Dynamic Overheating Report

Chase New Homes

West End Road, Ruislip

Final

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v.1	27.03.2026	Draft	S Jayaraman C Medina	V Shapland	A Kreglewska
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We are able to advise at all stages of projects from planning applications to handover.

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This report has been prepared by Hodkinson Consultancy using all reasonable skill, care and diligence and using evidence supplied by the design team, client and where relevant through desktop research.

Hodkinson Consultancy can accept no responsibility for misinformation or inaccurate information supplied by any third party as part of this assessment.

Executive Summary

The purpose of this report is to provide the overheating mitigation strategy for the proposed development at West End Road in Ruislip in the London Borough of Hillingdon by Chase New Homes in support of the planning application to ensure that the new-build dwellings comply with Approved Document O (2021) of the Building Regulations. The refurbished Grade II listed buildings are not classed as major refurbishment (less than 10 refurbished dwellings) and therefore does not require a TM59 assessment.

A sample of dwellings has been selected for the dynamic overheating assessment based on design characteristics that establish them as representative of the overall proposed scheme. This selection of dwellings includes consideration of varying floors and of different orientations.

The selected dwellings were evaluated in accordance with *CIBSE TM59: Design methodology for the assessment of overheating risk in homes (2017)*, with the requirements of *Approved Document O (2021)* applied to the new-build dwellings of the proposed development.

For the new-build dwellings, the following passive mitigation measures have been explored as far as practicable to avoid the need for active cooling:

- Window design maximising openable area and reducing instances of fixed glazing to increase natural ventilation and reduce solar gain;
- Solar control glazing, with G-values optimised alongside the energy strategy to ensure minimal solar gain whilst still achieving fabric energy efficiency targets;
- Mechanical ventilation with heat recovery (MVHR), with ventilation rates exceeding minimum Part F; and
- Where necessary due to noise risk considerations, air tempering (also known as peak lopping) units connected to the MVHR system to allow for mitigation when window-opening is constrained.

All modelled dwellings achieve compliance with the CIBSE TM59 overheating assessment criteria under the mandatory weather file (DSY1, 2020s, high-emissions, 50th percentile scenario). For the new-build dwellings, the assessment additionally demonstrates compliance with the requirements of Approved Document O. The results are based on key design features and passive mitigation measures following the London Plan cooling hierarchy as outlined within Table i.

Table i: Design features incorporated in new dwellings in accordance with the London Plan cooling hierarchy

Cooling hierarchy	Design feature	Discussion
1. Reduce amount of heat entering the building	Efficient building fabric and air tightness standards	In line with energy strategy (Hodkinson Consultancy, March 2026)
	Solar control glazing with G-value of 0.38	A low G-value reduces solar gain, but has implications on CO_2 emissions, fabric energy efficiency and internal daylight levels and has therefore been optimised to balance all aspects as far as possible
	External shading provided by balcony overhangs, external reveal depths and canopies	In line with design proposals (Aros Architects)
2. Minimise internal heat generation	Energy efficient design of building services	In line with energy strategy (Hodkinson Consultancy, March 2026)
3. Manage the heat	Concrete floor slab between dwellings in apartment blocks	The thermal mass of this will help reduce the risk of overheating by absorbing heat during the daytime
4. Passive ventilation	Openable windows used as the primary means of ventilation	Windows are simulated to open in accordance with the limits set out within Approved Document O (2021)
5. Mechanical ventilation	Background mechanical ventilation rate exceeding minimum Part F	80 l/s ventilation rates for the whole dwelling in all units
6. Active cooling	Air tempering bolt-on to MVHR to be provided to those dwellings with window opening limitations due to external noise	Air tempering to provide 1.97kW cooling capacity and ventilation rate of 83 l/s No requirement for active cooling

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1. INTRODUCTION

1.1 This document has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, to present the overheating mitigation strategy for the proposed development at West End Road in Ruislip, the London Borough of Hillingdon by Chase New Homes.

Site Location

1.2 The proposed development is located off West End Road in Ruislip, in the London Borough of Hillingdon. The site is located to the south of the London Underground rail line (Metropolitan and Piccadilly) and Ruislip train station and to the east of West End Road (A4180), as shown in Figure 1 below.

Figure 1: Site location (source: Google maps, Map data 2026)

Planning History & Development Description

1.3 This submission follows the refusal of full planning permission in June 2023 and grant of Listed Building Consent in October 2023 as well as detailed pre-application engagement between January and July 2024.

1.4 The 2023 application was refused for 11 reasons, these are summarised as follows:

- *The development would be overdevelopment of the site, detrimental to the setting of the Grade II listed buildings. A lack of detail of the treatment of the historic fabric of the listed buildings was provided to enable the benefits of the scheme to be weighed against any potential harms.*
- *The proposal would be visually dominant, and overdevelopment of the site at odds with the distinctive suburban character of the surrounding area, harming the visual amenity and character of the area.*
- *The unit mix fails to provide sufficient family sized units to reflect housing need in the Borough.*
- *Cycle parking design does not conform to the London Cycling Design Standards.*
- *Insufficient information on overheating and any mitigation required.*
- *Insufficient information on levels of daylight and sunlight amenity.*
- *Suitable SuDs was not shown to be incorporated.*
- *Inadequate information on potential harm to bat roosts.*
- *Failure to provide adequate provision of disabled units.*
- *Failure to provide adequate levels of amenity space for future occupants.*
- *Absence of completed S106 Agreement.*

1.5 On 24 October 2023 the parallel Listed Building Consent (LBC) application was granted (LPA Ref. 7969/APP/2023/1833) which addresses part of reason for refusal 1.

1.6 This updated report has been prepared following feedback and discussion on application 7969/APP/2024/2451 originally submitted in October 2024.

1.7 This new scheme is a fresh design approach to development on the site which has taken account of all matters raised during engagement with the Local Planning Authority to date. This approach has enabled the Applicant to develop a sensitive and attractive scheme which responds to local context, including the sites heritage significance, and will add positively to the quality of the area.

1.8 The proposed development is described as follows:

> *"The partial demolition of the Grade II Listed Building and conversion of the Listed Buildings to accommodate 3 residential units and the replacement of the existing hotel buildings (C1 Use Class) with new build flat blocks and houses (Class C3) that range between two and four storeys in height to accommodate 68 residential units (a total of 71 residential dwellings within the development) together with the creation of new public realm, landscaping improvements, provision of car parking (including disabled parking bays), cycle parking, refuse stores and servicing arrangements with associated forms of development."*

1.9 Figure 2 below indicates the proposed site plan.

Figure 2: Proposed Block Plan (source: Aros Architects, February 2026)

Overheating and Thermal Comfort

1.10 Maintaining comfortable thermal comfort conditions in the face of climate change and increasing temperatures is one of the greatest challenges to be addressed by designers. The main objective is to achieve thermal comfort and minimise summertime overheating without the use of conventional air conditioning systems, which typically have associated greenhouse gas emissions and impact on the urban heat island effect.

1.11 Dynamic thermal simulations have been carried out for representative dwellings, to determine whether there is a risk of overheating. The new-build dwellings have been assessed in line with Approved Document O.

1.12 Appropriate mitigation measures have been recommended to mitigate the overheating risk and ensure that comfortable thermal conditions are achieved.

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2. PLANNING POLICY

2.1 The following planning policies and requirements have informed the sustainable design of the proposed development.

National Planning Policy: NPPF

2.2 The revised National Planning Policy Framework (NPPF) was published on the 12th of December 2024 and sets out the Government's planning policies for England. It describes a proactive approach that plans should take to mitigating and adapting to climate change, considering the risk of overheating from rising temperatures.

2.3 New developments should be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change.

Regional Planning Policy: The London Plan (2021)

2.4 The following key policy of the London Plan is considered relevant to the proposed development and this Overheating Assessment:

2.5 **Policy SI4 Managing Heat Risk** states that development proposals should minimise adverse impacts on urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure and that major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy (Figure 3):

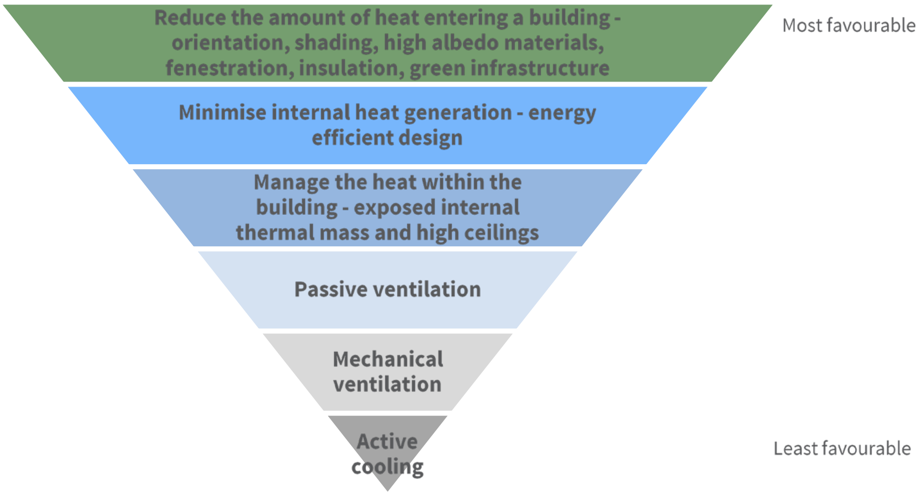


Figure 3: Cooling Hierarchy (London Plan 2021)

2.6 Low-energy measures should be used to mitigate overheating risk. These include solar shading, building orientation and solar-controlled glazing.

2.7 Passive ventilation should be prioritised, (accounting for external noise issues and local air quality). The increased use of air conditioning systems is not desirable. If active cooling systems, such as air conditioning systems, are unavoidable, these should be designed to reuse the waste heat they produce.

GLA Energy Assessment Guidance (2022)

2.8 The GLA Energy Assessment Guidance (2022) requires all developments to undertake a detailed analysis of the risk of overheating. The GHA Early Stage Overheating Risk Tool should be included within the assessment (see Appendix D).

2.9 For dwellings, final proposals must demonstrate compliance with Building Regulations Part O (2021) and CIBSE TM59 (2017).

Local Planning Policy: London Borough of Hillingdon Local Plan (2012)

2.10 London Borough of Hillingdon’s Local Plan was issued in two parts. Part 1: Strategic Policies was adopted in 2012 and Part 2: Development Management Policies was adopted in 2020. The key policies from these documents pertinent to this Overheating Assessment are:

> **Policy EM1: Climate Change Adaptation and Mitigation** – requires “*promoting the inclusion of passive design measures to reduce the impacts of urban heat effects*”.

3. OVERHEATING CRITERIA

3.1 The following building regulations and guidance provide a standardised approach to predicting overheating risk in residential dwellings within the UK. They set out the criteria by which the risk of overheating can be assessed or identified.

Approved Document O (2021)

3.2 The proposed new-build part of the development will be subject to Part O of the Building Regulations, for which requirements are set out within Approved Document O (AD(O)) for Overheating (2021). Compliance is based on meeting the following requirements:

- Reasonable provision to limit unwanted solar gains in summer and to provide adequate means to remove excess heat;
- Taking account of safety, noise, pollution, protection of falling and entrapment when developing the strategy. Mechanical cooling should only be considered when feasible passive means are insufficient.

3.3 There are two methods for demonstrating compliance under AD(O):

- **Simplified**: The simplified method requires dwellings to accommodate design limitations on maximum glazed areas, minimum openable areas for natural ventilation and external shading.
- **Dynamic**: The dynamic method requires dwellings to demonstrate compliance with CIBSE TM59 criteria (with a few specific limitations on use of the TM59 methodology) via dynamic thermal modelling.

3.4 For the purposes of this assessment, the dynamic method has been used for demonstrating compliance.

CIBSE TM59 (2017) Assessment Criteria

3.5 The criteria for the assessment of overheating risk have been specified by the Chartered Institute of Building Services Engineers (CIBSE) in TM59 *Design methodology for the assessment of overheating risk in homes* (2017). CIBSE TM59 provides a standardised approach to predicting overheating risk for both naturally and mechanically ventilated residential buildings.

3.6 The following criteria must be met in order to demonstrate compliance under a predominantly naturally ventilated scenario:

> **Criterion A**: The indoor operative temperature should not exceed the threshold comfort temperature by 1ºC or more for more than 3% of occupied hours in living rooms, kitchens and bedrooms.

> **Criterion B**: To guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am should not exceed 26°C for more than 1% of annual hours.

3.7 Under a predominantly mechanically ventilated scenario, all occupied rooms should not exceed an operative temperature of 26˚C for more than 3% of the annual occupied annual hours. This scenario can be used for homes with restricted window openings.

4. MODELLING APPROACH

4.1 Dynamic thermal modelling has been undertaken using DesignBuilder Software (v.2025.1). The new build units have been assessed against CIBSE TM59 guidance and the guidelines from the new Approved Document (O).

4.2 Thermal comfort category II has been used, representing normal expectation for new buildings and conversions.

Unit Selection

4.3 According to CIBSE TM59 "*The assessment should try to identify all the dwellings that are at risk of overheating. These are likely to be those (a) with large glazing areas, (b) on the topmost floor, (c) having less shading, (d) having large, sun-facing windows, (e) having a single aspect, or (f) having limited opening windows".*

4.4 The unit selection has followed the CIBSE TM59 methodology considering each of the criteria outlined above, including top floor units, those that are south and west facing with limited shading and those with limited window opening due to noise risk. The selection of units is broadly based on the following design characteristics, which make it representative of the development:

> Unit type (comprising both flats and houses);

> Façade orientation, including north, east, south and west;

> Occupancy (e.g., 1B2P, 2B4P, 3B4P etc.);

> Floor levels, including ground and top floor units;

> Exposure to noise risk conditions; and

> Inclusion of ‘worst-case’ units.

4.5 Table 1 outlines the units selected for overheating assessment.

Table 1: Dwelling unit selection for overheating analysis

Unit	Type	Size (m²)	Floor Level	Tenure	Orientation	Aspect	Noise Risk Category (Cass Allen, March 2026)
1	Flat	72	Top Floor	2B4P	South, West	Dual	Windows partially open (2% of floor area), windows fully closed
2	Flat	63	Top floor	1B2P	South, West	Dual	Windows partially open (2% of floor area), windows fully closed
3	Flat	50	Ground floor	1B2P	West	Single	Windows fully closed
4	Flat	73	Mid floor	2B4P	North, South, West	Dual	Windows fully closed and open
5	Flat	71	Mid floor	2B4P	South-east, South-west, North-west	Dual	Windows fully closed and open
6	House	94	2 storeys	3B4P	East, South, West	Dual	Windows open (4% of floor area), Windows partially open (2% of floor area), windows fully closed
7	House	102	2 storeys	3B5P	East, West	Dual	Windows open (4% of floor area), windows fully closed

4.6 It is acknowledged that not all unit types are included within the unit selection, however all scenarios that result in an increased risk of overheating have been included and all unit types across the development can be reasonably represented by one of the modelled types.

4.7 Internal layouts of the dwellings selected for assessment are presented in Appendix A. Design modelling inputs for the assessed dwellings can be found in Appendix B.

Site External Weather Conditions

4.8 External temperatures and incident solar gains are greatest during summer months, coinciding with periods of lower wind speeds. Solar altitude is also highest during summer months, increasing the effects of façade shading from balcony overhangs and window reveals. Such considerations should be accounted for when designing for overheating risk.

4.9 The effects of external conditions are vital in an overheating assessment as they influence:

> Solar heat gains (a function of incident direct and diffuse solar radiation and solar altitude); and

> Calculated natural ventilation rates (a function of external temperature, wind directions and speeds).

4.10 CIBSE design summer year (DSY) weather data for London Heathrow (representative of urban and semi-urban areas outside of the central activity zone (CAZ)) has been used for the 2020s, high emissions, 50% percentile scenario as required by CIBSE TM59.

4.11 The assessment of overheating risk has been undertaken using the DSY1 weather file, in accordance with the requirements of TM59, the London Plan and AD(O). The final mitigation strategy has also been tested under the more extreme DSY2 and DSY3 weather files and the results are presented in Appendix C.

Model Geometry and Local Shading

4.12 Overshadowing from the building blocks has been taken into account during the simulation, based on the model geometry and the site orientation (Figure 4).

4.13 Solar control forms an integral part of overheating mitigation strategies. External shading in the form of balconies and canopies is applied across many of the façades as part of the design proposals. These were incorporated in the simulation model as shown in Figure 5.

4.14 Horizontal shading devices such as balconies and overhangs are more efficient when applied in south oriented façades and during midday when the solar angle is high. Their role in reducing solar gains in the summer period is considered to be paramount.

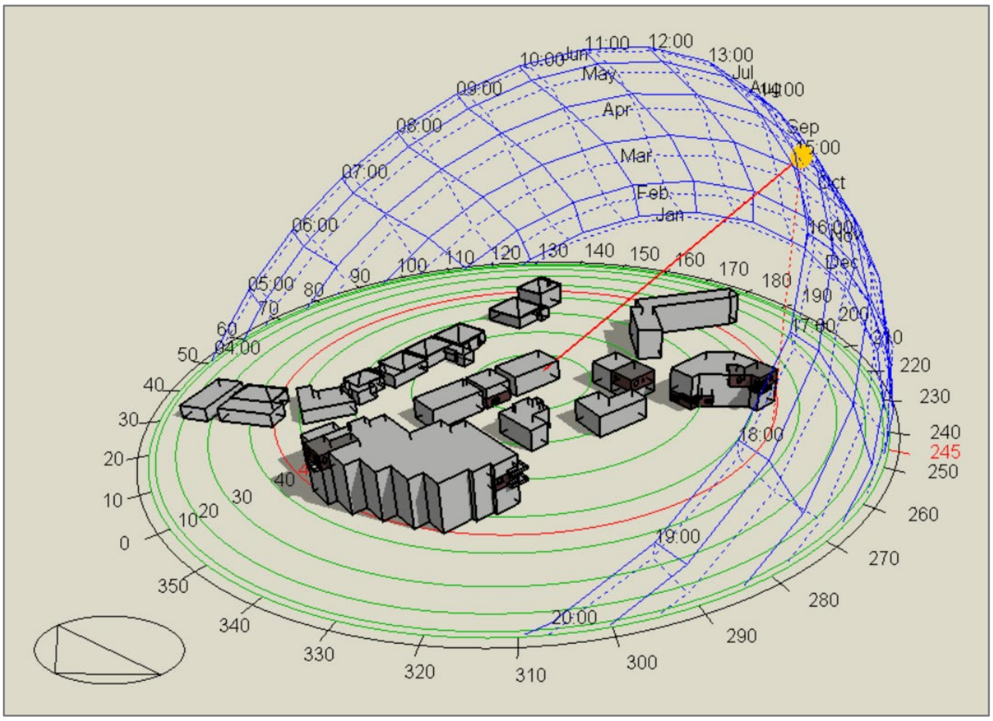


Figure 4: Simulation model from DesignBuilder (15th July @15:00)

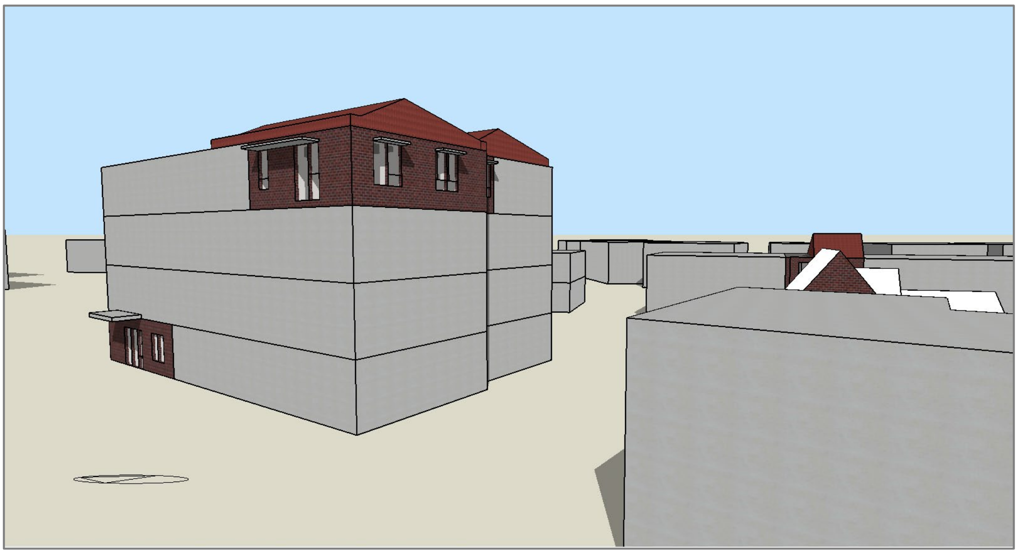


Figure 5: Simulation model from Design Builder showing horizontal shading in the form of balconies and canopies – Block K, view from southwest (15th July @15:00)

5. PASSIVE MITIGATION STRATEGY

New Dwellings

5.1 The following passive design measures have been incorporated in order to reduce the risk of overheating to an acceptable level, as determined by CIBSE TM59:

- High performance solar control glazing with a g-value of 0.38, optimised to mitigate overheating risk whilst achieving fabric energy efficiency targets and natural daylight provision;
- External shading is provided to some windows in form of balconies, 180 mm external reveal depths and canopies measuring 500mm and 800mm in depth;
- Highly efficient fabric envelope and high efficiency building services heating system, lighting and appliances are proposed in all dwellings to reduce internal gains;
- A concrete floor slab within the apartment blocks provides some thermal capacity to absorb excessive heat within the building;
- Openable areas of windows have been maximised, to ensure adequate natural ventilation:
    - For all dwellings, window casements open inwards to allow maximum openability;
    - Guarding heights are set at 1100mm from finished floor level for all floors at first floor level and above, enabling windows to be fully open without the need for safety restrictors;
    - Window designs have been refined to reduce fixed glazing, increasing the effective openable area and improving airflow rates in response to overheating analysis.
- A background mechanical ventilation system providing minimum Part F ventilation rates to dwellings, with the capacity to achieve up to 80l/s boosted air flow during hot weather;

5.2 The following results presented in Table 2 indicate that, based on the design modelling inputs in Appendix B and passive overheating mitigation measures outlined above, all assessed rooms meet the CIBSE TM59 criteria and therefore demonstrate an acceptable level of overheating risk.

