



Land East of Henfield Road, Cowfold

Noise Impact Assessment

May 2026

Acoustic South East



Outline Planning – Land East of Henfield Road (A281)- Noise Impact Assessment

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Project: J4205

Issue 1

Site: **Land East of Henfield Road (A281), Cowfold**

Client: **Landacre Developments Limited**

Contents

1	Introduction and Executive Summary	- 3 -
2	Context, Noise Criteria & Noise Assessment Methodology	- 4 -
2.1	<i>Application Description</i>	- 4 -
2.2	<i>Context</i>	- 4 -
2.3	<i>Site Location</i>	- 4 -
2.4	<i>Masterplan</i>	- 5 -
2.5	<i>Soundscape</i>	- 5 -
2.6	<i>Relevant Standards and Guidance</i>	- 6 -
2.7	<i>Methodology</i>	- 8 -
3	Measured Data	- 10 -
3.1	<i>LT1 (Close to A281)</i>	- 10 -
3.2	<i>LT2 (Close to Water Treatment Works)</i>	- 10 -
4	Computer Noise Modelling	- 11 -
4.1	<i>Noise Model Inputs</i>	- 11 -
4.2	<i>Noise Model Outputs</i>	- 12 -
4.3	<i>Noise Model Outcomes</i>	- 15 -
5	Discussion	- 16 -
5.1	<i>Sound Reduction Index</i>	- 16 -
5.2	<i>External Amenity Areas</i>	- 18 -
5.3	<i>ProPG 2017 Initial Site Risk Assessment</i>	- 18 -
5.4	<i>Building Regulations – Approved Document O – Overheating</i>	- 19 -
5.5	<i>Rigorous Calculations</i>	- 20 -
6	Recommendations	- 22 -
7	Conclusion	- 22 -

Tables

Table 1. BS8233:2014 Criteria	- 6 -
Table 2. Survey Data	- 8 -

Figures

Figure 1. Site Location	- 4 -
Figure 2. Proposed Site Masterplan	- 5 -
Figure 3. Survey Locations	- 9 -
Figure 4. Survey Locations (Images)	- 9 -
Figure 5. LT1 Survey Data	- 10 -
Figure 6. LT2 Survey Data	- 10 -
Figure 7. Daytime 2D Noise Contours - $L_{Aeq,16\text{ hour}}$	- 12 -
Figure 8. Night Time 2D Noise Contours - $L_{Aeq,16\text{ hour}}$	- 13 -
Figure 9. 2D Garden Noise Assessment	- 13 -
Figure 10. 2D Daytime Noise Mitigation Measures	- 14 -
Figure 11. Night Time Noise Mitigation Measures	- 14 -
Figure 12. Building Regulations, Approved Document O (Overheating)	- 15 -
Figure 13. Sound Reduction Index - Living Rooms	- 17 -
Figure 14. Sound Reduction Index- Bedrooms	- 17 -
Figure 15. ProPG2017 Assessment	- 18 -
Figure 16. Simplified Assessment of Bedroom Opening (Plots 1 and 9)	- 19 -
Figure 17. Equivalent Openable Area (m2)	- 19 -
Figure 18. Rigorous Calculations	- 21 -

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Issue 1	14/05/2026	Original Issue
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1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment to support an outline planning application for the erection of approximately 40 new dwellings.

As an outline application, the full details, room layouts, elevations and design are not yet finalised and will be dealt with in a reserved matters application in due course.

Standards and guidance referenced for this assessment include:

- BS8233 (Sound insulation and noise reduction for buildings) 2014
- National Planning Policy Framework (NPPF), 2024
- ProPG2017
- World Health Organisation Guidelines for Community Noise 1999, Revised 2018
- Building Regulations, Approved Document O
- Planning Noise Advice Document Sussex, November 2023

A number of class 1 sound level meters were used to assess the site soundscape and in particular the A281, the Clark Lifting site and the Waste Water Treatment Works located to the North East of the site. Each of these sound sources have the potential to impact on future residential development.

Forty new build properties are proposed on the site and these are set back from the A281 and protected from road traffic noise by the existing roadside properties of Oaklands, Willow Tree Cottage, Bracora, Bridgwater and Clark Lifting. The design of the site has also seen properties deliberately set back from the Eastern boundary with the Waste Water Treatment Works.

IMMI computer noise modelling software was used to calibrate the site, and then to introduce the new build properties onto the site. The outcomes of the noise modelling software are that the A281 is the dominant noise source impacting the site. The waste water treatment works provides a continual sound source which changes very little from the daytime to the night time period.

A rigorous calculation, using standard values from BS8233:2014 (Annex G.2) identifies that applying standard thermal double glazing and 2 trickle vents, achieves a Sound Reduction Index (SRI) of 27dB. This is sufficient to protect future occupants from daytime and night time soundscapes as well as the L_{Amax} events generated from road traffic noise on the A281 to the West of the site.

An initial site risk assessment, consistent with the approach in ProPG2017 has been carried out and identifies the site as negligible to low risk.

Proposed garden areas are all predicted to be below 55dB $L_{Aeq,16\text{ hour}}$, with the majority of the gardens being below 50dB $L_{Aeq,16\text{ hour}}$.

