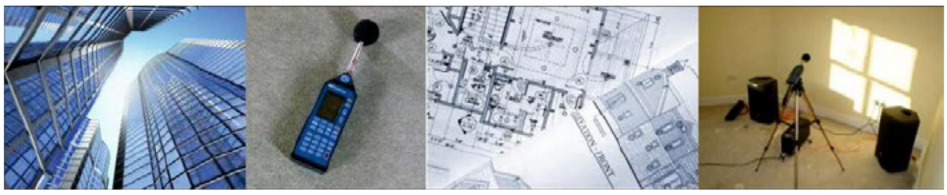
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OLD CLAYTON KENNELS
STORRINGTON ROAD
WASHINGTON
WEST SUSSEX

ACOUSTIC ASSESSMENT TO DISCHARGE
CONDITION 16 OF PLANNING APPLICATION DC/23/0701
v.2

Client:
CLOUD 9 ARCHITECTURE
Cell Block Studios
HM Naval Base
College Road
Portsmouth
PO1 3LJ

20th October 2026
Ref: M6087

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Project Reference	M6087
Issue No.	2
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Date	20th October 2026

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1. SUMMARY

1.1 An assessment of environmental noise has been undertaken at the Old Clayton Kennels on Storrington Road, Washington, West Sussex, .

1.2 The objective of the exercise is to demonstrate how an acceptable level of acoustic amenity will be provided for the future residents of the bungalows.

1.3 The existing ambient noise climate affecting the site has been established (Section 3), and the survey has confirmed a typical variation in daytime and night-time levels.

1.4 The means of attenuating the external noise levels have been described in Section 5, the key element being the provision of standard double glazing rated at 27 dB $R_w + C_{tr}$. Trickle ventilators, where used, should achieve a minimum of 32 dB $D_{n,e,w}$ in the open position.

1.5 Section 5 also provides an assessment of noise in external amenity areas, and confirms that 1.8m high acoustic barriers will be required to the boundaries of the south and east facing gardens.

1.6 Consideration has then been given to the final clause of Condition 16, and the acoustic impact of an open window strategy to address ventilation issues. It is noted that the majority of living rooms and bedrooms would be adversely affected if windows are open. Table 1.1 lists the elevations where each room type may adopt an open window. For all others, a supplementary mechanical solution, sufficient to satisfy the requirements of Approved Document F, will be required.

Plot	Living Rooms	Bedrooms
1	North and East	North & East
2	South and East	All
3	West, North and East	All
4	North, West and South	North, West & South
5	North and West	North, West & South
6	None	North & West
7	None	North
8	North	North

Table 6.3 – Elevations where Open Windows are Acceptable under Condition 16

1.7 It is noted that, notwithstanding the requirements of Condition 16, an assessment of the noise against ADO thresholds indicates that an open window strategy can in theory be adopted to counter overheating. However, this might then fall foul of Condition 16

1.8 Overall, it is concluded that, with the recommended measures in place, occupants of new properties will be provided with an acceptable acoustic environment

2. INTRODUCTION

2.1 An assessment of environmental noise has been undertaken at the site of a new development of eight bungalows at Storrington Road, Washington, West Sussex.

2.2 The site is situated adjacent to the A283, to the eastern edge of Washington (Figure 1 – Site Location).

2.3 The wider development includes a 60 bedroom care home immediately to the east, and it is noted that, as part of that development, a 2.5m high acoustic barrier has been constructed along the southern edge of the site.

2.4 It is recognised that the development here may be subject to various sources of environmental noise, road traffic being the most significant, and Condition 16 of the Planning Consent recognises the need to protect the acoustic amenity of prospective residents. This states:

> *No development above ground level shall take place on site until a scheme for protecting the proposed development from noise has been submitted to, and approved in writing by the Local Planning Authority. The proposed scheme shall achieve the following noise levels:*
>
> *a) Internal day time (0700 - 2300) noise levels shall not exceed 35dB LAeq, 16hr for habitable rooms (bedrooms and living rooms with windows open)*
> *b) Internal night time (2300 - 0700) noise levels shall not exceed 30dB LAeq with individual noise events not exceeding 45dB LAmax (bedrooms and living rooms with windows open).*
> *c) Garden/external amenity spaces should not exceed 55 dB LAeq, 16hr.*
>
> *If it is predicted that the internal noise levels specified above will not be met with windows open, the proposed mitigation scheme shall assume windows would be kept closed, and will specify an alternative rapid/purge ventilation system, to reduce the need to open windows. As a minimum, this will usually consist of a mechanical heat recovery ventilation system with cool air by-pass or equivalent.*

2.5 This report sets out the means by which the design of the scheme will meet the acoustic objectives set out in Condition 16 of the Planning Consent.

3. SURVEY OF NOISE LEVELS

3.1 The first step in the assessment of potential impact is to measure and describe the existing ambient noise levels affecting the site.

3.2 Reference is here made to the 2023 assessment by TetraTech, submitted alongside the planning application. Their report 784-B023904 "Noise Assessment for Proposed Development", v.6 dated 18 April 2023, described a thorough survey of environmental noise levels around the site, and subsequent analysis of impacts.

3.3 In brief, the site noise survey was conducted over a 5 day period, between Thursday 24th June 2021 to Monday 28th June 2021, involving continuous monitoring on the south-west of the site (adjacent to the A283 Storrington Road). In addition, attended short term measurements were taken during day, evening and night time periods at four other positions, distributed around the site boundary.

3.4 A computer model of the site was then developed by Ian Sharland Limited, using DGMR iNoise software 2026, using the baseline survey data. The model reflects the new and retained buildings in the locality and the adjacent road network. Noise sources were then introduced, the strength of which were calibrated to mirror the on-site measurements.

3.5 The model was then used to provide predictions for the noise levels across the site, during day time and night time periods.

3.6 Sections 5 & 6 of this report will discuss these noise levels, in respect of their suitability for residential building.

