






LUSTRE
CONSULTING

HAINE ROAD, RAMSGATE

NOISE ASSESSMENT





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NON-TECHNICAL SUMMARY

A new residential development is proposed on land to the west of Haine Road in Ramsgate. The local authority, Thanet Council, has requested that assessments of noise due to road traffic and nearby industrial/commercial activities are undertaken

Lustre Consulting has undertaken a noise survey to assess daytime and night-time noise levels affecting the proposed development site. The levels measured were reasonable, considering the locations of the measurement positions and the dominant nearby noise sources.

The effect of road traffic on the proposed dwellings has been assessed. It has been concluded that, even for the worst-case façades at the noisiest site boundary, acceptable noise levels can be achieved within the proposed dwellings.

By considering potential screening of Haine Road (by a screen or by buildings), as well as the development layout and orientation of the proposed buildings, noise levels affecting the building façades can be significantly reduced.

In addition, assessments have been undertaken to predict the potential noise impact of farm/industrial noise emanating from the west of the site, as well as due to the golf centre to the south/south-west of the site. For each potential source, the assessment determined a low noise impact.

As such, it is concluded that noise should not be considered to prohibit residential development on the site off Haine Road in Ramsgate.



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1.0 INTRODUCTION

Scope

- 1.1 This Noise Assessment, for the proposed development at Haines Road, Ramsgate, Kent (CT12 5ES) for a residential end use, has been prepared by Lustre Consulting Limited (Lustre) for the benefit of Active Land & Build Ltd. The assessment has been undertaken in accordance with our fee proposal 15/11/2017, which was formally approved by Active Land & Build Ltd on 17/11/2017.
- 1.2 A new residential development is proposed on land to the west of Haine Road in Ramsgate. The local authority, Thanet Council, has requested that assessments of noise due to road traffic and nearby industrial/commercial activities are undertaken.
- 1.3 This report presents the methodology and results of a noise survey to determine noise levels affecting the site, as well as an assessment of noise mitigation measures that should be considered as part of the development design.

Description of Proposed Development Site and Proposals

- 1.4 The proposed development site is currently an open field located on the western side of Haine Road in Ramsgate, with Spratling Lane runs along the northern site boundary. Spratling Street Farm is located at the north-western corner of the site, with Spratling Court Office Suites and Spratling court Farm located to the west of the site. Manston Golf Centre is located adjacent to the southern site boundary, towards the south-western corner of the site.
- 1.5 Figure 1 shows the site extent in red and its surroundings and Figure 2 shows the proposed site layout.



Figure 1: Existing Site Extent and Surroundings





Figure 2: Sketch of Proposed Site Layout





2.0 NOISE SURVEY

Methodology

- 2.1 A fully manned environmental noise survey has been undertaken during sample daytime and night-time periods to assess noise levels affecting the proposed development site.
- 2.2 Measurements were undertaken between 05:00 and 07:00 hours (night-time survey period) and between 10:00 and 13:00 hours (daytime survey period) on Monday 4 December 2017. These periods were selected as worst-case portions of the overall daytime and night-time periods.
- 2.3 The equipment used for the noise survey is described in Table 1.

Table 1 - Description of Equipment used for Noise Survey

Item	Make & Model	Serial Number
Type 1 sound level meter	01dB Fusion	11388
Type 1 ½" microphone	GRAS 40CE	259634
Calibrator	01 dB CAL21	34375252

- 2.4 L_{Amax} , L_{Aeq} , L_{A10} and L_{A90} sound pressure levels were measured throughout the noise survey periods over contiguous 125-millisecond intervals.
- 2.5 The noise monitoring equipment was calibrated before and after the noise survey periods. No significant change was found. Laboratory equipment calibration certificates can be provided upon request.
- 2.6 Two measurement positions were selected, to assess the variation in noise across the proposed development site. The measurement positions are described in Table 2 and indicated on Figure 3.

