

NOISE IMPACT ASSESSMENT REPORT

Longwater Road, Finchampstead

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EXECUTIVE SUMMARY

RPS has carried out a noise assessment for a proposed residential development at Land off Longwater Road, Finchampstead, comprising residential dwellings.

The assessment is based on the results of a noise survey carried out on the 10th and 11th April 2024.

The dominant source of noise affecting the proposed development site is road traffic on Longwater Road (B3106). The majority of the proposed development is expected to achieve the internal and external guideline noise levels with no mitigation in place. Only those dwellings closest to and facing Longwater Road (B3106) are expected to require mitigation.

Gardens located further into the site, and away from Longwater Road (B3106), will be screened by intervening buildings, therefore the orientation of these will need less careful consideration.

During the day and night-time, windows with standard thermal glazing will be sufficient to control internal noise levels in sensitive rooms closest to Longwater Road (B3106). An alternative means of ventilation will be required so that the occupant can close the windows when desired whilst maintaining adequate ventilation.

Dwellings further into the site would be screened by intervening dwellings, therefore they will achieve the recommended internal noise levels even with open windows on every facade.

An overheating assessment has been carried out in accordance with AVO guidance. The Early Stage Overheating Risk Tool identifies that the proposed development will be at a low risk of experiencing overheating. Therefore, it was not required to consider the overheating risk at the site further.

On the basis of the above, internal and external sound levels will meet the guideline values contained within the BS8233:2014/ProPG.

The assessment has found that significant effects are unlikely to occur as a result of noise and adverse effects have been mitigated through the location of the proposed development on the site and through the use of standard building materials.

It is considered that the aims of the NPSE and NPPF have been complied with.

Therefore, our recommendation to the decision maker is:

“Planning consent may be granted subject to the inclusion of suitable noise conditions.”

Contents

EXECUTIVE SUMMARYI

1 INTRODUCTION1

1.1 Overview1

1.2 Site Proposals1

2 POLICY & GUIDANCE2

2.1 National Policy & Guidance.....2

2.2 Local Planning Policy2

2.3 EHO Consultation3

3 BASELINE SOUND SURVEY4

3.1 Site Description4

3.2 Methodology & Instrumentation4

3.3 Meteorological Conditions.....5

3.4 Results and Discussion.....5

3.5 Subjective Noise Climate5

4 SITE RISK ASSESSMENT7

4.1 Stage 1 Noise Risk Assessment7

4.2 Overheating Risk Assessment8

5 NOISE IMPACT ASSESSMENT9

5.2 BS8233 Assessment of Daytime Noise Levels in Outdoors Living Area9

5.3 BS8233 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms9

5.4 Assessment of Night-time Noise Levels in Bedrooms10

6 MITIGATION MEASURES11

6.1 External Noise Level Guidelines11

6.2 Internal Noise Level Guidelines11

6.3 Ventilation and Overheating12

6.4 Other Relevant Issues.....13

7 UNCERTAINTY15

8 CONCLUSIONS16

Tables

Table 3.1: Equipment used during the sound surveys.5

Table 3.2: Summary of Baseline Sound Level Data.....5

Table 4.1: Stage 1 Site Noise Risk Assessment Average Daytime and Night-time Noise Levels7

Table 4.2: Stage 1 Overheating Risk Assessment.....8

Table 5.1: Average Daytime Noise Levels in Outdoor Living Areas9

Table 5.2: Facade Noise Level and Level of Attenuation Required to Achieve the Internal Day-Time Noise Guideline Levels10

Table 5.3: Facade Noise Level and Level of Attenuation Required to Achieve the Internal Night-Time Noise Guideline Levels10

Table 6.3: Plant Noise Limits for Air Source Heat Pumps (ASHP).....14

Appendices

- Appendix A Personnel and Individual Qualifications
- Appendix B Proposed Development Layout
- Appendix C Measurement Locations & Site Boundary
- Appendix D Site Survey Forms
- Appendix E Time History Graphs
- Appendix F Early-Stage Overheating Risk Tool
- Appendix G Policy & Guidance used in this Assessment

1 INTRODUCTION

1.1 Overview

- 1.1.1 The Acoustics team of RPS Planning and Environment (RPS) has been appointed by Catesby Strategic Land Ltd and Stonebond Properties (Guildford) Ltd to provide a noise impact assessment report for a proposed residential development on land east of Longwater Road, Finchampstead, RG40 3TS.
- 1.1.2 The site is located within the administrative area of Wokingham Borough Council (WBC).
- 1.1.3 The assessment has been undertaken based upon information provided by the project team.
- 1.1.4 This report provides details of a baseline sound survey which commenced at 12:15 hours on Wednesday 10th April and concluded at 12:30 hours on Thursday 11th April 2024. The sound survey was undertaken at the site to quantify the local noise climate and the sound levels incident upon the proposed dwellings and in proposed garden areas. A noise impact assessment of road traffic noise has been carried out and mitigation measures have been identified to ensure that internal and external amenity noise levels meet the relevant local and national noise policy aims / requirements.
- 1.1.5 RPS is a member of the Association of Noise Consultants (ANC), the representative body for acoustics consultancies, having demonstrated the necessary professional and technical competence. The assessment has been undertaken with integrity, objectivity and honesty in accordance with the Code of Conduct of the Institute of Acoustics (IOA) and ethically, professionally and lawfully in accordance with the Code of Ethics of the ANC.
- 1.1.6 The technical content of this assessment has been provided by RPS personnel, all of whom are corporate (MIOA) members or non-corporate associate members (AMIOA) of the IOA (the UK's professional body for those working in acoustics, noise and vibration). This report has been peer reviewed within the RPS team to ensure that it is technically robust and meets the requirements of our Integrated Management System. Qualifications of all RPS personnel involved in the creation of this document can be found Appendix A.
- 1.1.7 This assessment has been undertaken to accompany an outline planning application submission to WBC.

1.2 Site Proposals

- 1.2.1 The site is proposed for the erection of 40no. dwellings (Use Class C3), together with associated outdoor space and landscaping, drainage infrastructure, hard and soft landscaping, parking, access, and associated works.
- 1.2.2 A layout plan of the proposed development (Thrive Architects Site Layout Drawing¹) can be found in Appendix B.

¹ Thrive Architects Site Layout Project Name: Land at Longwater Road, Finchampstead. Job Number: CATE230603, Drawing Number: SL01, Rev: P1, Dated: 26/03/2024.

2 POLICY & GUIDANCE

2.1 National Policy & Guidance

- 2.1.1 The noise assessment will take into account the following guidance and legislation:
- National Planning Policy Framework, 2023 (NPPF)
 - Noise Policy Statement for England, 2010 (NPSE)
 - Planning Practice Guidance – Noise, 2019 (PPG)
 - British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS8233)
 - British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142)
 - Professional Practice Guidance on Planning and Noise, 2017 (ProPG)
 - Association of Noise Consultants: Acoustics, Ventilation, and Overheating Design Guide, 2021 (AVO)
- 2.1.2 Full details of guidance and legislation stated above can be found in Appendix G.

2.2 Local Planning Policy

Wokingham Borough Core Strategy Development Plan

- 2.2.1 The Wokingham Borough Core Strategy Development Plan (Adopted – 29 January 2010) [i] sets out the vision for how the borough of Wokingham will develop in the period to 2026 and how the council aims to protect and enhance the good quality of life enjoyed in the borough.
- 2.2.2 Core Policy 1 of the document is detailed below:

“CP1 – Sustainable development Planning permission will be granted for development proposals that:

...

8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers;

...”

Finchampstead Neighbourhood Development Plan 2022-2038

- 2.2.3 Neighbourhood Development Plans ensure that local communities are closely involved in the decisions which affect them.
- 2.2.4 The Finchampstead Neighbourhood Development Plan 2022-2038 [ii] (FNDP) has been developed to establish a guiding vision for the parish and to help deliver the local community’s aspirations and needs for the plan period 2022 – 2036.
- 2.2.5 The plan is a statutory document that will be incorporated into the Borough development plan and will be used by Wokingham Borough Council (WBC) alongside other policies and guidance to determine planning applications.
- 2.2.6 Policy GA1 of the document is detailed below:

“Policy GA1 - Improve environment and health from traffic pollution

As appropriate to their scale, nature and location development proposals should:

...

7. Demonstrate effective planning to mitigate noise and air pollution from traffic.”

2.2.7 Policy LPU/DH2 of the document is detailed below:

“LPU/DH2: Safeguarding amenity

1. Development proposals should not cause by themselves, or cumulatively with other existing or proposed development, a detrimental impact on the amenity of existing properties or unacceptable living conditions for new occupiers in terms of:

...

d. Noise and disturbance.

...”

3. Where an otherwise acceptable development could change its character to a use that would have a greater impact on amenity without needing planning permission, conditions will be applied to restrict such changes.”

Local Policy Conclusion

2.2.8 The policy and guidance outlined in section 2.1 of this assessment is considered to be consistent with the requirements of the Local Plan. Therefore, this assessment has been undertaken in accordance with policy and guidance listed in paragraph 2.1.1.

2.3 EHO Consultation

2.3.1 Consultation with the EHO was undertaken via email on the Monday 8th April 2024. The email detailed our methodology for this assessment.

2.3.2 A reply was received from Mr Chris Christofis on Monday 8th April 2024. The response is shown below:

‘That seems fine to me, the monitoring locations are appropriate, LT3 location is likely to be a low background as it is just fields as far as I can tell. But all good.

Look forward to the report, only thing worth a mention is if any ASHP are proposed, we like those included in the assessment please. We prefer that any tonal plant achieves 5dB below background at the receptors if possible (caters for any uncertainty), but will accept MCG scheme assessment criteria if presented. I don’t envisage any major problems with that location.’

