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Architectural & Environmental Acousticians

Noise & Vibration Engineers

Noise Impact Assessment

Land South of A14 Cambridge Services, CB23 4WU

[redacted]

Noise Impact Assessment

Project: LAND SOUTH OF A14 CAMBRIDGE SERVICES, CB23 4WU

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Our details:

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TABLE OF CONTENTS

1. INTRODUCTION

1.1 Cass Allen has been instructed by [redacted] to assess the noise impact of a proposed new development at Land South of A14 Cambridge Services, CB23 4WU.

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

1.3 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 occupied areas;
- To assess the potential impact of noise emissions from mechanical plant and operational activities associated with the development at the positions of existing sensitive receptors in the area.

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

2. PROJECT DESCRIPTION

2.1 The site is located in a mixed-use area and currently contains a combination of agricultural farmland and land undergoing excavation works. The site is bounded to the north east by Boxworth Road/Elsworth Road and commercial units are positioned north of this road. The A14 is positioned approximately 35m from the north eastern border of the site and the A14 Services boarders the site to the north. The A14 Services include restaurants, a fuel station and a hotel. To the south, east and west of the site is agricultural farmland.

2.2 The site location is shown in Figure 1 below.

Figure 1 Site Location and Surrounding Area

2.3 The proposal is to develop the site into commercial units. At this stage of the planning process, details of the proposed site layout are fairly general and subject to change. However, the site location plan is shown Appendix 1.

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3. PLANNING POLICY

National Policy

3.1 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.*

Local Policy

3.2 Greater Cambridge Sustainable Design and Construction Supplementary Planning Document (SPD) (January 2020) provides guidance on the assessment of noise affecting new developments. This document combines Cambridge and South Cambridgeshire Local Policies to create a unified approach. As referenced within the document, South Cambridgeshire Council's Local Plan (September 2018) Policy SC/10: Noise Pollution states:

> *1. Planning permission will not be granted for development which:*
>
> *a. Has an unacceptable adverse impact on the indoor and outdoor acoustic environment of existing or planned development;*
>
> *b. Has an unacceptable adverse impact on countryside areas of tranquillity which are important for wildlife and countryside recreation;*
>
> *c. Would be subject to unacceptable noise levels from existing noise sources, both ambient levels and having regard to noise characteristics such as impulses whether irregular or tonal.*
>
> *2. Conditions may be attached to any planning permission to ensure adequate attenuation of noise emissions or to control the noise at source. Consideration will be given to the*

increase in road traffic that may arise due to development and conditions or Section 106 agreements may be used to minimise such noise.

3. Where a planning application for residential development is near an existing noise source, the applicant will be required to demonstrate that the proposal would not be subject to an unacceptable noise levels both internally and externally.

4. The Council will seek to ensure that noise from proposed commercial, industrial, recreational or transport use does not cause any significant increase in the background noise level at nearby existing noise sensitive premises which includes dwellings, hospitals, residential institutions, nursing homes, hotels, guesthouses, and schools and other educational establishments.

3.3 The SPD also references Policy 35 – 'Protection of human health and quality of like from noise and vibration', as written in the Cambridge Local Plan (October 2018), which states:

Development will be permitted where it is demonstrated that:

a. it will not lead to significant adverse effects and impacts, including cumulative effects and construction phase impacts wherever applicable, on health and quality of life/amenity from noise and vibration; and

b. adverse noise effects/impacts can be minimised by appropriate reduction and/or mitigation measures secured through the use of conditions or planning obligations, as appropriate (prevention through high quality acoustic design is preferable to mitigation).

Residential and other noise sensitive development will be permitted where it can be demonstrated that future users of the development will not be exposed internally and externally to unacceptable levels of noise pollution/disturbance from existing or planned uses.

3.4 To address the requirements of the national and local policies, the following key acoustic matters have been assessed:

- Noise affecting the noise sensitive areas of the proposed development;
- Noise emissions from mechanical plant associated with the development at the position of existing sensitive receptors in the area; and
- Noise emissions from operational activities associated with the development at the positions of existing sensitive receptors in the area.

4. NOISE AFFECTING THE DEVELOPMENT

4.1 The noise levels that will exist within the noise sensitive areas of the finished development have been predicted based on the existing noise environment at the site and outline details for the design of the development. The predicted noise levels have then been compared with appropriate design criteria. Where the criteria have been predicted to be exceeded, suitable mitigation measures have been identified.

Design criteria – Internal noise levels

4.2 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*'.

