



Architectural & Environmental Consultants
Acoustics | Air Quality | Overheating

Noise Impact Assessment

Land North of Arborfield Road, Shinfield

Noise Impact Assessment

Project: LAND NORTH OF ARBORFIELD ROAD, SHINFIELD

Report reference: RP02-23676-R0

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1. EXECUTIVE SUMMARY

- 1.1 Cass Allen has been instructed by Bellway Homes (Thames Valley) Limited to assess the noise impact associated with a proposed residential development located north of Arborfield Road in Shinfield, Wokingham.
- 1.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 1.3 A noise survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from Arborfield Road and the A327 Eastern Relief Road.
- 1.4 A 3D noise model of the development was constructed based on traffic data provided by the project transport consultants. Two scenarios were modelled:
 1. A baseline scenario in 2027
 2. A future scenario in 2042 which includes the proposed development – this is ‘worst-case’ with respect to noise emissions.
- 1.5 The noise model was used to calculate road traffic noise levels at all facades of the development in the worst-case scenario (scenario 2 above).
- 1.6 Noise affecting the development has been assessed in accordance with ProPG guidance. The design of the development is acceptable subject to the adoption of standard thermal double glazing and acoustically upgraded trickle ventilators and acoustic screening around gardens. This can be investigated further at the detailed design stage.
- 1.7 Compliance with noise criteria in Building Regulations Part O has also been assessed. Some bedrooms will need to be designed so that windows can remain closed at night without the rooms overheating. This can be assessed further in due course.
- 1.8 In summary, it is our view that the site is suitable for the development in terms of noise and vibration levels and that planning permission may be granted subject to the imposition of suitable planning conditions.

2. INTRODUCTION

- 2.1 Cass Allen has been instructed by Bellway Homes (Thames Valley) Limited to assess the noise impact associated with a proposed residential development located north of Arborfield Road in Shinfield, Wokingham.
- 2.2 The assessment has been carried out in accordance with relevant local and national planning guidance.
- 2.3 The aims of the assessment were:
- to establish the suitability of existing noise and vibration levels at the site for the proposed development
 - where required, identify appropriate measures to optimise the acoustic design of the development and achieve acceptable noise and vibration levels in habitable areas
- 2.4 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION AND SITE CONTEXT

- 3.1 This assessment has been prepared to inform the full planning application for the erection of new dwellings, open space, landscaping, supporting infrastructure and associated works. A new through road is also proposed as part of the development, which will connect Arborfield Road to Cutbush Lane.
- 3.2 As shown in Figure 1, the site is currently an agricultural field located to the east of Shinfield. It is surrounded to the north, west and south by residential properties. The A327 Eastern Relief Road and B3349 Arborfield Road run adjacent to the eastern and southern boundaries, respectively, and are the principal sources of noise affecting both existing and proposed development.

Figure 1 Site Location and Surrounding Area



- 3.3 A current drawing of the proposed development layout is shown in Appendix 1.

4. PLANNING POLICY

National Policy

- 4.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Relevant sections in this case are highlighted below:

180. 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.

191. 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 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.

Noise Policy Statement for England

- 4.2 The Noise Policy Statement for England (NPSE) was published in March 2010 and seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. It also sets out the long-term vision of Government noise policy:

to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

- 4.3 The NPSE clarifies that noise should not be considered in isolation of the wider benefits of a scheme or development, and that the intention is to minimise noise and noise effects as far as is reasonably practicable having regard to the underlying principles of sustainable development.

- 4.4 The explanatory note of NPSE defines the terms used in the NPPF:

2.20: There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

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.

2.21: Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

- 4.5 The NPSE does not define the SOAEL numerically, stating in paragraph 2.22:

It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

Noise Planning Practice Guidance

- 4.6 The Noise Planning Practise Guidance (NPPG), as amended on 22 July 2019, provides further guidance on noise and reiterates the guidance within the NPPF and NPSE. It states that:

noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment.

- 4.7 The NPPG provides advice regarding how to determine the impact of noise, including whether or not a significant adverse effect or adverse effect is occurring or likely to occur and whether or not a good standard of amenity can be achieved.
- 4.8 It provides more descriptive detail for the definitions of NOEL, LOAEL and SOAEL than the NPSE, but does not specify numerical values. A summary of the advice given is reproduced in Table 1 below.

Table 1 Observed Effect Levels due to Noise (NPPG)

Perception	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 or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, 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 and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Local Policy

- 4.9 Relevant adopted local noise policies that are applicable to the forthcoming application are summarised below.

Wokingham Borough Core Strategy Development Plan (January 2010)

Planning permission will be granted for development proposals that...

- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers.

Wokingham Borough Councils Managing Development Delivery (MDD) Local Plan (February 2014)

Policy CC06 – Noise

1. *Proposals must demonstrate how they have addressed noise impacts to protect noise sensitive receptors (both existing and proposed) from noise impacts in line with Appendix 1 of the MDD.*
2. *Noise impact of the development must be assessed. Where there is no adverse impact (No Observed Effect Level) then noise will not be a material consideration.*
3. *Where there is an adverse effect (Lowest Observed Adverse Effect Level to Significant Observed Adverse Effect Level), then*
 - a) *the development layout must be reviewed. Where this results in there no longer being an adverse impact then design and mitigation measures should be incorporated accordingly.*
 - b) *where there is still an adverse impact then internal layout must be reviewed. Where this results in there no longer being an adverse impact then design and measures should be incorporated accordingly.*
 - c) *where there is still an adverse impact then physical mitigation measures such as barriers/mechanical ventilation must be reviewed. Where this results in there no longer being an adverse impact then design and mitigation measures should be incorporated accordingly.*
 - d) *where there is still an adverse impact and the development falls within the significant observed adverse effect level then planning permission will normally be refused.*

- 4.10 To address the requirements of the national and local policies, noise affecting the habitable areas of the proposed development has been assessed.

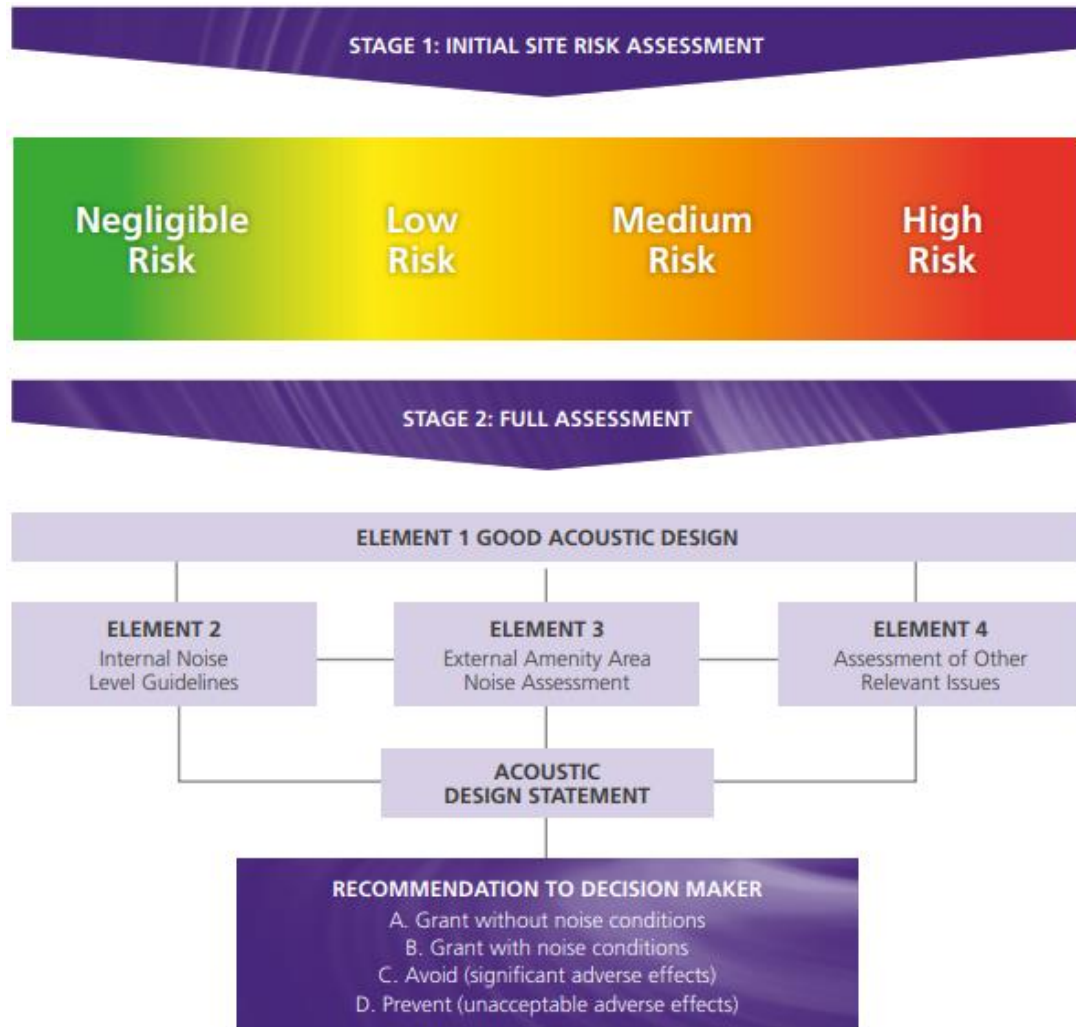
5. NOISE AFFECTING THE DEVELOPMENT

5.1 Specific guidance on the assessment of noise affecting new residential development is given in ProPG: Planning and Noise for New Residential Development, May 2017 (ProPG). The process within the ProPG guidance for the appraisal of noise levels affecting new residential development is considered to be current 'best practice' and has, therefore, been followed for the assessment. The assessment process can be summarised as follows:

- Stage 1 – measure noise levels at the site and carry out an initial noise risk assessment of the proposed development site based on the measured levels.
- Stage 2 – where a higher noise risk is identified, carry out a detailed assessment including the following four considerations:
 - Element 1 – the overall acoustic design and layout of the site
 - Element 2 – internal noise levels in habitable areas
 - Element 3 – noise levels in external amenity areas
 - Element 4 – consideration of other relevant issues
- Based on the results of the Stage 2 assessment, provide a recommendation to the decision maker on whether planning permission can and should be granted.

5.2 The process is shown visually in Figure 2 below.

Figure 2 ProPG Assessment Process



- 5.3 It should be noted that the guidance in ProPG relates primarily to noise from transportation sources, i.e. road traffic, aircraft, rail etc. Any significant noise from other sources (e.g. industrial, commercial or entertainment sources) is outside the scope of the ProPG guidance and, therefore, requires separate consideration. In this instance, commercial noise is insignificant compared to transportation noise so is not considered further.