5.3 These results are based on windows being open with no usability constraints, in accordance with paragraph 2.6 of AD(O):

- *When a room is occupied during the day (8am to 11pm), openings should be modelled to do all of the following:*
    - *Start to open when the internal temperature exceeds 22°C;*

  - *Be fully open when the internal temperature exceeds 26°C;*
  - *Start to close when the internal temperature falls below 26°C;*
  - *Be fully closed when the internal temperature falls below 22°C.*
- *At night (11pm to 8am), openings should be modelled as fully open if both of the following apply:*
  - *The opening is on the first floor or above and not easily accessible;*
  - *The internal temperature exceeds 23°C at 11pm.*
- When a ground floor or easily accessible room is unoccupied, both of the following apply.
  - *In the day, windows, patio doors and balcony doors should be modelled as open, if this can be done securely;*
  - *At night, windows, patio doors and balcony doors should be modelled as closed.*
- *An entrance door should be included, which should be shut all the time.*

Table 2: TM59 overheating results for new dwellings (assuming no window opening constraints) under DSY1 2020s

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 1	Bedroom 1	0.3	31	Pass
	Bedroom 2	0.4	29	Pass
	LKD	1.5	n/a	Pass
Unit 2	Bedroom 1	0.5	32	Pass
	LKD	2.6	n/a	Pass
Unit 3	Bedroom 1	0.3	24	Pass
	LKD	1.1	n/a	Pass
Unit 4	Bedroom 1	0.2	27	Pass
	Bedroom 2	0.2	18	Pass
	LKD	0.2	n/a	Pass

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 5	Bedroom 1	0.4	27	Pass
	Bedroom 2	0.6	25	Pass
	LKD	1.7	n/a	Pass
Unit 6	Bedroom 1	0.8	24	Pass
	Bedroom 2	1.2	32	Pass
	Bedroom 3	0.8	32	Pass
	LKD	2	n/a	Pass
Unit 7	Bedroom 1	0.7	31	Pass
	Bedroom 2	0.7	32	Pass
	Bedroom 3	0.6	32	Pass
	LKD	0.9	n/a	Pass

6. WINDOW OPENING CONSTRAINTS

6.1 A Noise Impact Evaluation has been completed by Cass Allen (March 2026), detailing window opening constraints due to noise under criteria within AD(O). The façade markup in the Cass Allen report (Figure 6), shows allowable window opening across the development site. Refer to Table 3 on the next page for more information on the colour coding used. The full Noise Impact Assessment has also been included in Appendix E.

Figure 6: AD(O) acoustic markup (Cass Allen, March 2026)

6.2 An Air Quality Assessment has been completed for the development by Cass Allen (March 2026) and it has been concluded that windows will not be required to be fixed shut due to air quality risk. The full Air Quality Assessment has also been included in Appendix F.

6.3 Units at ground floor level have window opening constraints due to security risk. These units will not rely on window opening for natural ventilation during sleeping hours.

Dwelling Results

6.4 The following results presented in Table 4 demonstrate the impact that night-time window opening constraints due to external noise and security considerations have on the risk of overheating within dwellings.

6.5 These results are based on the following noise limitations applied to bedroom windows:

Table 3: Night-time window opening limitations in bedrooms at first floor level and above

Zone 1	Red	Windows closed during sleeping hours
Zone 2	Orange	Windows restricted to an opening no greater than 2% of the floor area during sleeping hours
Zone 3	Yellow	Windows restricted to an opening no greater than 4% of the floor area during sleeping hours
Zone 4	Green	No limitations, windows open as per AD(O) rules

Table 4: TM59 overheating results for new dwellings (with window opening constraints due to noise and security risks) under DSY1 2020s

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 1	Bedroom 1	0.6	64	Fail
	Bedroom 2	0.7	58	Fail
	LKD	2.6	n/a	Pass
Unit 2	Bedroom 1	0.6	55	Fail
	LKD	2.7	n/a	Pass

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 3	Bedroom 1	1.0	86	Fail
	LKD	3.14	n/a	Fail
Unit 4	Bedroom 1	0.3	60	Fail
	Bedroom 2	0.4	59	Fail
	LKD	0.3	n/a	Pass
Unit 5	Bedroom 1	0.5	28	Pass
	Bedroom 2	0.7	62	Fail
	LKD	1.8	n/a	Pass
Unit 6	Bedroom 1	1.0	47	Fail
	Bedroom 2	1.8	89	Fail
	Bedroom 3	1.0	56	Fail
	LKD	3.2	n/a	Fail
Unit 7	Bedroom 1	1.3	163	Fail
	Bedroom 2	1.3	67	Fail
	Bedroom 3	1.0	107	Fail
	LKD	1.7	n/a	Pass

Mechanical Mitigation Measures

6.6 In order to mitigate the residual risk of overheating as a result of external noise constraints, mechanical measures have been explored. It is proposed to install an ‘air tempering’ (also known as ‘peak lopping’) cooling coil bolt-on to the MVHR system within the affected dwellings.

6.7 The air tempering system will be designed to provide 1.97 kW of DX cooling capacity and an air flow rate of 83 l/s. In flats falling into noise risk zone 1, air flow will be redirected to supply a greater proportion to bedrooms falling within this risk category.

6.8 The following results in Table 5 demonstrate that this system will be capable of reducing the risk of overheating to an acceptable level, within the CIBSE TM59 criteria. The criteria for predominantly naturally ventilated dwellings have been used, as windows can still be relied upon for daytime ventilation.

Table 5: TM59 overheating results for dwellings with air tempering strategy, under DSY1 2020s

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 1	Bedroom 1	0.0	5	Pass
	Bedroom 2	0.1	6	Pass
	LKD	1.2	n/a	Pass
Unit 2	Bedroom 1	0.0	2	Pass
	LKD	0.9	n/a	Pass
Unit 3	Bedroom 1	0.0	2	Pass
	LKD	0.4	n/a	Pass
Unit 4	Bedroom 1	0.0	2	Pass
	Bedroom 2	0.0	3	Pass
	LKD	0.0	n/a	Pass
Unit 5	Bedroom 1	0.2	6	Pass
	Bedroom 2	0.1	6	Pass
	LKD	1.4	n/a	Pass
Unit 6	Bedroom 1	0.5	26	Pass
	Bedroom 2	1.3	21	Pass
	Bedroom 3	0.7	18	Pass
	LKD	2.6	n/a	Pass
Unit 7	Bedroom 1	0.4	32	Pass
	Bedroom 2	0.5	27	Pass
	Bedroom 3	0.5	22	Pass
	LKD	1.0	n/a	Pass

7. CONCLUSION

7.1 The purpose of this report is to provide the overheating mitigation strategy for the proposed development at West End Road in Ruislip in the London Borough of Hillingdon by Chase New Homes in support of the planning application to ensure that the new-build dwellings comply with Approved Document O (2021) of the Building Regulations.

7.2 A sample of dwellings has been selected for the dynamic overheating assessment based on design characteristics that establish them as representative of the overall proposed scheme. This selection of dwellings includes consideration of varying floors and of different orientations.

7.3 The selected dwellings were evaluated in accordance with *CIBSE TM59: Design methodology for the assessment of overheating risk in homes (2017)*, with the requirements of *Approved Document O (2021)* applied to the new-build dwellings of the proposed development.

7.4 For the new -build dwellings, passive measures including improved window design, solar control glazing and enhanced background mechanical ventilation have been explored as far as practicable to avoid the need for active cooling.

7.5 Due to the noise risk at the site, window opening is constrained and passive measures are not sufficient to mitigate overheating in affected units. It has been demonstrated that peak lopping MVHR reduces overheating to an acceptable level in this instance, avoiding the need for full comfort cooling in the new-build dwellings.

7.6 All modelled dwellings achieve compliance with the CIBSE TM59 overheating assessment criteria under the mandatory weather file (DSY1, 2020s, high-emissions, 50th percentile scenario). The new buildings' assessment additionally demonstrates compliance with the requirements of Approved Document O. The results are based on key design features and passive mitigation measures following the London Plan cooling hierarchy.

APPENDICES

Appendix A - Assessed Dwellings

Appendix B - Design Modelling Inputs

Appendix C - Results of DSY2 and DSY3 Weather Scenarios

Appendix D - GHA Early Stage Overheating Risk Tool

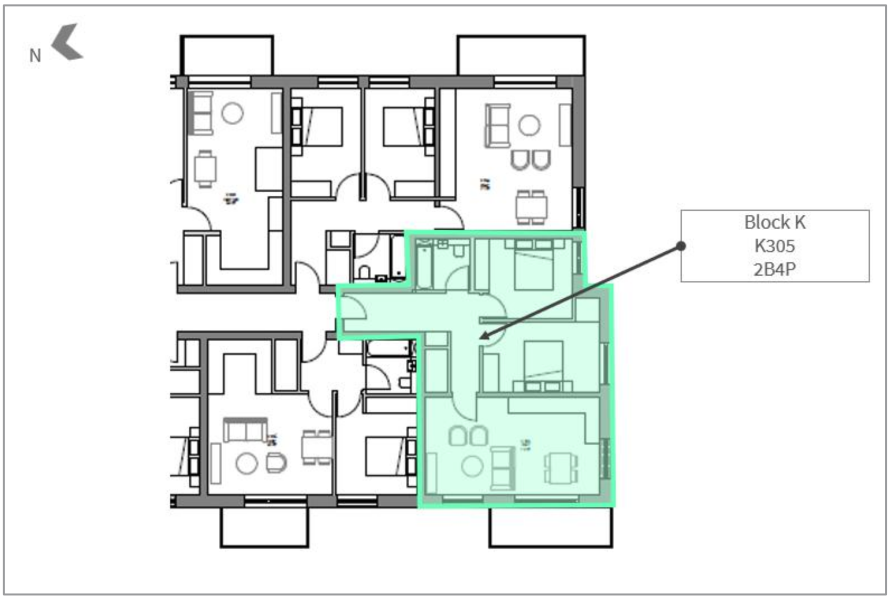
Appendix E – Noise Impact Assessment

Appendix F – Air Quality Assessment

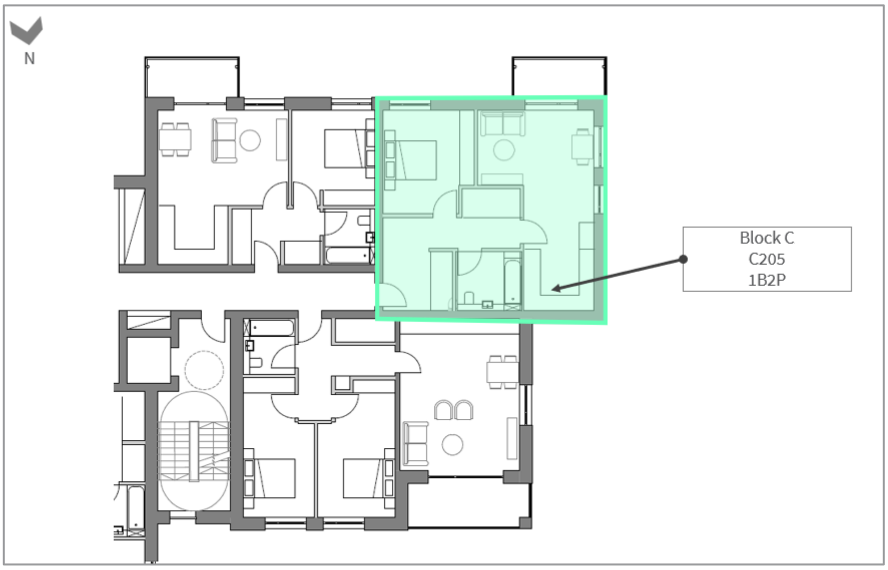
Appendix A

Assessed Dwellings

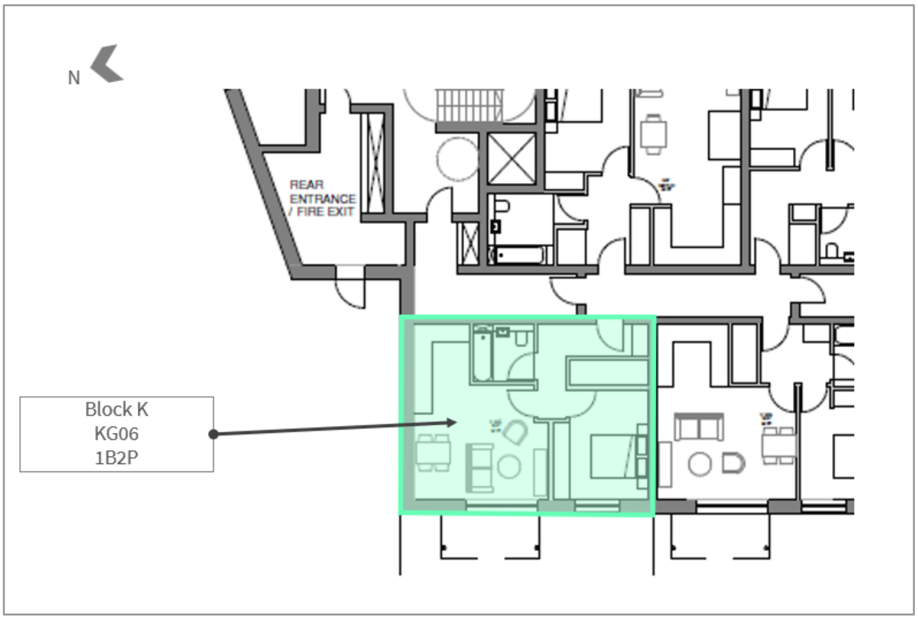
Unit 1



Unit 2



Unit 3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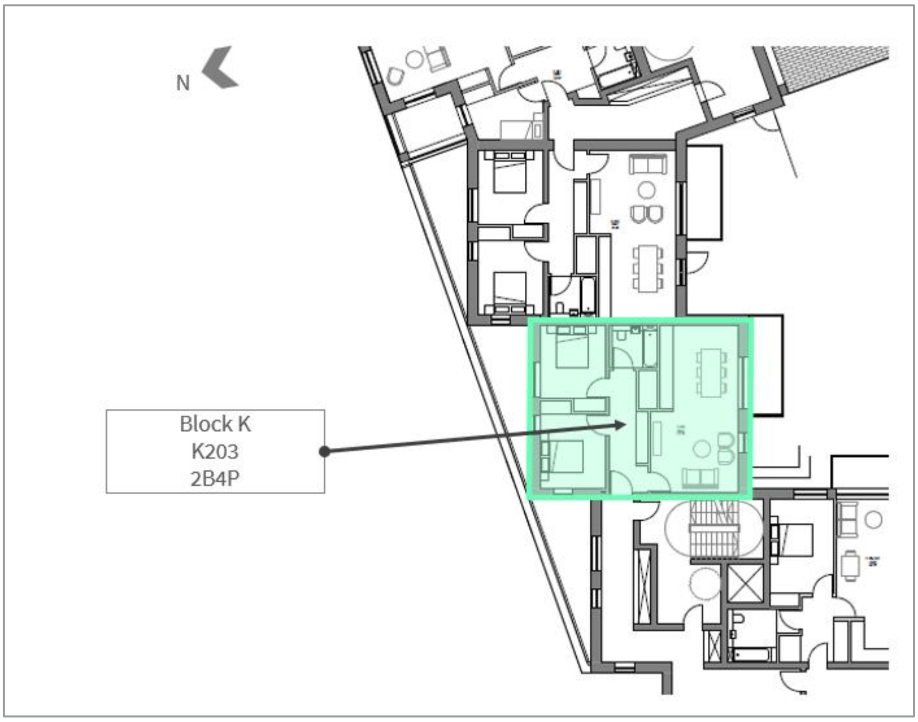
REAR ENTRANCE / FIRE EXIT
Block K
KG06
1B2P

Unit 4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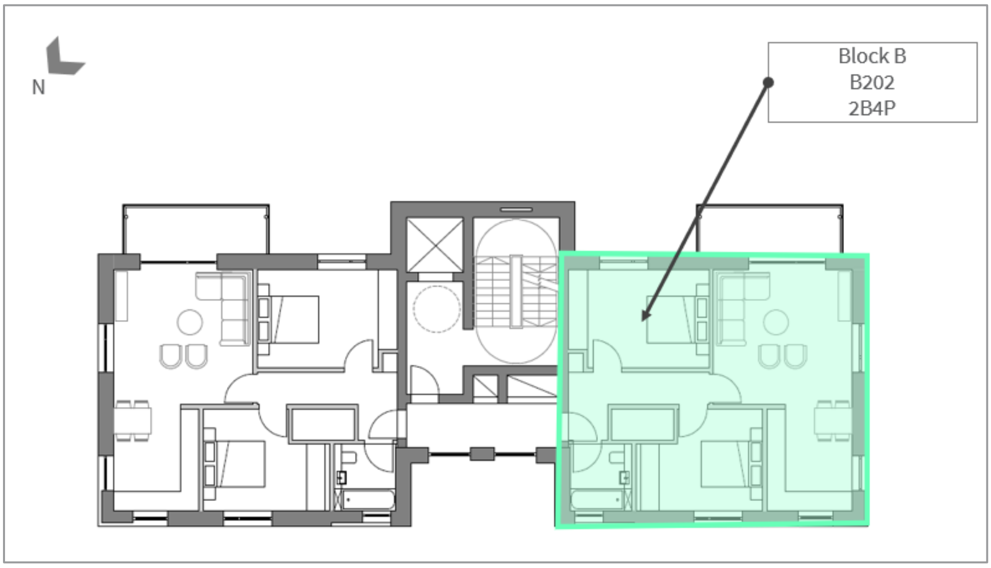
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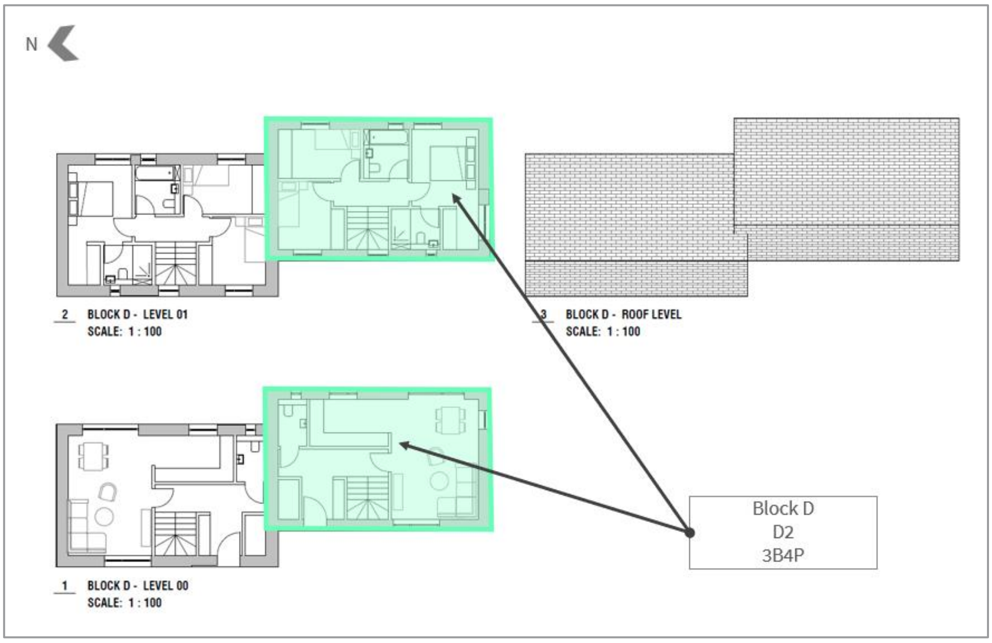
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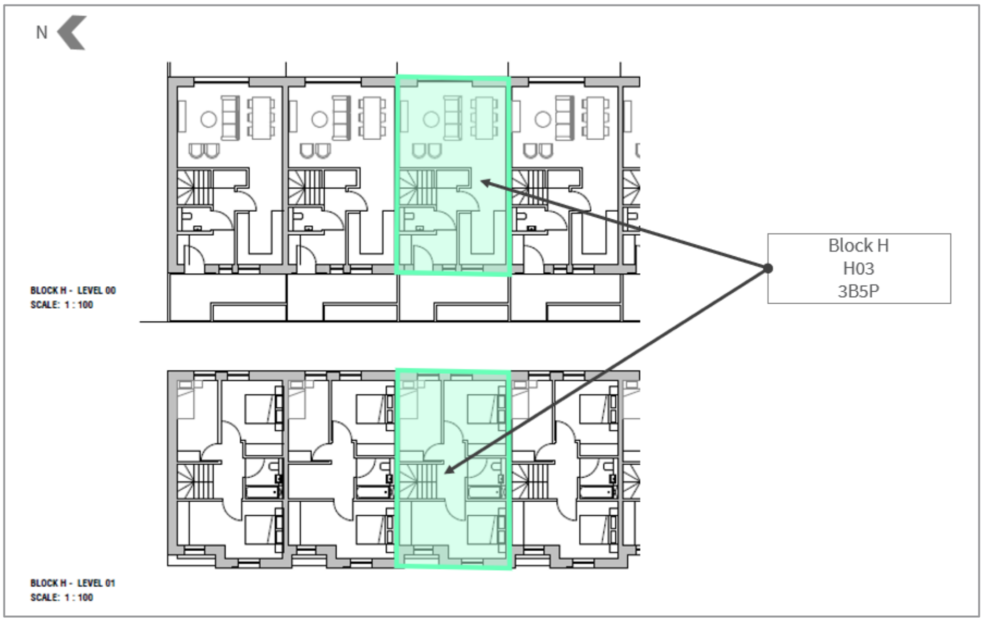
3B4P

Unit 7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3B5P

Appendix B
Design Modelling Inputs

The following modelling inputs have been included in the baseline dynamic thermal simulation.

Table B.1: Baseline dynamic thermal modelling design assumptions for new builds

Data Input			**Discussion**
Weather data	**Location**	CIBSE London Heathrow Design Summer Years (DSYs) for 2020s, high emissions, 50% percentile scenario	*Geographically closest and most representative industry-standard CIBSE weather data file*
Building Fabric Construction details	**External walls**	0.18 W/m^{2}K	*As per the Energy Statement (Hodkinson Consultancy, March 2026)*
	Roofs	Flat roof - 0.11 W/m^{2}K Plane - 0.09 W/m^{2}K	*As per the Energy Statement (Hodkinson Consultancy, March 2026)*
	Ground floor	0.10 W/m^{2}K	*As per the Energy Statement (Hodkinson Consultancy, March 2026)*
	Ceilings/floors	Assumed to be adiabatic between adjacent floors	*Concrete slabs will add to the thermal capacity of the building* *When dwelling units above / below heat loss is assumed to be zero*
	Party walls between units	Assumed to be adiabatic between adjacent dwellings	*Walls adjacent to other units are assumed to be lightweight partitions* *Adjacent units have been included in the dynamic simulation calculations*
	Partitions within units	Plasterboard partitions	*Assumed thicknesses as per drawings*
	Internal doors	0.91 m width for flats, 1.0 for houses	*As measured from drawings (Aros Architects floor plans)*
Windows	**Windows**	U value 0.90 W/m^{2}K	*As per the Energy Statement (Hodkinson Consultancy, March 2026)*
	Reveal depth	External reveal: 180 mm	*As measured from drawings (Aros Architects floor plans)*
	Sill / transom height	1.10 m	*In line with Part O requirements*
	Opening type	Windows: Inwards opening	*As confirmed with design team*

Data Input			**Discussion**
	Discharge Coefficient	Discharge coefficient: 0.53 – 0.55	*Calculated from window dimensions as per drawings (Aros Architects elevations) using the BB101 discharge coefficient calculator stated within Approved Document O (2021)*
Infiltration	**Air Tightness**	3.0 m^3/hr-m^2 @ 50 pascals	*As per the Energy Statement (Hodkinson Consultancy, March 2026)*

The following occupancy schedules and internal gains assumptions have been used, in accordance with CIBSE TM59 guidance.

