for demonstrating compliance with requirement O1. With the 'Simplified Method' the strategy to reduce overheating risk should be selected according to the location of the new residential building and whether it has cross-ventilation. Alternatively, the 'Dynamic Thermal Modelling Method' can be followed for demonstrating compliance with requirement O1.

Tables 1.3 and 1.4 of AD-O define minimum opening free areas[11] for 'high' and 'medium' risk locations as 13% and 4% of the floor area of the room, respectively, for compliance with the 'Simplified Method'.

The document also states that Requirement O(2)(a) is met in a new residential building if the building's overheating strategy for use by occupants takes account of, among others, noise at night.

Section 3 of the ADO '*Ensuring the overheating mitigation strategy is usable*' advises on noise levels above which it is unlikely that windows would be opened by an occupant and therefore alternative methods to mitigate overheating are needed. It states the following:

"Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am)."

The ANC/IOA '*Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O, July 2022, v1.0'* advises that, based on typical assumptions, the resulting outside-to-inside sound level difference for window openings necessary to satisfy the simplified method of AD-O are approximately 4 dB for 'High Risk Locations' and 9 dB for 'Medium Risk Locations'.

[11] Note *that the 'acoustic open area' (the measurable, cross-sectional, geometric area of an opening) will always be greater than the corresponding free area/equivalent area as defined in AD-O.*

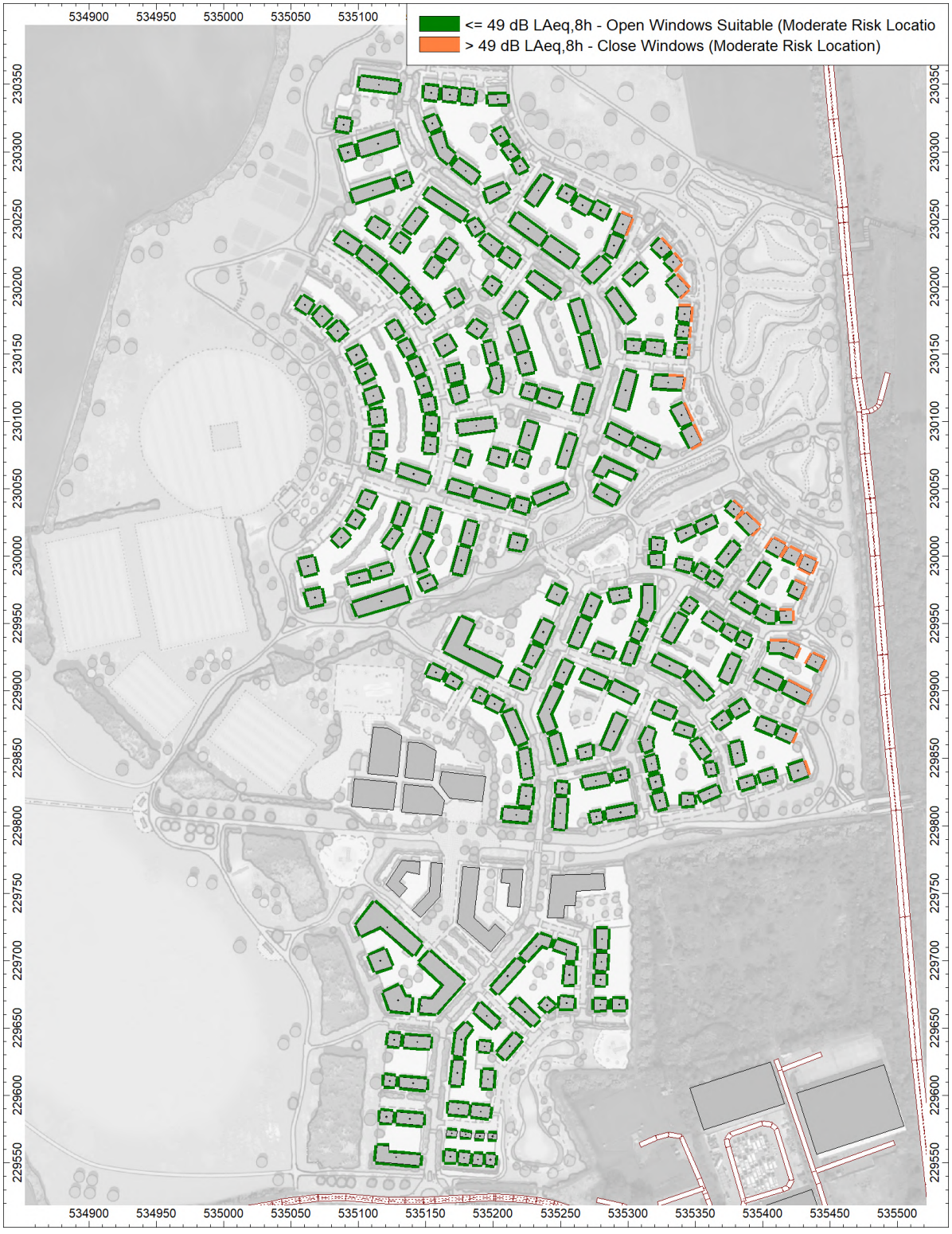
Effectively, it implies the following limiting external free-field levels above which external noise precludes the use of the simplified method, and dynamic thermal modelling should be used to demonstrate compliance. Alternatively, mechanical cooling may be used only where sufficient heat cannot be removed without it.

