

Woodpecker PLC

Land West of Coldharbour Farm, Emsworth

Noise Assessment August 2020

Executive Park, Avalon Way, Anstey, Leicester, LE7 7GR

Tel: +44 (0)116 234 8000

Email: nigel.mann@wyg.com

Document Control

Project: Land West of Coldharbour Farm, Emsworth
Client: Woodpecker PLC
Job Number: A113742
File Origin: O:\Acoustics Air Quality and Noise\Active Projects\A113742

Document Checking:

Prepared by:	Emma Aspinall <i>Environmental Consultant</i>	Initialled: EA
--------------	--	----------------

Checked by:	Lewis Kelter ^{AMIOA} <i>Senior Environmental Consultant</i>	Initialled: LK
-------------	---	----------------

Verified by:	Nigel Mann ^{MIOA} <i>Director</i>	Initialled: NM
--------------	---	----------------

Issue	Date	Status
1	28 th June 2019	First Issue
2	20 th August 2020	Second Issue – Revised barrier height and ventilation strategy
3		
4		

Contents Page

1.0	Introduction.....	1
2.0	Assessment Criteria.....	6
3.0	Assessment Methodology	7
4.0	Noise Survey	11
5.0	Assessment of Key Effects	15
6.0	Noise Mitigation	18
7.0	Conclusions	19

Appendix Contents

Appendix A – Acoustic Terminology and Abbreviations

Appendix B – Sketches

Appendix C – Report Conditions

1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment in support of a planning application for a proposed residential development on land to the west of Coldharbour Farm, Emsworth. This version of the report includes a reduction in barrier height from 4.0m to 2.4m following concerns over safety, as well updates to the glazing and ventilation strategy following an overheating assessment and comments from Havant Borough Council.

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 short-term and long-term effects of noise. The noise levels surrounding the proposed development have been predicted at local representative receptors using CADNA noise modelling software which incorporates ISO 9613 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 and noise contour plots relevant to the assessment are presented in Appendix B. Report Conditions are presented in Appendix C.

1.2 Legislative Context (England)

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 the National Planning Policy Framework (NPPF), published on 19th February 2019. With regard to noise and planning, NPPF contains the following statement at paragraph 170:

"170. 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 180, which state:

"180. 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 182 and 183 state:

"182. 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.

183. 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 Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No Specific Measures Required
Noticeable 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 (NOEL)	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable 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; closing windows for some of the time because of the noise. Potential for non-awakening 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)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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
Noticeable 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 Observed Adverse Effect	Prevent

The NPPF, NSPE and PPG: Noise 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 including the 'World Health Organisation Community Noise Guidelines' (1999) and 'BS 8233 – Guidance on Sound Insulation and Noise Reduction for Buildings' (2014), Section 2.0 presents the noise level criteria used as a basis of this assessment.

The PPG: Noise 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:

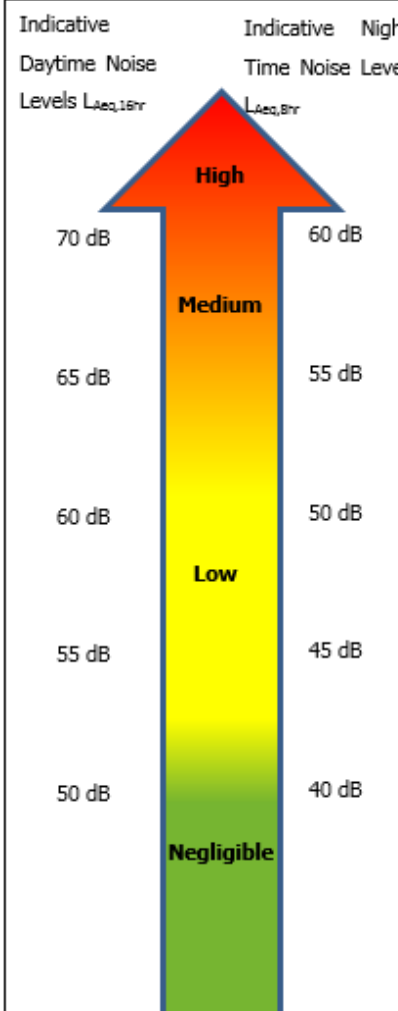
- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for 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

Noise Risk Assessment	Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels $L_{Aeq,15hr}$ Indicative Night-Time Noise Levels $L_{Aeq,8hr}$  70 dB 65 dB 60 dB 55 dB 50 dB 60 dB 55 dB 50 dB 45 dB 40 dB High Medium Low Negligible	Increasing risk of adverse effect	High noise levels indicate that there is an increased risk that development may be refused on noise grounds. The risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice. As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrates that a significant adverse noise impact will be avoided in the finished development. At low noise levels, the site is likely to be acceptable from a noise perspective <u>provided that</u> a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
	No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.

Stage 2 of the ProPG approach contains four key elements to be undertaken and considered systematically. The key elements are as follows:

- Element 1 – Good Acoustic Design Process
- Element 2 – Internal Noise Level Guidelines
- Element 3 – External Amenity Area Noise Assessment
- Element 4 – Assessment of Other Relevant Issues

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

2.0 Assessment Criteria

2.1 Internal Noise Assessment Criteria

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

BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'

