Bloor Homes and Sandleford Farm Partnership

Proposed Mixed-Use Development

Land at Sandleford Park, Newbury

Noise Assessment

January 2020

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2	15th March 2018	Updated Traffic Assessment and Minor Updates
3	06th September 2019	Updated Traffic Assessment and Planning Guidance
4	13th September 2019	Updated Layout and Minor Amendments
5	17th December 2019	Updated Traffic Assessment
6	14th January 2020	Minor Amendments

Contents Page

Appendix Contents

1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment for a proposed mixed-use development on land at Sandleford Park, Newbury; this version of the report includes updates to traffic flows, traffic assessment and planning policy and guidance.

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 existing noise levels within the surrounding area have been verified and 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)

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 on 19th February 2019. With regard to noise and planning, NPPF contains the following statement at paragraph 170:

"170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

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

A further 2 short statements are presented at paragraph 180, which state:

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

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

b. *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

Furthermore, paragraphs 182 and 183 state:

> *"182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.*
>
> *183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."*

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

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

Table 1.1 Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No Specific Measures Required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect (NOEL)	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
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 (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The NPPF, NPSE and 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.

2.0 Assessment Criteria

2.1 Internal Noise Assessment Criteria

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

BS 8233:2014 *'Guidance on sound insulation and noise reduction for buildings – Code of practice'*

Tables 3.54a &b of LA 111 published in November 2019 (Design Manual for Roads and Bridges)

BS 5228-1: 2009 + A1:2014 '*Code of Practice for Noise and vibration control on construction and open sites'*

BS 4142:2014 + A1:2019 *'Methods for rating and assessing industrial and commercial sound'*

Table 2.1 Noise Level Criteria and Actions (Noise affecting Proposed Residents)

Noise Level Criteria	Effect Level	Action / Justification
Bedrooms – 30 $dBL_{Aeq,8hours}$ / 45 dBL_{Amax} Living Rooms – 30 $dBL_{Aeq,16hours}$ External Amenity Space – 50 $dBL_{Aeq,16hours}$	No Observed Adverse Effect Level	None Within BS8233 / WHO criteria
Noise levels exceed: Bedrooms – 30 $dBL_{Aeq,8hours}$ / 45 dBL_{Amax} Living Rooms – 35 $dBL_{Aeq,16hours}$ External Amenity Space – 55 $dBL_{Aeq,16hours}$	Lowest Observed Adverse Effect Level	Mitigate to achieve: *Bedrooms – 30 $dBL_{Aeq,8hours}$ / 45 dBL_{Amax}* *Living Rooms – 35 $dBL_{Aeq,16hours}$* *External Amenity Space – 55 $dBL_{Aeq,16hours}$* Within BS8233 / WHO criteria
Noise levels exceed: Bedrooms – 30 $dBL_{Aeq,8hours}$ Living Rooms – 35 $dBL_{Aeq,16hours}$ External Amenity Space – 55 $dBL_{Aeq,16hours}$	Significant Observed Adverse Effect	Avoid However, if due to other design considerations noise criteria is not achievable or that the target criteria can be achieved for certain periods (e.g. when windows are closed), the following noise levels may be acceptable as an upper limit: Bedrooms – 35 $dBL_{Aeq,8hours}$ Living Rooms – 40 $dBL_{Aeq,16hours}$ External Amenity Space – 60 $dBL_{Aeq,16hours}$ This is on the basis that the guideline noise values do not represent people's response to noise in all cases with the specified criteria only a marginal exceedance of the target criteria.
Noise levels with mitigation exceed: Bedrooms – 35 $dBL_{Aeq,8hours}$ Living Rooms – 40 $dBL_{Aeq,16hours}$ External Amenity Space – 60 $dBL_{Aeq,16hours}$	Unacceptable Observed Adverse Effect	Prevent

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

Effect Level	Assessment	Noise Level Criteria
No Observed Adverse Effect Level Negligible	Change in Traffic Noise Levels	Short Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 0.1 dB –0.9 dB Long Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 0 dB and < 3 dB
Lowest Observed Adverse Effect Level Slight	Change in Traffic Noise Levels	Short Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 1.0 dB – 2.9 dB Long Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 3 dB and < 5 dB
Significant Observed Adverse Effect Moderate	Change in Traffic Noise Levels	Short Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 3 dB – 4.9dB Long Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 5 dB and < 10 dB
Unacceptable Observed Adverse Effect Significant	Change in Traffic Noise Levels	Short Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 5 dB Long Term Change in Noise Levels $L_{A10\ 18hr}$ ≥ 10 dB

Table 2.3 Noise Level Criteria and Actions (Construction Noise Assessment)

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	Construction Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are 10dB below the relevant threshold values **Fixed Limits** In rural areas noise levels exceed 50dB In urban areas noise levels exceed 55dB	No Action Required Complaints Relating To Plant Noise Unlikely
Lowest Observed Adverse Effect Level	Construction Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are equal/ below the relevant threshold values **Fixed Limits** In rural areas noise levels exceed 60dB In urban areas noise levels exceed 65dB	Mitigate to achieve site noise levels below relevant category threshold Values correspond to ABC Method of significance Effect at Dwellings Annex E.3.2 of BS 5228.
Significant Observed Adverse Effect	Construction Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are higher than the relevant threshold values *Or* Construction activities cause noise levels to increase by more than 3dB (where ambient noise levels exceed threshold Values) **Fixed Limits** In rural areas noise levels exceed 70dB In urban areas noise levels exceed 75dB)	Mitigate to achieve site noise levels below relevant category threshold Values correspond to ABC Method of significance Effect at Dwellings Annex E.3.2 of BS 5228.
Unacceptable Observed Adverse Effect	Construction Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are higher than the relevant threshold values *Or* Construction activities cause noise levels to increase by more than 10dB (where ambient noise levels exceed threshold Values) **Fixed Limits** In rural areas noise levels exceed 80dB In urban areas noise levels exceed 85dB	Mitigate to achieve site noise levels below relevant category threshold Values correspond to ABC Method of significance Effect at Dwellings Annex E.3.2 of BS 5228.

Table 2.4 Noise Level Criteria and Actions (Building Services Plant Assessment)

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	Building Services Plant	BS4142 Score of minus 10 or lower	No Action Required Complaints Relating To Plant Noise Unlikely
Lowest Observed Adverse Effect Level	Building Services Plant	BS4142 Score of minus 5 or higher	Mitigate to achieve: BS4142 Score of -5 or lower
Significant Observed Adverse Effect	Building Services Plant	BS4142 Score of plus 5 or higher	Mitigate to achieve: BS4142 Score of zero or lower
Unacceptable Observed Adverse Effect	Building Services Plant	BS4142 Score of plus 10 or higher	Mitigate to achieve: BS4142 Score of zero or lower

2.2 Noise Insulation Regulations

The 1975 Noise Insulation Regulations and subsequent amendment Regulations [noise insulation (amendment) regulations 1988] provide criteria for assessing the eligibility for noise mitigation or properties based on variations in traffic noise due to a new or improved road scheme. Noise level criteria are given within the Regulations which, if satisfied, indicate whether properties in the vicinity may be entitled to the installation of additional noise insulation or to a grant to cover the cost of the noise insulation.

The entitlement conditions of the Noise Insulation Regulations are triggered when:

i. 'the $L_{A10\ (18\ hour)}$ predicted figure is greater by at least 1 dB than the prevailing noise level'

ii. 'the $L_{A10\ (18\ hour)}$ predicted figure is not less than the specified level ($L_{A10\ (18\ hour)}$ = 68 dB)'

iii. 'the noise caused, or expected to be caused, by traffic using or expected to use the new highway makes an effective contribution to the $L_{A10\ (18\ hour)}$ predicted figure of at least 1 dB'

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 Input Data

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	Ordnance Survey	Ordnance Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 1:10,000 spot heights.
Traffic data, main surrounding roads	Vectos	Provided by Vectos
Traffic data – local roads	Vectos	Provided by Vectos
Building heights – around site	WYGE Observations	8 m height for two storey residential properties, and 4 m for Bungalows
Barrier heights	WYGE Observations	All existing barriers at 1.8 m with the exception of hedges and trees which are assumed to offer no noise protection.
Receptor positions	WYGE	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor 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.
Reflections	WYGE	First order reflections have been applied based on mirror image sources
Absorbent Ground	CADNA	Frequency dependant ground absorption has been applied based on values specified in VDI 2714/16 clause 6.3.
Façade Correction	CADNA	Façade corrections have been incorporated into the modelling
Master Plan	Bloor Homes	Drawing number SOxxx-SL-301 (Illustrative Masterplan – July 2018)

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 (Existing Ambient Noise Climate)

All roads expected to make a significant contribution, have been included within this assessment. Noise emissions from existing traffic flows have been provided by Vectos, in Section 3.2.9.

3.2.2 Model Input Data –Construction Phase

Information regarding noise emissions from equipment used during the construction phase has been been obtained from Annex C of BS 5228-1:2009 + A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. This annex presents a range of current sound level data on typical site equipment and common site activities.

This data is obtained by field measurements for items of plant in actual use on construction and open sites in the UK. Levels quoted in the database are based on an average (logarithmic) of measured sound levels, and where appropriate have been derived from more than one model of similarly sized plant. The results are presented as un-weighted octave band activity L_{eq} levels, and overall A-weighted activity L_{eq} levels in dB. All sound pressure levels are standardized to 10 metres from the plant.

The items of plant and associated noise levels shown in the tables below have been used for the purposes of this assessment and consider the range of typical activities likely to be employed during the construction phase of the proposed development. Items of mobile plant have been positioned in the areas on the development site that are close to both existing and proposed residential dwellings.

Table 3.2 Mobile Plant Construction Phase

Mobile Plant	BS 5228-1:2009 Annex C Ref.	Octave Band Sound Pressure Levels (Hz)								Model Input L_{Aeq} at 10 m
		63	125	250	500	1K	2K	4K	8K	
Wheeled Loader x1	Table C.2 No.26	87	82	77	78	73	70	64	57	79 dB
Articulated Dump truck x2	Table C.2 No.33	85	87	77	75	76	73	69	62	81 dB
Tracked Excavator x1	Table C.2 No.19	95	84	79	73	70	68	64	57	77 dB
Road Roller x1	Table C.5 No.19	87	85	75	73	75	73	69	63	80 dB

3.2.3 Building Services Plant Noise Data (School)

Point sources have been defined in the model to represent potential roof mounted plant associated with the new employment area. The maximum sound pressure levels of the point sources at 3 and 10 metres were calculated using the model as a conditional maximum level that the noise levels at nearby receptors were predicted to meet the BS 4142 assessment criteria. Noise emission limits have been specified to ensure that plant noise rating levels (including a + 6 dB acoustic feature correction) are at least 5 dB below existing daytime and night-time background noise levels.

