

Noise Assessment

Brome Grange hotel

Final Report

CONTENTS

INTRODUCTION

RISK ASSESSMENT METHODOLOGY

RISK ASSESSMENT FOR KEY NOISE SOURCES

INTERNAL NOISE LEVELS – MITIGATION

CONCLUSION

INTRODUCTION

This note sets out a Stage 1 Risk assessment to identify potential constraints relating to noise for the proposed development at the above site. It is understood that the Council require a noise assessment, specifically in relation to potential activity associated with the proposal. For completeness, other noise sources are addressed on a risk basis. The advice below is based on a desktop assessment for the reasons explained in this note.

Please see site below

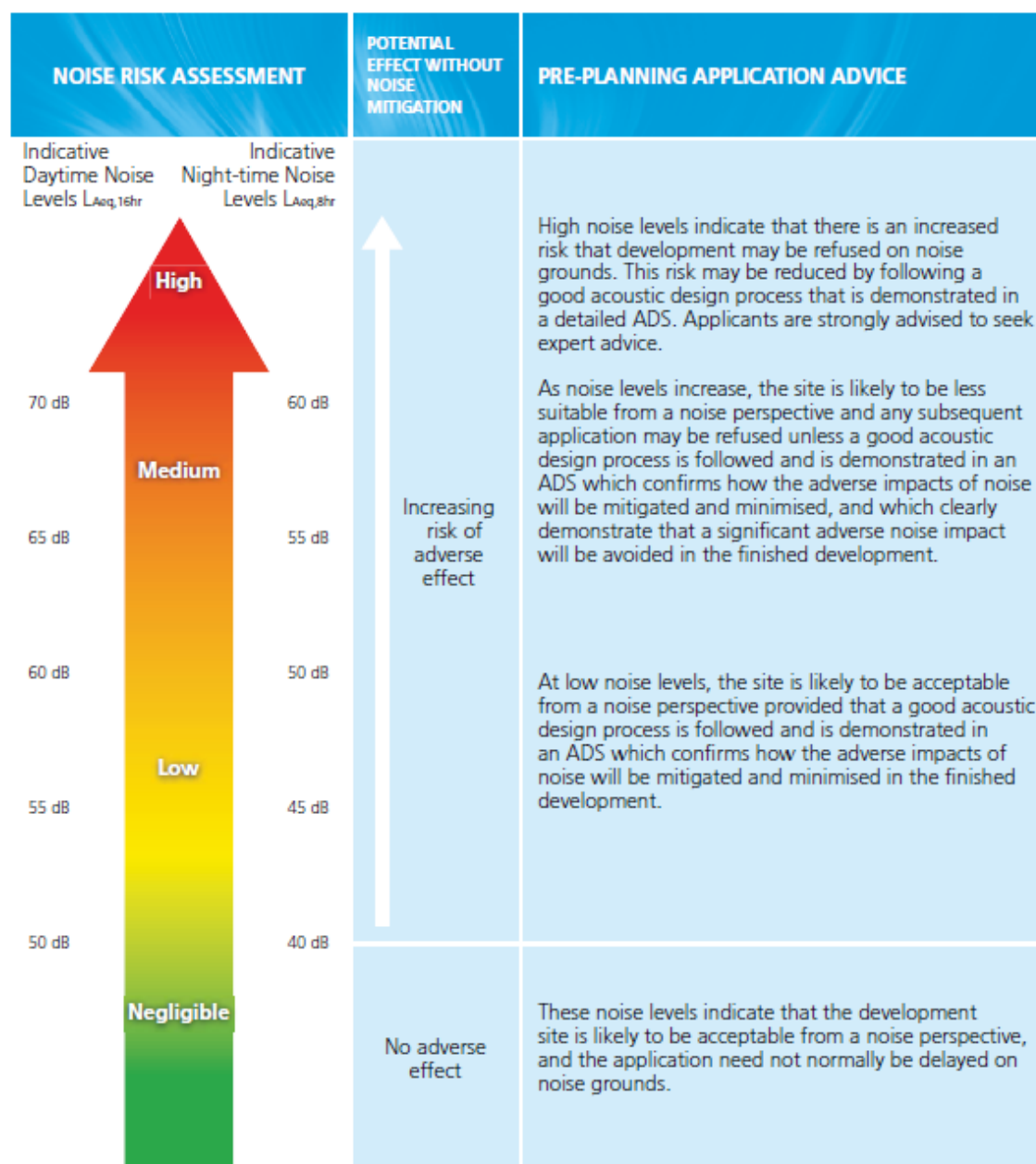


RISK ASSESSMENT METHODOLOGY

A risk assessment has been undertaken using the approach set out in the ANC/IOA/CIEH document "Professional Practice Guidance on Planning and Noise" (see Figure 1). The assessment has been informed by reference to The National Planning Policy Framework, Noise Policy Statement for England and Planning Practice Guidance-Noise, along with British Standards 8233:2014 ("Guidance on Sound Insulation and Noise Reduction for Buildings").

It provides a sense of the noise challenge at the development site and should be interpreted flexibly having regard to the locality, the project and wider context.

Figure 1.

**Figure 1 Notes:**

- Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
- $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.
- An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F} > 60$ dB means the site should not be regarded as negligible risk.

Figure 1. Stage 1– Initial Site Noise Risk Assessment

RISK ASSESSMENT FOR KEY NOISE SOURCES

Road traffic noise – A140

Likely Risk - Low

Noise from this road will not have an effect on proposed development. It is not expected that noise levels will be such as to require specific acoustic mitigation measures, and such measures, if required, would only be for the most exposed units.

Noise generation and impact on amenity noise to neighbouring properties

Likely Risk – Negligible

The effects of noise on noise-sensitive premises (NSPs) are varied and complicated. They include interference with speech communication, disturbance of work or leisure activities, disturbance of sleep, annoyance and possible effects on mental and physical health. In any neighbourhood, some individuals will be more sensitive to noise than others

There are houses located on the A140 along with an active Hotel (Brome Grange) which border the proposed site.

Duration of site operations. In general, the longer the duration of activities on a site, the more likely it is that noise from the site will prove to be an issue.

