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Land North of Shaw Lane, Carlton, Barnsley

Noise Impact Assessment

For:
Countryside Properties (UK) Ltd

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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Countryside Properties (UK) Ltd (hereafter referred to as 'the client') to undertake a noise impact assessment for a new residential development on land to the North of Shaw Lane, Carlton in Barnsley (hereafter referred to as 'the site').

This report details:

- The methodology and results of a noise survey conducted at the site
- An assessment of potential noise sources in the vicinity of the site which may affect the proposed residential dwellings
- Recommendations for the building envelope (fenestration and ventilation)

This report details the methodology and results of the assessment and has been prepared to support a planning application for the development.

The report has been prepared on behalf of the client for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult the client and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix A.

1.2 Site Description and Development Proposals

The proposals are for the construction of a new residential development. The site is approximately centred on grid reference: 437411,410330.

Figure 1.1 below indicates the approximate site location in red.

Figure 1.1: Location of Proposed Development



The site is bounded to the north and west by agricultural land. To the east, the site is bounded by a railway embankment with a small industrial estate beyond. The southern boundary is adjoined by Shaw Lane.

2 Noise Criteria

2.1 Assessment Guidance

National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹ was updated in February 2025 and sets out the Government's planning policies for England and how these are expected to be applied.

Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 187 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of.....noise pollution'.

Paragraph 198 advises that:

'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.....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'.

The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

Noise Policy Statement for England

The Noise Policy Statement for England² (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life

The NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2021)

2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

‘...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.’

British Standard 8233:2014 - Guidance on Sound Insulation and Noise Reduction for Buildings

British Standard 8233:2014 ‘Guidance on Sound Insulation and Noise Reduction for Buildings’ (BS 8233)³ provides recommendations for the control of noise both in and around buildings and suggests criteria and limits appropriate to their function. For residential dwellings, the main considerations are:

- Bedrooms - the effect of noise upon sleep
- Other habitable rooms - the effect of noise upon resting, listening and communicating

It is desirable that the internal ambient noise level does not exceed the guideline values as replicated in Table 2.1.

Table 2.1: Indoor Ambient Noise Levels for Dwellings – BS 8233:2014

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS8233 states:

‘If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.’

Whilst BS 8233 is primarily concerned with noise within dwellings, the following guidance is also provided for external amenity areas:

“For traditional external areas that are used for amenity space, such as gardens or patios it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might 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 the 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”.

³ British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings. BSI

ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)⁴ recommends compliance with indoor noise level targets in residential dwellings based on the guidance contained in BS 8233 (see Table 2.1). Additionally, with regard to individual noise events, ProPG states:

‘Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline, then the judgement of acceptability will depend not only on the maximum noise levels but also factors such as the source, number, distribution, predictability and regularity of the noise events.’

ProPG acknowledges that the internal target noise levels may only be practically achieved with windows closed in certain areas (e.g. in urban areas or sites adjacent to transportation noise sources) and states that:

‘In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide ‘whole dwelling ventilation’ in accordance with Building Regulations Approved Document F (e.g. trickle ventilators in the open position).

It should also be noted that the internal noise level guidelines are generally not applicable under ‘purge ventilation’ conditions as defined by Building Regulations Approved Document F, as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food).’

Approved Document O - Overheating

Approved Document O (ADO), 2021 is written in support of Part O of Schedule 1 to the Building Regulations 2010. ADO details methods of addressing overheating in new residential dwellings, and is applicable to developments in England only.

The approved document sets out the following relevant guidance in Section 3 regarding noise ingress into dwellings:

‘In locations where external noise may be an issue, the (noise) mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (23:00 to 07:00).

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:

- a) 40 dB $L_{Aeq,T}$ averaged over 8 hours between 11pm and 7am
- b) 55 dB $L_{Amax,F}$ more than 10 times a night between 11pm and 7am”

⁴ ‘ProPG Planning and Noise: New Residential Development (ProPG)’, 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

3 Noise Survey and Results

3.1 Overview

Noise monitoring was undertaken at the site between Thursday 7th and Friday 8th August 2025.

The following noise monitoring positions were selected (illustrated in Appendix B) as follows:

- 1 – at the eastern site boundary
- 2 – at the southern site boundary

All noise measurements were undertaken using NTi XL3 Type 1 integrating sound level meters. The sound level meters were connected to a windshield covered microphone at all times in free field conditions. All measurements were made at a height of approximately 4m above ground level.

The calibration of each measurement system was verified immediately before and after the survey period using a Brüel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted.

Measurements consisted of A-weighted broadband parameters including L_{Aeq} , L_{A10} , L_{A90} and $L_{Amax,F}$ together with linear octave band data.

3.2 Summary of Results

Table 3.1 presents a summary of the noise data for each measurement session, at each measurement position, rounded to the nearest decibel.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time (hh:mm)	$L_{Aeq,T}$ (dB)	$L_{Amax,F}^{[1]}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
1	23/02/26	10:30-23:00	62	-	69	47
	24/02/26	07:00-13:00	63	-	69	49
	23/02/26-24/02/26	23:00-07:00	58	86	60	45
2	23/02/26	14:30-23:00	47	-	51	40
	24/02/26	07:00-14:30	50	-	55	48
	23/02/26-24/02/26	23:00-07:00	42	74	52	35

Notes: ^[1] Highest value recorded during survey period

Analysis of audio recordings made concurrently with the measured noise levels indicates that the noise climate at the site was controlled by distant and local road traffic noise. Commercial noise from the industrial estate to the east was occasionally faintly audible during the daytime at monitoring position 2 during breaks in traffic on Shaw Lane.

