wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

GLADMAN DEVELOPMENTS LTD

LAND OFF CROSS ROAD, DEAL

NOISE ASSESSMENT REPORT

NOVEMBER 2021

wardell armstrong

Wardell Armstrong
41-50 Futura Park, Aspinall Way, Middlebrook, Bolton, BL6 6SU
Telephone: +44 (0)1204 227 227 www.wardell-armstrong.com

DATE ISSUED:	**26th NOVEMBER 2021**
JOB NUMBER:	**GM11782**
REPORT NUMBER:	**0002**
VERSION:	**V1.0**
STATUS:	**FINAL**

GLADMAN DEVELOPMENTS LTD

LAND OFF CROSS ROAD, DEAL

NOISE ASSESSMENT REPORT

NOVEMBER 2021

PREPARED BY:

Peter Kowalczuk (MIOA) — Senior Environmental Scientist (Acoustics)

REVIEWED BY:

Richard Calvert (MIOA) — Associate Director

APPROVED BY:

Mark Dawson (MIOA) — Technical Director *pp.*

CONTENTS

APPENDICES

DRAWINGS	**TITLE**
LE1380-001	Noise Monitoring Location Plan

EXECUTIVE SUMMARY

Wardell Armstrong LLP has carried out a noise assessment for the proposed residential development at Land off Cross Road, Deal comprising dwellings and associated infrastructure.

The noise assessment is based on data collected during an earlier noise assessment for the site, in January 2017. The use of previously measured data was confirmed to be acceptable via email by Mr Brian Gibson, a Senior Environmental Protection Officer at Dover District Council, on the 14th June 2021.

The dominant source of noise affecting the proposed development site was found to be road traffic on Cross Road and Ellens Road. The majority of the proposed development is expected to achieve the internal and external noise guideline levels with no specific mitigation measures in place. Only those noise sensitive rooms located closest to and facing the local road network will require a specific glazing and ventilation strategy. Therefore, living rooms and bedrooms located on the eastern, southern and western site boundaries will required standard thermal glazing together with alternative ventilation methods to allow windows to remain closed to achieve the internal guideline noise levels while maintaining background ventilation.

Sensitive rooms located on the screened facades of dwellings and those further into the proposed development are likely to achieve the internal guideline noise levels even with the windows open.

Properties across the site are at a Low-Negligible risk of experiencing overheating during the daytime and night-time periods. Therefore, no specific mitigation measures, to combat overheating, are thought to be required.

1 INTRODUCTION

1.1.1 By instruction dated 28th May 2021 from Mr Paul Roberts of Gladman Developments Ltd, Wardell Armstrong LLP (WA) was commissioned to undertake a noise assessment for a proposed residential development on land off Cross Road, Deal, Dover.

1.1.2 The proposed development site is located to the south-west of Deal, in the suburb of Walmer, to the west of Cross Road. To the north west, the site is bordered by existing residential properties and GA Vehicle Repairs Garage on Marlborough Road. To the east the site is bound by Cross Road, open land, and residential properties, with the Walmer station and further residential premises beyond. To the south and south west, the site is bordered by Ellens Road, with open land beyond. To the west, there is a DIY Motorist Car Parts premises fronting onto Ellens Road. The site is currently open fields, with an area of scrub and foliage towards the western and north-western site boundaries.

1.1.3 The proposed development is residential in nature and will comprise dwellings and associated infrastructure across a site of 8.61 hectare in area.

1.1.4 This noise report has been prepared in support of the outline planning application. It assesses the results of a noise survey carried out in accordance with current guidance and includes recommendations for noise mitigation as appropriate.

2 ASSESSMENT METHODOLOGY

2.1 Consultation

2.1.1 WA have been involved previously with the proposed development site, preparing a noise assessment report for land both to the west and east of Cross Road, Deal. This included an attended and unattended noise monitoring survey, representative of all noise sources affecting the site.

2.1.2 Due to the reduced volume of road traffic at the time this assessment was carried out, as a result of travel restrictions set in place to combat the Coronavirus pandemic, the noise levels measured in January 2017, as part of the earlier noise assessment, are considered to be more representative of the acoustic climate across the site, and have been used in this assessment.

2.1.3 Consultations have been carried out with Mr Brian Gibson, a Senior Environmental Protection Officer at Dover District Council (DDC). Mr Gibson confirmed via email dated 14th June 2021, that noise levels measured in 2017 can be considered to be representative of the acoustic environment at the site and are sufficient to inform the outline planning application for the proposed development.

2.2 Noise Survey

2.2.1 As part of this assessment, WA carried out an attended and unattended noise survey in 2017 to assess the noise levels of existing noise sources affecting the proposed development. As the noise survey was carried out to inform noise across the wider site, only the relevant Monitoring Locations (MLs) have been discussed in this noise assessment report.

2.2.2 The potential sources of noise affecting the development site are:

- Road traffic on Cross Road which runs along the eastern site boundary;
- Road traffic on Ellens Road which run along the south-western site boundary;
- GA Vehicle Repairs repair unit to the north west of the site on Marlborough Road; and,
- DIY Motorist Car Parts and Car Take Back unit to the west of the site, on Ellens Road.

2.3 Guidance and Legislation

2.3.1 An assessment is required to consider any potentially noise sensitive areas of the site. The potential impacts of the existing sources of noise on the proposed residential area of the development have been assessed with reference to;

- National Planning Policy Framework, 2021 (NPPF).
- Noise Policy Statement for England, 2010 (NPSE).
- Planning Practice Guidance - Noise, 2019 (PPG).
- ProPG: Planning & Noise: Professional Practice Guidance on Planning and Noise, 2017 (ProPG).
- AVO: Acoustics, Ventilation and Vibration – Residential Design Guide, 2020 (AVO).
- British Standard 8233: 2014 Guidance on Sound Insulation and noise reduction for buildings (BS8233).
- Department of Transport's memorandum, 'Calculation of Road Traffic Noise' (CRTN), 1998.

