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# Noise Impact Assessment

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**Proposed Residential Development Site  
Norcot Community Centre, Reading**

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**Reference: 8520/PR/DO  
Date: September 2020**



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|-----------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Client:</b>                                                                    |  | <b>Acoustic Consultant:</b>                                                                                                                                    |
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## Document Control

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|         |                       |            |                      |                     |
|         |                       |            |                      |                     |
|         |                       |            |                      |                     |
|         |                       |            |                      |                     |

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the external noise aspects as included in this report. We provide advice only in relation to noise and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.



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## 1. Introduction

Beard Construction appointed Acoustic Consultants Limited to carry out an environmental noise assessment and provide noise mitigation advice for the proposed residential development at Norcot Community Centre, Lyndhurst Road, Tilehurst Reading, RG30 6UB.

A noise survey was carried out on-site and the measured data has been used to assess the impact of noise upon the site and address planning condition 24, of Reading Borough Council planning application number 181377 which states:

*"24. The development hereby approved shall not commence beyond foundation level until a detailed scheme, informed by an assessment of the current noise environment, for protecting the dwellings from the external noise environment of the area has been submitted to and approved, in writing, by the Local Planning Authority. The scheme itself shall be designed, specified and constructed so that the sound insulation performance of the structure and the layout of the dwellings are such that the indoor ambient noise levels do not exceed the values detailed in Table 4 of BS 8233:2014 and the LMAX value stated in XXXX. Where opening windows will lead to an internal noise level increase of 5 dBA or greater above BS 8233:2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation. Noise from the system should not result in BS8233 internal levels being exceeded.*

*Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agrees in writing.*

*REASON: These details are required due to insufficient information being contained within this submission and in order to safeguard the amenity of occupants in accordance with Policy CC8 of the Reading Borough Local Plan 2019."*

The author of this report is a Full Member of the Institute of Acoustics with 10 years' experience within the field and, as such, is considered suitably qualified to undertake a noise impact assessment.

## 2. The Site

The proposed site is to be located at Norcot Community Centre, Lyndhurst Road, Tilehurst Reading, RG30 6UB. The proposal is for the demolishing of the existing derelict building and the erection of a three-storey building comprising 18 (8x1 and 10x2 bed) residential units (Use Class C3) with associated bin and cycle storage, a 96.4sqm (NIA) building for community use (Use Class D1), vehicle parking, landscaping and associated works

The site is surrounded mainly by residential housing. To the North of the site at approximately 70 metres, there is also Norcot Early Years Centre.

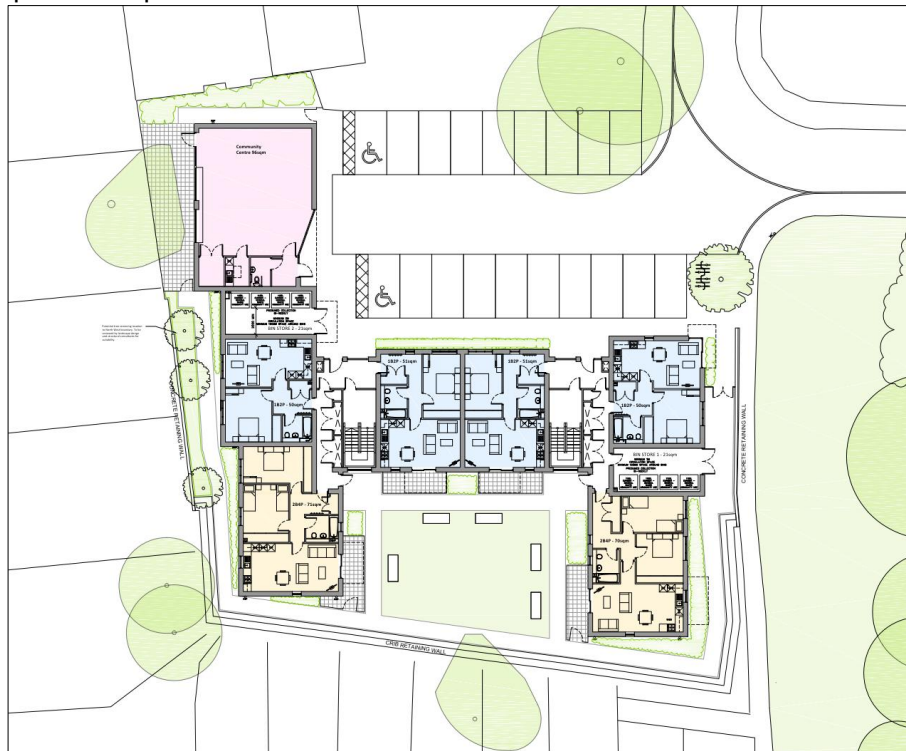
The main noise sources affecting the site is local road traffic in the surrounded road network and some distant rail traffic noise along the railway line to the north east and at approximately 200 metres away from the proposed development.