3.2.4 Delivery Vehicle Arriving/Exiting along service yard access road

The following calculations have been used to represent this as a line source in the model based on 30 deliveries in an hour.

- *Daytime $L_{Aeq,1hr}$ Noise Level (30 Deliveries)*

  1 x 10 seconds L_p = 68.2 dB at 3 m distance (vehicle arriving and leaving)

  $L_{Aeq(60\ mins)}$ = 10log(30/3600)(10 sec x $10^{0.1x79.0\ dB}$)

  = 48.2dB at 3 m distance

- *Daytime $L_{Aeq,1hr}$ Noise Level (1 Delivery)*

3.2.5 Newbury College Car Park Noise

An area source has been used to represent the noise levels associated with car parking from the adjacent Newbury College, the use of the car park generating a noise level of 55.0 dB in the centre of the area.

3.2.6 Recycling Noise - Combined Depositing Noise Data (HWRC)

The following calculations from the Newbury Household Waste Recycling Centre south east of the site are based on worst case measurements of the glass repository at a recycling facility in use at a similar site and the levels obtained below have been used in the model to represent its use. The calculations below are based on a maximum of 10 recycling events per hour, each event lasting 5 minutes and consisting of a vehicle approaching the recycling facility (1 min) followed by the tipping of bottles into the metal repository (3 mins) and then the vehicle departing (1 min). General noise such as glass bottles being carried to the container and vehicle doors opening/closing are also represented in the monitoring data. This is modelled as a point source.

- *L_{Aeq} Noise Level* – light vehicles

  10 × 1 minutes at L_p 44.7 dB at 3 m distance (vehicle arriving and manoeuvring)
  10 × 3 minutes at L_p 69.7 dB at 3 m distance (vehicle idling and bottle smashing)
  10 × 1 minutes at L_p 44.7 dB at 3 m distance (vehicle manoeuvring and leaving)

  $L_{Aeq(60\ mins)}$ = 10log(1/60)(20 min x $10^{0.1x44.7dB}$+30 min x $10^{0.1x69.7dB}$)

  = 66.7 dB at 3 m distance

- *L_{Amax} Noise levels* – light vehicles

  L_{Amax} used is as 88.3 dB at 3 m distance

3.2.7 Noise Breakout from the Rugby Ground, Leisure Centre, Proposed Public House, Newbury College and Park House School

In order to assess a worst case scenario within the model a noise breakout level of 70 dB @ 3m from the façade in order to represent noise from a proposed loud noise event such a school disco has been used within the daytime noise intrusion model.

3.2.8 Model Verification

The model was verified by modelling the monitoring locations for the 'existing' weekday scenario. Daytime and night-time L_{Aeq} and night-time L_{Amax} scenarios have been verified. The comparison between the monitoring and modelling results (including contributions from local roads) are shown in the tables below. Night-time L_{Amax} noise levels have been verified from observations made during attended short-term measurements.

Table 3.3 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	51.3	50.5	-0.8
LT2	51.5	53.1	1.6
LT3	51.0	53.9	2.9
LT4	66.0	66.0	0.0
LT5	52.2	53.0	0.8
LT6	61.1	61.1	0.0
ST1	77.2	77.6	0.4
ST2	76.5	77.6	1.1
ST3	64.4	67.3	2.9
ST4	50.3	51.1	0.8
ST5	51.0	53.0	2.0

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

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

Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
LT1	42.8	42.2	-0.6
LT2	41.9	44.9	3.0
LT3	47.4	43.3	-4.1
LT4	56.6	57.6	1.0
LT5	43.8	45.1	1.3
LT6	53.0	52.4	-0.6
ST1	70.6	70.1	-0.5
ST2	68.2	70.1	1.9
ST3	58.5	57.6	-0.9
ST4	40.6	42.3	1.7
ST5	37.2	45.5	8.3

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

Table 3.5 Modelled vs. Monitored Results $L_{Amax;\ night\text{-}time\ 23:00–07:00}$

Location	Monitored L_{Amax}	Modelled L_{Amax}	Difference between Monitored and Modelled Results
ST1	88.7	89.4	0.7
ST2	88.5	88.7	0.2
ST3	79.3	78.5	-0.8
ST4	57.2	64.0	6.8
ST5	57.0	67.7	10.7

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

The verification points show a divergence between monitored and modelled results of no more than 3 dB, with the exception of ST5 for the night-time L_{Aeq} scenario and ST4 and ST5 night-time L_{Amax} scenario where the model is predicting a higher noise level than was recorded during a short-term 15 minute measurement, probably due to the low frequency of vehicles using the smaller residential streets on which the measurements were obtained, therefore all models are assumed to be suitably verified.

3.2.9 Road Traffic Data (Development Related Traffic Noise Assessment)

All roads expected to make a significant contribution have been included within this assessment. Traffic flows and HGV percentages have been based on traffic data provided by Vectos. Due to no provision of opening year data, baseline data from the year 2017 has been used. The assessment scenarios are as follows:

- 2017 Baseline = Existing baseline conditions
- 2031 'Do Minimum' = Baseline conditions+ committed development flows
- 2031 'Do Something' = Baseline conditions + committed development flows + proposed development flows (Bloor Homes development traffic flows, three accesses in operation) (DS1)
- 2031 'Do Something' = Baseline conditions + committed development flows + proposed development flows (Entire Allocated Area + Sanfoin traffic flows, all four accesses in operation) (DS2)

Table 3.6 Baseline Data (2017)

Road	18hr AAWT Baseline 2017	HGV %
A339 (North of Retail Park)	24602	4
A339 (South of Pinchington Lane)	26055	4
A343 Andover Road Newbury (West of Newtown Road)	13699	0
Essex Street, Newbury	7207	0
A343 Andover Road Newbury	11236	1
Monks Lane, West of Access	12045	0
Monks Lane, East of Access	12045	0

Road	18hr AAWT Baseline 2017	HGV %
Pinchington Lane Newbury	10143	0
Warren Road*	1206	5
A339, East of Swan Roundabout	20802	4
Western Site Access*	-	-
Eastern Site Access*	-	-

*Traffic data was not provided for these roads, as such data has been taken from the traffic assessment associated with the adjacent Sandleford Park West development for these roads

Table 3.7 Traffic Data (2031)

Road	18hr AAWT Without Development 2031	HGV %	18hr AAWT With Development 2031 (4 Access – DS1)	HGV %	18hr AAWT With Development 2031 (3 Access – DS2)	HGV %
A339 (North of Retail Park)	45753	3	47123	3	46799	3
A339 (South of Pinchington Lane)	28208	3	28419	4	28578	4
A343 Andover Road Newbury (West of Newtown Road)	18491	1	19621	1	19738	1
Essex Street, Newbury	7398	2	7869	2	7287	2
A343 Andover Road Newbury	14783	2	14984	2	15929	1
Monks Lane, West of Access	12782	2	12258	2	12485	2
Monks Lane, East of Access	11480	2	12794	2	8621	3
Pinchington Lane Newbury	11033	2	10617	2	10263	2
Warren Road*	1370	4	4550	3	1370	4
A339, East of Swan Roundabout	26231	3	28931	3	25449	5
Western Site Access*	-	-	2249	0	2249	0
Eastern Site Access*	-	-	718	0	718	0

*Traffic data was not provided for these roads, as such data has been taken from the traffic assessment associated with the adjacent Sandleford Park West development for these roads

3.2.10 Sensitive Receptors

Existing noise levels have been assessed at properties across the site with respect to direct noise from the existing ambient noise climate surrounding the site. The locations of the proposed receptors are shown of SK02a of Appendix B.

Table 3.8 Proposed Residential Receptor Locations

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height (m)
R01	Northwest of the Site	Monks Lane	5	1.5/4.0
R02	Northwest of the Site	Monks Lane	18	1.5/4.0
R03	Northwest of the Site	Monks Lane	15	1.5/4.0
R04	Northwest of the Site	Proposed Western Site Access	25	1.5/4.0

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height (m)
R05	Northwest of the Site	Proposed Western Site Access	12	1.5/4.0
R06	North of the Site	Monks Lane	22	1.5/4.0
R07	North of the Site	Monks Lane	28	1.5/4.0
R08	North of the Site	Proposed Eastern Site Access	17	1.5/4.0
R09	Northeast of the Site	Monks Lane	17	1.5/4.0
R10	Northeast of the Site	Monks Lane	30	1.5/4.0
R11	Northeast of the Site	Proposed Eastern Site Access	98	1.5/4.0
R12	Northeast of the Site	Proposed Eastern Site Access	40	1.5/4.0
R13	Northeast of the Site	Proposed Eastern Site Access	10	1.5/4.0
R14	East of the Site	Proposed Eastern Site Access	17	1.5/4.0
R15	East of the Site	Proposed Eastern Site Access	17	1.5/4.0
R16	Southeast of the Site	Proposed Eastern Site Access	20	1.5/4.0
R17	Southeast of the Site	Proposed Eastern Site Access	10	1.5/4.0
R18	Northwest of the Site	Proposed Western Site Access	10	1.5/4.0
R19	West of the Site	Proposed Western Site Access	33	1.5/4.0
R20	West of the Site	Proposed Western Site Access	11	1.5/4.0
R21	West of the Site	Proposed Western Site Access	71	1.5/4.0
R22	West of the Site	Proposed Eastern Site Access	166	1.5/4.0
R23	Southwest of the Site	Proposed Eastern Site Access	11	1.5/4.0
R24	South of the Site	Proposed Eastern Site Access	320	1.5/4.0
R25	Southwest of the Site	Proposed Eastern Site Access	130	1.5/4.0
R26	Southwest of the Site	Proposed Eastern Site Access	34	1.5/4.0

Predicted traffic noise levels have been assessed at existing residential properties along Andover Road, Monks Lane and the A339. The locations of the proposed receptors are shown on SK02b of Appendix B.