2.3.2 Further details of these documents are included in Appendix A.

3 NOISE SURVEY

3.1.1 On the 25th and 26th January, and 9th February 2017, WA carried out a noise survey at the development site.

3.1.2 Noise measurements were taken at five monitoring locations. Locations are considered to be representative of the parts of the site which are closest to road traffic on Cross Road and Ellens Road, the GA Vehicle repairs premises, and the DIY Motorist Car Parts and Car Take Back premises. The monitoring locations are as follows, and are shown on Drawing Number LE13820-001:

- Monitoring Location 1: On the south eastern site boundary, approximately 15m from Ellens Road.
- Monitoring location 2: On the southern site boundary, approximately 5m from the junction of Cross Road, Station Road and Ellens Road.
- Monitoring location 3: In the central part of the site, approximately 5m from Cross Road.
- Monitoring location 4: On the western site boundary adjacent to the DIY Motorist Car Parts and Car Take Back site, approximately 20m from Ellens Road.
- Monitoring location 5: This location was 50m away from the vehicle repair garage, and outside the site boundary. Measurements could not be made at the north western boundary of the site due to temporary construction works, which would have affected the noise levels if monitoring on the site. This location was chosen to collect noise data from the vehicle repair garage without interference from the construction works.

3.1.3 The noise survey is summarised in Table 1 below.

Table 1: Summary of Monitoring Locations

Monitoring Location	Attended/ Unattended	Start	End
1	Attended	04:59 25/01/2017	10:02 25/01/2017
2	Unattended	19:29 25/01/2017	10:15 26/01/2017
3	Attended	04:58 25/01/2017	10:02 25/01/2017
4	Unattended	00:04 25/01/2017	19:15 25/01/2017
5	Attended	13:46 09/02/2017	14:46 09/02/2017

3.1.4 The measurement periods included the busiest times, with regards to road traffic, during the daytime and night-time periods.

3.1.5 Monitoring location 5 was monitored for a short period during the day to obtain noise levels of activities at the repair garage.

3.1.6 The measured noise levels allow a robust assessment to be made of the noise impact at the development site.

3.1.7 The noise measurements were made using three Class 1, integrating sound level meters. The microphones were mounted vertically on tripods 1.2m above the ground. The sound level meters were calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift ± 0.5dB in the calibration was noted during the survey.

3.2 Meteorological Conditions

3.2.1 On the 25th January, the weather conditions during the survey were as follows:

- Winds up to 3-4 m/s;
- Dew on the ground;
- Temperature approximately 0-2˚C;
- Cloudy sky and;
- Patches of fog.

3.2.2 On the 26th January, the weather conditions during the survey were as follows:

- Winds up to 4-5 m/s;
- Dew on the ground;
- Temperature approximately -1˚C and;
- Cloudy sky.

3.2.3 On the 9th February, the weather conditions during the survey were as follows:

- Winds up to 2-3 m/s;
- Temperature approximately 8˚C and;
- Partly cloudy sky.

3.2.4 For the purpose of this assessment daytime hours are taken to be 0700 to 2300 hours and night-time hours to be 2300 to 0700 hours.

3.2.5 A-weighted[1] L_{eq}[2] noise levels were measured to comply with the requirements of WHO and BS8233. A-weighted L_{90}[3] and L_{10}[4] noise levels, together with the maximum and minimum sound pressure levels, were also measured to provide additional information. The measured noise levels are set out in full in Appendix A.

3.3 Observations

3.3.1 Attended noise monitoring and playback of audio recordings, allow observations and detailed notes to be made of the significant noise sources which contribute to each of the measured levels. The observations identified the following:

Road Traffic Noise: Noise from road traffic on the Cross Road and Ellens Road was dominant across the development site during the daytime and night-time periods.

GA Vehicle Repairs: Noise from the vehicle repair shop was occasionally audible near the north western site boundary during daytime periods.

***DIY Motorist Car Parts and Car Take Back*:** Noise was occasionally audible in the western part of the site during daytime hours.

Birdsong: Birdsong was audible across the development site during day and night-time periods.

3.4 Measured Noise Levels

3.4.1 Noise from the commercial premises, GA Vehicle repairs and DIY Motorist Car Parts and Car Take Back, was found to be occasionally audible within the residential development area. The sources of noise were not dominant at any time and therefore an assessment in accordance with British Standard BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound was not required and these have not been considered further.

3.4.2 The measured noise levels for each monitoring location have been divided into daytime (0700-2300 hours) and night-time (2300-0700 hours) categories. The results are presented in Appendix B and summarised in Table 2 below.

[1] A' Weighting — An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions

[2] L_{eq} — Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

[3] L_{90} — The noise level which is exceeded for 90% of the measurement period.

[4] L_{10} — The noise level which is exceeded for 10% of the measurement period.

Table 2: Average Daytime and Night-time Noise Levels		
Time	**Monitoring Location**	**Measured Noise Level (Figures in dB L_{Aeq})**
0700-2300 2300-0700	1	52 47
0700-2300 2300-0700	2	61 50
0700-2300 2300-0700	3	53 48
0700-2300 2300-0700	4	47 36
0700-2300 2300-0700	5	43 -

3.4.3 The maximum noise levels, measured during the night-time period of the survey, are summarised in Table 3.

Table 3: Summary of the Maximum Night-time Noise Levels (Figures in dB L_{Amax})	
Monitoring Location	**Maximum Measured Noise Level**
1	71
2	83
3	74
4	64

4 SITE RISK ASSESSMENT

4.1 Noise Risk Assessment

4.1.1 In accordance with ProPG:2017, a Site Noise Risk Assessment (SNRA) has been carried out. The SNRA assesses the initial risk of noise from transportation sources having an adverse impact on a proposed development, based on the overall measured levels with no mitigation in place.

4.1.2 Noise monitoring was undertaken at the site boundaries, closest to Ellens Road and Cross Road. During the site visits and monitoring, the noise levels at the site were dominated by road traffic noise. These noise levels have been compared in Table 4 to guidance provided on Figure 1 (*Stage 1 – Initial Site Noise Risk Assessment)* of ProPG:2017, to assess the risk of an adverse impact.

