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CHRISTY'S LANE, SHAFTESBURY
NOISE IMPACT ASSESSMENT

Technical Report: R10065-2 Rev 1

Date: 13th November 2023



For: Planning Issues Ltd
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Parkside
Ringwood
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Project Title: Christy’s Lane, Shaftesbury – Noise Impact Assessment

Report Ref: R10065-2 Rev 1

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For and on behalf of 24 Acoustics Ltd				

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SUMMARY

Planning Issues Ltd has retained 24 Acoustics Ltd to carry out a noise impact assessment on a site off Christy's Lane, Shaftesbury. It is proposed to redevelop the site into 41 sheltered housing units in a single three storey block.

The site is potentially affected by road traffic noise using Christy's Lane along with occasional activity on site access roads associated with the nearby Lidl and Tesco supermarkets and a Tesco Petrol Station to the east of the site.

For internal noise, recommendations in terms of glazing and alternative means of ventilation have been provided to ensure that noise within habitable rooms, due to road traffic, would comply with maximum internal levels of 35 dB L_{Aeq} during the daytime and 30 dB L_{Aeq} and 45 dB $L_{Amax, f}$ at night to the north of the site and 30 dB L_{Aeq} during the daytime and 25 dB L_{Aeq} and 40 dB $L_{Amax, f}$ at night for other facades.

Noise levels in the external amenity area during the day are predicted to be less than 55 dB $L_{Aeq, 16hr}$ which is considered acceptable in planning terms.

On the above basis, it is considered that an appropriate acoustic environment can be provided to the proposed residential properties, both externally and internally.

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1.0 INTRODUCTION

- 1.1 Planning Issues Ltd has retained 24 Acoustics Ltd to carry out a noise impact assessment on a site at Christy's Lane, Shaftesbury. A planning application has been submitted for redevelopment of the site for sheltered housing (P/FUL/2023/05051).
- 1.2 The site is potentially affected by road traffic noise using Christy's Lane along with activity on site access roads associated with the nearby Lidl and Tesco supermarkets and a Tesco Petrol Station to the east of the site.
- 1.3 This report provides the results of the assessment. An explanation of noise terms used in this report is provided in Appendix A. All sound pressure levels in this report are given in dB re: 20 µPa.

2.0 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

- 2.1 The site is located to the south-west of the A350, Christy's Lane. The access road to a Tesco superstore runs to the south-west of the site with Shaftesbury Football Club further to the south. The access road to a Lidl store lies to the north-west of the site with a Tesco petrol station to the south-east.
- 2.2 The opening hours for the Tesco and Lidl stores and the Tesco petrol station are shown below:

Tesco Superstore

- Monday to Saturday 6.00 am – 12.00 am;
- Sunday 10.00 am – 16.00 pm.

Tesco Petrol Station

- Monday to Saturday 6.00 am – 22.00 pm;
- Sunday 7.00 am – 21.00 pm.

Lidl Store

- Monday to Saturday 8.00 am – 22.00 pm;
- Sunday 10.00 am – 16.00 pm.

- 2.3 There is potential for the development to be affected by noise from road traffic using Christy's Lane and road traffic using the adjacent supermarket access roads. Consideration has also been given to the potential for noise from the Tesco Petrol Station.
- 2.4 Planning consent is sought to construct 41 sheltered housing flats in a single three storey block. The block will be provided with an MVHR system to provide suitable ventilation to the dwellings. The proposed development scheme is shown in Figure 1.
- 2.5 The southern and eastern site boundary treatment will comprise a 2 m high close board fence with a minimum surface density of 12 kg/m².

3.0 STANDARDS AND GUIDANCE

National Planning Policy Framework and Noise Policy Statement for England

- 3.1 The National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions should ensure that new development is appropriate for its location taking into account the likely 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:
- 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 quality of life;
 - Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
- 3.2 The NPPF states that where the operation of an existing business could have a significant adverse effect on new development in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed. Paragraph 187 states:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an

existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

3.3 It is relevant to note that the Agent of Change principle applies under the condition of a likely significant adverse impact.

