ARDENT CONSULTING ENGINEERS

CAREBASE LTD

PROPOSED CARE HOME DEVELOPMENT: DANSON ROAD, BEXLEYHEATH

NOISE ASSESSMENT

REPORT REF: NO 190320-03
PROJECT NO: 190320
SEPTEMBER 2019

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DOCUMENT CONTROL SHEET

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
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1.0 INTRODUCTION

1.1 Ardent Consulting Engineers were instructed by Carebase Ltd to undertake a Noise Assessment to assess the site suitability for a proposed care home development.

Site Location

1.2 The site is situated to the south of Park View Road on Danson Road between Bexleyheath and Welling in the London Borough of Bexley.

1.3 The surrounding area and approximate site boundary is shown in **Figure 1.1**. To the north, beyond Park View Road is Crook Log Leisure Centre and Aspire Academy, Bexley, with associated sports fields. Further sports fields are located to the west of the site. The area to the east and south is largely residential.

1.4 The site is centred approximately at Ordnance Survey grid co-ordinates 547606E, 175495N.

Figure 1.1: Site Location Plan

Development Proposals

1.5 The proposals comprise the demolition of four existing dwellings (2 to 8 Danson Road) and development of a predominately two-storey 70 bed care home with associated parking and external amenity space. An extract of the indicative proposals is shown in **Figure 1.2**.

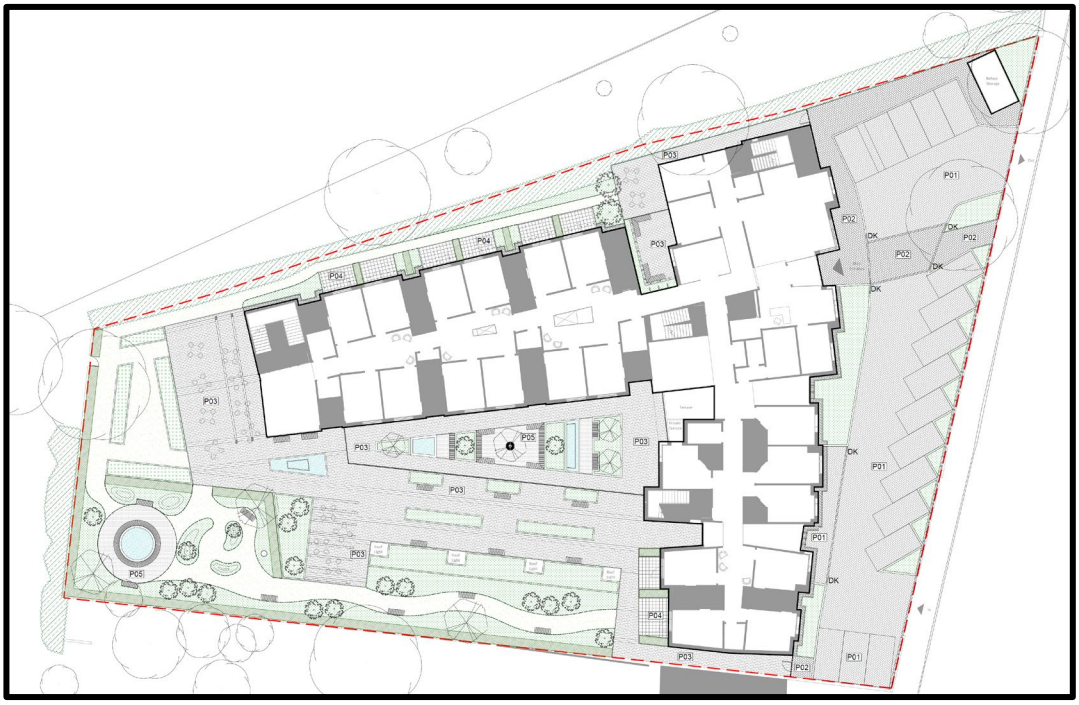


Figure 1.2: Development Proposals (Extract)

2.0 RELEVANT POLICY AND GUIDANCE

National Planning Policy Framework (NPPF) – February 2019

2.1 Under the NPPF: *paragraph 180 of Section 15*, with regard to environmental noise; Planning policies and decisions should aim to: -

- mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Noise Policy Statement for England (NPSE)

2.2 To avoid and mitigate adverse noise effects on health arising from and impacting on new development, the NPPF makes reference to NPSE. The NPSE was published in March 2010 and covers all forms of noise, other than occupational noise. For the purposes of this report, "Neighbourhood Noise" is most relevant as NPSE defined at paragraph 2.5:

"*neighbourhood noise which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street.* "

2.3 NPSE introduces three concepts to the assessment of noise in the UK:

- NOEL – No Observed Effect Level – This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.
- LOAEL – Lowest Observable Adverse Effect Level – This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level – This is the level above which significant adverse effects on health and quality of life occur.

2.4 NPSE does not numerically define levels for the NOEL, LOAEL or SOAEL rather it makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc.

National Planning Practice Guidance (2014)

2.5 The purpose of the guidance is to complement the NPPF and provide advice on how to deliver its policies.

2.6 The purpose of the guidance is to complement the NPPF and provide advice on how to deliver its policies.

2.7 The guidance includes a table (duplicated below) that summarises "the noise exposure hierarchy, based on the likely average response" and which offers "examples of outcomes" relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE.

Perception	Examples of outcomes	Increasing effect level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, eg turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, eg avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, eg regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, eg auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 2.1: Noise exposure hierarchy, based on the likely average response.

London Borough of Bexley Local Plan 2004

Policy G34

2.8 In considering proposals for development, the Council will have regard to matters of pollution, hazardous substances and energy efficiency and will oppose development which would give rise to unacceptable levels of air, ground or surface water pollution, including pollution to underground water resources, excessive noise or the contamination of land or put occupiers at risk from hazardous substances. The Health and Safety Executive will also be consulted on applications to site new development where hazardous substances are to be used or stored and on applications to develop at, or within the vicinity of, existing establishments where hazardous substances are present.

Policy ENV 39

2.9 In order to protect and enhance the quality of the built environment, the Council will seek to ensure that all new developments, including alterations and extensions, changes of use and other operations, including highway improvements, are satisfactorily located and are of a high standard of design and layout. In determining applications for development, the Council will consider the extent to which the proposal:

- is compatible with the character of the surrounding area, would not prejudice the environment of the occupiers of adjacent property, or adversely affect the street scene by reason of its (a) scale, (b) massing, (c) height, (d) layout, (e) elevational treatment, (f) materials and/or (g) intensity of development;

- is appropriately landscaped, including the retention of appropriate trees and shrubs and the incorporation of public art where relevant;

- has any unreasonable effect on the surrounding area by reason of noise and any emissions to land, air, or water, and is not, by reason of its location, itself adversely affected by such conditions as may already be in existence within the neighbourhood;

- makes adequate provision for vehicle parking in accordance with the Council's vehicle parking standards;

- takes due account of the need to deter crime, both against individuals and against public or private property whilst maintaining an attractive environment; and

- takes into consideration important local and strategic views, particularly where the proposed development is one which significantly exceeds the height of its surroundings or is located on a prominent skyline ridge.

Calculation of Road Traffic Noise – 1988

2.10 For new developments, road traffic noise levels should be predicted in accordance with *CRTN*. This prediction method uses the traffic flow, vehicle speed, and percentage of heavy-duty vehicles (HDVs, over 3.5 tonnes), road gradient and other factors to calculate noise levels at receptor points.

Calculation of Railway Noise – 1995

2.11 Calculation of Railway Noise (CRN) outlines methods of calculation to determine noise levels generated by each train, considering train types and speeds, traction (whether diesel or electric locomotives), track ballast, the number of carriages/wagons in each train and the topography of the site.

