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Architectural & Environmental Consultants

Noise | Vibration | Air Quality

Noise Assessment

143 Corby Road, Weldon

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Noise Assessment

Project: 143 CORBY ROAD, WELDON

Report reference: RP01-22484-R0

Client:
BRICKABILITY BG
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Document control:

REVISION	ISSUE DATE	REPORT BY	CHECKED BY	NOTES
0	23 November 2022	Chris McNeillie, MSc CEng MIOA, Director	Neil Morgan, BSc MIOA, Associate	Initial issue
1	12 December 2022	Chris McNeillie, MSc CEng MIOA, Director	Neil Morgan, BSc MIOA, Associate	Minor amendments

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1. EXECUTIVE SUMMARY

1.1 Cass Allen has been instructed by Brickability BG to assess noise affecting a proposed new development at 143 Corby Road, Weldon.

1.2 The assessment was carried out in accordance with relevant local and national planning guidance.

1.3 Noise surveys were previously carried out at the site by RandTech Consulting and the results have been used to inform the assessment. Noise levels at the site are dictated by road traffic noise emissions from Corby Road, the A43, and other main roads in the area.

1.4 A 3D noise model of the development was constructed based on the results of the previous surveys. The noise model was used to calculate road traffic noise levels at all facades of the development and in external amenity areas.

1.5 Noise affecting the development has been assessed in accordance with the ProPG guidance, as required by the Local Planning Authority. The impact of openable windows has also been considered in line with the AVO Guide and Part O of the Building Regulations.

1.6 The design of the development is compliant with noise-related planning policy subject to the adoption of acoustically upgraded glazing and ventilation and acoustic screening around gardens. This can be investigated further at the detailed design stage and may be secured by the imposition of a noise related planning condition by the Local Planning Authority.

1.7 In summary of the above, it is our view that the site is suitable for the development in terms of noise levels and that planning permission may be granted.

2. INTRODUCTION

2.1 The assessment has been carried out in accordance with relevant local and national planning guidance.

2.2 The aims of the assessment were:

- to establish the suitability of existing noise levels at the site for the proposed development
- where required, identify appropriate measures to optimise the acoustic design of the development and achieve acceptable noise levels in habitable areas

2.3 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION

3.1 The site currently contains a single dwelling and is located in a mixed-use area, bounded to the east by residential properties, to the south by Corby Road, and to the west by a petrol station. To the north of the site is a wooded area with the A43 beyond. The site location is shown in Figure 1 below.

Figure 1 Site Location and Surrounding Area

3.2 The proposal is to develop the site into five residential properties including an access road and external amenity areas. A current drawing of the proposed development layout is shown in Appendix 1.

4. PLANNING POLICY

National Policy

4.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Relevant sections in this case are highlighted below:

> *174. Planning policies and decisions should contribute to and enhance the natural and local environment by … preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of …noise pollution.*
>
> *185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative 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:*
>
> *a) 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;*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*
>
> *187. 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.*

Local Policy

4.2 North Northamptonshire Joint Core Strategy 2011-2031 provides guidance on the assessment of noise and vibration affecting new development in the borough. Policy 8 states:

> *Ensure quality of life and safer and healthier communities by:*
>
> *i. Protecting amenity by not resulting in an unacceptable impact on the amenities of future occupiers, neighbouring properties or the wider area, by reason of noise…*
>
> *ii. Preventing both new and existing development from contributing to or being adversely affected by unacceptable levels of …noise pollution.*

4.3 To address the requirements of the national and local policies, the key acoustic matter to be assessed in this case is noise affecting the habitable areas of the proposed development.

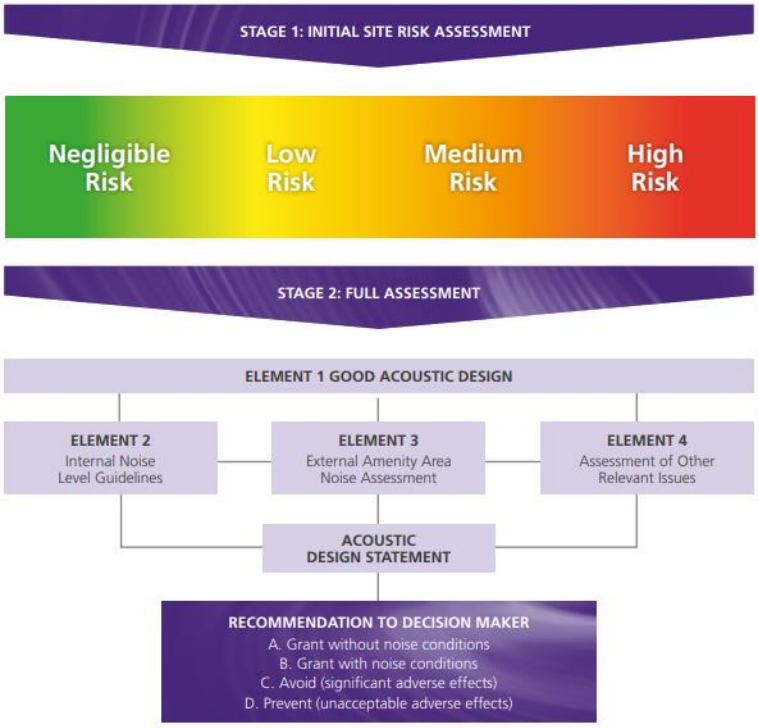
5. NOISE AFFECTING THE DEVELOPMENT

5.1 Specific guidance on the assessment of noise affecting new residential development is given in ProPG: Planning and Noise for New Residential Development, May 2017 (ProPG). The process within the ProPG guidance for the appraisal of noise levels affecting new residential development is considered to be current 'best practice' and has been followed for the assessment. The assessment process can be summarised as follows:

- Stage 1 – measure noise levels at the site and carry out an initial noise risk assessment of the proposed development site based on the measured levels.
- Stage 2 – where a higher noise risk is identified, carry out a detailed assessment including the following four considerations:
    - Element 1 – the overall acoustic design and layout of the site
    - Element 2 – internal noise levels in habitable areas
    - Element 3 – noise levels in external amenity areas
    - Element 4 – consideration of other relevant issues
- Based on the results of the Stage 2 assessment, provide a recommendation to the decision maker on whether planning permission can and should be granted.

5.2 The process is shown visually in Figure 2 below

Figure 2 ProPG Assessment Process



5.3 It should be noted that the guidance in ProPG relates primarily to noise from transportation sources, i.e. road traffic, aircraft, rail etc. Any significant noise from other sources (e.g. industrial, commercial or entertainment sources) is outside the scope of the ProPG guidance and, therefore, requires separate consideration. This is discussed further below in relation to noise from the adjacent petrol station.

Stage 1 – Noise survey and initial assessment

5.4 Noise surveys were previously carried out at the site by RandTech Consulting as part of previous noise assessments for the proposed development. The results of the surveys are shown in RandTech reports ref MDR/J4890 Revision a – d. Excerpts of the noise data from the reports are shown in Appendix 2 for convenience.

5.5 The noise survey results presented in the RandTech Consulting reports (and duplicated in Appendix 2) were measured using an appropriate calibrated sound level meter and we are not aware of any reason why the noise environment at the site would have changed significantly since, therefore the results have been used to inform the assessment outlined in this report.