4 Assessment

4.1 Acoustic Modelling

Noise levels at the façade of the proposed dwellings been predicted using a three-dimensional Cadna-A noise model. The model was constructed using topographical survey data and mapping from Ordnance Survey, in conjunction with drawings and information supplied by the client.

Noise propagation is calculated in spectral terms according to BS EN ISO 1963: 1996, with 2nd order reflections considered. All off-site buildings within the model have an assumed height of 8m above ground level, and are assumed to be reflective.

The following assumptions were used in the model:

- Ground absorption set to $G = 0.5$ for mixed ground
- Meteorological conditions: Temp. 10 °C, Relative Humidity 70%
- Reflections: set to two orders of reflection
- Absorption coefficient of buildings set to 0.2

The highest predicted façade noise levels for dwellings within the site boundary are presented as façade noise plots in Appendix C.

4.2 Internal Noise Levels

Feasibility of Open Windows

With regard to internal noise levels when windows are open, the World Health Organisation (WHO) Guidelines for Community Noise (1999) states:

'the noise reduction from outside to inside with the window partly open is 15 decibels'.

The results of the noise modelling discussed above indicate that some façades of the development are likely to be exposed to noise levels $>50\text{dB } L_{\text{Aeq},16\text{hr}}$, during the daytime and $>45 L_{\text{Aeq},8\text{hr}}$ during the night time.

On this basis, it is not recommended that permanently open windows are relied upon as the primary means of ventilation for habitable rooms in these areas.

A scheme of sound insulation will be required such that the minimum ventilation rates specified in Approved Document Part F can be achieved with windows closed. All habitable rooms are to be provided with mechanical ventilation and heat recovery systems, obviating the need for partially open windows or simple façade openings.

Windows can be opened for temporary purge ventilation (to enable discretionary rapid air changing) with resultant internal levels exceeding the noise criteria; however, this would be on a temporary basis at the occupier's discretion.

Scheme of Mitigation

Calculations have been performed to determine the glazing performance required to satisfy the internal noise criteria with closed windows. The calculations have incorporated the measured external noise level data and the rigorous noise ingress calculation methodology outlined in Annex G.2 of BS 8233:2014.

In addition to satisfying the requirements of BS 8233, the scheme of sound insulation presented below is expected to control individual noise events in line with the ProPG requirement to not exceed 45 dB $L_{Amax,F}$ internally within bedrooms more than 10 to 15 times per night, as set out in Section 2.

With reference to the NPSE, in satisfying the ProPG and BS 8233 guideline noise levels, the scheme of mitigation is considered to provide noise levels in line with the NOEL, in that noise may be audible but not at a level at which effects on health and quality of life are observed.

The following has been assumed for assessment purposes:

- Room and façade element dimensions are based on typical dimensions for a development of this type: 9m² bedrooms with up to 5m² façade area and 2m² of glazing
- Reverberation time of 0.5 seconds for habitable areas
- Masonry external wall construction
- Mechanical supply and extract ventilation without simple façade openings

Minimum sound reduction values for the glazing elements are presented in Table 4.1, based on commonly available products. Table 4.1 should be read in conjunction with the mitigation mark-up presented as Figure C4 in Appendix C.

Table 4.1: Required Sound Reduction of façade Elements for All Habitable Rooms

Element	Required Sound Reduction (dB)						Indicative Specification
	125 Hz	250 Hz	500 Hz	1kHz	2kHz	Weighted $R_w (R_w + C_{tr}) /$ $D_{n,e,w} (D_{n,e,w} + C_{tr})$	
Specification 1 Southern facing façades – All habitable rooms							
Glazing	27	26	29	39	45	32 (36)	4/15/6.5 Acoustic double glazing
Ventilation	42	37	37	43	57	41 (42)	Ryton AAC125HP acoustic through wall vent
Specification 2 – All other habitable rooms							
Glazing	21	20	26	38	37	32 (28)	4/16/6 thermal double glazing
Ventilation	37	35	32	33	37	33 (34)	Invisivent Evo AK Basic trickle vent

Alternative solutions to the indicative specifications shown in Table 4.1 may be considered if sound reduction performances are equivalent to (or greater than) those stipulated.

The glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing.

Calculations assume one ventilator per bedroom, and two for all other habitable rooms. The stated Invisivent performance is based on a ventilator with a length of 1m. Ventilation provision should be checked against the requirements of Approved Document Part F.

4.3 Mitigation of Overheating

Ambient Noise Levels

With reference to the ADO guidance set out in Section 2, when mitigating overheating, noise levels internally should not exceed 40 dB $L_{Aeq,8hr}$ or 55 dB $L_{Amax,F}$ during the night time (23:00-07:00). Façades should satisfy both the ambient noise level ($L_{Aeq,T}$) and the typical individual noise level requirement (dB $L_{Amax,F}$).