The reporting shows that the site is capable of being developed and outline planning consent should not be withheld on noise grounds.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Application Description

Outline planning application for approximately 40 residential dwellings, vehicular access, car parking, landscaping, open space and other associated works and infrastructure. All matters reserved except for the main site access

2.2 Context

The client proposes an outline application for the erection of approximately 40 new build properties at land to the East of the A281 in Cowfold. The size of the site is 2.6 hectares/6.4 acres.

The development is located behind existing roadside properties which include Oaklands, Willow Tree Cottage, Bracora, Bridgwater and Clarke Lifting Solutions. The latter of these is a commercial plant hire business.

The site is currently a horse paddock. The principal sound sources are those of the A281 located to the West and a water treatment works located to the North East of the site. Both sound sources have been assessed.

As an outline permission, it is anticipated that all final designs will be dealt with using a reserved matters application, made again to Horsham District Council. The principal of an outline application is to show that development is capable of occurring at the application site and to flag any concerns to the client around the site soundscape.

2.3 Site Location

The application site is noted in Figure 1 below.

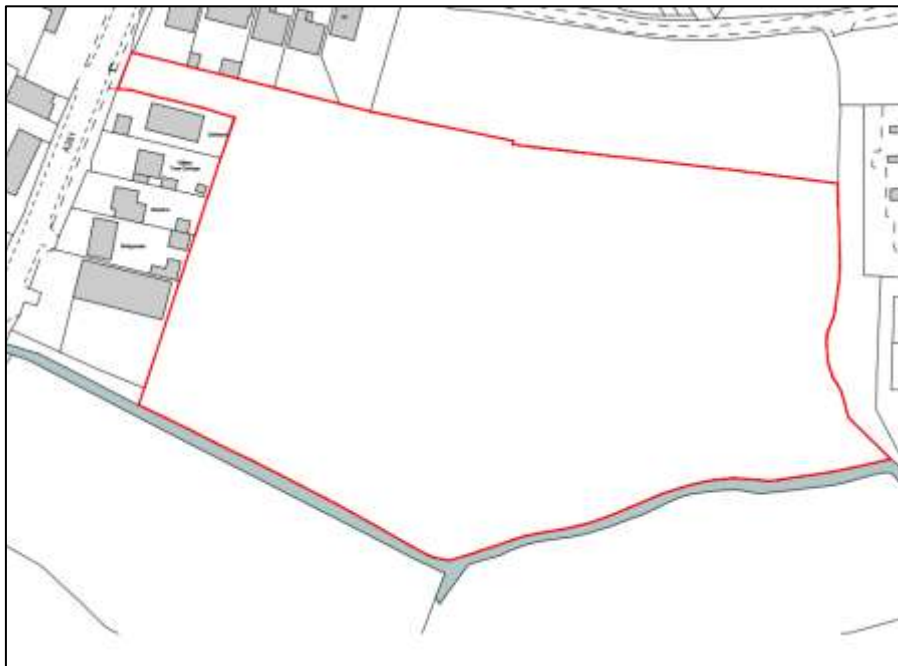


Figure 1. Site Location

2.4 Masterplan

The proposed layout can be seen in Figure 2 below. The properties are approximately 65m away from the roadside without any obvious line of sight of Cowfold Road (A281). The site is accessed from the North West adjacent to Oaklands, an existing property.

The properties are also set back from the Water Treatment Works located to the North East corner.



Figure 2. Proposed Site Masterplan

2.5 Soundscape

At the South East corner of the site, road traffic noise and birdsong were dominant. Aviation noise was also noted.

At the North East corner of the site, there was a continuous sound which did not change and this was likely to have been running water or a distant generator. Again, overhear aviation sounds and bird song were also apparent.

2.6 Relevant Standards and Guidance

2.6.1 National Planning Policy Framework, December 2024

The National Planning Policy Framework (Dec 2024) defines the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The following paragraphs are relevant within NPPF Section 15 (Conserving and enhancing the natural environment) states the following:

Paragraph 187(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, and

Paragraph 198 - 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 impact 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; and

Paragraph 200– 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.

2.6.2 BS8233:2014 - Guidance on Sound Insulation and Noise Reduction for Buildings

Table 4 of BS8233:2014 provides the following guideline values:

Activity	Location	Time period of day	
		07:00-23:00	23:00-07:00
Resting	Living Rooms	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Table 1. BS8233:2014 Criteria

It is relevant to note that Table 4 criteria in BS8233:2014 relates to continuous and anonymous sound. Where there are sounds which are irregular or which might attract a listener's attention, it is relevant to consider either a worst-case hour or to consider dropping the internal table 4 criterion by 5dB.

2.6.3 ProPG2017 – Professional Practice Guidance on Planning & Noise

Planning guidance (ProPG2017) relates to new residential development and airborne transportation noise, which includes exposure to road traffic, railway and aviation noise. Whilst ProPG, 2017 generally mirrors the requirements of BS8233:2014 and the World Health Organisation Guidelines, 1999, it goes further in setting a limit for inside bedrooms for L_{Amax} events and specifically, no more than 10 L_{Amax} events per night time period above 45dB(A).