5.6 Noise levels across the site are reported as being dictated by traffic on surrounding roads, which we would expect given the site location. The longer-term noise logging results shown in the graphs in Appendix 2 are also consistent with those that would be expected at a site dictated by road traffic noise from surrounding roads. For example, the reported noise levels are highest during the early morning and afternoon rush hour periods.

5.7 A series of shorter-term (15 minute) measurements were carried out by RandTech at seven positions from the front to the rear of the site. The results of these measurements show that noise levels are highest at the edge of the site facing Corby Road, but also that there is a significant contribution to noise levels at the rear of the site from road traffic on the A43. This would be expected given that the A43 is a busy dual carriageway.

5.8 No significant noise was reported at the site from activities associated with the adjacent petrol station. This is mainly due to the acoustic screening provided by the main petrol station building, which runs along most of the western boundary of the site and has a blank facade facing the site. There is also a ~2m high close-boarded timber fence which runs along the western boundary of the site and provides a good degree of additional acoustic screening to the southern area of the site that is not positioned behind the main petrol station building.

5.9 However, some low-level noise was identified from an extract fan on the facade facing the site. A measurement of this fan was carried out by RandTech and showed that noise from the fan is approximately 54 dB at 5m when running. The fan is understood to be a kitchen extract fan associated with the Greggs store within the petrol station building. The Greggs store is open from 0500-1700hrs on Monday to Friday and 0700-1630hrs on Saturdays and Sundays. The extract fan would only be expected to operate at these times.

5.10 Based on the results of the RandTech site noise survey, a 3D computer noise model has been developed to predict the noise levels that will exist across the entire development.

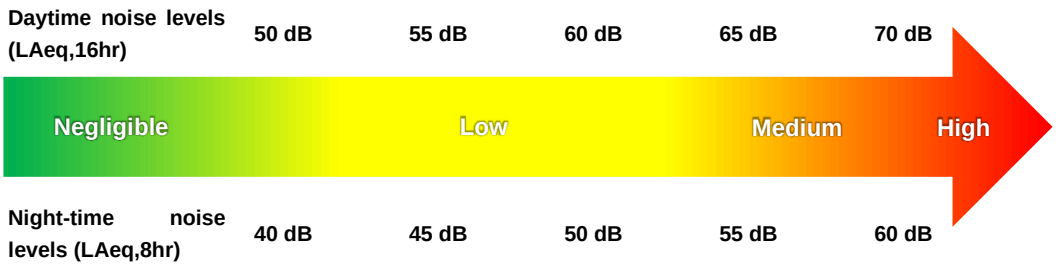
5.11 The 3D noise model was developed using Cadna/A v2023environmental noise modelling software. Cadna/A incorporates the calculation methodology outlined in the Department of Transport Welsh Office - *Calculation of Road Traffic Noise* (CRTN) for the assessment of road traffic noise propagation, and ISO 9613 for industrial-type noise (used in this case to predict noise emissions from the extract fan).

5.12 The layout of the existing site and surrounding area was input to the model, including existing buildings and fencing. Day and night-time average noise levels were then input for the surrounding roads (i.e. Corby Road and the A43) and calibrated to the results of the on-site noise measurements. It was found that the resultant model predictions matched up very well with the RandTech noise survey results at all measurement positions. The layout of the proposed development was then added to the model and the model was used to predict the noise levels external to the facades of the development and within each proposed external amenity area.

5.13 The methodology and results of the noise modelling are provided in Appendix 3. It can be seen from the modelling results that road traffic noise levels will be highest on facades of the development facing Corby Road and the A43.

5.14 The modelled noise levels can be compared with Figure 3 below to assess the 'noise risk' of the site. Where the noise risk is high, significant acoustic design measures may be required to achieve acceptable noise levels in the development. Where the noise risk is low, acceptable noise levels may be achievable with no specific acoustic design measures.

Figure 3 Noise Risk Assessment (Adaption of Figure 1 from ProPG)



5.15 It can be seen from a comparison of the predicted noise levels in Appendix 3 with Figure 3 that the site is 'Low' risk in relation to day and night-time noise levels. ProPG requires that a more detailed 'Stage 2' assessment is carried out for low risk sites but acknowledges that noise will rarely be a barrier for granting planning consent. The Stage 2 assessment is discussed further below.

5.16 It is also important to consider the type of noise at the site. In this case the site is also subject to some noise from the extract fan on the rear façade of the petrol station. Intermittent and/or tonal type noise from commercial or industrial uses is often more annoying to residents than noise from transportation sources at similar levels (e.g. road traffic, railways, aircraft etc). It is therefore necessary to assess the potential impact of this noise on the development separately.

5.17 BS4142:2014 – *Methods for rating and assessing industrial and commercial sound* (BS4142) can be used to assess the impact of noise from external industrial and/or commercial noise sources on residential receptors.

5.18 The BS4142 assessment methodology can be summarised as follows:

1. Measure the existing background noise levels (LA90,T dB) at the locations of nearby noise sensitive receptors during the quietest periods when the noise source(s) under investigation will operate;
2. Predict or measure the noise emissions (LAeq,T dB) from the noise source(s) under investigation at the location(s) of the nearby sensitive receptors, including corrections for any distinguishable acoustic features (e.g. tones, whines, screeches, hisses etc);
3. Subtract the measured background noise levels (item 1 above) with the measured or predicted rating noise levels (item 2 above) at each sensitive receptor. BS4142 states that:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

NOTE Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

5.19 Background noise levels (LA90) at the site were measured as part of the site noise survey outlined in Appendix 2. The measured background noise levels at the site during the early morning period (0500-0600hrs) when the fan would be expected to operate and background noise levels would be lowest was 41 dB LA90,1 hour.

5.20 The predicted rated noise levels (LAeq,T) from the extract fan at the closest bedroom window (Plot 3 Bedroom 3) from the model, including a correction of +2 dB to account for the subjective tonality of the noise (the noise is otherwise constant and therefore not intermittent or impulsive), is 50 dB LAr,Tr,

5.21 The rated noise level is 9 dB higher than the background noise level and therefore BS4142 would rate the noise as “an indication of significant adverse impact, depending on context”.