The existing and proposed site location plan is provided in Figure 1 and Figure 2 respectively.

Figure 1: Existing Site plan (google maps)



Figure 2: Proposed Site plan





## 3. Planning and Noise

### 3.1. Planning Condition

A planning application has been submitted and approved by Reading Borough Council (reference number 181377) for "Erection of a three storey building comprising 18 (8x1 and 10x2 bed) residential units (Use Class C3) with associated bin and cycle storage, a 96.4sqm (NIA) building for community use (Use Class D1), vehicle parking, landscaping and associated works." at Norcot Community Centre, Lyndhurst Road, Tilehurst, Reading, RG30 6UB with the following condition relating to this report:

*"24. The development hereby approved shall not commence beyond foundation level until a detailed scheme, informed by an assessment of the current noise environment, for protecting the dwellings from the external noise environment of the area has been submitted to and approved, in writing, by the Local Planning Authority. The scheme itself shall be designed, specified and constructed so that the sound insulation performance of the structure and the layout of the dwellings are such that the indoor ambient noise levels do not exceed the values detailed in Table 4 of BS 8233:2014 and the LMAX value stated in XXXX. Where opening windows will lead to an internal noise level increase of 5 dBA or greater above BS 8233:2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation. Noise from the system should not result in BS8233 internal levels being exceeded.*

*Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agrees in writing.*

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### 3.2. British Standard 8233:2014

British Standard 8233:2014 entitled "Guidance on sound insulation and noise reduction for buildings" came into effect on 28<sup>th</sup> February 2014.

Section 7.7.2 Table 4 of the British Standard 8233:2014 provides internal ambient noise levels for dwellings from noise sources 'without a specific character'. The British Standard guideline states that noise levels should not exceed those as noted in Table 4 of the British Standard and this is summarised below:



Table 1: British Standard 8233:2014 Internal Noise Criteria

| Activity                   | Location         | Daytime<br>(07:00 to 23:00)    | Night-time<br>(23:00 to 07:00) |
|----------------------------|------------------|--------------------------------|--------------------------------|
| Resting                    | Living Room      | 35 dB $L_{Aeq,16\text{ hour}}$ | -                              |
| Dining                     | Dining Room/area | 40 dB $L_{Aeq,16\text{ hour}}$ | -                              |
| Sleeping (daytime resting) | Bedroom          | 35 dB $L_{Aeq,16\text{ hour}}$ | 30 dB $L_{Aeq,8\text{ hour}}$  |

Section 7.7.2 Note 4 of the British Standard states *"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. Sporadic noise events could require separate values"*.

Section 3.4 of the "Guidelines for Community Noise" published by the World Health Organisation in 1999 (WHO 1999) states *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45  $L_{Amax}$  more than 10-15 times per night (Vallet & Verbey 1991)"*.



## 4. Noise Monitoring

A partially attended long term noise monitoring exercise was undertaken approximately between 11:23 hours on the 1<sup>st</sup> September 2020 and 9:08 hours on the 3<sup>rd</sup> September 2020 to determine the existing noise climate at the site.