The internal bedroom L_{Amax} values will be used in accordance with ProPG2017.

2.6.4 Planning Noise Advice Document Sussex, November 2023

A planning noise advice document which all Sussex local authorities have contributed to and signed up to (including Horsham) remains relevant. The guidance document has been followed in respect of measurement parameters and report presentation of data.

2.6.5 Building Regulations – Approved Document O – Overheating

Recently introduced Part O of the building regulation requires an assessment of whether bedroom windows can be opened at night. It is assumed that bedroom windows will be closed if either of the conditions below are met:

- Internal noise level exceeds 40dB $L_{Aeq, 8hour}$
- L_{Amax} events exceed 55dB L_{Amax} more than 10 times a night.

2.7 Methodology

A number of class 1 sound level meters were used to measure the site soundscape at relevant positions. These included the South West corner of the site close to Clark Lifting. This allowed an assessment of any external plant movements, but also an appreciation of the road side traffic noise.

A class 1 sound level meter was also placed in the North East corner/site boundary to measure sound from the Water Treatment Works to the East. Both locations were freefield surveys.

Unfortunately, whilst both sound level meters initially ran simultaneously, the data was corrupted for LT1. The site was therefore revisited on 1st – 8th May 2026 with LT1 using a different sound level meter. Due to the proximity of ponies in the large fields, both sound level meters used armoured hosing with the microphones placed at height to avoid damage from curious animals.

Both sound level meters were run in freefield conditions and used A Weighting and fast time weighting. Both sound level meters were calibrated on site before and after the survey with minimal drift observed. Whilst the roadside (LT1) position used a 1minute resolution to deal with the L_{Amax} events overnight, the waste water treatment works used a 5minute resolution as this was approximately 253m from the roadside and subjectively had minimal change in the site soundscape.

Survey(s) carried out by	Scott Castle BSc(Hons) Env Health, MCIEH CEnvH MIOA
Equipment Used	Svantek 971A Class 1 Sound Level Meter (LT1) Norsonic 118(C) Class 1 Sound Level Meter (LT2)
Location	WhatThreeWords:- LT1 - mows.fresh.flattens. 4.9m from corner fence post of Clark Lifting. 2.6m high above ground level WhatThreeWords:- LT2 – messy.rang.scope. 2.7m from corner fence post of WTW and Site boundary, 2.3m above ground level
Duration	LT1 – 1 st - 8 th May 2026 LT2 – 20 th -28 th April 2026

Table 2. Survey Data

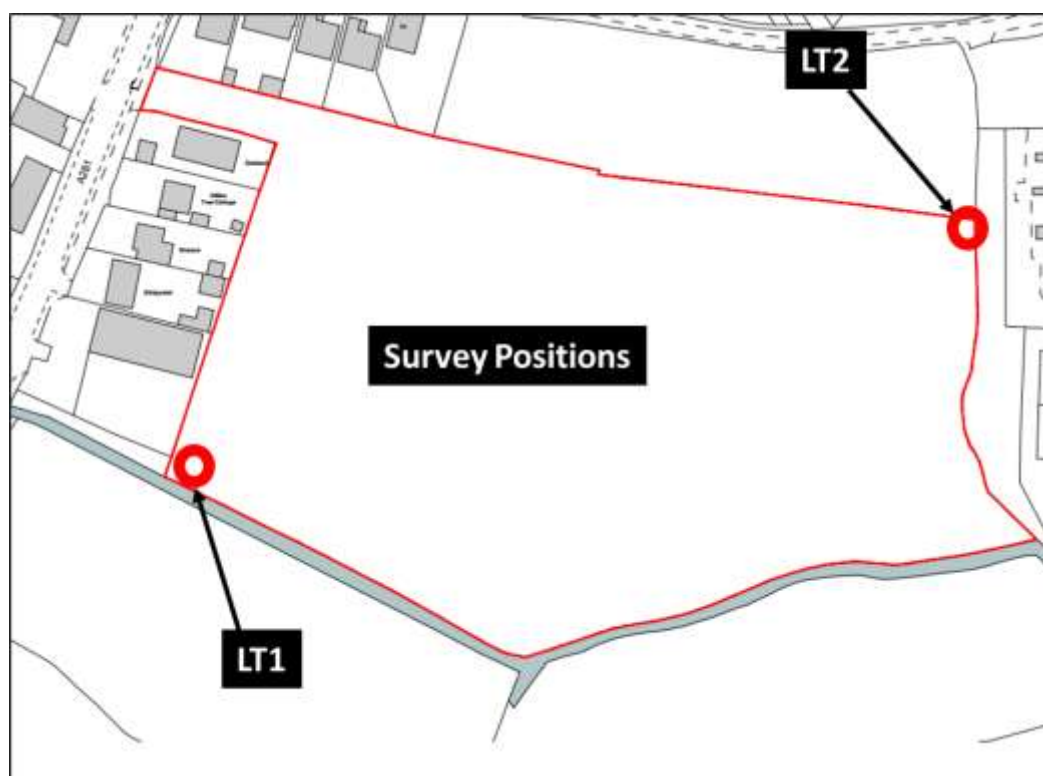


Figure 3. Survey Locations



Figure 4. Survey Locations (Images)

3 Measured Data

Whilst the measured data is presented for transparency, it is noted that the soundscape(s) experienced at the proposed properties will differ and this will be further explored within the noise modelling and discussion section.