4. ACOUSTIC GUIDELINES & STANDARDS

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

4.1.1 There is much guidance on the levels of intrusive noise which would be considered acceptable within residential accommodation such as this. Typical advice is found in British Standard 8233:2014 "Guidance on Sound Insulation and Noise Reduction for buildings". Following similar guidance in the 1999 World Health Organisation report "Guidelines for Community Noise", the Standard sets out the following limits for indoor ambient noise levels within living rooms and bedrooms of residential accommodation. This suggests:

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	35 dB(A) $L_{Aeq, 16\ hr}$	-
Dining	Dining room/Area	40 dB(A) $L_{Aeq, 16\ hr}$	-
Sleeping	Bedroom	35 dB(A) $L_{Aeq, 16\ hr}$	30 dB(A) $L_{Aeq, 8\ hr}$

Table 4.1 - BS8233 Indoor Guideline Values

4.1.2 It is usually considered that an open window will provide a reduction of some 10-15 dB(A)[1]. Therefore the 'good' internal standards quoted above would broadly equate to the following targets immediately outside the buildings:

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	48 dB(A) $L_{Aeq, 16\ hr}$	-
Dining	Dining room/Area	53 dB(A) $L_{Aeq, 16\ hr}$	-
Sleeping	Bedroom	48 dB(A) $L_{Aeq, 16\ hr}$	43 dB(A) $L_{Aeq, 8\ hr}$

Table 4.2 - BS8233 Derived Facade Guideline Values

4.1.3 BS8233 recognises that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB, and reasonable conditions will be achieved[2].

4.1.4 It should be noted that the levels quoted in BS8233 are intended to reflect the acceptability of steady, continuous noise. Sources of intermittent and tonal noise may generate greater annoyance for a similar overall magnitude. Whilst BS8233 does not explicitly state a correction for those circumstances, it may be appropriate to consider that the Good and Reasonable standards would be achieved with levels which are perhaps 5 dB lower than stated in the table above.

4.1.5 It is also noted that BS8233 was written from a view of designing new buildings to protect occupants from existing noise sources. This does necessarily infer, however, that the

[1] Reference PPG24 Planning & Noise, which adopted a mid-range value of 13 dB(A)
[2] Note, the relaxation specified in BS8233 must be read in conjunction with parallel guidance set out in Approved Document O.

acceptability of an occupant to an absolute level noise within a building will be different if the introduction of the noise source post-dates the construction of the building.

4.2 World Health Organisation Guidelines

4.2.1 Further advice is provided in the 1999 WHO report "Guidelines for Community Noise".

4.2.2 This indicates that the steady noise level in external amenity areas, such as gardens or outdoor living areas should not exceed 55 dB(A) $L_{Aeq,\ t}$, and should preferably be designed below 50 dB(A) $L_{Aeq,\ t}$.

4.2.3 The document also provides guidance on the impact of peak noise levels on sleeping conditions. This suggests that levels above 45 dB(A) L_{Amax} inside a bedroom would be disturbing to sleep. With windows open, this would equate to a level of approximately 58 dB(A) L_{Amax} externally.

4.3 Approved Document F Ventilation

4.3.1 Approved Document F (2021 edition, Volume 1 & 2) of the Building Regulations 2010 sets out the requirements for ventilation in dwellings. ADF describes three types of ventilation, summarised in the table below:

Type of Ventilation	Definition in ADF	Location/reason for ventilation	Required
Whole Dwelling Ventilation[3]	Whole building ventilation (general ventilation is normally continuous ventilation of rooms or spaces at a relatively low rate to dilute and remove pollutants and water vapour not removed by operation of extract ventilation, purge ventilation or infiltration, as well as supplying outdoor air into the building. For an individual dwelling this is referred to as 'whole dwelling ventilation'.	To provide fresh air to the building and to dilute and disperse residual water vapour not dealt with by extract ventilation as well as removing other pollutants which are released throughout the building	Continuously
Extract Ventilation	Extract ventilation is the removal of air directly from a space or spaces to the outside. Extract ventilation may be provided by natural means, e.g., by passive stack ventilation) or by mechanical means (e.g., by an extract fan or central system)	From rooms where most water vapour and/or pollutants are released, e.g., due to activities such as cooking or bathing. This is to minimise their spread to the rest of the building	Continuously or intermittently
Purge Ventilation	Purge ventilation is manually controlled ventilation of rooms or spaces at a relatively high rate to rapidly dilute pollution and/or water vapour. Purge ventilation may be provided by natural means (e.g., an openable window) or by a mechanical means (e.g., a fan)	Throughout the building to aid the removal of high concentrations of pollutants and water vapour released from occasional activities such as painting and decorating or accidental released such as smoke from burnt food or spillage of water	Occasionally

Table 4.3 – ADF Types of Ventilation

4.3.2 It is important to differentia between the need to provide 'purge ventilation' as required occasionally under ADF, against the provision of ventilation to help control overheating, which is now covered by Approved Document O Overheating. ADF states:

> *This document <ADF> sets minimum standards for purge ventilation for rapidly diluting indoor air pollutants and extracting water vapour where necessary in habitable rooms in dwellings. For domestic-type buildings, Part O may require a higher standard than the guidance given in this document for purge ventilation to remove excess heat. In this case, the higher of the two standards should be followed.*

4.3.3 There are various types of ventilation described in ADF, including:

[3] Not to be confused with 'background ventilation. ADF defines the term 'background ventilator' as a trickle vent.

Ventilation System	Provision with ADF System / Purpose		
	Whole Dwelling Ventilation	Extract Ventilation	Purge Ventilation
Background ventilation and intermittent extract fans	Background ventilators (trickle vents)	Intermittent extract fans	Typically provided by opening windows
Continuous mechanical extract (MEV)	Continuous mechanical extract – minimum low rate. Trickle vents to provide inlet air	Continuous mechanical extract – minimum high rates. Trickle vents to provide inlet air	Typically provided by opening windows
Continuous mechanical supply and extract with heat recovery (MVHR)	Continuous mechanical supply and extract – minimum low rate	Continuous mechanical supply and extract – minimum high rate	Typically provided by opening windows

Table 4.4 – ADF Template Systems

4.3.4 With regard to the provision of purge ventilation within habitable rooms, the approved document notes that there may be practical difficulties in achieving this (e.g., if unable to open a window due to excessive noise from outside).