Stage 1 – Noise survey and initial assessment

- 5.4 A noise survey was carried out at the site from 17 - 22 May 2024 to assess existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.
- 5.5 Average, maximum and background noise levels across the site were generally dictated by road traffic on the A327 Eastern Relief Road and Arborfield Road.

5.6 The noise survey results show that noise levels at these positions are as follows:

- Eastern edge of the site facing the A327:
 - Average noise levels during the daytime - 63 dB LAeq,0700-2300hrs
 - Average noise levels during the night-time - 55 dB LAeq,2300-0700hrs
 - Typical maximum noise levels during the night-time - 74 dB LAm_{ax}
- Southern edge of the site facing Arborfield Road:
 - Average noise levels during the daytime - 59 dB LAeq,0700-2300hrs
 - Average noise levels during the night-time - 53 dB LAeq,2300-0700hrs
 - Typical maximum noise levels during the night-time - 72 dB LAm_{ax}

5.7 A 3D noise model of the development was developed using Cadna/A v2023 MR2 environmental noise modelling software. The calculation methodology outlined in the Department of Transport Welsh Office - *Calculation of Road Traffic Noise* (CRTN) was adopted within the model to predict daytime road traffic noise emissions from the surrounding roads across the development based on traffic flow volume data for the roads.

5.8 The traffic flow volume data used in the model is shown in Table 2.

Table 2 Traffic Flow Volume Data for Noise Model

Road	Daytime Traffic Volume (See Note 1)	% HGV	Data Source
A327 Eastern Relief Road	26,758	5	2042 future year traffic flow from project transport consultants
Arborfield Road (East of site access)	14,817	0	2042 future year traffic flow from project transport consultants
Arborfield Road (West of site access)	16,412	0	2042 future year traffic flow from project transport consultants
Site access road	3,069	0	2042 future year traffic flow from project transport consultants

Note 1 18 hour AAWT

5.9 Initial modelling predictions of noise levels from the roads were found to correlate well with the results of the site noise surveys within the normal accepted tolerances of environmental noise modelling. The road traffic emission levels in the model are therefore considered to be accurate.

5.10 The noise model was used to predict the road traffic noise levels across the development. The modelling results are shown in Appendix 3 and show that road traffic noise levels will be highest on facades of the development that directly face the transportation noise sources (i.e. the A327 and Arborfield Road).

5.11 For the purposes of assessment against BS8233 criteria (refer to paragraphs 5.15 to 5.18 below), it is necessary to derive the 16 hour daytime and 8 hour night-time A-weighted equivalent

continuous noise levels (LAeq). The 2006 TRL report prepared for DEFRA - *Method for converting the UK road traffic noise index LA10,18h to the EU noise indices for road noise mapping* provides 'end correction' equations for deriving the 16 hour and 8 hour LAeq values from the LA10,18hr. These equations were applied to the predicted LA10,18hr road traffic noise levels to calculate the LAeq,16hr and LAeq,8hr noise levels. The results of all of the predictions are shown in Appendix 3 at a height of 1.5m above ground level for daytime noise levels (representative of habitable rooms and ground floor level) and a height of 4.5m for night-time noise levels (representative of bedrooms at first floor level).

- 5.12 The calculated noise levels can be compared with Figure 3 below to assess the 'noise risk' of the site. Where the noise risk is high, significant acoustic design measures may be required to achieve acceptable noise levels in the development. Where the noise risk is low, acceptable noise levels may be achievable with no specific acoustic design measures.

Figure 3 Noise Risk Assessment (Adaption of Figure 1 from ProPG)



- 5.13 Based on the calculated noise levels for the worst-case future transport scenario in 2042, the site is 'Medium' risk in relation to daytime noise levels and 'Medium' risk in relation to night-time noise levels. Therefore, ProPG requires that a more detailed 'Stage 2' assessment is carried out.

Stage 2 – Element 1 – Overall acoustic design of the site

- 5.14 The acoustic design of the development has been reviewed in relation to the measured noise levels at the site. The layout of the development is considered to represent good acoustic design for the following reasons:
- A 35m buffer has been incorporated between the closest dwellings and the A327, which reduces the noise impact from this source
 - Gardens are positioned behind dwellings so that they will be acoustically screened from the noise sources as far as practicable. In addition there is a public open space in the centre of the development which is screened from the existing road traffic sources
 - Internal layouts have been designed to minimise the number of sensitive rooms (bedrooms and living rooms) facing nearby noise sources as far as practicable

Stage 2 – Element 2 - Internal noise levels

- 5.15 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'.
- 5.16 Relevant BS8233 design criteria are summarised in Table 3 below.

Table 3 BS8233:2014 Internal Noise Criteria

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Dining	Dining room/area	40 dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour

- 5.17 It is also considered appropriate in this case to assess the potential impact of noise emissions from individual vehicle passes on the surrounding roads on the bedrooms of the development during the night-time. This is in line with guidance given in BS8233:2014 and ProPG, which both point out that regular individual noise events during the night have the potential to cause sleep disturbance.
- 5.18 Appropriate design criteria for acceptable maximum noise levels in habitable rooms of new residential developments are given in the ProPG guidance, which states that *"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 45 dB LAmax,F more than 10 times a night."*
- 5.19 Full construction details for the development have not been finalised as the project is at an early design stage. It has therefore been assumed that the external walls of the development will be constructed using a standard masonry construction (e.g. 102mm brick, 100mm insulated cavity, 100mm concrete block) or a light-weight construction designed to achieve a similar level of sound insulation (this is technically achievable subject to detailed design).
- 5.20 The ventilation strategy for the development has not yet been confirmed and therefore it is assumed that background ventilation will be provided via trickle ventilators in the building facade. This is a 'worst case' assumption from an acoustic perspective as trickle ventilators are often an acoustic weak point in the facade.
- 5.21 Calculations were carried out using facade modelling software in accordance with the methodology given in BS8233:2014 to calculate the sound insulation performance required of the glazing and ventilation to achieve the nominated internal noise criteria in the 'worst-case' habitable rooms of the development (i.e. the habitable rooms that will be subject to the highest external noise levels).
- 5.22 If acceptable internal noise levels can be achieved in 'worst case' habitable rooms then it follows that acceptable internal noise levels can be achieved in all other habitable rooms of the development using similar glazing and ventilator types.

5.23 The calculations were carried out based on the following dimensions/details for facade elements taken from architectural drawings:

- glazing – 1.9m² for bedrooms and 1.9m² for living rooms
- external walls – 6.6m² for bedrooms and 5.8m² for living rooms
- 2 in-frame trickle ventilators in bedrooms and 3 in-frame trickle ventilators in living rooms

5.24 The results of the calculations are shown in Appendix 4 and are summarised in Table 4 below.

Table 4 Acoustic Requirements for ‘Worst Case’ Habitable Rooms

‘Worst Case’ Rooms	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements (in Open Position)
Bedrooms and living rooms with direct line of sight to Arborfield Road and A327	27 dB Rw+Ctr	37 dB Dne,w + Ctr
All other habitable rooms	27 dB Rw+Ctr	31 dB Dne,w + Ctr

Note The requirements given are approximate only and should be confirmed at the detailed design stage when full design details are available.

5.25 Based on the results of the calculations summarised in Table 4 and the measured noise levels at the site (considering both the day and night-time average and maximum noise levels), an outline specification has been developed showing the approximate sound insulation performance requirements for all facades of the development. The facade specification is shown in Appendix 5.

5.26 The specification also shows examples of glazing and ventilator types that would typically be expected to achieve the required levels of sound insulation.

5.27 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the specification of suitable glazing and ventilation systems at the detailed design stage. It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the habitable rooms.

5.28 The above ProPG assessment for planning purposes is based on internal noise levels with windows closed (assumed to be “normal” circumstances). However, it is anticipated that residents will open their windows at times for thermal comfort (e.g. to prevent overheating in warmer months). Noise levels in the rooms will increase under these circumstances.

5.29 The development will be subject to Part O of the Building Regulations (Approved Document O), which came into effect on 15 June 2022. Section 3.2 of Approved Document O (ADO) states:

In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

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

a. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).

b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).

5.30 It is important to note that the Part O requirements only apply to bedrooms at night. There are no requirements for other habitable rooms (living rooms, dining rooms, etc).

5.31 The noise levels in bedrooms at night with the windows open will vary based on the external night-time noise levels and the size and extent of window opening required to control overheating. The wider the window needs to be open, the lower the sound insulation performance. The following indicative “outside to inside” reduction values have been adopted for the assessment based on current industry guidance¹:

- ~4 dB when the window is fully open
- ~9 dB when the window is open to around ~0.4m²
- 13 dB when the window is partially open to ~0.2m².

5.32 Therefore, it is possible to rely on a larger window opening to control overheating on quieter facades. The relationship between external noise levels and window openings for compliance with Part O is summarised in Table 5.

Table 5 External Part O Noise Criteria and Allowable Window Opening for Overheating

External Noise Levels outside Bedrooms at Night		Allowable night-time window opening to control overheating
Average Noise Levels (LAeq,8hrs)	Maximum Noise Levels (LMax) – see Note 1	
≤44 dB	≤59 dB	Fully open (to achieve 13% of the floor area which is typically ~1.3m ²). Ventilators fully open.
≤49 dB	≤64 dB	Open (~4% of floor area e.g. ~0.4m ²) – see Note 2. Ventilators fully open.
≤53 dB	≤68 dB	Partially open (~2% of floor area e.g. ~0.2m ²). Ventilators fully open.
≥54 dB	≥69 dB	Windows to be assumed to be fully closed during the night for the purposes of Part O compliance. Ventilators fully open.

Note 1 Not exceeded more than 10 times per night (between 11pm and 7am)

Note 2 An opening of 4% of the floor area would comply with the ‘simplified method’ for Part O compliance, if targeted, as the site is in a ‘medium risk’ area.

¹ These values are taken from guidance published in the draft document “Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O” Version 1.0 July 2022, by the Association of Noise Consultants. The values are based on a floor area of 10m² and a room height of 2.4m.

- 5.33 The criteria in Table 5 above have been applied to the predicted night-time noise levels from the model to show where open windows can be relied upon for the control of overheating and Part O compliance. The results are shown in Appendix 6.
- 5.34 It can be seen from Appendix 6 that windows to bedrooms directly facing Arborfield Road, the A327 Eastern Relief Road and the site access road, will need to be assumed to be closed during the night-time for the purposes of the overheating assessment due to the higher external noise levels. Open windows can be used to help address overheating in all other bedrooms across the rest of the site.