3.1 LT1 (Close to A281)

LT1 Freefield Measurement Data									
Day	Date	L _{Aeq} 16/8Hr		11th Highest L _{Amax}		Sound Reduction			
		Day	Night	1 min	2min	Day 16Hr	Night 8 Hr	L _{Amax} 1min	L _{Amax} 2min
Fri	01/05		49.4	69.44	66.89		19	24	22
Sat	02/05	52.2	47.7	67.9	67.9	17	18	23	23
Sun	03/05	52.2	47.5	67.44	67.44	17	18	22	22
Mon	04/05	51.5	48.3	68.58	67.84	17	18	24	23
Tues	05/05	51.8	51.4	70.23	67.88	17	21	25	23
Wed	06/05	51.8	48.3	70.65	69.55	17	18	26	25
Thu	07/05	53.0	49.0	72.43	69.74	18	19	27	25
Fri	08/05	53.9	-	-	-	19	-	-	-
AVERAGE:		52	49	70	68	17	19	25	23

Figure 5. LT1 Survey Data

3.2 LT2 (Close to Water Treatment Works)

LT2			
Logarithmically Averaged Day and Night time Periods (External - Freefield)-dB(A)			
L _{Aeq} , 16 hour- 07:00-23:00		L _{Aeq} , 8 hour 23:00-07:00	
Day 1	52.8	Night 1	51.5
Day 2	52.6	Night 2	51.8
Day 3	51.6	Night 3	50.5
Day 4	52.5	Night 4	51.5
Day 5	51.9	Night 5	51.8
Day 6	53.1	Night 6	51.8
Day 7	52.6	Night 7	52.1
Day 8	N/A	Night 8	52.3
Arithmetic Average	52.5	Arithmetic Average	51.6

Figure 6. LT2 Survey Data

4 Computer Noise Modelling

In order to see how noise varies at different positions around the proposed development it is possible to produce a noise contour map. A computer noise model has been completed using the computer package IMMI. Drawings of the area have been used to complete the noise models and the topography of the location recreated. IMMI faithfully implements the propagation method of ISO-9613:1996; Acoustics – Attenuation of sound during propagation outdoors.

The noise modelling software predicts freefield and A weighted dB values.

4.1 Noise Model Inputs

As stated, the noise model was used to consider the impact of approximately 40 properties located across the site.

The A281 was modelled on the basis of the fact that Clark Lifting was closed on Saturday, Sunday and bank holiday Monday in terms of the daytime. For the night time period, the road values were used.

For the water treatment works, the particular site was not accessible, and it was not possible to definitively determine which element on the site generates the measured noise levels. It was noted from visits to site that the sound was continuous. To overcome this, an area sound source was applied to the water treatment works and calibrated to the outcomes of LT2 at the site boundary.

Eastlands Lane was not assessed. This is a private Road with properties set back approximately 55m from the Lane. Existing properties in South Leas culdesac also act as a buffer for the road traffic. Through multiple visits to site, Eastlands Lane is not highly trafficked and unlikely to impact the application site.

To consider appropriately the agent of change principal, the LT1 position was reviewed to consider a worst-case hour to ensure that any noises generated from the yard were appropriately included within the model. The Clark Lifting yard was therefore created as an area sound source and calibrated to 58dB $L_{Aeq,1 \text{ hour}}$ to ensure that the hour between 15:00 to 16:00 hours (Thursday 7th May 2026) was included. The higher levels identified on the Friday afternoon at LT1 were due to the site access being strimmed.

The model was considered to be calibrated when the roadside, the Clark Lifting yard and the Water Treatment Works were all calibrated to their respective sound pressure levels. Once the sound sources were set, the model was saved and the 40 new properties introduced. The houses were introduced at 9m in height with garages at 5m. Privacy fences were added at 1.8m between gardens/properties. Receptor positions to represent windows were placed at 1.5m above ground level and 4.5m above ground level to represent first floor windows.

4.2 Noise Model Outputs

A number of 2D noise models have been created to show visually the site soundscape and any site-specific constraints. For the daytime (figure 7) and night-time models (Figure 8) these show the site and the colour contours and how these change.

To determine the feasibility of external amenity areas, three noise contours have been applied, with noise levels below 50dB $L_{Aeq,16 \text{ hour}}$, 50-55dB $L_{Aeq,16 \text{ hour}}$ and above 55dB $L_{Aeq,16 \text{ hour}}$. This is shown in Figure 9.

For the daytime mitigation measures these use a 21dB figure from the Acoustics Ventilation and Overheating Guidance dated 2020 for the level difference between outside to inside with standard thermal double glazing and standard trickle vents applied. Given the internal sound pressure level to be achieved is 35dB, then a 21dB difference for the daytime would provide for an external noise contour of 56dB $L_{Aeq,16 \text{ hour}}$. For the night time period, the internal sound pressure level to be achieved is less than 30, therefore for a 21dB increase to account for standard mitigation measures, this would be an external noise contour for the night time period (ie 23:00-07:00 hours) of 51dB $L_{Aeq,8 \text{ hours}}$. The daytime and night time mitigation measure are presented in Figures 10 and 11.