5.22 Important contextual considerations in this case are:

- Background levels are generally over 50 dB LA90 at the site for the periods during which the extract fan is expected to operate. It is only the first hour of extract fan operation (0500-0600hrs) when the measured background levels were below 50 dB LA90. From 0600-1700hrs, when the background levels are above 50 dB LA90, the extract fan noise would be rated as 'low impact'.
- The predicted levels above are at the position of the 'worst case' bedroom. The noise levels external to all bedrooms other than Plot 3 & 4 Bedroom 3 will be significantly lower as these are further from the fan (for example, the predicted rated fan noise level external to the rear bedrooms of Plot 1 & 2 is 40 dB LAr,Tr, and therefore would be rated as 'low impact' for all time periods).
- Residents moving into new properties are generally less sensitive to existing sources of low-level commercial noise than existing residents subject to new commercial noise sources. In this case, we expect that the new residents would be tolerant of the noise given that it is low-level generally and is only rated as 'significant' in accordance with BS4142 external to a couple of bedrooms between 0500-0600hrs, when any residents in those rooms are most likely to be asleep.
- It will be straightforward to reduce the extract fan noise down to acceptable levels in the affected bedrooms using appropriate windows and ventilators. However, it is also important to consider the impact of openable windows as per the Acoustic, Ventilation and Overheating Residential Design Guide, January 2020 (AVO Guide). With regards to overheating and thermal comfort, the development will be subject to the new Part O of the Building Regulations which came into force in June 2022. We expect that compliance with Part O requirements will require that these bedrooms are ventilated so that the windows can remain closed through the night-time period (2300-0700hrs) and this would include the period from 0500-0600hrs when the higher than ideal extract fan noise is present. This could also be controlled by a suitable planning condition if deemed necessary by the local planning authority.
- The predicted rated extract fan noise in all new external amenity areas would be rated as 'low impact' in accordance with BS4142 (the highest predicted level is 38 dB LAr,Tr in the garden of Plot 1). It should also be borne in mind that the extract fan is currently directly overlooking an existing garden.

5.23 On the basis of the above, it is our view that the extract fan noise is acceptable provided that it is reduced to acceptable levels in the affected bedrooms of Plot 3 & 4 when the windows are closed. This is discussed further below.

Stage 2 – Element 1 – Overall acoustic design of the site

5.24 The acoustic design of the development has been reviewed in relation to the measured noise levels at the site. In our view the proposed layout of the development is good from an acoustics perspective for the following reasons:

- The layout includes a buffer between Corby Road and the nearest new properties. The width of the buffer is similar to existing residential properties along Corby Road.

- The new access road on the site provides a buffer between the nearest new properties and the access road to the petrol station from Corby Road. The distance between the nearest new property and the access road is similar to the distance between the existing dwelling and the access road.
- The gardens to properties facing Corby Road are positioned behind the new dwellings and therefore are well acoustically screened from road traffic on Corby Road.
- The new access road and car parking area is located adjacent to the fan. These areas will be significantly less noise sensitive than the existing garden, which the extract fan currently directly overlooks. There is also the opportunity to reduce the extract fan noise in the new properties (discussed further below).

Stage 2 – Element 2 - Internal noise levels

5.25 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'.

5.26 Relevant BS8233 design criteria are summarised in Table 1 below.

Table 1 BS8233:2014 Internal Noise Criteria

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

5.27 It is also considered appropriate in this case to assess the potential impact of noise emissions from individual vehicle movements on the bedrooms of the development during the night-time. This is in line with guidance given in BS8233:2014 and ProPG, which both point out that regular individual noise events during the night have the potential to cause sleep disturbance.

5.28 Appropriate design criteria for acceptable maximum noise levels in habitable rooms of new residential developments are given in the ProPG guidance, which 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 45 dB LAmax,F more than 10 times a night.*"

5.29 Therefore, the following acoustic design criteria have been adopted for the development:

- Average noise levels in living rooms and dining rooms during the day should not exceed 35 dB LAeq,0700-2300hrs and 40 dB LAeq,0700-2300hrs respectively;
- Average noise levels in bedrooms should not exceed 35 dB LAeq,0700-2300hrs during the day and 30 dB LAeq,2300-0700hrs during the night;
- Maximum noise levels should not regularly exceed 45 dB LAmax in bedrooms during the night.

5.30 Full construction details for the development have not been finalised as the project is at an early design stage. It has therefore been assumed that the external walls of the development will be constructed using a standard masonry construction (e.g. 102mm brick, 100mm insulated cavity, 100mm concrete block) or a light-weight construction designed to achieve a similar level of sound insulation (this is technically achievable subject to detailed design). Consequently, internal noise levels would be dictated by external noise ingress via glazing and ventilators.

5.31 The ventilation scheme for the project has not yet been decided; therefore, for the purpose of the assessment, it has been assumed that background ventilation will be provided via trickle ventilators in the external facades as this represents a 'worst case' scenario in terms of noise ingress.

5.32 Calculations were carried out using facade modelling software in accordance with the methodology given in BS8233:2014 to calculate the sound insulation performance required of the glazing and ventilation to achieve the nominated internal noise criteria in the 'worst-case' habitable rooms of the development (i.e. the habitable rooms that will be subject to the highest external noise levels).

5.33 If acceptable internal noise levels can be achieved in 'worst case' habitable rooms then it follows that acceptable internal noise levels can be achieved in all other habitable rooms of the development using similar glazing and ventilator types.

5.34 The results of the calculations are shown in Appendix 4 and are summarised in Table 2 below.

Table 2 Acoustic Requirements for 'Worst Case' Habitable Rooms

'Worst Case' Rooms	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements (in Open Position)
Bedrooms facing Corby Road	26 dB Rw+Ctr	31 dB Dne,w + Ctr
Living rooms facing the A43	26 dB Rw+Ctr	31 dB Dne,w + Ctr
Bedrooms closest to the extract fan	26 dB Rw+Ctr	31 dB Dne,w + Ctr

5.35 The required sound insulation performance values in Table 2 could be achieved by the standard glazing and ventilator types shown in Table 3.

Table 3 Typical Glazing / Ventilator Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
4/16/4mm standard thermal double glazing	27
Ventilators	**Typical Acoustic Performance (Dnew + Ctr)**
Standard 'hit & miss' in-frame trickle ventilator	31

Note The acoustic performance of the glazing systems (including frames) should always be confirmed with the manufacturer before selection for installation on site

5.36 It can be seen from the above that acceptable internal noise levels will be achievable in the development with standard “non-acoustically upgraded” glazing and ventilators. It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the habitable rooms.

5.37 It should be noted that it will be possible to use lower acoustic performance façade elements for façades that are further from or acoustically screened from the surrounding noise sources. This could be investigated further at the detailed design stage.

5.38 The AVO Guide discusses the importance of considering the need for residents to open their windows during warmer months for thermal comfort, as this will reduce the sound insulation provided by windows and the external facade. The development will be subject to the recently published Part O of the Building Regulations (Approved Document O), which came into effect on 15 June 2022 and states:

> *In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*
>
> *Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.*
>
> *a. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).*
>
> *b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).*

5.39 The results of the noise modelling indicate that bedrooms directly facing Corby Road and the A43 may exceed the noise limits provided in Approved Document O when the windows are opened. This will depend how open the windows need to be to control overheating. This will need to be confirmed as part of the overheating assessment during the detailed design stage (this is a Building Regulations matter and therefore compliance will need to be demonstrated to Building Control).

Stage 2 – Element 3 – Noise levels in external amenity areas

5.40 BS8233 states that it is desirable that noise levels in external amenity areas of residential developments do not exceed 50 dB LAeq and that 55 dB LAeq,T should be regarded as an upper guideline value. However, BS8233 recognises that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources. In these cases, BS8233 states that the development should be designed to achieve the lowest practicable noise levels in the amenity spaces.

5.41 The noise modelling results indicate that noise levels in external amenity areas will comply with the BS8233 recommended levels. It should be noted that the modelling includes the benefit of the proposed min. 1.8m high close-boarded timber fencing to the gardens. The proposed development is therefore also considered to be acceptable based on noise levels in external amenity areas.