3 BASELINE SOUND SURVEY

3.1 Site Description

- 3.1.1 The proposed development is located on land to the east of Longwater Road, Finchampstead, RG40 3TS.
- 3.1.2 The land is currently used as farmland with public footpaths boarding it, as such it is currently grass covered and surrounded by trees and vegetation.
- 3.1.3 On the western boundary of the proposed development, running north to south of site, is Longwater Road (B3016) and is approximately 15 m from the proposed development.
- 3.1.4 A review of aerial mapping and photography identifies that there is a commercial premises, in the form of CEMEX Eversley Quarry & Landfill approximately 55 m to the southeast of site boundary. However, site observations suggest that the quarry operations have ceased and the site restored with features including footpaths, ponds, waterways and grassland. Also, a sewage treatment plant is situated approximately 315 m south of the development site.
- 3.1.5 Residential dwellings are located approximately 10 m to the north of the proposed development.
- 3.1.6 Appendix C illustrates the measurement locations and proposed development boundary.

3.2 Methodology & Instrumentation

- 3.2.1 An unattended baseline sound survey was undertaken at the site to quantify the existing local sound climate. The survey commenced at 12:15 hours on Wednesday 10th April 2024 and concluded at 12:30 hours on Thursday 11th April 2024.
- 3.2.2 Continuous noise measurements were undertaken at two locations, identified as 'LT1' and 'LT2' and described in full below:
 - LT1 – Free-field measurement position at a height of 1.5 m, on soft ground, on the western boundary of the proposed development, approximately 15 m from the Longwater Road (B3016).
 - LT2 – Free-field measurement position at a height of 1.5 m, on soft ground, on the southeastern boundary of the proposed development, approximately 55 m from land of CEMEX Eversley Quarry & Landfill.
- 3.2.3 All measurement positions were selected prior to the site visit to capture the baseline sound levels incident upon the proposed development. LT1 was chosen to capture road traffic noise from Longwater Road (B3016), and LT2 chosen to capture the potential industrial noise source (CEMEX Eversley Quarry & Landfill).
- 3.2.4 All sound level measurements were made using 'Class 1' Rion NL-52 sound level meters (SLM). The SLMs were set up to log the A-weighted broadband sound pressure level (SPL) in 100 ms periods. Measurements of the L_{Aeq} , L_{Amax} , and L_{A90} were undertaken at 100 ms intervals and averaged over 15-minute periods for the duration of the survey.
- 3.2.5 The equipment listed in
- 3.2.6 Table 3.1 below was used to undertake the survey:

Table 3.1: Equipment used during the sound surveys.

Measurement Location	Make / Model	Serial Number	Calibration Ref / Start / End	Last Calibration Date
LT1	Rion-NL-52	998567	94.0 / 93.9 / 93.9	18/03/2024
LT2	Rion-NL-52	998566	94.0 / 94.0 / 94.0	15/03/2024
Calibrator	Rion NC-74	34472822	N/A	27/09/2022

3.2.7 Site Survey Sheets can be found as Appendix D.

3.3 Meteorological Conditions

3.3.1 Meteorological conditions were monitored for the duration of the survey period using an RPS weather station, deployed at position LT1. The weather data is presented alongside the time history graphs in Appendix E, with addition to the Site Survey Sheets found in Appendix D.

3.3.2 During the survey period there were no rain events, with wind speeds remaining less than 3 m/s throughout the survey period.

3.3.3 Therefore, all of the noise data captured during the survey period is considered to be appropriate for the assessment.

3.4 Results and Discussion

3.4.1 The day and night-time levels measured at each position are presented in Table 3.2 below.

Table 3.2: Summary of Baseline Sound Level Data

Location	Daytime (07:00 – 23:00)		Night-time (23:00 – 07:00)			
	Ambient Sound Level, dB $L_{Aeq,T}$	Background Sound Levels, dB $L_{A90,T}$	Ambient Sound Level, dB $L_{Aeq,T}$	Maximum Sound Level*, dB L_{AFmax}	10 th Highest Per Night**, dB L_{AFmax}	Background Sound Levels, dB $L_{A90,T}$
LT1	58	44	51	74	72	27
LT2	48	40	41	70	64	26

NOTE:

* This is the maximum measured L_{AFmax} noise levels during the relevant survey period

** This has been calculated using 1-minute measurement periods.

3.4.2 The results of the unattended sound survey are presented graphically in Appendix E.

3.4.3 The measured data was post-processed into 15-minute periods for all locations.

3.4.4 The measured L_{Amax} levels were processed to 1-minute periods to allow for assessment of individual noise night-time noise events.

3.5 Subjective Noise Climate

- 3.5.1 Whilst deploying and collecting the monitoring equipment, the sound climate in the western part of the site was judged to be dominated by road traffic noise from movements on Longwater Road (B3016). Other noise sources included natural sounds such as wind in trees and bird song.
- 3.5.2 It was noted that the quarry to the south had been restored and was not in use at the time of the survey, therefore no commercial noise observed. The operative describes the area as 'a nature reserve', with pathways and area dedicated for nature, including ponds, grassland and waterways. This area is not open to the public.
- 3.5.3 Observations were taken along the public footpath to the south which runs parallel to the sewage treatment works. It was also noted that the sewage treatment works although audible when in close proximity on the footpath, this noise source was not audible on site.

4 SITE RISK ASSESSMENT

4.1 Stage 1 Noise Risk Assessment

4.1.1 Following the baseline assessment and survey it is necessary to undertake a preliminary assessment of the noise at the development site. the first stage of the ProPG assessment is to carry out a Stage 1 risk assessment.

4.1.2 A Stage 1 risk assessment gives a broad overview of the site suitability for residential development and determines the required level of detail for the Stage 2 risk assessment (including whether one is required at all).

Risk Levels

4.1.3 When assessed against the ProPG initial risk assessment guidance (reproduced in Appendix G), properties in the western part of the site, facing Longwater Road (B3016) are likely to be exposed to noise levels in the range of 'medium to low risk' category, with the remainder of the development site falling into the 'low to negligible risk' category.

4.1.4 Additionally, as there are more than 10 individual $L_{AF\ Max}$ events which exceed 60dB at LT1. Therefore, noise levels at the site cannot be considered to be negligible.

4.1.5 Table 4.1 below details the stage 1 Site Noise Risk Assessment at both measurement locations.

Table 4.1: Stage 1 Site Noise Risk Assessment Average Daytime and Night-time Noise Levels

Risk Assessment Location	Average Daytime Noise Level (dB $L_{Aeq,16hr}$)	Daytime Risk of Adverse Effect	Average Night-time Noise Level (dB $L_{Aeq, 8hr}$)	Night-time Risk of Adverse Effect
LT1	58	Low	51	Medium/Low
LT2	48	Negligible	41	Low/Negligible

4.1.6 Therefore, it has been determined that a Stage 2 risk assessment is still required according to the guidance in ProPG as outlined below:

“Medium to Low Risk

At low noise levels, the site is likely to 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.

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.”

4.1.7 The Site Noise Risk Assessment (SNRA) shows that good acoustic design will be required for the proposed development, to ensure that the potential risk of the noise impact is minimised, and guideline internal and external noise levels are achieved.

4.1.8 In accordance with ProPG:2017, a Stage 2 full noise assessment is required to ensure future residents close to the road are protected and good acoustic design has been implemented.

4.2 Overheating Risk Assessment

- 4.2.1 In accordance with the AVO guide, an Overheating Risk Assessment (ORA) has been carried out. The ORA assesses initial risk of overheating, caused by the need to mitigate against noise generated by nearby transportation sources, based on the noise levels at the development site.
- 4.2.2 The daytime ($L_{Aeq\ 16hr}$) and night-time ($L_{Aeq\ 8hr}$) noise levels measured at LT1 and LT2 have been compared to the information provided in Table 3-2 of AVO. The results of the assessment are shown in Table 4.2.

Table 4.2: Stage 1 Overheating Risk Assessment

Risk Assessment Location	Average Daytime Noise Level ($dB\ L_{Aeq\ 16hr}$)	Daytime Risk of Overheating	Average Night-time Noise Level ($dB\ L_{Aeq\ 8hr}$)	Night-time Maximum Noise Level ($dB\ L_{Amax}$)	Night-time Risk of Overheating
LT1	58	Medium	51	74	Medium
LT2	48	Negligible	41	70	Negligible

- 4.2.3 Table 4.2 indicates that during the daytime and night-time periods, proposed receptors located to the western part of the development, adjacent to Longwater Road (B3016), would be at a medium risk of experiencing overheating due to the likely acoustic design measures which would be required to achieve the recommended internal noise levels.
- 4.2.4 Proposed receptors further away from the western site boundary, and screened by intervening dwellings, are expected to experience lower noise levels, therefore will be at a Negligible risk of overheating, due to the likely acoustic design measures.
- 4.2.5 The ORA shows that good acoustic design will be required for proposed receptors adjacent to Longwater Road (B3106), to ensure that the risk of overheating is minimised and that guideline internal noise levels are achieved.
- 4.2.6 The overheating risk has been assessed with the use of the Good Homes Alliance Early-Stage Overheating Risk Tool, taking into account the location of the site, as well as the noise sources affecting the proposed development.
- 4.2.7 The Early-Stage Overheating Tool is shown in Appendix F. This indicates that the proposed development is at a low risk of experiencing overheating.
- 4.2.8 Therefore, a further Stage 2 AVO overheating assessment is not considered to be necessary.