Table 3.9 Existing Traffic Noise Receptor Locations

Ref.	Description	Height (m)
TR01	2, Copperbeech Place	4.0
TR02	260, Andover Road	4.0
TR03	Woodlands, Garden Close Lane	4.0
TR04	2 Gorselands	4.0
TR05	Charlcombe, Kendrick Road	4.0
TR06	214, Andover Road	4.0
TR07	243, Andover Road	4.0
TR08	241, Andover Road	4.0
TR09	2, Sunley Close	4.0
TR10	1, Sunley Close	4.0
TR11	Oakhaven, Warren Road	4.0
TR12	Warren House, Warren Road	4.0
TR13	Park Cottage, Warren Road	4.0
TR14	Enville House, Warren Road	4.0

Ref.	Description	Height (m)
TR15	Meadowside, Warren Road	4.0
TR16	Park House School, Warren Road	4.0
TR17	204, Andover Road	4.0
TR18	194, Andover Road	4.0
TR19	1, Dormer Close	4.0
TR20	150, Andover Road	4.0
TR21	3, Essex Street	4.0
TR22	225, Andover Road	4.0
TR23	15, Monkswood Close	4.0
TR24	136, Andover Road	4.0
TR25	82, Monks Lane	4.0
TR26	75, Monks Lane	4.0
TR27	71, Monks Lane	4.0
TR28	12, Heather Gardens	4.0
TR29	38, Monks Lane	4.0
TR30	25, Monks Lane	4.0
TR31	2, Sandleford Parade	4.0
TR32	Oaklands, Newtown Road	4.0
TR33	Hilton Newbury Centre, Pinchington Lane	4.0
TR34	4, Deadmans Lane	4.0
TR35	Unit 7, Sandleford	4.0
TR36	Lodge, Sandleford Place	4.0
TR37	20, Heather Gardens	4.0
TR38	52, Monks Lane	4.0
TR39	Copse View, Monks Lane	4.0
TR40	30, Monks Lane	4.0
TR41	28, Monks Lane	4.0
TR42	27, Monks Lane	4.0

Table 3.10 Existing Construction Noise Receptor Locations

Ref.	Description	Height (m)
CR1	Park House School	4.0
CR2	Meadowside, Warren Road	4.0
CR3	Park House School	4.0
CR4	Park House School	4.0
CR5	8 Dormer Close	4.0
CR6	10 Dormer Close	4.0
CR7	87 Monks Lane	4.0
CR8	85a Monks Lane	4.0
CR9	82 Monks Lane	4.0
CR10	75 Monks Lane	4.0
CR11	71 Monks Lane	4.0

Ref.	Description	Height (m)
CR12	12 Heather Gardens	4.0
CR13	20 Heather Gardens	4.0
CR14	Copse View, Monks Lane	4.0
CR15	42 Monks Lane	4.0
CR16	38 Monks Lane	4.0
CR17	32 Monks Lane	4.0
CR18	27 Monks Lane	4.0
CR20	23 Monks Lane	4.0
CR21	13 Monks Lane	4.0
CR22	4 Monks Lane	4.0
CR23	Newbury College	4.0
CR24	Public Footpath (GREE/9/1)	1.5

Table 3.11 Proposed Plant Receptor Locations

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height (m)
PL1	Proposed to the north east of the site	Parcel N1 School Plant	74m	4.0
PL2	Proposed to the north east of the site	Parcel N1 School Plant	54m	4.0
PL3	Proposed to the north east of the site	Parcel N1 School Plant	35m	4.0
PL4	Proposed to the north east of the site	Parcel N1 School Plant	48m	4.0
PL5	Proposed to the north east of the site	Parcel N1 School Plant	36m	4.0
PL6	Proposed to the north east of the site	Parcel N1 School Plant	53m	4.0
PL7	Proposed to the north east of the site	Parcel N1 School Plant	78m	4.0
PL8	Proposed to the north east of the site	Parcel N1 School Plant	91m	4.0

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). By reference to these maps the development is assessed as falling into Zones 4-5.

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 (WYG5)	s/n	2180560
B&K 2238	Environmental Noise Analyser (WYG7)	s/n	2622850
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	213441
Rion NL-32	Environmental Noise Analyser (WYG12)	s/n	213442
Rion NL-52	Environmental Noise Analyser (WYG14)	s/n	610212
Rion NL-52	Environmental Noise Analyser (WYG15)	s/n	710260

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 eleven locations (as specified in the following table and shown in SK01 of Appendix B) from Monday 21st May 2012 to Monday 28th May 2012. Attended short term measurements were undertaken at five locations during the day, evening, peak and night-time periods with six additional locations being measured unattended over a 114 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 westerly wind direction.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	Western boundary of the site close to Park House School and Sports College
LT2	Public footpath off Warren Road
LT3	Southern boundary off the site next to Gorse Covert
LT4	Northern boundary of the site in hedgerows next to Monks Lane
LT5	North of the site next to Crook's Copse
LT6	Eastern boundary of the site on the public footpath next to Newtown Road (A339)
ST1	Pavement next to Newtown Road (A339) next to the driveway of St Gabriel's School

Ref	Description
ST2	Pavement next to Newtown Road (A339) outside the entrance of the recycling centre
ST3	Pavement of the junction between Monks Lane
ST4	Pavement outside No.4 Dormer Close
ST5	Pavement outside No.7 Spencer Road

4.2 Noise Survey Results

Existing ambient noise levels around the site are dominated by road noise from Monks Lane to the north of the site. The east of the site is dominated by road noise from Newtown Road (A339). The west of the site is affected by noise from Park House School especially the outdoor sports areas.

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 x 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)
Daytime 07:00 - 23:00	114 hours	21/05/2012 - 28/05/2012 19:23 - 21:16	LT1	51.3	89.0	28.8	51.0	42.4
Night-time 23:00 – 07:00	56 hours	21/05/2012 - 28/05/2012 23:00 - 07:00		42.8	79.4	19.6	43.8	36.1
Daytime 07:00 - 23:00	113 hours	21/05/2012 - 28/05/2012 19:41 - 21:36	LT2	51.5	89.9	28.1	51.3	40.7
Night-time 23:00 – 07:00	56 hours	21/05/2012 - 28/05/2012 23:00 - 07:00		41.9	81.0	20.8	42.4	34.3
Daytime 07:00 - 23:00	28 hours	21/05/2012 - 28/05/2012 20:02 - 16:02	LT3	51.0	82.8	25.4	49.8	37.9
Night-time 23:00 – 07:00	16 hours	21/05/2012 - 28/05/2012 23:00 - 07:00		47.4	78.2	19.6	40.4	33.6
Daytime 07:00 - 23:00	114 hours	21/05/2012 - 28/05/2012 20:27 - 22:02	LT4	66.0	97.3	32.0	69.5	52.3
Night-time 23:00 – 07:00	56 hours	21/05/2012 - 28/05/2012 23:00 - 07:00		56.6	86.6	24.8	50.9	36.7
Daytime 07:00 - 23:00	113 hours	21/05/2012 - 28/05/2012 20:41 - 21:51	LT5	52.2	87.6	27.4	53.4	46.1
Night-time 23:00 – 07:00	56 hours	21/05/2012 - 28/05/2012 23:00 - 07:00		43.8	75.6	22.0	46.7	37.3

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)
Daytime 07:00 - 23:00	113 hours	21/05/2012 - 28/05/2012 21:02 - 22:17	LT6	61.1	88.9	33.9	62.7	54.0
Night-time 23:00 – 07:00	56 hours	21/05/2012 - 28/05/2012 23:00 - 07:00		53.0	78.7	22.1	56.9	40.2
Daytime 07:00 - 19:00	15 Mins	22/05/2012 10:55	ST1	77.2	87.3	51.9	81.4	61.2
	15 Mins	22/05/2012 11:20	ST2	76.5	91.9	52.1	80.6	63.6
	15 Mins	22/05/2012 11:59	ST3	64.4	78.1	45.4	69.3	50.6
	15 Mins	22/05/2012 12:19	ST4	50.3	65.2	41.7	52.7	45.1
	15 Mins	22/05/2012 12:36	ST5	51.0	70.3	41.4	52.4	44.7
Evening 19:00 - 23:00	15 Mins	28/05/2012 19:22	ST1	77.1	88.5	44.1	81.4	57.1
	15 Mins	28/05/2012 19:00	ST2	74.1	87.9	46.3	78.4	59.1
	15 Mins	28/05/2012 19:55	ST3	63.2	78.5	42.9	67.5	51.5
	15 Mins	28/05/2012 20:14	ST4	52.7	68.6	35.8	56.2	42.1
	15 Mins	28/05/2012 20:30	ST5	55.2	79.0	35.8	55.2	41.2
Night-time 23:00 - 07:00	15 Mins	21/05/2012 23:08	ST1	70.6	88.7	35.0	74.3	41.0
	15 Mins	21/05/2012 23:24	ST2	68.2	88.5	34.6	70.3	38.3
	15 Mins	21/05/2012 23:43	ST3	58.5	79.3	30.1	55.3	32.9
	15 Mins	22/05/2012 00:05	ST4	40.6	57.2	30.7	43.5	33.4
	15 Mins	22/05/2012 00:23	ST5	37.2	57.0	30.5	37.9	32.7

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

5.0 Assessment of Key Effects

5.1 Noise Intrusion Assessment (Existing Ambient Noise Levels)

Internal noise levels within proposed dwellings across the development have been assessed both with windows open, where a reduction from a partially open window of 10 dB has been used, and with windows closed where an assumption of glazing with specification R_w 30 dB (e.g 6/12/6mm double glazing or equivalent) has been used.

The results presented in Appendix C show the predicted noise intrusion levels at properties across the site. 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 however certain façades across the site facing Monks Lane and the West Berkshire Council Recycling Centre require mitigation. In order to achieve the recommended internal noise criteria, a range of mitigation measures are outlined in Section 6.1 of this report.

Noise intrusion levels have been determined using cumulative road traffic noise levels for 2031 (DS2). The following corrections have been used to determine the daytime L_{Aeq}, night-time L_{Night} noise levels.

- Daytime L_{Aeq}

  $L_{Aeq(16\text{-hour})} - L_{A10(18\text{-hour})} - 2$ dB

- Night-time L_{Aeq}

  $L_{night} = 0.90L_{A10(18\text{-hour})} - 3.77$ dB

A verified night-time L_{Amax} model (as verified in Table 3.4 of this report) has been used to determine maximum, worst case noise levels.

5.2 Road Traffic Noise Assessment

Table 5.1 below shows the results of the traffic noise assessment comparing the 'with' and 'without' development traffic noise levels for the year 2031 with three access scenarios on the public highways around the site.

