



Leslie Shipp & David Christian

Proposed Residential Development

Coldharbour Farm, Emsworth

Noise Assessment

August 2013

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

Tel: +44 (0)116 234 8000

Email: nigel.mann@wyg.com



Document Control

Project: Proposed Residential Development, Coldharbour Farm, Emsworth

Client: Leslie Shipp & David Christian

Job Number: A083757

File Origin: O:\Acoustics Air Quality and Noise\Active Projects\A083757

Document Checking:

Prepared by:	Graham Davis <i>Consultant Environmental Scientist</i>	Initialled: GD
--------------	---	----------------

Checked by:	Initialled:
-------------	-------------

Verified by:	Nigel Mann <i>Director</i>	Initialled: NM
--------------	-------------------------------	----------------

Issue	Date	Status
1	21 st Dec 2012	First Issue
2	24 th Dec 2012	Second Issue
3	23 rd August 2013	Third Issue – Layout Amendments
4		



Contents Page

1.0	Introduction.....	1
2.0	Assessment Criteria.....	2
3.0	Assessment Methodology	3
4.0	Noise Survey	7
5.0	Assessment of Key Effects	9
6.0	Conclusions	12

Appendix Contents

Appendix A – Acoustic Terminology and Abbreviations

Appendix B – Sketches



1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise and vibration assessment for a proposed residential development west of Coldharbour Farm Road, Emsworth.

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 from the proposed development have been predicted at local representative 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 and noise contour plots relevant to the assessment are presented in Appendix B.

1.2 Legislative Context (England)

PPG24 was replaced by NPPF on 27 March 2012. With regard to noise and planning NPPF contains the following 4 short statements (section 123):

- A. Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- B. Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- C. Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- D. Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.



2.0 Assessment Criteria

2.1 Internal Noise Assessment Criteria

The criteria in BS 8233:1999 '*Sound insulation and noise reduction for buildings – code of practice*' has been chosen as a suitable method for determining an adequate level of noise control to ensure that noise levels within existing properties, as a result of the proposed development, meet the following noise guideline values specified in the standard:

		Good	Reasonable	
Living rooms	$L_{Aeq} =$	30	- 40 dB	
Bedrooms	$L_{Aeq} =$	30	- 35 dB,	L_{Amax} , night-time = 45 dB
Gardens	$L_{Aeq} =$	50	- 55 dB	

BS 8233:1999 suggests that a typical façade, regardless of construction, will offer a maximum of 15 dB sound insulation when windows are open. For the purposes of this assessment, the maximum external noise level from the source under consideration will be 50 dB(A) during the daytime, and 45 dB(A) during the night-time to ensure a maximum daytime L_{Aeq} of 35 dB, and a maximum night-time L_{Aeq} of 30 dB within habitable rooms are achieved.

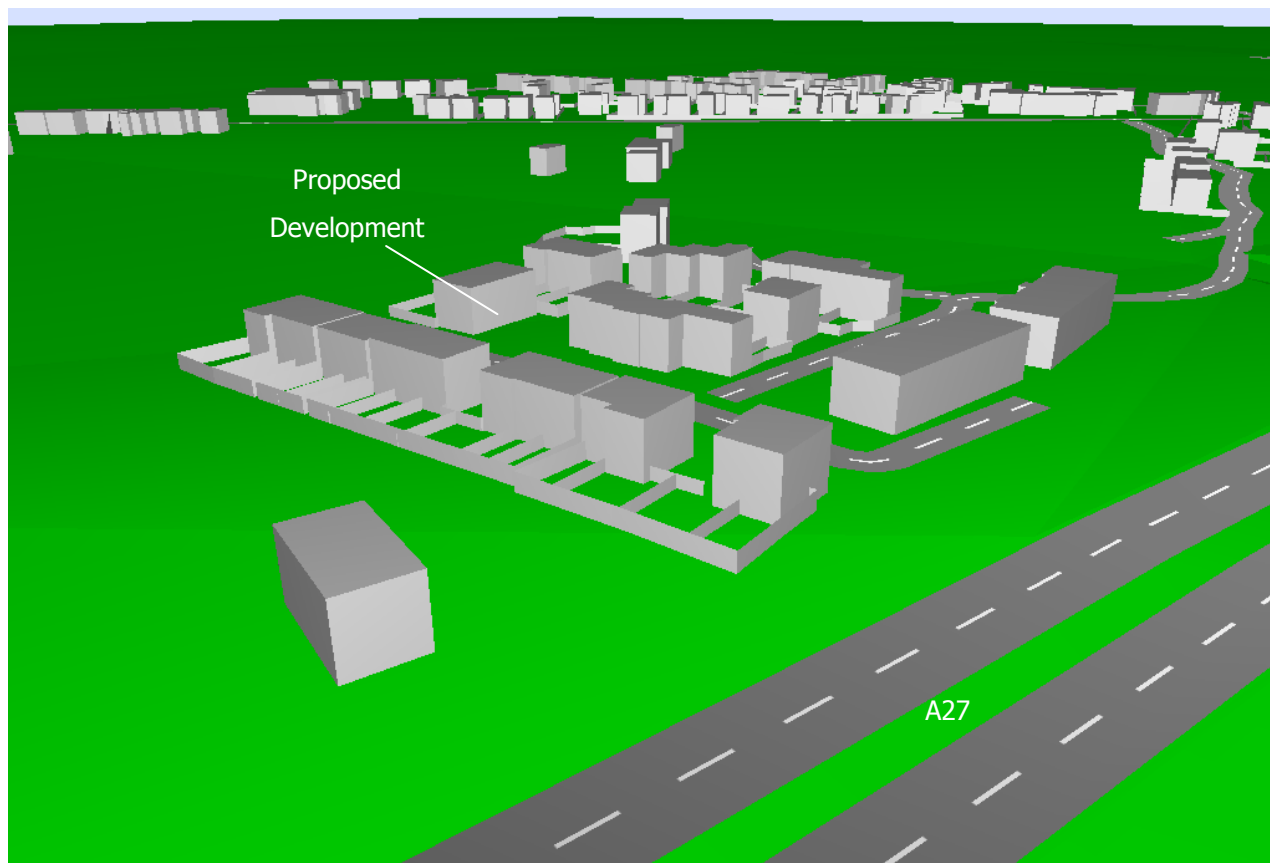
These levels are also comparable to the World Health Organisation Recommendations in their 'Guidelines for Community Noise' (1999) publication which states that outdoor levels of 45 dB $L_{Aeq,T}$ for open windows at night or internal levels of 30 dB $L_{Aeq,T}$ are guideline values to prevent sleep disturbance. Similarly outdoor levels of 60 dB L_{Amax} for open windows at night or internal levels of 45 dB L_{Amax} are also maximum guideline values to prevent sleep disturbance.