### 4.1. Monitoring Equipment

Sound Pressure Levels were measured using a Class 1 sound level meter with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 2: Equipment and Calibration Status

| <b>Equipment Description<br/>/ Manufacturer / Type</b> | <b>Serial Number</b> | <b>Date of<br/>Calibration</b> | <b>Calibration<br/>Certification<br/>Number</b> |
|--------------------------------------------------------|----------------------|--------------------------------|-------------------------------------------------|
| SLM, Svantek, 959                                      | 14784                | 22/04/2020                     | 34608                                           |
| Microphone, GRAS, 40AE                                 | 183810               | 22/04/2020                     | 34608                                           |
| Calibrator, Norsonic, 1251                             | 424062               | 27/08/2019                     | 32688                                           |

The measurement systems were checked before and after use with the calibrators and no significant drift was detected.

### 4.2. Noise Monitoring Procedure

A partially attended long term noise monitoring exercise was undertaken approximately between 10:53 hours on the 1<sup>st</sup> September 2020 and 9:38 hours on the 3<sup>rd</sup> September 2020 to determine the existing noise climate at the site.

The sound level meter was mounted within the site at a height of 3 metres above the ground so that it was above the height of the surrounding hoarding. The measurements position was a free field-level position. The monitoring location is shown in the figure below.

Figure 3: Monitoring location



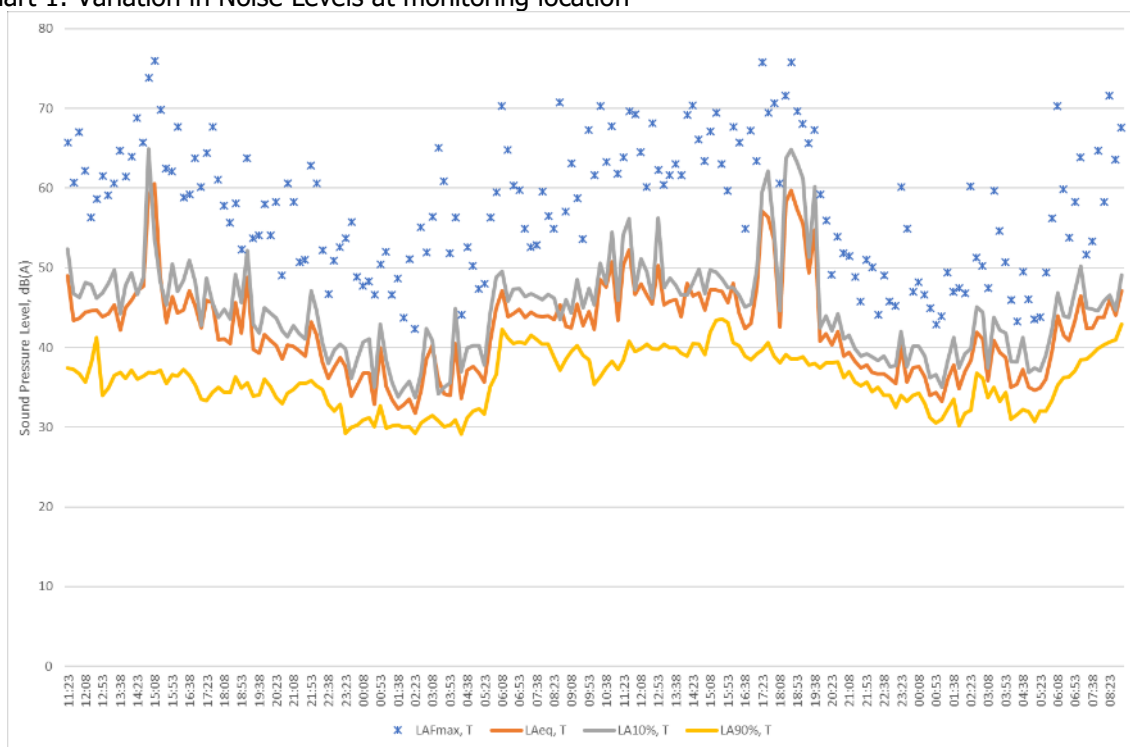
#### 4.3. Weather Conditions

During the measurement period, the weather was mostly dry and calm with temperatures of approximately 6-18 degrees Celsius, with partial cloud cover, no precipitation and wind speeds below 5 m/s. The weather conditions are not expected to have adversely affected the measurement process.

