Shaw Lane, Carlton, Barnsley

Noise Assessment

784-B029129

Noise Assessment for Proposed Residential Development

January 2022

Prepared on Behalf of Network Space Land Limited

tetratecheurope.com

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1.0 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

This report presents the findings of a noise assessment to support an outline planning application for up to 215 dwellings on Land at Shaw Lane, Carlton, Barnsley.

A description of the existing noise environment in and around the site is provided. Noise surveys have been undertaken and the results used to verify predictions of the effects of noise. The noise levels across the site have been predicted at proposed receptors using CADNA noise modelling software, which incorporates ISO 9613 and CRTN methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A and a set of location plans, noise contour plots relevant to the assessment are presented throughout the document.

1.2 LEGISLATIVE CONTEXT

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in National Planning Policy Framework (NPPF), published in July 2021. With regard to noise and planning, NPPF contains the following statement at paragraph 174:

"*174 Planning policies and decisions should contribute to and enhance the natural and local environment by:*

> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans…"*

A further 2 short statements are presented at paragraph 185, which state:
"185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of 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…"*

Furthermore, paragraphs 187 and 188 state:

"187. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

188. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

Planning Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, is to, *'identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.'*

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated as follows:

Table 1.1 NPPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
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, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			

Perception	Examples of Outcomes	Increasing Effect Level	Action
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The NPPF, NPSE and NPPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents, Section 2.0 presents the noise level criteria used as a basis of this assessment.

The NPPG also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*

1.3 PROPG PLANNING AND NOISE - NEW RESIDENTIAL DEVELOPMENT

Professional Practice Guidance on Planning and Noise for new residential development (ProPG) was launched on 22nd June 2017 by the Chartered Institute of Environmental Health (CIEH), the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA). The publication provides practitioners with guidance on the management of noise within the planning system in England.

The guidance is specifically for 'new residential development that would be exposed predominantly to noise from existing transport sources' and reflects the Government's overarching Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF), and Planning Practice Guidance (including PPG-Noise), as well as other authoritative sources of guidance.

The guidance provides advice for Local Planning Authorities (LPAs) and developers, and their respective professional advisers which complements Government planning and noise policy and guidance and, in particular, aims to:

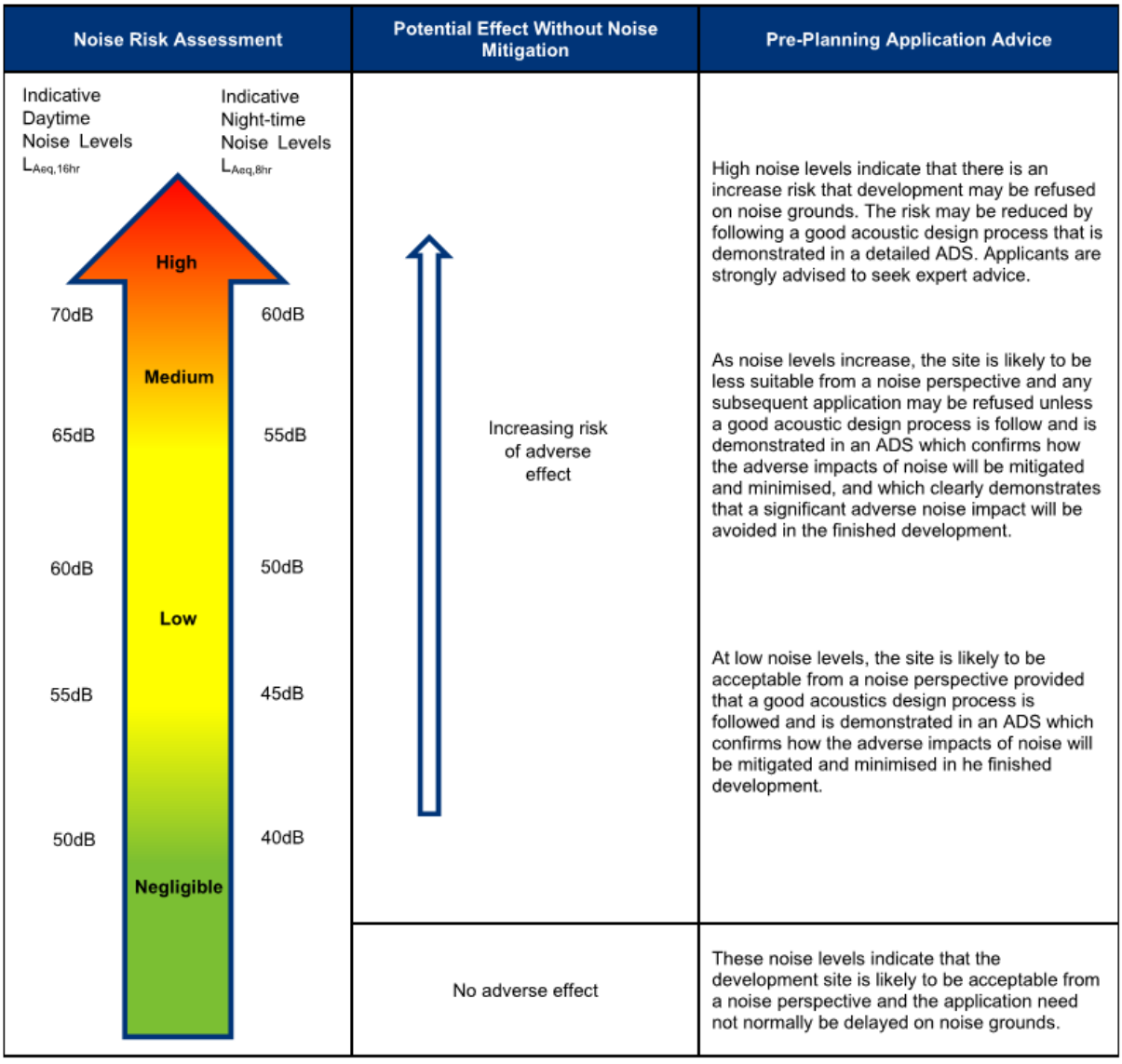
- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
- Promote appropriate noise exposure standards; and
- Assist the delivery of sustainable development.

There are two stages of the overall approach outlined in the ProPG:

- Stage 1 – an initial noise risk assessment of the proposed development site; and
- Stage 2 – a systematic consideration of 4 key elements which is underpinned by an Acoustic Design Statement.

With regards to Stage 1, ProPG provides guidance to produce an initial site risk assessment, pre-mitigation, with regards to noise based on the prevailing daytime and night time noise levels across the site, from which the site (or areas thereof) can be allocated a Noise Risk as shown in Figure 1.1 below, together with their corresponding sound levels as referred to in the ProPG.

Figure 1.1 ProPG Stage 1, Noise Risk Assessment



An Acoustic Design Statement is then produced which addresses issues found in Stages 1 & 2 of the ProPG approach including recommendations for mitigation.

1.4 ACOUSTIC CONSULTANTS' QUALIFICATIONS, PROFESSIONAL MEMBERSHIPS

The lead acoustic consultant for this assessment is Samantha Griffith. The report has been verified by Nigel Mann. Relevant qualifications, membership and experience are summarised below.

Table 1.2 Acoustic Consultants' Qualifications & Experience

Name	Education	Institute of Acoustics Post Graduate Diploma in Acoustic and Noise Control (Pass Date)	Experience in Undertaking Noise Assessments (Start date of working in noise & acoustics)	Attained Associate Membership of the Institute of Acoustics (date)	Attained Membership of the Institute of Acoustics (date)
Samantha Griffith	BSc (2015)	Dec (2020)	Jul (2017)	Jan (2021)	-
Ashley Shepherd	BSc 2013	-	Feb 2014	Feb 2014	Nov 2017
Nigel Mann	BSc (1997) Msc (1999)	Nov (2001)	Nov (1998)	Nov (2001)	Jul (2005)

2.0 ASSESSMENT CRITERIA

2.1 NOISE ASSESSMENT CRITERIA

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 & 2.2 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from the following standards and design guidance:

- BS 8233:2014 *'Guidance on sound insulation and noise reduction for buildings – Code of practice*'
- BS 4142:2014 + A1 2019 *'Methods for rating and assessing industrial and commercial sound'*
- World Health Organisation 'Guidelines on Community Noise' 1999

Table 2.1 Noise Level Criteria and Actions (Proposed Dwellings)

Effect Level	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	Noise levels below: Bedrooms – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms – 35 dB $L_{Aeq,16hours}$ External Amenity Space – 50 dB $L_{Aeq,16hours}$	No Action Required Within BS8233 Criteria
Lowest Observed Adverse Effect Level	Noise levels exceed: Bedrooms – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms – 35 dB $L_{Aeq,16hours}$ External Amenity Space – 50 dB $L_{Aeq,16hours}$	Mitigate to achieve: *Bedrooms – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax}* *Living Rooms – 35 dB $L_{Aeq,16hours}$* *External Amenity Space – 55 dB $L_{Aeq,16hours}$*
Significant Observed Adverse Effect	Noise levels exceed: Bedrooms – 35 dB $L_{Aeq,8hours}$ Living Rooms – 40 dB $L_{Aeq,16hours}$ External Amenity Space – 55 dB $L_{Aeq,16hours}$	Mitigate to achieve: *Bedrooms – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms – 35 dB $L_{Aeq,16hours}$* *External Amenity Space – 55 dB $L_{Aeq,16hours}$*
Unacceptable Observed Adverse Effect	Noise levels with mitigation exceed: Bedrooms – 35 dB $L_{Aeq,8hours}$ Living Rooms – 40 dB $L_{Aeq,16hours}$ External Amenity Space – 60 dB $L_{Aeq,16hours}$	Prevent

Table 2.2 Noise Level Criteria and Actions (BS4142 Noise Assessment)

Effect Level	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	BS4142 Score of zero or lower	No Action Required Score of zero or lower is an indication of the sound source having a low impact
Lowest Observed Adverse Effect Level	BS4142 Score of +5 or lower	Difference of +5 dB likely to be an indication of an adverse effect Mitigate to achieve: BS4142 Score of plus 5 or lower
Significant Observed Adverse Effect	BS4142 Score between +5 and +10	Difference of +10 dB likely to be an indication of a significant adverse effect Mitigate to achieve as low as practicable
Unacceptable Observed Adverse Effect	BS4142 Score of +10 or higher	Prevent Mitigate to achieve as low as practicable

3.0 ASSESSMENT METHODOLOGY

3.1 NOISE MODELLING METHODOLOGY

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict noise levels at a number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically.