4.3.5 Whilst ADF does give advisory residential noise limits during normal conditions (not boost)[4], it does not itself confirm limits for noise during purge ventilation.

4.4 Approved Document O – Overheating

4.4.1 Approved Document O Overheating describes the means by which designers can **protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures.**

4.4.2 The scope of the Document applies to residential dwellings and institutions, and includes the following building types:

[4] In line with BS8233 guidance.

Title	Purpose for which the building is intended to be used
Residential (dwellings)	Dwellings, which includes both dwellinghouses and flats.
Residential (institutional)	Home, school or other similar establishment, where people sleep on the premises. The building may be living accommodation for the care or maintenance of any of the following. a. Older and disabled people, due to illness or other physical or mental condition. b. People under the age of 5 years.
Residential (other)	Residential college, hall of residence and other student accommodation, and living accommodation for children aged 5 years and older.

Table 4.5 – ADO Scope

4.4.3 In respect of the acoustic implications, the Document considers the acceptable limits for noise within bedrooms at night. This applies when the method of overheating control is active – whether that be an open window, passive vent or mechanical system. The noise limits are summarised below:

a. 40dB $L_{Aeq,t}$, averaged over 8 hours (between 11pm and 7am).

b. 55dB $L_{Amax,f}$ more than 10 times a night (between 11pm and 7am).

4.4.4 Should an analysis of the external noise levels (for open windows/vents) indicate that these values will be exceeded, an alternative strategy should be adopted.

4.5 IOA/ANC Acoustics Ventilation and Overheating – Residential Design Guide

4.5.1 The Institute of Acoustic and Association of Noise Consultants have published the 'Acoustics Ventilation and Overheating – Residential Design Guide' (January 2020) to promote best practice in the design of residential buildings to control overheating in areas of high ambient noise.

4.5.2 When providing design targets inside the dwellings, the AVOG document advises that the internal noise standard of BS8233:2014 (as copied here in Table 4.2) should be achieved when providing adequate ventilation as defined in ADF. However, the document continues to propose that it is considered reasonable to allow higher levels of internal ambient noise from transport sources when higher rates of ventilation are required in relation to the overheating condition.

4.5.3 This proposition is based on the fact that overheating will occur for only part of the time, during which there will be a trade-off between acoustic and thermal conditions, given that

residents would have some control over their environment (a principle well established in the field of thermal comfort).

4.5.4 The guide indicates that the sound level difference across a façade, with standard opening windows, would be 13 dB(A), but that this figure may be greater if windows are shielded by balconies.

4.5.5 BS8233:2014 states that, if internal noise levels are no more than 5 dB greater than the levels shown here in Table 4.2, this would be a 'reasonable' standard. Therefore, if external noise levels do not exceed the following values when windows are open, conditions should be considered wholly acceptable, and therefore the threshold between No and Low Observed Adverse Effect Levels:

Location	0700 - 2300	2300 - 0700
Living Room	53 dB(A) LAeq, 16 hr	-
Bedrooms	53 dB(A) LAeq, 16 hr	48 dB(A) LAeq, 8 hr

Table 4.6 – Proposed LOAEL Façade Noise Levels with Windows Open

4.5.6 To consider the upper limit, beyond which internal conditions should not be deemed acceptable, reference is made to issue of speech interference. With reference to the numerical values in BS8233 (see Table 4.5 above), the AVOG document adopts an internal daytime limit of 50 dB(A), which would then equate to an external limit of 63 dB(A) when windows are open.

4.5.7 At night, reference is made to the WHO Night Noise Guidelines, which developed the original WHO Guidelines for Community Noise report. This states that if external noise levels exceed 55 dB(A) L_{Aeq}, 'adverse health effects occur frequency and a sizeable proportion of the population is highly annoyed and sleep disturbed'.

4.5.8 The table below therefore may be taken to represent the threshold for SOAEL:

Location	0700 - 2300	2300 - 0700
Living Room	63 dB(A) LAeq, 16 hr	-
Bedrooms	63 dB(A) LAeq, 16 hr	55 dB(A) LAeq, 8 hr