ADO states that for moderate risk locations (i.e. outside of London) the minimum free area of the open window should be at least 4% of the floor area of the room however it is typical to require a minimum free area of at least 5%. As the equivalent free area of a window varies as a function of the floor area, for a typical floor-to-ceiling height of 2.4m, a window open area of 5% of the floor area equates to an external to internal noise reduction of 10 dB.

Based on the above it is assumed that mitigation of overheating can be achieved with partially open windows where façade noise levels do not exceed 50 dB $L_{Aeq,8hr}$ or 65 dB $L_{Amax,F}$ during the night.

The three-dimensional noise model has been used to determine which of the façades across the development are likely to be exposed to noise levels above that which would allow for overheating to be achieved with partially open windows or normal simple façade openings less as set out above.

Figure C6 presents a marked-up drawing indicating ambient ($L_{Aeq,8hr}$) façade noise levels during the night time.

For façades marked blue, mitigation of overheating may be achieved with partially open windows up to 5% of the floor area or simple façade openings, depending on the duration of opening required.

For those façades exposed to noise levels > 50 dB $L_{Aeq,8hr}$ mitigation of overheating should be achieved via mechanical means without partially open windows.

Noise from Individual Events

Figure C7 presents a marked up drawing indicating façades which are predicted to be exposed to noise levels greater than 65 dB $L_{Amax,F}$ during the night time (marked in pink).

For façades marked in pink, noise levels are above the level at which mitigation of overheating may be achieved using partially open windows.

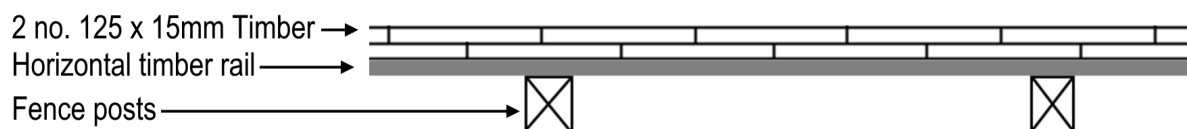
For façades marked in blue, mitigation of overheating may be achieved using partially open windows equivalent to $\leq 5\%$ of the floor area of the room in question.

5 External Amenity Areas

Noise levels in private external living areas have been calculated based on the Cadna-A noise model. To reduce noise levels as far as practicably possible acoustic fencing is recommended at the boundary of private gardens associated with Plots 1, 8, 19, 23 and 24 with a minimum height of 2.4m above ground level.

Acoustic fencing should include a concrete gravel board to prevent gaps at the foot of the fence. The fence itself should be formed of timber or other dense material having a minimum superficial mass $\geq 10\text{kg/m}^2$, and should be free of voids or gaps.

Figure 5.1 below presents a suitable build-up for the proposed noise barrier.



The proposed acoustic fencing locations are presented on the mitigation mark-up included as Figure C4, with a detailed mark-up presented as Figure C8.

6 Summary and Conclusions

A noise impact assessment has been performed for a new residential development on land North of Shaw Lane, Carlton.

A noise survey was undertaken at the site, to assess noise levels in the vicinity of the development. The noise climate was found to be controlled primarily by noise from local and distant road traffic.

A scheme of mitigation is set out in Section 4 of this report to satisfy relevant guideline noise levels for habitable rooms and external amenity areas.

The measures set out in this report are considered to provide suitable control of external noise levels for all habitable areas of the development and demonstrate that noise is not a constraint to the proposed development.

Appendix A – Abbreviations and Definitions

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 μPa).

A-weighting

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T , has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T . $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T . L_{A90} is typically taken as representative of background noise.