TABLE 12: EXTERNAL NOISE LEVELS ABOVE WHICH THE SIMPLIFIED METHOD (OPEN WINDOWS) CANNOT BE USED

Parameter	High Risk Location	Moderate Risk Location
$L_{Aeq,8h}$, averaged over 8 hours (between 11pm and 7am)	44 dB	49 dB
L_{AFmax}, more than 10 times a night (between 11pm and 7am)	59 dB	64 dB

Based on the results of the environmental noise survey and noise modelling, Figure 7 presents the suitability of open windows to demonstrate compliance with the Simplified Method of AD-O. It is understood that the site is within a 'Medium Risk Location' as defined in AD-O. Should this not be the case, the noise assessment should be updated. As such, an outside-to-inside sound level difference of 9 dB has been used, assuming opening free areas of 4% of the floor area of the room.

FIGURE 7: SUITABILITY OF OVERHEATING MITIGATION WITH OPEN WINDOWS (MEDIUM RISK LOCATION)



The assessment demonstrates that the vast majority of facades comply with the noise requirements of AD-O using open windows to mitigate overheating in accordance with the simplify method for a 'Moderate Risk Location'.

At facades where Figure 7 shows that the simplified method cannot be used, or where an alternative approach to the simplified method is desirable for other reasons, a dynamic thermal modelling based on CIBSE TM59 is required, and further acoustic investigation, depending on the actual opening free areas required to mitigate overheating. However, it is noted that dwellings requiring closed windows in order to achieve the ADO criteria on one façade do include a façade on a less noise-exposed side of the dwelling, where mitigation of overheating could be provided via openable windows, subject to the relevant overheating assessment.

A noise assessment for compliance with the noise criteria of AD-O when using dynamic thermal modelling is excluded from the scope at this stage.

9. Cumulative Assessment

In addition to the proposed residential-led development to the north of Badlock road (A507), which presents the core of this noise assessment, a proposed development for employment use (flexible use B2, B8, E(c) and E(g)) and solar farm) is proposed at the Land South of A507 and West of A10, Buntingford, as can be seen in Figure 3 of this report.

This proposed development will be subject to a separate Outline Planning Application, with all matters reserved save for access. For robustness, however, this assessment considers the likely changes to traffic noise in the surrounding road network, should both developments go ahead.