#### 4.4. Measured Noise Levels

A chart of the variation in ambient noise levels with time is provided below for the long-term monitoring location:

Chart 1: Variation in Noise Levels at monitoring location



From the measured environmental noise data, we have determined the following free-field octave band design 'daytime' and 'night-time' equivalent noise levels, and maximum noise levels at the monitoring location:

Table 3: Measured Octave Band Design Noise at 'monitoring location A'

| Parameter            | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dB(A) |
|----------------------|----|-----|-----|-----|------|------|------|------|-------|
| Day $L_{eq,(16hr)}$  | 53 | 50  | 46  | 44  | 43   | 41   | 42   | 38   | 49    |
| Night $L_{eq,(8hr)}$ | 49 | 41  | 39  | 36  | 34   | 31   | 32   | 29   | 40    |
| Night $L_{max(F)}$   | 60 | 57  | 53  | 51  | 50   | 48   | 49   | 45   | 56    |

(1) 10<sup>th</sup> highest recorded  $L_{Amax}$  event during the night time period



## 5. Noise Impact Assessment

A partially open window is expected to achieve a sound reduction of 15dB(A). Therefore where the external noise levels do not exceed the noise limiting internal criteria by more than 15 decibels the internal noise level criteria will be achieved.

It can be seen from the above-measured noise levels in Table 3 that the development experiences a daytime noise level of less than 50 dB  $L_{Aeq,16\text{ hour}}$ , a night time noise level of less than 45 dB  $L_{Aeq,8\text{ hour}}$  and maximum noise level less than 60 dB  $L_{AFmax}$ .

On this basis, the internal noise levels stated in planning condition 24 are achieved with open windows to the proposed dwellings and no specific noise control measures are required.



## 6. Summary & Conclusions

Beard Construction appointed Acoustic Consultants Limited to carry out an environmental noise assessment and provide noise mitigation advice for the proposed residential development at Norcot Community Centre, Lyndhurst Road, Tilehurst Reading, RG30 6UB.

A noise survey was carried out on-site and the measured data together with published traffic data was used to assess the impact of noise upon the site and address planning condition 24, of Reading Borough Council planning application number 181377.

A partially open window is expected to achieve a sound reduction of 15dB(A). Therefore where the external noise levels do not exceed the noise limiting internal criteria by more than 15 decibels the internal noise level criteria will be achieved.

On this basis, the internal noise levels stated in planning condition 24 are achieved with open windows to the proposed dwellings and no specific noise control measures are required.



## 7. Appendix 1 – Glossary of Acoustic Terminology

*Decibel (dB)* – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-pascals to 100 pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

*Equivalent sound absorption area of a room, A* - hypothetical area of a totally absorbing surface without diffraction effects, expressed in square metres (m<sup>2</sup>), which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration.

*Octave and Third Octave Bands* – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

*Reverberation time, T* – time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped NOTE Reverberation time is usually measured in octave or third octave bands. It is not necessary to measure the decay over the full 60 dB range. The decay measured over the range 5 dB to 35 dB below the initial level is denoted by T30, and over the range 5 dB to 25 dB below the initial level by T20.

*Weighted sound reduction index, R<sub>w</sub>* – single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies NOTE The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see Annex C and BS EN ISO 717-1).

*Sound pressure level* – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in pascals (Pa), typically from 20 micro-pascals to 100 pascals, but commonly simplified onto the decibel scale.

*Weighted standardized impact sound pressure level, L'<sub>nT,w</sub>* - single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.



NOTE weighted standardized impact sound pressure level is used to characterize the insulation of floors in buildings (see Annex C and BS EN ISO 717-2).

*Weighted standardized level difference,  $D_{nT,w}$*  – single-number quantity that characterizes the airborne sound insulation between rooms. NOTE Weighted standardized level difference is used to characterize the insulation between rooms in a building (see Annex C and BS EN ISO 717-1).



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