

Harworth Group

Land at Hay Green Lane, Birdwell

Noise Assessment

April 2020

Prepared on behalf of WYG Environment Planning Transport Limited.

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Contents

1.0	Introduction.....	1
2.0	Assessment Criteria.....	4
3.0	Assessment Methodology.....	7
4.0	Noise Survey.....	9
5.0	Assessment of Key Effects	12
6.0	Conclusion.....	14

Appendix Contents

Appendix A – Acoustic Terminology and Abbreviations

Appendix B – Sketches

Appendix C – Traffic [Data](#)

Appendix D – Baseline Noise Level Data (Long Term Locations)

Appendix E – Report Conditions

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 a proposed residential development at land at Hay Green Lane, Birdwell.

The assessment is based on the noise impact from road traffic noise on future residents with the scope of works agreed following consultation with James Gardham, Environmental Health Officer (EHO), Barnsley Council. It was agreed that noise associated with construction works would be addressed at this stage through a suitably worded planning permission.

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 Development have been predicted at local representative receptors using CADNA noise modelling software which incorporates CRTN and 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 are presented in Appendix B. Report Conditions are presented in Appendix E.

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 National Planning Policy Framework (NPPF), published in February 2019 and updated in July 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 an 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."

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:

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
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	No Observed Adverse Effect	No specific measures required

Response	Examples of outcomes	Increasing effect level	Action
	change in the quality of life.		
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			
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 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 '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.

2.0 Assessment Criteria

In order to enable the assessment of the Development in terms of LOAEL and SOAEL, **Error! Reference source not found.** 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 8233:2014:2014 'Guidance on sound insulation and noise reduction for buildings'

Table 2.1 Noise Level Criteria and Actions

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level (NOAEL)	Proposed Residents	Internal noise levels less than: Bedrooms (night-time) – 42 dBL _{Amax} Living Rooms (daytime) – 30 dBL _{Aeq,16hours} External noise levels less than: Night-time – 40 dBL _{night}	No Action Required Within BS8233 / WHO
Lowest Observed Adverse Effect Level (LOAEL)	Proposed Residents	Internal noise levels achieve (with windows open): <i>Bedrooms (night-time) – 30 dBL_{Aeq,8hours} / 45 dBL_{Amax}</i> <i>Living Rooms (daytime) – 35 dBL_{Aeq,16hours}</i> Private external Amenity Space (daytime) – 50 dBL _{Aeq,16hours}	None Within BS8233 / WHO Criteria
Significant Observed Adverse Effect Level (SOAEL)	Proposed Residents	Internal noise levels exceed (with windows closed): Bedrooms (night-time)– 30 dBL _{Aeq,8hours} / 45 dBL _{Amax} (More than 15 times per night) Living Rooms (daytime)– 35 dBL _{Aeq,16hours} Depending on context, external noise levels exceed: Private external Amenity Space (daytime) – 55 dBL _{Aeq,16hours}	Mitigate to achieve (with windows closed): Bedrooms – 30 dBL _{Aeq,8hours} / 45 dBL _{Amax} Living Rooms – 35 dBL _{Aeq,16hours} Depending on context, external amenity space Mitigate and reduce to a minimum
Unacceptable Observed Adverse Effect Level (UOAE)	Proposed Residents	Internal noise levels with windows closed exceed: Bedrooms (night-time) – 51 dBL _{Aeq,8hours} Living Rooms (daytime) – 57 dBL _{Aeq,16hours}	Avoid Values correspond with PPG24 Category D (mixed sources), planning permission should normally be refused.

2.1 ProPG Planning and Noise

Professional Practice Guidance on Planning and Noise for new residential development (ProPG) was published in May 2017 by the Chartered Institute of Environmental Health (CIEH), the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA). The guidance has been published to provide 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, it aims to:

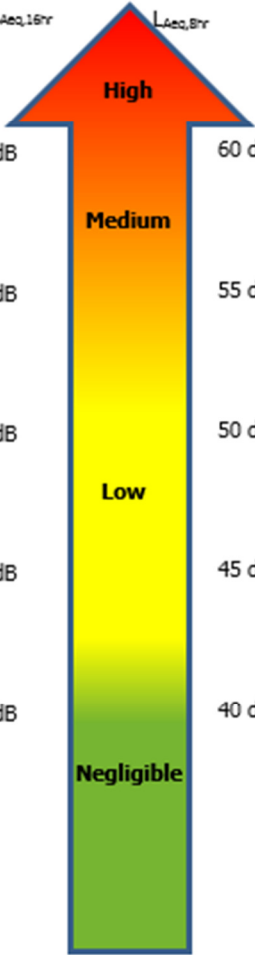

- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for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

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 regard to Stage 1, the ProPG provides guidance for producing 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 2.1, overleaf. This shows the various Noise Risks Categories (NRC) together with their corresponding sound levels as referred to in the ProPG. It should be noted that the categories are not distinct which allows context to be included within the assessment with the purpose of the Stage 1 assessment to determine the likely acoustic challenges on the site.

Figure 2.1 ProPG Stage 1, Noise Risk Assessment

Noise Risk Assessment	Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
<p>Indicative Daytime Noise Levels $L_{Aeq,16hr}$</p> <p>Indicative Night-Time Noise Levels $L_{Aeq,8hr}$</p>  <p>70 dB</p> <p>65 dB</p> <p>60 dB</p> <p>55 dB</p> <p>50 dB</p> <p>60 dB</p> <p>55 dB</p> <p>50 dB</p> <p>45 dB</p> <p>40 dB</p> <p>High</p> <p>Medium</p> <p>Low</p> <p>Negligible</p>	 <p>Increasing risk of adverse effect</p>	<p>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.</p> <p>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 mitigate and minimised, and which clearly demonstrates that a significant adverse noise impact will be avoided in the finished development.</p> <p>At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.</p>
	<p>No adverse effect</p>	<p>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.</p>

At Stage 2, which is not required to be progressed if the Stage 1 assessment determines a negligible risk, there are 4 elements which should be undertaken in parallel. These are:

- Good Acoustic Design Process
- Internal Noise Level Guidelines
- External Amenity Area Noise Assessment
- Assessment of Other Relevant Issues

There is then the requirement to present an ADS to provide sufficient evidence that the ProPG Stage 1 and Stage 2 Elements 1 to 4 have been followed. At this outline stage, a detailed site layout is not available and, therefore, an ADS is not required.

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict source noise levels at a large number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on the Department of Transport Welsh Office Calculation of Road Traffic Noise (CRTN) and ISO 9613 noise propagation methodology. 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	Ordnance Survey	Ordnance Survey
Topographical Data	EA	2m Lidar
Traffic data	Optima Highways & Transportation	18hr AAWT flows provided by Mosodi
Building heights – around site	WYGE Observations	8 m height for two storey residential properties, and 4 m for Bungalows Proposed buildings: set at 12m
Receptor positions	WYGE	1.5 m for daytime and single storey receptors. 4 m night-time / traffic two storey receptors.
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 Road Traffic Noise

To supplement measured noise level data at the site, road traffic noise modelling has been undertaken based on traffic data provided by Mosodi as part of a separate planning application (Ref: 2019/1573 - Land to the north and south of Dearne Valley Parkway, Hoyland, Barnsley) for which a noise report was submitted (Ref: Rockingham Phases 2 & 3 Dearne Valley Parkway, WYGE, December 2019).

The traffic data is based on the 2029 'Do Something' scenario which includes future traffic growth as well as anticipated future development generated traffic associated with the Hoyland Masterplan area. Data for all main local roads around the site were provided including the A61, which is located beyond existing dwellings to the west of the site, and the Dearne Valley Parkway. The raw data is presented in Appendix C. The data was provided as 18hr AAWT flows which generates a $L_{A10,18hr}$ noise level. Therefore, factors have to be applied in order to generate the noise indices relevant to this assessment as follows:

In order to generate an $L_{Aeq,16hour}$ noise level, the following factor has been applied to each modelled road:

- Daytime: $L_{Aeq,16hours} = L_{A10,18hours} - 2 \text{ dB}$

In order to generate an $L_{Aeq,8hour}$ noise level, the following factor has been applied to each modelled road:

- Night-time: $L_{Aeq,8hours} = L_{Aeq,16hours} - 3 \text{ dB}$

The night-time correction is based on a review of noise survey data presented in Table 4.3. At the long term locations, the difference between the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods on a weekday is 3 – 4 dB.

3.3 Tranquillity Rating

An assessment of the existing tranquillity level of the Site and surrounding area has been based on the mapping data published by Campaign to Protect Rural England (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).

4.0 Noise Survey

4.1 Noise Survey Methodology

A monitoring survey was undertaken on and around the site in 2018.

Equipment used during the survey included:

Rion NL-32	Environmental Noise Analyser (WYG12)	s/n	213442
Rion NL-52	Environmental Noise Analyser (WYG16)	s/n	1221576
Rion NL-52	Environmental Noise Analyser (WYG22)	s/n	1021257
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 to 0.1 dB was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

Baseline noise data was collected at 4 locations (as specified in the following table and shown in SK01 of Appendix B) from Thursday 9th August 2018 to Wednesday 15th August 2018. Attended short term measurements were undertaken at one location during day, evening and night-time periods with three additional locations being measured unattended over a 140-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 westerly wind direction during the survey.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT3	Field boundary to the south of Hay Green Lane
LT4	South eastern corner of Birdwell Rec
LT5	To the south of Shortwood Villas
ST4	Western end Shortwood Villas

4.2 Noise Survey Results

The dominant noise sources found in the area include road traffic noise from Dearne Valley Parkway and M1.

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).

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
Day ST4	15/08/2018 11:00	21	1-2	SW	6	Traffic along A6195
Evening ST4	14/08/2018 21:21	18	0-1	SW	8	Traffic along A6195
Night ST4	14/08/2018 23:30	17	1-2	SW	6	Traffic along A6195

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

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	61 Hours	08/08/2018 – 15/08/2018 07:00 - 23:00	LT3	46.4	85.3	33.1	46.9	44
Weekday Night-time 23:00 – 07:00	32 Hours	08/08/2018 – 15/08/2018 23:00 - 07:00		43.0	83.4	23.0	42.9	38
Weekend Daytime 07:00 - 23:00	32 Hours	11/08/2018 – 12/08/2018 07:00 - 23:00		47.6	83.9	34.5	48.6	46
Weekend Night-time 23:00 – 07:00	16 hours	11/08/2018 – 12/08/2018 23:00 - 07:00		42.4	74.3	29.7	43.8	38
Weekday Daytime 07:00 - 23:00	61 Hours	08/08/2018 – 15/08/2018 07:00 - 23:00	LT4	50.0	78.8	33.8	50.2	47
Weekday Night-time 23:00 – 07:00	32 Hours	08/08/2018 – 15/08/2018 23:00 - 07:00		45.9	75.6	23.0	45.8	41
Weekend Daytime 07:00 - 23:00	32 Hours	11/08/2018 – 12/08/2018 07:00 - 23:00		49.1	91.1	34.4	49.0	45
Weekend Night-time 23:00 – 07:00	16 hours	11/08/2018 – 12/08/2018 23:00 - 07:00		45.3	78.1	31.1	45.5	43
Weekday Daytime 07:00 - 23:00	61 Hours	08/08/2018 – 15/08/2018 07:00 - 23:00	LT5	49.5	82.8	32.7	50.0	46
Weekday Night-time 23:00 – 07:00	32 Hours	08/08/2018 – 15/08/2018 23:00 - 07:00		46.8	69.4	25.5	47.5	42
Weekend Daytime 07:00 - 23:00	32 Hours	11/08/2018 – 12/08/2018 07:00 - 23:00		51.9	87.6	33.6	53.6	48
Weekend Night-time 23:00 – 07:00	16 hours	11/08/2018 – 12/08/2018 23:00 - 07:00		46.2	77.4	31.2	47.6	38
Daytime	15 Mins	15/08/2018 11:00	ST4	51.2	65.3	42.5	54.2	45.9

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)
Evening	15 Mins	14/08/2018 21:21	ST4	45.2	57.5	34.9	48.0	40.7
Night-time	15 Mins	14/08/2018 23:55	ST4	42.9	59.3	33.9	45.9	36.2

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa

5.0 Assessment of Key Effects

5.1 ProPG Stage 1 Risk Assessment

Based on the daytime $L_{Aeq,16hr}$ and night-time $L_{Aeq,8hr}$ noise models, SK03 and SK04 present noise contour plots during the day and night-time periods which provides a representation of the range of noise levels across the site.

Table 5.1 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	ProPg Stage 1 Risk Assessment Noise levels
Daytime $L_{Aeq,16hr}$	Negligible
Night-time $L_{Aeq,8hr}$	Low

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

On the basis of the above, noise challenges at the site are negligible to low. Given that the site is located over 650m from the Dearne Valley Parkway and screened by existing residential dwellings from Sheffield Road to the west, it is considered that no practical or material good design processes would be relevant at this site.

Assessments of noise with regard to noise levels in proposed internal sensitive rooms and private external amenity areas have been undertaken in Sections 5.2 and 5.3.

5.2 Noise Intrusion Assessment

Internal noise levels at the proposed development, based on the existing ambient noise climate, 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 standard double glazing (4mm / 16mm / 4mm) with a sound reduction of 25 dB R_{tr} has been used. The predicted noise levels at the assessed receptors locations (as presented in SK01) are presented in Tables 5.2 and 5.3 below.

Table 5.2 Daytime Noise Intrusion Levels $L_{Aeq,16hour}$

Location	External L_{Aeq} Noise Level	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria (Internal L_{Aeq} dB)
R1	52.4	37.4	27.4	35
R2	51.4	36.4	26.4	35

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

Table 5.3 Night-time Noise Intrusion Levels $L_{Aeq,8hour}$

Location	External L_{Aeq} Noise Level	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria (Internal L_{Aeq} dB)
R1	49.4	34.4	24.4	30
R2	48.4	33.4	23.4	30

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

Glazing and Ventilation

As shown in the tables above, with windows closed, it is expected that standard double glazing will result in the $L_{Aeq,T}$ internal target noise level criteria being met in habitable rooms within the whole development site.

With windows open, internal noise levels within habitable rooms in some areas of the development site most exposed to traffic noise are predicted to be slightly above than the target criteria. It should be noted that predicted noise levels are within 5 dB of the target criteria which is not considered to be unacceptable in terms of BS 8233 guidance.

Nevertheless, as a good design measure, all habitable rooms with facades along the western and southern boundaries of the site facing Sheffield Road and the Dearne Valley Parkway should have the provision of a means of alternative ventilation in the form of trickle vents with a minimum specification of 32 dB $D_{n,e,w}$.

For most habitable rooms, due to future screening being provided by proposed dwellings which will reduce noise levels further resulting in predicted noise levels within the majority of habitable spaces will be within the target BS 8233 criteria.

Based on the above predicted noise levels in all habitable spaces will fall below the LOAEL.

5.3 External Amenity Assessment

As can be seen in Table 5.2 above, external daytime noise levels do not exceed the upper BS 8233 guideline value of 55 dB $L_{Aeq,T}$ and the SOAEL. Therefore, no mitigation is required.

5.4 Tranquillity Assessment

An assessment of the existing tranquillity level of the site has been based on the mapping data published by Campaign to Protect Rural England (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 Site and immediate surrounding area is assessed as falling into Zones 4-5 and is of low to moderate tranquillity. A public footpath is located to the east of the site, which is to be joined by pedestrian access routes open to the public within the site, thereby enhancing access to areas of greater tranquillity.

6.0 Conclusion

This report presents the findings of a noise assessment to inform an outline planning application for a proposed residential development at land of Hay Green Lane, Birdwell. Reference has been given to relevant guidance documents, including the Planning Practice Guidance: Noise and BS 8233 with the assessment demonstrating the suitability of the site for residential development. The NPPF gives a number of test points relating to noise which are referenced as bullet points below. Considering each of these points, the following conclusions can be drawn in relation to the proposed development:

NPPF 170 (e) and 180 (a)

With appropriate mitigation it is considered that the proposed development is not expected to give rise to significant adverse impacts on health or quality of life. A glazing and ventilation strategy has been provided which achieves both ventilation and internal ambient noise level requirements of L_{Aeq} daytime of 35 dB and L_{Aeq} night-time of 30 dB in all residential living spaces and bedrooms of the proposed development. Standard double glazing (e.g. 4mm/16mm/4mm) will be acceptable throughout the site. As a good design measure, trickle vents with a minimum specification of 32 dB $D_{n,e,w}$ are recommended for all habitable rooms with facades along the western and southern boundaries of the site facing Sheffield Road and the Dearne Valley Parkway.

NPPF 180 (b), 182 and 183

It is not considered that any existing businesses wanting to develop would be restricted by the proposals whilst the site is not located in an area which is relatively undisturbed by noise and prized for its recreational and amenity value for this reason.

Planning Practice Guidance: Noise

The noise mitigation measures recommended within this report are considered sufficient to reduce the effects of identified sources of noise, both existing and proposed, to prevent the adopted thresholds (within the context of BS 8233) for Significant Observed Adverse Effect Level (SOAEL) being exceeded for future residents.

Appendices

Appendix A – Acoustic Terminology and Abbreviations



An explanation of the specific acoustic terminology referred to within this report is provided below.

- 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.
- Lane** 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.



An explanation of abbreviations used within this report is provided below.

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

AAWT – Annual Average Weekday Traffic

DM – Do Minimum (Without Development Traffic Flows)

DS – Do Something (With Development Traffic Flows)

PPG – Planning Practice Guidance

WYGE – WYG Environment

NPPF – National Planning Policy Framework

NOAEL – No Observed Adverse Effect Level

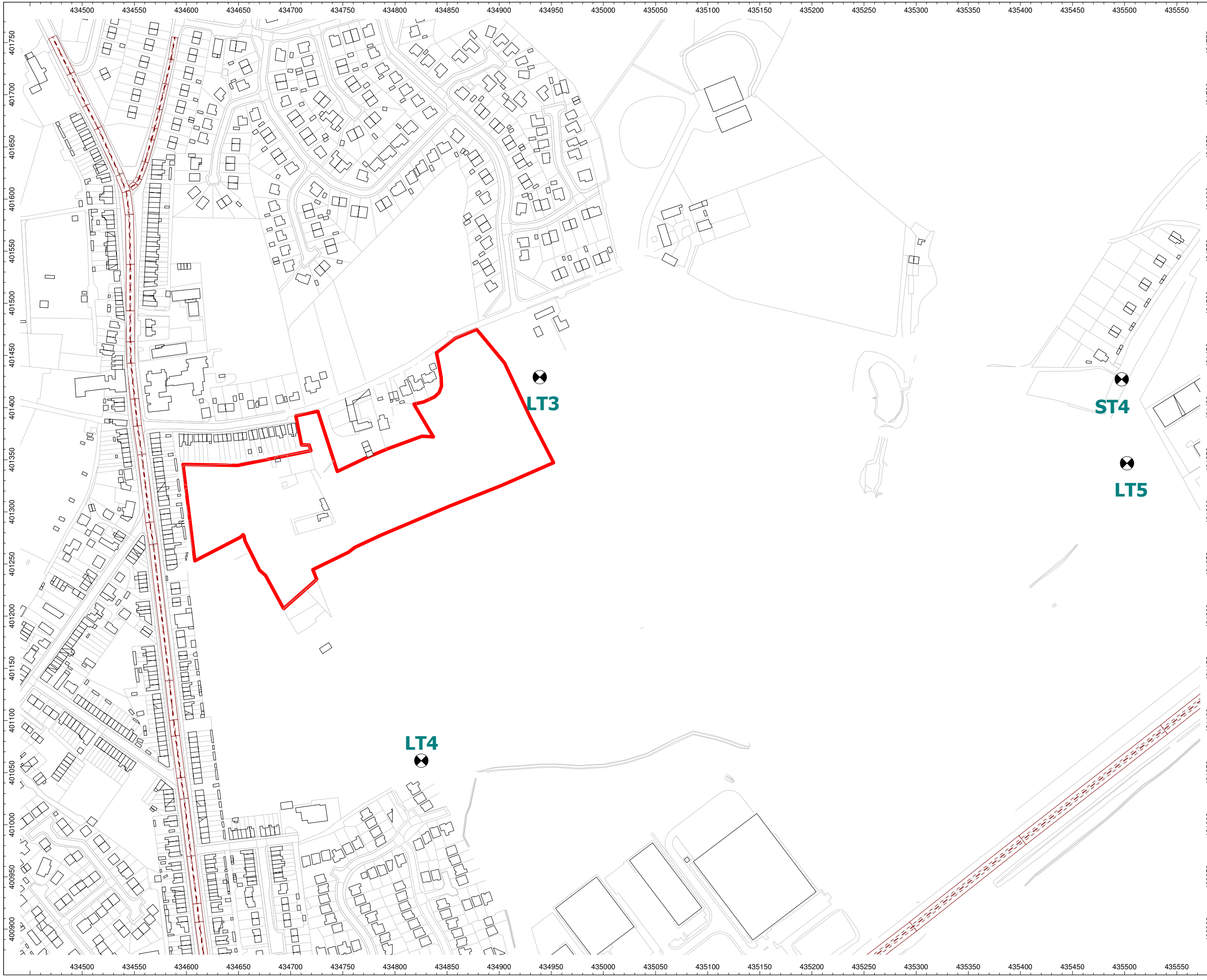
LOAEL – Lowest Observed Adverse Effect Level

SOAEL – Significant Observed Adverse Effect Level



Appendix B – Sketches

- SK01 Noise Monitoring Location Plan
- SK02 Proposed Receptor Location Plan
- SK03 ProPG Daytime Noise Contour Plot $L_{Aeq,16hour}$
- SK04 ProPG Night-time Noise Contour Plot $L_{Aeq,8hour}$



Client:
Harworth Group


Project:
**Land at Hay Green Lane,
Birdwell**


Project Number:
A116533

Drawing Title / Scenario:
**Noise Monitoring
Location Plan**

Drawing Number:
SK01

Key:

Monitoring
Locations: 

Site Boundary: 

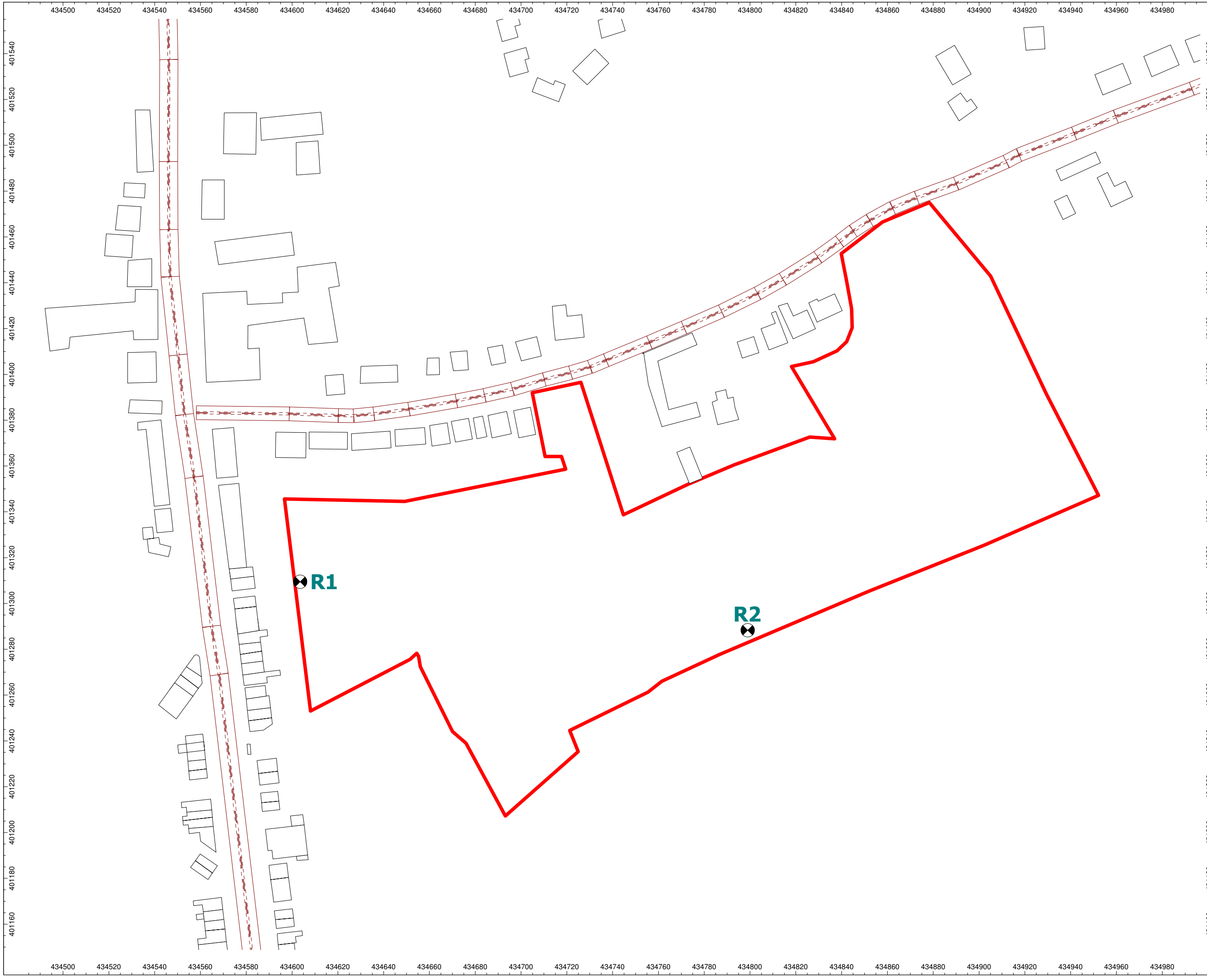
Scale : Not to scale

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Land at Hay Green Lane,
Birdwell

Project Number:
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Drawing Title / Scenario:
Proposed Receptor
Location Plan

Drawing Number:
SK02

Key:
Receptor
Locations:

Site Boundary:

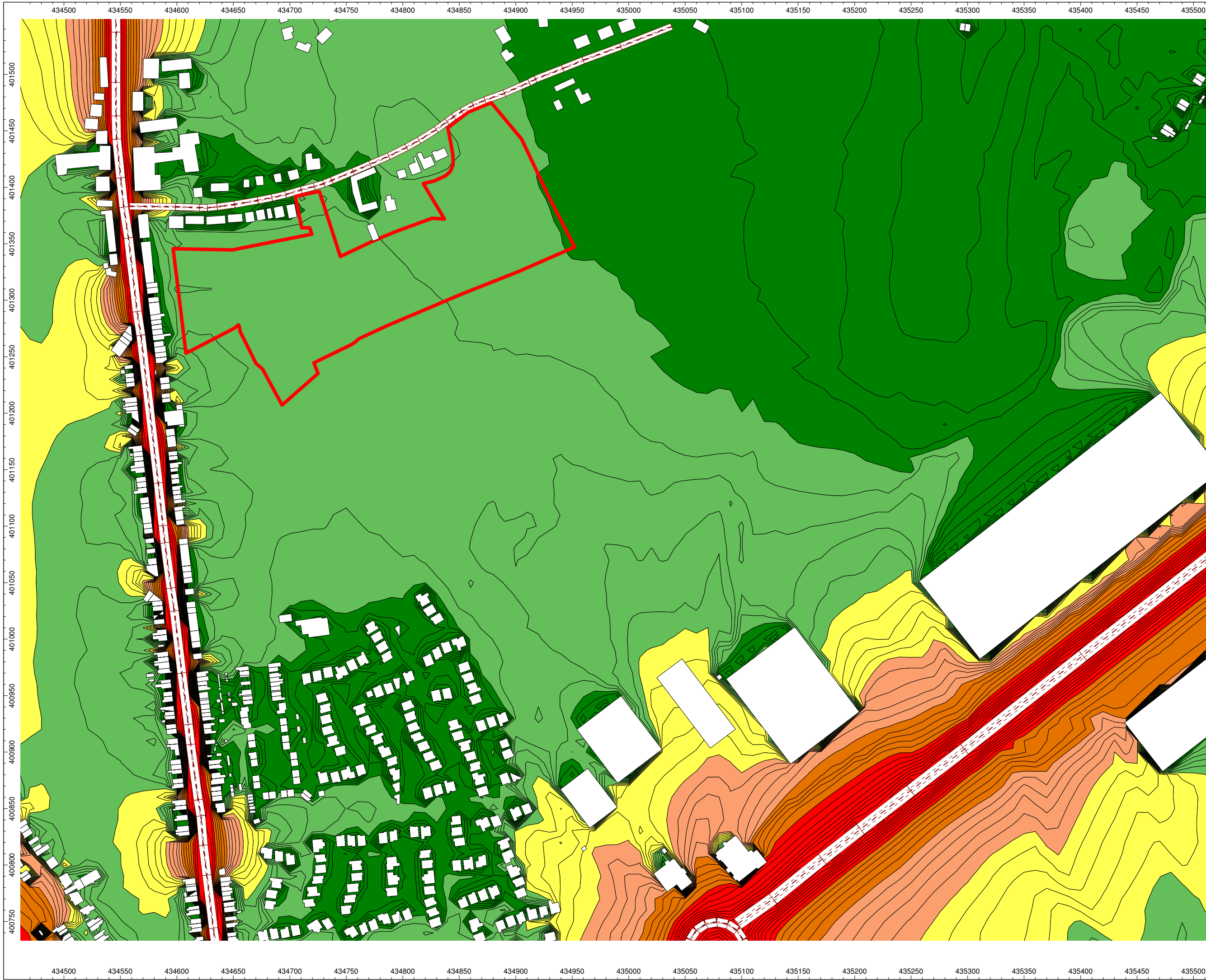
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Project:
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Project Number:
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Drawing Title / Scenario:
**ProPG Daytime Noise Contour
 Plot LAeq,16hour**

Drawing Number:
SK03

- Key:
- Site Boundary: —
- 0.0 - 50.0 dB
 - 50.0 - 55.0 dB
 - 55.0 - 60.0 dB
 - 60.0 - 65.0 dB
 - 65.0 - 70.0 dB
 - >70 dB

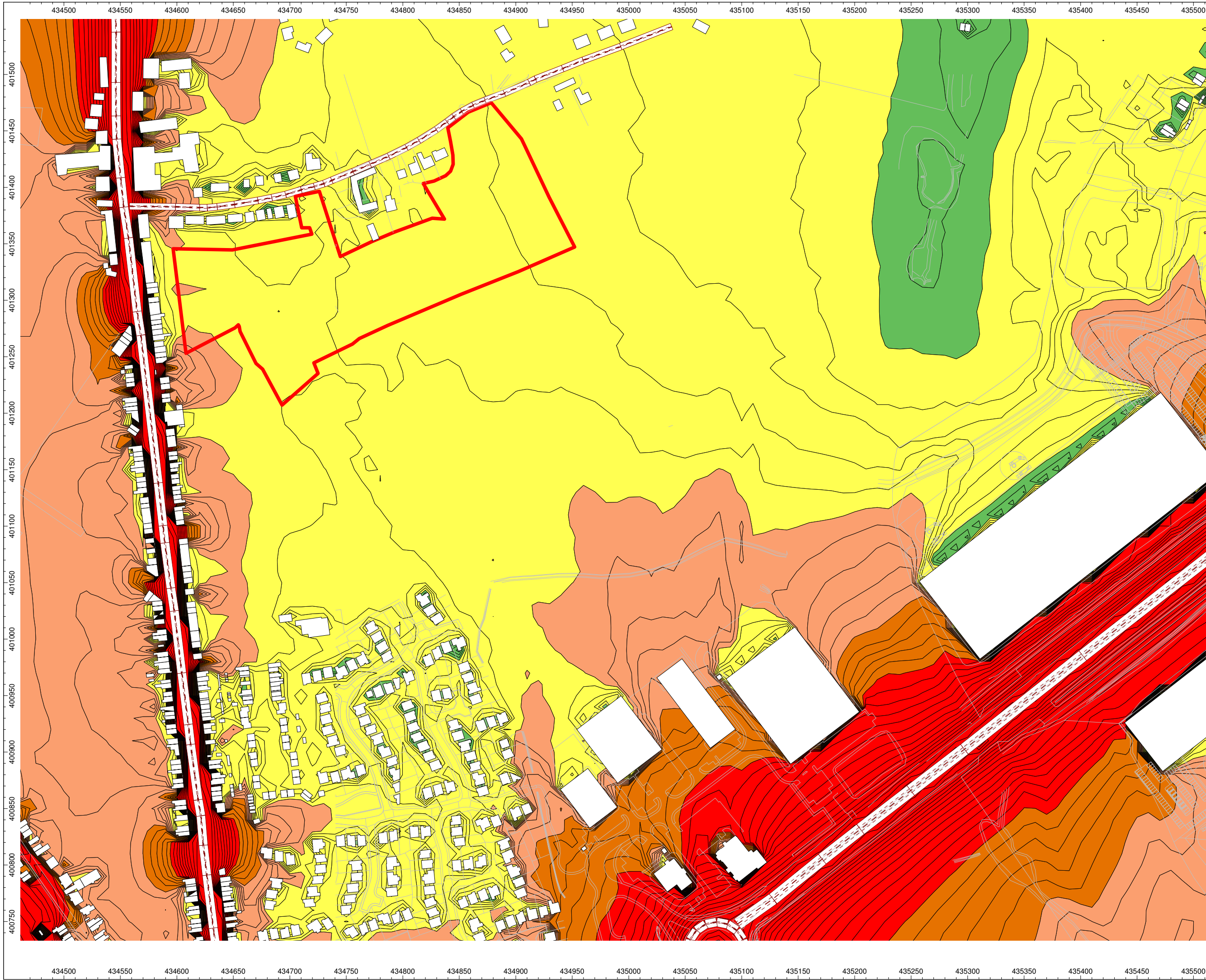
Contour plot for indicative purposes only.

Scale : Not to scale
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Project Number:
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Drawing Title / Scenario:
**ProPG Night-time Noise
 Contour Plot LAeq,8hour**

Drawing Number:
SK04

- Key:
- Site Boundary: —
- 0.0 - 40.0 dB
 - 40.0 - 45.0 dB
 - 45.0 - 50.0 dB
 - 50.0 - 55.0 dB
 - 55.0 - 60.0 dB
 - >60 dB

Contour plot for indicative purposes only.

Grid at 4m height

Scale : Not to scale
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Appendix C – Traffic Data

Location Name	18hr AAWT						Speeds (mph)
	Base 2017		DM 2029		DS 2029		
	Total	% HGV	Total	HGV %	Total	HGV %	
M1S	94727	11.0%	95581	10.9%	95946	11.0%	70
A61 (west of M1)	25710	15.4%	26429	15.0%	26929	15.5%	44
M1 N	98805	11.8%	99718	11.7%	100162	11.9%	70
A61 Sheffield Road	21845	8.6%	22053	8.5%	22253	8.5%	28
A61 Link East of M1 J36	39223	13.7%	41710	12.9%	43019	13.9%	40
A6135 S of B6096	11223	7.2%	11803	6.9%	12060	6.7%	30
Tankersley Lane	6945	5.6%	6965	5.6%	6965	5.6%	30
B6096	11518	7.4%	13137	6.5%	13137	6.5%	30
A6135 N of B6096	13752	9.4%	15098	8.6%	15354	8.5%	28
A6195 S of Kestrel Way	24097	14.3%	25628	13.4%	27138	15.0%	40
Sheffield Road	2615	9.3%	2927	8.3%	3136	7.7%	40
A6195 W of Phase 3	25568	13.8%	26721	13.2%	28440	14.5%	50
A6195 E of Phase 3	25568	13.8%	26721	13.2%	28359	14.3%	50
Proposed Access Road	-	-	-	-	2042	34.3%	30
A6195 E of Phase 2	25121	13.7%	26299	13.1%	26999	13.8%	70



Appendix D – Baseline Noise Level Data (Long Term Locations)

LT3

	WeekDay					Saturday					Sunday				
	LAeq	LAmx	LAmn	LA10	LA90	LAeq	LAmx	LAmn	LA10	LA90	LAeq	LAmx	LAmn	LA10	LA90
00:00	39.9	63.3	23.0	41.3	38	42.0	51.8	36.0	43.5	40	43.5	56.0	35.3	45.9	40
01:00	39.2	56.3	23.1	40.1	37	40.9	62.7	34.3	42.4	38	42.1	56.5	34.3	44.4	39
02:00	40.8	64.5	24.9	41.5	39	39.9	49.3	33.0	41.6	38	40.3	54.7	29.7	42.6	36
03:00	41.3	66.4	26.0	42.0	37	39.8	51.7	33.4	41.5	38	40.1	53.8	30.5	42.7	34
04:00	41.6	68.4	30.8	42.4	35	39.4	52.3	31.7	40.7	38	39.7	55.4	31.2	42.2	34
05:00	45.4	73.0	32.8	45.7	43	43.8	64.8	37.9	44.5	40	43.6	58.6	32.7	45.6	39
06:00	47.5	83.4	37.9	47.6	43	43.8	67.4	38.9	44.9	42	45.6	74.3	36.2	47.0	41
07:00	47.5	85.3	37.9	47.5	48	47.6	83.9	35.6	43.9	39	45.3	69.6	35.7	47.1	41
08:00	46.5	72.0	40.1	47.2	44	42.4	70.7	34.5	42.9	38	45.4	66.3	36.2	47.6	42
09:00	46.6	67.1	39.4	47.5	44	41.2	62.7	35.2	42.0	38	47.4	65.1	39.2	49.3	46
10:00	45.9	66.1	37.9	47.0	44	44.2	63.3	36.5	45.3	41	48.9	68.3	43.4	50.6	46
11:00	46.7	77.7	35.8	46.9	39	45.5	63.5	37.8	46.5	43	47.7	65.2	41.0	49.4	44
12:00	46.7	66.4	37.0	47.2	45	46.2	61.5	37.7	47.6	44	48.8	65.9	42.7	50.5	46
13:00	48.9	65.5	40.0	49.5	46	48.4	72.0	40.9	50.2	46	49.5	61.0	43.4	51.2	48
14:00	48.1	72.0	41.1	49.7	46	48.4	61.0	41.1	50.4	46	48.4	61.9	42.6	50.1	47
15:00	46.0	65.4	33.1	46.7	44	48.6	63.4	42.3	50.4	46	48.3	66.5	42.3	49.9	46
16:00	46.3	69.1	33.2	46.6	44	49.6	74.1	42.7	50.7	46	47.4	63.9	39.7	49.3	44
17:00	47.1	66.0	35.5	47.9	46	50.7	76.8	43.7	52.2	48	48.6	69.0	40.8	49.8	45
18:00	47.0	79.8	37.9	47.8	46	49.7	66.1	43.4	51.6	47	48.0	71.1	39.6	49.9	44
19:00	45.3	69.7	37.7	46.2	44	48.6	73.8	42.4	50.3	46	46.6	70.5	39.6	48.5	43
20:00	44.7	78.9	34.6	45.2	43	47.3	62.0	40.1	49.4	44	47.2	75.2	40.1	48.6	44
21:00	43.1	59.0	35.2	44.3	42	47.0	64.8	39.9	49.0	44	45.9	65.2	37.7	47.9	42
22:00	42.7	60.3	33.9	44.0	41	45.7	58.5	37.3	47.8	43	44.0	63.0	34.7	46.2	41
23:00	41.3	54.2	34.1	42.8	40	44.4	59.1	36.0	46.8	41	41.9	55.3	32.6	44.3	38

LT4

	WeekDay					Saturday					Sunday				
	LAeq	LAmx	LAmn	LA10	LA90	LAeq	LAmx	LAmn	LA10	LA90	LAeq	LAmx	LAmn	LA10	LA90
00:00	42.8	59.1	23.0	43.7	41	45.7	54.6	40.2	47.3	44	42.9	53.3	36.0	44.8	40
01:00	42.0	59.4	23.4	43.2	39	44.1	56.9	36.8	45.8	41	42.1	55.0	33.7	44.4	39
02:00	43.3	63.9	26.1	44.6	41	43.5	52.5	36.1	45.1	41	40.6	53.3	31.2	42.6	36
03:00	43.4	64.6	27.3	44.7	42	42.9	55.7	35.9	44.6	39	39.7	51.4	31.3	42.0	37
04:00	43.9	70.1	31.5	44.7	41	43.2	62.2	35.1	44.1	41	41.6	63.2	31.1	42.1	35
05:00	49.0	75.6	33.8	49.5	44	47.7	69.7	38.5	47.9	43	47.7	68.9	33.7	48.5	41
06:00	50.1	71.6	40.9	50.8	48	49.7	67.0	40.6	50.1	43	49.7	78.1	38.3	49.3	43
07:00	50.2	70.4	43.0	51.2	46	47.8	68.5	37.9	48.2	41	47.1	67.5	36.9	47.7	43
08:00	50.2	76.0	40.7	50.1	47	49.1	77.6	37.5	48.5	41	46.0	72.5	38.0	47.0	42
09:00	51.5	78.8	39.4	50.8	47	50.4	76.4	38.0	46.7	41	49.7	73.3	39.5	49.6	45
10:00	51.1	75.4	41.7	50.9	48	53.8	83.2	39.4	51.4	43	51.1	73.3	42.4	51.6	48
11:00	49.7	72.7	40.1	49.8	47	51.1	75.8	39.8	50.1	42	48.9	70.6	41.4	50.2	45
12:00	50.5	73.9	41.6	50.6	48	47.9	73.1	38.9	48.4	45	53.1	75.9	42.5	53.5	45
13:00	52.2	76.7	43.4	53.3	49	49.5	73.3	41.3	49.7	46	49.0	66.1	43.6	50.2	47
14:00	51.5	74.3	44.6	52.6	49	48.4	70.6	40.6	50.1	45	49.1	70.7	42.2	49.3	46
15:00	50.2	78.0	36.9	50.5	48	47.6	64.7	42.2	48.9	46	47.6	63.2	43.0	48.5	46
16:00	49.6	65.4	38.6	50.2	50	48.6	68.4	43.5	50.1	46	51.1	91.1	39.7	47.6	45
17:00	50.7	70.9	41.4	51.5	49	49.5	73.1	45.0	50.5	47	47.7	68.9	41.4	48.8	45
18:00	50.0	75.6	39.4	51.0	49	49.3	70.9	44.3	50.7	47	49.4	76.5	39.5	50.3	45
19:00	49.1	71.6	41.6	50.2	46	49.1	72.8	43.1	50.2	45	46.0	65.3	40.5	47.6	43
20:00	47.7	66.6	36.9	48.9	46	46.8	66.1	41.0	48.4	44	46.1	67.8	40.2	47.7	44
21:00	46.3	70.9	34.8	46.9	46	47.0	63.2	40.9	48.7	43	44.7	63.7	37.9	46.7	42
22:00	45.1	63.0	33.8	45.9	44	45.8	61.2	37.7	47.5	44	42.6	60.2	34.4	44.5	38
23:00	44.1	58.8	34.5	45.5	42	43.9	57.6	36.2	45.8	41	40.9	52.9	32.5	43.4	36

LT5

	WeekDay					Saturday					Sunday				
	LAeq	LAmx	LAmn	LA10	LA90	LAeq	LAmx	LAmn	LA10	LA90	LAeq	LAmx	LAmn	LA10	LA90
00:00	45.1	62.2	28.6	47.8	39	43.1	54.7	36.8	44.8	41	46.8	60.5	33.9	50.0	38
01:00	44.2	61.4	27.9	45.9	40	41.9	55.7	35.1	43.9	38	44.6	58.9	33.4	48.1	38
02:00	45.0	69.0	28.5	46.8	38	41.4	56.5	33.9	43.7	39	43.0	58.6	31.2	46.3	35
03:00	44.2	65.6	25.5	46.1	39	41.1	51.7	33.4	43.3	37	43.4	60.6	31.4	46.5	37
04:00	44.6	69.4	29.7	46.4	38	42.2	52.9	33.6	44.2	40	44.5	61.8	31.6	47.7	35
05:00	48.7	63.2	34.7	49.1	42	46.0	59.4	38.7	47.7	42	50.8	77.4	38.4	52.6	44
06:00	51.6	69.4	38.6	51.4	45	48.2	57.5	41.7	50.0	45	50.3	73.1	39.2	52.7	46
07:00	51.9	75.4	40.0	51.8	48	47.1	60.6	38.4	49.7	43	50.0	69.2	37.0	52.7	44
08:00	51.0	67.2	40.7	52.2	50	44.9	59.8	35.9	47.2	41	51.4	84.4	37.0	53.0	44
09:00	49.8	67.3	38.2	51.1	46	45.8	58.7	37.3	47.9	43	52.1	61.8	37.6	54.7	48
10:00	49.0	67.1	37.6	50.1	46	47.2	63.9	38.9	49.5	43	53.7	87.6	42.9	54.5	49
11:00	47.9	60.8	36.4	47.6	38	50.9	78.6	38.9	50.8	47	51.7	62.6	40.5	53.8	49
12:00	49.2	68.6	36.3	49.7	47	50.7	67.6	39.3	52.5	48	53.8	65.3	45.7	55.6	51
13:00	51.3	63.8	40.7	52.3	48	51.9	67.5	39.3	54.3	46	54.5	62.5	43.7	56.8	51
14:00	51.2	72.9	41.3	52.8	47	52.2	73.3	40.8	54.5	48	53.5	65.3	40.4	55.8	50
15:00	49.7	64.8	33.7	50.3	45	53.1	79.3	41.1	55.1	48	53.3	66.3	40.5	55.7	50
16:00	47.7	63.6	33.1	48.1	46	53.0	71.8	41.6	54.9	48	52.4	62.7	38.2	54.8	50
17:00	50.0	73.4	36.3	50.7	48	55.0	76.6	43.8	57.0	50	52.9	71.5	41.5	55.4	48
18:00	49.0	66.5	35.4	49.6	46	53.8	68.2	43.4	56.3	49	52.0	69.3	36.0	54.3	49
19:00	49.9	82.8	34.9	49.5	44	52.5	67.9	38.4	55.0	47	51.0	66.2	38.7	53.8	46
20:00	46.7	74.0	37.2	47.9	43	51.7	65.8	36.6	54.4	47	51.1	71.0	38.7	53.8	47
21:00	46.6	68.6	35.5	48.7	43	51.6	71.7	37.8	53.8	44	51.0	75.2	35.7	52.8	44
22:00	46.2	64.6	32.7	48.1	43	50.3	65.4	37.2	52.8	45	49.8	72.6	33.6	52.0	43
23:00	44.8	64.0	34.0	47.1	41	49.1	71.5	35.4	51.8	43	45.9	60.5	31.4	49.4	35



Appendix E – Report Conditions



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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.