Table 2 - Description of Noise Measurement Positions

Measurement Position	Description
A	At the south-eastern corner of the site, approximately 4m from the edge of Haines Road
B	At the northern site boundary
C	At the south-western corner of the site



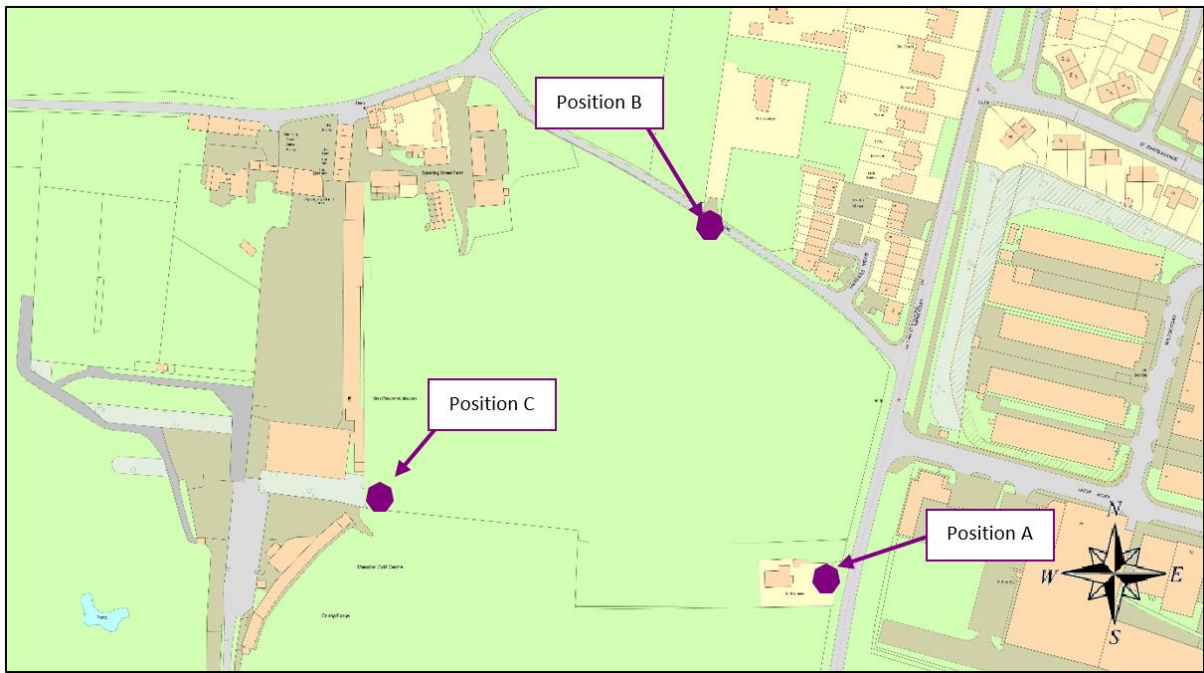


Figure 3: Site Plan Indicating Approximate Locations of Measurement Positions Locations

- 2.7 At both measurement positions, the measurement microphone was mounted on a tripod approximately 1.5m above ground level in free-field (i.e. not close to any vertical acoustically reflective surfaces).
- 2.8 Throughout the measurement periods, there was no rainfall, a minimally cloudy sky and only light wind. These conditions are considered appropriate for undertaking environmental noise measurements.

Results

- 2.9 The measured L_{Amax} , L_{Aeq} , L_{A10} and L_{A90} sound pressure levels during the daytime and night-time survey periods are summarised in Table 3.

Table 3 - Summary of Noise Survey

Measurement Position	Period	Measured Noise Level (dB)			
		L_{Amax}	L_{A10}	L_{Aeq}	L_{A90}
A	05:00 – 06:00	87	80	75	47
	06:00 – 07:00	90	82	78	58
	10:00 – 11:00	90	82	78	68
	11:00 – 12:00	88	81	79	72
	12:00 – 13:00	92	81	78	71
B	10:00 – 11:00	79	50	55	43





Measurement Position	Period	Measured Noise Level (dB)			
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}
	11:00 – 12:00	81	51	56	43
C	10:00 – 11:00	60	48	46	40
	11:00 – 12:00	63	44	43	39

- 2.10 We would consider the levels measured to be reasonable, considering the location of the measurement positions and the dominant nearby noise sources.
- 2.11 Throughout each noise survey period, the noise climate at each measurement position was noted to be affected, to varying extents, by road traffic using Haine Road. At measurement position B, occasional vehicle movements along Spratling Lane also affected the measured noise levels.
- 2.12 At measurement position C, activities on the adjacent Manston Golf Centre were noted to be audible. Activities on the farm/industrial premises to the west/north-west were not noted to be significant, with only occasional vehicle movements being noticeable.