Table 4.7 – Proposed SOAEL Threshold Façade Noise Levels with Windows Open

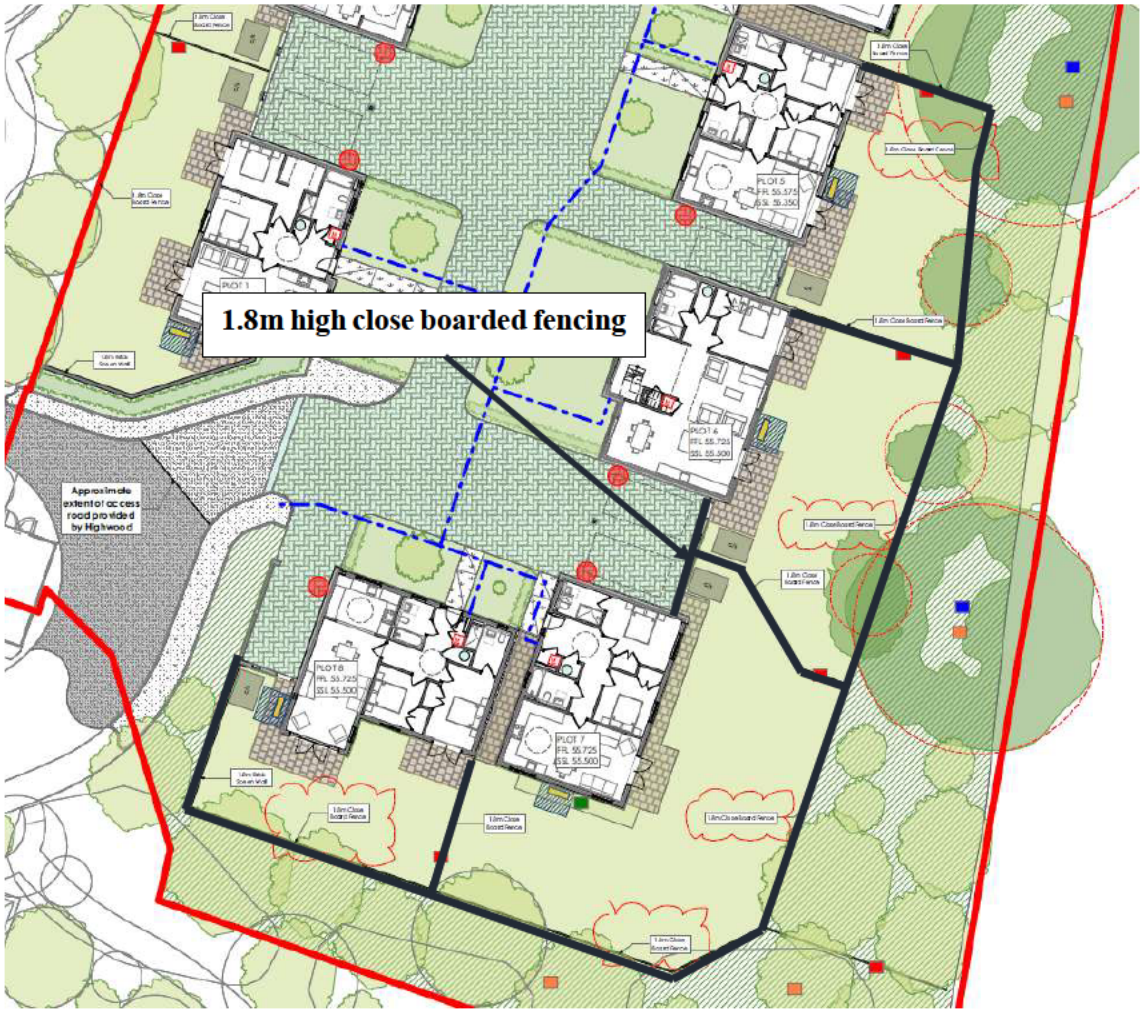
5. ACOUSTIC DESIGN

EXTERNAL AMENITY SPACE

5.1 The World Health Organisation offers guidance that, to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise. This criterion is repeated in Condition 16.

5.4 The site plan shown in Figure 2 includes the provision of a 1.8m high close boarded timber fence to the boundaries of the south and east facing gardens. For clarity this is shown in the plan extract below:

5.3 The construction of the fencing should be 25mm thick, square-edged timber boards with butt-joints and a 25mm x 150mm cover strip behind each joint. The design of the timber posts will avoid gaps between posts and boards, and barge boards will be used to seal any gaps at the bottom of the barrier.



5.4 The predicted noise levels across each amenity space then either falls entirely below the 55 dB(A) target (shaded green), else features a significant area where levels are below 55 dB(A):

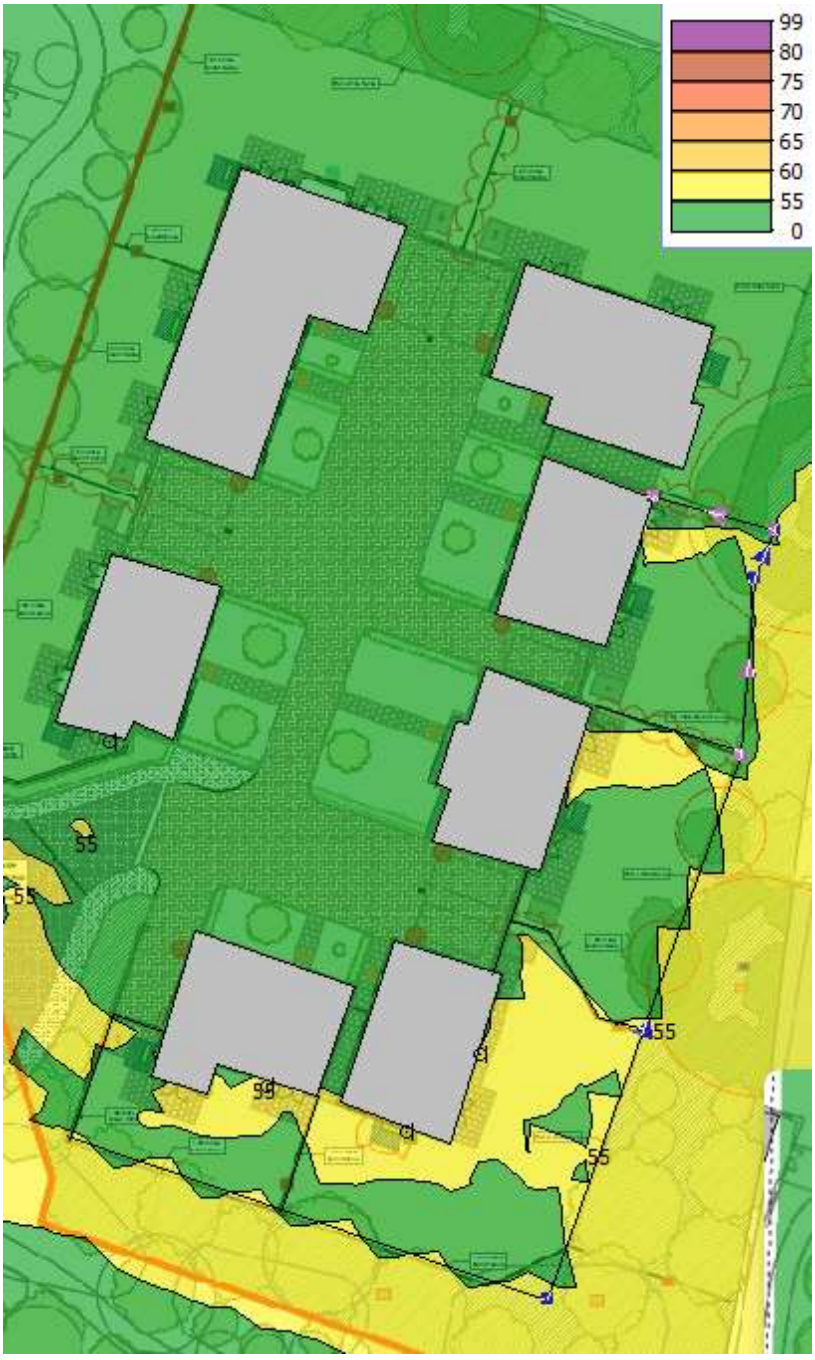


Figure 5.1 – Amenity Area Noise Levels $L_{Aeq,\ 16\ hr}$

INTERNAL NOISE LEVELS

5.5 The model has then been used, with the barriers in place, to produce maps for noise levels affecting the facades of the properties. These predictions are shown in the figures immediately below:

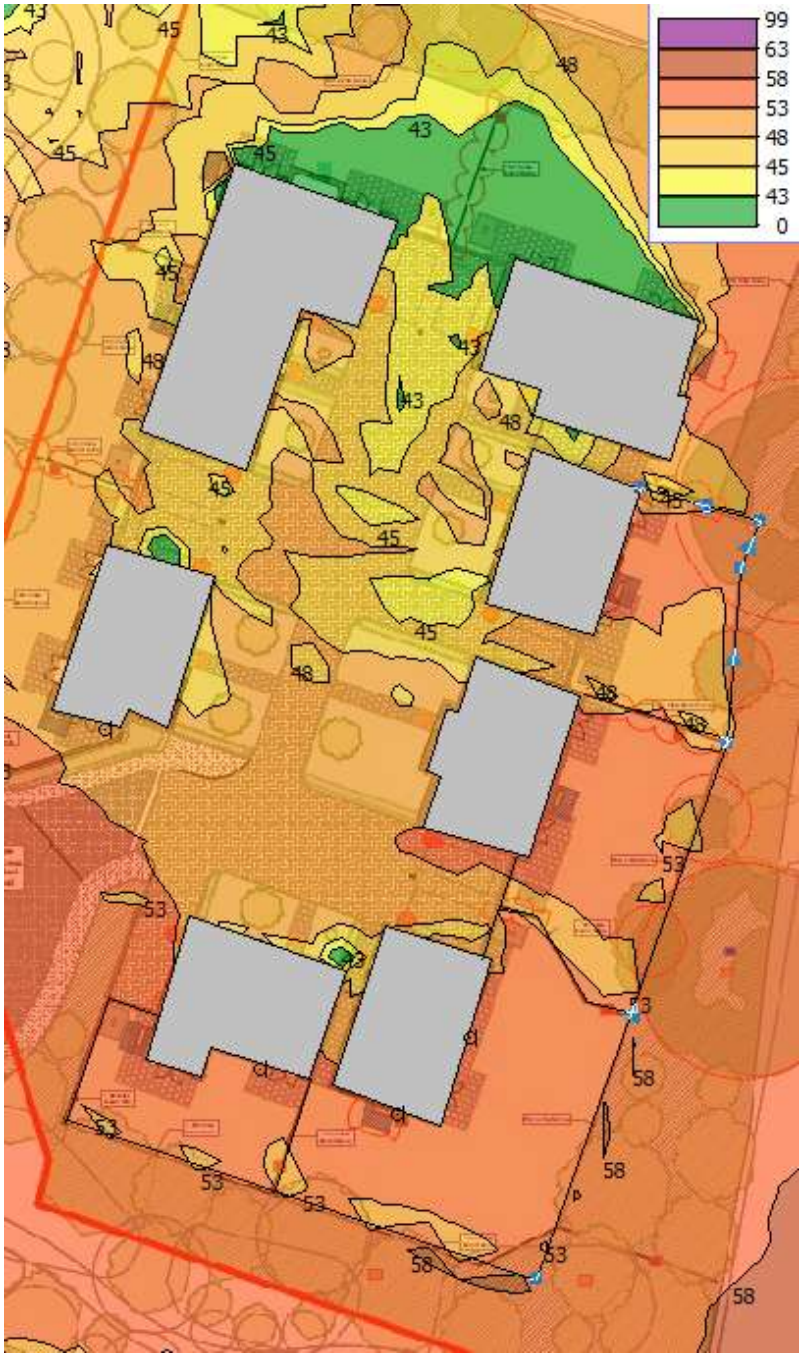


Figure 5.2 - Day Time $L_{Aeq, 07.00 – 23.00}$

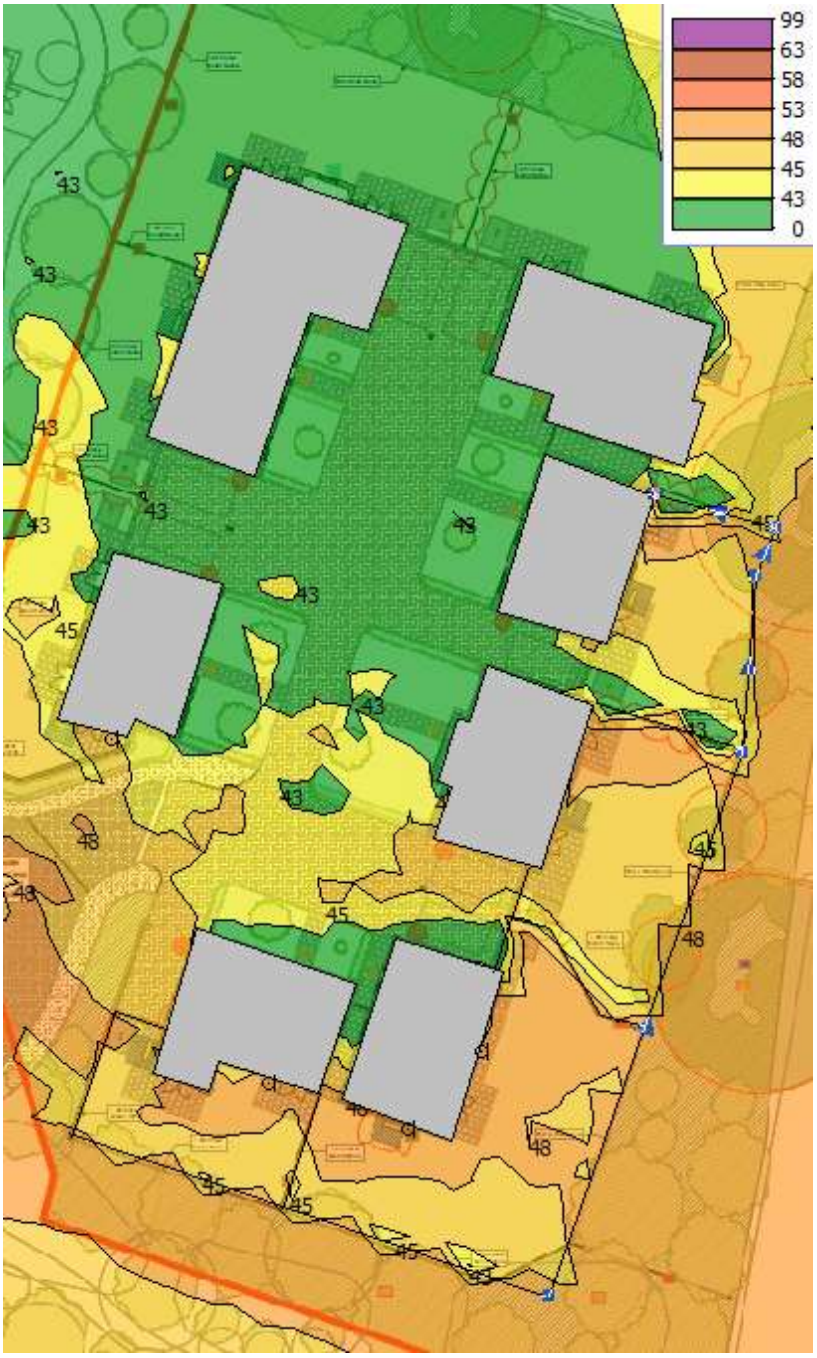


Figure 5.3 - Night Time $L_{Aeq, 23.00 – 07.00}$

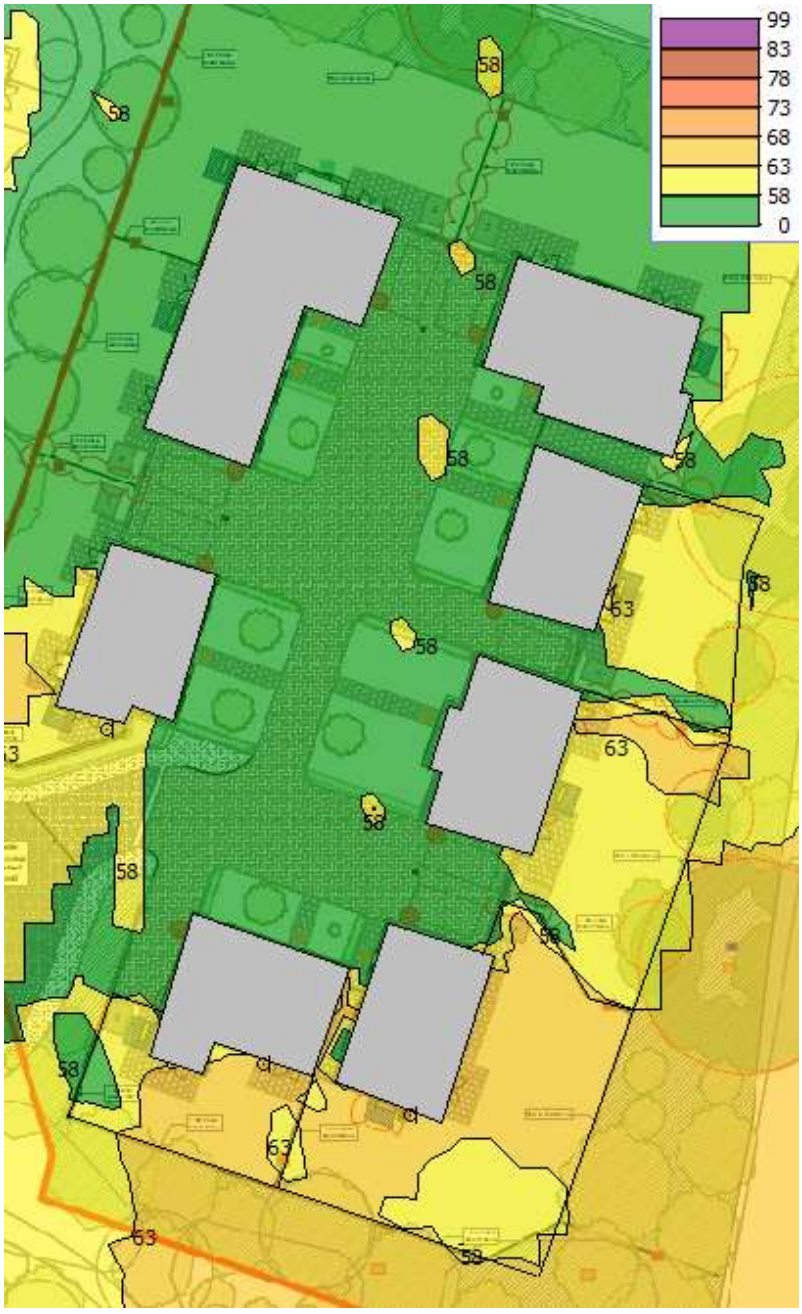


Figure 5.4 - Night Time $L_{Amax,\ 2300 – 0700}$

5.6 Section 4.4.1 of this report has provided guidance for internal noise levels within residential rooms as stated within BS8233. These mirror the requirements of Condition 16, namely

Living Rooms:	≤35 dB(A) $L_{Aeq,\ 07.00 – 23.00}$
Bedrooms:	≤30 dB(A) $L_{Aeq,\ 23.00 – 07.00}$, and also
	≤45 dB(A) $L_{Amax,\ 23.00 – 07.00}$

5.7 In respect of glazing, the highest noise levels incident upon any façade of the development are as follows:

Day Time:	60 dB(A) L_{Aeq}, 07.00 – 23.00
Bedrooms:	53 dB(A) L_{Aeq}, 23.00 – 07.00, and also
	67 dB(A) L_{Amax}, 23.00 – 07.00

5.8 The facades of the building therefore need to provide, in the worst case, a sound level difference of 25 dB(A) for Living Rooms, and 23 dB(A) for bedrooms.

5.9 It is understood that the external walls will be a cavity masonry construction comprising brick outer leaf, full fill cavity and a 100mm blockwork internal leaf. The acoustic performance of this is c.50 dB Rw + Ctr, which is quite sufficient for the requirement.