Control of Pollution Act 1974

2.12 The local authority has powers under the Control of Pollution Act 1974 to control noise from construction sites. Section 60 of the Act allows a local authority to serve a notice of its requirements for the control of site noise. This notice may include specification of plant that is or is not to be used, hours during which the construction works can be carried out and levels of noise emission. Section 61 of the Act allows a contractor or developer to take the initiative and agree with the local authority the methods of construction, steps to minimise noise and hours of work.

The Environmental Protection Act 1990

2.13 Local authorities have a duty to deal with statutory nuisances under the Environmental Protection Act 1990. For noise to amount to a statutory nuisance, it must be "prejudicial to health or a nuisance" as outlined in Section 79 of the Act. Any proposed development should not result in a statutory nuisance being declared. Should the Local Authority declare a development to cause a statutory nuisance, an abatement notice can be served to the person responsible who has up to 21 days to appeal to Magistrates' Court, as detailed in Section 80 of the Act.

The Building Regulations 2010

2.14 Building Regulations approvals are required for most new buildings and for most types of works on existing buildings. Part 10 of The Building Regulations 2010 contains provisions, including power for local authorities to test building work, take samples, and provision to ensure compliance. Part E of the Regulation 'Resistance to the passage of sound' is expanded in Approved Document E, which provides robust details to control and mitigate noise within buildings. This Document is separated over four parts which include:

- E1: Protection against sound from other parts of the building and adjoining buildings;
- E2: Protection against sound within dwelling-house etc.;
- E3: Reverberation in the common internal parts of buildings containing flats or rooms for residential purposes;
- E4: Acoustic conditions in schools.

World Health Organisation

2.15 The WHO document *Guidance on Community Noise* specifies additional information for noise affecting noise sensitive receptors and forms the basis of many noise limitations and design ranges for internal and external ambient noise levels. It defines noise as *'a class of sounds that are considered unwanted'* (by the listener), *'that adversely affects, or may affect the physiological and psychological wellbeing of people.'* Much of the research around this study is based on transportation noise.

2.16 Further guidance on the recommended levels is given in the World Health Organisation (WHO) Guidelines for Community Noise. In this document it is stated that:

2.17 "*To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq."*

2.18 WHO also states the following paragraph with regard to the effects of L_{Amax} events in a night-time period:

"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991)."

2.19 WHO guidance *'Night Noise Guidelines for Europe'* is concerned with the longer-term average noise levels that are covered by the EU Directive on Environmental Noise, although this does appear to suggest external maximum noise levels of around 57dBA outside bedrooms during the night to achieve internal maximum levels of 42dBA.

2.20 The World Health Organisation has recently published Environmental Noise Guidelines – for the European Region (2018) to provide recommendations for protecting human health from exposure to noise sources such as transportation (road traffic, railway and aircraft), wind turbine noise and leisure noise.

2.21 The guidance document defines the 'strength' of recommendation (for protecting against noise exposure) as either 'strong' or conditional', outlined below.

Strength of Recommendation

*"A **strong** recommendation can be adopted as policy in most situations. The guideline is based on the confidence that the desirable effects of adherence to the recommendation outweigh the undesirable consequences. The quality of evidence for a net benefit – combined with information about values, preference and resources – inform this recommendation, which should be implemented in most circumstances."*

*"A **conditional** recommendation requires a policy-making process with substantial debate and involvement of various stakeholders. There is less certainty of its efficacy owing to lower quality of evidence of a net benefit, opposing values and preferences of individuals and populations affected or the high resource implications of the recommendation, meaning there may be circumstances or settings in which it will not apply."*

Noise source	dB L_{den}	dB L_{night}	dB $L_{Aeq,\ 24hr}$ (yearly average)	Recommendation
Road Traffic	53	45	-	Strong
Railway	54	44	-	Strong
Aircraft	45	40	-	Strong
Wind Turbine	45	-	-	Conditional
Entertainment	-	-	70	Strong/Conditional

Table 2.2: Extract from Environmental Noise Guidelines for the European Region

2.22 External (free-field) recommendations included in the Environmental Noise Guidelines for the European Region are presented in **Table 2.1** for specific noise sources.

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

2.23 Formerly a Code of Practice, the 2014 revision of BS8233 is now presented and intended as a guidance document. The standard is mainly concerned with building design from an acoustic standpoint. It does however, contain information relevant to environmental noise more specifically by stating guidance for desirable internal noise levels for dwellings and other buildings. An extract of Table 4 of the document relevant for residential development is reproduced in **Table 2.3**.

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

Table 2.3: Extract from Table 4 – Indoor ambient noise levels in dwellings

2.24 The guidance of BS8233:2014 with regards to external amenity spaces is as follows:

"*For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited*."

2.25 Section 7.7.5 provides guidance for suitable internal sound levels for hotels and rooms for residential purposes, which, as stated in Note 1 of the same section, is inclusive of care homes. The Standard goes on to say that it is desirable to avoid intrusive noise, both airborne and impact in bedrooms, especially when occupants are sleeping (typically assumed to be at night-time).

2.26 Table H.3 in Annex H specifies a range of internal criteria to be achieved in hotels, which, for internal spaces such as bedrooms and living areas, is largely the same as desired internal levels within residential dwellings, as mentioned in **Table 2.2** above.

ProPG: Planning and Noise - May 2017

2.27 Guidance in ProPG Planning and Noise provides an approach which aims to inform developers, practitioners and local authorities on how potential residential sites should be assessed. The guidance also builds upon government planning policy that noise should not be treated in isolation and there should be a holistic approach to good acoustic design.

2.28 ProPG sets out a 2-stage approach; the first of which is a risk assessment to identify the likelihood of significant adverse impact, then depending on the outcome of this risk assessment the extent of the acoustic design statement required. The graphic in Figure 2.1 is an extract from ProPG and indicates the level of risk associated with ranges of sound levels and provides some guidance on the likely extent of work associated with progressing a development exposed to these sound levels.

2.29 In relation to maximum noise levels, 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 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events."