Table 4: Initial Site Noise Risk Assessment Average Daytime and Night-time Noise Levels

Risk Assessment Location	Average Daytime Noise Level (dB $L_{Aeq,16hr}$)	Daytime Risk of Adverse Effect	Average Night-time Noise Level (dB $L_{Aeq, 8hr}$)	Night-time Risk of Adverse Effect
ML3	53	Low	48	Low
ML4	47	Negligible	36	Negligible

4.1.3 Table 4 indicates that proposed receptors, in close proximity to Cross Road, are at a Low risk of experiencing an adverse noise impact due to road traffic during the daytime and night-time periods.

4.1.4 Table 4 also shows that proposed receptors located closest to the Ellens Road, are at a Negligible risk of experiencing an adverse noise impact during the daytime and night-time periods.

4.1.5 Noise levels further into the site and further away from the southern and eastern boundaries are expected to be lower, and therefore the potential for an adverse noise impact at receptors will be reduced.

4.1.6 As there are more than 10 individual $L_{AF, Max}$ events which exceed 60dB at ML3, the noise impact at the site cannot be considered to be negligible, therefore a Stage 2 full assessment has been carried out to consider this.

4.1.7 The SNRA shows that good acoustic design will be required for the proposed development, to ensure that the potential risk of the noise impact is minimised, and internal and external noise guideline levels are achieved.

4.2 Overheating Risk Assessment

4.2.1 In accordance with the AVO guide, an Overheating Risk Assessment (ORA) has been carried out. The ORA assesses initial risk of overheating, caused by the need to mitigate against noise generated by nearby transportation sources, based on the noise levels at the development site.

4.2.2 The daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$) noise levels measured at ML1 and ML2 have been compared to the information provided in Table 3-2 of AVO. The results are shown in Table 5.

Table 5: Stage 1 Overheating Risk Assessment

Risk Assessment Location	Average Daytime Noise Level (dB $L_{Aeq,16hr}$)	Daytime Risk of Overheating	Average Night-time Noise Level (dB $L_{Aeq,8hr}$)	Night-time Maximum Noise Level (dB L_{Amax})	Night-time Risk of Overheating
ML3	53	Low	48	74	Low
ML4	47	Negligible	36	64	Negligible

4.2.3 Table 5 indicates that during the daytime and night-time periods, proposed receptors located in the eastern part of the development, adjacent to Cross Road would be at a Low risk of experiencing overheating due to the likely acoustic design measures required to achieve the recommended internal noise levels.

4.2.4 Proposed dwellings located on the southern site boundary, closest to and facing Ellens Road, are at a Negligible risk of experiencing overheating during the daytime, and night-time.

4.2.5 Proposed receptors further away from the eastern site boundary are expected to experience lower noise levels, therefore will be at a negligible risk of overheating, due to the likely acoustic design measures.

4.2.6 The ORA shows that the risk of overheating is low, even at the site boundaries when windows are closed to achieve internal noise guideline levels.

4.2.7 In accordance with AVO, due the Low risk of overheating at the site, a Stage 2 overheating assessment is not required.

5 NOISE IMPACT ASSESSMENT

5.1 Introduction

5.1.1 The results of the ProPG:2017 Stage 1: Initial Site Noise Risk Assessment show that the proposed dwellings closest to Cross Road are at a Low risk of experiencing an adverse noise impact due to road traffic during the daytime and night-time. However, the site experiences $L_{AF,max}$ individual noise levels above 60dB(A) during the night-time, therefore a full noise assessment has been carried out to establish the likely requirements for mitigation measures.

5.1.2 Therefore, this section details the likely mitigation measures necessary to reduce this risk at proposed dwellings.

5.2 Predicted Noise Levels

5.2.1 The development framework plan, Drawing No. L572-L-12, prepared in July 2021 and used to inform the noise assessment for the proposed development. The development framework plan indicates that the area of the site which will be developed for residential use will occupy 4.17ha of the overall site area. A standoff has been incorporated between the residential area and Ellens Road, that runs adjacent to the south-western site boundary.

5.2.2 Therefore, the measured noise levels have been distance corrected to give noise levels at the proposed receptor locations. Table 6 shows the corrections and the resultant noise levels.

Table 6: Summary of External Noise Levels to be used within the Noise Assessment (Figures in dB(A))							
Monitoring Location	Time (Hours)	Distance Between Monitoring Location and Dominant Source of Noise (m)	Approximate Distance Between Nearest Proposed Dwelling and Dominant Source of Noise (m)	L_{Aeq}		$L_{AF, max}$	
				Correction (dB)(A)	Calculated (dB)(A)	Correction (dB)(A)	Calculated (dB)(A)
1	0700-2300	15	30	-3	49	-6	-
	2300-0700				44		65
2	0700-2300	5	55	-10	51	-21	-
	2300-0700				40		62
3	0700-2300	5	5	0	53	0	-
	2300-0700				48		74
4	0700-2300	20	20	0	47	0	-
	2300-0700				36		64
5	0700-2300	50	50	0	43	0	-
	2300-0700				-		

5.2.3 Based on the results obtained, a robust assessment can be made of the predicted noise levels at the site and of the mitigation necessary to achieve the required noise levels at the development.

5.3 Assessment of Daytime Noise Levels in Outdoor Living Areas

5.3.1 The daytime noise levels at the proposed residential development area, are shown in Table 7 below.

Table 7: Average Daytime Noise Levels in Outdoor Living areas		
Assessment Location	**Residential property Location**	**Noise Level (Figures in dB $L_{Aeq, 16hrs}$)**
1	Residential properties in the eastern part of the site, approximately 30m from Station Road.	49
2	Residential properties in the eastern part of the site, approximately 55m the road junction.	50
3	Residential properties in the central part of the site, approximately 5m from Cross Road.	53
4	Residential properties in the western part of the site, approximately 20m from Ellens Road.	47
5	Residential properties in the northern site part of the site, approximately 50m from GA Vehicle repairs.	43

5.3.2 The noise levels are all within the upper noise guideline levels of 55dB(A), therefore mitigation measures would not be required for outdoor living areas across the site.

