Noise Assessment

05 & 10, Aspal Close, Beck Row

Final Report 25th March 2023

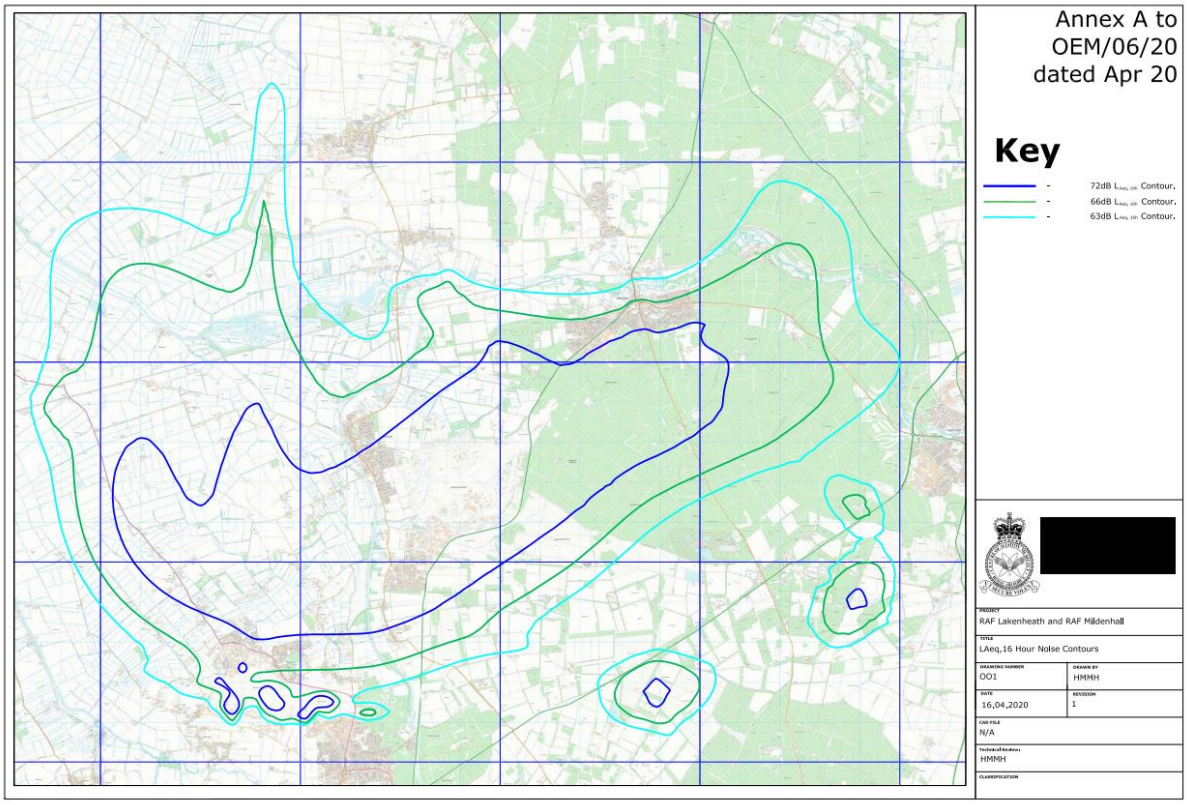
CONTENTS

INTRODUCTION

This statement sets out a Stage 1 Risk assessment to identify potential constraints relating to noise for the proposed development at 5 and 10 Aspal Close, Beck Row. It is understood that the council require a noise assessment, specifically in relation to military aircraft activity associated with the nearby (MOD) Mildenhall and Lakenheath bases. For completeness, other noise sources are addressed on a risk basis also. The advice below is based on a desktop assessment for the reasons explained in this note.

Please see sites below

The Site has been noted to lie within the 66 dB LAeq,16 h Contour of Royal Air Force (RAF) Mildenhall and RAF Lakenheath, based on the 2020 MOD report(1). The contour map has been presented below and indicates the location of The Site.