To determine the areas where a simplified overheating assessment might be permissible, an night time noise contour of 50dB $L_{Aeq,8 \text{ hour}}$ has been created. This, shows areas where an open window with a 10dB reduction (Association of Noise Consultants Approved Document O Noise Guide 2024) will achieve the Building Regulations Approved Document O target of 40dB $L_{Aeq,8 \text{ hour}}$ internally. A 2D plan is presented in Figure 12.

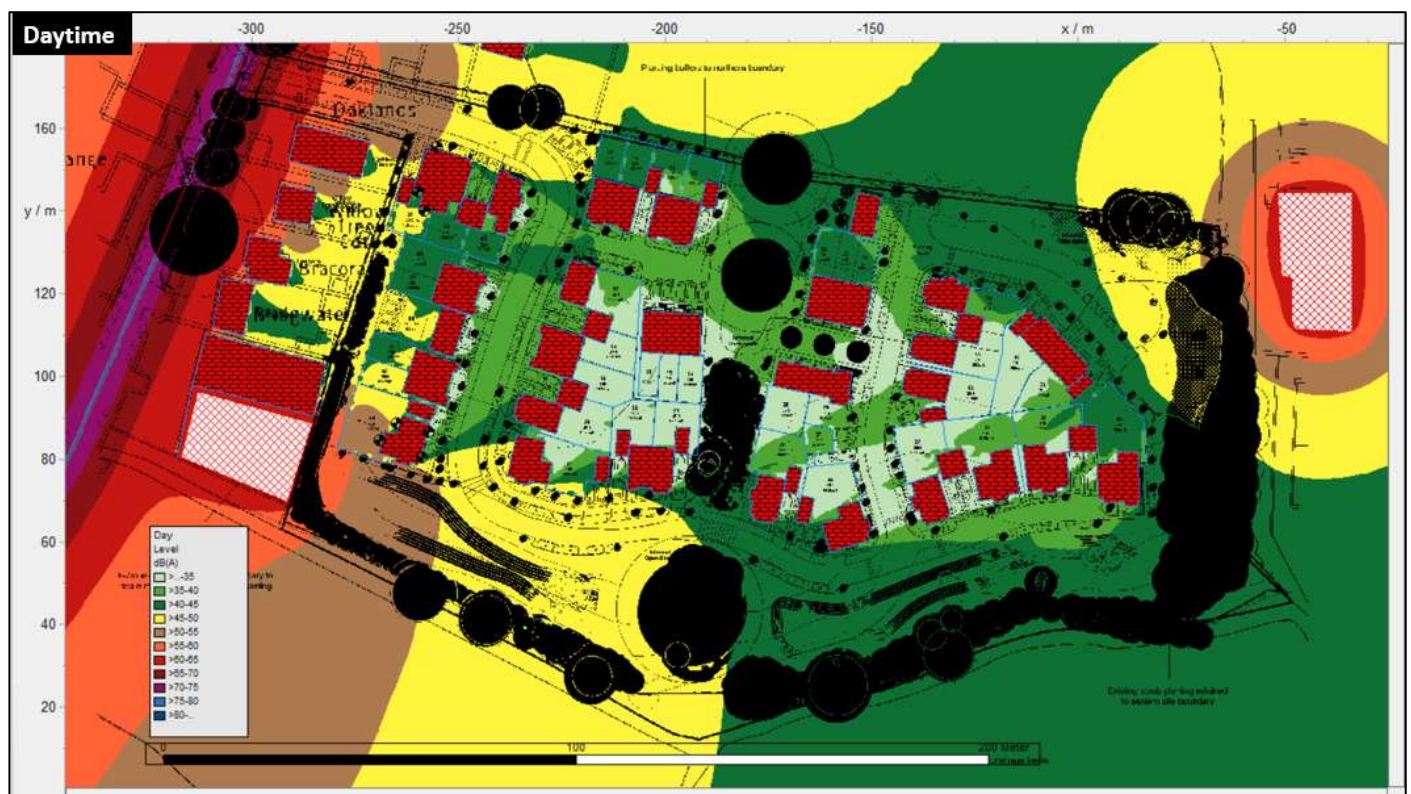


Figure 7. Daytime 2D Noise Contours - $L_{Aeq,16 \text{ hour}}$

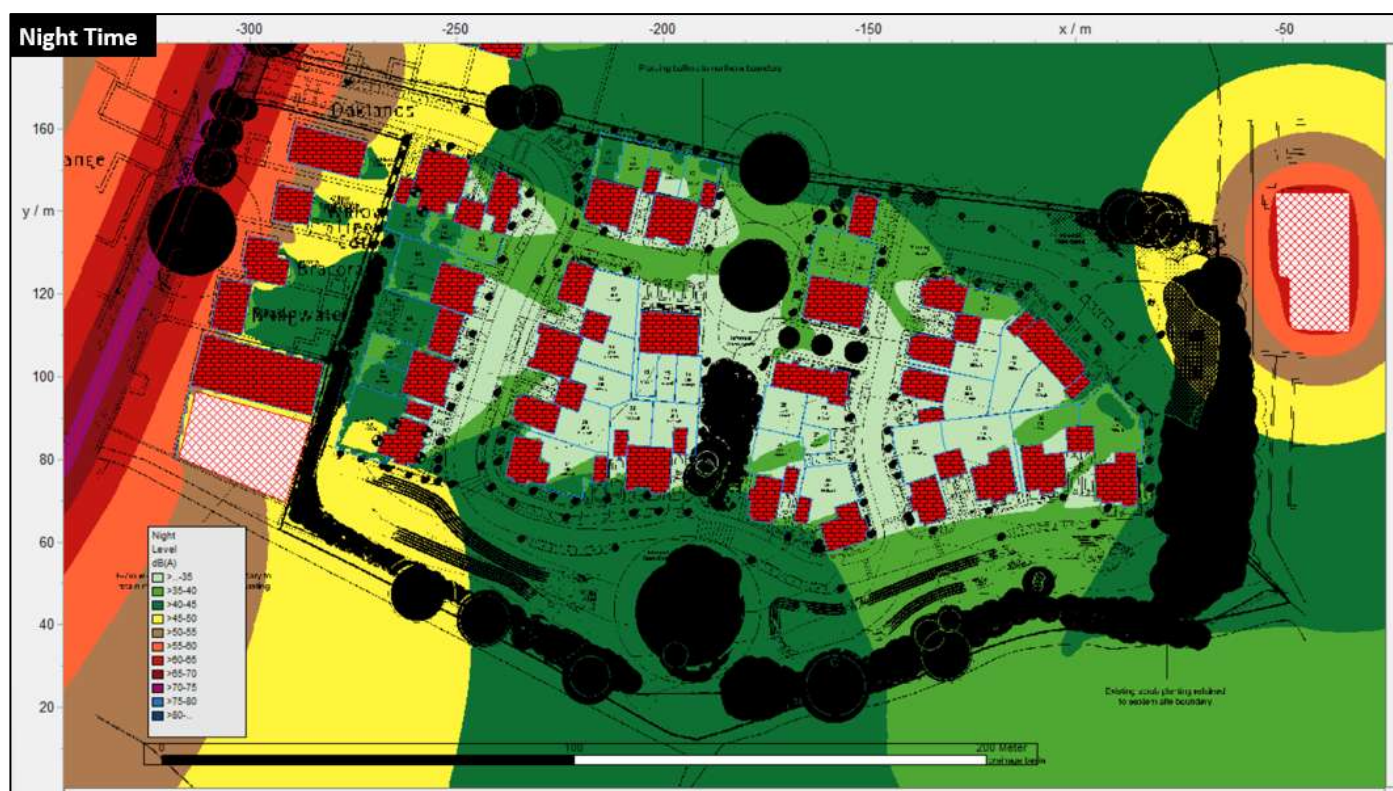


Figure 8. Night Time 2D Noise Contours - $L_{Aeq,16}$ hour



Figure 9. 2D Garden Noise Assessment



Figure 10. 2D Daytime Noise Mitigation Measures



Figure 11. Night Time Noise Mitigation Measures



Figure 12. Building Regulations, Approved Document O (Overheating)

4.3 Noise Model Outcomes

A summary of the noise modelling is as follows:

- The dominant part of the site soundscape is the A281 main road located to the West of the site
- The existing properties to the West of the site act as a barrier for road traffic noise.
- All garden locations are below 55dB $L_{Aeq,16 \text{ hour}}$, with the majority predicted to be below 50dB $L_{Aeq,16 \text{ hour}}$
- For the daytime, there are no plots requiring enhanced mitigation measures.
- For the night time period, there are no plots requiring enhanced mitigation measures based on L_{Aeq} alone. L_{Amax} events are discussed further below.