Stage 2 – Element 4 – Other relevant issues

5.42 In our view the design and acoustic approach outlined above and embedded in the development design generally is in line with both local and national noise policy. It is common for residential properties to be situated near to roads and this is an acceptable scenario provided that the properties are acoustically upgraded where necessary to achieve acceptable noise levels in habitable areas.

Recommendation to decision maker

5.43 It is our view that there is no noise-related reason why planning permission should not be granted.

6. CONCLUSIONS

6.1 Noise levels at the site are dictated by road traffic noise emissions from Corby Road, the A43, and other main roads in the area.

6.2 A 3D noise model of the development was constructed based on the results of site noise surveys and used to calculate road traffic noise levels at all facades of the development and in external amenity areas.

6.3 Noise from an extract fan at the back of the petrol station has been assessed in accordance with BS4142. The noise is predicted to generally have a low impact on the proposed properties and will be well within BS8233 recommended levels in the nearest bedrooms when their windows are closed.

6.4 The design of the development is compliant with noise-related planning policy subject to the adoption of acoustically upgraded glazing and ventilation and acoustic screening around gardens.

6.5 It is our view that the site is suitable for the development in terms of noise levels and that planning permission may be granted.

Appendix 1 Development Layout

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Appendix 2 Survey Results

Excerpts from RandTech Consulting Ltd reports MDR/J4890a-e

Noise Survey Method

Measurement of L_{Aeq} & L_{Amax} with 1hour recording intervals, were taken at the site location of proposed Plot 2 dwelling, free-field, 1.5m above ground level, representing the noisiest location for the habitable room windows in the proposed residential development. Please see attached site plans.

The instrumentation used for the noise measurement survey was a Rion NL-52 precision grade real time analyser/sound level meter, serial number 00510142. The RTA was calibration checked before and after the measurement periods. A copy of the instrumentation certificate of calibration is attached.

Recorded Measurement

The noise measurement survey was undertaken from 13.00hrs 10/1/22 to 13.00hrs 11/1/22, to define the typical environmental noise levels for the day 07.00hrs-23.00hrs period and night 23.00hrs-07.00hrs period, under satisfactory weather conditions at the site location.

The day $L_{Aeq\ 16hr}$ level for recorded was 52.4dB

The night $L_{Aeq\ 8hr}$ level recorded was 46.4dB

The average night $L_{Amax\ 1hr}$ level recorded was 61.5dB

The primary noise contribution was from the continuous road traffic in the locality and from the continuous operation of a ventilation system with a discharge grille located on rear wall of the petrol station retail building, please see the attached graph for the survey period for L_{Aeq} & L_{Amax} with 1 hour recording intervals.

In addition, we measured the continuous daytime noise from an extract fan located on the rear wall of the petrol station building, recording 54.4dB $L_{Aeq\ 30min}$ at a distance of 5m from the fan, where the fan noise was just higher than the road traffic noise. The nearest proposed house window will be approximately 8m distance from the extract fan location, which suggests a fan noise level at the nearest residential window, Plot 3, of approximately 50dB $L_{Aeq\ t}$; this is fairly comparable with the daytime road traffic noise level of 52.4dB $L_{Aeq\ 16hr}$ which we established for Plot 2 road façade, which will be used for the design selection of mitigation.

In addition, the petrol station site has a small cion operated air compressor for tyre inflation located on the west side of the petrol station site and this makes no noise contribution to any plot locations on the proposed development site.

In addition, the petrol station operation, which includes a grocery shop and two takeaway restaurant operations make no clearly audible noise impact to the plot locations on the proposed development site, in comparison to the primary noise impact from road traffic inn the locality.

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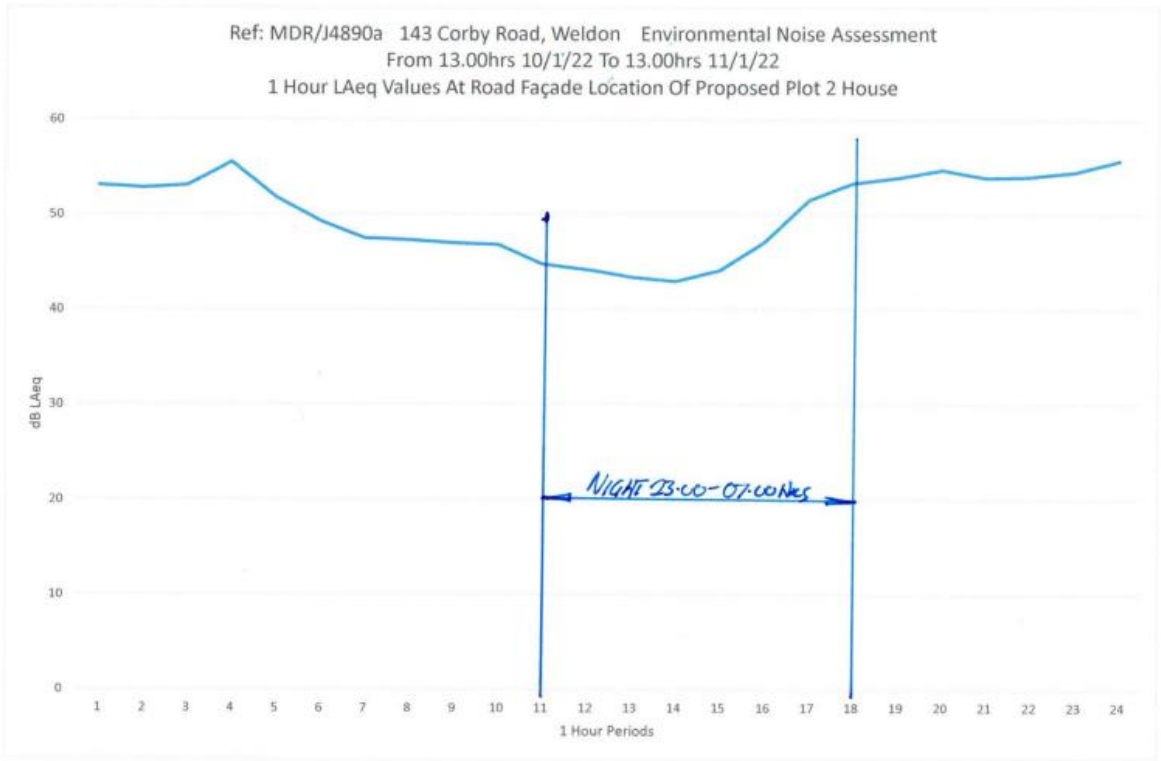
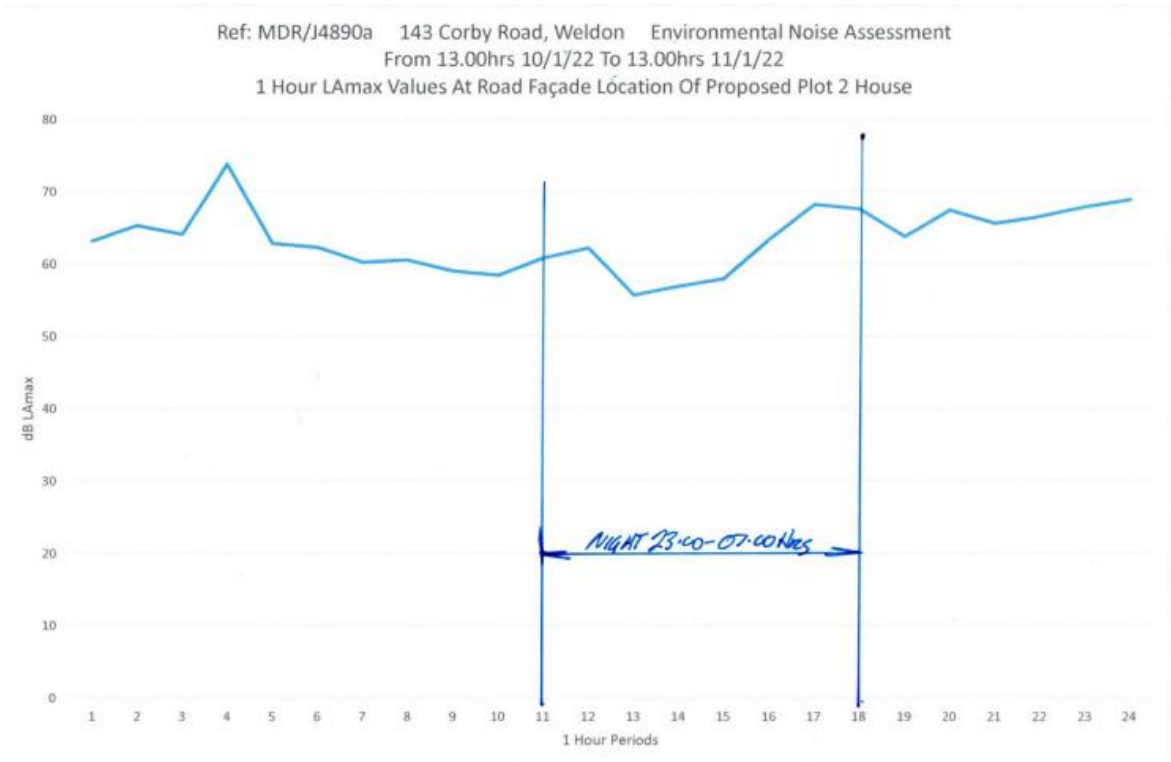