As advised by the Applicant's traffic consultants, the daily 2-way HGV movements for this site south of the A507 would be around 27 vehicles. The relative Basic Noise Level (BNL) change has been assessed for 2023 Baseline Traffic and Year 2035 Cumulative Traffic, considering both proposed developments north and south of the A507.

The predictions of changes in traffic noise have been undertaken in accordance with the BNL principles detailed within CRTN. These predictions consider the relative change in noise level that is likely as a result of changes in traffic pattern at a notional roadside receptor for each considered road link. The relevant traffic parameters and predicted changes in noise level are presented Table 13.

Table 13: Road traffic Basic Noise Level (BNL) Changes – Cumulative Assessment

Road Link	Year 2023 Baseline Traffic			Year 2035 Predicted Cumulative Traffic*			BNL Change, dB
	AAWT-18H	HGV%	Speed (km/h)	AAWT 18H	HGV%	Speed (km/h)	
Ermine St W	1464	6.6	97	1677	6.4	97	+0.8
Ermine St E	2345	2.1	97	2653	2.1	97	+0.6
The A10 N of Ermine St	9468	7.0	97	10837	6.8	97	+0.6
The A10 S of Ermine St	9590	6.6	97	11027	6.5	97	+0.6
The A10 S of Throcking Ln	9637	6.4	97	10904	6.3	97	+0.5
The A10 N of Baldock Rd	9900	7.2	97	11195	7.1	97	+0.5
Baldock Rd East of A10	9800	4.9	48	11824	4.5	48	+0.7
Side Access	1237	6.7	30	1370	6.7	30	+0.7
The A10 S of Baldock Rd	15399	7.0	97	18685	6.5	97	+0.8
Baldock Rd West of A10	9927	4.9	69	13818	4.1	48	-0.7
Baldock Rd East of Site Access	10415	4.9	97	14358	4.1	48	-6.3
Baldock Rd West of Site Access	10415	4.9	97	12420	4.6	48	-6.7
Baldock Rd West of High Street	6169	4.6	48	7726	4.2	48	+0.8
High Street N	3280	2.5	48	3904	2.4	48	+0.8
High Street S	7974	3.4	48	9456	3.2	48	+0.7
High Street North of Hare St	7950	3.2	48	9429	3.1	48	+0.2

Hare Street	4507	4.0	48	5261	3.8	48	+0.6
High Street South of Hare St	7311	2.5	48	8454	2.5	48	+0.6
Station Road north of the A10	7976	3.8	64	9082	3.7	64	+0.5
Access	233	3.0	30	258	3.0	30	+0.4
The A10 South	20879	5.7	80	24510	5.5	80	+0.7
The A10 West	15586	6.9	97	18893	6.4	97	+0.8
Throcking Ln	271	1.0	50	475	1.3	48	+2.4
** Year 2035 Predicted Cumulative Traffic includes Growth Background Traffic and Proposed Development Traffic from both sites north and south of Baldock Road, as provided by the Applicant's Traffic Consultants.*							

It can be seen that changes to the Basic Noise Level (BNL) on the surrounding road network as a result of the combined traffic of both Proposed Developments is predicted to remain largely below 1 dB, which is considered negligible with reference to Table 3. A major decrease in noise levels (in the order of 6-7 dB) is expected on Baldock Road due to the reduction in traffic speed, should both proposed developments go ahead. A minor increase in noise levels is predicted in Throcking Lane due to an increase in traffic flows.

10. Conclusion

inacoustic has been commissioned to prepare a Noise Assessment report for a residential-led development on Land North of A507 and West of A10, Buntingford, Hertfordshire.

The report follows the guidance within Stage 1 of ProPG[12]: *Professional Practice Guidance on Planning & Noise* and assesses the noise risks and opportunities for the proposed Framework Plan . It has been produced to assess the initial suitability of the site for new residential development and to inform the development of the Masterplan.

As indicative only, the report also assesses noise impact upon an Illustrative Masterplan.