The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data and model settings as given in the table below have been used.

Table 3.1 Modelling Parameters Sources and Input Data

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	Ordnance Survey	Ordnance Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 1:10,000 spot heights.
Traffic data	Tetra Tech	Provided by Tetra Tech's transport consultants
Building heights – around site	Tetra Tech Observations	8 m height for two storey residential properties, and 4 m for Bungalows. 3m per storey for multi-storey developments.
Barrier heights	Tetra Tech Observations	All existing barriers at 1.8 m with the exception of hedges and trees which are considered to offer no noise protection. Proposed garden fences are considered to be 1.8m.
Receptor positions	Tetra Tech	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor properties. 1.5 m height for model grid and monitoring locations for validation.
Plans	Spawforths	Drawing Title: Masterplan 37DPHDPH Dated: 15/09/2019

It is acknowledged that a number of the values of parameters chosen will affect the overall noise levels presented in this report. However, it should be noted that the values used, as identified above, are worst case.

3.2 MODEL INPUT DATA

3.2.1 Model Verification

The model was verified by modelling the monitoring locations for the 'existing' weekday scenario. Daytime and night-time L_{Aeq} and night-time L_{Amax} scenarios have been verified. Within the exercise, greater weight and confidence within verified noise levels have been given to the long-term monitoring

positions due to the longer exposure time; the comparison between the monitoring and modelling results are shown in the tables below.

Table 3.2 Modelled vs. Monitored Results $L_{Aeq;\ daytime\ 07:00 – 23:00}$

Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
LT1	45.4	45.3	-0.1
LT2	53.6	51.7	-1.9
LT3	49.9	52.7	2.8
MT1	55.7	58.4	2.7
MT2	59.6	59.8	0.2
ST1*	52.2	51.2	-1.0
ST2*	45.7	50.0	4.3
ST3*	52.0	55.3	3.3
ST4	59.7	58.7	-1.0

All values are sound pressure levels in dB re: $2x\ 10^{-5}$ Pa
*The highest L_{Aeq} monitored has been used.

Table 3.3 Modelled vs. Monitored Results $L_{Aeq;\ night\text{-}time\ 23:00– 07:00}$

Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
LT1	41.9	41.9	0.0
LT2	45.6	47.9	2.3
LT3	47.1	49.5	2.4
ST1	46.4	48.0	1.6
ST2	44.3	46.5	2.2
ST3	49.9	52.0	2.1

All values are sound pressure levels in dB re: $2x\ 10^{-5}$ Pa

Table 3.4 Modelled vs. Monitored Results $L_{Amax;\ night\text{-}time\ 23:00– 07:00}$

Location	Monitored L_{Amax}	Modelled L_{Amax}	Difference between Monitored and Modelled Results
LT1	67.2	64.9	-2.3
LT2	69.6	70.1	0.5
LT3	71.5	72.6	1.1
ST1	68.1	71.5	3.4
ST2	67.8	68.9	1.1
ST3	62.7	75.4	12.7

All values are sound pressure levels in dB re: $2x\ 10^{-5}$ Pa
*10^{th} Highest L_{Amax}

The verification points show a divergence between monitored and modelled results of no more than +/- 2.8 dB. This is with the exception of location ST2 and ST3 during the daytime L_{Aeq} scenario and ST1 to ST3 during the night-time L_{Amax} scenario, where the model is predicting a higher level than was recorded during short term measurements. Following a review of sound files, this is due to a lower

frequency of vehicles passing during the short-term 15-minute measurements. Therefore, the models are considered to be suitably verified.

3.2.2 Existing Industrial Units

During the baseline monitoring there was minimal activity occurring from industrial premises adjacent to the railway line. As such, as a worst-case assessment, noise levels from the Tetra Tech data base has been sourced to be included within the daytime noise intrusion assessment. The noise levels used are shown in the table below to present metal crushing and moving being moved within the yards of the industrial premises.

Table 3.5 Industrial Operations

Description	Linear Octave Band Noise Levels (dB)								
	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	dB L_{WA}
Metal Handling	85	90	95	100	101	101	97	87	106.5
Metal Tipping	78	83	87	95	99	100	97	92	110

3.3 SENSITIVE RECEPTORS

The location of proposed sensitive receptors is shown on Figure 3.1 below and external amenity receptors are shown on Figure 3.2.

