



HALLAM LAND MANAGEMENT LIMITED

Land At Newark Road, Sutton in Ashfield

Noise Assessment Report

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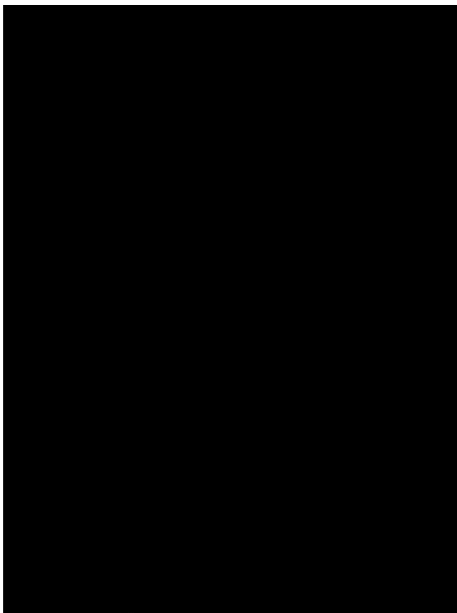
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EXECUTIVE SUMMARY

Wardell Armstrong LLP has carried out a noise assessment to accompany an outline planning application for a proposed residential development on Land at Newark Road, Sutton in Ashfield. This report supersedes the Land off Newark Road, Sutton in Ashfield Noise & Vibration Assessment Report that was prepared by Wardell Armstrong LLP in 2017 to accompany the 2017 outline planning application (planning ref. no. V/2017/0565).

The main sources of noise at the proposed development site are road traffic on Newark Road located to the north and Coxmoor Road to the east, and industrial noise at the industrial units located to the north.

Road traffic noise has been assessed against the guideline values suggested by Planning & Noise (Professional Practice Guidance on Planning & Noise, 2017) and the British Standard 8233:2014 Guidance on Sound Insulation and noise reduction for buildings. A Site Noise Risk Assessment has been carried out in accordance with ProPG showing that the majority of the site, in the southern and western areas will not need mitigation. Proposed receptors in the northern and eastern parts of the proposed development, near Newark Road and Coxmoor Road are at a low to medium risk of experiencing an adverse noise impact due to road traffic during both the day and night-time periods.

Industrial noise from the units located to the north has been assessed in accordance with British Standard 4142:2014+A1:2019 Methods for Rating & Assessing Industrial & Commercial Sound. Proposed receptors in the northern area of the site are at a low risk of an adverse impact due to industrial noise.

Outline mitigation measures for road traffic noise are set out in Section 6 of this report, which include the orientation of dwellings with gardens on the screened side of the dwellings, and a combination of double-glazing and alternative means of ventilation for facades facing Newark Road and Coxmoor Road. The proposed ventilation system would provide background ventilation and be capable of mitigating overheating within the proposed dwellings. Any mitigation requirements can be confirmed, on a plot-by-plot basis, once a detailed design layout is available.

Overall, future occupiers will not be exposed to unacceptably high levels of noise, and the proposed development will meet the appropriate external and internal noise standards during the daytime and night-time, with the use of normal methods of mitigation, in compliance with relevant planning policies and guidance.

1 INTRODUCTION

- 1.1.1 Wardell Armstrong LLP (WA) has been commissioned by Hallam Land Management Limited (HLML) to undertake a noise assessment for a proposed residential development on Land off Newark Road, Sutton in Ashfield. This report supersedes the Land off Newark Road, Sutton in Ashfield Noise & Vibration Assessment Report (Wardell Armstrong 2017) that was prepared to accompany the 2017 outline planning application (planning reference number V/2017/0565). The purpose of this report is to update the noise assessment to reflect current baseline noise levels and traffic flows at the site, as well as changes to planning policy and assessment guidance that have occurred since the original report was prepared.
- 1.1.2 The proposed development site is located to the southeast of the Town of Sutton in Ashfield. To the north, the site is bound by Newark Road (B6022) with industrial premises beyond. To the east, the site is bordered by Coxmoor Road (B6139) with open agricultural land and Sherwood Way South (B6139) beyond. To the south, the site is bordered by open agricultural land and residential premises adjacent to Coxmoor Road. To the west, the site is bordered by existing residential dwellings on Searby Road, and open agricultural land. The site currently comprises open agricultural land.
- 1.1.3 The proposed development comprises the construction of up to 300 residential dwellings and associated infrastructure over an area of 20 hectares (ha). The location of the site is shown on Figure 1.
- 1.1.4 WA originally carried out a noise assessment for the proposed development in 2017, which was prepared to accompany an outline planning application, and this noise assessment report provides an update to the earlier assessment. This report assesses the results of updated baseline noise monitoring in accordance with current guidance and includes recommendations for noise mitigation where appropriate.

2 ASSESSMENT METHODOLOGY

2.1.1 The following methodology has been used:

- A noise assessment is required to consider the potential effects of existing noise sources on the proposed residential development. The noise sources of concern are road traffic on Newark Road and Coxmoor Road and industrial noise from the units situated to the north.
- WA has carried out an attended and unattended noise survey to establish the current baseline noise levels experienced on the site.

2.1.2 In-line with current guidance, the scope of the noise assessment includes consideration of noise at the residential areas of the proposed development, specifically in terms of the potential impact of existing industrial and transportation noise. The noise assessment takes into account current guidance, including the following:

- National Planning Policy Framework, 2021 (NPPF).
- Planning Practice Guidance, Noise 2019 (PPG).
- Noise Policy Statement for England, 2010 (NPSE).
- ProPG Planning & Noise – Professional Practice Guidance on Planning & Noise, 2017 (ProPG).
- Acoustics Ventilation & Overheating (AVO) – Residential Design Guide, 2020.
- British Standard 8233:2014 Guidance on Sound Insulation and noise reduction for buildings (BS8233).
- British Standard 4142:2014+A1:2019 Methods for Rating & Assessing Industrial & Commercial Sound (BS4142).

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

2.2 Overheating

2.2.1 On sites where future dwellings are affected by transportation noise, occupants would require windows to be closed for some or all the time in order to reduce noise levels experienced and the need to keep windows closed some or all of the time may lead to an overheating condition in proposed dwellings. Therefore, in addition to whole dwelling ventilation requirements, this assessment includes an AVO assessment to consider the potential risk of overheating in the residential rooms of the development.

3 NOISE SURVEY

3.1 Introduction

3.1.1 Between the 7th and 9th March 2022, WA carried out a noise survey to measure existing ambient and background noise levels at the proposed development site.

3.1.2 Unattended noise measurements, supplemented with audio recordings, were taken between 11:40 hours on 7th March 2022 and 13:00 hours on 9th March 2022. Six monitoring locations (ML(s)) were selected to capture the noise from road traffic on Newark Road and Coxmoor Road, and noise from the industrial units to the north.

3.1.3 Table 1, below, details the noise monitoring periods at the monitoring locations (illustrated on Figure 1), together with associated observations undertaken during the installation and decommissioning of the noise monitor.

Table 1: Noise Monitoring Periods			
Monitoring Location	Start Date and Time	Finish Date and Time	Comments
ML1	12:12 07/03/22	12:12 08/03/22	The main source of noise was road traffic on Newark Road. Road traffic on Coxmoor road to the east could also be heard.
ML2	12:26 08/03/22	12:44 09/03/22	The main source of noise was road traffic on the Newark Road/Coxmoor Road cross junction. Owing to the presence of traffic lights, cars could be heard accelerating away from standing. Rustling of wind in trees and bird noise could also be heard.
ML3	12:00 08/03/22	12:25 09/03/22	The main source of noise was road traffic on Coxmoor Road. Bird noise could also be heard and rustling of wind in bushes.
ML4	13:00 08/03/22	13:01 09/03/22	The main source of noise was distant road traffic on Coxmoor Road. Rustling of wind in bushes could also be heard.
ML5	11:40 07/03/22	11:38 08/03/22	The main source of noise was road traffic on Newark Road to the north. Road Traffic noise could also be heard from Coxmoor Road to the east during lulls in traffic on Newark Road. No noise could be heard from industrial area to the north. Bird noise could be heard.
ML6	12:00 07/03/22	12:36 08/03/22	The main source of noise was road traffic on Coxmoor Road to the east. Newark Road could also be heard, but Coxmoor Road was dominant. Bird noise could also be heard.