Hours of work. For any NSP, some periods of the day will be more sensitive than others

Attitude of the site operator. It is well established that people's attitudes to noise can be influenced by their attitudes to the source or activity itself. Noise control targets for the evening period in such cases will need to be stricter than those for the daytime inclusive of the day of the week the operations are being run (Monday – Saturdays).

The existing dwellings and guests of the hotel will need to be factored when discussing the noise impact. The type of activity within the proposed units is negligible and will have the following activities;

Laundry = Washing machines and dryers in use at any time in the proposed unit. There is also associated extraction, air conditioning and a potential radio in use.

Microbrewery = Boilers, pumps and chillers in use at any time in the proposed unit. There is also associated extraction, air conditioning and a potential radio in use. A typical use may consist of the below;

Activity	Duration	Noise	Aroma
Brewing; water is heated and added to raw materials, then boiled for up to 1.5 hours	1.5 hours	Boiler Pumps	Boiled hops
Fermentation; beer sits in sealed containers whilst alcohol conversion takes place	5 days	None	None
Racking; beer is pumped into a holding tank then casks/kegs are filled by gravity	3 hours	Pumps, Cask movement	Fresh beer
Conditioning; casked beer stored in a cold room	1-4 weeks	None	None
Delivery; raw materials are delivered to the brewery and beer is taken to outlets	Twice a week	Cask Movement Delivery	None
Cleaning & cask washing; vessels are cleaned after each brew	3-5 hours per brew	Pumps, Cask movement	None

Fresh good and fry goods = Chillers, There is also associated extraction, air conditioning and a potential radio in use.

Vehicles, such as forklifts and commercial vans will be electric with EV charging throughout.

Deliveries to site will take place towards the middle of the day. Deliveries from the site will be limited, taken via transit van (electric).

INTERNAL NOISE LEVELS – MITIGATION

It is possible to apply objective standards to the assessment of noise output with good design of new commercial units. The nationally applied standard is BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'. Table 4 of the standard contains the following design targets for residential dwellings, which have been adopted in the consideration of Masterplan constraints:
BS8233:2014 Table 4 – Indoor ambient noise levels for dwellings which will be applied to the existing units along the A140.