5 NOISE IMPACT ASSESSMENT

- 5.1.1 The results of the ProPG:2017 Stage 1: Initial Site Noise Risk Assessment show that the proposed dwellings closest to Longwater Road (B3106) are at a medium risk of experiencing an adverse noise impact due to road traffic during the daytime and night-time periods.
- 5.1.2 Therefore, this section details the likely mitigation measures necessary to reduce this risk at proposed dwellings.

5.2 BS8233 Assessment of Daytime Noise Levels in Outdoors Living Area

- 5.2.1 The measured daytime noise levels, as detailed in Table 3.2, have been used to determine the noise levels likely in outdoor living areas of proposed dwellings in the vicinity of the noise sources during the daytime period.
- 5.2.2 Table 5.1 summarises the measured noise level and the attenuation required to achieve the noise upper guideline value of 55 dB $L_{Aeq, 16hr}$ as set-out in BS8233, during the daytime in outdoor living areas.

Table 5.1: Average Daytime Noise Levels in Outdoor Living Areas

Representative Monitoring Location	Measured Noise Level (dB $L_{Aeq, 16hr}$)	Distance from Longwater Road to LT1 / Longwater Road to External Amenity	Distance Corrected Noise Level	Level of Attenuation Needed to Achieve 55dB $L_{Aeq, 16hr}$ in Outdoor Living Areas
LT1	58	17 / 32	55	0
LT2	48	N/A	48	-7

- 5.2.3 As shown in Table 5.1 gardens located near the traffic sources are going to meet upper guidelines limit of 55dB $L_{Aeq, 16hr}$ when taking into consideration the standoff distance of 30m for Longwater Road. The gardens are located behind the proposed buildings which will provide additional attenuation. Additionally, close boarded garden fences are likely to be installed at each plot boundary line which will further reduce the noise levels in external amenity areas.
- 5.2.4 Gardens located further into the development would be screened by development massing, therefore, are likely to achieve the external lower desirable noise guideline value of 50 dB $L_{Aeq, 16hr}$ as set out in BS8233 without the need for mitigation.

5.3 BS8233 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

- 5.3.1 The daytime noise levels in noise sensitive rooms of the proposed dwellings have been assessed in accordance with BS8233 for living room and bedroom areas. The daytime noise guideline level within living rooms and bedrooms is 35 dB $L_{Aeq, 16hr}$.
- 5.3.2 The calculated daytime noise levels have been used to determine the noise levels likely at facades of the dwellings during the daytime period.
- 5.3.3 Before internal noise levels can be calculated, 3 dB(A) must be added to the free-field measured levels to allow for the reflection of noise from the proposed facades when the buildings are in place. Additionally, distance correction has been accounted for plot 1 and plot 22.

- 5.3.4 The calculated noise levels at the facades of the proposed dwellings, together with the level of attenuation required to achieve 35 dB $L_{Aeq\ 16hr}$ in living rooms and bedrooms is summarised in Table 5.2

Table 5.2: Facade Noise Level and Level of Attenuation Required to Achieve the Internal Day-Time Noise Guideline Levels

Plot Number	Noise Level at the Façade of the Property (dB $L_{Aeq\ 16hr}$)	Level of Attenuation Needed to Achieve the Noise Guideline Levels in Bedrooms (dBA)
23, 24, 25	61	26
1, 22	58	23
Rest of dwellings	51	16

- 5.3.5 Dwellings located further into the development, are screened from nearby roads by intervening buildings will experience lower noise levels than those shown in Table 5.2 above and therefore a reduced level of noise attenuation will be required.

- 5.3.6 Mitigation is discussed in Section 6 of this report.

5.4 Assessment of Night-time Noise Levels in Bedrooms

- 5.4.1 The night-time noise levels in noise sensitive rooms of the proposed dwellings have been assessed in accordance with BS8233 and ProPG for bedroom areas. The guideline noise level within bedroom areas is 30 dB $L_{Aeq\ 8hour}$. In addition, individual noise events should not normally exceed 45 dB L_{Amax} .
- 5.4.2 The calculated night-time noise levels have been used to determine the noise levels likely at the facades of the dwellings during the night-time period.
- 5.4.3 Before internal noise levels can be calculated, 3 dB(A) must be added to the free-field measured levels to allow for the reflection of noise from the proposed facades when the dwellings are in place.
- 5.4.4 The measured noise levels at the facades of the proposed dwellings, together with the level of attenuation required to achieve 30 dB L_{Aeq} and 45 dB L_{Amax} in the bedrooms, are summarised in Table 5.3.

Table 5.3: Facade Noise Level and Level of Attenuation Required to Achieve the Internal Night-Time Noise Guideline Levels

Plot Number	Noise Level at the Façade of the Property (dB $L_{Aeq\ 8hr}$)	Maximum Noise Level at the Façade of the Property (dB L_{Amax})	Level of Attenuation Needed to Achieve the Noise Guideline Levels in Bedrooms (dBA)
23, 24, 25	54	75	30
1, 22	51	72	27
Rest of dwellings	44	67	22

- 5.4.5 The results indicate that noise sensitive rooms, nearest to the western boundary, closest to and facing B3106, will require up to 30 dB mitigation to minimise the impact of road traffic noise during the nighttime period. Mitigation is discussed in Section 6 of this report.

- 5.4.6 The facades further into the site will be screened by intervening buildings. It is considered that the levels of attenuation required will be similar as detailed as LT2 in Table 5.3.

6 MITIGATION MEASURES

6.1 External Noise Level Guidelines

- 6.1.1 As discussed in Section 5, the noise levels in proposed external amenity areas are likely to achieve the external lower desirable noise guideline value of 50 dB $L_{Aeq,16hr}$ as set out in BS8233 without the need for mitigation.
- 6.1.2 However, further mitigation should be considered to reduce noise levels in the external amenity areas in the most exposed gardens, which are predicted to meet the upper guidelines limit of 55dB $L_{Aeq,16hr}$, such as the installation of 1.8m close boarded garden fences along each plot boundary.

6.2 Internal Noise Level Guidelines

- 6.2.1 This section of the report examines how the internal noise level guidelines (INLGs) of the ProPG can be met. The ProPG INLGs are based on BS 8233:2014 (provided in Appendix A) and by meeting these criteria it is generally agreed that adverse noise effects will be avoided.
- 6.2.2 To achieve the ProPG INLGs, the building facade can be designed to provide the level of attenuation required. Section **Error! Reference source not found.** and **Error! Reference source not found.** of this report have identified that the building façades in the most exposed sections of site need to achieve acoustic attenuation of 30 dB (outside to inside) to meet the ProPG / BS 8233:2014 INLGs. The building façade needs to provide 30 dB $R_w + C_{tr}$ sound insulation to meet the ProPG INLGs.
- 6.2.3 It has been assumed that the glazing to noise sensitive rooms would comprise approximately 25% of the facade area. To calculate the overall attenuation provided by this percentage of glazing in a brick or block facade, a non-uniform partition calculation can be used at a later design stage.
- 6.2.4 The assessment has shown that noise guideline levels will not be achieved in noise sensitive with windows open. This is typical of any residential development near a source of noise.
- 6.2.5 Therefore, some of these windows will need to be kept closed to achieve internal noise guideline levels.
- 6.2.6 Noise sensitive rooms near Longwater Road will achieve noise guideline levels with 10/12/4 double glazing with windows closed. The sensitive rooms located further away from the road will achieve noise guideline levels with 4/12/4 double glazing with windows closed. During times where windows need to be closed to achieve acceptable noise levels, an alternative means of ventilation will be required. At this stage of the design the ventilation strategy for the project has not been confirmed. Therefore, for this assessment it has been assumed that ventilation would be provided via in frame trickle vents within at each window. This will ensure that noise guideline levels are met as a minimum, whilst ventilation is also provided (Building Regulations Part F (ADF) assessment should be undertaken to confirm the required ventilation area and thus number and type of vents).

Table 6.1: Glazing & Ventilation Sound Reduction Data

Plot Number	Glazing & ventilation	Frequency (Hz)								
		31.5	63	125	250	500	1000	2000	4000	8000
23, 24, 25	Glazing 10/12/4	14	20	26	27	34	40	38	46	46
	2x Greenwood 5000EAW.AC1	30	30	42	40	36	48	53	56	56
1, 22	Glazing 10/12/4	14	20	26	27	34	40	38	46	46
	2x Greenwood 5000EAW.AC1	30	30	42	40	36	48	53	56	56

Rest of dwellings	Glazing 4/12/4	12	18	24	20	25	23	29	35	35
	2x Greenwood 5000EAW.AC1	30	30	42	40	36	48	53	56	56

6.3 Ventilation and Overheating

- 6.3.1 It is a requirement that of Building Regulations ADF that the following types of ventilation are provided in dwellings:
- whole dwelling ventilation (previously referred to as ‘background’ ventilation);
 - extract ventilation (in kitchens and bathrooms); and
 - purge ventilation.
- 6.3.2 Dwellings should also be designed to avoid overheating (this is normally achieved by using open windows). Overheating is now covered by the Building Regulations Approved Document O (ADO).
- 6.3.3 The likely acoustic impact of each type of ventilation and mitigating overheating is discussed in the following sections.