3.1.4 The noise measurements were made using Class 1 integrating sound level meters, with the microphones mounted on a tripod set at 1.5 m above the ground and more than 3.5 m from any other reflecting surfaces. 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 in the calibration during the survey was noted.

3.1.5 A-weighted¹ L_{eqs}^2 were measured in accordance with current guidance. The maximum and minimum sound pressure levels, A-weighted L_{90s}^3 , A-weighted L_{10s}^4 were also measured to provide additional information. The measured noise levels are set out in full within Appendix B.

3.2 Meteorological Conditions

3.2.1 The weather conditions from the 7th to the 9th March 2022 were obtained on site during the noise survey and from the Weather Underground ('Wunderground') meteorological website. From the 7th to the 9th March 2022, the weather conditions were as follows:

- Temperatures between 0 and 13°C.
- Wind speed <5 m/s.
- Dry weather conditions.

3.3 Existing Noise Levels

3.3.1 Measured road traffic noise values at ML1, ML2 and ML3 are summarised in Table 2, below. ML4, ML5 and ML6 were used to measure background noise levels and industrial noise levels, also shown in Table 2. Daytime hours are taken to be 07:00 to 23:00 hours and night-time to be 23:00 to 07:00 hours. In accordance with ProPG, to establish a representative maximum noise level, the tenth highest maximum noise levels throughout the night-time period has been taken.

Noise Monitoring Location	Daytime dB(A) $L_{eq, 16hour}$	Night-time dB(A) L_{eq}	
		8hour	*Night-time dB(A) $L_{max,f}$
ML1	57	53	66
ML2	59	54	76
ML3	61	55	73
ML4	48	42	62
ML5	66	60	76
ML6	49	43	57

**In accordance with ProPG, the 10th highest $L_{Amax,f}$ level during the night-time has been selected.*

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_{eqs} 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.

3.4 Uncertainty

3.4.1 To reduce measurement uncertainty, the following steps have been taken:

- The background noise measurement location was selected to be representative of the background noise levels at the closest proposed receptors to the noise sources.
- In accordance with guidance, the sound level meters were mounted on tripods 1.5m above the ground. The monitoring locations were also more than 3.5m from any other reflecting surfaces.
- The noise measurements were taken during dry and calm weather conditions.
- The noise measurements were undertaken during representative daytime and night-time periods.
- The daytime and night-time background noise measurements were undertaken in accordance with the reference period required by BS4142.
- The results of each measurement period were reported to the nearest 0.1dB.
- Background noise measurements were made using Class 1 integrating sound level meters.

4 ROAD TRAFFIC NOISE ASSESSMENT

4.1 Site Noise Risk Assessment

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

4.1.2 A noise model was built in the noise modelling software SoundPLAN version 8.2. The noise model considers the existing undeveloped site and its surrounding environment. The propagation of noise across the site will be affected by the presence of proposed dwellings and, therefore, the model is only relevant for those dwellings closest to the noise source.

4.1.3 The model was calibrated using the measured data collected at ML1, ML2 and ML3 (shown in Table 2). The modelled values allow for predictions of existing noise levels across the site, and figures showing daytime $L_{Aeq,16hour}$, night-time $L_{Aeq,8hour}$ and night-time $L_{Amax,f}$ levels are included as Figures 2 to 4. The colouring on the figures shows the potential noise risk of noise from Newark Road and Coxmoor Road in accordance with ProPG:2017.

4.1.4 The existing noise levels across the site, derived from the modelling, at a height of 1.5m during the daytime and 4m (to represent 1st floor bedroom height) during the night-time are presented in Table 3, below. To assess the risk category of the site, the levels have been compared to guidance provided on *Figure 1, Stage 1 – Initial Site Noise Risk Assessment* of ProPG:2017.

Table 3: Initial Site Noise Risk Assessment Average Daytime and Night-time Noise Levels				
Risk Assessment Location	Daytime Noise Level Range (dB $L_{Aeq,16hr}$)	Daytime Risk of Adverse Effect	Night-time Noise Level Range (dB $L_{Aeq,8hr}$)	Night-time Risk of Adverse Effect
ML1	54-61	Low	42-59	Low to Medium
ML2	56-62	Low	43-60	Low to Medium
ML3	56- 63	Low	46-60	Low to Medium

4.1.5 The figures within Table 3 indicate that there is potential for proposed dwellings closest to Newark Road and Coxmoor Road to be at medium risk of experiencing an adverse noise impact due to road traffic. Further into the site, however, noise levels will be lower and the potential for an adverse noise impact is reduced.

4.1.6 In accordance with ProPG, where there are more than ten noise events at night with an $L_{Amax,f}$ higher than 60dB, a site should not be regarded as negligible risk. As shown

in Table 2 and Figure 4A, the $L_{Amax,f}$ level would be higher than 60dB and, as such, the potential noise impact at the site cannot be considered as a negligible risk. The SNRA, therefore, shows that local noise mitigation and good acoustic design is required for the areas of the site closest to the Newark Road and Coxmoor Road (in terms of road traffic noise).

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 by closing windows, 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 predicted at representative locations of dwellings closest to Newark Road and Coxmoor Road have been compared to the information provided in Table 3.2 of the AVO and the results are shown in Table 4, below.

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 Adverse Effect
ML1	57	Low	53	66	Medium
ML2	59	Medium	54	76	Medium
ML3	61	Medium	55	73	Medium
*10 th Highest event					

4.2.3 The figures within Table 4 indicate that during the daytime and night-time periods, proposed receptors adjacent to Newark Road and Coxmoor Road would be at a low to medium risk of an overheating condition.

4.2.4 When assessing an overheating risk, the AVO states a Level 2 assessment may be undertaken when the risk of overheating is identified as low or medium as part of the ORA. However, although a medium risk is predicted for proposed dwellings adjacent to Newark Road and Coxmoor Road, the development is located in a rural location in the north midlands that does not experience high temperatures very often and is unlikely to experience the urban 'heat island' effect and, therefore, unlikely to experience overheating.

4.2.5 The design of the development could reduce the risk of overheating with dual aspect dwellings to allow at least one façade with habitable rooms to be screened from road

noise on either Newark Road or Coxmoor Road. This will allow windows on the screened side to be open and reduce the risk of overheating.

- 4.2.6 It is, therefore, considered that a Level 2 assessment is not required. The risk of overheating should be reconsidered during the detailed design of the development and reviewed by a Mechanical and Electrical Engineer. Overheating risk is not considered further.

4.3 Acoustic Design Statement

- 4.3.1 The results from the ProPG:2017 Stage 1: Initial SNRA show that parts of the proposed development located near to Newark Road are at (up to) a medium risk of experiencing an adverse noise impact due to road traffic during the night-time periods. Parts of the site near Coxmoor Road are at up to a medium risk during both daytime and night-time periods.

BS8233 Assessment of Daytime Noise Levels in Outdoor Living Areas

- 4.3.2 The noise model has been used to determine the noise levels likely in outdoor living areas of dwellings in close proximity to the noise sources during the daytime period. Figure 2 shows the daytime noise levels across the whole site.
- 4.3.3 The calculated noise levels, together with the level of attenuation required to achieve the upper guideline of 55dB $L_{Aeq, 16hour}$ recommended in BS8233, during the daytime in outdoor living areas is summarised in Table 5, below.