Figure 3.1 Indicative Proposed Sensitive Receptor Locations

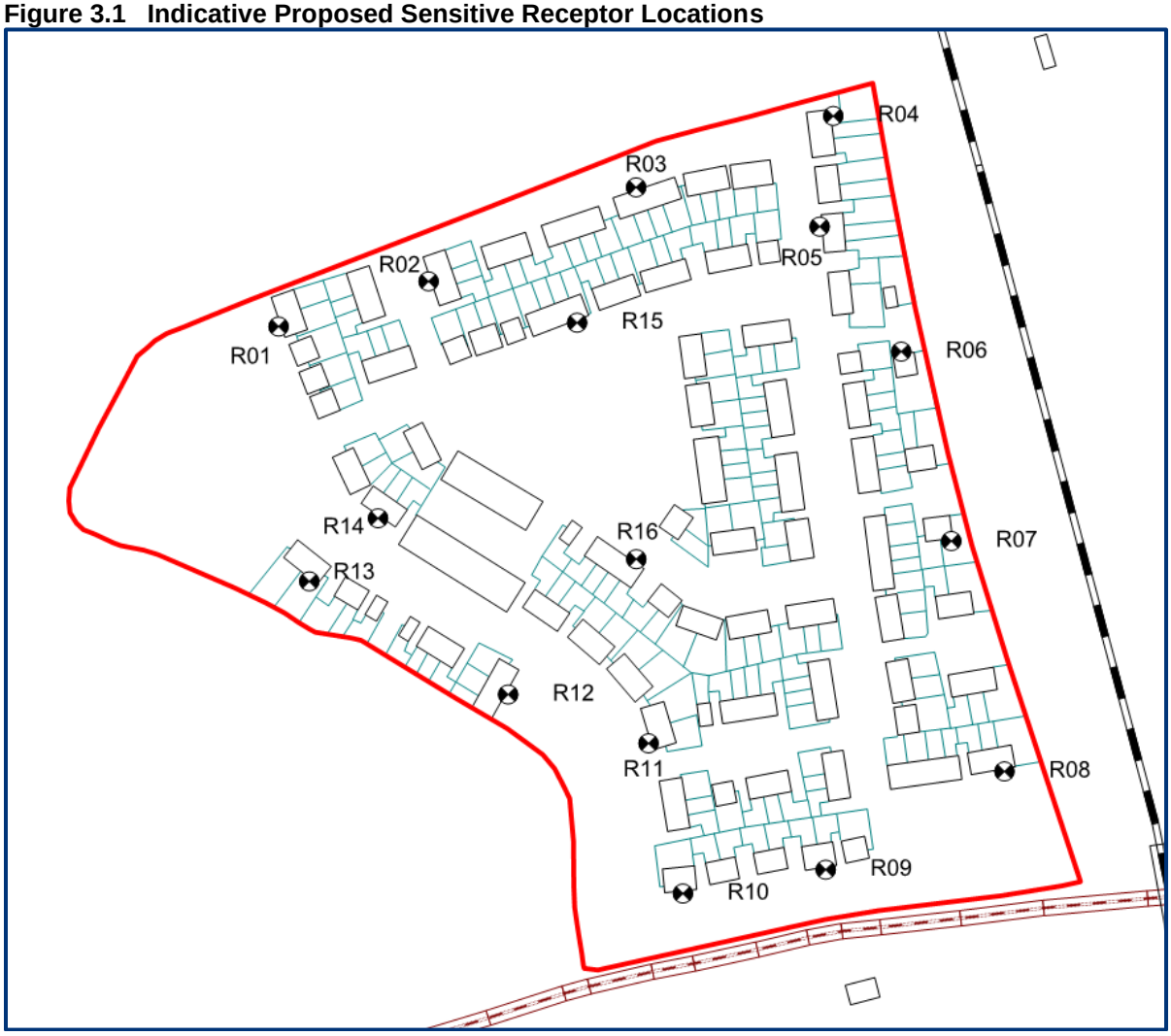


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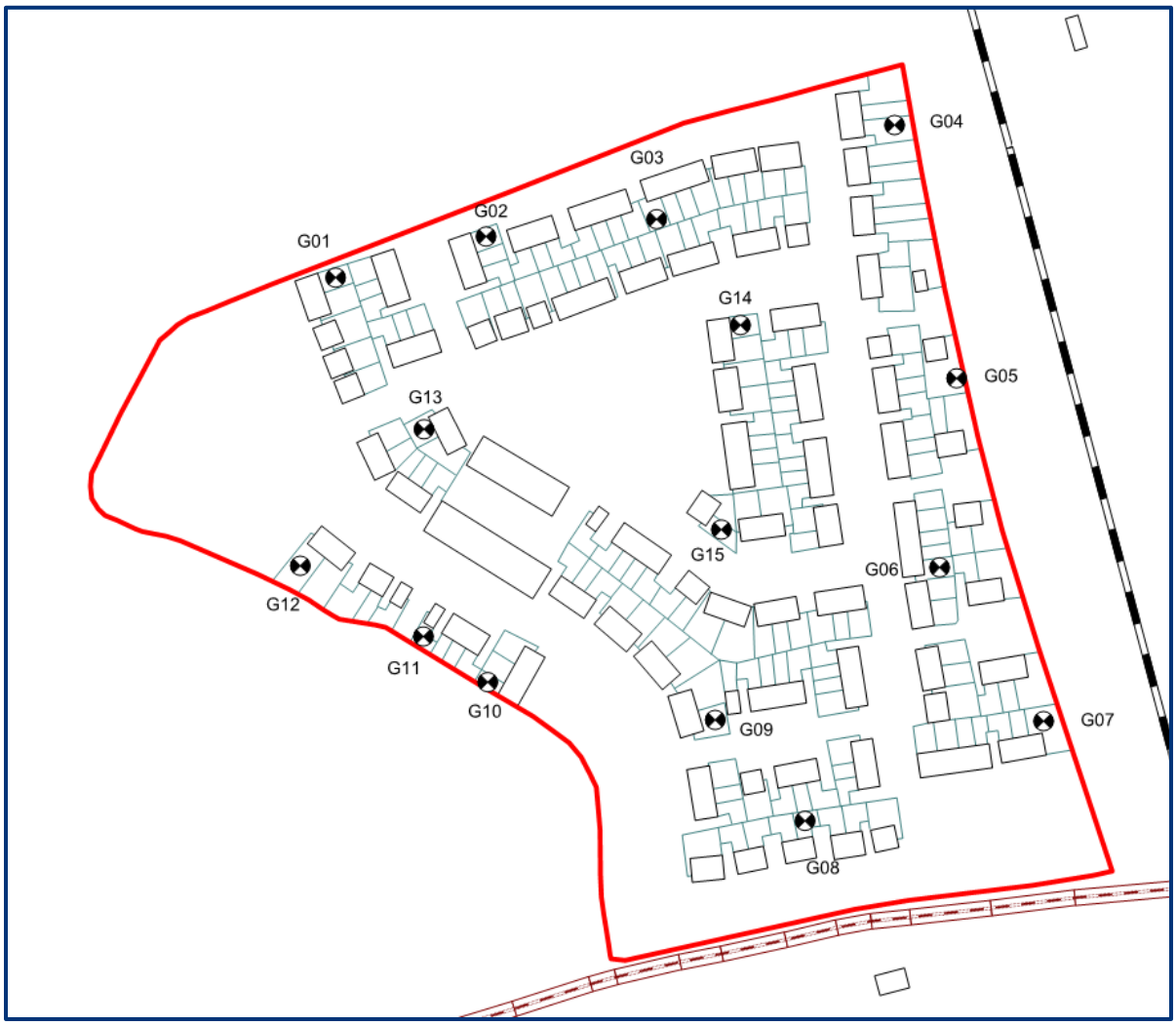
Figure 3.2 Indicative Proposed External Amenity Receptor Locations



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3.4 TRANQUILLITY RATING

An assessment of the existing tranquillity level of the site has been based on the mapping data published by CPRE, the countryside charity. This uses a colour coded system and a 500m assessment grid for the whole of England, and a tranquillity rating of between 1 and 10 is assigned (1 being least tranquil and 10 being most).

4.0 NOISE SURVEY

4.1 NOISE SURVEY METHODOLOGY

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

Norsonic 140	Environmental Noise Analyser	s/n	1402987
Norsonic 1251	Sound Calibrator	s/n	25010
Rion NL-52	Environmental Noise Analyser (WYG18)	s/n	843173
Rion NL-52	Environmental Noise Analyser (WYG22)	s/n	1021257
Rion NL-52	Environmental Noise Analyser (WYG27)	s/n	264490
Rion NL-52	Environmental Noise Analyser (WYG31)	s/n	1276552
Rion NC-75	Sound Calibrator	s/n	35270131

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice, a drift of 0.2 dB was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

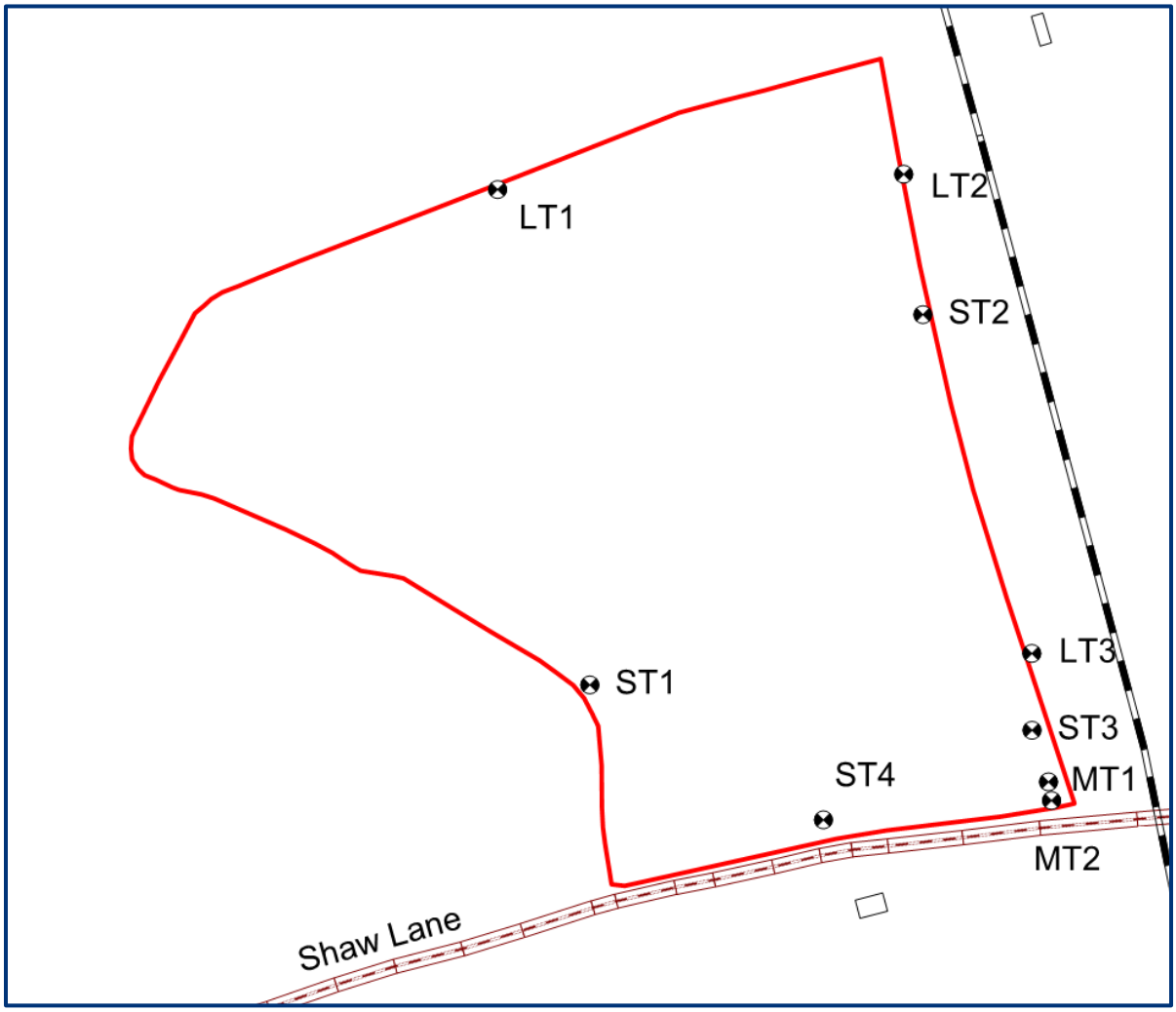
A baseline monitoring survey was undertaken at eight locations (as specified in the following table and shown in Figure 4.1 below) from Friday 19th July 2019 to Wednesday 24th July 2019. Attended short term measurements were undertaken at four locations during day, evening and night-time periods with three additional locations being measured unattended over a 119-hour period. The raw data collected from the long-term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry. Anemometer readings confirmed that wind speeds were less than 5 ms^{-1} at all times during the survey, with a predominant southerly wind direction during the survey.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	Northern boundary of the site, approx. 310m north of Shaw Lane
LT2	Eastern boundary of the site, approx. 270m north of Shaw Lane
LT3	Eastern boundary of the site, approx. 70m north of Shaw Lane
MT1	South-eastern corner of the site, approx. 10m north of Shaw Lane
MT2	South-eastern corner of the site, approx. 5m north of Shaw Lane
ST1	Western boundary of the site, approx. 90m north of Shaw Lane
ST2	Eastern boundary of the site, approx. 210m north of Shaw Lane
ST3	Eastern boundary of the site, approx. 40m north of Shaw Lane
ST4	Southern boundary of the site, approx. 10m north of Shaw Lane

Figure 4.1 Noise Monitoring Locations



4.2 NOISE SURVEY RESULTS

The existing ambient noise climate is characterised by road traffic noise from Shaw Lane, occasional activity from the industrial premises to the east, plant noise from industrial premises to the south-west, occasional overhead aircraft, and occasional agricultural work on the site.