Whole Dwelling Ventilation

- 6.3.4 If façade openings (such as trickle ventilators) are used to provide the minimum ‘whole dwelling’ ventilation rates under Building Regulations Part F, they should not increase internal noise levels above the INLG values when in their open position. In the most exposed sections of the development, by using ventilation openings that provide approximately 34 dB $D_{n,e,w}$ ² the ProPG internal noise criteria are likely to be met. This level of performance can be achieved using an acoustically attenuated trickle ventilator (e.g. Greenwood 5000EAW.AC1, or similar).
- 6.3.5 Where dwellings overlook the Longwater Road, a higher sound insulation performance of 46 dB $D_{n,e,w}$ is required for ventilation openings. This can be achieved using a high-performance acoustic ventilation opening, such as a through-wall system or high-performance trickle ventilator (e.g. Greenwood 5000EAW.AC1, or similar).
- 6.3.6 At this stage of the design the ventilation strategy for the project has not been confirmed. Therefore, it may be that a mechanical ventilation and heat recovery system (MVHR) type solution might be implemented in some or all dwellings. Should this be the case, passive façade openings (such as trickle vents) will not be required. MVHR system’s intake and exhausts are ducted to the façade and the systems themselves inherently provide a higher level of sound insulation than trickle vents and therefore significant noise intrusion via this type of system is considered very unlikely. If required, intakes and exhausts can be attenuated but this is only normally required on developments subject to very high noise levels and is unlikely to be the case for this site.

² The above performance specification assumes that only one ventilation opening is required. Should more than one ventilation opening be required in a space to meet the requirements of Approved Document F (equivalent area requirements), the required acoustic performance in terms of $D_{n,e,w}$ will need to be increased by + 10 log N, where N is the number of vents required. For example, if two vents are required to provide sufficient equivalent area the performance of each vent will need to be increased by 3 dB.

Extract Ventilation

- 6.3.7 Extract ventilation is required in rooms where most pollutants or water vapour are generated i.e., kitchens (e.g. cooker hoods) and bathrooms (e.g. bathroom fans). These spaces are not considered habitable rooms and the method used to provide ventilation is unlikely to reduce the sound insulation of the façade, as extract ventilation is provided mechanically. Therefore, it is unlikely that providing extract ventilation in these spaces will result in adverse noise impacts.

Purge Ventilation

- 6.3.8 Purge ventilation is required to allow rapid removal of pollutants released from occasional activities (e.g. burning the toast or when painting) and is normally provided by open windows. It is generally accepted that as purge ventilation is only required occasionally and for short periods, therefore increases in noise level during the purge ventilation condition (e.g. when windows are opened) will not result in adverse noise impacts.
- 6.3.9 In summary, the above paragraphs show that the ventilation requirements of the Building Regulations can be provided using standard design solutions, whilst still meeting the ProPG / BS 8233:2014 internal noise level criteria.

Overheating

- 6.3.10 The normal method of providing relief from overheating is to open windows. When windows are open to provide thermal comfort, it is likely that internal noise levels will increase. The impact that any increased internal noise levels will have will depend on two factors:
- the level of noise inside the dwelling / habitable rooms; and
 - how often windows need to be opened (i.e., how often / long occupants are exposed to increased noise levels).
- 6.3.11 To reduce any adverse noise impacts the proposed dwellings, where possible, should be designed to reduce both the duration of and how often windows are required to be opened to remove excess heat (i.e. avoid overheating). This will in turn reduce adverse noise effects, as occupants will be exposed to increased noise levels for a shorter period of time.
- 6.3.12 At this stage of the design information relating to if and how often the proposed dwellings are likely to overheat is not available. It is therefore not possible at this stage to identify potential noise impacts as a result of windows being opened to provide relief from overheating.
- 6.3.13 The guideline noise levels in ADO for a bedroom are, 40 dB $L_{Aeq, 8 \text{ hour}}$ and 45 dB $L_{A_{f, \text{max}}}$ (night-time only) outside, and it must be noted that during an overheating condition, the window may be open fully. A fully open window is understood to provide around 9dB attenuation. Most of the development would not be at risk of elevated sound levels during overheating conditions such as dwellings located further away from Longwater Road. However, dwellings located close to Longwater Road could exceed the values stated in ADO.
- 6.3.14 Therefore, dwellings facing Longwater Road will need further consideration in terms of overheating. It is possible that these plots will likely require alternative cooling systems, however, this should be verified by a mechanical and electrical engineer.

6.4 Other Relevant Issues

Air Source Heat Pumps Limiting Level

- 6.4.1 Consultation with the LPA, as detailed in Section 2.3 of this report, requested that limiting levels be suggested for the use of Air Source Heat Pumps (ASHP) in this development.

6.4.2 The LPA requested that:

“any tonal plant achieves 5dB below background at the receptors if possible (caters for any uncertainty)”

6.4.3 Table 3.2 reports the measured L_{A90} background levels at positions LT1 and LT2

6.4.4 Table 6.1 below details the calculated limiting levels for ASHPs used within the development.

Table 6.1: Plant Noise Limits for Air Source Heat Pumps (ASHP)

Representative Monitoring Location	Time Period	ASHP Limiting Level at NSR (dBA)
LT1	Day	39
	Night	22
LT2	Day	35
	Night	21

6.4.5 The plant noise limits in Table 6.1 are based on background (L_{90}) noise levels measured on site during the April 2024 noise survey.

Occupants of the Development

6.4.6 Element 4(iii) of the ProPG brings attention to the likely occupants of the development, and states:

“LPAs should bear in mind the extent to which occupants are likely to be able to exercise choice about living with the acoustic conditions in and around the proposed residential development. In addition, certain groups such as families with young children, students and the elderly may all have different requirements and sensitivities as regards to acoustic conditions and, in particular, varying needs for access.”

6.4.7 The development is proposed to contain normal residential type accommodation. Although it is possible that people more vulnerable to noise may live in the new dwellings, the development is not considered to be any more sensitive to noise than other standard residential development.

6.4.8 It has also been shown that adverse impacts as a result of noise are unlikely to occur in the proposed development with the proposed mitigation measures in place. In particular, internal sound levels are likely to be below the LOAEL as defined in PPG-N. External sound levels are likely to be below LOAEL for the majority of the development with plots located close to Longwater Road will be above LOAEL but below SOAEL as defined in PPG-N.

7 UNCERTAINTY

- 7.1 All noise assessments include a measure of uncertainty. Wherever possible, good practice measurement techniques and worst-case assumptions have been employed to reduce the possibility that noise impacts are under-estimated.
- 7.2 The noise measurement data used in this assessment was collected in the early stage of 2024 and are deemed to be representative of those occurring on the site.
- 7.3 The prediction of internal and external ambient noise levels is based on measured $L_{Aeq,T}$ and $L_{Amax,F}$ data from the sound survey. The internal noise level assessment has been carried out based on the worst-case, most exposed facades comprised of entirely standard glass windows. As such, the façades will likely provide improved sound reduction, and the majority of the site will also experience lower sound levels at the relevant façades. Even using the worst-case assumptions, the internal noise levels in BS 8233:2014 are comfortably met with windows closed and as such this methodology provides a margin to account for any calculation uncertainty.
- 7.4 Although all noise assessments contain some uncertainty, it is not believed that the uncertainty associated with this assessment would significantly alter the findings and recommendations of this report.

8 CONCLUSIONS

- 8.1 RPS has carried out a noise assessment for the proposed residential development located at land off Longwater Road, Finchampstead. The assessment has been undertaken in accordance with National Planning Policy Framework, 2023 (NPPF), Noise Policy Statement for England, 2010 (NPSE), Planning Practice Guidance – Noise, 2019 (PPG), British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS8233), Professional Practice Guidance on Planning and Noise, 2017 (ProPG) and Association of Noise Consultants: Acoustics, Ventilation, and Overheating Design Guide, 2021 (AVO)
- 8.2 A baseline sound survey, which commenced at 12:15 hours on Wednesday 10th April and concluded at 12:30 hours on Thursday 11th April 2024, was undertaken at the site to quantify the local noise climate and the sound levels incident upon the proposed dwellings and in proposed garden areas
- 8.3 The survey found that the dominant noise source, which will potentially affect the residents of the proposed residential development, is road traffic on Longwater Road (B3106).
- 8.4 The results of the noise survey and assessment indicate that to meet the guideline value of 55dB $L_{Aeq\ 16\ Hour}$ in outdoor living areas, up to 3 dB mitigation should be provided for those gardens located closest to Longwater Road (B3106), in the western part of the development.
- 8.5 Gardens should be located on the screened sides of dwellings which lie closest to Longwater Road (B3106). In addition, localised close boarded fencing should be provided around gardens nearest to the road. The height and location of the fencing can be determined during the detailed design stage of the application.
- 8.6 Gardens located further into the site, and away from Longwater Road (B3106), will be screened by intervening buildings, therefore the orientation of these will need less careful consideration.
- 8.7 During the day and night-time, windows with standard thermal glazing will be sufficient to control internal noise levels in sensitive rooms closest to Longwater Road (B3106). An alternative means of ventilation will be required so that the occupant can close the windows when desired whilst maintaining adequate ventilation.
- 8.8 Dwellings further into the site would be screened by intervening dwellings, therefore they will achieve the recommended internal noise levels even with open windows on every facade.
- 8.9 An overheating assessment has been carried out in accordance with AVO guidance. The Early Stage Overheating Risk Tool identifies that the proposed development will be at a low risk of experiencing overheating. Therefore, it was not required to consider the overheating risk at the site further.
- 8.10 On the basis of the above, internal and external sound levels will meet the guideline values contained within the BS8233:2014/ProPG.
- 8.11 The assessment has found that significant effects are unlikely to occur as a result of noise and adverse effects have been mitigated through the location of the proposed development on the site and through the use of standard building materials.
- 8.12 It is considered that the aims of the NPSE and NPPF have been complied with.
- 8.13 Therefore, our recommendation to the decision maker is:

“Planning consent may be granted subject to the inclusion of suitable noise conditions.”