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 a potential residential development site and should be interpreted flexibly having regard to the locality, the project and wider context.

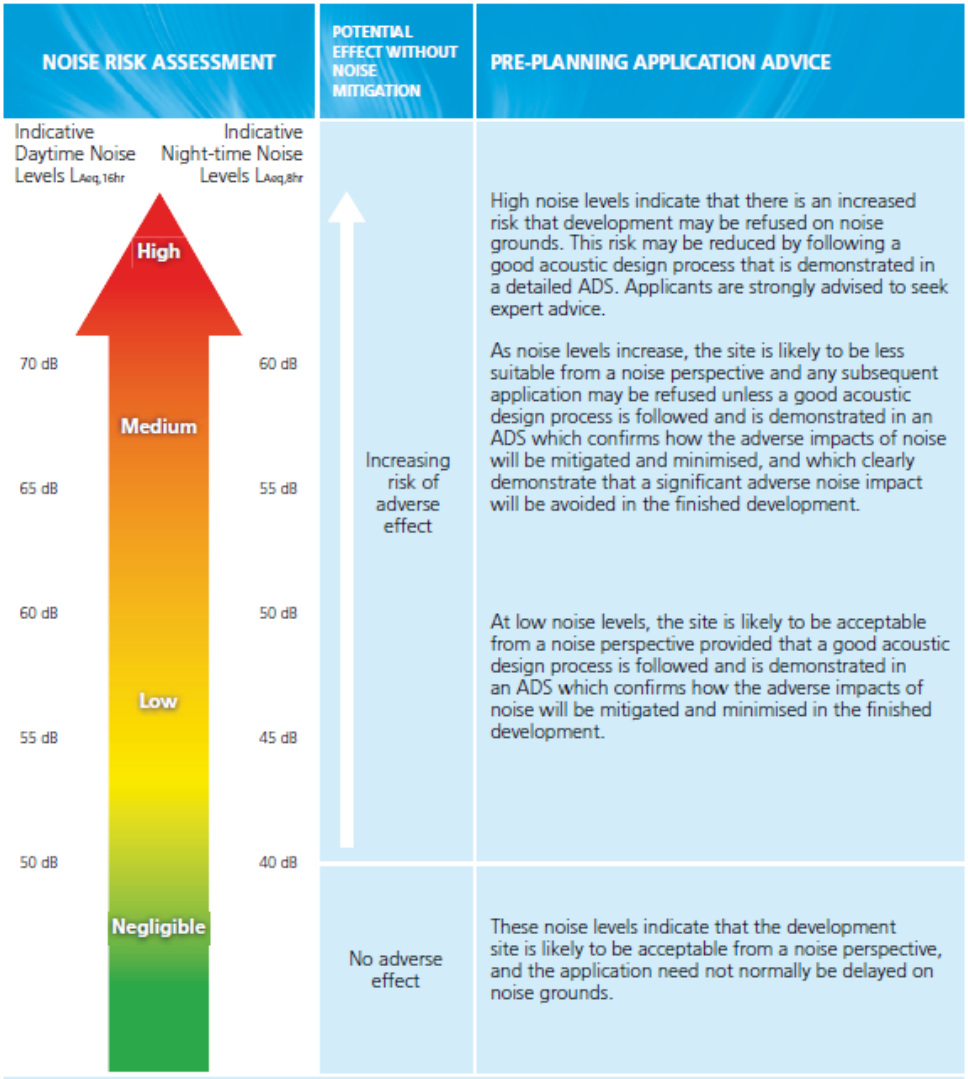


Figure 1. Stage 1– Initial Site Noise Risk Assessment

Figure 1.