3.4 The NPPF refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life.

3.5 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

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

3.6 The Planning Practice Guidance (PPG) [Reference 3] is written to support the NPPF with more specific planning guidance. The PPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The PPG states that noise can over-ride other planning concerns, where

justified, but that it is important to look at noise in the context of wider characteristics of the proposal, its users and its surroundings.

- 3.7 The PPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.
- 3.8 In general terms it is considered that a noise impact with an effects level which is lower than SOAEL is acceptable (providing the effect is mitigated to a minimum). There is currently, however, a discontinuity between the above guidance and objective technical criteria for use in planning noise impact assessments. For this site it is considered that the appropriate (technical and objective) standards for use in assessing the noise impact are British Standard 8233: 2014 and guidance from the World Health Organisation for habitable rooms in the proposed development.

Professional Practice Guidance on Planning & Noise (ProPG)

- 3.9 The Professional Practice Guidance on Planning and Noise (ProPG) [Reference 4] was published jointly by the Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health in May 2017. The guidance relates to the consideration of existing sources of transportation noise upon proposed new residential development and strives to:
- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
 - Encourage the process of good acoustic design in and around new residential developments;
 - Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
 - Improve understanding of how to determine the extent of potential noise impact and effect; and
 - Assist the delivery of sustainable development.
- 3.10 It is important to note that the guidance in ProPG does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy.

BS 8233:2014 and WHO Guidelines

- 3.11 BS 8233:2014 [Reference 5] provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB $L_{Aeq,16hr}$ in living rooms and bedrooms during the day, 40 dB $L_{Aeq,16hr}$ in dining rooms during the day and 30 dB $L_{Aeq,8hr}$ in bedrooms at night. A relaxation of 5 dBA in the above figures is given in the standard for rooms which are naturally ventilated (by opening windows).
- 3.12 BS 8233:2014 also notes that “*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night.*”
- 3.13 Although the guidelines have no formal standing, the World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines [Reference 6] suggest internal night-time noise levels not exceeding 30 dB $L_{Aeq,8hr}$ or regularly (10 – 15 times per night) exceeding 45 dB $L_{Amax,f}$ for ‘a good night’s sleep’.

BS 4142:2014+A1:2019

- 3.14 The relevant standard for assessing noise from industrial / commercial development in relation to residential dwellings is BS 4142:2014 + A1:2019 [Reference 7]. The standard provides a method for rating and assessing industrial and commercial sound in relation to residential properties. The standard advocates a comparison between the typical measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered.
- 3.15 For rating purposes if the noise source is tonal, impulsive or otherwise distinctive in character, a rating correction may be applied depending on the severity of the character. The standard states that a difference between the rating level and the background level of around +10 dB or more is likely to be an indication of a significant adverse impact depending on the context, a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context, and where the rating level does not exceed the background level it is an indication of a low impact, depending on the context.

Consultation

- 3.16 An Environmental Health Officer for Dorset Council has provided the following feedback in relation to the application:

"The proposed site lies on a busy road and potentially noisy activities take place at commercial properties surrounding. The applicant needs to demonstrate that there will be no adverse noise affect upon new residents. A suitable and sufficient noise assessment needs to be undertaken taking into consideration noise from traffic on the A30, vehicles visiting the petrol station and nearby supermarket, refuelling activities, deliveries, and any other noisy plant located at the petrol station or nearby supermarkets. The assessment should inform a scheme for protecting the proposed dwellings and amenity spaces (garden area) from the external noise climate.

A good acoustic design process should be followed in accordance with 'Professional Practice Guidance on Planning and Noise: New Residential Development' (May 2017 or later versions)."

