Appendix 6.3

Title	Site Suitability Noise Assessment		
Project	Southleigh, Havant		
Reference	2856.AP.03.02	**Author(s)**	FD
Date	29 May 2025	**Reviewer**	RM

1.0 Overview

1.1 This appendix provides details of the site suitability noise assessment that has been undertaken for the proposed development. The assessment should be read in conjunction with the following accompanying appendices:

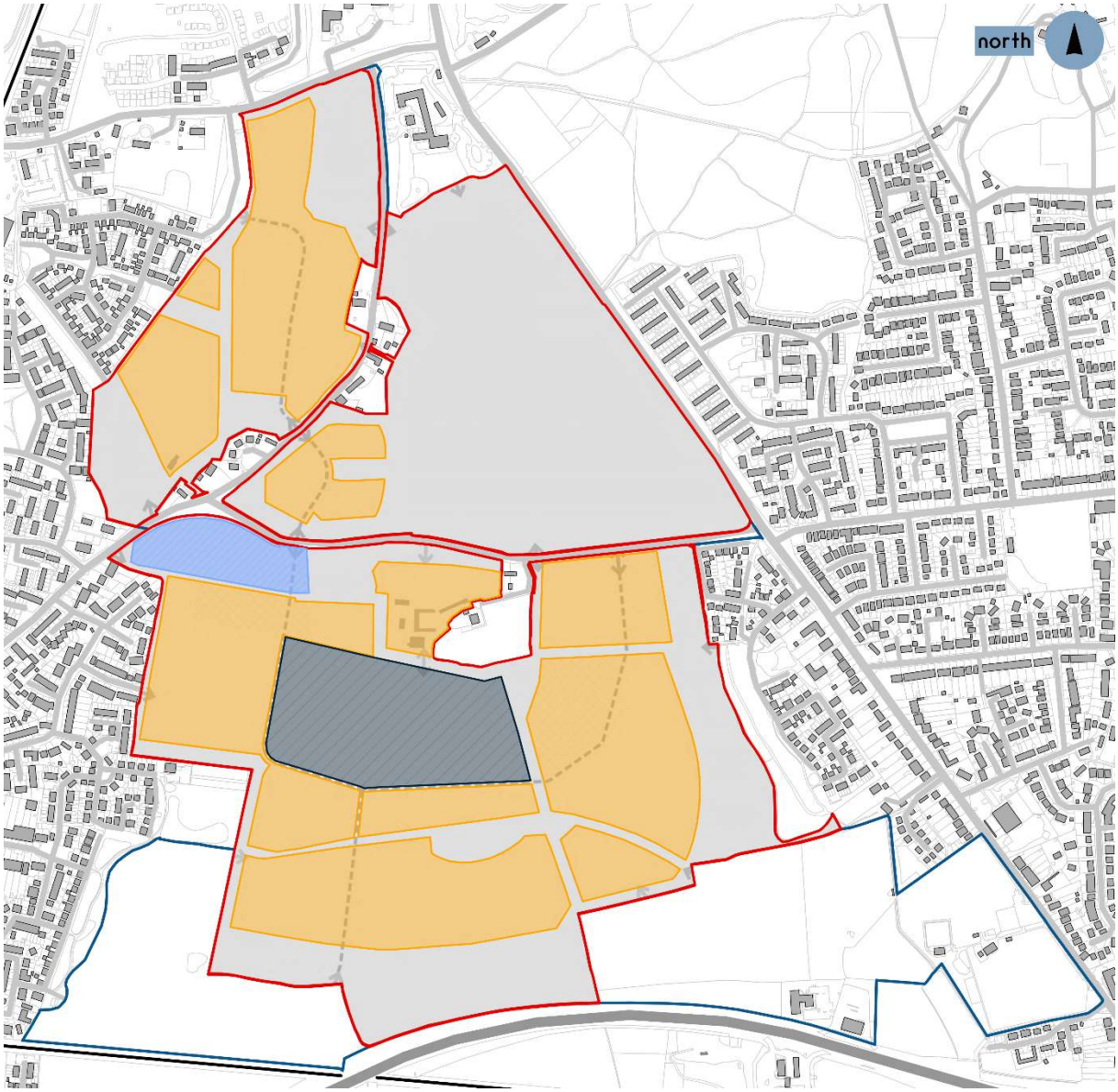
- **Appendix 6.1**: Planning Policy and Guidance
- **Appendix 6.2**: Baseline Noise Survey

1.2 As the application is outline only, the guidance set out in this appendix provides an overview of the various methods available to ensure suitable noise conditions to proposed receptors across the development are achieved. The guidance herein is not necessarily prescriptive and detailed acoustic design development can be expected at the reserved matters stage.

1.3 This assessment has been based on the *Stantec* Land Use Parameter Plan (ref: 333101046-*BL-M-01 Revision C*). The layout, set within the context of the immediate surrounding area is replicated as **Image 1**. It is important to note that as the application is outline in nature, the layout is not prescriptive from a noise mitigation perspective. Other layout options may be suitable, subject to further detailed design and noise assessment works in due course.

Image 1. Land Use Parameter Plan

Application boundary, Allocation boundary, Residential, Residential and education, Local centre and residential



1.4 The site is located to the east of the town of Havant and forms the majority of land proposed for allocation in the emerging Havant Borough Council (HBC) Local Plan, known as "*Building a Better Future*".

1.5 The allocation is known as "*Allocation 1: Southleigh*". It is proposed for residential development with an indicative 2,100 dwellings. The site, of which this report focuses, includes all of the land within the allocation that is controlled by *Bloor Homes*.