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 the Department of Transport Calculation of Road Traffic Noise (CRTN) and 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	No barriers included within the model other than proposed barriers.
Receptor positions	WYGE	0.05m from façade, 1m height for gardens, height of 1.5 m for ground floor, 4 m for first floor properties with ground floor or bungalow dormer windows. 7 m for dormer windows on two storey properties. 1.5 m height for model grid and monitoring locations for validation.
Absorbent Ground	CADNA	Frequency dependant ground absorption has been applied based on values specified in VDI 2714/16 clause 6.3.

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 Traffic Noise Data

All roads expected to make a significant contribution, have been included within this assessment. Noise emissions from existing traffic flows have been derived from verification of the measured noise levels, along with observations made during the site survey and/or WYG Environment (WYGE) experience of similar road systems. Estimates of the vehicle speeds have been made based upon the speed restrictions currently in force in the area.

3.2.2 Model Verification

The model was verified by modelling the monitoring locations for the 'existing' scenario. A daytime and night time L_{Aeq} and night time L_{Amax} scenario has been verified. 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	77.6	77.8	0.2
LT2	66.7	66.7	0.0

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	71.4	71.7	0.3
LT2	60.6	60.6	0.0

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

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

Location	Monitored L_{Amax}	Modelled L_{Amax}	Difference between Monitored and Modelled Results
LT1	85.3	83.4	-1.9
LT2	69.6	70.7	1.1

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

The verification points show a divergence between monitored and modelled results of no more than 1.9 dB. (15 minute night-time measurement), all models are assumed to be suitably verified.



3.2.3 Sensitive Receptors

Existing noise levels have been assessed at properties throughout the site with respect to direct noise from the existing ambient noise climate surrounding the site. The layout showing the locations of the proposed receptors assessed is shown of SK02 of Appendix B.

Table 3.5 Residential Receptor Locations

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height (m)
R1	Property to the south of the site	A27	42.5	4.0
R2	Property to the south of the site	A27	33.5	4.0
R3	Property to the south of the site	A27	29.15	4.0
R4	Property to the south of the site	A27	21.5	4.0
R5	Property to the south of the site	A27	39.23	4.0
R6	Property to the north west of the site	A27	76.15	4.0
R7	Property to the north west of the site	A27	97.25	4.0
R8	Property to the north of the site	A27	97.35	4.0
R9	Property to the north of the site	A27	108.68	4.0
R10	Property to the north east of the site	A27	129.35	4.0
R11	Property to the centre of the site	A27	97.52	4.0
R12	Property to the centre of the site	A27	78.25	4.0
R13	Property to the centre of the site	A27	62.57	4.0
R14	Property to the centre of the site	A27	61.2	4.0
R15	Property to the centre of the site	A27	65.44	4.0

Table 3.6 Garden Receptor Locations

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height (m)
G1	Plot to the south west of the site	A27	18.7	1.0
G2	Plot to the centre of the site	A27	76.5	1.0
G3	Plot to the centre of the site	A27	66.5	1.0
G4	Plot to the north of the site	A27	95.2	1.0
G5	Plot to the north of the site	A27	107.5	1.0
G6	Plot to the north east of the site	A27	133.5	1.0



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:

B&K 2260	Environmental Noise Analyser (WYG1)	s/n	2361273
B&K 2238	Environmental Noise Analyser (WYG9)	s/n	2684499
B&K 4231	Calibrator	s/n	2176211
Rion NL-32	Environmental Noise Analyser (WYG11)	s/n	123729
Rion NL-32	Environmental Noise Analyser (WYG12)	s/n	213442

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice and no drift 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 five locations (as specified in the following table and shown in SK01 of Appendix B) from Wednesday 5th December 2012 to Wednesday 12th December 2012. Attended short term measurements were undertaken at two locations during the day, evening, peak and night-time periods with three additional locations being measured unattended over a 112 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 cold and dry with minor scattered showers. Anemometer readings confirmed that wind speeds were less than 5 ms⁻¹ at all times during the survey with a predominant westerly wind direction.