Stage 2 – Element 3 – Noise levels in external amenity areas

- 5.35 BS8233 states that it is desirable that noise levels in external amenity areas of residential developments do not exceed 50 dB LAeq and that 55 dB LAeq,T should be regarded as an upper guideline value. However, BS8233 recognises that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources. In these cases, BS8233 states that the development should be designed to achieve the lowest practicable noise levels in the amenity spaces.
- 5.36 Noise levels in some gardens are predicted to exceed the 55 dB LAeq,T limit. The range of calculated noise levels within gardens across the development are 45 – 63 dB LAeq,16hour. Approximately 25% of gardens within the development exceed the upper guideline value of 55 dB LAeq,16hour. Whilst this is not ideal, it is not uncommon for noise levels in gardens in urban areas to be higher than the BS8233 recommended levels.
- 5.37 To reduce noise levels in these gardens as far as practicable, it is recommended that 2.4m high close-boarded timber fencing is used around the gardens where levels are predicted to be higher than the BS8233 recommended levels. The recommended boundary treatments are shown indicatively in Appendix 7. The fencing should be imperforate including between posts and the ground, should have a minimum surface mass of 10 kg/m² and be maintained in accordance with manufacturers recommendations for its lifespan.
- 5.38 With the recommended boundary treatments, noise levels within gardens across the development are calculated to be 45 – 57 dB LAeq,16hour and only 7 gardens would exceed the upper guideline value of 55 dB LAeq,16hour.
- 5.39 In summary of the above, noise levels in external amenity areas of the development are predicted to be acceptable subject to the incorporation of boundary treatments as recommended in paragraph 5.37 above and Appendix 7. If deemed necessary, this could be secured through the imposition of a suitable planning condition.

Stage 2 – Element 4 – Other relevant issues

- 5.40 In our view the design and acoustic approach outlined above is in line with both local and national noise policy. It is common for residential properties to be situated near to main roads and this is an acceptable scenario provided that the properties are acoustically upgraded where necessary to achieve acceptable noise levels in habitable areas.

Recommendation to decision maker

- 5.41 It is our view that planning permission may be granted in relation to noise affecting habitable areas of the development subject to the imposition of suitable planning conditions to ensure that acceptable noise levels are achieved in the finished development.

6. CONCLUSIONS

- 6.1 Cass Allen was instructed by Bellway Homes (Thames Valley) Limited to assess the noise impact associated with a proposed residential development located north of Arborfield Road in Shinfield, Wokingham.
- 6.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 6.3 A noise survey was carried out at the site. Noise levels at the site were dictated by road traffic noise emissions from Arborfield Road and the Eastern Relief Road.
- 6.4 A 3D noise model of the development was constructed based on traffic data provided by the project transport consultants. Two scenarios were modelled:
 1. A baseline scenario in 2027
 2. A future scenario in 2042 which includes the proposed development – this is ‘worst-case’ with respect to noise emissions
- 6.5 The noise model was used to calculate road traffic noise levels at all facades of the development in the worst-case scenario (scenario 2 above).
- 6.6 Noise affecting the development was assessed in accordance with ProPG guidance. The design of the development is acceptable subject to the adoption of standard thermal double glazing and acoustically upgraded trickle ventilators and acoustic screening around gardens. This can be investigated further at the detailed design stage.
- 6.7 Compliance with noise criteria in Building Regulations Part O was also assessed. Some bedrooms will need to be designed so that windows can remain closed at night without the rooms overheating. This can be assessed further in due course.
- 6.8 In summary, it is our view that the site is suitable for the development in terms of noise and vibration levels and that planning permission may be granted subject to the imposition of suitable planning conditions.

Appendix 1 Proposed Development Layout

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OATLANDS ROAD

Approved & Consented
PHASE 1

presentation planning layout

SCHEDULE OF ACCOMMODATION		
House type	Description	Qty
Private		
HP	The Hooper - 2 Bed House - 2B3P - M4(2)	6
QU+	The Quilter +- 3 Bed House - 3B4P - M4(2)	2
BM	The Blennere - 3 Bed House - 3B5P - M4(2)	13
HA	The Harper - 3 Bed House - 3B5P - M4(2)	40
PA	The Parkman - 3 Bed House - 3B5P - M4(2)	18
SC+	The Schwelmer +- 4 Bed House - 4B5P - M4(2)	10
SR	The Sculptor - 4 Bed House - 4B6P - M4(2)	4
RE	The Reedmatier - 4 Bed House - 4B5P - M4(2)	8
PG	The Pargeter - 4 Bed House - 4B5P - M4(2)	14
AR	The Arkwright - 4 Bed House - 4B6P - M4(2)	9
Private Total		124
Affordable		
B1 - 1BP1	1 Bed Apartment - 1B2P - M4(2)	3
B1 - 2BP1	2 Bed Apartment - 2B4P - M4(2)	5
B2 - 1BP1	1 Bed Apartment - 1B2P - M4(2)	4
B2 - 2BP1	2 Bed Apartment - 2B4P - M4(2)	5
B3 - 1BP1	1 Bed Apartment - 1B2P - M4(3)	5
B3 - 1BP2	1 Bed Apartment - 1B2P - M4(3)	5
B3 - 2BP1	2 Bed Apartment - 2B5P - M4(3)	1
BA	The Baker - 2 Bed House - 2B4P - M4(2)	12
TI	The Tillman - 3 Bed House - 3B5P - M4(2)	19
PW	The Plooshtwright - 3 Bed House - 3B5P - M4(2)	6
WL	The Walker - 4 Bed Bespoke House - 4B6P - M4(2)	2
Affordable Total		67
Overall Total		191

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land north of arborfield road, shinfield - cutbush phase 2

rev date by details

Presentation Planning Layout

reference 022307-BEL-TV-01

05.08.2024 created
1:500 @ A0 scaling
JeH contact
revision

Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by road traffic on surrounding roads.

Survey Period:

17/05/2024 to 22/05/2024

Survey Objectives:

- To identify noise sources that contribute to ambient noise levels at the site;
- To measure noise levels around the site over a typical day and night-time period.

Equipment Used:

Type	Manufacturer	Model	Serial Number
Sound level meter ¹ (noise logger)	Rion	NL-32	00530374
Sound level meter ¹ (noise logger)	Rion	NL-32	00482672
Calibrator	Rion	NC-74	34551703

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring.

Measurement Positions:

Position (refer plan below)	Description
L1	Unattended noise logging position. 3m above ground level. Free-field. Direct line of sight to Arborfield Road
L2	Unattended noise logging position. 3m above ground level. Free-field. Direct line of sight to a327 Eastern Relief Road

Site Plan showing Measurement Positions:



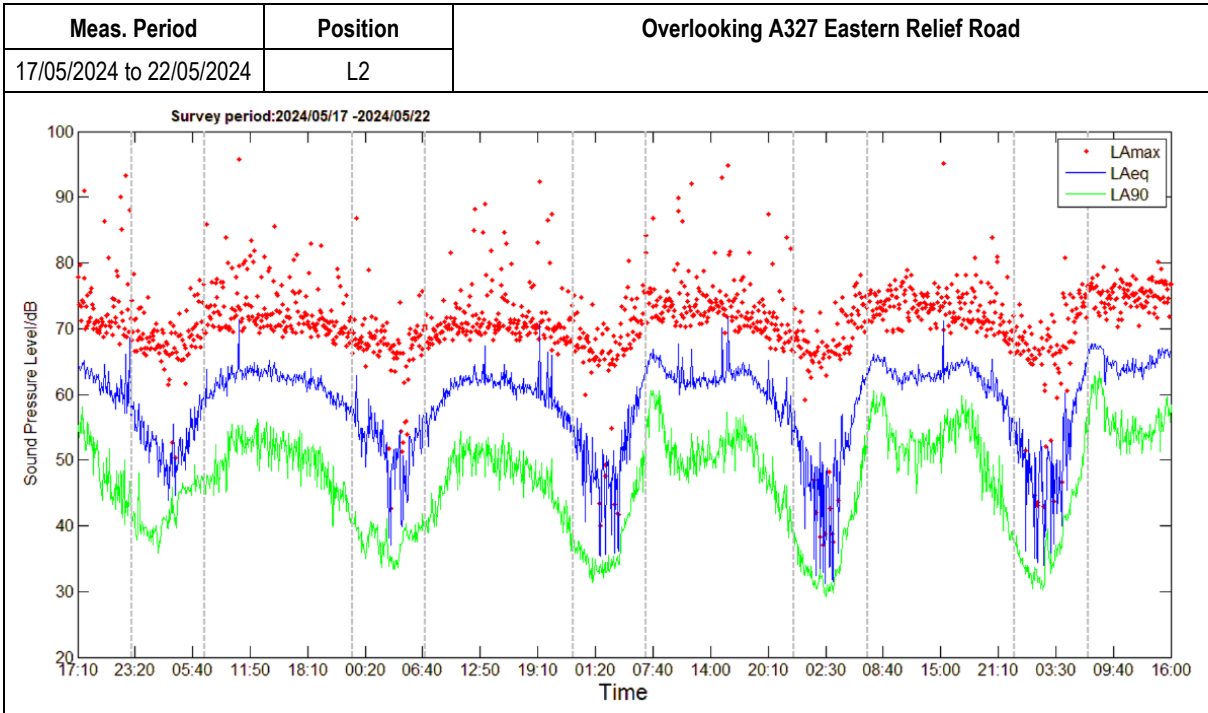
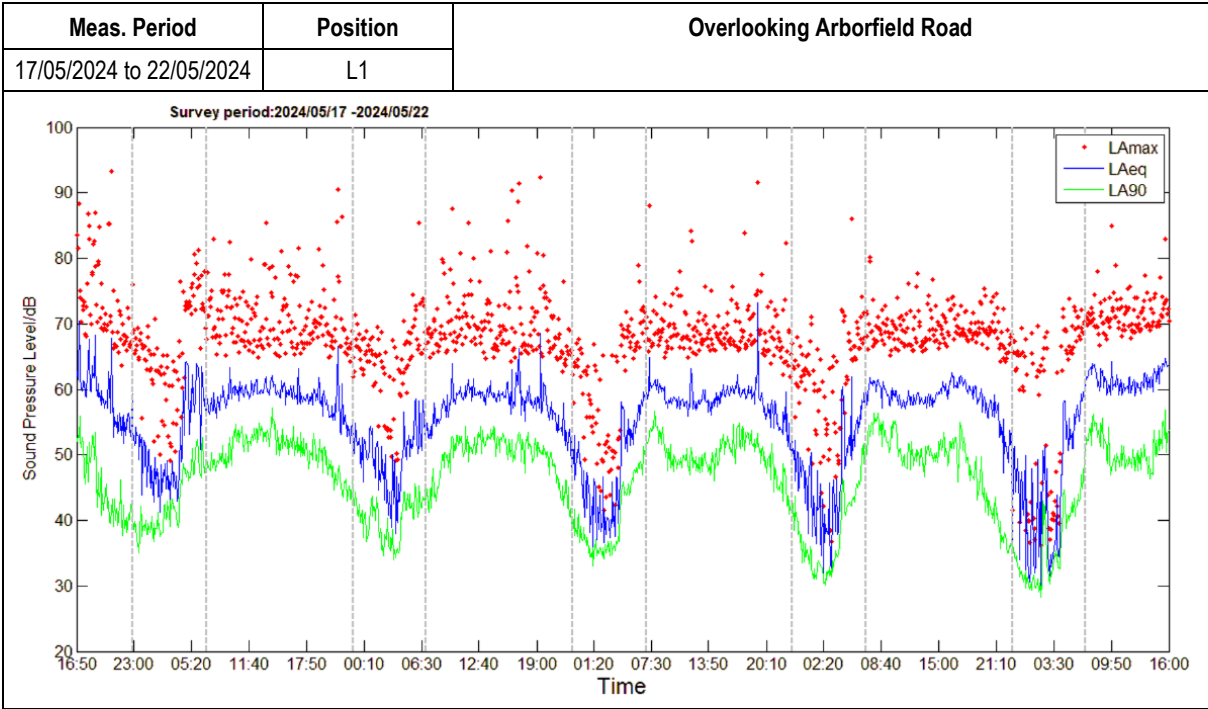
Unattended Noise Monitoring Results:

Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB ¹	LAeq,8hr, dB	LA90,5mins, dB ¹	LAm _{ax} , dB ²
17/05/2024 to 22/05/2024	L1	59	50	52	42	70-72
17/05/2024 to 22/05/2024	L2	63	52	55	40	73-74

Note 1: Typical lowest measured during the period shown.

Note 2: Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

Unattended Noise Monitoring Results:



Appendix 3 Modelling Results

Modelling Software:

CADNA/A Version 2023 MR2

Modelled Scenarios:

Baseline 2027 – Existing scenario (without development)
Future year 2042 – Future scenario (with development)

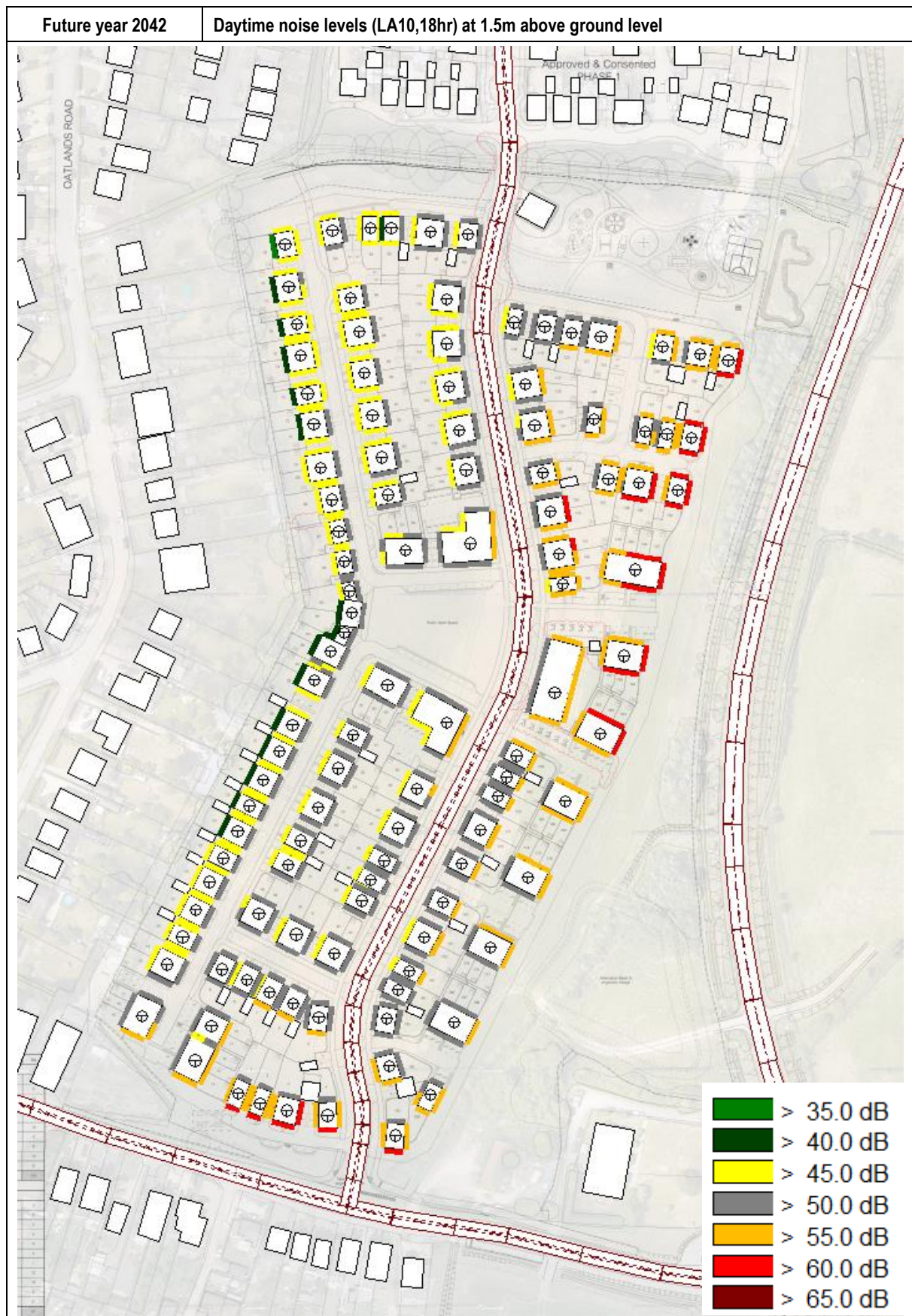
Data inputs:

- Noise survey results
- Topographical data for the site
- Development layout

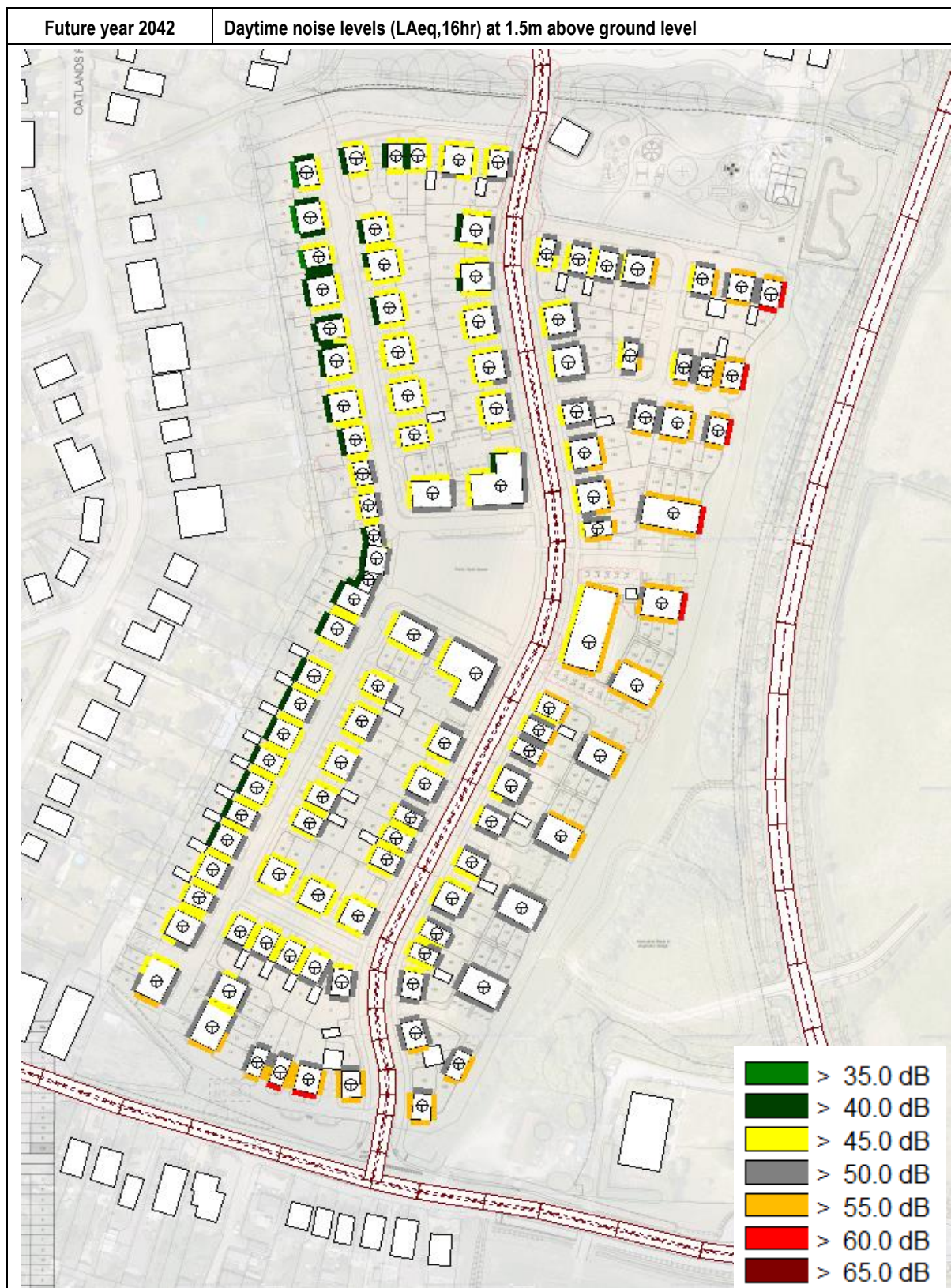
**Calculation
Algorithms Used:**

- Calculation of Road Traffic Noise 1988 – Department of Transport
- ISO 9613-1:1993 Acoustics-Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere
- ISO 9613-2:1996 Acoustics-Attenuation of sound during propagation outdoors – Part 2: General method of calculation