5.4 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

5.4.1 Before internal noise levels can be calculated 3dB(A) must be added to the free-field measured levels to allow for the reflection of noise from the proposed housing façades, when the buildings are in place.

5.4.2 The measured and calculated daytime noise levels, as detailed in Table 6, have been used to determine the noise levels likely at the façades of properties in the vicinity of the monitoring locations during the daytime period.

5.4.3 The calculated noise levels at the façades of the properties, together with the level of attenuation required to achieve 35dB L_{Aeq} in the living room and bedroom areas, during the daytime, in accordance with BS8233 and WHO, are summarised in Table 8 below.

Table 8: Façade Noise Level at Properties in the Vicinity of the Monitoring Locations and Level of Attenuation Required to Achieve the Internal Daytime Noise Guideline Levels (Figures in dB(A))			
Assessment Location	**Residential Properties**	**Noise Level at the Façade of the Property (L_{Aeq})**	**Level of Attenuation Needed to Achieve 35dB L_{Aeq} in Living Room and Bedroom Areas**
1	Residential properties in the eastern part of the site, approximately 30m from Station Road.	52	17
2	Residential properties in the eastern part of the site, approximately 55m from the road junction.	53	18
3	Residential properties in the central part of the site, approximately 5m from Cross Road.	56	21
4	Residential properties in the western part of the site, approximately 20m from Ellens Road.	50	15
5	Residential properties in the northern part of the site, approximately 50m from GA Vehicle repairs.	46	11

5.4.4 The facades of the properties further into the site will be protected by the buildings themselves and/or be screened by intervening buildings. It is considered that the noise levels at these facades, and therefore the level of attenuation the facades would need to provide, if any, to achieve appropriate internal noise levels in the living room and bedroom areas, will be less than those shown in Table 8.

5.5 Assessment of Night-time Noise Levels in Bedrooms

5.5.1 The measured night-time noise levels, as detailed in Table 6, have been used to determine the noise levels likely at the façades of properties across the site, during the night-time period.

5.5.2 Before internal noise levels can be calculated 3dB(A) must be added to the free field measured levels to allow for the reflection of noise from the proposed housing facades when the buildings are in place.

5.5.3 The calculated noise levels at the façades of properties, together with the level of attenuation required to achieve 30dB L_{Aeq} and 45dB $L_{Amax,f}$ in the bedrooms, are summarised in Table 9 below.

Table 9: Façade Noise Level at Properties in the Vicinity of the Monitoring Locations and Level of Attenuation Required to Achieve the Internal Night-time Noise Guideline Levels (Figures in dB(A))				
Assessment Location	**Residential Properties**	**Noise Level at the Façade of the Property (L_{Aeq})**	**Maximum Noise Level at the Façade of the Property (L_{AMax})**	**Level of Attenuation Needed to Achieve the Noise Guideline Levels in Bedrooms**
1	Residential properties in the eastern part of the site, approximately 30m from Station Road.	47	68	23
2	Residential properties in the eastern part of the site, approximately 55m from the road junction.	43	65	20
3	Residential properties in the central part of the site, approximately 5m from Cross Road.	51	77	32
4	Residential properties in the western part of the site, approximately 20m from Ellens Road.	39	67	22
5	Residential properties in the northern site part of the site, approximately 50m from GA Vehicle repairs.	33	54	9

5.5.4 The facades of the properties further into the site will be protected by the buildings themselves and/or be screened by other buildings. It is considered that the noise levels at these facades, and therefore the level of attenuation, if any, the facades would need to provide to achieve the 30dB L_{Aeq} and 45dB $L_{Af,max}$ in the bedrooms, will be less than those detailed in Table 9.

6 NOISE ATTENUATION SCHEME

6.1 Introduction

6.1.1 The results of the noise assessment for the proposed residential areas of the development, indicate that noise mitigation measures would need to be incorporated into the proposed site design to ensure that the required noise levels are achieved within outdoor living areas, internal living rooms and bedrooms.

6.2 Daytime Noise Levels in Outdoor Living Areas

6.2.1 The calculated noise levels, as shown in Table 7 of this report, indicate that outdoor living areas across the development site achieve the recommended outdoor noise guideline levels without mitigation.

6.3 Glazing Requirements for Daytime in Bedrooms and Living Room Areas

6.3.1 When assessing daytime noise levels in living rooms, the noise attenuation provided by the overall building facade should be considered. To mitigate noise levels, the composition of the building facade can be designed to provide the level of attenuation required. Glazing is generally the building element which attenuates noise the least, so the proportion of glazing in a building facade is an important consideration when assessing overall noise attenuation.

6.3.2 In the absence of design details for the building facades, it has been assumed that the glazing to noise sensitive rooms would comprise about 25% of the facade area. To calculate the overall attenuation provided by this percentage of glazing in a brick or block facade, a non-uniform partition calculation can be used.

6.3.3 The calculation combines the different degrees of attenuation of the wall element and the window element. A facade element comprising solid brick or blockwork, will attenuate by 45-50dB (British Standard 8233: “Sound insulation and noise reduction for buildings – Code of practice” 1999) whereas standard double glazing will attenuate road traffic noise by 26-29dB(A) (BRE Digest 379 “Double glazing for heat and sound insulation”). The overall noise attenuation provided by this combination is, therefore, between 31.9dB(A) and 34.9dB(A).

6.3.4 The noise attenuation requirements for living rooms and bedrooms during the daytime in properties in different areas of the site are summarised in Table 8. The requirements indicate that noise sensitive rooms on facades of dwellings, located closest to and facing the noise sources, should be provided with standard thermal

double glazing, with closed windows and alternative methods of maintaining ventilation to ensure that internal guideline noise levels are achieved.

6.3.5 However, with windows open, the attenuation provided by the façade will be approximately 13dB(A). This would potentially allow the recommended internal noise guideline level to be exceeded in some living rooms closest to the roads. Dwellings screened from road traffic noise by intervening buildings, and those located in the north-eastern part of the site will achieve the internal guideline noise level even with open windows.