Table 5: Average Daytime Noise Levels in Outdoor Living areas		
Residential Property Location	Noise Level (dB $L_{Aeq, 16}$ hour)	Level of Attenuation Needed to Achieve 55dB L_{Aeq} in Outdoor Living Areas
Proposed residential dwellings in the northern part of the site (i.e. ML2, approximately 12m from Newark Road, and 9m from Coxmoor Road).	59	4
Proposed residential dwellings in the eastern part of the site (i.e. ML3, approximately 11m from Coxmoor Road).	61	6
Proposed residential dwellings in the northern part of the site (i.e. ML1 approximately 10m from Newark Road).	57	2

- 4.3.4 The figures within Table 5 shows that, during the daytime, noise levels affecting the northern and eastern parts of the development site are above the upper guideline level of 55dB L_{Aeq} . Noise mitigation measures are, therefore, required for properties in these areas. The outdoor living areas of dwellings located further into the site will

be further from the roads and will be protected by the intervening dwellings and, therefore, will not require any mitigation measures.

Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

- 4.3.5 The daytime noise levels in noise sensitive rooms of the proposed dwellings located closest to Newark Road and Coxmoor Road have been assessed in accordance with BS8233 for living room and bedroom areas. The guideline daytime noise level within living rooms and bedrooms is 35 dB $L_{Aeq,16\text{ hour}}$.
- 4.3.6 The measured daytime noise levels have been used to determine the noise levels likely at facades of dwellings closest to and facing Newark Road and Coxmoor Road during the daytime period. Figure 2 shows the daytime $L_{Aeq, 16\text{hour}}$ noise levels across the whole, undeveloped site.
- 4.3.7 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 facades of the proposed dwellings. The calculated noise levels at the facades of the proposed dwellings located nearest to Newark Road and Coxmoor Road, together with the level of attenuation required to achieve 35dB $L_{Aeq, 16\text{hour}}$ in living rooms and bedrooms are summarised in Table 6, below.

Table 6: Façade Noise Level at Properties adjacent to Newark Road and Coxmoor Road and Level of Attenuation Required to Achieve the Internal Daytime Guideline Noise Level (dB(A))		
Residential Property Location	Noise Level at the Facade of the Property ($L_{eq, 16\text{hour}}$)	Level of Attenuation Needed to Achieve Guideline Noise Levels in Living Rooms and Bedrooms
Proposed residential dwellings in the northern part of the site (i.e. ML2, approximately 12m from Newark Road, and 9m from Coxmoor Road).	62	27
Proposed residential dwellings in the eastern part of the site (i.e. ML3, approximately 11m from Coxmoor Road).	64	29
Proposed residential dwellings in the northern part of the site (i.e. ML1, approximately 10m from Newark Road).	60	25

- 4.3.8 The results indicate that the noise sensitive rooms closest to and facing Newark Road and Coxmoor Road are likely to exceed guideline noise levels with windows open during the daytime. Those facades will, therefore, require mitigation measures to reduce the level of road traffic noise. Outline mitigation measures are discussed in Section 6 of this report.

4.3.9 The facades of dwellings located further into the site will be screened by the intervening buildings. It is, therefore, considered that the noise levels at these facades and the level of attenuation the facades would need (if any) to achieve 35dB L_{Aeq} in the living room and bedroom areas during the daytime will be less than those detailed in Table 6.

Assessment of Night-time Noise Levels in Bedrooms

4.3.10 The night-time noise levels in bedrooms of the proposed dwellings located closest to Newark Road and Coxmoor Road have been assessed in accordance with BS8233. The guideline noise level within bedroom areas is 30dB $L_{Aeq,8hour}$. In addition, individual noise events should not normally exceed 45dB $L_{Amax,f}$.

4.3.11 The measured night-time noise levels have been used to determine the noise levels likely at facades of dwellings closest to and facing Newark Road and Coxmoor Road, during the night-time. Figures 3 and 4 show the night-time $L_{Aeq,8hour}$ and night-time $L_{Amax,f}$ noise levels across the whole undeveloped site.

4.3.12 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 facades of the proposed dwellings. The calculated noise levels at the facades of the dwellings, together with the level of attenuation required to achieve 30dB $L_{Aeq,16hour}$ and 45dB $L_{Amax,f}$ in the bedrooms, are summarised in Table 7, below.

Table 7: Façade Noise Level at Properties adjacent to Newark Road and Coxmoor Road and Level of Attenuation required to Achieve the Internal Night-time Guidance Noise Levels (Figures in dB(A))			
Residential Property Location	Noise Level at the Façade of the Property ($L_{eq, 8hour}$)	Maximum Noise Level at the Façade of the Property ($L_{max,f}$)	Level of Attenuation Needed to Achieve the Noise Guideline Levels in Bedrooms
Proposed residential dwellings in the northern part of the site (i.e. ML2 approximately 12m from Newark Road, and 9m from Coxmoor Road).	57	79	34
Proposed residential dwellings in the eastern part of the site (i.e. ML3 approximately 11m from Coxmoor Road).	58	76	31
Proposed residential dwellings in the northern part of the site (i.e. ML1 approximately 10m from Newark Road).	56	72	27

- 4.3.13 The results indicate that the noise sensitive rooms closest to and facing Newark Road and Coxmoor Road are likely to exceed guideline noise levels with windows open during night-time period. Those facades will, therefore, require mitigation to minimise the impact of road traffic noise. Outline mitigation measures are discussed in Section 6 of this report.
- 4.3.14 The facades of dwellings located further into the site will be screened by the intervening buildings. It is, therefore, considered that the noise levels at these facades and the level of attenuation the facades would need to provide to achieve 30dB L_{Aeq} and 45dB L_{Amax} time in the living room and bedroom areas during the night will be less than those detailed in Table 7.

5 INDUSTRIAL NOISE ASSESSMENT

- 5.1.1 No industrial noise was observed at any time during the survey. The previous assessment, undertaken by WA in 2017, noted that industrial noise was not dominant during the survey and, at that time, an employee from the area of the industrial estate closest to the proposed development site confirmed that that area of the industrial estate is generally quiet. As such, an assessment of industrial noise in accordance with British Standard BS4142:2014 is not required to assess noise from the industrial estate closest to the site.
- 5.1.2 The 2017 assessment did, however, note that observations showed the industrial noise from the Ardagh Group premises, a metal and plastic packaging production site located 400 m to the north of the development site boundary, was audible on occasions. Therefore, to provide a robust assessment, an industrial noise assessment has been carried out in accordance with BS4142 to assess the impact of noise from the Ardagh Group premises on proposed sensitive receptors, using data from the 2017 assessment. The previous assessment used the same monitoring locations as this assessment and are labelled according.
- 5.1.3 The main source of noise was observed to be from mechanical plant during the manufacturing process. Night-time measurements were taken at ML1 in the 2017 survey to represent proposed receptors located in the northern part of the site. Background noise levels measured in the most recent survey have been used to assess industrial noise.

Selection of Specific Industrial Sound

- 5.1.4 The industrial noise was found to be just audible between 23:00-05:00 (05/04/17 06/04/17) in the absence of any traffic noise. The specific noise level is the level of industrial noise in the absence of any other noise sources. Using computer software, it was possible to extract the relevant specific noise level of 40dB L_{Aeq} from the ambient noise levels measured at ML1, located 10 m from Newark Road.

Rating level

Acoustic Feature Correction

- 5.1.5 BS4142 includes guidance on the application of an additional weighting that should be applied to the specific sound level should the industrial noise (experienced at proposed receptors) be tonal, impulsive or intermittent. Observations at the MLs during the survey allows for the identification of such characteristics.