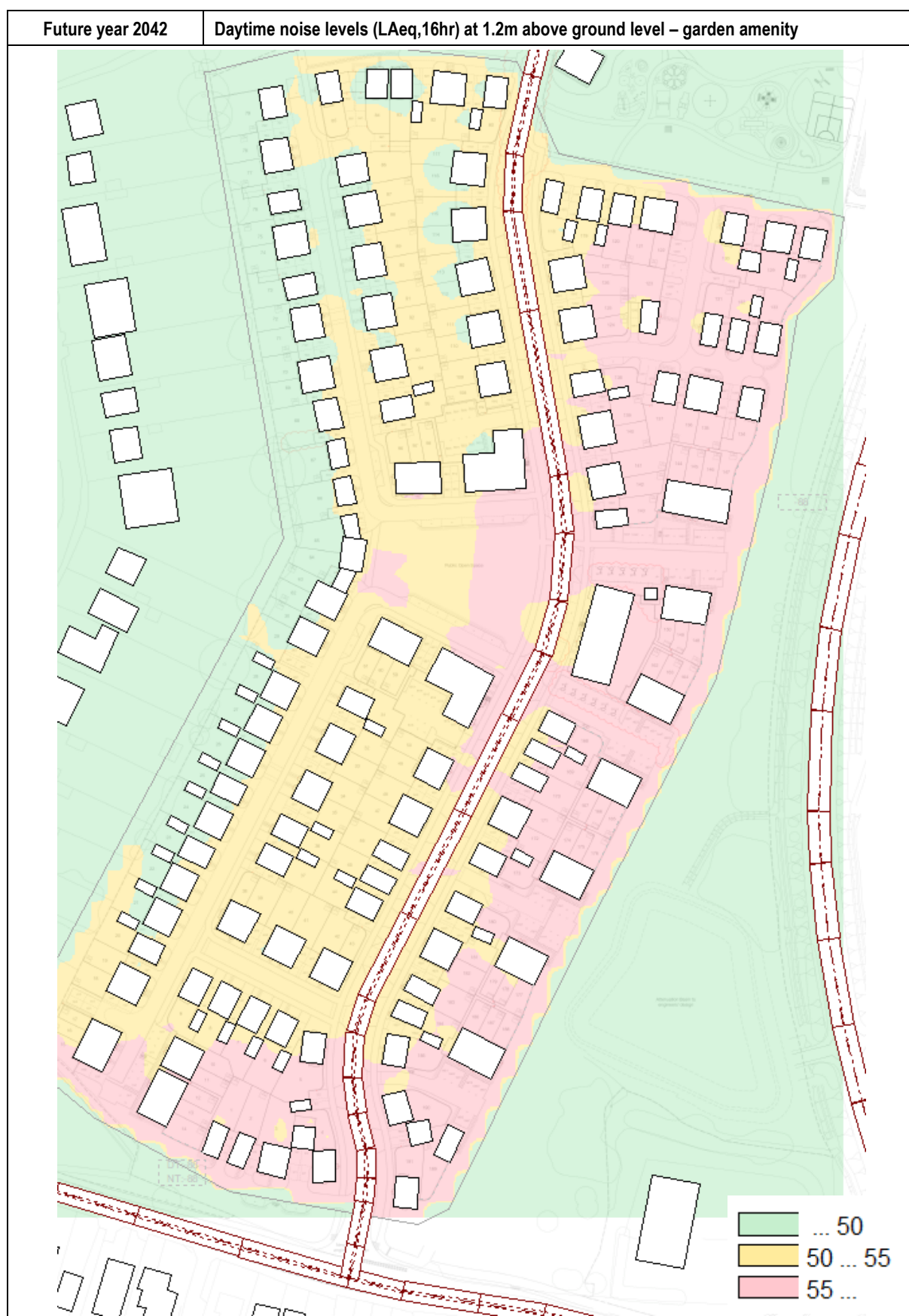
Modelling Printout:



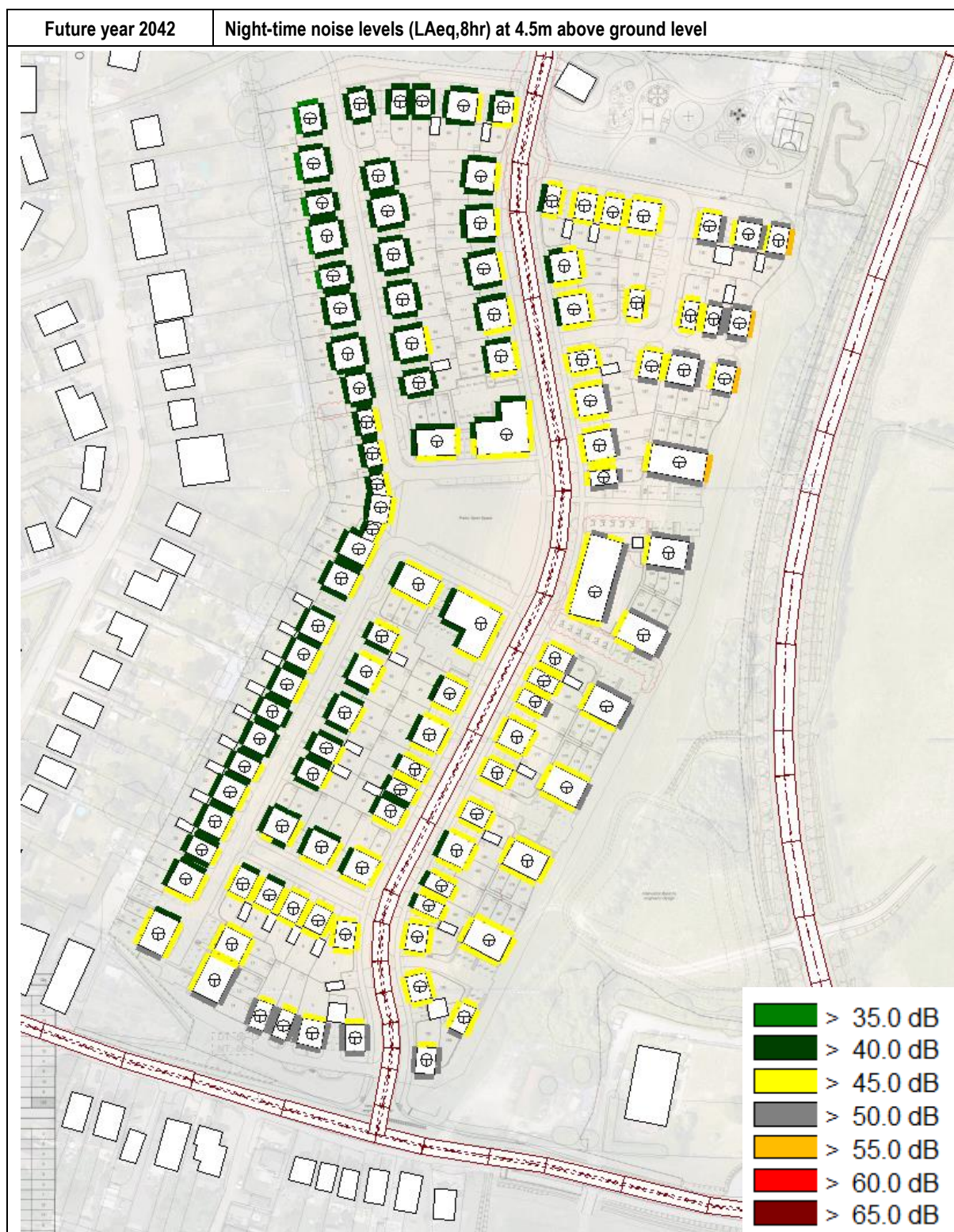
Modelling Printout:



Modelling Printout:



Modelling Printout:



Calculated future year noise levels at all plots within the development

Sensitive Receptor	Predicted Future Road Traffic Noise Levels (2042 including development traffic)			
	LA10,18hrs (0600-0000hrs) at 1.5m height	LA10,18hrs (0600-0000hrs) at 4.5m height	LAeq,16hrs (0700-2300hrs) at 1.5m height	LAeq,8hrs (2300-0000hrs) at 4.5m height
Plot1	62	65	59	55
Plot2	62	65	60	55
Plot3	62	65	60	55
Plot4	62	65	60	55
Plot5	56	59	54	49
Plot6	55	58	53	48
Plot7	55	57	53	48
Plot8	54	57	52	47
Plot9	54	57	52	48
Plot10-11	56	59	54	49
Plot12-14	60	64	58	54
Plot15-17	58	62	56	52
Plot18-19	54	57	52	47
Plot20	53	56	51	46
Plot21	53	55	51	46
Plot22	52	55	50	46
Plot23	52	55	50	45
Plot24	52	54	50	45
Plot25	52	54	50	45
Plot26	52	55	50	45
Plot27	52	55	51	46
Plot28	52	55	50	46
Plot29-30	54	56	52	46
Plot31	54	56	52	47
Plot32-33	54	55	52	46
Plot34-35	54	56	52	47
Plot36	54	55	52	45
Plot37	53	55	51	46

Sensitive Receptor	Predicted Future Road Traffic Noise Levels (2042 including development traffic)			
	LA10,18hrs (0600-0000hrs) at 1.5m height	LA10,18hrs (0600-0000hrs) at 4.5m height	LAeq,16hrs (0700-2300hrs) at 1.5m height	LAeq,8hrs (2300-000hrs) at 4.5m height
Plot38-39	52	54	50	45
Plot40-41	52	55	50	46
Plot42-43	54	56	52	47
Plot44	53	56	52	47
Plot45	54	56	52	47
Plot46	55	57	53	47
Plot47-48	54	57	53	47
Plot49-50	55	57	53	48
Plot51-58	56	58	54	48
Plot59-61	54	56	52	47
Plot62-63	53	56	52	46
Plot64-65	55	56	53	47
Plot66	53	55	51	46
Plot64	-88	56	-83	47
Plot65	-88	55	-83	46
Plot67	52	54	50	45
Plot68	51	54	50	45
Plot69-70	52	54	50	45
Plot71-72	51	54	49	44
Plot73	50	53	48	44
Plot74-75	50	53	48	44
Plot76	49	52	48	43
Plot77-78	51	53	49	44
Plot79	50	52	48	43
Plot80	54	56	52	47
Plot81-82	52	55	50	46
Plot83	50	54	49	45
Plot84	49	53	47	44
Plot85	51	53	49	44
Plot86	52	54	50	45

