SYNTEGRA CONSULTING

Land West of Station Road, Lingfield

Noise Impact Assessment

February 2022

Ref: 21-8827

Rev B

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1. Executive Summary

An assessment has been carried out of the present noise climate at the **Land West of Station Road, Lingfield** and the impact of that noise on the proposed development. The proposed scheme involves development of the site into residential comprising 26 flats and 73 houses.

The site is located in Lingfield, on the existing Star Fields, bounded by the B2028 and Station Road to the south and east respectively. The area is primarily residential with a public house, The Star Inn located to the west of the proposed development. To the south of the site is Lingfield Park Racecourse.

The assessment is based on the results of a noise measurement survey that has been carried out over a five-day period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

The initial site risk assessment identified that the site has a low-medium risk in terms of noise.

Good acoustic design has been shown by location of the majority of the properties on the site such that openable windows as primary ventilation is feasible, and where this is not possible using the building envelope and alternative ventilation to adequately protect residents from adverse impacts due to noise.

It has been identified that the requirements of the Local Authority in respect of internal noise levels can only be achieved through careful consideration of the building envelope. The construction assumptions that have led to this conclusion are:

- **The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.**
- **For houses facing or overlooking the B2028, Station Road or the Star Inn on the south-eastern, eastern and western site boundaries:**
    - **A typical double glazing system in a 4/12/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w.**
    - **Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 40 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.**
- **For houses and flats in northern and central parts of the development:**
    - **A typical double glazing system in a 4/12/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w.**
    - **Openable windows would be acceptable for primary ventilation.**

The assessment has also shown that the external noise level criteria would be achieved within all of the proposed amenity areas.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise. It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

2. Introduction

This report has been prepared to support the planning application for the proposed development at the **Land West of Station Road, Lingfield**. The proposed scheme involves development of the site into residential comprising 26 flats and 73 houses.

The report assesses, through on-site noise measurements, the impact of the existing noise climate on the proposed development.

A glossary of acoustic terminology is provided in **Appendix 1**.

The site is located in Lingfield, on the existing Star Fields, bounded by the B2028 and Station Road to the south and east respectively. The area is primarily residential with a public house, The Star Inn located to the west of the proposed development. To the south of the site is Lingfield Park Racecourse. The location of the proposed development site is provided in **Figure 2.1**. The proposed site layout is shown in **Figure 2.2.**

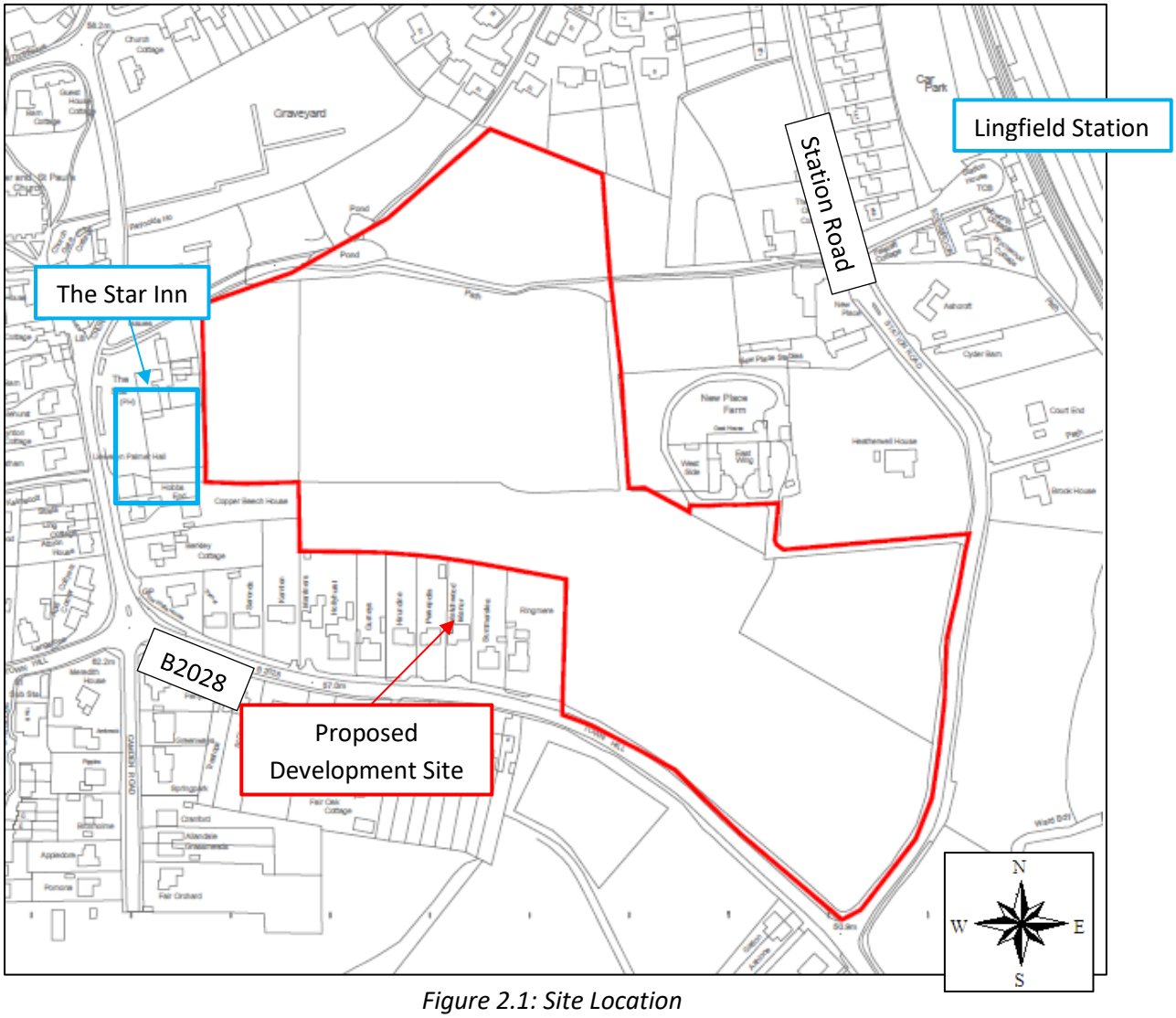


Figure 2.1: Site Location

Figure 2.2: Proposed Site Layout with Representative Receptor Locations

3. Planning Policy

3.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was released in March 2012 and last updated in July 2021. The purpose of the planning system is to contribute to the achievement of sustainable development and to encourage good design. There are three dimensions to sustainable development: economic, social and environmental.