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

Table 1 Recommended Internal Ambient Noise Level Criteria

Space	Internal Ambient Noise Level Criteria, dB LAeq,T
Executive Office	35-40
Staff/meeting room, training room	35-45
Open plan/ Speculative office	45-50
Corridors/ Reception / Circulation spaces	45-55
Toilets	50-55

Existing site noise levels

4.4 A noise survey was carried out at the site from 17th to 19th Novermber 2021 to assess existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.

4.5 Average noise levels across the site were generally dictated by road traffic on the A14. Average noise levels at the northern edge of the site were also affected by sporadic vehicle movements on Boxworth Road/Elsworth Road.

4.6 Maximum noise levels at the north of the site were dictated by vehicle passes on the A14. Maximum noise levels at the northern edge of the site were generally dictated by vehicle movements on Boxworth Road/Elsworth Road.

4.7 Background noise levels (LA90) across the site were dictated by constant road traffic noise from the A14.

4.8 Areas of the development at the eastern edge of the site will be subject to the highest noise levels as a results of road traffic on the A14. The noise survey results show that noise levels at this position are as follows:

- Average noise levels during the daytime - 62 dB LAeq,0700-2300hrs;
- Average noise levels during the night-time - 52 dB LAeq,2300-0700hrs;

The above noise levels include a distance correction to take into account the distance between the nearest proposed building and the A14. Our calculations assume the nearest proposed building will be positioned no closer than 45m from the A14.

Internal noise levels in noise-sensitive rooms

4.9 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.

4.10 The ventilation scheme for the project has not yet been decided and therefore we have assumed that buildings are to be ventilated using full mechanical ventilation systems. Therefore, there will be no background ventilators in the external facades (e.g. trickle ventilators etc).

4.11 In our view, the sound insulation performance of the glazed elements within the facade would need to be approximately 30dB Rw + Ctr. The requirements given are approximate only and should be confirmed at the detailed design stage when full design details are available. Our assessment assumes the proposed building is located close to the A14. Should the building be located further away, noise levels will be lower and as such the sound insulation requirements of the facade would also be lower.

4.12 The required sound insulation performance values could typically be achieved by the glazing types shown in Table 2.

Table 2 Typical Glazing Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
4/16/4mm standard thermal double glazing	27
6/16/6.4mm thermal double glazing	31

4.13 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the specification of suitable glazing and ventilation systems at the detailed design stage. It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the occupied rooms.

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

5. PLANT NOISE IMPACT ASSESSMENT

Design criteria – Mechanical plant noise

5.1 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 nearby sensitive receptors.

5.2 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, and add 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.

5.3 It is understood that South Cambridgeshire District Council consider "less than or equal to the existing background level at the boundary" to be an appropriate criterion for noise emissions from new developments within their borough. These criteria have been adopted for the assessment of noise emissions from the development.

5.4 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 have been used to develop limits for plant noise emissions from the new development at the positions of the surrounding residential

properties in accordance with the BS4142 assessment methodology. The limits are shown in Table 3 below.

Table 3 BS4142 Noise Limits - Free-field Levels

Location	Period	
	Day-time/Evening (0700-2300hrs)	Night-time (2300-0700hrs)
Site boundary	52 dB LAr,Tr	49 dB LAr,Tr

Note 1 The above limits are 'rated' noise levels. Any mechanical plant noise emissions should have appropriate corrections for the character of the noise applied and still meet these limits.

Proposed mechanical plant design

5.5 Detailed design information is not yet available for external mechanical plant or commercial activities associated with the development, and therefore noise emissions from external mechanical plant and commercial activities cannot be accurately predicted at the positions of nearby residential properties at this stage.

5.6 The selection and design of external mechanical plant will be reviewed as project information becomes available to ensure that the project BS4142:2014 noise limits given in Table 3 are achieved.

6. CONCLUSIONS

6.1 Cass Allen was instructed by [redacted] to assess the suitability of the site for the proposed development with regards to noise.

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

6.3 A noise survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from the A14.

6.4 Noise affecting the development has been assessed in accordance with BS8233. The site is considered to be acceptable for commerical development subject to the adoption of the glazing and ventilation strategy as detailed in this report. This can be investigated further as more details of the development design become available.

6.5 Appropriate limits for noise from mechanical plant and commercial activities have been calculated based on measured noise levels at the site and guidance given in BS4142. This will be investigated further as more details become available.

6.6 In summary of the above it is our view that the site is suitable for the development in terms of noise levels.

Appendix 1 Site Location Plan

Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by road traffic on the A14.