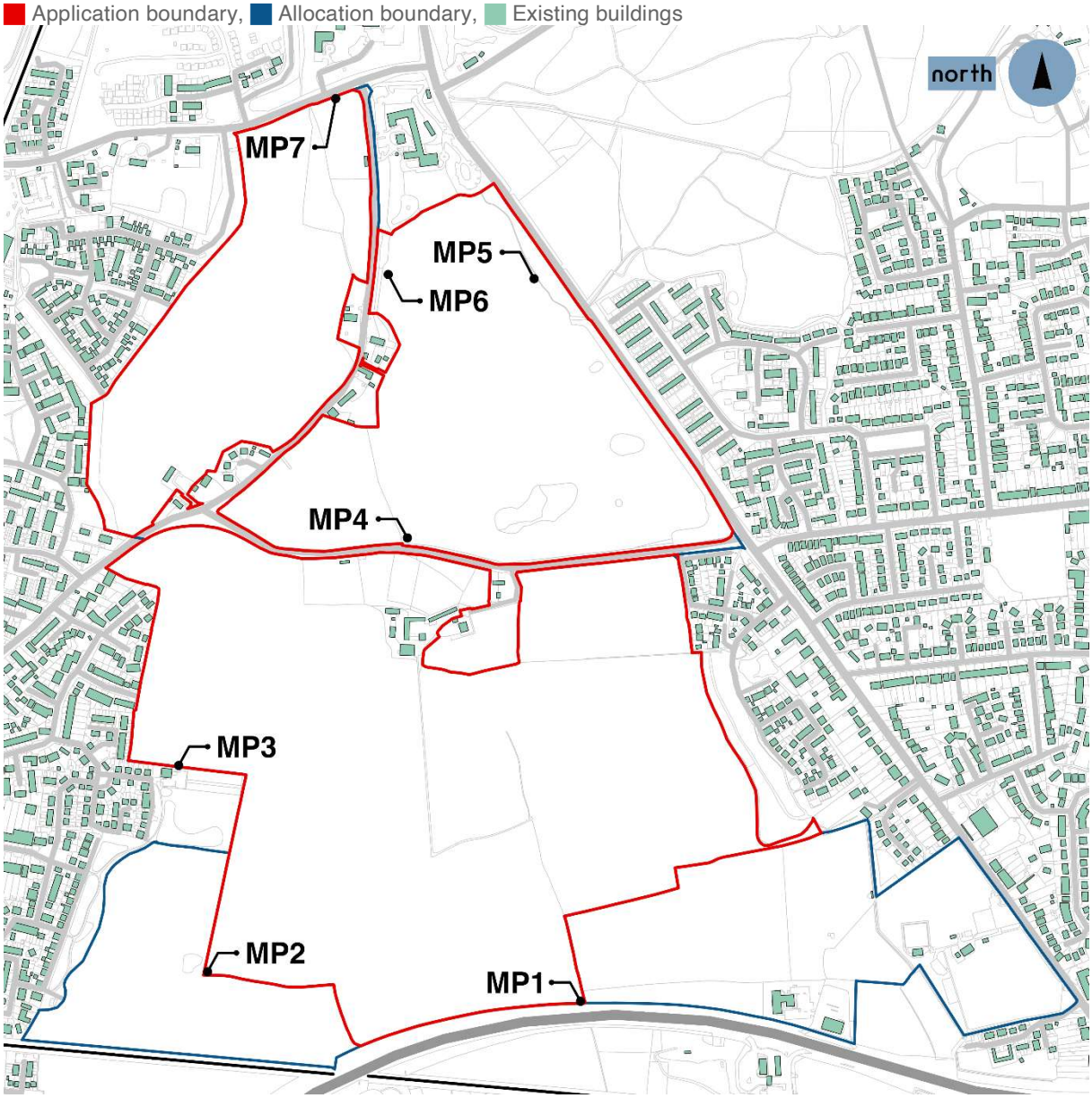
1.6 By implementing a noise mitigation strategy following the principals set out within this appendix, it is expected to be entirely possible to achieve suitable noise conditions for future residents both internally and externally. Noise mitigation measures shall be confirmed at the reserved matters stage as appropriate.

2.0 Noise Climate

Noise Survey

2.1 Noise survey works have been undertaken at the site, as set out in **Appendix 6.2**, with detailed results also provided in that appendix. Unattended noise measurements were taken at the positions indicated in **Image 2**.

Image 2: Unattended noise survey positions



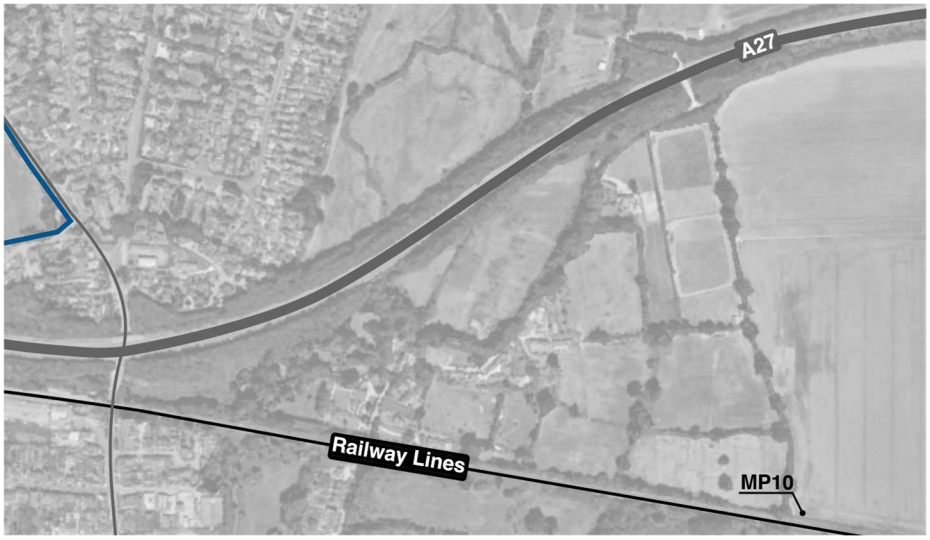
2.2 A summary of the noise levels measured at the unattended positions and used within the noise modelling of the site are presented in **Table 1**.

Table 1 Summary period noise levels measured during the unattended noise surveys

Measurement Position	Daytime (0700-2300)	Night-time (2300-0700)	
	$L_{Aeq,16hr}$	$L_{Aeq,8hr}$	L_{Amax}
MP1: A27	67	63	78
MP2: A27 / Railway line	54	50	58
MP3: Stride Community Centre	51	49	55
MP4: Southleigh Road	59	50	70
MP5: Horndean Road	54	50	65
MP6: Eastleigh Road	52	47	61
MP7: Bartons Road	57	51	65

2.3 Measurements of train passbys were taken on a public footpath at position MP10 to the east of the site indicated in **Image 3**.

Image 3. MP10 location



Aerial image courtesy of *Google Maps*

2.4 Using the results of the train passbys and train timetable information, day and night-time noise levels from the railway lines have been quantified and used within the noise modelling (measured noise data was converted to single event levels, SELs, and then extrapolated as appropriate). These noise levels are detailed in **Table 2**. Further guidance on the prediction methodology used can be provided on request.

Table 2 Calculated railway noise levels

Measurement Position	Daytime (0700-2300)	Night-time (2300-0700)	
	$L_{Aeq,16hr}$	$L_{Aeq,8hr}$	L_{Amax}
MP10: Railway lines	61	57	83

Noise Sources

2.5 During the noise surveys, the following potential noise sources were considered (noting that not all were concluded to be significant for consideration):

- A27 (Havant Bypass),
- Railway lines to the south,
- Southleigh Road running through the site,
- Eastleigh Road running through the site,
- B2148 (Horndean Road) along the eastern boundary,
- Bartons Road along the northern boundary,
- Stride Community Centre on the western boundary,
- A27 service station to the south,
- Emsworth recreational ground to the southeast which includes a bowling green, tennis courts, a skatepark and a playground, and
- Havant Rifle Club to the northeast.