Central to the NPPF, paragraph 10 states: *'At the heart of the National Planning Policy Framework is a **presumption in favour of** **[permitting]** **sustainable development**'*. This is expanded upon in paragraph 11, where it is stated:

*'…For **decision-taking** this means:*

- *approving development proposals that accord with an up-to-date development plan without delay; or*
- *where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:*
    - *the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or*
    - *any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole'*

Paragraph 174 states '*Planning policies and decisions should contribute to and enhance the natural and local environment by… preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of… noise pollution…*'.

Paragraph 185 states: '*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

- *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life (see Explanatory Note to the Noise Policy Statement for England (DEFRA)).*
- *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*
- *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'*

3.2 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) (2010) aims to '*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'.*

3.3 Local Planning Policy

The site is located within the administrative boundary of Tandridge District Council. The Tandridge District Council Local Plan is made up of the Core Strategy (published 2008) and the Local Plan Part 2: Detailed Policies (published 2014).

The Local Plan Part 2 contains Policy DP22: *Minimising Contamination, Hazards & Pollution*. In relation to noise, DP22 states:

"Noise

C. The Council will require noise generating forms of development or proposals that would affect noise-sensitive development to be accompanied by a statement detailing potential noise generation levels and any mitigation measures proposed (such as containment of the noise generated, screening barriers or restrictive activities/hours of operation) to ensure that all noise is reduced to an acceptable level. Where a development proposal is able to demonstrate that acceptable noise levels will be achieved, the application will be supported.

D. For proposals involving new residential development sited close to transport derived noise sources, applications will be considered against the noise exposure categories as outlined in the Noise Exposure Categories table (see supporting text), as well as other material considerations where necessary.

E. For proposals involving residential and other noise sensitive development that would be sited close to commercial/industrial noise sources (i.e. where transport is not the dominant noise source), the Council will consider applications against the current version of BS4142 in order to assess the likelihood of complaints from future occupiers and therefore the acceptability of the proposed development."

Part D of the advice reproduced above is the relevant policy and the Noise Exposure Categories table referenced is set out in the Local Plan Part 2 document, which appears to be lifted from the now revoked Planning Policy Guidance 24 (PPG24). The use of the revoked guidance was still relevant in 2014, when the policy was adopted, however the Professional Practice Guidance (ProPG) is now widely considered to have replaced PPG24 and is the current authoritative document for noise assessments across the country. Accordingly, Syntegra will utilise the ProPG guidance (detailed in **Section 4.2**) to assess noise impacts on the proposed development, in line with current good acoustic practice.

4. Guidance Documents

4.1 Planning Practice Guidance for Noise

The Planning Practice Guidance for Noise (PPG-Noise) was published in March 2014 and last updated in July 2019. The PPG provides advice on how to determine the noise impact on development:

'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 Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.'

The document goes on to provide a definition for the levels of noise exposure at which an effect may occur:

*'**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.*

***No observed effect level:** this is the level of noise exposure below which no effect at all on health and quality of life can be detected.'*

It is important to understand that as the PPG-Noise does not provide any advice with respect to specific noise levels/ limits for different sources of noise, it is appropriate to consider other sources of advice and guidance documents when considering whether new developments would be sensitive to the prevailing acoustic environment.

4.2 Professional Practice Guidance on Planning & Noise.

The Professional Practice Guidance (ProPG) on Planning and Noise for New Residential Development was published in May 2017 by the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH). The document has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England and provides numerical acoustic standards in line with the objectives of the Government's planning and noise policy. As a collaboration between the ANC, IOA and CIEH the document has been designed to encourage a good acoustic design process and aims to protect people from the harmful effects of noise.

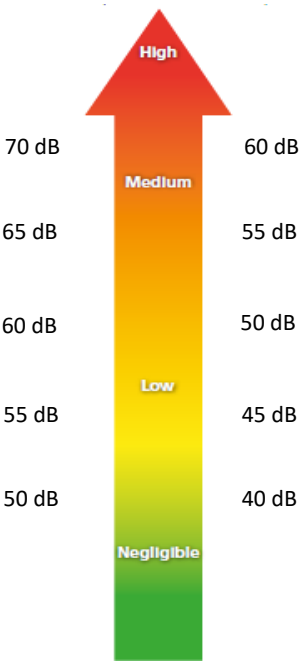
The ProPG notes that it '*does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate'.*

The ProPG advocates a two-stage approach, first providing an initial noise risk assessment of the proposed development site before undertaking a systematic approach to the noise impact assessment. The results of the initial noise risk assessment are an indication as to how detailed the noise impact assessment will need to be in order to satisfactorily assess all acoustic challenges.

1.1.1. **Stage 1: Initial Site Noise Risk Assessment**

The initial noise risk assessment compares the site noise levels (which can be obtained by measurement or prediction, or a combination of the two, as appropriate) against a risk scale and determines the risk of adverse effects from noise at the site. The purpose of the initial noise risk assessment is to provide an indication of the level of acoustic challenges at the site. In general, the higher the level of risk identified, the greater the level of detail that will be required within the noise impact assessment in order to satisfactorily demonstrate that adverse impacts will be minimised to an acceptable level.