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period). For the long-term (LT) locations, the presented L_{Aeq},T and $L_{A10,T}$ are average noise levels whilst the L_{A90} is the modal noise level of each 5 minute measurement over the stated survey period.

Table 4.2 Meteorological Conditions during the Survey

Survey Location	Date & Time	Temperature (ºC)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Day ST1	23/07/2019 09:34	21	0 – 1	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	23/07/2019 09:49	21	0 – 1	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	23/07/2019 10:04	21	0 – 1	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	23/07/2019 10:19	21	0 – 1	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	23/07/2019 14:18	28	2 – 3	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	23/07/2019 14:33	28	2 – 3	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	23/07/2019 14:48	28	2 – 3	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	23/07/2019 15:03	28	2 – 3	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST1	24/07/2019 10:35	23	1 - 2	S	4	Road traffic noise Shaw Lane, plant noise from premises to the SW
Day ST2	23/07/2019 11:51	26	1 - 2	S	1	Road traffic noise Shaw Lane
Day ST2	23/07/2019 12:06	26	2 - 3	S	1	Road traffic noise Shaw Lane
Day ST2	23/07/2019 12:22	26	1 - 2	S	1	Road traffic noise Shaw Lane
Day ST2	23/07/2019 12:37	26	2 - 3	S	1	Road traffic noise Shaw Lane
Day ST2	23/07/2019 14:02	28	2 - 3	S	0	Road traffic noise Shaw Lane, agricultural mobile plant
Day ST2	24/07/2019 10:15	22	1 - 2	S	6	Road traffic noise Shaw Lane
Day ST3	23/07/2019 10:40	24	0 – 1	S	1	Road traffic noise Shaw Lane
Day ST3	23/07/2019 10:56	24	0 – 1	S	1	Road traffic noise Shaw Lane
Day ST3	23/07/2019 11:11	24	0 – 1	S	1	Road traffic noise Shaw Lane
Day ST3	23/07/2019 11:26	24	0 – 1	S	1	Road traffic noise Shaw Lane
Day ST3	23/07/2019 12:58	27	1 - 2	S	1	Road traffic noise Shaw Lane
Day ST3	23/07/2019 13:13	27	1 - 2	S	1	Road traffic noise Shaw Lane
Day ST3	23/07/2019 13:28	27	1 - 2	S	1	Road traffic noise Shaw Lane
Day ST3	23/07/2019 13:43	27	1 - 2	S	1	Road traffic noise Shaw Lane

Survey Location	Date & Time	Temperature (ºC)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Day ST3	24/07/2019 09:58	22	0 – 1	S	1	Road traffic noise Shaw Lane
Day ST4	24/07/2019 09:39	22	0 – 1	S	3	Road traffic noise Shaw Lane
Evening ST1	23/07/2019 19:00	29	1 - 2	S	0	Road traffic noise Shaw Lane, agricultural mobile plant
Evening ST2	23/07/2019 19:37	29	0 - 1	S	1	Road traffic noise Shaw Lane, agricultural mobile plant
Evening ST3	23/07/2019 19:20	29	0 - 1	S	0	Road traffic noise Shaw Lane, agricultural mobile plant
Night ST1	23/07/2019 05:02	16	0 - 1	S	1	Road traffic noise Shaw Lane, plant noise from premises to the SW
Night ST1	23/07/2019 06:41	17	0 - 1	S	0	Road traffic noise Shaw Lane, plant noise from premises to the SW
Night ST2	23/07/2019 05:44	16	0 - 1	S	1	Road traffic noise Shaw Lane, plant noise from premises to the SW
Night ST2	23/07/2019 05:49	16	0 - 1	S	1	Road traffic noise Shaw Lane, plant noise from premises to the SW
Night ST3	23/07/2019 05:24	16	0 - 1	S	1	Road traffic noise Shaw Lane, plant noise from premises to the SW
Night ST3	23/07/2019 06:19	16	0 - 1	S	1	Road traffic noise Shaw Lane, plant noise from premises to the SW

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2 x 10^{-5} Pa).

Table 4.3 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Daytime 07:00 - 23:00	47 Hours	19/07/2019 – 24/07/2019 12:08 – 11:03	LT1	45.4	84.9	32.5	47.0	43.0
Weekday Night-time 23:00 – 07:00	24 Hours	19/07/2019 – 24/07/2019 23:00 - 07:00		41.9	67.2	28.0	42.9	40.0
Weekend Daytime 07:00 - 23:00	32 Hours	20/07/2019 – 21/07/2019 07:00 - 23:00		44.8	77.7	31.1	46.0	38.0
Weekend Night-time 23:00 – 07:00	16 hours	20/07/2019 – 21/07/2019 23:00 - 07:00		40.7	62.4	30.7	41.4	36.0
Weekday Daytime 07:00 - 23:00	48 Hours	19/07/2019 – 24/07/2019 11:30 – 10:54	LT2	53.6	86.1	31.2	51.2	42.0

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Night-time 23:00 – 07:00	24 Hours	19/07/2019 – 24/07/2019 23:00 - 07:00		45.6	69.6	29.8	45.4	37.0
Weekend Daytime 07:00 - 23:00	32 Hours	20/07/2019 – 21/07/2019 07:00 - 23:00		44.5	74.7	32.3	47.4	40.0
Weekend Night-time 23:00 – 07:00	16 hours	20/07/2019 – 21/07/2019 23:00 - 07:00		41.2	63.8	31.6	42.3	38.0
Weekday Daytime 07:00 - 23:00	48 Hours	19/07/2019 – 24/07/2019 10:48 – 11:18	LT3	49.9	81.8	30.1	51.9	42.0
Weekday Night-time 23:00 – 07:00	24 Hours	19/07/2019 – 24/07/2019 23:00 - 07:00		47.1	77.9	31.0	47.4	43.0
Weekend Daytime 07:00 - 23:00	32 Hours	20/07/2019 – 21/07/2019 07:00 - 23:00		44.2	72.9	32.3	48.9	40.0
Weekend Night-time 23:00 – 07:00	16 hours	20/07/2019 – 21/07/2019 23:00 - 07:00		43.5	68.0	32.5	45.5	37.0
Daytime 07:00 - 19:00	2.75 Hours	23/07/2019 09:32 – 11:17	MT1	55.7	77.2	33.6	59.4	39
Daytime 07:00 - 19:00	3 Hours	23/07/2019 12:00 – 15:00	MT2	59.6	92.1	33.7	61.4	40
Daytime 07:00 - 19:00	15 Mins	23/07/2019 09:34	ST1	44.7	66.1	36.3	47.1	39.3
	15 Mins	23/07/2019 09:49	ST1	45.4	56.4	36.2	48.9	39.5
	15 Mins	23/07/2019 10:04	ST1	45.9	67.7	37.8	48.6	41.0
	15 Mins	23/07/2019 10:19	ST1	46.9	63.0	38.4	49.7	41.0
	15 Mins	23/07/2019 14:18	ST1	65.3*	79.8	37.7	65.0	44.1
	15 Mins	23/07/2019 14:33	ST1	47.8	62.4	37.4	50.7	42.4
	15 Mins	23/07/2019 14:48	ST1	62.5*	74.3	39.1	67.0	44.7
	15 Mins	23/07/2019 15:03	ST1	52.2	66.7	39.2	52.1	42.8
	15 Mins	24/07/2019 10:35	ST1	45.0	65.7	36.5	47.6	40.1
	15 Mins	23/07/2019 11:51	ST2	45.7	66.4	38.0	47.2	40.2
	15 Mins	23/07/2019 12:06	ST2	42.4	53.5	36.5	45.2	38.5
	15 Mins	23/07/2019 12:22	ST2	43.6	59.7	35.6	45.7	39.4
	15 Mins	23/07/2019 12:37	ST2	45.1	69.2	37.1	46.2	39.7
	10 Mins	23/07/2019 14:02	ST2	74.4	91.4	38.0	70.5	42.9
	15 Mins	24/07/2019 10:15	ST2	44.0	66.9	38.0	46.0	40.4
	15 Mins	23/07/2019 10:40	ST3	51.1	66.5	37.1	53.8	41.0
	15 Mins	23/07/2019 10:56	ST3	51.6	68.3	35.6	55.1	39.2
	15 Mins	23/07/2019 11:11	ST3	51.6	72.5	34.5	54.1	38.4
	15 Mins	23/07/2019 11:26	ST3	50.8	70.2	35.5	54.2	40.6
	15 Mins	23/07/2019 12:58	ST3	50.6	68.7	35.5	53.0	41.2

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
	15 Mins	23/07/2019 13:13	ST3	52.0	80.9	36.8	52.0	40.4
	15 Mins	23/07/2019 13:28	ST3	50.8	70.2	37.0	52.6	41.4
	15 Mins	23/07/2019 13:43	ST3	50.4	66.4	36.4	53.9	40.3
	15 Mins	24/07/2019 09:58	ST3	48.2	62.7	36.8	51.5	40.5
	15 Mins	24/07/2019 09:39	ST4	59.7	74.6	35.5	64.4	42.5
Evening 19:00 - 23:00	15 Mins	23/07/2019 19:00	ST1	48.3	63.8	40.6	50.9	43.2
	15 Mins	23/07/2019 19:37	ST2	67.5*	83.8	35.5	66.2	41.8
	15 Mins	23/07/2019 19:20	ST3	48.3	70.2	34.6	50.8	38.9
Night-time 23:00 - 07:00	15 Mins	23/07/2019 05:02	ST1	44.0	68.1	35.4	48.2	37.8
	15 Mins	23/07/2019 06:41	ST1	46.4	62.1	39.1	49.1	41.9
	15 Mins	23/07/2019 05:44	ST2	44.3	67.8	36.1	45.3	38.8
	15 Mins	23/07/2019 05:59	ST2	43.2	65.7	37.8	44.8	40.4
	15 Mins	23/07/2019 05:24	ST3	48.6	60.7	38.9	52.3	41.5
	15 Mins	23/07/2019 06:19	ST3	49.9	62.7	38.9	53.1	43.0