2.6 The noise levels across the site were noted to be controlled by the surrounding road network; notably the A27 to the south, Horndean Road to the east, Bartons Road to the north and Eastleigh Road and Southleigh Road both of which intersect the site. Noise levels from the railway line had minimal impact on the land controlled by *Bloor Homes*.

2.7 The results of the noise surveys and observations on site suggest that the activities from the Havant Gun Club, the Stride Community Centre, Emsworth Recreational Ground and the A27 service station are not readily discernible above the ambient noise climate in the areas of the site neighbouring them. If necessary, further consideration of noise from these sources can be given at the reserved matters stage however they are not expected to be significant.

Noise Modelling

Software

2.8 A computer-based noise prediction program (*Wölfel* IMMI version 24) has been used to determine the noise levels generated across the site by the various noise sources, using CRTN[1] and ISO9613[2] as a basis to determine noise propagation paths throughout the model.

2.9 This software allows for the calculation of noise levels at specific points around a model, from a series of noise sources simultaneously, or produce noise contour plots. The noise model used has taken account of the following effects:

- Distance,
- Screening,
- Surface reflections,
- Topography, and
- The surrounding built up area.

2.10 The noise sources within the noise model have been calibrated as best as is reasonably practicable to the levels measured during the various noise survey works that have been undertaken for the scheme.

Noise Modelling Assumptions and Limitations

2.11 As the design for the scheme is outline in nature at this stage, assumptions have been made to allow for effective noise modelling to be undertaken. To consider potential noise mitigation

[1] CRTN – Calculation of Road Traffic Noise, Department of Transport, 1988
[2] ISO 9613-2:2024 - Acoustics - Attenuation of sound during propagation outdoors - Part 2: Engineering method for the prediction of sound pressure levels outdoors

options, hypothetical buildings have been introduced within the noise model, set approximately on the worst affected parcels identified for residential development on the previously noted land use parameter plan in **Image 1**.

2.12 The following building heights (taken from local ground level to the tallest point) have been used with the noise model:

- Houses: 8 m
- Garages: 3.5 m

2.13 The following window heights (to centre of windows) have been used within point calculations at the proposed building façades to determine the likely required façade noise mitigation:

- Ground Floor: 1.5 m
- First Floor: 4.5 m

2.14 Noise contour plots illustrating baseline noise levels across the site are presented as **Image 4** and **Image 5** for daytime and night time respectively.

Image 4. Daytime baseline noise contour plot

Daytime $L_{Aeq,16hour}$ noise levels across undeveloped site at 1.5 m above local ground level

<40, ≥40 to 45, ≥45 to 50, ≥50 to 55, ≥55 to 60, ≥60 to 65, ≥65 to 70, ≥70

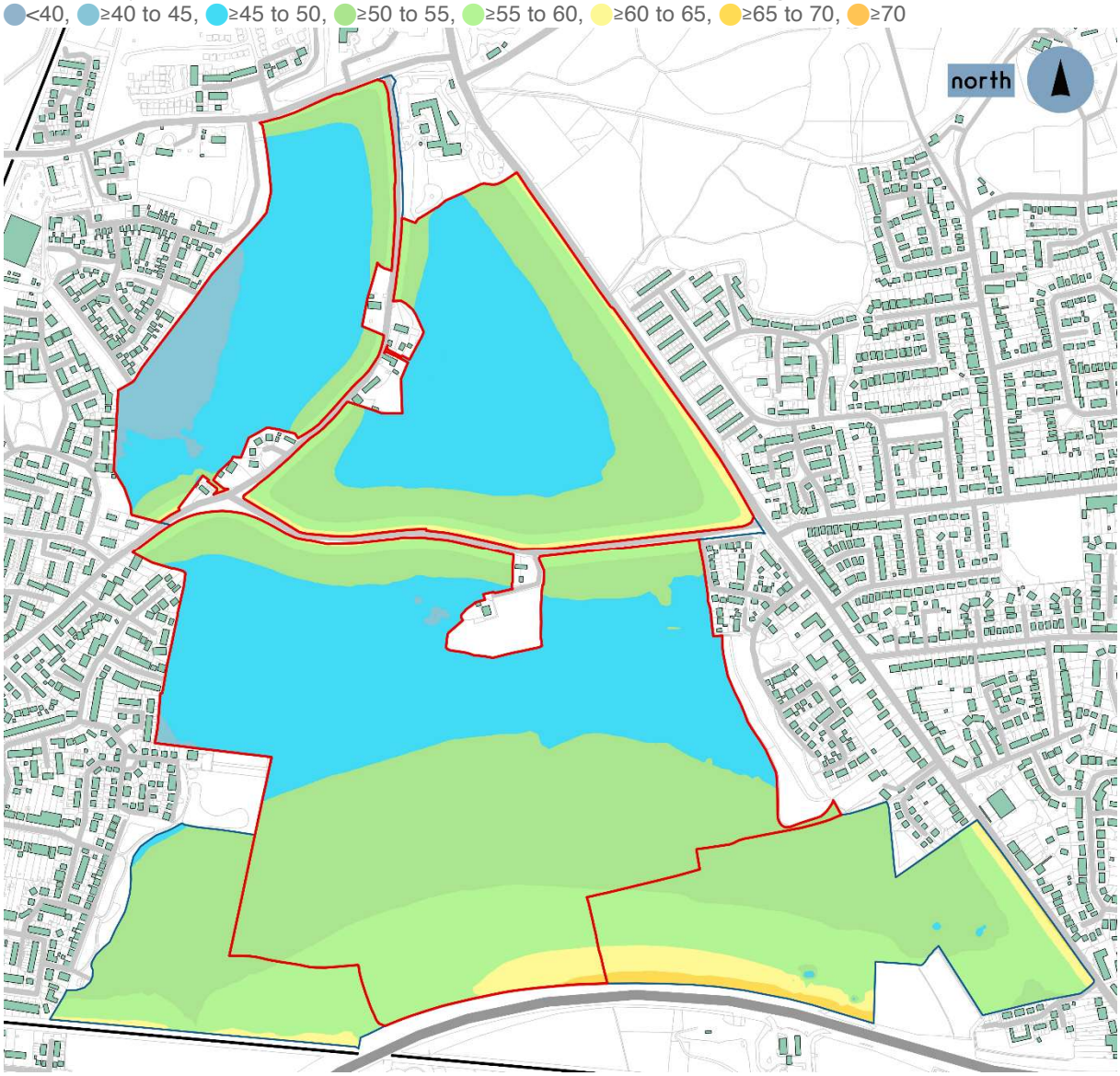
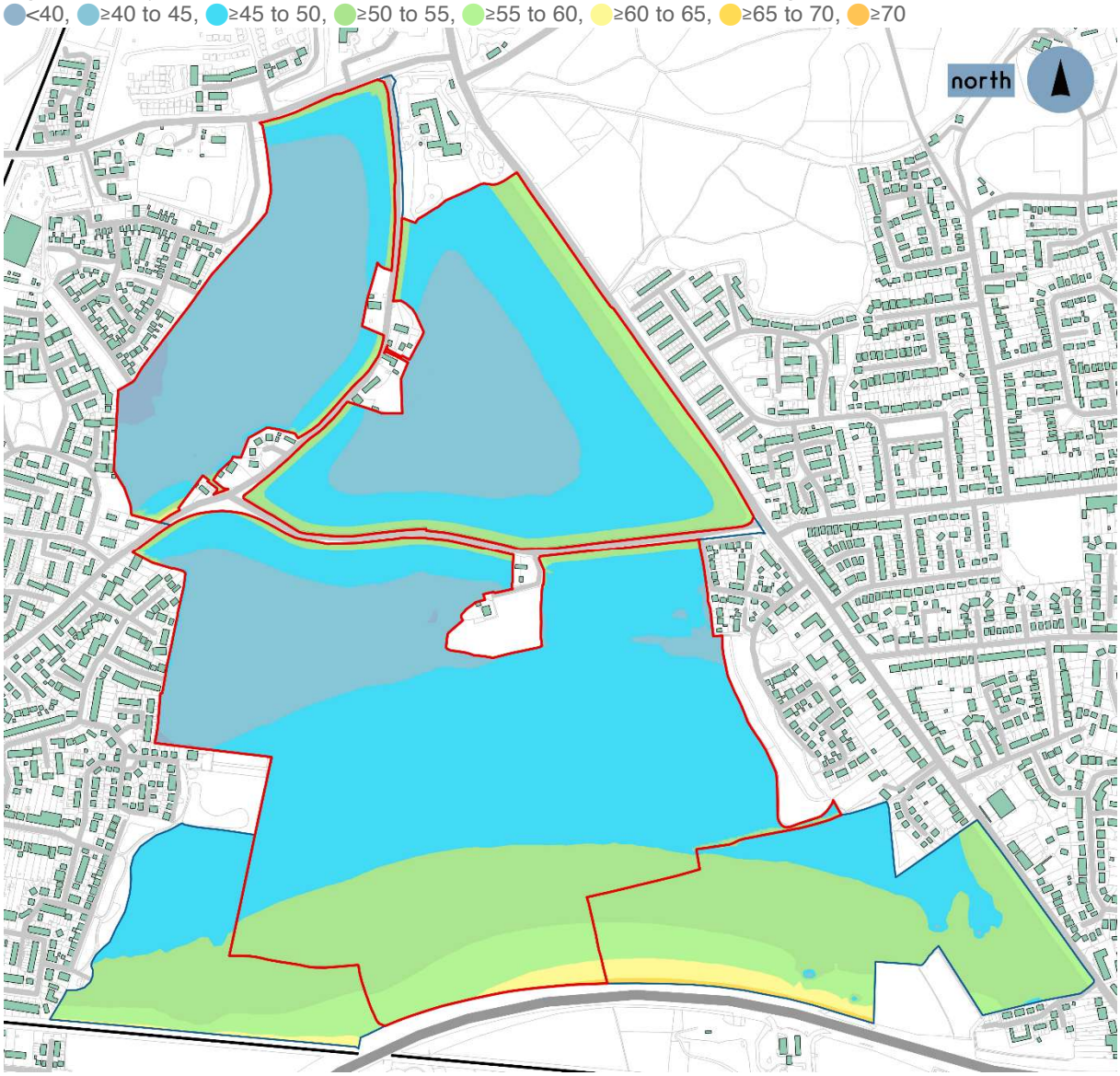