Summary

3.17 The impact of noise upon the proposed development has been assessed using the following recommended maximum internal noise levels:

- 35 dB $L_{Aeq,16hr}$ daytime noise level for living rooms;
- 30 dB $L_{Aeq,8hr}$ night-time noise level for bedrooms;
- 45 dB $L_{Amax,f}$ night-time noise levels in bedrooms for regular events;
- BS:4142:2014 for plant noise.

4.0 NOISE MEASUREMENT PROCEDURE AND RESULTS

Instrumentation

4.1 Noise measurements were undertaken on the site between 10th and 17th October 2023 using the following equipment:

- Rion (Class 1) precision sound level meter x 2 Type NL52;
- Rion (Class 1) precision sound level meter x 2 Type NL31;
- Brüel and Kjær acoustic calibrator Type 4231.

Noise Measurement Procedure

4.2 The noise measurement locations used (shown in Figure 1 and described below) were chosen to establish how noise from Christy's Lane, the supermarket access roads, petrol

station and car parks affects the proposed site. Two unattended long-term measurement locations were selected and are described below:

- Location 1 – On the northern site boundary with clear line of sight to Christy's Lane;
- Location 2 – On the southern site boundary with clear line of sight to the Tesco access road and car park.

4.3 In order to assess typical ambient noise levels, the sound level meters were configured to continuously monitor in one minute sample periods. The meters were set up to measure and store overall A-weighted statistical parameters including the L_{Aeq} , L_{Amax} and L_{A90} parameters (measured on fast response). Noise measurements were made in accordance with BS 7445: 1991 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use' [Reference 8].

4.4 The instrumentation was powered by external batteries and stored in a weatherproof case. Throughout the course of the survey, an outdoor microphone windshield was used. The weather was generally dry with wind speeds less than 5 m/s, however, where weather conditions were unsuitable for noise measurement, data has been removed prior to analysis.

4.5 Calibration of all noise monitoring instrumentation was checked before and on completion of the measurements and no drift was found. The calibration of 24 Acoustics' instrumentation is traceable to National Standards.

Results

4.6 The results of the survey are shown graphically in Appendix B and are summarised in Tables 1 and 2.

Date and Time	Daytime	Night	
	L _{Aeq} , 16 hour	L _{Aeq} , 8 hour	L _{Amax,f} Typical
Tue 10th October 2023	69*	62	81
Wed 11th October 23	69*	66*	79
Thur 12th October 23	70*	64	81
Fri 13th October 23	-	61	80
Sat 14th October 23	69*	60	78
Sun 15th October 23	69	63	79
Mon 16th October 23	70	63	81
Tue 17th October 23	70*	-	-
Representative	69	63	81 max

Table 1: Noise Survey Results, Location 1, Christy’s Lane * partial measurement

Date and Time	Daytime	Night	
	L _{Aeq} , 16 hour	L _{Aeq} , 8 hour	L _{Amax,f} Typical
Tue 10th October 2023	65*	54	77
Wed 11th October 23	66*	57*	76
Thur 12th October 23	67*	58	78
Fri 13th October 23	-	55	79
Sat 14th October 23	66*	55	77
Sun 15th October 23	64	53	78
Mon 16th October 23	66	56	79
Tue 17th October 23	66*	-	-
Representative	65	55	79 max

Table 2: Noise Survey Results, Location 2, Tesco Access Road * partial measurement

4.7 From subjective observations, it was noted that road traffic noise from the A350 Christy’s Lane was the dominant source across much of the site. Noise from vehicles using the Tesco and Lidl access roads was also significant.

4.8 Measured background noise levels for the early morning period, 05.00 – 06.00 am, prior to opening of either supermarket, were 42 – 44 dB L_{A90, 15min}.

5.0 NOISE IMPACT ASSESSMENT

Noise from Road and Car Park Movements

5.1 Measured noise levels have been corrected to represent noise levels incident upon facades of the proposed building using standard acoustic theory. Break-in calculations have been undertaken using drawings for the proposed development, provided to 24 Acoustics in October 2023.