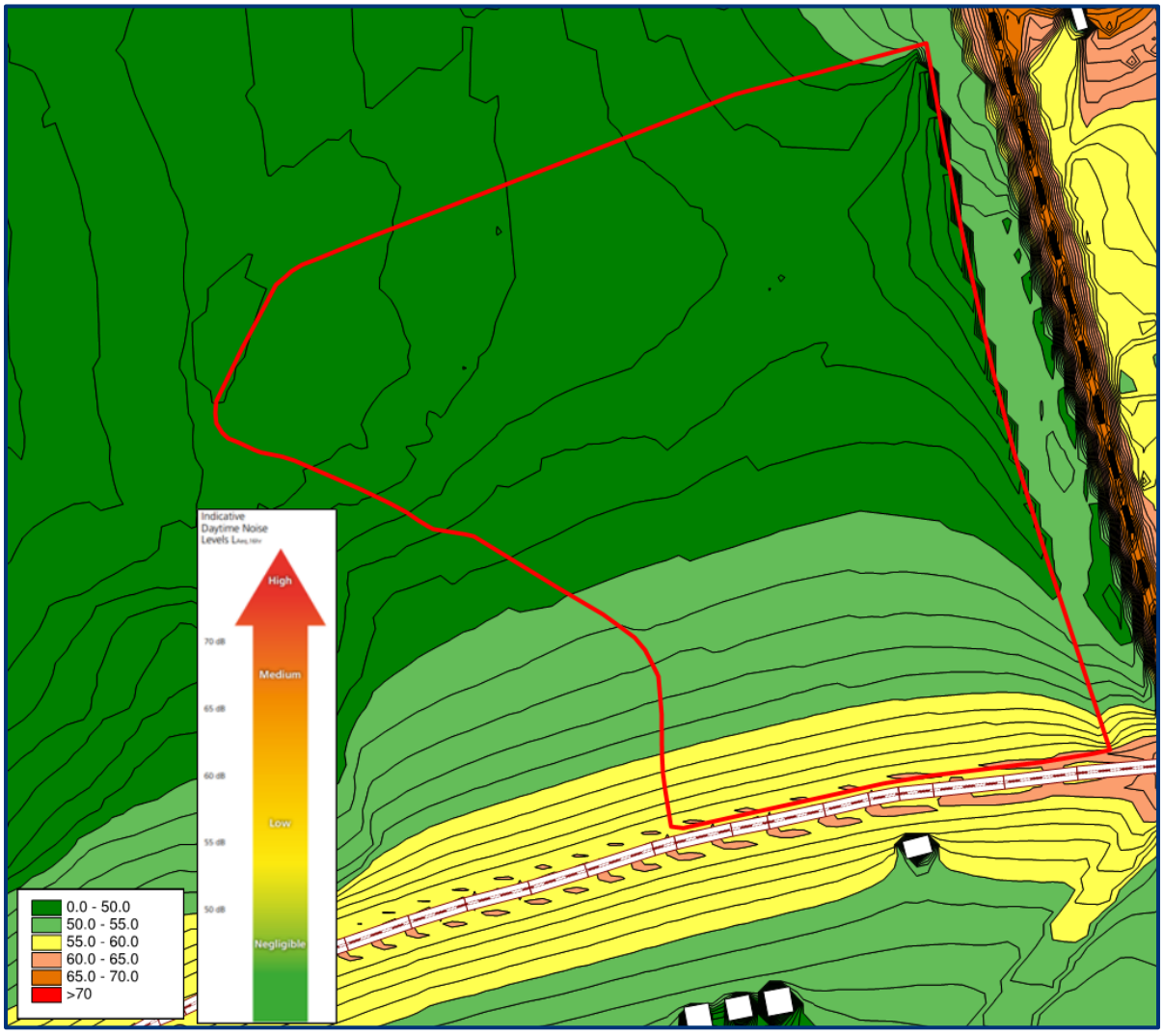
All values are sound pressure levels in dB re: 2×10^{-5} Pa

5.0 ASSESSMENT OF KEY EFFECTS

5.1 PROPG STAGE 1 ASSESSMENT

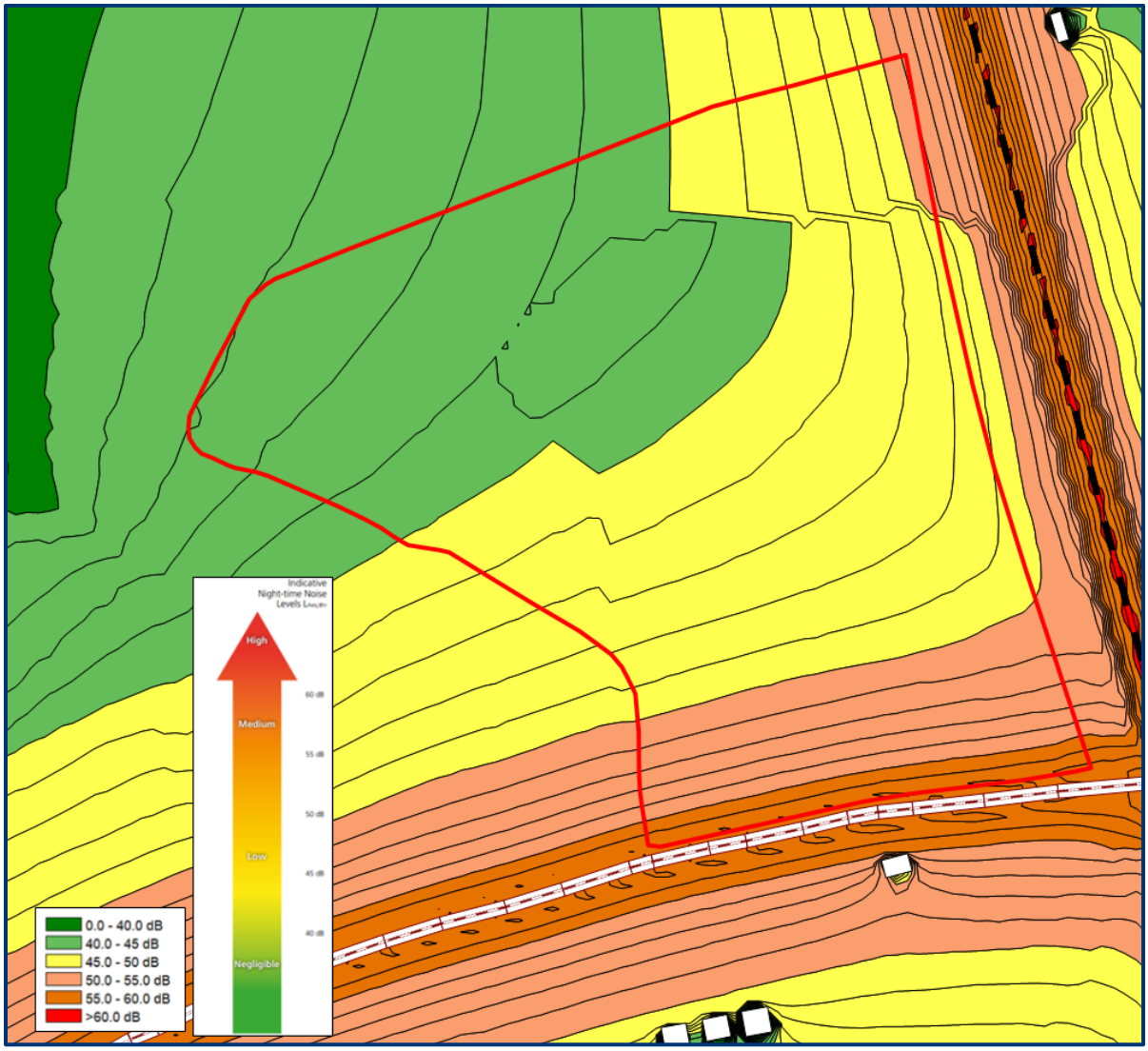
Based on the verified L_{Aeq} noise models, noise levels at the site are between 36-60 dB $L_{Aeq,16hours}$ during the daytime and between 34-53dB $L_{Aeq,8hours}$ in the night-time. Therefore, the site falls within 'Negligible' to 'Low' Noise Risk Categories during daytime and 'Negligible' to 'Low' Noise Risk Categories during night-time periods, shown illustratively on Figure 5.1 and 5.2 below. As such, these noise levels indicate that a good acoustic design process should be followed and an Acoustic Design Statement showing how adverse impacts of noise will be minimised through mitigation which is detailed in Section 6.0.