It is considered that the proposed site is largely suitable for mixed-use residential-led development, subject to following 'Good Acoustic Design' during the development of the Masterplan.

An assessment of cumulative noise impacts due to changes if traffic noise levels in the surrounding road network, should the Proposed Development go ahead along with the proposed employment use development to the south of A507, has also been undertaken. This assessment identifies that that the combined traffic from both developments will produce largely negligible changes in the local road network.

In light of the above, which demonstrates that the site is predicted to meet the requirements of the relevant British Standard and planning guidance, it is considered that noise does not present a constraint to the mixed-use development of the site, considering the current proposed Framework Plan.

The following Appendices are also included in the report:

- Appendix A - Glossary of terms
- Appendix B - Full-time noise survey history graphs.
- Appendix C - Noise maps.

[12] ProPG: Professional Practice Guidance on Planning & Noise. ANC, IOA, CIEH, May 2017

11. APPENDICES

Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 14: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}.

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1hour}$ dB and $L_{A90,15mins}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

Appendix B – Sound Measurement Results

FIGURE 8: MEASURED TIME HISTORY – MP1

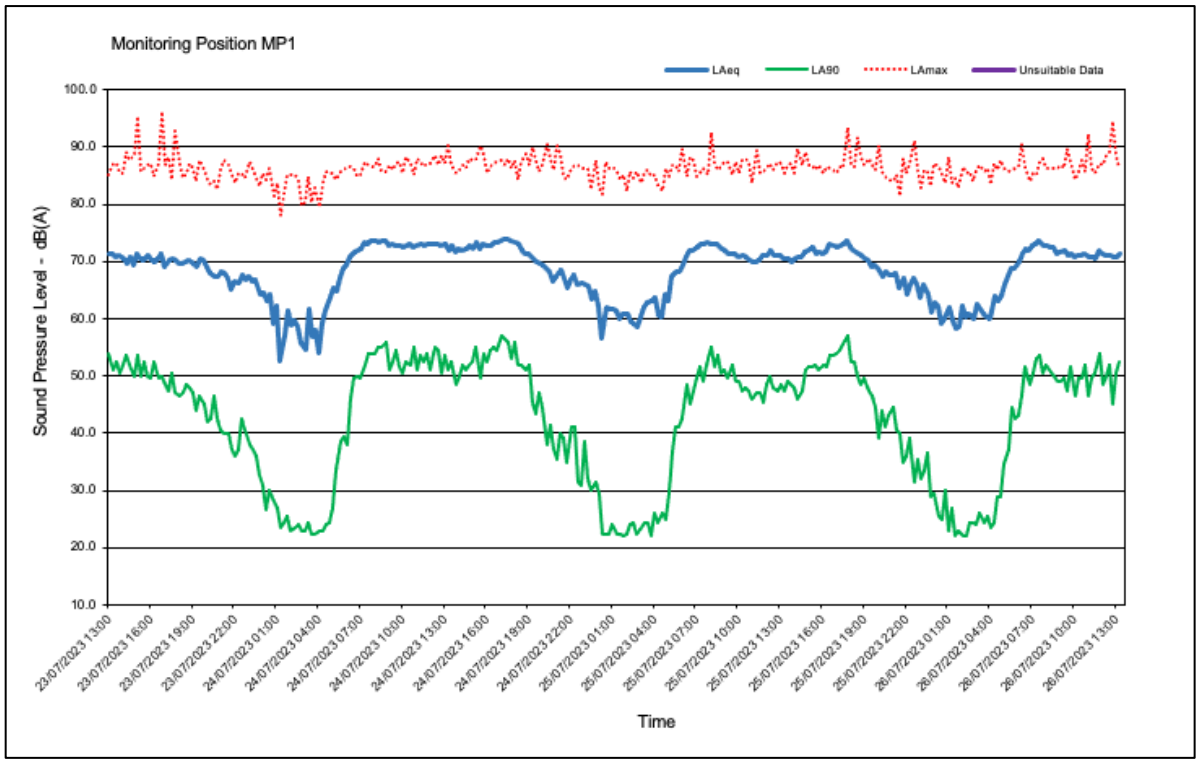
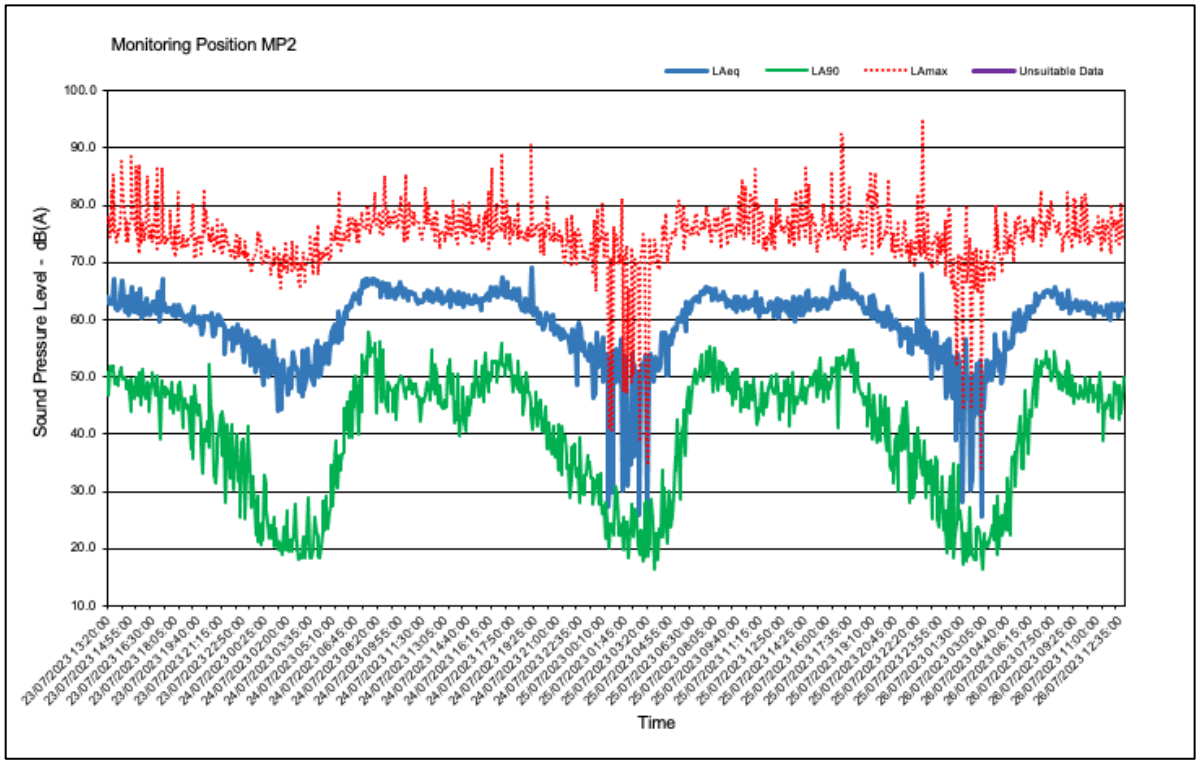


FIGURE 9: MEASURED TIME HISTORY – MP2



Appendix C - Noise Maps

FIGURE 10: INITIAL SITE NOISE RISK ASSESSMENT – FRAMEWORK PLAN - DAYTIME (GRID AT 1.5M HIGH)