Table 4.1 Noise Monitoring Locations

Ref	Description	Grid Reference	
		X	Y
LT1	Southern Boundary of Coldharbour Farm	474458.80	106493.04
LT2	Western Boundary of Coldharbour Farm	474443.45	106562.41
ST1	Coldharbour Farm Road Facing Coldharbour Farm Field	474634.93	106481.64
ST2	Car Park Facing Playing Fields Adjacent to Coldharbour Farm Road	474677.25	106647.52



4.2 Noise Survey Results

Existing ambient noise levels around the site are dominated by the A27. Noise from the railway line to the south was occasionally audible at 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).

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).

Table 4.2 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)
Day 07:00 - 23:00	112 hours	05/12/2012 - 12/12/2012 13:20 - 12:50	LT1	77.6	87.0	40.5	81.0	65.3
Night 23:00 - 07:00	56 hours	05/12/2012 - 12/12/2012 23:00 - 07:00		71.4	85.3	32.2	69.7	46.8
Day 07:00 - 23:00	112 hours	05/12/2012 - 12/12/2012 13:28 - 12:48	LT2	66.7	73.5	58.7	66.2	61.2
Night 23:00 - 07:00	56 hours	05/12/2012 - 12/12/2012 23:00 - 07:00		60.6	69.6	33.0	61.6	48.4
Day 07:00 - 19:00	15 Mins	05/12/2012 14:20	ST1	65.9	90.8	56.4	64.7	60.2
	15 Mins	05/12/2012 14:38	ST2	56.2	69.2	50.0	58.3	53.0
Evening 19:00 - 23:00	15 Mins	05/12/2012 20:01	ST1	60.9	67.5	51.1	63.3	56.8
	15 Mins	05/12/2012 20:18	ST2	57.6	72.5	44.5	61.3	51.2
Night 23:00 - 07:00	15 Mins	05/12/2012 23:11	ST1	57.1	75.7	41.3	60.5	49.4
	15 Mins	05/12/2012 23:28	ST2	53.5	70.2	41.6	55.5	45.9
Train Passing	1 Min	05/12/2012 15:16	@ 3m from rail line	67.1	72.9	62.8	70.4	63.9
	1 Min	05/12/2012 19:43		66.7	77.7	56.6	70.1	60.4
	1 Min	05/12/2012 19:44		71.8	86.4	56.8	75.1	62.1
	1 Min	05/12/2012 19:46		65.2	78.0	54.7	68.4	58.3
	1 Min	05/12/2012 19:49		66.5	74.6	60.2	68.8	63.0
	1 Min	05/12/2012 19:50		70.7	81.1	56.6	76.5	61.4

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



5.0 Assessment of Key Effects

5.1 Noise Intrusion Assessment

Internal noise levels within potential dwellings have been assessed both with windows open, where a reduction from a partially open window of 15 dB has been used, and with windows closed where an assumption of glazing with specification R_{TRA} 30 dB (e.g 6/16/8mm double glazing or equivalent) has been used. In addition the effects of the proposed 2.5 noise barriers are included.

The results presented in tables 5.1 – 5.3 below show the predicted noise intrusion levels at properties within the proposed development site including road traffic noise from the A27 and rail noise. The recommended WHO/BS 8233 internal noise levels are generally met across the site during the daytime and night-time, assuming a windows-closed scenario. In order to achieve the recommended internal noise criteria, a range of mitigation measures are outlined in Section 6.0 of this report; SK05 in Appendix B shows the glazing and ventilation requirements for bedrooms and living rooms of the proposed development.

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}
R1	70.5	55.5	40.5	35
R2	72.1	57.1	42.1	35
R3	71.8	56.8	41.8	35
R4	73.8	58.8	43.8	35
R5	66.6	51.6	36.6	35
R6	64.4	49.4	34.4	35
R7	63.1	48.1	33.1	35
R8	60.3	45.3	30.3	35
R9	53.2	38.2	23.2	35
R10	60.8	45.8	30.8	35
R11	60.9	45.9	30.9	35
R12	61.9	46.9	31.9	35
R13	63.0	48.0	33.0	35
R14	61.8	46.8	31.8	35
R15	64.3	49.3	34.3	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}
R1	64.4	49.4	34.4	30
R2	66.0	51.0	36.0	30
R3	65.8	50.8	35.8	30
R4	68.0	53.0	38.0	30
R5	60.6	45.6	30.6	30
R6	58.3	43.3	28.3	30
R7	57.0	42.0	27.0	30
R8	54.2	39.2	24.2	30
R9	47.1	32.1	17.1	30
R10	54.7	39.7	24.7	30
R11	54.8	39.8	24.8	30
R12	55.7	40.7	25.7	30
R13	56.9	41.9	26.9	30
R14	55.7	40.7	25.7	30
R15	58.1	43.1	28.1	30

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

Table 5.3 Night-time Noise Intrusion Levels L_{Amax} 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}
R1	75.7	60.7	45.7	45
R2	77.4	62.4	47.4	45
R3	77.1	62.1	47.1	45
R4	79.5	64.5	49.5	45
R5	71.9	56.9	41.9	45
R6	69.7	54.7	39.7	45
R7	68.4	53.4	38.4	45
R8	65.6	50.6	35.6	45
R9	58.5	43.5	28.5	45
R10	65.9	50.9	35.9	45
R11	65.9	50.9	35.9	45
R12	66.8	51.8	36.8	45
R13	68.0	53.0	38.0	45
R14	66.9	51.9	36.9	45
R15	69.6	54.6	39.6	45

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



5.2 Garden Noise Levels

Daytime noise levels in gardens and private external spaces of the proposed development have been assessed in the table below. The location of the garden receptor locations are shown on SK03 in Appendix B.