Image 5. Night time baseline nosie contour plot

Night time $L_{Aeq,8hour}$ noise levels across undeveloped site at 4.5 m above local ground level



3.0 Assessment Criteria

New Residential Receptors

3.1 The assessment criteria set out in **Table 3** has been adopted, considering the relevant national and local planning policy and guidance, as set out within **Appendix 6.1**.

Table 3 Noise assessment criteria

Location	Time Period	Single Number Criterion, dB	Noise Index	Note(s)
Habitable rooms (internal)	0700-2300	≤ 35	$L_{Aeq,16hour}$	-
	2300-0700	≤ 30	$L_{Aeq,8hour}$	-
		≤ 45	$L_{Amax,F}$	Not normally exceeded more than 10 times per night
External amenity areas (external)	0700-2300	≤ 55	$L_{Aeq,16hour}$	**Aspirational** upper threshold to be achieved where practicable

3.2 In addition to the above, The Building Regulations Approved Document O: Overheating (ADO) was published in December 2021. It sets out overheating mitigation requirements for new buildings and has a requirement for noise to be considered when ensuring occupants' "*reasonable enjoyment*" of their dwellings.

3.3 It is noted that compliance with the Building Regulations is not a matter for planning, however the requirements of ADO in relation to noise are intrinsically linked to the considerations that apply when undertaking noise assessments for residential development. To follow the good acoustic design practices and an aspiration for more sustainable/energy conscious developments, the requirements of the ADO have been considered.

3.4 Taking into account the above and the location of the site, where external noise levels exceed 50 dB $L_{Aeq,8hour}$ and / or 65 dB $L_{Amax,F}$ during the night-time period, it will be necessary to provide a building overheating control strategy that does not necessarily rely solely on partially open windows to bedrooms. This approach is based on the simplified method set out within acoustics industry guidance and may be subject to change should the guidance be revised.

Education Provision

3.5 Noise to the potential school sites has been considered in respect of the relevant noise intrusion criteria set out within Building Bulletin 93: Acoustic design of schools (BB93).

3.6 To provide an indicator of site suitability at this stage, the internal ambient noise level requirement for a primary school classroom under natural ventilation conditions (40 dB $L_{Aeq,30minues}$) can be considered. This relates to a free field external noise level of circa 53 dB $L_{Aeq,30minues}$ when considering initial feasibility and taking a typical loss of 13 dB(A) through a partially open window.

3.7 It is noted that the developer of the school site may opt to use a strategy of mechanical or hybrid ventilation which would mean glazing and other façade elements could be specified to control significant higher levels of noise intrusion. For this reason, the proposed school sites should be considered less noise sensitive than the proposed residential areas.

4.0 Good Acoustic Design Considerations

4.1 To control noise to the proposed development, optimisation of the site layout at an early stage has been considered, balancing the need to maximise the developmental potential of the site, the control of noise and considering other non-acoustic related factors, such as visual and other technical constraints.