World Health Organisation: *Guidelines for Community Noise (1999)*

Table 2.1 Noise Level Criteria and Actions

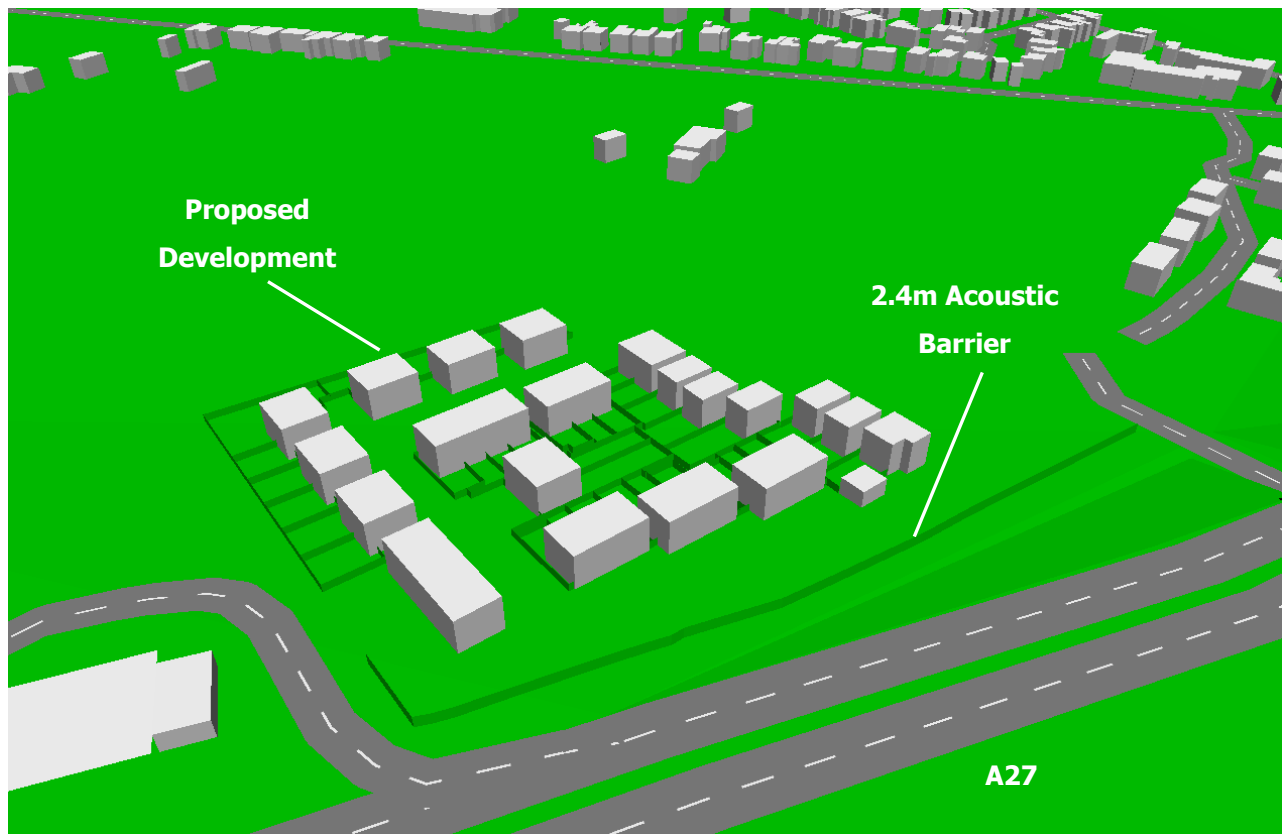
Effect Level	Noise Level Criteria	Action / Justification
No Observed Adverse Effect	Bedrooms – 30 dBL _{Aeq,8hours} Living Rooms – 30 dBL _{Aeq,16hours} External Amenity Space – 50 dBL _{Aeq,16hours}	None Within BS8233 / WHO criteria
Lowest Observed Adverse Effect Level (LOAEL)	Noise levels exceed: Bedrooms – 30 dBL _{Aeq,8hours} Living Rooms – 35 dBL _{Aeq,16hours} External Amenity Space – 55 dBL _{Aeq,16hours}	Mitigate to achieve: Bedrooms – 30 dBL _{Aeq,8hours} Living Rooms – 35 dBL _{Aeq,16hours} External Amenity Space – 55 dBL _{Aeq,16hours} Within BS8233 / WHO criteria
Significant Observed Adverse Effect Level (SOAEL)	Noise levels exceed: Bedrooms – 35 dBL _{Aeq,8hours} Living Rooms – 40 dBL _{Aeq,16hours} External Amenity Space – 60 dBL _{Aeq,16hours}	Avoid However, if due to other design considerations noise criteria is not achievable or that the target criteria can be achieved for certain periods (e.g. when windows are closed), the following noise levels may be acceptable as an upper limit: Bedrooms – 35 dBL _{Aeq,8hours} Living Rooms – 40 dBL _{Aeq,16hours} External Amenity Space – 60 dBL _{Aeq,16hours} This is on the basis that the guideline noise values do not represent people's response to noise in all cases with the specified criteria only a marginal exceedance of the target criteria.
Unacceptable Observed Adverse Effect Level (UOAEL)	Noise levels with mitigation exceed: Bedrooms – 35 dBL _{Aeq,8hours} Living Rooms – 40 dBL _{Aeq,16hours} External Amenity Space – 60 dBL _{Aeq,16hours}	Prevent

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three dimensional noise modelling has been undertaken based on the monitoring data to predict L_{Aeq} and L_{Amax} noise levels at a large number of locations both horizontally and vertically. CADNA noise modelling software has been used (as shown in Figure 3.1). 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.

Figure 3.1 CADNA Noise Model



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

Table 3.1 Modelling Parameters Sources and Assumptions

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, main surrounding roads	WYGE	Traffic flows for local roads based on WYGE observations and experience.
Traffic data – local roads	WYGE	Traffic flows for local roads based on WYGE observations and experience.
Building heights – around site	WYGE Observations	8 m height for two storey residential properties, and 4 m for Bungalows
Barrier heights	WYGE Observations	All existing barriers at 1.8 m with the exception of hedges and trees which are assumed to offer no noise protection.
Receptor positions	WYGE	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor. 1.5 m height for model grid and monitoring locations for validation.
Plans	R H Partnership Architects	Title: Proposed Site Plan Drawing no: P0768-RHP-00-ZZ-PL-A-0010 Revision: P3 Dated: 24/06/2019

It is acknowledged that a number of these assumptions will affect the overall noise levels presented in this report. However, it should be noted that certain assumptions made, as identified above, are worst case.

3.2 Model Input Data

3.2.1 Existing Ambient Noise Climate

Noise sources affecting the Site, including all roads expected to make a significant contribution, have been used within this assessment. Noise emissions from existing road traffic flows have been derived from verification of the measured noise levels, along with observations made during the Site survey and/or WYG Environment experience of similar road systems.

3.2.2 Model Verification

The models were verified by modelling the monitoring locations for the 'existing' scenario, including contributions from the surrounding road network. Worst-case daytime and night-time L_{Aeq} and night-time L_{Amax} scenarios have been verified; noise from birdsong and the dawn chorus during the daytime period has been removed from long-term measurements. The comparison between the monitoring and modelling results are shown in Tables 3.2 – 3.4 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	68.4	68.4	0.0
LT2	60.2	59.7	-0.5
LT3	53.6	55.1	1.5

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

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

Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
LT1	63.9	63.9	0.0
LT2	55.8	55.5	-0.3
LT3	50.2	50.8	0.6

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

Table 3.4 Modelled vs. Monitored Results L_{Aeq} ; night-time 23:00– 07:00

Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
LT1*	86.8	86.8	0.0
LT2*	76.0	78.0	2.0
LT3*	76.9	73.0	-3.9

*Excluding Top 15 L_{Amax} events

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

Within the verification exercise, greater weight and confidence has been given to the long-term measurements due to a longer exposure time representing noise around the site. The verification points show a divergence between monitored and modelled results of no more than ± 2.0 dB during both the daytime and night-time L_{Aeq} and L_{Amax} scenarios for nearly all long-term locations, with the exception of LT3. Given that LT1 and LT2 lie closer to the road network, greater weight and confidence has been given to these locations. Therefore the models are considered to be suitably verified.