Activity Location (proposed commercial development) 07:00 to 23:00 23:00 to 07:00

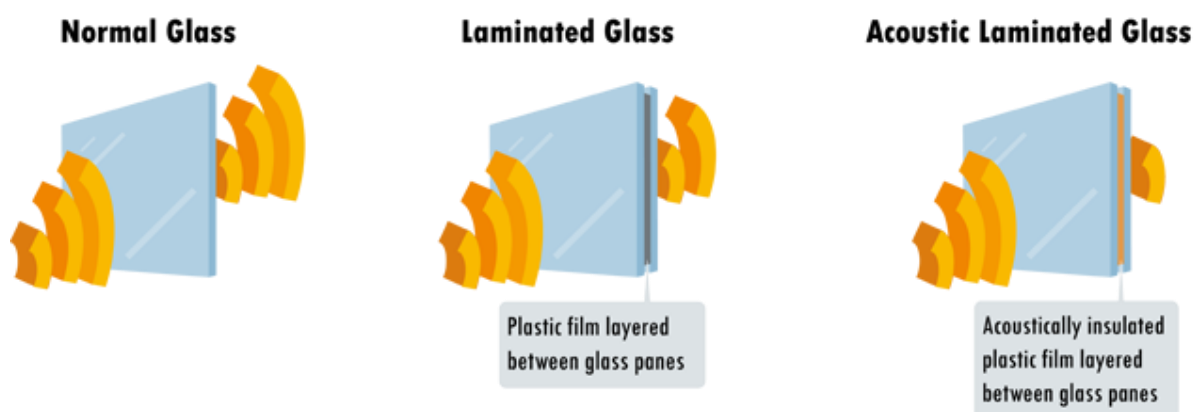
Resting Living room 35 dB LAeq, 16 hour --

Dining room/area 40 dB LAeq, 16 hour --

Sleeping (daytime resting) Bedroom 35 dB LAeq, 16 hour 30 dB LAeq, 8 hour

Windows

This would be achieved, for example by a 10mm pane and a 6.4mm laminated pane separated by a 20mm cavity. Again, sufficient background ventilation should be provided by in-frame trickle ventilators fitted with acoustic hoods, or an alternative acoustic ventilator providing the same or better acoustic performance as the glazing system.



Acoustic foams will be used during installation to ensure that noise cannot leak into the dwelling between the wall and the window frame. High-performance acoustic sealants will be used to prevent noise skirting around the frame.

The secondary window is a separate unit consisting of a single glazed pane within its own frame and is fitted on the room side of your existing windows and sealed around the edges

Where reliance on closed acoustic windows is necessary, such a scheme would be accompanied by appropriate alternative ventilation, acoustically treated where necessary (for example, mechanical ventilation and heat recovery system, or a passive ducted system).

Doors

Soundproof Doors add more mass which dissipates the noise, as well as preventing sound from getting around the frame and through the internal locking mechanism. doors employ the same glazing as the Soundproof windows (above), also using two different thicknesses of glass in order to combat the coincidence frequency.

Walls

Walls Noise Reduction Insulations i.e. acoustic membranes, rockwools and mute boards. Complementary High Mass Materials which are materials of different densities stop sounds at a greater range of frequencies. Acoustic Sealants seal up gaps that soundwaves can travel through.

Walls to be a cavity wall (timber frame) with full fill CavityTherm 360 An engineered system providing added resilience against increases in wind-driven rain resulting from climate change. CavityTherm 360 is a bio-enhanced high performance composite board of enhanced PIR with a Lambda value as low as 0.020 W/mK for full fill cavity wall applications.

CavityTherm 360 offers all of the unique benefits of our full fill built-in wall insulation system along with pioneering environmentally sensitive features that meet both the RIBA 2030 Climate Challenge and LETI targets.

When built into a traditional 110-150mm cavity using standard foundation widths, building skills and local materials CavityTherm 360 achieves U-Values down to 0.12 W/m²K. An environmentally conscious solution to low energy design, that results in traditional homes that meet the RIBA 2030 Climate Challenge targets.