Sensitive Receptor	Predicted Future Road Traffic Noise Levels (2042 including development traffic)			
	LA10,18hrs (0600-0000hrs) at 1.5m height	LA10,18hrs (0600-0000hrs) at 4.5m height	LAeq,16hrs (0700-2300hrs) at 1.5m height	LAeq,8hrs (2300-000hrs) at 4.5m height
Plot87-88	52	54	50	44
Plot89-90	51	53	49	44
Plot91-92	51	54	50	45
Plot93-94	52	54	50	45
Plot95	52	54	50	45
Plot96-98	55	56	53	46
Plot99-107	56	58	54	48
Plot108-109	54	56	53	47
Plot110-111	54	56	52	47
Plot112-113	53	55	51	46
Plot114-115	53	55	51	46
Plot116-117	54	56	52	47
Plot118	53	56	51	47
Plot119	54	56	52	47
Plot120	56	57	54	48
Plot121-122	57	59	55	50
Plot123	57	59	55	49
Plot124-125	57	59	55	49
Plot126-127	56	57	54	48
Plot128	64	66	61	55
Plot129	60	62	58	52
Plot130	58	61	56	51
Plot131	57	60	55	50
Plot132	60	62	57	52
Plot133	64	66	62	55
Plot134	64	66	62	55
Plot135-136	61	63	59	53
Plot137	60	61	57	51
Plot138	56	59	54	50
Plot139-140	61	61	59	51

Sensitive Receptor	Predicted Future Road Traffic Noise Levels (2042 including development traffic)			
	LA10,18hrs (0600-0000hrs) at 1.5m height	LA10,18hrs (0600-0000hrs) at 4.5m height	LAeq,16hrs (0700-2300hrs) at 1.5m height	LAeq,8hrs (2300-000hrs) at 4.5m height
Plot141-142	61	61	58	51
Plot143	60	61	58	51
Plot144-147	64	65	62	55
Plot148-150	63	65	61	55
Plot151-161	60	62	58	52
Plot162-164	62	64	60	54
Plot165-167	60	62	58	52
Plot168	59	61	57	51
Plot169	57	60	55	50
Plot170	58	60	56	50
Plot171-172	57	59	55	49
Plot173	56	58	54	49
Plot174-176	58	60	56	51
Plot177-179	57	59	55	49
Plot180	56	58	54	48
Plot181-182	55	57	53	48
Plot183	56	57	54	48
Plot184	55	57	53	48
Plot185	55	57	53	48
Plot186-188	56	59	54	49
Plot189	58	60	56	51
Plot190	58	60	56	50
Plot191	62	64	60	54

Appendix 4 FACSIM Calculations

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PROJECT: Land north of Arborfield Road, Shinfield

ROOM: Bedroom

VARIANT: Worst-Case Average Noise Level (LAeq)

NOTES:

Room Dimensions [m] **3.5** X **3.2** X **2.4**

Room Volume = **26.9** m³

Partition Area = **8.4** m²

Ventilation ref area = **10.0** m²

Free Field SPL K = **3** dB

SELECT Free Field or Façade SPL for model input >>> **Free Field SPL**

NOTES:

EXTERNAL SPECTRUM (A weighted)

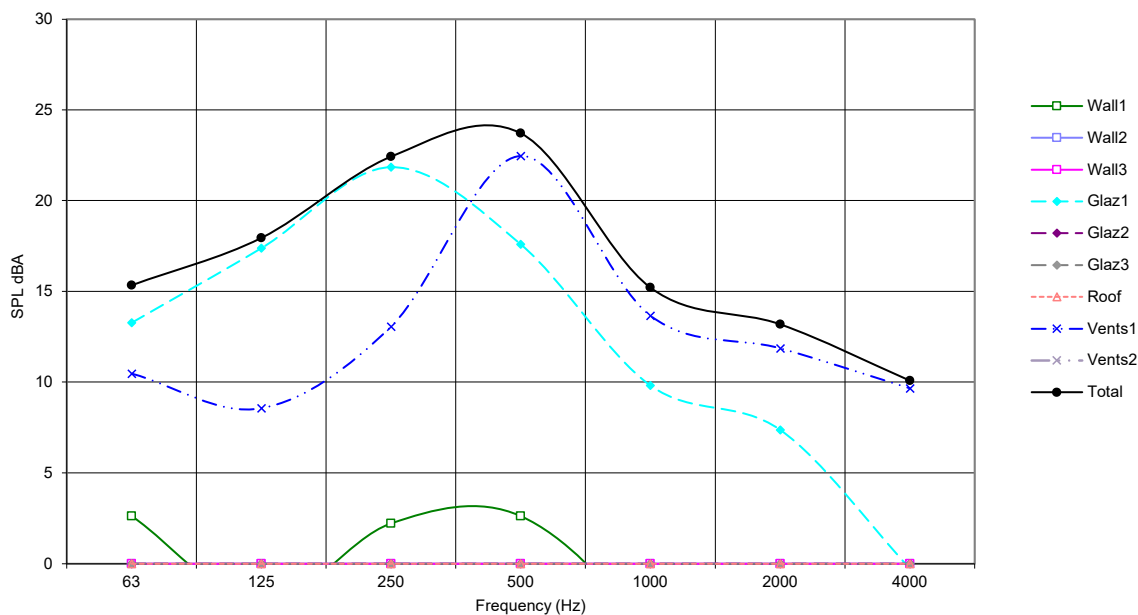
dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	55.0							
	36.8	40.9	44.4	47.8	51.0	48.2	43.0	Reference spectrum

REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	6.6	36	45	44	47	57	67	77	0%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 27 dB Rw + Ctr - Standard Thermal Double Glazing	1.9	20	20	19	27	38	37	40	53%	27 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		26	26	25	33	44	44	46				
Resultant SPL inside room excluding ventilators dB	24.9	14	17	22	18	10	7	0	54%			

Ventilator Type	Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Greenwood 5000EAW.AC1 (Vent + 1 External Acoustic Module)	2	33	39	38	32	44	43	40	46%	39	-1	-2
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	24.2	10	9	13	22	14	12	10	46%			
Total SPL inside room	27.6	15	18	22	24	15	13	10				

Element contribution to total internal noise level

PROJECT: Land north of Arborfield Road, Shinfield

ROOM: Bedroom

VARIANT: Worst-Case Maximum Noise Level (L_{Amax})

NOTES:

Room Dimensions [m] **3.5** X **3.2** X **2.4**

Room Volume = **26.9** m³

Partition Area = **8.4** m²

Ventilation ref area = **10.0** m²

Free Field SPL K = **3** dB

SELECT Free Field or Façade SPL for model input >>> **Free Field SPL**

NOTES:

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	69.0							
	50.8	54.9	58.4	61.8	65.0	62.2	57.0	Reference spectrum

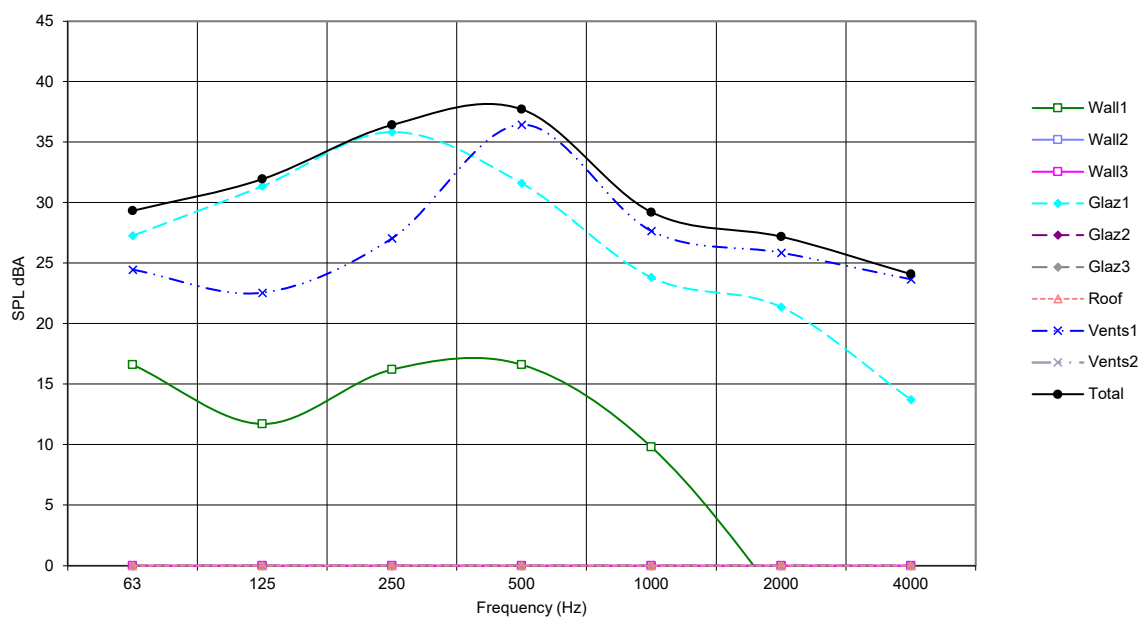
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	6.6	36	45	44	47	57	67	77	1%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 27 dB Rw + Ctr - Standard Thermal Double Glazing	1.9	20	20	19	27	38	37	40	53%	27 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		26	26	25	33	44	44	46				
Resultant SPL inside room excluding ventilators dB		38.9	28	31	36	32	24	21	14	54%		

Ventilator Type	Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Greenwood 5000EAW.AC1 (Vent + 1 External Acoustic Module)	2	33	39	38	32	44	43	40	46%	39	-1	-2
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		38.2	24	23	27	36	28	26	24	46%		
Total SPL inside room		41.6	29	32	36	38	29	27	24			

Element contribution to total internal noise level



PROJECT: Land north of Arborfield Road, Shinfield

ROOM: Living Room

VARIANT: Worst-Case Average Noise Level (LAeq)

NOTES:

Room Dimensions [m] $\begin{matrix} W \\ 3.2 \end{matrix}$ X $\begin{matrix} L \\ 4.3 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$

Room Volume = 33.0 m³

Partition Area = 7.7 m²

Ventilation ref area = 10.0 m²

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>> ☐ Free Field ☒ Façade

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	62.0							
	43.8	47.9	51.4	54.8	58.0	55.2	50.0	Reference spectrum