6.3.6 On occasions, this may be acceptable to a resident, but when quiet conditions are required, the resident should be able to close the windows whilst maintaining adequate ventilation. Alternative methods of ventilation are therefore required in living rooms and bedrooms of dwellings located closest to the north eastern, eastern and southern site boundaries to allow the windows to remain closed when the occupant so chooses. Alternatively, to meet the required noise levels, living rooms could be located on the screened side of the proposed buildings, away from the main source of noise.

6.3.7 Glazing and ventilation requirements can be confirmed, on a plot-by-plot basis, at the reserved matters stage.

6.4 Glazing Requirements for Night-time in Bedroom Areas

6.4.1 The noise attenuation requirements for bedrooms across the site are summarised in Table 9.

6.4.2 The requirements indicate that standard thermal double glazing should ensure that internal noise levels are met, with windows closed, for dwellings located closest to and facing the nearby roads. Proposed dwellings further into the site, will be screened by intervening buildings, from the main sources of noise, and are expected to achieve the internal noise levels even with windows open to provide ventilation.

6.4.3 However, with windows open, the attenuation provided by the façade will be approximately 13dB(A). This would allow the recommended internal noise limit to be exceeded in bedrooms closest to the roads. Acoustic ventilation would therefore need to be installed in those facades to allow the windows to remain closed when the resident so chooses. Dwellings screened from road traffic noise by intervening buildings, and those located in the north-eastern part of the site will achieve the internal noise guideline levels with open windows.

6.4.4 Glazing and ventilation requirements can be confirmed, on a plot-by-plot basis, at the reserved matters stage.

6.5 Acoustic Ventilation Requirements

6.5.1 It is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 2000 Approved Document F1 Means of Ventilation and British Standard BS5925 1991: "Code of Practice for Ventilation Principles and Designing for Natural Ventilation". Acoustic ventilation is only recommended for noise sensitive rooms, which are bedrooms and living/dining rooms.

6.5.2 The implementation of the standard thermal glazing together with appropriate acoustic ventilation where necessary should ensure that the required internal daytime and night-time noise limits are achieved.

6.5.3 The requirement for acoustic ventilation can be confirmed on a plot by plot basis at the reserved matters stage.

7 CONCLUSIONS

7.1.1 Wardell Armstrong has carried out a noise assessment for the proposed residential development located at Cross Road, Deal. The dominant noise source, which will potentially affect the residents of the proposed residential development, is road traffic on Cross Road, Ellens Road and Station Road.

7.1.2 In policy terms, there is no presumption against development in places with high noise levels, provided that the noise can be adequately mitigated taking into account the economic and social benefits of the proposed scheme.

7.1.3 The resultant noise levels can be assessed against the guideline values set out in BS8233. It should be remembered that the internal guideline values are health-based and are therefore relatively inflexible; however adequate noise mitigation is relatively straightforward to engineer. The external guideline values are based on amenity and allow noise to be balanced against any benefits gained from the location of the proposed scheme.

7.1.4 Noise from the commercial premises GA Vehicle repairs and DIY Motorist Car Parts and Car Take Back was found to be occasionally audible within the development site. However, the noises were not dominant and therefore did not need to be assessed separately.

7.1.5 The results of the noise survey and assessment indicate that the guideline level of 55dB$L_{Aeq\ (16\ Hour)}$ in outdoor living areas will be met throughout the proposed development without mitigation measures.

7.1.6 With windows open, the attenuation provided by the façade would allow the internal noise limits to be exceeded in some living room and bedroom areas located closest to and facing the roads. Dwellings in the remainder of the site will achieve the internal guideline levels even with open windows.

7.1.7 The requirements indicate that standard thermal double glazing, with an alternative means of ventilation, should ensure that internal noise guideline levels are met in living rooms and bedroom areas for proposed dwellings closest to the roads.

7.1.8 Acoustic ventilation would therefore need to be installed in some of the living rooms and bedrooms located nearest to, and with a direct line of sight, of the local roads to allow the windows to remain closed when the occupant so chooses. Alternatively, to meet the required noise levels, living rooms and bedrooms could be located on the screened side of those dwellings, facing away from the main sources of noise.

7.1.9 The requirement for glazing and acoustic ventilation will be confirmed, on a plot-by-plot basis at the detailed application/reserved matters stage.

APPENDICES

APPENDIX A

Noise Legislation and Guidance

National Planning Policy Framework

A.1 In July 2021 the 'National Planning Policy Framework' (NPPF) was updated as the current planning policy guidance within England. Paragraph 185 of the NPPF states:

A.2 '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 values for this reason;"*

Noise Policy Statement for England

A.3 With regard to 'adverse impacts' the NPPF refers to the 'Noise Policy Statement for England' (NPSE), which defines three categories, as follows:

- 'NOEL – No Observed Effect Level
  This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- LOAEL – Lowest Observed Adverse Effect Level
  This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level
  This is the level above which significant adverse effects on health and quality of life occur'.

A.4 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are

taken to mitigate and minimise the adverse effects of noise. However, this does not mean that such adverse effects cannot occur.

Planning Practice Guidance

A.5 The Planning Practice Guidance (PPG) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable; however, it has no adverse effect as it does not cause any change in behaviour or attitude.

A.6 Once noise crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise.

A.7 Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.

A.8 At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. The following Table summarises the noise exposure hierarchy.

Table 1: National Planning Practice Guidance Noise Exposure Hierarchy			
Response	**Examples of Outcomes**	**Increasing Effect Level**	**Action**
Not present	No Effect	No Observed Effect	No specific measures required
		No Observed Effect Level	
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

A.9 The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

"It can, where justified, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern."

A.10 British Standard 8233 "Guidance on sound insulation and noise reduction for buildings" 2014, suggests the following guideline noise levels and states that they are based on guidelines issued by the World Health Organisation;

- 35 dB $L_{Aeq\ (16\ hour)}$ during the day time in noise sensitive rooms
- 30 dB $L_{Aeq\ (8\ hour)}$ during the night time in bedrooms
- 45 dB $L_{Af,Max}$ during the night time in bedrooms
- 50 dB $L_{Aeq\ (16\ hour)}$ desirable external noise levels for amenity space such as gardens and patios
- 55 dB $L_{Aeq\ (16\ hour)}$ upper guideline value which would be acceptable in noisier environments.