Table 5.1 Difference Between With and Without Development Scenarios (2017 and 2031) DS1

Location	Traffic Noise Without Development 2017 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference between with and without development scenarios (dB(A))	Traffic Noise Without Development 2031 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference between with and without development scenarios (dB(A))
TR01	64.1	65.5	1.4	65.7	65.5	-0.2
TR02	66.6	68.2	1.6	68.2	68.2	0.0
TR03	64.7	65.9	1.2	66.2	65.9	-0.3
TR04	66.2	67.8	1.6	67.8	67.8	0.0
TR05	65.4	67.0	1.6	67.0	67.0	0.0

Location	Traffic Noise Without Development 2017 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference between with and without development scenarios (dB(A))	Traffic Noise Without Development 2031 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference between with and without development scenarios (dB(A))
TR06	66.3	67.8	1.5	67.9	67.8	-0.1
TR07	64.4	65.9	1.5	66.0	65.9	-0.1
TR08	65.4	66.9	1.5	66.9	66.9	0.0
TR09	60.0	61.2	1.2	61.1	61.2	0.1
TR10	58.5	59.6	1.1	59.5	59.6	0.1
TR11	57.7	58.7	1.0	58.6	58.7	0.1
TR12	59.7	60.7	1.0	60.6	60.7	0.1
TR13	59.1	60.0	0.9	59.9	60.0	0.1
TR14	56.5	57.2	0.7	57.1	57.2	0.1
TR15	56.3	57.0	0.7	56.3	57.0	0.7
TR16	57.7	58.4	0.7	58.2	58.4	0.2
TR17	67.3	68.8	1.5	68.8	68.8	0.0
TR18	65.5	67.0	1.5	67.0	67.0	0.0
TR19	66.6	68.2	1.6	68.2	68.2	0.0
TR20	64.6	66.1	1.5	66.2	66.1	-0.1
TR21	63.7	64.8	1.1	64.8	64.8	0.0
TR22	68.2	69.7	1.5	69.7	69.7	0.0
TR23	65.8	67.7	1.9	67.5	67.7	0.2
TR24	66.1	68.1	2.0	67.8	68.1	0.3
TR25	66.3	67.3	1.0	67.4	67.3	-0.1
TR26	66.4	67.4	1.0	67.5	67.4	-0.1
TR27	65.8	66.8	1.0	66.9	66.8	-0.1
TR28	63.9	64.7	0.8	64.9	64.7	-0.2
TR29	65.2	65.0	-0.2	65.8	65.0	-0.8
TR30	65.2	64.8	-0.4	65.8	64.8	-1.0
TR31	62.2	62.7	0.5	62.7	62.7	0.0
TR32	67.5	68.0	0.5	67.9	68.0	0.1
TR33	68.9	69.4	0.5	69.3	69.4	0.1
TR34	67.8	68.2	0.4	68.1	68.2	0.1
TR35	73.3	73.7	0.4	73.6	73.7	0.1
TR36	69.6	70.2	0.6	69.3	70.2	0.9
TR37	63.8	63.1	-0.7	64.7	63.1	-1.6
TR38	65.9	63.2	-2.7	66.7	63.2	-3.5
TR39	66.1	65.3	-0.8	66.7	65.3	-1.4
TR40	64.5	64.2	-0.3	65.1	64.2	-0.9
TR41	63.0	62.7	-0.3	63.6	62.7	-0.9
TR42	64.5	64.2	-0.3	65.1	64.2	-0.9

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

Table 5.2 below shows the results of the cumulative traffic noise assessment comparing the 'with' and 'without' development traffic noise levels for the year 2031 with four access scenarios on the public highways around the site.

Table 5.2 Difference Between With and Without Development Scenarios (2017 and 2031) DS2

Location	Traffic Noise Without Development 2017 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference between with and without development scenarios (dB(A))	Traffic Noise Without Development 2031 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference between with and without development scenarios (dB(A))
TR01	64.1	65.6	1.5	65.7	65.6	-0.1
TR02	66.6	68.3	1.7	68.2	68.3	0.1
TR03	64.7	66.0	1.3	66.2	66.0	-0.2
TR04	66.2	68.0	1.8	67.8	68.0	0.2
TR05	65.4	67.1	1.7	67.0	67.1	0.1
TR06	66.3	68.0	1.7	67.9	68.0	0.1
TR07	64.4	66.1	1.7	66.0	66.1	0.1
TR08	65.4	67.3	1.9	66.9	67.3	0.4
TR09	60.0	63.0	3.0	61.1	63.0	1.9
TR10	58.5	62.0	3.5	59.5	62.0	2.5
TR11	57.7	61.0	3.3	58.6	61.0	2.4
TR12	59.7	65.2	5.5	60.6	65.2	4.6
TR13	59.1	65.1	6.0	59.9	65.1	5.2
TR14	56.5	61.0	4.5	57.1	61.0	3.9
TR15	56.3	63.0	6.7	56.3	63.0	6.7
TR16	57.7	63.1	5.4	58.2	63.1	4.9
TR17	67.3	68.9	1.6	68.8	68.9	0.1
TR18	65.5	67.1	1.6	67.0	67.1	0.1
TR19	66.6	68.3	1.7	68.2	68.3	0.1
TR20	64.6	66.2	1.6	66.2	66.2	0.0
TR21	63.7	65.0	1.3	64.8	65.0	0.2
TR22	68.2	69.8	1.6	69.7	69.8	0.1
TR23	65.8	67.7	1.9	67.5	67.7	0.2
TR24	66.1	68.0	1.9	67.8	68.0	0.2
TR25	66.3	67.2	0.9	67.4	67.2	-0.2
TR26	66.4	67.3	0.9	67.5	67.3	-0.2
TR27	65.8	66.7	0.9	66.9	66.7	-0.2
TR28	63.9	64.7	0.8	64.9	64.7	-0.2
TR29	65.2	66.3	1.1	65.8	66.3	0.5
TR30	65.2	66.1	0.9	65.8	66.1	0.3
TR31	62.2	62.8	0.6	62.7	62.8	0.1
TR32	67.5	67.7	0.2	67.9	67.7	-0.2
TR33	68.9	69.0	0.1	69.3	69.0	-0.3
TR34	67.8	67.9	0.1	68.1	67.9	-0.2
TR35	73.3	73.3	0.0	73.6	73.3	-0.3
TR36	69.6	70.0	0.4	69.3	70.0	0.7
TR37	63.8	63.3	-0.5	64.7	63.3	-1.4
TR38	65.9	64.1	-1.8	66.7	64.1	-2.6
TR39	66.1	66.6	0.5	66.7	66.6	-0.1
TR40	64.5	65.5	1.0	65.1	65.5	0.4
TR41	63.0	64.0	1.0	63.6	64.0	0.4
TR42	64.5	65.5	1.0	65.1	65.5	0.4

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

When the differences between the 2017 and 2031 'with' and 'without' development traffic noise contributions for the three access scenario (DS1) are compared with the noise change criteria given in Table 2.2 of this report, all representative receptors would be considered to experience a 'negligible' effect as a result of the proposed development.

When the differences between the 2017 and 2031 'with' and 'without' development traffic noise contributions for the four access scenario (DS2) are compared with the noise change criteria given in Table 2.2 of this report, most representative receptors would be considered to experience a 'negligible' or 'slight' effect as a result of the cumulative effects of the proposed development. Properties along Sunley Close and Warren Road are expected to experience a 'moderate to significant' effect due to the increased traffic volumes across the site.

5.3 Construction Phase – Noise Assessment

Noise levels from potential construction activity associated with the development of the site have been assessed in accordance with BS 5228-1:2009 + A1 2014 criteria which indicate if a significant effect is likely to occur at noise sensitive properties.

Point sources representing all likely items of plant have been represented in the model and in the case of mobile plant these have been placed in worst case location with respect to nearby noise sensitive premises. Worst case assumptions regarding the 'on-time' of individual plant items have also been made and represented in the calculations. In order to ensure that the assessment is worst case, it is assumed that all proposed construction activity is occurring simultaneously. This construction noise assessment assumes vehicle access from Monks Lane.

Significance based on fixed limits

The table below shows predicted levels of construction noise at existing noise sensitive properties for comparison with the recommended noise limit criteria.

Table 5.3 Construction Noise Assessment Results (Fixed Limits Method)

Ref	Construction Noise Level (dB(A))	Criteria (dB(A))	Within Recommended fixed noise limit
CR01	54.0	70.0	Yes
CR02	53.4	70.0	Yes
CR03	52.3	70.0	Yes
CR04	55.1	70.0	Yes
CR05	47.8	70.0	Yes
CR06	50.9	70.0	Yes
CR07	51.4	70.0	Yes
CR08	50.5	70.0	Yes
CR09	49.9	70.0	Yes
CR10	51.5	70.0	Yes

Ref	Construction Noise Level (dB(A))	Criteria (dB(A))	Within Recommended fixed noise limit
CR11	50.8	70.0	Yes
CR12	57.7	70.0	Yes
CR13	62.8	70.0	Yes
CR14	63.6	70.0	Yes
CR15	64.6	70.0	Yes
CR16	63.6	70.0	Yes
CR17	64.6	70.0	Yes
CR18	62.9	70.0	Yes
CR19	62.5	70.0	Yes
CR20	62.1	70.0	Yes
CR21	56.7	70.0	Yes
CR22	60.6	70.0	Yes
CR23	59.9	70.0	Yes
CR24	61.9	70.0	Yes

The results indicate that the noise levels at all façades of the existing noise sensitive properties would be within the recommended criteria. Noise levels within the fixed limit criteria are likely to result in internal conditions where conversation would not be difficult.

5.3.1 Significance based on noise change – ABC Method

The table below presents the findings of a daytime construction noise assessment at noise sensitive properties surrounding the site. Daytime is regarded as weekdays 07:00 – 19:00 and Saturdays 07:00 – 13:00.

Table 5.4 Construction Noise Assessment Results (ABC Method) – Daytime

Nearest Sensitive Receptors	Measured Existing Ambient Noise Level (L_{Aeq})	Rounded to nearest 5 dB	Predicted Site Noise	Category	Threshold	Significant Effect?
CR01	51.5	50.0	54.0	A	65	No
CR02	51.5	50.0	53.4	A	65	No
CR03	51.5	50.0	52.3	A	65	No
CR04	51.5	50.0	55.1	A	65	No
CR05	51.5	50.0	47.8	A	65	No
CR06	51.5	50.0	50.9	A	65	No
CR07	51.5	50.0	51.4	A	65	No
CR08	51.5	50.0	50.5	A	65	No
CR09	51.5	50.0	49.9	A	65	No
CR10	51.5	50.0	51.5	A	65	No
CR11	51.5	50.0	50.8	A	65	No
CR12	51.5	50.0	57.7	A	65	No
CR13	50.3	50.0	62.8	A	65	No
CR14	50.3	50.0	63.6	A	65	No
CR15	50.3	50.0	64.6	A	65	No
CR16	50.3	50.0	63.6	A	65	No
CR17	50.3	50.0	64.6	A	65	No

Nearest Sensitive Receptors	Measured Existing Ambient Noise Level (L_{Aeq})	Rounded to nearest 5 dB	Predicted Site Noise	Category	Threshold	Significant Effect?
CR18	50.3	50.0	62.9	A	65	No
CR19	50.3	50.0	62.5	A	65	No
CR20	66.0	65.0	62.1	B	70	No
CR21	66.0	65.0	56.7	B	70	No
CR22	66.0	65.0	60.6	B	70	No
CR23	66.0	65.0	59.9	B	70	No
CR24	66.0	65.0	61.9	B	70	No

In accordance with ABC method of assessment outlined in BS 5228-1:2009+A1 2014, a significant effect is deemed to occur if the site noise level exceeds the threshold level for the category appropriate to the Ambient Noise level. It can be seen from the results tabulated above that all nearby noise sensitive premises included in this assessment are currently exposed to ambient noise levels which comply with Category A-B.