REVERBERATION TIME

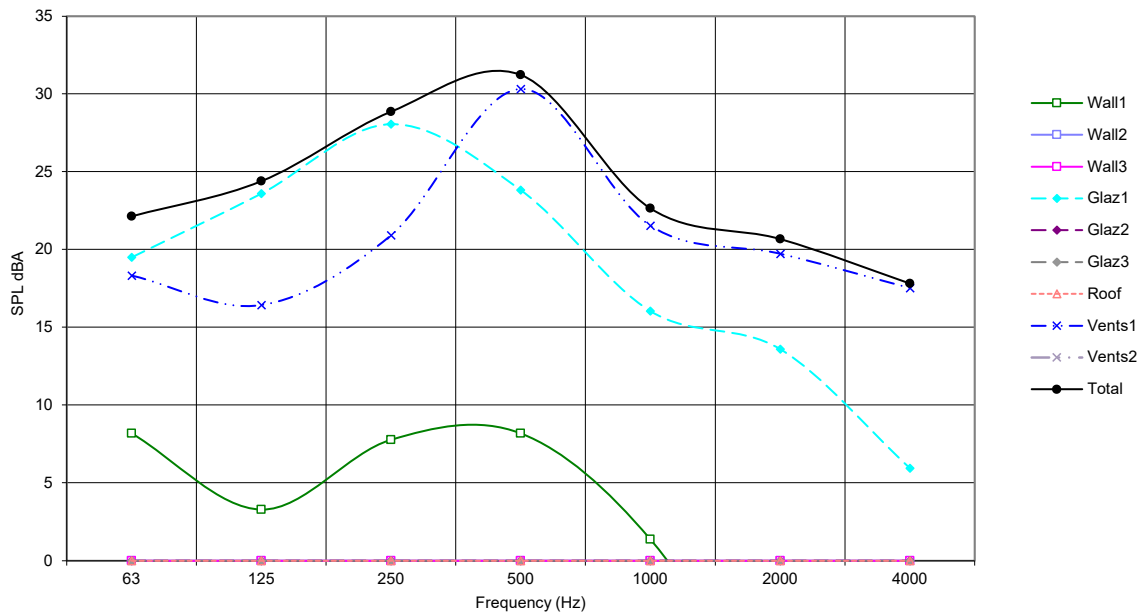
DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element	Area [m ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	5.8	36	45	44	47	57	67	77	1%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 27 dB Rw + Ctr - Standard Thermal Double Glazing	1.9	20	20	19	27	38	37	40	44%	27 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		26	26	25	32	43	43	46				
Resultant SPL inside room excluding ventilators dB	31.1	20	24	28	24	16	14	6	45%			

Ventilator Type	Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Greenwood 5000EAW.AC1 (Vent + 1 External Acoustic Module)	3	33	39	38	32	44	43	40	55%	39	-1	-2
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	32.1	18	16	21	30	22	20	18	55%			
Total SPL inside room	34.6	22	24	29	31	23	21	18				

Element contribution to total internal noise level



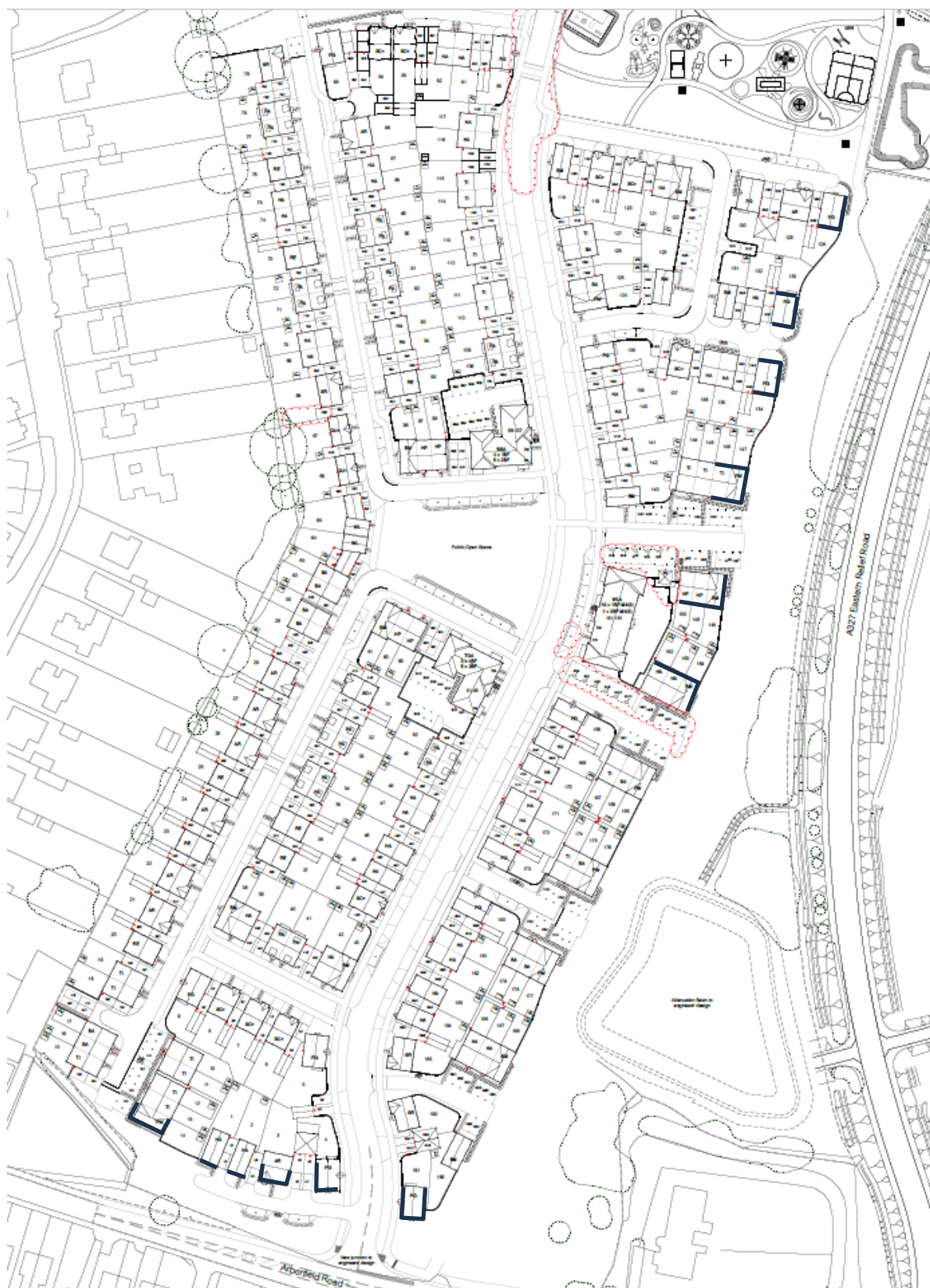
Appendix 5 Outline Acoustic Facade Specification

Reference	Colour	Glazing Specification	Ventilator Specification
FC01	unmarked	27 dB Rw+Ctr	31 dB Dnew+Ctr
FC02		27 dB Rw+Ctr	37 dB Dnew+Ctr

NOTES:

Values must include the Ctr correction. Manufacturers or suppliers should provide laboratory test data demonstrating that the proposed systems are capable of achieving the values given. Windows should be tested as complete systems (rather than just the glazing in isolation) and trickle ventilators should be in the open position.

All floors:



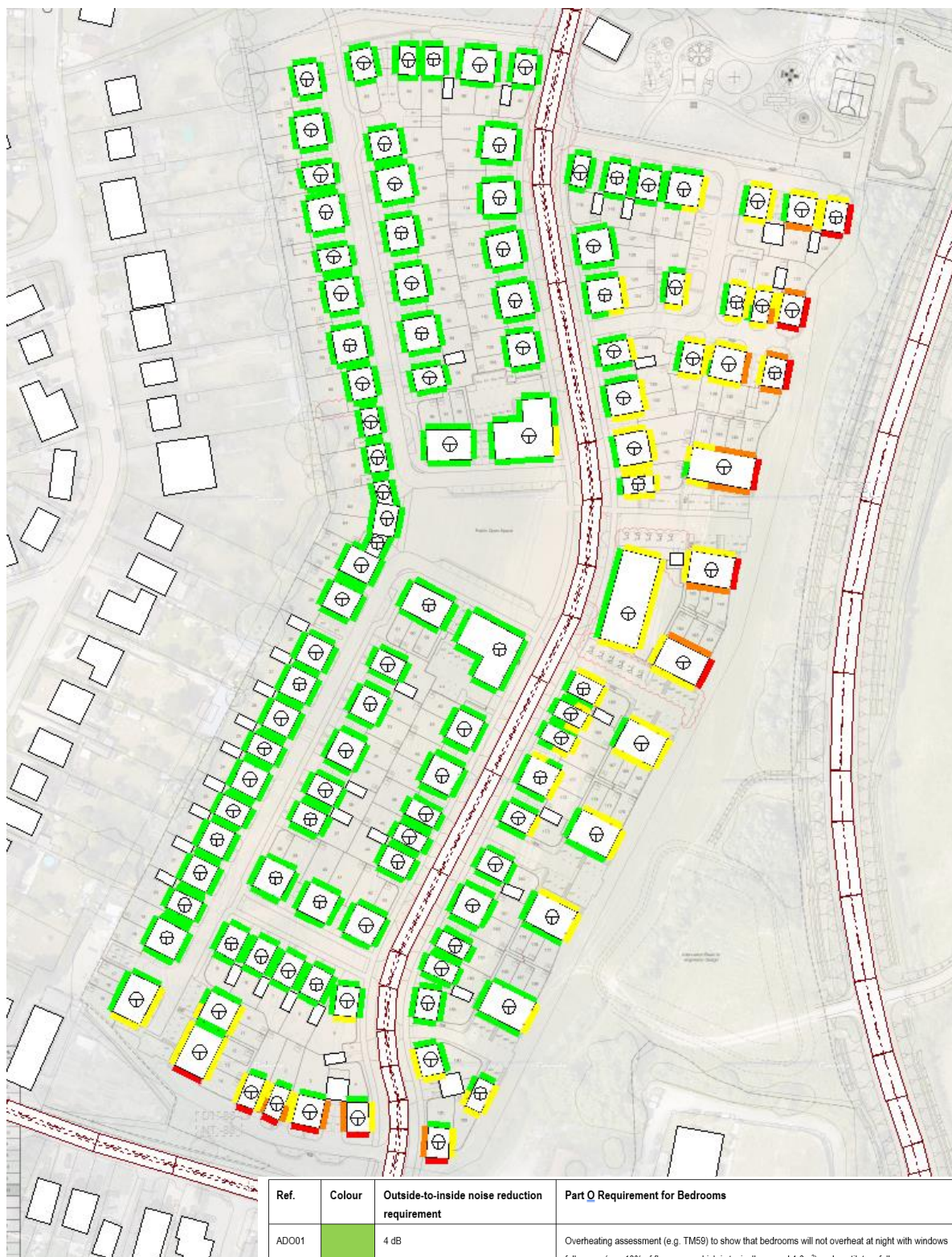
Reference	Colour	Glazing Specification	Ventilator Specification
FC01	unmarked	27 dB Rw+Ctr	31 dB Dnew+Ctr
FC02		27 dB Rw+Ctr	37 dB Dnew+Ctr

NOTES:

Values must include the Ctr correction. Manufacturers or suppliers should provide laboratory test data demonstrating that the proposed systems are capable of achieving the values given. Windows should be tested as complete systems (rather than just the glazing in isolation) and trickle ventilators should be in the open position.