Figure 5.1 ProPG Stage 1 Noise Risk Contour Plot Daytime $L_{Aeq,16hr}$ (Grid Height 1.5m)



Not to scale
OS Licence No. AL553611

Figure 5.2 ProPG Stage 1 Noise Risk Contour Plot Night-time $L_{Aeq,8hr}$ (Grid Height 4.0m)



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5.2 PROPG STAGE 2 ASSESSMENT – ELEMENT 2: INTERNAL NOISE LEVELS

Modelling and assessment have been undertaken for proposed sensitive properties across the site using the masterplan layout. Internal noise levels within proposed properties have been assessed both with windows open, where a reduction from a partially open window of 10 dB has been used, and with windows closed where an assumption of glazing with specification R_w+C_{tr} 30 dB (e.g. 6/12/8mm double glazing or equivalent) has been used. The results presented in Tables 5.1 – 5.3 in the tables below, show the predicted noise intrusion levels at properties across the site.

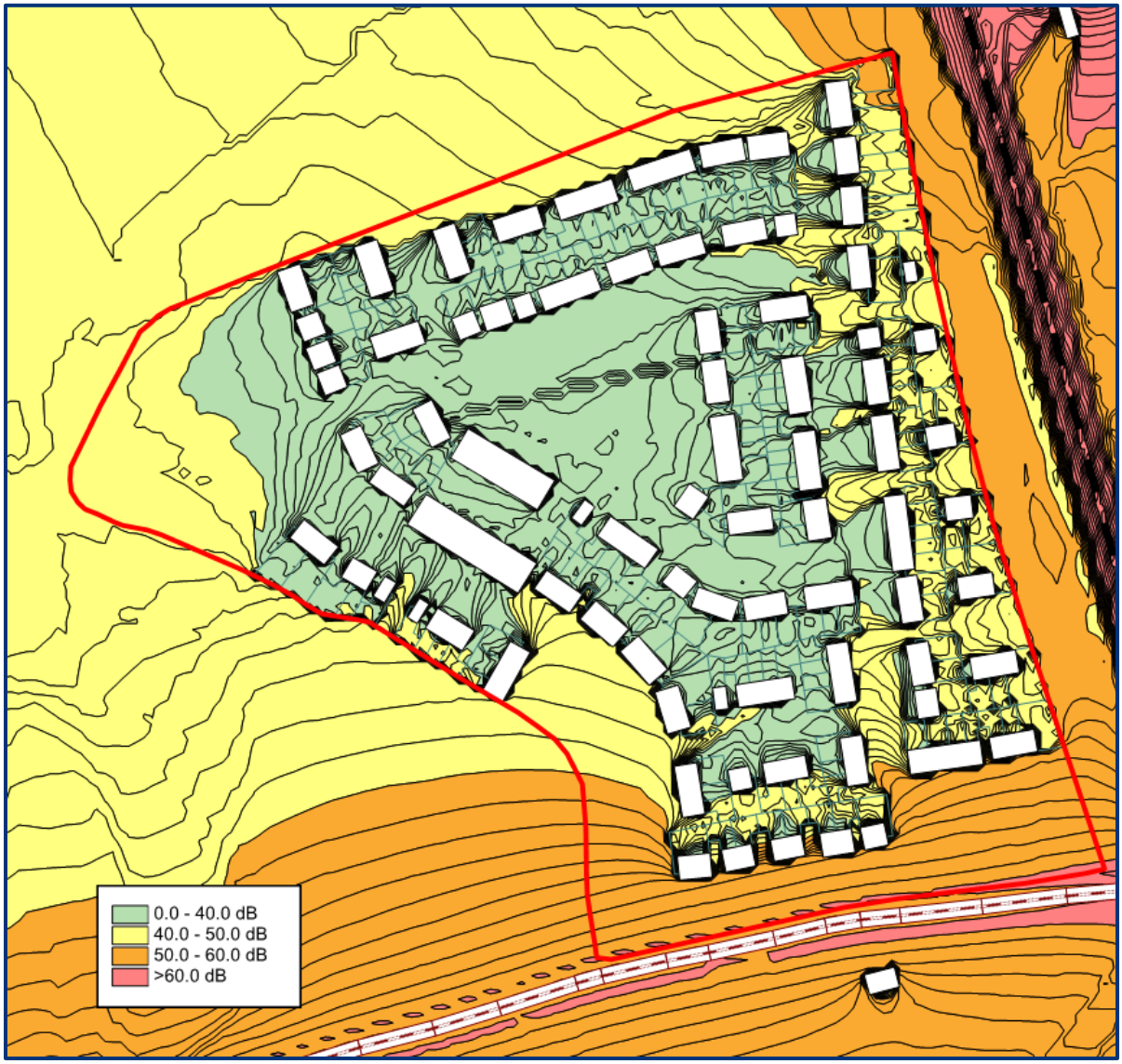
Noise intrusion levels have been determined using verified noise levels based on monitoring data. Additionally, sound sources detailed in Section 3.2.2 of this report have been included for the industrial premises adjacent to the railway line, to present a worst-case noise intrusion assessment.

Proposed noise levels across the site during the daytime and night-time are shown illustratively on Figure 5.3 and 5.4 below.

Table 5.1 Daytime Noise Intrusion Levels $L_{Aeq\ 16\ hour}$

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	37.0	27.0	7.0	35
R02	31.9	21.9	1.9	35
R03	44.2	34.2	14.2	35
R04	49.8	39.8	19.8	35
R05	35.7	25.7	5.7	35
R06	48.1	38.1	18.1	35
R07	49.3	39.3	19.3	35
R08	53.1	43.1	23.1	35
R09	57.0	47.0	27.0	35
R10	56.6	46.6	26.6	35
R11	47.5	37.5	17.5	35
R12	46.9	36.9	16.9	35
R13	39.0	29.0	9.0	35
R14	34.3	24.3	4.3	35
R15	36.6	26.6	6.6	35
R16	34.2	24.2	4.2	35

Figure 5.3 Proposed Daytime $L_{Aeq,16hr}$ Noise Level Contour Plot (Grid Height 1.5m)



Not to scale
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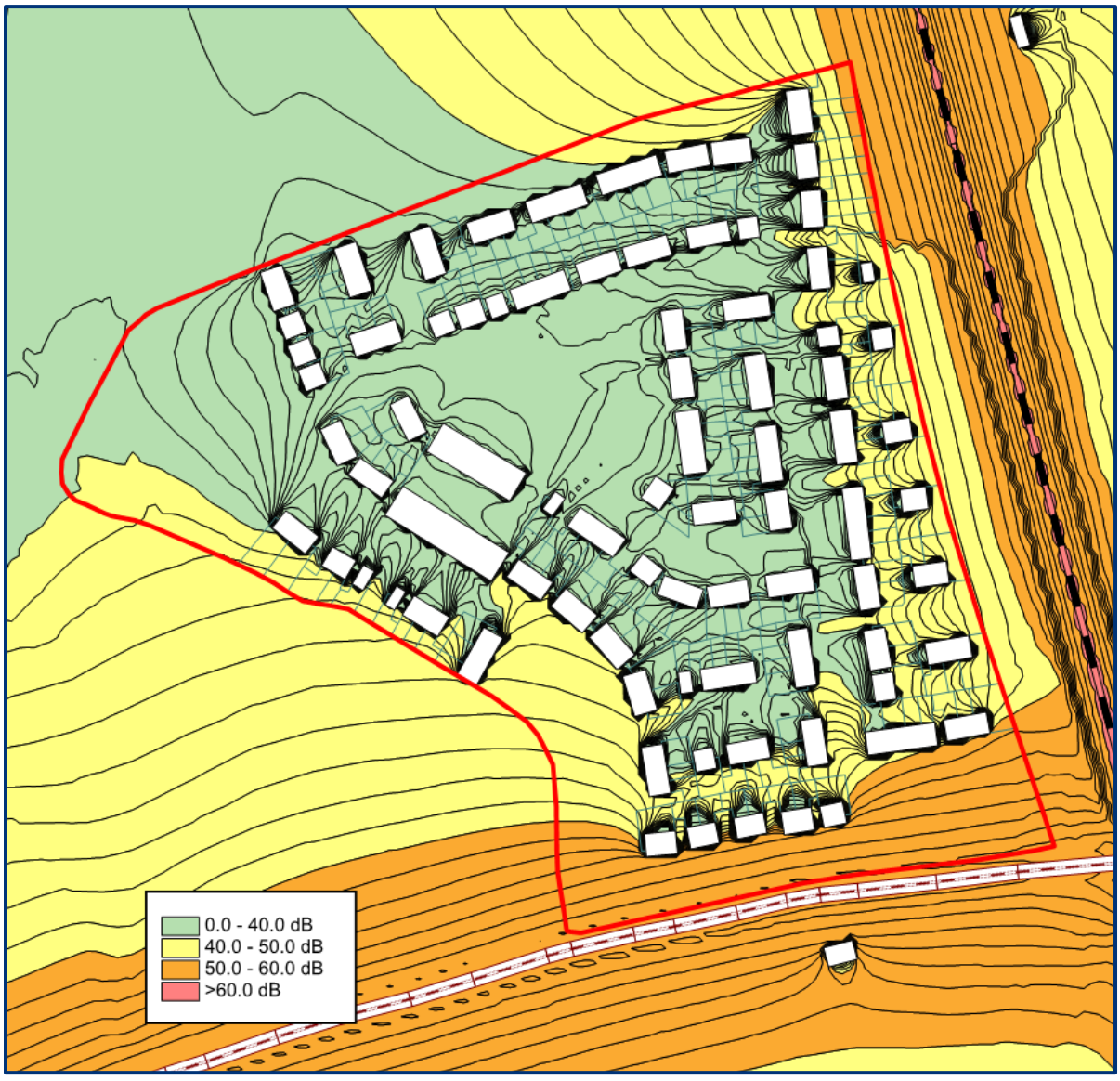
Table 5.2 Night-time Noise Intrusion Levels $L_{Aeq\ 8\ hour}$

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	34.6	24.6	4.6	30
R02	29.0	19.0	0.0	30
R03	39.9	29.9	9.9	30
R04	48.2	38.2	18.2	30
R05	31.6	21.6	1.6	30
R06	44.9	34.9	14.9	30
R07	46.7	36.7	16.7	30
R08	50.1	40.1	20.1	30

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R09	53.9	43.9	23.9	30
R10	53.6	43.6	23.6	30
R11	44.6	34.6	14.6	30
R12	43.8	33.8	13.8	30
R13	40.6	30.6	10.6	30
R14	32.8	22.8	2.8	30
R15	33.3	23.3	3.3	30
R16	31.1	21.1	1.1	30

All values are sound pressure levels in dB re: 2x 10^{-5} Pa.