$L_{AF \max}$

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

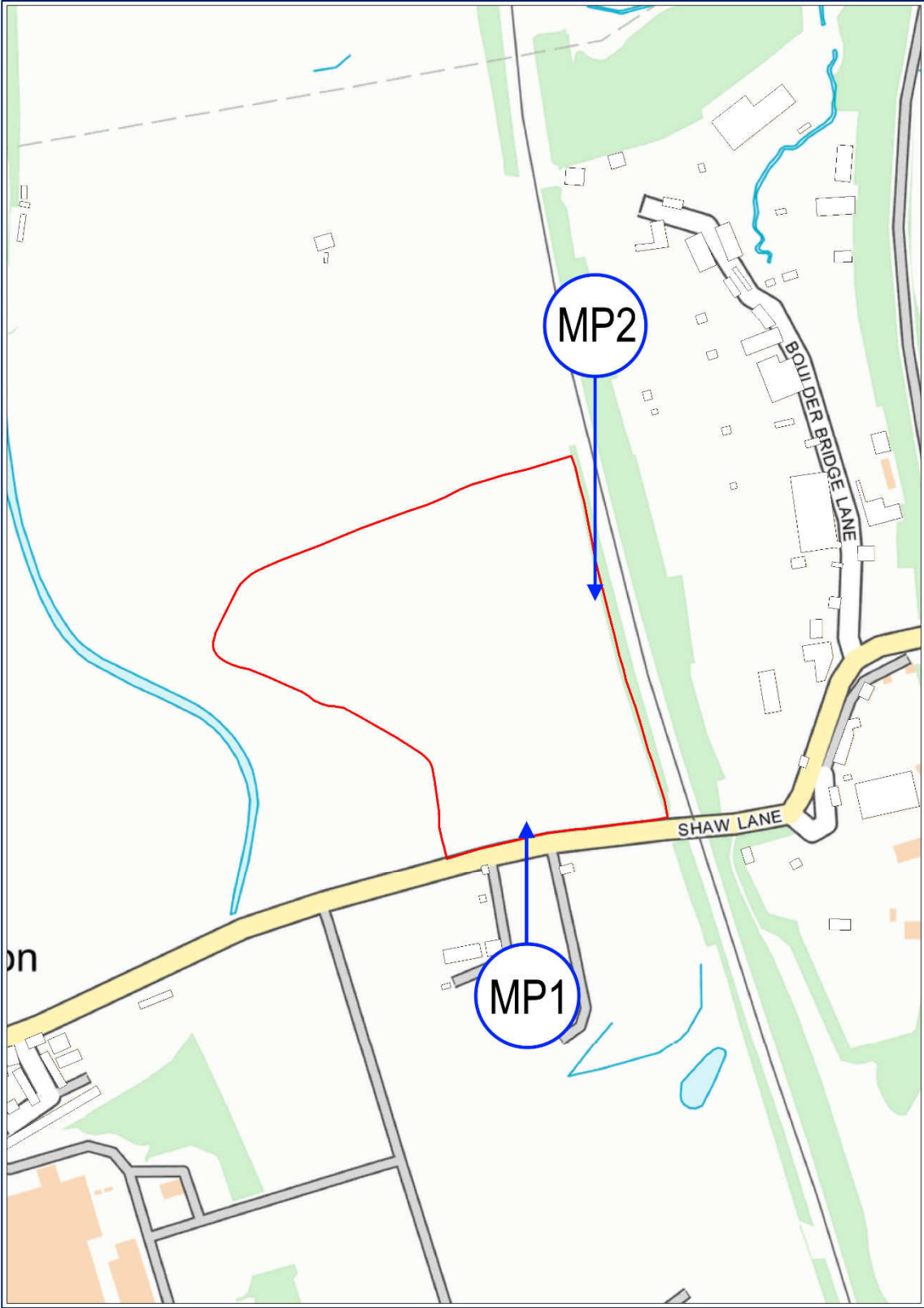
Single Event Level / Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_w)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_w is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix B – Noise Monitoring Positions