- From a night time $L_{Aeq,8 \text{ hour}}$ plot which differentiates between noise levels above and below 50dB $L_{Aeq,8 \text{ hour}}$, it is apparent that the majority of the site may be able to open windows to mitigate thermal overheating. It is however noted that the L_{Aeq} is only one of the two criteria to be achieved with L_{Amax} events also being taken in consideration. A more detailed “simplified assessment” will be carried out in section 5.4.

5 Discussion

5.1 Sound Reduction Index

By being aware of how the soundscape impacts the proposed property, the Sound Reduction Index (SRI) can be calculated.

There are three drivers which impact the façade sound reduction index or SRI. These are the daytime continuous noise levels measured over 16 hours in $L_{Aeq,T}$, the night time continuous noise levels over 8 hours, also measured in $L_{Aeq,T}$. Additionally, ProPG2017 requires a consideration of the number of L_{Amax} events which will occur in a bedroom during the night time period. Specifically, ProPG2017 requires no more than ten events exceeding 45dB L_{Amax} measured internally. Whichever of these drivers is highest is applied to ensure that the residents are protected from each criterion.

As an outline assessment, it is apparent that floor plans are not yet determined. Therefore, receptor positions have been added to plot 1 at the North West corner of the site, close to the A281 and also plot 9, in the South East corner, again in proximity with the A281 and also Clark Lifting.