Figure 5.4 Proposed Night-time $L_{Aeq,8hr}$ Noise Level Contour Plot (Grid Height 4.0m)



Not to scale
OS Licence No. AL553611

Table 5.3 Night-time Noise Intrusion Levels L_{Amax}

Location	External L_{Amax} at 1m from facade	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	Criteria Internal L_{Amax}
R01	58.2	48.2	28.2	45
R02	52.5	42.5	22.5	45
R03	62.0	52.0	32.0	45
R04	70.2	60.2	40.2	45
R05	54.8	44.8	24.8	45
R06	66.9	56.9	36.9	45
R07	68.8	58.8	38.8	45
R08	73.5	63.5	43.5	45
R09	77.7	67.7	47.7	45
R10	77.3	67.3	47.3	45
R11	68.3	58.3	38.3	45
R12	67.5	57.5	37.5	45
R13	64.3	54.3	34.3	45
R14	56.4	46.4	26.4	45
R15	56.3	46.3	26.3	45
R16	54.1	44.1	24.1	45

All values are sound pressure levels in dB re: $2x\ 10^{-5}$ Pa.

The recommended WHO/BS 8233 internal noise levels are not exceeded across the site assuming a windows-closed scenario at the majority of receptor locations during the daytime and night-time L_{Aeq}. However, in a windows-open scenario, target noise level criteria are exceeded at certain locations across the site during both daytime and night-time periods. Additionally, there are a number of receptors that exceed the L_{Amax} internal noise levels with windows closed.

Therefore, in order to achieve the target internal noise level criteria, mitigation measures are outlined in Section 6.1 of this report.

5.3 PROPG STAGE 2 ASSESSMENT – ELEMENT 3: EXTERNAL AMENITY ASSESSMENT

Daytime noise levels in private external spaces of the proposed development have been assessed, the results of which are shown in Table 5.4 below.

Table 5.4 Private External Amenity Area Noise Levels $L_{Aeq,16hr}$

Receiver No.	External $L_{Aeq,\ 16\ hr}$ Daytime	BS 8233 Target Criteria L_{Aeq}
G01	34.3	50-55
G02	37.8	50-55
G03	34.5	50-55
G04	48.4	50-55

Receiver No.	External $L_{Aeq,\ 16\ hr}$ Daytime	BS 8233 Target Criteria L_{Aeq}
G05	47.8	50-55
G06	42.9	50-55
G07	48.9	50-55
G08	39.8	50-55
G09	38.8	50-55
G10	39.7	50-55
G11	39.3	50-55
G12	38.1	50-55
G13	30.6	50-55
G14	35.5	50-55
G15	33.6	50-55

The results in the Table 5.4 above show that daytime L_{Aeq} noise levels within private external amenity areas are predicted to fall below the lower BS8233 external amenity area level of 50 dB $L_{Aeq,16hours}$ across the development site and thus is within or below the LOAEL.

5.4 BS4142 ASSESSMENT – ADJACENT INDUSTRIAL UNITS

Due to minimal activity occurring at the adjacent industrial premises, an assessment comparing the predicted worst-case activity noise from the industrial yards with the typical measured background noise L_{A90} noise levels at the closest existing residential receptors (for the purposes of this assessment, the lowest daytime or night-time monitoring values at the representative monitoring locations has been used). The assessment presented below has been undertaken with plant operating at full capacity and assesses the noise levels within the external amenity spaces, as required in BS4142. As the industrial premises are only open during daytime, only this period has been assessed.

In accordance with Section 9.2 of BS4142:2014:A1:2019 a 3dB correction has been applied to derive the noise rating level for potential impulsive noise.

Table 5.5 BS4142 Assessment for Industrial Unit

Ref	Existing Measured Average Background L_{A90}	Noise rating level from plant (with +3 dB Correction)	BS 4142 Score
	Daytime	Daytime	Daytime
G01	38	29	-6
G02	38	35	0
G03	38	30	-6
G04	40	42	5
G05	40	37	0
G06	40	33	-5
G07	40	37	0
G08	43	30	-10

Ref	Existing Measured Average Background L_{A90}	Noise rating level from plant (with +3 dB Correction)	BS 4142 Score
	Daytime	Daytime	Daytime
G09	39	31	-5
G10	39	25	-11
G11	39	23	-14
G12	39	23	-13
G13	38	22	-13
G14	38	31	-4
G15	40	25	-12

The assessment above demonstrates that worst-case noise levels from the existing industrial premises are predicted to be up to 5 dB above the existing background noise levels during the daytime at all surrounding modelled external amenity receptor locations. As such, additional mitigation for the gardens fences along the eastern boundary is discussed in Section 6 of this report.

5.5 TRANQUILLITY ASSESSMENT

An assessment of the existing tranquillity level of the site has been based on the mapping data published by CPRE. This uses a colour coded system and a 500m assessment grid for the whole of England, and a tranquillity rating of between 1 and 10 is assigned (1 being least tranquil and 10 being most).

By reference to these maps the development is assessed as falling into Zone 7 and therefore the area has a degree of tranquillity. However, the development site comprises cultivated fields and does not include existing recreation areas, therefore access to areas of greater tranquillity value is not expected to be adversely affected by the scheme.

6.0 ACOUSTIC DESIGN STATEMENT (MITIGATION)

6.1 GLAZING AND VENTILATION STRATEGY (DETAILED APPLICATION)

The glazing and ventilation strategy is designed to achieve internal daytime L_{Aeq} of 35 dB, an internal night-time L_{Aeq} of 30 dB and an internal night-time L_{Amax} of 45 dB in habitable rooms of the proposed development. It highlights which areas will feature enhanced glazing and an alternative means of ventilation in order to meet both ventilation and internal ambient noise criteria (shown in section 2.1).

All living rooms will benefit from standard double glazing with a sound reduction of $R_w + C_{tr}$ 30 dB as a minimum, along with an alternative means of ventilation across a number of facades. The assessment has demonstrated that this level of glazing is sufficient to meet internal noise level targets in a window-closed scenario across the site.

A number of bedroom spaces will benefit from standard double glazing with a sound reduction of $R_w + C_{tr}$ 30 dB as a minimum, along with an alternative means of ventilation across all facades. Bedroom facades adjacent to Shaw Lane will feature enhanced glazing with a sound reduction of up to $R_w + C_{tr}$ 33 dB, along with an alternative means of ventilation which matches the performance of the glazing. The assessment has demonstrated that this level of glazing is sufficient to meet internal noise level targets in a window-closed scenario across the site. Glazing and ventilation strategy for living rooms and bedrooms are shown in Appendix B.

Alternative ventilation can be provided in several ways from acoustic trickle vents (which need to have a minimum sound reduction equal to or greater than the glazing), to other passive ventilation systems.

To achieve less than 5dB above the background noise level, garden fences that run parallel to the railway line and industrial properties to the east of the development, will be increased to at least 2.2m in height.

The assessment presented below has been undertaken with plant operating at full capacity and assesses the noise levels within the external amenity spaces, inclusive of the increased fence height.

The location of the increased garden fence height is shown in Figure 6.1 below.

Table 6.1 BS4142 Assessment for Industrial Unit – With Mitigation

Ref	Existing Measured Average Background L_{A90}	Noise rating level from plant (with +3 dB Correction)	BS 4142 Score
	Daytime	Daytime	Daytime
G01	38	29	-6
G02	38	35	0
G03	38	30	-6
G04	40	42	2
G05	40	37	-1
G06	40	33	-5

Ref	Existing Measured Average Background L_{A90}	Noise rating level from plant (with +3 dB Correction)	BS 4142 Score
	Daytime	Daytime	Daytime
G07	40	37	-1
G08	43	30	-10
G09	39	31	-5
G10	39	25	-11
G11	39	23	-14
G12	39	23	-13
G13	38	22	-13
G14	38	31	-4
G15	40	25	-12

In accordance with the guidance presented within BS 4142, this is considered to represent a low impact and would be within the Low Observed Adverse Effect Level.

Figure 6.1 Increased Garden Fence Height Locations

7.0 CONCLUSIONS

This report presents the findings of a noise assessment to support an outline planning application for up to 215 dwellings on Land at Shaw Lane, Barnsley. The NPPF gives test points relating to noise; considering these the following conclusions can be drawn:

NPPF Paragraphs 174 (e) and 185 (a)

The proposed development is not expected to have a 'significant adverse impact' on health or quality of life.

With regard to proposed residential receptors, it is considered that all 'adverse impacts on health and quality of life' (relating to noise) are mitigated by the use of an appropriate glazing strategy with alternative means of ventilation which is compliant with Building Regulations. The suggested glazing and ventilation specifications will be achievable.

NPPF Paragraphs 187 (b), 188

An assessment of the existing tranquillity level of the site has some tranquillity and recreational value, however existing rights of way are to be maintained and therefore the development will not restrict access to areas of greater tranquillity.