Appendix C – Figures

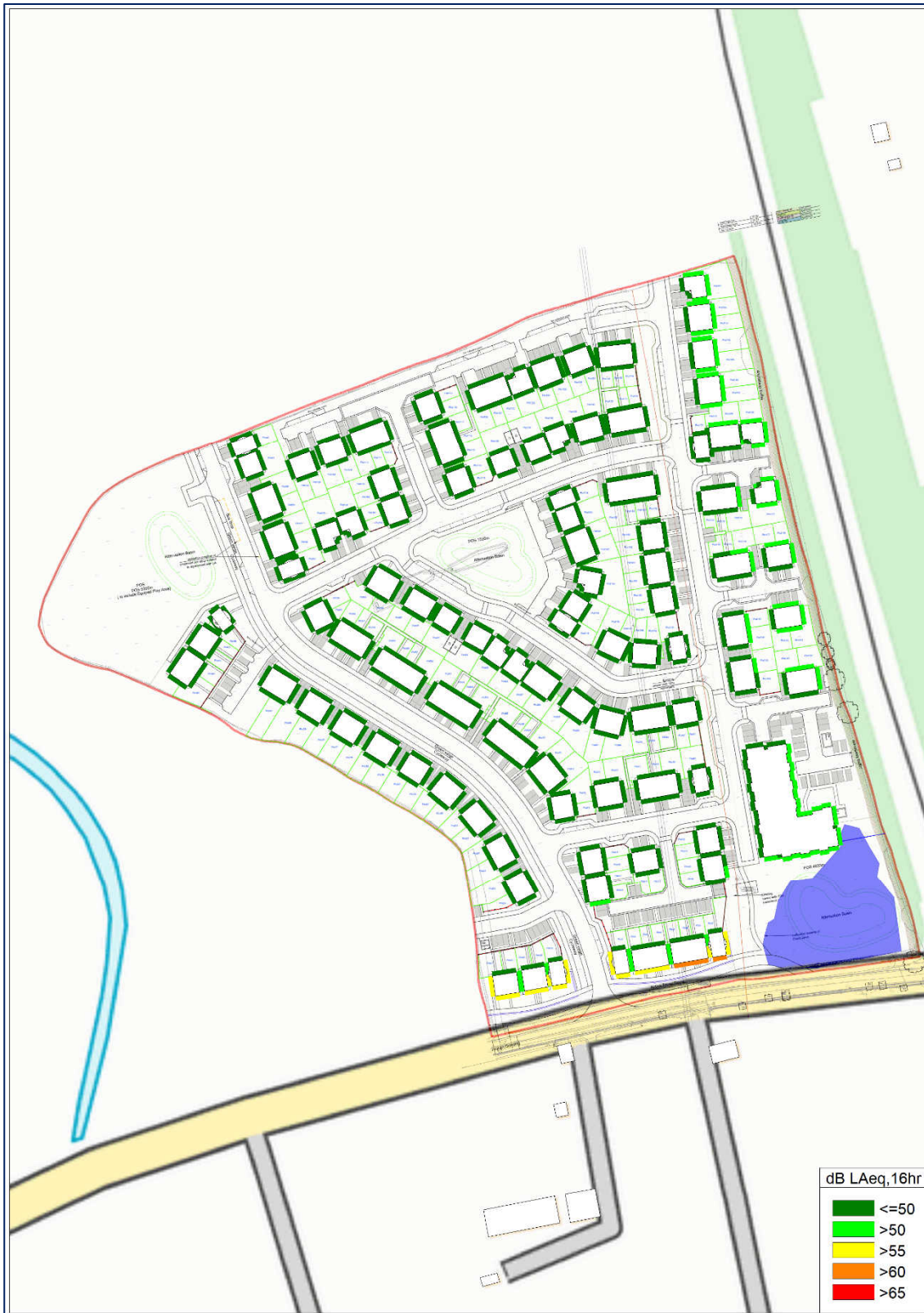


Figure C1: Daytime façade noise levels (dB $L_{Aeq,16hr}$)