The initial risk assessment and associated notes are provided in Figure 1 of the ProPG and reproduced in **Table 4.1**.

Noise Risk Assessment		Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels, $L_{Aeq,16hr}$	Indicative Night-time Noise Levels, $L_{Aeq,8hr}$		
		Increasing risk of adverse effect	High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed Acoustic Design Statement (ADS). Applicants are strongly advised to seek expert advice.
			As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.
			At low noise levels, the site is likely be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
		No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.

Notes:

a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.

b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".

c. $L_{Aeq,16hr}$ is for daytime 0700 hrs – 2300 hrs, $L_{Aeq,8hr}$ is for night-time 2300 hrs – 0700 hrs.

d. An indication that there may be more than 10 noise events at night (2300 hrs – 0700 hrs) with $L_{Amax,F}$ > 60 dB means that the site should not be regarded as negligible risk.

Table 4.1: Stage 1: Initial Site Risk Assessment

Where sites are exposed to industrial or commercial noise that is considered to be "dominant" then an assessment in line with BS 4142:2014 '*Methods for rating and assessing industrial and commercial sound'* should be carried out.

1.1.2. **Stage 2: Full Assessment**

1.1.2.1. **Stage 2: Element 1 – Good Acoustic Design Process**

Following a good acoustic design process is an implicit part of achieving good design as required by Government planning and noise policy. It is imperative that acoustic design is considered at an early stage of the development process and the aim should be to avoid "unreasonable" acoustic conditions and prevent "unacceptable" acoustic conditions.

Good acoustic design does not simply mean compliance with the recommended internal and external noise criteria. Instead, an integrated solution should be provided whereby the optimal acoustic outcome is achieved, without design compromises that will adversely affect living conditions and the quality of life of residents or other sustainable design objectives and requirements.

A good acoustic design should consider (in this order):

- *'Maximising the spatial separation of noise sources and receptors.*
- *Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.*
- *Using topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.*
- *Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.*
- *Using the layout of the scheme to reduce noise propagation across the site.*
- *Using the orientation of buildings to reduce the noise exposure of noise-sensitive rooms.*
- *Using the building envelope to mitigate noise to acceptable levels.'*

1.1.2.2. **Stage 2: Element 2 – Internal Noise Level Guidelines**

The ProPG contains Figure 2, which is a table with associated notes drawing on the advice contained within BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings'*, the World Health Organization's Guidelines for Community Noise 1999 (WHO guidelines) and current best practice. This table is reproduced in **Table 4.2**.

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ 45 dB $L_{Amax,F}$ (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

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 $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax,F}$ 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.

Table 4.2: ProPG Internal Noise Level Guidelines

1.1.2.3. Stage 2: Element 3 – External Amenity Area Noise Assessment

The ProPG considers the advice provided within BS 8233:2014 and the PPG-Noise in respect of external amenity areas, and presents the following advice, which is selected from both documents, in order to carry out a full assessment of noise levels:

i. *'If 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.'*

ii. *'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 $L_{Aeq,16hr}$.'*

iii. *'These guideline values may not be achievable in all circumstances where development might*

be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.'

iv. *'Whether or not external amenity spaces are an intrinsic part of the overall design, consideration of the need to provide access to a quiet or relatively quiet external amenity space forms part of a good acoustic design process'*

v. *'Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:*

- *A relatively quiet façade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
- *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or large open balcony in a different, protected, location); and/or*
- *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, publically accessible, external 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). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.'*

1.1.2.4. Stage 2: Element 4 – Assessment of Other Relevant Issues

The final element of Stage 2 is an assessment of '*other relevant issues*' and the ProPG suggests that the following issues are considered before making any final conclusions with respect to noise impacts:

i. *'compliance with relevant national and local policy'*

ii. *'magnitude and extent of compliance with ProPG'*

iii. *'likely occupants of the development'*

iv. *'acoustic design v. unintended adverse consequences'*

v. *'acoustic design v. wider planning objectives'.*

The ProPG notes that '*not all of the issues listed above will arise in every planning application and some may already have been addressed as an inherent part of good acoustic design. In addition, LPAs* [Local Planning Authorities] *may wish to add other relevant issues depending on local circumstances and priorities.'*

5. Baseline Noise Levels

In order to determine the extent to which the site is currently affected by noise, a detailed measurement study has been carried out at the site. Measurements have been carried out in order to characterise the existing noise climate over a 5-day period. To the south and east of the site, the noise climate was dominated by road traffic noise along the B2028 and Station Road, as well as some noise from passing trains. To the west of the site, the noise climate was dominated by plant noise from the Star Inn as well as road traffic from the surrounding road network. Regular aircraft flyovers heading to and from Gatwick Airport were noted. On Saturday 18th and Monday 20th December, during the measurement period, two events were held at the Lingfield Park Racecourse.

The noise measurements utilised two Type 1 Precision Sound Level Meters, both with a current certificate of calibration, the full list of equipment is detailed in **Appendix 3**. Before and after the measurement period the equipment was calibrated in order to ensure that the equipment had remained within reasonable calibration limits (+/- 0.5 dB). Noise Measurements were carried out in consecutive 5 minutes periods with a 1 second resolution.

Measurements were carried out between 1030 hrs on Friday 17th December 2021 and 1145 hrs on Tuesday 21st December 2021.

During the noise measurement survey the weather conditions ranged from a high of 9°C during the daytime to a low of 3°C overnight. The wind speeds were moderate (approximately 2 – 4 m/s), with occasional stronger gusts, predominantly easterly in direction. Cloud cover was noted to be 100% at the start and end of the survey.