Ref: MDR/J4890a 143 Corby Road, Weldon Environmental Noise Assessment
From 13.00hrs 10/1/22 To 13.00hrs 11/1/22
1 Hour LAeq Values At Road Façade Location Of Proposed Plot 2 House
dB LAeq
1 Hour Periods
NIGHT 23:00-07:00Hrs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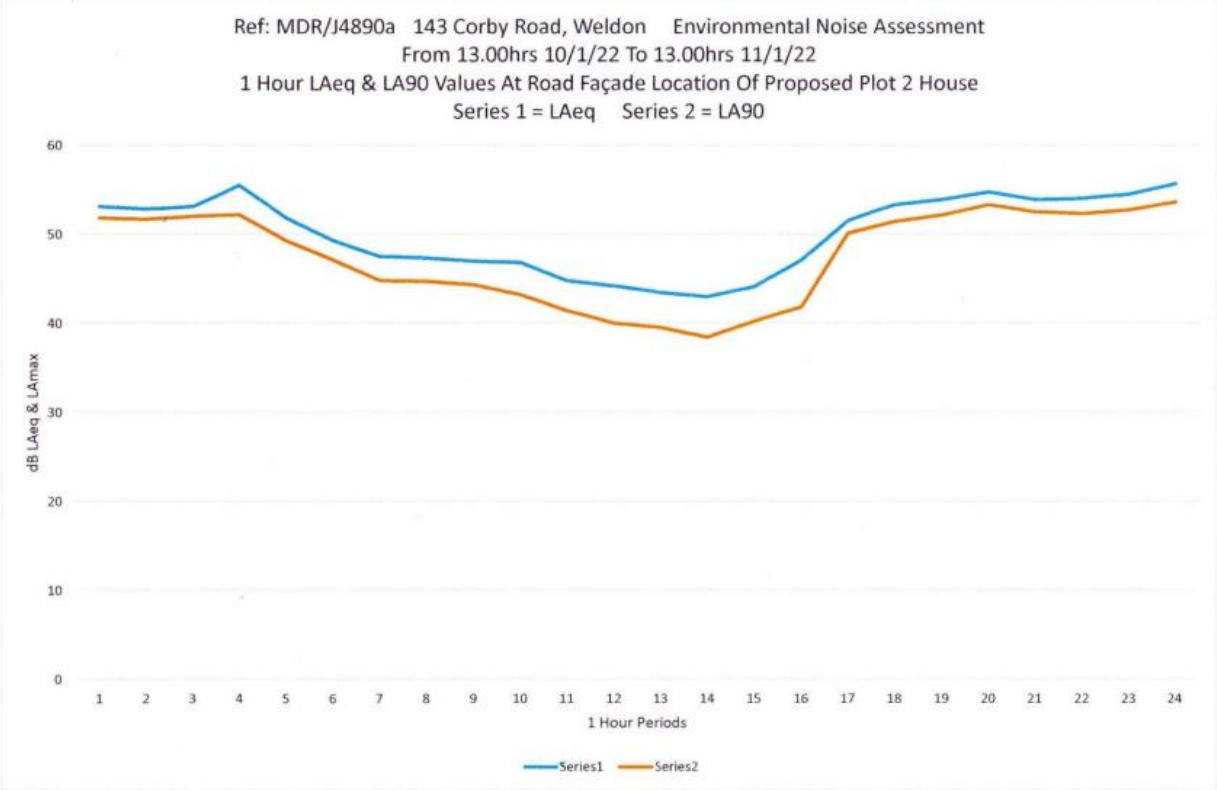