Without definitive window sizes, it is possible to apply the generic window/brickwork ratios from BS8233:2014 rigorous calculations (see Annex G2). It is relevant from a good acoustic design perspective to place receptors at the front and rear of the properties to see how these differ.

An assessment has been made of habitable rooms at ground and first floor spaces. These have been split to include bedrooms and living room spaces.

It is relevant to note that living room and bedroom calculations differ, as whilst living rooms are subject to only the daytime predicted sound pressure levels, bedrooms must consider both daytime and night time continuous sound pressure levels as well as L_{Amax} events during the night to protect sleep.

The daytime SRI is the predicted external freefield sound pressure level minus 35dB as per the Table 4 values in BS8233:2014 and the same for the night time values (albeit minus 30dB).

The L_{Amax} SRI is achieved by using the predicted night time external sound pressure level and comparing this with the measured night time survey noise level. The SRI figure is then adjusted to prevent no more than 10 L_{Amax} events per night inside the bedroom environment above 45dB L_{Amax} . The adjustment process takes account of each of the 6 measured night time periods to ensure that no individual night exceeds 10 events of 45dB L_{Amax} inside the bedroom.

5.1.1 Living Room Areas

Living Rooms		
Location	Predicted Daytime	Daytime SRI
Plot 9 GF REAR	50.6	15.6
Plot 9 FF REAR	54.3	19.3
Plot 9 GF(2) REAR	49.4	14.4
Plot 9 FF(2) REAR	52.3	17.3
Plot 9 GF Front	38.1	3.1
Plot 9 FF Front	39.1	4.1
Plot 9 front GF(2)	34.3	-0.7
Plot 9 front FF(2)	35.7	0.7
Plot 1 North GF	49.7	14.7
Plot 1 GF REAR	38.1	3.1
Plot 1 North FF	50.9	15.9
Plot 1 FF REAR	42.9	7.9
Plot 1 REAR (2) GF	45.0	10.0
Plot 1 REAR (2) FF	47.3	12.3

Figure 13. Sound Reduction Index - Living Rooms

The maximum Sound Reduction Index(SRI) required for a living room is 19dB (rounded).

5.1.2 Bedrooms

Bedroom Sound Reduction Index						
Location	Predicted Daytime	Predicted Night Time	Daytime SRI	Night Time SRI	Night Time L _{Amax}	SRI to Apply
Plot 9 GF REAR	50.6	45.2	15.6	15.2	24	24
Plot 9 FF REAR	54.3	47.5	19.3	17.5	26	26
Plot 9 GF(2) REAR	49.4	44.2	14.4	14.2	23	23
Plot 9 FF(2) REAR	52.3	46.7	17.3	16.7	25	25
Plot 9 GF Front	38.1	34.3	3.1	4.3	13	13
Plot 9 FF Front	39.1	35.0	4.1	5.0	14	14
Plot 9 front GF(2)	34.3	30.6	-0.7	0.6	9	9
Plot 9 front FF(2)	35.7	31.8	0.7	1.8	11	11
Plot 1 North GF	49.7	46.8	14.7	16.8	26	26
Plot 1 GF REAR	38.1	34.5	3.1	4.5	14	14
Plot 1 North FF	50.9	48.1	15.9	18.1	27	27
Plot 1 FF REAR	42.9	39.6	7.9	9.6	19	19
Plot 1 REAR (2) GF	45.0	41.9	10.0	11.9	21	21
Plot 1 REAR (2) FF	47.3	44.2	12.3	14.2	23	23

Figure 14. Sound Reduction Index- Bedrooms

The worst-case SRI to be achieved is 27dB for a bedroom which is driven by the overnight L_{Amax} events from the A281.

5.4 Building Regulations – Approved Document O – Overheating

As per section 2.5.5 above, there are 2 criteria which must be achieved in order for future occupants to be able to open windows to mitigate thermal overheating during the night time period.

Recently introduced Part O of the building regulation requires an assessment of whether bedroom windows can be opened at night. It is assumed that bedroom windows will be closed if either of the conditions below are met:

- Internal noise level exceeds 40dB $L_{Aeq, 8\text{hour}}$
- L_{Amax} events exceed 55dB L_{Amax} more than 10 times a night.

Simplified Assessment of Window Opening (Bedroom)						
Location	Predicted Night Time	Below 50dB $L_{Aeq, 8\text{hour}}$	Open Window-Internal SPL	Below 40dB $L_{Aeq, 8\text{hour}}$ Internally	Less than 10 L_{Amax} Events Below 55dB	Openable Bedroom Window during Night
Plot 9 FF REAR	47.5	Yes	37.5	Yes	No	No
Plot 1 North FF	48.1	Yes	38.1	Yes	No	No

Figure 16. Simplified Assessment of Bedroom Opening (Plots 1 and 9)

Whilst it is apparent that the bedroom windows may not be opened to mitigate thermal overheating as per Figure 16 above, the openable area may be calculated as follows in Figure 17 below.

EA Method				
Location	Predicted Night Time	DntW	Room Volume	Openable Area
Plot 9 FF REAR	47.5	7.5	36	1.015
Plot 1 North FF	48.1	8.1	36	0.9

Figure 17. Equivalent Openable Area (m2)

The data from Figure 17 should be shared with your overheating consultant in due course, as it is inevitable that any future assessment carried out for a reserved matters application would include more detail around how overheating might be managed.