Appendix 6 Part Q Acoustic Requirements for Bedrooms at Night

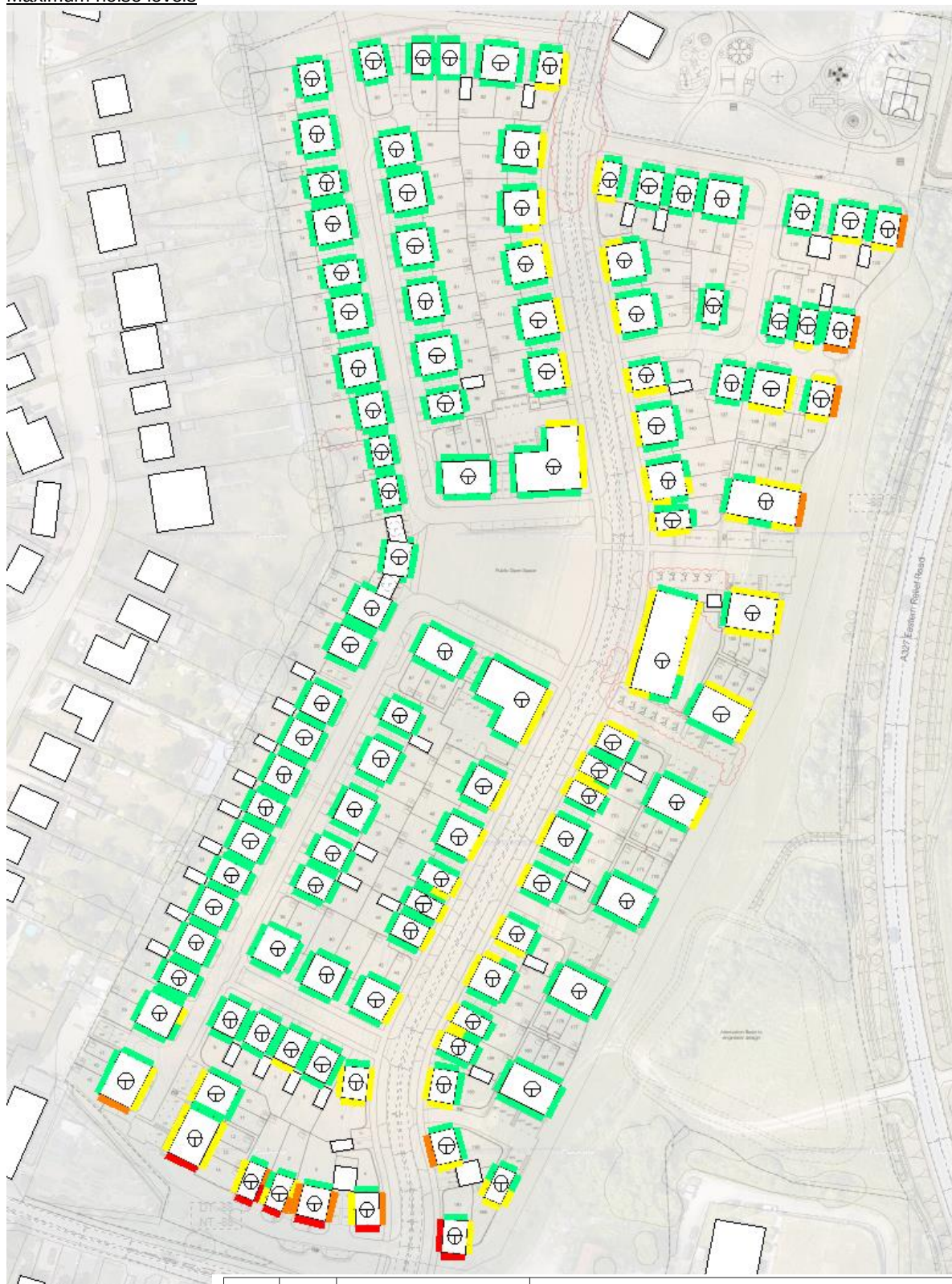
Average noise levels



Note 1 ADO requirements only apply to bedrooms during night-time hours (23:00-07:00)

Note 2 The window open area is specified above as an actual open area, not 'equivalent open area' and the values may therefore need to be converted as part of the overheating assessment.

Maximum noise levels

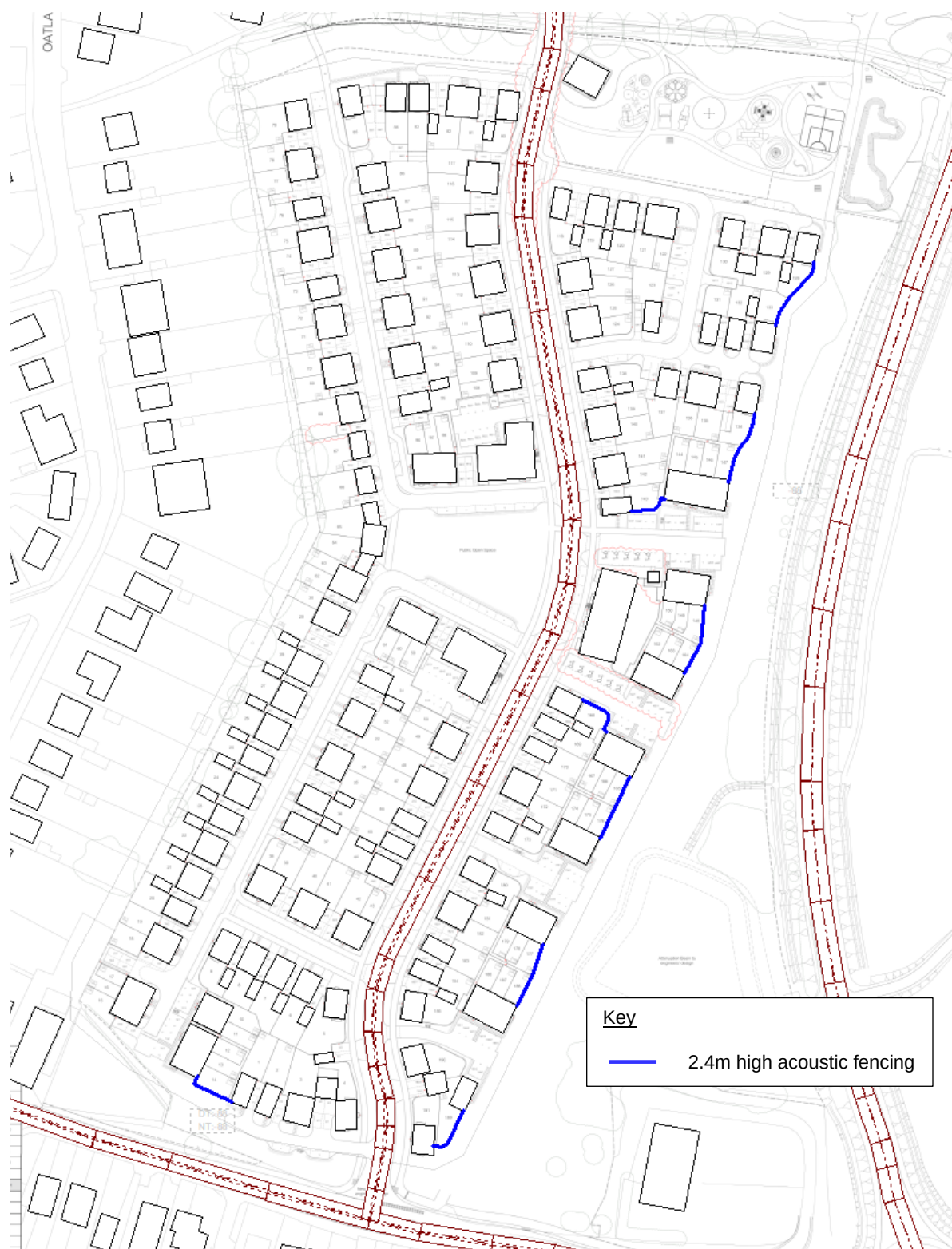


Ref.	Colour	Outside-to-inside noise reduction requirement	Part Q Requirement for Bedrooms
ADO01	Green	4 dB	Overheating assessment (e.g. TM59) to show that bedrooms will not overheat at night with windows fully open (e.g. 13% of floor area, which is typically around 1.3m ²) and ventilators fully open.
ADO02	Yellow	9 dB	Overheating assessment (e.g. TM59) to show that bedrooms will not overheat at night with windows open (e.g. 4% of floor area, which is typically around 0.4m ²) and ventilators fully open.
ADO03	Orange	13 dB	Overheating assessment (e.g. TM59) to show that bedrooms will not overheat at night with windows partially open (e.g. ~2% of floor area, which is typically around 0.2m ²) and ventilators fully open.
ADO04	Red	>13 dB	Overheating assessment (e.g. TM59) to show that bedrooms on these facades will not overheat at night with windows fully closed and ventilators fully open.

Note 1 ADO requirements only apply to bedrooms during night-time hours (23:00-07:00)

Note 2 The window open area is specified above as an actual open area, not 'equivalent open area' and the values may therefore need to be converted as part of the overheating assessment.

Appendix 7 Acoustic Boundary Treatments





Architectural & Environmental Consultants

Acoustics | Air Quality | Overheating

This report has been prepared by Cass Allen Associates Ltd in accordance with the CDM regulations with all reasonable skill, care and diligence, and taking account of the resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid at the time of collection. This report is for the exclusive use of the client named above; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from Cass Allen Associates Ltd. Cass Allen Associates Ltd disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of work.



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with this report, please
click here to send us an
email and we will call you
back to discuss