A.11 In addition, for internal noise levels it states;

"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

A.12 Furthermore, with regard to external noise, the Standard states;

"However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".

BS8233 Guidance on sound insulation and noise reduction for buildings

A.13 British Standard 8233 "Guidance on sound insulation and noise reduction for buildings" 2014 bases its advice on the WHO Guidelines. In addition, for internal noise levels it states:

> *"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."*

A.14 Furthermore, with regard to external noise, the Standard states:

> *"For traditional external areas that are used for amenity space such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guidance value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."*

British Standard 4142:2014+A1:2019 (BS4142), Method for rating and assessing industrial and commercial sound:

A.15 BS4142 is used to rate and assess sound of an industrial and/or commercial nature including:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

A.16 The standard is applicable to the determination of the following levels at outdoor locations:

- rating levels for sources of sound of an industrial and/or commercial nature; and
- ambient, background and residual sound levels, for the purposes of:

1) Investigating complaints;

2) Assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

3) Assessing sound at proposed new dwellings or premises used for residential purposes.

A.17 The purpose of the BS4142 assessment procedure is to assess the significance of sound of an industrial and/or commercial nature.

A.18 BS4142 refers to noise from the industrial source as the 'specific noise' and this is the term used in this report to refer to noise which is predicted to occur due to activities associated with Ridgewood Industrial Park. The 'specific noise' levels, of the existing industrial premises that have been measured are detailed in Section 4 of this report.

A.19 BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level (L_{A90}). Section 4 provides details of the background noise survey undertaken.

A.20 Certain acoustic features can increase the significance of impacts over that expected from a simple comparison between the specific noise level and the background noise level. In particular BS4142 identifies that the absolute level of sound, the character, and the residual sound and the sensitivity of receptor should all be taken into consideration. BS4142 includes allowances for a rating penalty to be added if it is found that the specific noise source contains a tone, impulse and/or other characteristic, or is expected to be present. The specific noise level along with any applicable correction is referred to as the 'rating level'.

A.21 The greater the increase between the rating level over the background noise level, the greater the magnitude of the impact. The assessment criteria given by BS4142 are as follows:

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- 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.

A.22 During the daytime, BS4142 requires that noise levels are assessed over 1-hour periods. However, during the night-time, noise levels are required to be assessed over 15-minute periods.

A.23 Where the initial estimate of the impact needs to be modified due to context, BS4142 states that all pertinent factors should be taken into consideration, including:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise

A.24 ProPG Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

A.25 A two-stage process is suggested:

- Stage 1 – Initial Noise Risk Assessment
- Stage 2 – Detailed assessment (Acoustic Design Statement), required where the Stage 1 risk is identified above negligible.

The guidance reflects the Government's overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance - Noise and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisors, on achieving good acoustic design in and around new residential developments.

AVO: Acoustics, Ventilation and Overheating Residential Design Guide

A.26 The AVO guide recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating. The application of the AVO Guide is intended to demonstrate good acoustic design in accordance with ProPG. A two-stage assessment approach is advised as:

- Stage 1: Site Risk Assessment
- Stage 2: Detailed Assessment of Adverse Effect

A.27 The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage. It also assists in educating clients, environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

Appendix B

Noise Monitoring Results

ML1 – Adjacent to the south eastern site boundary (Approx. 7m from Station Road)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
25/01/2017 – Night time						
05:00-05:15	27.9	18.5	50.6	22.2	30.6	Road traffic, train noise and noise from horse stables.
05:15-05:30	43.9	19.9	68.3	24.6	41.9	
05:30-05:45	44.1	24.1	66.9	26.7	41.9	
05:45-0:600	49.3	24.3	66.6	28.8	46.4	
06:00-06:15	43.3	23.6	66.4	27.8	41.6	
06:15-06:30	49	25.5	64.9	29.1	52	
06:30-06:45	50.1	27.7	71.1	31.2	49	
06:45-07:00	49.5	29.7	65.3	33.4	52.1	
Overall	47.3	18.5	71.1	26.3	45.9	

ML1 – Adjacent to the south eastern site boundary (Approx. 7m from Station Road)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
25/01/2017 - Daytime						
07:00-08:00	52.2	31.6	68.6	38.6	55.5	Road traffic, train noise and noise from horse stables.
08:00-09:00	52.4	31.9	71.8	38.1	56.5	
09:00-10:00	51.8	32.1	74.3	37.2	54.3	
Overall	52.1	31.6	74.3	37.8	55.7	

ML2– Road Traffic Noise (Unattended) – Adjacent to Ellens Road (Approx. 5m where Ellens road, Cross Road and Station Road meet)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
25/01/2017 – 26/01/2017 – Night time						
23:00 - 23:15	50.4	25.8	70.3	29.5	50.2	Dominant traffic noise from Cross Road and Ellens Road. Railway noise also audible.
23:15 - 23:30	31.5	23.2	43.3	25.2	34.6	
23:30 - 23:45	48.6	20.3	75.5	22	37.5	
23:45 - 00:00	52.3	20.7	77.7	24.4	51.4	
00:00 - 00:15	41.5	22.5	59.8	24.5	43.1	
00:15 - 00:30	45.7	19.9	71.4	20.9	47.3	
00:30 - 00:45	44.5	20.2	71.6	22.6	31.9	
00:45 - 01:00	47	21.4	76	22.4	40.1	
01:00 - 01:15	54	20.1	83.2	20.7	30.3	
01:15 - 01:30	34.4	20.9	52.6	22.5	33.1	
01:30 - 01:45	43.2	19.9	65.9	21.1	29.1	
01:45 - 02:00	26.8	20.1	44.2	20.7	29.4	
02:00 - 02:15	26.7	21.1	40.8	22.2	29.6	
02:15 - 02:30	25.8	20.3	38.9	21.5	28.8	
02:30 - 02:45	41.4	20.3	67.4	21.4	29.6	
02:45 - 03:00	26.2	21.4	43.2	21.9	29.2	
03:00 - 03:15	26.7	21.3	41.2	22	29.7	
03:15 - 03:30	44.2	21.4	68.8	22	32.4	
03:30 - 03:45	26.5	21	43.7	22.3	28.8	