Table B.2: Occupancy and equipment gains for dwellings (CIBSE TM59)

Unit/room type	Occupancy	Equipment Load
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am, 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gain in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom	1 person at 70% gains from 11 pm to 8 am, 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours

Appendix C

Result of DSY2 and DSY3 Weather Scenarios

The dynamic overheating assessment has also been run under the more extreme DSY2 and DSY3 weather files, with results presented in Tables C.1 and C.2.

TM59 states that compliance should be met for the DSY1 weather scenario, and that additional testing can be undertaken using the 2020 versions of DSY2 and DSY3. However, it is acknowledged that meeting the CIBSE compliance criteria is challenging for the DSY2 and DSY3 weather files.

The overheating mitigation strategy presented within the main body of this report demonstrates the passive measures that have been implemented to reduce the risk of overheating as far as practicable. In the future, residents could use further adaptation measures to combat any additional overheating risk.

Table C.1: Dwelling overheating results for DSY2 2020s – TM59

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 1	Bedroom 1	0.8	28	Pass
	Bedroom 2	0.8	33	Fail
	LKD	2.8	n/a	Pass
Unit 2	Bedroom 1	0.4	13	Pass
	LKD	2.8	n/a	Pass
Unit 3	Bedroom 1	0.3	10	Pass
	LKD	2.0	n/a	Pass
Unit 4	Bedroom 1	0.1	10	Pass
	Bedroom 2	0.3	14	Pass
	LKD	1.4	n/a	Pass
Unit 5	Bedroom 1	0.9	27	Pass
	Bedroom 2	0.7	23	Pass
	LKD	3.2	n/a	Fail

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 6	Bedroom 1	1.6	58	Fail
	Bedroom 2	2.1	53	Fail
	Bedroom 3	1.8	49	Fail
	LKD	4.4	n/a	Fail
Unit 7	Bedroom 1	1.5	68	Fail
	Bedroom 2	1.5	64	Fail
	Bedroom 3	1.5	56	Fail
	LKD	2.9	n/a	Pass

Table C.2: Dwelling overheating results for DSY3 2020s – TM59

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 1	Bedroom 1	0.4	20	Pass
	Bedroom 2	0.6	25	Pass
	LKD	3.3	n/a	Fail
Unit 2	Bedroom 1	0.0	10	Pass
	LKD	3.1	n/a	Fail
Unit 3	Bedroom 1	0.2	9	Pass
	LKD	2.0	n/a	Pass
Unit 4	Bedroom 1	0.2	8	Pass
	Bedroom 2	0.4	15	Pass
	LKD	0.6	n/a	Pass

Unit	Room	TM59 Criterion A: Hours of exceedance (pass ≤ 3 %)	TM59 Criterion B: Bedroom temperature hours > 26 °C (pass ≤ 32)	Overall compliance with TM59
		% Hours of overheating	Hours of overheating	
Unit 5	Bedroom 1	0.5	28	Pass
	Bedroom 2	0.7	25	Pass
	LKD	4.3	n/a	Fail
Unit 6	Bedroom 1	2.5	65	Fail
	Bedroom 2	3.0	66	Fail
	Bedroom 3	2.6	55	Fail
	LKD	6.3	n/a	Fail
Unit 7	Bedroom 1	1.5	92	Fail
	Bedroom 2	2.1	86	Fail
	Bedroom 3	1.9	77	Fail
	LKD	44	n/a	Fail

Appendix D

GHA Overheating Checklist

EARLY STAGE OVERHEATING RISK TOOL

Version 1.0, July 2019

Good Homes Alliance

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes.

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING

KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map	South east	**4**	4
	Northern England, Scotland & NI	**0**	
	Rest of England and Wales	**2**	

#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	**3**	2
	Grtr London, Manchester, B'ham	**2**	
	Other cities, towns & dense sub-urban areas	**1**	

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context	**1**	0

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant	**Day** - reasons to keep all windows closed	**8**	4
	Day - barriers some of the time, or for some windows e.g. on quiet side	**4**	
	Night - reasons to keep all windows closed	**8**	4
	Night - bedroom windows OK to open, but other windows are likely to stay closed	**4**	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme	**1**	0
#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels	**1**	0

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples	**3**	3
#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures	**3**	0

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance	**1**	1

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans	>2.8m and fan installed	**2**	0
	> 2.8m	**1**	

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space	>65%	**12**	4
	>50%	**7**	
	>35%	**4**	

#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation	Single-aspect	**3**	1
	Dual aspect	**0**	

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per **#6**		Full	Part	2
	>65%	**6**	**3**	
	>50%	**4**	**2**	
	>35%	**2**	**1**	

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance		Openings compared to Part F purge rates			3
		= Part F	+50%	+100%	
	Single-aspect	minimum required	3	4	
	Dual aspect		2	3	

TOTAL SCORE 16 = Sum of contributing factors: 22 *minus* Sum of mitigating factors: 6

High 12 **Medium** 8 **Low**

score >12:
Incorporate design changes to reduce risk factors and increase mitigation factors
AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12:
Seek design changes to reduce risk factors and/or increase mitigation factors
AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8:
Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

Appendix E
Noise Impact Assessment

cass allen

Architectural & Environmental Consultants

Noise | Vibration | Air Quality

Noise Impact Evaluation

The Barn Hotel, Ruislip

Cass Allen
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Noise Impact Evaluation

Project: THE BARN HOTEL, RUISLIP

Report reference: RP01-22530-R7

Client:

CHASE NEW HOMES
8 PARKWAY
WELWYN GARDEN CITY
AL8 6HG

Our details: CASS ALLEN ASSOCIATES LTD

Document control:

REVISION	ISSUE DATE	REPORT BY	CHECKED BY	NOTES
0	22 December 2022	Cian Grunfeld, MSc BEng, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Initial Issue
1	03 January 2023	Cian Grunfeld, MSc BEng, Acoustics Consultant	Chris McNeillie, MSc CEng MIOA, Director	Updated report layout
2	09 March 2023	Cian Grunfeld, MSc BEng, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Update following comments
3	12 August 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Revised following updated layout
4	13 August 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Minor changes on the above
5	21 August 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Ronny Ospina Orozco, MSc MIOA, Senior Acoustics Consultant	Revised following updated layout
6	09 September 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Updated local policies
7	03 March 2026	Benjamin Briggs, BSc (Hons), Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Updated layout and assessment

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1. EXECUTIVE SUMMARY

1.1 Cass Allen has been instructed by Chase New Homes to assess the noise impact of the proposed development at The Barn Hotel, Ruislip.

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 West End Road and railway noise emissions from Ruislip Underground Station.

1.4 Noise affecting the development has been assessed in accordance with ProPG guidance. The design of the development is considered to be acceptable subject to the adoption of acoustically upgraded glazing and ventilation. This can be investigated further at the detailed design stage.

1.5 Advice has been provided in regard to Building Regulations Part O to assist the overheating assessment. Bedrooms facing West End Road and the railway 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.

1.6 In summary of the above it is our view that the site is suitable for the development in terms of noise levels and that planning permission should be granted.

2. INTRODUCTION

2.1 The assessment has been carried out in accordance with relevant local and national planning guidance.

2.2 The aims of the assessment were:

- To establish the suitability of existing noise 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 levels in habitable areas.

2.3 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION

3.1 The site currently contains The Barn Hotel and is located in a residential area, bounded to the east by properties on Eversley Crescent and to the west by West End Road. To the north of the site is Ruislip Underground Station and railway line and a Waitrose supermarket beyond the railway line.

3.2 The site location is shown in Figure 1 below.

Figure 1 Site Location and Surrounding Area

3.3 The proposal is to develop the site into 7 residential blocks. The two existing listed buildings in the centre of the site will remain and be used for residential purposes. The proposed site layout is presented 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:

> *187. 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.*
>
> *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 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.*

Local Policy

4.2 The London Plan – *The Spatial Development Strategy for Greater London* (March 2021) Chapter 3 states that:

> *3.13.10 Noise and other impact assessments accompanying planning applications should be carefully tailored to local circumstances and be fit for purpose. That way, the particular characteristics of existing uses can be properly captured and assessed. […] Boroughs should pay close attention to the assumptions made and methods use in impact assessments to ensure a full and accurate assessment.*

4.3 The plan also outlines Policy D14 Noise, which states:

> *In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:*
>
> *1) avoiding significant adverse noise impacts on health and quality of life*
>
> *2) reflecting the Agent of Change principle as set out in Policy D13 Agent of Change*

> *3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses*
>
> *4) improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity)*
>
> *5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation*
>
> *6) where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles*
>
> *7) promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver*

4.4 Hillingdon Council's Local Plan Document – *Strategic Policies* (November 2012) Policy EM8 states that:

> *"The council will seek to ensure that noise sensitive development … are only permitted if noise impacts can be adequately controlled and mitigated."*

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

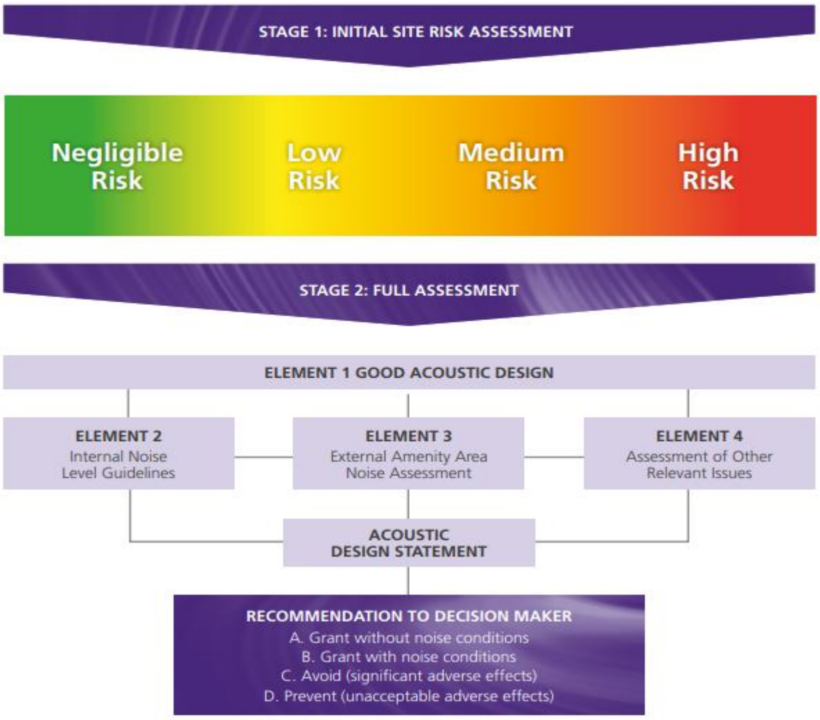
5. NOISE AFFECTING THE DEVELOPMENT

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 of the new blocks. 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 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 case, there are no commercial noise sources affecting the site and therefore only transportation noise has been considered.

5.4 The noise affecting the existing buildings to remain is assessed separately to the proposed new buildings in Stage 2 Element 2b below.

Stage 1 – Noise survey and initial assessment

5.5 A noise survey was carried out at the site from 6th to 14th December 2022 to measure existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.

5.6 Average noise levels (LAeq) across the site were generally dictated by road traffic on West End Road. Average noise levels at the northern edge of the site were also affected by railway noise from Ruislip Underground station.

5.7 Maximum noise levels (LAmax) at the north of the site were dictated by a combination of vehicle movements on West End Road and train arrivals and departures at Ruislip Underground station. Maximum noise levels at the south and western edges of the site were generally dictated by vehicle movements on West End Road.

5.8 Background noise levels (LA90) across the site were dictated by constant road traffic noise from the West End Road.

5.9 Measurements taken inside the existing buildings to remain were dictated by road traffic on West End Road and patron noise within the hotel.

5.10 Noise was also identified from aircraft movements; however, noise from aircraft was sporadic and low-level when compared with noise from road traffic and the railway.

5.11 Boundaries of the development at the northern and western edges of the site will be subject to the highest noise levels. The noise survey results show that noise levels at these positions are as follows:

- Western edge of the site facing West End Road:
  - Average noise levels during the daytime - 66 dB LAeq,0700-2300hrs;
  - Average noise levels during the night-time - 60 dB LAeq,2300-0700hrs;
  - Typical maximum noise levels during the night-time - 77 dB LAmax.
- Northern edge of the site facing Ruislip Underground station:
  - Average noise levels during the daytime - 57 dB LAeq,0700-2300hrs;
  - Average noise levels during the night-time - 50 dB LAeq,2300-0700hrs;
  - Typical maximum noise levels during the night-time - 79 dB LAmax.

5.12 Based on the results of the site noise survey, a 3D computer noise model was developed to predict and assess the noise levels that will exist across the entire development.

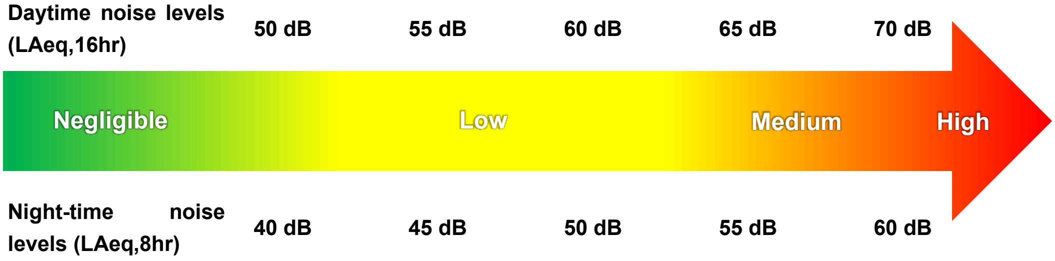
5.13 The 3D noise model was developed using Cadna/A v2026 MR1 environmental noise modelling software. Cadna/A incorporates the calculation methodology outlined in the Department of Transport Welsh Office - Calculation of Road Traffic Noise (CRTN) for the assessment of road traffic noise propagation, CRN for rail noise.

5.14 The layout of the development and surrounding area was input into the model. To calculate the spread of noise levels around the site, day and night-time average noise levels were input for West End Road, the London Underground and calibrated to the results of the on-site noise measurements.

5.15 The methodology and results of the noise modelling are provided in Appendix 3.

5.16 The measured 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)**



5.17 It can be seen from a comparison of the measured noise levels in paragraph 5.11 above with Figure 3 that the site is 'Medium' risk in relation to daytime noise levels and 'Medium-High' 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

5.18 The acoustic design of the development has been reviewed in relation to the measured noise levels at the site.

5.19 Acoustic treatment of the facades with noise mitigation is the preferred approach in this case as it allows more efficient use of the land available. This approach is in line with current planning guidance, where the efficient use of land and the need for housing is a priority.

Stage 2 – Element 2a - Internal noise levels

5.20 ProPG states that 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*'. Relevant design criteria are summarised in Table 1 below.

Table 1 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 45 dB LAmax[1]

Note 1: ProPG 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.*"

5.21 Therefore, the following acoustic design criteria have been adopted for the development:

- Average noise levels in living rooms and dining rooms during the day should not exceed 35 dB LAeq,0700-2300hrs and 40 dB LAeq,0700-2300hrs, respectively;
- Average noise levels in bedrooms should not exceed 35 dB LAeq,0700-2300hrs during the day and 30 dB LAeq,2300-0700hrs during the night;
- Maximum noise levels should not regularly exceed 45 dB LAmax in bedrooms during the night.

5.22 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). The existing buildings are also masonry although the details of glazing and wall construction are not currently known. Masonry construction provide high levels of sound insulation and consequently, internal noise levels in both the new and existing buildings would be dictated by external noise ingress via glazing and ventilators.

5.23 The ventilation strategy for the development has not yet been confirmed and therefore as a robust 'worst-case' assessment it is assumed that background ventilation will be provided via trickle ventilators in the building facade. For our calculations, two trickle ventilators are applied to bedrooms and three to living rooms.

5.24 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 of the new build dwellings 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).

5.25 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.

5.26 The calculations were carried out based on the dimensions/details for facade elements taken from provided drawings.

5.27 The results of the calculations are shown in Appendix 3 and are summarised in Table 2 below.

Table 2 Preliminary Acoustic Requirements for 'Worst Case' Habitable Rooms – New Buildings

'Worst Case' Rooms	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements (in Open Position)
Bedrooms on the West End Road facade	37 dB Rw+Ctr	42 dB Dne,w + Ctr
Bedrooms on the Railway Facade	39 dB Rw+Ctr	45 dB Dne,w + Ctr
Living rooms on the West End Road and Railway facade	34 dB Rw+Ctr	38 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.

5.28 The required sound insulation performance values in Table 2 could typically be achieved by the glazing and ventilator types shown in Table 3.

Table 3 Typical Glazing and Ventilator Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
High acoustic performance double glazing	34
High acoustic performance double glazing	37
Very High acoustic performance double glazing	39
Example Ventilators	**Typical Acoustic Performance (Dnew + Ctr)**
Greenwood 5000EAW.AC2 (vent + 2 acoustic module – external & internal)	38
Passivent AL-dB 800 air supply window vent	42
Brookvent Tunal SUS 290-10	45

Note 1 The acoustic performance of the glazing systems (including frames) should always be confirmed with the manufacturer before selection for installation on site.

Note 2 Where a higher rated glazing has been specified, the overall performance will be limited by the frames, therefore test data for the whole system should be used, rather than just glazing alone.

5.29 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the installation 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.

5.30 It should be noted that it will be possible to use lower acoustic performance glazing and ventilators for habitable rooms on facades that are further from or acoustically screened from the surrounding noise sources. This can be investigated further at the detailed design stage.

5.31 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 may 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. Part O of the Building Regulations (Approved Document O), which came into effect on 15 June 2022 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).*

5.32 The results of the noise model indicate that areas of the development facing the railway and West End Road may exceed the noise limits provided in Approved Document O when the windows are opened. The overheating assessment is therefore not likely to be able to rely solely on open windows in these areas.

5.33 The areas in which open windows will need to be avoided (or a limit set on the open area of the window) will need to be confirmed as part of the overheating assessment during the detailed design stage. As an indication, a preliminary assessment regarding facades where windows can be assumed to be fully open, partially open or not open at all can be found in Appendix 5.

Stage 2 – Element 2b - Internal noise levels – existing buildings

5.34 Noise levels in the existing listed buildings have been measured as part of the site noise survey and were found to be in line with the assessment criteria given above. Therefore, noise levels are at this stage considered to be suitable in these buildings for the proposed residential development with no changes to the building envelope.

5.35 This assessment is based on the current internal layout of the existing buildings. This can be assessed further at a later stage, as the design develops.

Stage 2 – Element 4 – Noise levels in external amenity areas

5.36 ProPG/BS8233 state 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, the guidance 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, the guidance states that the development should be designed to achieve the lowest practicable noise levels in the amenity spaces.

5.37 Noise levels on balconies of Blocks C and K overlooking West End Road are anticipated to exceed the recommended levels by up to 5-10 dB. Whilst this is not ideal, in our view, exceeding the recommended levels would not mean that balconies would be unacceptable to future residents. The reasons for this are as follows:

- Most developments in urban areas will be subject to noise levels above the ProPG recommended noise levels for balconies[1];
- It is common for noise levels on balconies facing main roads to exceed the ProPG recommended noise levels in Ruislip and elsewhere;
- It is reasonable to assume that residents would prefer the option to have a noisier balcony as opposed to having no balcony at all;
- There is no evidence we are aware of that high noise levels on balconies present a risk to residents' health and well-being;
- Planners often consider it to be beneficial to the street-scape to have balconies facing roads as they may help marry the development to the surrounding area.

5.38 The current design of the development is therefore considered to be acceptable in relation to noise levels in external amenity areas.

Stage 2 – Element 5 – Other relevant issues

5.39 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 railway lines 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

5.40 It is our view that planning permission should be granted in relation to noise affecting habitable areas of the development.

---

[1] Table 2 from BS8233 notes that daytime noise levels will typically exceed 50-55 dB LAeq,16hr in areas close to busy main roads. It was also found in the UK National Noise Incidence Study 2000/2001 that 90% of UK homes were exposed to daytime noise levels >50dB LAeq,16hr and 54% of UK homes were exposed to noise >55dB LAeq,16hr. It is reasonable to assume that a high percentage of these were in urban areas.

6. CONCLUSIONS

6.1 A noise survey was carried out between 6 and 14 December 2022.

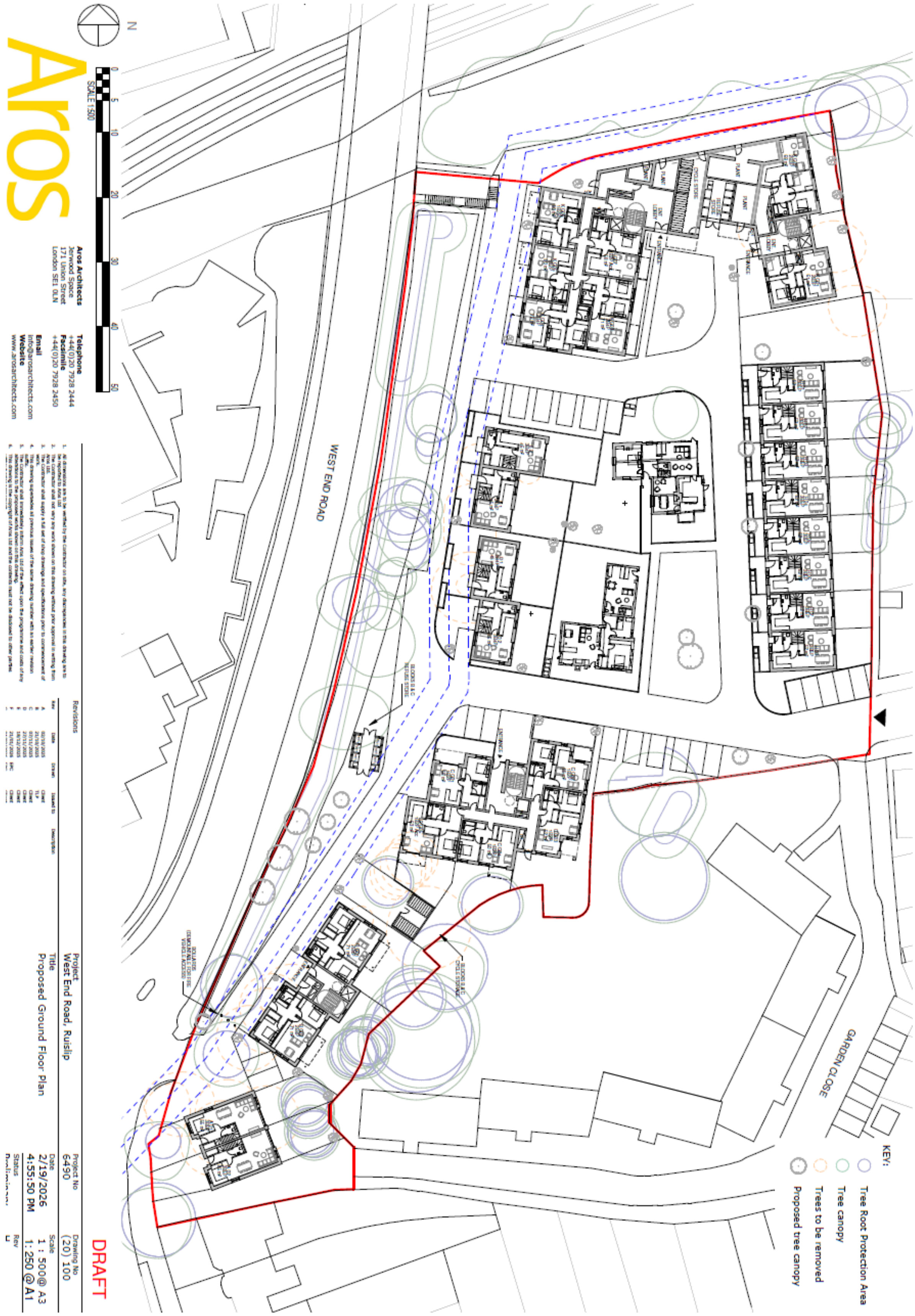
6.2 The results of the noise survey were used to calculate noise ingress through the facades of the proposed habitable rooms and glazing and ventilator performance requirements were specified to meet appropriate design criteria.