5.1.6 Whilst the noise from the Ardagh Group premises was found not to contain any impulsive sounds and no weighting for impulsivity is required, the onsite observations did indicate that some of the noise could be perceived as tonal and, as such, a weighting of 2dB has been applied. No other characteristics are present in the noise and, therefore, no further noise weighting is required.

Selection of the Background Sound

5.1.7 Section 8 of BS4142 provides guidance on the selection of the background sound to be used in the assessment. BS4142 states that the background sound levels should be representative of the period being assessed (i.e. daytime or night-time periods) and that there is no ‘single’ background sound level. As such, an assessment of the measured background sound levels is required to select the most appropriate and representative background sound level.

5.1.8 An assessment has been carried out based upon the measured sound levels during only the night-time, as this was the only time period during which the industrial noise was heard. The background sound levels measured during the 2022 survey at ML5 were taken in the absence of any industrial noise. The measured background sound levels at this location are, therefore, representative of the development site. The analysis of the background sound levels is shown in **Appendix D** and demonstrates that representative sound levels have been chosen for the night-time period. Table 9, below, shows the selected background sound levels used in the assessment.

Table 8: Representative Background Sound Levels (Figures in dB)	
Monitoring Location	Night-time Background Sound Level (L_{A90,15min})
ML5	41

Comparison of the Background and Rating Levels

5.1.9 In accordance with BS4142, the rating levels of operations from the Ardagh Group premises at ML1 have been compared with the representative background sound levels, as shown in Table 10, below.

Table 9: Comparison of specific noise levels and background sound levels		
Description		Night-time
Specific Noise Level, L _{Aeq} (dB)		40
Acoustic Feature Correction	Tonality (dB)	+2
Calculated Rating Level		42
Measured Background Sound Level at ML5 L _{A90} (dB)		41
Excess of the rating level over the background sound level		+1

5.1.10 The figures in Table 10 indicate that noise levels from Ardagh Group will exceed the measured background noise level during the night-time by 1dB. BS4142 suggests that

this will create a low impact depending on the context. Further assessment of the context of the noise has, therefore, been undertaken to determine whether the noise levels are significant.

BS4142 Context Assessment

5.1.11 BS4142:2014 States the “...the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs”. The first requirement of this statement has been determined within the noise impact assessment section, above. In order to determine the context in which the industrial sound from Ardagh Group will reside, the following three factors must be considered:

- The absolute level of sound.
- The character and level of the specific sound.
- The sensitivity of the receptor.

Absolute Level of Sound

5.1.12 To determine the first context test in BS4142, it is necessary to determine whether the residual and background sound levels are ‘high’ or ‘low’.

Section 11 of BS4142 states that “...where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night. Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.”

5.1.13 As the night-time rating level of noise from Adargh Group and the background noise level are neither particularly ‘low’ or ‘high’, the difference between the rating level and background sound level is relevant in this case. As shown in Table 10, the rating level and background sound level are equal to each other. The noise impact is, therefore, considered to be **low**.

Character & Level of Residual Sound Compared with the Specific Sound

5.1.14 The residual noise level is 54dB during the night-time and the specific noise level is 40dB. The 14dB L_{Aeq} difference between the two indicates that the industrial noise is not likely to be readily distinguishable and is unlikely to be audible. The impact of the industrial noise is, therefore, likely to be **low**.

Sensitivity of Receptor

With regard to pertinent factors to be taken into consideration, Section 11 of BS4142 states that “...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, such as: i) facade insulation treatment; ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and iii) acoustic screening.”

5.1.15 At this stage in the development, the extent of façade insulation, ventilation and acoustic screening that will be provided to mitigate traffic noise is not known. The traffic noise will affect a similar part of the development that could potentially be affected by industrial noise and, therefore, the mitigation would also reduce any industrial noise levels. In order to provide a robust assessment, however, no additional mitigation measures have been assumed.

Summary of BS4142 Assessment in relation to the context

5.1.16 The results of the BS4142, when considered in relation to the context assessment, indicate that noise levels from Adragh Group premises will cause a **low** impact at receptors (the lowest category set out in BS4142) during the night-time and, as such, mitigation measures will not be required.

6 OUTLINE MITIGATION MEASURES

6.1 Introduction

6.1.1 At this outline planning stage, the exact locations of the dwellings are unknown and mitigation measures are recommended in outline terms, only.

6.2 Road Traffic

Daytime Noise Levels in Outdoor Living Areas

6.2.1 The noise levels, as detailed in Table 5 and shown on Figure 2, indicate that outdoor living areas in the north, north-eastern and eastern parts of the site (closest to Newark Road and Coxmoor Road) will require mitigation in order to achieve the daytime noise guideline level of 55dB L_{Aeq} .

6.2.2 To achieve noise guideline levels in properties nearest to Newark Road and Coxmoor Road, it is recommended that gardens are located on the screened side of dwellings, with localised close boarded fencing used around garden areas, where required. With these mitigation measures in place, all plots will meet the guidance level of 55dB $L_{Aeq, 16hour}$ suggested by BS8233 for outdoor living areas.

6.2.3 It should be noted that the final mitigation measures will depend upon the final layout of the site and mitigation requirements can be confirmed on a plot-by-plot basis once a detailed design layout is available.

Daytime and Night-time levels in Living Rooms and Bedrooms

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

6.2.5 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 façade area. To calculate the overall attenuation provided by this percentage of glazing in a brick or block façade, a non-uniform partition calculation can be used.

6.2.6 The calculation combines the different degrees of attenuation of the wall element and the window element. A façade element comprising a standard modern solid brick or block work construction will typically attenuate by 50-55dB (BS8233 Table E1.A)

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 between 32dB(A) and 35dB(A).

- 6.2.7 The noise attenuation requirements for proposed noise sensitive living room and bedroom facades nearest to Newark Road and Coxmoor Road are summarised in Table 6 (page 11) and Table 7 (page 12). The requirements indicate that standard thermal double glazing should ensure that, for those dwellings located closest to Newark Road and Coxmoor Road, internal noise levels are met with the windows closed. With windows open, however, the attenuation provided by the façade will be approximately 13dB(A). This would potentially allow the recommended internal noise guideline levels to be exceeded in some living rooms and bedrooms closest to and facing both Newark Road and Coxmoor Road.

On occasion, this may be acceptable to a resident, but when quiet conditions are required, the resident should be able to close windows whilst maintaining adequate ventilation. Therefore, depending on the final location of proposed dwellings, a double-glazing scheme combined with an alternative method of ventilation would be required for sensitive rooms in those dwellings closest to and facing both Newark Road and Coxmoor Road.

- 6.2.8 It is recommended that the ventilation proposed at the site should 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' as a minimum.
- 6.2.9 Living rooms and bedrooms located on the screened side of the dwellings, facing away from Newark Road and Coxmoor Road, and all facades further into the site, are likely to meet the guideline noise levels even with windows open.
- 6.2.10 Glazing and ventilation requirements can be confirmed on a plot-by-plot basis once a detailed design layout is available.