5.10 The critical element will be the glazing, where a minimum performance of 27 dB Rw + Ctr is recommended.

5.11 The table below sets out the frequency targets for the glazing:

Frequency	Hz	63	125	250	500	1K	2K	4K	Overall Rating Rw + Ctr
Sound Reduction	dB	21	21	18	26	37	42	33	27

Table 5.1 – Glazing Performance Specification

5.12 It is recommended that a 4 / 16 / 4 configuration will be suitable.

5.13 With respect to background ventilation, if any where trickle vents are required, these vents should be specified with a minimum acoustic performance of 32 dB $D_{n,e,w}$ in the open position.

5.14 The means of providing higher rates of ventilation will be discussed in Section 6 of this report.

6. MEANS OF VENTILATION

6.1 Overheating Mitigation, Approved Document O

6.1.1 The preferred means of countering overheating issues is usually to rely on open windows to provide the necessary ventilation.

6.1.2 Open windows do have an adverse impact on the acoustic integrity of the building construction, however, and ADO has therefore confirmed the maximum acceptable internal noise levels when windows are opened for this specific purpose.

6.1.3 To repeat Para.4.7.3 above, the acceptable levels are:

a. 40dB $L_{Aeq,t}$, averaged over 8 hours (between 11pm and 7am).

b. 55dB $L_{Amax,f}$ more than 10 times a night (between 11pm and 7am).

6.1.4 The question is then how the internal targets of 40 dB $L_{Aeq,t}$ and 55dB $L_{Amax,f}$ equate to an external 'façade noise level', when the windows are open for the purposes of overheating.

6.1.5 At this point, it is necessary to explain the difference between free-field and façade noise levels. The former represents the sound level which would be recorded at a particular position, with no buildings (or other reflecting surfaces) nearby. The latter represents the sound level which would be recorded directly in front of a building. As such, it will include acoustic energy which passes the microphone and is then reflected back off the building, past the microphone again. The correction between two equivalent measurements is normally taken to be 3 dB (the façade value being the louder).

6.1.6 It is then necessary to consider the likely acoustic loss through the open window. Approved Document O provides a simplified estimate of 9 dB. This replates to properties in a 'medium risk' area for overheating, as would be the case here. The loss is based on windows being set to an open area which is 4% of the floor area of the bedroom.

6.1.7 It is noted that this loss relates to the difference between the free-field noise level at the location and the resulting internal noise level. The difference between the façade noise level and resulting internal noise level would be some 7 dB.

6.1.8 This value is lower than the guidance provided in PPG24 'Planning and Noise', which advised that a partially open window would provide a reduction between 10 and 15 dB(A).

6.1.9 The value quoted in Approved Document O is offered in a conservative manner, to allow for a safe, simplified assessment of conditions. The Document does allow for a more detailed assessment of acoustic loss.

6.1.10 In the first instance, reference is made here to the work by Napier University, and their much-referenced report on the acoustic performance of windows, NANR116: 'Open/Closed Window Research - Sound Insulation Through Ventilated Domestic Windows', April 2007

6.1.11 To counter overheating, the windows require an open area of at least 4% of the floor area. A review of the floor plans indicates that bedrooms have floor areas approximately 14m^2. This indicates that the open area of the windows would need to be 0.56m^2.

6.1.12 Assuming a side hung casement window, the Napier Report would indicate that the acoustic loss from outside (façade level) to inside would be 12 – 15 dB(A), for the openings here.

6.1.13 The final approach is to consider a 'first-principles ' calculation of the loss through the window. This would reflect the open area, the sound reduction of the opening (zero) and the acoustic absorption of the room into which the sound is travelling.

6.1.14 Table 6.1 provides this calculation and indicates an acoustic loss from outside (façade level) to inside of 13 dB(A).

Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
Reference facade SPL, outside	dB	105	102	98	96	96	93	87	82	**100**
SRI open Window	dB	0	0	0	0	0	0	0	0	
Reflection Loss, 0.56m2	dB	-4	-2	0	0	0	0	0	0	
Area correction, 0.56m2	dB	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	
Absorption in room	m2	11.27	11.27	11.27	11.27	11.27	11.27	11.27	11.27	
Absorption Loss	dB	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	
Net SPL	dB	88	87	85	83	83	80	74	69	**87**
Difference	dB	17	15	13	13	13	13	13	13	

Table 6.1 – Calculation of loss through an open window

6.1.15 The table below summarises the various results:

Source	Difference between façade sound level (road traffic) and resulting internal noise level
ADO Simplified	9 dB(A)
PPG24	10 – 15 dB(A)
Napier University NANR116 Study	12 – 15 dB(A)
First Principles Calculation	13 dB(A)

Table 6.2 – Acoustic Loss for Traffic Noise through 0.56m^2 opening.

6.1.16 It is therefore concluded that a reduction of 13 dB(A) would be a reasonable, safe prediction of the acoustic loss across this development, and the criteria of ADO would therefore equate to external facade noise limits of,

Bedrooms – 53 dB $L_{Aeq,2300 - 0700}$
Bedrooms – 68 dB $L_{AFmax, 2300 - 0700}$

6.1.17 A review of the noise maps in Figures 5.2 – 5.4 indicates that no façade will exceed these façade noise levels. Therefore, **all properties can rely upon open widows for means of overheating mitigation, under ADO.**

6.2 General Ventilation/Condition 16

6.2.1 Notwithstanding the statutory requirements of ADO, Planning Condition 16 indicates that the internal noise targets of BS8233 (see Para 5.8) must be achieved when windows are open.

6.2.2 Allowing the same 13 dB(A) loss through a partially open window, the condition sets the following external noise limits for openable window:

Living Rooms: ≤48 dB(A) $L_{Aeq, 07.00 – 23.00}$
Bedrooms: ≤43 dB(A) $L_{Aeq, 23.00 – 07.00}$, and also
≤58 dB(A) $L_{Amax, 23.00 – 07.00}$

6.2.3 With reference to Figures 5.2 – 5.4, it can be seen that a number of elevations experience modest noise levels but the others are more exposed. Table 6.3 confirms which room types on which elevations can adopt an open window strategy for general ventilation, without adversely affecting the internal noise levels:

Plot	Living Rooms	Bedrooms
1	North and East	North & East
2	South and East	All
3	West, North and East	All
4	North, West and South	North, West & South
5	North and West	North, West & South
6	None	North & West
7	None	North
8	North	North

Table 6.3 – Elevations on Which Open Windows are Acceptable for General Ventilation

6.2.4 **For all living rooms and bedrooms on other elevations, it will be necessary to provide a means of ventilation to satisfy the requirements of Approved Document F, without opening windows**.