6.3 Appropriate internal noise levels are anticipated to be readily achievable in occupied areas of both the new build and retained buildings of the development.

6.4 Advice has been provided in regard to Building Regulations Part O to assist the overheating assessment. Bedrooms facing West End Road and the railway 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.

6.5 It is our view that the site is suitable for the development in terms of noise levels and that planning permission should be granted with respect to noise.

Appendix 1 Site Layout



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 and noise from train passes on the adjacent railway. Vibration levels at the site were very low.

Survey Period:

06/12/2022 to 14/12/2022

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]	NTi Audio	XL2	A2A-17487-E0
Calibrator	NTi Audio	600 000 388	15011
Sound level meter[1] (noise logger)	Rion	NL-32	00530374
Calibrator	Rion	NC-74	34551703
Sound level meter[1]	Rion	NL-52	00965090

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.

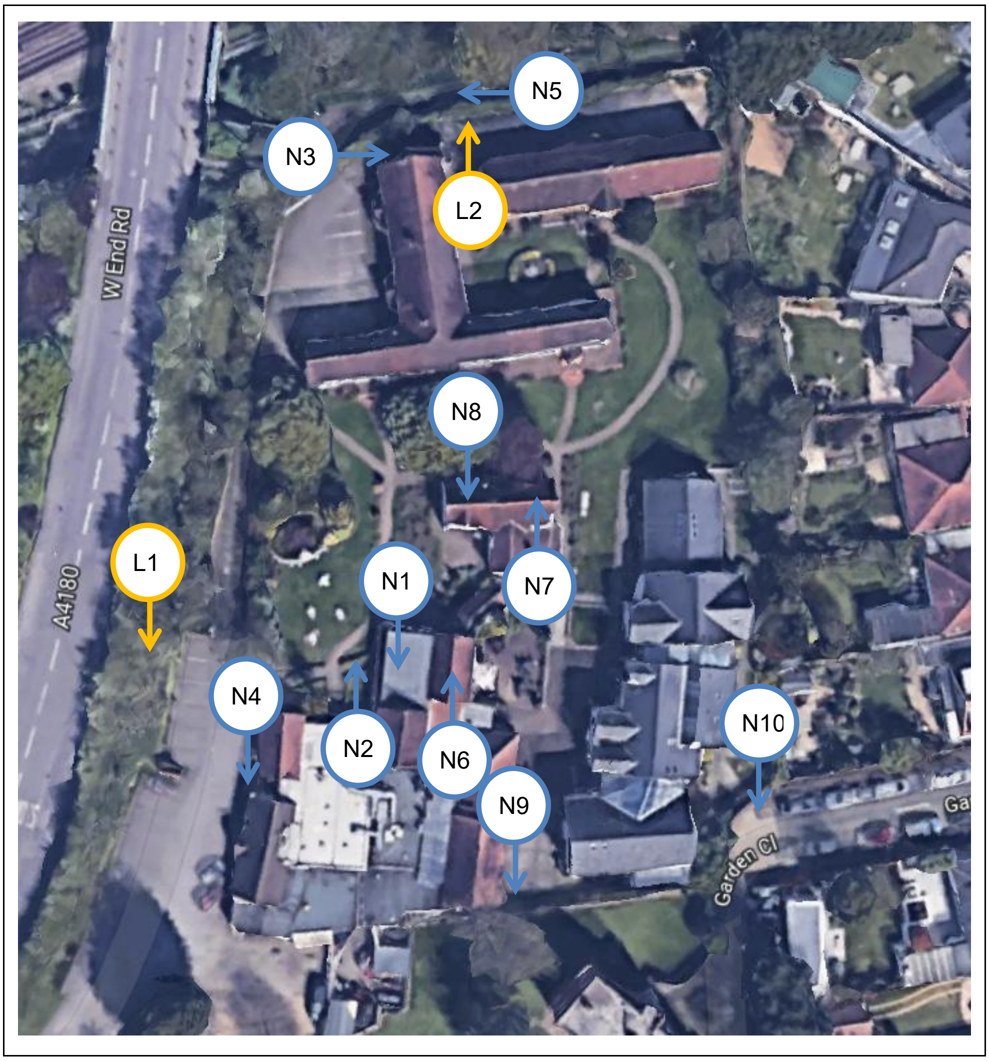
Measurement Positions:

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above ground. Inside dining room, 1.5m from window facing West, towards West End Road (35m).
N2	Attended noise monitoring position. 1.5m above ground. Free-field. Outside dining room, 1.5m from window facing West, towards West End Road (32m).
N3	Attended noise monitoring position. 1.5m above ground. Free-field. Proposed façade location, 27m from railway.
N4	Attended noise monitoring position. 1.5m above ground. Free-field. Proposed façade location, 21m from West End Road.
N5	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to railway (22m).

Measurement Positions:

Position (refer plan below)	**Description**
N6	Attended noise monitoring position. 1.5m above ground. Inside Tudor Lodge, 1.5m from window facing North, towards railway (84m).
N7	Attended noise monitoring position. 1.5m above ground. Inside ground floor bedroom, 1.5m from window facing East.
N8	Attended noise monitoring position. 1.5m above ground. Inside first floor bedroom, 1.5m from window facing South.
N9	Attended noise monitoring position. 1.5m above ground. Free-field. Proposed façade location, 35m from Garden Close.
N10	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Eversley Crescent (43m).
L1	Unattended noise logging position. 2m above ground level. Free-field. Direct line of sight to West End Road (6m).
L2	Unattended noise logging position. 2m above ground level. Free-field. Direct line of sight to railway (25m).

Site Plan showing Measurement Positions:



Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LAmax, dB	LA90, dB	Observations
06/12/2022	N1	12:10	3 mins	39	59	29	Noise dictated by road traffic from West End Road and noise within the hotel.
06/12/2022	N1	12:15	5 mins	37	58	29	Noise dictated by road traffic from West End Road and noise within the hotel.
06/12/2022	N1	12:20	5 mins	41	63	31	Noise dictated by road traffic from West End Road and noise within the hotel.
06/12/2022	N2	12:30	5 mins	52	59	45	Noise dictated by road traffic from West End Road and water feature on hotel premises.
06/12/2022	N3	12:50	5 mins	52	63	46	Noise dictated by railway, road traffic from West End Road and helicopter flyover.
06/12/2022	N4	13:10	5 mins	55	64	44	Noise dictated by road traffic from West End Road.

Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LAmax, dB	LA90, dB	Observations
06/12/2022	N5	13:30	2 mins	55	62	50	Noise dictated by railway and road traffic from West End Road.
06/12/2022	N5	13:35	1 min	56	63	49	Noise dictated by railway and road traffic from West End Road.
06/12/2022	N6	13:50	5 mins	33	54	29	Noise dictated by road traffic from West End Road and aircraft flyover.
06/12/2022	N6	14:00	5 mins	33	55	28	Noise dictated by road traffic from West End Road.
06/12/2022	N7	14:15	5 mins	18	36	28	Noise dictated by road traffic from West End Road.
06/12/2022	N8	14:25	5 mins	28	47	20	Noise dictated by road traffic from West End Road.
06/12/2022	N8	14:45	5 mins	26	42	21	Noise dictated by road traffic from West End Road.
06/12/2022	N7	15:10	5 mins	25	42	19	Noise dictated by road traffic from West End Road and aircraft flyover.
06/12/2022	N9	15:30	5 mins	51	61	46	Noise dictated by road traffic from West End Road and helicopter flyover.
06/12/2022	N10	15:50	5 mins	46	57	40	Noise dictated by road traffic from Eversley Crescent and West End Road, and helicopter flyover.
06/12/2022	N9	16:00	5 mins	50	61	46	Noise dictated by road traffic from West End Road and helicopter flyover.
06/12/2022	N3	16:10	5 mins	52	59	47	Noise dictated by railway, road traffic from West End Road and helicopter flyover.
06/12/2022	N10	16:20	5 mins	50	65	40	Noise dictated by road traffic from Eversley Crescent, Garden Close and West End Road, and helicopter flyover.

Unattended Noise Monitoring Results:

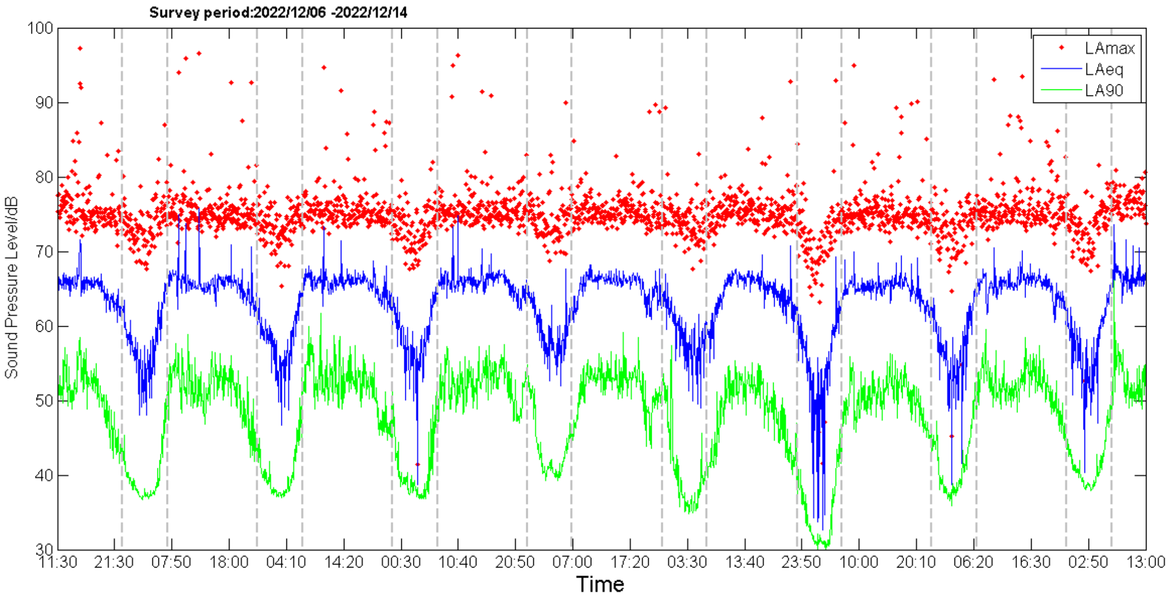
Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB[1]	LAeq,8hr, dB	LA90,5mins, dB[1]	LAmax, dB[2]
06/12/2022 to 14/12/2022	L1	66	52	60	38	77
06/12/2022 to 12/12/2022	L2	57	46	50	34	79

Note 1: Typical lowest measured during the period shown.

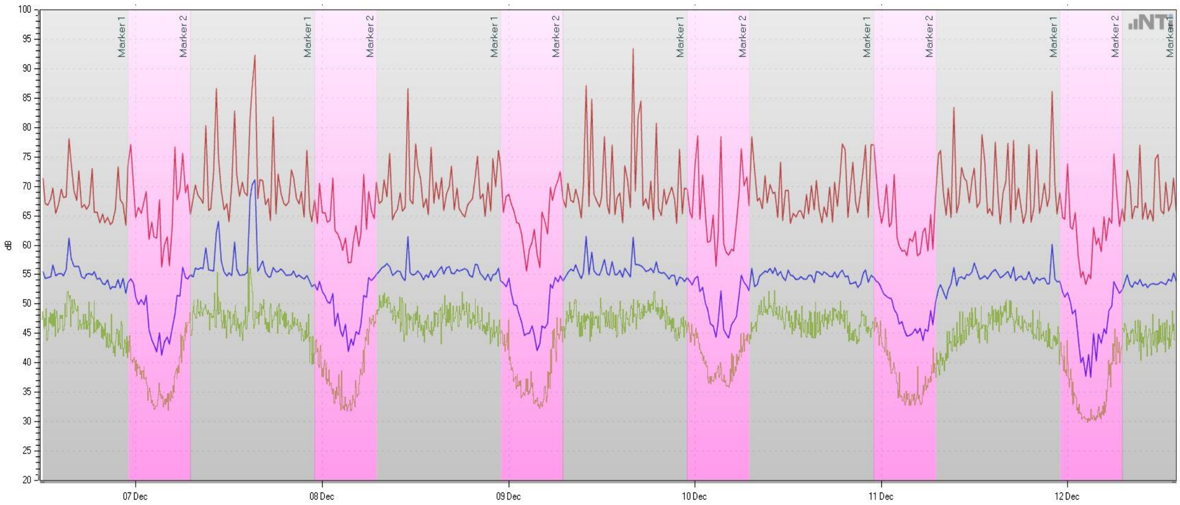
Note 2: Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

Unattended Noise Monitoring Results:

Meas. Period	Position
06/12/2022 to 14/12/2022	L1



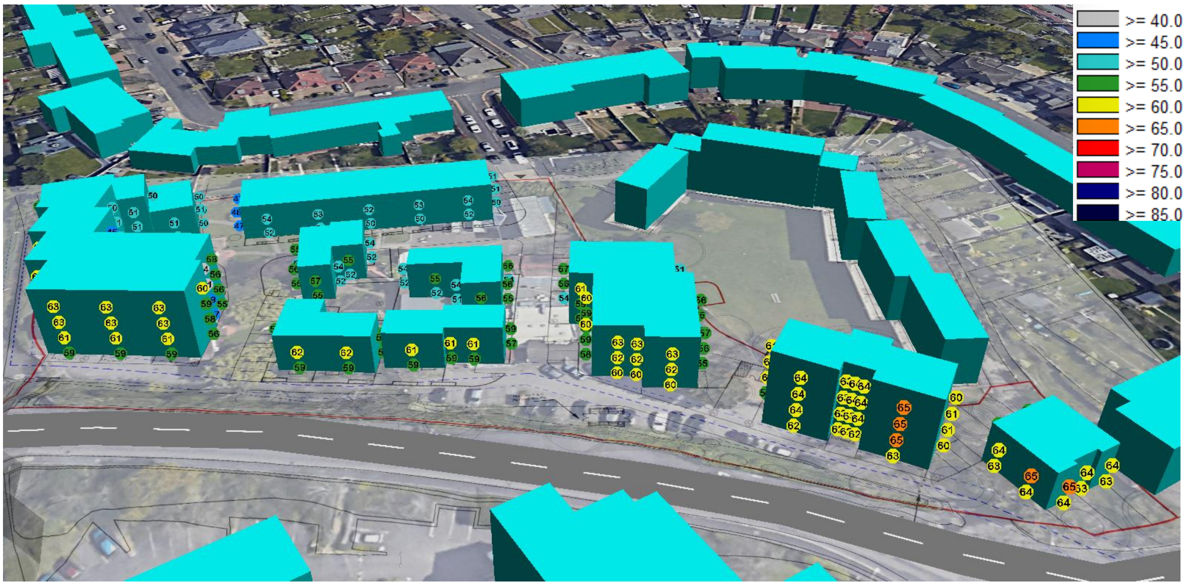
Meas. Period	Position
06/12/2022 to 12/12/2022	L2



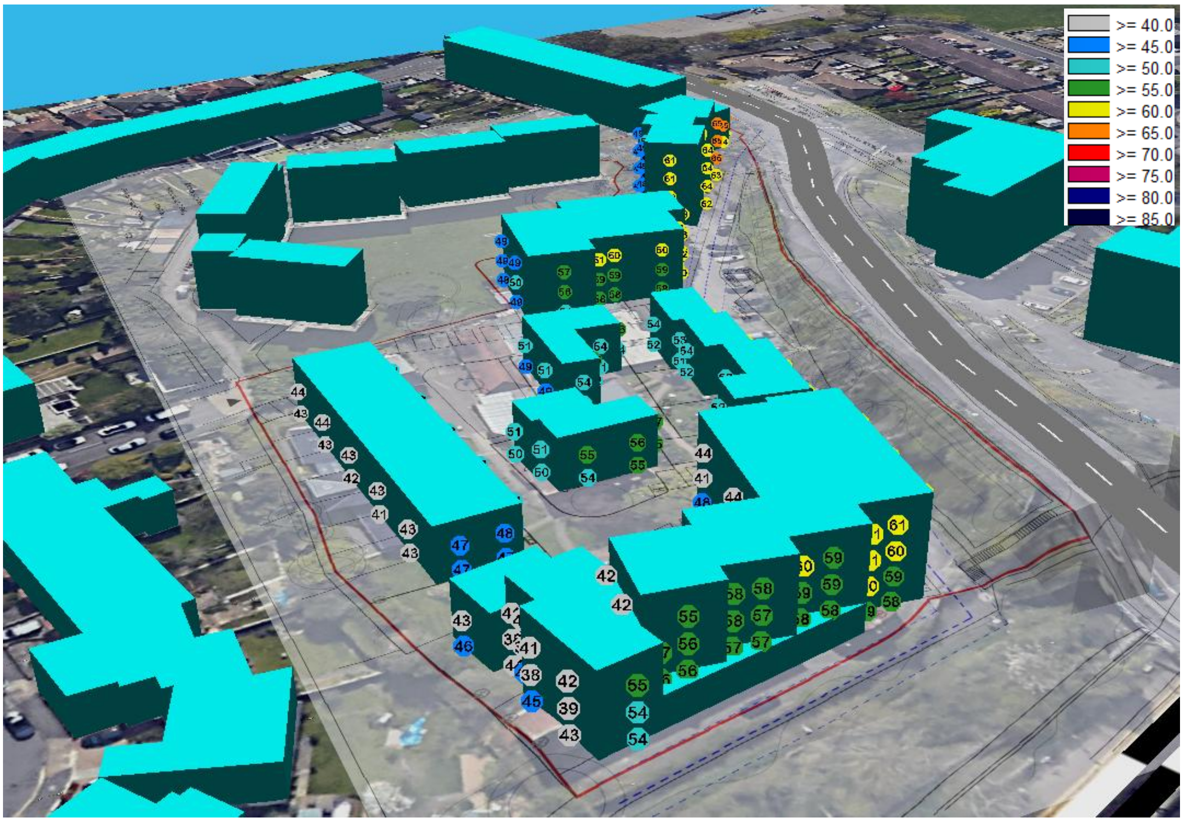
Appendix 3 Modelling Results

Modelling Software:	CADNA/A Version 2026 MR1
Modelled Scenarios:	Day and night-time average noise levels across the site Night-time maximum noise levels
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 9613-2:2024 Acoustics-Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors

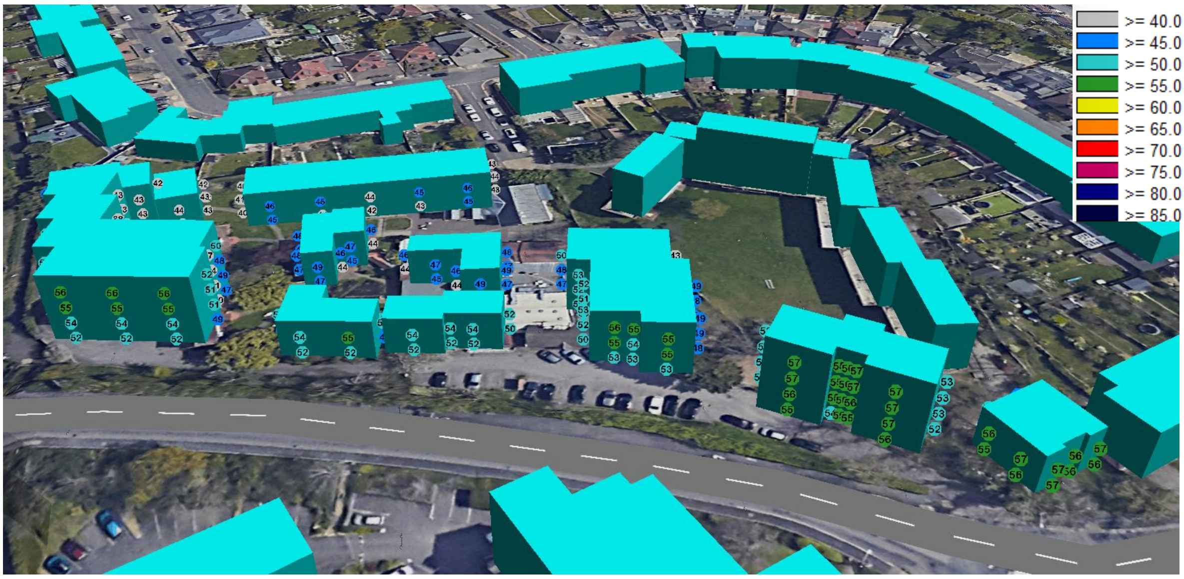
Modelling Printout:

Scenario	Daytime noise levels (LAeq,16hr) on the West End Road facade
	

Scenario	Daytime noise levels (LAeq,16hr) facing the railway

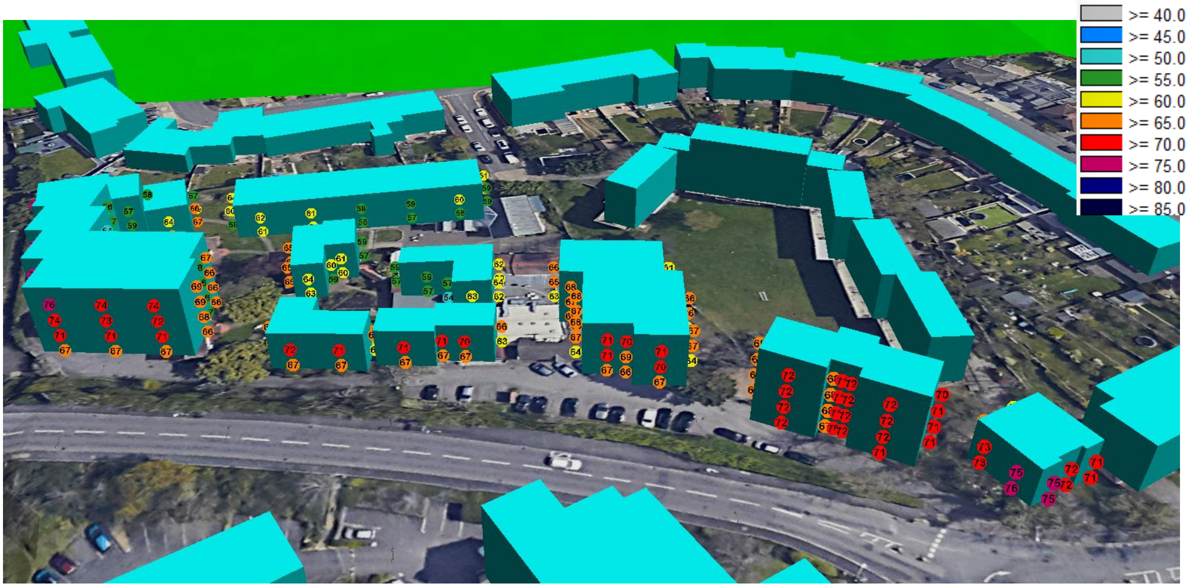


Scenario	Night-time noise levels (LAeq,16hr) on the West End Road facade

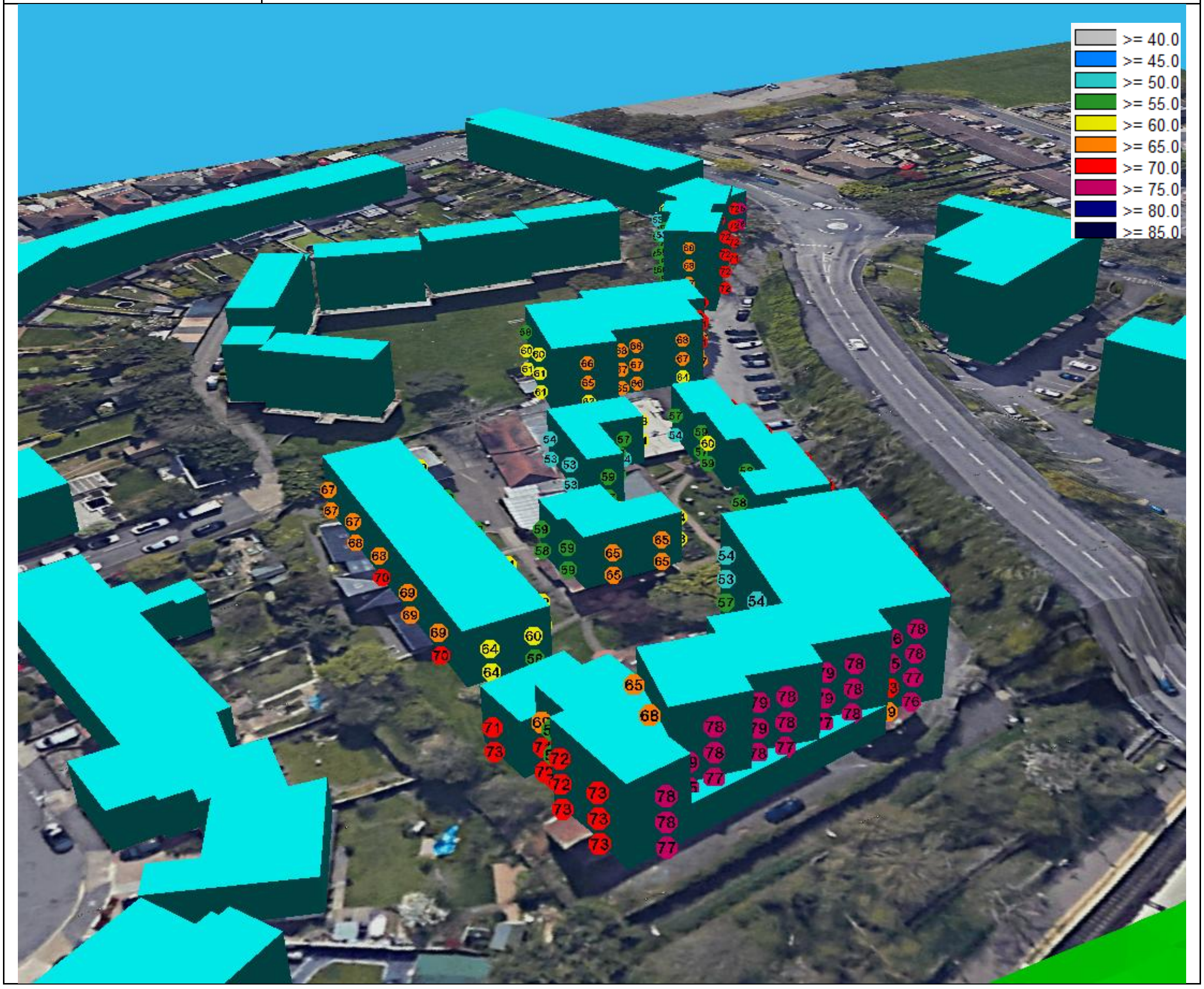


Scenario	Night-time noise levels (LAeq,16hr) facing the railway

Scenario	Night-time Maximum noise levels (LAmax) on the West End Road facade



Scenario	Night-time noise levels (LAmax) facing the railway



Appendix 4 Facade Noise Ingress Calculations

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FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

			W		L		H	
PROJECT:	The Barn Hotel	Room Dimensions [m]	3.3	X	4.2	X	2.4	
ROOM:	Block A - Bedroom							
VARIANT:	Worst-Case Daytime Average Noise Level (LAeq)				Room Volume =		33.1	m3
NOTES:	Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.				Partition Area =		16.5	m2
					Ventilation ref area =		10.0	m2
	SELECT Free Field or Façade SPL for model input >>>	🟩			Free Field SPL	K =	3	dB

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)	65.0								
		46.8	50.9	54.4	57.8	61.0	58.2	53.0	**Reference spectrum**

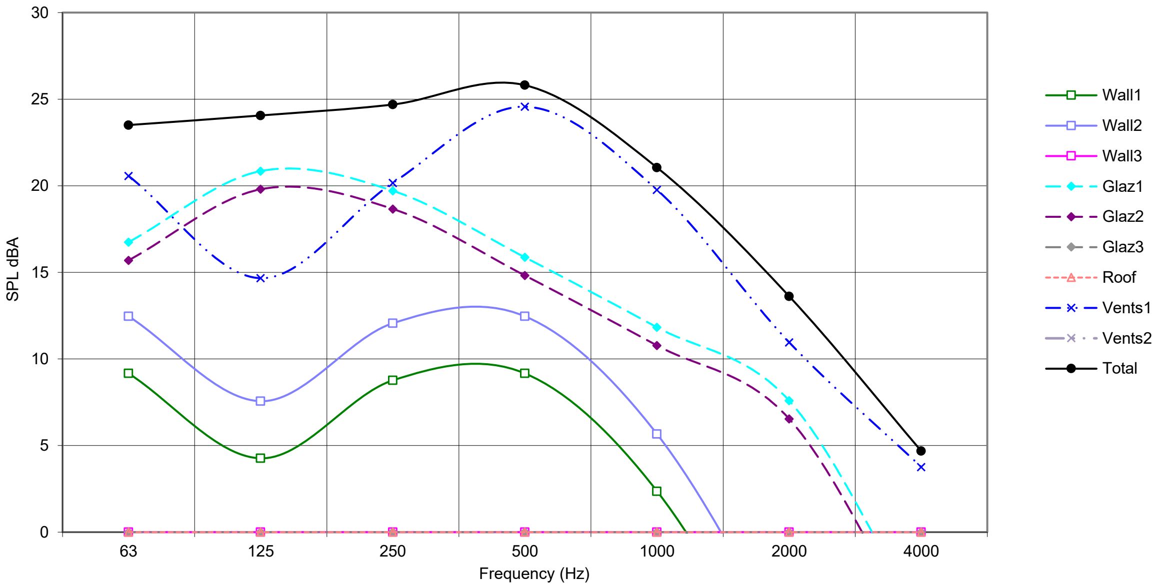
REVERBERATION TIME

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 [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	3.6	36	45	44	47	57	67	77	2%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	7.8	36	45	44	47	57	67	77	5%	54	0	-4
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.8	27	27	32	39	46	48	55	25%	37 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.2	27	27	32	39	46	48	55	19%	37 (inc Ctr)	-	-
	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		31	32	37	43	51	53	60				
	Resultant SPL inside room excluding ventilators dB	28.2	20	24	23	20	15	10	-3	51%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Greenwood 2500EAW.AC2 (Vent + 2 Acoustic Modules - External & Interna	2	32	42	40	39	47	53	55	49%	45	-2	-3
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	28.1	21	15	20	25	20	11	4	49%			
	Total SPL inside room	**31.2**	24	24	25	26	21	14	5				

Element contribution to total internal noise level



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT: The Barn Hotel
ROOM: Block A - Bedroom
VARIANT: Worst-Case Night-time Average Noise Level (LAeq)
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

	W		L		H
Room Dimensions [m]	3.3	X	4.2	X	2.4

Room Volume =	33.1	m3
Partition Area =	16.5	m2
Ventilation ref area =	10.0	m2
Free Field SPL K =	3	dB

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

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)	57.0								
		38.8	42.9	46.4	49.8	53.0	50.2	45.0	**Reference spectrum**

REVERBERATION TIME

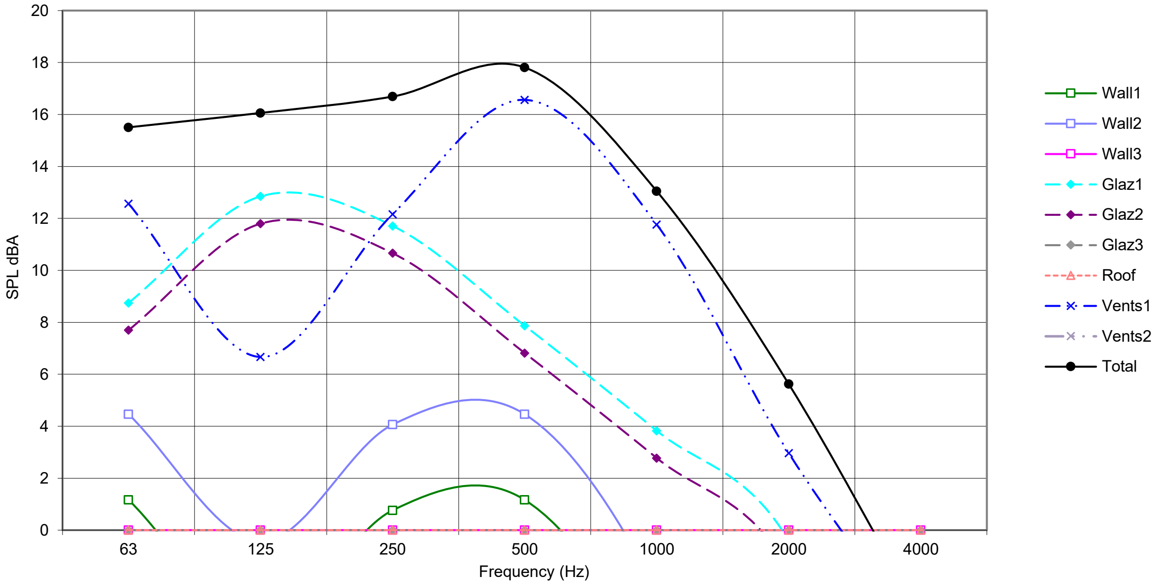
DIRECT INPUT ----->									**No data**
EQUAL RT for all bands ----->									
		0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	3.6	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	7.8	36	45	44	47	57	67	77	5%	54	0	-4
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.8	27	27	32	39	46	48	55	25%	37 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.2	27	27	32	39	46	48	55	19%	37 (inc Ctr)	-	-
	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		31	32	37	43	51	53	60				
	Resultant SPL inside room excluding ventilators dB	20.2	12	16	15	12	7	2	-11	51%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Greenwood 2500EAW.AC2 (Vent + 2 Acoustic Modules - External & Inte	2	32	42	40	39	47	53	55	49%	45	-2	-3
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	20.1	13	7	12	17	12	3	-4	49%			

Total SPL inside room	**23.2**	16	16	17	18	13	6	-3

Element contribution to total internal noise level



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT: The Barn Hotel
ROOM: Block A - Bedroom
VARIANT: Worst-Case Night-time Maximum Noise Level (LAmax)
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

	W		L		H
Room Dimensions [m]	3.3	X	4.2	X	2.4

Room Volume =	33.1	m3
Partition Area =	16.5	m2
Ventilation ref area =	10.0	m2
Free Field SPL K =	3	dB

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

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	76.0	64.7	64.7	63.1	67.5	72.6	68.0	62.1	
Road traffic spectrum (according to BS 8233:1999 section 6)									
		64.7	64.7	63.1	67.5	72.6	68.0	62.1	**Direct input**

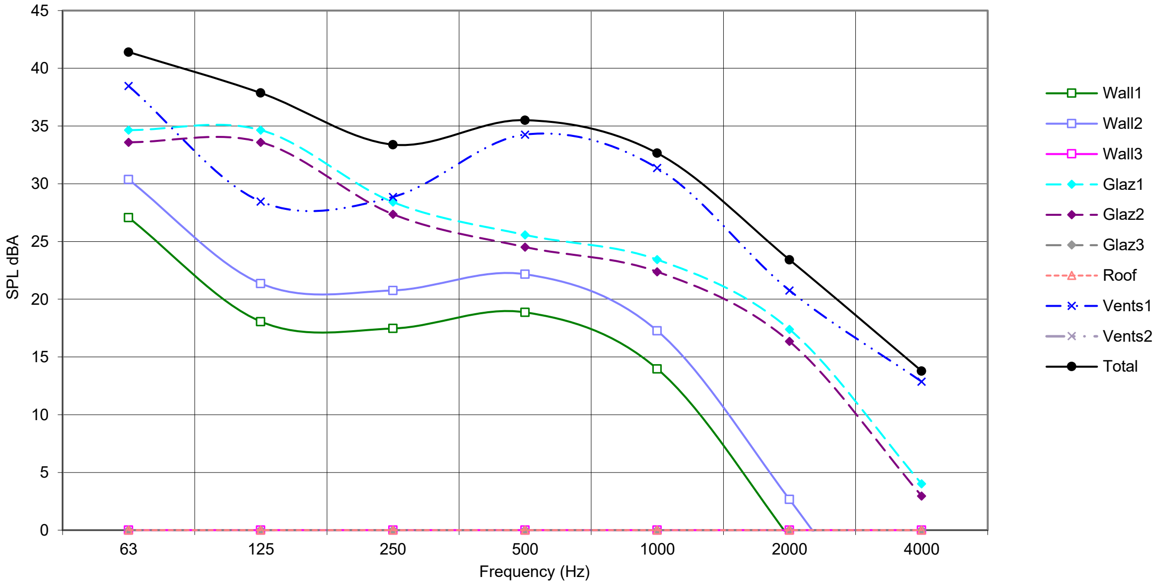
REVERBERATION TIME

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 [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	3.6	36	45	44	47	57	67	77	3%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	7.8	36	45	44	47	57	67	77	6%	54	0	-4
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.8	27	27	32	39	46	48	55	26%	37 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.2	27	27	32	39	46	48	55	20%	37 (inc Ctr)	-	-
	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		31	32	37	43	51	53	60				
	Resultant SPL inside room excluding ventilators dB	41.8	38	37	32	29	27	20	7	54%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Greenwood 2500EAW.AC2 (Vent + 2 Acoustic Modules - External & Internal)	2	32	42	40	39	47	53	55	46%	45	-2	-3
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	41.0	38	28	29	34	31	21	13	46%			
	Total SPL inside room	**44.4**	41	38	33	36	33	23	14				

Element contribution to total internal noise level



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT: The Barn Hotel
ROOM: Block A - Living Room
VARIANT: Worst-Case Daytime Average Noise Level (LAeq)
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

	W		L		H	
Room Dimensions [m]	6.1	X	4.5	X	2.4	
Room Volume =	65.6	m3				
Partition Area =	25.4	m2				
Ventilation ref area =	10.0	m2				
Free Field SPL K =	3	dB				

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

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)	64.0								
		45.8	49.9	53.4	56.8	60.0	57.2	52.0	**Reference spectrum**

REVERBERATION TIME

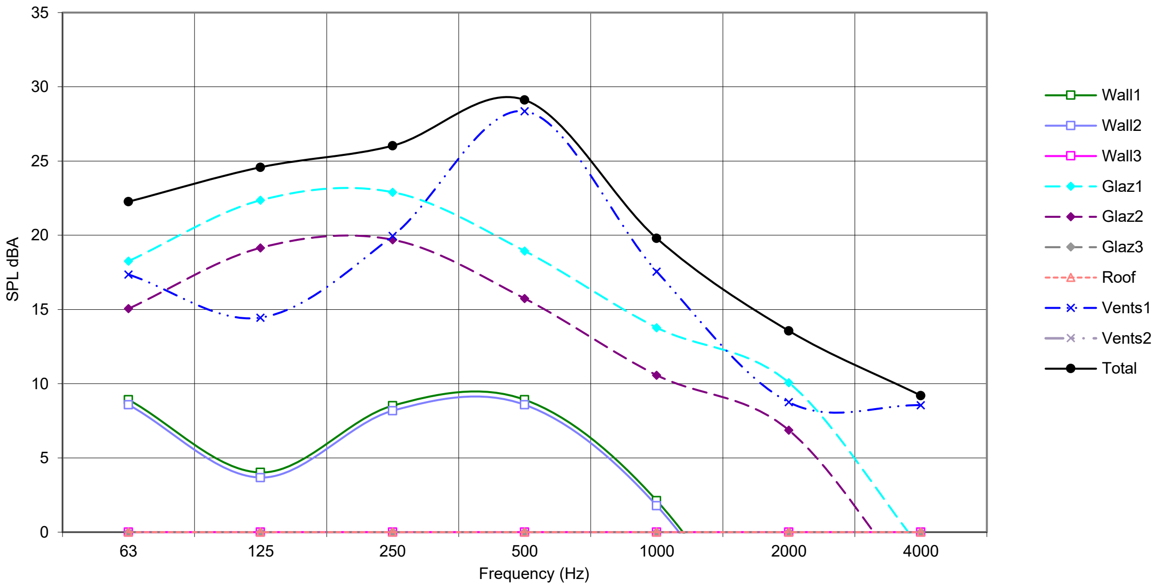
DIRECT INPUT ----->									**No data**
EQUAL RT for all bands ----->									
		0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.6	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	7.9	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	34 dB Rw + Ctr - High Acoustic Performance Double Glazing	6.0	25	25	28	35	44	45	51	30%	34 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	34 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.9	25	25	28	35	44	45	51	15%	34 (inc Ctr)	-	-
	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		29	30	32	39	48	49	55				
	Resultant SPL inside room excluding ventilators dB	29.3	21	24	25	21	16	12	1	48%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Greenwood 5000EAW.AC2 (Vent + 2 Acoustic Modules - External & Inte	3	33	40	38	33	47	53	48	52%	42	-2	-4
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	29.7	17	14	20	28	18	9	9	52%			

Total SPL inside room	**32.5**	22	25	26	29	20	14	9

Element contribution to total internal noise level



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT:	The Barn Hotel				
ROOM:	Block G - Bedroom				
VARIANT:	Worst-Case Daytime Average Noise Level (LAeq)				
NOTES:	Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.				

	W		L		H
Room Dimensions [m]	3.1	x	3.5	x	2.4

Room Volume =	26.0	m3
Partition Area =	15.8	m2
Ventilation ref area =	10.0	m2
Free Field SPL K =	3	dB

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

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)	63.0								
		44.8	48.9	52.4	55.8	59.0	56.2	51.0	**Reference spectrum**

REVERBERATION TIME

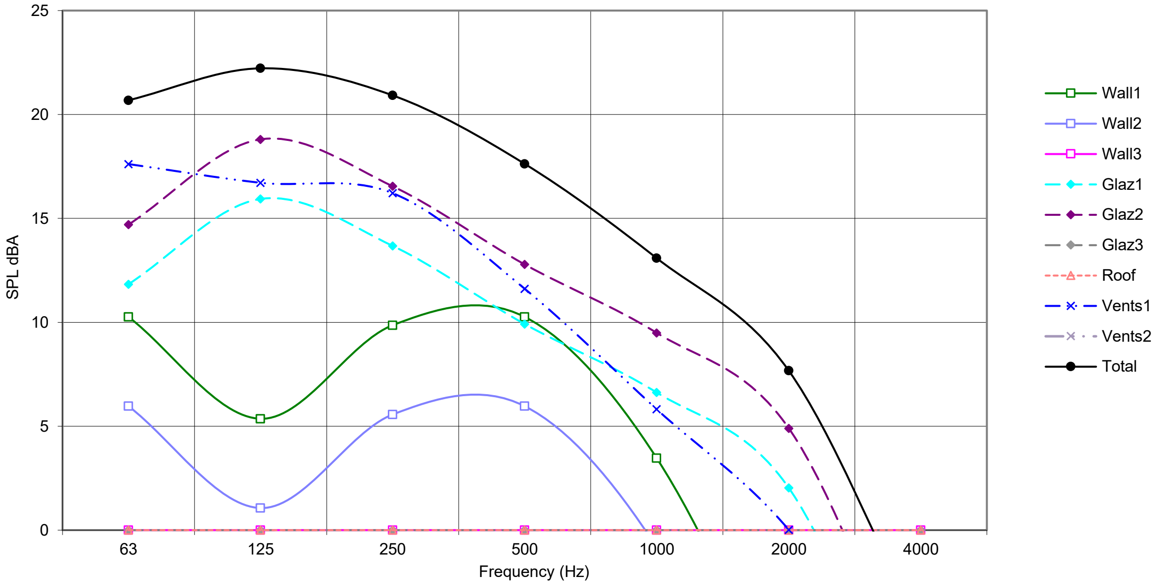
DIRECT INPUT ----->									**No data**
EQUAL RT for all bands ----->									
		0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	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	7%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	3%	54	0	-4
	ATTENUATION		2	2	2	2	2	2	2				
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	19%	39 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	37%	39 (inc Ctr)	-	-
	ATTENUATION		2	2	2	2	2	2	2				
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			33	34	39	45	53	55	64				
Resultant SPL inside room excluding ventilators dB		25.1	18	21	19	16	12	7	-7	66%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Brookvent TunalSus 290-10	2	34	39	43	51	60	63	67	34%	50	-1	-5
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB		22.2	18	17	16	12	6	0	-9	34%			

Total SPL inside room	**26.9**	21	22	21	18	13	8	-5

Element contribution to total internal noise level



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT:	The Barn Hotel	Room Dimensions [m]	W		L		H	
			3.1	X	3.5	X	2.4	
ROOM:	Block G - Bedroom							
VARIANT:	Worst-Case Night-time Average Noise Level (LAeq)	Room Volume =	26.0	m3				
NOTES:	Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.	Partition Area =	15.8	m2				
		Ventilation ref area =	10.0	m2				
	SELECT Free Field or Façade SPL for model input >>> 🟩	Free Field SPL K =	3	dB				