Noise from Supermarket Plant and Delivery Bays

- 5.2 Plant areas for both the Tesco and Lidl supermarkets are located to the west of the supermarket buildings. As such they are a significant distance from the proposed development, in excess of 100 m, and therefore relative to ambient road traffic noise levels this is considered unlikely to be significant.
- 5.3 The Lidl delivery bay is located to the west of the Lidl building and is therefore screened from the proposed development by the supermarket building itself. The Tesco delivery bay is located between the two supermarket buildings and is surrounded by a solid fence. On that basis it is considered that activity within the supermarket delivery bays will result in no significant impact at the proposed development.

Tesco Petrol Station

- 5.4 Activity from vehicles using the petrol station is accounted for within the measured noise levels. Consideration has been given to a fuel delivery to the petrol station. Deliveries can take place at any time of the day and will be infrequent in nature. Assuming a typical noise level of 85 dBA at 1 m from a fuel tanker pump (from 24 Acoustics in-house database) would indicate a predicted noise level of 54 dB L_{Aeq} at the upper floors of the proposed development. This is significantly lower than the prevailing ambient noise levels at the site.

Mitigation Measures

- 5.5 As much of the development is subject to noise from mixed commercial sources including the petrol station, for facades facing the east, west and south, an internal noise limit 5 dB lower than that specified in BS 8233 has been utilised. North facing facades have been designed to achieve the limits specified in BS 8233. Noise mitigation measures will be required to all facades and these can be seen in Figures 2 and 3.
- 5.6 Figures 2 and 3 also show the facades to which these apply for living rooms and bedrooms on all floors. It should be noted that background ventilation in accordance with Part F of the Building Regulations [Reference 9] will be required along with measures to prevent excess heat build-up in the proposed dwellings.
- 5.7 It should be noted that the spaces identified will be contingent on closed windows in order to obtain a satisfactory acoustic internal environment. The assessment assumes a masonry

wall construction with a minimum R_w of 55 dB and a roof construction with a minimum R_w of 49 dB.

- 5.8 The acoustic design of the façade system should be checked and updated post-planning and prior to the start of construction to reflect any late design changes (room volumes and/ or glazed area dimensions).
- 5.9 On that basis, acceptable internal noise levels in accordance with BS 8233:2014 will be achieved with windows closed.