NOISE CRITERIA

Professional Practice Guidance on Planning and Noise has been developed by a working group consisting of representatives from the Association of Noise Consultants (ANC), Institute of Acoustics (IOA), Chartered Institute of Environmental Health (CIEH) and practitioners from a planning and local authority background. The guidance was made effective in May 2017 to provide a recommended approach to the management of noise within the planning system in England. The document draws upon the legislation, guidance and standards available at the time of publication and reflects the Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and Planning Practice Guidance (such as PPG-Noise), as well as other authoritative sources of guidance.

The ProPG recommended approach involves two sequential stages covering an initial noise risk assessment and then full assessment considering four key elements. These cover a good acoustic design process, observing internal noise level guidelines, undertaking an external amenity area noise assessment and consideration of other relevant noise issues.

Activity	Location	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq, 16\,h}$	-
Dining	Dining room / area	40 dB $L_{Aeq, 16\,h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16\,h}$	30 dB $L_{Aeq, 8\,h}$ 45 dB $L_{Amax(F)}$

Table 1 – ProPG Internal Noise Level Guidelines.

The dominant sound source at The Site was the intermittent aircraft noise associated with the military during the daytime. In the absence of RAF jet activity, daytime sound levels fall between 58 – 65 dB LAeq, 16 h (17-24/02/2023).

The highest-measured levels were recorded when RAF activity occurred during the measurement period, varying between 72 – 78 dB LAeq, 16h (23/02/2023). Days in which the military base operates have demonstrated a worst-case day.

The initial site noise risk assessment has been categorised (in the worst-case) as ‘high risk’ on the future occupants of the new noise sensitive development.

Where a high noise risk has been noted, the pre-planning application advice stated in ProPG is as follows:

“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.

Daytime measurements used for assessment are based on the highest-measured daytime level of 74 dB LAeq,16hr recorded on Friday, 23/02/23; however, on days where military base activity was not present, daytime sound levels were significantly lower, 55 – 61 dB LAeq,16hr. Similarly, night-time levels were generally found to be between 48 – 53 dB LAeq, 8hr, with the exception of Thursday, where military activity abnormally occurred in the night-

time period between 06:00 and 07:00 am. Therefore, opening windows may be considered acceptable most of the time, with potentially excessive levels on days where jets associated with the RAF base are operating.

RISK ASSESSMENT FOR KEY NOISE SOURCES

AIRCRAFT NOISE

Likely Risk – Medium

In October 2015, the Occupational Health and Environmental Medicine Wing, Noise and Vibration Division published aircraft noise contours based on measured noise surveys around Lakenheath and Mildenhall (Report OEM/47/15). The recommendation in that report was that noise contours should be produced using noise modelling software.

In January 2017, a report was published which contains modelled noise contours relating to F-15 aircraft at Lakenheath (Report OEM/08/17). Reference has been made to both reports and sets of contours in the analysis that follows, because the site is, potentially, affected by aircraft from both Mildenhall and Lakenheath.

Military aircraft activity is unpredictable and sporadic, so it is not possible to undertake surveys at an individual site which represent an identifiable typical scenario, so reference to the published information in the above reports is necessary.

The site is situated some 6.0 km south-west of RAF Lakenheath and 1.1 km north of RAF Mildenhall. The runway at RAF Lakenheath is aligned with the site, i.e. aircraft on approach and/or departure routes from the airfield do generally pass in the vicinity of the site.

The site, by reference to the 2015 and 2017 reports is located within the 66 dB LAeq,16hr contour. Where a high noise risk has been noted, the pre-planning application advice stated in ProPG is as follows: *"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."*

The initial site noise risk assessment has been categorised (in the worst-case) as 'high risk' on the future occupants of the new noise sensitive development. ProPG states it is imperative for acoustic design to be considered at an early stage of the development control process, as to avoid unreasonable acoustic conditions and prevent those which are unacceptable.

It is understood that typical operational hours of the Lakenheath and Mildenhall airbases are 0600 to 2300 hours, albeit there are times when flights may occur outside of these hours (aircraft on active operational service, for example). The recommendations on noise mitigation, below, take account of the potential for aircraft noise to occur on a sporadic basis.