APPENDICES

Appendix A

Personnel and Individual Qualifications

Stephen Hale – Consultant – Acoustics

BSc (Hons) Sound Engineering, Member of the Institute of Acoustics

Stephen is an Acoustic Consultant and Sound Insulation specialist with over seven years' experience. He has a First-Class Bachelor of Science Degree in Sound Engineering and also has an Institute of Acoustics Certificate of Confidence in Environmental Noise Measurement. He has been a member of the IOA since 2016.

Stephen joined RPS in 2021, he has project managed and undertaken noise assessments for a variety of developments, including: large scale mixed-use developments, incorporating commercial, retail, leisure and residential elements; energy from waste facilities; manufacturing facilities; distribution centres; retail units; minerals extraction and exploration; solar farms; and petrol service filling stations. He has provided input into Environmental Impact Assessments (EIAs) and undertaken noise assessments to support planning applications and discharge planning conditions. He has a Continuous Professional Development (CPD) Record to support this competency and experience.

Stephen has been involved BS 4142 noise assessments for both the previous and current 2014 version of BS 4142. He is familiar with the Standard and has attended RPS CPD training seminars regarding the revised 2014 version of the Standard. On the basis of Stephen's overall experience in acoustics, combined with particular focus on BS 4142 and with the assistance of more experienced colleagues, he is deemed competent for BS 4142 assessments.

For this project Stephen has taken on the role of consultant responsible for carrying out the acoustic assessment.

Stephen was also responsible for undertaking the site visit, carrying out sound monitoring, downloading and processing the survey data, undertaking the assessment, preparing the report, figures and appendices.

Yanko Yankov – Senior Consultant – Acoustics

BEng Acoustics Engineering, Member of the Institute of Acoustics (MIOA)

Yanko is Senior Acoustic Consultant with over seven years of experience. He has a Bachelor of Engineering Degree in Acoustics Engineering and also is a member of the Institute of Acoustics.

Yanko joined RPS in 2023, however he has been working in the field of Acoustics since 2017. He has project managed and undertaken assessment for a variety of developments, including: residential schemes; large scale mixed-use developments, incorporating commercial, retail, leisure and residential elements; road schemes; railway schemes; solar farms; and railway depots.

Yanko has been involved BS 4142 noise assessments for both the previous and current 2014 version of BS 4142. He is familiar with the Standard and has attended RPS CPD training seminars regarding the revised 2014 version of the Standard. On the basis of Stephen's overall experience in acoustics, combined with particular focus on BS 4142 and with the assistance of more experienced colleagues, he is deemed competent for BS 4142 assessments.

For this project Yanko has taken on the role of consultant responsible for reviewing and updating the acoustic assessment.

Richard Calvert – Associate – Acoustics

BSc (Hons) Acoustics; Member of the Institute of Acoustics (MIOA)

Richard is an Acoustic Consultant with over twenty years' experience. He has been a member of the Institute of Acoustics since 2004 and a corporate Member of the Institute of Acoustics (MIOA) since 2009.

Richard has a special interest in building acoustics involving the internal design of various building types such as residential, education and commercial. He has been involved in the design and build of numerous schools and commercial premises to BREEAM standards.

Richard has project managed and undertaken assessments for a variety of developments, including: residential schemes; large scale mixed-use developments, incorporating commercial, retail, leisure and residential elements; energy from waste facilities; manufacturing facilities; distribution centres; retail units; road schemes; minerals extraction and exploration; solar farms; and commercial projects including motorway service stations.

He has provided input into Environmental Impact Assessments (EIAs) and undertaken noise assessments to support planning applications, discharge planning conditions and planning appeals; he has also provided technical advice on mitigation options. He has a Continuous Professional Development Record to support this competency and experience.

Richard has been involved in many BS 4142 noise assessments using both the previous and current 2014 version of the standard. On the basis of Richard's overall experience in acoustics combined with particular focus on BS 4142, he is deemed competent to undertake BS 4142 assessments.

For this project Richard has taken on the role of Project Manager and has been responsible for overseeing the project.

Richard was also responsible for reviewing the assessment and report, figures and appendices.

Pam Lowery – Associate Director – Acoustics

MEng Civil and Environmental Engineering, MSc Environmental Strategy, MIOA, PIEMA

Pam is an Associate Director working within the RPS acoustics team. She joined the team in 2024, based out of the Birmingham office. Pam has over 22 years' experience in the Acoustics, Noise and Vibration sector and was previously at AECOM where she spent just over 6 years as part of their Acoustics team. Prior to her consultancy roles, Pam worked for two major public sector clients in the UK – National Highways (formerly Highways Agency) and High Speed Two (HS2 Ltd).

She is a Member of the Institute of Acoustics and a Practitioner Member of the Institute of the Environmental Management and Assessment. She is also a member of the IOA's Sound, Noise and Health Group and the Association of Noise Consultants Sustainability Committee.

Pam has extensive experience in environmental acoustics, with a focus on Transportation. She has provided technical and policy support in the assessment of numerous road and rail projects for local and national government clients in the UK and Ireland. She has also led the development of noise and vibration assessment procedures for road schemes included within the Design Manual for Roads and Bridges, as well as co-authoring the suite of HS2 Phase One acoustics technical standards.

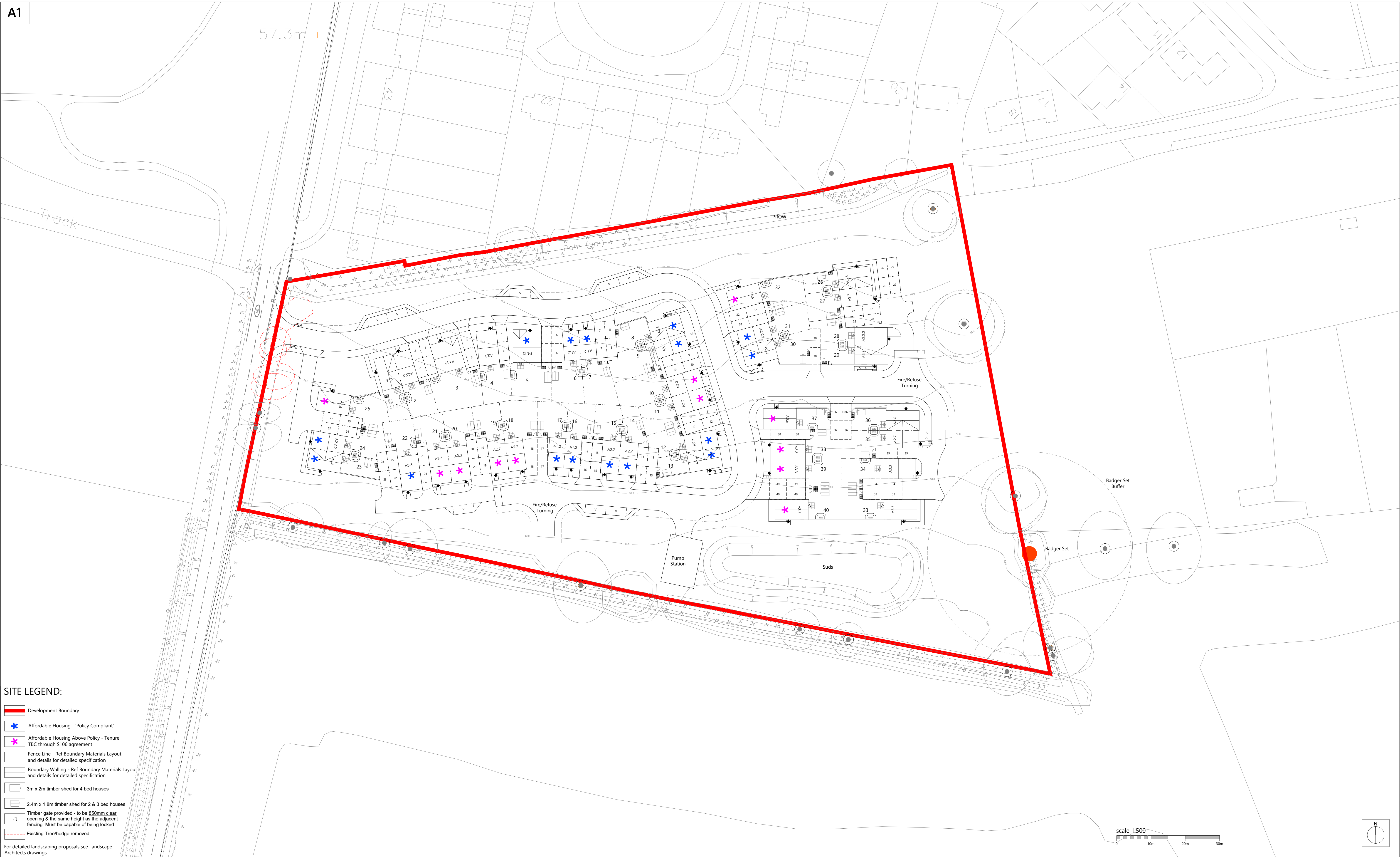
Pam is familiar with the BS 4142 standard and has been involved in providing guidance on its application, particularly in relation to the stationary plant systems to be used on the HS2 Phase One project. On the basis of Pam's overall experience in acoustics, combined with her experience relating to the application of BS 4142 and with the assistance of more experienced colleagues, she is deemed competent for BS 4142 assessments.

REPORT: NOISE ASSESSMENT

For this project Pam has taken on the role of Technical Lead and has been responsible for authorising all deliverables.