External Amenity

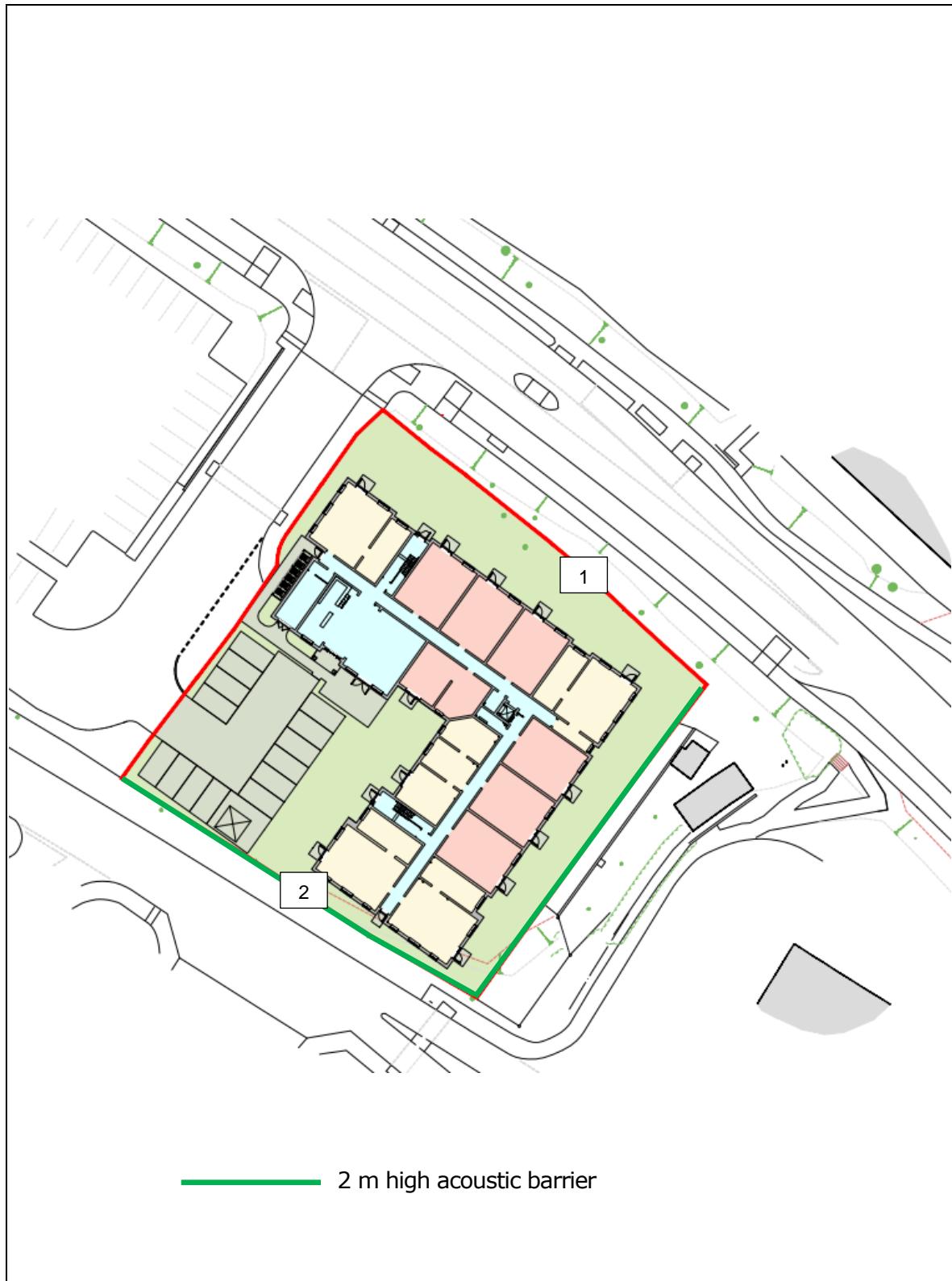
- 5.10 Noise levels in the patio area external to the ground floor lounge are anticipated to be no greater than 55 dB $L_{Aeq, 16hr}$ and this is considered acceptable in planning terms.