Table 5.4 Garden Noise Levels $L_{Aeq,16hr}$

Ref	External $L_{Aeq,16hr}$ Daytime	BS 8233 Upper Limit Criteria L_{Aeq}
G1	62.9	55.0
G2	54.8	55.0
G3	55.5	55.0
G4	54.7	55.0
G5	52.2	55.0
G6	48.5	55.0

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

To protect outdoor space, it is recommended that 2.5m high solid timber fence is used at garden boundaries exposed to the A27. The results in the table above show that daytime L_{Aeq} noise levels within gardens are predicted to be within the target criteria of 55 dB where properties are screened from the A27 by the proposed building envelope. For gardens to the south-west of the site (plots 6 – 15A) the criteria will be exceeded.

Although predicted noise levels in this area of the site are in excess of 55 dB, the noise experienced is considered not to be of such a level as to prohibit the use of these spaces. The decision as to whether these outdoor spaces are utilised should lie with the occupant with most favouring the option of private external space than no private external space at all.



6.0 Noise Mitigation

6.1 Glazing and Ventilation Strategy

The ventilation strategy provided in SK05 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 also highlights which areas would require enhanced glazing, or an alternative means of ventilation in order to meet both ventilation and internal ambient noise criteria. 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), other passive ventilation systems or mechanical ventilations systems.

6.2 Acoustic Barriers

There will be the requirement to install acoustic barriers around gardens within the proposed development site with the assessment undertaken in Section 5, taking into account the installation of 2.5m high close boarded fences along garden boundaries which are outlined in SK05. The minimum height of the solid element of the barriers needs to be at least 2.5 metres; barriers need to be durable and can comprise either walls, fences or hedges with no air gaps.



7.0 Conclusions

Noise and Vibration surveys have been undertaken in connection with the proposed new housing development on west of Coldharbour Farm Road, Emsworth. The findings of the assessment are presented below.

NPPF 123 A & B

In considering the NPPF test in section 123, points A & B. The proposed development is not expected to have an 'adverse impact' on health or quality of life. Similarly, with regard to NPPF (123) point B, it is considered that all 'adverse impacts on health and quality of life' (relating to noise) are mitigated by the use of 2.5m high garden fences and enhanced glazing and alternative ventilation.

NPPF 123 C & D

Given that nearby the site is surrounded by similarly residential properties to the east and noise levels at the site dominated by road traffic noise from the A27, it is not considered that any existing businesses wanting to develop would be particularly restricted by the introduction of the new sensitive use of the proposed development.

The development is situated in a CPRE Zone 4 - 6 area of tranquillity (Zone 1 being the least tranquil and Zone 10 being the most tranquil), as such is not considered to be an area of Tranquillity.

Glazing and Ventilation Strategy

The recommended WHO/BS 8233 internal noise levels are generally met across the site during the daytime and night-time, assuming a windows-closed scenario. A glazing and ventilation strategy has been provided which achieves both ventilation and internal ambient noise level requirements of $L_{Aeq \text{ daytime}}$ 35 dB, $L_{Aeq \text{ night-time}}$ of 30 dB and $L_{Amax \text{ night-time}}$ of 45 dB in all residential bedroom and living spaces of the proposed development. The suggested glazing specifications are understood to be achievable. Double glazing with a sound reduction of R_{TRA} 30 dB is sufficient across the majority of the site in order to achieve the target internal noise levels when windows.

Barriers

There will be the requirement to install 2.5m high acoustic barriers (in the form of acoustic fences) along the boundary of gardens to the west of the site which are not screened from the A27 by proposed building envelopes.