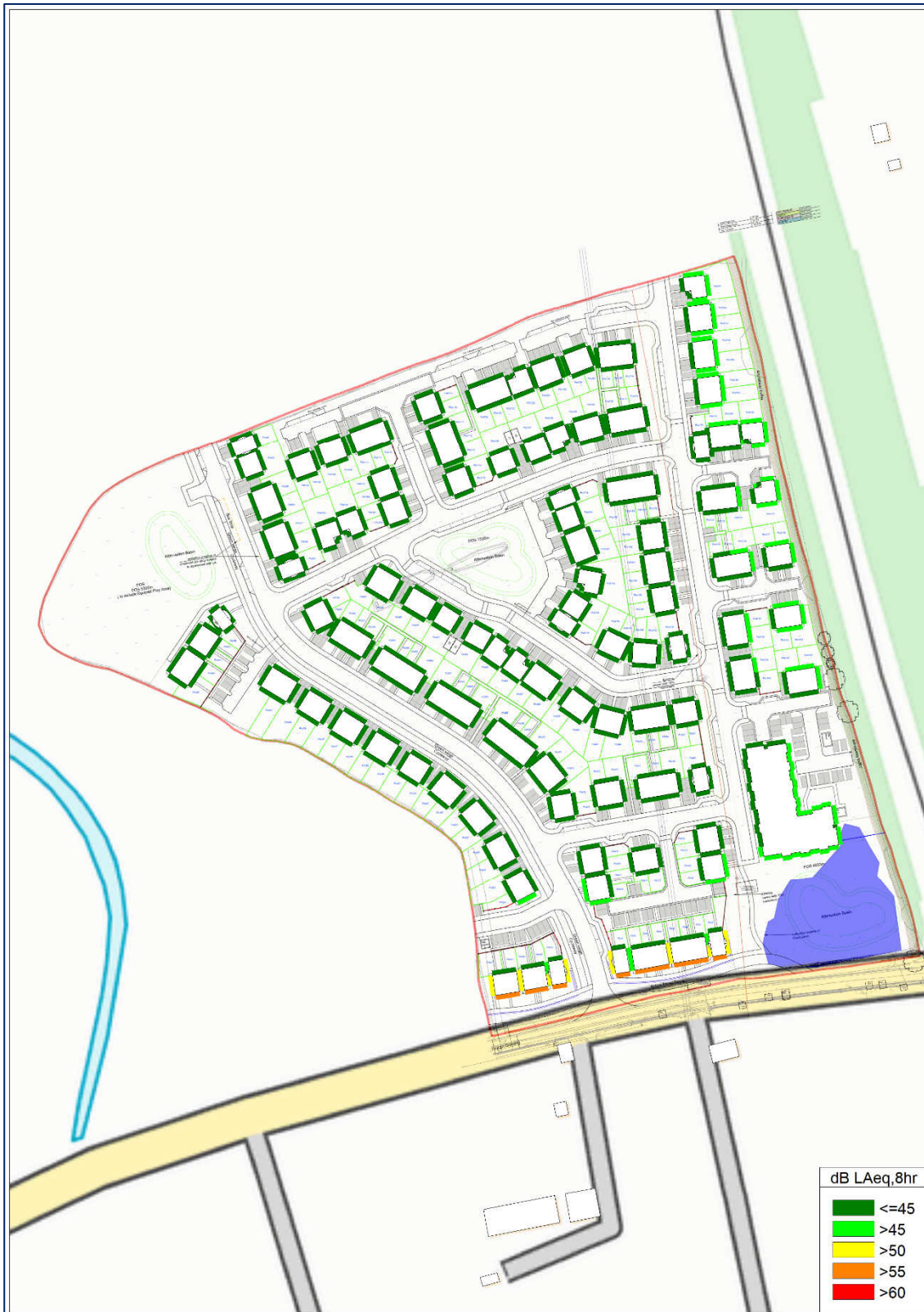


Figure C2: Night time façade noise levels (dB $L_{Aeq,8hr}$)