6.0 CONCLUSIONS

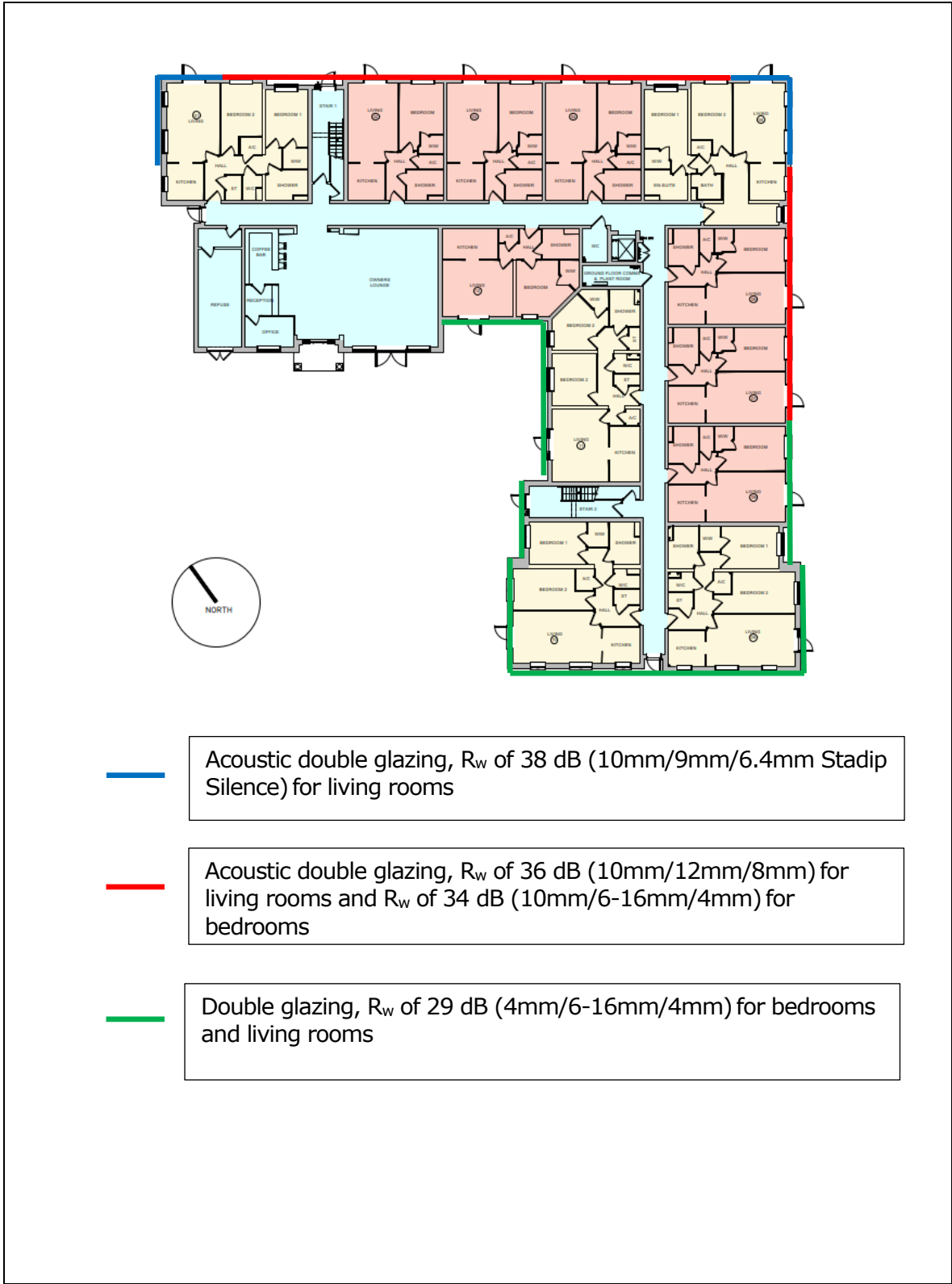
- 6.1 Planning Issues Ltd has retained 24 Acoustics Ltd to carry out a noise impact assessment on a site off Christy's Lane, Shaftesbury. It is proposed to redevelop the site into 41 sheltered housing units in a single three storey block.
- 6.2 The site is potentially affected by road traffic noise using Christy's Lane along with activity on site access roads associated with the nearby Lidl and Tesco supermarkets and a Tesco Petrol Station to the east of the site.
- 6.3 For internal noise, recommendations in terms of glazing and alternative means of ventilation have been provided to ensure that noise within habitable rooms, due to road traffic, would comply with maximum internal levels of 35 dB L_{Aeq} during the daytime and 30 dB L_{Aeq} and 45 dB $L_{Amax, f}$ at night to the north of the site and 30 dB L_{Aeq} during the daytime and 25 dB L_{Aeq} and 40 dB $L_{Amax, f}$ at night for other facades.
- 6.4 Noise levels in the external amenity area during the day are predicted to be less than 55 dB $L_{Aeq, 16hr}$ which is considered acceptable in planning terms.
- 6.5 On the above basis, it is considered that an appropriate acoustic environment can be provided to the proposed residential properties, both externally and internally.