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

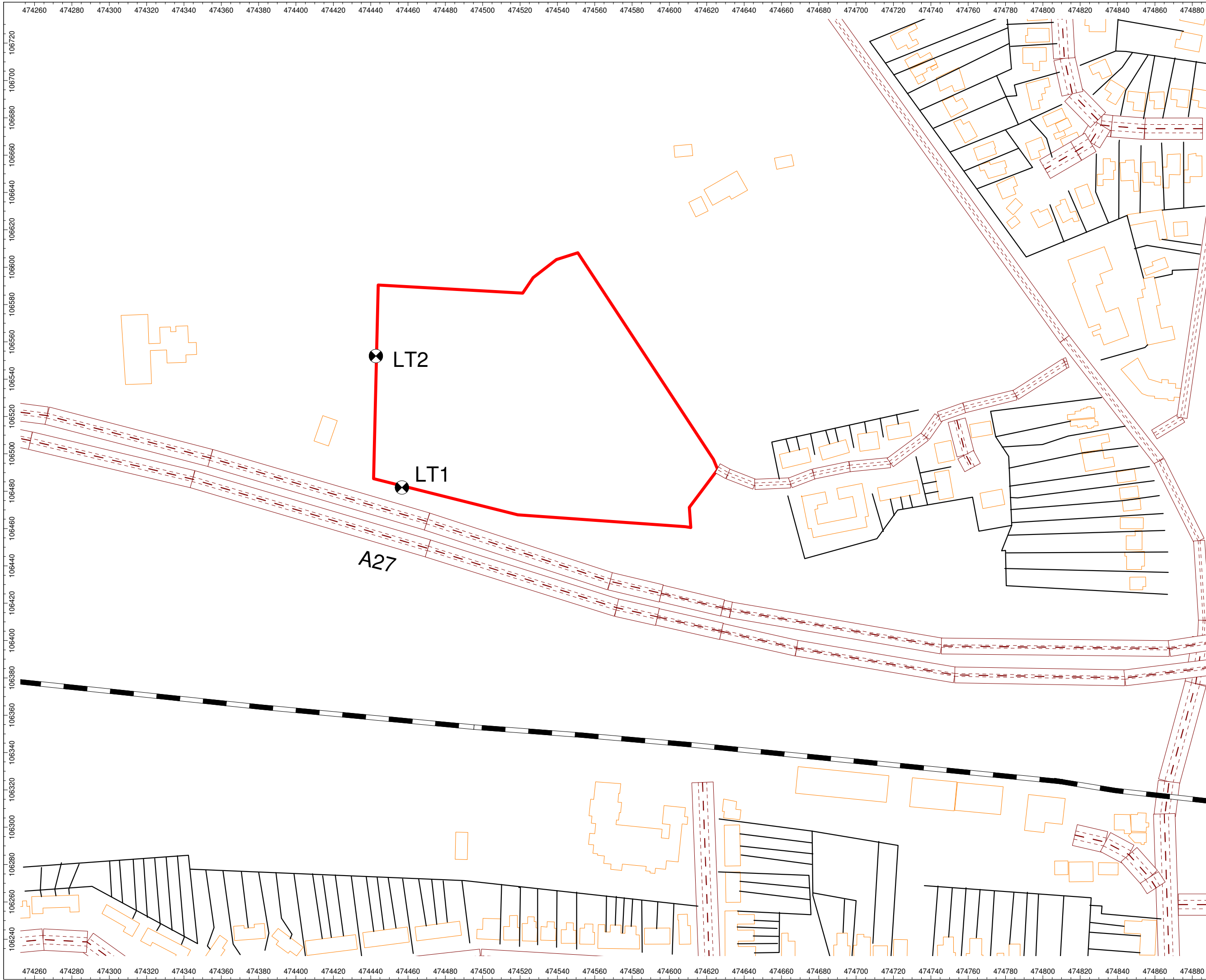
SK01 Noise Monitoring Locations

SK02 Site Layout and Receptor Locations

SK03 Daytime $L_{Aeq,16hr}$

SK04 Night-time $L_{Aeq,8hr}$

SK05 Glazing and Ventilation Strategy



Client:
Leslie Shipp & David Christian

Project:
Coldharbour Farm, Emsworth

Project Number:
A083757

Drawing Title / Scenario:
Noise Monitoring Location Plan

Drawing Number:
SK01

Key:
Site Boundary: —

Scale : Not to scale

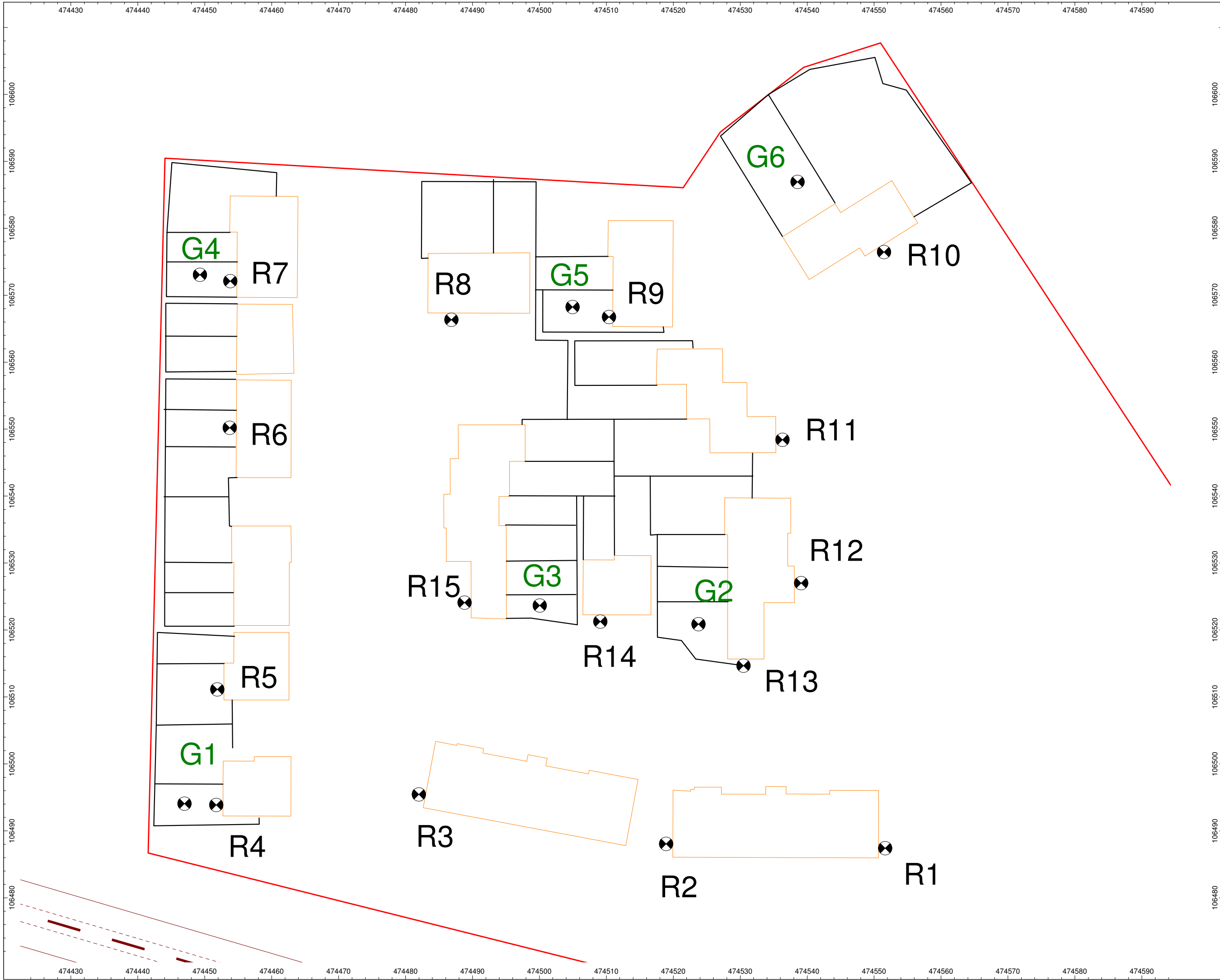
Contour Plot Presented For
Indicative Purposes Only
WYGE Leicester 23.08.13

This map is based upon Ordnance Survey material reproduced by WYG on behalf of Her Majesty's Stationary Office, © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to civil proceedings. Licence Number AL 553611



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

© WYG Environment



Client:
Leslie Shipp & David
Christian

Project:
Coldharbour Farm,
Emsworth

Project Number:
A083757

Drawing Title / Scenario:
Receptor Locations

Drawing Number:
SK02

Key:
Site Boundary: —

Scale : Not to scale

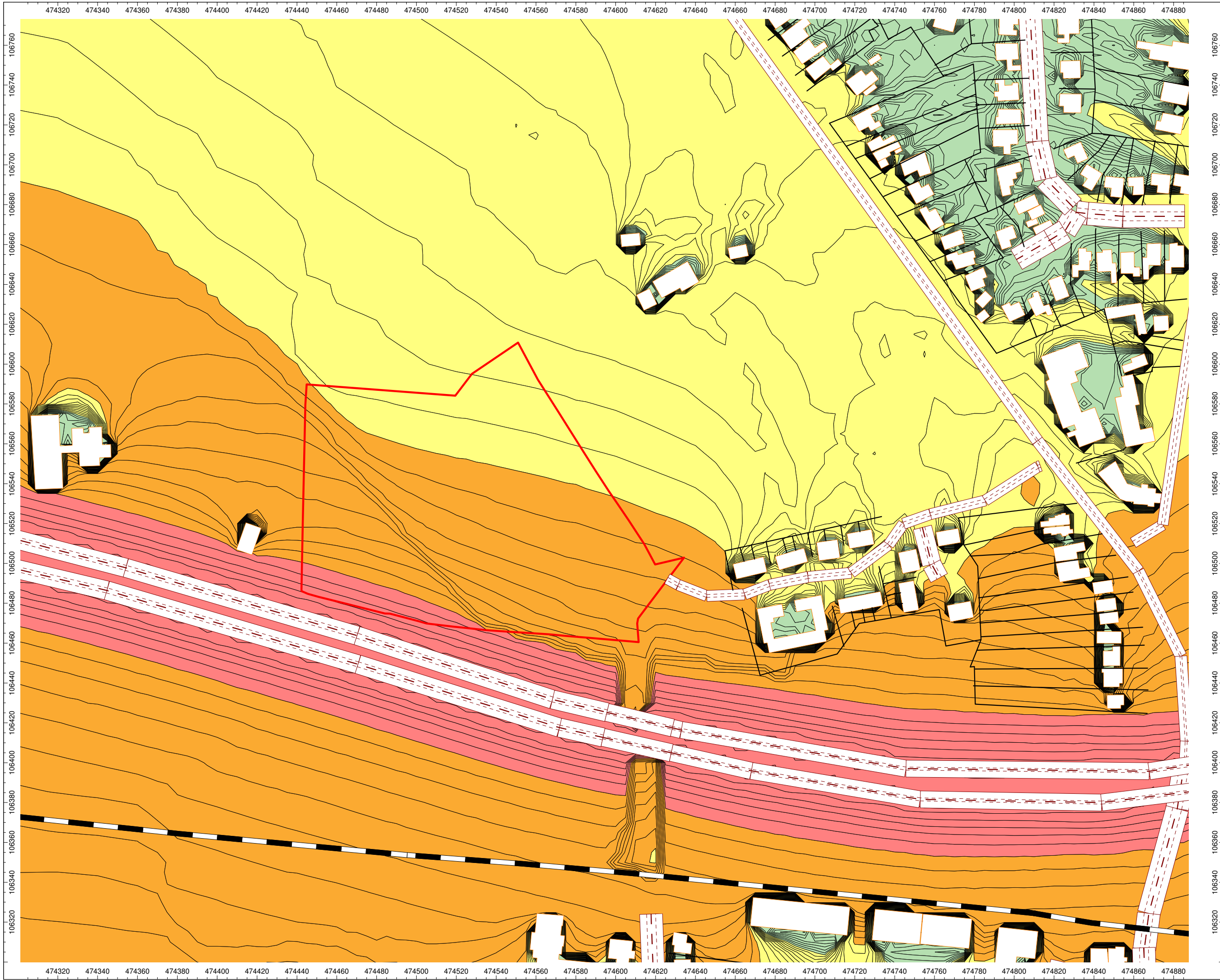
WYGE Leicester 23.08.13

This map is based upon Ordnance Survey material reproduced
by WYG on behalf of Her Majesty's Stationary Office.
© Crown Copyright. Unauthorised reproduction infringes
Crown copyright and may lead to civil proceedings.



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

© WYG Environment



Client:
Leslie Shipp & David
Christian

Project:
Coldharbour Farm,
Emsworth

Project Number:
A083757

Drawing Title / Scenario:
Daytime Noise Contour Plot
LAeq, 16hr

Drawing Number:
SK03

Key:

Site Boundary: —

0.0 - 55.0 dB
55.0 - 65.0 dB
65.0 - 75.0 dB
>75.0 dB

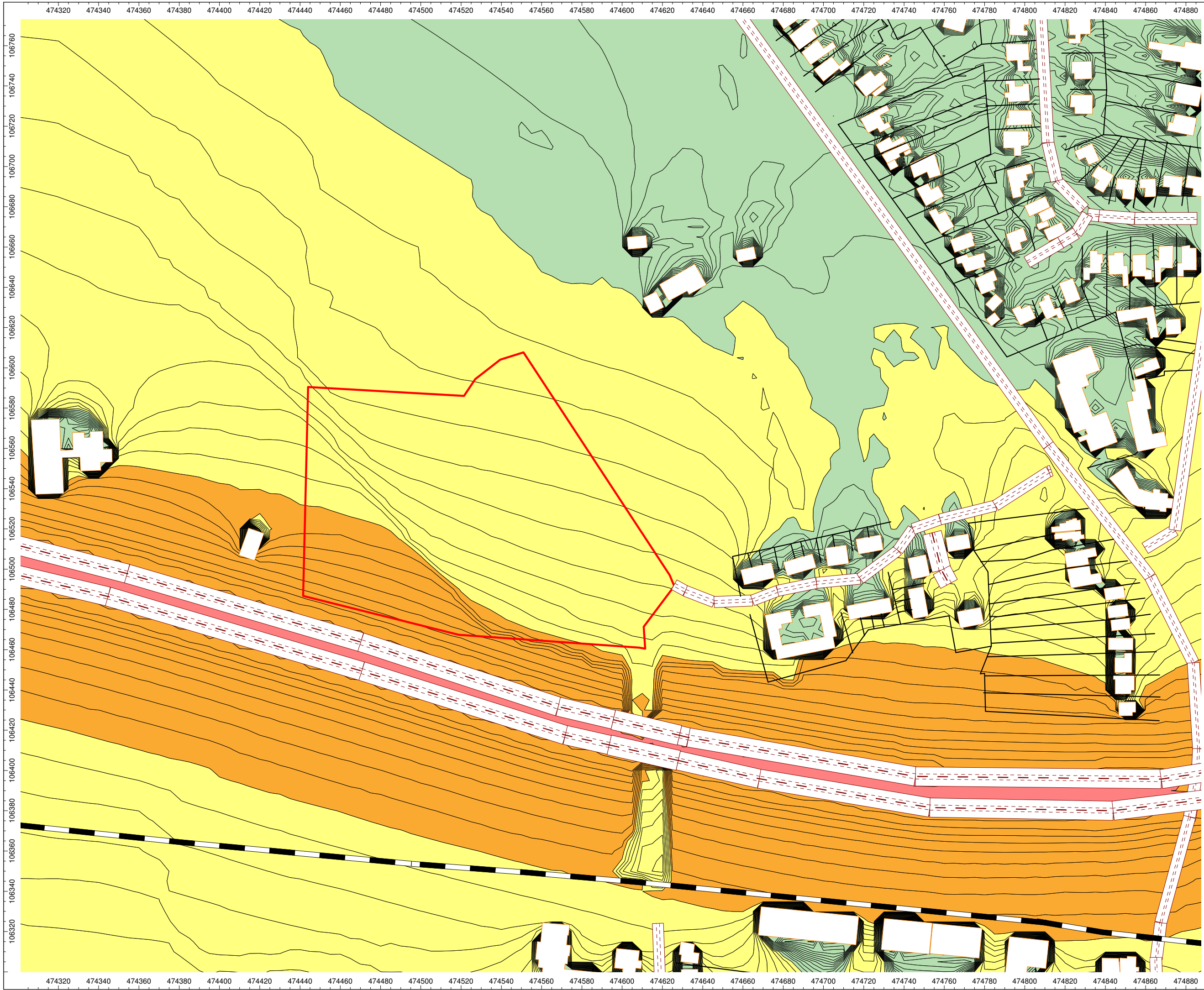
Scale : Not to scale

Contour Plot Presented For
Indicative Purposes Only
WYGE Leicester 23.08.13

This map is based upon Ordnance Survey material reproduced
by WYG on behalf of Her Majesty's Stationary Office.
© Crown Copyright. Unauthorised reproduction infringes
Crown copyright and may lead to civil proceedings.
Licence Number AL 553611



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



Client:
Leslie Shipp & David
Christian

Project:
Coldharbour Farm,
Emsworth

Project Number:
A083757

Drawing Title / Scenario:
Night-time Noise Contour
Plot LAeq, 8hr

Drawing Number:
SK04

Key:

Site Boundary: 

 0.0 - 55.0 dB
 55.0 - 65.0 dB
 65.0 - 75.0 dB
 >75.0 dB

Scale : Not to scale

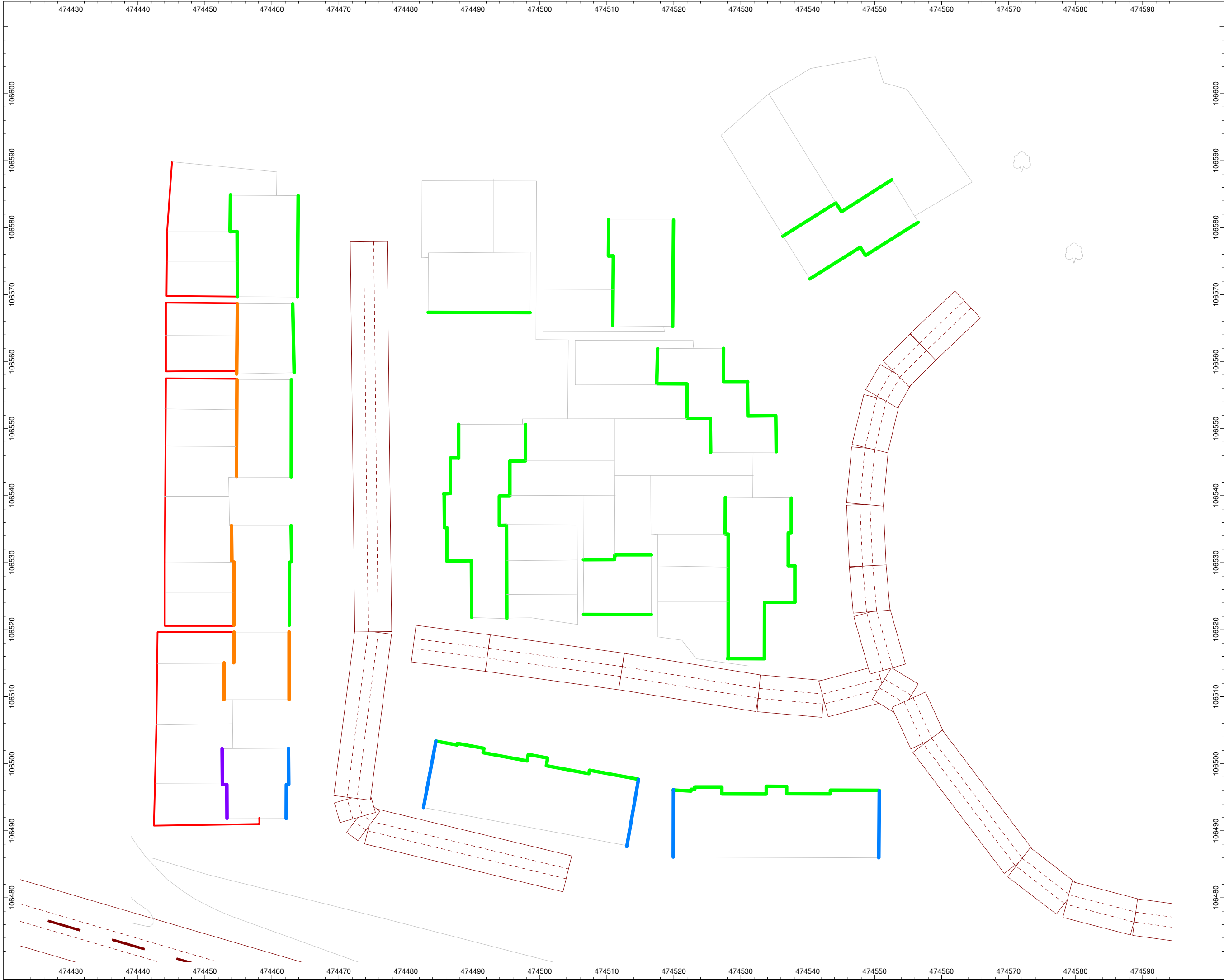
Contour Plot Presented For
Indicative Purposes Only
WYGE Leicester 23.08.13

This map is based upon Ordnance Survey material reproduced
by WYG on behalf of Her Majesty's Stationary Office.
© Crown Copyright. Unauthorised reproduction infringes
Crown copyright and may lead to civil proceedings.
Licence Number AL 553611



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

© WYG Environment



Client:
Leslie Shipp & David Christian

Project:
**Coldharbour Farm,
Emsworth**

Project Number:
A083757

Drawing Title / Scenario:
**Glazing & Ventilation
Strategy**

Drawing Number:
SK05

Key:
2.5m Garden Barriers: 

**Enhance Glazing (RTRA 38 dB)
and Alternative Ventilation
Required:** 

**Enhance Glazing (RTRA 35 dB)
and Alternative Ventilation
Required:** 

**Enhance Glazing (RTRA 32 dB)
and Alternative Ventilation
Required:** 

**Alternative Ventilation
Required (RTRA 30 dB):** 

Scale : Not to scale

**Contour Plot Presented For
Indicative Purposes Only
WYGE Leicester 23.08.13**

This map is based upon Ordnance Survey material reproduced
by WYG on behalf of Her Majesty's Stationary Office,
© Crown Copyright. Unauthorised reproduction infringes
Crown copyright and may lead to civil proceedings.
Licence Number AL 553611



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

© WYG Environment