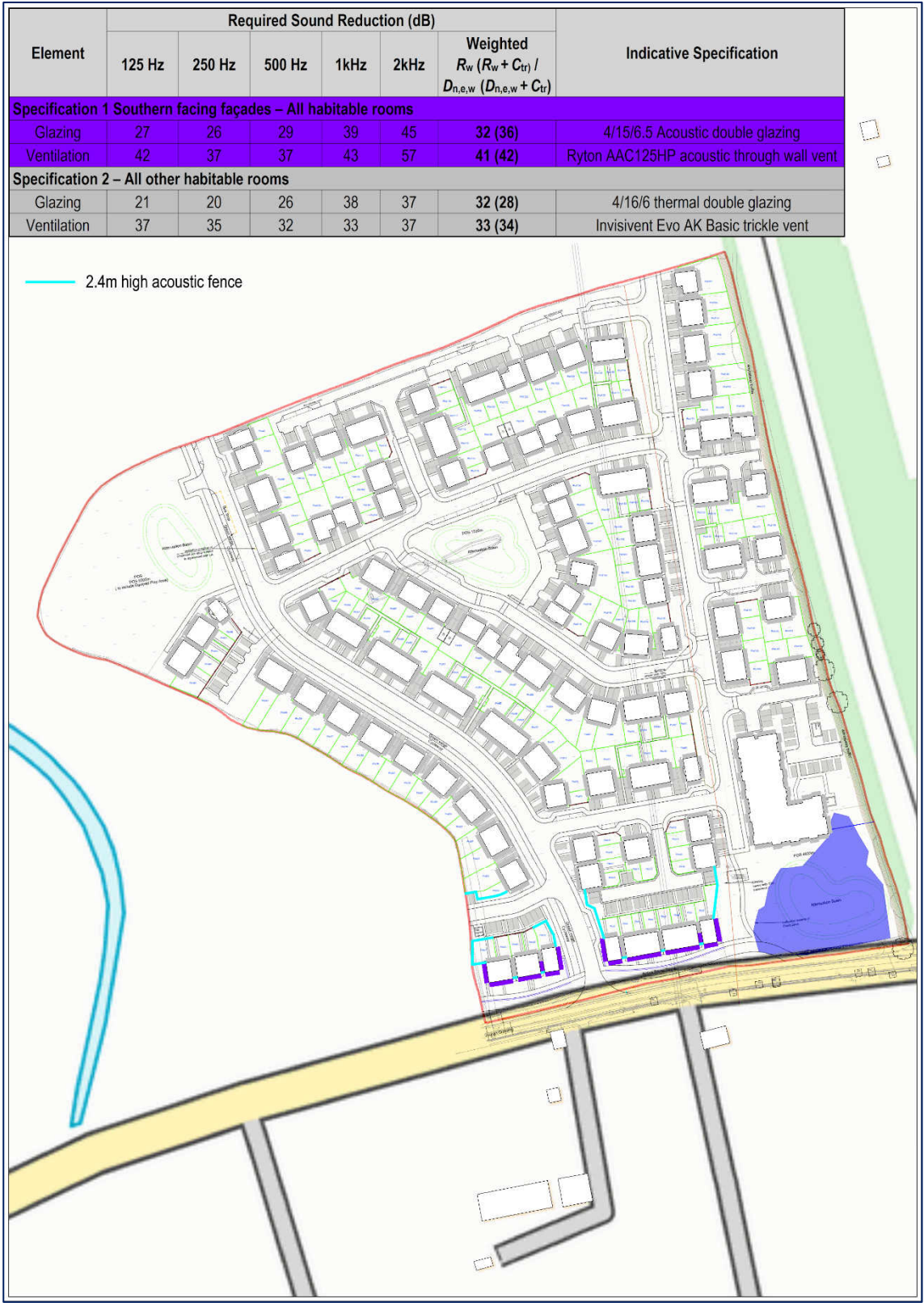


Figure C4: Noise mitigation mark-up



Figure C5: Daytime noise contour plot at 1.5m above ground level

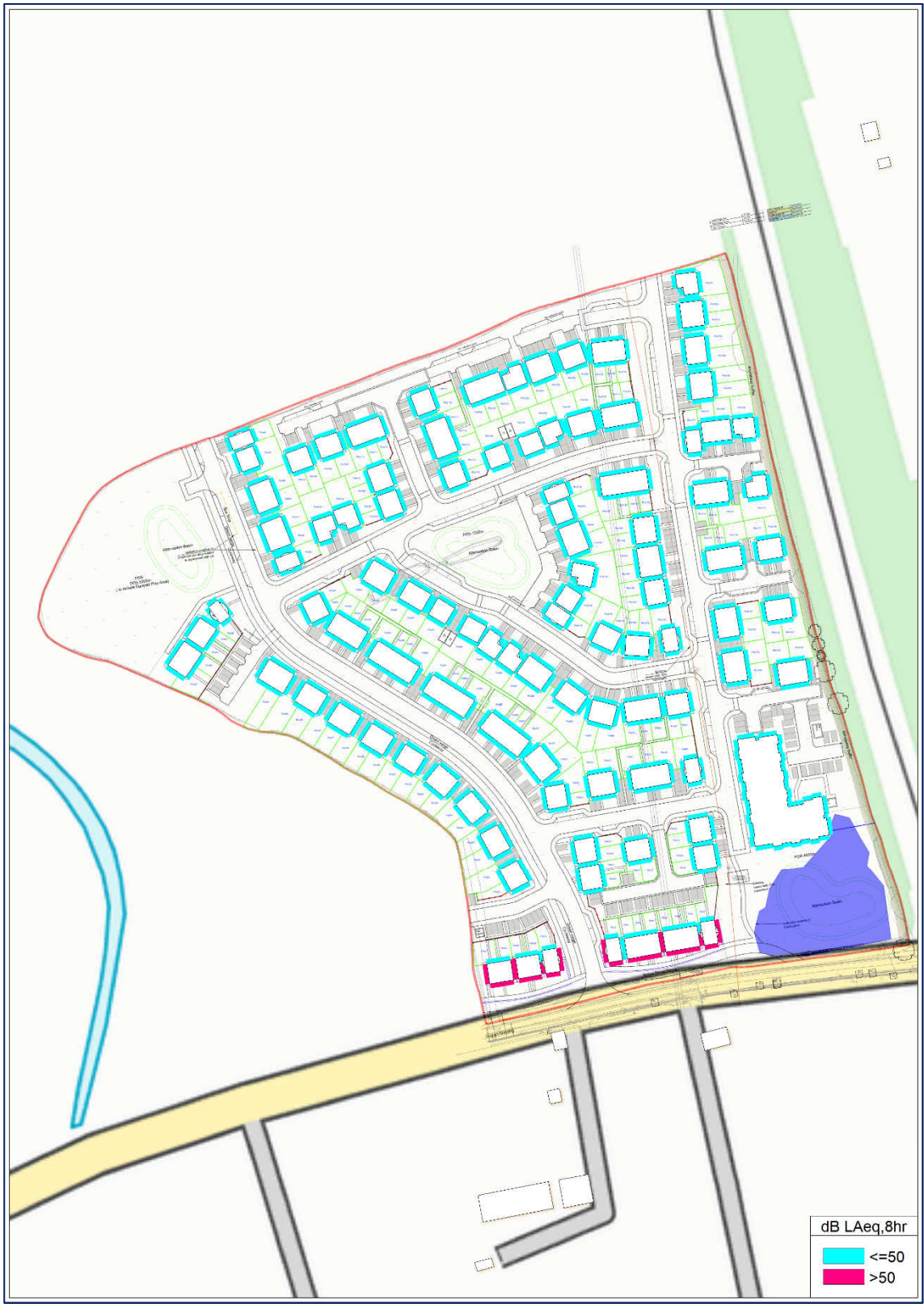


Figure C6: Night time overheating (dB $L_{Aeq,8hr}$)