03:45 - 04:00	30.3	22.6	46.4	24.1	33	
04:00 - 04:15	29.5	22.5	43.8	23.9	32.6	
04:15 - 04:30	40.3	22	63.1	23.5	34.8	
04:30 - 04:45	32.4	22.9	46.3	26.3	35.3	
04:45 -05:00	51	25.5	74.7	28.6	40	
05:00 -05:15	44.4	24.6	67	28	36.8	
05:15 - 05:30	51.3	27.7	73.4	30.9	49.4	
05:30 - 05:45	52.4	29.2	75.2	32.5	47.4	
05:45 - 06:00	55.7	29.3	78.2	32.7	54.8	
06:00 - 06:15	50.4	29.8	72.8	32.5	49	
06:15 - 06:30	54.4	32.7	76.8	35.9	53.5	
06:30 - 06:45	56.5	34.1	81.1	36.6	57.4	
06:45 - 07:00	59.2	34.7	78.2	37.9	61.3	
Overall	50.1	19.9	83.2	22.3	41.5	

ML2– Road Traffic Noise (Unattended) – Adjacent to Ellens Road (Approx. 5m where Ellens road, Cross Road and Station Road meet)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
26/01/2017 - Daytime						
07:00-08:00	58.7	35.4	78	39	62.3	Dominant traffic noise from Cross Road. Railway noise also audible.
08:00-09:00	61.9	36.1	94.8	40.5	63.9	
09:00-10:00	61.6	34.3	91.2	37.9	61.7	
Overall	60.9	34.3	94.8	39	62.8	

ML3 – Adjacent to the western site boundary (Approx. 5m from Cross Road)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
26/01/2017 – Night time						
05:00-05:15	41.3	24.9	68.4	27.8	34.6	Dominant traffic noise from Cross Road. Railway noise also audible.
05:15-05:30	44.2	26.8	66.5	29.6	39.2	
05:30-05:45	46.9	29.4	72.6	31.6	39	
05:45-0:600	47.2	28.9	71.1	33.5	42	
06:00-06:15	44.4	29.8	69.9	31.7	40	
06:15-06:30	47.4	32.6	70.4	34.5	44.2	
06:30-06:45	50.7	33.6	74.3	35.7	49.4	
06:45-07:00	50.9	34	72.4	36.2	47.1	
Overall	47.6	24.9	74.3	31.0	42.9	

ML3 – Adjacent to the western site boundary (Approx. 5m from Cross Road)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
25/01/2017 - Daytime						
07:00-08:00	52.6	35.1	75.9	37.4	53.9	Dominant traffic noise from Cross Road. Railway noise also audible.
08:00-09:00	53.2	35.9	73.8	38.5	55.7	
09:00-10:00	53.1	34.1	76.8	36.6	52.2	
Overall	53	34.1	76.8	37.4	54.2	