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)	56.0								
		37.8	41.9	45.4	48.8	52.0	49.2	44.0	**Reference spectrum**

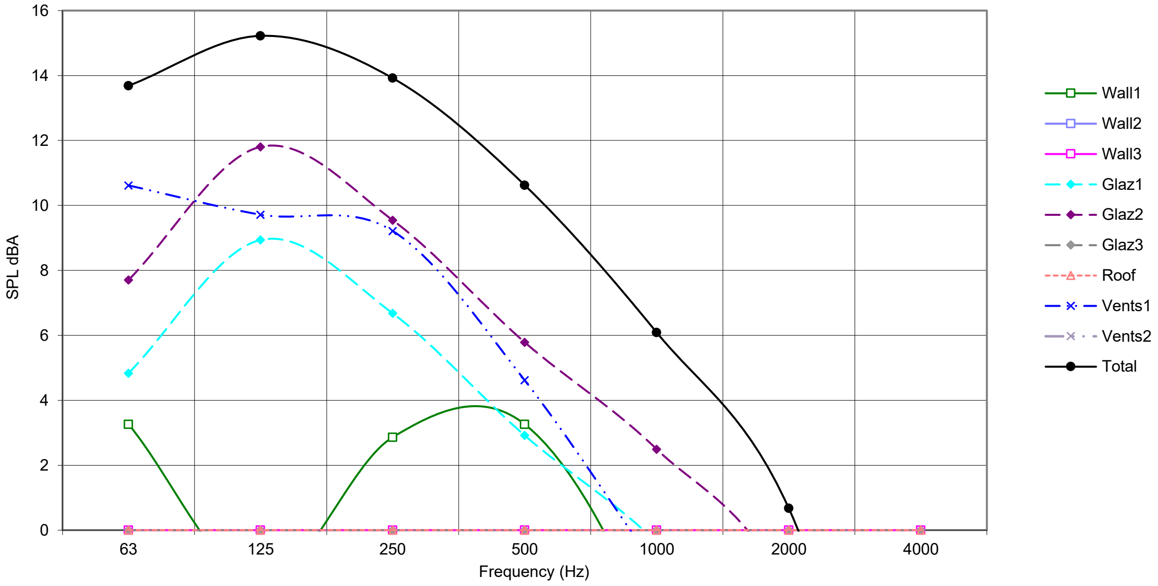
REVERBERATION TIME

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 [m2]	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	7%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION		2	2	2	2	2	2	2				
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	19%	39 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	36%	39 (inc Ctr)	-	-
	ATTENUATION		2	2	2	2	2	2	2				
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			33	34	39	45	53	55	64				
Resultant SPL inside room excluding ventilators dB		18.1	11	14	12	9	5	0	-14	66%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Brookvent TunalSus 290-10	2	34	39	43	51	60	63	67	33%	50	-1	-5
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB		15.2	11	10	9	5	-1	-7	-16	34%			
Total SPL inside room		**19.9**	14	15	14	11	6	1	-12				

Element contribution to total internal noise level



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT: The Barn Hotel
ROOM: Block G - Bedroom
VARIANT: Worst-Case Night-time Maximum Noise Level (LAmax)
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

	W		L		H
Room Dimensions [m]	3.1	X	3.5	X	2.4

Room Volume = 26.0 m3
Partition Area = 15.8 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>> 🟩 Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	76.0	64.7	64.7	63.1	67.5	72.6	68.0	62.1	
Road traffic spectrum (according to BS 8233:1999 section 6)									
		64.7	64.7	63.1	67.5	72.6	68.0	62.1	**Direct input**

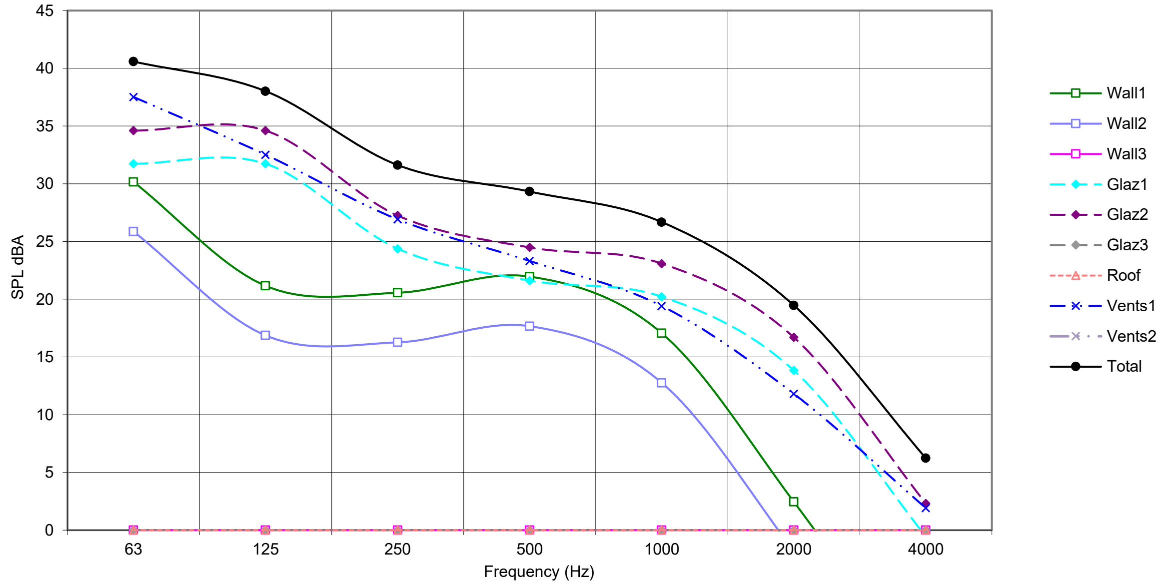
REVERBERATION TIME

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 [m2]	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	7%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	3%	54	0	-4
	ATTENUATION		2	2	2	2	2	2	2				
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	17%	39 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	33%	39 (inc Ctr)	-	-
	ATTENUATION		2	2	2	2	2	2	2				
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		33	34	39	45	53	55	64				
	Resultant SPL inside room excluding ventilators dB	40.9	38	37	30	28	26	19	4	60%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	[illegible]	2	34	39	43	51	60	63	67	40%	50	-1	-5
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	39.2	38	33	27	23	19	12	2	40%			
	Total SPL inside room	**43.2**	41	38	32	29	27	19	6				

Element contribution to total internal noise level



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

			W		L		H
PROJECT:	The Barn Hotel	Room Dimensions [m]	3.1	X	3.5	X	2.4
ROOM:	Block G - Bedroom						
VARIANT:	Worst-Case Night-time Maximum Noise Level (LAmax)	Room Volume =	26.0	m3			
NOTES:	Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.	Partition Area =	15.8	m2			
		Ventilation ref area =	10.0	m2			
	SELECT Free Field or Façade SPL for model input >>> 🟩	Free Field SPL K =	3	dB			

NOTES:

EXTERNAL SPECTRUM (A weighted)

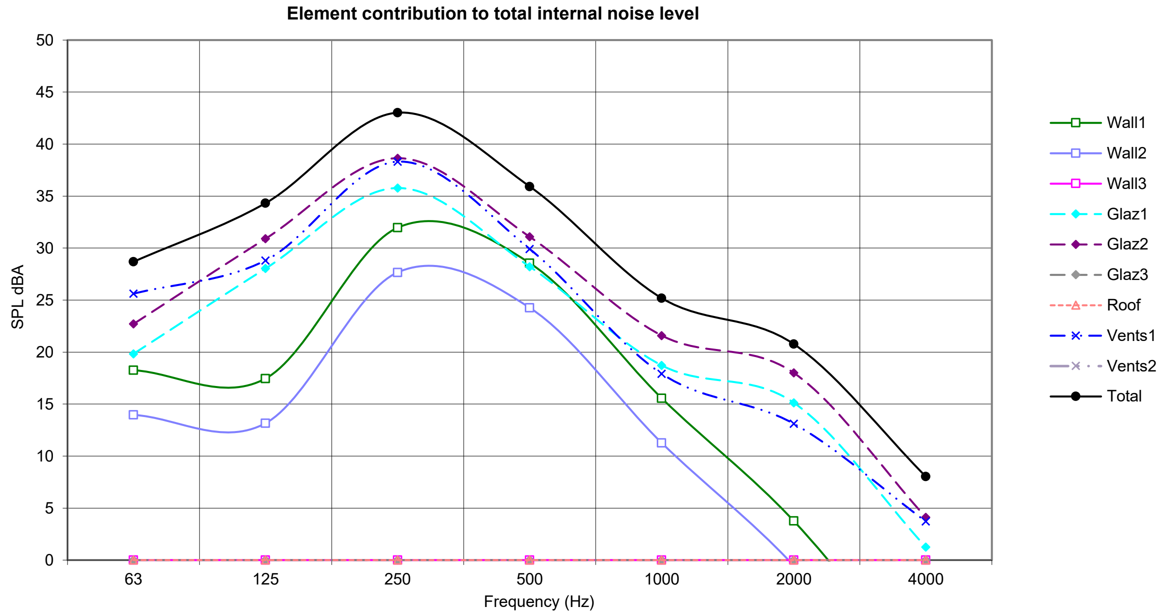
	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	79.0	52.8	61.0	74.5	74.1	71.1	69.3	63.9	
Road traffic spectrum (according to BS 8233:1999 section 6)									
		52.8	61.0	74.5	74.1	71.1	69.3	63.9	**Direct input**

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 [m2]	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	9%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	3%	54	0	-4
	ATTENUATION		2	2	2	2	2	2	2				
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	19%	39 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	37%	39 (inc Ctr)	-	-
	ATTENUATION		2	2	2	2	2	2	2				
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		33	34	39	45	53	55	64				
	Resultant SPL inside room excluding ventilators dB	42.8	26	33	41	35	24	20	6	68%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Brookvent TunalSus 290-10	2	34	39	43	51	60	63	67	32%	50	-1	-5
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	39.5	26	29	38	30	18	13	4	32%			
	Total SPL inside room	**44.4**	29	34	43	36	25	21	8				



FACSIM V2.7.10 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT: The Barn Hotel
ROOM: Block G - Living Room
VARIANT: Worst-Case Daytime Average Noise Level (LAeq)
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

	W		L		H
Room Dimensions [m]	4.8	X	6.1	X	2.4

Room Volume = 69.7 m3
Partition Area = 26.1 m2
Ventilation ref area = 10.0 m2

SELECT Free Field or Façade SPL for model input >>> 🟩 Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

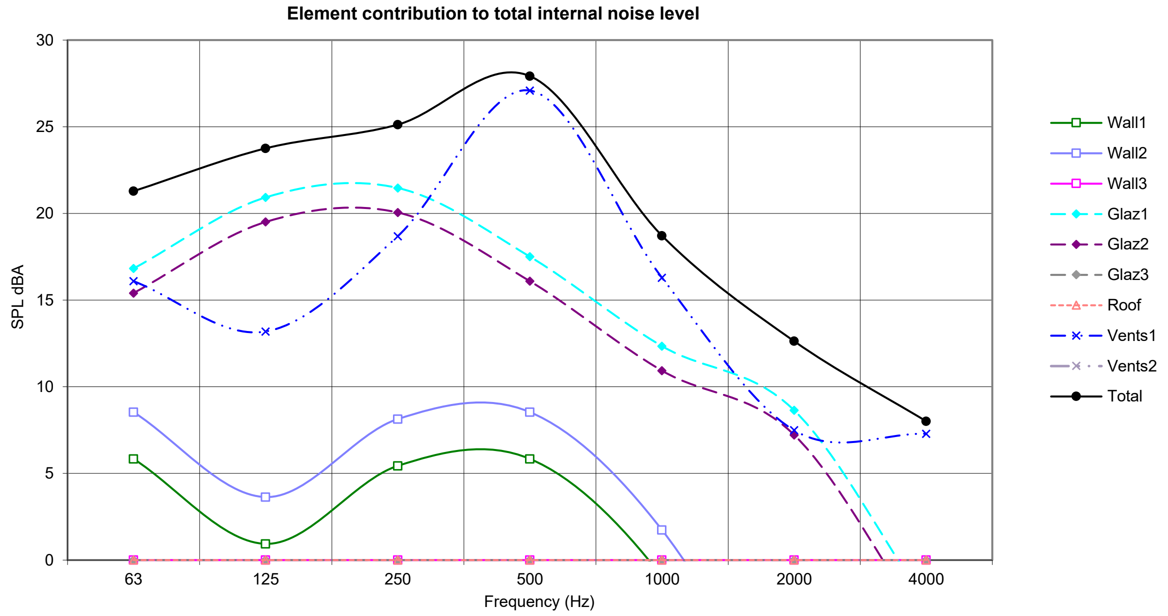
	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-								**No data**
Road traffic spectrum (according to BS 8233:1999 section 6)	63.0								
		44.8	48.9	52.4	55.8	59.0	56.2	51.0	**Reference spectrum**

REVERBERATION TIME

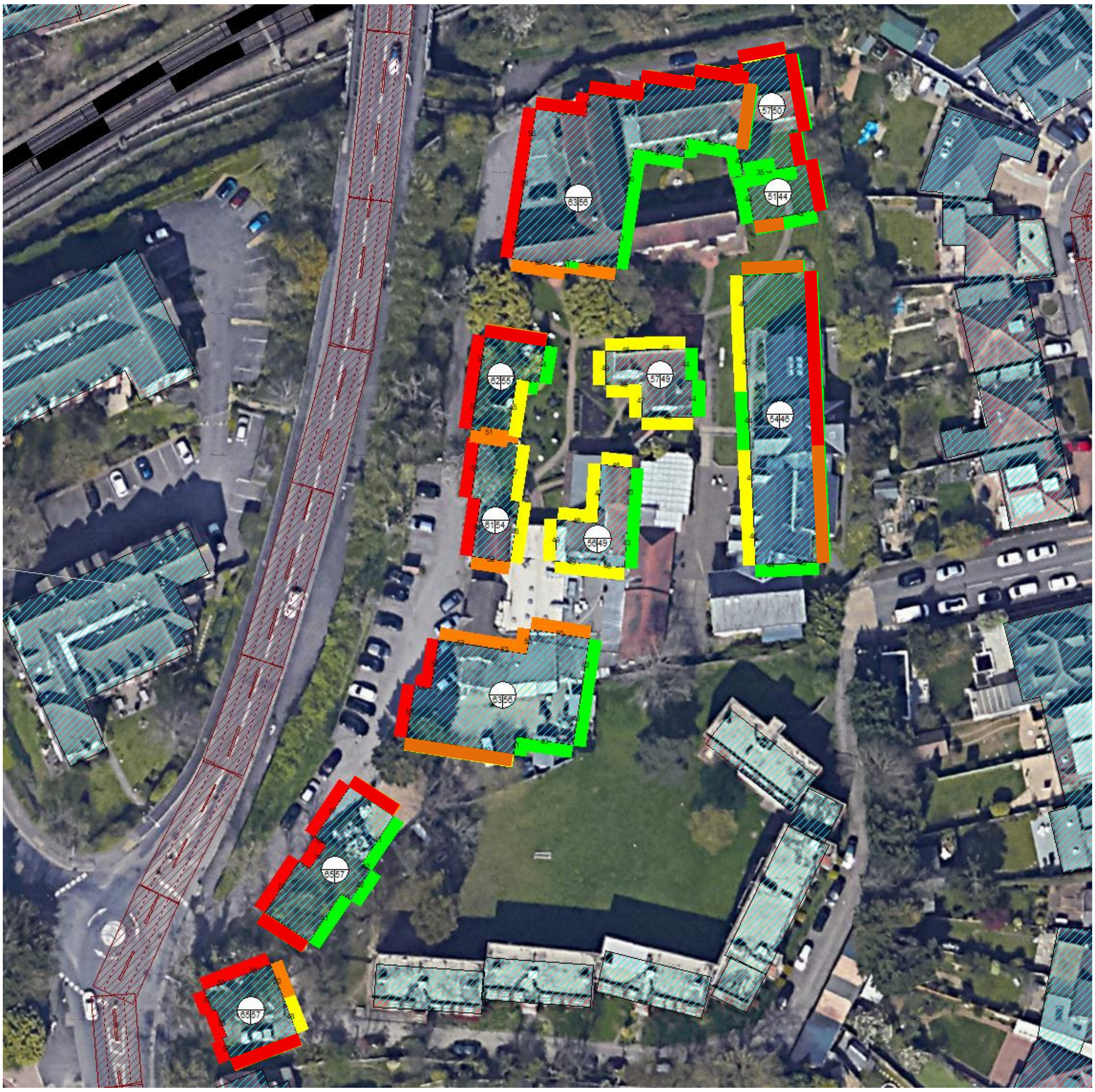
DIRECT INPUT ----->									**No data**
EQUAL RT for all bands ----->									
		0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	5.7	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION												
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	10.5	36	45	44	47	57	67	77	2%	54	0	-4
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	34 dB Rw + Ctr - High Acoustic Performance Double Glazing	5.8	25	25	28	35	44	45	51	28%	34 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	34 dB Rw + Ctr - High Acoustic Performance Double Glazing	4.2	25	25	28	35	44	45	51	20%	34 (inc Ctr)	-	-
	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		29	29	32	39	48	49	55				
	Resultant SPL inside room excluding ventilators dB	28.5	20	23	24	20	15	11	0	51%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Greenwood 5000EAW.AC2 (Vent + 2 Acoustic Modules - External & Inte	3	33	40	38	33	47	53	48	49%	42	-2	-4
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	28.5	16	13	19	27	16	7	7	49%			
	Total SPL inside room	**31.5**	21	24	25	28	19	13	8				



Appendix 5 Part O Acoustic Requirements for Bedrooms at Night



Ref.	Colour	Outside-to-inside noise reduction requirement	Part O Requirement for Bedrooms
ADO01	🟩	4 dB	Energy 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	🟨	9 dB	Energy 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	🟧	13 dB	Energy 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	🟥	>13 dB	Energy 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.

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Acoustics | Air Quality | Overheating

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Appendix F

Air Quality Assessment

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Architectural & Environmental Consultants

Noise | Vibration | Air Quality

Air Quality Assessment

The Barn Hotel, Ruislip

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Air Quality Assessment

Project: THE BARN HOTEL, RUISLIP

Report reference: RP02-22530-R3

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0	20 July 2023	Hazel Swinfen BSc (Hons), AMIEnvSc, Air Quality Consultant	Paul Hayward, BSc (Hons) MSc MIAQM MIEnvSc, Technical Director - Air Quality	Initial issue
1	31 July 2023	Hazel Swinfen BSc (Hons), AMIEnvSc, Air Quality Consultant	Paul Hayward, BSc (Hons) MSc MIAQM MIEnvSc, Technical Director - Air Quality	Revised following comments
2	22 July 2024	Hazel Swinfen BSc (Hons), AMIEnvSc, Senior Air Quality Consultant	Paul Hayward, BSc (Hons) MSc MIAQM MIEnvSc, Technical Director - Air Quality	Revised following design change
3	26 March 2026	Hazel Swinfen BSc (Hons), MIAQM, AMIEnvSc, Senior Air Quality Consultant	Paul Hayward, BSc (Hons) MSc MIAQM MIEnvSc, Technical Director - Air Quality	Redesign

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1. EXECUTIVE SUMMARY

1.1 Cass Allen has been instructed by Chase New Homes to assess the potential air quality effects associated with a proposed residential development at The Barn Hotel, Ruislip in London Borough of Hillingdon (LBH). The assessment was carried out in accordance with relevant local, regional and national planning policy and guidance.

1.2 The site is located within Ruislip Town Centre Air Quality Focus Area (AQFA), which is identified as having high levels of exposure to poor air quality. It is also located approximately 540m north-east of the Hillingdon Air Quality Management Area (AQMA), which was declared due exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO_2). Air quality in the vicinity is primarily influenced by vehicle emissions along the A4180 West End Road and the local road network.

1.3 Emissions of construction phase dust and particulate matter (PM_{10}) were assessed in accordance with Institute of Air Quality Management (IAQM) guidance. A Medium Risk of dust soiling and a Low Risk of PM_{10} health effects have been identified, respectively, in the absence of mitigation. Suitable best practice mitigation measures have been recommended, and no significant residual air quality impacts are expected.

1.4 A detailed atmospheric dispersion model was utilised to predict NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) concentrations at relevant sensitive receptor locations within the study area during the operation of the development. This followed Department for Environment, Food and Rural Affairs (Defra) and Environmental Protection UK (EPUK) & IAQM guidance.

1.5 The results indicate that pollutant concentrations at proposed sensitive receptors are expected to be below the relevant AQOs and within London Air Pollution Exposure Criteria (APEC) Category A during the operational phase, with no requirement for additional mitigation and no requirement for windows to be fixed shut. Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Accordingly, the overall effect of the proposed development is considered ‘not significant’ with regard to air quality.

1.6 An Air Quality Neutral (AQN) Assessment was undertaken following Mayor of London / GLA guidance. This indicated that the development is likely to generate trips in excess of the relevant benchmark. However, the development meets the aspirations of the NPPF with regard to projects in sustainable locations and, taking into account Travel Plan and other intrinsic emissions mitigation measures, it is judged that the development will comply with AQN criteria, without the requirement for additional mitigation or an offsetting payment.

1.7 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

2. INTRODUCTION

2.1 Cass Allen has been instructed by Chase New Homes to assess the potential air quality effects associated with a proposed residential development at The Barn Hotel, Ruislip in Hillingdon, London. The assessment has been carried out in accordance with relevant local, regional and national planning guidance and is intended to accompany the planning application (ref: 7969/APP/2023/1473) which has been held in abeyance whilst the scheme was redesigned.

2.2 The aim of the assessment is to consider air quality conditions, and their potential to influence the development in terms of its design, scale and layout, taking into account the following aspects:

- Dust and PM emissions generated by construction phase activities;
- Exhaust emissions from construction plant and traffic;
- The exposure of new sensitive receptors to elevated pollutant concentrations; and
- Emissions from traffic generated by the operation of the development.

2.3 Subsequently, where required, appropriate measures are identified to minimise the impacts.

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 The site currently contains multiple hotel buildings, a restaurant and carparking and is located in a primarily residential area. To the north of the site is Ruislip Underground Station, to the east and south are existing dwellings and to the west is a retirement housing complex, which have the potential to be affected by emissions generated by the development.

3.2 The site location is shown in Figure 1.

Figure 1 Site Location and Surrounding Area

3.3 The proposal is to redevelop the previous hotel site into a 71-dwelling residential development.

3.4 With regard to air quality, the site is located within Ruislip Town Centre AQFA, which is identified as having high levels of exposure to poor air quality. It is also located approximately 540m north-east of the Hillingdon AQMA, which was declared due exceedances of the annual mean AQO for NO_2. Air quality in the vicinity is primarily influenced by vehicle emissions along the A4180 West End Road and the local road network. These sources have the potential to influence air quality conditions at the site.