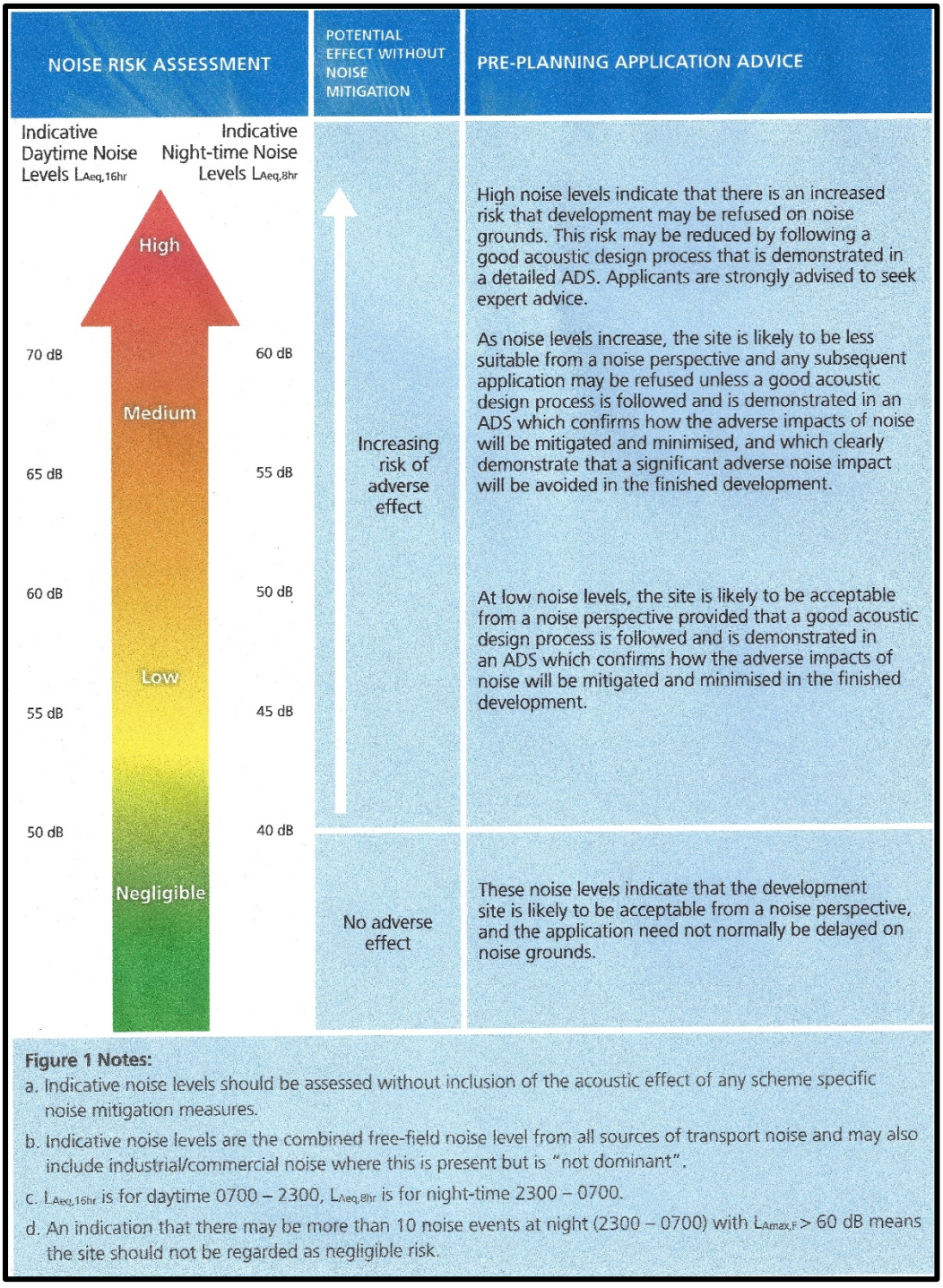


Figure 2.1: Extract from Figure 1 in ProPG – Initial Site Noise Risk Assessment

Local Authority Guidance

2.30 Discussions were held with Mr Richard Angerson, Environmental health officer of the London Borough of Bexley Council to agree on a suitable noise assessment methodology for the proposed development. Ardent proposed an assessment in line with the above guidance mentioned in this section of the report, which was accepted by the Local Authority.

2.31 Mr Angerson provided the following information and typical planning conditions which are applied to applications of this kind, to assist with assessment.

"Before the first occupation, details of plant room / fixed machinery and mechanical services noise (including CHP) and attenuation measures shall be submitted to and approved in writing by the Local Planning Authority. The rating level of noise emitted from fixed plant on the site shall be 5dB below the existing representative background level at any time. The noise levels shall be determined 1 metre from the façade of residential properties with measurements and assessments made according to BS 4142: 2014. The approved measures shall be installed and maintained thereafter.

Reason: In the interests of the amenities of future occupiers."

*"Prior to the construction of any building incorporating residential use details of noise attenuation measures (glazing and ventilation) shall be submitted to and agreed in writing by the Local Planning Authority. The level of protection shall be sufficient to achieve the levels specified in BS8233:2014 and in accordance with the configurations specified in the **** Report Ref: ***, dated ***."*

"Before development commences a demolition/construction methodology shall be submitted to and approved in writing by the Local Planning Authority, and the development shall not be carried out except in accordance with the approved details, which shall cover the following points: i. demolition and construction methods and techniques (including the avoidance of burning on site and vehicle movements); days/hours of work and deliveries of construction materials. ii. means of minimising noise and vibration (including any piling), and compliance with BS 5228; iii. means of minimising dust and similar emissions, in accordance with Air Quality: Best Practice Guidance - The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance (published by the Greater London Authority, July 2014); iv. means for the identification, removal and safe disposal of asbestos; v. construction site lighting; vi. contact arrangements for the public, including 'out of hours' telephone numbers for named contacts).

Reason: In the interests of the amenities of nearby local residents. These details are required at the start of the project as they relate to the demolition/construction works"

2.32 We will seek to work with the Local Planning Authority on noise related issues and the precise wording of any conditions.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 The environmental noise survey was undertaken between the 3rd to 6th September 2019. Locations were chosen in order to obtain representative baseline noise levels due to the main observed noise sources within the vicinity of the development site.

3.2 Continuous automated sound level monitoring was undertaken at 2 positions across the site as shown in **Figure 3.1**. The locations were selected to represent exposed areas and in areas that equipment could be securely positioned.

Figure 3.1: Monitoring Positions

3.3 Noise measurements presented as time histories can be found in **Appendix A** and are summarised in the following paragraphs.

Measurement Procedures

3.4 Staff involved with the measurements and observations are fully competent with regard to the requirements of environmental noise measurement. Measurement procedures used within this assessment conformed to relevant guidance within *BS 7445* and *CRTN* where appropriate.

Instrumentation

3.5 The equipment used was as follows:

- 2 x No Norsonic NOR140 Sound Level Meters
- Norsonic 1251 Class 1 Calibrator

3.6 All equipment used has been professionally calibrated. Field calibration of the sound level meters was undertaken before and after measurement to ensure no drifting of the calibration signal. Calibration certificates are available on request.

Observations

3.7 The main noise sources observed on site were distant and local road traffic, emergency vehicle sirens, residential activity, birdsong and distant rail.

3.8 All measurements used within the calculations, mitigation recommendations and conclusions were taken during times of appropriate weather and representative traffic conditions.

Results

3.9 The $L_{Aeq,}$ $L_{Amax,}$ and L_{A90} acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as time histories in **Appendix A.**

3.10 **Table 3.1** provides a summary of the measured noise levels.

Monitoring location	Ambient Noise Level dB $L_{Aeq, T}$		Representative night-time L_{AMax} dB(A)
	Daytime [07:00 - 23:00]	Night-time [23:00 - 07:00]	
Position 1	66	62	83
Position 2	53	49	69

Table 3.1: Site average noise levels for daytime and night-time

3.11 The representative L_{Amax} level is the value which has been exceeded less than 10 times in the 8-hour night-time period, i.e. one which can be considered to be 'not normally exceeded' as per the WHO guidelines.

3.12 Average sound levels are in the region of 53dB$L_{Aeq,16hour}$ to 66dB$L_{Aeq,16hour}$ during the day and 49dB$L_{Aeq,8hour}$ to 62dB$L_{Aeq,8hour}$ at night.

3.13 This would be considered a 'medium to high risk' development site for residential use when compared with Figure 1 included in Section 2 of ProPG, as shown in **Figure 2.1** of this report. A high-risk site is summarised as:

"High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice."

3.14 This would not prohibit the development as good acoustic design processes will be followed to reduce sound levels to as low as practical.

3.15 Representative octave band levels are provided in **Table 3.2**. These are used in glazing calculations to ensure a robust calculation of internal noise levels.

		Octave band centre frequency dB							
		63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
P1	$L_{Aeq:16hr}$ (day)	68	65	62	61	63	59	54	48
	$L_{Aeq:8hr}$ (night)	62	60	56	57	59	55	50	44
	$L_{Amax:T}$ (night)	84	80	82	82	78	73	66	60
P2	$L_{Aeq:16hr}$ (day)	60	53	51	48	49	46	42	35
	$L_{Aeq:8hr}$ (night)	56	49	47	44	45	41	38	32
	$L_{Amax:T}$ (night)	72	65	62	61	58	58	67	57

Table 3.2: Octave band data for noise monitoring locations

4.0 CONSTRUCTION PHASE

4.1 Given the proximity of proposed construction to neighbouring noise sensitive properties such as residential areas, it is possible that site clearance, preparation and construction noise may impact nearby receptors.