3.2.3 Model Verification (Specific Noise Sources)

Noise levels from the building services plant associated with the Shell garage to the west were observed and measured during the noise survey, with the data detailed in Table 3.5 below.

Table 3.5 Building Services Noise Level Data

Description	Model Representation	Frequency (Hz)							Total L_{Aeq} dB(A)
		125	250	500	1k	2k	4k	8k	
Building Services Plant @ 1m distance	Point Source	66.1	64.4	60.4	58.7	51.4	42.9	32.3	62.8

3.3 Sensitive Receptors

Existing noise levels have been assessed at properties in all areas of the site with respect to direct noise from the existing ambient noise climate surrounding the site. The locations of the proposed receptors are shown of SK02 of Appendix B.

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:

Rion NL-52	Environmental Noise Analyser	s/n	1221575
Rion NL-52	Environmental Noise Analyser	s/n	1221576
Rion NL-52	Environmental Noise Analyser	s/n	253702
Rion NL-52	Environmental Noise Analyser	s/n	1276552
Rion NC-74	Sound Calibrator	s/n	35046823

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 SK01 of Appendix B) from Thursday 16th May 2019 to Friday 24th May 2019. Attended short term measurements were undertaken at five locations during day, evening and night-time periods with three additional locations being measured unattended over a 186-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 with scattered showers. Anemometer readings confirmed that wind speeds were less than 5 ms^{-1} at all times during the survey, with a predominant easterly wind direction, during the survey.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	Adjacent to exit slip road from Emsworth East Services on the A27
LT2	Eastern extent of Emsworth East Services site area.
LT3	North-eastern boundary of the site
ST1	Adjacent to 20 Coldharbour Farm Road
ST2	Adjacent to car park entrance opposite 34 Horndean Road
ST3	Western boundary of site with Emsworth East Services (Shell Garage)
ST4	Adjacent to slip road exit from A27 to Emsworth West Services

Ref	Description
ST5	Washington Road (footpath), located between A27 and railway

4.2 Noise Survey Results

The existing noise sources dominant in the surrounding area include road traffic noise from the A27 towards the south of the site and Horndean Road to the east of the site, railway noise from the south of the site. Noise was occasionally audible from building services plant associated with the services to the west of 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 (°C)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Daytime ST1	23/05/2019 14:56	22.0	1-2	E	4	Road traffic noise (A27 and Coldharbour Farm Road).
Daytime ST2	23/05/2019 16:00	22.0	1-3	E	4	Road traffic noise (Horndean Road).
Daytime ST3	23/05/2019 15:34	22.0	1-2	E	4	Road traffic noise (A27), and plant noise from services.
Daytime ST4	23/05/2019 16:49	22.0	1-2	E	4	Road traffic noise (A27, slip road).
Daytime ST5	23/05/2019 15:14	22.0	1-2	E	4	Road traffic noise (A27) and railway.
Evening ST1	23/05/2019 21:27	18.0	1-2	NE	3	Road traffic noise (A27).
Evening ST2	23/05/2019 21:48	17.0	1-2	NE	3	Road traffic noise (Horndean Road).
Evening ST3	23/05/2019 20:48	19.0	1-2	NE	4	Road traffic noise (A27), and plant noise from services.
Evening ST4	23/05/2019 20:15	19.0	1-2	NE	6	Road traffic noise (A27).
Evening ST5	23/05/2019 21:09	18.0	0-2	NE	3	Road traffic noise(A27) and railway noise.
Night-time ST1	24/05/2019 00:39	13.0	0-2	E	2	Road traffic noise (A27).
Night-time ST2	23/05/2019 23:31	13.0	0-2	E	2	Road traffic noise (A27, Horndean Road).
Night-time ST3	24/05/2019 01:01	12.0	0-2	E	1	Road traffic noise (A27) and plant noise from services.
Night-time ST4	24/05/2019 01:18	12.0	0-2	E	1	Road traffic noise (A27).
Night-time ST5	24/05/2019 00:22	13.0	0-2	E	2	Road traffic noise (A27).

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: 2×10^{-5} Pa). 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 4.3 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	90 Hours	16/05/2019 - 24/05/2019 07:00 - 23:00	LT1	68.4	97.2	36.3	71.4	60.0
Weekday Night-time 23:00 - 07:00	48 Hours	16/05/2019 - 24/05/2019 23:00 - 07:00		63.9	92.2	28.4	63.1	36.0
Weekend Daytime 07:00 - 23:00	32 Hours	18/05/2019 - 19/05/2019 07:00 - 23:00		68.3	104.4	37.0	71.3	60.0
Weekend Night-time 23:00 - 07:00	16 Hours	18/05/2019 - 19/05/2019 23:00 - 07:00		60.9	92.0	26.9	61.9	40.0
Weekday Daytime 07:00 - 23:00	90 Hours	16/05/2019 - 24/05/2019 07:00 - 23:00	LT2	60.2	92.2	34.8	61.0	57.0
Weekday Night-time 23:00 - 07:00	48 Hours	16/05/2019 - 24/05/2019 23:00 - 07:00		55.8	84.4	28.0	55.4	36.0
Weekend Daytime 07:00 - 23:00	32 Hours	18/05/2019 - 19/05/2019 07:00 - 23:00		59.1	91.1	39.3	60.1	56.0
Weekend Night-time 23:00 - 07:00	16 Hours	18/05/2019 - 19/05/2019 23:00 - 07:00		53.6	81.5	27.5	53.6	47.0
Weekday Daytime 07:00 - 23:00	90 Hours	16/05/2019 - 24/05/2019 07:00 - 23:00	LT3	53.6	91.7	32.4	53.6	48.0
Weekday Night-time 23:00 - 07:00	48 Hours	16/05/2019 - 24/05/2019 23:00 - 07:00		50.2	83.2	21.8	48.2	32.0
Weekend Daytime 07:00 - 23:00	32 Hours	18/05/2019 - 19/05/2019 07:00 - 23:00		53.6	98.1	35.0	53.4	50.0
Weekend Night-time 23:00 - 07:00	16 Hours	18/05/2019 - 19/05/2019 23:00 - 07:00		46.6	77.9	18.8	46.7	40.0
Daytime 07:00 - 19:00	15 Mins	23/05/2019 14:56	ST1	62.2	81.0	52.6	61.2	58.6
	15 Mins	23/05/2019 16:00	ST2	62.4	72.5	52.0	61.9	56.0
	15 Mins	23/05/2019 15:34	ST3	55.4	64.5	48.4	55.6	54.2
	15 Mins	23/05/2019 16:49	ST4	68.7	81.6	53.0	68.8	66.7
	15 Mins	23/05/2019 15:14	ST5	59.7	80.4	48.7	58.3	56.0
Evening 19:00 - 23:00	15 Mins	23/05/2019 21:27	ST1	53.3	62.3	40.5	53.1	52.6
	15 Mins	23/05/2019 21:48	ST2	58.8	81.6	39.7	53.1	48.5
	15 Mins	23/05/2019 20:48	ST3	54.3	75.0	42.3	53.5	53.7
	15 Mins	23/05/2019 20:15	ST4	66.6	83.4	46.0	65.4	65.7