7 CONCLUSIONS

- 7.1.1 Wardell Armstrong LLP has carried out a noise assessment to accompany an outline planning application for a proposed residential development on Land at Newark Road, Sutton in Ashfield. This has identified that the noise sources that may potentially affect the residents of the proposed residential development are road traffic on Newark Road and Coxmoor Road, and noise from the industrial units located to the north.
- 7.1.2 Road traffic noise levels have been assessed against the guideline values suggested by ProPG and BS8233. The SNRA (carried out in accordance with ProPG) shows that proposed receptors in the northern and eastern parts of the proposed development, near Newark Road and Coxmoor Road, are at a low to medium risk of experiencing an adverse noise impact due to road traffic noise during the day and night-time periods, with no mitigation in place. Industrial noise from the units to the north of the site are expected to have no more than a low impact on the proposed development and will likely be inaudible.
- 7.1.3 Recommended (outline) mitigation measures for road noise are set out in Section 6 of this report. Mitigation along the northern and eastern edges of the site includes placing gardens on the screened side of dwellings to meet outdoor living area noise guidelines. To protect internal amenity, sensitive rooms closest to and facing Newark Road and Coxmoor Road would require an alternative means of ventilation to allow windows to be closed and suitable level of ventilation to be maintained. The proposed ventilation system would provide background ventilation and be capable of mitigating overheating within the proposed dwellings. Final mitigation requirements can be confirmed on a plot-by-plot basis once a detailed design layout is available.

APPENDIX A
Noise Legislation and Guidance

Appendix A: Noise Legislation and Guidance

National Planning Policy Framework

- B.1 In July 2021 the 'National Planning Policy Framework' (NPPF) was amended as the current planning policy guidance within England.
- B.2 Paragraph 185 of the NPPF states:
- B.3 'Planning policies and decisions should also ensure that new development is appropriate for its location taking in 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 impact that could arise from the development. In doing so they should:
- B.4 Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impact on health and the quality of life;
 - B.5 Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'...
- B.6 Paragraph 187 of the NPPF states:
- B.7 "Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

Noise Policy Statement for England

- B.8 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.’

B.9 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

B.10 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.

B.11 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.

B.12 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.

B.13 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.

National Planning Practice Guidance Noise Exposure Hierarchy			
Perception	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

B.14 The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

“Neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement) expects noise to be considered

in isolation, separate from the economic, social and other environmental dimensions of proposed development.”

BS8233 Guidance on sound insulation and noise reduction for buildings

B.15 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:

B.16 “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.”

B.17 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.”

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

B.18 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.

B.19 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.

B.20 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.

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

B.21 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.

B.22 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 existing, 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.

B.23 The purpose of the BS4142 assessment procedure is to assess the significance of sound of an industrial and/or commercial nature.

B.24 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 the existing industrial premises. The 'specific noise' levels, of the existing industrial premises that have been measured are detailed in this report.

B.25 BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level (L_{A90}). This report provides details of the measured or calculated background noise levels.

B.26 Section 8 of BS4142 discusses ways to determine the background sound level, in Section 8.1 it states;

'Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.'

B.27 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'.

B.28 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.

B.29 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.

B.30 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.

AVO: Acoustics, Ventilation and Overheating Residential Design Guide

- B.31 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:
- B.32 • Stage 1: Site Risk Assessment
- B.33 • Stage 2: Detailed Assessment of Adverse Effect
- B.34 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 Survey Results

ML5 Daytime Results 07/03/2022 - 08/03/2022				
Date and time	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
	(dB)	(dB)	(dB)	(dB)
07/03/2022 12:00	65.77	81.29	69.3	51.7
07/03/2022 13:00	65.87	86.33	69.2	52.9
07/03/2022 14:00	66.55	88.87	69.6	53.8
07/03/2022 15:00	66.63	79.61	69.8	54.7
07/03/2022 16:00	67.85	77.78	70.5	60.6
07/03/2022 17:00	67.65	77.06	70.6	57.1
07/03/2022 18:00	67.07	94.76	69.9	52.8
07/03/2022 19:00	64.81	85.32	69	50.2
07/03/2022 20:00	63	77.2	68	45.7
07/03/2022 21:00	62.01	80.27	67	44.1
07/03/2022 22:00	61.81	77.27	67	44.2
08/03/2022 07:00	67.23	81.77	70.5	54.6
08/03/2022 08:00	67.4	77.02	70.2	57.5
08/03/2022 09:00	65.59	78.18	69.3	52.1
08/03/2022 10:00	64.76	78.3	68.6	51.2
Overall	65.9	94.76	69.6	50.3

ML5 Night time Results 07/03/2022 - 08/03/2022				
Date and time	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
	(dB)	(dB)	(dB)	(dB)
07/03/2022 23:00	57.39	72.61	61.1	40.9
07/03/2022 23:15	55.98	72.81	56.2	37.7
07/03/2022 23:30	54.94	72.23	54	37.3
07/03/2022 23:45	55.99	74.83	53.5	38.8
08/03/2022 00:00	53.65	72.41	51	37.7
08/03/2022 00:15	53.18	71.66	50.3	36.9
08/03/2022 00:30	53.1	73.27	45.7	35.4
08/03/2022 00:45	50.05	74.44	46.6	35.2
08/03/2022 01:00	54.83	71.58	51.7	34.7
08/03/2022 01:15	50.8	72.64	45.7	34.5
08/03/2022 01:30	52.92	74.3	47.7	34.1
08/03/2022 01:45	46.68	70.27	41.7	33.5
08/03/2022 02:00	52.85	73.4	47.5	35.1
08/03/2022 02:15	51.88	76.14	45.2	34.2
08/03/2022 02:30	54.19	72.67	50.9	34.9
08/03/2022 02:45	49.65	69.59	46.2	33.8
08/03/2022 03:00	53.5	72.74	49	34.8
08/03/2022 03:15	49.86	72.12	46.4	36.9
08/03/2022 03:30	52.11	72.34	49.4	38.1
08/03/2022 03:45	54.98	73.23	51.9	36.4
08/03/2022 04:00	56.25	78.47	54.1	36.5
08/03/2022 04:15	55.66	74.73	56.6	39
08/03/2022 04:30	57.24	72.55	59.8	40.2
08/03/2022 04:45	59.83	77.42	64.6	43.8
08/03/2022 05:00	60.65	76.58	65.7	42.7
08/03/2022 05:15	63.03	80.49	67.7	47
08/03/2022 05:30	64.86	74.76	69.5	49.2
08/03/2022 05:45	64.34	75.65	69.1	49.3

08/03/2022 06:00	64.3	77.2	69.4	48.1
08/03/2022 06:15	64.44	75.18	69.3	49.7
08/03/2022 06:30	65.2	77.22	69.6	51.6
08/03/2022 06:45	66.48	87.64	69.7	51.7
Overall	59.6	87.64	64.3	36

Start date & time	Lmax
07/03/2022 23:00	69.78
07/03/2022 23:01	69.53
07/03/2022 23:02	69.42
07/03/2022 23:03	69.33
07/03/2022 23:04	70.03
07/03/2022 23:05	68.31
07/03/2022 23:06	68.66
07/03/2022 23:07	70.22
07/03/2022 23:08	72.61
07/03/2022 23:09	44.54
07/03/2022 23:10	71.21
07/03/2022 23:11	53.27
07/03/2022 23:12	72.05
07/03/2022 23:13	51.11
07/03/2022 23:14	66.66
07/03/2022 23:15	71.2
07/03/2022 23:16	67.69
07/03/2022 23:17	71.05
07/03/2022 23:18	68.11
07/03/2022 23:19	69.74
07/03/2022 23:20	72.81
07/03/2022 23:21	52.32
07/03/2022 23:22	67.63
07/03/2022 23:23	55.22
07/03/2022 23:24	70.89
07/03/2022 23:25	70.26
07/03/2022 23:26	66.8
07/03/2022 23:27	54.91
07/03/2022 23:28	67.11
07/03/2022 23:29	52.69
07/03/2022 23:30	67.51
07/03/2022 23:31	56.91
07/03/2022 23:32	70.66
07/03/2022 23:33	57.44
07/03/2022 23:34	66.89
07/03/2022 23:35	52.3
07/03/2022 23:36	68.92
07/03/2022 23:37	68.61
07/03/2022 23:38	72.23
07/03/2022 23:39	54.05
07/03/2022 23:40	68.45
07/03/2022 23:41	46.05
07/03/2022 23:42	71.11