4.2 A detailed construction programme; specific plant data and operations are not available at this stage of the project. Therefore, it is not possible to undertake a detailed assessment of likely impact at this stage.

4.3 Reasonable construction noise limits can be derived using the Example Method 1 (the ABC Method) of BS 5228, within section E.3.2. Table E.1 from the standard is reproduced below in **Table 4.1:**

Table E.1 **Example threshold of significant effect at dwellings**

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A [A]	Category B [B]	Category C [C]
Night-time (23.00–07.00)	45	50	55
Evenings and weekends [D]	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3 Applied to residential receptors only.

[A] Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

[B] Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

[C] Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

[D] 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Table 4.1: Table E.1 from BS 5228: Part 1

4.4 Existing ambient noise levels across much of the site will place the site and surroundings within Category A of Table E.1. Therefore, the following noise ambient noise levels (as a result of construction activities) should be considered as reasonable limits to adhere to during construction works.

Time Period	Construction Noise Limits L_{Aeq} (dB)
Saturday 08:00 – 13:00	55
Weekdays 08:00 – 18:00	65

Table 4.2 - Construction Noise Limits

4.5 A noise and vibration management plan can be produced to control the works and a Section 61 application can be submitted to council, in accordance with the Control of Pollution Act 1974 if appropriate.

5.0 MITIGATION RECOMMENDATIONS

5.1 The measured results and indicative layout were used to undertake calculations, presented in **Appendix B**, for suitable façade treatments, as outlined in the following paragraphs.

5.2 Careful design of internal layout can be beneficial to achieve suitable internal sound levels; for example, positioning non-sensitive rooms such as kitchens and bathrooms on the more exposed façades and sensitive rooms such as bedrooms and living areas on more the sheltered elevations.

External Building Fabric - Non-Glazed Elements

5.3 It is assumed that the non-glazed external building fabric elements of the proposed development comprise masonry cavity walls. This would typically provide a sound reduction performance of at least the figures shown in **Table 5.1** when tested in accordance with BS EN ISO 10140-2:2010 (figures derived from: *Representative Values of Airborne SRI for Some Common Structures:* Appendix B of Flakt Woods 'Guide to Noise Control').

Element	Octave band centre frequency SRI, dB					
	125	250	500	1k	2k	4k
Masonry Cavity Wall	34	43	55	66	77	85

Table 5.1: Non-glazed elements assumed sound reduction performance

5.4 This would contribute towards a significant reduction of ambient noise levels in combination with a good quality double-glazed window configuration, as shown in **Table 5.2.**

External Building Fabric - Specification of Glazed Units

5.5 Sound reduction performance calculations have been undertaken to specify the minimum performance required from glazed elements in order to achieve recommended internal noise levels shown in **Table 2.3** of **Chapter 2**.

5.6 Standard thermal double glazing and standard ventilation (Type A) is suitable across the majority of the site, with the exception of properties facing onto Danson Road, which will require enhanced glazing and ventilation performance (Type B).

5.7 Calculations have been based on habitable rooms with relatively higher ratios of glazing to masonry, in order to present a more onerous assessment. This specification therefore presents a robust assessment, for BS8233:2014 criteria for internal noise levels in all affected facades.

5.8 The detailed layout of the buildings on site is not known at this stage. Assumptions have been made regarding room sizes in the calculation sheets.

5.9 Glazing calculations have been performed using the L_{Aeq} and L_{Amax} values (as appropriate) as detailed in **Table 3.1**, together with the octave band levels as shown in **Table 3.2**.

5.10 The required glazing performance is shown in **Table 5.2**. The performance is specified for the whole window unit, including the frame.

Glazing Type reference, description and typical dimensions(mm)	Sound Reduction Index R_W	Octave band centre frequency (Hz) SRI (dB)					
		125	250	500	1k	2k	4k
Type A Standard Glazing (6/16/6mm)	32	20	21	30	35	32	37
Type B Enhanced Glazing (10.8/24/16.8mm)	46	35	41	48	53	55	65

Table 5.2: Minimum glazing specification

External Building Fabric - Specification of Vents

5.11 It should be noted that there may be additional considerations for glazing requirements such as security and thermal performance, therefore the above specified glazing is merely guidance for how the acoustic criteria can be achieved. Alternative glazing could be used in place of the above specified units, assuming the minimum acoustic performance is met.

5.12 In addition, where non-sensitive rooms and sensitive rooms form part of an open plan area, for example a dining and kitchen area, the glazing specification for the more sensitive room should be used across all windows in this area.

5.13 To achieve the suitable internal criteria, it is necessary that windows remain closed and alternative means of ventilation is provided across the site. Windows are not sealed and residents may choose to open the windows whilst accepting that internal sound levels may not meet the internal performance criteria.

Element	Octave band centre frequency SRI, dB						Overall
	125	250	500	1k	2k	4k	Dn,e,w
Type A Standard ventilator	36	34	31	34	38	38	35
Type B Enhanced Ventilator	41	39	38	47	43	46	43

Table 5.3: Required minimum attenuation values for ventilation

5.14 All major building elements should be tested in accordance with BS EN ISO 10140-2:2010. Sole glass performance data would not necessarily demonstrate compliance with this specification. No further mitigation measures would be required to achieve the recommended internal noise levels.

External Amenity Space

5.15 External sound levels on private terraces positioned on the northern elevation are marginally above those set out in guidance. Screened terraces up to a height of 1.5m can provide line of sight acoustic screening from road traffic noise along Danson Road and Park View Road. Screening could comprise either glazed, brickwork or solid timber close-boarded fence with a thickness of at least 20mm (with no gaps).

5.16 The guidance in BS8233:2014 notes that a compromise between elevated noise levels and other factors, including other planning requirements should be considered.

5.17 The proposals are to locate a communal garden to the centre and rear of the site. Average daytime sound levels at Position 2 (rear) are in the region of 53dBA, which is within the upper guidance criteria for external spaces, as noted in **Section 2** of this report.

5.18 Furthermore, the orientation of the proposed building layout is likely to provide additional screening from road traffic along Danson Road and Park View Road. Therefore, all future residents will have access to an external amenity space that is within the guidance criteria and as such, the amenity of future residents will be sufficiently protected.

Construction Phase

5.19 In accordance with local policy, construction activities should only take place between the hours of 08:00 and 18:00 on weekdays and between 08:00 – 13:00 on Saturdays. No construction activity which can cause excessive noise should be carried out during the night, on Sundays or on bank holiday's without additional consideration to controlling noise and with the prior approval of the LPA.

5.20 During construction, the contractor will employ best practicable means to control noise from construction operations.

5.21 Temporary screening in the form of solid timber hoarding can be used where operations are adjacent to sensitive receptors. Consideration will be given to neighbouring residential properties when locating the temporary site compounds and material stockpiles.

5.22 Stationary equipment and plant such as generators can be attenuated to reduce noise levels or placed as far as practicable from any existing noise sensitive properties, and preferably in areas benefiting from existing or purpose-built attenuation such as bunding or behind non-sensitive buildings.

5.23 Delivery of materials and removal of waste from the site will be planned to minimise disturbance to neighbouring properties. Idling of plant, machinery and delivery vehicles should be prohibited when not in use.

5.24 If required noise levels can be monitored regularly in accordance with BS 5228 to ensure the above set limits are not exceeded. In addition to the above all other guidance within BS 5228–1 will be followed at all times.