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	23/05/2019 21:09	ST5	55.3	75.1	42.5	54.6	52.8
Night-time 23:00 - 07:00	15 Mins	24/05/2019 00:39	ST1	48.4	61.2	27.8	44.8	49.2
	15 Mins	23/05/2019 23:31	ST2	54.4	72.2	35.4	48.0	43.7
	15 Mins	24/05/2019 01:01	ST3	46.4	58.2	29.8	43.7	44.4
	15 Mins	24/05/2019 01:18	ST4	59.9	76.9	32.1	51.9	48.3
	15 Mins	24/05/2019 00:22	ST5	49.8	61.8	34.4	48.4	47.1

5.0 Assessment of Key Effects

5.1 ProPG Stage 1 Assessment

Based on the verified L_{Aeq} noise models, noise levels across the open site are between 54 - 69 dB $L_{Aeq,16hours}$ during the daytime and between 54 - 64 dB $L_{Aeq,8hours}$ during the night-time. Therefore, the site falls within the 'Low' to 'High' Noise Risk Categories during the daytime and the 'Medium' to 'High' Noise Risk Categories during the night-time period. As such, these noise levels indicate that the development site will require good acoustic design (particularly with respect to night-time noise levels) and an Acoustic Design Statement.

5.2 ProPG Stage 2 Assessment – Element 2: Internal Noise Levels

Internal noise levels within potential dwellings 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 30 dB (e.g 6/12/6mm double glazing or equivalent) has been used. The assessment is inclusive of a 2.4m high acoustic barrier along the southern boundary of the site. The results presented in tables 5.1 – 5.3 below show the predicted noise intrusion levels at properties across the site.

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

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	57.1	47.1	27.1	35
R02	56.1	46.1	26.1	35
R03	56.6	46.6	26.6	35
R04	56.5	46.5	26.5	35
R05	57.3	47.3	27.3	35
R06	52.3	42.3	22.3	35
R07	50.0	40.0	20.0	35
R08	45.5	35.5	15.5	35
R09	40.9	30.9	10.9	35
R10	48.4	38.4	18.4	35
R11	51.0	41.0	21.0	35
R12	44.6	34.6	14.6	35
R13	46.9	36.9	16.9	35
R14	48.7	38.7	18.7	35
R15	46.8	36.8	16.8	35

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

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	57.9	47.9	27.9	30
R02	56.5	46.5	26.5	30
R03	56.6	46.6	26.6	30
R04	56.5	46.5	26.5	30
R05	59.2	49.2	29.2	30
R06	54.5	44.5	24.5	30
R07	51.6	41.6	21.6	30
R08	44.7	34.7	14.7	30
R09	39.3	29.3	9.3	30
R10	45.7	35.7	15.7	30
R11	48.5	38.5	18.5	30
R12	42.9	32.9	12.9	30
R13	44.7	34.7	14.7	30
R14	46.6	36.6	16.6	30
R15	44.5	34.5	14.5	30

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

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	80.3	70.3	50.3	45
R02	79.0	69.0	49.0	45
R03	79.1	69.1	49.1	45
R04	78.9	68.9	48.9	45
R05	81.7	71.7	51.7	45
R06	77.0	67.0	47.0	45
R07	74.1	64.1	44.1	45
R08	67.1	57.1	37.1	45
R09	57.9	47.9	27.9	45
R10	67.6	57.6	37.6	45
R11	70.6	60.6	40.6	45
R12	65.3	55.3	35.3	45
R13	67.2	57.2	37.2	45
R14	69.1	59.1	39.1	45
R15	67.0	57.0	37.0	45

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

The BS 8233 internal noise levels are met across the site during the daytime and night-time L_{Aeq} scenarios, assuming a windows-closed scenario. However, during the night-time L_{Amax} scenario, noise levels are exceeded assuming a windows-closed scenario for facades exposed to the A27. 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 Spaces

Daytime noise levels in private external amenity spaces of the proposed development have been assessed. The scheme has been designed to reduce noise levels within garden areas through the use of solid garden fences and maximising the screening provided by the proposed dwellings; fences will be constructed from brick or solid timber panels with no gaps and be a minimum of 1.8 metres high, to protect external amenity spaces within the proposed development.

The locations of these receptors are illustratively shown in SK02 of Appendix B with the results of this assessment presented below in Table 5.4.

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

Ref	External $L_{Aeq,16hr}$ Daytime	BS 8233 Upper Limit Criteria L_{Aeq}
G01	51.3	55.0
G02	50.0	55.0
G03	49.5	55.0
G04	42.9	55.0
G05	45.3	55.0
G06	45.3	55.0

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

The results in the table above show that daytime L_{Aeq} noise levels within private external amenity areas are not predicted to exceed the BS 8233 upper guideline value (55 dB).

6.0 Noise Mitigation

6.1 Glazing and Ventilation Strategy

The glazing and ventilation strategy provided in SK06 has been 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 would feature an alternative means of ventilation in order to meet both ventilation and internal ambient noise criteria. It is understood from the overheating assessment, all dwellings will feature some form of mechanical ventilation with an example product being the Zehnder ComfoCool Q600. Table 6.1 below details the glazing specification required to achieve the recommended internal ambient noise criteria, with all locations shown on SK06 of Appendix B.