5.5 Rigorous Calculations

A rigorous calculation has been carried out using the worst-case predictions from the noise model. This is for the north elevation of plot 1 with a potential bedroom placed at first floor.

The sample sizing has been taken from BS8233:2014 section G.2 which indicates as follows:

- Façade: 10m²
- Window – 1.5m²
- Available Wall – 8.5m²
- Ceiling – 15m²

The daytime sound pressure level of 53dB L_{Aeq,16 hour} has been applied.

As a bedroom, the required SRI to be achieved is 27dB. The resulting SRI obtained is 27dB assuming a standard masonry construction and pitched roof with tiles, as per Figure 18 below.

Note that the rigorous calculation uses 2 standard trickle vents and standard thermal double glazing (4\12\4).

Clearly, as an outline application, this demonstrates that bedrooms are feasible. However, in due course, window sizing will be important as will the potential to place windows onto the quieter facades, which represents good acoustic design.

Non Frequency Dependent Variables			Key for Table Below				
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)			
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)			
S _f	Total Facade Area (m^2)	10	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)			
S _{wi}	Window Area (m^2)	1.5	A	Equivalent Absorption Area of Rx Room			
S _{ew}	External Wall Area (m^2)	8.5	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)			
S _{rr}	Ceiling Area (m^2)	15					
S	Total Area sound enters the room (m^2)	25					

Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	56	52	50	50	47	40
D _{n,e}	2x SIMON SL	31.8	32.2	28.2	28.9	31.5	36.9
R _{wi}	4_12_4	24	20	25	35	38	35
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00

BS8233 Calculation Details							
Term From Equation Below	Octave Band Centre Frequency						
	125	250	500	1000	2000	4000	
Leq,ff	56	52	50	50	47	40	
A _o /S . 10^(-D _{n,e} /10)	0.000264	0.000241	0.000605	0.000515	0.000283	8.17E-05	
S _{wi} /S . 10^(-R _{wi} /10)	0.000239	0.0006	0.00019	1.9E-05	9.51E-06	1.9E-05	
S _{ew} /S . 10^(-R _{ew} /10)	2.7E-05	4.28E-05	1.35E-05	2.15E-06	3.4E-07	1.08E-07	
S _{rr} /S . 10^(-R _{rr} /10)	0.000951	0.000239	3.01E-05	3.01E-05	3.01E-05	3.01E-05	
10log10(S/A)+3	6.565473	5.51812	4.9382	4.9382	5.218487	5.218487	
Leq,2	34.27127	28.02072	24.17462	22.47012	17.31184	6.385293	
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1	
A-Weighted Leq	18.17127	19.42072	20.97462	22.47012	18.51184	7.385293	

A-Weighted Level Outside	54	Plot 1 North FF
BS8233 Predicted Internal A-Weighted Level	27	
Predicted Building Envelope SRI	27	

BS8233 Calculation can be seen below:	
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$	

Figure 18. Rigorous Calculations

6 Recommendations

As an outline application it is important that in due course, any reserved matters application addresses good acoustic design consistent with the approach in ProPG2017.

For example, in the plot 9 data above, it is apparent that at first floor to the rear (facing the roadside/Clark Lifting), the external SPL is 54.3dB $L_{Aeq, 16 \text{ hour}}$. For the corresponding first floor on the front of the building, the external freefield sound pressure level is only 35.7dB, a reduction of 19dB (Rounded). It would therefore be practicable in due course to consider bedrooms on the quieter façade(s).

7 Conclusion

A number of class 1 sound level meters were used to assess the site soundscape and in particular the A281, the Clark Lifting site and the Waste Water Treatment Works located to the North East of the site. Each of these sound sources have the potential to impact on future residential development.

Forty new build properties are proposed on the site and these are set back from the A281 and protected from road traffic noise by the existing roadside properties of Oaklands, Willow Tree Cottage, Bracora, Bridgwater and Clark Lifting. The design of the site has also seen properties deliberately set back from the Eastern boundary with the Waste Water Treatment Works.

IMMI computer noise modelling software was used to calibrate the site, and then to introduce the new build properties onto the site. The outcomes of the noise modelling software are that the A281 is the dominant noise source impacting the site. The waste water treatment works provides a continual sound source which changes very little from the daytime to the night time period.

A rigorous calculation, using standard values from BS8233:2014 (Annex G.2) identifies that applying standard thermal double glazing and 2 trickle vents, achieves a Sound Reduction Index (SRI) of 27dB. This is sufficient to protect future occupants from daytime and night time soundscapes as well as the L_{Amax} events generated from road traffic noise on the A281 to the West of the site.

An initial site risk assessment, consistent with the approach in ProPG2017 has been carried out and identifies the site as negligible to low risk.

Proposed garden areas are all predicted to be below 55dB $L_{Aeq, 16 \text{ hour}}$, with the majority of the gardens being below 50dB $L_{Aeq, 16 \text{ hour}}$.

The reporting shows that the site is capable of being developed and outline planning consent should not be withheld on noise grounds.