Appendix B

Proposed Development Layout



Romsey	T:01794 367703	Rev	Description	Date	Au	Ch
Portishead	T:01275 407000	A	Issued for Planning	31.05.24	MK	
London	T:01794 367703					

www.thrivearchitects.co.uk

This drawing is the copyright of Thrive Architects Ltd ©. All rights reserved. Ordnance Survey Data © Crown Copyright. All rights reserved. Licence No. 100007359. Permission is granted to scale from this drawing for the purposes of **Local Authority Planning Applications only**. For all other purposes, DO NOT scale from this drawing. Contractors, Sub-contractors and suppliers are to check all relevant dimensions and levels of the site and building before commencing any shop drawings or building work. Any discrepancies should be recorded to the Architect. Where applicable this drawing is to be read in conjunction with the Consultants' drawings / Clients' Construction Specification.

Project	Land at Longwater Road, Finchampstead		
Drawing	Site Layout		
Client	Catesby Estates PLC & Stonebond Properties (Guildford) Limited		
Job no.	CATE230603	Date	26.03.24
Dwg no.	SL01	Rev.	A
Author	MK	Checked	
Status	PLANNING	Scale	1:500 at A1
Client ref.		Office	Romsey

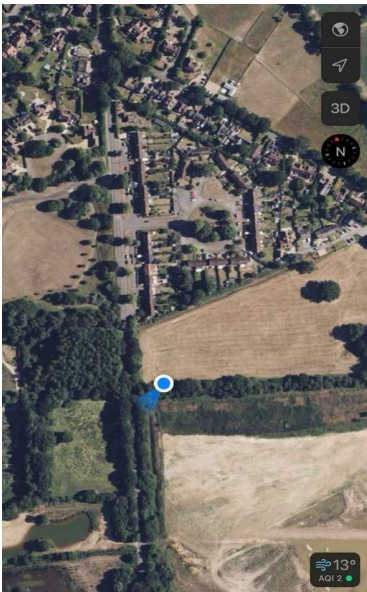


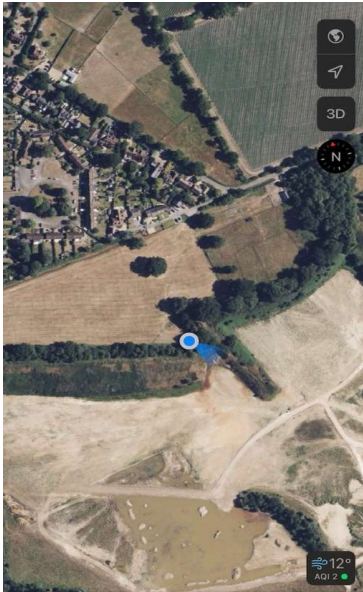
Measurement Locations & Site Boundary



Appendix D

Site Survey Forms

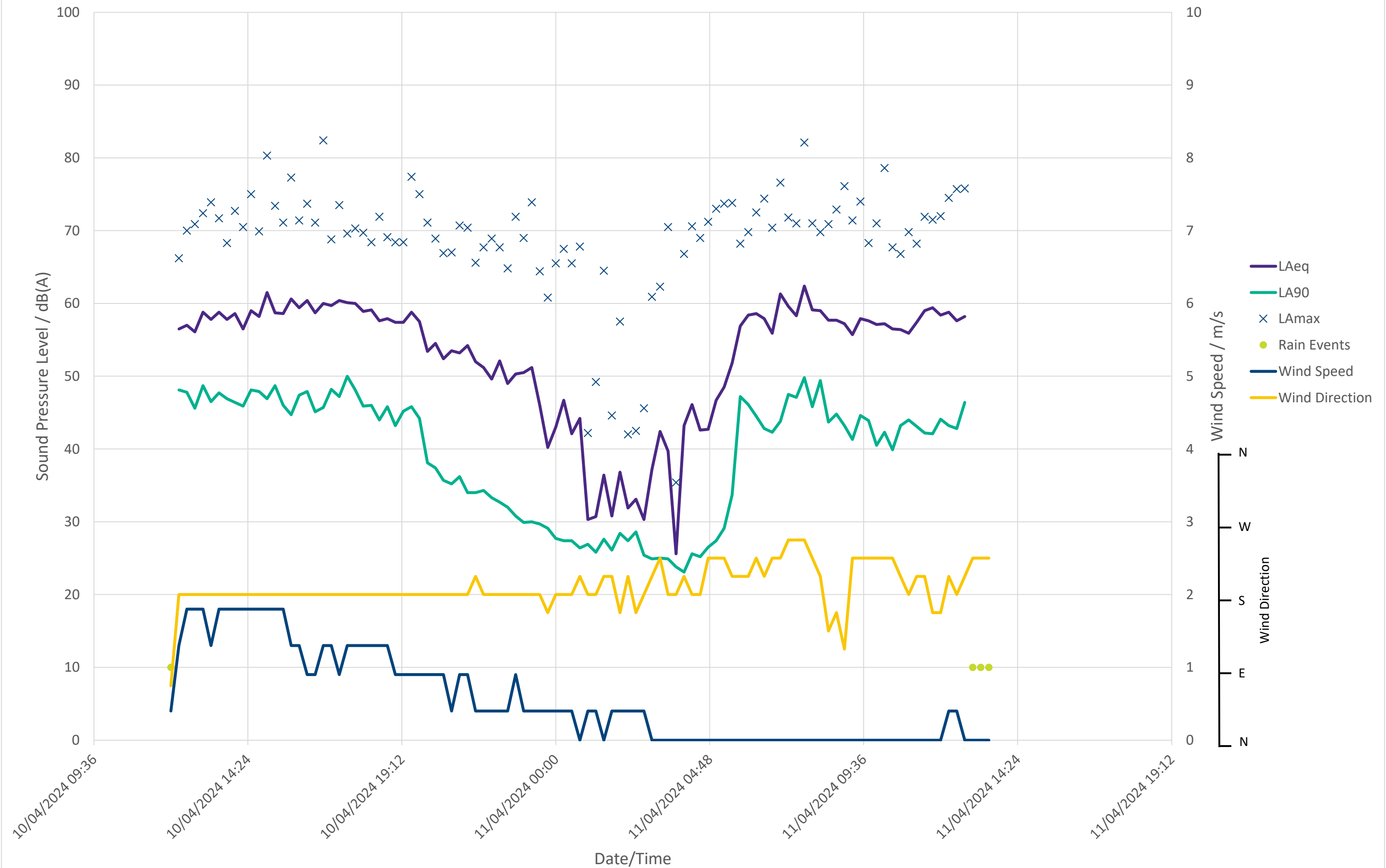
Location		30429 - LT1								
Purpose of Monitoring		Background noise levels								
Relevant Guidance / Standard		BS 7445-2								
Sound Measurement System										
RPS ID	Manufacturer / Model		Serial Number		Last Lab Verification		Filename		Memory Card ID	
167	Rion-NL-52		998567		18/03/2024		102		yes	
Mic Height	Measurement Interval	Dynamic Range (dB)	Time Weighting		Frequency Weighting		Façade / Freefield		Photo?	
1.5	100ms	25 - 138	Fast		A & Z		Freefield		✓	
			START				END			
Personnel			SDH				SDH			
Date / time			10/04/2024 12:15				11/04/2024 12:45			
Calibrator	RPS ID		33				33			
	Manufacturer / Model		RION-NC-74				RION-NC-74			
	Serial Number		34472822				34472822			
	Date last verification		12/10/2023				12/10/2023			
	Reference level (dB)		94.0				94.0			
	Meter reading (dB)		93.9				93.9			
Wind speed (m/s) & dir'n Av.			1.3		S		0.8		S	
Cloud cover (100%= 8 oktas)			7				8			
Temperature (degrees Celsius)			16				17			
Relative Humidity (%)			70				82			
Likely temp. inversion / Precipitation / Fog / Wet ground / Frozen ground / Snow cover? (tick boxes)			TI	P	F	S	TI	P	F	S
			x	x	x	x	x	x	x	x
Subjective description / additional details			Clear day				Clear day			
Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))										
SLM located in south west corner of the site. Ground is soft ground, road is hard ground, flat topo between SLM and source										
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)										
RTN is dominate on site, no industrial sources noted, field used by dog walkers, bird song and wildlife observed										
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)										
No change to noise climate on collection										
Photographs of measurement location										
										

Location		30429 - LT2								
Purpose of Monitoring		Background noise levels								
Relevant Guidance / Standard		BS 7445-2								
Sound Measurement System										
RPS ID	Manufacturer / Model		Serial Number		Last Lab Verification		Filename		Memory Card ID	
166	Rion-NL-52		998566		15/03/2024		102		yes	
Mic Height	Measurement Interval	Dynamic Range (dB)	Time Weighting		Frequency Weighting		Façade / Freefield		Photo?	
1.5	100ms	25 - 138	Fast		A & Z		Freefeild		✓	
			START				END			
Personnel			SDH				SDH			
Date / time			10/04/2024 12:15				11/04/2024 12:45			
Calibrator	RPS ID		33				33			
	Manufacturer / Model		RION-NC-74				RION-NC-74			
	Serial Number		34472822				34472822			
	Date last verification		12/10/2023				12/10/2023			
	Reference level (dB)		94.0				94.0			
	Meter reading (dB)		94.0				94.0			
Wind speed (m/s) & dir'n Av.			1.3		S		0.8		S	
Cloud cover (100%= 8 oktas)			7				8			
Temperature (degrees Celsius)			16				17			
Relative Humidity (%)			70				82			
Likely temp. inversion / Precipitation / Fog / Wet ground / Frozen ground / Snow cover? (tick boxes)			TI	P	F	S	TI	P	F	S
			x	x	x	x	x	x	x	x
Subjective description / additional details			Clear day				Clear day			
Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))										
SLM located in south east corner of the site. Ground is soft ground, flat topo between SLM and source										
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)										
RTN is dominate on site, no industrial sources noted, field used by dog walkers, bird song and wildlife observed										
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)										
No change to noise climate on collection										
Photographs of measurement location										
										