Table 6.1 – Night-time Noise Intrusion Levels, L_{Amax} and Glazing Specification

Location	External L_{Amax} at 1m from facade	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	Criteria Internal L_{Amax}	Glazing Specification to Achieve Criteria ($R_w + C_{tr}$, dB)
R01	80.3	70.3	50.3	45	36
R02	79.0	69.0	49.0	45	34
R03	79.1	69.1	49.1	45	35
R04	78.9	68.9	48.9	45	34
R05	81.7	71.7	51.7	45	37
R06	77.0	67.0	47.0	45	32
R07	74.1	64.1	44.1	45	30
R08	67.1	57.1	37.1	45	30
R09	57.9	47.9	27.9	45	30
R10	67.6	57.6	37.6	45	30
R11	70.6	60.6	40.6	45	30
R12	65.3	55.3	35.3	45	30
R13	67.2	57.2	37.2	45	30
R14	69.1	59.1	39.1	45	30
R15	67.0	57.0	37.0	45	30

The assessment is inclusive of a 2.4m high acoustic barrier along the southern boundary of the site detailed within the proposed site plans.

6.2 External Amenity Areas

External amenity areas have been assessed with close-boarded garden fences across the site at a standard height of 1.8m. Daytime noise Levels within all amenity areas are below the BS8233:2014 upper guideline value of 55 dB(A).

7.0 Conclusions

NPPF 170 (e) and 180 (a)

In considering the NPPF test in section 170 (e), the proposed development is not expected to have an 'adverse impact' on health or quality of life. Similarly, with regard to NPPF section 180, point A, it is considered that all 'adverse impacts on health and quality of life' (relating to noise) are mitigated by the use of the following mitigation:

Facades exposed to the A27 will feature enhanced glazing with a minimum sounds reduction of up to $R_w + C_{tr}$ 37 dB, whilst all other dwellings will feature standard double glazing of $R_w + C_{tr}$ 30 dB. All dwellings will feature some form of mechanical ventilation in-line with the findings of the overheating assessment in order to meet both ventilation and internal ambient noise criteria.

The site will also benefit from a 2.4m high acoustic barrier along the southern boundary of the site detailed within the proposed site plans.

NPPF 180 (b), 182 and 183

It is considered that the mitigation measures outlined within this report are suitable to reduce any noticeable and intrusive noise from the surrounding environment within proposed dwellings and therefore it is considered that existing businesses would not be restricted by the proposed development.

Planning Practice Guidance: Noise

It is considered that the noise mitigation in Section 6.0 of this report is sufficient to reduce the effects of any noticeable and disruptive noise being currently emitted from the surrounding environment by helping to prevent noise levels exceeding BS 8233 criteria for L_{Aeq} within all areas of the proposed development.

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 than 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

PPG24 – Planning Policy Guidance

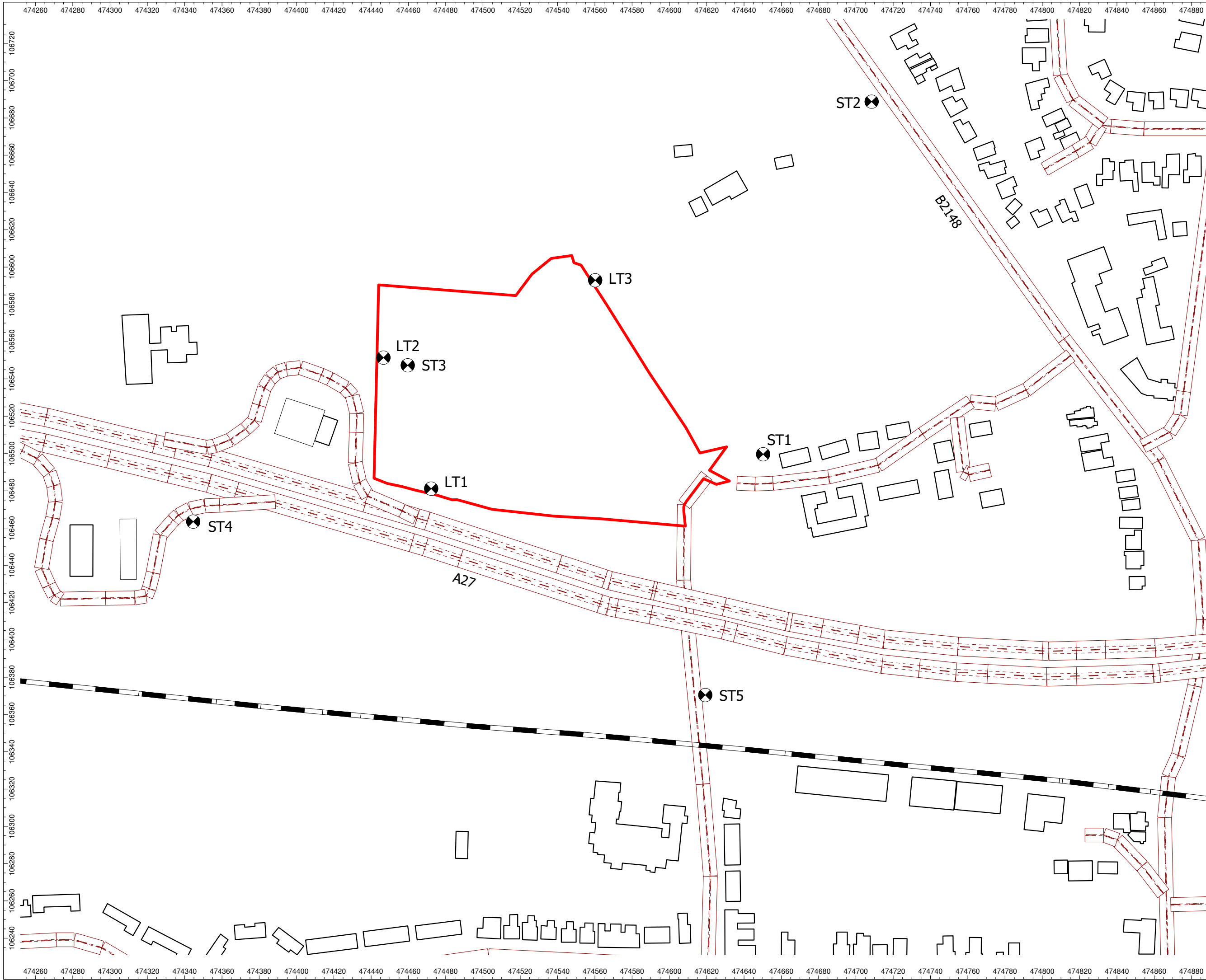
UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