Noise measurements were carried out at Measurement Position 1 (MP1) and Measurement Position 2 (MP2).

MP1 was located in a free-field location in the south of the site, close to the junction of Station Road and the B2028, approximately 1.5m above ground level. Noise at this location was dominated by road traffic along the B2028 and Station Road. The position also had line of sight to the railway and train noise was noted though not considered dominant.

MP2 was located to the west of the site in a free-field location in the west of the site, overlooking the rear of the Star Inn, at approximately 2m above ground level. Noise at this location was dominated by plant noise from an extract fan associated with the Star Inn during setup and collection of the equipment.

The noise monitoring positions are shown in **Figure 5.1**.

Figure 5.1: Noise Monitoring Location

Table 5.1 below displays a summary of the measured noise levels and detailed measurement results are presented in **Appendix 4**.

Measurement Position	Period (hours)	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)
MP1	Daytime (0700 – 2300)	64	81
	Night-time (2300 – 0700)	54	76
MP2	Daytime (0700 – 2300)	51	71
	Night-time (2300 – 0700)	45	64

Table 5.1: Summary of Free Field Semi-Permanent Noise Levels

Note: The average noise levels stated are logarithmic for L_{Aeq}. The $L_{Amax,F}$ noise levels stated are the arithmetic average of the hourly noise levels during the daytime (0700 hrs – 2300 hrs) and the 10th highest $L_{Amax,F,5min}$ noise level at night (2300 hrs – 0700 hrs), as noted in Table 4.2.

5.2 Source Noise Measurements

Plant noise from the Star Inn (presumed kitchen extract) was dominant at the western boundary of the site. Recorded source noise levels for the kitchen extract are shown in **Table 5.2.** We understand that the pub's kitchen closes before 23:00 every night therefore it is not expected that noise from kitchen extract plant will affect night-time noise levels, which is reflected in the MP2 noise levels.

Measurement Position	Period	$L_{Aeq,T}$ (dB)
MP2	00:05:00	51

Table 5.2: Source noise measurements for kitchen extract plant at the Star Inn

5.3 Noise Modelling

In order to determine the future noise levels across the site, the noise measurement data has been utilised to inform a noise model of the proposed development site within the SoundPLAN noise modelling software. Road traffic count information for the B2028 to the south of the site and Saxbys Lane to the north of the site has also been obtained from the Department for Transport (DfT) website. Calculations of road traffic noise have been carried out within SoundPLAN using the methodologies set out within the Technical Memorandum *'Calculation of Road Traffic Noise'* (CRTN) produced by the Department of Transport in 1988. The relationship between $L_{A10,18hr}$ (as calculated by the CRTN methodologies) and both the $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ has been defined by TRL and Casella Stanger on behalf of Defra in their report *'Method for converting the UK road traffic noise index $L_{A10,18h}$ to the EU noise indices for road noise mapping'* dated 24th January 2006 and are utilised to calculate the period noise levels. Railway noise has been added to the model using the train timetable through Lingfield Station and the methodologies set out within the Technical Memorandum *'Calculation of Railway Noise'* (CRN) produced by the Department of Transport in 1995. Plant noise from the Star Inn has been added into the model as a point source, with distance attenuation based on ISO 9613 methodologies.

The L_{Amax} has been predicted using a standard distance correction from the road, assuming a point source at the closest point of the road. MP1 is 10m from the nearest road. Receptor W is 93m from the nearest road. Receptors S and E are both 20m from the nearest road Receptor N is 120m from the nearest road.

The predicted noise levels at the worst-case façade of representative houses (as shown in **Figure 2.2**) at first floor level (which is the worst-case for all houses) is provided in **Table 5.3.**

Assessment Location	Façade	Daytime $L_{Aeq,16hr}$ (dB)	Night-time $L_{Aeq,8hr}$ (dB)	Night-time L_{Amax} (dB)
Receptor N	East	46	43	56
Receptor E	East	55	51	70
Receptor S	South West	69	55	70
Receptor W	West	53	42	58

Table 5.3: Predicted Noise Levels

6. Initial Site Risk Assessment

The initial site risk assessment has been carried out by comparing the results of the noise measurement survey against the criteria presented in **Table 4.1**. The outcome of the initial site risk assessment is presented in **Table 6.1**.

Measurement Position	Daytime Ambient Noise Level $L_{Aeq,16hr}$ (dB)	Initial Noise Risk Assessment (Daytime)	Night-time Ambient Noise Level $L_{Aeq,8hr}$ (dB)	Initial Noise Risk Assessment (Night-time)
MP1	64	Low - Medium	54	Low - Medium

Table 6.1: Initial Site Risk Assessment

The results of the initial site risk assessment based on the measured noise levels indicate that the site has a low - medium risk in terms of noise. The initial site risk assessment can therefore conclude that the site has a low - medium risk in terms of noise. The pre-application advice associated with this risk category is:

Low-Medium: '*As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an Acoustic Design Statement (ADS) which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.'*

7. Full Assessment

7.1 Good Acoustic Design

Good acoustic design has been shown by location of the majority of the properties on the site such that openable windows as primary ventilation is feasible, and where this is not possible using the building envelope and alternative ventilation to adequately protect residents from adverse impacts due to noise.

7.2 Internal Noise Level Assessment

Note 5 of **Table 4.2** suggests that internal noise levels should ideally be achieved in as many properties as possible with windows open. Due to the relatively high noise levels present at eastern and south-eastern boundaries of the site, those habitable rooms overlooking the B2028 and Station Road will not be able to achieve the requirement with windows open, and therefore the sound insulation of the building façade will be required to mitigate noise levels. We note that this does not necessitate that the windows be sealed shut but requires that an alternate primary means of ventilating the properties is provided (as defined by the Building Regulations Approved Document F). In carrying out our assessment, Syntegra have therefore made the following assumptions:

- The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.
- For houses facing or overlooking the B2028, Station Road or the Star Inn on the south-eastern, eastern and western site boundaries:
    - A typical double glazing system in a 4/12/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w.
    - Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 40 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.
- For houses and flats in northern and central parts of the development:
    - A typical double glazing system in a 4/12/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w.
    - Openable windows would be acceptable for primary ventilation.