6.0 CONCLUSIONS

6.1 Noise levels have been measured at two locations across the site. Measured levels have been used to calculate and assess suitable glazing specification.

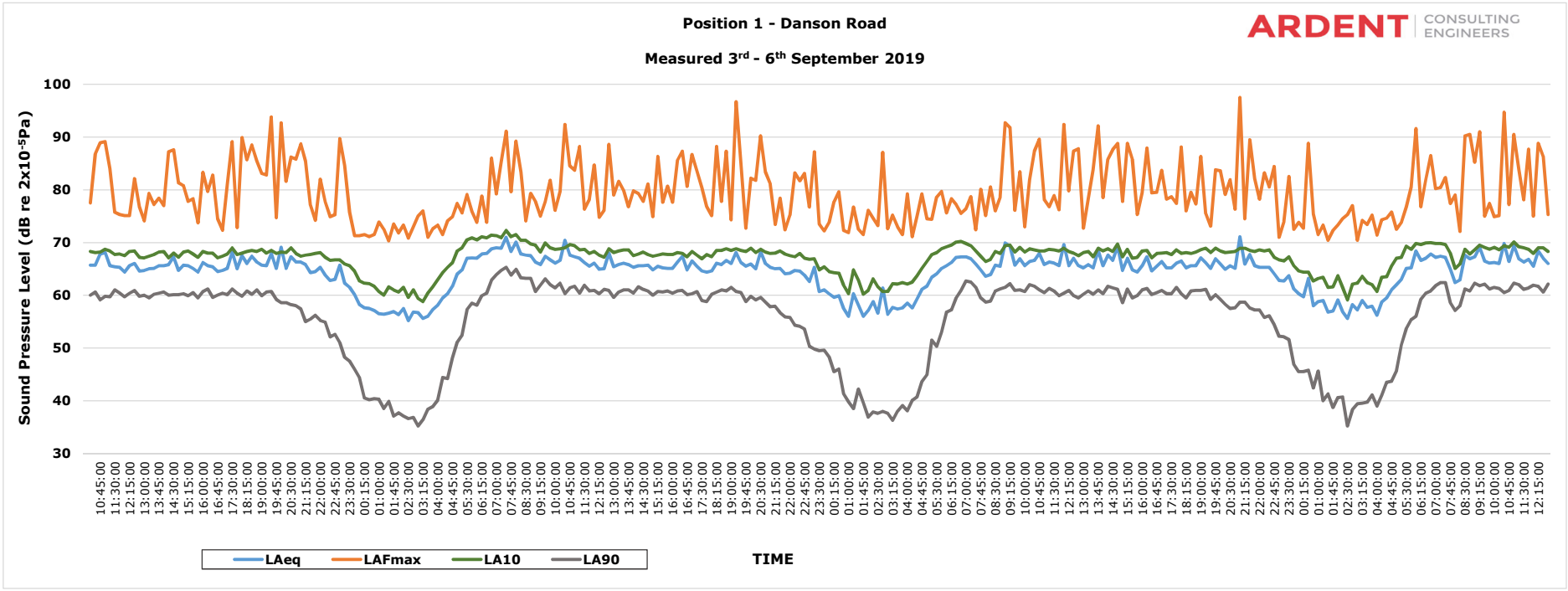
6.2 This is considered a 'medium to high risk' site when considered in accordance with guidance in ProPG. Expert Acoustics advice has been sought and good acoustic design processes should be followed to reduce sound levels across the site.

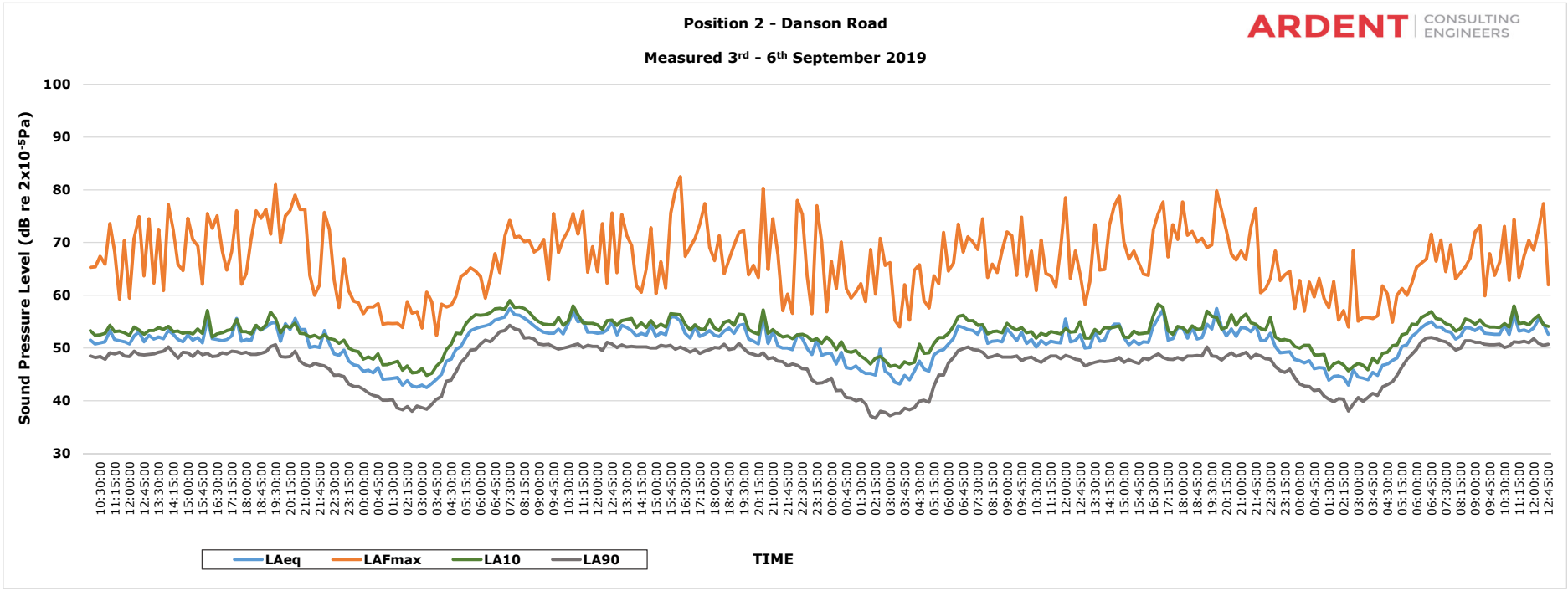
6.3 Control measures should be implemented to manage potential impacts from construction noise.

6.4 External sound levels in the proposed communal garden to the rear of the site are within the limits set out in relevant national guidance and local policy.

6.5 This assessment demonstrates that the site is suitable for the proposed care home development subject to the recommendations included in this report.