When the category threshold values are compared to the site noise level experienced at the noise sensitive properties during the demolition/construction phase of the development it is shown that the site noise levels are below the relevant threshold value and the impact is not considered to be significant during the daytime hours on Weekdays 07:00 – 19:00 and Saturdays 07:00 – 13:00 at all receptors.

5.4 Building Services Plant Noise Assessment

This assessment has been undertaken in order to establish the maximum external plant noise levels for the new school. The calculations are based on the potential location of the plant (shown on SK02 of Appendix B). The assessment compares the predicted worst case noise levels from proposed building service plant (BSP) with the existing measured average background noise L_{A90} at the surrounding existing residential receptors. As the proposed plant noise could contain a 'distinguishable hum', a 6dB correction (specified in 9.2 of BS 4142) has been added to create the Plant 'Rating Level at Receptor'.

A series of predictions were made by defining different sound power levels at the point sources. When the sound pressure levels are set as shown in Table 5.4 (which are considered to be achievable), the noise rating levels at all the representative receptors are predicted to be at least 5 dB below the background levels during the daytime and night-time as shown in Table 5.5.

Table 5.5 Proposed Emission Limits for BSP as Modelled

BSP Location	Noise Emission Limit - Sound Pressure Level	
	Daytime	Night-time
Roof of Proposed School	64.9 dB(A) at 3 m *OR* 54.4 dB(A) at 10 m	55.9 dB(A) at 3 m *OR* 45.4 dB(A) at 10 m

Table 5.6 BS 4142 Assessment for Proposed Plant

Ref	Existing Measured Average Background L_{A90}		Noise rating level from plant (with +6 dB Correction)		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
PL1	46	37	38	30	-8	-7
PL2	46	37	37	29	-9	-8
PL3	46	37	40	32	-6	-5
PL4	46	37	38	29	-8	-8
PL5	46	37	41	32	-5	-5
PL6	46	37	37	28	-9	-9
PL7	46	37	38	29	-8	-8
PL8	46	37	35	27	-11	-10

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

5.5 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 development is assessed as falling into Zones 4-5 and is considered to have some tranquillity value.

There is currently a of public right of way that falls within the site (GREE/9/1) which provides access from Warren Road to the A339. As this footpath does not provide access to any areas of greater tranquillity it is considered that the proposed development will not reduce the access to areas of tranquillity in this part of the site, indeed the provision of the footpaths and access to the County Park element of the development is considered to significantly increase access to areas of tranquillity for a significantly wide catchment.

6.0 Noise Mitigation

6.1 Glazing and Ventilation Strategy

The mitigation measures below are sufficient to reduce the effects of noticeable and disruptive noise currently being emitted from the surrounding environment by helping to prevent noise levels exceeding BS 8233 criteria for L_{Aeq} and L_{Amax} within all areas of the proposed development. These mitigation measures are also detailed in SK06 of Appendix B.

In order 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, dwellings within approximately 25 metres of Monks Lane with sensitive facades facing the roads require enhanced glazing in order to meet internal target noise levels.

An alternative means of ventilation will be required in order to meet both ventilation and internal ambient noise criteria for façades facing Monks Lane (within 70m), Newbury College Car Park (within 40m) and the A339/ HWRC, Andover Road (within 400m/300m). Alternative ventilation can be provided in several ways such as 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.

Care should be taken to minimise the potential impact of noise via careful design of site/building layout such as consideration of the appropriate positioning of living rooms, bedrooms and gardens. Within the buildings themselves, living rooms and bedrooms should ideally be located on shielded façades with non-sensitive spaces such as corridors, bathrooms, en-suite, utility rooms, windowless gable ends and kitchens located on the road facing façades of residential properties.

7.0 Conclusions

NPPF 170(e) and 180 (a)

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

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 $L_{Aeq\ daytime}$ 35 dB, $L_{Aeq\ night\text{-}time}$ of 30 dB and $L_{Amax\ night\text{-}time}$ of 45 dB in all residential bedroom and living spaces of the proposed development. The suggested glazing specifications are understood to be achievable. Standard double glazing is sufficient across the majority of the site in order to achieve the target internal noise levels when windows are closed, however, enhanced glazing is required for plots facing Monks Lane and West Berkshire Council Recycling Centre in order to meet internal targets for noise levels. Alternative ventilation (e.g. trickle vents) will be required for living rooms and bedrooms in plots located further into the site.

NPPF 180 (b), 182 and 183

Given that nearby the site is surrounded by similarly residential properties, 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 4-5 area of tranquillity (Zone 1 being the least tranquil and Zone 10 being the most tranquil), however the provision of the footpaths and access to the County Park element of the development is considered to significantly increase access to areas of tranquillity for a significantly wide catchment.

Planning Practice Guidance: Noise

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

Appendices

Appendix A – Acoustic Terminology and Abbreviations

Acoustic Terminology

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

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

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

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

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

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

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

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

Abbreviations

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

PPG – Planning Practice Guidance

UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

WYGE – WYG Environment

Appendix B – Sketches

SK01 Noise Monitoring Locations

SK02a Proposed Noise Intrusion Receptor Locations

SK02b Proposed Traffic Noise Receptor Locations

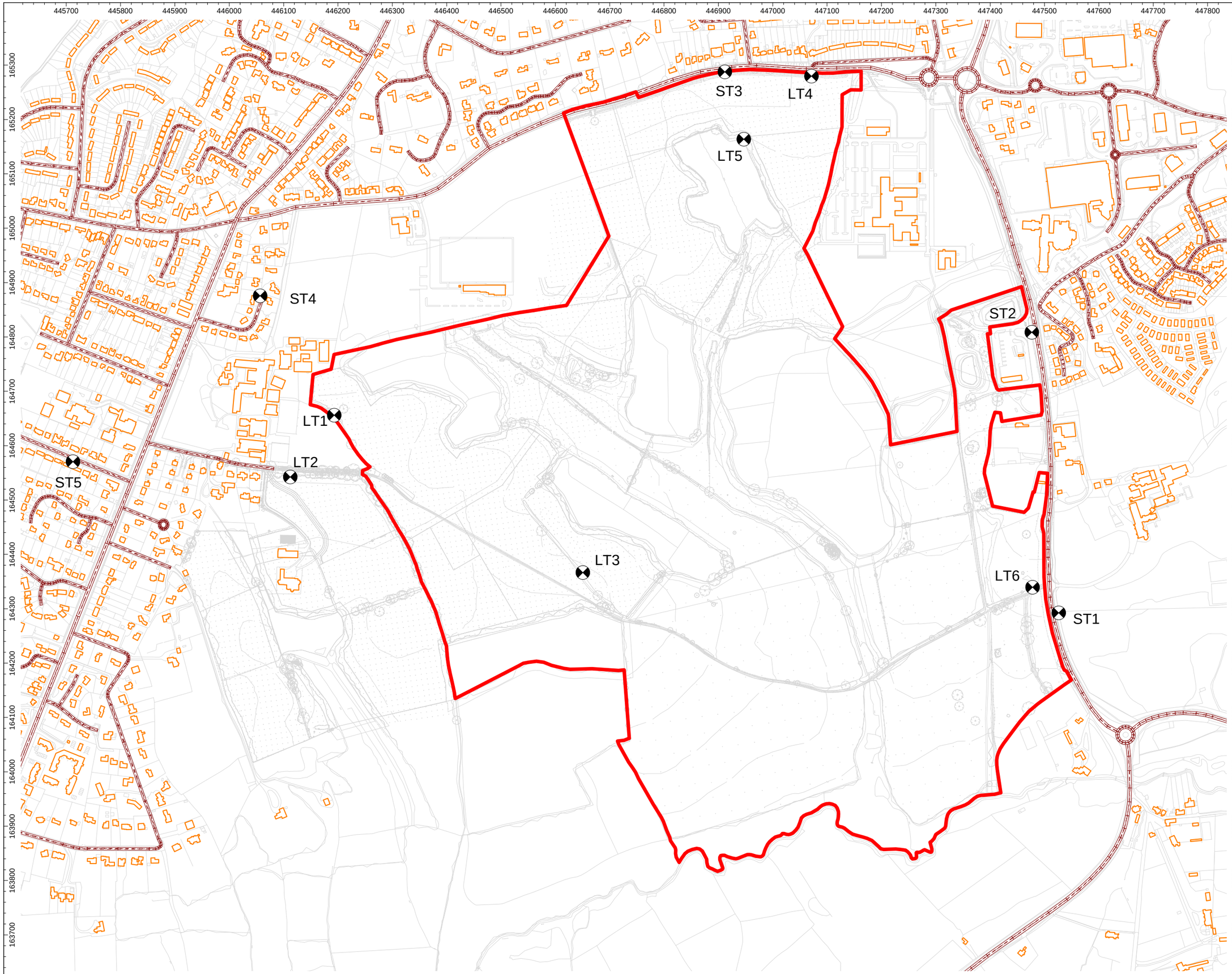
SK02c Proposed Construction Noise Receptor Locations

SK03 Daytime 'Do Minimum' $L_{A10,18hr}$ Noise Contours (2017)

SK04 Daytime 'Do Something' (4 Access) $L_{A10,18hr}$ Noise Contours (2031)