4.2 Where practicable, buffer zones have been included between the road network and prospective residential areas to reduce the levels of noise that future residents will experience.

4.3 Continuous roadside acoustic screening adjacent to key road links affecting the site (in particularly the A27) was not considered practicable nor desirable for this site due to visual constraints and the topography of embankment on which the A27 passes the site.

4.4 Instead, the intent shall be either to orientate buildings to screen garden areas where practicable (balanced against the access requirements for the plots) or, where this is not possible, the potential for localised screening is considered to gardens (discussed later in this report).

5.0 Outline Noise Control Measures

Overview

5.1 The noise mitigation guidance and specifications provided in the following sections are presented to demonstrate how the site can be made entirely suitable for residential development in respect to the control of noise to proposed receptors. Further assessment will be required at the reserved matters stage to confirm mitigation specifications.

Assumptions

5.2 For the purposes of this assessment, it has been assumed that dwellings across the site will utilise a cavity masonry façade construction. This does not preclude the use of alternative lightweight constructions if there is a subsequent preference to do so, but Suono must be consulted to verify that any such proposed construction offers the required sound insulation performance.

5.3 Typical internal room dimensions have been taken as follows (expected to be suitably representative of the dwellings typically proposed by the developer):

- Living Rooms: 5 m x 4 m x 2.7 m with 5 m^2 of glazing
- Bedrooms: 4 m x 3 m x 2.7 m with 1.8 m^2 of glazing

5.4 For the purposes of calculation, it has been assumed that living rooms would be provided with up to three trickle ventilators, and with up to two in bedrooms.

5.5 The above dimensions/assumptions should not be taken as limitations, but rather reasonable figures used for the purposes of the assessment given the variability of dwelling design. These figures should be reviewed at the detailed design stage as appropriate.

Control of External Noise Levels

5.6 External noise levels across the site are such that it should be possible to provide areas achieving levels not exceeding the relevant aspirational criterion of 55 dB $L_{Aeq,16hr}$ in all external amenity areas, subject to the implementation of specific mitigation measures.

5.7 The noise contour plot shown previously as **Image 4** indicates the expected levels of noise during the daytime at 1.5 m above local ground level without screening provided by the development.

5.8 The vast majority of the site is already subject to external noise levels less than 55 dB $L_{Aeq,16hour}$ during the daytime (in most areas significantly less).

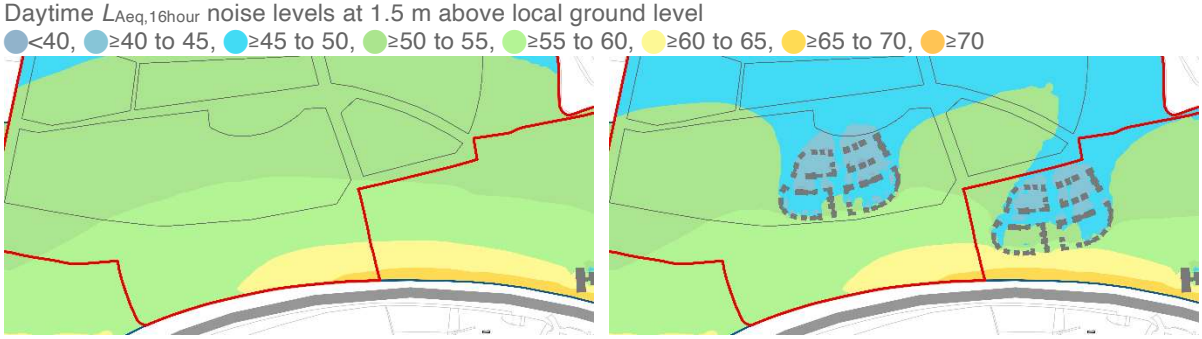
5.9 In areas closer to the noise sources affecting the site, as mentioned previously, dwellings should be oriented such that external amenity areas are screened from the nearby noise sources.

5.10 The suitability of screening external amenity areas using dwellings is demonstrated in **Image 6**. The same area to the south of the site in close proximity to the A27 is presented both with and without an example housing layout. As can be seen from the image, noise levels in areas that are screened from the nearby noise sources reduce significantly to within the external amenity area criteria.

Image 6a. Baseline noise levels

Image 6b. Levels with example housing layout

Daytime $L_{Aeq,16hour}$ noise levels at 1.5 m above local ground level



5.11 Any large gaps between dwellings may need to be closed through the introduction of appropriate height fences/brick walls.

5.12 Verification as to the need for these barriers will be determined upon receipt of a final development layout. If deemed to be necessary, these screening elements must provide a mass of 10 kg/m^2 across their total surfaces, with no gaps or holes, including at the base.

5.13 The example above should be taken as a demonstration of the principles behind screening using barriers and dwellings, and not firm requirements.

5.14 Further detailed consideration of external amenity noise can be given at a later stage, however, it is expected that it will be possible to control noise to most, if not all, external amenity areas within the prospective residential areas of the land use parameter plan such that the relevant noise criterion can be met.

Control of Internal Noise Levels

Partially Open Windows

5.15 Based on the baseline noise modelling undertaken to date and on the assumption that a partially open window can provide a loss from free field external noise levels to reverberant noise levels internally of approximately 13 dB(A), is expected to be possible to achieve the relevant internal noise criteria within proposed dwellings across the majority of the site with partially open windows. This is once screening is taken into account from proposed dwellings closest to the nearby noise sources once a layout has been developed to a suitable stage.

5.16 Where it is not practicable to achieve the relevant internal noise criteria with windows partially open, suitably specified glazing and ventilation elements will be proposed to ensure the criteria can be achieved with windows closed.