APPENDIX A


Position 1 - Danson Road
Measured 3rd - 6th September 2019
ARDENT CONSULTING ENGINEERS
Sound Pressure Level (dB re 2x10-5Pa)
100
90
80
70
60
50
40
30
LAeq
LAFmax
LA10
LA90
TIME


Position 2 - Danson Road
Measured 3rd - 6th September 2019
ARDENT CONSULTING ENGINEERS
Sound Pressure Level (dB re 2x10-5Pa)
100
90
80
70
60
50
40
30
LAeq
LAFmax
LA10
LA90
TIME

APPENDIX B

ARDENT CONSULTING ENGINEERS

Noise Break-in Calculation - Position 1

Description	
Ardent CE Project No.	**190320**
Property Address	**Danson Road**
Room Type	**Bedroom**
Parameter	**LAeq, 16h**

Room Dimensions and Areas	
Room volume	35.00
Total Surface area	65.50
Wall façade area	10.00
Roof façade area	0.00
Glazing area	3.60
Dne Ref Area, A0	10.00

- Based on typical size

Total façade area	13.60

Room Absorption Calcuation	63	125	250	500	1000	2000	4000	8000	
Estimated Reverberation time	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**- Typical Bedroom RT**
Alpha bar	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
Total Absorption	14.09	14.09	14.09	14.09	14.09	14.09	14.09	14.09	
10Log S/A	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	

Façade level	63	125	250	500	1000	2000	4000	8000	A
Measured Noise Level	68.4	65.0	61.6	60.8	63.2	59.1	53.8	47.8	66.4
Façade to free field	0	0	0	0	0	0	0	0	
Angle of view	0	0	0	0	0	0	0	0	
Screening (Maekewa)	0	0	0	0	0	0	0	0	
Distance correction	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	
Noise level at façade (Leq)	68	65	62	61	63	59	54	48	66

Composite SRI	63	125	250	500	1000	2000	4000	8000	Rw	
Glazing SRI	30	35	41	48	53	55	65	65	51	**Pilkington Acoustic Glazing**
Transmission Coefficient	0.001000	0.000316	0.000079	0.000016	0.000005	0.000003	0.000000	0.000000		
Wall SRI	28	34	43	55	66	77	85	85	55	**Typical masonry cavity wall (300mm - 380kg/m2)**
Transmission Coefficient	0.001585	0.000398	0.000050	0.000003	0.000000	0.000000	0.000000	0.000000		
Roof SRI	23	26	43	52	60	65	65	65	51	
Transmission Coefficient	0.005012	0.002512	0.000050	0.000006	0.000001	0.000000	0.000000	0.000000		
Ventilation, Dne	32	41	39	38	47	43	46	46	43	**Airvac 5000 EAW - AC2**
Transmission Coefficient	0.000631	0.000079	0.000126	0.000158	0.000020	0.000050	0.000025	0.000025		
Average Transmission Coeff	0.001894	0.000435	0.000150	0.000123	0.000016	0.000038	0.000019	0.000019		
Average SRI	27	34	38	39	48	44	47	47	44	

Calculated Internal Noise Level, dB	63	125	250	500	1000	2000	4000	8000	A	
Lp (Reverberant), line source	42.0	32.2	24.2	22.5	16.1	15.7	7.3	1.3	24.8	
Lp (Direct)	41.2	31.4	23.4	21.7	15.3	14.9	6.5	0.5	23.9	**Criteria**
Lp (Rev & Direct)	45	35	27	25	19	18	10	4	27.4	**≤ 35**
BS8233	44	34	26	25	18	18	9	3	27	**≤ 35**

ARDENT CONSULTING ENGINEERS

Noise Break-in Calculation - Position 1

Description	
Ardent CE Project No.	**190320**
Property Address	**Danson Road**
Room Type	**Bedroom**
Parameter	**LAeq, 8h**

Room Dimensions and Areas	
Room volume	35.00
Total Surface area	65.50
Wall façade area	10.00
Roof façade area	0.00
Glazing area	3.60
Dne Ref Area, A0	10.00

- Based on typical size

Total façade area	13.60

Room Absorption Calcuation	63	125	250	500	1000	2000	4000	8000	
Estimated Reverberation time	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**- Typical Bedroom RT**
Alpha bar	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
Total Absorption	14.09	14.09	14.09	14.09	14.09	14.09	14.09	14.09	
10Log S/A	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	

Façade level	63	125	250	500	1000	2000	4000	8000	A
Measured Noise Level	61.8	59.5	56.4	56.5	59.4	55.2	49.6	43.6	62.4
Façade to free field	0	0	0	0	0	0	0	0	
Angle of view	0	0	0	0	0	0	0	0	
Screening (Maekewa)	0	0	0	0	0	0	0	0	
Distance correction	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	
Noise level at façade (Leq)	62	60	56	57	59	55	50	44	62

Composite SRI	63	125	250	500	1000	2000	4000	8000	Rw	
Glazing SRI	30	35	41	48	53	55	65	65	51	**Pilkington Acoustic Glazing**
Transmission Coefficient	0.001000	0.000316	0.000079	0.000016	0.000005	0.000003	0.000000	0.000000		
Wall SRI	28	34	43	55	66	77	85	85	55	**Typical masonry cavity wall (300mm - 380kg/m2)**
Transmission Coefficient	0.001585	0.000398	0.000050	0.000003	0.000000	0.000000	0.000000	0.000000		
Roof SRI	23	26	43	52	60	65	65	65	51	
Transmission Coefficient	0.005012	0.002512	0.000050	0.000006	0.000001	0.000000	0.000000	0.000000		
Ventilation, Dne	32	41	39	38	47	43	46	46	43	**Airvac 5000 EAW - AC2**
Transmission Coefficient	0.000631	0.000079	0.000126	0.000158	0.000020	0.000050	0.000025	0.000025		
Average Transmission Coeff	0.001894	0.000435	0.000150	0.000123	0.000016	0.000038	0.000019	0.000019		
Average SRI	27	34	38	39	48	44	47	47	44	

Calculated Internal Noise Level, dB	63	125	250	500	1000	2000	4000	8000	A	
Lp (Reverberant), line source	35.4	26.7	19.0	18.2	12.3	11.8	3.1	-2.9	20.1	
Lp (Direct)	34.6	25.9	18.2	17.4	11.5	11.0	2.3	-3.7	19.3	**Criteria**
Lp (Rev & Direct)	38	29	22	21	15	14	6	0	23	**≤ 30**
BS8233	37	29	21	20	14	14	5	-1	22	**≤ 30**

ARDENT CONSULTING ENGINEERS

Noise Break-in Calculation - Position 1

Description	
Ardent CE Project No.	**190320**
Property Address	**Danson Road**
Room Type	**Bedroom**
Parameter	**LAmax**

Room Dimensions and Areas		
Room volume	35.00	**- Based on typical size**
Total Surface area	65.50	
Wall façade area	10.00	
Roof façade area	0.00	
Glazing area	3.60	
Dne Ref Area, A0	10.00	

Total façade area	13.60

Room Absorption Calcuation	63	125	250	500	1000	2000	4000	8000	
Estimated Reverberation time	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**- Typical Bedroom RT**
Alpha bar	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
Total Absorption	14.09	14.09	14.09	14.09	14.09	14.09	14.09	14.09	
10Log S/A	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	

Façade level	63	125	250	500	1000	2000	4000	8000	A
Measured Noise Level	83.6	79.6	82.0	81.9	78.1	72.6	66.2	59.9	82.9
Façade to free field	0	0	0	0	0	0	0	0	
Angle of view	0	0	0	0	0	0	0	0	
Screening (Maekewa)	0	0	0	0	0	0	0	0	
Distance correction	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	
Noise level at façade (Leq)	84	80	82	82	78	73	66	60	83

Composite SRI	63	125	250	500	1000	2000	4000	8000	Rw	
Glazing SRI	30	35	41	48	53	55	65	65	46	**Pilkington Acoustic Glazing**
Transmission Coefficient	0.001000	0.000316	0.000079	0.000016	0.000005	0.000003	0.000000	0.000000		
Wall SRI	28	34	43	55	66	77	85	85	55	**Typical masonry cavity wall (300mm - 380kg/m2)**
Transmission Coefficient	0.001585	0.000398	0.000050	0.000003	0.000000	0.000000	0.000000	0.000000		
Roof SRI	23	26	43	52	60	65	65	65	51	
Transmission Coefficient	0.005012	0.002512	0.000050	0.000006	0.000001	0.000000	0.000000	0.000000		
Ventilation, Dne	32	41	39	38	47	43	46	46	43	**Airvac 5000 EAW - AC2**
Transmission Coefficient	0.000631	0.000079	0.000126	0.000158	0.000020	0.000050	0.000025	0.000025		
Average Transmission Coeff	0.001894	0.000435	0.000150	0.000123	0.000016	0.000038	0.000019	0.000019		
Average SRI	27	34	38	39	48	44	47	47	44	