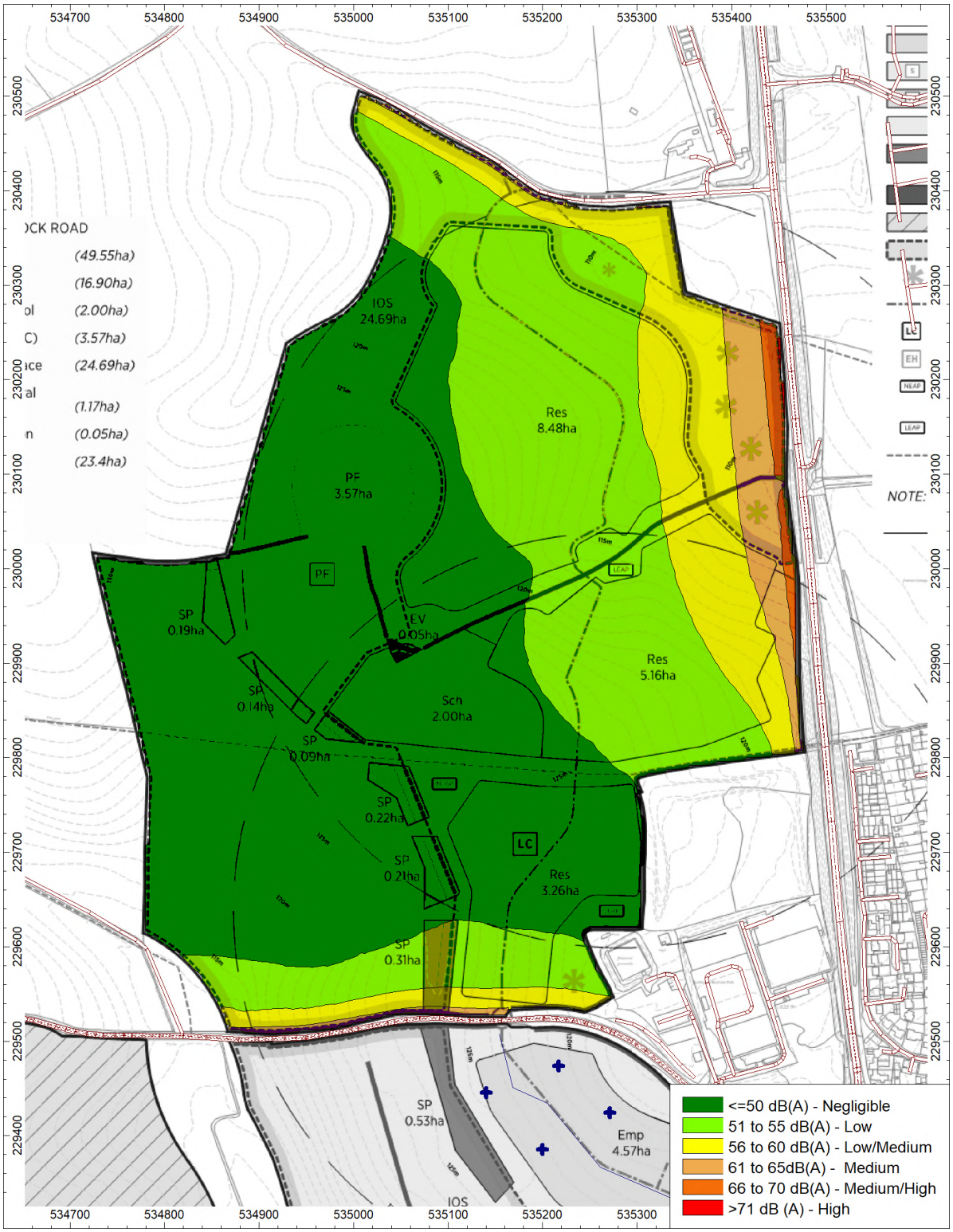


FIGURE 11: INITIAL SITE NOISE RISK ASSESSMENT – FRAMEWORK PLAN - NIGHT-TIME (GRID AT 4M HIGH)