07/03/2022 23:43	70.17
07/03/2022 23:44	43.69
07/03/2022 23:45	45.6
07/03/2022 23:46	50.3
07/03/2022 23:47	72.49
07/03/2022 23:48	71.49
07/03/2022 23:49	72.01
07/03/2022 23:50	48.4
07/03/2022 23:51	52.58
07/03/2022 23:52	72.73
07/03/2022 23:53	70.56
07/03/2022 23:54	52.01
07/03/2022 23:55	74.83
07/03/2022 23:56	51.48
07/03/2022 23:57	68.95
07/03/2022 23:58	69.5
07/03/2022 23:59	54.88
08/03/2022 00:00	70.12
08/03/2022 00:01	51.97
08/03/2022 00:02	52.13
08/03/2022 00:03	55.72
08/03/2022 00:04	72.41
08/03/2022 00:05	57.14
08/03/2022 00:06	69.27
08/03/2022 00:07	54.07
08/03/2022 00:08	68.08
08/03/2022 00:09	52.78
08/03/2022 00:10	48.37
08/03/2022 00:11	47.5
08/03/2022 00:12	41.91
08/03/2022 00:13	68.25
08/03/2022 00:14	53.54
08/03/2022 00:15	69.79
08/03/2022 00:16	62.48
08/03/2022 00:17	64.61
08/03/2022 00:18	68.04
08/03/2022 00:19	56.03
08/03/2022 00:20	71.06
08/03/2022 00:21	43.77
08/03/2022 00:22	50.52
08/03/2022 00:23	49.42
08/03/2022 00:24	40.98
08/03/2022 00:25	40.69
08/03/2022 00:26	41.2
08/03/2022 00:27	48.38
08/03/2022 00:28	46.21
08/03/2022 00:29	71.66
08/03/2022 00:30	73.27
08/03/2022 00:31	62.89
08/03/2022 00:32	45

08/03/2022 00:33	72.12
08/03/2022 00:34	54.75
08/03/2022 00:35	40.76
08/03/2022 00:36	39.74
08/03/2022 00:37	38.72
08/03/2022 00:38	38.57
08/03/2022 00:39	51.47
08/03/2022 00:39	45.39
08/03/2022 00:40	42.88
08/03/2022 00:41	40.05
08/03/2022 00:42	44.95
08/03/2022 00:43	71.11
08/03/2022 00:44	52.76
08/03/2022 00:45	53.48
08/03/2022 00:46	48.24
08/03/2022 00:47	40.64
08/03/2022 00:48	50.58
08/03/2022 00:49	45.73
08/03/2022 00:50	47.57
08/03/2022 00:51	49.33
08/03/2022 00:52	54.51
08/03/2022 00:53	53.23
08/03/2022 00:54	47.43
08/03/2022 00:55	55.77
08/03/2022 00:56	43.15
08/03/2022 00:57	49.43
08/03/2022 00:58	74.44
08/03/2022 00:59	65.21
08/03/2022 01:00	70.55
08/03/2022 01:01	56.75
08/03/2022 01:02	40.66
08/03/2022 01:03	70.79
08/03/2022 01:04	53.43
08/03/2022 01:05	71.25
08/03/2022 01:06	70.38
08/03/2022 01:07	47.23
08/03/2022 01:08	46.87
08/03/2022 01:09	51.79
08/03/2022 01:10	71.21
08/03/2022 01:11	54.65
08/03/2022 01:12	51.85
08/03/2022 01:13	71.58
08/03/2022 01:14	67.04
08/03/2022 01:15	66.48
08/03/2022 01:16	65.12
08/03/2022 01:17	51.87
08/03/2022 01:18	50.81
08/03/2022 01:19	41.48
08/03/2022 01:20	39.64
08/03/2022 01:21	39.27

08/03/2022 01:22	52.77
08/03/2022 01:23	44.47
08/03/2022 01:24	72.64
08/03/2022 01:25	41.42
08/03/2022 01:26	70.7
08/03/2022 01:27	71.63
08/03/2022 01:28	67.34
08/03/2022 01:29	69.56
08/03/2022 01:30	39.98
08/03/2022 01:31	36.78
08/03/2022 01:32	40.39
08/03/2022 01:33	69.55
08/03/2022 01:34	59.68
08/03/2022 01:35	53.21
08/03/2022 01:36	74.3
08/03/2022 01:37	43.32
08/03/2022 01:38	44.32
08/03/2022 01:39	40.96
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08/03/2022 01:43	48.73
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08/03/2022 01:45	40.31
08/03/2022 01:46	41.48
08/03/2022 01:47	42.22
08/03/2022 01:48	50.77
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08/03/2022 01:50	65.32
08/03/2022 01:51	35.5
08/03/2022 01:52	39.89
08/03/2022 01:53	47.33
08/03/2022 01:54	70.27
08/03/2022 01:55	42.41
08/03/2022 01:56	43.24
08/03/2022 01:57	49.67
08/03/2022 01:58	40.05
08/03/2022 01:59	68.97
08/03/2022 02:00	73.4
08/03/2022 02:01	43.49
08/03/2022 02:02	44.89
08/03/2022 02:03	67.54
08/03/2022 02:04	60.68
08/03/2022 02:05	67.97
08/03/2022 02:06	42.14
08/03/2022 02:07	41.33
08/03/2022 02:08	42.73
08/03/2022 02:09	46.98
08/03/2022 02:10	55.59
08/03/2022 02:11	72.46

08/03/2022 02:12	44.79
08/03/2022 02:13	43.63
08/03/2022 02:14	42.09
08/03/2022 02:15	43.45
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08/03/2022 02:17	67.87
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08/03/2022 02:25	42.59
08/03/2022 02:26	37.95
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08/03/2022 02:30	44.1
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08/03/2022 02:33	69.94
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08/03/2022 02:35	49.1
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08/03/2022 02:38	69.98
08/03/2022 02:39	72.67
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08/03/2022 02:41	43.2
08/03/2022 02:42	51.56
08/03/2022 02:43	52.48
08/03/2022 02:44	68.77
08/03/2022 02:45	60.56
08/03/2022 02:46	44.33
08/03/2022 02:47	44.28
08/03/2022 02:48	40.87
08/03/2022 02:49	62.31
08/03/2022 02:50	63.53
08/03/2022 02:51	63.24
08/03/2022 02:52	53.5
08/03/2022 02:53	48.55
08/03/2022 02:54	69.59
08/03/2022 02:55	58.75
08/03/2022 02:56	53.75
08/03/2022 02:57	37.68
08/03/2022 02:58	48.65
08/03/2022 02:59	66.36
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08/03/2022 03:01	66.45

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08/03/2022 03:15	55.4
08/03/2022 03:16	41.4
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08/03/2022 03:23	46.25
08/03/2022 03:24	45.54
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08/03/2022 03:26	68.99
08/03/2022 03:27	46.76
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08/03/2022 03:30	45.65
08/03/2022 03:31	45.31
08/03/2022 03:32	67.08
08/03/2022 03:33	50.23
08/03/2022 03:34	72.34
08/03/2022 03:35	70.36
08/03/2022 03:36	61.4
08/03/2022 03:37	49.63
08/03/2022 03:38	54.27
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08/03/2022 03:41	43.95
08/03/2022 03:42	56.53
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08/03/2022 03:45	41.04
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08/03/2022 03:47	46.45
08/03/2022 03:48	67.54
08/03/2022 03:49	45.58
08/03/2022 03:50	54.83
08/03/2022 03:51	73.23

08/03/2022 03:52	72.38
08/03/2022 03:53	70
08/03/2022 03:54	69.74
08/03/2022 03:55	46.15
08/03/2022 03:56	63.23
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08/03/2022 04:40	72.38
08/03/2022 04:41	51.11