Calculated Internal Noise Level, dB	63	125	250	500	1000	2000	4000	8000	A	
Lp (Reverberant), line source	57.2	46.8	44.6	43.6	31.0	29.2	19.7	13.4	43	
Lp (Direct)	56.4	46.0	43.8	42.8	30.2	28.4	18.9	12.6	42.2	**Criteria**
Lp (Rev & Direct)	60	49	47	46	34	32	22	16	46	**≤ 45**
BS8233	59	49	47	46	33	31	22	15	45	**≤ 45**

ARDENT CONSULTING ENGINEERS

Noise Break-in Calculation - Position 2

Description	
Ardent CE Project No.	**190320**
Property Address	**Danson Road**
Room Type	**Bedroom**
Parameter	**LAeq, 16h**

Room Dimensions and Areas	
Room volume	35.00
Total Surface area	65.50
Wall façade area	10.00
Roof façade area	0.00
Glazing area	3.60
Dne Ref Area, A0	10.00

- Based on typical size

Total façade area	13.60

Room Absorption Calcuation	63	125	250	500	1000	2000	4000	8000	
Estimated Reverberation time	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**- Typical Bedroom RT**
Alpha bar	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
Total Absorption	14.09	14.09	14.09	14.09	14.09	14.09	14.09	14.09	
10Log S/A	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	

Façade level	63	125	250	500	1000	2000	4000	8000	A
Measured Noise Level	60.4	53.0	50.5	48.0	49.3	45.6	41.7	34.9	53.2
Façade to free field	0	0	0	0	0	0	0	0	
Angle of view	0	0	0	0	0	0	0	0	
Screening (Maekewa)	0	0	0	0	0	0	0	0	
Distance correction	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	
Noise level at façade (Leq)	60	53	51	48	49	46	42	35	53

Composite SRI	63	125	250	500	1000	2000	4000	8000	Rw	
Glazing SRI	18	20	21	30	35	32	37	44	32	**Thermal 6/16/6**
Transmission Coefficient	0.015849	0.010000	0.007943	0.001000	0.000316	0.000631	0.000200	0.000040		
Wall SRI	28	34	43	55	66	77	85	85	55	**Typical masonry cavity wall (300mm - 380kg/m2)**
Transmission Coefficient	0.001585	0.000398	0.000050	0.000003	0.000000	0.000000	0.000000	0.000000		
Roof SRI	23	26	43	52	60	65	65	65	51	
Transmission Coefficient	0.005012	0.002512	0.000050	0.000006	0.000001	0.000000	0.000000	0.000000		
Ventilation, Dne	36	36	34	31	34	38	38	38	35	**Standard Trickle Vent**
Transmission Coefficient	0.000251	0.000251	0.000398	0.000794	0.000398	0.000158	0.000158	0.000158		
Average Transmission Coeff	0.005545	0.003124	0.002432	0.000851	0.000377	0.000284	0.000169	0.000127		
Average SRI	23	25	26	31	34	35	38	39	34	

Calculated Internal Noise Level, dB	63	125	250	500	1000	2000	4000	8000	A	
Lp (Reverberant), line source	38.7	28.8	25.2	18.1	15.9	11.0	4.8	-3.2	22.4	
Lp (Direct)	37.8	27.9	24.4	17.3	15.1	10.1	4.0	-4.1	21.5	**Criteria**
Lp (Rev & Direct)	41	31	28	21	19	14	7	-1	25	**≤ 35**
BS8233	41	31	27	20	18	13	7	-1	24	**≤ 35**

ARDENT CONSULTING ENGINEERS

Noise Break-in Calculation - Position 2

Description	
Ardent CE Project No.	**190320**
Property Address	**Danson Road**
Room Type	**Bedroom**
Parameter	**LAeq, 8h**

Room Dimensions and Areas	
Room volume	35.00
Total Surface area	65.50
Wall façade area	10.00
Roof façade area	0.00
Glazing area	3.60
Dne Ref Area, A0	10.00

- Based on typical size

Total façade area	13.60

Room Absorption Calcuation	63	125	250	500	1000	2000	4000	8000	
Estimated Reverberation time	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**- Typical Bedroom RT**
Alpha bar	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
Total Absorption	14.09	14.09	14.09	14.09	14.09	14.09	14.09	14.09	
10Log S/A	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	

Façade level	63	125	250	500	1000	2000	4000	8000	A
Measured Noise Level	55.5	48.9	46.8	44.3	45.2	41.0	37.7	31.6	49.1
Façade to free field	0	0	0	0	0	0	0	0	
Angle of view	0	0	0	0	0	0	0	0	
Screening (Maekewa)	0	0	0	0	0	0	0	0	
Distance correction	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	
Noise level at façade (Leq)	56	49	47	44	45	41	38	32	49

Composite SRI	63	125	250	500	1000	2000	4000	8000	Rw	
Glazing SRI	18	20	21	30	35	32	37	44	32	**Thermal 6/16/6**
Transmission Coefficient	0.015849	0.010000	0.007943	0.001000	0.000316	0.000631	0.000200	0.000040		
Wall SRI	28	34	43	55	66	77	85	85	55	**Typical masonry cavity wall (300mm - 380kg/m2)**
Transmission Coefficient	0.001585	0.000398	0.000050	0.000003	0.000000	0.000000	0.000000	0.000000		
Roof SRI	23	26	43	52	60	65	65	65	51	
Transmission Coefficient	0.005012	0.002512	0.000050	0.000006	0.000001	0.000000	0.000000	0.000000		
Ventilation, Dne	36	36	34	31	34	38	38	38	35	**Standard Trickle Vent**
Transmission Coefficient	0.000251	0.000251	0.000398	0.000794	0.000398	0.000158	0.000158	0.000158		
Average Transmission Coeff	0.005545	0.003124	0.002432	0.000851	0.000377	0.000284	0.000169	0.000127		
Average SRI	23	25	26	31	34	35	38	39	34	

Calculated Internal Noise Level, dB	63	125	250	500	1000	2000	4000	8000	A	
Lp (Reverberant), line source	33.8	24.7	21.5	14.4	11.8	6.4	0.8	-6.5	18.4	
Lp (Direct)	32.9	23.8	20.7	13.6	11.0	5.5	0.0	-7.4	17.5	**Criteria**
Lp (Rev & Direct)	36	27	24	17	14	9	3	-4	21	**≤ 30**
BS8233	36	27	24	16	14	8	3	-5	20	**≤ 30**

ARDENT CONSULTING ENGINEERS

Noise Break-in Calculation - Position 2

Description	
Ardent CE Project No.	**190320**
Property Address	**Danson Road**
Room Type	**Bedroom**
Parameter	**LAmax**

Room Dimensions and Areas		
Room volume	35.00	**- Based on typical size**
Total Surface area	65.50	
Wall façade area	10.00	
Roof façade area	0.00	
Glazing area	3.60	
Dne Ref Area, A0	10.00	

Total façade area	13.60

Room Absorption Calcuation	63	125	250	500	1000	2000	4000	8000	
Estimated Reverberation time	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**- Typical Bedroom RT**
Alpha bar	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
Total Absorption	14.09	14.09	14.09	14.09	14.09	14.09	14.09	14.09	
10Log S/A	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	