Table 7.1 identifies the likely L_{Aeq} and L_{Amax} internal noise levels, assuming windows closed, utilising the *Simple Calculation Method* described in BS 8233:2014. It can be seen that habitable rooms at the worst affected façade on the south-eastern and eastern and western site boundaries (overlooking the B2028, Station Road and the Star Inn respectively) will achieve the requirements of the ProPG with closed windows and all other façades will achieve the requirements with open windows.

Assessment Location	Period (hrs)	External Noise Levels (dB) (ref. **Table 5.3**)	Sound Insulation of Glazing (dBA) [1]	Internal Noise Levels (dB)	Compliance with ProPG Criteria
Ambient Noise Level L_{Aeq} (dB)					
N	Daytime (0700 – 2300)	46	15	31	✓
	Night-time (2300 – 0700)	43	15	28	✓
E	Daytime (0700 – 2300)	55	34	21	✓
	Night-time (2300 – 0700)	51	34	17	✓
S	Daytime (0700 – 2300)	69	34	35	✓
	Night-time (2300 – 0700)	55	34	21	✓
W	Daytime (0700 – 2300)	53	34	38	✓
	Night-time (2300 – 0700)	42	34	8	✓
Maximum Noise Level L_{AFmax} (dB)					
N	Night-time (2300 – 0700)	56	15	41	✓
E	Night-time (2300 – 0700)	70	34	36	✓
S	Night-time (2300 – 0700)	70	34	36	✓
W	Night-time (2300 – 0700)	58	34	24	✓

Table 7.1: Internal Noise Levels

Note: (1) A glazing reduction of 15 dB denotes an open window.

7.3 External Noise Level Assessment

The site layout in **Figure 2.2** above indicates the location of the rear gardens.

The noise levels within the gardens have been predicted within the SoundPLAN noise model and are reproduced in **Table 7.2**. The predicted noise levels are also compared against the ProPG criteria (lower guideline value 50 dB $L_{Aeq,16hr}$ and higher guideline value 55 dB $L_{Aeq,16hr}$) within **Table 7.2**. It should be noted that the predictions have been carried out taking into account the noise reduction from a standard 1.8m high timber fence around the garden areas.

Assessment Location	Predicted External Noise Levels $L_{Aeq,16hr}$ (dB) (ref. Appendix 4)	Compliance with Upper Guideline Criteria	Compliance with Lower Guideline Criteria
N	41	✓	✓
E	41	✓	✓
S	49	✓	✓
W	49	✓	✓

Table 7.2: External Noise Levels

7.4 Assessment of Other Relevant Issues

The assessment has shown that a reasonable internal noise environment can be achieved, in line with the requirements of the Local Authority, BS 8233 and the ProPG through careful consideration of the building envelope and ventilation requirements. Whilst it would be ideal to achieve the internal level criteria with open windows, it is common to achieve the criteria relying on closed windows in noisier areas. Such as an approach is advocated in the PPG-Noise.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise. It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

8. Conclusion

An assessment has been carried out of the present noise climate at the **Land West of Station Road, Lingfield** and the impact of that noise on the proposed development.

The assessment is based on the results of a noise measurement survey that has been carried out over a five day period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

The initial site risk assessment identified that the site has a low-medium risk in terms of noise.

Good acoustic design has been shown by location of the majority of the properties on the site such that openable windows as primary ventilation is feasible, and where this is not possible using the building envelope and alternative ventilation to adequately protect residents from adverse impacts due to noise.

It has been identified that the requirements of the Local Authority in respect of internal noise levels can only be achieved through careful consideration of the building envelope. The construction assumptions that have led to this conclusion are:

- **The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.**
- **For houses facing or overlooking the B2028, Station Road or the Star Inn on the south-eastern, eastern and western site boundaries:**
    - **A typical double glazing system in a 4/12/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w.**
    - **Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 40 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.**
- **For houses and flats in northern and central parts of the development:**
    - **A typical double glazing system in a 4/12/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w.**
    - **Openable windows would be acceptable for primary ventilation.**

The assessment has also shown that the external noise level criteria would be achieved within all of the proposed amenity areas.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise. It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

9. Appendix 1: Glossary of Acoustic Terminology

Term	Description
'A'-Weighting	*This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.*
Decibel (dB)	*This is a tenth (deci) of a bel. The decibel can be a measure of the magnitude of sound, changes in sound level and a measure of sound insulation. Decibels are not an absolute unit of measurement but are an expression of ratio between two quantities expressed in logarithmic form.*
$L_{Aeq,T}$	*The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. T may be as short as 1 second when used to describe a single event, or as long as 24 hours when used to describe the noise climate at a specified location. $L_{Aeq,T}$ can be measured directly with an integrating sound level meter.*
L_{A10}	*The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 10 per cent of a given time and is the L_{A10T}. The L_{A10} is used to describe the levels of road traffic noise at a particular location.*
L_{A50}	*The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 50 per cent of a given time and is the L_{A50T}.*
L_{A90}	*The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time and is the L_{A90T}. The L_{A90} is used to describe the background noise levels at a particular location.*
L_{Amax}	*The 'A'-weighted maximum sound pressure level measured over a measurement period.*

10.Appendix 2: Professional Statement

David Yates

David Yates is a full member of the Institute of Acoustics (MIOA) and has over ten years' experience in acoustic consultancy. David has particular expertise in environmental noise providing acoustic consultancy for residential and mixed use planning applications, plant noise and vibration, construction noise and the design of acoustic, noise and vibration control. David is also experienced in providing sound insulation testing and design advice. David is familiar with the application of all relevant standards associated with his work, including but not limited to, BS 4142, BS 8233, BS 7445, BS 6472, BS 5228, BS 140 series, BS 16283 series and BS 717 series. David manages the acoustic department and is responsible for maintaining Syntegra's ANC membership.