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08/03/2022 04:45	55.47
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08/03/2022 04:47	73.19
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08/03/2022 04:49	77.42
08/03/2022 04:50	70.51
08/03/2022 04:51	71.95
08/03/2022 04:52	69.37
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08/03/2022 05:05	49.37
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08/03/2022 05:10	71.49
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08/03/2022 05:14	73.07
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08/03/2022 05:17	71.95
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08/03/2022 05:24	71.78
08/03/2022 05:25	69.81
08/03/2022 05:26	71.18
08/03/2022 05:27	73.53
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08/03/2022 05:29	71.51
08/03/2022 05:30	67.99
08/03/2022 05:31	72.21

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08/03/2022 05:33	72.53
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08/03/2022 05:35	74.74
08/03/2022 05:36	69.42
08/03/2022 05:37	74.44
08/03/2022 05:38	71.18
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08/03/2022 05:48	72.97
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08/03/2022 05:59	71.79
08/03/2022 06:00	70.87
08/03/2022 06:01	72.95
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08/03/2022 06:04	77.2
08/03/2022 06:05	71.74
08/03/2022 06:06	75.43
08/03/2022 06:07	74.8
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08/03/2022 06:09	73.15
08/03/2022 06:10	71.78
08/03/2022 06:11	71.67
08/03/2022 06:12	72.13
08/03/2022 06:13	72.21
08/03/2022 06:14	71.95
08/03/2022 06:15	74.29
08/03/2022 06:16	75.18
08/03/2022 06:17	70.86
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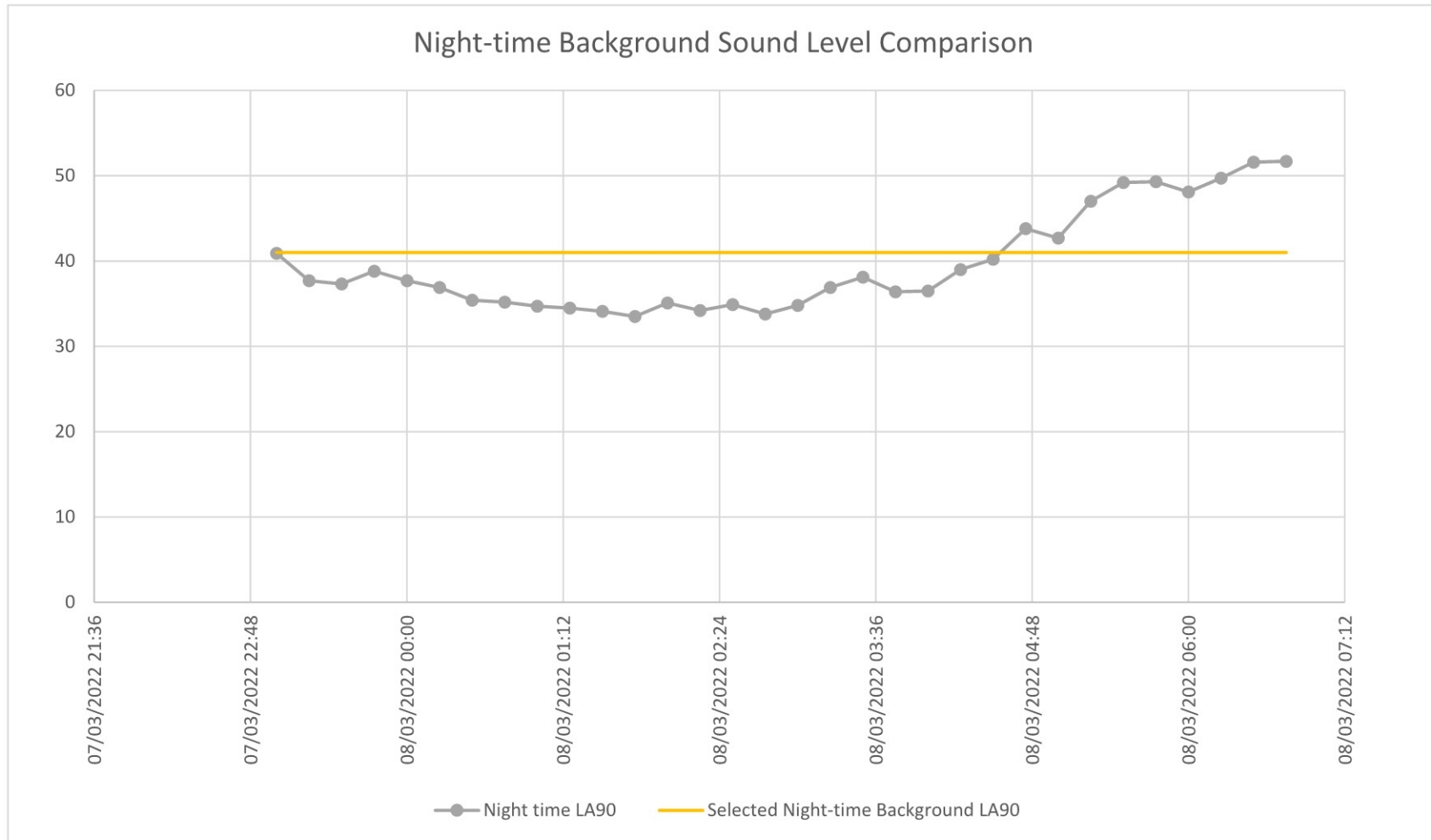
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08/03/2022 06:27	72.36
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08/03/2022 06:29	71.39
08/03/2022 06:30	72
08/03/2022 06:31	71.81
08/03/2022 06:32	73.04
08/03/2022 06:33	72.38
08/03/2022 06:34	77.22
08/03/2022 06:35	74.39
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08/03/2022 06:48	73.47
08/03/2022 06:49	87.64
08/03/2022 06:50	71.29
08/03/2022 06:51	72.37
08/03/2022 06:52	71.97
08/03/2022 06:53	72.4
08/03/2022 06:54	72.75
08/03/2022 06:55	77.94
08/03/2022 06:56	76.02
08/03/2022 06:57	71.97
08/03/2022 06:58	71.76

10th highest event 76.14

APPENDIX C

Selection of the Background Sound Level

Appendix D - Selection of the background sound level - ML5



FIGURES



KEY

- Site Boundary
- Noise Monitoring Locations

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD

CLIENT	HALLAM LAND MANAGEMENT LIMITED
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PROJECT	NEWARK ROAD
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DRAWING TITLE	FIGURE 1 - NOISE MONITORING LOCATION PLAN
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DRG No.	ST19319-002	REV	A	
DRG SIZE	A3	SCALE	1:3,000	DATE
				26/04/2022
DRAWN BY	EF	CHECKED BY	COB	APPROVED BY
				SU



- NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
- BIRMINGHAM
 - BOLTON
 - CARDIFF
 - CARLISLE
 - EDINBURGH
 - GLASGOW
 - LONDON
 - MANCHESTER
 - SHEFFIELD
 - STOKE ON TRENT





Key

- Site Boundary
- Existing Buildings
- Road

Daytime L_{Aeq} dB

- <= 50.0
- 50.0 - 55.0
- 55.0 - 60.0
- > 60.0

CLIENT: HALLAM LAND MANAGEMENT LIMITED

PROJECT: ST19319 - Newark Road

TITLE: Figure 2 - Daytime Noise Contours Across the Proposed Site

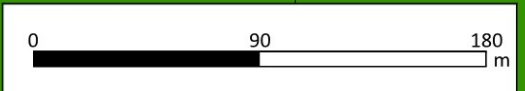
DRG NO: ST19319/002	REV: A
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DRG SIZE: A3	SCALE: 1:3000	DATE: 26/04/2022
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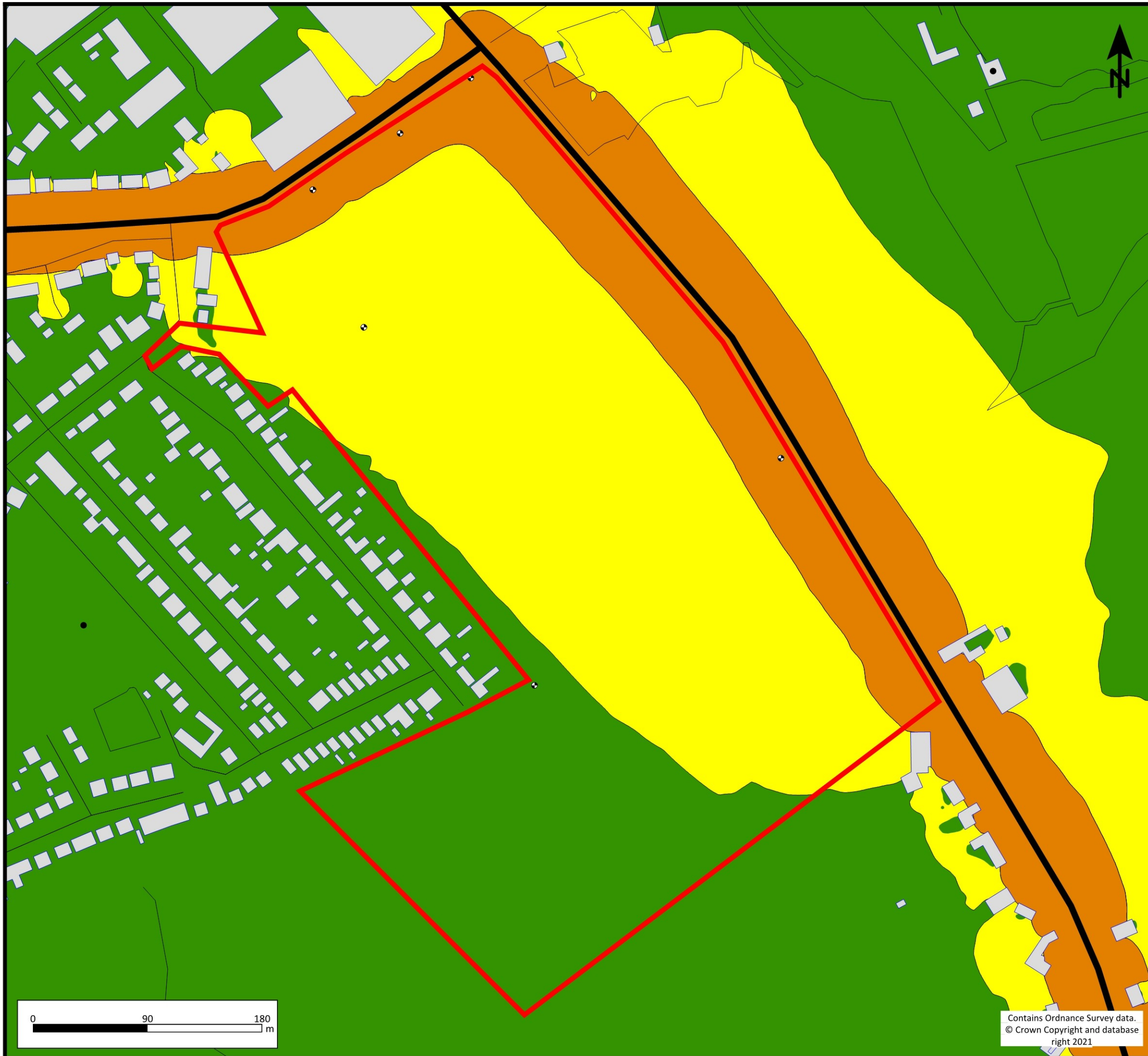
DRAWN BY: CO	CHECKED BY: EF	APPROVED BY: SU
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NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM

<input type="checkbox"/> BIRMINGHAM	<input type="checkbox"/> GLASGOW
<input type="checkbox"/> BOLTON	<input type="checkbox"/> LONDON
<input type="checkbox"/> CARDIFF	<input type="checkbox"/> MANCHESTER
<input type="checkbox"/> CARLISLE	<input type="checkbox"/> SHEFFIELD
<input type="checkbox"/> EDINBURGH	<input type="checkbox"/> STOKE ON TRENT



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Key

- Site Boundary
- Existing Buildings
- Road

Night time L_{Aeq} dB

- ≤ 40.0
- 40.0 - 50.0
- 50.0 - 60.0
- > 60.0

CLIENT: HALLAM LAND MANAGEMENT LIMITED

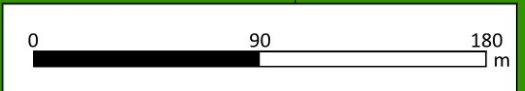
PROJECT: ST19319 - Newark Road

TITLE: Figure 3 - Night time Noise Contours Across the Proposed Site

DRG NO: ST19319/003	REV: A
---------------------	--------

DRG SIZE: A3	SCALE: 1:3000	DATE: 12/04/2022
--------------	---------------	------------------

DRAWN BY: CO	CHECKED BY: EF	APPROVED BY: SU
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<input type="checkbox"/> BIRMINGHAM	<input type="checkbox"/> GLASGOW
<input type="checkbox"/> BOLTON	<input type="checkbox"/> LONDON
<input type="checkbox"/> CARDIFF	<input type="checkbox"/> MANCHESTER
<input type="checkbox"/> CARLISLE	<input type="checkbox"/> SHEFFIELD
<input type="checkbox"/> EDINBURGH	<input type="checkbox"/> STOKE ON TRENT



Key

- Site Boundary
- Existing Buildings
- Road

Night time L_{max} dB

- <= 60.0
- 60.0 - 70.0
- 70.0 - 80.0
- > 80.0

CLIENT: HALLAM LAND MANAGEMENT LIMITED

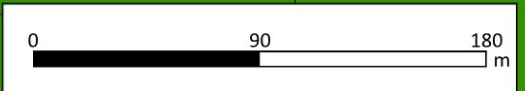
PROJECT: ST19319 - Newark Road

TITLE: Figure 4 - Night time Maximum Noise Contours Across the Undeveloped Site

DRG NO: ST19319/004	REV: A
---------------------	--------

DRG SIZE: A3	SCALE: 1:3000	DATE: 12/04/2022
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DRAWN BY: EF	CHECKED BY: EF	APPROVED BY: SU
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<input type="checkbox"/> BIRMINGHAM	<input type="checkbox"/> GLASGOW
<input type="checkbox"/> BOLTON	<input type="checkbox"/> LONDON
<input type="checkbox"/> CARDIFF	<input type="checkbox"/> MANCHESTER
<input type="checkbox"/> CARLISLE	<input type="checkbox"/> SHEFFIELD
<input type="checkbox"/> EDINBURGH	<input type="checkbox"/> STOKE ON TRENT

STOKE-ON-TRENT

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

BIRMINGHAM

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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

Desk Lodge
2 Redcliffe Way
Bristol
BS1 6NL
Tel: +44 (0)117 203 4477

BURY ST EDMUNDS

Armstrong House
Lamdin Road
Bury St Edmunds
Suffolk
IP32 6NU
Tel: +44 (0)1284 765 210

CARDIFF

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

CARLISLE

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Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
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EDINBURGH

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

GLASGOW

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Glasgow
G1 2EU
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LEEDS

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Leeds
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LONDON

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TRURO

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Wheal Jane Earth Science Park
Baldhu
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