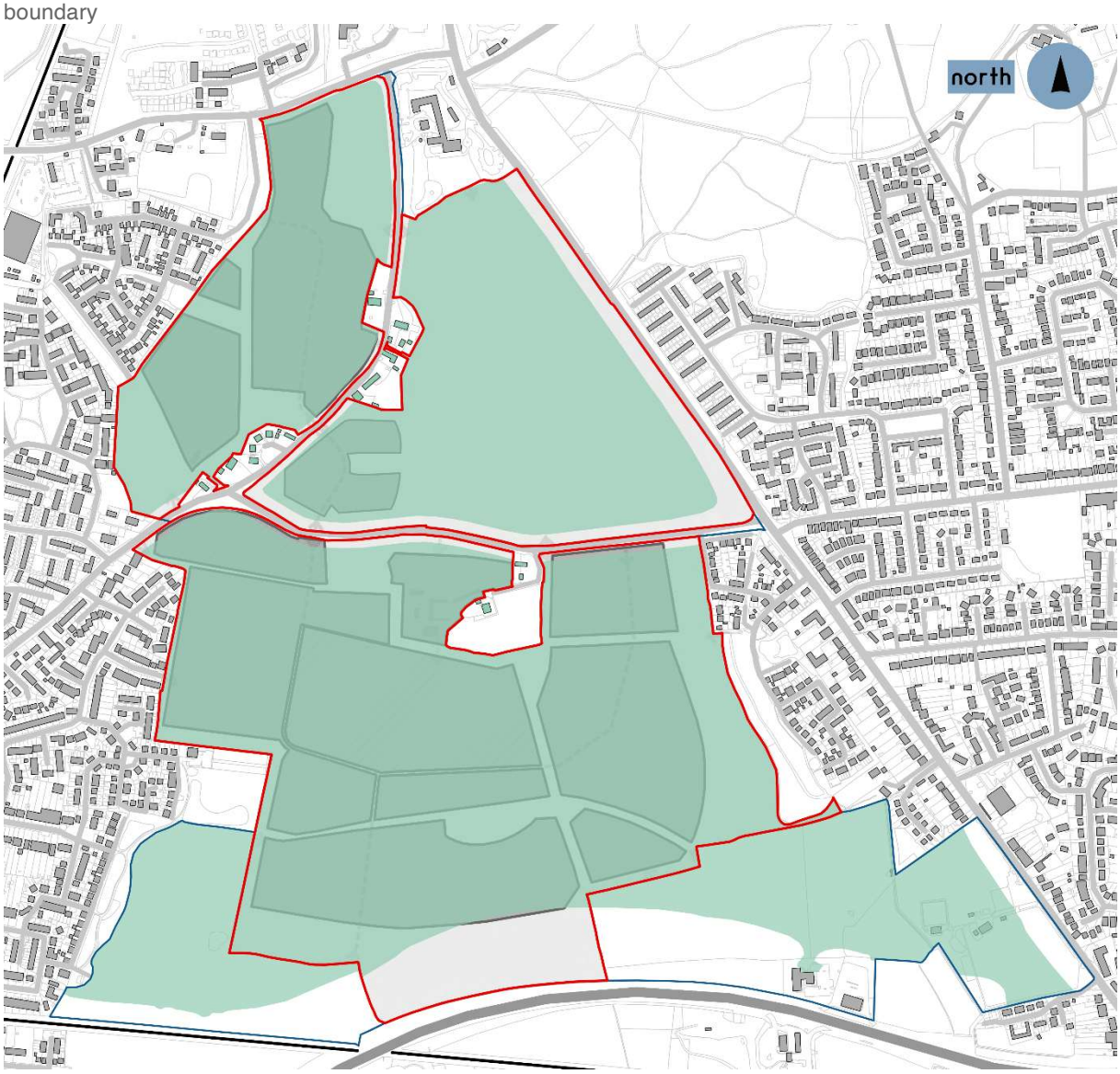
Control of Noise Intrusion Through Façade Based Measures

5.17 To provide an initial indication of what façade mitigation measures may be required across the site, **Image 7** indicates the areas where the use of standard thermal double glazing (typically expected to achieve a performance of circa R'_w 30 dB) and non-acoustic direct path trickle vents (typically expected to achieve a performance of circa $D_{ne,w}$ 35 dB) will be sufficient to control noise intrusion to dwellings.

5.18 The figure should not be taken as a constraint, and does not include the noise screening effects of any build form across the development. The above noise control strategy can be expected to be sufficient for a significant proportion of the site, once the screening effects of the proposed dwellings are taken into account.

Image 7. Area where no acoustically enhanced façade mitigation will be required

Standard thermal glazing and non-acoustic direct path trickle vents. Application boundary, Allocation boundary



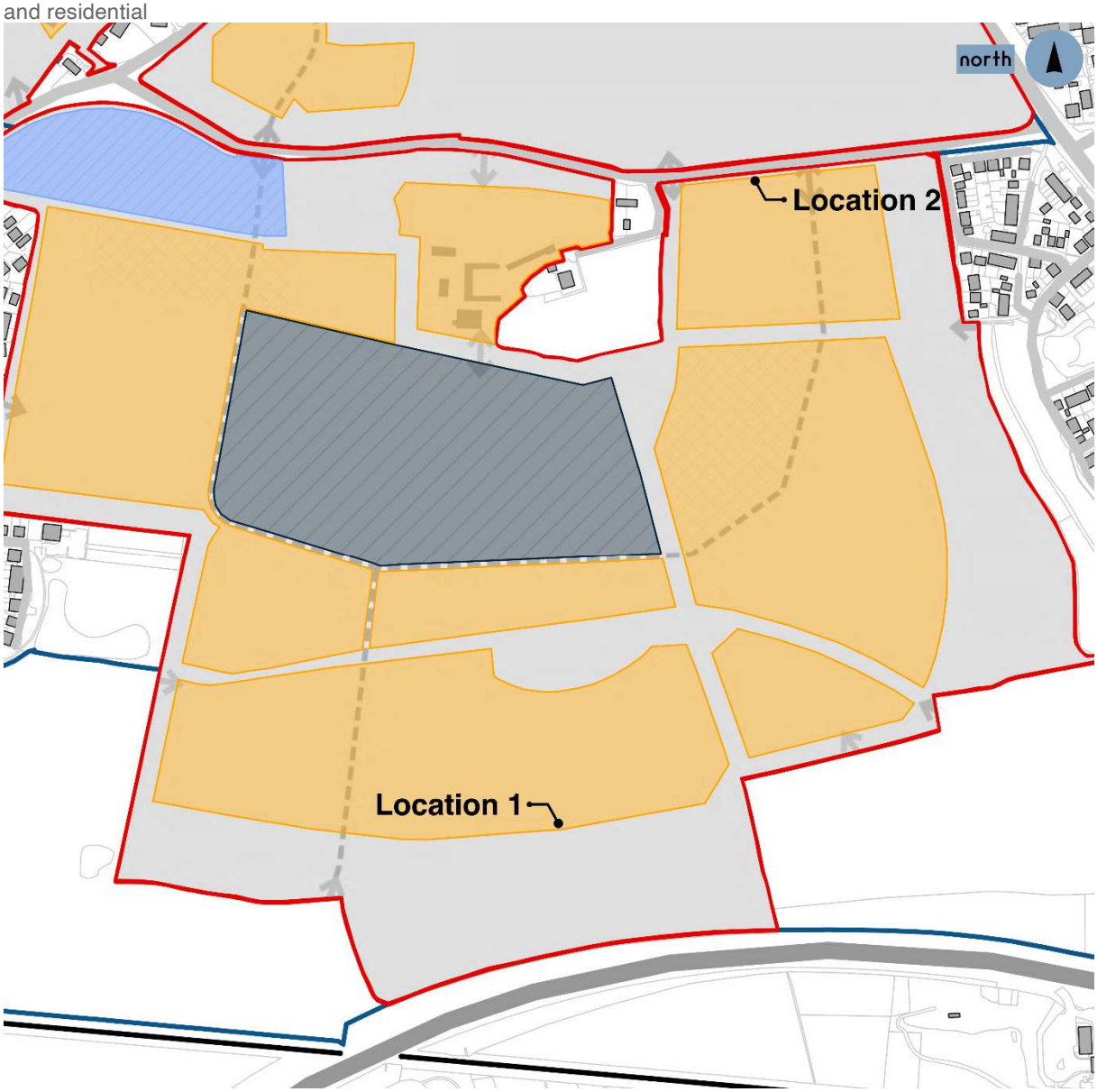
5.19 In prospective residential areas outside of the regions identified in green, marginally acoustically enhanced glazing and ventilation specifications may be required, however the extent and exact specification of these will depend on the final site layout. Further details of façade mitigation where necessary will be provided at reserved matters stage.