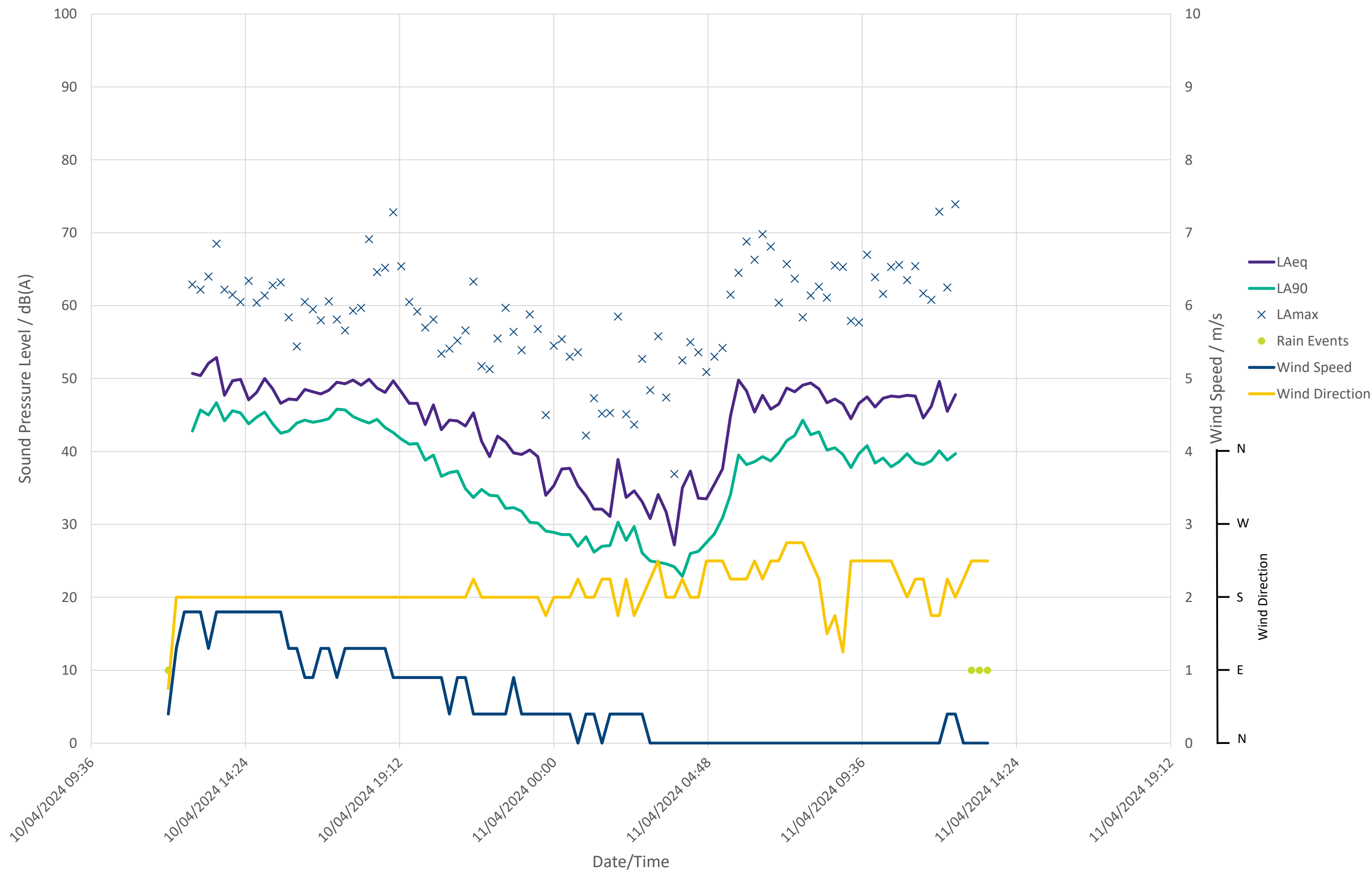
Appendix E

Time History Graphs

LT1 Time History



LT2 Time History



Appendix F

Early-Stage Overheating Risk Tool

EARLY STAGE OVERHEATING RISK TOOL

Version 1.0, July 2019



This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply.

Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes.

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING

KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map	South east	4	2
	Northern England, Scotland & NI	0	
	Rest of England and Wales	2	
#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	3	0
	Grtr London, Manchester, B'ham	2	
	Other cities, towns & dense sub-urban areas	1	

#8 Do the site surroundings feature significant blue/green infrastructure?

Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context

1

1

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant	Day - reasons to keep all windows closed	8	4
	Day - barriers some of the time, or for some windows e.g. on quiet side	4	
	Night - reasons to keep all windows closed	8	4
	Night - bedroom windows OK to open, but other windows are likely to stay closed	4	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green?

Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme

1

1

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas?

Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels

1

1

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples	3	0
#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures	3	0

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation?

Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance

1

0

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future?

Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans

>2.8m and fan installed

2

0

> 2.8m

1

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space	>65%	12	0
	>50%	7	
	>35%	4	
#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation	Single-aspect	3	0
	Dual aspect	0	

#13 Is there useful external shading?

Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6

Full Part

>65%

6

3

0

>50%

4

2

>35%

2

1

#14 Do windows & openings support effective ventilation?

Larger, effective and secure openings will help dissipate heat - see guidance

Openings compared to Part F purge rates

= Part F

+50%

+100%

Single-aspect

minimum required

3

4

0

Dual aspect

2

3

TOTAL SCORE

7

= Sum of contributing factors:

10

minus

Sum of mitigating factors:

3

High

12

Medium

8

Low

score >12:

Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12:

Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8:

Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

Appendix G

Policy & Guidance used in this Assessment

Noise Policy Statement for England

The Noise Policy Statement for England [iii] (NPSE), published in March 2010 by Defra, aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.

Paragraph 1.6 of the NPSE sets out the long-term vision and aims of Government noise policy:

“Noise Policy Vision

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

“Noise Policy Aims

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

- avoid significant adverse impacts on health and quality of life.*
- mitigate and minimise adverse impacts on health and quality of life.*
- and where possible, contribute to the improvement of health and quality of life.”*

The aims require that all reasonable steps should be taken to avoid, mitigate and minimise adverse effects on health and quality of life whilst also taking into account the guiding principles of sustainable development, which include social, economic, environmental and health considerations.

National Planning Policy Framework

The National Planning Policy Framework [iv] (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The emphasis of the Framework is to allow development to proceed where it can be demonstrated to be sustainable. In relation to noise, Paragraph 185 of the Framework states:

“Planning policies and decisions should 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 the 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; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.’*

Planning Practice Guidance – Noise (PPG-N)

The Government has published Planning Practice Guidance on a range of subjects including noise [v]. The guidance forms part of the NPPF and provides advice on how to deliver its policies. The PPG-N reiterates general guidance on noise policy and assessment methods provided in the NPPF, NPSE and British Standards (BSs) and contains examples of acoustic environments commensurate with various effect levels. This guidance is provided in the reproduced in the following table:

Apx Table 1: Summary of Guidance from NPSE and PPGN

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level (NOEL)			
Not present	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, 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 and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

British Standard 8233:2014

BS 8233:2014 [vi] provides guideline values for desirable internal ambient noise levels in unoccupied spaces including.

Guidance in respect of desirable indoor ambient noise levels in dwellings is contained in Table 4 of BS 8233:2014 and are reproduced below.

Apx Table 2: Internal ambient noise criteria.

Activity	Location	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)	
		$L_{Aeq,16h}$ (dB)	$L_{Aeq,8h}$ (dB)	L_{AFmax} (dB)
Resting	Living room	35	-	-
Dining	Dining area	40	-	-
Sleeping & Daytime Resting	Bedroom	35	30	45

NOTE 4 Regular individual noise events (e.g aircraft, trains) can result in sleep disturbance. A guideline value may be set in terms of the Sound Exposure Level (SEL) or $L_{Amax,F}$, depending on the character and number of events within a given night. In noise-sensitive rooms during the night-time period, good acoustic design can generally be adopted such that individual noise events do not normally exceed 45 dB $L_{Amax,F}$ more than 10 times per night. However, where it is not reasonably practicable to achieve this criteria, the choice of criteria will be dictated by additional factors such as the source, number, predictability, and regularity of noise events

With reference to noise levels in residential external amenity areas BS 8233:2014 provides the following guidance:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban 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. 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.”

British Standard 4142:2014+A1:2019

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' describes a method for rating and assessing sound of an industrial and/or commercial nature. The standard is applicable to the determination of the rating level of industrial or commercial sound as well as the ambient, background and residual noise levels for the purposes of investigating complaints, assessing sound from proposed new, modified or additional sources or assessing sound at proposed new dwellings. The determination of whether a noise amounts to a nuisance is beyond the scope of the Standard, as is rating and assessment of indoor noise levels. The Standard compares the "rating level" of the noise (i.e. the specific noise level from the site under investigation adjusted using penalties for acoustic character such as tonality or impulsiveness) with the pre-existing background noise level.

The foreword to the Standard provides the following introduction for the assessment of human response to sound:

"Response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood."

The note to paragraph 8.5 of the Standard is relevant to the assessment of the proposed development and states:

"Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation."

BS 4142:2014+A1:2019 primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the 'specific sound' from the proposed development) at residential NSRs. The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the 'rating level', whether or not a rating penalty is applied. The 'residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound or when the specific sound sources is absent or yet to be introduced, as in a planning application situation.