CavityTherm 360 U-Values Table

Thickness(mm)	Block Thermal Conductivity			
	1.13	0.51	0.15	0.11

Thickness(mm)	Block Thermal Conductivity			
105 (110mm O/A)	0.17	0.17	0.16	0.15
120 (125mm O/A)	0.15	0.15	0.14	0.14
145 (150mm O/A)	0.13	0.12	0.12	0.12

Roof

The roof space will be insulated with increased depth to add layers/massing to ensure adequate protection against potential noise from aircraft overhead. Within the pitched rafters will be ECO360 MA Bio-enhanced, superior performance PIR insulation suitable for sloped roofs (ventilated, hybrid or warm).

ECO360 MA for roofs offers excellent insulation performance with a thermal conductivity of 0.020 W/mK. Using pioneering environmentally conscious technology, ECO360 MA in roof applications will reduce heat loss while also delivering excellent thermal bridging details.

This bio-enhanced insulation is lightweight, easy to install and combines high compressive strength with low thermal conductivity, providing a high performance solution for roof insulation. ECO360 MA is halogen free. The product packaging is bio-degradable and the overall packaging content has been reduced significantly

ECO360 U -Values Table

Thickness between (mm)	Thickness below (mm)	Rafter Centres	
		400mm	600mm
150	50	0.13	0.12

MVHR systems would be installed (typically those with an external sound level above 55 dB LAeq,16hr during the day or 45 dB LAeq,8hr at night). The number and location of those properties can be determined with detailed further analysis at design and construction stage.

In general terms, the system typically consists of fans within the roof area of a property which extract and supply air from and to the premises via small bore ductwork built into the building.

It should be noted that the advice above is based on the worst case assessment undertaken using the scheme layout plan and is to demonstrate that an acceptable environment can be achieved. Final design specifications for acoustic treatment can be undertaken at design and construction stage. Approval of the details of such matters can be required by planning condition if felt necessary.

Quality control & workmanship

Quality control and workmanship should always be considered very carefully. Noise control measures can fail to perform adequately if they are not built as the designer intended.

Such failures can have serious implications for noise control e.g. incorrect fitting of windows will reduce the performance of the glazing system. Effective sound insulation and noise control often require careful detailing on the part of the designer and a high standard of workmanship on the part of the contractor.

Correct execution of the detailing should be checked on site and the completed development should be fully commissioned where required before handover. As a result, post completion testing/reporting will likely be required as part of a planning condition.

Noise control is only one aspect of environmental design and designers should be aware that the solution to a noise problem can cause difficulties elsewhere e.g. thermal insulation, solar gain, cold bridging, ventilation and condensation. Much information on the environment in and around buildings is available and should be considered at an early stage of the design process.

CONCLUSION/MITIGATION

The site is generally surrounded by farmland, a small collective of residential properties and a hotel. Other potential sources of noise in the vicinity of the site are machinery/activity from the hotel, the A140 and residential properties. These are of sufficient distance from the site, and unlikely to be significant noise generators and as such do not represent a constraint on the development.

There are no significant constraints on the development site in relation to noise, beyond a medium risk, for which a mitigation strategy is set out, and will be subject to a future detailed acoustic design statement.

The advice above is based on a desktop assessment of likely noise sources, with a "worst case" approach being taken to assess whether the risk is manageable so that an acceptable environment can be achieved.

Design specifications for acoustic treatment can be undertaken as proposals progress, and a mitigation strategy can be delivered where necessary to ensure internal levels within dwellings within the BS8233:2014 standards. Initial recommendations are made above with materials and suggested enhancements, all are subject to availability and building control approval.

It should be noted that the initial analysis, above, demonstrates that an acceptable environment can be achieved through the use of established constraints and design parameters. Final design specifications for acoustic treatment will be undertaken as development proposals progress.

It can be concluded that the site is suitable for residential development in respect of the noise environment, subject to appropriate mitigation measures and that there would be no technical noise reason to resist residential development of the site.