REFERENCES


1. Department for Communities and Local Government. National Planning Policy Framework, 2023.
2. DEFRA, Noise Policy Statement for England, March 2010.
3. Planning Practice Guidance, Department of Communities and Local Government (revised July 2019).
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5. British Standards Institution. British Standard 8233: Guidance on sound insulation and noise reduction for buildings, 2014.
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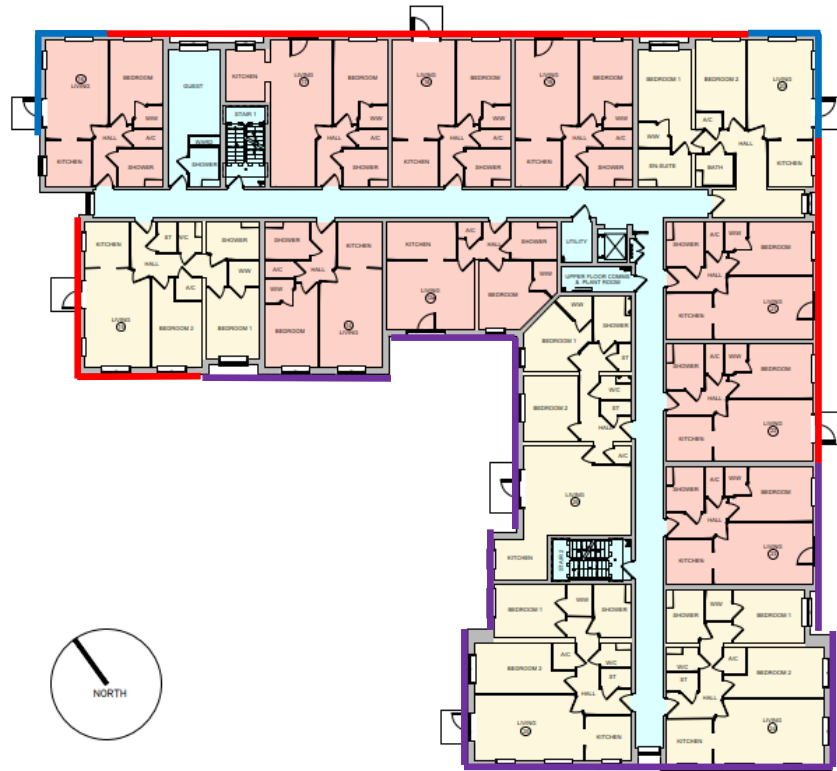


Project: Christy's Lane, Shaftesbury	Title: Site Location, Noise Survey Locations and Acoustic Fence		
DWG No: Figure 1	Scale: N.T.S.		Rev: -
Date: November 2023	Drawn By: AR		Job No: 10065




- Acoustic double glazing, R_w of 38 dB (10mm/9mm/6.4mm Stadip Silence) for living rooms
- Acoustic double glazing, R_w of 36 dB (10mm/12mm/8mm) for living rooms and R_w of 34 dB (10mm/6-16mm/4mm) for bedrooms
- Double glazing, R_w of 29 dB (4mm/6-16mm/4mm) for bedrooms and living rooms

Project: Christy's Lane, Shaftesbury		Title: Site Layout showing Noise Mitigation Requirements for Ground Floor		
DWG No: Figure 3	Scale: N.T.S.	Rev: -		
Date: November 2023	Drawn By: AR	Job No: 10065		



- Acoustic double glazing, R_w of 38 dB (10mm/9mm/6.4mm Stadip Silence) for living rooms
- Acoustic double glazing, R_w of 36 dB (10mm/12mm/8mm) for living rooms and R_w of 34 dB (10mm/6-16mm/4mm) for bedrooms
- Acoustic double glazing, R_w of 34 dB (10mm/6-16mm/4mm) for bedrooms and living rooms

Project: Christy's Lane, Shaftesbury		Title: Site Layout showing Noise Mitigation Requirements for First and Second Floors		
DWG No: Figure 3	Scale: N.T.S.	Rev: -		
Date: November 2023	Drawn By: AR	Job No: 10065		

APPENDIX A: NOISE TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dB(A) is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB(A). The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dB(A) corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In an attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

- i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

- ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

APPENDIX B: NOISE SURVEY RESULTS