4. PLANNING POLICY

Air Quality Legislation

4.1 The wider air quality legislation underpinning national, regional and local planning policy, is summarised in Appendix 1.

4.2 The National AQOs and Air Quality Standards Regulations limit and target values for the UK are summarised in the Air Quality Strategy. These limits, for ten key air pollutants, are based on both European Union directives and World Health Organization (WHO) guidelines. They are periodically updated, informed by the latest scientific evidence, to protect public health, vegetation and ecosystems. The Local Air Quality Management (LAQM) regime requires local authorities to regularly evaluate the air quality in their areas based on these AQOs.

4.3 As a regional pollutant, many sources of $PM_{2.5}$ are beyond local authority control therefore, it does not form part of the LAQM regime. However, long-term (2040) targets for ambient $PM_{2.5}$ concentrations are set in 'The Environmental Targets (Fine Particulate Matter) (England) Regulations' (2023), and an interim (2028) target is published in the 'Environmental Improvement Plan' (2023). $PM_{2.5}$ is a key air pollutant for health impacts, and local authorities must monitor progress towards meeting these reduced levels.

4.4 The National AQOs for the pollutants most associated with vehicle emissions, and therefore applicable to this assessment, are detailed in Table 1.

Table 1 UK National Air Quality Objectives

Pollutant	Objective	Averaging Period
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
	200µg/m^3 not to be exceeded more than 18 times per year	1-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
	50µg/m^3 not to be exceeded more than 35 times per year	24-hour mean
Particulate Matter ($PM_{2.5}$)	20µg/m^3	Annual mean

4.5 The above AQOs are typically applied where there is 'relevant exposure', i.e., where members of the public are likely to be present for the relevant averaging periods, or regularly exposed, and not in workplaces where relevant provisions concerning health and safety at work apply.

National Policy

4.6 Outline guidance for the assessment of air quality affecting new developments is given in the 'National Planning Policy Framework' (NPPF) (December 2024; as amended February 2025). Relevant sections in this case are included in Appendix 1.

Regional Policy

4.7 London air quality policy is outlined in Appendix 1.

Local Policy

4.8 LBH planning policy relevant to air quality is summarised in Appendix 1.

Summary

4.9 To address the requirements of the national and local policies, the following key air quality matters have been considered:

- Construction phase fugitive emissions of dust and PM impacts at existing receptors;
- Construction phase plant and vehicle emissions impacts at existing receptors;
- Operational phase vehicle emissions exposure at proposed receptors; and
- Operational phase vehicle emissions impacts at existing receptors.

5. ASSESSMENT METHODOLOGY

5.1 The scope and methodology for this assessment have been determined with regard to:

- Defra 'LAQM Technical Guidance' (May 2025) (LAQM.TG22);
- Mayor of London 'London LAQM Technical Guidance' (2019) (LLAQM.TG(19)); and
- Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM), 'Land Use Planning & Development Control: Planning for Air Quality' (January 2017) (LUPDC).

Construction Phase

5.2 The assessment of potential air quality impacts during the construction phase has focused on the generation and dispersion of dust and PM_{10}, following the IAQM Guidance on the Assessment of Dust from Demolition and Construction, (January 2024), methodology, summarised as follows:

- Step 1 – screen the need for an assessment: impacts to sensitive human and ecological receptors should be considered where they are located within 250m or 50m of the site boundary, respectively (as shown on Figure 2). These receptors should also be considered if they are within 50m of a route used by construction vehicles up to 250m from the site entrance.
- Step 2A – estimate the dust emission magnitude for each of the main construction activities – demolition, earthworks, general construction, and trackout.
- Step 2B – determine the sensitivity of the receiving environment, through consideration of factors such as meteorological conditions, the number of nearby receptors, their proximity and their sensitivity. Other factors to consider are detailed in Box 9 of the guidance. A wind rose for nearby Northolt meteorological station is in Appendix 2.
- Step 2C – define the risk of impacts.
- Step 3 – identify site-specific mitigation requirements (in addition to basic project controls).

5.3 As indicated within the guidance, the use of professional judgment is necessary, due to the diverse range of projects that are subject to dust impact assessment, meaning that it is not possible to be prescriptive as to how to assess the impacts.

5.4 Exhaust emissions from construction vehicles and plant may impact local air quality. The potential for significant effects resulting from these emissions has also been considered with reference to screening and significance criteria in LUPDC.

5.5 A review of the Multi-Agency Geographic Information for the Countryside (MAGIC) website did not identify any statutory designated ecological sites within the relevant screening distances, and therefore these have been excluded from the construction phase assessment.

Operational Phase

5.6 LUPDC indicates that a change in Light Duty Vehicle (LDV - cars and small vans <3.5t gross vehicle weight) flows of 500 Annual Average Daily Traffic (AADT) and/or Heavy Duty Vehicle (HDV - goods vehicles + buses >3.5t gross vehicle weight) flows of 100 AADT or more is potentially significant, and likely to require further assessment. This also applies to a change in LDV flows of 100 AADT and/or HDV flows of 25 AADT or more on routes through or close to an AQMA. Where these thresholds are not exceeded, a detailed assessment of air quality impacts is not normally required, and the resulting effect is normally considered 'not significant'.

5.7 The project's transport consultant (Paul Basham Associates) has indicated that the development is expected to generate a traffic flow of approximately 105 AADT, which are expected to disperse rapidly onto the road network and therefore, no significant impacts are anticipated at existing receptors, and these are excluded from further assessment.

5.8 The development is located within an AQFA but outside of any AQMAs. This is unusual because AQFAs are typically declared in areas where exceedances of AQOs have been recorded and as such, are within declared AQMAs. Whilst the assessment of pollutant concentrations at proposed receptors within this AQFA may not strictly be required, it is recognised that the development has the potential to expose future occupants to elevated pollutant concentrations and therefore, detailed dispersion modelling has been undertaken as part of an overall robust approach.

5.9 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been considered in the operational phase assessment as road traffic is a major source of these pollutants and their concentrations are often close to, or in exceedance of, the relevant AQOs in urban locations. Cambridge Environmental Research Consultants' (CERC) ADMS-Roads (version 5.1.0.2) atmospheric dispersion model has been used to predict pollutant concentrations at the proposed receptor (PR) locations detailed in Table 2.

Table 2 Modelled Receptor Locations

ID	Description	Grid Reference (OSGB)	Height (m)*
PR1	East of site access road	509404.0, 186823.6	1.5
PR2		509418.9, 186844.6	
PR3		509438.0, 186872.7	
PR4	Western site boundary	509448.0, 186920.5	
PR5		509454.8, 186947.4	
PR6		509457.5, 186962.5	

* To represent the average adult breathing zone above floor level and to align with Defra national background modelling used within this assessment.

5.10 To assess the site suitability of the development, the following scenarios have been modelled:

- 2024 – Model Verification; and
- 2029 – Anticipated Opening Year, With Development.

5.11 Traffic data are provided in Appendix 3 and modelling methodology (including Emissions Factors Toolkit (EFT), meteorology, verification and adjustment), is detailed in Appendix 4.

5.12 The study area, including modelled road links and receptors, is shown in Figure 2 below.

PM$_{2.5}$ Targets

5.13 Additionally, Defra's 'PM$_{2.5}$ Targets: Interim Planning Guidance' (October 2024), prompts developers to consider:

1. *How has exposure to PM$_{2.5}$ been considered when selecting the development site?*
2. *What actions and/or mitigations have been considered to reduce PM$_{2.5}$ exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM$_{2.5}$ and its precursors?*

5.14 Accordingly, these aspects are also considered in the operational phase assessment.

Assessment Criteria

5.15 For proposed receptors, the potential for elevated pollutant concentrations is considered with respect to the relevant AQOs and the London APEC, as detailed in Table 3, to determine the suitability of the site for the proposed use and the requirement for mitigation.

Table 3 London Air Pollution Exposure Criteria

Category	Applicable Range (NO$_2$)	Applicable Range (PM$_{10}$)	Recommendation
APEC - A	>5% below AQO (<38µg/m^3)	Annual mean: >5% below AQO (<38µg/m^3) 24-hour mean: >1 day below AQO (<34 days per year)	No air quality grounds for refusal; mitigation of any emissions should be considered.
APEC - B	Between 5% below or above AQO (38-42µg/m^3)	Annual mean: Between 5% below or above AQO (38-42µg/m^3) 24-hour mean: Between 1 day above or below AQO (34-36 days per year)	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered (site layout and ventilation).
APEC - C	>5% above AQO (>42µg/m^3)	Annual mean: >5% above AQO (>42µg/m^3) 24-hour mean: >1 day above AQO (>36 days per year)	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes.

Note: derived from London Councils Air Quality and Planning Guidance, 2007.

Air Quality Neutral Assessment

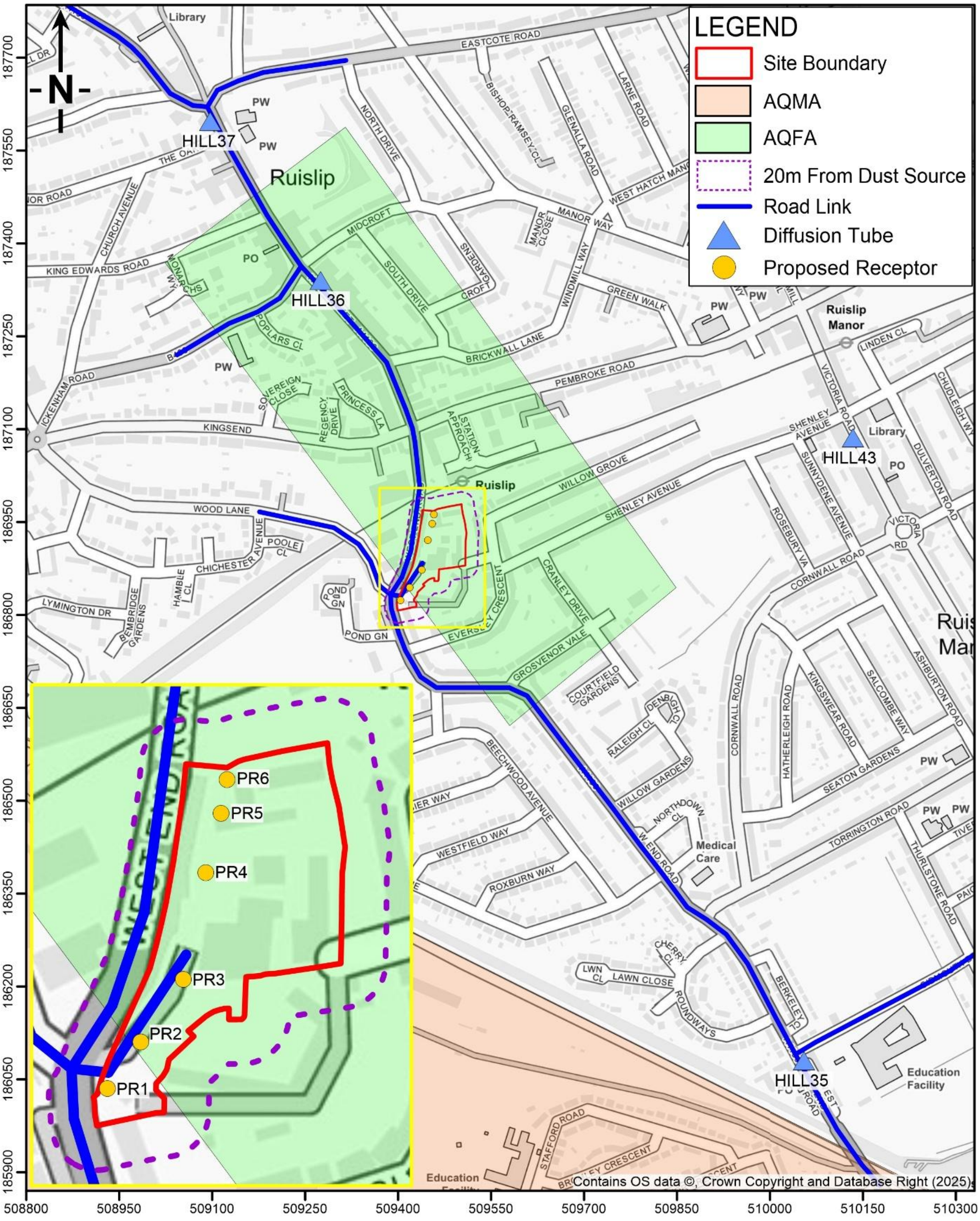
5.16 An AQN Assessment has also been undertaken in line with the Mayor of London / GLA London Plan Guidance – Air Quality Neutral (AQN LPG) (February 2023) and considers the total (gross) emissions of nitrogen oxides (NO_x) and $PM_{2.5}$ from road transport.

5.17 Applicable data for the Development are included in Table 4.

Table 4 Input Data for Air Quality Neutral Calculations

Parameter	Value
Energy and Heat generation plant	Electrically powered system – no new combustion sources
Number of dwellings	71
Development trips	105 AADT

Figure 2 Study Area



6. BASELINE CONDITIONS

6.1 Air quality conditions in the vicinity of the site have been reviewed to provide a baseline for consideration. The collected data are included in the tables below and were obtained from LBH and Defra. Monitoring locations are indicated on Figure 2.

Table 5 LBH Monitored Concentrations across Study Area– NO_2

ID	Location	Type	Distance to site (m)	Annual Mean (µg/m^3)				
				2020	2021	2022	2023	2024
HILL35	West End Rd, south of Sidmouth Dr, outside Aroma House Chinese. HA4 6LR	Roadside	965	28.9	28.0	27.2	23.9	19.5
HILL36	Outside Vodafone, 69 High St. HA4 8JB	Roadside	410	28.1	31.6	32.7	29.7	25.7
HILL37	2/6 High St, parking & church sign. HA4 7AW	Roadside	720	28.1	30.4	31.7	27.1	23.5
HILL43	Outside tattoo / Five Star nail parlours, 60 Victoria Rd. HA4 0AH	Roadside	640	29.1	28.2	28.6	24.1	20.3

Note: Data obtained from LBH Air Quality Annual Status Report (ASR) for 2024 (May 2025). Results from 2020 and 2021 are likely to be atypical due to COVID-19 travel restrictions.

6.2 As indicated in Table 5 above, NO_2 concentrations in the vicinity of the site were below the annual mean AQO during the five most recent monitoring years, 2020-2024. The general trend shows air quality conditions in the area improving over time, and this is illustrated in Figure 6 of the LBH ASR.

Table 6 Mapped Background Annual Mean Concentrations across Study Area (µg/m^3)

2024 (Model Verification)				2029 (Development Operation)			
*NO_x	NO_2	PM_{10}	$PM_{2.5}$	NO_x	NO_2	PM_{10}	$PM_{2.5}$
16.5 - 18.9	12.3 - 14.0	12.5 - 13.3	7.7 - 8.0	13.6 - 15.6	10.3 - 11.7	12.1 - 12.9	7.3 - 7.7

Note: Data obtained from https://uk-air.defra.gov.uk/data/laqm-background-home. A range is given as the study area spans multiple grid squares. * Nitrogen oxides (nitric oxide (NO) & NO_2).

6.3 No monitoring of PM_{10} or $PM_{2.5}$ is undertaken in the vicinity of the site. However, Defra-predicted background concentrations for 2024 and 2029 are 'well below' (defined by the IAQM as <75% of) the relevant AQOs and are expected to reduce further in future years. These background concentrations are later combined with roadside modelling results to provide total predicted environmental concentrations at receptor locations.

7. CONSTRUCTION PHASE ASSESSMENT

7.1 As sensitive receptors were identified within the relevant IAQM screening distances, the assessment progressed to Step 2, which has been summarised in the tables below.

Table 7 Step 2A – Dust Emission Magnitude for Construction Activities

Activity	Magnitude	Explanation
Demolition	Medium	Total building volume 12,000-75,000m^3, demolition activities 6-12m above ground.
Earthworks	Small	Total site area <18,000m^2, <5 heavy earth moving vehicles active at any one time.
Construction	Medium	Total building volume 12,000-75,000m^3.
Trackout	Small	Nominal unpaved road length, <20 HDV outward movements in any one day.

Table 8 Step 2B – Sensitivity of the Area

Potential Impact	Details	Construction Activity			
		Demolition	Earthworks	Construction	Trackout
Dust Soiling: Amenity	10-100 high sensitivity receptors within 20m of site	High	High	High	High
PM_{10}: Health	As above and low background PM_{10} concentration	Low	Low	Low	Low

Table 9 Step 2C – Summary of Impact Risks to Define Site-Specific Mitigation

Potential Impact	Construction Activity			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Low Risk	Medium Risk	Low Risk
Human Health	Low Risk	Negligible	Low Risk	Negligible

7.2 It should be noted that the prevailing winds are south-westerly (as shown in Appendix 2) and thus, locations to the north-east, downwind of the site, are most at risk of construction dust impacts. Overall, the development is considered Medium Risk for dust soiling effects and Low Risk for PM_{10} health effects, in the absence of mitigation. Following implementation of the applicable recommended mitigation measures for the relevant activities' risk levels in Appendix 5, it is anticipated that the residual effect of the construction phase will be not significant.

7.3 With regard to construction traffic, the construction phase flows are not expected to exceed the criteria detailed in paragraph 5.6 and therefore, significant residual effects are not anticipated.

8. OPERATIONAL PHASE ASSESSMENT – SITE SUITABILITY

8.1 To consider the suitability of the site for the proposed use, the potential for future occupants of development to be exposed to exceedances of the relevant AQOs has been assessed. Modelled predicted pollutant concentrations at proposed receptors are detailed in Table 10.

Table 10 Predicted Pollutant Concentrations at the Development in 2029

Receptor	Annual Mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
APEC Category A Threshold	***38***	***38***	***19***
PR1	16.9	14.2	8.4
PR2	14.4	13.7	8.1
PR3	12.9	13.4	7.9
PR4	12.4	13.4	8.0
PR5	12.2	13.3	7.9
PR6	12.2	13.3	7.9

Note: Results are reported to the nearest 0.1µg/m^3. Any apparent discrepancies are due to rounding.

8.2 The data in Table 10 show that pollutant concentrations were predicted to be below the relevant annual mean AQOs at all proposed receptor locations. The highest predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations were 16.9µgm^3 14.2µg/m^3 and 8.4µg/m^3, respectively, at receptor PR1.

8.3 The annual mean NO_2 concentrations predicted by the model were all below 60µg/m^3. As indicated in LAQM.TG22, a breach of the hourly mean AQO for NO_2 is unlikely where this is the case. Equally, exceedances of the 24-hour mean AQO for PM_{10} are not anticipated, as all predicted annual mean concentrations fall below the 32µg/m^3 proxy value.

8.4 All predicted pollutant concentrations were more than 5% below the relevant AQOs, classified as APEC Category A. It is therefore not anticipated that proposed receptors would be exposed to exceedances of the relevant AQOs and as such, the site is considered to be suitable for the proposed use, without the requirement for additional mitigation such as unopenable windows.

8.5 In addition to the above, Defra guidance recommends consideration of how a development will reduce exposure to $PM_{2.5}$. In terms of selecting this development site, which is in an area where $PM_{2.5}$ concentrations are expected to be well below the AQO and where there is no requirement to reduce exposure further, exposure to $PM_{2.5}$ has been considered.

9. AIR QUALITY NEUTRAL ASSESSMENT

Building Emissions

9.1 It is understood that the Development will utilise an electrically powered heating system, such as air/ground source heat pumps. Accordingly, there will be no local building emissions and the Development is considered AQN in terms of building emissions, with respect to AQN LPG (2023).

Transport Emissions

9.2 An AQN Assessment has been undertaken for the total traffic generation of 105 AADT, as summarised in Table 11, with key inputs detailed in Table 4.

Table 11 Summary of Air Quality Neutral Assessment

Parameter	Value
Residential benchmark trip rate (Outer London)	447 trips per dwelling per annum
Development Transport Emissions Benchmark (TEB)	71 dwellings × 447 trips = 31,737 trips per annum
Actual development trips	105 AADT × 365 days = 38,325 trips per annum
Difference (Actual - TEB)	+6,588 trips per annum
Air Quality Neutral?	No

9.3 The calculation in Table 11 indicates that, in the absence of mitigation, the development will not be AQN, based on the gross development trip assumptions. Where this is the case, the guidance states that intrinsic transport *'mitigation measures should exceed the minimum requirements in the London Plan policies'*.

9.4 According to the development Framework Travel Plan (Paul Basham Associates Ltd, 2024) the parking provision on site (19 spaces) falls below the maximum allowance in the London Plan (2021) (39-59 spaces) thus exceeding *the minimum requirements* as stated above. Furthermore, the provision of active electric vehicle (EV) charging points to 100% of spaces within the development will also *exceed the minimum requirements in the London Plan policies* (20%). Moreover, the Framework Travel Plan outlines various hard and soft emissions mitigation measures including:

- Provide of 162 secure long stay cycle parking spaces;
- Liaise with local cycle shops to discuss discounts and vouchers;
- Appoint a Travel Plan Coordinator (TPC);
- TPC to produce Resident Welcome Pack including:
    - Details of the TPC
    - Walking and cycling routes;
    - Bus stop locations, prices and times;
    - Rail Station information;
    - Electric charging information;
    - Car sharing information and benefits; and
    - Personalised Travel Planning Advice;
- Establish a dedicated Travel Plan website; and
- Surveys, monitoring and feedback to ensure targets are met.

9.5 The final cost of these measures cannot be confirmed until exact quantities and specifications are determined, and suppliers are identified. However, these aspects are expected to benefit air quality during the operation of the development and therefore, meet the requirements of paragraph 5.1.4 of AQN LPG and the LBH requirement for development to be Air Quality Positive (AQP) in AQFAs.

9.6 It is important to highlight that the selected site naturally encourages sustainable travel, as per NPPF (December 2024) Section 110. It is located close to town centre amenities and has easy access to wider London via Underground and bus routes, with an associated Public Transport Accessibility Level (PTAL) of 4. Additionally, intrinsic design measures detailed in the Design & Access Statement, such as the conversion of an existing road into an attractive pedestrian access to town (including the nearby Underground station), will further facilitate the transition to more sustainable modes of transport.

9.7 Accordingly, taking into account the emissions mitigation measures included in the Framework Travel Plan, it is judged that the development will meet AQN and AQP criteria.

Offsetting Cost

9.8 In line with the AQN LPG (2023) and LBH LAQM documents, if a development is not deemed to be AQN and cannot implement appropriate emissions mitigation, a damage cost calculation should be undertaken to evaluate the offsetting cost that is applicable to the development, as a last resort.

9.9 Whilst such a calculation is not necessarily required for a development of this scale and nature, particularly given the points made above regarding proposed mitigation measures, a ‘Planning Specialist Observations’ document (LBH; dated 13 January 2025) was received following planning submission, indicating that an S106 payment should be made to offset pollutant emissions associated with the development. Details of the methodology for the calculation of the cost specified in the document are limited, but an updated calculation has been undertaken, below, utilising more recent tools, guidance and Defra damage costs and taking into account the reduced quantum, of the development. This has followed the methodologies outlined in the AQN LPG (2023) and Defra ‘Air Quality Damage Cost Update 2025’ guidance.