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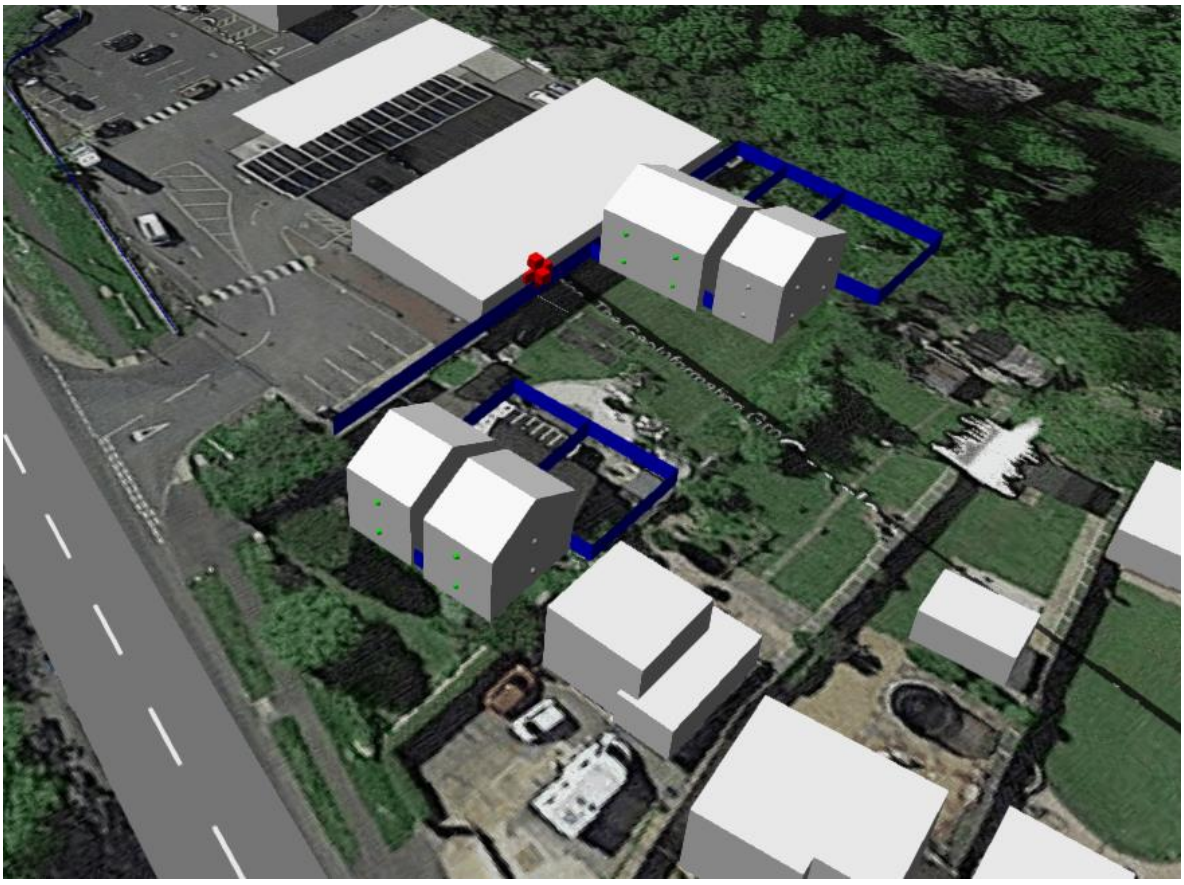
Appendix 3 Modelling Results

Modelling Software:	CADNA/A Version 2022
Modelled Scenarios:	Day and night-time average noise levels across the site.
Data inputs:	• Noise survey results • Development layout
Calculation Algorithms Used:	• Calculation of Road Traffic Noise 1988 – Department of Transport • ISO 9613-1:1993 Acoustics-Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere • ISO 9613-2:1996 Acoustics-Attenuation of sound during propagation outdoors – Part 2: General method of calculation

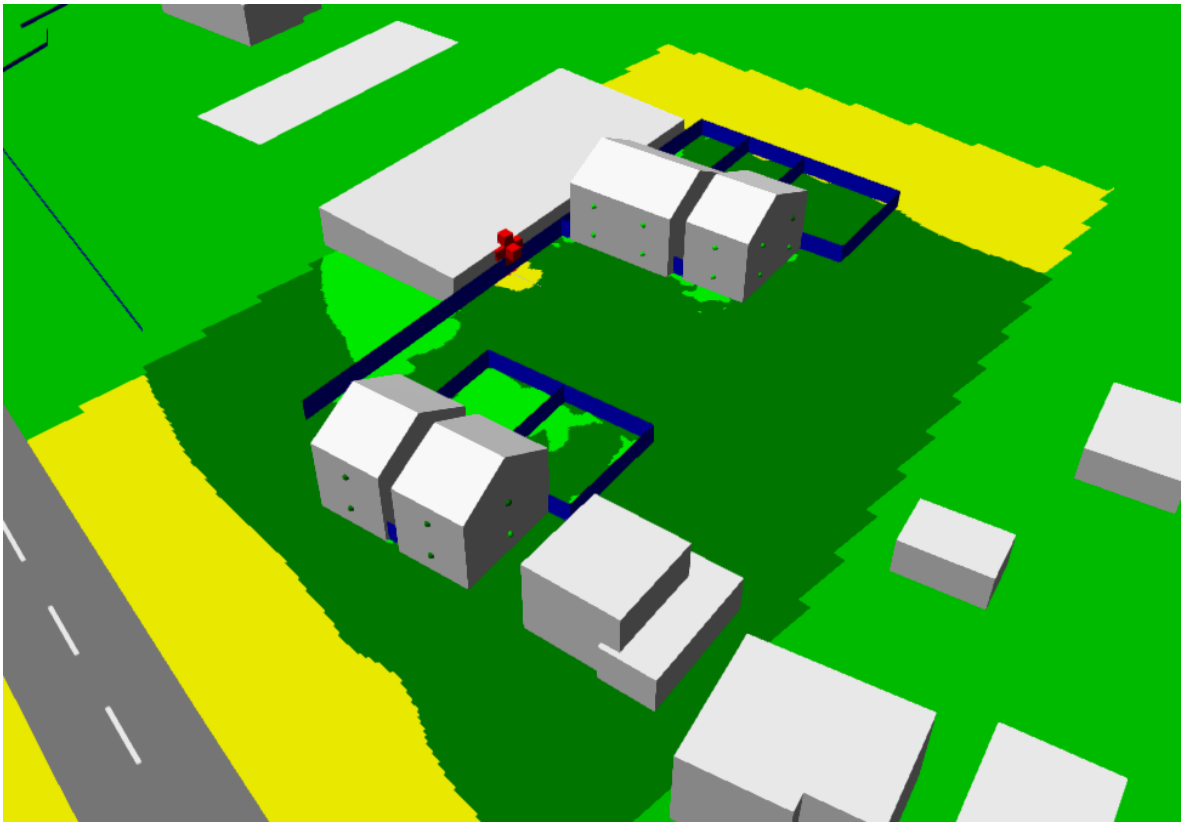
Modelling Printout:

Scenario	Site Layout

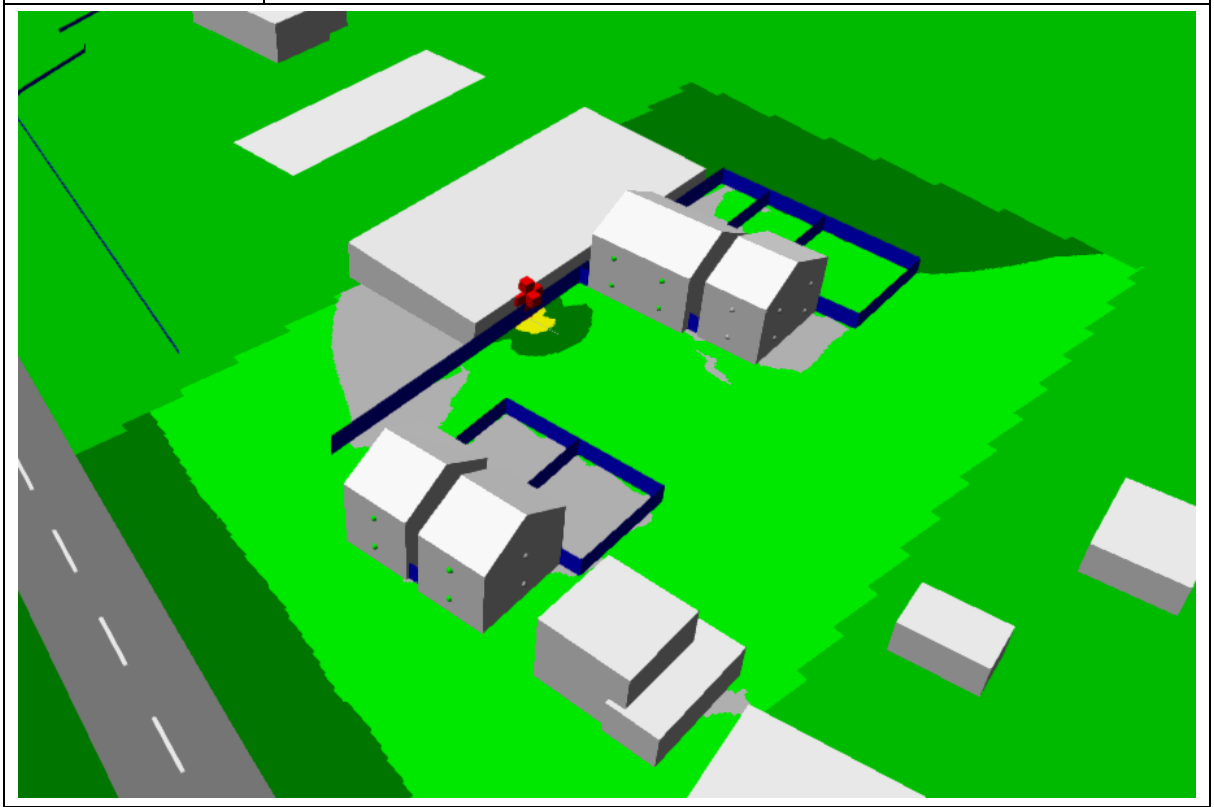


Modelling Printout:

Scenario	Daytime noise levels (LAeq,16hr) at 1.5m above ground level



Scenario	Night-time noise levels (LAeq,8hr) at 1.5m above ground level



Appendix 4 Facade calculations

FACSIM V2.7.7 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT:	143 Corby Road, Weldon
ROOM:	Worst case Bedroom facing extract fan (Plot 3 Bedroom 3)
VARIANT:	Lar,Tr (extract fan noise)
NOTES:	

Room Dimensions [m] W 2.5 X L 3.4 X H 2.4

Room Volume = 20.4 m3
Partition Area = 15.1 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>> Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

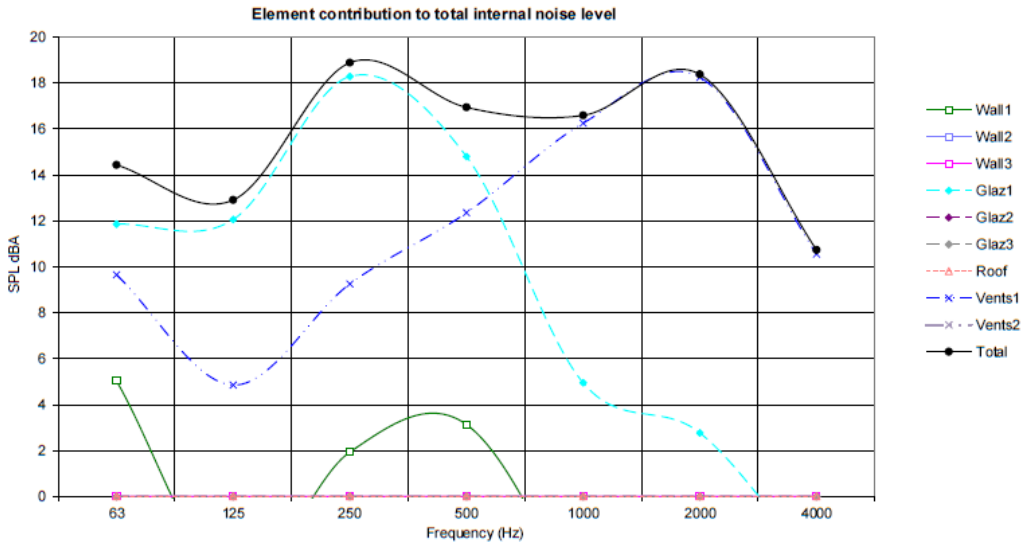
	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	50.0	34.8	35.0	39.7	43.9	45.4	42.7	38.7	
Road traffic spectrum (according to BS 8233:1999 section 6)									
		34.8	35.0	39.7	43.9	45.4	42.7	38.7	**Direct input**

REVERBERATION TIME

DIRECT INPUT ---->								**No data**
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	13.7	36	45	44	47	57	67	77	2%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	26 dB Rw + Ctr - Standard Thermal Double Glazing	1.4	19	19	18	25	37	36	38	44%	26 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		29	29	28	35	47	47	49				
	Resultant SPL inside room excluding ventilators dB	21.5	13	12	18	15	5	3	-3	47%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Hit and miss trickle (4000mm^2) e.g. Titon Trimvent XS13	1	30	35	35	36	34	29	33	52%	32	0	-1
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	22.0	10	5	9	12	16	18	11	53%			
	Total SPL inside room	**24.8**	14	13	19	17	17	18	11				



FACSIM V2.7.7 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS123 54-3 and BS8233

PROJECT:	143 Corby Road, Weldon
ROOM:	Worst case Bedroom facing Corby Road (Plot 1 Bedroom 2)
VARIANT:	LAmax
NOTES:	

Room Dimensions [m] W 3.2 X L 3.1 X H 2.4

Room Volume = 23.8 m3
Partition Area = 16.4 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>>
Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								**No data**
Road traffic spectrum (according to BS 8233:1999 section 6)	69.0								
		50.8	54.9	58.4	61.8	65.0	62.2	57.0	**Reference spectrum**

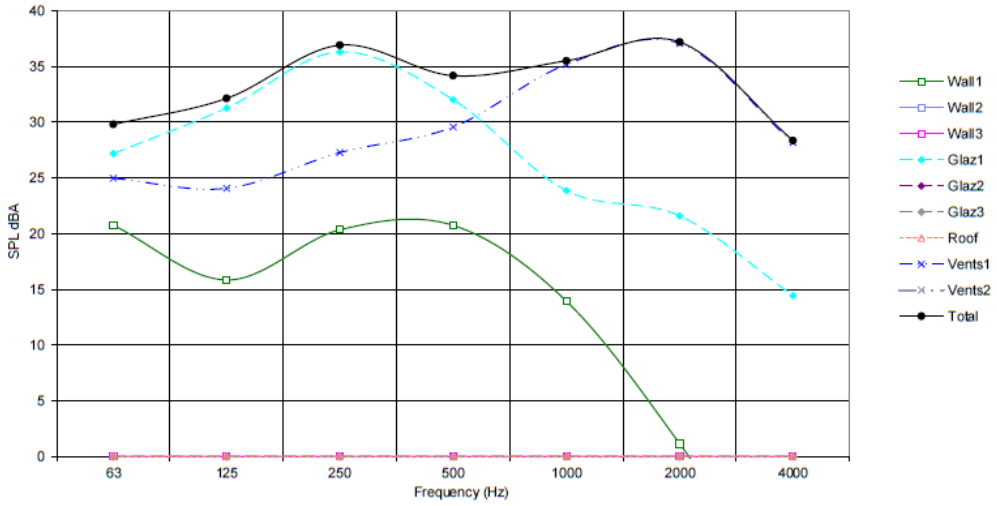
REVERBERATION TIME

DIRECT INPUT ---->								**No data**
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	15.0	36	45	44	47	57	67	77	2%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	26 dB Rw + Ctr - Standard Thermal Double Glazing	1.4	19	19	18	25	37	36	38	42%	26 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		29	30	28	36	47	47	49				
	Resultant SPL inside room excluding ventilators dB	39.3	28	31	36	32	24	22	14	44%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Hit and miss trickle (4000mm^2) e.g. Titon Trimvent XS13	1	30	35	35	36	34	29	33	56%	32	0	-1
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	40.4	25	24	27	30	35	37	28	56%			
	Total SPL inside room	**42.9**	30	32	37	34	36	37	28				