Road Traffic Noise

Noise Levels Affecting the Proposed Development Site

- 2.13 Based on the noise survey results, the daytime and night-time noise levels affecting the eastern site boundary due to road traffic using Haine Road have been determined and are summarised in Table 4.

Table 4 - Measured Road Traffic Noise Levels

Location	Daytime L _{Aeq} (16 hour) (dB) (07:00 – 23:00 hours)	L _{Aeq} (8 hour) (dB) (23:00 – 07:00 hours)	Typical L _{Amax} (dB) (23:00 – 07:00 hours)
East of Site	78	74	89
West of Site	45	40	55

Noise Criteria

- 2.14 British Standard 8233: 2014 “*Guidance on sound insulation and noise reduction for buildings*” recommends acceptable internal noise limits for residential dwellings, as presented in Table 5, which are currently considered to be the industry standard.





Table 5 - BS 8233: 2014 Internal Noise Limits

Activity	Location	07:00 – 23:00 hours	23:00 – 07:00 hours
Resting	Living room	35 dB L _{Aeq} (16 hour)	-
Dining	Dining room/area	40 dB L _{Aeq} (16 hour)	-
Sleeping / daytime resting	Bedroom	35 dB L _{Aeq} (16 hour)	30 dB L _{Aeq} (8 hour)

2.15 In addition, the World Health Organisation (WHO) document “*Guidelines for Community Noise*” (1999) advises the following:

“For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991)”

2.16 In addition, the WHO document suggests that the noise level in external amenity areas should ideally not be above 50-55 dB L_{Aeq, 16 hour}.

Farm/Industrial Noise

Assessment Criteria

2.17 BS 4142: 2014 “*Method for rating and assessing industrial and commercial sound*”, presents a method for assessing the level of impact due to a commercial or industrial noise source, based on a comparison of the source noise level and the background noise level, both of which are measured or predicted at a noise sensitive receiver e.g. a residential property.

2.18 The specific noise level due to the source is determined, with corrections applied if the source is tonal or intermittent, or contains any other distinctive audible characteristics. The rating level is then compared to the background noise level and the level of impact can be estimated, depending on context, in accordance with the following advice:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse noise impact
- A difference of around +5 dB is likely to be an indication of an adverse noise impact
- Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low noise impact





Activity Noise Assessment

2.19 The properties to the west and north-west of the site were noted to consist of the following:

- Spratling Street Farm
- Spratling Court Office Suites
- Spratling Court Farm – noted to be used as storage units

2.20 During our time on-site, activities in and around the above properties were not noted to be significant, or indeed audible for most of the time. Activities on Spratling Street Farm appeared to involve occupants on foot moving around the site and onto the fields that occupy the proposed development site, to feed and tend to the horses that occupy the site. No audible activities were noted to be emanating from the Spratling Court Office Suites.

2.21 Occasional small van movements were noted, to and from part of Spratling Court Farm during normal daytime working hours. Our BS 4142 assessment of these movements is shown in Table 6.

Table 6 - BS 4142 Assessment – Small Van Movements

Element	Level (dB)	
	Small Van Arrival	Small Van Departure
Source SEL at 10m	77	77
Distance Attenuation to Nearest Proposed Residential Building Façade	-10	-10
Screening Attenuation	-10	-10
Unfavourable Feature Correction (Intermittency)	+3	+3
Conversion to LAeq (1 hour)	-36	-36
Predicted LAeq (1 hour)	24	24
Total LAeq (1 hour)	27	
Typical Measured LA90 Background Noise Level	39	
Difference	-12	

2.22 It can be seen that the BS 4142: 2014 assessment indicates a low noise impact at the nearest future residential dwellings due to the observed activities on the site to the east.