SK05 Glazing and Ventilation Strategy

SK06 Do Minimum 2017/Do Something (4 Access) 2031: Noise Level Difference Plot



Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Noise Monitoring Locations

Drawing Number:
SK01

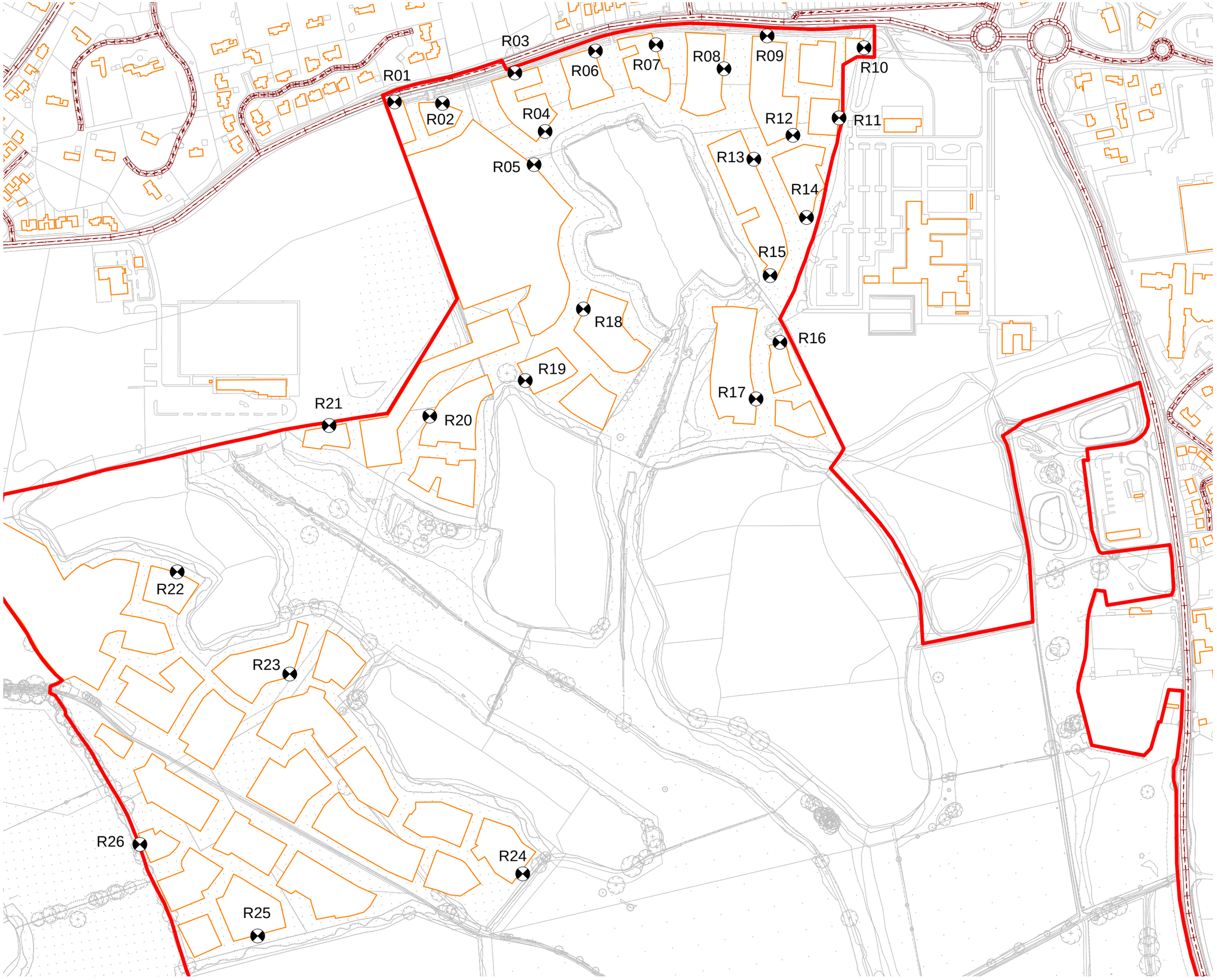
Key:

Site Boundary:

Scale : Not to scale

WYGE Leicester 13.09.19

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



Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Proposed Noise Intrusion Receptor Locations

Drawing Number:
SK02a

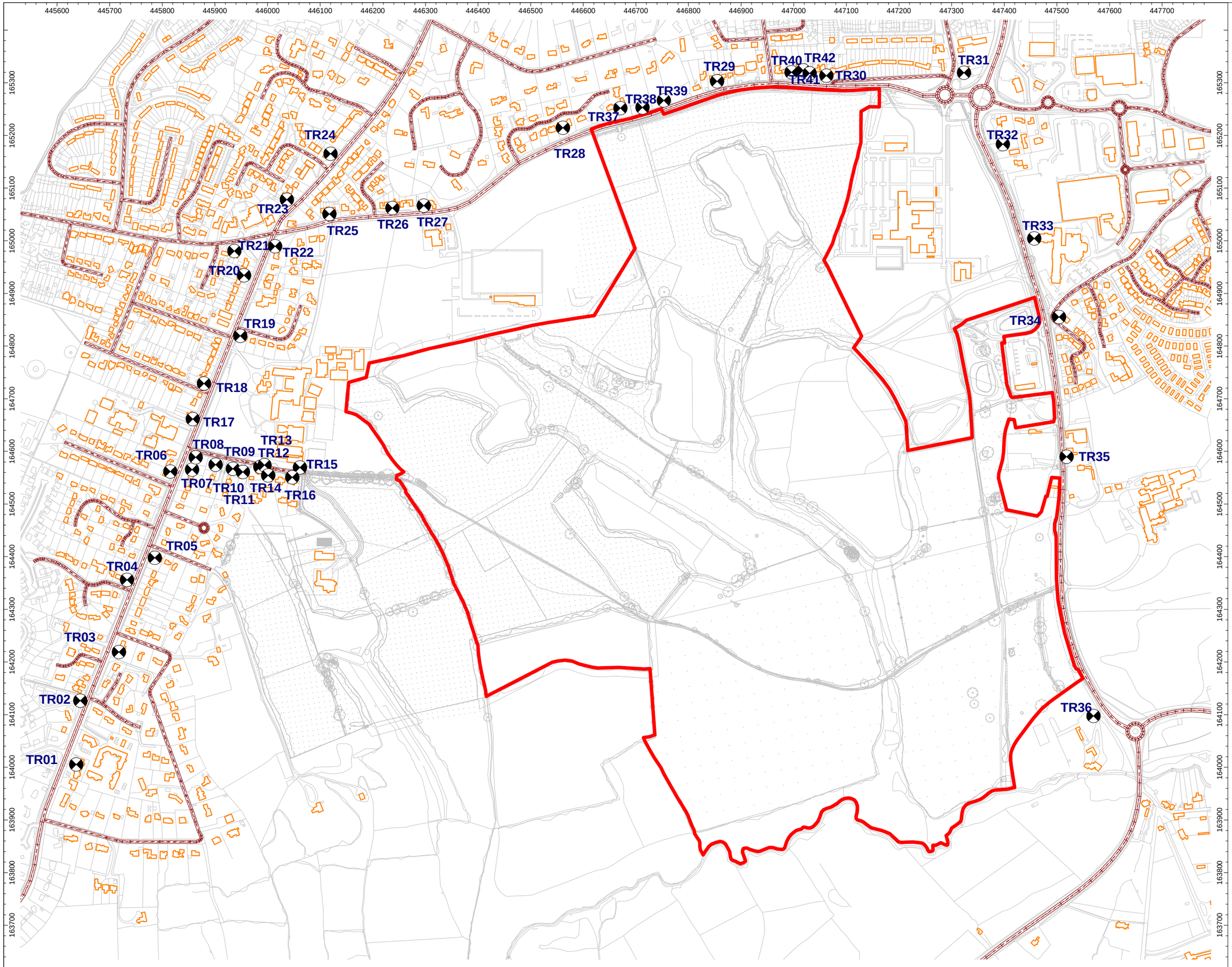
Key:

Site Boundary:

Scale : Not to scale

WYGE Leicester 13.09.19

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



Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Proposed Traffic Noise Receptor Locations

Drawing Number:
SK02b

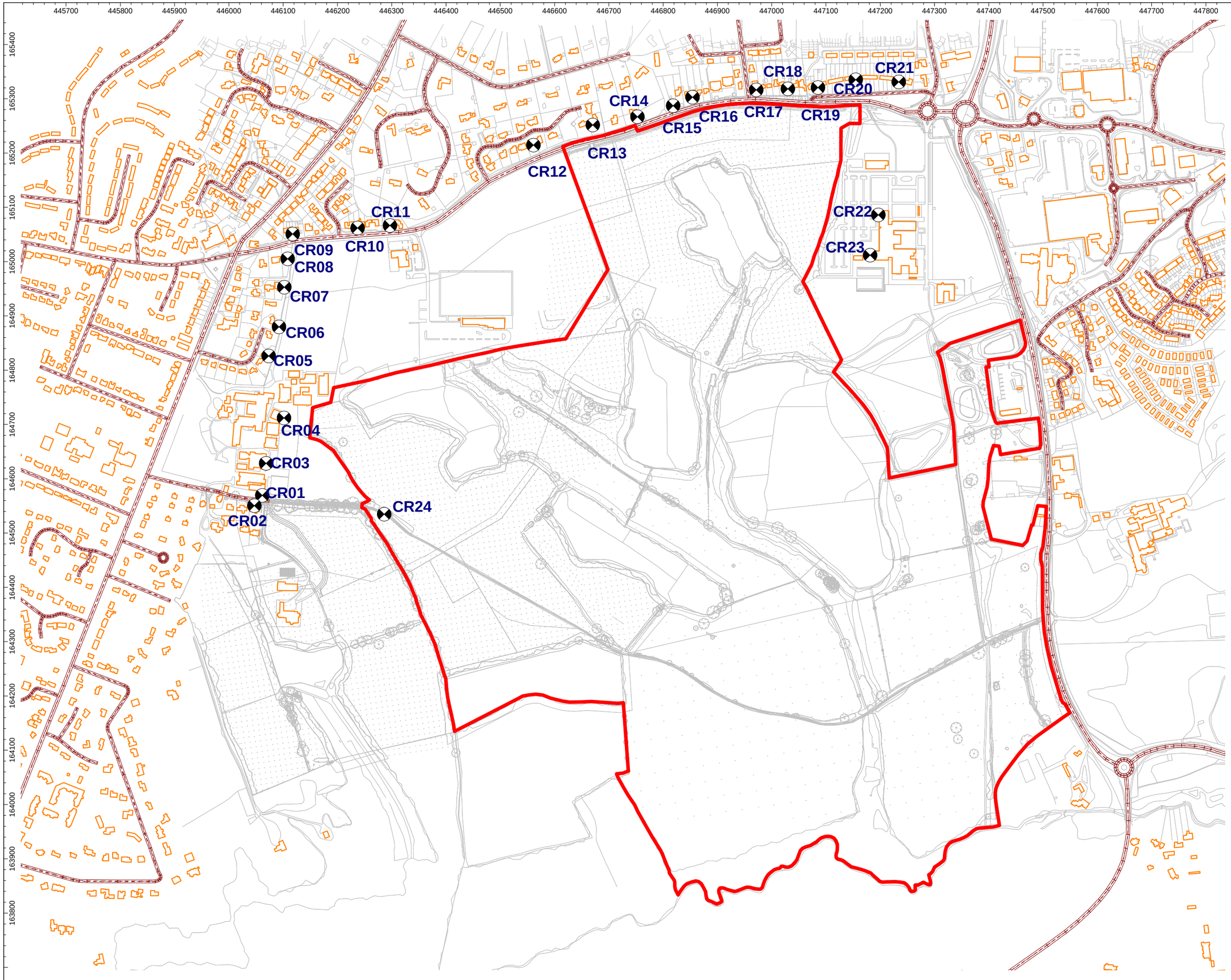
Key:

Site Boundary:

Scale : Not to scale

WYGE Leicester 13.09.19

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



Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Proposed Construction Noise Receptor Locations