Element contribution to total internal noise level



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FACSIM V2.7.7 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT:	143 Corby Road, Weldon
ROOM:	Worst case Bedroom facing Corby Road (Plot 1 Bedroom 2)
VARIANT:	LAeq,8hrs
NOTES:	

Room Dimensions [m] W 3.2 X L 3.1 X H 2.4

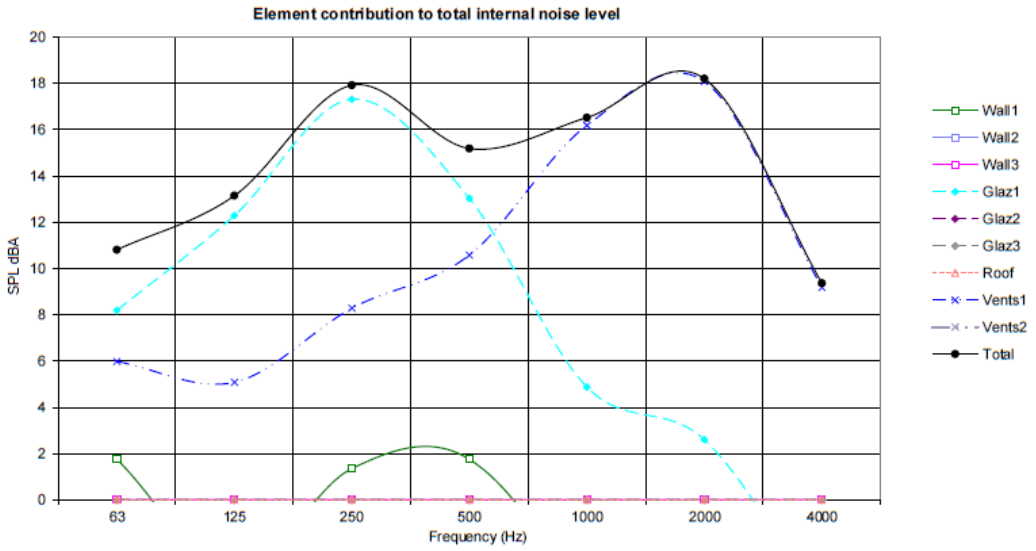
Room Volume = 23.8 m3
Partition Area = 16.4 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>> Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-								**No data**
Road traffic spectrum (according to BS 8233:1999 section 6)	50.0								
		31.8	35.9	39.4	42.8	46.0	43.2	38.0	**Reference spectrum**
REVERBERATION TIME									
DIRECT INPUT ----->									**No data**
EQUAL RT for all bands ----->									
		0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	15.0	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	26 dB Rw + Ctr - Standard Thermal Double Glazing	1.4	19	19	18	25	37	36	38	41%	26 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		29	30	28	36	47	47	49				
	Resultant SPL inside room excluding ventilators dB	20.3	9	12	17	13	5	3	-5	44%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Hit and miss trickle (4000mm^2) e.g. Titon Trimvent XS13	1	30	35	35	36	34	29	33	56%	32	0	-1
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	21.4	6	5	8	11	16	18	9	56%			
	Total SPL inside room	**23.9**	11	13	18	15	17	18	9				



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FACSIM V2.7.7 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

PROJECT:	143 Corby Road, Weldon
ROOM:	Worst case Living room facing A43
VARIANT:	LAeq,16hrs
NOTES:	

Room Dimensions [m]: W 5.0 X L 4.2 X H 2.6

Room Volume = 54.6 m3
Partition Area = 23.9 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>> Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

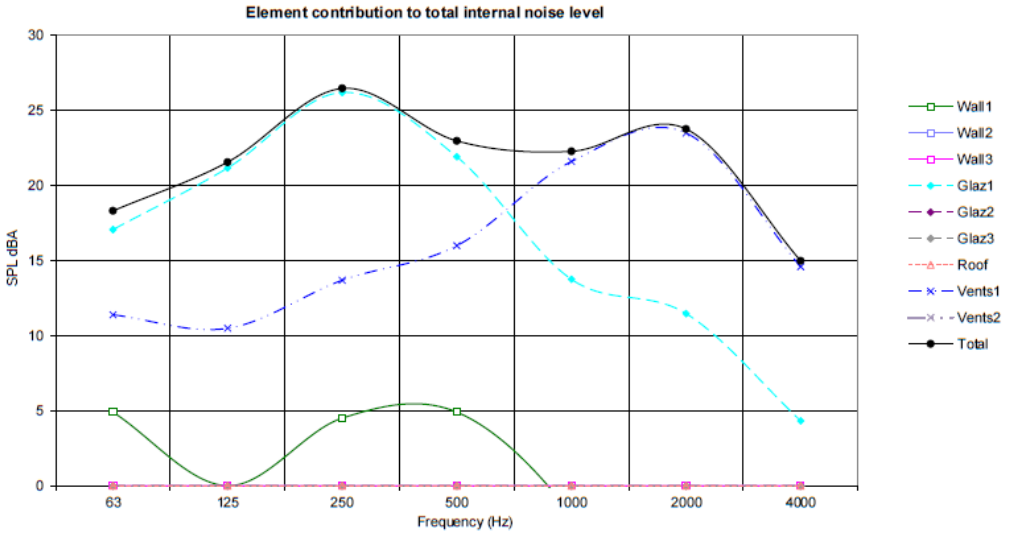
	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								No data
Road traffic spectrum (according to BS 8233:1999 section 6)	56.0								
		37.8	41.9	45.4	48.8	52.0	49.2	44.0	Reference spectrum

REVERBERATION TIME

DIRECT INPUT ---->								No data
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	17.9	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	26 dB Rw + Ctr - Standard Thermal Double Glazing	6.0	19	19	18	25	37	36	38	61%	26 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		25	25	24	31	42	42	44				
	Resultant SPL inside room excluding ventilators dB	29.0	17	21	26	22	14	11	4	62%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Hit and miss trickle (4000mm^2) e.g. Titon Trinvent XS13	2	30	35	35	36	34	29	33	37%	32	0	-1
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	26.8	11	10	14	16	22	23	15	38%			
	Total SPL inside room	**31.1**	18	22	26	23	22	24	15				



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