Golf Centre Noise

2.23 The Manston Golf Centre is located to the south/south-west of the site and includes a golf range adjacent to the southern site boundary, separated and screened from the proposed development site by a tall earth/grass bund. The golf range has 20 bays and its opening hours are from 08:00 hours on weekdays and from 07:00 hours on weekends and bank holidays. In the summer, the range closes at 21:30 hours and in the winter at 20:30 hours (18:00 hours on Sundays).

2.24 The noted activities on the golf range are as follows:

- Customers striking golf balls
- Golf ball collection vehicle
- Golf ball dispensing machine

2.25 The measured noise levels due to the various activities on Monday 4 December 2017 and the results are shown in Table 7.

Table 7 - Measured Activity Noise Levels

Activity	Measured SEL at Distance
Golf ball strike – driver	90 dB at 1m
Golf ball strike – 6 iron	78 dB at 1m
Golf ball strike – pitching wedge	73 dB at 1m
Golf ball collection vehicle	74 dB at 100m
Golf ball dispensing machine	73 at 10m

2.26 We have undertaken calculations in accordance with BS 4142: 2014 to assess the potential noise impact of the golf range activities on the nearest proposed dwellings. Our calculations are based on a worst-case daytime hour and therefore assume on the following:

- All 20 bays in use
- 7 bays using a driver, 7 bays using an iron, 6 bays using a pitching wedge – 2 shots per minute each





- Golf ball strikes subject to +9 dB unfavourable characteristics correction, in accordance with BS 4142: 2014 (+ 6 dB impulsivity correction and +3 dB intermittency correction)
- Golf ball collection vehicle operated 4 times per hour
- Golf ball collection vehicle subject to +3 dB intermittency correction
- Golf ball dispensing machine operated 40 times per hour
- Golf ball dispensing machine subject to +3 dB intermittency correction
- -10 dB screening attenuation due to the large bund already in place along the northern boundary of the golf range

2.27 Our calculations are shown in Table 8 below.

Table 8 - Golf Range BS 4142 Assessment

Activity	Measured SEL at Distance	Distance Correction (dB)	Quantity Correction (dB)	Screening Correction (dB)	Correction to L_{Aeq} (1 hour) (dB)	Unfavourable Feature Correction (dB)	Rating Noise Level (dB)
Golf ball strike – driver	90 dB at 1m	-37	+21	-10	-36	+9	38
Golf ball strike – 6 iron	78 dB at 1m	-37	+21	-10	-36	+9	25
Golf ball strike – pitching wedge	73 dB at 1m	-37	+21	-10	-36	+9	20
Golf ball collection vehicle	74 dB at 100m	-17	+16	-10	-36	+3	30
Golf ball dispensing machine	73 at 10m	0	+6	-10	-36	+3	37
Total Rating Noise Level (dB)							41
Typical Daytime Background Noise Level (dB)							39
Difference (dB)							+2





- 2.28 The worst-case BS 4142: 2014 assessment therefore indicates a low noise impact at the nearest future residential dwellings due to the golf range activities. In addition, the golf range noise levels along this site boundary are comfortably less than the WHO guideline values for external amenity areas of 50-55 dB $L_{Aeq, 16 \text{ hour}}$.





3.0 CONCLUSIONS AND RECOMMENDATIONS

Noise Mitigation Measures

- 3.1 The results of the noise survey detailed in Chapter 2 establish that the noise source effecting the site will be road traffic noise. The BS 4142: 2014 assessment indicates a low noise impact at the nearest future residential dwellings due to the observed activities. The worst-case BS 4142: 2014 assessment indicates a low noise impact at the nearest future residential dwellings due to the golf range activities and are comfortably less than the WHO guideline values for external amenity areas of 50-55 dB LAeq, 16 hour.
- 3.2 The following sections describe measures that should be considered as part of the development design to reduce the effect of road traffic noise across the proposed development site.