Drawing Number:
SK02c

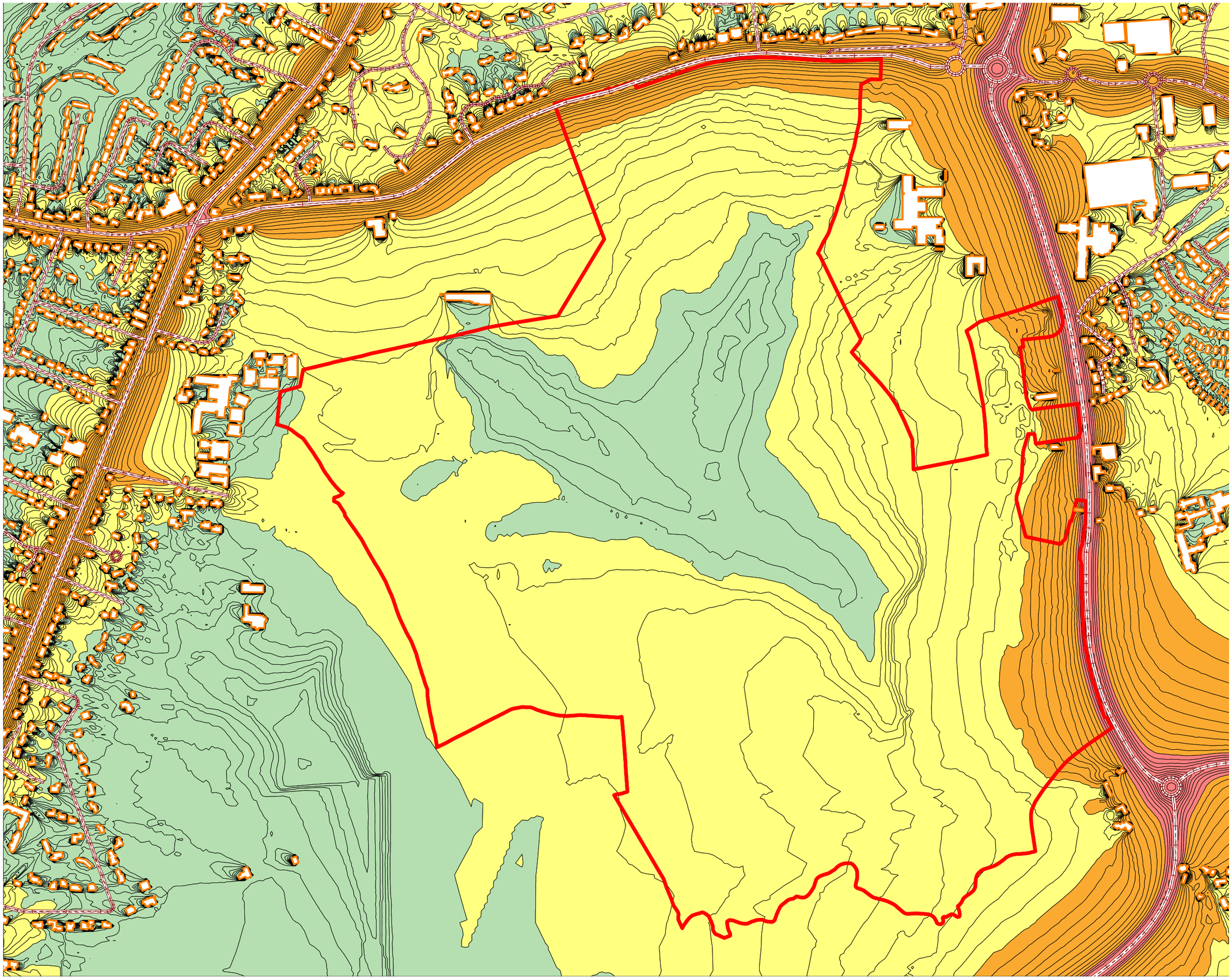
Key:

Site Boundary:

Scale : Not to scale

WYGE Leicester 13.09.19

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



Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Daytime 'Do Minimum' LA10, 18hr Noise Contours (2017)

Drawing Number:
SK03

Key:

Site Boundary:

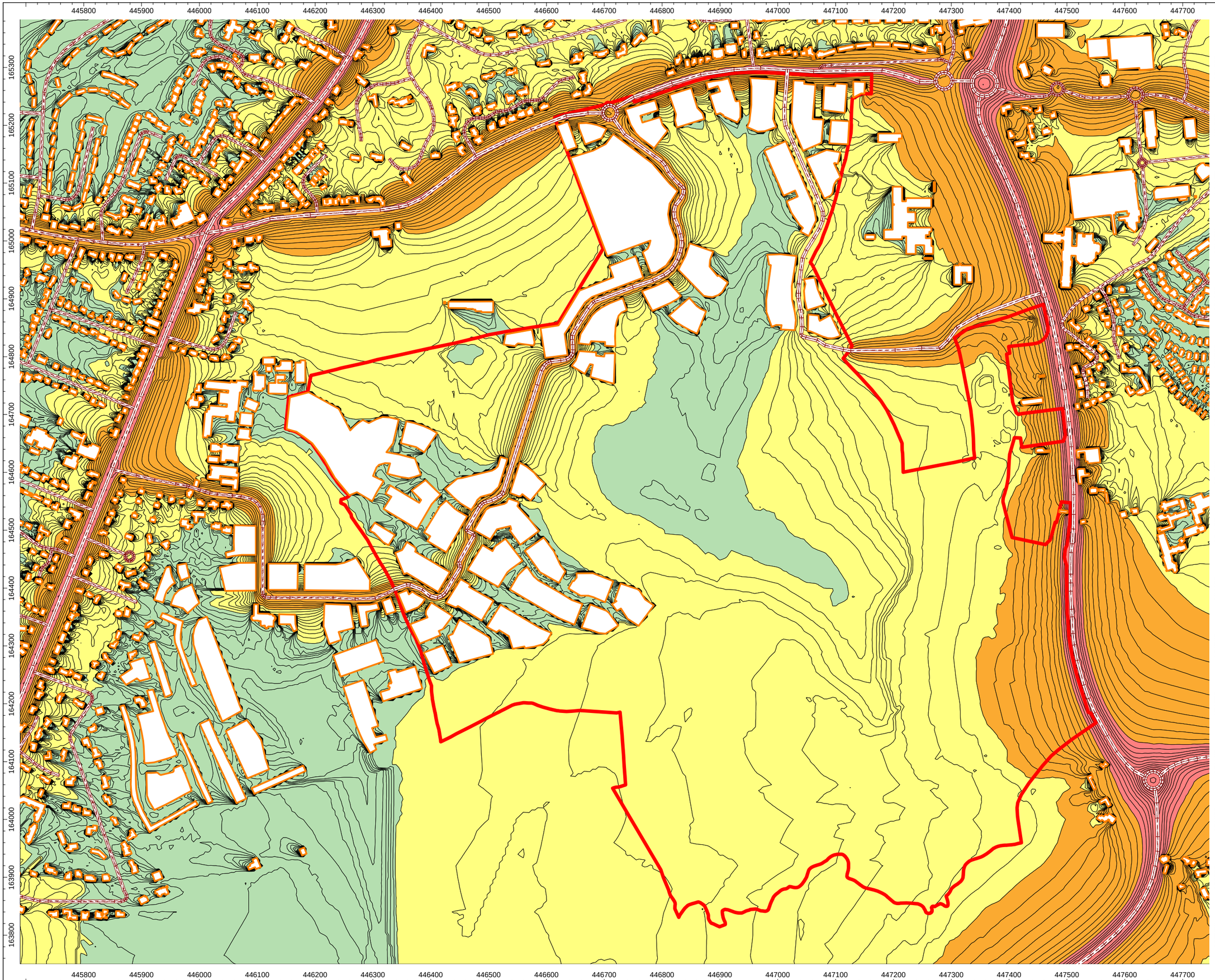
- 0.0 - 50.0 dB
- 50.0 - 60.0 dB
- 60.0 - 70.0 dB
- >70.0 dB

Scale : Not to scale

WYGE Leicester 17.12.19

Licence Number AL 553611

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



Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Daytime 'Do Something' LA10 (4 Access), 18hr Noise Contours (2031)

Drawing Number:
SK04

Key:

Site Boundary:

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

Scale : Not to scale

WYGE Leicester 17.12.19

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

Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Glazing and Ventilation Strategy

Drawing Number:
SK05

Key:

Glazing Rw 30 dB & Ventilation Dnew 30dB:

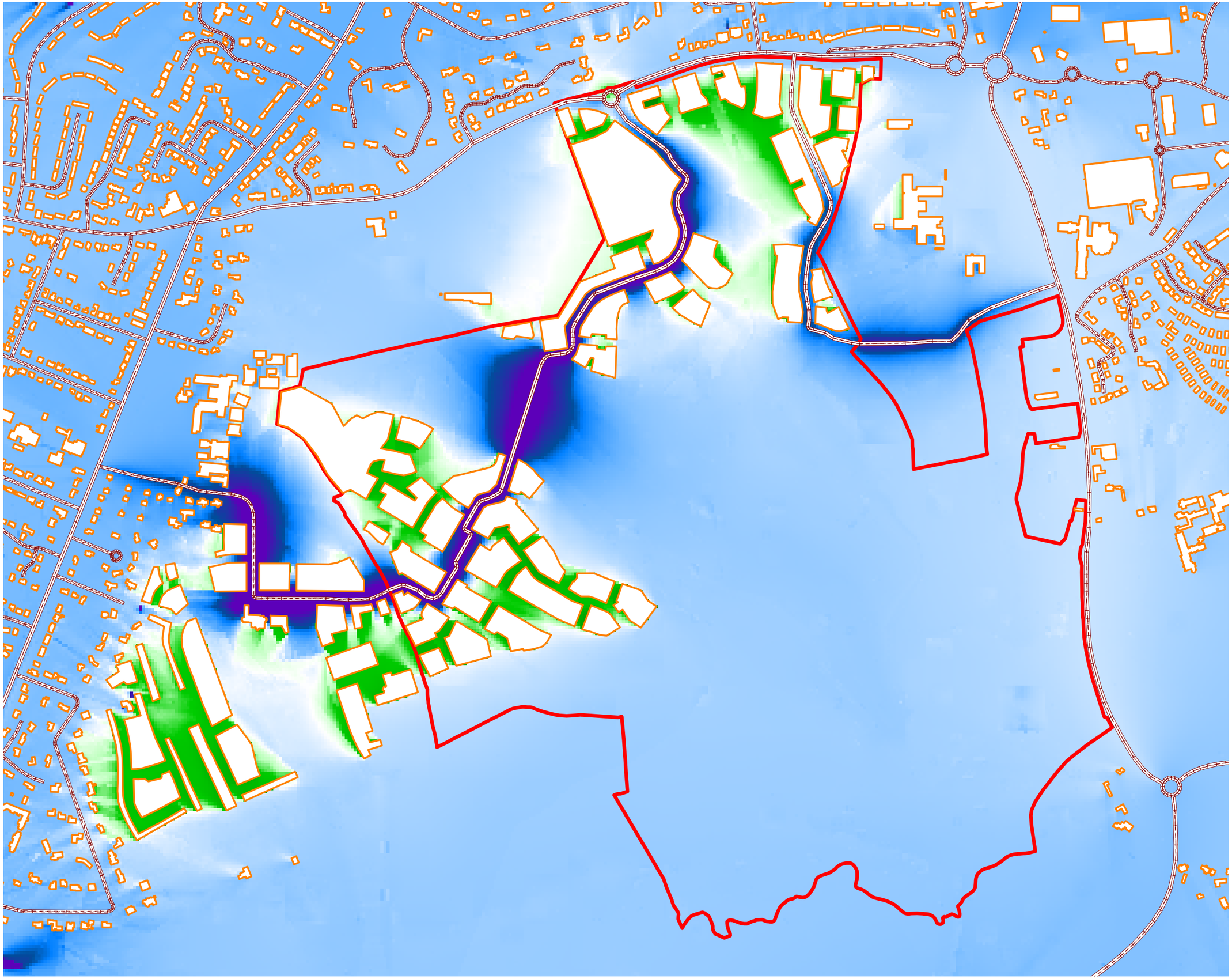
Enhanced Glazing & Alternative Ventilation:

Site Boundary:

Scale : Not to scale

WYGE Leicester 13.09.19

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



Client:
Bloor Homes & Sandleford Farm Partnership

Project:
Land at Sandleford Park, Newbury

Project Number:
A106825-1

Drawing Title / Scenario:
Do Minimum 2017/Do Something (4 Access) 2031: Noise Level Difference Plot

Drawing Number:
SK06

Key:

Site Boundary:

- >= -10
- >= -5
- >= -3
- >= -1
- >= 4
- >= 5
- >= 10

Scale : Not to scale

WYGE Leicester 17.12.19

Licence Number AL 553611

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

Appendix C – Noise Intrusion Results

Table AC.1 Daytime Noise Intrusion Levels $L_{Aeq\ 16\ hour}$

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	69.1	59.1	39.1	35
R02	63.3	53.3	33.3	35
R03	66.9	56.9	36.9	35
R04	56.6	46.6	26.6	35
R05	63.4	53.4	33.4	35
R06	62.2	52.2	32.2	35
R07	57.2	47.2	27.2	35
R08	57.0	47.0	27.0	35
R09	66.7	56.7	36.7	35
R10	60.8	50.8	30.8	35
R11	53.7	43.7	23.7	35
R12	49.4	39.4	19.4	35
R13	57.6	47.6	27.6	35
R14	54.0	44.0	24.0	35
R15	54.0	44.0	24.0	35
R16	54.6	44.6	24.6	35
R17	58.3	48.3	28.3	35
R18	63.7	53.7	33.7	35
R19	52.8	42.8	22.8	35
R20	63.1	53.1	33.1	35
R21	46.4	36.4	16.4	35
R22	51.6	41.6	21.6	35
R23	63.7	53.7	33.7	35
R24	49.4	39.4	19.4	35
R25	45.8	35.8	15.8	35
R26	57.5	47.5	27.5	35

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

Table AC.2 Night-time Noise Intrusion Levels $L_{Aeq\ 8\ hour}$

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	58.2	48.2	28.2	30
R02	54.7	44.7	24.7	30
R03	56.4	46.4	26.4	30
R04	47.4	37.4	17.4	30
R05	53.2	43.2	23.2	30
R06	52.9	42.9	22.9	30
R07	51.9	41.9	21.9	30

Location	External L_{Aeq} at 1m from facade	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R08	49.0	39.0	19.0	30
R09	56.3	46.3	26.3	30
R10	52.4	42.4	22.4	30
R11	46.1	36.1	16.1	30
R12	42.2	32.2	12.2	30
R13	48.4	38.4	18.4	30
R14	44.9	34.9	14.9	30
R15	45.2	35.2	15.2	30
R16	45.6	35.6	15.6	30
R17	48.9	38.9	18.9	30
R18	53.5	43.5	23.5	30
R19	44.9	34.9	14.9	30
R20	52.9	42.9	22.9	30
R21	41.6	31.6	11.6	30
R22	42.8	32.8	12.8	30
R23	53.4	43.4	23.4	30
R24	41.0	31.0	11.0	30
R25	37.5	27.5	7.5	30
R26	48.0	38.0	18.0	30

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

Table AC.3 Night-time Noise Intrusion Levels L_{Amax}

Location	External L_{Amax} at 1m from facade	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	Criteria Internal L_{Amax}
R01	77.2	67.2	47.2	45
R02	72.8	62.8	42.8	45
R03	75.1	65.1	45.1	45
R04	65.0	55.0	35.0	45
R05	67.1	57.1	37.1	45
R06	72.0	62.0	42.0	45
R07	70.1	60.1	40.1	45
R08	67.6	57.6	37.6	45
R09	75.5	65.5	45.5	45
R10	74.8	64.8	44.8	45
R11	71.8	61.8	41.8	45
R12	65.1	55.1	35.1	45
R13	69.7	59.7	39.7	45
R14	71.6	61.6	41.6	45
R15	71.3	61.3	41.3	45
R16	65.9	55.9	35.9	45
R17	70.2	60.2	40.2	45

Location	External L_{Amax} at 1m from facade	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	Criteria Internal L_{Amax}
R18	64.8	54.8	34.8	45
R19	66.4	56.4	36.4	45
R20	64.2	54.2	34.2	45
R21	61.0	51.0	31.0	45
R22	63.8	53.8	33.8	45
R23	69.0	59.0	39.0	45
R24	73.7	63.7	43.7	45
R25	71.5	61.5	41.5	45
R26	62.3	52.3	32.3	45

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

Appendix D – Construction and Environmental Management Plan (CEMP) – Noise

A construction noise assessment has been undertaken in accordance with BS 5228:2009 which demonstrates that noise from daytime construction activity on the site is not considered to be significant. The full details of the assessment are presented in the noise technical report which supports the proposed scheme.

Despite the favourable assessment, a number of additional mitigation measures are recommended to keep construction site noise to a minimum. The following practices are derived from those detailed in BS 5228-1:2009 and those most appropriate to the site are outlined below.

Source Noise Control

Wherever possible noise will be controlled at source.

a) avoid unnecessary revving of engines and switch off equipment when not required;

b) keep internal haul routes well maintained and avoid steep gradients;

c) use rubber linings in, for example, chutes and dumpers to reduce impact noise;

d) minimize drop height of materials;

e) start up plant and vehicles sequentially rather than all together.

As far as reasonably practicable, sources of significant noise will be enclosed or screened. The extent to which this can be done depends on the nature of the machine or process to be enclosed and their ventilation requirements. For maximum benefit, screens will be close to the source of noise.

Plant Location

The plant and activities to be employed on that site will be reviewed to ensure that they are the quietest available for the required purpose; this is in accordance with best practicable means. For an existing operational site, where reasonably practicable, noisy plant or activities will be replaced by less noisy alternatives if noise problems are occurring. Noise from existing plant and equipment can often be reduced by modification or by the application of improved sound reduction methods, but this will only be carried out after consultation with the manufacturer. Suppliers of plant will often have ready-made kits available and will often have experience of reducing noise from their plant.

Working Methods

Where reasonably practicable, quiet working methods will be employed, including use of the most suitable plant, reasonable hours of working for noisy operations, and economy and speed of operations.

Scheduling of Works

It is proposed that the scheduling of any construction works at the site be within daytime hours. The following hours of construction working are proposed;

a) Monday to Friday: 07:00 – 19:00
b) Saturday: 07:00 – 13:00
c) Sundays and Bank Holidays: No Working

Maintenance

Regular and effective maintenance by trained personnel is essential and will do much to reduce noise from plant and machinery. Increases in plant noise are often indicative of future mechanical failure.

Training

Operatives will be trained to employ appropriate techniques to keep site noise to a minimum, and will be effectively supervised to ensure that best working practice in respect of noise reduction is followed. All employees will be advised regularly of the following, as part of their training:

a) the proper use and maintenance of tools and equipment;

b) the positioning of machinery on site to reduce the emission of noise to the neighbourhood and to site personnel;

c) the avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment;

d) the protection of persons against noise;

e) the operation of sound measuring equipment (selected personnel).

Special attention will be given to the use and maintenance of sound-reduction equipment fitted to power tools and machines.

Community Relations

Good relations with people living and working in the vicinity of site operations are of paramount importance. Early establishment and maintenance of these relations throughout the duration of site operations, will go some way towards allaying people's fears. It is suggested that good relations can be developed by keeping people informed of progress and by treating complaints fairly and expeditiously. The person, company or organization carrying out work on site will appoint a responsible person to liaise with the public.

In general, the longer the duration of activities on a site, the more likely it is that noise from the site will prove to be an issue. In this context, good public relations and communication are important. The hours of working will be planned in advance and disseminated. There will be a need to adhere strictly to the stated schedule and ensure that the community is informed of their likely durations.

Noise Monitoring

On-site noise levels will be monitored regularly, particularly if changes in machinery or project designs are introduced, by a suitably qualified person appointed specifically for the purpose. The following monitoring scheme is proposed;

Noise Monitoring Scheme

Noise monitoring during the construction phase will be undertaken in accordance with the guidance presented in Annex G of BS 5228-1:2009 which states that the following information will be recorded:

a) the measured values of L_{Aeq} and, where appropriate, $L_{pA(max)}$ or L_{A01}, together with details of the appropriate time periods;

b) details of the instrumentation and measurement methods used, including details of any sampling techniques, position of microphone(s) in relation to the site and system calibration data;

c) any factors that might have adversely affected the reliability or accuracy of the measurements;

d) plans of the site and neighbourhood showing the position of plant, associated buildings and notes of site activities during monitoring period(s);

e) notes on weather conditions, including where relevant, wind speed/direction, temperature, presence of precipitation, etc.;

f) time, date and name of person carrying out the measurement.

Proposed construction noise monitoring locations are shown on the accompanying Appendix C. It is proposed that noise levels will be routinely monitored and reported at these locations for 4 hours during construction activities on a monthly basis. Additional measurements will be undertaken to establish whether specific equipment or practices will be capable of achieving the Noise Emission Limits as set out below or in light of any complaints.

Vibration Monitoring

Vibration monitoring will be undertaken during the construction phase; monitoring will record ppv, max displacement, VDV and acceleration. Measurement will generally be undertaken in accordance with the procedure described in BS ISO 4866:2010: Guidelines for the measurement of vibrations and evaluation of their effects on structures.

Works will stop and alternative methods employed if vibration exceeds 5mm/s.

Records of the monitoring will be consistent with the requirements of BS7385:1990 and will include:

- Description of the vibration source
- Type and condition of the building
- Purpose of the measurement
- Reference to BS7385
- Position of transducer and manner of coupling type and make of transducer
- Frequency range and linearity
- Assessment of the sources of error
- PPV recorded and associated frequency

Appendix E – Report Conditions

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

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

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

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

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