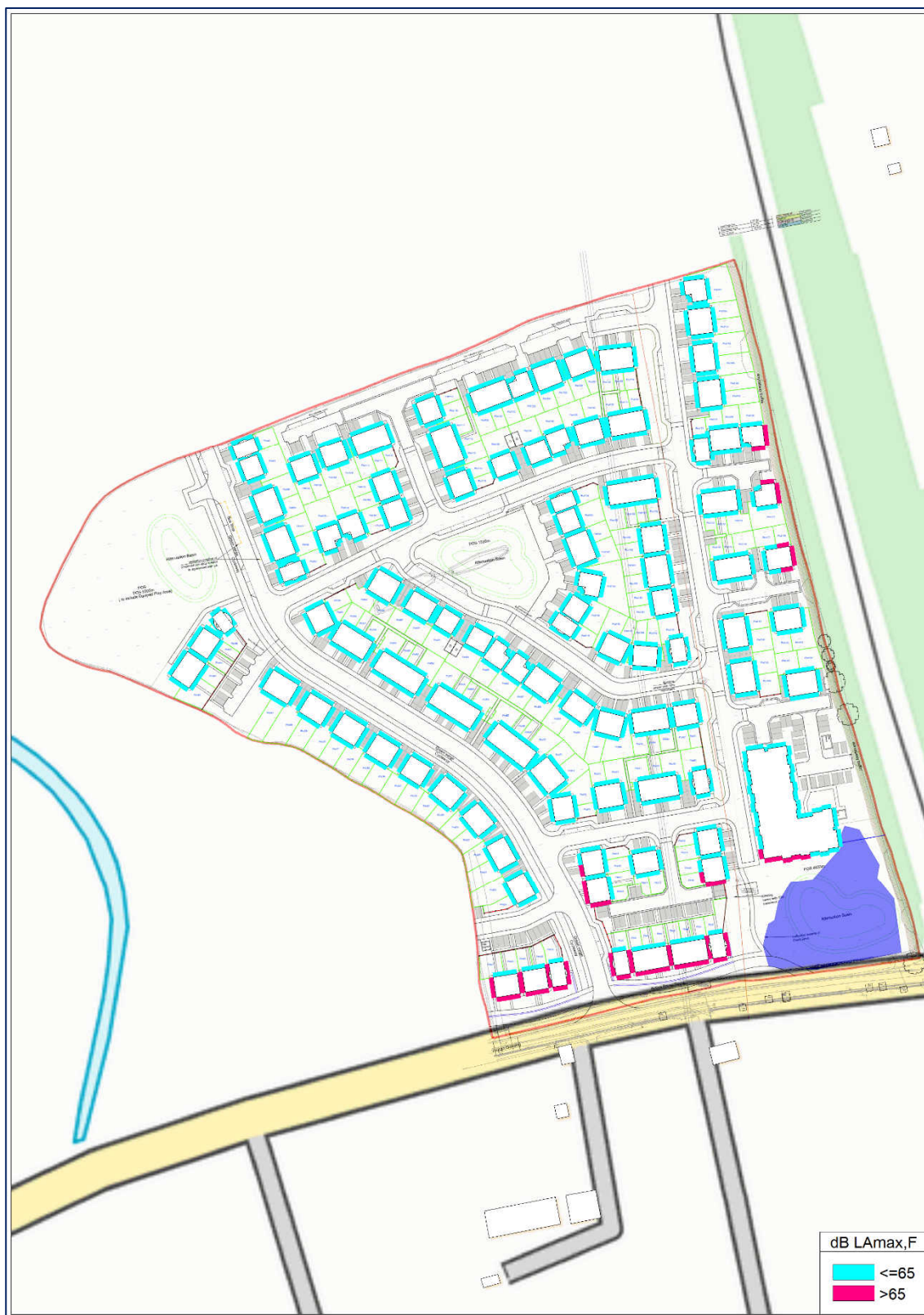


Figure C7: Night time overheating (dB $L_{Amax,F}$)

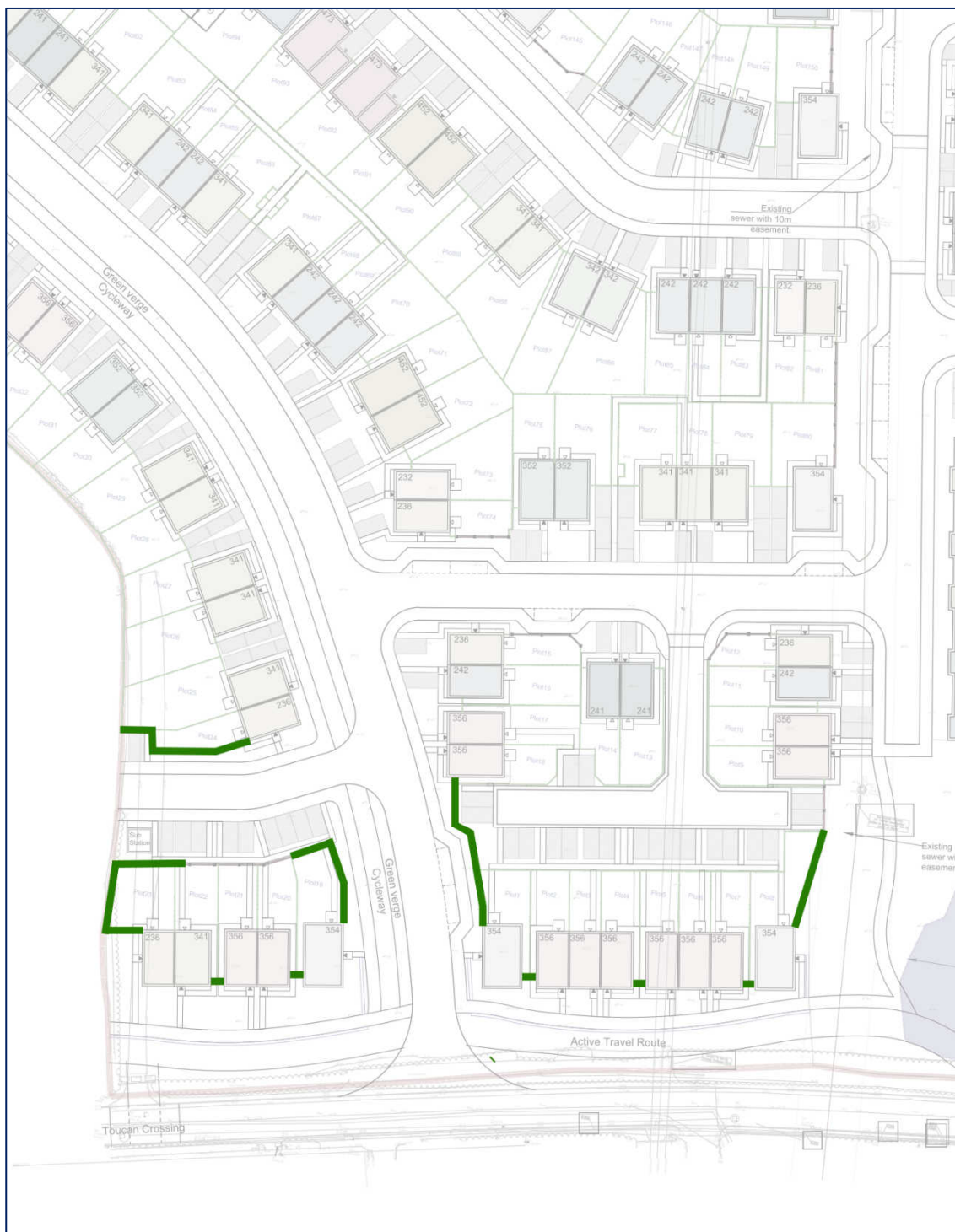


Figure C8: Acoustic fence mark-up