Screening of Road Traffic Noise

- 3.3 Construction of an acoustic screen or earth/grass bund along the noisiest (eastern) site boundary would provide significant attenuation of noise levels affecting the facades of the proposed development. Foliage generally provides negligible sound reduction, unless it is used to visually obscure a dense acoustic screen.
- 3.4 In general, a screen or bund would be expected to provide at least 5 dB attenuation, if it obscures line of sight between the source (e.g. Haine Road) and receiver (residential facade). In general, the taller the screen, the greater the attenuation.
- 3.5 With reference to the proposed site plan shown in Figure 2, a screen or bund may not be practical for proposed properties 1-5 at the south-eastern corner of the site, however there is scope for a screen or bund to be located along the eastern boundary of the site adjacent to the 'Central Green', which would provide a positive benefit to proposed properties 91-100 and those further west.
- 3.6 The proposed location of buildings along the east of the site will in themselves provide significant screening of properties in the centre and west of the site. This will reduce the noise levels affecting the external façades and external amenity areas of properties in the centre and west of the site.

Development Layout

- 3.7 Consideration should be given to the layout of the site and the proposed buildings. For example, taller buildings could be constructed at the noisier (eastern) site boundary, to provide screening (and acoustic attenuation) of the main noise source – Haine Road.





3.8 In addition, residential buildings along the eastern boundary, could be orientated such that habitable rooms (living rooms and bedrooms) face west (away from Haine Road), and less sensitive rooms (kitchens, bathrooms, circulation) face Haine Road.

Construction of External Façades

3.9 Based on the noise survey results, it is considered that noise levels on a large proportion of the site are sufficiently low such that the BS 8233/WHO internal noise level standards could be achieved when residential windows are open.

3.10 For residential facades directly facing Haine Road, the BS 8233/WHO internal noise level standards above could be achieved by the appropriate design and construction of external facades, using, for example:

- Acoustic double glazing (e.g. R_w 48 dB)
- A mechanical ventilation heat recovery system (MVHR)
- Dense external walls (e.g. brick/block cavity)

3.11 The construction suggestions made above represent the worst-case and the acoustic requirements of the various buildings and facades will vary, depending on their orientation, location and their exposure to Haine Road.

3.12 If the screening and building orientation recommendations detailed above are considered, then it should be possible to reduce the façade acoustic requirements, to the extent that less onerous glazing and trickle ventilation could be used in certain areas on the eastern side of the site.

3.13 Due to the increased distance and screening from noise due to road traffic using Haine Road, we would expect the BS 8233/WHO internal noise level standards to be achievable in the centre of the site using the following constructions:

- Laminated double glazing (e.g. R_w 40 dB)
- Window-frame-mounted acoustic trickle ventilators
- Dense external walls (e.g. brick/block cavity)

3.14 On the western side of the site, daytime and night-time road traffic noise levels were noted to be sufficiently low so as to permit the following:

- Thermal (non-acoustic) double glazing





- Ventilation via openable windows (or trickle vents)
- Dense external walls (e.g. brick/block cavity)

3.15 Further analysis will be undertaken during the project design stage to assess the variation in noise levels across the proposed development layout, such that the specific acoustic requirements of the various external façades for each block can be determined accordingly.

External Amenity Areas

3.16 Based on the noise survey results, it is considered that noise levels on a large proportion of the site are already less than the WHO guidelines for external amenity areas (50-55 dB $L_{Aeq, 16 \text{ hour}}$). The construction of buildings along the eastern/Haine Road boundary will provide additional screening of road traffic noise, such that noise levels on a greater proportion of the site will be less than the WHO guidelines.



APPENDIX A
ACOUSTIC
TERMINOLOGY

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing (20×10^{-6} Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
$L_{Aeq,T}$	<p>The A-weighted equivalent continuous noise level over the time period T</p> <p>This is the sound level that is equivalent to the average energy of noise recorded over a given period.</p>
L_{A90}	The noise level exceeded for 90% of the time (also referred to as the background noise level)
<ul style="list-style-type: none">R_w	<ul style="list-style-type: none">The weighted (w) sound reduction index (R), a single figure rating of the laboratory airborne sound insulation performance of a construction, usually measured across the frequency range 100-3150Hz.The higher the value, the greater the sound insulation, and the more onerous the requirement.
$D_{n,ew}$	<p>The weighted (w) element (e) normalised (n) level difference (D), an indicator of the ability of a small building element (such as a trickle ventilator) to reduce sound in a particular frequency band.</p> <p>The higher the value, the greater the sound reduction, and vice versa.</p>



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