WYGE – WYG Environment

Appendix B – Sketches

- SK01 Noise Monitoring Locations
- SK02 Proposed Receptor Locations and Acoustic Barrier Location
- SK03 Existing Daytime $L_{Aeq,16hr}$
- SK04 Existing Night-time $L_{Aeq,8hr}$
- SK05 Existing Night-time $L_{Aeq,8hour}$ (including Site Layout and 2.4m Acoustic Barrier)
- SK06 Glazing and Ventilation Strategy



Client:
Woodpecker PLC

Project:
Coldharbour Farm,
Emsworth

Project Number:
A113742

Drawing Title / Scenario:
Noise Monitoring
Locations

Drawing Number:
SK01

Key:

Site Boundary: —

Scale : Not to scale

WYGE Leicester 17.08.20

Licence Number AL 553611



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

© WYG Environment



Client:
Woodpecker PLC

Project:
**Coldharbour Farm,
Emsworth**

Project Number:
A113742

Drawing Title / Scenario:
**Proposed Receptor
Locations & Acoustic
Barrier Location**

Drawing Number:
SK02

Key:

Site Boundary: 

2.4m Acoustic Barrier: 

Scale : Not to scale

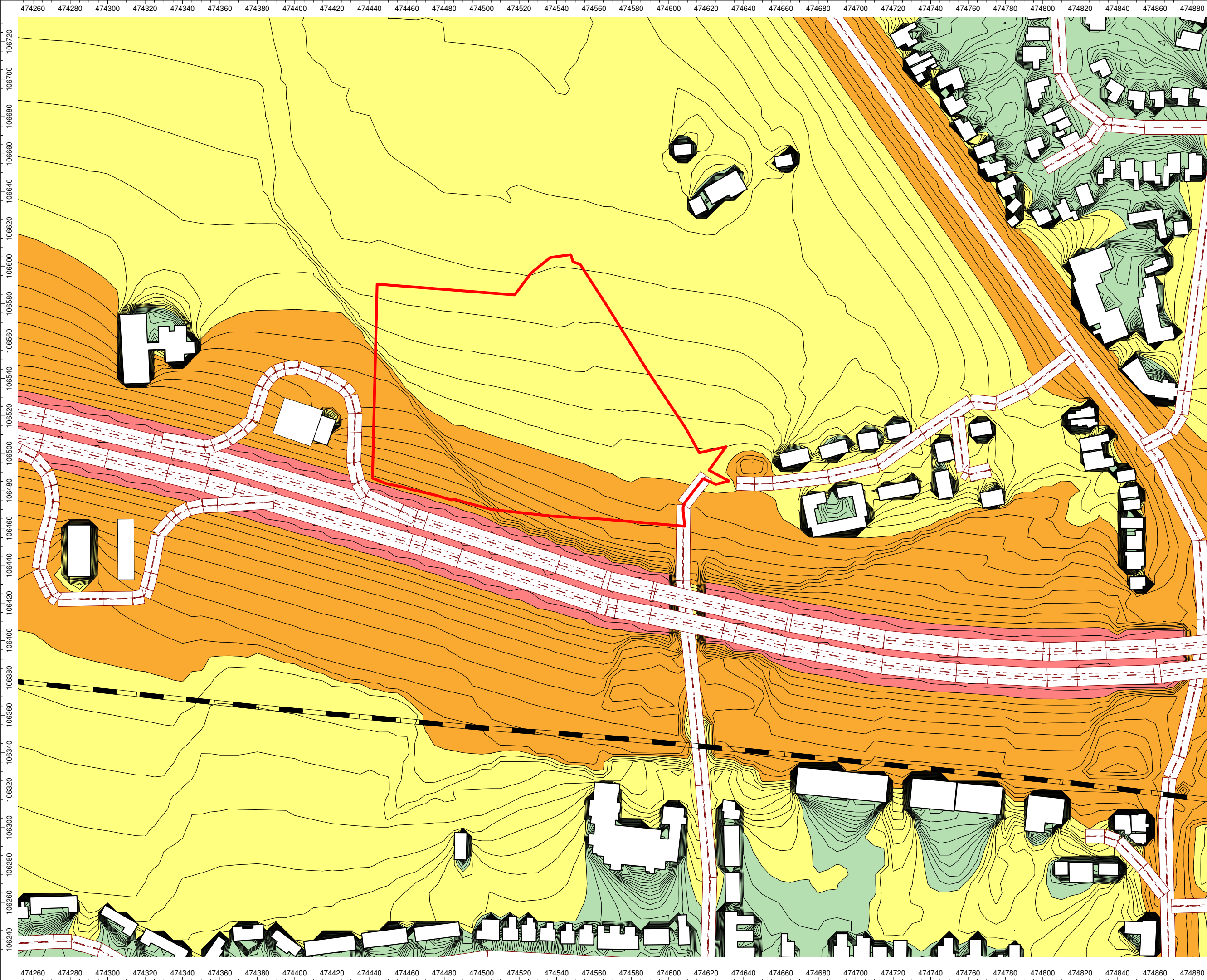
WYGE Leicester 17.08.20

Licence Number AL 553611



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

© WYG Environment



Client:
Woodpecker PLC

Project:
Coldharbour Farm,
Emsworth

Project Number:
A113742

Drawing Title / Scenario:
Existing Daytime
LAeq 16hr Noise
Levels

Drawing Number:
SK03

Key:

Site Boundary: —

0.0 - 50.0 dB
50.0 - 60.0 dB
60.0 - 70.0 dB
>70.0 dB

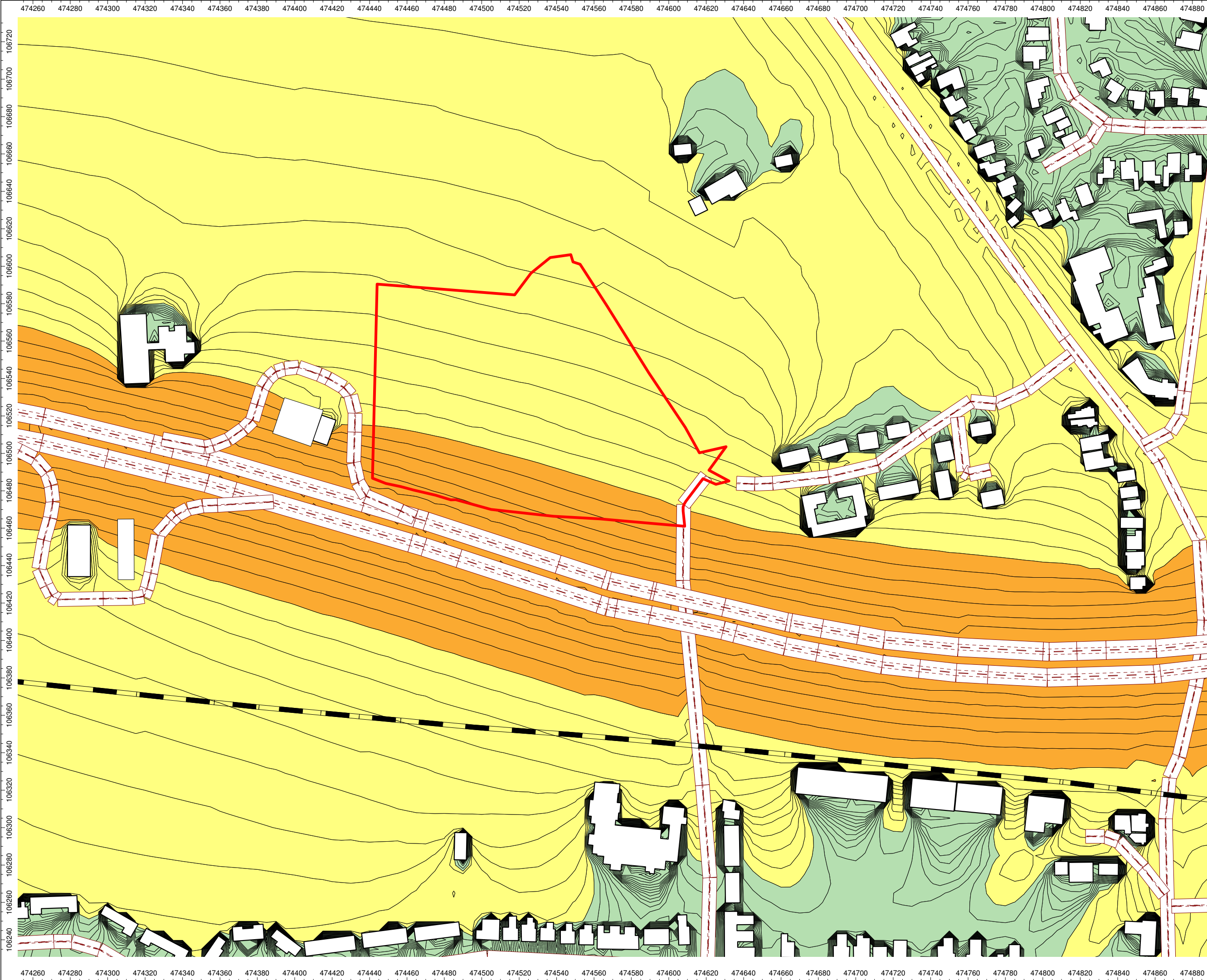
Scale : Not to scale

WYGE Leicester 17.08.20

Licence Number AL 553611



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



Client:
Woodpecker PLC

Project:
Coldharbour Farm,
Emsworth

Project Number:
A113742

Drawing Title / Scenario:
Existing Night-time
LAeq 8hr Noise
Levels

Drawing Number:
SK04

Key:

Site Boundary: 