Survey Period:

17/11/2021 to 19/11/2021

Survey Objectives:

- To identify noise sources that contribute to ambient noise levels at the site;
- To measure noise levels around the site over a typical day and night-time period.

Equipment Used:

Type	Manufacturer	Model	Serial Number
Sound level meter[1] (noise logger)	Rion	NL-32	01182950
Calibrator	Rion	NC-74	34551703
Sound level meter[1]	Rion	NL-52	00965090

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring.

Measurement Positions:

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to the A14 (~45m away).
N2	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Boxworth Road/Elsworth Road (~10m away) and the A14 (~320m away).
L1	Unattended noise logging position. 3m above ground level. Free-field. Direct line of sight to A14 (~225m away).

Site Plan showing Measurement Positions:

Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LAmax, dB	LA90, dB	Observations
17/11/2021	N1	11:05	5 mins	67	73	64	Noise dictated by road traffic from A14
		11:10		67	73	65	
		11:15	11 secs	68	72	66	
		11:15	13 secs	66	68	64	
		11:15	8 secs	67	69	66	
	N2	11:35	5 mins	59	73	53	Noise dictated by road traffic from A14. Maximum levels dictated by fast vehicle passes on Boxworth Road/Elsworth Road
		11:41	5 mins	63	79	55	

Unattended Noise Monitoring Results:

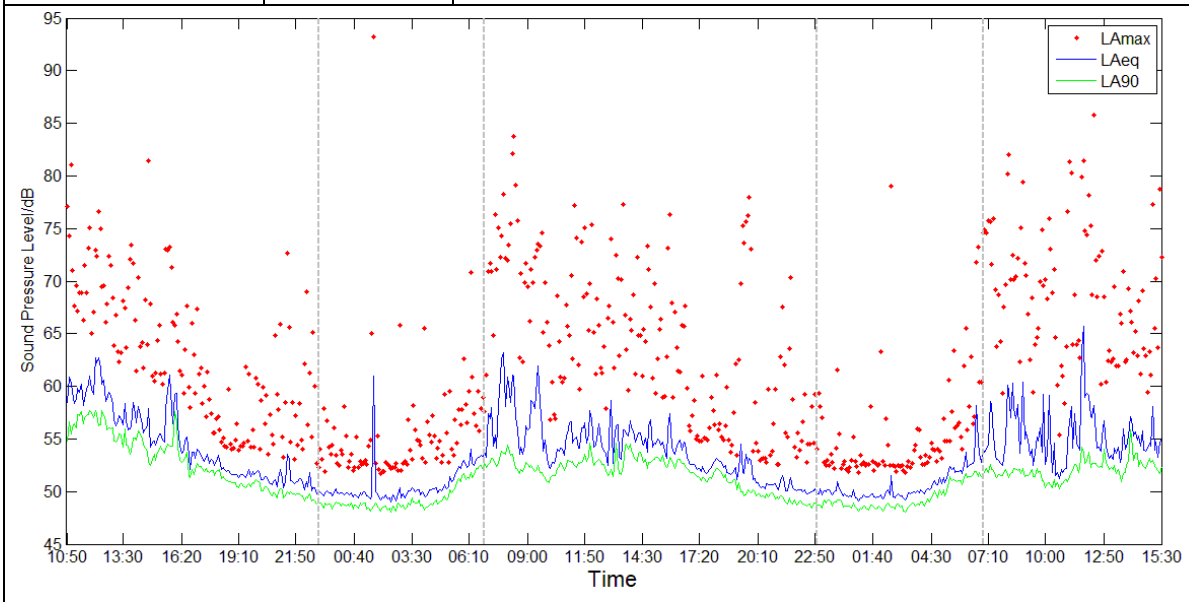
Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB[1]	LAeq,8hr, dB	LA90,5mins, dB[1]	LAmax, dB[2]
17/11/2021 to 19/11/2021	L1	55	52	51	49	58-60

Note 1: Typical lowest measured during the period shown.

Note 2: Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

Unattended Noise Monitoring Results:

Meas. Period	Position	
17/11/2021 to 19/11/2021	L1	



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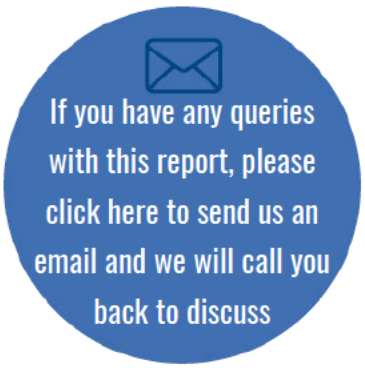

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