Planning Practice Guidance: Noise

Noise levels at proposed receptors are predicted to fall below the Significant Observed Adverse Effect Level (SOAEL) during both daytime and night-time periods.

APPENDICES

APPENDIX A – ACOUSTIC TERMINOLOGY AND ABBREVIATIONS

Acoustic Terminology

dB — Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.

dB(A) — Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.

L_{Aeq} — Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq,\ 07:00\ –\ 23:00}$ for example, describes the equivalent continuous noise level over the 12 hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower that the $L_{Aeq,\ 07:00\ –\ 23:00}$.

L_{Amin} — The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.

L_{Amax} — The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.

L_n — Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say. 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the $L_{A10,\ 1\ hr}$ = x dB.

The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.

R_w — The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

Abbreviations

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

PPG – Planning Practice Guidance

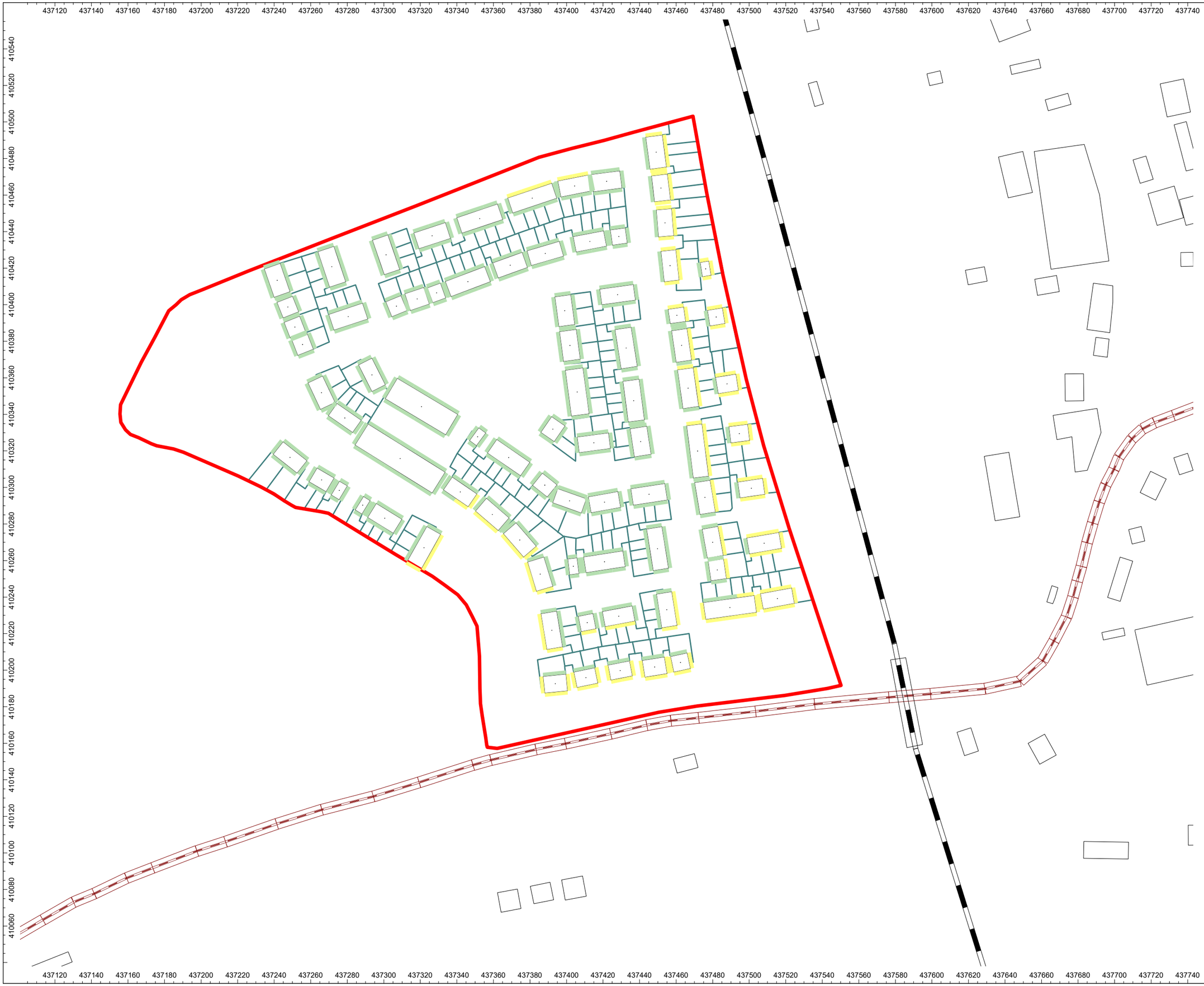
UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

APPENDIX B – SKETCHES

SK01 Glazing and Ventilation Strategy (Living Rooms)

SK02 Glazing and Ventilation Strategy (Bedrooms)



Client:
Network Spaces

Project:
Shaw Lane, Barnsley

Drawing Title / Scenario:
Glazing and Ventilation Strategy - Living Rooms

Drawing Number:
SK01

Key:

- Natural Ventilation
- Alternative Ventilation
- Enhanced Glazing >Rw 30dB

Site Boundary:

Scale : Not to scale

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Executive Park
Avalon Way
Anstey
Leicestershire
LE7 7GR
Tel 0116 234 8000

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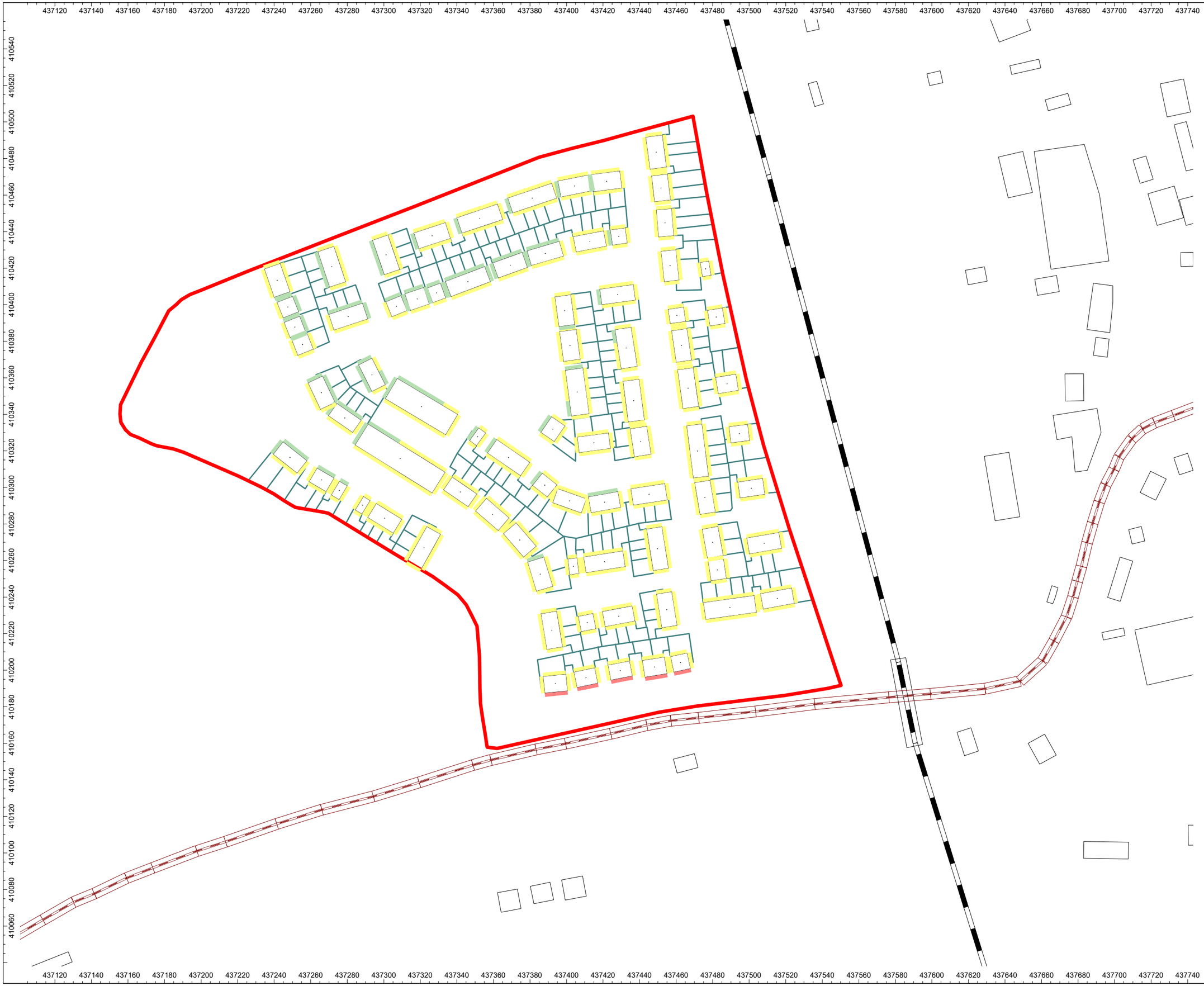

Client:
Network Spaces

Project:
Shaw Lane, Barnsley

Drawing Title / Scenario:
Glazing and Ventilation Strategy - Bedroom

Drawing Number:
SK02

Key:

- Natural Ventilation
- Alternative Ventilation
- Enhanced Glazing >Rw 30dB
- Enhanced Glazing >Rw 40dB

Site Boundary:

Scale : Not to scale

Tetra Tech 28.01.22

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Tel 0116 234 8000

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APPENDIX C – REPORT CONDITIONS

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