6.2.5 Such systems might include whole dwelling ventilation systems or individual room fans. Once the mechanical consultant and Client have agreed the preferred solution, the selections should be referred to the Acoustician, to check that internal fan noise will be acceptable.

7. CONCLUSION

7.1 The foregoing assessment has looked at the levels of ambient noise affecting the new residential development at Storrington Road, Washington, on behalf of Cloud 9 Architecture.

7.2 It has been shown that noise levels within the vast majority of private amenity areas can meet the WHO's guidance of 55 dB L_{Aeq}, with the provision of new acoustic barriers along the southern and eastern boundaries (1.8m respectively).

7.3 It has been concluded that, by specifying appropriate glazing and facade constructions, alongside acoustically treated ventilators, it will be possible to ensure that an acceptable internal environment can be provided within new dwellings when windows are closed.

7.4 Condition 16 requires the same standard to be achieved if windows are open. This will not be the case due to the noise affecting for the many of the building elevations. Therefore, where listed, the affected bedrooms and living rooms will require supplementary mechanical ventilation.

FIGURE 1 – LOCATION PLAN

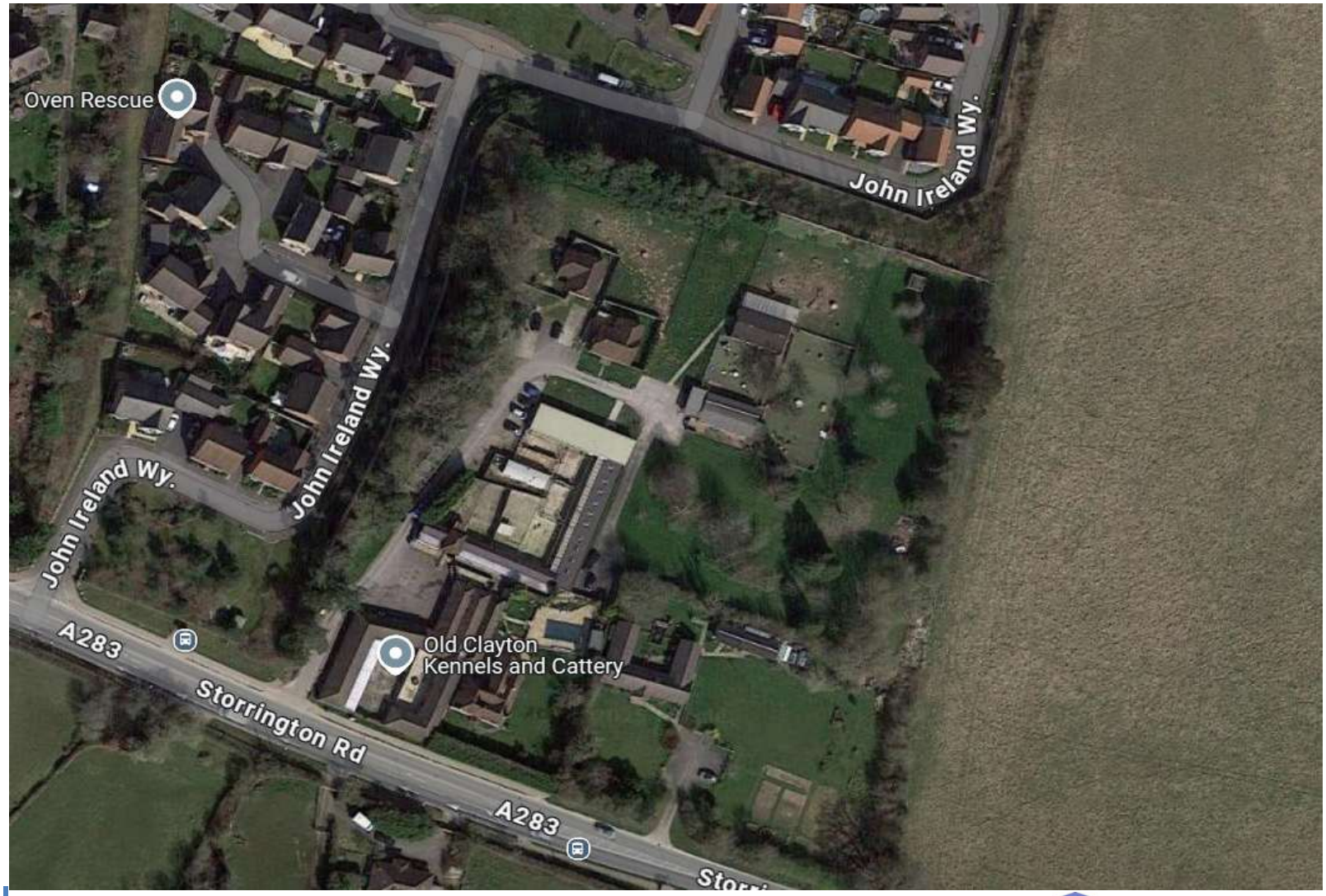


FIGURE 2 – SITE PLAN



APPENDIX 1 - TERMINOLOGY RELATING TO NOISE

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10-6 Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
Leq,T	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
Lmax,T	A noise level index defined as the maximum noise level during the period T. Lmax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L90,T	A noise level index. The noise level exceeded for 90% of the time over the period T. L90 can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade Noise Level	At a distance of 1m in front of a large sound reflecting object such as a façade.
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	Range of frequencies whose upper limit is twice the lower limit.
DnT,w	The single number quantity that characterises airborne sound insulation between rooms over a range of frequencies.
Rw	Single number quantity that characterises the airborne sound insulating properties of a material or building element over a range of frequencies.