NOISE LEVELS IN GARDENS

There is no mitigation available to protect gardens from overhead aircraft noise and reference to the contours would indicate that sound levels in the gardens would equate to 66 dB LAeq,16 hours.

This is dependent on many variables, such as departure and approach routes, aircraft types and intensity of activity which is not predictable as it may be for a civilian airport.

This is an issue that must be weighed in the balance for any development in this area, and does not appear to preclude residential development in Beck Row generally.

BS 8233:2014 recommends that “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.” However, the document recognises that these guideline values are not achievable in all circumstances and in higher noise areas, a compromise might be warranted. In such circumstances, development should be designed to achieve the lowest practicable levels in these external amenity spaces. A 55dB LAeq,T target is a robust and reasonable one to adopt in this instance.

ROAD TRAFFIC NOISE

Aspal Close

Likely Risk - Low

Nosie 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 properties (i.e. the “front line” of properties on the boundary if they are within approximately 10 metres of the road edge).

OTHER NOISE SOURCES

Likely Risk - Negligible

INTERNAL NOISE LEVELS – MITIGATION

It is possible to apply objective standards to the assessment of noise and the design of new dwellings and how one should seek to achieve these objective standards. 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

Activity Location 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

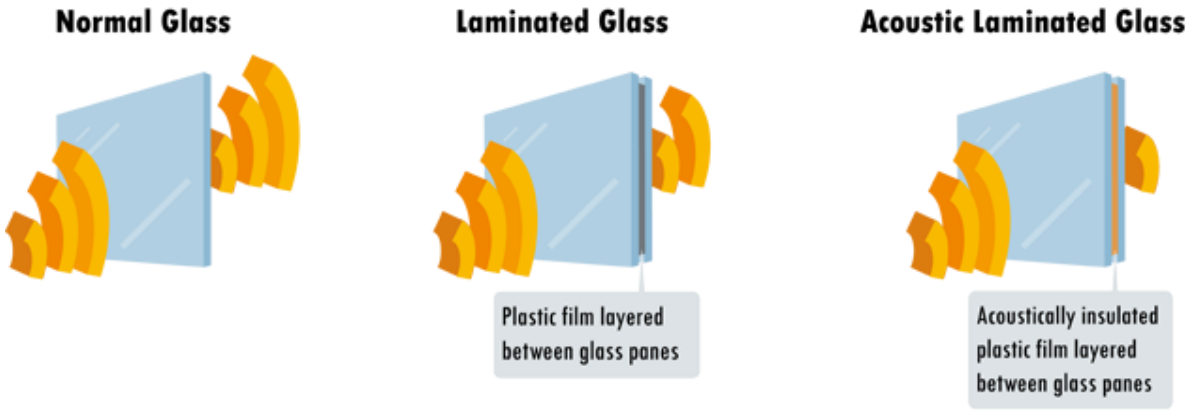
WINDOWS

In all cases, acceptable internal noise levels in living rooms would be achieved by the provision of a good quality standard thermal double-glazing unit (minimum sound reduction performance of RW = 33 dB) and improvement of the ‘coincidence frequency’.

This would be achieved, for example by 2 x 6mm panes of glass separated by a 20mm cavity. 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.

For bedrooms, it is recommended that an enhanced specification of acoustic glazing be provided, to protect against peak noise levels, from occasional aircraft. An acoustic system with a minimum sound reduction performance of RW = 39 dB is recommended.

This would be achieved, for example by a 10mm pane and a 6.4mm laminated pane of glass 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, a whole-house mechanical ventilation and heat recovery system, or a passive ducted system).

Level 1 Risk Assessment following the AVO Guide			Internal ambient noise level dB re. 20 µPa		
Location	Windows	Ventilation State	Day dB $L_{Aeq,T}$	Night dB $L_{Aeq,T}$	Max dB $L_{Amax(F)}$
Habitable rooms	Window closed and ventilators open	Building Ventilation	34	21	28
	Windows partially open	Overheating Ventilation	62	49	56

Table 6 – Estimated IANL from different ventilation conditions.