Professional Practice Guidance (ProPG) Planning and Noise – New Residential Development

ProPG [vii] provides practitioners with guidance on a recommended approach to the management of noise within the planning system in England for new residential development. The guidance has been produced by the ANC, IOA and Chartered Institute of Environmental Health (CIEH) and is expected to be widely adopted by planning authorities as best practice when considering noise affecting new residential development. The scope of this ProPG is restricted to the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources, though it is considered appropriate to incorporate other sources of noise where they are present but not dominant.

Overview

This ProPG advocates a systematic, proportionate, risk based, two-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 is challenging. The two sequential stages of the overall approach are:

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

The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are listed below, with further details in the following sections:

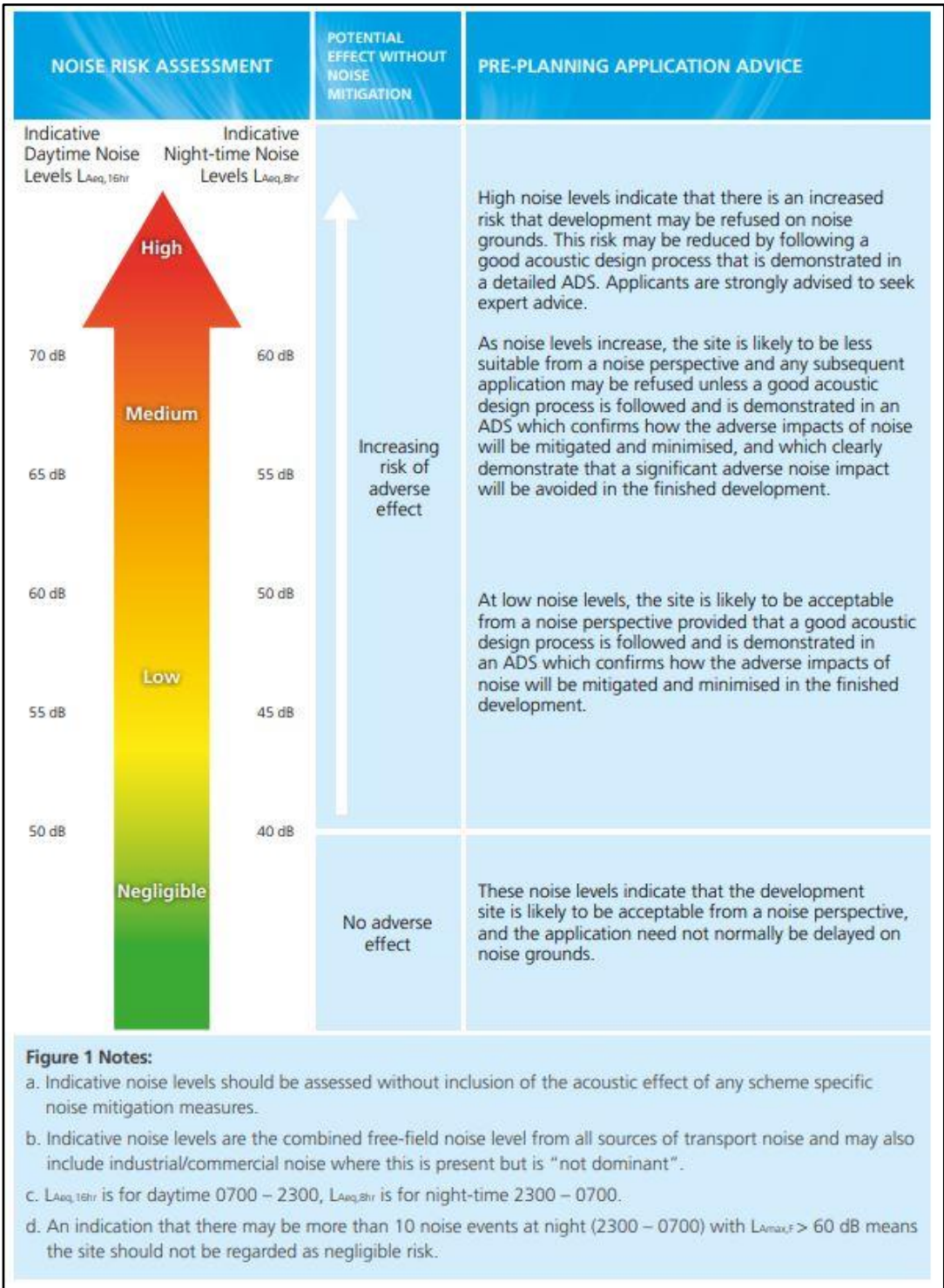
- Element 1 – demonstrating a “Good Acoustic Design Process”;
- Element 2 – observing “Internal Noise Level Guidelines”;
- Element 3 – undertaking an “External Amenity Area Noise Assessment”; and
- Element 4 – consideration of “Other Relevant Issues”.

The approach is underpinned by the preparation and delivery of an ADS. An ADS for a site assessed as high risk should be more detailed than for a site assessed as low risk. An ADS should not be necessary for a site assessed as negligible risk.

Stage 1 Risk Assessment

The Stage 1 Initial Site Noise Risk Assessment that is provided in Figure 1 of the ProPG is shown below in Apx Figure 1. This initial risk assessment is based on indicative noise levels derived from current guidance and experience. The indicative noise levels are intended to provide a sense of the noise challenge at a potential residential development site and should be interpreted flexibly having regard to the locality, the project and the wider context. In the final column, the initial noise risk assessment is aligned with pre-planning application guidance that highlights the increasing importance of good acoustic design as the noise risk increases.

Apx Figure 1: ProPG Stage 1 - Initial Site Noise Risk Assessment



Stage 2 Element 1 - Good Acoustic Design Process

The ProPG states that planning applications for new residential development should include evidence that the following have been properly considered:

- Check the feasibility of relocating or reducing noise levels from relevant sources.
- Consider options for planning the site or building layout.
- Consider the orientation of proposed building(s).

- Select construction types and methods for meeting building performance requirements.
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.
- Assess the viability of alternative solutions.
- Assess external amenity area noise.

Stage 2 Element 2 – Internal Noise Level Guidelines

The internal noise level guidelines provided under Element 2 above in Figure 2 of ProPG are provided in Apx Table 3 below. These are based upon the guidance in British Standard (BS) 8233:2014: 'Guidance on sound insulation and noise reduction for buildings.

Apx Table 3: ProPG Internal Noise Level Guidelines

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

Accompanying Note 4, 5, 6 & 7 from Figure 2 of the ProPG states the following:

“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 ten 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 (see Section 3.D).”

Paragraphs 2.34 to 2.36 of the ProPG contain guidance regarding the use of open windows in relation to ventilation and overheating:

“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 [viii] (e.g., trickle ventilators) in the open position (see Supplementary Document 2). 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. In this case a more detailed assessment of the potential impact on occupants should be provided in the ADS. It should be noted that overheating issues will vary across the country and any specific design solutions will need to be developed alongside advice from energy consultants.”

Paragraph 2.38 of the ProPG states the following with respect to mechanical service plant:

Where mechanical services are used as part of the ventilation or thermal comfort strategy for the scheme, the impact of noise generated by these systems on occupants should also be assessed.

Stage 2 Element 3 – External Amenity Area Noise Assessment

The ProPG refers to the design ranges in BS 8233:2014 with respect to the assessment of external amenity, as well as guidance in the PPG-N. Based on these two documents the following guidance is provided with respect to the assessment of noise in external amenity areas:

(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 facade (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 five-minute walking distance).”*

Stage 2 Element 4 – Other Relevant Issues

The ProPG states that the following other relevant issues, should be considered, where appropriate:

- (i) compliance with relevant national and local policy;
- (ii) magnitude and extent of compliance with the ProPG criteria;
- (iii) likely occupants of the development;
- (iv) acoustic design v unintended adverse consequences; and
- (v) acoustic design v wider planning.

Planning Recommendations

Having followed this approach to its end, it is envisaged that noise practitioners will then have a choice of one of four possible recommendations to present to the decision maker. In simple terms, the choice of recommendations are as follows:

- Planning consent may be granted without any need for noise conditions;
- Planning consent may be granted subject to the inclusion of suitable noise conditions;
- Planning consent should be refused on noise grounds in order to avoid significant adverse effects (“avoid”); or
- Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects (“prevent”).

Acoustics, Ventilation and Overheating Residential Design Guide (AVO)

The AVO guide [ix] recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating.

The application of the AVO Guide is intended to demonstrate good acoustic design in accordance with ProPG.

A two-stage assessment approach is advised as:

- Stage 1: Site Risk Assessment
- Stage 2: Detailed Assessment of Adverse Effect

The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage.

It also assists in educating clients, environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

REFERENCES

- i Wokingham Borough Core Strategy Development Plan (Adopted – 29 January 2010).
- ii Finchampstead Neighbourhood Development Plan 2022-2038.
- iii Department for Environmental, Food and Rural Affairs. Noise Policy Statement for England 2010.
- iv Ministry of Housing, Communities and Local Government. National Planning Policy Framework 2021.
- v Department for Levelling Up, Housing and Communities. National Planning Policy Framework 2012.
- vi British Standards Institution. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings. 2014.
- vii ProPG: Planning & Noise - Professional Practice Guidance on Planning & Noise (new residential development). 2017.
- viii The Building Regulations 2010. Approved Document F: Ventilation. Office of the Deputy Prime Minister. 2010.
- ix ANC & IOA. Acoustics Ventilation and Overheating: Residential Design Guide. Version 1.1. 2020.