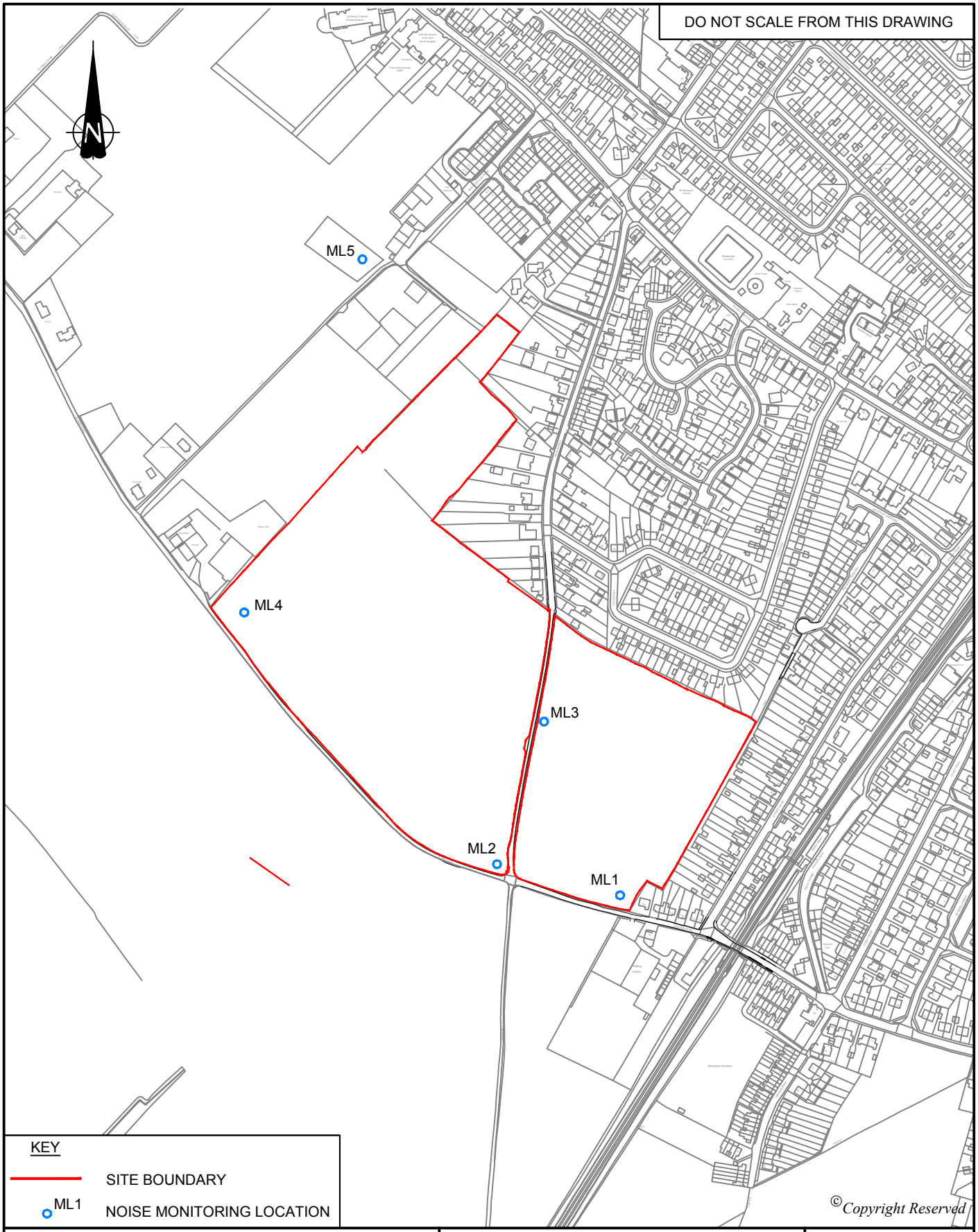
ML4 – Car dealership and Road Traffic Noise (Unattended) – Adjacent to Car dealership on the Western boundary and Ellens Road (Approx. 20m from Car dealership and Ellens road)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
25/01/2017 – Night time						
00:15 - 00:30	24.7	19.4	48.3	20.5	27.1	
00:30 - 00:45	28	19.3	49.7	20.6	30.7	
00:45 - 01:00	29.3	19	51.5	20.3	29.9	
01:00 - 01:15	35.8	19	55.5	20.7	32.3	
01:15 - 01:30	25.7	19.2	46.9	20.5	28.4	
01:30 - 01:45	30.7	19.3	47.9	21.1	31.3	
01:45 - 02:00	30.5	19.7	56.5	21.5	32	
02:00 - 02:15	27.6	20.8	47.3	22.3	30.9	
02:15 - 02:30	32.8	20.5	52.6	22.6	32.2	
02:30 - 02:45	30.3	20.6	50.1	22.6	32.3	
02:45 - 03:00	27.4	19.8	46.6	22	30.7	
03:00 - 03:15	30.6	20.2	48.6	22.3	32	
03:15 - 03:30	26.7	19.6	52.1	21	29.1	
03:30 - 03:45	33.2	19.3	56	21.1	32.6	
03:45 - 04:00	27.4	19.8	48.8	21.6	29.8	
04:00 - 04:15	28.1	19.7	49	21.6	31.6	
04:15 - 04:30	37.8	21.5	62.5	23.4	33.1	
04:30 - 04:45	27.3	20.1	47.6	22.1	30.4	
04:45 -05:00	26	19.6	46.8	21.5	28.7	
05:00 -05:15	27.2	19.9	57.7	21.8	29.4	
05:15 - 05:30	37.7	20.2	59.9	22.1	32.9	
05:30 - 05:45	33	21.3	51.8	23.5	34.5	
05:45 - 06:00	41.8	22	61.2	24.6	40.3	
06:00 - 06:15	35.9	22.2	55.9	24.4	36.6	
06:15 - 06:30	37.9	23.2	58.9	26	37	
06:30 - 06:45	43.7	24.3	64.2	27.3	40.1	
06:45 - 07:00	45.1	27	63.9	29.1	45.4	
Overall	36.2	19	64.2	21.6	32.9	

ML4 – Car dealership and Road Traffic Noise (Unattended) – Adjacent to Car dealership on the Western boundary and Ellens Road (Approx. 20m from Car dealership and Ellens road)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
26/01/2017 – Daytime						
07:00-08:00	49	28.5	74.4	32.1	51.8	Car entering and leaving site. Road traffic noise from Ellens Road.
08:00-09:00	49.6	28.9	68.6	33.1	54.3	
09:00-10:00	48.5	30.3	76.1	33	50.7	
10:00-11:00	44.2	30.1	65.8	32.7	47.5	
11:00-12:00	44.3	30.7	65.9	33.5	46.7	
12:00-13:00	45.7	30.6	64.8	33.4	48.7	
13:00-14:00	44.4	28.8	63.7	33.2	46.3	
14:00-15:00	45.1	29.5	63.7	32.6	47.9	
15:00-16:00	48	29.6	69.1	33.1	51.2	
16:00-17:00	48.6	32	70	35.3	52.8	
17:00-18:00	47.3	31.6	68	34.2	50.5	
18:00-19:00	45.3	30.6	63.2	33.1	47.4	
Overall	47.1	28.5	76.1	33.2	50.2	

ML5– Car repair shop – Opposite the entrance to the repair garage (Approx. 50m from Front of garage)						
Time	**L_{Aeq} (dB)**	**$L_{A\ min}$ (dB)**	**$L_{A\ max}$ (dB)**	**L_{A90} (dB)**	**L_{A10} (dB)**	**Comments**
09/02/2017 – Daytime						
13:46 – 14:01	43.8	38.2	63.5	39.6	45	Hand tools, car engines, heavy tools and cars entering and leaving the site.
14:01 – 14:16	42	37.5	58	39.3	43.5	
14:16 – 14:31	43.8	37.3	68.3	39.6	45.9	
14:31 – 14:46	43.5	37.9	65.9	39.9	44.7	
Overall	43.3	37.3	68.3	39.6	44.7	

DRAWINGS

DO NOT SCALE FROM THIS DRAWING



CLIENT: Gladman Developemnts Ltd	DRG No.: LE13820-001		REV:
PROJECT: Cross Road, Deal	SIZE: A4	SCALE: 1:5000@A4	DATE: 19-05-17
	DRAWN BY: DR	CHECKED BY: TD	APPROVED BY: CMD
DRAWING TITLE: Noise Monitoring Locations			

wardell armstrong

your earth our world

N:\LE\LE13820 - CROSS ROAD DEAL KENT\03 - DESIGN\AUTOCAD\LE13820-001 NOISE MONITORING LOCATIONS.DWG

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

BRISTOL
Desklodge
2 Redcliffe Way
Bristol
BS1 6NL

BURY ST EDMUNDS
6 Brunel Business Court
Eastern Way
Bury St Edmunds
Suffolk
IP32 7AJ
Tel: +44 (0)1284 765 210

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial
Estate Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Hyatt Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong