



Persimmon Homes

Proposed Residential Development

Keresforth Road, Dodworth

Noise Assessment

April 2018

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Document Control

Project: Keresforth Road, Dodworth – Noise Assessment

Client: Persimmon Homes

Job Number: A106371

File Origin: O:\Acoustics Air Quality and Noise\Fee Earning Projects\A106371

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Issue	Date	Status
1	10 th April 2018	First Issue
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3		
4		



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1.0 Introduction

This noise assessment has been prepared by WYG on behalf of Persimmon Homes to inform a planning application for a proposed residential development on land off Keresforth Road, Dodworth, Barnsley. The M1 is located to the east of the site.

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

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

1.1 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. 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.

In support of the NPPF, The Planning Practice Guidance: Noise (PPG) web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. 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 NPPG 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 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 NPPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents, 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 NPPG also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*

2.0 Assessment Criteria

2.1 LOAEL and SOAEL 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.

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): Bedrooms (night-time) – 30 dBL _{Aeq,8hours} / 45 dBL _{Amax} Living Rooms (daytime) – 35 dBL _{Aeq,16hours} 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.

For the purposes of this assessment, the target noise level criteria with regard to habitable spaces is 35 dB L_{Aeq,16hours} for living rooms and 30 dB L_{Aeq,8hours}.

*With regard to noise in private external amenity areas, Section 7.7.3.2 within BS 8233 specifies that it “is desirable that the external noise level does not exceed 50 dB L_{Aeq,T} with an upper guideline value of 55 dB



L_{Aeq,16hours} which would be acceptable in noisier environments". However, BS8233 recognises that these guidelines values "are not achievable in all circumstances where development may be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited". This approach has been applied within this assessment with the SOAEL for private external amenity spaces set at 60 dB L_{Aeq,16hours}.

2.2 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:

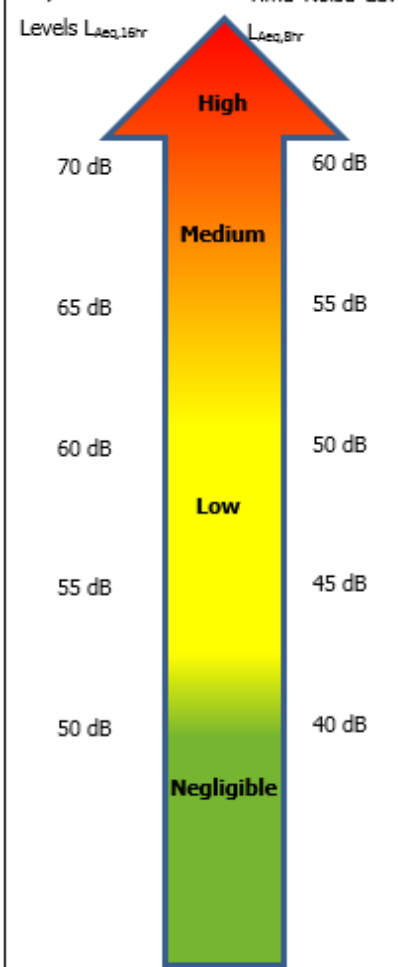
- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for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

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 (ADS).

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. 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
Indicative Daytime Noise Levels $L_{Aeq,16hr}$ Indicative Night-Time Noise Levels $L_{Aeq,8hr}$  High Medium Low Negligible 70 dB 65 dB 60 dB 55 dB 50 dB 60 dB 55 dB 50 dB 45 dB 40 dB	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 mitigate 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 ~~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.
	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.

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.

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} noise levels at a large number of locations both horizontally and vertically. CADNA noise modelling software has been used which is based on the Department of Transport 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 – around site	Ordnance Survey	Ordnance Survey
Ground levels	Ordnance Survey / WYG	On-site topographical data / 2m contours in the area within and surrounding the site
Traffic data	WYGE	WYGE validated noise measurements.
Building heights	WYGE Observations	8 m height
Barrier heights	WYGE Observations	No existing barrier included within the models, 2.1 proposed barriers within model
Receptor positions	WYGE	Height of 1.5 m for living rooms 4 m for bedrooms. 1.5 m height for model grid (day) and monitoring locations for validation. 4 m for model grid (night).
Absorbent Ground	CADNA	Frequency dependant ground absorption has been applied based on values specified in VDI 2714/16 clause 6.3.
Site Layout	Persimmon Homes	Proposed Planning Layout KRD-20147-001 Rev D

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 Model Verification

The model was verified by modelling the monitoring locations for the 'existing' scenario. The daytime and night time L_{Aeq} scenario has been verified for LT1 and LT2. The comparison between the monitoring and modelling results are shown in the tables below.

Table 3.2 Daytime Modelled vs. Monitored Results $L_{Aeq,T}$

Monitoring Position	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between modelled and measured noise level (dB)
LT1	61.3	61.9	0.6
LT2	58.5	60.7	2.2

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

Table 3.3 Night-time Modelled vs. Monitored Results $L_{Aeq,T}$

Monitoring Position	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between modelled and measured noise level (dB)
LT1	54.5	55.9	1.4
LT2	53.3	54.6	1.3

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

As all of the verification points show a divergence between monitored and modelled results of no more than 3 dB, the models are considered suitably verified.

3.3.6 Sensitive Receptors

The locations of proposed receptor locations are presented in SK02a (facades) and SK02b (gardens) in Appendix B.

3.3 Tranquillity Rating

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).



4.0 Noise Survey

4.1 Noise Survey Methodology

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

Equipment used during the survey included:

Norsonic 140	Environmental Noise Analyser	s/n	1402987
Norsonic 1251	Sound Calibrator	s/n	25010
Rion NL-52	Environmental Noise Analyser (WYG20)	s/n	253702
Rion NL-52	Environmental Noise Analyser (WYG22)	s/n	1021257

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 six locations (as specified in the following table and shown in SK01 of Appendix B) from Thursday 16th November 2017 to Tuesday 21st November 2017, with two additional short measurements undertaken on Wednesday 6th December 2017. Attended short term measurements were undertaken at six locations during day, evening and night-time periods with two additional locations being measured unattended over a 116-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 southerly direction.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	South east corner of the site
LT2	North east corner of the site
ST1	Barnsley Road, north of the site
ST2	North east corner of the site
ST3	South west corner of the site
ST4	South east corner of the site
ST5	Middle of the site, approx. 40m from eastern site boundary



Ref	Description
ST6	Middle of the site, approx. 10m from eastern site boundary

1.1 Noise Survey Results

The dominant noise sources is road traffic noise from the 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 ST1	21/11//2017 09:51	12	2-3	S	8	Traffic along Barnsley Road
Day ST2	21/11//2017 10:25	12	1-2	S	8	Traffic along M1 slip road
Day ST3	21/11//2017 11:05	12	2-3	S	8	Traffic along M1
Day ST4	21/11//2017 10:40	12	1-2	S	8	Traffic along M1 slip road
Day ST5	06/12//2017 09:07	10	1-2	S	6	Traffic along M1 slip road
Day ST6	06/12//2017 09:43	10	2-3	S	7	Traffic along M1 slip road
Evening ST1	20/11//2017 21:39	12	0-1	S	6	Traffic along Barnsley Road
Evening ST2	20/11//2017 22:26	11	1-2	S	7	Traffic along M1 slip road
Evening ST3	20/11//2017 22:03	11	2-3	S	7	Traffic along M1
Evening ST4	20/11//2017 22:46	11	1-2	S	6	Traffic along M1 slip road
Night ST1	21/11//2017 00:12	11	0-1	S	8	Traffic along Barnsley Road
Night ST2	20/11//2017 23:26	11	1-2	S	7	Traffic along M1 slip road
Night ST3	20/11//2017 23:48	11	0-1	S	8	Traffic along M1
Night ST4	20/11//2017 23:04	11	0-1	S	6	Traffic along M1 slip road

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 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)
Week Day 07:00 - 23:00	45 Hours	16/11/2017 – 21/11/2017 07:00 - 23:00	LT1	61.3	88.5	41.6	62.5	56
Week Night 23:00 – 07:00	24 Hours	16/11/2017 – 21/11/2017 23:00 - 07:00		54.5	80.0	30.7	55.5	45
Weekend Day 07:00 - 23:00	32 Hours	18/11/2017 – 19/11/2017 07:00 - 23:00		60.4	81.5	41.1	61.5	55
Weekend Night 23:00 – 07:00	16 hours	18/11/2017 – 19/11/2017 23:00 - 07:00		53.2	74.0	34.0	55.3	46
Week Day 07:00 - 23:00	45 Hours	16/11/2017 – 21/11/2017 07:00 - 23:00	LT2	58.5	78.7	41.6	60.1	56
Week Night 23:00 – 07:00	24 Hours	16/11/2017 – 21/11/2017 23:00 - 07:00		53.3	78.5	33.7	54.1	44
Weekend Day 07:00 - 23:00	32 Hours	18/11/2017 – 19/11/2017 07:00 - 23:00		56.9	79.3	40.4	58.2	52
Weekend Night 23:00 – 07:00	16 hours	18/11/2017 – 19/11/2017 23:00 - 07:00		51.1	69.7	34.2	53.1	44
Day 07:00 - 19:00	15 Mins	21/11//2017 09:51	ST1	69.2	86.1	48.1	73.4	54.1
	15 Mins	21/11//2017 10:25	ST2	61.2	68.5	53.8	63.6	57.3
	15 Mins	21/11//2017 11:05	ST3	50.1	66.2	39.0	51.8	47.5
	15 Mins	21/11//2017 10:40	ST4	59.3	68.8	53.8	61.6	56.2
	30 Mins	06/12//2017 09:07	ST5	61.3	80.8	53.2	63.0	56.9
	30 Mins	06/12//2017 09:43	ST6	64.4	75.9	53.7	67.8	58.5
Evening 19:00 - 23:00	15 Mins	20/11//2017 21:39	ST1	65.4	80.6	42.6	70.5	48.1
	15 Mins	20/11//2017 22:26	ST2	49.6	63.1	42.6	52.7	44.5
	15 Mins	20/11//2017 22:03	ST3	43.2	55.3	36.5	45.6	39.5
	15 Mins	20/11//2017 22:46	ST4	51.1	65.2	39.9	54.4	45.0
Night 23:00 - 07:00	15 Mins	21/11//2017 00:12	ST1	58.7	81.1	35.0	51.8	38.0
	15 Mins	20/11//2017 23:26	ST2	49.0	64.6	40.7	51.8	43.5
	15 Mins	20/11//2017 23:48	ST3	40.3	57.7	33.9	42.9	36.8
	15 Mins	20/11//2017 23:04	ST4	51.3	63.7	42.9	54.4	46.0

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 verified daytime $L_{Aeq,16\text{hours}}$ and night-time $L_{Aeq,8\text{hours}}$, 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 $L_{Aeq,16\text{hr}}$	Low to Medium
	Low to Medium
Night-time $L_{Aeq,8\text{hr}}$	Medium to High
	Medium to High

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

On the basis of the above, the Stage 1 risk assessment shows that the acoustic challenges within the site range from low to high risk. Therefore, a good acoustic design process will be required to be followed.

5.2 Good Acoustic Design Process

Mitigating against noise from the M1 has formed an integral part of the design process from the early masterplanning stages. This exercise established that the most appropriate and beneficial form of mitigation is the positioning of the 1st row of buildings facing the M1 to act as a barrier to rear gardens and properties further into the site as far as practicable. The positioning of the buildings also allows for a stand-off from the eastern site boundary to be incorporated to accommodate internal access roads and a landscape strip. 2.1m barriers (close boarded fences or walls around garden boundaries) are also included within the scheme design to provide localised screening around proposed gardens most exposed to the M1.

Barriers are in the form of close boarded fences which are of solid construction and no air gaps and a minimum mass of 10kg/m^2 are proposed around garden boundaries most exposed to noise from the M1. A barrier location plan is presented in SK07 with the barriers included within the assessments presented in Sections 5.3 and 5.4.

5.3 External Amenity Assessment

Table 5.2 presents predicted noise levels within selected gardens. The receptor locations are presented in SK02b and a daytime noise contour plot is presented in SK05.

**Table 5.2 Garden Noise Levels $L_{Aeq,16hours}$**

Ref	External L_{Aeq}	SOAEL L_{Aeq}	Within SOAEL
G1	57.1	60	Yes
G2	49.2	60	Yes
G3	52.7	60	Yes
G4	48.7	60	Yes
G5	52.4	60	Yes
G6	51.6	60	Yes
G7	52.3	60	Yes
G8	57.0	60	Yes
G9	54.1	60	Yes
G10	51.8	60	Yes
G11	48.4	60	Yes
G12	50.4	60	Yes
G13	51.6	60	Yes

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

As can be seen in Table 5.2 noise levels are predicted to be generally below 55 dB $L_{Aeq,16hours}$ in the majority of gardens with a small number of gardens which are most exposed to noise from the M1 in the northern and southern parts of the site slightly above 55 dB $L_{Aeq,16hours}$. Noise levels in all gardens are predicted to be below the SOAEL in all gardens.

5.4 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. With windows closed, based on BS 8233 detailed noise intrusion calculations on the assumption of standard double glazing (4mm/16mm/6mm) and standard trickle vents (32 dB $D_{n,e,w}$), attenuation provided by the building facade of 29 dB for living rooms and 27 dB for bedrooms has been considered. Varying configurations of room size and facade construction would result in increased levels of attenuation. The predicted noise levels at the assessed receptors locations (as presented in SK02a) are presented in Tables 5.3 and 5.4. The daytime and night-time L_{Aeq} noise contour plots are presented in SK05 and SK06 respectively. Following a review of the long-term noise data, by addressing the L_{Aeq} in bedrooms, the required glazing and ventilation specification is sufficient to address the majority of peak (L_{Amax}) noise levels from road traffic noise.

Table 5.3 Daytime Noise Intrusion Levels $L_{Aeq,16hr}$

Ref	External $L_{Aeq,16hr}$ Daytime	Internal $L_{Aeq,16hr}$ Daytime (Windows Open)	Internal $L_{Aeq,16hr}$ Daytime (Windows Closed)	BS 8233 Target Criteria L_{Aeq}	Below SOAEL	Mitigation Required
R1	46.9	31.9	17.9	35	Yes	No
R2	64.2	49.2	35.2	35	No (Windows Open)	Yes (see below and SK08)
R3	65.7	50.7	36.7	35	No	Yes (see below and SK08)
R4	47.4	32.4	18.4	35	Yes	No
R5	65.7	50.7	36.7	35	No	Yes (see below and SK08)
R6	46.9	31.9	17.9	35	Yes	No
R7	66.1	51.1	37.1	35	No	Yes (see below and SK08)
R8	64.6	49.6	35.6	35	No	Yes (see below and SK08)
R9	47.5	32.5	18.5	35	Yes	No
R10	64.0	49.0	35.0	35	No (Windows Open)	Yes (see below and SK08)
R11	61.0	46.0	32.0	35	No (Windows Open)	Yes (see below and SK08)
R12	47.8	32.8	18.8	35	Yes	No
R13	56.7	41.7	27.7	35	No (Windows Open)	Yes (see below and SK08)
R14	51.8	36.8	22.8	35	No (Windows Open)	Yes (see below and SK08)
R15	51.3	36.3	22.3	35	No (Windows Open)	Yes (see below and SK08)
R16	57.0	42.0	28.0	35	No (Windows Open)	Yes (see below and SK08)

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

Table 5.4 Night-time Noise Intrusion Levels $L_{Aeq,8hr}$

Ref	External $L_{Aeq,8hr}$ Night-time	Internal $L_{Aeq,8hr}$ Night-time (Windows Open)	Internal $L_{Aeq,8hr}$ Night-time (Windows Closed)	BS 8233 Target Criteria L_{Aeq}	Below SOAEL	Mitigation Required
R1	43.3	28.3	16.3	30	Yes	No
R2	60.8	45.8	33.8	30	No	Yes (see below and SK09)
R3	62.0	47.0	35.0	30	No	Yes (see below and SK09)
R4	44.1	29.1	17.1	30	Yes	No
R5	61.9	46.9	34.9	30	No	Yes (see below and SK09)
R6	43.4	28.4	16.4	30	Yes	No
R7	62.4	47.4	35.4	30	No	Yes (see below and SK09)
R8	60.9	45.9	33.9	30	No	Yes (see below and SK09)
R9	44.4	29.4	17.4	30	Yes	No
R10	60.3	45.3	33.3	30	No	Yes (see below and SK09)
R11	58.0	43.0	31.0	30	No	Yes (see below and SK09)
R12	44.7	29.7	17.7	30	Yes	No
R13	53.7	38.7	26.7	30	No (Windows Open)	Yes (see below and SK09)

Ref	External $L_{Aeq,8hr}$ Night-time	Internal $L_{Aeq,8hr}$ Night-time (Windows Open)	Internal $L_{Aeq,8hr}$ Night-time (Windows Closed)	BS 8233 Target Criteria L_{Aeq}	Below SOAEL	Mitigation Required
R14	48.2	33.2	21.2	30	No (Windows Open)	Yes (see below and SK09)
R15	47.6	32.6	20.6	30	No (Windows Open)	Yes (see below and SK09)
R16	52.6	37.6	25.6	30	No (Windows Open)	Yes (see below and SK09)

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

As shown in the tables above, with windows closed, standard double glazing with standard trickle vents will generally result in the $L_{Aeq,T}$ internal target noise level criteria being met throughout the majority of the site.

With windows open, internal noise levels within parts of the site most exposed to traffic noise are predicted to exceed the target criteria. Therefore, alternative means of ventilation will be required for some habitable rooms within the site. Alternative ventilation can be provided in several ways from acoustic trickle vents (which should to have a comparable acoustic performance as the glazing), other passive ventilation systems or mechanical ventilation systems.

Where an enhanced specification is required, standard double glazing (4mm/16mm/6mm) and acoustic trickle vents (44 dB $D_{n,e,w}$) will result in attenuation provided by the building façade of 35 dB for living rooms and 32 dB for bedrooms. The locations where noise mitigation is required to the glazed unit to habitable rooms is presented in SK08 and SK09 in Appendix B.

5.5 Assessment of Other Related Issues

The assessment presented above is considered to demonstrate that the site can be developed where significant noise effects will be avoided with appropriate noise design measures.

No existing businesses wanting to develop would be restricted by the proposals.

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 development is assessed as falling into Zones 2 - 4 and of low tranquillity value. There are no public rights of way within or adjacent to the site, with the nearest public right of way being approximately 300m west of the site. As the proposed development, will not disrupt current public rights of way the development is considered to have a negligible effect on local access to areas of greater tranquillity. In addition, the proposal provides additional access to wooded areas to the west which will be further shielded from traffic noise by the development.



It is considered that the assessment demonstrates that the proposed development is compliant with relevant national planning policy and the principles of the ProPG.

5.6 Acoustic Design Statement

- Noise surveys have been undertaken and used to inform the masterplanning process. Road traffic noise is the dominant noise source at the site. Noise models have been verified based on the measured noise levels and established the level of noise intrusion across the site. The noise modelling has established that acoustic challenges at the site are of low to high risk.
- Mitigating against noise from the M1 has formed an integral part of the design process from the early masterplanning stages. This exercise established that the most appropriate and beneficial form of mitigation is the positioning of the 1st tier of buildings to the M1 to act as a barrier to rear gardens and properties further into the site as far as practicable.
- The positioning of the buildings also allows for a stand-off from the eastern site boundary to be incorporated to accommodate internal access roads and a landscape strip. Further localised screening is provided within the site around garden boundaries. With these measures, significant noise effects are predicted to be avoided within private external amenity areas.
- A glazing and ventilation strategy has been recommended to meet the relevant BS 8233 criteria in proposed internal habitable spaces.
- No existing business will have unreasonable restrictions put on them as a result of the proposed development whilst the site is not prized for its recreational or amenity value.



6.0 Conclusions

This report presents the findings of a noise assessment to support a planning application for a proposed residential development on land off Keresforth Road, Dodworth, Barnsley. The assessment has been assessed against the four test points within paragraph 123 of the NPPF with the findings outlined below. Reference has been given to relevant guidance documents, including the Planning Practice Guidance: Noise, BS 8233 and the ProPG – Planning and Noise with the assessment demonstrating the suitability of the site for residential development.

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 appropriate mitigation which is referenced below.

A glazing and ventilation strategy has been provided which achieves both ventilation and internal ambient noise level requirements of $L_{Aeq \text{ daytime}}$ of 35 dB and $L_{Aeq \text{ night-time}}$ of 30 dB in all residential living spaces and bedrooms of the proposed development. Standard double glazing (e.g. 4mm/16mm/6mm) will be acceptable throughout the site with alternative ventilation required for living rooms and bedrooms most exposed to traffic noise. As a good acoustic design measure, barriers in the form of close boarded fences are recommended along garden boundaries most exposed to traffic noise.

NPPF 123 C & D

No existing businesses wanting to develop would be restricted by the proposals. An assessment of the existing tranquillity level of the site undertaken and identified that the site is not highly prized for its tranquillity and recreational value in terms of noise. The proposed development is considered to have a negligible effect on local access to any areas of tranquillity.

Planning Practice Guidance: Noise / ProPG – Planning and Noise

The noise mitigation in Section 5 of this report is sufficient to reduce the effects of identified sources of noise being currently emitted from the surrounding environment to prevent the adopted thresholds (within the context of BS 8233) of where the Significant Observed Adverse Effect Level (SOAEL) would be exceeded for future residents.

An Acoustic Design Statement is presented in Section 5.6 and it is considered that the assessment demonstrates that the proposed development is compliant with relevant national planning policy and the principles of the ProPG.



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

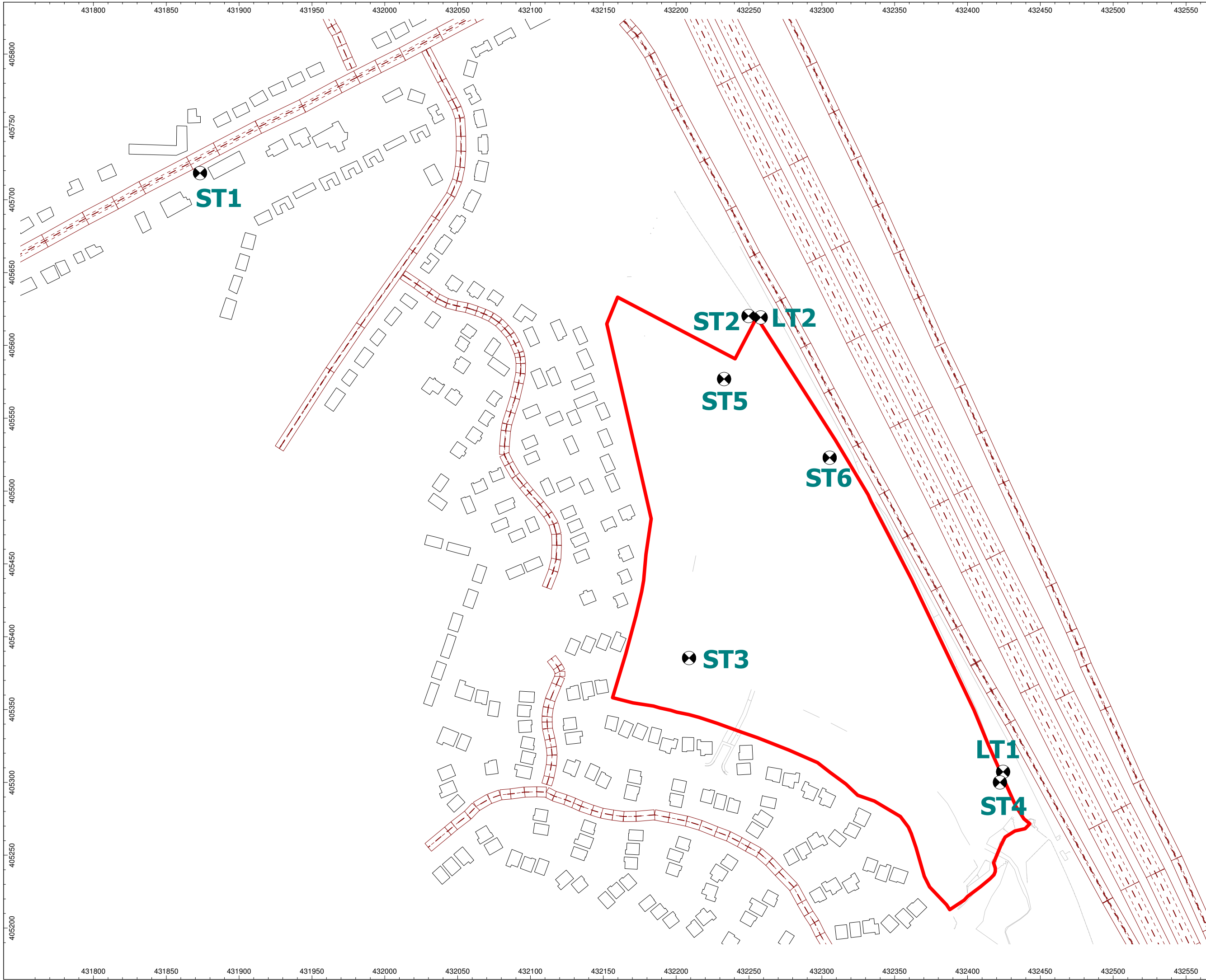
PPG24 – Planning Policy Guidance

WYGE – WYG Environment



Appendix B – Sketches

- SK01 Noise Monitoring Location Plan
- SK02a Proposed Receptor Location Plan (Facades)
- SK02b Proposed Receptor Location Plan (Gardens)
- SK03 ProPG Stage 1 Proposed Daytime $L_{Aeq,16hr}$ Noise Contour Plot
- SK04 ProPG Stage 1 Proposed Night-time $L_{Aeq,8hr}$ Noise Contour Plot
- SK05 Noise Contour Plot Proposed Daytime $L_{Aeq,16hr}$
- SK06 Noise Contour Plot Proposed Night-time $L_{Aeq,8hr}$
- SK07 Indicative Barrier Location Plan
- SK08 Noise Mitigation Plan – Daytime
- SK09 Noise Mitigation Plan – Night-time



Client:
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Project Number:
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Drawing Title / Scenario:
**Noise Monitoring
Location Plan**

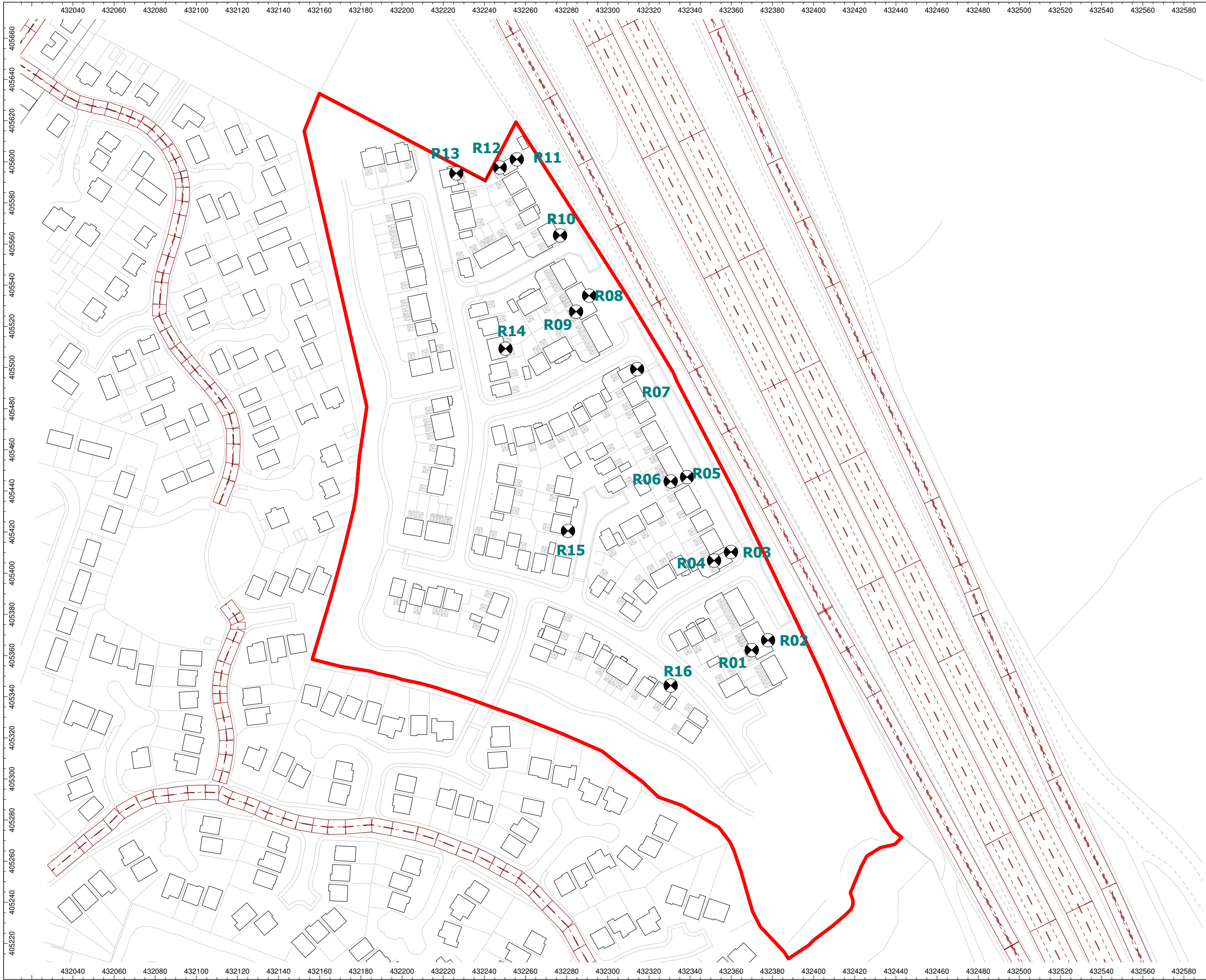
Drawing Number:
SK01

Key:

Noise
Monitoring
Locations: 

Site Boundary: 

Scale : Not to scale



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Drawing Title / Scenario:
**Receptor
Location Plan
(Facades)**

Drawing Number:
SK02a

Key:

Receptor
Locations: 

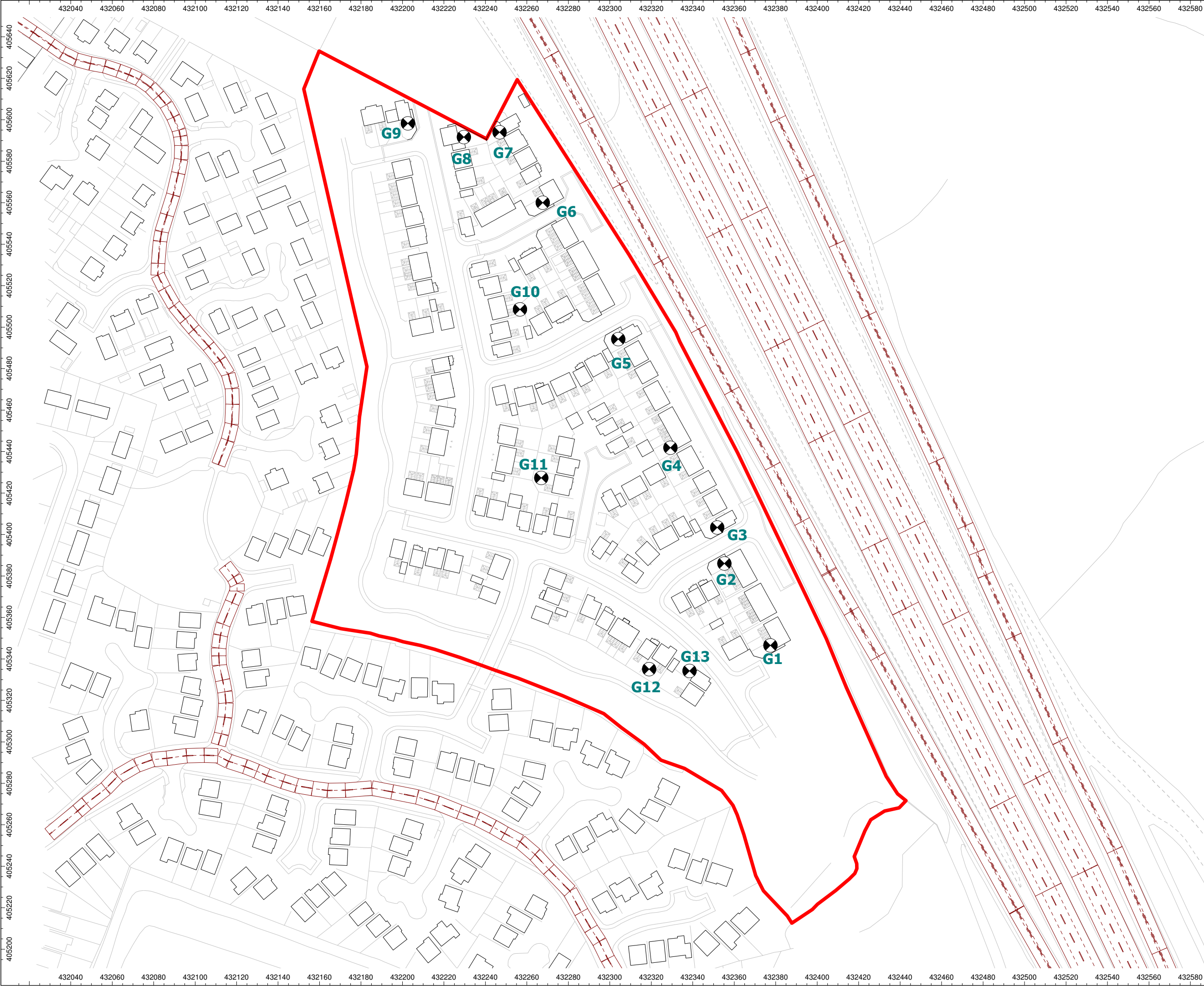
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Drawing Title / Scenario:
Receptor
Location Plan
(Gardens)

Drawing Number:
SK02b

Key:

Receptor
Locations:

Site Boundary:

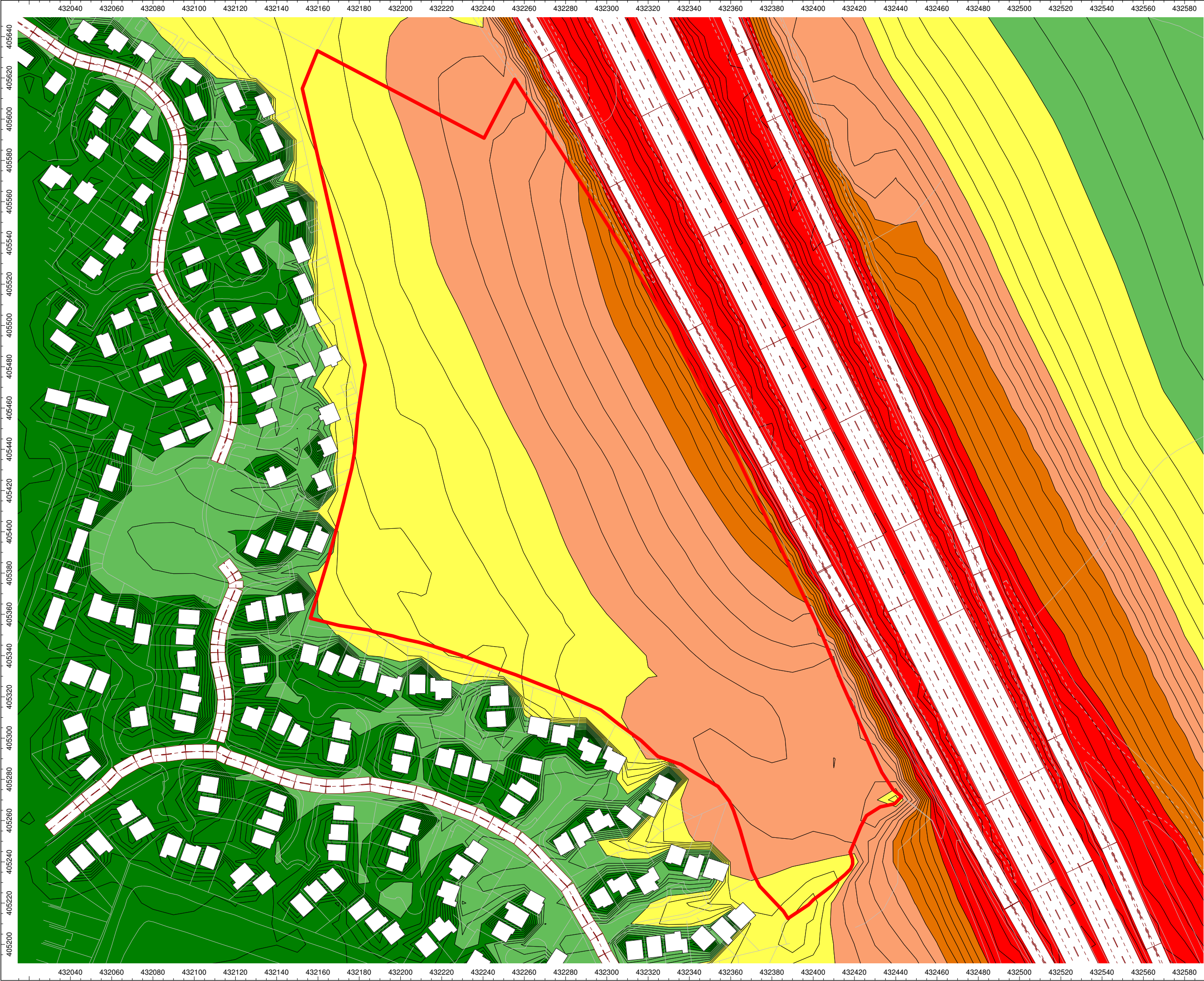
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Drawing Title / Scenario:
**ProPG Stage 1
Daytime LAeq,16hour
Noise Contour Plot**

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.

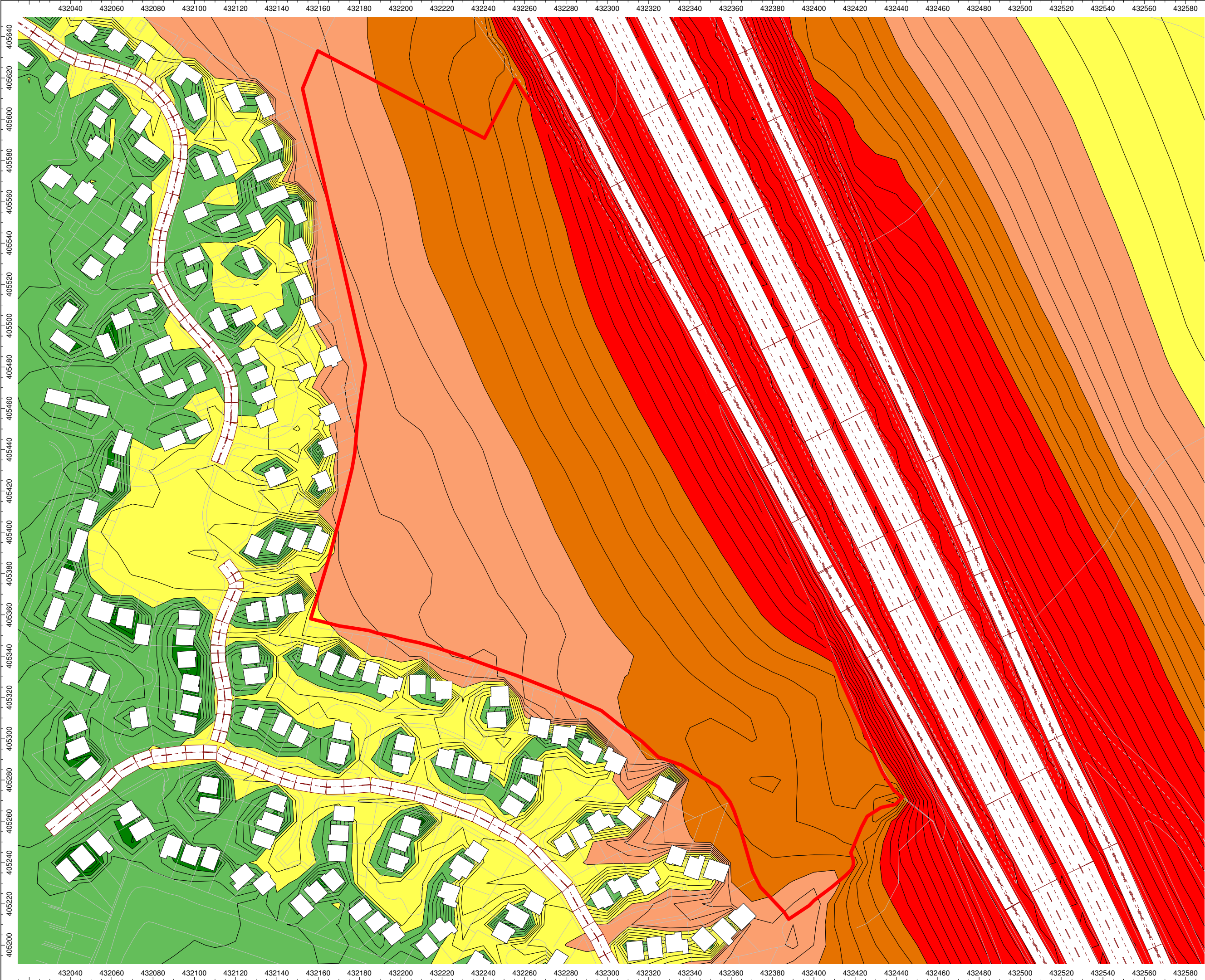
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Drawing Title / Scenario:
ProPG Stage 1
Night-time LAeq,8hour
Noise Contour Plot

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.

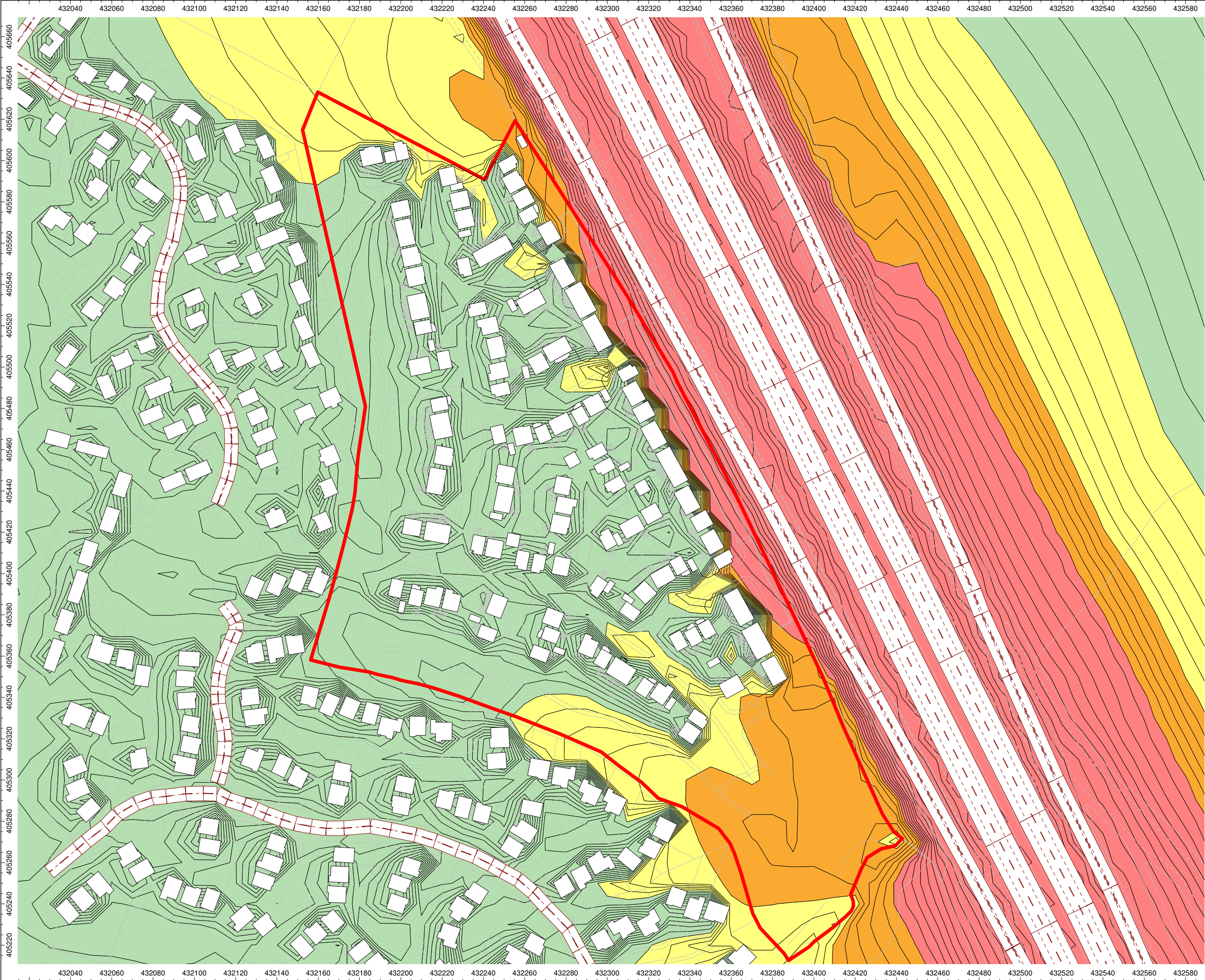
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Drawing Title / Scenario:
**Daytime LAeq,16hour
Noise Contour Plot**

Drawing Number:
SK05

- Key:
- Site Boundary: 
-  <55 dB(A)
 -  55 - 60 dB(A)
 -  60 - 65 dB(A)
 -  >65 dB(A)

Contour plot for indicative
purposes only.