5.20 Hypothetical dwellings have been considered in some prospective residential areas to demonstrate how façade mitigation measures can be successfully used to control noise intrusion to dwellings. Mitigation specifications are not prescriptive and are subject to change, depending on the final site layout.

5.21 The locations of these hypothetical dwellings are indicated in **Image 8**.

Image 8. Hypothetical dwelling locations for noise intrusion calculations

Application boundary, Allocation boundary, Residential, Residential and education, Local centre and residential



Glazing

5.22 It may be necessary to allow for glazing of a specification beyond that of standard thermal double glazing to the residential facades/dwellings most exposed to noise from Southleigh Road. The acoustic performance requirements for these enhanced specifications are set out within **Table 4**.

Table 4 Acoustic performance of enhanced glazing

Hypothetical location	**Typical Glazing Configuration**	**Apparent Sound Reduction Index, *R*' dB at Octave Band Centre Frequency, Hz**					
		125	**250**	**500**	**1k**	**2k**	**4k**
Location 2	6 mm glass, 16 mm gap, 4 mm glass	22	22	28	39	39	42

5.23 Standard thermal double glazing (typically expected to achieve a performance of circa R'_w 30 dB) will be suitable to control noise intrusion to the hypothetical dwelling at location 1.

Ventilation

5.24 Non-acoustic direct path trickle vents (typically expected to achieve a performance of circa $D_{ne,w}$ 35 dB) will be sufficient to control noise intrusion to the hypothetical dwellings at locations one and two.

5.25 It is anticipated that dwellings shall employ mechanical extract ventilation (MEV) systems designed to meet the requirements of the Building Regulations Approved Document F, with trickle ventilators and continuously running mechanical extract fans in wet rooms/bathrooms, or full mechanical ventilation if there is a preference to do so.

5.26 The ventilation strategy for the proposed dwellings must be considered in further detail once the scheme's layout is fixed. It may be able to utilise open windows in certain sections of the site to provide background ventilation to the proposed dwellings. Verification of this will be made at a later date once a detailed layout has been developed.

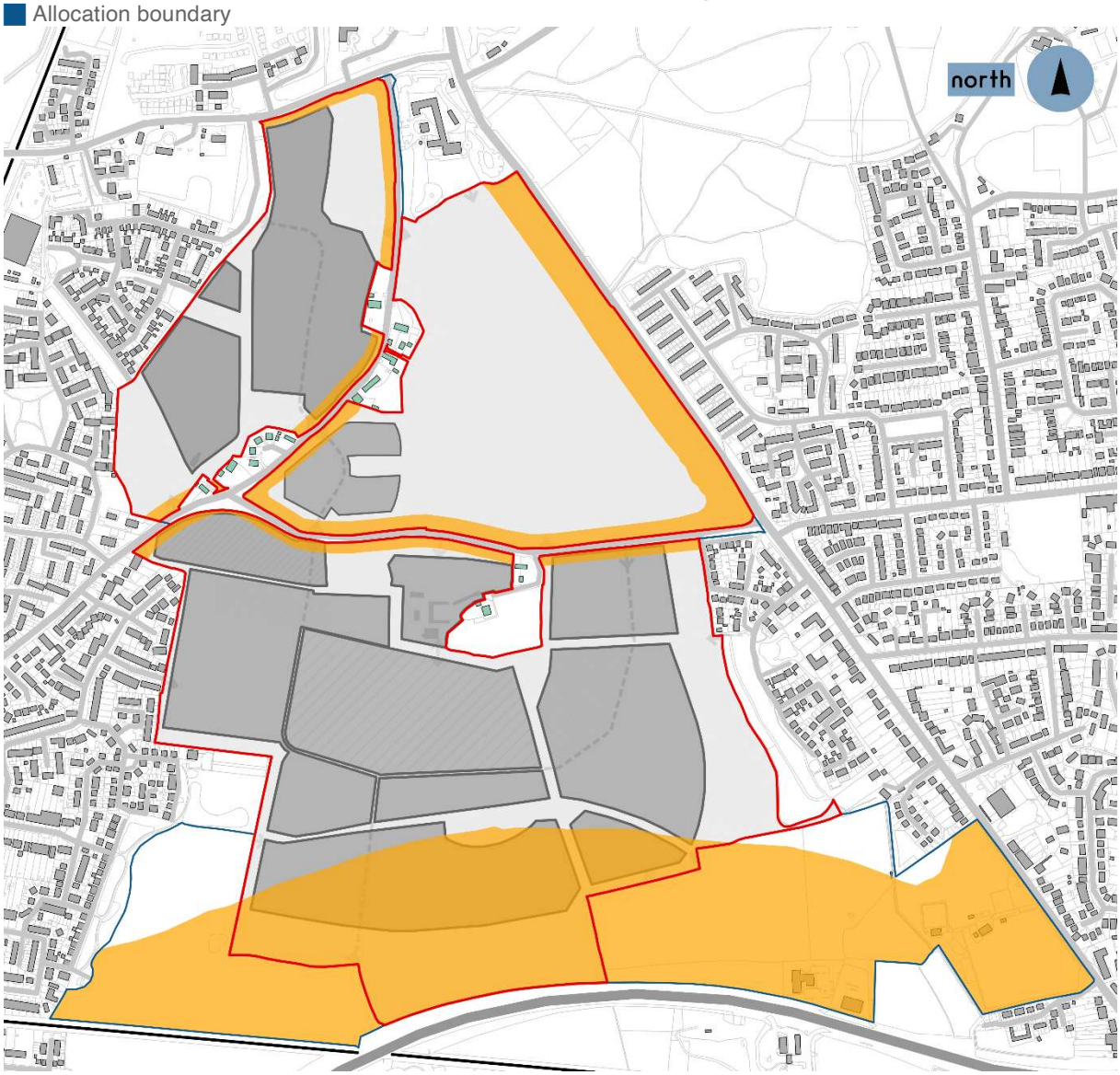
Control of overheating / Building Regulations Approved Document O

5.27 The areas of the site which may not be able to rely on the use of partially open windows for overheating control are shown in **orange** on **Image 9** below.