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
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

LOFT

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

Along with Rockwool Rollbatt Thermal Insulation (150mm x doubled to provide 300mm total thickness) is made up of medium density stone wool insulation. The thermal insulation boasts acoustic properties in addition to being fire performance rated A1 Euroclass non-combustible. Rollbatt is pre-split into either 2 x 600mm widths or 3 x 400mm widths. Excellent thermal insulation outstanding acoustic protection non-combustible – Euroclass A1Multi-application available as a complete roll, pre-cut widths, or pre-split, for easy installation durability – will not sag or slump considerably enhances thermal performance and sound reduction in, increasing energy efficiency and creating quieter spaces.

As an all-round high specification option for thermal, acoustic and fire performance, Rockwool Rollbatt is the ideal insulation solution for all building types.

Product	Format	Thickness (mm)	Width (mm)	Length (mm)	Area (m^2/pack)	Lambda (W/mK)	R-value (Wm^2/K)
TwinRoll	Pre-split (2 x 100mm thickness), not pre-cut	200 (2 x 100)	1200	2750	6.60	0.044	2.27
Roll	Single thickness, not pre-cut	150	1200	3650	4.38	0.044	3.41
Roll	Single thickness, not pre-cut	170	1200	3200	3.84	0.044	3.86
Rollbatt	Single thickness, pre-cut	100	1200 (2 x 600)	4800	5.76	0.044	2.27
Rollbatt	Single thickness, pre-cut	100	1200 (3 x 400)	4800	5.76	0.044	2.27
Rollbatt	Single thickness, pre-cut	150	1200 (2 x 600)	3650	4.38	0.044	3.41
Rollbatt	Single thickness, pre-cut	150	1200 (3 x 400)	3650	4.38	0.044	3.41

Mechanical Ventilation and Heat Recovery (MVHR) system will be installed within property where internal noise levels, with windows open, would exceed the BS 8233 “reasonable” design targets for day and night. The applicant has accepted this recommendation. On this basis, 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. The extracts usually take air from “wet rooms” such as kitchens, bathrooms and toilets. The supply fans usually provide air to living areas and bedrooms.

The system may be designed such that the extracted air is filtered and treated with a percentage of the air being returned to the living areas (hence the “heat recovery”). MVHR systems are now being installed as a matter of course into buildings in order to comply with the requirements of recent Building Regulations relating to energy conservation and building air-tightness. In this respect, the system is sustainable.

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 residential properties. Other potential sources of noise in the vicinity of the site are other residential properties, which 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.

Stage 1 assessment in accordance with ProPG Planning and Noise: New Residential Development has provided that the site is influenced by dominant aircraft noise.

The initial site noise risk assessment has been categorised as 'high risk' on the future occupants of the new noise sensitive development. There are no significant constraints on the development site in relation to noise, beyond the aircraft noise associated with Lakenheath and Mildenhall, for which a mitigation strategy is set out.

The fact the site has already has a residential property aides the case another dwelling would not suffer an worse impact from noise. The new proposed dwellings will be built of new, improved materials as set out within this statement. Providing the residents with a more comfortable living arrangement.

There is a low risk of noise from the Aspal Close having an effect no effect on the southern boundary of the site, but this is not expected to have an influence beyond 10 metres from the road edge.

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.

The assessment in accordance with ProPG have reviewed a good acoustic design process, internal ambient noise levels, external amenity areas and other matters. Commensurate design specifications have been established considering latest industry guidance. Wall and roof structures have been recommended in Appendix E to enhance sound insulation with respect to daytime military aircraft noise.

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, 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.

A recommendation is made to the decision maker to grant permission with condition to include acoustic recommendations given in this report.