Table 12 Offsetting Cost Calculation Inputs

Input	Value
Trips over the benchmark	6,588 / 365 = 18 AADT (0% HDV)
Average speed	20km/hr
Emissions year	2029
Area / road type	London / London - Outer
Defra road transport central damage cost per tonne (‘outer London’) from updated 2025 damage costs	NO_x: £40,048
	$PM_{2.5}$: £353,225
Development excess vehicle emissions above the benchmark (Defra Emissions Factors Toolkit v13.1)	NO_x: 0.002 tonnes/year
	$PM_{2.5}$: 0.001 tonnes/year

9.10 The results of the emissions cost calculation are shown in Table 13, which includes the 2% uplift per year specified in the AQN LPG (2023).

Table 13 Emissions Cost Calculation Outputs

Emissions Year	Calculated Cost by Pollutant	
	NO_x	$PM_{2.5}$
2029	£68.08	£176.61
2030	£69.44	£180.14
2031	£70.83	£183.75
2032	£72.25	£187.42
2033	£73.69	£191.17
2034	£75.17	£194.99
2035	£76.67	£198.89
2036	£78.20	£202.87
2037	£79.77	£206.93
2038	£81.36	£211.07
2039	£82.99	£215.29
2040	£84.65	£219.60
2041	£86.34	£223.99
2042	£88.07	£228.47
2043	£89.83	£233.04
2044	£91.63	£237.70
2045	£93.46	£242.45
2046	£95.33	£247.30
2047	£97.24	£252.25
2048	£99.18	£257.29
2049	£101.17	£262.44
2050	£103.19	£267.69
2051	£105.25	£273.04
2052	£107.36	£278.50
2053	£109.50	£284.07
2054	£111.70	£289.75
2055	£113.93	£295.55
2056	£116.21	£301.46
2057	£118.53	£307.49
2058	£120.90	£313.64
Total Cost		**£9,926.77**

9.11 The calculated emissions cost value in Table 13 (£9,926.77) gives an indication of the potential cost of the development to local air quality over a 30-year period. This is considered to be a robust estimate as in reality, emissions from associated vehicles are expected to reduce significantly year upon year, due, in part, to the uptake in electric vehicles and the Mayor's continued prioritising of clean air. However, it is still considerably lower than that calculated in the LBH document for the previous (larger) scheme (£115,083). As stated above, it is not understood how this figure was reached and it appears to be based on the total development emissions instead of the excess emissions above the benchmark, as outlined in paragraph 5.2.1 of AQN LPG.

9.12 There has been no indication from LBH at this stage with respect to what the financial contributions sought would be spent on, which is the principle of a Section 106 legal agreement and required as per paragraph 5.1.4 of AQN LPG. Without this information, it cannot be determined whether the planning conditions are 'necessary… directly related to the development… [and] fairly and reasonably related in scale and kind to the development' as per Section 58 of the NPPF and paragraph 122 of the Community Infrastructure Levy (CIL) Regulations (2010). Thus, an assessment of compliance against the above criteria cannot be undertaken for the requested payment laid out in the 'Planning Specialist Observations' document.

9.13 Furthermore, it should be noted that the proposed ban on the sale of new vehicles with tail-pipe emissions by 2035, and the expansion of the Ultra Low Emission Zone across all London boroughs in August 2023, which has come into place since the AQN guidance was published, are likely to reduce the development's operational emissions and associated offsetting cost significantly. As such, the provision of a 30-year cost is considered to be unrealistic.

9.14 Regardless, according to paragraph 2.1.2 within the AQN LPG, the payment of an offsetting cost should be the exception not the rule and experience indicates that it is always preferrable to London Councils that neutrality is achieved through intrinsic mitigation and that the payment of a lump sum is a last resort. Moreover, measure 5 of the LBH Air Quality Local Action Plan 2019-2024 (referenced within the 'Planning Specialist Observations' document and the LBH ASR 2025) states that: '*NO_x damage calculation costs are requested to form the basis of planning obligation for costs where the developer mitigation is insufficient*.' The cost of the Travel Plan measures referenced above are expected to exceed the relatively minor damage cost and consequently, the development is expected to also be AQP.

9.15 Accordingly, it is our view that the proposed mitigation measures, in the context of a site which is ideally situated for public transport use, should be sufficient to address AQN concerns without the requirement for additional mitigation or an offsetting payment.

10. CONCLUSIONS

10.1 Cass Allen was instructed by Chase New Homes to assess the potential air quality effects associated with a proposed residential development at The Barn Hotel, Ruislip in Hillingdon, London. The assessment was carried out in accordance with relevant local, regional and national planning policy and guidance.

10.2 Emissions of construction phase dust and PM_{10} were assessed in accordance with IAQM guidance. A Medium Risk of dust soiling and a Low Risk of PM_{10} health effects have been identified, in the absence of mitigation. Suitable best practice mitigation measures have been recommended and no significant residual air quality impacts are expected.

10.3 A detailed atmospheric dispersion model was utilised to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations at relevant sensitive receptor locations within the study area during the operational phase. This followed Defra TG22 and EPUK and IAQM LUPDC guidance.

10.4 The results indicate that pollutant concentrations at proposed sensitive receptors are expected to be below the relevant AQOs during the operational phase. As the predicted pollutant concentrations are within London APEC Category A, no additional mitigation is required, and windows are not required to be fixed shut.

10.5 Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Based on the extent of predicted population exposure to NO_2, PM_{10} and $PM_{2.5}$ impacts, the overall effect of the development is considered to be ‘not significant’, with regard to air quality, with no requirement for additional mitigation.

10.6 An AQN Assessment was undertaken following Mayor of London / GLA guidance. This indicated that the development is likely to generate trips in excess of the relevant benchmark. However, the development is in line with the aspirations of the NPPF with regard to development in sustainable locations and, taking into account Travel Plan and other intrinsic emissions mitigation measures, it is judged that the development will comply with AQN criteria, without the requirement for additional mitigation or an offsetting payment.

10.7 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

Appendix 1 Air Quality Legislation and Policy

Legislation

Defra and the Devolved Administrations (2007) - The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2):

The Air Quality Strategy provides a framework for reducing air pollution in the UK, with the aim of meeting the requirements of European Union (EU) legislation. This has been brought into UK law via the EU (Withdrawal) Act 2018 (as amended) and is referred to as 'retained EU law'.

The air quality standards set within the Air Quality Strategy are recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO), based on current scientific knowledge regarding the effects of each pollutant on health and the environment.

The AQOs are medium-term policy-based targets set by the government, taking into account economic efficiency, practicability, feasibility and timescales. Whilst some of the AQOs correspond with the EPAQS / WHO limits, others have a margin of tolerance, by specifying a number of permitted exceedances of the standard over a given period.

Many of the AQOs in the Air Quality Strategy have been made statutory in England via The Air Quality (England) Regulations, 2000, The Air Quality (England) Amendment Regulations, 2002 and The Air Quality Standards (Amendment) Regulations, 2016 – Statutory Instrument 2016 No. 1184.

Environmental Protection Act (1990):

Section 79 of the Environmental Protection Act 1990 defines statutory nuisance relevant to dust and particles as:

> *Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance…*
>
> *Any accumulation or deposit which is prejudicial to health or a nuisance.*

Furthermore, Section 80 states that where a statutory nuisance is shown to exist, the Local Authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the Local Authority may abate the nuisance and recover expenses. However, there are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist and nuisance is a subjective concept, its perception being highly dependent upon the existing conditions and the change which has occurred.

Environment Act (2021):

The Act mandates that local authorities review and document local air quality within their jurisdiction by way of staged appraisals and respond accordingly, with the aim of meeting the AQOs defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions that are likely to be responsible for any failure to achieve the AQOs, or to identify relevant sources within neighbouring authorities' areas. Where the objective(s) are not likely to be achieved within the relevant period(s), the authority is required to designate an AQMA. For each AQMA the Local Authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality, in order to work towards achieving air quality standards in the future.

Defra (2019) Clean Air Strategy:

The UK Government's Clean Air Strategy sets out the comprehensive actions required to improve air quality, required from all parts of government and society.

The primary focus of previous iterations of the Clean Air Strategy has been NO_2, and its principal source – road traffic. The 2019 Strategy broadens the focus into other areas, including actions on clean growth and pollutant emissions from other sources such as industry, agriculture, and domestic wood-burning stoves.

Policy

National

NPPF sections relevant to air quality are stated below for planning policy context:

110. *…Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.*

187. *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 … air … pollution. Development should, wherever possible, help to improve local environmental conditions such as air … quality.*

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.*

199. *Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.*

201. *The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.*

Regional (London)

The GLA and Mayor of London Mayor's Air Quality Strategy (2010), sets out a framework for delivering improvements to London's air quality. It includes measures to reduce emissions from transport, homes, offices and new developments, as well as promoting sustainable travel and raising awareness of air quality issues. Of relevance to this assessment are:

Policy 6 – Reducing emissions from construction and demolition sites

…The Mayor will work with London boroughs, the GLA group and the construction industry.

Policy 7 - Using the planning process to improve air quality

…The Mayor will ensure that new developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions.

The Mayor's London Plan (2021) sets out the integrated economic, environmental, transport and social framework for development in London over the next 20-25 years, and forms part of the development plan for Greater London. Relevant to this AQA are:

Policy D3 Optimising site capacity through the design-led approach

…D Development proposals should

…9) help prevent or mitigate the impacts of noise and poor air quality.

Policy SI 1 Improving air quality

A Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.

B To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:

1) *Development proposals should not:*
    - a) *lead to further deterioration of existing poor air quality*
    - b) *create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits*
    - c) *create unacceptable risk of high levels of exposure to poor air quality.*

2) *In order to meet the requirements of Part 1, as a minimum:*
    - a) *development policies must be at least Air Quality Neutral*
    - b) *development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures*
    - c) *major development proposals must be submitted with and Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1*
    - d) *development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure…*

D *In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.*

E *Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.*

Local Planning Policy

The two sections of the Hillingdon Local Plan form the council's future development strategy for the borough and set out a framework and detailed policies to guide planning decisions. The Local Plan Part 2 comprises Development Management Policies, Site Allocations and Designations and the Policies Map, which deliver the detail of the strategic policies set out in the Local Plan Part 1. With regard to air quality, the following is applicable:

Policy DMEI 14: Air Quality

A) *Development proposals should demonstrate appropriate reductions in emissions to sustain compliance with and contribute towards meeting EU limit values and national air quality objectives for pollutants.*

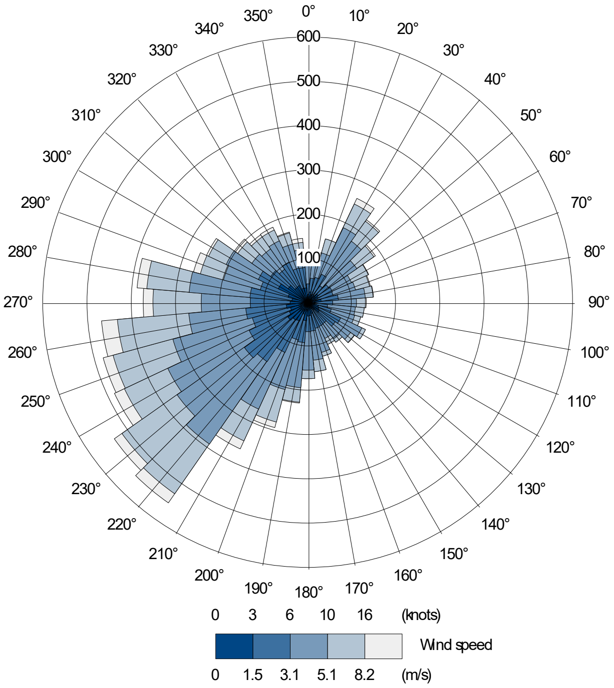
B) *Development proposals should, as a minimum:*

    - i) *be at least "air quality neutral";*
    - ii) *include sufficient mitigation to ensure there is no unacceptable risk from air pollution to sensitive receptors, both existing and new; and*
    - iii) *actively contribute towards the improvement of air quality, especially within the Air Quality Management Area.*

The LBH Air Quality Action Plan, 2019-2024, published May 2019, implements actions which will gain improvements where the pollution levels are the highest, and across the whole borough, to bring about health benefits from better air quality. According to this document, LBH have developed actions in under seven broad themes:

- *Monitoring and other core statutory duties;*
- *Emissions from developments and buildings;*
- *Public health and awareness raising;*
- *Delivery servicing and freight;*
- *Borough fleet actions;*
- *Localised solutions; and*
- *Cleaner transport.*

Appendix 2 Wind Rose for Northolt (2024)



Appendix 3 Traffic Data

Traffic data for the dispersion model were obtained from the Department for Transport (DfT) Traffic Counts and supplemented by additional data from the London Atmospheric Emissions Inventory (LAEI) and the project's Transport Consultant. Where necessary, traffic data were converted to the appropriate assessment year using a robust factor derived from Defra Trip End Model Presentation Program (TEMPro) (version 8.1).

2024 Model Verification

ID	Description	Road Type	Speed (km/h)	AADT	%HDV
1	Site access Rd, off A4180 West End Rd	London - Outer	-	-	-
2	A4180 West End Rd, north of site access Rd, mini-roundabout approach/exit	London - Outer	5	16,243	3.05
3	A4180 West End Rd	London - Outer	21	16,243	3.05
4	A4180 West End Rd, south of Kingsend/Pembroke Rd, traffic light junction approach/exit	London - Outer	5	16,243	3.05
5	A4180 High Street, north of Kingsend/Pembroke Rd, traffic light junction approach/exit	London - Outer	5	16,243	3.05
6	A4180 High Street	London - Outer	23	16,243	3.05
7	A4180 High Street, south of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	London - Outer	5	16,243	3.05
8	A4180 High Street, north of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	London - Outer	5	31,973	6.33
9	A4180 High Street, south of The Oaks	London - Outer	26	31,973	6.33
10	A4180 High Street, north of The Oaks, mini-roundabout approach/exit	London - Outer	5	26,908	7.26
11	B466 Eastcote Rd, east of A4180 High Street, west of St Martins Approach, mini-roundabout approach/exit	London - Outer	5	23,910	4.28
12	B466 Eastcote Rd, east of St Martins Approach, west of North Drive	London - Outer	32	23,910	4.28
13	A4180 Bury Street, west of High Street, south of Sharps Lane, mini-roundabout approach/exit	London - Outer	5	22,936	4.36
14	A4180 Bury Street, north of Sharps Lane, south of Mill Drive, mini-roundabout approach/exit	London - Outer	45	21,890	4.38
15	A4180 West End Rd, south of site access Rd, north of Pond Green, mini-roundabout approach/exit	London - Outer	5	20,626	5.64
16	A4180 West End Rd, south of Pond Green, west of Grosvenor Vale	London - Outer	24	17,219	6.48
17	A4180 West End Rd, south of Grosvenor Vale, north of Torrington Rd	London - Outer	31	17,170	6.35
18	A4180 West End Rd, south of Torrington Rd, north of Sidmouth Drive	London - Outer	24	20,253	5.93
19	A4180 West End Rd, south of Sidmouth Drive, north of Bedford Rd	London - Outer	28	20,253	5.93
20	Sidmouth Drive, east of A4180 West End Rd, junction approach/exit	London - Outer	5	6,830	1.31
21	Sidmouth Drive, west of Dartmouth Rd	London - Outer	15	6,830	1.31
22	Wood Lane, west of A4180 West End Rd, mini-roundabout approach/exit	London - Outer	5	7,680	0.96

ID	Description	Road Type	Speed (km/h)	AADT	%HDV
23	Wood Lane, east of Chichester Avenue	London - Outer	23	7,680	0.96
24	B466 Midcroft, west of A4180 High Street, junction approach/exit	London - Outer	5	18,218	6.78
25	B466 Midcroft onto Ickenham Rd	London - Outer	26	18,218	6.78

2029 With Development

ID	Description	Speed (km/h)	AADT	%HDV
1	Site access Rd, off A4180 West End Rd	5	105	0.00
2	A4180 West End Rd, north of site access Rd, mini-roundabout approach/exit	5	16,923	3.05
3	A4180 West End Rd	21	16,923	3.05
4	A4180 West End Rd, south of Kingsend/Pembroke Rd, traffic light junction approach/exit	5	16,923	3.05
5	A4180 High Street, north of Kingsend/Pembroke Rd, traffic light junction approach/exit	5	16,870	3.05
6	A4180 High Street	23	16,870	3.05
7	A4180 High Street, south of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	5	16,870	3.05
8	A4180 High Street, north of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	5	33,207	6.33
9	A4180 High Street, south of The Oaks	26	33,207	6.33
10	A4180 High Street, north of The Oaks, mini-roundabout approach/exit	5	27,947	7.26
11	B466 Eastcote Rd, east of A4180 High Street, west of St Martins Approach, mini-roundabout approach/exit	5	24,833	4.28
12	B466 Eastcote Rd, east of St Martins Approach, west of North Drive	32	24,833	4.28
13	A4180 Bury Street, west of High Street, south of Sharps Lane, mini-roundabout approach/exit	5	23,821	4.36
14	A4180 Bury Street, north of Sharps Lane, south of Mill Drive, mini-roundabout approach/exit	45	22,735	4.38
15	A4180 West End Rd, south of site access Rd, north of Pond Green, mini-roundabout approach/exit	5	21,475	5.64
16	A4180 West End Rd, south of Pond Green, west of Grosvenor Vale	24	17,937	6.48
17	A4180 West End Rd, south of Grosvenor Vale, north of Torrington Rd	31	17,886	6.35
18	A4180 West End Rd, south of Torrington Rd, north of Sidmouth Drive	24	21,088	5.93
19	A4180 West End Rd, south of Sidmouth Drive, north of Bedford Rd	28	21,035	5.93
20	Sidmouth Drive, east of A4180 West End Rd, junction approach/exit	5	7,094	1.31
21	Sidmouth Drive, west of Dartmouth Rd	15	7,094	1.31
22	Wood Lane, west of A4180 West End Rd, mini-roundabout approach/exit	5	7,976	0.96
23	Wood Lane, east of Chichester Avenue	23	7,976	0.96
24	B466 Midcroft, west of A4180 High Street, junction approach/exit	5	18,921	6.78
25	B466 Midcroft onto Ickenham Rd	26	18,921	6.78

Appendix 4 Dispersion Model Details

Model Details and Input Parameters

Parameter	Value
Emissions Factors	Defra Emissions Factors Toolkit v13.1 using the traffic data in Appendix 3
Emissions Year	2024 for verification, 2029 for future scenario
Background Concentrations	Defra (2021) maps – 2024 for verification, 2029 for future scenario
Surface Roughness	Site – 0.5m; Meteorological Station – 0.2m
Monin-Obukhov Length	Site – 30m; Meteorological Station – 10m
Meteorological Data	Northolt (2024)
Road-contribution Adjustment Factor	1.36 – see Model Verification, below
NO_x to NO_2 conversion	Defra's NO_x to NO_2 Calculator v9.1 and Defra (2021) mapped background concentrations
Canyon	Not applicable to this study area
Gradient	Not applicable to this study area

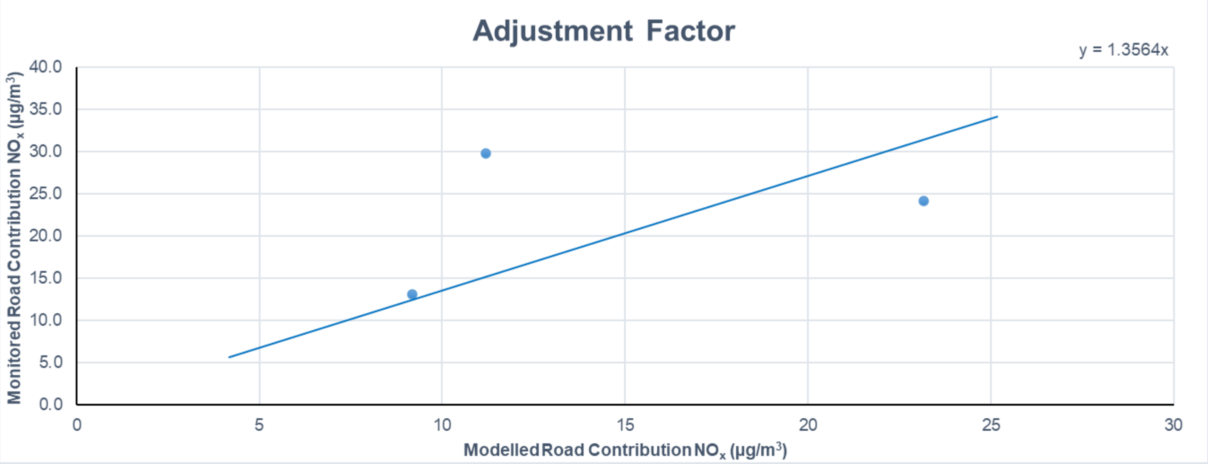
Model Verification

The model has been verified using the LAQM.TG22 methodology. The model has been used to predict 2024 annual mean road-NO_x contributions at roadside monitoring locations within the study area. The modelled road-NO_x concentrations have been compared with the 'measured' road-NO_x utilising the Defra NO_x to NO_2 Calculator. As the model was shown to underpredict, this verification factor has been applied to the assessment results. Due to the lack of local PM monitoring data, the adjustment factor for NO_2 was also utilised for PM_{10} and $PM_{2.5}$, following the LAQM.TG22 methodology.

2024 Model Verification (all concentrations in μg/m³)

Monitor ID	Monitored NO_2	Background NO_2	Monitored Road NO_x	Modelled Road NO_x	Ratio
HILL35	19.5	13.6	13.1	9.2	1.426
HILL36	25.7	13.0	29.8	11.2	2.657
HILL37	23.5	13.0	24.1	23.2	1.041

Comparison of Measured Road-NO_x with Modelled Road NO_x



Calculation of Model Uncertainty

To assess model uncertainty, the Root Mean Square Error (RMSE) of the above data was calculated to provide an estimate of the average error of the model. The overall weighted RMSE value calculated following model verification was 3.77μgm³ (9.43%), which is within the acceptable range specified in LAQM.TG22.

Appendix 5 Recommended Construction Phase Mitigation

Highly Recommended Mitigation Measures for Medium Risk Sites

General Communication

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information, where applicable.
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this Appendix. Further, 'desirable' measures from IAQM guidance should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.
- Make complaints log available to the Local Authority on request.
- Record any exceptional incidents that cause dust and/or air emissions, either on or off-site should be recorded, and the action taken to resolve the situation, in the logbook.

Monitoring

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

Preparing and Maintaining the Site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on-site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site. If they are being reused on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.
- Ensure all vehicle operators switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply is available on the site for effective dust/PM suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes/conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Demolition (Medium Risk)

- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Construction (Medium Risk)

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case make sure that that appropriate additional control measures are in place.