5.28 It is expected that once a layout is introduced onto the site, the buildings of which will provide inherent acoustic screening, the region where open windows may be relied upon for overheating control can be expected to increase, potentially significantly.

Image 9. Overheating assessment noise constraints

Areas where openable windows can't be relied upon for overheating control. Application boundary, Allocation boundary



5.29 A summary is provided below with respect to how the requirements of ADO can be addressed and therefore overheating suitably controlled, considering the scheme's noise constraints. It is noteworthy that only high-level guidance can be provided at the scheme's outline stage.

- Guidance provided within this noise report shall be used to identify initial constraints on the extent to which openable windows may be utilised to provide relief from overheating.

- A full dynamic simulation will be carried out using the TM59 methodology as stipulated within Approved Document O, where deemed necessary, taking guidance from a suitably qualified overheating consultant as necessary.

- Means to control overheating effects through passive means such as low G value glazing, shading and other such measures shall be considered.

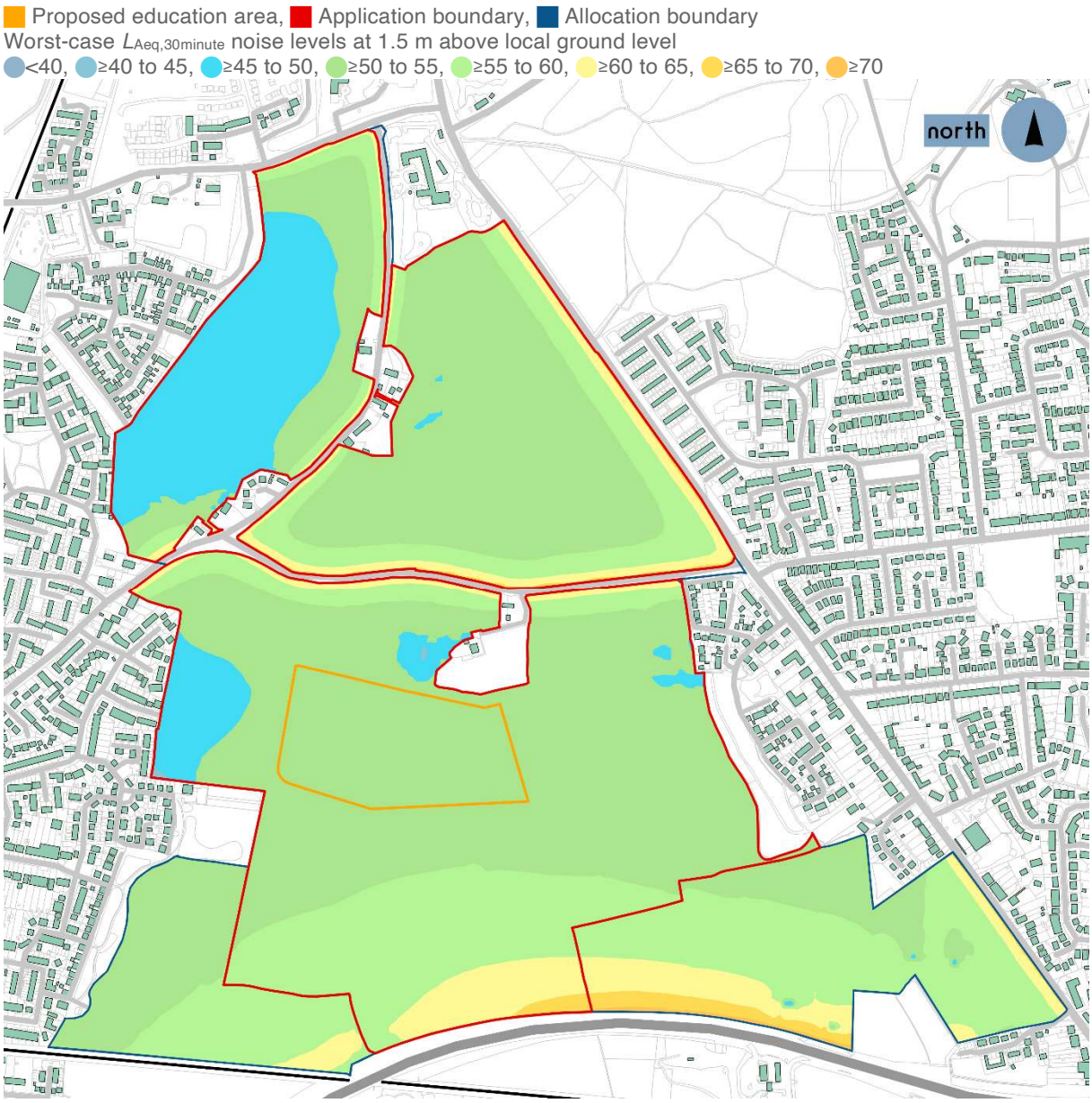
- If the above measures are not found to be sufficient, means of additional ventilation is expected to be required for bedrooms in the identified areas in orange (i.e. through the use of additional fans, for example), with flow rates sufficient to meet the TM59 temperature criteria for bedrooms during sleeping hours.

5.30 It is recommended that external noise emissions from any mechanical ventilation systems used to provide additional airflow for overheating control (or otherwise) should ideally be limited to 30 dB $L_{Ar,Tr}$ at 3 m (when running at normal operating duty) from each termination to avoid disturbance to the properties they are serving and to immediate neighbours.

Education Provision

5.31 The following **Image 10** indicates noise levels in terms of highest magnitude $L_{Aeq,30min}$ during the daytime (between circa 08:00 and 16:00, taken to be inclusive of typical school opening times).

Image 10. School Noise Conditions



5.32 Noise levels throughout the entire area designated for the education provision are below 53 dB $L_{Aeq,30minutes}$. Therefore, suitable internal ambient noise levels are expected to be achievable under natural ventilation conditions before the consideration of any other site layout factors.

5.33 Based on the above, and taking into account that a school building envelope may be designed to control noise ingress with window closed and with suitable ventilation provided, noise is not expected to be a significant constraint on the design of the proposed school provision.

Local Centre

5.34 No details of the local centre are currently known in respect to potential noise generating activities. It is suggested that suitably worded conditions can be developed to control noise from its operation (including any associated plant).

5.35 Should the local centre include a function space which may have the ability to generate amplified music, due consideration must be given to the control of said noise at the reserved matters stage. It is again expected that this element could be controlled by way of a suitably worded planning condition.