Contour Plot at 1.5m Height

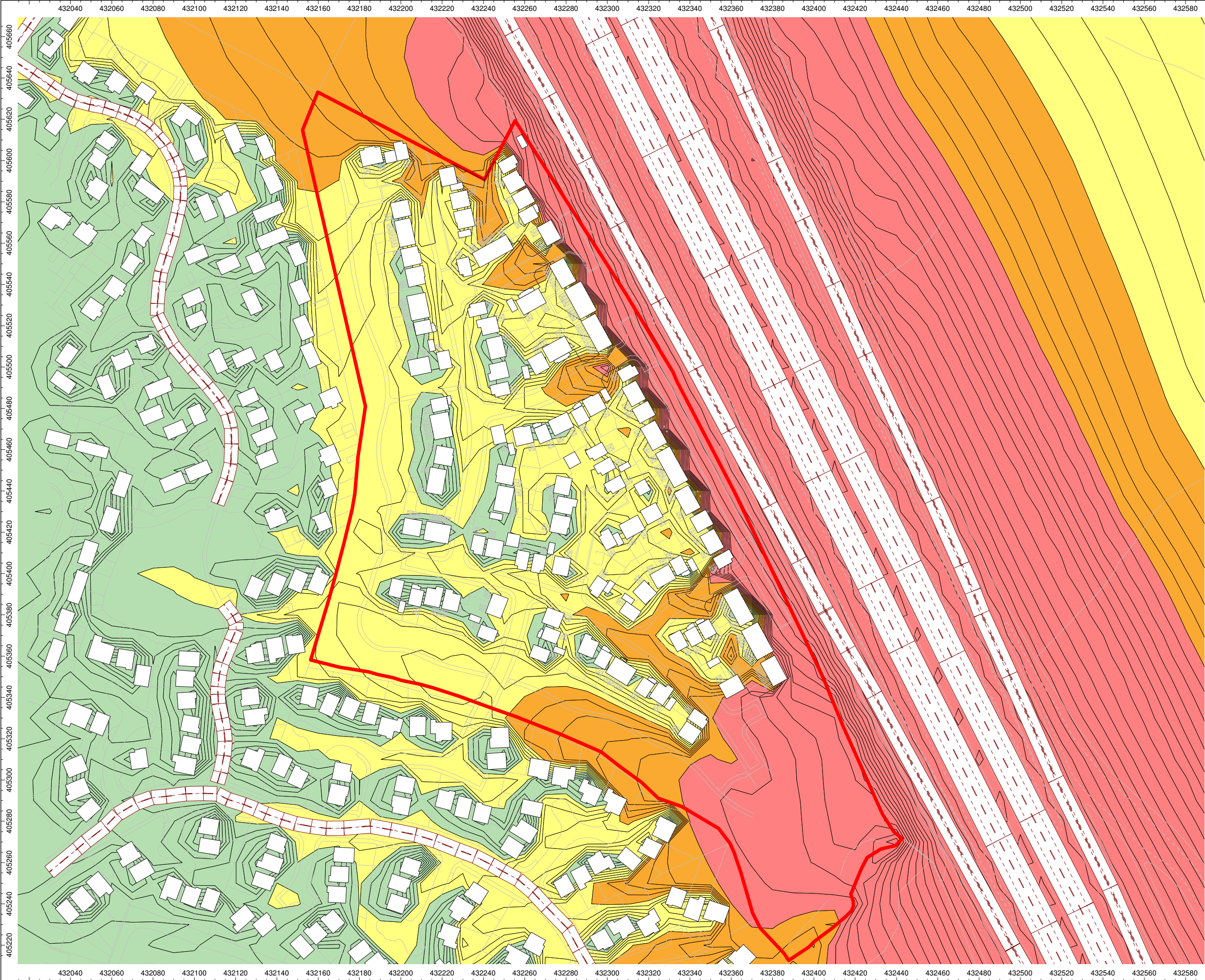
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Drawing Title / Scenario:
**Night-time LAeq,8hour
Noise Contour Plot**

Drawing Number:
SK06

- Key:
- Site Boundary: —
- <45 dB(A)
 - 45 - 50 dB(A)
 - 50 - 55 dB (A)
 - >55.0 dB(A)

Contour plot for indicative
purposes only.

Contour Plot at 4.0m Height

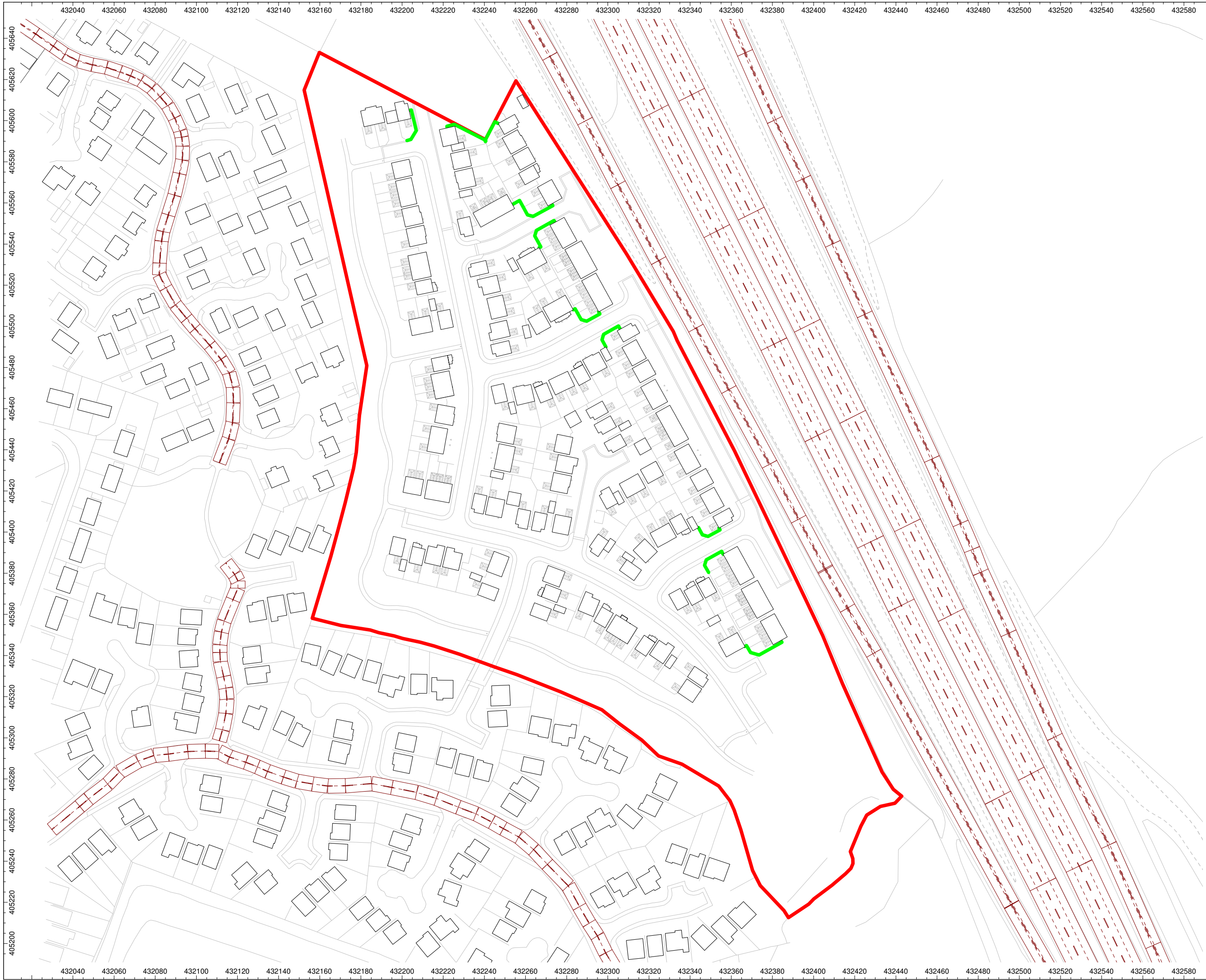
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Drawing Title / Scenario:
**Proposed Barrier
Location Plan**