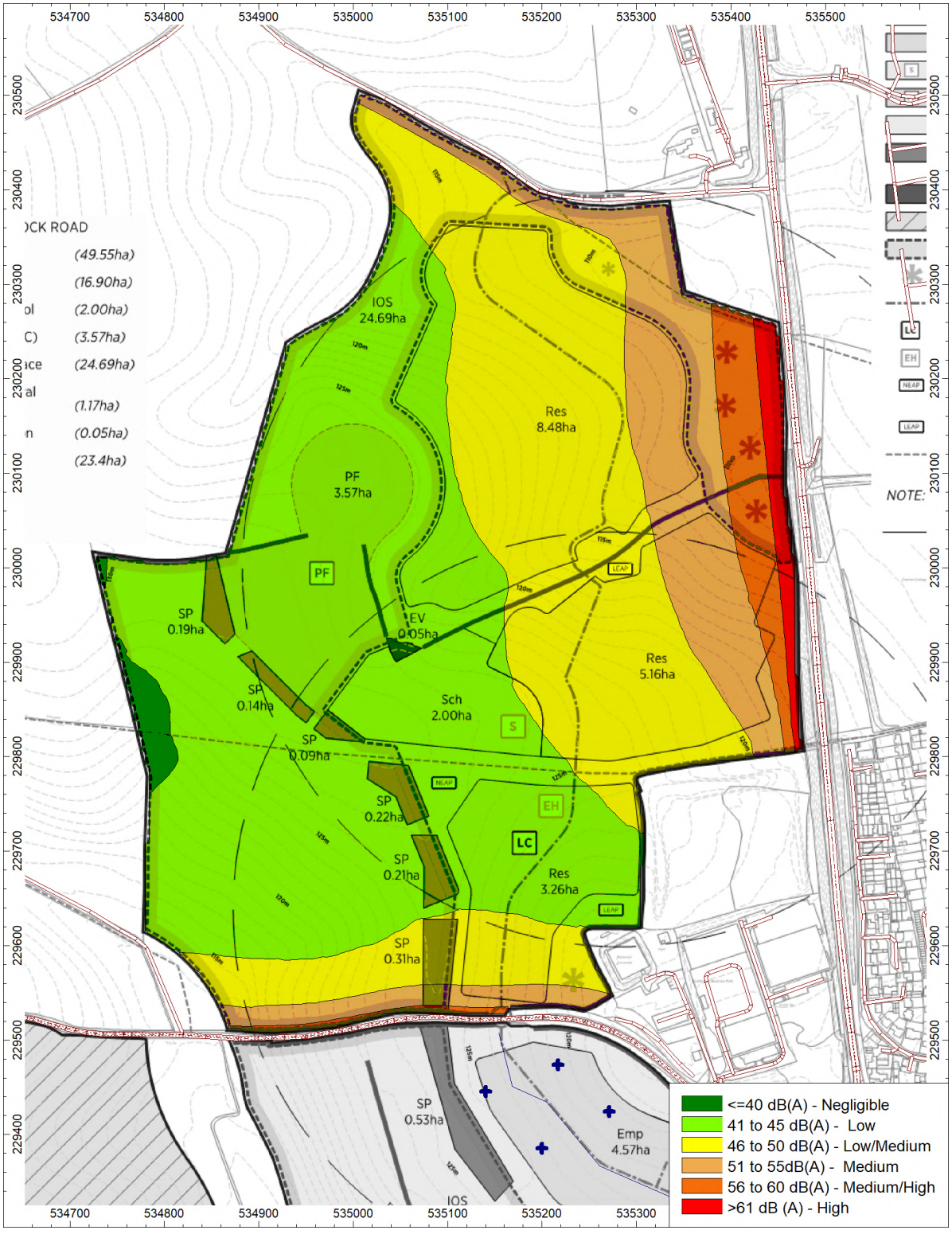
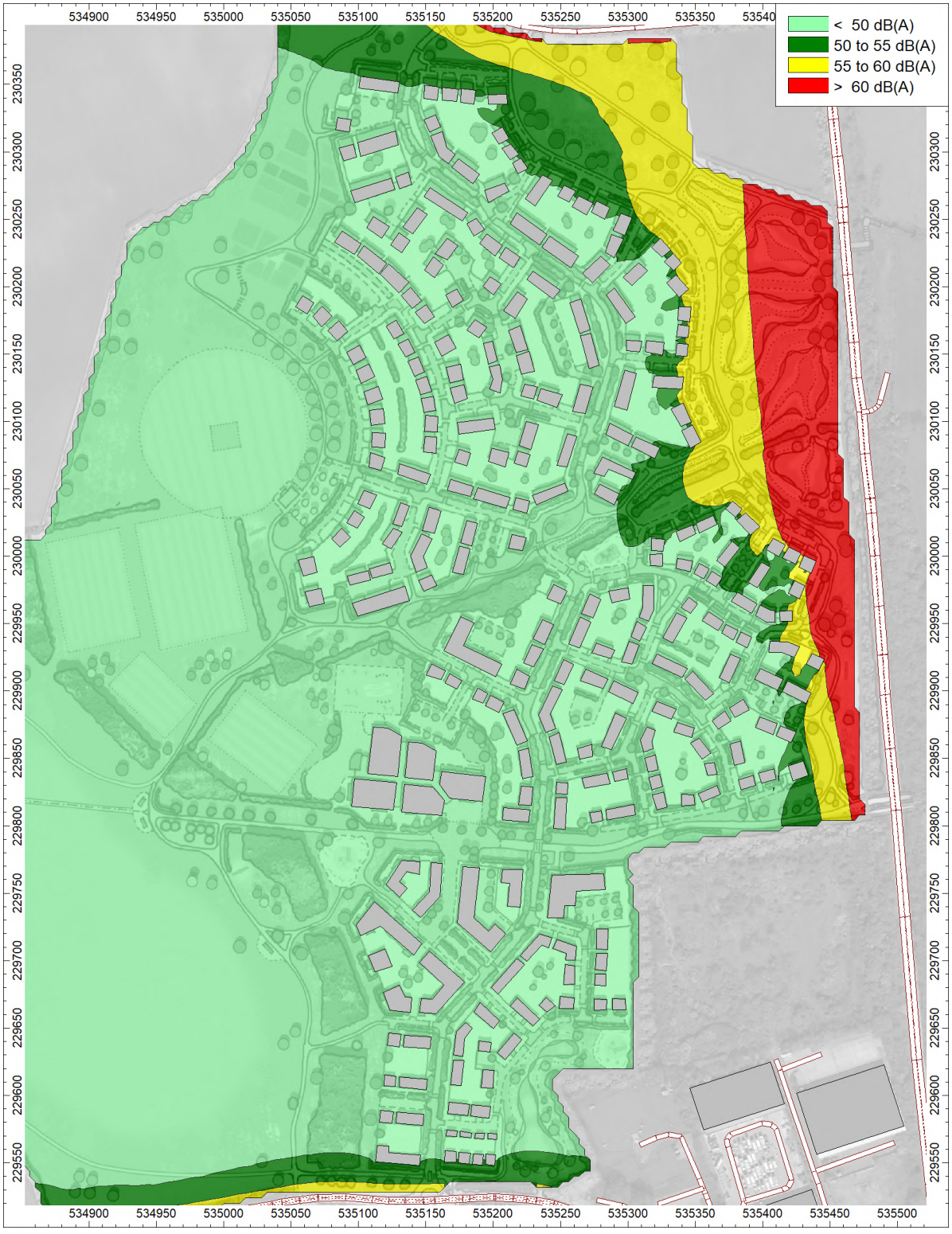


FIGURE 12: OUTLINE FAÇADE MITIGATION MEASURES - ILLUSTRATIVE MASTERPLAN

FIGURE 13: EXTERNAL AMENITY AREAS - ILLUSTRATIVE MASTERPLAN – L_{AEQ} DAYTIME



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