11.Appendix 3: List of Equipment

Equipment Type	Manufacturer	Serial Number	Calibration Certification Number	Date of Last Calibration Check
Nor-140 Type 1 Sound Level Meter	Norsonic	1406389	TCRT21/1767	November 2021
Nor-1225 Microphone	Norsonic	225519	TCRT21/1767	November 2021
Nor-1209 Preamplifier	Norsonic	20598	TCRT21/1767	November 2021
Nor-1251 Sound Calibrator	Norsonic	35115	TCRT21/1761	November 2021
NL-52 Sound Level Meter	Rion	00264527	TCRT21/1373	June 2021
SVAN 958	Svantek	92843	*No certificate number provided*	February 2021
MK 255 Microphone	Microtech Gefell	20197	*No certificate number provided*	February 2021
SV12L Preamplifier	Svantek	106885	*No certificate number provided*	February 2021

12.Appendix 4: Detailed Noise Measurement Results

Measured Noise levels – MP1

Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
1300-1400	66	89	67	65
1400-1500	66	84	66	66
1500-1600	66	78	66	65
1600-1700	65	81	66	65
1700-1800	65	84	66	64
1800-1900	64	80	65	63
1900-2000	63	78	64	62
2000-2100	62	77	63	60
2100-2200	60	79	61	57
2200-2300	59	77	59	57
2300-0000	59	88	61	56
0700-2300	**64**	**80**	**64**	**63**
2300-0700	**59**	**88**	**61**	**56**

MP1 17/12/2021

Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	55	76	58	51
0100-0200	51	76	53	47
0200-0300	49	74	51	40
0300-0400	47	71	49	30
0400-0500	48	74	50	33
0500-0600	52	74	55	33
0600-0700	57	76	59	53
0700-0800	61	81	62	60
0800-0900	64	79	64	63
0900-1000	64	80	65	63
1000-1100	65	86	66	64
1100-1200	66	89	66	65
1200-1300	65	82	66	64
1300-1400	65	87	65	64
1400-1500	65	87	66	64
1500-1600	65	91	67	64
1600-1700	65	78	65	64
1700-1800	63	78	64	62
1800-1900	63	83	65	63
1900-2000	62	76	63	60
2000-2100	61	78	61	58
2100-2200	58	76	60	57
2200-2300	58	78	60	57
2300-0000	56	74	58	51
0700-2300	**64**	**82**	**64**	**62**
2300-0700	**53**	**74**	**54**	**42**

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Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	57	82	59	53
0100-0200	53	76	55	49
0200-0300	49	74	52	28
0300-0400	45	73	50	28
0400-0500	48	74	52	28
0500-0600	50	75	53	34
0600-0700	56	76	58	42
0700-0800	59	76	61	56
0800-0900	61	78	63	60
0900-1000	63	80	64	62
1000-1100	64	80	65	64
1100-1200	65	79	65	64
1200-1300	64	78	65	63
1300-1400	64	90	65	63
1400-1500	65	86	65	64
1500-1600	65	90	66	64
1600-1700	64	78	65	63
1700-1800	62	76	63	61
1800-1900	61	79	62	60
1900-2000	62	77	64	61
2000-2100	60	78	61	58
2100-2200	59	76	61	57
2200-2300	56	74	58	54
2300-0000	53	73	55	49
0700-2300	**63**	**80**	**63**	**61**
2300-0700	**53**	**75**	**54**	**39**

MP1 19/12/2021

Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	53	82	57	31
0100-0200	45	72	50	28
0200-0300	45	72	51	28
0300-0400	48	75	51	28
0400-0500	50	73	55	29
0500-0600	57	79	60	54
0600-0700	61	77	63	59
0700-0800	64	82	65	62
0800-0900	66	93	66	63
0900-1000	65	82	66	65
1000-1100	66	91	66	64
1100-1200	65	80	66	65
1200-1300	66	88	66	64
1300-1400	65	81	66	64
1400-1500	65	88	66	65
1500-1600	66	79	66	65
1600-1700	65	80	66	65
1700-1800	65	91	67	64
1800-1900	64	77	64	63
1900-2000	62	78	63	62
2000-2100	61	78	62	59
2100-2200	59	78	61	57
2200-2300	59	78	61	56
2300-0000	56	76	59	49
0700-2300	**64**	**83**	**65**	**63**
2300-0700	**55**	**76**	**56**	**38**

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Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	51	74	54	29
0100-0200	50	76	53	28
0200-0300	45	72	49	29
0300-0400	49	73	53	29
0400-0500	50	76	53	29
0500-0600	56	76	59	51
0600-0700	60	77	62	57
0700-0800	64	78	65	62
0800-0900	65	79	66	64
0900-1000	65	88	66	64
1000-1100	65	82	65	64
1100-1200	65	81	65	64
0700-2300	**65**	**82**	**65**	**64**
2300-0700	**54**	**75**	**55**	**36**

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Measured Noise levels – MP2

Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
1200-1300	60	95	59	48
1300-1400	51	75	53	48
1400-1500	51	74	54	48
1500-1600	51	66	53	49
1600-1700	50	71	51	48
1700-1800	50	69	52	48
1800-1900	51	74	52	47
1900-2000	50	68	53	48
2000-2100	50	67	51	48
2100-2200	49	66	51	47
2200-2300	48	64	50	46
2300-0000	45	57	47	44
0700-2300	**53**	**72**	**53**	**48**
2300-0700	**45**	**57**	**47**	**44**