 0.0 - 50.0 dB
 50.0 - 60.0 dB
 60.0 - 70.0 dB
 >70.0 dB

Scale : Not to scale

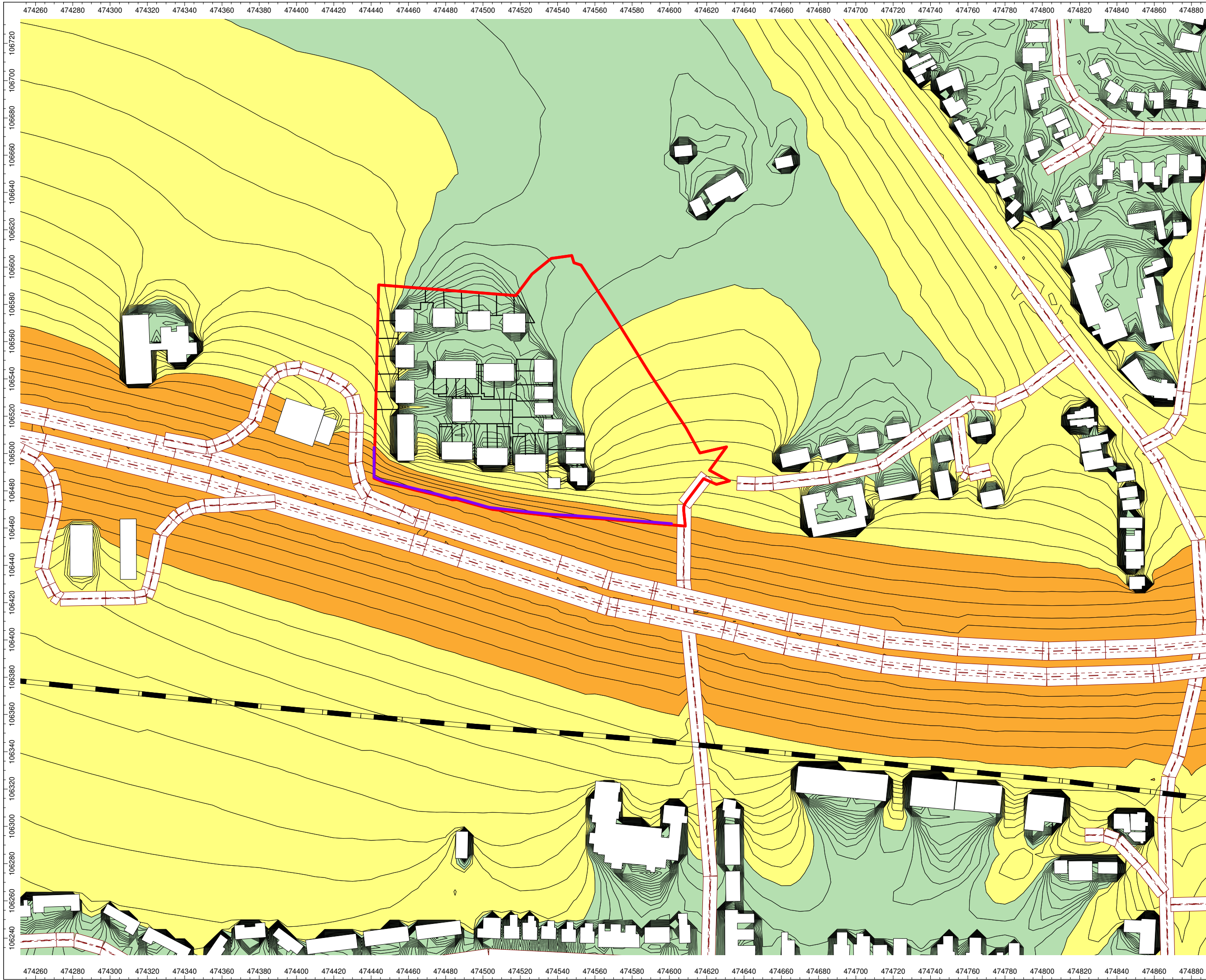
WYGE Leicester 17.08.20

Licence Number AL 553611



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

© WYG Environment



Client:
Woodpecker PLC

Project:
Coldharbour Farm,
Emsworth

Project Number:
A113742

Drawing Title / Scenario:
Existing Night-time LAeq
8hr Noise Levels (including
Site Layout and Acoustic
Barrier)

Drawing Number:
SK05

Key:

Site Boundary: —

2.4m Acoustic
Barrier: —

■ 0.0 - 50.0 dB
■ 50.0 - 60.0 dB
■ 60.0 - 70.0 dB
■ >70.0 dB

Scale : Not to scale

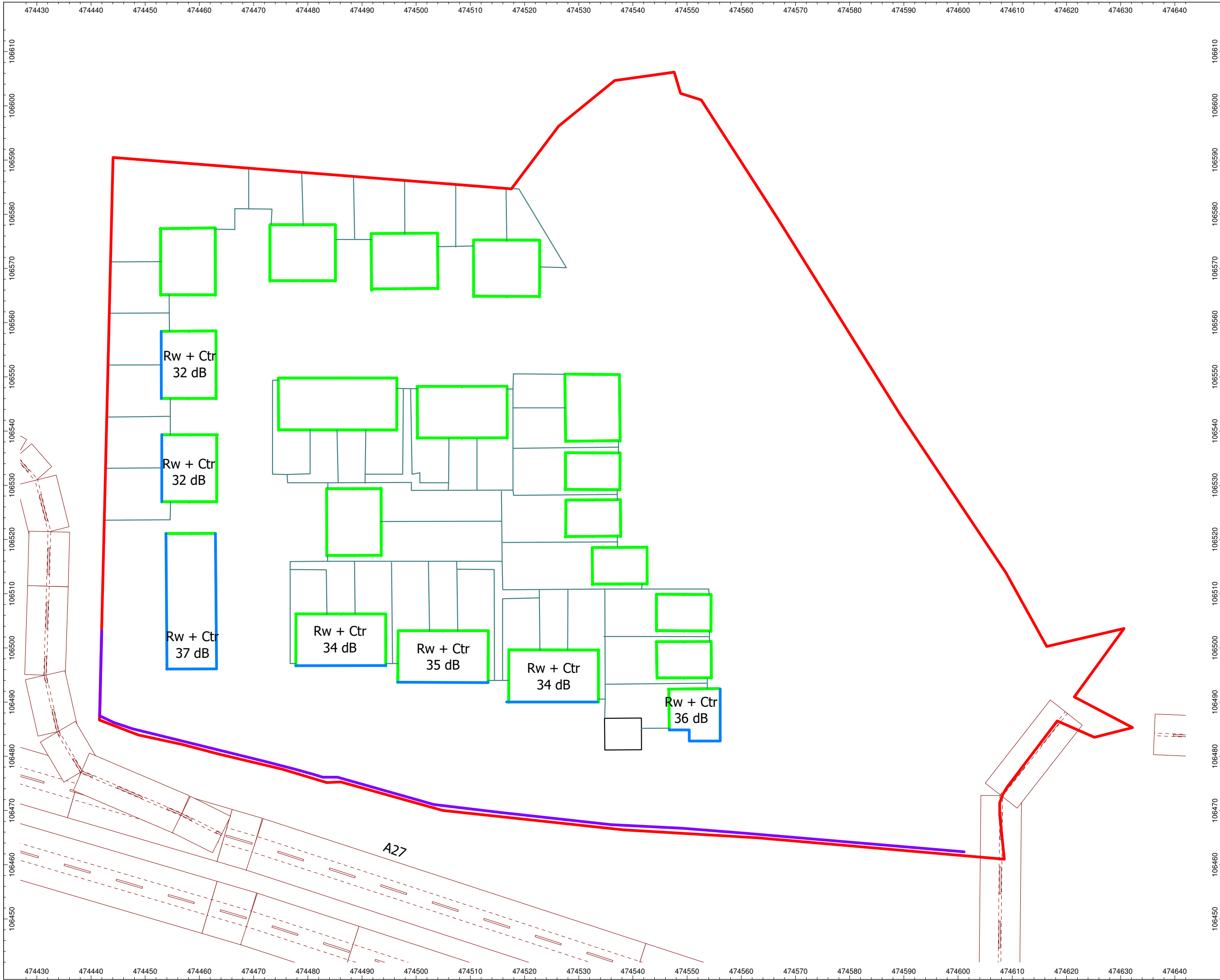
WYGE Leicester 17.08.20

Licence Number AL 553611



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

© WYG Environment



Client:
Woodpecker PLC

Project:
Coldharbour Farm,
Emsworth

Project Number:
A113742

Drawing Title / Scenario:
Glazing and Ventilation
Strategy

Drawing Number:
SK06

Key:

Site Boundary: 

Enhanced Glazing
Rw + Ctr 32-37 dB: 

Rw + Ctr 30 dB: 

2.4m Acoustic
Barrier: 

Scale : Not to scale

WYGE Leicester 17.08.20

Licence Number AL 553611



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

© WYG Environment

Appendix C – Report Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of [Woodpecker PLC] ("the Client") for the proposed uses stated in the report by [WYG Environment Planning Transport Limited] ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted or warranty given for; unconfirmed data, third party documents and information supplied to WYG or for the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report. WYG does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.