Façade level	63	125	250	500	1000	2000	4000	8000	A
Measured Noise Level	72.2	64.6	61.7	60.8	58.3	58.3	66.5	56.7	69.3
Façade to free field	0	0	0	0	0	0	0	0	
Angle of view	0	0	0	0	0	0	0	0	
Screening (Maekewa)	0	0	0	0	0	0	0	0	
Distance correction	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	
Noise level at façade (Leq)	72	65	62	61	58	58	67	57	69

Composite SRI	63	125	250	500	1000	2000	4000	8000	Rw	
Glazing SRI	18	20	21	30	35	32	37	44	46	**Thermal 6/16/6**
Transmission Coefficient	0.015849	0.010000	0.007943	0.001000	0.000316	0.000631	0.000200	0.000040		
Wall SRI	28	34	43	55	66	77	85	85	55	**Typical masonry cavity wall (300mm - 380kg/m2)**
Transmission Coefficient	0.001585	0.000398	0.000050	0.000003	0.000000	0.000000	0.000000	0.000000		
Roof SRI	23	26	43	52	60	65	65	65	51	
Transmission Coefficient	0.005012	0.002512	0.000050	0.000006	0.000001	0.000000	0.000000	0.000000		
Ventilation, Dne	36	36	34	31	34	38	38	38	35	**Standard Trickle Vent**
Transmission Coefficient	0.000251	0.000251	0.000398	0.000794	0.000398	0.000158	0.000158	0.000158		
Average Transmission Coeff	0.005545	0.003124	0.002432	0.000851	0.000377	0.000284	0.000169	0.000127		
Average SRI	23	25	26	31	34	35	38	39	34	

Calculated Internal Noise Level, dB	63	125	250	500	1000	2000	4000	8000	A	
Lp (Reverberant), line source	50.5	40.4	36.4	30.9	24.9	23.7	29.6	18.6	35.5	
Lp (Direct)	49.6	39.5	35.6	30.1	24.1	22.8	28.8	17.7	34.7	**Criteria**
Lp (Rev & Direct)	53	43	39	34	28	26	32	21	38	**≤ 45**
BS8233	52	42	38	33	27	26	32	21	38	**≤ 45**

APPENDIX C

Noise Mitigation Plan

N

	Enhanced glazing and ventilation (Type B)
	Screened / fenced terraces

APPENDIX D

From: Angerson, Richard <Richard.Angerson@bexley.gov.uk>
Sent: 23 August 2019 09:53
To: Ashley Shepherd <[redacted]
Cc: Environmental Health Dev Control Consultation <EHDCC@bexley.gov.uk>
Subject: RE: 190320 - Danson Road, Bexleyheath - Noise Assessment

Dear Ashley,

Thanks for your email.

Bexley don't have specific noise assessment policies but we advocate the approach in "ProPG: Planning and Noise, May 2017" (i.e. BS8233 derived criteria for internal noise and external amenity where practically achievable.) We are therefore happy for you to proceed with the assessment as outlined in your proposed methodologies.

For plant noise target criteria, 10dB below representative background is sought if possible but we would accept 5dB below (determined in accordance with BS4142).

Typical plant noise condition would be:

"Before the first occupation, details of plant room / fixed machinery and mechanical services noise (including CHP) and attenuation measures shall be submitted to and approved in writing by the Local Planning Authority. The rating level of noise emitted from fixed plant on the site shall be 5dB below the existing representative background level at any time. The noise levels shall be determined 1 metre from the façade of residential properties with measurements and assessments made according to BS 4142: 2014.The approved measures shall be installed and maintained thereafter.

Reason: In the interests of the amenities of future occupiers."

If the assessment identifies the need for enhanced acoustic glazing/ventilation the following condition is normally recommended:

*"Prior to the construction of any building incorporating residential use details of noise attenuation measures (glazing and ventilation) shall be submitted to and agreed in writing by the Local Planning Authority. The level of protection shall be sufficient to achieve the levels specified in BS8233:2014 and in accordance with the configurations specified in the **** Report Ref: ***, dated ***."*

Demolition and construction methodology planning conditions and associated NRMM condition tend only to be applied to "major" developments (>10 residential units) and/or where neighbour representations express particular concerns.

The typically imposed condition would be:

"Before development commences a demolition/construction methodology shall be submitted to and approved in writing by the Local Planning Authority, and the development shall not be carried out except in accordance with the approved details, which shall cover the following points: i. demolition and construction methods and techniques (including the avoidance of burning on site and vehicle movements); days/hours of work and deliveries of construction materials. ii. means of minimising noise and vibration (including any piling), and compliance with BS 5228; iii. means of minimising dust and similar emissions, in accordance with Air Quality: Best Practice Guidance - The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance (published by the Greater London Authority, July 2014); iv. means for the identification, removal and safe disposal of asbestos;

v. construction site lighting; vi. contact arrangements for the public, including 'out of hours' telephone numbers for named contacts).

Reason: In the interests of the amenities of nearby local residents. These details are required at the start of the project as they relate to the demolition/construction works"

Our permitted hours under COPA ’74 provisions are noisy works between 08:00 and 18:00 hours Monday to Fridays and 08:00 to 13:00 hours on Saturday. Noisy works (audible beyond site boundary) are prohibited on Sundays and Public Holidays.

Hope that helps.

Regards

Richard

Richard Angerson
Environmental Health Officer

London Borough of Bexley
Environmental Protection Team
Public Protection Service
Civic Offices, 2 Watling Street
Bexleyheath, Kent, DA6 7AT
Direct Tel: 020 3045 5649

APPENDIX E

ACOUSTIC TERMINOLOGY

The effects of noise on human beings may be expressed in terms of physiological damage and annoyance. It is, however, only the annoyance impacts that need to be considered in detail when addressing environmental noise impacts. Annoyance also includes the immediate effects of activity interference, for example sleep disturbance and speech interference.

The practice has become to measure sound levels in decibels (dB). The decibel scale is logarithmic rather than linear and it is useful to bear in mind that a noise level change of 3dB would be equivalent to doubling the energy level (for example doubling the volume of traffic) and that an increase of 10 dB is perceived, subjectively, as a doubling of loudness. The human ear responds differently to sounds of different frequency. The ear perceives high frequency sound of a given sound pressure level more loudly than a low frequency sound at the same level. The A-weighted sound level, dB(A), takes this response into consideration and is commonly used for measurement of environmental noise in UK. It thus indicates the subjective human response to sound.

Environmental noise levels vary continuously from second to second, it is clearly impractical to specify the sound level continuously and thus time averaging is required. In practice human response has been related to various units which include allowance for the fluctuating nature of sound with time. For the purpose of this report these include:

LAeq,T : the equivalent A-weighted continuous sound level.

This unit relates to the equivalent level of continuous sound for a specific time period T, for example 16 hours for daytime noise. It contains all the sound energy of the varying sound levels over the same time period and expresses it as a continuous sound level over that period. The unit is used for assessing traffic and industrial noise for planning purposes and in particular for PPG24.

LA10,T : the A-weighted level of sound exceeded for 10% of the time period T.

This unit is used for traffic noise measurement and is the preferred unit for prediction of traffic noise in the publication, 'Calculation of Road Traffic Noise'.

LA90,T : the A-weighted level of sound exceeded for 90% of the time period T.

This unit is commonly used to represent the background noise and is used in assessing the effects of industrial noise in UK.

LAmax : the maximum A-weighted level of sound over a period of measurement.

LAr,T : the rating level.

The specific Noise plus any adjustments for the characteristic features of the noise. Used for comparison between background levels with the noise source off.

SEL : the Sound Exposure Level.

Sound exposure level abbreviated as SEL and LAE, is the total noise energy produced from a single noise event condensed into a 1 second time period.

Rw : weighted sound reduction index.

A laboratory-measured value as defined in ISO717 Part 1.

DnTw :

The equivalent of Rw, but measured onsite as oppose to in a laboratory