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Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	47	62	49	45
0100-0200	48	66	49	46
0200-0300	45	62	46	44
0300-0400	46	59	47	44
0400-0500	45	64	46	44
0500-0600	44	57	45	44
0600-0700	47	67	49	45
0700-0800	53	80	54	47
0800-0900	50	77	52	48
0900-1000	51	73	53	49
1000-1100	51	71	53	49
1100-1200	51	69	53	49
1200-1300	51	73	53	50
1300-1400	52	69	54	49
1400-1500	51	73	52	50
1500-1600	51	69	52	49
1600-1700	51	69	52	49
1700-1800	51	69	53	49
1800-1900	49	66	50	48
1900-2000	49	64	51	48
2000-2100	48	65	49	47
2100-2200	47	62	48	45
2200-2300	44	57	45	44
2300-0000	44	64	46	44
0700-2300	**50**	**69**	**52**	**48**
2300-0700	**46**	**62**	**47**	**44**

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Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	44	51	44	43
0100-0200	43	56	44	43
0200-0300	43	62	44	43
0300-0400	43	57	43	43
0400-0500	44	57	44	43
0500-0600	44	58	44	44
0600-0700	50	67	54	44
0700-0800	51	69	55	47
0800-0900	51	73	53	47
0900-1000	50	70	51	47
1000-1100	50	67	51	47
1100-1200	49	69	51	47
1200-1300	51	77	54	47
1300-1400	51	70	53	49
1400-1500	53	72	55	49
1500-1600	50	75	52	47
1600-1700	51	73	54	47
1700-1800	49	73	52	46
1800-1900	49	68	50	46
1900-2000	50	68	52	46
2000-2100	49	68	52	46
2100-2200	47	65	50	44
2200-2300	47	66	49	44
2300-0000	46	68	47	45
0700-2300	**50**	**70**	**52**	**47**
2300-0700	**46**	**59**	**45**	**44**

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Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	44	55	44	43
0100-0200	43	54	44	43
0200-0300	43	50	43	43
0300-0400	43	48	43	43
0400-0500	43	48	43	43
0500-0600	44	53	44	44
0600-0700	48	69	50	45
0700-0800	51	80	53	46
0800-0900	52	80	55	49
0900-1000	51	73	53	48
1000-1100	51	73	54	48
1100-1200	51	70	53	48
1200-1300	49	69	50	47
1300-1400	50	70	52	48
1400-1500	53	77	57	49
1500-1600	55	84	53	47
1600-1700	48	66	50	47
1700-1800	50	68	53	47
1800-1900	48	68	49	47
1900-2000	49	69	50	46
2000-2100	50	75	50	46
2100-2200	47	75	48	45
2200-2300	45	64	45	44
2300-0000	44	64	44	44
0700-2300	**51**	**73**	**51**	**47**
2300-0700	**44**	**55**	**44**	**43**

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Time	$L_{Aeq,T}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	43	50	43	43
0100-0200	43	48	43	43
0200-0300	43	53	43	43
0300-0400	43	49	43	43
0400-0500	43	46	43	43
0500-0600	45	64	45	44
0600-0700	47	69	47	44
0700-0800	53	80	55	46
0800-0900	50	69	53	46
0900-1000	50	69	52	48
1000-1100	48	72	51	47
0700-2300	**51**	**73**	**53**	**47**
2300-0700	**44**	**54**	**44**	**43**

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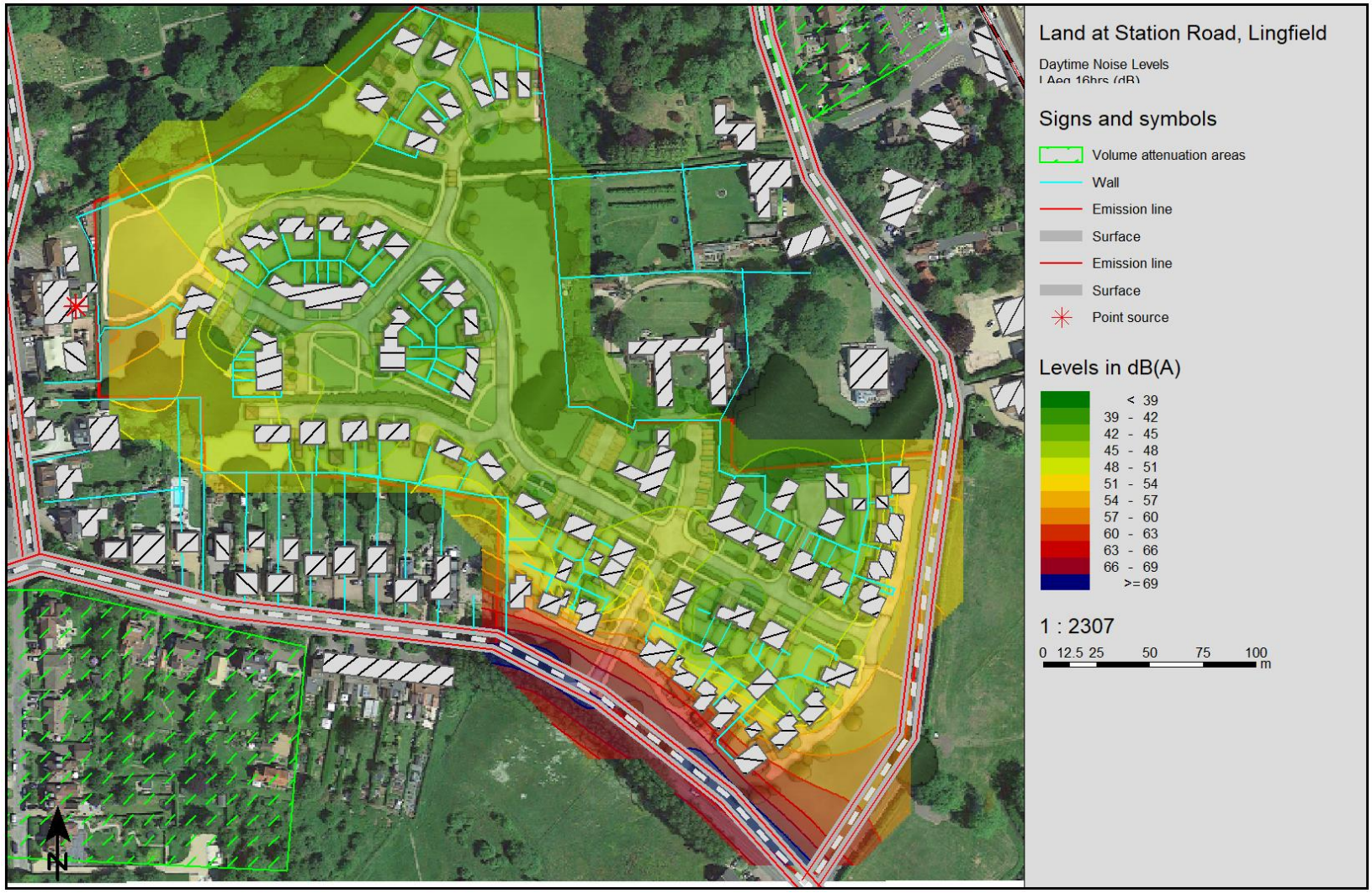
13.Appendix 5: Noise Contours across the Proposed Development Site