Drawing Number:
SK07

Key:
2.1m High Barrier: —

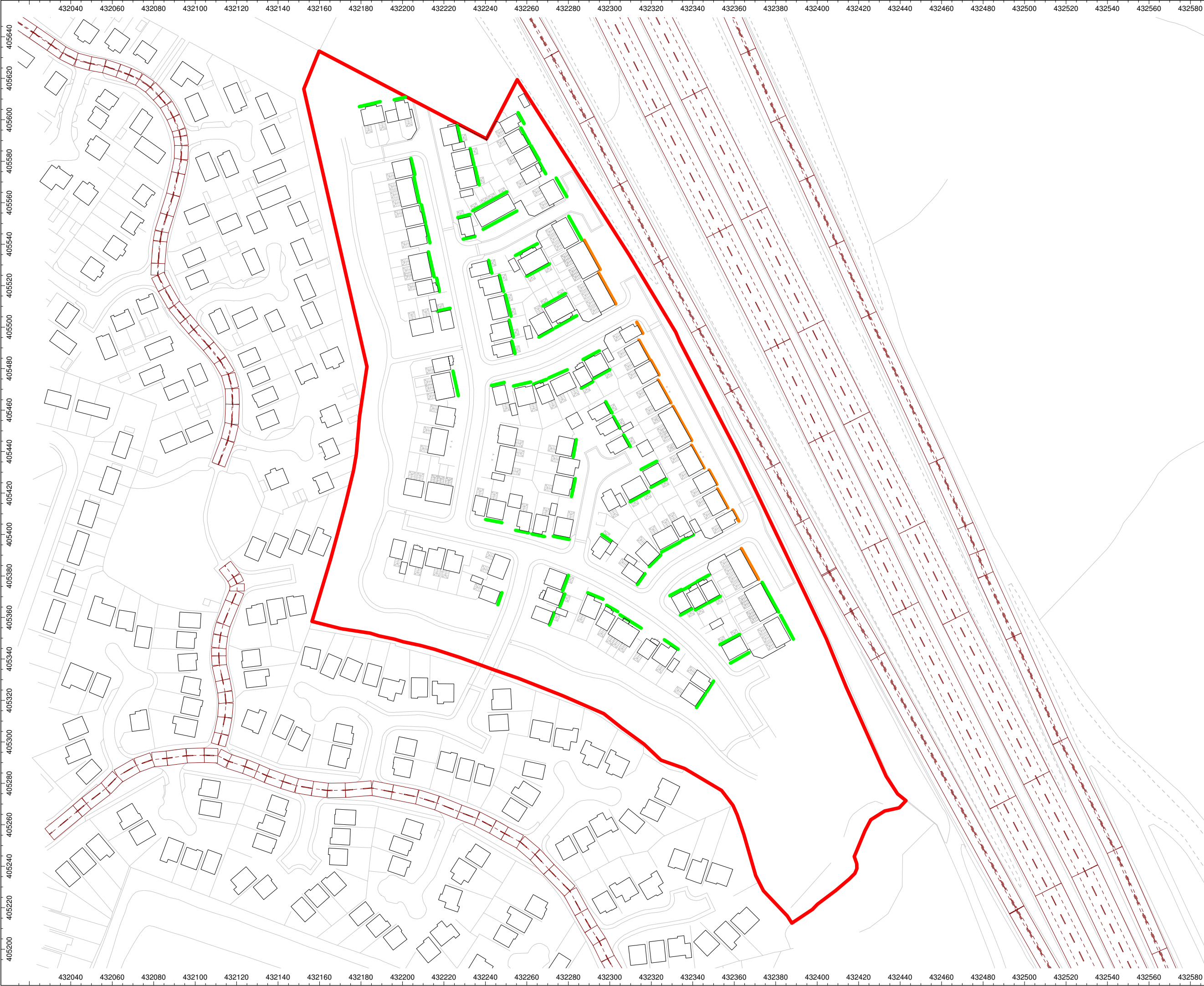
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Drawing Title / Scenario:
**Required Mitigation
Strategy - Living Rooms**

Drawing Number:
SK08

- Key:
- Site Boundary: —
 - Standard Glazing & Standard Trickle Vents: —
 - Standard Glazing & Acoustic Trickle Vents: —

Example specifications:

Acoustic Trickle Vent:
Dn,e,w 44dB

Standard Trickle Vent:
Dn,e,w 32dB

Standard Double Glazing:
4/16/6 29 dB Rtr

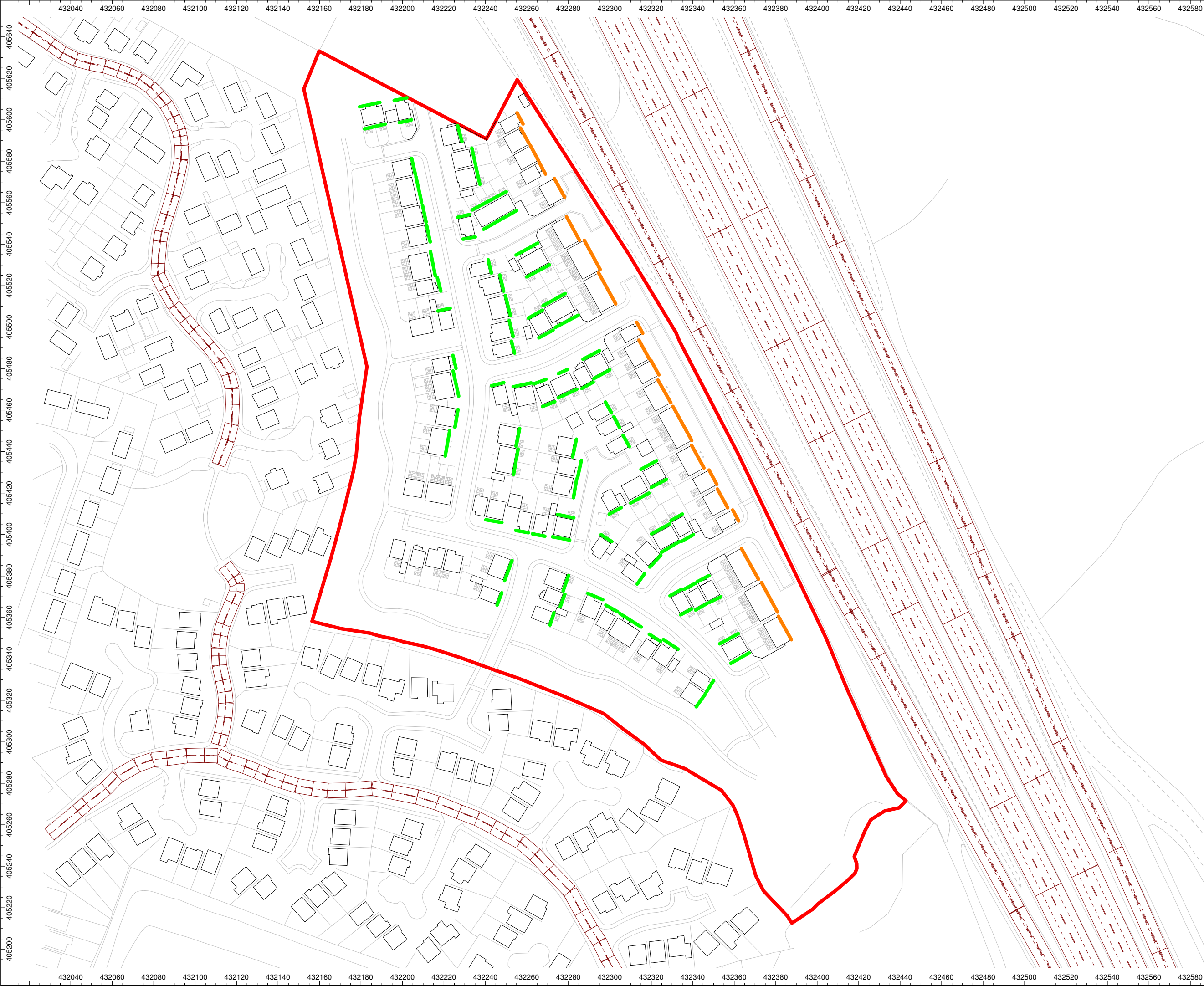
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Drawing Title / Scenario:
**Required Mitigation
Strategy - Bedrooms**

Drawing Number:
SK09

Key:

Site Boundary: —

Standard Glazing &
Standard Trickle Vents: —

Standard Glazing &
Acoustic Trickle Vents: —

Example specifications:

Acoustic Trickle Vent:
Dn,e,w 44dB

Standard Trickle Vent:
Dn,e,w 32dB

Standard Double Glazing:
4/16/6 29 dB Rtr

Scale : Not to scale

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