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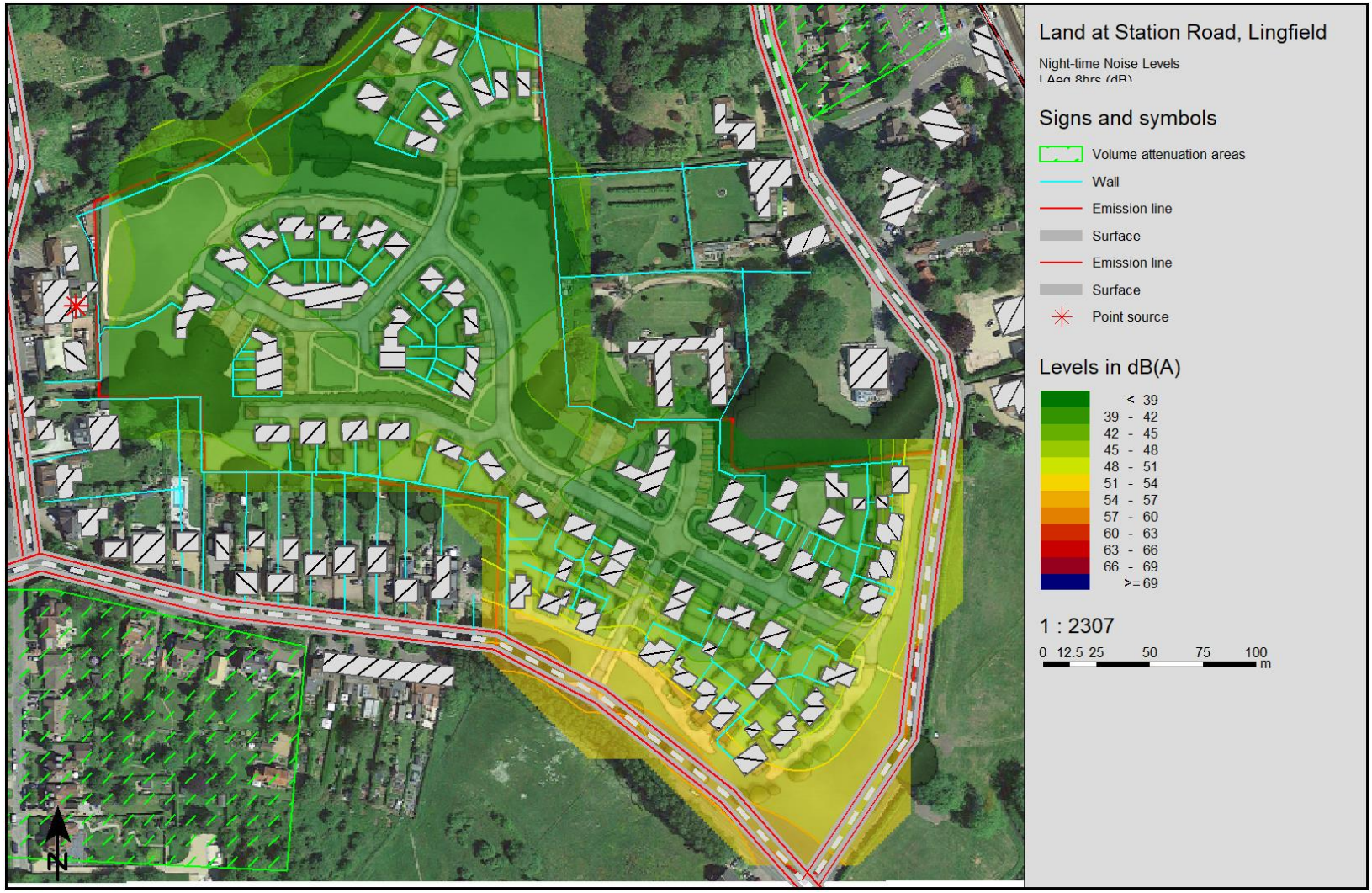

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